DINCEL
STRUCTURAL WALLING

DINCEL STRUCTURAL WALLING

EARTHQUAKE HAZARD RISK PREVENTION

University of Technology, Sydney

FOREWORD

08th December 2008

To all Engineers, Researchers and Scientists

Recently, I came across the very promising product, the Dincel-Wall, developed by Dincel Construction System with superior and obvious advantages over traditional walls. To date, Dincel Construction System has already been used in excess of 150 Australian buildings since its availability in August 2006. The new product is easier to design and construct with superior structural properties. Due to its speed of installation and elimination of critical paths in between the building trades, the load bearing Dincel-Walls can achieve significant cost and time savings. The structural design principles of Dincel Construction System have been previously certified by Professor Mark Bradford of the University of New South Wales **(Download – Structural Engineering Design Certification)** which clearly defines the Dincel Construction System Design principles. In 2009, the researchers at the University of Technology Sydney and the engineers from Dincel Construction System will undertake a major Research and Development project consisting of a series of large-sized specimens using Dincel-Walls on the UTS shake table state-of-the-art facility. These tests promise to revolutionise the future of load bearing walls in earthquake resistant construction with obvious social and economical benefits.

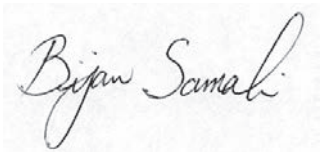
I have reviewed the entirety of the following articles titled:

☐ **(Download – Earthquake Design and Brick Walls)**

☐ **(Download – The Roles of Masonry Infill Walls In An Earthquake)**

and I agree with the contents of the above articles.

Regards



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PREFACE

The earth's crust is made of several tectonic plates. The crust are on the constant move and in the process store significant amount of strain energy at the plate boundaries. The sudden rupture of fault lines at plate boundaries and the subsequent release of this energy constitutes "Inter plate" earthquakes. Earthquakes are not limited to fault ruptures at the tectonic plate boundaries. Rupture of secondary faults within tectonic plates can also cause earthquakes with potential for damage (Intra plate earthquakes). As a result earthquakes can occur at irregular intervals sometimes with very long time gaps and in places not necessarily near major plate boundaries. Although Australia is not on the edge of a tectonic plate, the continent experiences earthquakes because the Indo-Australian plate is pushed north and is colliding with the Eurasian, Philippine, and Pacific plates. This causes stresses to build up in the interior of the plate which is released during earthquakes.

The falling of masonry brick walls are recognised as the most important reason for the loss of lives during earthquakes. As a result, Australian building authorities have introduced new earthquake requirements (Australia – May 2008) restricting the use of brick walls in buildings.

Future earthquakes could be more damaging because the world's population is increasing, with larger risk of affecting larger population centres in the future.

If there is no known history it does not mean that an earthquake will not occur. Earthquakes can occur at any place and at any time. The most efficient way to avoid a disaster caused by earthquakes is by employing earthquake resisting structures built by using materials to suit.

Human life is the first priority to protect. The property damage to businesses, living quarters and public facilities can be disruptive or even devastating. **The insurance companies may have every right to refuse building and professional's insurance policies if the building structures are not designed and detailed for the appropriate building authority regulations.**

For example AS1170.4-2007 Earthquake Code for Australia states:

- The top and bottom of all walls must be tied to floor slabs. This may not be practically possible in the case of unreinforced masonry; and
- Load bearing un-reinforced masonry structures not allowed more than 12m to 15m high depending on the soil type. (Refer AS3700 – 2001 Amdt-3, Appendix A-A Table AA3); and
- Non-load bearing un-reinforced masonry is allowed for buildings over 12m provided the supporting structure is designed to resist additional earthquake actions caused due to the presence of masonry walls and their likely collapse like a pack of cards is prevented; and
- The top of all footings (including piled foundation) must be tied to each other if allowable earth bearing pressure is less than 250kpa.

The following documents have been prepared to alert professionals what to consider in earthquake resisting structures.

(Download – EARTHQUAKE DESIGN AND BRICK WALLS)

(Download – THE ROLES OF MASONRY INFILL WALLS IN AN EARTHQUAKE)

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