These citations are from the Earthquakes and the Built Environment Index on CD-ROM. EBEI is a cooperative effort of the Multidisciplinary Center for Earthquake Engineering Research (MCEER) at SUNY at Buffalo, the Earthquake Engineering Research Center (EERC) at U/C Berkeley, and the Newcastle Earthquake Project in Australia. It includes the QUAKELINE* database produced at MCEER and also the Earthquake Engineering Abstracts database produced by U/C Berkeley's Center, in addition to the Newcastle Earthquake Database. Also included on EBEI are records for the book collections of MCEER and EERC. EBEI contains a total of 100,000 citations. EBEI is updated twice a year. Use of the citations in this computersearch for purposes other than for non-profit research or education is forbidden. (PRIVATE)

QUAKELINE (1987-present) provides more than 30,000 citations and abstracts covering the literature of earthquake engineering and natural hazards mitigation. The MCEER Information Service produces the database with funding from the National Science Foundation, the Federal Emergency Management Agency, and the New York State Science and Technology Foundation. About 4,000 records per year are added to QUAKELINE.

Earthquake Engineering Abstracts (1971-present) provides more than 49,000 citations and abstracts on earthquake engineering and seismic hazards mitigation. The National Information Service for Earthquake Engineering (NISEE), a public service project sponsored by the National Science Foundation, maintains the database at the Earthquake Engineering Research Center (EERC), University of California at Berkeley. About 3,700 records per year are added to the database.

The Newcastle Earthquake Database (1989-present) is compiled by the Newcastle Region Public Library of Australia. It provides over 2,800 citations and abstracts specifically on the 1989 Newcastle, Australia earthquake.

All items cited in the QUAKELINE database are available in the collection of the MCEER Information Service. To obtain materials, or for information on QUAKELINE or on earthquake hazards mitigation, contact the MCEER Information Service:

Email: mceeris@acsu.buffalo.edu
Voice: (716) 645-3377 Fax: (716) 645-3379
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SHAPE MEMORY ALLOYS: SEISMIC RETROFIT ISSUES

Computersearch of Earthquakes and the Built Environment Index (EBEI) (5 records)
Search performed by D. Tao October 2002

NISC DISCover Report
Earthquakes and the Built Environment Index 1971 - May 2002

Search Strategy

#1: 31 : kt,ti-shape memory alloy
#2: 13,164 : retrofit* or strengthen* or repair*
#3: 5 : #1 and #2

Output for Set: 3

Total Matches: 5
Total Records Output: 5

Date: Monday, October 28, 2002

Record 1.

Title: Computational aspects of one-dimensional shape memory alloy modeling with phase diagrams.; A local integration method for coupled damage and plasticity.; On the characterization of localized solutions in inelastic solids: an analysis of wave propagation in a softening bar.; Seismic analysis for design or retrofit of gravity bridge abutments.; Seismic design of bridge piers based on damage avoidance design.; Seismic design of bridge columns based on control and repairability of damage.; Structural welding code -- reinforcing steel: including metal inserts and connections in reinforced concrete construction.

Author: Govindjee, Sanjay; Kaspar, Eric. p.; Govindjee, Sanjay; Hall, Garrett; Armero, Francisco; Fishman, K. L.; Richards, R.; Divito, R. C.; Mander, John B.; Cheng, Chin-Tung; Cheng, Chin-Tung; Mander, John B.


Source: Dept. of Civil Engineering, University of California: (Berkeley, Calif.), 27 pages; 1998

Key Terms: Shape memory alloys; University of California, Berkeley. Dept. of Civil Engineering.; Engineering mathematics; Plasticity; University of California, Berkeley. Dept. of Civil Engineering.; Engineering Materials » Dynamic testing; Strains and stresses » Mathematical models; University of California, Berkeley. Dept of Civil Engineering.; Bridges » Abutments; Viaducts » Design and construction; Earthquake resistant design; National Center for Earthquake Engineering Research [U.S.]; Bridges » Foundations and piers » Earthquake effects; Bridges » Earthquake effects; Bridges, Concrete » Design and construction; National Center for Earthquake Engineering Research [U.S.]; Bridges » Foundations and piers » Earthquake effects; Bridges » Earthquake effects; Columns, Concrete; National Center for Earthquake Engineering Research [U.S.]; Reinforcing bars » Welding; Welding; Steel, Structural

Publication Type: monograph
Call Number: 500/C23/98/03
Record 2.

Title: ANALYTICAL STUDIES OF SHAPE MEMORY ALLOY DAMPERS FOR STRUCTURAL CONTROL OF BASE ISOLATED BRIDGES.

Author: Wilde, Krzysztof; Gardoni, Paolo; Fujino, Yozo

Author Affiliation: Department of Civil Engineering, University of Tokyo, Hongo 7-3-1, Bunkyo-ku, Tokyo 113, Japan.


Notes: 17 references. Graphs, diagrams. This workshop was held in cooperation with the Japan International Center for Disaster Mitigation Engineering (INCEDE) and was supported by the Japan Society for the Promotion of Sciences and the National Science Foundation. On cover: Post-Earthquake Reconstruction Strategies; NCEEER-INCEDE Center-to-Center Project. Availability refers to the entire conference proceedings and not to this individual paper.

Key Terms: Base isolated bridges; Base isolation systems; Elevated highway bridges; Hysteresis; Laminated rubber bearings; Response simulation; Shape memory alloy [SMA] dampers; Smart isolation systems; Smart materials; Stress strain relations

Quakeline Abstract:

Base isolation provides a very effective passive method of protecting bridges from the hazard of earthquakes. The proposed smart isolation system combines the laminated rubber bearing with the device made of shape memory alloy (SMA). The constitutive law for superelastic material is extended to describe a hardening of the stress-strain relation of SMA at large strain levels. The smart base isolation utilizes the different responses of the SMA at different levels of strain to control the displacements of the rubber bearing at various excitation levels. At the same time the hysteresis of the alloy is used to increase the energy dissipation capacity. The performance of the smart base isolation is compared with the responses of laminated rubber bearing with lead core to quantify the benefits of applying SMA for isolation of elevated highway bridges. (Authors’ abstract).

Major Topics: Earthquake Resistant Design, Construction, Retrofitting, and Repair; Properties of Materials and Components

Language: English

Publication Type: Conference paper; Technical report


Call Number: QUAKELINE; SEL TA654.6.T423 no.97-0005

Document Numbers: EEA-323718

Record ID: QKLN-1999-0591

Database: QUAKELINE

Record 3.

Title: Shape memory alloy dampers for seismic rehabilitation of existing buildings.

Author: Sweeney, S. C.; Hayes, J. R., Jr.

Source: Public Works Research Institute: (Tsukuba-shi, Japan); Wind and Seismic Effects, Proceedings of the 27th Joint Meeting of the U.S.-Japan Cooperative Program in Natural Resources Panel on Wind and Seismic Effects, pages 317-332; 1995

Key Terms: Damping devices; Retrofitting; Bracing

EEA Abstract:

Current research with shape memory alloys (SMA) involves experimenting with devices incorporating these materials in dampers that can be installed in new and existing buildings to modify structural behavior under strong lateral loads. Prototype devices have been developed that produce a nearly square hysteresis loop, providing significant energy-dissipation capabilities. These devices could be incorporated into existing braces or in braces added to moment frame structures. Tuning the device to the particular force, displacement, and hysteretic characteristics is achieved by altering the cross-sectional area, length and configuration of the material or device. An analysis of a typical concrete frame structure incorporating SMA damping devices demonstrates their feasibility.

Publication Type: paper

Call Number: 500/W552/1995

Document Numbers: Technical Memorandum of PWRI 3387

Record ID: EEA-317112

Database: EARTHQUAKE ENGINEERING ABSTRACTS
Quakeline Abstract:
Results on the implementation of tuned mass dampers (TMD) using different energy dissipation mechanisms in a laboratory model are reported. Three damping schemes were used for the resistant scheme of the TMD: viscoelastic dampers, pre-stressed shape-memory alloy (SMA) cables, and linear-friction dampers. The objective of these tests was to verify the dynamic characteristics of nonlinear TMDs predicted in analytical research previously conducted by the writers and to assess the predictability of the structural response using simple mathematical models. (Authors' abstract).

Major Topics: Dynamics of Structures; Earthquake Resistant Design, Construction, Retrofitting, and Repair; Properties of Materials and Components

Language: English

Publication Type: Conference paper

Availability: International Association for Structural Control, c/o Department of Civil Engineering, University of Southern California, Los Angeles, CA 90089-2531, USA.

Call Number: QUAKELINE: SEL TA654.9.W67 1994 v.2

Record ID: QKLN-1995-1930

Database: QUAKELINE

Record 5.

Title: COMPARATIVE STUDY OF FOUR PASSIVE ENERGY DISSIPATION SYSTEMS.

Author: Aiken, Ian D.; Nims, Douglas K.; Kelly, James M.

Author Affiliation: Earthquake Engineering Research Center, University of California at Berkeley, CA, USA.


Notes: 8 references. Graphs, photographs, diagrams.

Key Terms: Coulomb friction dampers; Earthquake simulator tests; Energy dissipating struts; Model structures; Multistory buildings; Nitinol; Passive energy dissipation systems; Shape memory alloy; Sliding friction dampers; Structure bracing systems; Viscoelastic shear dampers; Energy dissipation devices » nonlinear response; Damping devices » nonlinear response » viscoelastic; Shape memory alloys » damping devices; Friction damping; Coulomb friction; Bracing » energy dissipation devices; Shaking table tests » energy dissipation devices » damping devices

Quakeline Abstract:
This paper describes and compares earthquake simulator tests of four new types of passive energy dissipators that were performed at the Earthquake Engineering Research Center of the University of California at Berkeley. The four types of energy dissipators are a Coulomb friction damper; a self-centering friction device in which the slip load is proportional to the slip displacement; a viscoelastic shear damper; and a shape memory alloy. Two different model structures were used in the experimental studies, and the energy dissipators were incorporated as part of the bracing systems of the structures. (Authors' abstract).

EEA Abstract:
This paper describes and compares earthquake simulator tests of four new types of passive energy dissipators that were performed at the Earthquake Engineering Research Center of the University of California at Berkeley. The four types of energy dissipators are a Coulomb friction damper; a self-centering friction device in which the slip load is proportional to the slip displacement; a viscoelastic shear damper; and a shape memory alloy. Two different model structures were used in the experimental studies, and the energy dissipators were incorporated as part of the bracing systems of the structures. (Authors' abstract).