CURRICULUM VITAE ET STUDIORUM



Stefano Pampanin is Associate Professor (formerly *Reader*, equivalent to Full Professor in the US system) in Structural Design & Earthquake Engineering at the University of Canterbury, Christchurch, New Zealand, where he joined in 2002.

He received his Laurea¹ (*magna cum laude*) in Civil (Structural) Engineering at the University of Pavia, a Masters in Structural Engineering at the University of California at San Diego and a Ph.D. in Earthquake (Structural) Engineering. at the Technical University of Milan.

EDUCATION

1997/20000 **Ph.D.** in Earthquake Engineering at the Technical University of Milan

Thesis: "Alternative design philosophies and seismic response of precast concrete buildings" Co-supervisors: Prof. G. M. Calvi and Prof. Nigel Priestley

- 1998/1999 **Masters** in Structural Engineering. at Univ.. of California, San Diego (UCSD) Thesis: "Analytical Modeling of the Seismic Behavior of frame systems jointed ductile connections" Supervisor: Prof. Nigel Priestley
- 1992-1997 Laurea* (grade 110/110 cum laude) in Civil (Structural) Engineering, University of Pavia.
 (*5 years degree, equivalent to BE+ME plus thesis) Thesis Title: "Study on the boundary conditions of the colonnades of the Leaning Tower of Pisa, through Finite Element dynamic analysis with contact surfaces". Supervisor: Prof. Giorgio Macchi.
- 1987-1992 High School Diploma (grade 60/60), Classical Liceum Ugo Foscolo, Pavia

EMPLOYMENT

- 2009- Associate Professor (formerly *Reader*, equiv. to Full Professor in US System), in Structural Design & Earthquake Engineering, University of Canterbury, NZ
- 2007-2008 Senior Lecturer Above the Bar, University of Canterbury, NZ
- 2002-2006 Senior Lecturer (equiv. to Associate Professor in US System), University of Canterbury, Christchurch, NZ
- 2005- International Faculty Staff member of the ROSE School in Pavia, European School for Advanced Studies for the Mitigation of the Seismic Risk, ROSE School Pavia.
- 2006- Co-founder and Co-Director of *PRESSS Limited*, specializing in design, analysis and peer review of post-tensioned & dissipating frames and walls as well as seismic assessment and retrofit of existing buildings
- 4/2002-7/2002 Visiting Lecturer at the University of Canterbury, Christchurch, NZ
- 2000-2002 Post-Doctoral Research Fellow and Fixed Term Lecturer, Dept. of Structural Mechanics, University of Pavia
- 1997- 2001 Fellow, at graduate level, of the "*Advanced School of Integrative Education*" (SAFI) under the University Institute for Advanced Studies (IUSS) in Pavia
- 1992-1997 Selected Student, following national competition, of the Collegio Borromeo in Pavia (the most ancient University College in Italy, 1561)

PROFESSIONAL/CONSULTING ACTIVITIES

Chartered Professional Engineer (Italy) since 1998.

Franco Pampanin Consulting Engineering (Studio Ingegneria Franco Pampanin)

- Intern and trainee (occasional/part time basis) 1994-1997

- Associate/Advisor (occasional basis) of Pampanin Consulting Engineering (Studio Ingegneria Pampanin), Pavia, Italy, 1998-

Involvement in the structural/seismic design, assessment and retrofit of reinforced concrete buildings, (typically 4-7 storey buildings). This include foundation (raft/discrete) and superstructure, retaining walls, finite element analysis ranging from macro-models to plate/shell elements.

Consultant, Expert, on behalf of the University of Canterbury, in Research and Development projects related to structural/seismic engineering, 2002-Examples:

a) Fastening techniques and anchorages for seismic application (see research Projects)

b) <u>TechNet</u> Scheme used for the dissemination of knowledge/conceptual design of solutions in collaboration with engineering firms. Mentor/Design subconsultant/Peer reviewer of PRESSS concrete and Pres-Lam buildings.

c) Recently engaged in the proposition of a strengthening/retrofit intervention for St. Elmo's building (1930 RC frames with infills), damaged after the Sept earthquake. The additional damage following the Feb 22 earthquake prompted the owner to demolish the building.

PRESSS Limited (Prefabricated Seismic Structural Systems), Christchurch

Founder (co-) and Director (co-) 2006 -

External consultant/advisor/peer reviewer for several feasibility studies or actual projects on the application of PRESSS-technology for either the design of new building or the retrofit of existing ones. See more details later.

Prestressed Limited (Prefabricated Seismic Structural Systems), University of Canterbury, Chch -

Founder (co-) and Director (co-) 2008-

Spin-off company of the University of Canterbury owning the IP and patent of the Pres-Lam technology, (currently commercialized in NZ and Australia by the STIC Ltd Research & Development Consortium as part of the EXPAN building system)

Chartered Professional Engineer (New Zealand) since 2011.

SCHOLARSHIPS & FELLOWSHIPS

- 2000-2002 Post-Doctoral Research Fellowship (Assegno di Ricerca) Dept. of Structural Mechanics, University of Pavia "Seismic Vulnerability of Existing Reinforced Concrete Buildings"
- 1997-2001 Fellowship and Diploma, at graduate level, from the "Advanced School of Integrative Education" (SAFI) under the University Institute for Advanced Studies (IUSS) in Pavia This graduate level school consisting on interdisplinaty courses in addition and complementary to those specific of the Doctoral degree was dedicated to selected Ph.D. fellows from the whole university.

- 1/1999-9/1999 Graduate Research Assistantship at UCSD
- 9/1998-9/1999 <u>Fulbright</u> Scholarship as "Visiting Scholar" (12 available in all Italy for all faculties) for a research period of one year at the University of California, San Diego The novelty and personal pride of being awarded this well-recognized fellowship derived from the fact that the candidate (at that time Ph.D. student) applied and was exceptionally selected within a list of visiting researchers with already a Ph.D. title (Post-Doctoral Fellow).
- 1997-2000 Doctoral Scholarship from the Italian Ministry of Education at Technical University of Milan. First in the ranking of the competition (based on CV, plus written and oral exams) for two positions within the program in Earthquake Engineering at the Technical University of Milan, Italy. Prior to that, he had also won the scholarship at the Civil Engineering at University of Pavia (3 positions available), but decided to take up the offer from Milan
- 1992-1997 Selected student (after competition based on written and oral exams) of the Collegio Borromeo in Pavia (1561, oldest university college in Italy)

PRIZES AND AWARDS

- Sandy Cormack Award 2010 New Zealand Concrete Society "for the most original and innovative paper in the development of the knowledge and use of concrete" for the Co-authored paper "Comparison of Strain Hardening Behaviour of Non-Tearing and Traditional Reinforced Concrete Beams". The topic of the paper was the refinement of a beam-column connection system capable of limiting the beam elongation and thus reducing the damage to the adjacent floor, preventing possible unseating failure mechanism.
- NZSEE 2010 Best Research Paper Award with the co-authored paper "Global Response of a Two Storey Pres-Lam Timber Building". This test on a 3D building with Post-tensioned timber (Laminated Veneer Lumber, LVL) frames in one directions, post-tensioned timber coupled shear walls in the other, concrete-timber-concrete composite double tee floor system represented the first large scale experimental validation of an innovative solution for multi-storey
- NZSEE 2010 Best Poster Paper Award with the co-authored poster paper "Experimental Investigation of the Seismic Behaviour of Slotted Reinforced Concrete Beam-Column Connections". Presentation of further testing on beam-column subassemblies on a newly developed solution to mitigate damage to floor system by limiting the beam elongation in a plastic hinge connection.
- NZSEE 2009 Best Poster Paper Award with the co-authored poster paper "Development and Validation of a Non-Tearing Floor Precast Concrete Structural System for Seismic Regions". From the concept to the design, analysis, construction and testing of a large scale frame system with non-tearing floor connection
- NZSEE 2008 Best Research Paper Award with the co-authored paper "Design and Construction Feasibility and Detailing of Prestressed Timber Buildings for Seismic Areas".
- NZSEE 2007 Best Research Paper Award with the co-authored paper "Advanced Flag-Shaped Systems for High Seismic Performance Including Near Fault Effects. Evolution of the self-centering and dissipative PRESSS-technonlogy systems for both concrete or timber by using a combination of hysteretic (displacement-proportional) and viscous (velocity proportional) dampers in addition to the self-centering provided by unbonded

tendons. Such system can robustly sustain either a near-field and a far-field earthquake motions, including higher-than-designed (e.g. beyond MCE) ground motion intensities.

- Ivan Skinner Award 2005 (EQC/NZSEE)"for the advancement of Earthquake Engineering Research in New Zealand" <u>Inaugural recipient</u> of this prestigious awards presented directly by Ivan Skinner, well re-known engineer for his high creativity and innovation combined with rigor and commitment.
- Otto Glogau Award 2005 from the NZ Society of Earthquake Engineering for the invited singly authored paper "Emerging Solutions for High Seismic Performance of Precast/Prestressed Concrete Buildings" published in the ACT (Advanced Concrete Technology) Journal. In this paper, an overview of latest developments in the field of low-damage systems in terms of conceptual design, experimental and numerical validation, analytical and modeling tools, design guidelines and code standard as well as implementation in real-building in practice is provided.
- NZSEE 2005 Best Research Paper Award with the single-authored paper "Seismic Vulnerability and Retrofit Strategies of Existing under-designed reinforced Concrete Buildings". In this paper a discussion on issues and concerns in terms of inherent vulnerability of pre-1970s reinforced concrete buildings, as typical of the older construction practice overseas but also in NZ, was provided, along with preliminary indications on possible technical solutions for the retrofit of pre-1970s reinforced concrete. This paper was basically based on the background information and preliminary results of the FRST-Funded Project (2004-2011) "Retrofit Solutions for NZ Multi-Storey Reinforced Concrete Buildings" for which I have acted as Associate Project Leader and Principal Investigator of the University of Canterbury Team, focusing on Reinforced Concrete Structures.
- Sandy Cormack Award 2004 NZConcrete Society "for the most original and innovative paper in the development of the knowledge and use of concrete". First author of the co-authored paper "Cable-stayed and suspended solutions for precast concrete frame systems". This paper, reporting on the successful effort of introducing PRESSS-Technology in Italy (known as Brooklyn System, with more than ten buildings design and constructed in few years) and represent one of my first key-presentation in the effort of introducing and further developing PRESSS-technology in New Zealand.
- *fib* (International Federation of Concrete) Diploma 2003 for *Young Engineers* (under 40year old). Winner of Category Research for outstanding contribution in the Research on Reinforced Concrete. Prestigiuos international recognition, awarded biannualy after an international selection based on pre-selected candidates proposed by the fib National groups. The candidate was invited at the fib Symposium in Athens May 2003 to receive the award and present his research work developed during and after his Ph.D.
- **PCI** (Precast/Prestressed Concrete Institute) **Martin P. Korn Award 2000** for the coauthored paper "*Preliminary Results and Conclusions from the PRESSS Precast 5-Story Test Building*", reporting the final large scale pseudo-dynamic test in 1999 at University of California, San Diego, on a fully 3D building (biggest test ever carried out at that time in US) with unbonded post-tensioned frames in one directions, coupled and post-tensioned shear walls in the others, double tees as well as hollowcore floor systems. The paper has been extensively cited and being referred to as a milestone literature on the topic of seismic resisting precast concrete buildings.

COMMITTEE MEMBERSHIP

Member of *fib* Committee 7 "Seismic Design" (2003-)

Chairman: Prof. Pinto. Deputy Chairman: Prof. Michael Fardis. (from 2005, following late Prof. Bob Park). This committee of international experts oversees and coordinate the work of fib subtasks or Working group in the preparation of state-of-art documents, guide for good practice or pre-code design guidelines in the area of seismic design of reinforced/precast/prestressed concrete.

Co-chairman of the *fib* Working Group 7.5 "Seismic Design of Buildings Incorporating High Performance Materials". (2003-)

Member of the *fib (federation internationale du beton)* Working Group WG 7.3/7.4 "Precast and Prestressed Concrete Structures Designed for Earthquake Resistance" (under the *fib* Commission 7, "Seismic Design"). Co-author with Prof. Minehiro Nishiyama (Kyoto University) of the chapter "Modeling and Analytical Methods" of the Final Bulletin. (1999-)

Member *fib* WG 7.6 "Comparison of Seismic Code Provisions". Co-Convenors: Prof. Fumio Watanabe, Prof. Jim Tanaka. (2003-)

Member *fib* WG 6.10 "Precast Concrete Buildings in Seismic Regions: guide of good practice", Chairman. Prof. S. Tsoukantas. (2007-)

Member of the Task Group on Precast Concrete for the revision of the NZS3101:2006 Concrete Code. Main Author of Appendix B (Normative) "Special Provisions for Jointed Ductile Connections)

Council Member of the NZ Concrete Society (2003-2007)

Management Committee Member of the NZ Society for Earthquake Engineering (2005-2010; 2011-)

Committee Member, ACI (American Concrete Institute)-440-F Committee for the preparation of Guidelines on Seismic Retrofit of Existing R.C. Building using Fiber Reinforced Polymers (2006-2008)

Committee Member, "Precast Concrete Floor Overview Group" (PCFOG) organized by the Department of Building and Housing for the preparation of Guidelines for the Design, Assessment and Retrofit of Hollowcore Floors (2007-2009)

Steering Committee member of-the EERI (Earthquake Engineering Research Institute)- US Geological Survey - Project PAGER (Prompt Assessment of Global Earthquakes for Response), (2008-) targeting to develop simplified mechanically-based model and vulnerability/fragility curves for buildings around the globe, with the goal of producing rapid estimation of damage and losses along with the current information on Shake-Map etc.

DBH Commission of Enquiry 2011 - Expert Panel Member – Investigation on the collapse and damage to multi-storey reinforced concrete buildings following the Feb 22 Christchurch Earthquake.

Stefano Pampanin

RESEARCH CONTRACTS AND GRANTS

Summary of selected major research projects granted and carried out as **Principal Investigator or Objective Leader** since year 2002. Total funds: ≈ **NZ\$10+ Million**

- UoC Principal Investigator (PI) and Associate Project Leader of the joined FRST project with University of Auckland "Retrofit solution for NZ Earthquake Resistant multistorey buildings ": NZ\$2.4 Million at UoC (2004-2011). Extensive international collaboration (Toronto, Stuttgart, Tokyo, Mumbai, Pavia, Genova, Milan). As PI of the University of Canterbury team, and overall project Objective leader (pre-1970s buildings) I have led the research on seismic vulnerability of RC buildings and retrofit strategies and solutions. Extensive experimental, numerical and analytical investigations have been carried out as part of the project, leading to the development of cost-effective techniques for improving the performance of existing RC buildings typical of NZ stock
- Objective leader and UoC Principal Investigator in STIC Ltd (Structural Timber Innovation Consortium) R&D Project for prestressed timber multi-storey building: overall project NZ\$10Million; NZ\$3.6Million for the Objective "Frames and Walls" (at UoC) (2008-2013).

Major AU-NZ joined project (total budget of NZ\$10 Million) in collaboration with University of Auckland (Objective: Portal Frames), University of Technology, Sydney (Objective Floor) and University of Canterbury (Objective Frames and Walls), for which I am active as the Principal Investigator. 50-50 co-funded by Industry (driven by the LVL manufacturers) and FRST government agency.

- **Co-PI** of FRST-funded research project "Non-structural elements in building seismic performance" NZ\$365,000 (2010-2011). The project aims to investigate the seismic performance of ceilings, claddings, facades, partitions and propose remedy solutions to mitigate the damage. It is intended to lead to the proposal for a major multi-year research project towards the development of the next generation of earthquake-resisting buildings, capable of sustaining a design level earthquake with minimum damage to both the structure and the non-structural component.
- PI of the Natural Hazard Platform Recovery Project on "Seismic Performance of Multistorey RC Buildings following the Feb 22 Christchurch Earthquake: Recommendation for repair, retrofit and reconstruction" Approx NZ\$170,000 (Feb 2011- Sept 2011). This recovery project aims to assist different stake-holders (DIA, CCC, DBH, CERA, Structural Engineers and Architect Community, e.g. SESOC, IPENZ/NZIA, etc, building owners and contractors) in the space of seismic performance evaluation and ad-interim recommendations for retrofit /strengthening of existing reinforced concrete (RC) multistorey buildings after the Christchurch earthquake. In addition, suggestions for the practical use and immediate implementation of advanced low-damage structural systems for the medium-long term re-construction of Christchurch City will also be provided.
- PI of the Natural Hazard Platform Recovery Project on "Stairs" Approx NZ\$85,000 (Feb 2011- Sept 2011). One of the most alarming results of the Feb 22 Christchurch earthquake has been the collapse or extensive damage to stairs. This partly unexpected low-performance has raised significant concern amongst the technical and non-technical communities of the structural integrity of these precast concrete stairwells. This task-projects specifically focuses on the collection of information on performance of stairs looking and cataloguing construction details, design criteria and construction practice-systems and provide recommendations for good practice in the design of new stairwells systems as well as in the retrofitting of existing ones

- University of Stuttgart "Seismic Behaviour of Structural Connections with Post-Installed Rebars" NZ\$89,000 (2009-2011). The project has included experimental tests on column-to-foundation connections implementing post-installed rebars. Tests under monotonic as well as reversed cyclic loading have been carried out at the University of Canterbury to investigate the behaviour of post-installed rebars for new or retrofit design solutions.
- Industry-funded project (**German** Company) on "Development and testing of fasteners for seismic applications" NZ\$300,000 (2007-2010). The project has been focusing on the assessment and seismic performance of anchors/fasteners under realistically simulated earthquake loadings both experimentally (shake-table) and numerically (finite element models). Innovative solutions to mitigate the damage and precent collapse of the anchors and thus to the "fastened object" (which could be life-threatening) has been proposed, developed and tested.
- B.S. Italia (Styl-Comp Group): "Development of post-tensioned solution for The Brooklyn System" ≈ NZ\$300,000 for experimental tests (2001-2004).Collaborator on Three international patents. This work represented the introduction of PRESSS-technology in Italy, initially for low-seismic regions, with draped tendons to achieve longer span and shallower beam units. Tests were carried out at the University of Pavia until 2002, followed by significant research development in NZ for the development of a PRESSS-Brooklyn system (e.g. rocking-dissipative solutions, with draped tendons and internal or external dissipaters).
- Carter_Holt_Harvey (2nd Largest LVL manufacturer in NZ) Development of Innovative solutions for multi-storey seismic resisting systems in timber. NZ\$45,000 plus material. This project (2004-2006) led to the development of the Pres-Lam technology (PRESSS in timber, or prestresseed-laminated timber) and the filing of a AU-NZ and international patent, for which I am a co-inventor (amongst three), owned by Prestressed Timber Limited a spin-off company of the University of Canterury, of which I am co-dounder and co-Director of.
- NZ Earthquake Commission (EQC) project "Residual deformation in Performance Based Design": NZ\$ 35,000 (2004-2006). This research project looked the extent and role of Residual displacement (or deformation, drift) as a complementary damage indicator or performance indicators, in addition to the more traditional maximum drift and ductility. Many structures design according to code, would suffer residual deformation and drift with unexpectedly higher costs of repairing and fixing. In the new design of structures, importance has to be given to re-centering properties and devices, capable to bring back the structure to the original position without offsets/tilting.
- Royal Society of New Zealand, ISAT, Joint EU/NZ Research Project on" "Reduction of Seismic Risk for Existing Buildings, NZ\$ 6,000 (2004)/ This travel grants facilitated the establishement of a strong network between the NZ-FRST Retrofit project and the EU-funded multi-million euro project LESSLOSS, led by the University of Pavia and involving approximately 40 research units in Europe.
- Key researcher and member of the Management Committee of the NZ\$4.2 Million FRSTproject "Future Building Systems" for precast concrete structures (2003-2011). The target of the whole project has been to develop to the extent of being able to apply to the construction practice emerging and innovative low-damage seismic resisting systems capable of withstanding a severe earthquake with only minor structural damage as opposed to traditional systems (where plastic hinges implies damage often beyond the reparability threshold). As part of this project I have led the development and validation of the external replaceable dissipaters (Plu&Play) for beam-column joints, walls, columns and the use of a jointed articulated floor concept to further limit the damage to the floor system.

Summary of Research & Development Activities -Impact on Code Design and Industry take-up

As a member of the Research Units of the University of Pavia and of the University of California at San Diego first (1997-2002) and subsequently of the University of Canterbury (since 2002) he has been involved in several national and international research projects in the field of Structural Design & Earthquake Engineering, with particular emphasis on:

- a) Seismic Design of Reinforced Concrete and Precast/Prestressed Concrete Structures;
- b) Assessment of Seismic Vulnerability of Existing Buildings;
- c) Strengthening/Retrofitting Strategies and Techniques;
- d) Use of advanced or high-performance materials (Fiber Reinforced Concrete, FRC; Fiber Reinforced Polymers, FRP; Shape Memory Alloys, SMA, Supplemental Damping Devices) for the structural rehabilitation of buildings;
- e) Development and design of innovative solutions for Multi-storey Timber Buildings based on Prestressed/Post-tensioned connection (Pres-Lam system).

A short summary of the major outcomes and achievements in these areas is given below:

a) Seismic Design of Reinforced Concrete and Precast/Prestressed Concrete Structures

Dr. Pampanin received the PCI (Precast/Prestressed Concrete Institute) "Martin P. Korn Award" 2000 for the article "Preliminary Results and Conclusions from the PRESSS Precast 5-Story Test Building". In the 2003 he was awarded the <u>fib Diploma</u> for Younger Engineers (under 40 years-old) for outstanding contribution in the research of reinforced concrete.

He was Member of the Council of the NZ Concrete Society from 2003-2007 and Member of the NZ Society of Earthquake Engineering from 2005-2010.

In 2005, he was nominated the inaugural recipient of the <u>EQC/NZSEE Ivan Skinner Award</u> for the "Advancement of Earthquake Engineering in New Zealand".

Since 1999 he has been active member of several fib (fédération internationale du béton) international committees for the preparation of pre-code bulletins or state-of-the art for good practice.

He is member of the main **Committee 7 on Seismic Design** and member of the Working Groups **WG 7.3/7.4** "Seismic Design of Precast Concrete Buildings" (Bulletin n.27), **WG 7.6** "Critical comparison of Seismic Codes", and **WG 6.10** "Precast concrete buildings in seismic regions: guide for good practice".

Since 2005 he has been nominated <u>co-chairman of the fib</u> WG 7.5 "Seismic Design of Buildings Incorporating High Performance Materials", position previously held by the late Prof. Robert Park.

In the period 2003-2006, he has been actively involved in the revision of the New Zealand Design Code for Reinforced Concrete and Prestressed Concrete Structures **NZ3101:2006**.

In particular he served as main author of the **Appendix B** (Normative) "Special Provisions for the Seismic Design of Precast Jointed Ductile connections" which represents the most advanced code related to these innovative solutions.

He has been a key researcher and member of the Research Management Committee of the multiyear project "Future Building System" funded to the University of Canterbury by the **FRST** (Foundation of Research Science and Technology) to develop innovative solutions for precast concrete structures (2003-2011) **NZ\$4.8M** Since 1998 he has been dedicating and significantly contributing, in various roles (Researcher, lecturer, guest speaker, external consultant, designer, peer reviewer), to the development of the **PRESSS system** (precast concrete dry and ductile connection jointed by post-tensioning) favouring its practical implementation in Italy (Brooklyn System, BS Italia s.r.l.) and in New Zealand (as a co-designer and peer reviewer of the first two PRESSS multi-storey buildings) as well as its dissemination of knowledge with courses and seminars of various duration, targeted to students as well as to a wide Industry representation (engineers/architects/contractor/precasters) in New Zealand, US, Canada, Mexico, Chile, Argentina, Italy, Germany, Portugal, Greece, Japan.

The presentation of the innovative solutions for precast concrete developed in Italy with the Company BS Italia s.r.l. (Bergamo) has received the <u>Sandy Cormack Award</u> at the <u>NZ Concrete</u> <u>Society</u> national conference in 2004 for the most innovative contribution.

An invited single-authored overview paper for the Japanese ACT Journal (Journal of Applied Concrete Technology) was awarded the <u>Otto Glogau Award</u> in the 2005 as best paper written by a member of the NZ Society of Earthquake Engineering.

The further developments of the system and their experimental validation through shake table testing of post-tensioned walls combining self-centering with hysteretic and viscous dissipation (in parallel) have been granted the <u>NZSEE 2007 Best Research Paper Award</u> with the paper "Advanced Flag-Shaped Systems for High Seismic Performance Including Near Fault Effects".

Following the successful Series of Seminar around NZ organized by the NZConcrete Society and Precast NZ in 2005 on 'Introduction of PRESSS Technology" with Prof. Nigel Priestley, Len McSaveney and A/Prof Stefano Pampanin as guest speakers, he has been recently completed and presented with a series of Seminars in March 2010 the "PRESSS Design Handbook", recently published by the NZCS and consisting of a) introductory theory b) a full step-by-step design example of a five-storey building using this technology c) design chart and d) software HYBRID for the section/connection analysis and design.

He is an invited faculty member of the European School for Advanced Studies on Reduction of Seismic Risk (<u>ROSE School</u>) Pavia since 2006 where he has taught a graduate course in Feb 2007 on "Seismic Design of Precast/Prestressed Systems" and a course in Feb 2010 on "Seismic Design of Prefabricated Concrete and Timber structures".

In 2007 he was invited as **Visiting Professor** at the University of Federico Santa Maria, Valparaiso, Chile for a two weeks course on PRESSS-technology for multi-storey building to undergraduate and postgraduate students as well as for a series of seminars to practicing engineers in Santiago del Chile and Mendoza (Argentina).

Prof. Ing. Stefano Pampanin is a **Chartered engineer** in Italy since 1998 and active (though on a occasional basis) associate of the Studio Franco Pampanin in Pavia with focus on structural modeling and design, including seismic design.

In New Zealand he has been acting as external consultant for several feasibility studies on the application of PRESSS-technology for either the design of new building or the retrofit of existing ones. Since 2006, he is co-founder and **Director of PRESSS Ltd** in Christchurch.

He has been engaged as a co-designer and quasi-independent peer-reviewer for the first two multistorey PRESSS-type concrete buildings in New Zealand:

a) the first one is the MacDiarmid Building for Victoria University in Wellington as a result of a fruitful collaboration between Dunning Thornton Consulting (primary structural engineers) and PRESSS Ltd (sub-consultant and quasi-independent peer reviewer)

The project has been awarded the NZ Concrete Society Supreme Award and the Best Technology award in 2009.

b) the second one is the Endoscopy Consultants Building for Southern Cross Hospitals located in Christchurch and developed in collaboration with Structex Metro Ltd (primary structural engineers)

and PRESSS Ltd (sub-consultant and quasi-independent peer reviewer). The building have very successfully sustained with basically no damage both the Sept 4 and the Feb 22 Earthquakes

b,c) Vulnerability Assessment and Strengthening/Retrofit of existing Reinforced Concrete Structures

In the period 1998-2002, while at University of Pavia, he has been *Assistant Project Scientist* for the co-ordinated national research project (PRIN) on the "Seismic Vulnerability of Existing Reinforced Concrete Buildings" designed for gravity loads-only, as typical of Italian practice before the introduction of seismic-oriented codes in mid 70's. As part of the program, experimental quasi-static cyclic tests on a series of beam-column subassemblies and on a three story frame, 2/3 scaled, were carried out at the University of Pavia.

In a second phase of the research investigation, funded by the European Commission and the National Ministry of Research, analytical-experimental investigations on retrofitting interventions with FRP (Fiber Reinforced Polymer) materials were carried out (beam-column joint subassemblies and on a three story frame system).

In the year 2001, Dr. Pampanin was funded from the University of Pavia with a competitive grant for Young Researchers (under 35 years old) as Principal Investigator for the Research Project: "Strengthening and Retrofitting Techniques for the Reduction of Seismic Vulnerability in Existing Reinforced Concrete Buildings" (In Italian). Alternative solutions based on Fiber Reinforced Polymer materials as well as on a newly proposed steel haunch connection (joined research-project with the University of Toronto) between beams and columns have been successfully developed since.

Since joining the University of Canterbury in 2002, he has been granted as *Principal Investigator* of the University of Canterbury and *Associate Project Leader* a major multi-year (2004-2010) research project on "**Retrofit Solutions for NZ Multistory Buildings**" (Multistorey Buildings, steel, masonry and concrete) funded by the Foundation for Research, Science and Technology (FRST). (in cooperation with the Auckland University). Nominated Objective Leader (out of two objectives) and responsible for pre-1970 designed structures (independently on the material). Total funding: **NZ\$4.8M** (2004-2011) out of which **NZ\$2.4M** to the University of Canterbury

In 2005 he received the **NZSEE 2005 Best Research Paper Award** for the best technical paper (single authored) with an overview of these studies on "Seismic Vulnerability Assessment and Retrofit Strategies for Existing Reinforced concrete Buildings".

Since 2006 he has been invited as a member of the **ACI 440-7** Committee for the preparation of Guidelines on "Seismic Retrofit of Existing RC Buildings using FRP composites"

Following the September 2010 and, in particularly, the February 2011 Earthquakes in Christchurch, New Zealand.

Dr. Pampanin has been leading a **Recovery Project** task group investigating the "Seismic Performance of Multi-storey RC Buildings following the **Feb 22 Christchurch Earthquake**: Recommendation for repair, retrofit and reconstruction"

In addition, as a part of the outcome of the multi-year research activity on the Seismic Retrofit Solutions, a **Seismic Retrofit Handbook** for RC Buildings is under preparation under the leadership and main authorship of Dr. Pampanin to assist the practitioner engineers and CCC in seismic repair, retrofit and recovery efforts.

The Handbook will focus on the performance-based seismic assessment and retrofit strategies, following by several user-friendly sections on how to approach several retrofit solutions including concrete jacketing, FRP jacketing, external post-tensioning, selective weakening, added haunch or steel braces, and added conventional/rocking shear walls (concrete/timber). The handbook will integrate with the NZSEE 2006 Guidelines on Seismic Assessment and Evaluation.

d) Design of multi-storey buildings using post-tensioned timber systems

Since 2004 he has been a key player in the conceptual development, experimental and numerical validation and practical on-site implementation of innovative post-tensioned timber solutions for large span multi-storey buildings referred to as **Pres-Lam**.

He is **co-inventor** (along with Dr. Alessandro Palermo and Prof. Andy Buchanan) of the **patent** "An Engineered Wood Construction System for High Performance Structures" (PCT/NZ2007/00026).

The high interest of the industry in such an opportunity has led to the development of a Research and Development Consortium **STIC Ltd** (Structural Timber Innovation Company), co-funded by the major NZ and Australia Timber Industry stakeholders and the NZ FRST. Three Research providers are: University of Canterbury (Frames and walls), University of Technology Sydney, UTS (Floors) and University of Auckland (Portal Frames).

Dr. Pampanin is acting as Objective Leader and UoC Principal Investigator.

Total Funding NZ\$10M (2008-2013), of which NZ\$3.6M to University of Canterbury.

The co-authored paper "Feasibility and Detailing of Prestressed Timber Buildings for Seismic Areas" was awarded the <u>NZSEE Best Research Paper Award 2008.</u> The co-authored paper "Global Response of a Two Storey Pres-Lam Timber Building' received the <u>NZSEE Best</u> <u>Research Paper award 2010</u>".

The **World's first application of a Pres-Lam** system has been completed in Nelson, New Zealand, for the Nelson Marlborough Institute of Technology. The first Pres-Lam system in Europe could be realized soon in Parma, Italy, for the headquarter offices of the Province, after winning an international competition with a sustainable-design solution.

(http://europaconcorsi.com/projects/124447-Concorso-d-idee-per-la-realizzazione-del-nuovo-palazzo-per-uffici-della-provincia-di-Parma-/print)

In Europe and internationally, not only in NZ, the concept and potential of Pres-Lam technology is being widely disseminated and rapidly welcome by the construction industry, along with other similar engineer-wood technology (e.g. GluLam, X-Lam or CLT, Pres-Lam)

(http://www.ilgiornaledellarchitettura.com/immagini/IMG20101221093316450.PDF)

Two more Pres-Lam buildings are either under completion of under construction in New Zealand in 2011.

RESEARCH TOPICS (Specific)

Analytical, Modeling and Design

- Rocking Motion of Multi-Blocks Ancient Columns (using either 3-D Finite Element Analyses, simplified section analyses or closed-form solutions)
- Seismic Response of R.C. (Precast and Cast-in-Place) Buildings (new-design and existing)
- Section Analysis Procedure in absence of Strain compatibility (i.e. unbonded reinforcement/tendons, rocking, contact surfaces and elements)
- Modeling of the Inelastic Behavior of the joint panel zone within under-designed (poorly detailed) R.C. beam-column connections
- Joint Shear Strengthening using externally bonded FRP (Fiber Reinforced Polymers)
- Multi-lever performance-based retrofit strategies for existing reinforced concrete buildings
- Non-invasive retrofit solution for existing R.C. frames based on a diagonal metallic "haunch"
- Selective weakening techniques for the retrofit of frames and walls systems
- Framework for Performance-Based Design and Assessment accounting for Residual Deformations
- Effects of irregularity on the inelastic torsion response with focus on residual displacements
- Displacement incompatibility issues between floor and lateral seismic resisting systems
- Seismic Behavior of FRC (fiber reinforced concrete) members and subassemblies
- Behaviour and Design of innovative multi-storey prestressed timber buildings
- Use of High performance Materials (High Strength Concrete, Fiber Reinforced Concrete, Fiber Reinforced Polymers, Shape Memory Alloys) for the Design or Rehabilitation of concrete Structures
- Effects of flexible Diaphragms on the seismic performance of RC, Timber and Unreinforced Masonry Buildings
- Damage Mechanisms and Behaviour of Hollowcore floor systems
- Design and Retrofit guidelines for Hollowcore floors
- Non structural elements in seismic performance of buildings (infills, facades, glazings, ceilings, content)

Experimental

- Pseudo-dynamic Large Scale Test on a Five-Storey Precast Concrete Building (UC San Diego)
- Quasi-Static Cyclic Tests on a Three Storey pre-1970 RC Frame (Univ. of Pavia)
- Quasi-Static Cyclic Tests on pre-1970s RC Beam-Column Joint Subassemblies (University of Pavia and University of Canterbury). Several configurations (plain round or deformed bars, anchorage details, with or without slabs)
- FRP Strengthening of Existing R.C. Beam-Column subassemblies and a Three-Storey Frame (University of Pavia and University of Canterbury)
- Gravity load cyclic test on several One-Storey Precast Concrete Frames with alternative beam-column connection solutions (Brooklyn system, University of Pavia)
- Uni-axial and bi-directional quasi-static cyclic tests on precast beam-column joints implementing post-tensioned/dissipative hybrid solutions (i.e. PRESSS-Brooklyn, University of Canterbury)
- Quasi-Static tests on precast post-tensioned rocking walls (Hollow core) for industrial plants (UoC)
- Quasi-Static tests on beam-column joints or column-to foundation connections using fiber reinforced concrete beam-column subassemblies (UoC)

- Quasi-static and Pseudo-dynamic tests on unbonded post-tensioned bridge piers with additional dissipation devices (hybrid systems)
- Bi-directional response of existing exterior (corner) beam-column joints design prior to the 1970s.
- Quasi-static (and pseudo-dynamic) tests on timber (LVL) post-tensioned timber walls, beam-column joints, column-to foundation connections and 3D two-storey building, with frame, walls and floors
- Uni- and bi-directional quasi-static tests exterior 2-D and 3-D (corner) joints implementing a low-invasive haunch retrofit solution
- Beam and column testing including Steel Fiber Reinforced Concrete
- Shake table testing of 1:2 scaled Unreinforced Masonry Building
- Shake-table testing of in plan irregular one-storey building. Evaluation of torsional effects.
- Shake table testing on post-tensioned concrete or timber walls, implementing hysteretic and/or viscous dampers.
- Shake table testing of anchorage to concrete solutions (fastening techniques)
- Shake table testing of 1:4 scale five storey post-tensioned timber frame building
- Shake table testing of 1:2.5 scale three storey existing reinforced concrete building before and after retrofit

LIST OF PUBLICATIONS

Author of more than **200 scientific peer reviewed publications**, including book chapters, design code guidelines, scientific journals, international and national conferences. (See full list).

Chapters in Book or Code Design Guidelines

- 1. Pampanin, 2010 (Ed.) "PRESSS Design Handbook" New Zealand Concrete Society, Wellington, New Zealand, pp.283
- 2. Pampanin, S., 2010 "Introduction to PRESSS-Technology", Part I of PRESSS Design Handbook:, New Zealand Concrete Society, Wellington, March 2010, pp. 89
- 3. Marriott, D., Pampanin, S., 2010 "PRESSS-Technology: Design Example" Part II of PRESSS Design Handbook:, New Zealand Concrete Society, March 2010, pp. 142
- 4. Palermo, A., Pampanin, S., 2010 "Design Charts" Part III of PRESSS Design Handbook, New Zealand Concrete Society, Wellington, March 2010, pp. 51
- 5. Moghaddasi, MK, Cubrinovski, M, Pampanin, S, Carr, AJ and Chase, JG 2010. "A robust probabilistic evaluation of soil-foundation-structure interaction effects on structural response," Chapter in: "Soil-Foundation-Structure Interaction," (Editors: Orense, Chuow and Pender), CRC Press, Taylor & Francis Group, UK, pp. 77-84, ISBN: 978-415-60040-8 (invited book chapter).
- Pampanin, 2010 "Damage-control self-centering structures: from laboratory testing to onsite applications", Series "Geotechnical, Geological, and Earthquake Engineering, Volume 13"; Chapter 28 in the book "Advancements in Performance-Based Earthquake Engineering (M Fardis Editor) Publisher Springer, ISBN: 978-90-481-8745-4 (Print) 978-90-481-8746-1 (Online), Part 3, pp. 297-308
- Pampanin, 2009 "Alternative Performance-Based Retrofit Strategies and Solutions for Existing R.C. Buildings", Series "Geotechnical, Geological, and Earthquake Engineering, Volume 10" Chapter 13 within the Book "Seismic Risk Assessment and Retrofitting - with special emphasis on existing low rise structures"- (Editors: A. Ilki, F. Karadogan, S. Pala and E. Yuksel) Publisher Springer, pp. 267-295
- 8. Bull, D., Fenwick, R., Pampanin, S., 2009 "Key considerations in hollow-core floor performance" Chapter 5 within the Code Provisions "Seismic Performance of Hollow Core Floor Systems: Guidelines for Design Assessment and Retrofit", Structural Engineering Society of New Zealand, New Zealand Society for Earthquake Engineering, New Zealand Concrete Society, Supported by Department of Building and Housing Department of Building and Housing, New Zealand, April
- Deam, B., Pampanin, S., 2008 Chapter "Seismic Design of Lateral Resisting System" of the book Timber Design Guide (Editor: A. Buchanan), published by Timber Design Society, pp. 334
- Pampanin, S., 2007 "Developments in seismic design and retrofit of structures: modern technology built on the ancients' wisdom". Chapter 6 within the book "Hazards and the Built Environment: Attaining Built-in Resilience (Editor: Lee Bosher), Taylor and Francis;" London, June 2008, 400 Publisher, pp. 96-123, ISSN: 978-0-415-42730-2.
- 11. Christopoulos, C., Filiatrault, A., Pampanin, S. 2006, "Self-Centering Systems. Chapter 7 of the Book on "Energy Dissipation and Supplemental Damping", Christopoulos, C., Filiatrault, A., 2006, IUSS PRESS Publisher. (Contribution acknowledged in the preface of the book)
- 12. Pampanin, S., Park, R. 2006 "Special provisions for the seismic design of jointed precast

concrete systems". Appendix B of NZS3101:2006 Concrete Design Standard. Standards New Zealand, ISBN: 1-86975-043-8

 Pampanin, S., Nishiyama, M., 2004 "Modeling and Analytical Methods". Chapter 9 of *fib* (federation internationale du beton) Bulletin n. 27 Seismic Design of Precast Concrete Buildings, Lausanne, Switzerland, International federation of Concrete pp. 210

Refereed Journal Publications

- Kam, W.Y., Pampanin, S., Elwood, K., 2012, Seismic Performance of Reinforced Concrete Buildings in the 22 February Christchurch (Lyttleton) Earthquake, Special Issue, Bulletin of the New Zealand Society of Earthquake Engineering, Vol. 44(4), 239-279
- 15. Moghadassi, Cubrinovski, M., Pampanin, S., Carr, A., Chase, G., 2012, Stochastic quantification of soil-shallow foundation-structure interaction, Journal of Earthquake Engineering, under publication
- 16. Iqbal, A., Pampanin, S., Palermo, A., Buchanan, A., 2012(?) "Performance of LVL Walls Coupled with UFP Dissipaters" Earthquake Engineering and Structural Dynamics, under re-submission
- 17. Brignola, A. Pampanin, S., Podesta', S. 2012(?) "Experimental evaluation of diaphragm stiffness, for the performance-based retrofit of masonry buildings", Earthquake Spectra, under publication
- Genesio, G., Ozbolt, J., Pampanin, S., Eligehausen, R. 2012(?) "Seismic Assessment of Existing Exterior RC Joints - 3D Finite Element Analysis", ACI Journal of Structural Division, tentatively accepted with minor modifications
- 19. Palmieri, M. and Pampanin, S., 2011(?), 'Seismic Performance of High-Rise Buildings With PRESSS-Technology'', Journal of Earthquake Engineering, Special Issue, under review, tentatively accepted with minor modifications
- 20. Baird, A., Palermo, A., Pampanin, 2011, Facade Damage Assessment of Multi-Storey Buildings in the Christchurch Earthquake, Special Issue, Bulletin of the New Zealand Society of Eathquake Engineering, Vol. 44(4), 368-377
- 21. Baird, A., Palermo, A., Pampanin, 2011, Damage Assessment of Facades for RC Buildings in the 2011 Chtistchurch Earthquake, Structural Concrete, the Journal of fib, international federation of concrete.
- 22. Kam, W.Y., Pampanin, S., 2011, Seismic Performance of RC Buildings in the 22 February 2011 Christchurch Earthquake, Structural Concrete, the Journal of fib, international federation of concrete 12(4), 223-233, December DOI: 10.1002/suco.201100044
- Palermo, A., Giorgini, S., Pampanin, S., Buchanan, A.H., 2011 "Potential of Longitudinal Post-Tensioning for Short-to- Medium Span Timber Bridges", Structural Engineering International, Journal of the International Association for Bridge and Structural Engineering (IABSE), Volume 21, Number 3, August, pp. 349-355(7), ISSN: 1016-8664
- 24. Pampanin, S., Akguzel, U. 2011 "Performance-based Retrofit or reinforced concrete Structures using FRP: Challenges and Solutions ", Special Issue on FRP, Structural Engineering International (SEI), Journal of the International Association for Bridge and Structural Engineering (IABSE) Volume 21, Number 3, August 2011, pp. 260-270(11), ISSN: 1016-8664

25. Buchanan, A.H., Palermo, A., Carradine, D., Pampanin, S., 2011, "Post-tensioned Timber Frame Buildings" The Structural Engineer, Institute of Structural Engineers, (IStructE), UK, Vol 89(17), pp. 24-31, ISSN: 1466-5123

- 26. Baird, A., Palermo, A., Pampanin, S. and Riccio, P., 2011, "Focusing on reducing the earthquake damage to Façade Systems" Bulletin of New Zealand Society of Earthquake Engineering, Vol. 44(2), pp. 108-120, ISSN: 1174-9857
- Akguzel, U., Pampanin, S., 2011 "Assessment and Design Procedure for the Seismic Retrofit of Reinforced Concrete Beam-Column Joints using FRP Composite Materials, ASCE Journal of Composites for Construction, doi:10.1061/(ASCE)CC.1943-5614.00002
- Kam, W.Y. Pampanin, S., Dhakal, R., Gavin, H., Roeder, C., 2011, 'Seismic Performance of Reinforced Concrete Buildings in the 4th September 2010 Darfield (Canterbury) earthquake, Bulletin of New Zealand Society of Earthquake Engineering, Special Issue, 43(4): 340-351
- 29. Marriott, D., Pampanin, S., Palermo A., 2011, 'Biaxial Testing of Unbonded Post-Tensioned Rocking Bridge Piers With External Replaceable Dissipaters, Earthquake Engineering and Structural Dynamics, 40 (15), 1723-1741
- Moghaddasi, M, Cubrinovski, M, Chase, JG, Pampanin, S and Carr, AJ 2011. "Effects of Soil-Foundation-Structure Interaction on Seismic Structural Response via Robust Monte Carlo Simulation," *Engineering Structures*, 33 (4): 1338-1347, April , ISSN: 0141-0296
- Moghaddasi, M., Cubrinovski, M., Chase, G., Pampanin, S., Carr, A. 2011, Probabilistic Evaluation of Soil-Foundation-Structure Interaction Effects on Seismic Structural Response', Earthquake Engineering and Structural Dynamics, 4(2): 135-154, Feb, http://dx.doi.org/10.1002/eqe.1011.
- Newcombe, M.P., Van Beerschoten, W.A., Carradine, S., Pampanin, S., Buchanan, A. H., 2010 "In-Plane Experimental Testing of Timber-Concrete Composite Floor Diaphragms" ASCE Journal of Structural Engineering, 136 (11): 1461-1468, ISSN: 0733-9445
- MacRae, G.A., Clifton, G.C., Mackinven, H., Mago, N., Butterworth, J. and Pampanin, S. (2010) The Sliding Hinge Joint Moment Connection. Bulletin of the New Zealand Society for Earthquake Engineering, 43(3), 202-212.
- 34. Uma, S.R., Pampanin, S., Christopoulos. C., 2010, 'Development of probabilistic framework for performance-based seismic assessment of structures considering residual deformations', Journal of Earthquake Engineering, 14(7): 1092-1111
- 35. Kam, W., Pampanin, S., Palermo, A. and Carr, A., 2010, 'Self-centering structural systems with combination of hysteretic and viscous energy dissipations" Earthquake Engineering and Structural Dynamics, 39 (10): 1083–1108, August
- 36. Akguzel, U. and Pampanin, S. 2010, 'Effects of Variation of Axial Load and Bidirectional Loading on Seismic Performance of GFRP Retrofitted Reinforced Concrete Exterior Beam–Column Joints', ASCE Journal of Composites for Construction, 14 (1): 94-104
- 37. Smith, S. Fragiacomo, Pampanin, S., Buchanan, 2009 'Construction time and cost estimates for post-tensioned multi-storey timber buildings', Journal of Construction Materials, ICE (Institution of Civil Engineers, Special Issue 2009 "Timber in Construction", Volume 162; Issue 4; pp: 141-149; ISSN: 1747-650X, E-ISSN: 1747-6518
- 38. Brignola, A., Pampanin, S. and Podesta', S. 2009, 'Evaluation and control of the in-plane stiffness of Timber floor for the performance-based retrofit of URM buildings', Bulletin of the New Zealand Society for Earthquake Engineering, 42(3): 204-221

- 39. Marriott, D., Pampanin, S., Palermo A., 2009, 'Quasi-static and Pseudo-Dynamic testing of Unbonded Post-tensioned Rocking Bridge Piers with External Replaceable Dissipaters', Earthquake Engineering and Structural Dynamics, 38(3):331-354, March
- Palermo A., Pampanin, S., 2008 'Enhanced Seismic Performance of Hybrid Bridge Systems: Comparison with Traditional Monolithic Solutions, Journal of Earthquake Engineering, Taylor and Francis, 12 (8): 1267-1295, ISSN 1363-2469 print/ 1559-808X online
- 41. Marriott, D., Pampanin, S., Bull, D., Palermo A., 2008 'Dynamic Testing of Precast, Post-Tensioned Rocking Wall Systems with Alternative Dissipating Solutions, Bulletin of the NZ Society for Earthquake Engineering, 41(2), 90-103, ISSN No. 1174-9857
- 42. Newcombe, M., Pampanin, S., Buchanan, A., Palermo, 2008 "Section analysis and cyclic behavior of post-tensioned jointed ductile connections for multi-storey timber buildings", Journal of Earthquake Engineering, Special Issue, 12 (S1) , pp. 83-110 ISSN: 1363-2469
- 43. Buchanan, A., Deam, B., Fragiacomo, M., Pampanin, S., Palermo, A., 2008 "Multi-Storey Prestressed Timber Buildings in New Zealand", Structural Engineering International (SEI), published by IABSE, Special Issue on Tall Timber Buildings, Volume 18, Number 2, 166-173
- 44. Pampanin, S., Bolognini, D., Pavese, 2007 "Performance-based Seismic Retrofit Strategy for Existing Reinforced Concrete Frame Systems using FRP composites", ASCE Journal of Composites for Construction, Invited Paper for Special Issue on "Recent International Advances in FRP Research and Application in Construction", Vol. 11, No. 2, March/April 2007, pp. 211-226, ISSN 1090-0268/2007/2-211-226
- 45. Palermo, A., Pampanin, S., Marriott, D., 2007 "Design, Modeling and Experimental Investigation of Seismic-Resistant Bridge piers with post-tensioned dissipating connections" ASCE Journal of Structural Engineering, Vol. 133, No. 11, November 2007, pp. 1648-1661
- Pettinga, D., Pampanin, S., Christopoulos, C., Priestley, M.J.N., 2007 "The Role of Inelastic Torsion in the Determination of Residual Deformations", Journal of Earthquake Engineering, Special Issue, 11 (s1), pp.133 - 157 ISSN: 1559-808X (electronic) 1363-2469 (paper)
- Pettinga, J.D., Christopoulos, C., Pampanin, S., Priestley, M.J.N., 2007 "Effectiveness of Simple Approaches in Mitigation Residual Deformations in Buildings", Earthquake Engineering and Structural Dynamics Journal, 36(12): 1763-1783, DOI: 10.1002/eqe.717
- Pampanin, S., Christopoulos, Chen, T-H., 2006 "Development And Validation of a Metallic Haunch Seismic Retrofit Solution for Existing Under-Designed RC Frame Buildings, Earthquake Engineering and Structural Dynamics; 35 (14):1739–1766, Nov
- Pampanin. S., 2006 "Controversial Aspects in Seismic Assessment and Retrofit of Structures in Modern Times: Understanding and Implementing Lessons from Ancient Heritage" Bulletin of NZ Society of Earthquake Engineering, June, Vol. 39, N.2, 120-133 Extension of the conference paper awarded NZSEE Best Research Paper in 2005
- 50. Palermo A., Pampanin, S., Calvi, G.M. 2005 'Concept and development of Hybrid Systems for Seismic-Resistant Bridges", Journal of Earthquake Engineering, Imperial College PRESS, Vol. 9 (6), pp. 899-921
- Pampanin S., 2005, "Emerging Solutions for High Seismic Performance of Precast/Prestressed Concrete Buildings", Journal of Advanced Concrete Technology (ACT), invited paper for Special Issue on "High performance systems", Vol. 3 (2), pp. 202-22 NZSEE Otto Glogau Award 2005

- 52. Christopoulos, C. and Pampanin, S., 2004 "Towards a Performance-Based Seismic Design of MODF Structures with Explicit Consideration of Residual Deformations", Invited Paper, ISET Journal of Earthquake Technology, Special Issue on Performance Based Seismic Design (Guest Ed. M.J.N. Priestley) March, paper n. 440 (ISSN 0972-0405), 41(1):53-73
- 53. Pampanin, S., 2003 "Alternative design philosophies and seismic response of precast concrete buildings" Structural Concrete, the journal of fib (international federation of concrete).Vol. 4, No. 4, pp. 203-211. Dec.
- 54. Christopoulos, C., Pampanin, S., and Priestley M.J.N., 2003, "Performance-Based Seismic Response of Frame Structures Including Residual Deformations". Part I: Single-Degree-of-Freedom Systems, Journal of Earthquake Engineering (JEE), Vol. 7, No. 1, pp. 97-118.
- 55. Pampanin, S., Christopoulos, C., and Priestley M.J.N., 2003, "Performance-Based Seismic Response of Frame Structures Including Residual Deformations". Part II: Multi-Degree-of-Freedom Systems, Journal of Earthquake Engineering (JEE), Vol. 7, No. 1, pp. 119-147.
- Calvi, G.M., Magenes, G, Pampanin, S., 2002. "Relevance of Beam-column Joint Damage and Collapse in RC Frame Assessment", Journal of Earthquake Engineering, Special Issue, sup6(1):75-100
- Pampanin, S., Priestley, M.J.N, Sritharan, S., 2001 "Analytical Modeling of the Seismic Behaviour of Precast Concrete Frames Designed with Ductile Connections", Journal of Earthquake Engineering (JEE), Imperial College Press, Vol. 5, No.3, pp.329-367.
- 58. Priestley, M.J.N., Sritharan, S., Conley, J., Pampanin, S., 2000. "A Summary of Test Results from the PRESSS 5-Storey Precast Concrete Building", Journal of the Structural Engineering Society New Zealand (Inc.), SESOC, Vol. 13, N.1.
- Priestley, M.J.N., Sritharan, S., Conley, J., Pampanin, S., 1999. "Preliminary Results and Conclusions from the PRESSS Precast 5-Story Test Building", PCI Journal (Precast/Prestressed Concrete Institute), Vol. 44, No.6, pp.42-67. PCI Martin P. Korn Award 2000

Refereed Conference Proceedings

- van Beerschoten, W., Smith, T., Palermo, A., Pampanin, S., and Ponzo, F. C. (2011b) "The Stiffness of Beam to Column Connection in Post-Tensioned Timber Frames." CIB W18 Workshop on Timber Structures, Alghero, Italy.
- 61. Smith, T., Pampanin, S., Carradine, D., Buchanan, A., Ponzo, F., Cesare, A. D., and Nigro, D. (2011a). "Experimental Investigations into Post-Tensioned Timber Frames with Advanced Damping Systems." Il XIV Convegno di Ingegneria Sismica, Associazione Nazionale di Ingegneria Sismica, Bari, Italy.
- 62. Akgüzel, U., Quintana Gallo, P., Pampanin, S., 2011 "Seismic strengthening of a nonductile RC frame structure using GFRP sheets", *Proceedings of the Ninth Pacific Conference on Earthquake Engineering*, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 197
- 63. Devereux, C.P., Holden, T.J., Buchanan, A.H., Pampanin, S., 2011 "NMIT Arts & Media Building Damage Mitigation Using Post-tensioned Timber Walls", *Proceedings of Proceedings of the Ninth Pacific Conference on Earthquake Engineering*, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 90
- 64. Genesio, G., Eligehausen, R., Pampanin, S., 2011 "Application of Post-Installed Anchors for Seismic Retrofit of RC Beam-Column Joints: Design Method", *Proceedings* of the Ninth Pacific Conference on Earthquake Engineering, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 106
- 65. Kam, W.Y., Pampanin, S., 2011 "Displacement-based seismic retrofit design for nonductile RC frame structures using local retrofit interventions at beam-column joints" *Proceedings of the Ninth Pacific Conference on Earthquake Engineering*, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 192
- 66. Mahrenholtz, C., Eligehausen, R., Pampanin, S., 2011 "Seismic Behaviour of Columnto-Foundation Connections with cast-in and post-installed rebars. Phase I: Deterioration of bond between reinforcing bars and concrete subject to cyclic loads and cyclic cracks, *Proceedings of the Ninth Pacific Conference on Earthquake Engineering*, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 222
- 67. Newcombe, M.P., Marriott, D., Kam, W. Y., Pampanin, S., Buchanan, A.H., 2011 "Design of UFP-coupled post-tensioned timber shear walls", *Proceedings of the Ninth Pacific Conference on Earthquake Engineering*, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 132
- 68. Palmieri, M., Pampanin, S., 2011 "Feasibility of high-rise buildings with PRESSStechnology", *Proceedings of the Ninth Pacific Conference on Earthquake Engineering*, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 93
- 69. Pampanin, S., Kam, W.Y., Akguzel, U., Quintana-Gallo P., 2011, "Considerations on the seismic performance of pre-1970s RC buildings in the Christchurch CBD during the 4th Sept 2010 Canterbury earthquake: was that really a big one?" *Proceedings of the Ninth Pacific Conference on Earthquake Engineering*, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 179
- 70. Quintana Gallo, P., Akgüzel, U., Pampanin, S., Carr, A. J., 2011 "Shake table tests of non-ductile as-built and repaired RC frames" *Proceedings of Proceedings of the Ninth Pacific*

Conference on Earthquake Engineering, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 201

- 71. Singh, J., MacRae, G. A., Dhakal, R. P., Pampanin, S., 2011 "Building Seismic Ceiling Fragility using Spectral Acceleration", *Proceedings of the Ninth Pacific Conference on Earthquake Engineering*, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 63
- 72. Tasligedik, A.S., Pampanin, S., Palermo, A., 2011 "Damage Mitigation Strategies of 'Non-Structural' Infill Walls: Concept and Numerical-Experimental Validation Program, *Proceedings of the Ninth Pacific Conference on Earthquake Engineering*, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 120
- 73. Smith, T., Wong, R., Newcombe, M., Carradine, D., Pampanin, S., Buchanan, A., Seville, R., McGregor, E., 2011 "The Demountability, Relocation and Re-use of a High Performance Timber Building", *Proceedings of the Ninth Pacific Conference on Earthquake Engineering*, "Building an Earthquake-Resilient Society", 14-16 April, Auckland, New Zealand, paper 187
- 74. Sarti, F., Palermo, A., Pampanin, S., 2011 "Simplified Design Tools For Post-Tensioned Timber Beams And Walls" *Proceedings of the Structural Engineers World Congress* 2011, April 4-6, Como, Italy
- 75. Baird, A., Diaferia, R., Palermo, A.: Pampanin, S. 2011 "Numerical Modelling of Local Cladding-Structure Interaction, *Proceedings of the Structural Engineers World Congress 2011,* April 4-6, Como, Italy
- 76. Diaferia, R., Baird, A., Palermo, A. Pampanin, S. 2011, "Numerical Study on the Seismic Interaction Between 2D Seismic Resisting Frames and Claddings", *Proceedings of* the Structural Engineers World Congress 2011, April 4-6, Como, Italy
- 77. Baird, A., Palermo, A., Pampanin, S., Diafeira, R., 2011 "Parametric Investigation of Seismic Interaction Between Precast Concrete Cladding Systems and Moment Resisting Frames", *Proceedings of the ASCE-SEI Structures Congress*, Las Vegas, Nevada April 14-16
- Giorgini, S., Palermo, A., Carradine, D., Pampanin, S., 2011, "Long Term Effects on Unbonded Post-Tensioned Timber Beams", *Proceedings of the ASCE-SEI Structures Congress*, Las Vegas, Nevada April 14-16
- 79. Crews, K., Buchanan, A., Quenneville, P. and Pampanin, S. (2011) Development of High Performance Structural Timber Systems for Non Residential Buildings in New Zealand and Australia". Hong Kong: Twelfth East Asia-Pacific Conference on Structural Engineering and Construction (EASEC-12), 26-28 Jan 2011.
- 80. Genesio, G., Sharma, A., Eligehausen, R., Pampanin, S. Reddy, G.R., 2010 "Development of Seismic Retrofit Technique of RC Frame Using Fully Fastened Haunch Elements: Static to Dynamic Testing", *Proceedings of 14th Symposium on Earthquake Engineering14SEE, Indian Institute of Technology*, Roorkee, December 17-19, paper AA0017
- Sharma, A., Genesio, G., Reddy, G.R., Eligehausen, R., Pampanin, S. Vaze, K.K., 2010 "Experimental Investigations on Seismic Retrofitting of Reinforced Concrete Beam-Column Joints", *Proceedings of 14th Symposium on Earthquake Engineering14SEE, Indian Institute of Technology*, Roorkee, December 17-19, paper AA007

- 82. Akguzel, U., Pampanin, S., 2010 "Seismic Upgrading of Exterior Beam-Column Joints Using GFRP Composites", 14th European Conference on Earthquake Engineering, Ohrid, Macedonia, 30 Aug-3 Sept.
- 83. Brignola, A., Podesta', S., Pampanin, S., 2010 "In-plane cyclic testing of timber floors", 14th European Conference on Earthquake Engineering, Ohrid, Macedonia, 30 Aug-3 Sept.
- 84. Cusiel, M.R., Newcombe, M.P. Pampanin, S. & Buchanan, A.H., Palermo, A. 2010 "The Effect of Joint Flexibility on the Seismic Response of Post-tensioned LVL Frames" 14th European Conference on Earthquake Engineering, Ohrid, Macedonia, 30 Aug-3 Sept.
- 85. Genesio, G., Eligehausen, R, Pampanin, S., 2010 "Seismic Assessment of Existing Beam-Column joints" 14th European Conference on Earthquake Engineering, Ohrid, Macedonia, 30 Aug-3 Sept.
- 86. Genesio, G., Eligehausen, R, Pampanin, S., 2010 "Application of Post-Installed Anchors for Seismic Retrofit of Frames" 14th European Conference on Earthquake Engineering, Ohrid, Macedonia, 30 Aug-3 Sept.
- Iqbal, A., Pampanin, S., Buchanan, A.H., & Palermo A., 2010 "Seismic Response of Post-Tensioned Timber Walls" 14th European Conference on Earthquake Engineering, Ohrid, Macedonia, 30 Aug-3 Sept.
- 88. Kam, W.Y., Pampanin, S., 2010 "Selective Weakening and Post-tensioning for Retrofit of Non-Ductile R.C. Exterior Beam-Column Joints", 14th European Conference on Earthquake Engineering, Ohrid, Macedonia, 30 Aug-3 Sept.
- 89. Moghaddasi, M., Cubrinovski, M., Pampanin, S., Carr, A., Chase, J.G. 2010, "Development of a Probabilistic Seismic Design Framework for Soil-Shallow Foundation-Structure Systems, 14th European Conference on Earthquake Engineering, Ohrid, Macedonia, 30 Aug-3 Sept.
- 90. Newcombe, M.P. Pampanin, S. & Buchanan, A.H. 2010 "Analysis and Numerical modelling of a Two-Storey Post-Tensioned Timber Frame with Timber-Concrete Composite Floor Diaphragms" 14th European Conference on Earthquake Engineering, Ohrid, Macedonia, 30 Aug-3 Sept.
- 91. Pampanin, S., 2010 "Retrofit Solutions for pre-1970s R.C. Buildings: an overview of latest research developments in New Zealand" *14th European Conference on Earthquake Engineering*, Ohrid, Macedonia, 30 Aug-3 Sept.
- 92. Smith, T., Pampanin, S., Palermo, A., Buchanan, A.H., 2010 "A variable cost analysis of Prestressed Laminated timber structures" *14th European Conference on Earthquake Engineering*, Ohrid, Macedonia, 30 Aug-3 Sept.
- 93. Giorgini, S., Neale, A., Carradine, D., Palermo, A., Pampanin, S., Buchanan, A. 2010" Design Procedure for Predicting Time Dependent Effects in unbounded Post-Tensioned Timber Frames and Beams, *CIB-W18 meeting*, Nelson, New Zealand, 22-26 August
- Newcombe, M., Cusiel, M., Pampanin, S., Palermo, A., Buchanan, A.H., 2010" Simplified Design of Post-tensioned Timber Buildings", *CIB-W18 meeting*, Nelson, New Zealand, 22-26 August

- 95. Kam, W.K., Pampanin, S. and Bull, D. 2010 "Selective weakening retrofit for existing R.C. structures concept, validation and design example". *9th US National and 10th Canadian Conference on Earthquake Engineering: Reaching Beyond Borders*, 25-29 Juy, Toronto, Canada.
- 96. Kam, W.Y., Quintana Gallo, P., Akguzel, U. and Pampanin, S. 2010 Influence of slab on the seismic response of sub-standard detailed exterior reinforced concrete beam column joints. *9th US National and 10th Canadian Conference on Earthquake Engineering: Reaching Beyond Borders*, 25-29 July, Toronto, Canada.
- 97. Newcombe, M.P. Pampanin, S. & Buchanan, A.H. 2010 "Experimental Testing of a Two-Storey Pre-Lam Timber Building", *9th US and 10th Canadian Conf. on Earthquake Engineering*, 25-29 July, Toronto, Canada
- Kam, W.Y., Quintana Gallo, P., Akguzel, U., Pampanin, S., 2010 "Influence of Slab on the Seismic Response of Sub-Standard Detailed Exterior Reinforced Concrete Beam Column Joints", 9th US and 10th Canadian Conf. on Earthquake Engineering, July 25-29 2010
- 99. Palermo, A., Pampanin, A., Carradine, D., Buchanan, A.-H., Dal Lago, B., Dibenedetto, C., Giorgini, S., Ronca, P., 2010 "Enhanced Performance of Longitudinally Posttensioned Long-Span LVL Beams", World Conference in Timber Engineering, Riva del Garda, 20-24 June, paper 572
- 100.Iqbal, A., Pampanin, S., Palermo, A., Buchanan, A.H. 2010 "Seismic Performance of Full-Scale Post-Tensioned Timber Beam-Column Joints", *World Conference in Timber Engineering*, Riva del Garda, 20-24 June, paper 391
- 101.Newcombe, M., Pampanin, S., Buchanan A., 2010 "Design, Fabrication And Assembly of A Two-Storey Post-Tensioned Timber Building", *World Conference in Timber Engineering*, Riva del Garda, 20-24 June, paper 260
- 102.Palermo, A., Pampanin, A., Giorgini, S., Gilling, N., Buchanan, A.-H., 2010 "Potential Of Longitudinal Post-Tensioning For Timber Bridges" *World Conference in Timber Engineering*, Riva del Garda, 20-24 June
- 103.Pino, S., Pampanin, S., Carradine, D., , Deam, B., Buchanan, A.H., 2010 "Dynamic Response of a Multi-Storey Post-Tensioned Timber Building", World Conference in Timber Engineering, Riva del Garda, 20-24 June, paper 390
- 104.Genesio, G., Eligehausen, R., Sharma, A., Pampanin, S., 2010 "Experimental and Numerical Study towards a Deformation-based Seismic Assessment of Substandard Exterior R.C. Beam-Column Joints", *Proceedings of FraMCoS-7 (Fracture Mechanics of Concrete and Concrete Structures)*, Jeju, Korea, 23-28 May
- 105.Pampanin, 2010 "Alternative Performance-Based Retrofit Strategies and Solutions for Reinforced Concrete Buildings", Workshop on Sustainable Development Strategies for Construction in China, Europe and Italy for the post-earthquake reconstruction of L'Aquila, Rome 19-20 April
- 106.Au, E.V., Bull, D.K., and Pampanin, S., 2010 "Experimental Investigation of the Seismic Behaviour of Slotted Reinforced Concrete Beam-Column Connections" *Proceedings NZSEE Conference*, Wellington, New Zealand, 26-28 March, Paper 46 NZSEE Best Poster Paper Award 2010
- 107.Kam, W.Y., Pampanin, S. and Bull, D.K.. 2010, "A Summary of Test Results for

Selective Weakening and Post-tensioning for Retrofit of Non-Ductile R.C. Exterior Beam-Column Joints", *Proceedings NZSEE Conference*, Wellington, New Zealand, 26-28 March, Paper 29

- 108.Iqbal, A., Pampanin, S. and Buchanan, A.H., 2010, "Seismic Performance of Prestressed Timber Beam-Column Sub-Assemblies", *Proceedings NZSEE Conference*, Wellington, New Zealand, 26-28 March, Paper 27
- 109.Leslie, B.J., Bull, D.K., and Pampanin, S. 2010 "The Seismic Performance of a Non-Tearing Floor Precast Concrete Structural System", *Proceedings NZSEE Conference*, Wellington, New Zealand, 26-28 March, Paper 30, NZSEE Best Student Paper Award 2010
- 110.Moghaddasi, M. Cubrinovski, M., Pampanin, S. Carr, A.J., and Chase, J.G. 2010 'Soil-Foundation-Structure Interaction Effects on Nonlinear Seismic Demand of Structures" *Proceedings NZSEE Conference*, Wellington, New Zealand, 26-28 March, Paper 17
- 111.Newcombe, M., Pampanin, S., and Buchanan, A.H., 2010 "Global Response of a Two Storey Pres-Lam Timber Building" *Proceedings NZSEE Conference*, Wellington, New Zealand, 26-28 March, Paper 28 NZSEE Best Research Paper Award 2010
- 112. Quintana-Gallo, P., Pampanin, S., Carr, A.J.and Bonelli, P., 2010 "Shake Table Tests of Under-designed RC Frames for the Seismic Retrofit of Buildings Design and similitude requirements of the benchmark specimen" *Proceedings NZSEE Conference*, Wellington, New Zealand, 26-28 March, Paper 39
- 113.Palermo, A. ., Pampanin, S. Baird, A. and Riccio, P. 2010 "Focusing on reducing the earthquake damage to non-structural components in buildings: research needs and future internationally coordinated plans", *Proceedings NZSEE Conference*, Wellington, New Zealand, 26-28 March, Paper 70
- 114.Pino, D.P.M., Pampanin, S., Buchanan, A.H. and Deam, B.L., 2010 "Shake Table Response of Multi-Storey Post-Tensioned Timber Buildings", *Proceedings NZSEE Conference*, Wellington, New Zealand, 26-28 March, Paper 72
- 115.Kam, W.K. and Pampanin, S. 2009 Experimental and numerical validation of selective weakening retrofit for existing non-ductile R.C. frames. San Francisco, CA, USA: *ATC-SEI Conference on Improving the Seismic Performance of Existing Buildings and Other Structures*, 9-11 Dec.
- 116.Moghaddasi, M, Cubrinovski, M, Chase, JG, Pampanin, S, Carr, AJ 2009. "A robust probabilistic evaluation of soil-foundation-structure interaction effects on structural response," *International Workshop on Soil-Foundation-Structure Interaction* (SFSI 2009), Auckland, NZ, Nov 26-27, CD-ROM, pp. 72-78.
- 117. Moghaddasi, M, Chase, JG, Cubrinovski, M, Pampanin, S and Carr, AJ 2009. "Period Dependency of Variation in Structural Response Considering Nonlinear SSI and Monte Carlo Simulation," 13th Asia-Pacific Vibrations Conference (13APVC), Christchurch, New Zealand, November 22-25.
- 118.Buchanan, A.H., Pampanin, S., Newcombe, M., Palermo, A., 2009 "Non-Conventional Multi-Storey Timber Buildings using post-tensioning", 11th International Conference on Non-Conventional Materials and Technologies (NOCMAT), 6-9 Sept, University of Bath
- 119.Brignola, A., Pampanin, S., Podesta', S., 2009 "Determinazione sperimentale della

l

rigidezza di piano dei solai lignei oer il consolidamento sismico degli edifice in muratura", Proceedings of ANIDIS XIII (Associazione Nazionale di Ingegneria Sismica), 28 June – 2 July, Bologna (in Italian)

- 120.Palmieri, M. Plizzari, G., Pampanin, S., Mackecnie, J., 2009 Seismic Performance of SFRC Columns Subjected to Bi-directional Cyclic Loading, *Proceedings of ANIDIS XIII* (Associazione Nazionale di Ingegneria Sismica), 28 June – 2 July, Bologna (in Italian)
- 121.Smith, T., Pampanin, S., Buchanan, A., 2009, Post-tensioned Timber Buildings: Cost, Construction and a Business Case Study, *Proceedings of ANIDIS XIII (Associazione Nazionale di Ingegneria Sismica)*, 28 June – 2 July, Bologna
- 122.Giovinazzi S., Pampanin S. 2009. Multi-Criteria Approach For Seismic Risk Mitigation, WCCE ECCE TCCE Joint Conference: Earthquake & Tsunami. Istanbul, June
- 123. Akguzel, U., and Pampanin, S, 2009 Analytical Model for Shear Strengthening of RC Beam-Column Joints Using Composite Materials, *Proceedings NZSEE Conference*, Christchurch, New Zealand, 3-5 April
- 124.Marriott, D.J, Pampanin, S., Bull, D.K. and Palermo A., 2009 Probabilistic Seismic Loss Assessment of Advanced Post-Tensioned Precast Bridge Systems *Proceedings NZSEE Conference*, Christchurch, New Zealand, 3-5 April
- 125. Arefi, M.J., Pampanin, S., Cubrinovski, M. 2009, Effects of SSI on the seismic response of older structures before & after retrofit, *Proceedings NZSEE Conference*, Christchurch, New Zealand, 3-5 April
- 126.Moghaddasi K., M., Cubrinovski, M., Pampanin, S., Carr, A.J., Chase J.G., 2009, Monte Carlo simulation of SSI effects using simple rheological soil model, *Proceedings* NZSEE Conference, Christchurch, New Zealand, 3-5 April
- 127.Newcombe, M.P., Van Beerschoten, W.A., Carradine, David, Pampanin, S. Buchanan1, A. H., Deam, B. L. & Fragiacomo, M. 2009 In-Plane Experimental Testing of Timber-Concrete Composite Floor Diaphragms, *Proceedings NZSEE Conference, Christchurch, New Zealand, 3-5 April* **NZSEE Best Student Paper Award 2009**
- 128. Amaris, A., Pampanin, S. ., Bull, D.K., Carr, A.J., 2009, Numeric Investigation on Seismic Response of Multi-storey post-tensioned Hybrid "Jointed" Precast Frames with Non-tearing Floor Connections, *Proceedings NZSEE Conference, Christchurch, New Zealand, 3-5 Apri*
- 129.Kam, W.Y., Pampanin, S., Bull, D.K., 2009 Experimental Validation of Selective Weakening Approach for the Seismic Retrofit of Exterior Beam-Column Joints, *Proceedings NZSEE Conference, Christchurch, New Zealand, 3-5 April*
- 130.Eligehausen, R., Genesio, G., Ožbolt, J., Pampanin, S., 2008 "3D Analysis of Seismic Response of RC Beam-Column Exterior Joints before and after Retrofit", *Proceedings of the International Conference on Repairing, Retrofit and Rehabilitation ICRRRR, Cape Town, Nov*
- 131.Palmieri, M., Pampanin, S., Plizzari, G., Mackechnie, J., 2008 "Experimental investigation on the seismic behaviour of SFRC columns under biaxial bending, *Proceedings of the International Conference on Repairing, Retrofit and Rehabilitation ICRRRR*, Cape Town, 24-26 Nov

- **132.**Pampanin, S. "Simple and Low-Cost Technology for a Total Damage-Control: the Ultimate Challenge of Earthquake Engineering" Fumio Watanabe Symposium 24-26 October 2008, Kyoto
- 133.Akguzel, U., Pampanin., S. 2008 "Effects of Variation of Axial Load and Bi-Directional Loading on the FRP Retrofit of Existing B-C Joints" Proceedings 14th World Conference in Earthquake Engineering, Beijing 12-17
- 134.Amaris, A.D., Pampanin, S., Bull, D.K. and Carr, A.J. 2008 "Experimental Performance of Hybrid Frames Systems with Non-Tearing Floor Connections", *Proceedings 14th World Conference in Earthquake Engineering*, Beijing 12-17 October
- 135.Kam, W.Y., Pampanin, S., 2008 "Selective Weakening Techniques for Retrofit of Existing Reinforced Concrete Structures", *Proceedings 14th World Conference in Earthquake Engineering*, Beijing 12-17 October
- 136.Kam, W.Y., Pampanin, S., Palermo, A., Carr, A. 2008 "Implementation of Advanced Flag-Shape (AFS) Systems for Moment-Resisting Frame Structures", *Proceedings* 14th World Conference in Earthquake Engineering, Beijing 12-17 October
- 137.Marriott, D., Pampanin, S., Bull, D., Palermo, A., 2008 "Shake-Table Testing of Hybrid Post-Tensioned Precast Wall Systems with Alternative Dissipating Solutions", *Proceedings 14th World Conference in Earthquake Engineering*, Beijing 12-17 October
- 138. Moghaddasi, M., Pampanin. S., Chase, G., 2008 °Simplified Method for Performance-Based Design of Non-Structural Components, ," 14th World Conference in Earthquake Engineering, October, Beijing, 12-17 October
- 139.Newcombe, M., Pampanin, S., Buchanan, A., Palermo, 2008, "Seismic Design of Posttensioned Timber Frames," 14th World Conference in Earthquake Engineering, October, Beijing, 12-17 October
- 140.Palermo., A., Pampanin, S., 2008, "Analysis and Simplified Design of Precast Jointed Ductile Connections", *Proceedings 14th World Conference in Earthquake Engineering*, Beijing 12-17 October
- 141.Personeni, S., Di Pilato, M., Palermo, A., Pampanin, S., 2008 "Numerical Investigations on the Seismic Response of Masonry Infilled Steel Frames", Proceedings 14th World Conference in Earthquake Engineering, Beijing 12-17 October
- 142.Pettinga, J.D., Pampanin, S., Christopoulos, C., Carr, A.J., Rolando, C.B. 2008 "Experimental Investigation into Residual Displacements due to Inelastic Torsional Response", *Proceedings 14th World Conference in Earthquake Engineering*, Beijing 12-17 October
- 143. Pettinga, J.D., Christopoulos, C., Pampanin, S., 2008 "Predicting Inelastic Torsional Response with the Inclusion of Dynamic Rotational Stiffness", *Proceedings 14th World Conference in Earthquake Engineering*, Beijing 12-17 October
- 144.Cattanach, A., and Pampanin, S., 2008 "21st Century Precast: the Detailing and Manufacture of NZ's First Multi-Storey PRESSS-Building" *Proceedings NZ Concrete Industry Conference*, Rotorua, 2-4 Oct
- 145.Boys, A., Bull, D.K., Pampanin, S., 2008 "Seismic Performance of Concrete Columns with Inadequate Transverse Reinforcement" *Proceedings NZ Concrete Industry Conference*,

Rotorua, 2-4 Oct

- 146.Amaris, A.D., Pampanin, S., Bull, D.K. and Carr, A.J. "Solutions to Control and Minimize Floor Damage in Precast Concrete Buildings under Severe Earthquake Loading", *Proceedings NZ Concrete Industry Conference*, Rotorua, 2-4 Oct
- 147.Iqbal, A, Pampanin, S., Buchanan, 2008 Seismic Behavoiur of Prestressed Timber Columns under Bi-directional Loading, *Proceedings* 10th World Conference on Timber Engineering, Miyazaki, Japan, June 2-5
- 148.Smith, T., Pampanin, S., Fragiacomo, M., Buchanan, A., 2008 "Design and Construction of Prestressed Timber Buildings for Seismic Areas", *Proceedings 10th World Conference on Timber Engineering*, Miyazaki, Japan, June 2-5
- 149.Marriott, D., Pampanin, S., Bull, D., Palermo, A., 2008 "Dynamic Testing of Precast, Post-Tensioned Rocking Wall Systems with Alternative Dissipating Solutions *Proceedings NZSEE Conference, Wairakei, New Zealand, April*
- 150.Boys, A., Bull, D.K., Pampanin, S., 2008 "Seismic Performance Assessment of Inadequately Details Columns" Proceedings NZSEE Conference, Wairakei, New Zealand, April
- 151.Smith, T., Pampanin, S., Buchanan, A., Fragiacomo, M., 2008 "Feasibility and Detailing of Prestressed Timber Buildings for Seismic Areas Proceedings NZSEE Conference, Wairakei, New Zealand, April NZSEE Best Research Paper Award 2008
- 152.Kam, W.Y., Pampanin, S., Palermo, A., Carr, A. 2008 "Design Procedure and Behaviour of Advanced Flag-Shape (AFS) MDOF Systems, *Proceedings NZSEE Conference, Wairakei, New Zealand, April*
- 153. Amaris, A, Pampanin, S., Bull, D.K. & Carr, A.J. 2008 Experimental Investigation on a Hybrid Jointed Precast Frame with Non-tearing Floor Connections *Proceedings NZSEE Conference, Wairakei, New Zealand, April*
- 154.Iqbal, A, Pampanin, S., Buchanan, 2008 Experimental Study of Seismic-Resistant Prestressed Timber Columns, *Proceedings NZSEE Conference, Wairakei, New Zealand*
- 155.Brignola, A., Podesta', S., Pampanin, S., 2008, In Plane Stiffness of Wooden Floors, Proceedings NZSEE Conference, Wairakei, New Zealand
- 156.Iqbal, A, Pampanin, S., Buchanan, A., Palermo, A., 2007 "Improved Seismic Performance of LVL Post-tensioned Walls Coupled with UFP devices, *Proceedings 8th Pacific Conference on Earthquake Engineering*, Singapore
- 157.Palermo, A., Pampanin, S., 2007 "Simplified Design and Analysis Method for hybrid sections", *Proceedings 8th Pacific Conference on Earthquake Engineering*, Singapore
- 158. Weng, K., Pampanin, S., 2007 "Concept and Application of selective Weakening techniques to frame systems", *Proceedings 8th Pacific Conference on Earthquake Engineering*, Singapore
- 159. Giovinazzi, S., Pampanin, S., 2007 Multi-Criteria Approaches for Earthquake Retrofit Strategies at Regional Scale, *Proceedings 8th Pacific Conference on Earthquake Engineering*, Singapore

- 160.Mackinven, H., MacRae, G., Pampanin, S., Clifton, C., Butterworth, J., 2007 "Sliding Hinge Joints and Subassemblies for Steel Moment Frames", *Proceedings Pacific Conference* on Earthquake Engineering, Singapore, Dec.
- 161.Pampanin, S., Akguzel, U., Attanasi, G., (2007)." Seismic Upgrading of 3-D Exterior R.C. Beam Column Joints Subjected To Bi-Directional Cyclic Loading Using GFP Composites, 8th FRPRCS, International Conference on Fiber Reinforced Polymers for Reinforced Concrete Structures, University of Patrass, Greece, July
- 162.Wiebe, L., Christopoulos, C. and Pampanin, S., 2007, "Seismic Response Of Self-Centering Base-Rocking Steel Structures" *Proceedings Ninth Canadian Conference on Earthquake Engineering Ottawa*, Ontario, Canada 26-29 June
- 163.Jensen, J., Bull, D.K., Pampanin, S., 2007 "Experimental Investigation of Existing Hollowcore Seating Connection Seismic Behaviour Pre and Post Retrofit Intervention, Proceedings Proceedings NZSEE Conference, Palmerston North, paper 12
- 164.Amaris, A., Pampanin, S., Bull, D.K., Carr, A., 2007 "Development of a Non-Tearing Floor Solution for Jointed Precast Frame Systems, *Proceedings NZSEE Conference, Palmerston North, paper 14*
- 165.Akguzel, U. and Pampanin, S., 2007 "Experimental Behaviour of Exterior Beam-Column Joint Subassemblies Retrofitted using GFRP Composites", *Proceedings NZSEE Conference, Palmerston North, paper 15*
- 166.Marriott, D., Pampanin, S., Bull, D.K., Palermo, A., 2007 "Improving the Seismic Performance of Existing Reinforced Concrete Buildings using Advanced Rocking Wall Solutions", *Proceedings NZSEE Conference, Palmerston North, paper 17*
- 167.Clifton, C., MacRae, G., Mackinven, H., Pampanin, S., Butterworth, J., 2007 "Sliding Hinge Joints and Subassemblies for Steel Moment Frames", *Proceedings NZSEE* Conference, Palmerston North, paper 19
- 168.Weng., K. Pampanin, S., Carr, A., Palermo, A., 2007 "Advanced Flag-Shaped Systems for High Seismic Performance Including Near Fault Effects", *Proceedings NZSEE Conference, Palmerston North, paper 21*, NZSEE Best Research Paper Award 2007
- 169. Giovinazzi, S. and Pampanin, S., 2007, Mitigation Analyses for the Selection of Effective Seismic Retrofit Strategies at a Territorial Scale", *Proceedings NZSEE Conference, Palmerston North, paper 51*
- 170.Smith., T., Ludwig., F., Pampanin., S., Fragiacomo, M., Buchanan, A., Deam, B., Palermo, A. 2007 "Seismic Response of Hybrid-LVL Coupled Walls under Quasi-Static and Pseudo-dynamic Testing, *Proceedings NZSEE Conference, Palmerston North, paper 60*
- 171.Palermo, A., Pampanin, S., Buchanan, A., 2007 "Criteri di Progettazione e Indagini Sperimentali su Connessioni Antisimiche con Cavi di Post-tensione per Edifici Multipiano in Legno (LVL)", ANIDIS, Proceedings of the Italian National Conference on Earthquake Engineering, Pisa, June, paper n. 337 (In Italian)
- 172.Palermo, A., Pampanin, S., 2006 "Progettazione sismica di Edifici inPrefabbricato con post-tensione", CTE
- 173.Uma, S.R., Pampanin., S., Christopoulos, C., 2006, A Probabilistic Framework to Develop Performance Objectives Based on Maximum and Residual Deformations,

Proceedings of the 1st ECEES, Geneva, Switzerland, Sept

- 174.Giovinazzi S., Pampanin, S., Lagomarsino S. 2006, Vulnerability Models and Damage Scenarios for Pre-1970 R.C. Buildings Before and After Alternative Retrofit Strategies, *Proceedings of the 1st ECEES, Geneva,* Switzerland, Sept
- 175.Uma, S.R., Pampanin S., Carr, A. 2006 Formulation of Integrated Beam-Column-Joint Model for Seismically Non-Conforming R.C. Frame Systems, *Proceedings of the 1st ECEES, Geneva,* Switzerland, Sept
- 176.Palermo, A., Pampanin, S., Buchanan A., 2006 Experimental Investigations on LVL Seismic Resistant Wall and Frame Subassemblies, *Proceedings of the 1st ECEES, Geneva,* Switzerland, Sept, paper n. 983
- 177.Marriott, D., Palermo, A. Pampanin, S., 2006, Bi-Directional Quasi-Static and Pseudo-Dynamic Tests of Damage-Resistant Bridge Piers with Hybrid Connections, *Proceedings* of the 1st ECEES, Geneva, Switzerland, Sept, paper 794
- 178.Pampanin, S., Palermo, A., Amaris, A., Akguzel, U., 2006 Experimental Investigations On Alternative High-Performance Jointed Ductile Connections For Precast Frame Systems, *Proceedings of the 1st ECEES, Geneva,* Switzerland, Sept, paper 804
- 179.Kam, W., Pampanin, S., Palermo, A., Carr, A., 2006, Advanced Flag-Shape Systems For High-Seismic Performance, Proceedings of the 1st ECEES, Geneva, Switzerland, Sept
- 180.Pampanin,S., Palermo, A., Buchanan, A., Fragiacomo, M., Deam, B. 2006 "Code Provisions for Seismic Design of Multi-Storey Post-tensioned Timber Buildings, CIB Workshop, Florence, August.
- 181.Pampanin, S., Amaris, A., Palermo, A., 2006 Implementation and Testing of Advanced Solutions for Jointed Ductile Seismic Resisting Frames Proceedings of the 2nd fib Congress, Naples, June, Paper n. 0852
- 182.Palermo, A., Pampanin, S., Marriott, D., 2006, Quasi-static Tests of Seismic Resistant Bridge Piers with Hybrid Connections: Comparison with Monolithic Solutions, *Proceedings of the 2nd fib Congress*, Naples, June, Paper n. 0851
- 183.Uma, S.R., Pampanin, S., Christopoulos, C., 2006, Probabilistic formulation of a performance-based matrix combining maximum and residual deformations, *Proceedings* of the Annual NZSEE Conference, Napier, March
- 184.Giovinazzi, S., Lagomarsino S., Pampanin, S., 2006, Vulnerability Methods and Damage Scenario for Seismic Risk Analysis as Support to Retrofit Strategies: an European Perspective, *Proceedings of the Annual NZSEE Conference*, Napier, March
- 185.Ireland, M., Pampanin, S., Bull, D.K., Concept and Implementation of a Selective Weakening Approach for the Seismic Retrofit of R.C. Buildings 2006, *Proceedings of the Annual NZSEE Conference*, Napier, March
- 186.Jensen, J., Bull, D.K., Pampanin, S. Conceptual Retrofit Strategy for Existing Hollowcore Seating Connections 2006, *Proceedings of the Annual NZSEE Conference*, Napier, March
- 187.Eligehausen, R., Ožbolt, J., Genesio, G., Hoehler M. S Pampanin, S. 2006 Three-Dimensional Modelling of Poorly Detailed Rc Frame Joints, *Proceedings of the Annual*

NZSEE Conference, Napier, March

- 188.Pettinga, J.D., Priestley, M.J.N., Pampanin, S., Christopoulos, C., 2006 Accounting for the Effects on Residual Deformations due to Torsional Response, *Proceedings of the Annual NZSEE Conference*, Napier, March
- 189.Marriott, D., Boys, A., Pampanin, S., Palermo, A., 2006 Experimental Validation of High-Performance Hybrid Bridge Piers, *Proceedings of the Annual NZSEE Conference*, Napier, March
- 190. Amaris, A. Pampanin, S., Palermo, A., 2006 Uni and Bi-directional Quasi Static Tests on Alternative Hybrid Precast Beam Column Joint Subassemblies, *Proceedings of the NZSEE Annual Conference*, Napier, March
- 191.Palermo, A., Pampanin, S., Marriott, D., 2006 Quasi-static Tests of Seismic Resistant Bridge Piers with Hybrid Connections: comparison with Monolithic Solutions, *Proceedings of the second fib Congress*, Naple, June
- 192.Pampanin, S., Amaris, A., Palermo, A., 2006 Implementation and Testing of Advanced Solutions for Jointed Ductile Seismic Resisting Frames, *Proceedings of the second fib Congress*, Naple, June
- 193.Pampanin, S., Bolognini, D., Pavese, A., Magenes, G., Calvi, 2005 "Experimental tests on frame subassemblies and systems designed for gravity loads and retrofitted with FRP", *Proceedings of the International Conference on Repairing, Retrofit and Rehabilitation* ICRRRR, Cape Town
- 194.Pampanin. S., 2005, "Controversial Aspects in Seismic Assessment and Retrofit of Structures in Modern Times: Understanding and Implementing Lessons from Ancient Heritage" *Proceedings NZ Concrete Society Conference*, Auckland
- 195.Pettinga, D., Pampanin, S., Christopoulos, C., Priestley, M.J.N. 2005, "Effects of Irregularities on the Residual Displacements of Structures Subjected to Inelastic Torsional Response", *Proceedings of 4th Workshop on Irregular Concrete Structures (4WICS)*, Thessaloniki
- 196.Palermo, A., Pampanin, S., Carr, A., 2005. "Efficiency of Simplified Alternative Modelling Approaches to Predict the Seismic Response of Precast Concrete Hybrid Systems", *fib Symposium Keep Concrete Attractive*, Budapest
- 197.Palermo, A., Pampanin, S., Buchanan, A., Newcombe, M., 2005 "Seismic Design of Multi-Storey Buildings using Laminated Veneer Lumber (LVL)", *Proceedings NZSEE National Conference*, Wairakei
- 198.Palermo, A., Pampanin, S., 2005 "Application of Hybrid Concept for an Improved Seismic Ductile Design of Bridges", *Proceedings NZSEE National Conference*, Wairakei
- 199.Pampanin, S., 2005 "Seismic Vulnerability Assessment and Retrofit Strategies for Under-designed Reinforced Concrete Buildings", *Proceedings NZSEE National Conference*, Wairakei, NZSEE Best Research Paper Award 2005
- 200.Pampanin, S., Christopoulos, C., 2005. "Low-invasive seismic retrofit solution for under-designed reinforced concrete frame system: *Proceedings JAEE Kobe 2005* Commemoration Symposium.
- 201.Pampanin, S., Pagani, C., Zambelli, S., 2004 "Cable-Stayed and Suspended Post-

Tensioned Solutions for Precast Concrete Frames: The Brooklyn System", Proceedings NZ Concrete Society Conference, Queenstown, NZ, September, NZCS Sandy Cormack Award 2004

- 202.Pampanin, S., Bolognini, D., Pavese, A., Magenes, G., Calvi G.M., 2004 "Multi-level Seismic Rehabilitation of Existing Frame Systems and Subassemblies using FRP composites", *Proceedings 2nd International Conference on FRP Composites in Civil Engineering* (CICE2004), Adelaide, Dec
- 203.Palermo, A., Pampanin, S., 2004 "Enhanced Seismic Performance of hybrid bridge systems", *Proceedings of fib Symposium on "Segmental Construction"*, New Delhi.
- 204. Christopoulos, C., Pampanin, S., Priestley, M.J.N, 2004 "Seismic Design and Response of Buildings Including Residual Deformations", *Proceeding 13th World Conference on Earthquake Engineering*, Vancouver, August, paper n. 2976
- 205.Palermo, A., Pampanin, S., Calvi, G.M. 2004 "Use of Controlled rocking in the Seismic Design of Bridges, *Proceeding 13th World Conference on Earthquake Engineering*, Vancouver, August, paper n. 4006
- 206.Magenes, G., Pampanin, S., 2004 "Seismic Response of Gravity-load Designed frame systems withj masonry infills" *Proceeding 13th World Conference on Earthquake Engineering*, Vancouver, August, paper n. 4004
- 207.Pampanin, S., 2004 "Seismic Assessment and Retrofit Strategies of not-seismically Designed R.C. Frame Systems" *Proceedings of New Zealand Conference in Earthquake Engineering*, Rotorua, March
- 208. Magenes, G., Pampanin, S., Galli, M. 2004 "Simulazione della risposta dinamica non.lineare dell'edificio Bob.Code di 4 piani mediante un modello tridimensionale a plasticità concentrata" *Proceeding 11th National Conference on Earthquake Engineering*, Genova, January (In Italian)
- 209. Magenes, G., Pampanin, S., Baletta, G., 2004 "Simulazione della risposta sismica di edifici in cemento armato pre-normativa con tamponature" *Proceeding 11th National Conference on Earthquake Engineering*, Genova, January (In Italian)
- 210.Palermo, A., Pampanin, S., Calvi, G.M. 2004 "L'uso del rocking controllato nella progettazione sismica di ponti a telaio: confronto con soluzioni tradizionali, *Proceeding* 11th National Conference on Earthquake Engineering, Genova, January (In Italian)
- 211.Pampanin, S. and Christopoulos, C., 2003 "Non-invasive Retrofit of Existing RC Frames Designed for Gravity Loads only", *Proceedings of the fib2003 Symposium - Concrete Structures in Seismic Regions,* Athens, May
- 212.Pampanin, S., Magenes, G. and Carr, A. 2003 "Modeling of Shear Hinge Mechanism in poorly detailed beam.-column joints", *Proceedings of the fib2003 Symposium Concrete Structures in Seismic Regions*, Athens; May
- 213.Mola, F., Knisel, S., Pagani, C., Pampanin, S., Zambelli, S., 2003 "Precast R.C. Frames Assembled by post-tensioned tendons", Proceedings of 2nd Specialty Conference on "Conceptual Approach to Structural Design", Milano Bicocca, Italy, July
- 214. Pampanin, S., Nishiyama, M., 2002, "Critical Aspects in Modeling the Seismic Behavior of Prcast/Prestressed Concrete Buildings Connections and Systems", 1st fib congress "Concrete Structures in the 21st Century", Osaka, paper E-367.
- 215. Pampanin, S., Christopoulos, C. and Priestley, M.J.N., 2002. "Framework for

Performance-Based Seismic Design and Assessment of Frames Considering Residual Deformations", *Proceedings*, 12th European Conference on Earthquake Engineering, London, September, paper n.100.

- 216.Pampanin, S., Calvi, G.M., Moratti, M., 2002, "Seismic Behaviour of R.C. Beam-Column Joints Designed for Gravity Only", *Proceedings of the 12th European Conference on Earthquake Engineering*, London, September, paper n.726.
- 217.Calvi, G.M., Magenes, G., Pampanin, S., 2002, "Experimental Test on a Three Storey Reinforced Concrete Frame Designed for Gravity Only", *Proceedings of the 12th European Conference on Earthquake Engineering*, London, September, paper n.727.
- 218.Calvi, G.M. Magenes, M., Pampanin, S., 2001, "Studio Sperimentale sulla Risposta Sismica di Edifici a Telaio in Cemento Armato Progettati per Soli Carichi da Gravità" (in Italian) Proceeding 10th National Conference on Earthquake Engineering, Potenza-Matera, September.
- 219.Calvi, G.M., Pampanin, S., Fajfar, P., Dolsek. M., 2000, "New Methods for Assessment and Design of Structures in Seismic Zones: Present State and Research Needs", *Proceedings of the International Workshop Mitigation of Seismic Risk* Support to Recently Affected European Countries, Belgirate (VB), Italy, 27-28 November.
- 220.Pampanin, S., Priestley, M.J.N, Sritharan, S., Calvi, G.M., 2000, "Alternative Seismic Design Philosophies for Precast Concrete Buildings: Prospectives for the Italian Reality" (In Italian) *Proceedings of the 13th CTE Convention*, Pisa, November.
- 221.Pampanin, S., Priestley, M.J.N, Sritharan, S., 2000, "Passive Energy Dissipation and Self-Centering Capabilities in Precast Ductile Connections", *Proceedings Second European Conference on Structural Control (2ECSC)*, ENPC, Champse-sur-Marne, France, July 3-6.
- 222.Pampanin, S., Sritharan, S., Priestley, M.J.N., Calvi, G.M., 1999, "Large Scale Test of a Five- Story Precast Concrete Building with Ductile Connections", (In Italian) *Proceedings (CD-ROM) 9th National Conference on Earthquake Engineering (ANIDIS)*, Torino, September

Technical Reports

- 223.Pettinga, D., Pampanin, S., Christopoulos, C. and Priestley M.J.N., 2007. "Development in the prediction and mitigation of Residual Deformations due to Seismic Demand, including Asymmetric Structural Response", Research Report, European School on Advanced Studies on Reduction of Seismic Risk (ROSE), Pavia, ISBN: 978-88-6198-001-3
- 224.Pampanin, S., Christopoulos, C. and Priestley M.J.N., 2002. "Residual Deformations in the Performance-Based Seismic Assessment of Frame Systems", Research Report *ROSE* (European School on Advanced Studies on Reduction of Seismic Risk) 2002/2, Pavia, pp. 226
- 225.Pampanin, S., Priestley, M.J.N, Sritharan, S., 2000, "Precast Seismic Structural Systems: PRESSS Phase 3. The Five Story Precast Test Building. Vol 3-4. Frame Direction Response", SSRP Report 2000/08, University of California, San Diego
- 226.Sritharan, S., Pampanin, S., Conley, J., 2002 "Precast Seismic Structural Systems: PRESSS Phase 3. The Five Story Precast Test Building. Vol 3-3.- Design Verification,

Instrumentation and Test Procedures", ISU-ERI-Ames Rep. No. ERI-03325, Iowa State Univ. Ames, Iowa, 14-68

Theses and Dissertations

- 227.Pampanin, S., 2000 "Alternative design philosophies and seismic response of precast concrete buildings", [Ph.D. Dissertation], Department of Structural Engineering, Technical University of Milan
- 228.Pampanin, S., 2000 "Analytical Modeling of the Seismic Behavior of frame systems ductile connections", [Masters Dissertation] Department of Structural Engineering, University of California at San Diego, U.S.A.
- 229.Pampanin, S. 1997 "Study on the boundary conditions of the Leaning Tower of Pisa colonnade by finite element dynamic analysis with contact surfaces" (in Italian)". [Laurea Thesis], Department of University of Pavia, Italy

Other work

a) Non-refereed Journal Publications

- 230.Pampanin, S., 2011 "Alternative Seismic Design Philosophies and Solutions for Precast Concrete Buildings - Emerging Solutions for Damage-Resisting Structures: Part 2/3", CPI Journal, Concrete Plants International, Volume X (translated in English, German, Spanish, French, Italian)
- 231.Pampanin, S., 2010 "Alternative Seismic Design Philosophies and Solutions for Precast Concrete Buildings - Emerging Solutions for Damage-Resisting Structures: Part 1/3", CPI Journal, Concrete Plants International, Volume 6 (translated in English, German, Spanish, French, Italian)
- 232.Pampanin, S., 2010 "Filosofie di progettazione sismica e soluzioni di rinforzo di edifici esistenti: puntando a soddisfare aspettative e esigenze di una società moderna" Special Issue n. 25 on "Emergenza in Abruzzo, Progettazione Sismica in Giappone, Turchia, Nuova Zealanda" Trasporti & Cultura, Campanotto Editore
- 233.Pampanin, S., Buchanan, A., Palermo, A., 2010 "Legno lamellare e precompressione: il Sistema Pres-Lam - nuove opportunità per il legno" (In Italian) Special Issue n. 25 on "Emergenza in Abruzzo, Progettazione Sismica in Giappone, Turchia, Nuova Zealanda" Trasporti & Cultura, Campanotto Editore
- 234.Pampanin, S. 2005, "Seismic-Resistant Solutions for Precast Concrete Buildings" ELITE- The International Journal of Precast Art, Issue n. 12
- 235.Pampanin, S, 2002. "Forces or Displacements?: Alternative Seismic Design Philosophies" *ELITE- The International Journal of Precast Art*, Issue n.5, pp. 68-75.
- 236.Pampanin, S., 2002. "Innovative Seismic Connections for Precast Concrete buildings", ELITE- The International Journal of Precast Art, Issue n.4, pp. 53-60.
- 237.Pampanin, S. 2001. "Seismic Design of Precast Concrete Buldings", ELITE- The International Journal of Precast Art, Issue n.3, pp.50-57.

b) Conference Oral Presentation (without paper in the proceedings)

- 238.Pampanin, S., Kam, W.Y., Akguzel, U., 2011 "Performance-Based Retrofit Strategies and Solution for pre-1970s Reinforced Concrete Buildings: an Overview of Latest Developments", *Proceedings of Proceedings of the Ninth Pacific Conference on Earthquake Engineering*, "Building an Earthquake-Resilient Society", Special Session on Seismic Retrofit of RC Structures, 14-16 April, Auckland, New Zealand, paper 90
- 239.Pampanin, S., 2008 'Emerging Damage-Resistant Connections for the Performance-Based Design and Retrofit of Structures'', SILE08, International Seminar on Precast Concrete Connection, Invited Keynote address, Lisbon 21 Nov
- 240.Pampanin, S., Pagani, C., Zambelli, S., 2004 "Concept, Design and Application of a Newly Developed Post-Tensioned Precast Frame System" *PCI Convention, Atlanta*, October
- 241.Pampanin, S., 2004 "Seismic Assessment and Retrofit Strategies of not-seismically Designed R.C. Frame Systems" *New Zealand Conference in Earthquake Engineering*, Poster Presentation, Rotorua, March

Stefano Pampanin

TEACHING and DISSEMINATION of KNOWLEDGE

Period 2002-2011

University of Canterbury, Christchurch, New Zealand

Note that the Academic Year (A.Y) in New Zealand goes from February to November

Postgraduate Level

2003-2004-2005-2006-2007-2008-2011 (Seven Academic Years)

Special Topic: Advanced Concrete Design

Postgraduate course (40 hours): -Displacement-based and Performance-Based design -Seismic Design of low-damage precast/prestressed structures -Seismic Assessment and Retrofit of existing buildings. Number of students:**10-15**.

Undergraduate Level

2005-2006-2007-2008-2009-2011 (Six Academic years)

	 "Structural Concrete" (ENCI332) for civil engineering students (3rd BE degree year out of four), merging two courses on Structural Mechanics 2 and Design 2 (ENCI311 e ENCI331, see below): Concrete Technology Behaviour and Design of reinforced concrete and prestressed concrete members (statically determined structures) Experimental <u>laboratory</u> with tests on several beams, columns and/or beam-column joints Flexural Failure, Shear Failure, Prestressed Concrete, Post-tensioned concrete, Fiber Reinforced Concrete (Group work with oral presentation in front of industry representative as part of an annual Workshop) Number of students: 130-150.
2011-	
	"Engineering Mechanics" for engineering students (100 level, intermediate, 1 st year out of four of BE degree). Responsible of one of the two Streams. Number of Students in the stream: 250+
2003-2004 (Two Academic Years)	
	"Structural Mechanics 2" (ENCI331)
	for civil engineering students (3rd year out of four).
	-Basic Theory for the analysis of reinforced concrete sections and members
	First Semester. Number of students: 90-100 .

"Design 2" (ENCI311) for civil engineering students (3rd year out of four). Design of reinforced concrete sections and members, theory and laboratory with experimental tests on r.c. beams. Second Semester. Number of students: **90-100**.

2003-2004-2005-2006-2007-2008-2009-2011

(Eight Academic Years)

"Reinforced Concrete" (ENCI 426) for 4th year (final year for civil engineering BE students).

- Introduction to frame and wall systems using prestressing and (unbonded) post-tensioning.
- Prestressed concrete for statically undetermined structures.

Number of students: 80-90.

European School for Advanced Studies in Seismic Reduction of E

<u>ROSE School Pavia</u> (Invited member of the International Faculty)

Feb/Mar 2007
"Seismic Design of Precast/Prestressed Concrete Structures".
Four weeks intense block-course (40 hours of theory plus 40 hours of design classes)
Number of students: 30.

Feb/Mar 2010

"Seismic Design of Prefabricated Concrete and Timber Structures". Four weeks intense block-course (40 hours of theory plus 40 hours of design classes) Number of students: **40**.

University of Santa Maria, Valparaiso, Chile (visiting Professor 2007)

April 2007

"Seismic Design of Precast/Prestressed Concrete Structures", two weeks block course as part of the semester course on seismic design of reinforced concrete structures. Number of students: **35-40**.

University of Naples,. Federico II (visiting Professor 2010)

May 2010

"Fundamental of Displacement Based Design", one week block course to doctoral students of 3 different Universities and 4 different Doctoral Program Number of students: **16**.

Number of students: 35-40.

Period 1996-2002

University of Pavia; ROSE School; University of California, San Diego

A.Y. 1999-2000, 2000-2001 & 2001-2002 (Three academic years)

> **Senior Tutor** (Cultore della materia) for **Structural Design** courses University of Pavia, Faculty of Engineering(Civil Engineering and Building Engineering Degree).

> Member of **examiner committees** of Structural Design (Tecnica delle Costruzioni I) for Building Engineering students (Ingegneria Edile/Architettura)

> **Design Classes** (50 hours) within the course Structural Design (Tecnica delle Costruzioni I) – Laurea Degree in Building Engineering (Ingegneria Edile/Architettura). University of Pavia

Thesis Laboratory (50 hours) within the course Structural Design -Laurea Degree in Building Engineering (Ingegneria Edile/Architettura). University of Pavia

- November 2001 **Teaching Assistant** for the post-graduate course (approx. 60 hours) "Seismic Design and Retrofit and Bridges" by Prof. Gian Michele Calvi, European School in Earthquake Engineering, **(ROSE School), IUSS, Pavia**
- May 2001 **Teaching Assistant** for the post-graduate course (approx. 60 hours) "Basics of Seismic Design" by Prof. M.J.Nigel Priestley, European School in Earthquake Engineering, **(ROSE School), IUSS, Pavia**
- June 2000 Lecturer of the block "Basics of Signal Analysis", as part of the Laboratory on Towers, during the international seminar/course "Evaluation of seismic risk and reduction of vulnerability of historical structures" Pavia, Italy, 18-30 Giugno 2000
- 1999 Collaborator within the **Outreach Program** to Secondary School Students (7th-8th grade) organized by the EERI (Earthquake Engineering Research Institute) Student Chapter at the University of California, San Diego

Tutor, Faculty of Engineering, University of Pavia,
Courses of"
Physics I for Laurea degree (5 years) students (50 hours)
Physic (Module A) for diploma (3 years degree) students (50 hours)

Note: He has been receiving very high **Teaching Surveys** at the University of Canterbury, as well as at the ROSE School in Pavia and in the occasion of courses to practitioners.

In the past years, the teaching survey results at the University of Canterbury, have been consistently amongst the highest of the whole Department and Faculty of Engineering (range of 4.2-4.5 out of 5.0) well above the average of the Faculty of Engineering.

Miscellaneous Invited Lectures/Seminars/Courses and Journal Review

He has delivered **Invited lectures/seminars** at more than **40** <u>Universities, Research Institution or</u> <u>Groups of Structural Engineers</u> overseas *since 2000* including **Europe** (Italy, Germany, Greece, Turkey, Portugal, Switzerland), **U.S.** (UC San Diego, UC Berkeley, Stanford, Rurtherford and Checkene, Degenkolb, SUNY at Buffalo), **Mexico** (Veracruz), **Chile** (Santiago, Valparaiso), **Argentina** (Mendoza), **Canada** (Toronto), **Japan** (Kyoto, Tokyo University, Tokyo Institute of Technology, Tsukuba), **India** (BARC Research Centre Mumbai) **Singapore** (Nanyang Technological University), **Australia** (Adelaide, Melbourne), **New Zealand** (Auckland, Wellington, Christchurch, Nelson, Dunedin, Hamilton, Taupo, Rotorua)

Series of **Seminars/Courses in New Zealand** to **practitioner engineers** via NZ Concrete Society, NZSEE, SESOC, etc (e.g. Introduction to PRESSS-technology, 2005; Anchorage to Concrete and Fasterning Techniques, 2005-2006-2007 etc, PRESSS Design Handbook, 2010; Seismic Peformance of Reinforced Concrete Buildings following the Feb 22 Earthquake, 2011)

He has been acting as a **Reviewer** for **13 major international journals** on Structural and/or Earthquake Engineering from **U.S.** (ASCE J. of Structural Division; ASCE J. of Composites in Construction; EESD J. of Earthquake Engineering and Structural Dynamics; Engineering Structures; PCI J. of the Precast/Prestressed Concrete Institute; Earthquake Spectra, EERI), **Europe** (JEE, Journal of Earthquake Engineering; BEE, Bulletin of Earthquake Engineering); **Asia** (ACT, Journal of Advanced Concrete Technology, Japan; ISET Journal of Earthquake Technology, India; Advances in Structural Engineering; SESOC Journal of Structural Engineering Society of NZ)

RESEARCH GROUP

Since joining the University of Canterbury in 2002, Dr. Pampanin has been successfully dedicating a significant effort to create and lead a sound, dynamic and internationally-oriented research group comprising of approximately 15-20 young researchers (including Masters and Ph.D. Students, International Exchange students, Visiting researchers, Post-doctoral fellow)

In addition to the direct applications to major research grants, he has been very proactive in searching, suggesting and providing letters of support for his students in order to obtain additional scholarships, travel and conference funds, awards and prizes.

The success of the research group and value of such mentoring effort to younger engineers and researchers has been somehow confirmed by the several **scientific recognitions** obtained by the same **students** in the form of prizes/awards/travel funds etc (again on the top of the aforementioned externally funded scholarships and grants).

Few examples:

NZSociety of Earthquake Engineering Scholarships (Jensen, 2006; Masoud Moghaddasi 2010),

NZConcrete Society Scholarship (Marriott, 2005),

NZSEE Best Student Papers (Pettinga, 2006, Newcombe, 2009, Leslie 2010),

NZSEE Best Conference Paper (Kam, 2007, Smith, 2008, Newcombe 2010)

NZSEE Best Poster Paper (Leslie, 2009, Euving Au 2010)

Chch Heritage Trust Fellowship (Marriott, 2006, Kam, 2007);

Bright Future Scholarship (Michael Newcombe, 2008)

UoCanterbury targeted Doctoral Scholarship (Akguzel, 2005)

UoC Doctoral Scholarship (Masoud Moghaddasi, 2008; Java Arefi 2009; Wouter 2010)

Travel Funds for Study Abroad from the Royal Society of NZ (Amaris, Akguzel, Marriott, Weng, Masoud Moghaddasi).

Stefano Pampanin

Mentoring and educating younger engineers: student supervision

As Primary Supervisor or Co-supervisor he has supervised until completion approximately:

9 Ph.D. Students24 Laurea or Masters Students9 Final year Projects

Legenda for the table below: P= Principal Supervisor; C= Co-supervisor

Stefano Pampanin

Status	Ph.D. Thesis	Laurea or Masters	Final year Project
		Thesis	, ,
Completed (Dec 2011)	Technical University of Milan Alessandro Palermo, C, 2000- 2004 ROSE School Didier Pettinga C, 2003-2006 (Rose school, Pavia) University of Genova Anna Brignola, C, 2006-2009 University of Canterbury Yati C, 2002-2005 (UoC) Dion Marriott, P., 2004-2009 (University of Canterbury) Alejandro Amaris, P., 2004-2010 Kam Weng, P, 2006-2011 Asif Iqbal, P, 2007-2011 Umut Akguzel, P, 2005-2011	Università di Pavia Matteo Moratti, C, 1999-2000 Fabio Cattaneo, C, 2001-2002 Andrea Vecchietti, C, 2001-2002 Daniele Casarini, C, 2001-2002 Giordano Baletta, C, 2001-2002 Roberto Nassi, C, 2002-2003 Antonio Gnocchi, C, 2003-2004 Francesco Del Prete, C, 2003- 2004 Mario Galli, C, 2002-2003 ROSE School, Pavia Mario Galli, C, 2002-2003 ROSE School, Pavia Mario Galli, C, 2003-2004 Michael Newcombe, P, 2006- 2007 Javad Arefi, C, 2008 Michele Palmieri, P., 2009-2010 University of Canterbury Eric Hertanto, P, 2003-2006 Tsiu Te-Chen, P, 2003-2006 James Jensen, C, 2005-2007 Lisa Woods, C, 2006-2008 Alistair Boys, C, 2006-2008 Alistair Boys, C, 2006-2008 Ben Leslie, C, 2007-2010 Eu Ving Au, C, 2008-2010 University of Brescia Michele Palmieri, C, 2007-2008 Ben Leslie, C, 2007-2008 Ben Leslie, C , 2007-2008 Technical University of Milan Francesco Sarti, C, 2010-2011	University of Canterbury J McGirr, P, 2003 L Taylor, P, 2004 J Jensen, C, 2004 R Mckenzie, P, 2004 W Juno, C, 2004 Norwegian Student C, 2004 M Trowland, P, 2004 MI Newcombe, C, 2005 A Boys, C, 2005 P Lock, P, 2005 SWeselman, P, 2005 R Laffont, S 2005 (Ecole S. Etienne, France) A Williams, 2006 T Smith, C, 2006 M LeHeux, 2008 A Bruce, C 2009 M Cusiel, P, 2009
In Progress	University of Canterbury Michael Newcombe, P, 2008- (submitted, under review)	University of Canterbury Denis Pino Merino, P, 2009- 2011 (submitted, under review)	
	Masoud Moghadassi, P, 2007- (due mid-2012)	ROSE School, Pavia Ricardo Roldan, P., 2010-(due mid- 2012) Jaspreet Singh C. 2010-(due	
	Patricio quintana Gallo, P, 2009- (due end 2012)	mid-2012 Andres Ayes Bonilla, P., 2010-	
	Ali Sahin Tasligedik, P, 2009-	(due mid- 2012)	
	Rose School Pavia		
	Michele Palmieri, P., 2010-		
	Stuttgart University, Germany		
	Giovacchino Genesio, C, 2005- (defence Feb 2012)		

Note that the Internal regulation of the Department of Civil Engineering at University of Canterbury requires the minimum of two supervisors/co-supervisors

UNIVERSITY Services and Administrative Roles

Chair of the Structures & Geotechnical Cluster (2011-): coordinator of activities (teaching, research, university and professional services, communication, liaison with industry, external funding agencies and stakeholders/end-users) and strategic plan of the structural/geotechnical Cluster within the Department of Civil and Natural Resources Engineering.

The Cluster comprises of 14 academic staff members (approximately one third of the department), is responsible for a consistent part of the overall Department activities and is recognized as an important asset of the College of Engineering and University of Canterbury.

Director of 2nd Professional Year Studies (2007-2009): Responsible /Coordinator of the third year courses. Revision and approval of student curricula, enrolments, managements of electronic database, administrative/executive role on behalf the Head of Department (HOD).

Active developer of the **Structural Laboratory:** development, strengthening and implementation of several quasi-permanent and dismountable testing set-up for quasi-static monotonic or cyclic and/or pseudo-dynamics in one or two directions on members, subassemblies and structural systems (beams, columns, floors, beam-column connections, wall system, 2D and 3D frames)

Responsible for **Laboratory Trips** to external special guests: given the intense experimentallybased R&D activities we have been promoting, we tend to receive several visits (official or informal) during the years from: Ministers and Politicians (Education, Agriculture and Forestry, Research Science and Technology) NZ ambassadors overseas, foreign delegation of scientists or educators, participants to national and international workshops and conferences, groups of local engineers/architects/contractors/developers as well as students of all level from Intermediate to High school to University as part of the promotion of Science and Technology

Member of the **Research Committee of the Department (2004-2009)**; representing the Structural Group (Cluster). Selection and internal allocation of Research Funds from the Faculty/College of Engineering

Member of the **Postgraduate Studies Committee (2005-2009)**: representing the Structural Group (Cluster), responsible of the international relationships, student exchange, crediting, scholarships, travel and conferences.

Member of the **Public Relations Committee (2004-2009)**: preparation of official events, web-site, marketing, Outreach programs (dissemination to the wider scientific and non-scientific community), newsletter etc.

See for example **Science Learn Hub** for high-school students (www.sciencelearn.co.nz); interview/news at TV One news (http://tvnz.co.nz/view/page/411415/1257614); or interview at Radio Channels (Cultural Society Dante Alighieri)