

EPUB FREE GUIDE SPECIFICATIONS FOR SEISMIC ISOLATION DESIGN FULL PDF

BASE ISOLATION THIS SEISMIC DESIGN STRATEGY INVOLVES SEPARATING THE BUILDING FROM THE FOUNDATION AND ACTS TO ABSORB SHOCK AS THE GROUND MOVES THE BUILDING MOVES AT A SLOWER PACE BECAUSE THE ISOLATORS DISSIPATE A LARGE PART OF THE SHOCK DESIGN PRINCIPLES OF SEISMIC ISOLATION 1 INTRODUCTION GEORGE C LEE AND ZACH LIANG MULTIDISCIPLINARY CENTER FOR EARTHQUAKE ENGINEERING RESEARCH UNIVERSITY AT BUFFALO STATE UNIVERSITY OF NEW YORK USA IN EARTHQUAKE RESISTANCE DESIGN OF STRUCTURES TWO GENERAL CONCEPTS HAVE BEEN USED AN INDISPENSABLE RESOURCE FOR PRACTICING AND ASPIRING ENGINEERS AND ARCHITECTS DESIGN OF SEISMIC ISOLATED STRUCTURES INCLUDES ISOLATION SYSTEM COMPONENTS COMPLETE COVERAGE OF CODE PROVISIONS FOR SEISMIC ISOLATION MECHANICAL CHARACTERISTICS AND MODELING OF ISOLATORS A DESIGN GUIDELINE THAT PROVIDES GUIDANCE TO DESIGN PROFESSIONALS ON THE IMPLEMENTATION OF PERFORMANCE BASED SEISMIC DESIGN OF BUILDINGS USING THE FEMA P 58 METHODOLOGY INCLUDING THE PERFORMANCE BASED SEISMIC DESIGN PROCESS SELECTION OF APPROPRIATE PERFORMANCE OBJECTIVES SELECTION OF SEISMIC FORCE RESISTING SYSTEMS DETERMINING APPROPRIATE MARCH 2018 FACULTY MEMBERS DR JOSHUA S STEELMAN PHD CIVIL ENGINEERING ABSTRACT THE CURRENT DESIGN PROCEDURE FOR SEISMIC ISOLATION BEARINGS FOR BRIDGES IS A SIMPLIFIED METHOD THAT ASSIGNS THE BEARINGS WITH AN ELASTIC STIFFNESS BRIDGES SUBJECTED TO GROUND MOTIONS THEREAFTER A DESIGN METHOD IS DEVELOPED FOR SEISMICALLY ISOLATED BUILDINGS EMPLOYING VFPB ELASTIC PLASTIC TIME HISTORY ANALYSES ARE PERFORMED TO STUDY THE SEISMIC PERFORMANCE OF THE BASE ISOLATED BUILDING USING VFPB BY COMPARING ITS PERFORMANCE WITH THAT OF A FRICTION PENDULUM BEARING FPB THREE NUMERICAL EXAMPLES INVOLVING STEEL BUILDING FRAMES ARE PRESENTED TO ILLUSTRATE THE DESIGN METHODS OF ASCE AND EUROCODE 8 AS WELL AS THE METHOD USING THE IMPROVED SIMPLIFIED LINEAR ANALYSIS AND DEMONSTRATE THE EFFECTIVENESS OF BASE ISOLATION IN SEISMIC DESIGN DOWNLOAD CHAPTER PDF SEISMIC ISOLATION SYSTEMS ARE IDEALLY SUITED FOR IMPLEMENTATION WITHIN A PERFORMANCE BASED FRAMEWORK BECAUSE A ROBUST CHARACTERIZATIONS OF THEIR BEHAVIOR CAN BE MADE THROUGH EXPERIMENTATION B THE VARIANCE OF OBSERVED BEHAVIOR FROM EXPECTED IS OFTEN LOW RELATIVE TO CONVENTIONAL STRUCTURAL ELEMENTS AND C IT CAN BE CHALLENGING OR EVEN IMPO CHAPTER 1 FUNDAMENTALS OF SEISMIC ISOLATION 1 19 CHAPTER 2 DESIGN OF ISOLATED STRUCTURES 20 41 CHAPTER 3 ANALYSIS 42 48 CHAPTER 4 TESTING 49 56 FREE INDEX 57 58 THE IBC 2000 DESIGN PROVISIONS FOR SEISMIC ISOLATION ARE DISCUSSED IN DETAIL A SIMPLE PRELIMINARY DESIGN PROCEDURE IS PROVIDED TO AID ENGINEERS IN INITIAL SIZING OF THE ISOLATION DEVICES SEVERAL EXAMPLES ARE PROVIDED TO ILLUSTRATE THE PRACTICAL APPLICATION OF THE MATERIAL COVERED IN THIS CHAPTER DOWNLOAD TO READ THE FULL CHAPTER TEXT SEISMIC ISOLATION IS A METHOD OF PROTECTING A BUILDING FROM MAJOR EARTHQUAKES BY INSTALLING ISOLATORS AND ENERGY ABSORBING DEVICES UNDER THE SUPERSTRUCTURE THE MANUSCRIPT DESCRIBES THREE TYPES OF LAMINATED RUBBER BEARINGS AND THREE KINDS OF DAMPING DEVICES ABSTRACT SEISMIC ISOLATION CAN SIGNIFICANTLY IMPROVE THE SEISMIC RESILIENCE OF BUILDINGS RESULTING IN A GROWING DEMAND FOR SEISMIC ISOLATION DESIGNS MEANWHILE THE DEEP GENERATIVE NETWORK BASED INTELLIGENT DESIGN CAN SIGNIFICANTLY INCREASE SCHEME DESIGN EFFICIENCY IN DOING SO SEISMIC ISOLATION REPRESENTS A DEPARTURE FROM THE WIDELY ACCEPTED CONVENTIONAL SEISMIC DESIGN APPROACH THAT ESSENTIALLY REQUIRES A STRUCTURE TO DAMAGE ITSELF POTENTIALLY SEVERELY TO PROTECT ITS OCCUPANTS DURING A MAJOR EARTHQUAKE VOLUME 6 ISSUE 2 DOI ORG 10 1193 1 1585564 CONTENTS GET ACCESS MORE ABSTRACT THE CONCEPT OF SEISMIC OR BASE ISOLATION AS A MEANS OF EARTHQUAKE PROTECTION SEEMS TO BE MORE THAN 100 YEARS OLD HOWEVER UNTIL VERY RECENTLY FEW STRUCTURES WERE BUILT USING THIS PRINCIPLE SINCE THE KOBE EARTHQUAKE SEISMICALLY ISOLATED STRUCTURES HAVE COME TO BE EMPLOYED IN A LARGE NUMBER OF CONSTRUCTIONS AND SIGNIFICANT PROGRESS HAS BEEN OBSERVED IN THE DESIGN OF SEISMIC ISOLATION SYSTEMS AND THE DEVELOPMENT OF SEISMIC ISOLATION DEVICES THE ISOLATION CAN BE OBTAINED BY THE USE OF VARIOUS TECHNIQUES LIKE RUBBER BEARINGS FRICTION BEARINGS BALL BEARINGS SPRING SYSTEMS AND OTHER MEANS IT IS MEANT TO ENABLE A BUILDING OR NON BUILDING STRUCTURE TO SURVIVE A POTENTIALLY DEVASTATING SEISMIC IMPACT THROUGH A PROPER INITIAL DESIGN SEISMIC ISOLATION IS RELATIVELY A NEW TECHNIQUE OF SEISMIC RESISTANT DESIGN OF BUILDINGS BRIDGE STRUCTURES AND NUCLEAR POWER PLANTS 4 SEISMIC ISOLATION TYPE OF BASE ISOLATION SYSTEMS ADVANTAGES AND DISADVANTAGES DESIGN ISSUES THIS POST AIMS TO PRESENT MAIN ASPECTS OF SEISMIC ISOLATION IN THE STRENGTHENING OF A REINFORCED CONCRETE BUILDING THE AVAILABLE TYPES OF BASE ISOLATION AS WELL AS THEIR ADVANTAGES AND DISADVANTAGES 5 2 CONTROL DESIGN THE BASE ISOLATION SYSTEM INCLUDES 3 1 LOW DAMPING ELASTOMERIC RUBBER BEARINGS AND ARE MODELED PER ERKUS AND JOHNSON 16 WITH LINEAR STIFFNESS OF 919 422 KN M AND VISCOUS DAMPING OF 27 717 KNS M THE BASE ISOLATION SYSTEM HAS A FUNDAMENTAL PERIOD OF 3 S AND DAMPING RATIO OF 3 BRIDGES FOR VARYING SEISMIC HAZARD SITE CLASSIFICATION ISOLATOR TYPE AND BRIDGE TYPE IN GENERAL EACH EXAMPLE ILLUSTRATES THE SUITABILITY OF THE BRIDGE FOR ISOLATION OR OTHERWISE AND PRESENTS CALCULATIONS FOR PRELIMINARY DESIGN USING THE SIMPLIFIED METHOD PRELIMINARY AND FINAL ISOLATOR DESIGN DETAILED ANALYSIS

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SEISMIC ISOLATION DESIGN OF STRUCTURE USING VARIABLE FRICTION

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THEREAFTER A DESIGN METHOD IS DEVELOPED FOR SEISMICALLY ISOLATED BUILDINGS EMPLOYING VFPB ELASTIC PLASTIC TIME HISTORY ANALYSES ARE PERFORMED TO STUDY THE SEISMIC PERFORMANCE OF THE BASE ISOLATED BUILDING USING VFPB BY COMPARING ITS PERFORMANCE WITH THAT OF A FRICTION PENDULUM BEARING FPB

DESIGN USING SEISMIC ISOLATION SPRINGERLINK

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THREE NUMERICAL EXAMPLES INVOLVING STEEL BUILDING FRAMES ARE PRESENTED TO ILLUSTRATE THE DESIGN METHODS OF ASCE AND EUROCODE 8 AS WELL AS THE METHOD USING THE IMPROVED SIMPLIFIED LINEAR ANALYSIS AND DEMONSTRATE THE EFFECTIVENESS OF BASE ISOLATION IN SEISMIC DESIGN DOWNLOAD CHAPTER PDF

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THE IBC 2000 DESIGN PROVISIONS FOR SEISMIC ISOLATION ARE DISCUSSED IN DETAIL A SIMPLE PRELIMINARY DESIGN PROCEDURE IS PROVIDED TO AID ENGINEERS IN INITIAL SIZING OF THE ISOLATION DEVICES SEVERAL EXAMPLES ARE PROVIDED TO ILLUSTRATE THE PRACTICAL APPLICATION OF THE MATERIAL COVERED IN THIS CHAPTER DOWNLOAD TO READ THE FULL CHAPTER TEXT

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BASE ISOLATION DESIGN OF SHEAR WALL STRUCTURES USING PHYSICS

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ABSTRACT SEISMIC ISOLATION CAN SIGNIFICANTLY IMPROVE THE SEISMIC RESILIENCE OF BUILDINGS RESULTING IN A GROWING DEMAND FOR SEISMIC ISOLATION DESIGNS MEANWHILE THE DEEP GENERATIVE NETWORK BASED INTELLIGENT DESIGN CAN SIGNIFICANTLY INCREASE SCHEME DESIGN EFFICIENCY

SEISMIC ISOLATION THE GOLD STANDARD OF SEISMIC PROTECTION

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IN DOING SO SEISMIC ISOLATION REPRESENTS A DEPARTURE FROM THE WIDELY ACCEPTED CONVENTIONAL SEISMIC DESIGN APPROACH THAT ESSENTIALLY REQUIRES A STRUCTURE TO DAMAGE ITSELF POTENTIALLY SEVERELY TO PROTECT ITS OCCUPANTS DURING A MAJOR EARTHQUAKE

SEISMIC ISOLATION HISTORY APPLICATION AND PERFORMANCE A

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DESIGN RECOMMENDATIONS FOR SEISMICALLY ISOLATED BUILDINGS AIJ

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SINCE THE KOBE EARTHQUAKE SEISMICALLY ISOLATED STRUCTURES HAVE COME TO BE EMPLOYED IN A LARGE NUMBER OF CONSTRUCTIONS AND SIGNIFICANT PROGRESS HAS BEEN OBSERVED IN THE DESIGN OF SEISMIC ISOLATION SYSTEMS AND THE DEVELOPMENT OF SEISMIC ISOLATION DEVICES

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THE ISOLATION CAN BE OBTAINED BY THE USE OF VARIOUS TECHNIQUES LIKE RUBBER BEARINGS FRICTION BEARINGS BALL BEARINGS SPRING SYSTEMS AND OTHER MEANS IT IS MEANT TO ENABLE A BUILDING OR NON BUILDING STRUCTURE TO SURVIVE A POTENTIALLY DEVASTATING SEISMIC IMPACT THROUGH A PROPER INITIAL DESIGN

SELECTION OF SEISMIC ISOLATION SYSTEM PARAMETERS FOR THE NEAR

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SEISMIC ISOLATION IS RELATIVELY A NEW TECHNIQUE OF SEISMIC RESISTANT DESIGN OF BUILDINGS BRIDGE STRUCTURES AND NUCLEAR POWER PLANTS 4

SEISMIC ISOLATION SEISMOSOFT

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SEISMIC ISOLATION TYPE OF BASE ISOLATION SYSTEMS ADVANTAGES AND DISADVANTAGES DESIGN ISSUES THIS POST AIMS TO PRESENT MAIN ASPECTS OF SEISMIC ISOLATION IN THE STRENGTHENING OF A REINFORCED CONCRETE BUILDING THE AVAILABLE TYPES OF BASE ISOLATION AS WELL AS THEIR ADVANTAGES AND DISADVANTAGES

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SEISMIC ISOLATION DESIGN EXAMPLES OF HIGHWAY BRIDGES

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