

HAWAIIAN CONNECTIONS

THE HAWAII LOCAL TECHNICAL ASSISTANCE PROGRAM

VOLUME 9, No. 2

SUMMER 2007

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Please pass this on to other interested parties in your office.

THE NEW AND IMPROVED SADDLE ROAD

FHWA Central Federal Lands Highway and Hawaii Divisions

The next time you drive between Hilo and Kona, you will notice something drastically different about Saddle Road...

During World War II, Saddle Road was constructed by the Department of the Army as a one lane facility, to provide access to its military training facilities located in the saddle between Mauna Loa and Mauna Kea. On May 29, 2007, almost 60 years later, a "maile untying" and Hawaiian blessing ceremony was held to commemorate the completion of the first 7-mile long segment of the Saddle Road, State Route 200 Improvement project.

The 48-mile Saddle Road Improvement project is a cooperative effort among the Department of the Army, Federal Highway Administration, Hawaii Department of Transportation, County of Hawaii and other agencies. The Saddle Road project is exceptional in that after 20 years of planning and design, it currently incorporates numerous context sensitive design elements and other environmentally sensitive contract requirements, including the following:

- A 'fire-prevention' cross section to prevent burning objects tossed from vehicles from leaving the paved road surface, and to prevent vehicles from driving off the new road pavement.
- Hunting and recreational enhancements including game studies, access improvements and hunting management.
- Adjustment of alignment to avoid/minimize impacts on Hawaiian cultural values associated with certain types of trees and 'kipukas.'
- Pullouts for interpretation of archeological, historic and traditional cultural resources
- Pullouts for educating the public on the problems associated with abandoning unwanted pets along the roadway, introduction of alien organisms, and the potential for fire from passing vehicles.
- Restriction on bulldozing soil from areas with invasive species into those areas free from such.
- Special construction precautions in the event lava tubes, caves or native



The new and improved Saddle Road.

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THE NEW AND IMPROVED SADDLE ROAD

(Continued from Page 3)

Hawaiian burials or ritual sites are encountered.

- Use of only native seed and plantings, in cooperation with the DOA and several local high schools.
- Blending cut and fill slopes more naturally with the surrounding terrain.
- Minimization of the amount of exposed soil at any one time.
- Clearing of trees and shrubs along an irregular edge to create a more gradual transition and feathered edge to remaining vegetation.
- Steam-cleaning and fumigating construction equipment when entering the project.
- Restriction and control of night time lighting to prevent downing of endangered birds, and also to prevent light pollution for the nearby Mauna Kea observatories.

The completion of the 7-mile long segment is only the start. New or reconstruction of the entire Saddle Road is planned for completion in 2012, pending appropriation of funding. Almost sixty percent of the improvements will be on new alignment, thereby removing numerous alignment deficiencies as well as separating civilian and military traffic within the Pohakuloa Training Area (PTA) boundaries.

Have a safe and enjoyable ride on the new and improved Saddle Road, the next time you drive between Hilo and Kona!!!



Saddle Road prior to improvement project.



Saddle Road after improvement project.



Distant view of the improved segment of Saddle Road.

LESSONS LEARNED FROM THE KIHOLO BAY EARTHQUAKE

By Jiro Sumada, County of Hawaii Department of Public Works

The October 15, 2006 magnitude 6.7 Kiholo Bay earthquake was the largest and most damaging earthquake to hit the island of Hawaii in nearly a quarter century. For many residents, it was their first experience with the sheer power and duration of a large earthquake. The scope of the response and recovery effort was also unprecedented for many workers in the County of Hawaii's Dept. of Public Works. This unfortunate disaster event generated several lessons that will improve future Public Works' emergency response and recovery activities.

The earthquake occurred on a Sunday morning at 7:07 AM. It was located 3 miles off the West coast of the island of Hawaii, about 24 miles deep. The strong shaking lasted approximately 15 seconds and was followed by several smaller and shorter after-shocks. The most violent shaking was felt by residents in the towns of Kona, North Kohala and Waimea. To date the earthquake has caused about \$25 million in damage to County and \$200 million in State facilities. Based on our records of some 1,700 safety inspections, 67 private homes experienced severe structural damage that rendered them uninhabitable and 227 private homes and businesses have restricted access to certain of their parts.

In any disaster, there are things that go right and hopefully only a few things that go wrong. Being a Sunday morning with little traffic around the island resulted in a quick activation of the Civil Defense



Image is property of Stephens Media LLC
Large boulders on Queen Ka'ahumanu Highway.

Emergency Operations Center (EOC) and all six Highway Maintenance baseyards within 15 to 30 minutes. This led to an effective initial response by Public Works to open all but one County road. We were also able to assist State Highways in opening the majority of their roadways by nightfall on the first day.

Another positive development was our Building Division organized structural safety inspections of residential and commercial properties, free of charge to those that experienced earthquake damage. With the critical help of several private volunteer structural engineers from Honolulu, some 1,700 safety inspections were done. This service gave the general public (including non-earthquake victims) a tremendous reassurance that the County government was there to help them in their time of need.

Major lessons were also learned about how things could be improved. First, while the overall structural safety inspection effort was a success, simple things went wrong. For example, we started using the wrong assessment forms and only when the volunteer engineers from Honolulu came did we switch to a more comprehensive rapid damage assessment form. The use of the ATC-20 (Applied Technology Council Postearthquake Safety Evaluation of Buildings) forms in a real disaster highlighted elements that needed



Pa'auilo Bridge collapse.

(Continued on Page 8)

NEWS FROM OUR PARTNERS...

STEVEN FONG SCHOLARSHIP GOLF TOURNAMENT 2007



The Hawaii Asphalt Paving Industry (HAPI) and the Cement and Concrete Products Industry (CCPI) are again jointly working together to put on the 5th Annual Golf Tournament in memory of a very special

individual, **Steve Fong**. The tournament has been so well received, the Industry and Agencies have made this an annual event.

Steve was an Engineer with the Federal Highway Administration, as well as a past President of CCPI, who passed away in March of 2002 after a long illness. Those of you who knew Steve, and had been exposed to the "Fong Treatment," can relate to what this man was like and why he was so special. Steve would always test your knowledge and decision-making abilities, all in his hope of making better engineers, and most importantly, better people.

Proceeds from this Scholarship Golf Tournament will be used to benefit an undergraduate student enrolled in the Civil and Environmental Engineering program at the University of Hawaii, Manoa Campus.

The 2007 Golf Tournament will be held at the Pearl Country Club on **Thursday, August 16, 2007** starting a 12:30pm (Shot gun start). Format for the Golf Tournament is 3-person modified scramble. Cost for the event is as follows: Individual Entry - \$125; Corporate & Tee Sponsor Entry - \$525; Awards Dinner Only - \$20

Special "Steve Fong Golf Tournament" Golf Shirts are available in a limited supply for \$20 on a first come-first serve basis.

For more information call:

Raymond Nii, HAPI (842-3211)

Wayne Kawano, CCPI (848-7100)

Randy Matsumoto, HAPI (842-3227)

2007 Hawaii Procurement Institute Conference September 17 & 18, 2007 East-West Center



The 2007 Hawaii Procurement Institute ("HPI") Conference provides a forum to broaden understanding of important procurement issues. As it has done in the past, the 2007 HPI Conference will feature a wide variety of leaders in the procurement community and include the opportunity for balanced discussion and open discourse. 2007 HPI Conference topics include:

- I. Contract Considerations for Procuring Agencies
 - A. Sealed Bid vs. Negotiated Proposals
 - B. How Much Do You Need and When
 - C. Who's Doing What
 - D. Socioeconomic Policies, including Small Business Preferences
- II. Lessons Learned/Best Practices for various contracting methods
 - A. Pros and Cons Sealed Bids vs. Sealed Proposals
 - B. Outsourcing Technical Expertise
- C. Teaming Agreements/Subcontractor Requirements
- III. Public/Private Partnerships
 - A. Needs and expectations of the government
 - B. Needs and expectations of the contractors,
 - C. Examples of Best Practices.
- VI. Contractor's rights, responsibilities and dispute resolution (aka the Protest Process). Mechanisms to ensure fair and open competition, are they working?

** Conference speakers include: **Todd Waldman** (ACOE), **Russ Saito** (DAGS), **Alice Hall** (HHSC), **Ann Murata** (SBA) and many other procurement professionals.

If you have any questions or would like more information, please email HPI's *Interim Executive Director*, **Jessica Horiuchi** at jhoriuchi@ahfi.com.

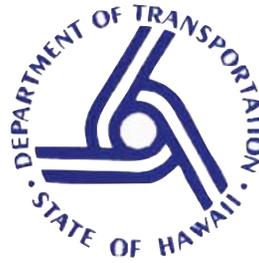
HAWAII DOT RESEARCH PROGRAM

NEW WEBSITE UNVEILED

The Materials Testing and Research Branch of the Highways Division has unveiled a new website dedicated to its research program.

The website, www.hawaii-rdtt.com, includes sections on the Research Program Organization & Guidelines, and descriptions of proposed, new and on-going research projects sponsored by the agency. Sections on the implementation of

research results and on completed projects are planned.



According to a document posted on the website, the establishment of a research website was one of the recommendations offered by a peer exchange conference that was hosted by the Materials Testing and Research Branch on September 19-21, 2006.

A MOMENT IN HISTORY

By C.S. Papacostas, Hawaii LTAP

In the last issue of Hawaiian Connections I spoke about the recent national trends to look for innovative highway financing methods, including various types of public-private partnerships. Many of these ideas, however, are not new. For example, the following appeared in Thrum's 1927 Hawaiian Annual in its retrospect of the previous year:

"KALIHI TUNNEL PROJECT: The steady development of the windward side of Oahu is pressing the long mooted question of the need of other avenues than the long and tortuous pali road connecting it with Honolulu. The most feasible, and least expensive, has long been thought to be by a tunnel through the Koolau range at the head of Kalihi valley, and steps have been taken, by action of the engineering association, looking to the project, on a toll basis, being at once entered upon by a company to be incorporated to push the undertaking, at an estimated cost of \$1,250,000."

Established in 1902, the Engineering Association, now known as Engineers and Architects Association of Hawaii (<http://community.hei.com/eah/>) is the oldest of its kind in Hawai'i. It meets for lunch on most Fridays at Laniakea, the Richard Street YWCA. Its Kalihi Tunnel procurement recommendation was never adopted.

When completed in 1957, the first "puka in the pali" (or, for our mainland readers, "hole in the precipice") was a Territory of Hawai'i project in the adjacent Nu'uuanu Valley. The Wilson Tunnel in Kalihi Valley, also a publicly financed project, came later. For a longer history of the pukas see www.ascehawaii.org/herit2001.html#1001

PROTECTING AGAINST ROCKFALL

By *Brennon T. Morioka & Brandon Hee, HDOT*

The State of Hawaii Department of Transportation (HDOT) is committed to protecting the public against rockfalls along our roadways. This is a challenging task involving uncertainties about when and where rockfalls may occur, high costs of mitigation, as well as cultural, historical and environmental concerns. It is imperative that we, as engineers, seek appropriate solutions to these kinds of recurring problems.

Waimea Bay on the north shore of Oahu is a case in point.

On March 6, 2000, approximately twenty cubic yards of rock dislodged from the top of a 90-foot high vertical cliff along the north side of the bay and fell onto Kamehameha Highway directly below. As additional hazardous potential rockfalls still existed, HDOT initiated a major mitigation project at the site. The highway was closed for a total of 95 days with traffic rerouted through a temporary bypass built on the adjacent beach.

The mitigation relocated the roadway away from the cliff to allow for the construction of a 10-foot wide and 5-foot deep rockfall catchment ditch and the installation of a 1,000-foot long and 10-foot high fence with a jersey barrier along its base. The setback of the roadway away from the cliff employed a mechanically stabilized earth wall comprised of intervening layers of surge rock and polyethylene geogrids.

In February of 2007, a large boulder was dislodged from an area just below the source of the previous rockfall. The safety features in place contained the boulder within the catchment ditch.

On April 7, 2007, a large rock mass of about 500 cubic yards from the two earlier sources slid off the cliff face. The catchment ditch worked beyond its design capacity and contained most of the debris. Portions of the rockfall fence were crushed to the ground but it effectively reduced the amount of debris that ended up on the roadway. No one was injured and the only vehicle accident occurred when a truck attempted to negotiate through the debris after police had already closed the road to traffic.

Immediately following the April rockfall, HDOT geotechnical engineers and Earth Tech engineers and geologists assessed the stability of the slope; Goodfellow Brothers mobilized heavy equipments to break up large boulders; Janod Construction checked the cliff face for possible native Hawaiian burial sites and scaled the mountainside to remove unstable rocks; and Tajiri Lumber and HDOT maintenance crews hauled away the debris under the supervision of archeologists monitoring for possible burial remains.

HDOT managed to open the highway, the only link around the north side of the island, for rush hour traffic on April 9, only two days after what is considered to be Hawaii's largest rockslide event along a highway in recent memory. HDOT's rapid and efficient response



Photo taken after the Feb 2007 rockfall, with the rockfall sources of March 2000, February 2007, and April 2007 all indicated. Photo was provided by **Brandon Hee** (HDOT) and rockfall sources were identified by **Yucheng Pan** (Earth Tech).

ROCKFALLS ALONG HAWAII HIGHWAYS

set a high standard for the nation and a new record in Hawaii. Many highway users expressed their gratitude and satisfaction to the crews working at the site.

HDOT's mission to adequately protect highway users against rockfalls requires reasonable engineering judgment, and, oftentimes, compromise. For example, in order to achieve proper catchment, the highway should ideally be relocated even farther away from the cliffside. This relocation was not possible because it would disrupt the world famous Waimea Bay beach and the existing protected marshlands. Draping a strong ringnet system over the entire slope would also be effective but it would adversely affect significant archeological, cultural, and aesthetic conditions. Therefore, in the spirit of context sensitive design, and based on engineering judgment, the original impact fence was designed only to retain medium-sized boulders falling from the cliff, rather than to contain large mass rockslides.

We believe this was the correct and appropriate solution. Based on the recent rockfall events, however, we are looking into possibly strengthening the fence to handle larger impact energies. We are also considering the use of bolting, demolition, and localized netting for other specific rockfall hazards in the area identified through additional surveys.

HDOT strives to be proactive in rockfall protection and hazard mitigation. Based on the Oahu island-wide rockfall hazard rating completed by HDOT and Earth Tech, funding has been allocated to address the hazardous slopes of Makapuu point (northern half) and Pali Highway near the Kapaa Quarry Road, within the next couple of years. The rockfall site on Kamehameha Highway on the south cliff side of Waimea Bay is rated high and the design and environmental assessment portion of the work is scheduled to begin this year.

We are also finalizing a rockfall hazard rating study to help us prioritize projects around the State. Recent rockfall projects in response to heavy rains in early 2006 and the effects of a magnitude 6.7 earthquake in October of the same year will be accounted for in this study.

Continuous monitoring of sites identified as being prone to rockfalls is also critical. HDOT and University

of Hawaii geology and mapping faculty and researchers are considering the use of new scanning technology to evaluate slopes based on topography, slope, and curvature plots.



Condition after April 2007 rockslide showing crushed rockfall fence.

There are all kinds of hazards that surround us as we go about our daily lives. As engineering professionals here at HDOT, it is our duty to do our best in providing safe passage for all of Hawaii's travelers. We will continue to use sound practice in developing and maintaining our highway facilities, and also be proactive and open to new technologies and processes in order to do our jobs better. Rockfall hazard mitigation is one of the many areas in which HDOT looks to stay ahead of the curve because too many people are counting on us to do so.

Ardalan Nikou and Yucheng Pan of Earth Tech were major contributors to this article.

LESSONS LEARNED FROM THE KIHOLO BAY EARTHQUAKE *(Continued from Page 3)*



House near costal landslide.

Public Works personnel working at Civil Defense were overwhelmed by the sheer volume of tasks they faced, limiting their ability to think strategically. However, our Public Works Community Outreach Specialist, helped the Director and Deputy to think 3-5 days ahead of the “fires” they were dealing with. This relates to the third major lesson learned about the effective use of the media.

The structural safety inspection program was initiated within 4 hours after the earthquake but only limited details of the program were sent out to the public. By day two, a local realtor advised his associates by email that the County was doing free structural inspections. Within a few hours we were inundated with request for the free service whether earthquake damage was sustained or not. This added to the workload of our inspectors by about 30% in the first 2 weeks. With better planning and aggressive use of the media, we could have minimized the number of No-Damage or Cosmetic Damage requests.

By constantly critiquing our performance, adjusting our practices and sharing what we’ve learned with others, we hope to continue improving our services to the public.

updating to conform to common construction practices in Hawaii. We are very grateful to the Structural Engineers Association of Hawaii for taking the lead in updating the form to benefit all Counties in the State.

Another lesson learned was the need for a dedicated policy planning team at the EOC to assist decision makers in anticipating response and recovery efforts. During the first three days after the earthquake, the

Better Mousetrap?

Have you or one of your co-workers built a better mousetrap recently? A modified gadget? An improved way to do a job?

Please let us know about it. The best entries will be featured in a future issue of Hawaiian Connections.



Your name and phone number:

Inventor’s name and phone:

Invention:

Please fax this form to (808) 956-8851.

FREE PUBLICATIONS

1. [Hawaii LTAP Workshop \(1996\)](#) - Storm Water Management - Design
2. [Hawaii LTAP Workshop \(2001\)](#) - Turbo Architecture Training Course
3. [Hawaii LTAP Workshop \(1998\)](#) - Subsurface Utility Engineering Short Course
4. [Hawaii LTAP Workshop \(1993\)](#) - Traffic Control Equipment & Software Demonstration Project 93 - Participant Notebook
5. [Hawaii LTAP Workshop \(2002\)](#) - Engaging Stakeholders in Your Project: Tools and Techniques
6. [Hawaii LTAP Workshop \(1986\)](#) - Culvert Inspection Manual
7. [Hawaii LTAP Workshop \(2006\)](#) - National Environmental Policy Act (NEPA) and the Transportation Decision Making Process
8. [Hawaii LTAP Workshop \(2001\)](#) - Using the National ITS Architecture for Deployment
9. [Hawaii LTAP Workshop \(2002\)](#) - Prestressed Concrete Beam Design Workshop: Load and Resistance Factor Design
10. [NCHRP-Report-432 \(1999\)](#) - High-Load Multi-Rotational Bridge Bearings
11. [TRR-1641 \(1998\)](#) - Energy, Air Quality, and Fuels 1998
12. [TRR-1642 \(1998\)](#) - Maintenance and Management of Bridge Structures
13. [FHWA-SA-06-016](#) - Innovative Intersection Safety Improvement Strategies and Management Practices: A Domestic Scan
14. [TRR-1647 \(1998\)](#) - General Design and Roadside Safety Features
15. [FHWA-SA-93-053](#) - Ice Detection and Highway Weather Information Systems Summary Report: Test and Evaluation Project 011
16. [FHWA-PA-89-022 + 85-02](#) - Manual for Inspecting Bridges for Fatigue Damage Conditions
17. [TRR-1640 \(1998\)](#) - Traffic Safety: Management, Enforcement, Older Drivers, Heavy Vehicles, and Motorcycles
18. [TRR-1637 \(1998\)](#) - Technology Transfer and Training
19. [TRR-1635 \(1998\)](#) - Highway Safety Modeling, Analysis, and Design
20. [NCHRP-Synthesis-240 \(1997\)](#) - Toll Plaza Design
21. [TRR-1672 \(1999\)](#) - Maintenance Management and Winter Services
22. [TRR-1631 \(1998\)](#) - Driver and Vehicle Modeling
23. [TRR-1625 \(1998\)](#) - Progress in Transportation Data 1998

**We are cleaning and reorganizing the Transportation Library!
Please take the time to review this list. Any remaining copies will
be discarded by SEPTEMBER 2007.**

Hawaii LTAP Transportation Library

The Hawaii Local Technical Assistance Program Library is located in Holmes Hall 143A at the University of Hawaii. The library houses over 10,000 transportation-related technical reference materials. Informational and workshop videos may also be found in the library. Reference materials and videos are available to the public and may be borrowed or copied.

Database of all materials may be found on the web at:

Videos -
<http://hltap.eng.hawaii.edu/video.html>

Publications -
www.eng.hawaii.edu/~tlib

Website:
<http://hltap.eng.hawaii.edu/>

For more information, please contact us at 956-8719.



Director's Note

by C.S. Papacostas



Since March 1995 I have been researching and reporting on historical events of engineering interest for the Hawai'i Section of the American Society of Civil Engineers (ASCE) in the Wiliki o Hawai'i, the monthly newsletter of the engineering and surveying societies in the state.

Following their publication in the newsletter, these vignettes are posted on the ASCE-Hawai'i website at www.ascehawaii.org under the "History & Heritage" section.

On occasion, as I thumb through the historical archives for my monthly contribution, I come across certain events or situations that may be of interest to you, the readers of Hawaiian Connections.

Starting with this issue, we will feature some of these gems in a new section titled A Moment in History. Not wishing to monopolize the new series, however, I am asking all of you to contribute to it by sending a short write-up about interesting historical events that you want to share, along with your name and affiliation, for inclusion in a future issue. Preference will be given to subjects related to Hawai'i's transportation system.

On another topic, it is time for me to again call for submissions of entries to our annual "Better Mousetrap" collection. Please let us know if you or a co-worker came up with anything, whether a gadget or an improved way to do a job. The best entries will be featured in a future issue.

As always, I encourage you to submit your requests for training that we can help organize and deliver. Requests may be sent in at any time as our executive board meets monthly to discuss the updated list. It is important to us to make sure that our training program addresses your expressed needs and that the knowledge you gain from it is put to good use.

Program Manager's Note

by Juli Kobayashi



These past few months I had the opportunity to travel to attend meetings and conferences on the Mainland, where I was able to gather important information for different events and activities that we are coordinating.

In April, I went to Lehi, Utah to visit Utah's Construction Career Days (CCD) event along with **Melanie Martin** of the Hawaii DOT. Over 5,800 middle and high school students participated in this rewarding experience. We were given a first hand look at a successful CCD event and how much effort it takes to coordinate all the different activities. Our appreciation goes to the Utah LTAP staff for giving us the opportunity to learn from them and share this experience with our Hawaii CCD committee.

Following Utah's CCD event, I attended the 2007 National Association of County Engineers (NACE) Annual Management and Technical Conference with **Jiro Sumada**, Deputy Director of Public Works for the County of Hawaii. This conference took place in Milwaukee, Wisconsin and it was the first time that Hawaii was represented. There were county engineers and highway superintendents from all over the nation that shared their perspectives on issues related to their job. Some of the "hot topics" included traffic, safety, construction, maintenance, asset management and more. The networking and the exhibits were invaluable and gave us an appreciation for NACE and their membership. We would like to pursue the opportunity to start a Hawaii chapter of NACE and look forward to supporting the organization.

Finally, I just came back from our LTAP Regional meeting in Boise, Idaho. Each state that attended gave an update on their center and some of the many activities and accomplishments throughout the year. It is always good to hear about the successful and innovative ways that different centers are able to reach their customers needs.

*Hawaiian Connections features scenic pictures from various locations in Hawaii.

In this issue, we are featuring the Island of Maui. On the front cover is the dominant volcano, Haleakala. Haleakala last erupted in 1790. The summit rises 10,023 feet above sea level. Many people visit the crater to watch the sunrise and sunset. In the crater visitors can see the Haleakala silversword (on the back cover). This plant is endemic to a 2,471 acre area at 6,890 to 9,843 feet elevation in the crater and outer slopes of Haleakala Volcano.

HAWAII LTAP NEWS

In the month of May we assisted **Paul Santo**, of the Hawaii Department of Transportation (HDOT) Bridge Design Section, and **Ray McCormick** of GMP-Hawaii, with a three-day bridge design seminar, "Bridge Design and Load Rating in accordance with the AASHTO Load and Resistance Factor Design (LRFD) & Load and Resistance Factor Rating (LRFR) Bridge Specifications".

Beginning in October 2007, all bridges must be designed utilizing the AASHTO LRFD Bridge Design Specifications. The HDOT has transitioned to the

LRFD design specifications and requires all bridges be designed and rated in accordance with the LRFD & LRFR Specifications.

The seminar was intended to assist bridge engineers comprehend and implement state-of-the-art design methodologies for concrete bridge design and rating. It highlighted key design steps for concrete superstructure including decks and girders. It focused on the unified method of design for reinforced and prestressed concrete, sectional shear design utilizing modified compression field theory, and strut-and-tie method for disturbed regions. The seminar also included an overview of the latest AASHTO LRFR load rating procedures and practices as they relate to concrete bridges. Finally, the seminar provided an overview of current and forthcoming LRFD seismic design provisions utilizing the latest seismic knowledge and most current USGS seismic hazard maps.

For more information on this workshop or previous workshops please contact us at (808) 956-9006.



Bridge LRFD & LRFR Seminar

What did YOU think?

Editor's Note: In this feature, we quote our associates and stakeholders about our activities. This selection, highlights the Bridge LRFD & LRFR seminar held in May.

"...All of the instructors, without exception, are experienced, very knowledgeable and effective in communicating their understanding of the subject matter to the participants. Additionally, all participants were encouraged during the lecture to ask questions to clarify any misunderstanding or vagueness.

I would highly recommend future participants to enroll in this seminar, if they are in any way associated with bridge design, whether in the private or public sectors of the industry..."

Submitted by: **Robert Yanabu**, County of Hawaii, Department of Public Works.





HAWAII LOCAL TECHNICAL ASSISTANCE PROGRAM

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The Hawaii Local Technical Assistance (LTAP) is a cooperative program of the University of Hawaii Department of Civil and Environmental Engineering, the Hawaii Department of Transportation, Highway Division, State of Hawaii and the U.S.. Department of Transportation Federal Highway Administration, Hawaii. The LTAP program provides technical assistance and training programs to local transportation related agencies and companies in order to assist these organizations in providing cost-effective improvements for the nation's highways, roads and bridges. Our office is located at:

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*Website:
<http://hltap.eng.hawaii.edu/>*

The contents of this newsletter do not necessarily reflect the official views or policies of the HDOT, FHWA or the University of Hawaii. The newsletter is intended to convey useful information to the local highway and transportation personnel. Any references to commercial products or organizations are included only for informational purposes and are not intended as endorsements by the Hawaii LTAP.

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