

Student project


- Key Topics:
- earthquake [1]
 - engineering [2]

Seismic assessment of reinforced concrete walls in Australia [3]
This project assessed the performance of reinforced concrete walls in response to rare and very rare earthquakes. This research firstly reassessed the seismic activities for 500 year and 2500 return period earthquakes in Australia. Using the results of earthquake hazard demand, the performance of existing reinforced concrete walls was assessed in response to these events. Cost effective changes or detailing provisions were recommended from the results.


Research team

Student researcher

[4]



Dr Ryan Hoults
[4]
RESEARCH LEADER



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Full description

This PhD assessed the performance of reinforced concrete walls in response to rare and very rare earthquakes. This research analysed both rectangular and C-shaped concrete walls to develop a secondary cracking model to predict the potential of cracks forming in these types of walls. It was found that the direction of loading and the mode of bending were particularly important for the seismic performance of these sorts of walls.
This project was completed in September 2017.

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[7]



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[8]



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21 AUG 2018

[9]



New online - September 2017





13 SEP 2017

[10]

Publications

Year	Type	Citation
2019	Journal Article	Hoult, R. D. [4], Goldsworthy, H. M. [11] & Lumantarna, E. [12] Vulnerability Functions for RC Shear Wall Buildings in Australia [13]. <i>Earthquake Spectra</i> 35 , 27 (2019). DOI [14] Google Scholar [15]
2018	Journal Article	Hoult, R. D. [4], Goldsworthy, H. M. [11] & Lumantarna, E. [12] Plastic hinge analysis for lightly reinforced and unconfined concrete structural walls [18]. <i>Bulletin of Earthquake Engineering</i> 16 , 46 (2018). DOI [19] Google Scholar [20]
2018	Journal Article	Hoult, R. D. [4], Goldsworthy, H. M. [11] & Lumantarna, E. [12] Plastic hinge length for lightly reinforced C-shaped concrete walls [23]. <i>Journal of Earthquake Engineering</i> (2018). doi:https://doi.org/10.1080/13632465.2018.1511111
2017	Conference Paper	Hoult, R. D. [4], Goldsworthy, H. M. [11] & Lumantarna, E. [12] Seismic Assessment of the RC building stock of Melbourne from rare and very rare earthquake events [28]. <i>Australian Earthquake Engineering Society Conference 2016</i> (2017). Google Scholar [29]
2017	Journal Article	Hoult, R. D. [4], Lumantarna, E. [12] & Goldsworthy, H. M. [11] Soil amplification in low-to-moderate seismic regions [32]. <i>Bulletin of Earthquake Engineering</i> 15 , 1945-1963 (2017). DOI [33] Google Scholar [34]
2017	Journal Article	Hoult, R. D. [4], Goldsworthy, H. M. [11] & Lumantarna, E. [12] Plastic hinge length for lightly reinforced rectangular concrete walls [37]. <i>Journal of Earthquake Engineering</i> 1-32 (2017). doi:http://dx.doi.org/10.1080/13632465.2017.1351111
2017	Thesis	Hoult, R. D. [4] Seismic assessment of reinforced concrete walls in Australia [42]. (2017). at <http://hdl.handle.net/11343/192443 [43]> Google Scholar [44] BibTeX [45] EndNote XML [46]
2016	Conference Paper	Hoult, R. D. [4], Goldsworthy, H. M. [11] & Lumantarna, E. [12] Displacement Capacity of Lightly Reinforced Rectangular Concrete Walls [47]. <i>Australian Earthquake Engineering Society 2016 Conference</i> (2016). Google Scholar [48]
2016	Conference Paper	Hoult, R. D. [4], Goldsworthy, H. M. [11] & Lumantarna, E. [12] Non-ductile seismic performance of reinforced concrete walls in Australia [52]. <i>Australasian Structural Engineering Conference 2016</i> (2016). Google Scholar [53]
2015	Conference Paper	Rumsewicz, M. [57] Research proceedings from the 2015 Bushfire and Natural Hazards CRC & AFAC conference [58]. <i>Bushfire and Natural Hazards CRC & AFAC annual conference 2015</i> (Bushfire and Natural Hazards CRC & AFAC annual conference 2015) (2015). Google Scholar [59]
2014	Conference Paper	Leonard, M. [62] <i>et al.</i> Deaggregating the differences between seismic hazard assessments at a single site [63]. <i>Australian Earthquake Engineering Society Conference 2014</i> (2014). Google Scholar [64]
2014	Conference Paper	Hoult, R. D. [4] <i>et al.</i> The 2012 Moe Earthquake and Earthquake Attenuation in South Eastern Australia [67]. <i>Australian Earthquake Engineering Society Conference 2014</i> (2014). Google Scholar [68]
2014	Conference Paper	Hoult, R. D. [4], Goldsworthy, H. M. [11] & Lumantarna, E. [12] Seismic Performance of Typical C-Shaped Reinforced Concrete Shear Cores in Australia [71]. <i>Australian Earthquake Engineering Society Conference 2014</i> (2014). Google Scholar [72]
2013	Conference Paper	Hoult, R. D. [4], Lumantarna, E. [12] & Goldsworthy, H. M. [11] Ground Motion Modelling and Response Spectra for Australian Earthquakes [75]. <i>Australian Earthquake Engineering Society Conference 2013</i> (2013). Google Scholar [76]

Resources

DATE [79]	TITLE [80]	DOWNLOAD	KEY TOPICS
07 Jul 2015	Ryan Hoult PhD Progress Report 2015 [81]	 67.5 KB	[82] (67.5 KB)
11 Sep 2015	Improvements and difficulties associated with the seismic assessment of infrastructure in Australia [83]	 1.95 MB	[84] (1.95 MB) [1], infrastructure [85]
24 Oct 2016	Seismic assessment and design philosophy of reinforced concrete in Australia [86]	 221.44 KB	[87] (221.44 KB) [1], engineering [2], resilience [88]
23 Mar 2020	Dr Ryan Hoult - early career researcher entry 2020 [89]	 0 bytes	[90] (0 bytes) [1], engineering [2]

Posters

26 JUN 2015

Seismic Assessment and Design Philosophy of Reinforced Concrete Walls in Australia

[91]
EARTHQUAKE [1], ENGINEERING [2]

The aim of this research is assess the seismic performance of typical RC walls and cores in Australia to...

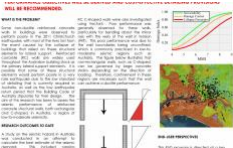


[92]

Seismic Assessment and Design Philosophy of Reinforced Concrete Walls in Australia

[92]
EARTHQUAKE [1], ENGINEERING [2]

The focus of this research is to assess the performance of existing reinforced concrete (RC) wall and core...



[93]

Seismic assessment and design philosophy of reinforced concrete walls in Australia


[93]
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The focus of this research is to assess the performance of existing reinforce concrete (RC) wall and core...

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Cost-effective mitigation strategy for building related earthquake risk [94]

BUILT ENVIRONMENT [95]

 Prof Michael Griffith
University of Adelaide [96]

[96]



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