Effects Of Near Fault Ground Motions On Frame Structures

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The Complete Story of Destiny! From origins to Shadowkeep [Timeline and Lore explained] *Effects Of Near Fault Ground*
Effects of near-fault and far-fault ground motions on nonlinear dynamic response and seismic damage of concrete gravity dams 1. Introduction. Dams are important lifeline engineering which have contributed to the development of civilization for a... 2. Characteristics of near-fault ground motions. It ...

Effects of near-fault and far-fault ground motions on ...
Ground motions close to a fault can be significantly influenced by directivity effects. When the rupture and slip direction relative to a site coincide, and a significant portion of the fault ruptures towards the site, the ground motion can exhibit the effects of forward-directivity.

Effects of near-fault ground motions and equivalent pulses ...
Near-fault ground motion includes the characteristics of forward directivity and fling step. In addition to ground motion, the aspect ratio of the pier, as a representative factor of a structural system, influences the seismic behavior of bridges. Thus, this study assessed the seismic response of bridges with various aspect ratios under the near-fault and far-fault ground motion conditions. Nonlinear static analysis was first performed to evaluate the seismic capacity of the pier.

Special Issue "Effects of Near-Fault Ground Motions on ...
The latter is described with idealized pulses and near-fault seismic records strongly influenced by forward-directivity or fling-step effects (from Northridge, Kobe, Kocaeli, Chi-Chi, Aegion). In addition to the well known dependence of the resulting block slippage on variables such as the peak base velocity, the peak base acceleration, and the critical acceleration ratio, our study has consistently and repeatedly revealed a profound sensitivity of both maximum and residual slippage: (1) on ...

Effects of Near-Fault Ground Shaking on Sliding Systems ...
Near-fault ground motions have caused much damage in the vicinity of seismic sources during recent earthquakes. These ground motions come in large varieties and impose high demands on structures compared to " ordinary " ground motions. Recordings suggest that near-fault ground motions are characterized by a large high-energy pulse.

Effects of Near-Fault Ground Motions on Frame Structures ...
Conclusions 1) The long-period pulse has a significant effect on the tunnel, which makes the near-fault ground motions more damaging... 2) For a given pulse period, the pulse with larger amplitude brings more energy and leads to higher strains in rock and... 3) The period of the pulse can ...

Effect of near-fault ground motions with long-period ...
Effects of Near-Fault Ground Motion and Fault-Rupture on the Seismic Response of Reinforced Concrete Bridges

Effects of Near-Fault Ground Motion and Fault-Rupture on ...
Closure to " Effect of Near-Fault Vertical Ground Motions on Seismic Response of Highway Overcrossings " by Sashi K. Kunnath, Emrah Erduran, Y. H. Chai, and Mark Yashinsky Discussion of " Effect of Near-Fault Vertical Ground Motions on Seismic Response of Highway Overcrossings " by Sashi K. Kunnath, Emrah Erduran, Y. H. Chai, and Mark Yashinsky

Effect of Near-Fault Vertical Ground Motions on Seismic ...
Abstract. Near-fault ground motions exhibiting forward directivity effects are critical for seismic design because they impose very large seismic demands on buildings due to their large-amplitude pulselike waveforms. The current challenge in seismic design codes is to recommend simple (easy-to-apply) yet proper rules to explain the near-fault forward directivity (NFFD) phenomenon for seismic demands.

Implementation of Near-Fault Forward Directivity Effects ...
On Topography: One of the main effects of the faults on topography is that they very often result in the development of distinct types of steep slopes which are aptly called fault scarps. Three types of fault associated scarps are often recognized- fault scarps, fault-line scarps and composite-fault scarps.

Faults: Meaning, Causes and Effects | Rocks | Geology
step effect is the outcome of the tectonic permanent deformation of the earth in the proximity of the fault. It manifests itself in the record with a static residual displacement, oriented parallel to the fault strike with strike-slip earthquakes and perpendicular to the fault with purely dip-slip normal or thrust earthquakes Abraha-mson 2001 .

Effects of Near-Fault Ground Shaking on Sliding Systems
of severe, long-period pulses in near-fault ground motions may be a key factor in causing damages. Thus, it is necessary to investigate the effect of the long-period pulse on tunnels in order to interpret the observed damages. At present, there are two approaches to account for near-fault ground motions.

1558. Effect of near-fault ground motions with long-period ...
Characteristics of Near-Fault Ground Motions. · F d Di ti it Eff tForward Directivity Effect: – Fault rupture propagates toward a site with Vr ≈ β (and slip vector points toward the site). – Appears in the form of two-sided velocity pulse. – Observed in the strike-normal directionfor strike-slip and dip-slip faults.

NEAR-FAULT GROUND MOTIONSFAULT GROUND MOTIONS ...
To investigate the effects of earthquake characteristics, two categories of strong ground motions are assumed through IDA method, i.e. near and far-field sets. To study the extent of modification for various heights of structures, 4 – 6 and 10 stories moment-resisting concrete frames are considered as case studies.

Effects of Near-fault Strong Ground Motions on ...
The analyses results revealed that the seismic performance of the CBFs without FVDs is very poor and sensitive to the velocity pulse period and the intensity of the NF ground motion due to brace ‐ buckling effects. Installing FVDs into the CBFs significantly improved their seismic performance by maintaining their elastic behaviour.

Effect of near ‐ fault ground motion and damper ...
near-fault phenomenon requires consideration in the design process for structures that are located in the near-fault region, which is usually assumed to extend about 10 to 15 km from the seismic source (1996 SEAOC Blue Book). Aside from directivity effects, near-fault ground motions are more severe than " ordinary "

EFFECTS OF NEAR-FAULT GROUND MOTIONS ON FRAME STRUCTURES
Effects of Near Fault and Far Fault Ground Motions on Nonlinear Dynamic Response and Seismic Improvement of Bridges. Mohammad Hajali, Abdolrahim Jalali, Ahmad Maleki. Abstract. In this study, the dynamic response of bridges to earthquakes near and far from the fault has been investigated. With respect to available data and showing the effects ...

Effects of Near Fault and Far Fault Ground Motions on ...
Ground motions with velocity pulses caused by near-fault directivity have received a great deal of attention from engineers and seismologists because of their potential to cause severe damage to structures.

These proceedings contain 48 innovative papers consolidating the development of creep research since 1990 and discussing the new horizons in this fundamental field of applied mechanics in the coming century. This volume is useful for researchers and graduate course students in the relevant fields.

The specialty section Earthquake Engineering is one branch of Frontiers in Built Environment and welcomes critical and in-depth submissions on earthquake ground motions and their effects on buildings and infrastructures. Manuscripts should yield new insights and ultimately contribute to a safer and more reliable design of building structures and infrastructures. The scope includes the characterization of earthquake ground motions (e.g. near-fault, far-fault, short-period, long-period), their underlying properties, their intrinsic relationship with structural responses, and the true behaviors of building structures and infrastructures under risky and uncertain ground motions. More specific topics include recorded ground motions, generated ground motions, response spectra, stochastic modeling of ground motion, critical excitation, geotechnical aspects, soil mechanics, soil liquefaction, soil-structure interactions, pile foundations, earthquake input energy, structural control, passive control, active control, base-isolation, steel structures, reinforced concrete structures, wood structures, building retrofit, structural optimization, uncertainty analysis, robustness analysis, and redundancy analysis. This eBook includes four original research papers, in addition to the Specialty Grand Challenge article, on the critical earthquake response of elastic-plastic structures under near-fault or long-duration ground motions which were published in the specialty section Earthquake Engineering. In the early stage of dynamic nonlinear response analysis of structures around 1960s, a simple hysteretic structural model and a simple sinusoidal earthquake ground motion input were dealt with together with random inputs. The steady-state response was tackled by an equivalent linearization method developed by Caughey, Iwan and others. In fact, the resonance plays a key role in the earthquake-resistant design and it has a strong effect even in case of near-fault ground motions. In order to draw the steady-state response curve and investigate the resonant property, two kinds of repetition have to be introduced. One is a cycle, for one forced input frequency, of the initial guess of the steady-state response amplitude, the construction of the equivalent linear model, the analysis of the steady-state response amplitude using the equivalent linear model and the update of the equivalent linear model based on the computed steady-state response amplitude. The other is the sweeping over a range of forced input frequencies. This process is quite tedious. Four original research papers included in this eBook propose a new approach to overcome this difficulty. Kojima and Takewaki demonstrated that the elastic-plastic response as continuation of free-vibrations under impulse input can be derived in a closed form by a sophisticated energy approach without solving directly the equations of motion as differential equations. While, as pointed out above, the approach based on the equivalent linearization method requires the repetition of application of the linearized equations, the method by Kojima and Takewaki does not need any repetition. The double impulse, triple impulse and multiple impulses enable us to describe directly the critical timing of impulses (resonant frequency) which is not easy for the sinusoidal and other inputs without a repetitive procedure. It is important to note that, while most of the previous methods employ the equivalent linearization of the structural model with the input unchanged, the method treated in this eBook transforms the input into a series of impulses with the structural model unchanged. This characteristic guarantees high accuracy and reliability even in the large plastic deformation range. The approach presented in this eBook is an epoch-making accomplishment to open the door for simpler and deeper understanding of structural reliability of built environments in the elastic-plastic range

This SEAOC Blue Book: Seismic Design Recommendations is the premier publication of the SEAOC Seismology Committee. The name Blue Book is renowned worldwide among engineers, researchers, and building officials. Since 1959, the SEAOC Blue Book, previously titled Recommended Lateral Force Requirements and Commentary, has been a prescient publication of earthquake engineering. The Blue Book has been at the vanguard of earthquake engineering in California and around the world. This edition of the Blue Books offers a series of articles, that cover specific topics, some related to a particular code provision and some more general relating to an area of practice. While different than the previous editions of the Blue Books, it builds upon the tremendous effort of those who have forged earthquake engineering practice via the previous half-century of Blue Book editions. The Blue Book provides: insight and discussion of earthquake engineering concepts; interpretations of sometimes ambiguous or conflicting provisions of various codes, standards, and guidelines; and practical guidance on design implementation.

Maintenance, Safety, Risk, Management and Life-Cycle Performance of Bridges contains lectures and papers presented at the Ninth International Conference on Bridge Maintenance, Safety and Management (IABMAS 2018), held in Melbourne, Australia, 9-13 July 2018. This volume consists of a book of extended abstracts and a USB card containing the full papers of 393 contributions presented at IABMAS 2018, including the T.Y. Lin Lecture, 10 Keynote Lectures, and 382 technical papers from 40 countries. The contributions presented at IABMAS 2018 deal with the state of the art as well as emerging concepts and innovative applications related to the main aspects of bridge maintenance, safety, risk, management and life-cycle performance. Major topics include: new design methods, bridge codes, heavy vehicle and load models, bridge management systems, prediction of future traffic models, service life prediction, residual service life, sustainability and life-cycle assessments, maintenance strategies, bridge diagnostics, health monitoring, non-destructive testing, field testing, safety and serviceability, assessment and evaluation, damage identification, deterioration modelling, repair and retrofitting strategies, bridge reliability, fatigue and corrosion, extreme loads, advanced experimental simulations, and advanced computer simulations, among others. This volume provides both an up-to-date overview of the field of bridge engineering and significant contributions to the process of more rational decision-making on bridge maintenance, safety, risk, management and life-cycle performance of bridges for the purpose of enhancing the welfare of society. The Editors hope that these Proceedings will serve as a valuable reference to all concerned with bridge structure and infrastructure systems, including students, researchers and engineers from all areas of bridge engineering.

This book sheds new light on improved methods for the study of the initiation and run-out of earthquake-induced landslides. It includes an initiation study method that considers tension-shear failure mechanism; an improved, rigorous, dynamic sliding-block method based on dynamic critical acceleration; and a run-out analysis of earthquake-induced landslides that takes account of the trampoline effect, all of which add to the accuracy and accessibility of landslide study. The book includes abundant illustrations, figures and tables, making it a valuable resource for those looking for practical landslide research tools.

The nonlinear response of rigid-plastic, elastoplastic, and bilinear systems is presented in terms of the dimensionless pi-products resulting from rigorous dimensional analysis. Building on this analysis, the research shows that both linear and nonlinear structural responses from a variety of records which exhibit distinguishable pulses scale better with the peak pulse acceleration than with peak pulse velocity, indicating that the peak pulse acceleration is a more representative intensity measure of the earthquake shaking.