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A VITAL RESOURCE

The Hawaii Asphalt Paving Industry is the local resource for all things asphalt pavement. Have a question about asphalt pavements? Call HAPI! Government agencies, owners, contractors, and consultants reach out to HAPI when they have a question. In addition, our training program helps to increase knowledge and awareness of our ubiquitous product.

Let's review what is happening in our industry.

HAPI appreciates the yearly opportunity to contribute to *Building Industry Hawaii's* annual *Construction Preview* issue. Our articles in 2019 and 2020 were about Stone Matrix Asphalt (SMA) and Balanced Mix Design (BMD), respectively. Since the 2019 article, the Department of Transportation (HDOT) has used SMA to pave Pali Highway. Their next project to use SMA is the Resurfacing of Interstate Route H-1 from Miller Pedestrian Overpass to Kapiolani Overpass. SMA is an excellent surface course that will continue to be used on Oahu roads.

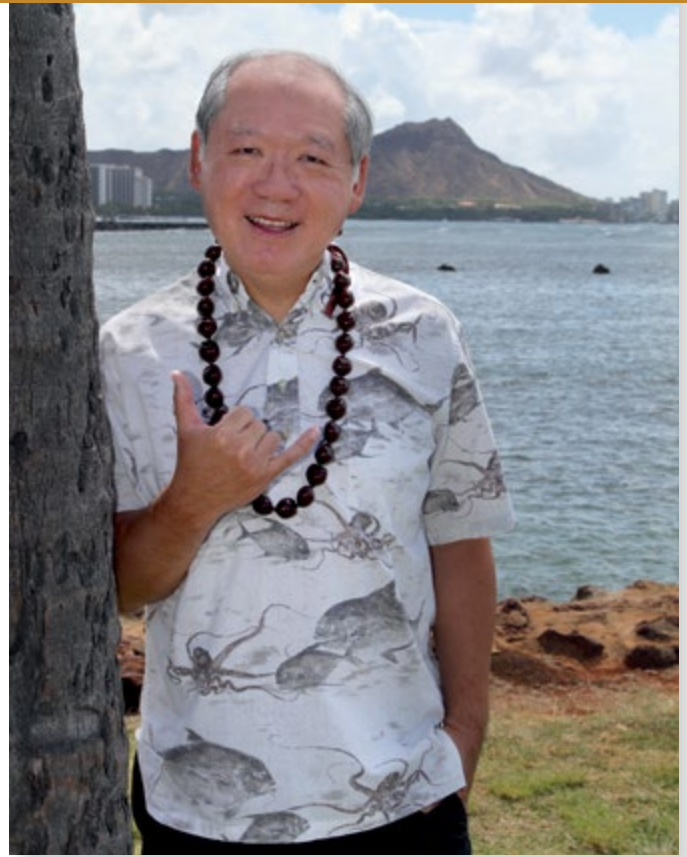
BMD is an enhanced approach to designing asphalt paving mixtures to achieve a satisfactory balance between rutting resistance and crack resistance. It has the potential to result in longer-lasting asphalt pavements. A task group with members from HDOT, FHWA, HAPI and the University of Hawaii, has been formed to explore this potential.

HDOT is also looking at a couple of technologies that may improve our asphalt pavements. The use of recycled plastics in pavements has the potential to improve our mixes and be a sustainable practice. HDOT is planning to do a pilot project to evaluate the use of plastic in our asphalt pavements.

HDOT is also considering the use of a highly modified asphalt (HiMA) binder, which is designed to enhance the durability of asphalt pavements. HDOT already uses a polymer modified binder (PMA). HiMA binder is produced with about twice the amount of polymer than PMA and has been shown to exhibit better rutting and fatigue cracking performance.

Government agencies are becoming more focused on pavement preservation, which is the practice of extending the life of a pavement with the use of pavement treatments. HDOT is using crack filling and slurry seal treatments. The City and County of Honolulu uses slurry seal and seal coating. The County of Kauai is focused on using seal coating. The County of Maui uses micro-surfacing and is the only agency that uses in-house staff to get the job done.

Training is particularly important to our industry. We have developed two types of training. One type is our training program started in 2015 that offers the same courses



annually. It has been immensely popular, with just about 900 attendees at our annual "Best Practices for Asphalt Pavement" workshops, "Use of Geosynthetics" workshops, and understanding a JMF submittal presentations. In 2020, we launched our HAPI Shorts virtual weekly lunchtime lessons (see page 6) which have been attended by over 400 people. Thanks to our members and industry friends for their contributions to the success of these programs.

The other type of training developed was to meet a specific need, which involves bringing requested training courses to Hawaii, saving locals the time and expense of travelling to locations on the Mainland. For example, in October we brought the Airfield Asphalt Certification Program to Oahu, instead of people having to travel to Auburn, Ala., to take the training and exam. We will continue to be on the lookout for workshops that we can bring to Hawaii, which will enhance the knowledge of our asphalt industry.

Lastly, we continue to be a resource for our local government agencies. We are appreciative of the opportunities we have had to work together on joint committees and planning of industry activities such as the recent LTAP Pavement Preservation workshop. We look forward to working together to improve our local roads and highways.

Jon M. Young, PE, FASCE, ENV SP, LEED AP
Executive Director



Hawaii Preserves for Perpetuity

BY SANDY LENDER AND JON YOUNG

HAPI Director Jon Young shares pavement maintenance methods common across the island chain with an eye toward perpetual pavement systems

Different states use different pavement preservation and maintenance methods to maximize their paving budgets. While department of transportation (DOT) materials specifiers and pavement managers alike know the importance of pouncing on the right pavement with the right treatment at the right time, funding coffers ultimately dictate what can be done and when.

In Hawaii, the Hawaii DOT (HDOT) recommends mill-and-fill and crack fill maintenance procedures, but the different counties along the island chain have regional and weather-induced needs influencing their funding reservoirs. Hawaii Asphalt Pavement Industry (HAPI) Executive Director Jon Young discussed the pavement treatments used in Hawaii during a HAPI Shorts, Lunchtime Lessons webinar.

The County of Hawaii performs overlays in addition to mill-and-fills with the three pavers owned by the agency.

Since 2016, the County of Kauai has been using a sealcoat as its pavement treatment.

The County of Maui's approach to pavement preservation is to perform crack filling, and to lean heavily on slurry seal and micro surfacing treatments.

The City and County of Honolulu also perform mostly slurry seal and seal coat treatments, and do so in a

manner that returns the roads to traffic by 3:30 p.m.

Oahu has embarked on a robust pothole patching program. They use the throw-and-go approach as this method allows them to quickly repair potholes. Look at these stats:

- In 2008, Oahu repaired 82,850 potholes
- In 2009: 64,816 potholes
- In 2010: 41,805 potholes
- In 2011: 67,715 potholes
- In 2012: 52,070 potholes
- In 2013: 51,647 potholes
- In 2014: 39,951 potholes
- In 2015: 32,976 potholes
- In 2016: 42,656 potholes
- In 2017: 28,570 potholes
- In 2018: 20,987 potholes
- In 2019: 15,527 potholes
- In 2020: 11,711 potholes
- In 2021: 8,027 potholes

The decrease in potholes can be attributed to the city's repaving program and their maintenance of the roads using pavement treatments. In 2012, HAPI members welcomed then Mayor Peter Carlisle and joined the Department of Facility Maintenance to demonstrate four pavement preservation methods the city would evaluate as part of its effort to improve road conditions. Over 120 guests from city, state and federal government agencies, as well as contractors and consulting firms,

attended the demonstration to observe the application of the four treatments. We demonstrated crack filling, a fog seal, a sealcoat and a slurry seal. The demonstration areas were then monitored by the city to evaluate how the various treatments perform under local weather conditions, especially Hawaii's high level of ultra-violet radiation.

Then in 2014, HAPI members donated labor, material and equipment to pavement treatment research being done by our University of Hawaii.

The counties and agencies use various pavement management systems to assess whether the preferred treatment regimen is the best option. For example, the County of Maui uses iWorQ, which offers a subjective pavement distress rating system based on what the engineer sees happening with regard to fatigue, transverse, longitudinal, patching and/or edge cracking. The engineer scores or rates the distress according to the extent of the cracking segment (low to high) and the severity of distress (low to high).

In the event a pavement has a low enough score, an agency that typically depends on a sealcoat knows this process is merely burning money for the season. Members of HAPI who perform maintenance work have the opportunity to reach out to agencies and recommend robust methods that will target and correct pavement system troubles from the bottom-up, prior to performing the preservation treatments that seal and protect from the top-down, but



this is a rare occurrence. The agencies are the parties that determine the treatments they have the funding for.

Deep maintenance and preservation tag-team can be avoided with perpetual pavement planning. Light maintenance and preservation tag-team can be a smart, infrequent method of protecting a long-lasting pavement that's been designed for permanence.

When a team designs in long-lasting performance, the asphalt roadway can last 35, 65, 95 years and up with minimal structural improvements during its life. In fact, the Asphalt Pavement Alliance (APA) has built its Perpetual Pavement Award on that concept. The awards started in 2010 and now have over 150 winners—award-winning pavements achieved through conservative designs.

The cost savings for an agency are obvious.

You may ask why a perpetual pavement concept fits in the pavement maintenance topic this month. It's because any long-lasting pavement system requires only infrequent maintenance or surface preservation for it to remain long-lasting. Like a deck requires a fresh coat of paint every few years to protect its wooden planks from the sun, a 35-year-old road requires a check-up once in a while to make sure the elements aren't causing harm.

To win a Perpetual Pavement Award, the system must meet the following criteria:

- have 35+ years of service;
- experience minimal structural improvements totaling less than 4 inches of gain;
- incur infrequent resurfacing; and
- show no deep structural distress.

This means a 45-year-old pavement that needs a mill-and-fill to correct some freeze-thaw cracking could have 2 inches of depth milled, a 2-inch lift replaced, a sealcoat sprayed on top the next summer, and have gained only a smooth new ride for the taxpayers. That's a minimal maintenance and preservation investment on a long-lasting, award-winning roadway.

At this time, Hawaii has not yet

designed any perpetual pavements. HDOT has recently designed a road with a 50-year service life and, since 2007, new city streets pavement sections are like a perpetual pavement design.

For more information on how to

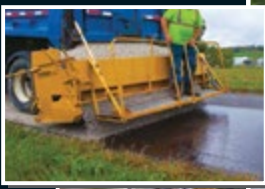
select minimally invasive maintenance treatments, visit the Treatment Toolbox tab at <https://roadresource.org/>.

This article is courtesy of Sandy Lender, editor of AsphaltPro magazine.

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Hungry for Asphalt? Starting in July 2020, HAPI satisfied the appetite of hungry people with our “HAPI Shorts” program—weekly lunchtime sessions.

Each Wednesday at 11:30 a.m., we conduct a 30- to 40-minute presentation via a Zoom meeting. Our goal is to build a library of 25 to 30 sessions on topics such as specifying pavement mixes, open-graded mixes, SMA, etc. that will repeat two or three times during a year. The sessions are FREE, but we ask that you register.

Now nearing the end of our second year, we have conducted over 55 sessions with 25 unique subjects. Just over half of the sessions have been presented by Jon Young, executive director of HAPI, and the other half presented by a variety of guest speak-

ers. We appreciate that several of our members volunteered their time to



Chris Lubbers

be speakers such as Brandon Silva from Pavement Management Solutions (assisted by Ames Engineering Inc., and SSI); Chris Lubbers and Gary Fitts from Kraton Polymers US LLC; Jarrett Welch from Quality Paving Consultants; and Todd Mansell from Caterpillar.

We also thank a couple of friends of HAPI for their time to be a guest

speaker: Dr. Arudi (Raj) Rajagopal from Infrastructure Management and Engineering, and Mike Huner from Huner Consulting LLC.



Jarrett Welch

Of course, our program would not be a success without people attending the various sessions. The sessions have attracted over 450 attendees. In addition to people from Hawaii, the sessions also attracted people from other states: California, Idaho, Iowa, Kentucky, Minnesota, New York and Nevada; and other countries: Canada, China, Egypt, India, Pakistan and Saudi Arabia.

We thank all the attendees for taking time from their busy schedule to participate in our sessions. We hope that we were able to broaden their understanding of our industry with topics ranging from design to construction to maintenance of asphalt pavements.

The following is what attendees have said about our HAPI Shorts program:

- “The information and presentation benefits both inexperienced and experienced paving participants.”
- “Great job! I love these sessions. Scheduling during lunch is very convenient.”
- “I thoroughly enjoyed the sessions. The choice of topics, presenters and the knowledge they shared was exceptional. I would love to see the continuation of program from HAPI.”
- “Subject matter was very interesting and presented/explained in a way that was easier for someone with less experience (like me) to understand.”
- “Courses were great. I enjoyed they were short, to the point and full of information.”
- “You (HAPI) have done an exceptional job of putting this program together. The topics are relevant and updated. It has filled my knowledge gaps. Mahalo!”

Our HAPI Shorts program is gaining momentum. We hope that you will join us.

For additional information, please visit: <http://hawaii-asphalt.org/education/hapi-shorts/>

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Asphalt Alphabet Soup

BY JON M. YOUNG

HMA, PMA and SMA are just a few of the acronyms used in the asphalt industry related to asphalt mixtures used for the surface or wearing course of our roads.

Hot mix asphalt (HMA) is a generic term that includes many different types of mixtures of aggregate blends and asphalt cement (binder). HMA mixtures are classified mainly as dense-graded, gap-graded and open-graded.

In Hawaii, dense-graded mixtures are used on the majority of the roads. Examples of dense-graded mixtures are aggregate blends such as the HDOT Mix no. IV and Mix no. V, combined with the appropriate binder.

Stone Matrix Asphalt (SMA) is a gap-graded mixture that is an excellent surface course usually reserved for high-traffic and truck volumes on interstates and primary roads. It was most recently used on the resurfacing of the Pali Highway.

Open-Grade Friction Course (OGFC) is an open-graded mixture that is used to improve drainage and surface friction. It is also called Porous Friction Course (PFC). The most recent use of OGFC was on the section of Hawaii Belt Road at the Ka'awali'i Gulch and Laupahoe Gulch.

Asphalt mixtures must be specified by both the aggregate blend and the binder. This information can be provided either on the construction plans or in the project specifications.

Aggregate blends are typically found in the specifications such as the HDOT Mix Nos. II, III, IV and V as shown in TABLE 703.09-2-HMA Grading Requirements of their 2005 Standard Specifications. The FAA P401 specifications and the UGFS have similar aggregate blend tables. SMA blends are often referred to by the nominal maximum aggregate size. A table of SMA blends would typically have blends titled 19.0 mm, 12.5 mm and 9.5 mm.



mixture. If only PMA is used to specify the asphalt mixture, how does the contractor know what aggregate blend and binder to use to produce the mixture?

There are multiple levels of binders containing polymer additive.

The agency or specifier cannot just specify PMA or HiMA without attaching the grading requirement for the binder such as PG64E-22, PG72E-22 and PG76-22.

Examples for correct calls out for asphalt mixtures would be Mix no. IV using PG64E-22; Mix no. V using PG64-16; and 12.5 mm SMA using PG76-22.

Specifying asphalt mixtures with both the aggregate blend and binder stated leaves no doubt about what mixture to use for the asphalt pavement.

Binders are either neat (unmodified) or modified. Neat binders used in Hawaii are performance-graded binders PG 64-16 and PG 64-22.

In Hawaii, modified binders are produced using polymers and are referred to as Polymer Modified Asphalt (PMA). There is also a highly modified asphalt binder often times referred to as HiMA.

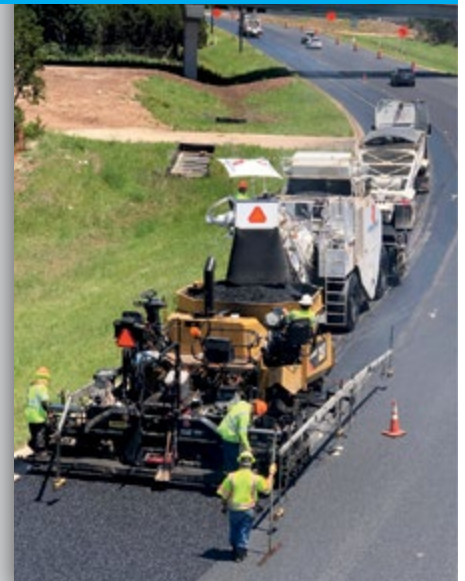
The acronym PMA is oftentimes incorrectly used to describe an asphalt



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ACTIVE MEMBER PROJECT HIGHLIGHTS

HAPI's active members are companies whose primary business is the supply of asphalt for the manufacture of asphalt pavement, and asphalt suppliers.



ASPHALT TERMINAL AT KALAELOA HARBOR **Asphalt Hawaii**

A steady supply of consistent, high-quality asphalt binder is available with a local asphalt terminal in Kalaeloa on Oahu. The terminal was completed in 2009 to mitigate the effects of any asphalt shortage like the one the state experienced in 2005 which temporarily crippled the industry.

The Kalaeloa terminal provides a majority of unmodified asphalt binder and all-modified binder for paving Hawaii's roads. Locally produced modified asphalts provide a significant resource for our paving industry to better tailor our approach to the various requirements of each project. In addition to roads, airfield projects also have asphalt pavements produced with modified asphalt binder.



KAMEHAMEHA SCHOOLS, KAPALAMA – BISHOP DRIVE, PRINCESS DRIVE, ADMINISTRATION PARKING **Grace Pacific LLC**

The main roads of Kamehameha Schools Kapalama campus underwent reconstruction to revitalize the pavement structure and give the aging administration parking lot a well-deserved facelift. The scope consisted of cold planing, resurfacing and reconstruction of asphalt concrete pavement. The scope of work also included pavement striping and wheel stop installation.

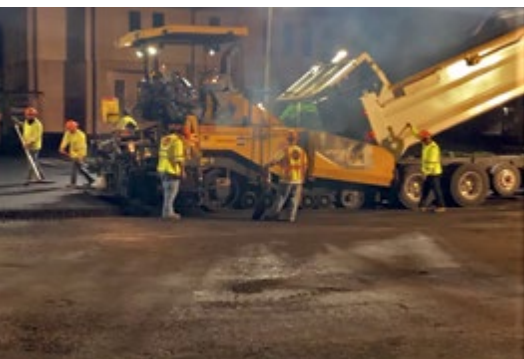
Kamehameha Schools has a new road to match the first-class campus and the breathtaking views of Honolulu.



RESURFACE TRI-INTERSECTION (ROUTE 16/8/10) **Hawaiian Rock Products Corporation**

Construction of the Resurface Tri-Intersection project in Barrigada/Mangilao, Guam was completed in November 2019. This intersection is one of the busiest intersections in Guam. With frequent stops, starts and turns, coupled with the high traffic volume, the wearing course became severely shoved and rutted. The scope of work included removing and replacing deteriorated and shoving asphalt concrete pavement and replacing damaged sensor loop wires for traffic control lights. The addition of fibers and polymer to the asphalt overlay mix were used to further strengthen the pavement.

The new overlay has eliminated the shoving and rutting problem of the pavement, leaving the traveling public with a much-improved intersection.



KILAUEA AVENUE REHABILITATION **Jas. W. Glover Ltd.**

Kilauea Avenue is a main thoroughfare in Hilo that is heavily used by the community and has not been resurfaced for years. The project involved the full removal of the current pavement structure down to the existing subgrade. The new pavement structure consisted of 4-inch layer of aggregate base course, 6-inch layer of asphalt concrete base, and 2-inch layer of HDOT Mix No. IV, in addition to the 12 inches of excavation down to subgrade and additional excavation as needed to provide a 6-inch reveal at the curb face.

When completed in December 2021, the community will benefit with a safe and smooth travel way.

MAPUNAPUNA INDUSTRIAL PARK RESURFACING

Road and Highway Builders LLC

The Mapunapuna Industrial Park is bordered by Moanalua Freeway to the north, Moanalua Street to the west, Nimitz Highway to the south and Puuloa Road to the east. The project was completed in April 2021. The scope of work included cold planning, resurfacing and reconstruction of asphalt concrete pavements. The scope of work also included adjustment of utilities, installation of pavement markings and vehicle loop detectors, reconstruction of concrete curb and gutter, reconstruction and repair of catch basins and installation of drain inlet and trench drains.

The tenants of the industrial park and its visitors now have a pothole- and crack-free road.

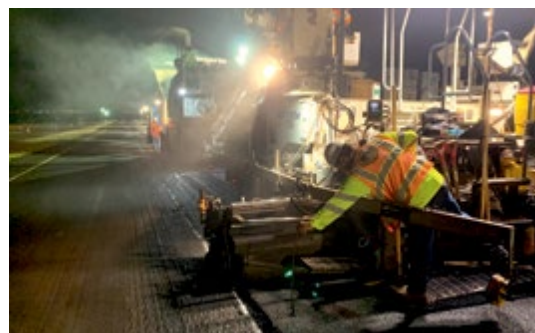


HALEAKALA HIGHWAY RESURFACING, MILE MARKER 0.90 – 7.76

Maui Paving LLC

Haleakala Highway is the main thoroughfare leading residents and visitors from all areas of Maui to upcountry Maui and the summit of Haleakala. This project is part of the Hawaii DOT Installation of Pavement Preservation Strategies and Surface Treatments at Various Locations contract, which started in 2018 and will extend into 2022. Maui Paving has completed to date \$7.4 million in work orders with an anticipated \$1.8 million still to come.

The general scope of work for these work orders includes cold planning of weakened pavement areas and placing 2 inches of hot mix asphalt pavement.



MT. KA'ALA ROAD PAVEMENT REPAIR

Road Builders Corporation

The project included pavement repairs to approximately the middle five miles of roadway, consisting of 2 3/8-inch-thick cold milling and paving. The project overcame several challenges. The road, only 10 to 13 feet wide with no shoulder area for most of the length of the road, made the movement of equipment extremely restricted. Adverse weather conditions such as low clouds limiting sight resulted in no work on those days. Steep grades of the road were difficult for trucks with heavy loads traversing up and down the mountain road; trucks could only be loaded to half of their normal capacity.

The repaired road now provides a safer travel way to the Air Force Station at the top of Mt. Ka'ala.



KOA RIDGE RESIDENTIAL DEVELOPMENT

Road Builders Corporation

The roads in the Koa Ridge Development are being constructed to City and County of Honolulu standards as they will eventually be turned over to the city. In general, the typical road section has a surface course of the City Mix No. 4, over an asphalt concrete base. These asphalt layers are placed on top of an aggregate base course.

For this pavement section, cracking is intended to be limited to the surface layer, which should be scheduled for replacement typically every 13 to 15 years. The remainder of the section may remain in place and untouched for many years. This is the concept of a perpetual pavement.



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- E** a construction or lab equipment supplier
- L** a company that does asphalt paving
- M** a material supplier
- O** a non-paving or non-pavement treatment contractor
- P** a company that produces hot mix asphalt
- Q** a company that has a quarry
- T** a company that applies pavement treatments such as crack repair, seal coat and slurry seal

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HAPI CALENDAR

Be on the lookout for upcoming workshops and events. Visit our website for the most current listing, <http://hawaiiasphalt.org/news-events/calendar-of-events/>

JANUARY:

- HAPI Lunch Meeting

MARCH:

- Understanding a Job Mix Formula Submittal workshop
- HAPI Annual Paving Conference (Virtual)

APRIL:

- Best Practices for Asphalt Pavements workshops
- Best Practices for Asphalt Pavements – The Next Level workshops

MAY:

- APWA Annual Meeting

JULY:

- HAPI Lunch Meeting

SEPTEMBER:

- Understanding a Job Mix Formula Submittal workshop

OCTOBER:

- Use of Geosynthetics for Asphalt pavements workshops
- HAPI Scholarship applications due

DECEMBER:

- HAPI Holiday Virtual Trivia Event

HAPI EDUCATIONAL RESOURCES

One of the missions of HAPI is to have continual learning for the contracting and design community. Below are resources that can be accessed by scanning the QR codes.

See the full website for more information, <http://hawaiiasphalt.org>

ASPHALT GUIDE

HAPI Asphalt Pavement Guide is an interactive guide to everything about asphalt pavements and pavement treatments.



HAPI SHORTS

Each Wednesday at 11:30 a.m., we conduct a 30- to 40-minute presentation via a Zoom meeting.



TRAINING PROGRAM

The HAPI Training Program provides educational seminars and workshops that are regularly scheduled (i.e., once every year).



ONLINE LIBRARY

A library of articles and references about asphalt pavement and pavement treatments offer information about current developments within the industry.



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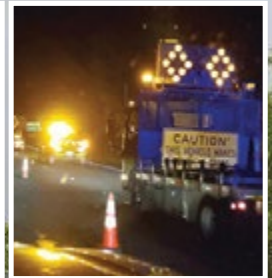


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