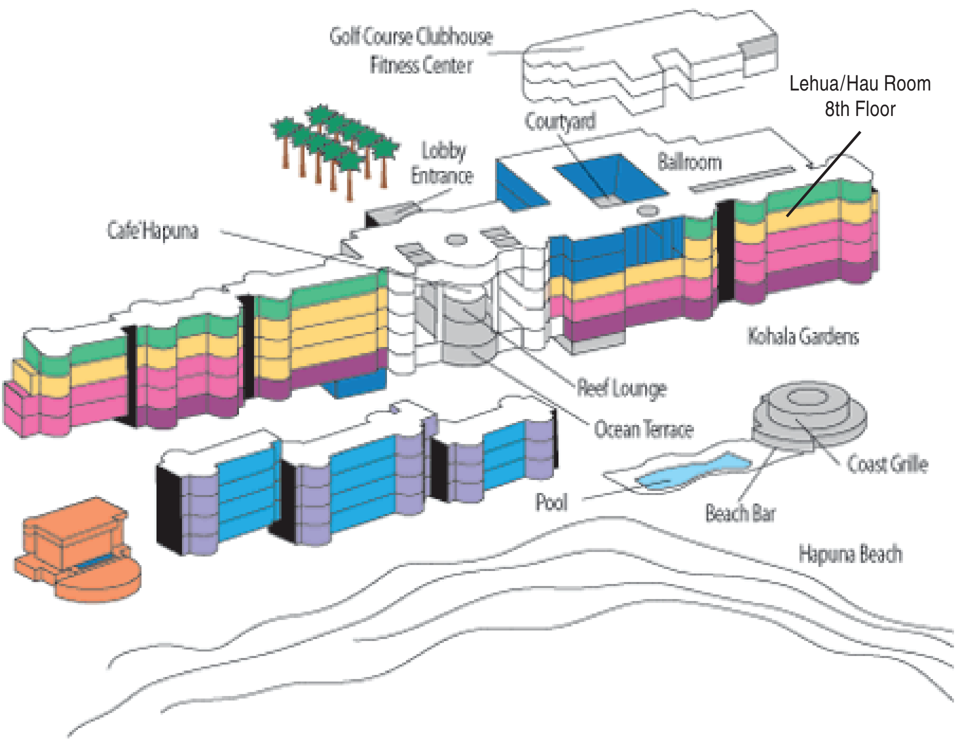
# 1st ACI/JCI Joint Seminar

Hapuna Beach Prince Hotel
Waimea, Hawaii
July 16-18, 2014



Golf Course Clubhouse
Fitness Center
Lehua/Hau Room
8th Floor
Courtyard
Lobby
Entrance
Ballroom
Cafe' Hapuna
Kohala Gardens
Reef Lounge
Ocean Terrace
Coast Grille
Pool
Beach Bar
Hapuna Beach

# Schedule
# 1st ACI/JCI Joint Seminar
# Hapuna Beach Prince Hotel
# Waimea, Hawaii

## Wednesday, July 16

| Time | Event | Location |
|---|---|---|
| 6:00 PM – 9:00 PM | ACI/JCI Joint Seminar Welcome Reception and Dinner<br>Guests of seminar participants are welcome | Poolside |

## Thursday, July 17

| Time | Event | Location |
|---|---|---|
| 7:00 AM – 8:00 AM | Buffet Breakfast | Pre-Function Area |
| 8:00 AM – 8:30 AM | Welcome and Introductory Remarks<br>ACI: President Bill Rushing<br>JCI: President Hirozo Mihashi<br>JCI: Chair, JCI Committee on JCI-ACI Collaboration, Kyuichi Maruyama<br>ACI: Seminar Program Organizer for ACI, Andrew Taylor | Lehua/Hau Room |
| 8:30 AM – 9:00 AM | JCI Paper #1:<br>Title: Structural Design Requirements for Tsunami Evacuation Buildings in Japan<br>Author: Yoshiaki Nakano<br>Affiliation: Institute of Industrial Science<br>University of Tokyo<br>Tokyo, Japan | Lehua/Hau Room |
| 9:00 AM – 9:30 AM | ACI Paper #1:<br>Title: The ASCE 7 Tsunami Loads and Effects Design Standard for the U.S.<br>Author: Gary Chock, S.E., FSEI<br>Affiliation: President, Martin & Chock, Inc.<br>Honolulu, Hawaii, USA | Lehua/Hau Room |

## Thursday, July 17

| Time | Event | Location |
| --- | --- | --- |
| 9:30 AM – 10:00 AM | JCI Paper #2:<br>Title: Evaluation of Tsunami Force Acting on Bridge Girders<br>Authors: Kyuichi Maruyama, Yasushi Tanaka, Kenji Kosa, Akira Hosoda, and Norimi Mizutani<br>Presenter: Kyuichi Maruyama<br>Affiliation: Department of Civil and Environmental Engineering<br>Nagaoka University of Technology<br>Nagaoka, Japan | Lehua/Hau Room |
| 10:00 AM – 10:15 AM | Break | Pre-Function Area |
| 10:15 AM – 10:45 AM | ACI Paper #2:<br>Title: Elimination of Diagonal Reinforcement in Earthquake-Resistant Coupling Beams through Use of Fiber-Reinforced Concrete<br>Authors: Gustavo J. Parra-Montesinos, J. K. Wight, C. Kopczynski, R. D. Lequesne, M. Setkit, A. Conforti, and J. Ferzli<br>Presenter: Gustavo J. Parra-Montesinos<br>Affiliation: Department of Civil and Environmental Engineering<br>University of Wisconsin<br>Madison, Wisconsin, USA | Lehua/Hau Room |
| 10:45 AM – 11:15 AM | JCI Paper #3:<br>Title: Global Strategy of JCI on ISO Standard for Seismic Evaluation and Retrofit of Concrete Structure<br>Author: Masaomi Teshigawara<br>Affiliation: Graduate School of Environmental Studies<br>Department of Environmental Engineering and Architecture<br>Nagoya University<br>Nagoya, Japan | Lehua/Hau Room |
| 11:15 AM – 11:45 AM | ACI Paper #3:<br>Title: Use of High-Strength Reinforcement for Earthquake-Resistant Concrete Structures<br>Authors: D. J. Kelly, A. Lepage, D. Mar, J. I. Restrepo, J. C. Sanders, and A. W. Taylor<br>Presenter: Andrew W. Taylor, Ph.D., S.E., FACI<br>Affiliation: KPFF Consulting Engineers<br>Seattle, Washington, USA | Lehua/Hau Room |

## Thursday, July 17

| Time | Event | Location |
|---|---|---|
| 11:45 AM – 12:00 PM | General questions and discussion about morning papers | |
| 12:00 PM – 1:00 PM | Lunch<br>Welcome: ACI Executive Vice President Ronald Burg | Breezeway |
| 1:00 PM – 1:30 PM | JCI Paper #4:<br>Title: A New AIJ Standard for Seismic Capacity Calculation—Recent Advances in Beam-Column Joint Design and Seismic Collapse Simulation on Reinforced Concrete Frame Buildings<br>Author: Hitoshi Shiohara<br>Affiliation: Graduate School of Engineering<br>Department of Architectural Engineering<br>University of Tokyo<br>Tokyo, Japan | Lehua/Hau Room |
| 1:30 PM – 2:00 PM | ACI Paper #4:<br>Title: Factors that Affect the Drift Ratio at Axial Failure of Nonductile RC Buildings<br>Author: Adolfo Matamoros<br>Affiliation: Department of Civil, Environmental, and Architectural Engineering<br>University of Kansas<br>Lawrence, Kansas, USA | Lehua/Hau Room |
| 2:00 PM – 2:30 PM | JCI Paper #5:<br>Title: Seismic Response of RC Bridge Piers Considering Interaction with Piles and Soil Foundation<br>Authors: Takeshi Maki, Hiroshi Mutsuyoshi, and Anawat Chotesuwan<br>Presenter: Takeshi Maki<br>Affiliation: Department of Civil and Environmental Engineering<br>Saitama University<br>Saitama, Japan | Lehua/Hau Room |

## Thursday, July 17

| Time | Event | Location |
|---|---|---|
| 2:30 PM – 3:00 PM | ACI Paper #5:<br>Title: Lessons Learned from Reinforced Concrete Wall Tests<br>Authors: Catherine French, Sri Sritharan, Beth Brueggen, and Sriram Aaleti<br>Presenter: Catherine French<br>Affiliation: College of Science and Engineering Distinguished Professor<br>Department of Civil Engineering<br>University of Minnesota<br>Minneapolis, Minnesota, USA | Lehua/Hau Room |
| 3:00 PM – 3:15 PM | Break | Pre-Function Area |
| 3:15 PM – 3:45 PM | General questions and discussion about all papers | Lehua/Hau Room |
| 3:45 PM – 4:00 PM | Closing remarks<br>Bill Rushing | Lehua/Hau Room |
| 4:00 PM | Adjourn seminar | Lehua/Hau Room |
| 4:05 PM | Group photo | Lehua/Hau Room |
| 6:30 PM – 9:00 PM | Dinner<br>Guests of seminar participants are welcome | Ocean Terrace |

## Friday, July 18

| Time | Event | Location |
|---|---|---|
| 10:00 AM | Light buffet breakfast (coffee, fruit, pastries) for ACI/JCI planning meeting attendees | Milo Room |
| 10:00 AM – 12:00 PM | ACI/JCI planning meeting | Milo Room |

# Speakers and Abstracts for First ACI/JCI Joint Seminar July 17, 2014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| **Author:** | Yoshiaki Nakano |
| **Affiliation:** | Institute of Industrial Science<br>University of Tokyo<br>Tokyo, Japan |
| **Title:** | Structural Design Requirements for Tsunami Evacuation Buildings in Japan |



**Abstract:**

The Great East Japan Earthquake that struck northern Japan in 2011 caused devastating damage, both to property and human life. For structural design of tsunami evacuation buildings, the Japanese Cabinet Office issued "Guidelines for tsunami evacuation buildings" in 2005, but very few buildings have been designed based on the Guidelines.

After the 2011 event, a joint team of IIS UTokyo and BRI extensively inspected the tsunami-damaged buildings and investigated their lateral strength, structural type, site condition, observed damage, and so on. The team reviewed the Guidelines and proposed necessary revisions based on findings from damage observation and discussions. In 2011, the Ministry of Land, Infrastructure, Transport and Tourism adopted the proposal and newly issued the Interim Guidelines on the Structural Design of Tsunami Evacuation Buildings.

This paper presents the outline of the structural requirements for tsunami evacuation buildings stipulated in the new Japanese Interim Guidelines. The relationship between structural size, tsunami inundation depth, and required lateral strength is also discussed.



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| **Author:** | Gary Chock, S.E., FSEI |
| **Affiliation:** | President, Martin & Chock, Inc.<br>Honolulu, Hawaii, USA |
| **Title:** | The ASCE 7 Tsunami Loads and Effects Design Standard for the U.S. |



**Abstract:**

The Tsunami Loads and Effects Subcommittee of the ASCE/SEI 7 Standards Committee has developed a new Chapter 6, Tsunami Loads and Effect, for the 2016 edition of the ASCE 7 standard, Minimum Design Loads for Buildings and Other Structures. Chapter 6 provides loads and other requirements for tsunami and its effects. The 2016 edition of the ASCE 7-16 Tsunami Loads and Effects chapter will be applicable initially to the states of Alaska, Washington, Oregon, California, and Hawaii, which are tsunami-prone regions that have probabilistically quantifiable hazards resulting from tsunamigenic earthquakes of subduction mechanism.

The International Building Code (IBC) references design provisions that are given in American Society of Civil Engineers Standard 7. The ASCE 7 Standard becomes part of an enacted building code law through adoption of the model International Building Code by the local authority having jurisdiction (such as a state, county, or city). The IBC would incorporate ASCE 7-16 in 2018. Therefore, it is anticipated that the first national tsunami design provisions of ASCE 7 would be utilized as a part of mandatory building codes of U.S. jurisdictions after 2020.

In these states, it is recognized by federal, state, and local governments that mitigation of tsunami risk to public safety requires emergency preparedness for evacuation, in addition to structural resilience of critical facilities necessary for immediate response and economic and social recovery. The lesson of the recent catastrophic tsunami is that historical records alone do not provide a sufficient measure of the potential heights of future tsunamis. Engineering design must consider the occurrence of events greater than scenarios in the historical record, based on the underlying seismicity of subduction zones. For U.S. national tsunami design provisions to achieve a consistent reliability standard of structural performance for community resilience, Probabilistic Tsunami Hazard Analysis (PTHA) consistent with source seismicity is performed in addition to consideration of historical event scenarios. PTHA generates large probabilistic catalogs of tsunami waveforms directly from the source mechanisms in accordance with logic tree probabilities for each possible subduction source mechanism (for example, slip distribution and extent of rupture) consistent with their estimated plate convergence rates, and propagates these waveforms to the offshore regimes of the coastlines.

PTHA results are embodied in Offshore Tsunami Amplitude maps. These hazard maps are defined at a bathymetry water depth contour of 100 m offshore and serve to document the regional probabilistic tsunami hazard. The Maximum Considered Tsunami is defined for a 2% probability of being exceeded in a 50-year period, or a 2475-year average return period. It is the design basis event used for design, consisting of the inundation depths and flow velocities at the stages of inflow and outflow most critical to the structure. Key parameters for the tsunami basis of design are the Offshore Tsunami Amplitude, Inundation Depth, Runup elevation, and maximum (horizontal) Inundation Limit. Offshore Tsunami Amplitude is measured where the water depth is 100 m. Inundation Depth is the depth of tsunami water level with respect to the local grade plane. Runup Elevation is the elevation above reference datum at the tsunami inundation limit. Maximum Inundation Limit is the maximum horizontal extent of the inundation zone relative to the shoreline at Mean Sea Level.


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| **Authors:** | Kyuichi Maruyama, Yasushi Tanaka, Kenji Kosa, Akira Hosoda, and Norimi Mizutani |
| **Presenter:** | Kyuichi Maruyama |
| **Affiliation:** | Department of Civil and Environmental Engineering |
| | Nagaoka University of Technology |
| | Nagaoka, Japan |
| **Title:** | Evaluation of Tsunami Force Acting on Bridge Girders |



**Abstract:**

This paper deals with what tsunami force acted on bridge girders by the Great East Japan Earthquake, which broke out in March 11, 2011. First of all, a lot of efforts were conducted to collect almost all data of bridge girders in the inundation area. Satellite images on Internet websites proved effective to make a quick survey of any bridge in the inundation area. For damage analysis, the detailed data of bridges were collected through authorities. In total, 252 bridges out of 1793 bridges in the inundation area were washed away. In order to categorize bridges which should survive against the tsunami, the method proposed by Prof. Kosa was introduced. In the method, the resistance of a bridge is expressed as a function of the self-weight of a bridge girder, and the force due to tsunami is defined by hydrodynamic equation. More than 200 bridges, including both washed away bridges and survived ones, were analyzed. The analytical results showed the importance of characteristics of tsunami, such as velocity and height in the land. Then, motion pictures taken during attack of tsunami were examined to evaluate the velocity and height of tsunami in the land. When bridges in a limited area, where the tsunami velocity could be similar to the assumed value, were taken into account, the method was effective

to see whether bridges were survived or not. Furthermore, field survey showed that bridges washed away by tsunami should have had uplift force by tsunami. Experimental investigation was done using a water channel in different scales to examine what forces acted on bridge girders and to develop a proper simulation model.

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| **Authors:** | Gustavo J. Parra-Montesinos, J. K. Wight, C. Kopczynski, R. D. Lequesne, M. Setkit, A. Conforti, and J. Ferzli |
| **Presenter:** | Gustavo J. Parra-Montesinos<br>Affiliation: Department of Civil and Environmental Engineering<br>University of Wisconsin<br>Madison, Wisconsin, USA |
| **Title:** | Elimination of Diagonal Reinforcement in Earthquake-Resistant Coupling Beams through Use of Fiber-Reinforced Concrete |

**Abstract:**

Results from experimental research that led to the development of a new design of coupling beams constructed with high-performance fiber-reinforced concrete (HPFRC) and simplified reinforcement detailing are presented, along with information related to its implementation in a high-rise building in the city of Seattle, WA. Coupling beam specimens were tested under large displacement reversals to evaluate the possibility of simplifying diagonal and confinement reinforcement detailing without compromising seismic performance. Experimental results indicate that the use of HPFRC allows the complete elimination of diagonal reinforcement in beams with span-to-height ratios greater than or equal to approximately 2.2. Also, special confinement reinforcement, as used in regular reinforced concrete coupling beams, was found to only be required over a distance of half the beam height from each beam end. Drift capacity of the HPFRC coupling beam specimens, when subjected to shear reversals with amplitudes comparable to the upper shear limit allowed in the ACI Building Code, was approximately 6% or greater.

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| **Author:** | Masaomi Teshigawara |
| **Affiliation:** | Graduate School of Environmental Studies<br>Department of Environmental Engineering and Architecture<br>Nagoya University<br>Nagoya, Japan |
| **Title:** | Global Strategy of JCI on ISO Standard for Seismic Evaluation and Retrofit of Concrete Structure |

**Abstract:**

The reduction of earthquake damage in the earthquake-prone area including Japan is important. For this purpose, it is the most important to improve earthquake resistance of buildings.

In 1981, a check of lateral force-carrying capacity was specified in the seismic design code of Japan. Providing the strength to buildings and the ductility to structural members are required in this seismic design code. However, for buildings designed by working stress design method before 1981, the seismic performance against extreme large earthquakes was unidentified. Diagnosis of the earthquake resistance and execution of necessary seismic strengthening for buildings have been promoted from the 1970s. The concept and the outlines of the seismic diagnosis method in Japan are introduced. The three levels of diagnosis, the primary, the second, and the third diagnosis, are provided for the prompt screening of seismic capacity of the buildings. Seismic performance is evaluated by the seismic index of “Is” that is the product of the strength and ductility index of the building. The seismic index of “Is” corresponds to the input energy of the earthquake. In other

words, the earthquake-resistant performance of the building is expressed as the intensity of earthquake to that the building can resist. The seismic capacity of more than 80% of special buildings such as the educational facilities were evaluated and strengthened by the diagnostic criteria up to 2010. The seismic diagnosis method in Japan has been applied to a lot of buildings and the efficiency is verified through many damage earthquakes.

To make use of this technique for improving the earthquake resistance of buildings at earthquake-prone area in the world, the standardization of evaluation of seismic performance and strengthening of buildings are tried in the ISO/TC 71/SC 7 (Maintenance and repair of concrete structures). The draft of this ISO standard provides the standard work items related to seismic assessment and retrofit, and standard procedures in each stage, and makes contents and the scope of each duty clear.

To confirm and to judge the seismic performance, the monitoring system of seismic performance using IT sensors is also introduced.


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| **Authors:** | D. J. Kelly, A. Lepage, D. Mar, J. I. Restrepo, J. C. Sanders, and A. W. Taylor |
| **Presenter:** | Andrew W. Taylor, Ph.D., S.E., FACI<br>Affiliation: KPFF Consulting Engineers<br>Seattle, Washington, USA |
| **Title:** | Use of High-Strength Reinforcement for Earthquake-Resistant Concrete Structures |



**Abstract:**

In the U.S., the specified yield strength of primary reinforcement of special concrete moment frames and special concrete shear walls may not exceed 60 ksi. As part of the Applied Technology Council ATC-98 Project, the use of high-strength reinforcement as primary reinforcement for seismic-force-resisting systems (SFRS) was studied. The purpose of the project was to examine the feasibility of using specified yield strength greater than 60 ksi and if so, to recommend changes in design requirements and to reinforcing steel specifications. The use of ASTM A706 Grade 80 was specifically examined, and it was determined that Grade 80 reinforcement could be used with little change to ACI 318. It was also found that additional research is needed before a complete set of recommendations for use of reinforcement Grades 100 and 120 are made. This paper highlights the main findings and recommendations of the ATC-98 project. In particular, this paper discusses (i) desirable mechanical properties for high-strength reinforcing steel, (ii) the deformation capacity of concrete members reinforced with high-strength longitudinal reinforcement, (iii) minimum depths of interior beam-column joints in special moment frames, (iv) spacing of the transverse reinforcement to delay buckling of the longitudinal reinforcement, and (v) requirements for detailing lap-spliced bars.



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| **Author:** | Hitoshi Shiohara |
| **Affiliation:** | Graduate School of Engineering<br>Department of Architectural Engineering<br>University of Tokyo<br>Tokyo, Japan |
| **Title:** | A New AIJ Standard for Seismic Capacity Calculation—Recent Advances in Beam-Column Joint Design and Seismic Collapse Simulation on Reinforced Concrete Frame Buildings |



**Abstract:**

A new concept of joint hinging failure having been developed in Japan is presented, which will be implemented in a new draft provision for seismic design of beam-column joints in the New AIJ (Architectural Institute of Japan) Standard for Seismic Capacity Calculation. This paper discusses the key issues of the new draft provisions, with background, test data verification, theory, and analyses with emphasis on why such a new concept is necessary. The design factors affecting the strength of joint hinging failure are discussed for seismic design consideration. Seismic collapse simulation is made by nonlinear time-history analysis for moment frames with BC joints failing in the joint hinging failure mode, to demonstrate the challenge of strength degradation and severe slip hysteretic relationships inherent to the joint hinging failure. Draft equations giving the strength of joint hinging failure of BC joints are also introduced.

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| **Author:** | Adolfo Matamoros |
| **Affiliation:** | Department of Civil, Environmental, and Architectural Engineering<br>University of Kansas<br>Lawrence, Kansas, USA |
| **Title:** | Factors that Affect the Drift Ratio at Axial Failure of Nonductile RC Buildings |

**Abstract:**

Performance and evaluation criteria for reinforced concrete (RC) columns developed as part of rehabilitation standards and guides such as FEMA-273 (1997), FEMA-356 (2000), ASCE-41 (2007), the ASCE-41 supplement No. 1 (Elwood et al., 2007), and the ACI 369 Rehabilitation Guide (2011) were based on limited experimental data. Test data were particularly scarce for severely damaged columns subjected to shear reversals. Given the complexity involved in testing full-scale components with unstable behavior and the inherent potential for damage to the testing equipment and sensors, very few column tests had been carried out to column axial failure when those provisions were developed, forcing experts to rely on their judgment to overcome information gaps. Due to the uncertainty caused by the lack of data, the result was a set of rehabilitation criteria that was limited in scope and conservative in nature.

A recent effort funded by the National Science Foundation and undertaken under the umbrella of the PEER center was aimed at improving the understanding of the risk of collapse in older RC buildings and to use that information to improve rehabilitation standards used by practicing engineers. One of the thrusts of this research program focused on the risk of collapse posed by RC columns with reinforcing details considered to be inadequate in modern seismic codes. The column research thrust consisted of 12 physical simulations (Henkhaus 2010; Woods and Matamoros 2010) and computer simulations (Sammarco and Matamoros 2010) investigating the effect of several parameters on column behavior and on the drift ratio at axial failure. The presentation describes the main findings of the experimental program on RC columns and the changes being implemented in rehabilitation standards as a result.

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| **Authors:** | Takeshi Maki, Hiroshi Mutsuyoshi, and Anawat Chotesuwan |
| **Presenter:** | Takeshi Maki |
| **Affiliation:** | Department of Civil and Environmental Engineering<br>Saitama University<br>Saitama, Japan |
| **Title:** | Seismic Response of RC Bridge Piers Considering Interaction with Piles and Soil Foundation |

**Abstract:**

In the 1995 Great Hanshin (Kobe) Earthquake, the severe damage of many bridges mainly arose because their reinforced concrete (RC) piers lacked sufficient load-carrying capacity and ductility. Consequently, many bridge piers in Japan have been strengthened using various techniques, such as concrete jacketing, steel jacketing, and fiber sheet wrapping,

so that they will withstand future strong earthquakes. A bridge is usually designed to avoid, as far as possible, any damage to its foundation so that damage can be easily investigated after an earthquake for an appropriate judgment of restoration. Enhancement of the load-carrying capacity of a bridge pier by one of the aforementioned strengthening techniques, however, may influence the location and degree of seismic damage when a strong earthquake occurs. In particular, it is anticipated that such strengthening may cause damage to be concentrated in the foundation. To clarify and verify the overall seismic behavior of a bridge system comprising superstructure, pier, pile foundation, and surrounding soils, several quantitative investigations have been made in this study using substructured pseudo-dynamic (Sub-PsD) testing method, which combines numerical calculations and loading test of structural elements.

By means of a simplified three-degrees-of-freedom model, seismic behavior of RC bridge piers and pile foundations were evaluated based on Sub-PsD tests for cases where pier strengthening and foundation strengthening are implemented. The Sub-PsD test verified that, as pier flexural capacity is enhanced through pier strengthening, the damage caused by future earthquakes may be concentrated in the foundation. The test result also showed that foundation strengthening can effectively prevent the foundation damage, which may occur after pier strengthening. Numerical analysis based on Sub-PsD test results was also carried out to quantitatively clarify how damage shifts between the pier and the pile foundation with different levels of strengthening. The results of the analysis indicated that the importance of a ratio of capacities of the pier and the pile foundation, as well as a balance of dissipated energy in between them, was highlighted when the capacity and stiffness of the pier were increased by strengthening. Furthermore, as foundation capacity was increased, bridges exhibited behavior with a bounding tendency in the load demand. The maximum load in the foundation converged to a bounded value soon after no foundation yielding was ensured.

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| **Authors:** | Catherine French, Sri Sritharan, Beth Brueggen, and Sriram Aaleti |
| **Presenter:** | Catherine French |
| **Affiliation:** | College of Science and Engineering Distinguished Professor<br>Department of Civil Engineering<br>University of Minnesota<br>Minneapolis, Minnesota, USA |

| **Title:** | Lessons Learned from Reinforced Concrete Wall Tests |
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**Abstract:**

This paper will describe some of the findings learned from rectangular and T-shaped wall studies conducted at the University of Minnesota. Issues investigated included the effect of anchorage details (that is continuous, lap-spliced, and mechanically anchored reinforcement), reinforcement distribution, and multi-directional testing.

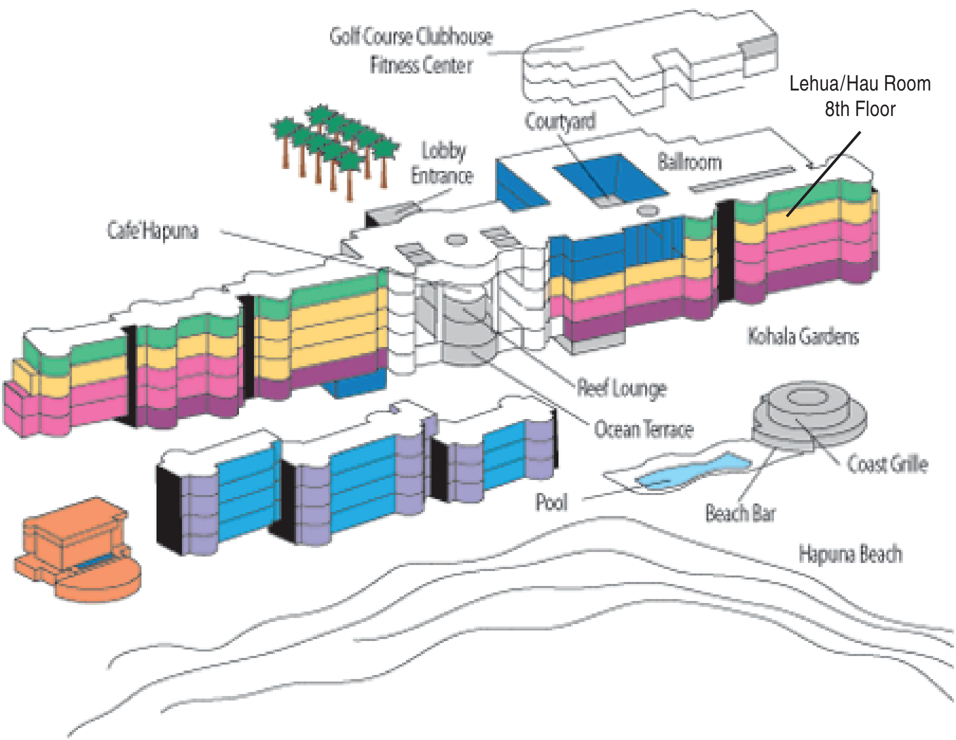
# JCI Attendees:

| Name | Affiliation |
|---|---|
| Hirozo Mihashi | President of JCI<br>Professor Emeritus<br>Tohoku University |
| Chizuko Mihashi | Guest |
| Kyuichi Maruyama | Professor Emeritus<br>Nagaoka University of Technology |
| Hiroshi Mutsuyoshi | Professor<br>Department of Civil and Environmental Engineering, Saitama University |
| Tetsuya Ishida | Professor<br>Department of Civil Engineering<br>University of Tokyo |
| Koichi Kusunoki | Associate Professor<br>Earthquake Research Institute<br>University of Tokyo |
| Hitoshi Shiohara | Professor<br>Department of Architectural Engineering<br>Graduate School of Engineering<br>University of Tokyo |
| Tomohiro Miki | Associate Professor<br>Department of Civil Engineering<br>Kobe University |
| Masaomi Teshigawara | Professor<br>Department of Environmental Engineering and Architecture<br>Nagoya University |
| Yoshiaki Nakano | Professor<br>Director General<br>Institute of Industrial Science<br>University of Tokyo |
| Takeshi Maki | Associate Professor<br>Division of Environmental Science and Infrastructure Engineering<br>Graduate School of Science and Engineering<br>Saitama University |

# ACI Attendees:

| Name | Affiliation |
|---|---|
| JoAnn Browning<br>& Adolfo | David and Jennifer Spencer Distinguished Chair & Dean<br>College of Engineering<br>University of Texas at San Antonio |
| Ron Burg | Executive Vice President<br>American Concrete Institute |
| Gary Chock | President<br>Martin & Chock, Inc. |
| Kelly Dudley<br>& Phillip | Manager, Technical Committees and Activities<br>American Concrete Institute |

| Name | Affiliation |
|---|---|
| Cathy French<br>& Dan | Professor<br>Department of Civil Engineering<br>University of Minnesota |
| Fred Goodwin<br>& Carol | Fellow Scientist<br>BASF Construction Chemicals |
| Trey Hamilton<br>& Nancy | Associate Professor<br>Department of Civil & Coastal Engineering<br>University of Florida |
| Ron Janowiak<br>& Barb | Chair, ACI Technical Activities Committee<br>Senior Staff Engineer, Exelon Nuclear |
| Neven Krstulovic-Opara | Senior Structural Engineer<br>ExxonMobil, Upstream Research Company |
| Kimberly Kurtis<br>& Melissa | Associate Chair - Graduate Programs<br>Professor<br>Structural Engineering, Mechanics and Materials<br>Georgia Institute of Technology |
| Kevin MacDonald<br>& Lori | President<br>Beton Consulting Engineers LLC |
| Adolfo Matamoros<br>& JoAnn | Professor, Department of Civil, Environmental, and Architectural Engineering<br>University of Kansas |
| Khaled Nahlawi | Senior Engineer<br>American Concrete Institute |
| Jan Olek<br>& Anna | Professor, Lyles School of Civil Engineering<br>Purdue University |
| Gustavo Parra-Montesinos | Professor, Department of Civil and Environmental Engineering<br>University of Wisconsin |
| Bill Rushing<br>& Sheila | President, American Concrete Institute<br>Vice President, Waldemar S. Nelson & Co. Inc. |
| Matt Senecal<br>& Beth | Senior Engineer<br>American Concrete Institute |
| Michael Stenko<br>& Patricia | President<br>Transpo Industries |
| Andy Taylor<br>& Tory | Associate<br>KPFF Consulting Engineers |
| Eldon Tipping | Chairman<br>Structural Services, Inc. |
| Sharon Wood | Vice-President, American Concrete Institute<br>Dean, Cockrell School of Engineering<br>University of Texas at Austin |
| Greg Zeisler | Senior Engineer<br>American Concrete Institute |
| Jerzy Zemajtis<br>& Agata and Kasper | Senior Engineer<br>American Concrete Institute |



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