

SOLUTIONS

PROJECT HIGHLIGHTS

Kwik Bond 1121 Polyester Polymer Concrete (PPC) Overlay

<http://www.mdt.mt.gov/research/projects/kwikbond.shtml>

This new experimental project involves a bridge deck rehabilitation system using an engineered composite polyester polymer concrete overlay system that, per the manufacturer's information, can rehabilitate ride defects; seal out moisture, oxygen and chloride ions from permeating into the deck; and return traffic in two hours (based on thickness of overlay) at temperatures down to 40°F.

The Kwik Bond 1121 Polyester Polymer Concrete (PPC) overlay was applied in 2014 on three (3) bridge decks, located in Stillwater County, for the purpose of extending the life of the deck and restoring the integrity of the skid resistance. Overlay thickness averaged 1.25" (3.2 cm). A High Molecular Weight Methacrylate (HMWM) sealer base coat was applied prior to the overlay application.

The paving process involved one pass, relocation of the slip form paver to the other prepared deck, and then another paving pass; this allows the previous PPC application to cure (average 3-4 hours). The next step was to move back to the original deck and proceed with another pass. This process was repeated until the decks received the full PPC treatment.



RESEARCH PROGRAMS

Fall 2014

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The three decks will be monitored for wear and pavement condition for a minimum of five years.

Additional information can be found on the project web page (<http://www.mdt.mt.gov/research/projects/kwikbond.shtml>), or by contacting Craig Abernathy (cabernathy@mt.gov or 406.444.6269).

High Friction Surface Bridge Deck Treatments (HFSTs)

High Friction Surface Treatments (HFSTs) are pavement surfacing systems that provide skid-resistant properties not typically associated with conventional materials. The spot application of a thin layer of durable, high friction aggregates as a topping on specially engineered resin or a polymer binder affords long-lasting traction (as stated by manufacturer information), while making the overlay much more resistant to wear and polishing.

In an effort to validate the added friction and durability claims, the Montana Department of Transportation (MDT) constructed an experimental project in 2014 applying this treatment on three decks located in Roundup, Big Timber, and Kalispell.

The Kalispell and Roundup sites were constructed by the vendor Poly-Carb Mark using their 135 Safe-T-Seal as an initial crack seal repair, followed by the application of their 163 Flexogrid Overlay System.

The Big Timber Site was managed by the contractor Z & Z Asphalt Inc. with the vendor Dayton Superior as the supplier of the Unitex High Surface Friction (Pro-Poxy) Components.

Application of each of these treatments was similar involving two (2) lifts (or layers) of aggregate using a two-part epoxy binder blended onsite during construction. Each vendor used the same Armorstone (basalt quartzite granite) aggregate supplied by Washington Rock Quarries, Inc.

Other than necessary deck repairs, the first critical element of the process was the preparation of the

deck surface for adequate adhesion of the epoxy binder and subsequent aggregate. One main difference between the Poly-Carb and Dayton process is that Poly-Carb promotes the addition of an initial crack-welding polymer (135 Safe-T-Seal) prior to the overlay





system, while the Dayton approach involves the application of an initial heavy coat of epoxy in an effort to seal any existing cracks.

Each product layer required a curing time based on ambient atmospheric conditions and judgment based on the vendor's knowledge of the product.

These treatments will be evaluated through the MDT Research Experimental Projects Program. More information can be found on the project web page (<http://www.mdt.mt.gov/research/projects/polycarb.shtml>), or by contacting Craig Abernathy (cabernathy@mt.gov or 406.444.6269).

Summer Transportation Institute 2014

The Western Transportation Institute (WTI) at Montana State University (MSU) in cooperation with MDT hosted the 2014 Summer Transportation Institute (STI). STI is intended to spark interest in transportation careers; aid in the development of the next generation of engineers, scientists, planners, and designers; and address the nation's need for a diverse pool of transportation professionals. The STI recruited rising tenth, eleventh, and twelfth grade students from a mix of backgrounds and hometowns and was free to all selected participants with program expenses paid by a grant from the Federal Highway Administration (FHWA) and in kind contributions from MDT, WTI and MSU. Students lived on campus while learning about career opportunities in transportation. The two-week program provided a multidisciplinary academic curriculum, which included guest speaker presentations, hands-on laboratories, and field trips.

Twelve students participated in the program at MSU from June 15 to June 27, 2014. Students learned about all modes of transportation and gained leadership skills while working on team design-build projects. Topics and activities included road ecology, urban planning, traffic engineering, geotechnical engineering, concrete mix designs with the actual mixing of concrete batches and testing for strength, bridge design and a team design and build competition, aviation, and traffic

safety/human factors. Highlights included field trips to the MDT headquarters in Helena, Gallatin Field Airport, Holcim cement plant and quarry, and a tour of the Knife River asphalt plant and gravel pit. In addition, the participants learned about college preparation and career planning.

During the evenings and weekend, STI students participated in educational, sports, and team-building activities.





STI program and application information can be found on WTI's website at <http://www.wti.montana.edu/education/summertransportationinstitute/>.

<http://www.mdt.mt.gov/research/projects/admin/summer.shtml> or by contacting Kris Christensen (krchristensen@mt.gov or 406.444.6125).

More information about this and previous years programs can be found on Research's website at

LIBRARY CORNER

Introduction to MDT Library's New Catalog

Accessible from our [library homepage](#), the MDT Library now has a [new online catalog interface](#). The catalog is the means to search our collection, which has over 20,000 titles in a variety of formats. No registration is required to search the catalog, and many of the titles we have included are freely available online. Whenever possible, we include links, so that when you search in our catalog, you can link right to the publication. To check out print or audiovisual materials, you need to be registered as a library patron. All MDT employees are registered; for those outside of MDT, you need to complete our [patron registration form](#).

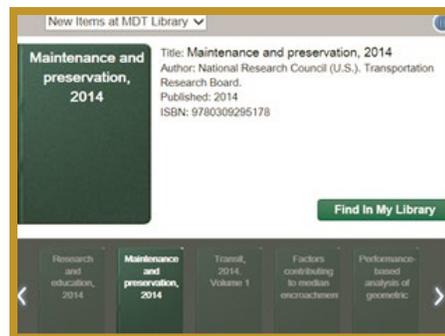
Our new catalog is designed to be more user-friendly and intuitive. If you've used our catalog before, you'll notice some big differences, as you can see in the below image of the new catalog homepage.



This new interface offers the following features:

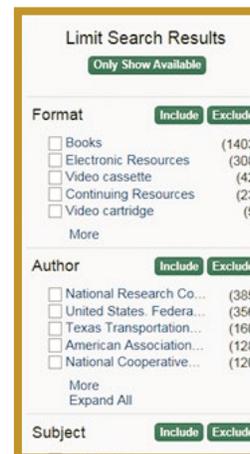
- In the center of the homepage, you'll see a scrolling display of all of our recently added

publications. This is a new visual way to see what's added to our collection.



New Materials Scrolling Display

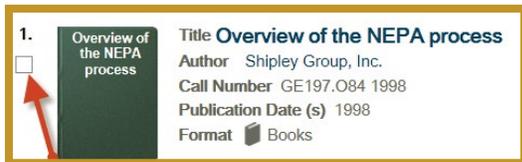
- Instead of relying on the Advanced Search option to limit your search when you get too many results, you can now use the limiters that appear on the left-hand side of your search results list.





These limiters show options for including or excluding subjects, formats, and more from the results. Because the possible options for authors, subjects, and so on are provided by the system, you don't have to generate them yourself as limiters.

- You can now use the back arrow in your internet browser when moving through the catalog. With our old interface, you had to click on "Go Back" within the catalog to return to the previous page. This is one way that the new catalog interface has been made to be more intuitive for users.
- As with our previous catalog interface, you can create lists of items by clicking in the box next to the results you want to save (identified by the red arrow shown in the following image).



If you go to the "My Lists" link in the top right hand corner, you can see all of the records you've marked. With our new catalog, you can save lists of items that can be retrieved during future catalog sessions. You need to log in to create and access saved lists; your log-in information is provided when you register as an MDT Library patron. When you log in, you can create new lists to which you can add results found in your searches.

If you're not registered as a patron, you can still add items to a list; they'll be added to a temporary list, however, which will be deleted when you close out of your session or if your session times out.

A user guide will soon be available that provides more detailed instructions on using the new catalog interface. If you have any questions, please contact Katy Callon (kcallon@mt.gov or 406.444.0871).

DID YOU KNOW?

YouTube Safety Videos

The MDT Library has a [video collection](#) available to help train staff on a variety of safety-related topics. Last fall, in meeting with staff to ascertain library needs and improvements that could be made, staff requested more current, easily accessible videos for their safety trainings. In response to this request, we have created a [Safety Materials webpage](#), accessible from our [library homepage](#), which offers links to MDT's safety video collection as well as Montana's LTAP [webinars](#) and [videos](#). We've also recently added a link to a listing of freely available [YouTube videos on safety topics](#).



To generate this list, we met with staff to identify which safety topics they'd like to see included. Then our 2014 summer intern Whitney Bugni searched for related videos that were current and from reputable sources. Our librarian Katy Callon double-checked the list, and it's now available from our [Safety Materials page](#). Note that this list does not constitute endorsement of these videos by MDT, and we do ask that the videos are additionally reviewed for accuracy before being shown to staff.

Please contact Katy Callon (kcallon@mt.gov or 406.444.0871) if you have any questions.



NEW RESEARCH REPORTS

[Impacts of Increased Canadian Economic Development on Northern Montana Highways](#)

[Montana Summer Transportation Institute 2014 Final Report](#)

A listing of all past and current projects can be found at
http://www.mdt.mt.gov/research/projects/sub_listing.shtml.

NEW EXPERIMENTAL REPORTS

[Break-Out Square Post Breakaway System](#)

[Evaluation of Durable Traffic Pavement Marking Tape \(PMT\)](#)

[Kwik Bond PPC 1121 Polyester Polymer Concrete \(PPC\) Overlay](#)

[Wet-reflective Bead Technology Pavement Marking](#)

A listing of all past and current projects can be found at
http://www.mdt.mt.gov/research/projects/exp_sub_listing.shtml.

CALENDAR OF EVENTS

December

AASHTO SCOR Meeting 12/3-4/14
MDT RRC Meeting 12/17/14
Domestic Scan Topics Chosen

January

TRB Annual Meeting 1/11-15/15
AASHTO SCOR/RAC Meeting 1/11/15
MDT RRC Meeting 1/28/15

February

NCHRP (FY2015) Synthesis Topics
Due 2/13/15
SHRP2 Round 5 Applications Due 2/13/15
MDT RRC Meeting 2/25/14

March

IDEA Research Topics Due 3/1/15
TCRP (FY2015) Synthesis Topics Due
3/16/15
MDT RRC Meeting 3/31/15
NCHRP (FY2016) Projects Chosen
SHRP2 Round 5 Selections
Announced

April

National Library Week 4/12-18/15
Research & Library Customer
Appreciation Event 4/15/15
MDT RRC Meeting 4/28/14
MDT Research Topic Statements Due
4/30/15





REMINDER

Information on research services and products, such as research and experimental project processes and reports and technology transfer services, can be found on the Research web site at www.mdt.mt.gov/research.

MDT's library collection can be searched through the [library catalog](#). The catalog and other information resources are available through the [MDT Library web site](#).



There's now an [RSS feed](#) available to provide subscribers with updates of all new Research and Experimental products. Our [Summer 2014 Newsletter](#) Did You Know section provided details about this new feature. RSS stands for Rich Site Summary; the symbol to the left is the icon to let you know a feed is available. An RSS feed sends you notifications when new material is posted to a website. If you subscribe or "add" the Research feed, you'll be notified when new materials such as final reports, task reports, project summaries, implementation reports, supplementary project materials, and more are available. The feed is available on our [Research page](#) by clicking on the "Subscribe to Updates" link under the Tech Transfer section of the left-hand menu.

There are a variety of ways to subscribe. There are feed subscription services such as [feedly](#), [MyYahoo feed reader](#), and more. If you use Internet Explorer, [these instructions](#) are available; they also cover how to add a feed to your Outlook email. If your organization uses a web browser or email system outside of these, please contact your IT department for instructions on how to add a feed.

We also continue to have listservs available. You can [sign up](#) to be added to our listserv distribution lists for research final reports, experimental reports, solicitations, and newsletters, and then you'll receive notifications when these new materials are available.

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