

Presentation to Construction Client's Group

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25th Feb 2015

Christchurch Earthquakes 2010 - 2011

Building Damage
URM – Shaking damage
RC – Shaking damage

Ground Damage
Infrastructure Damage

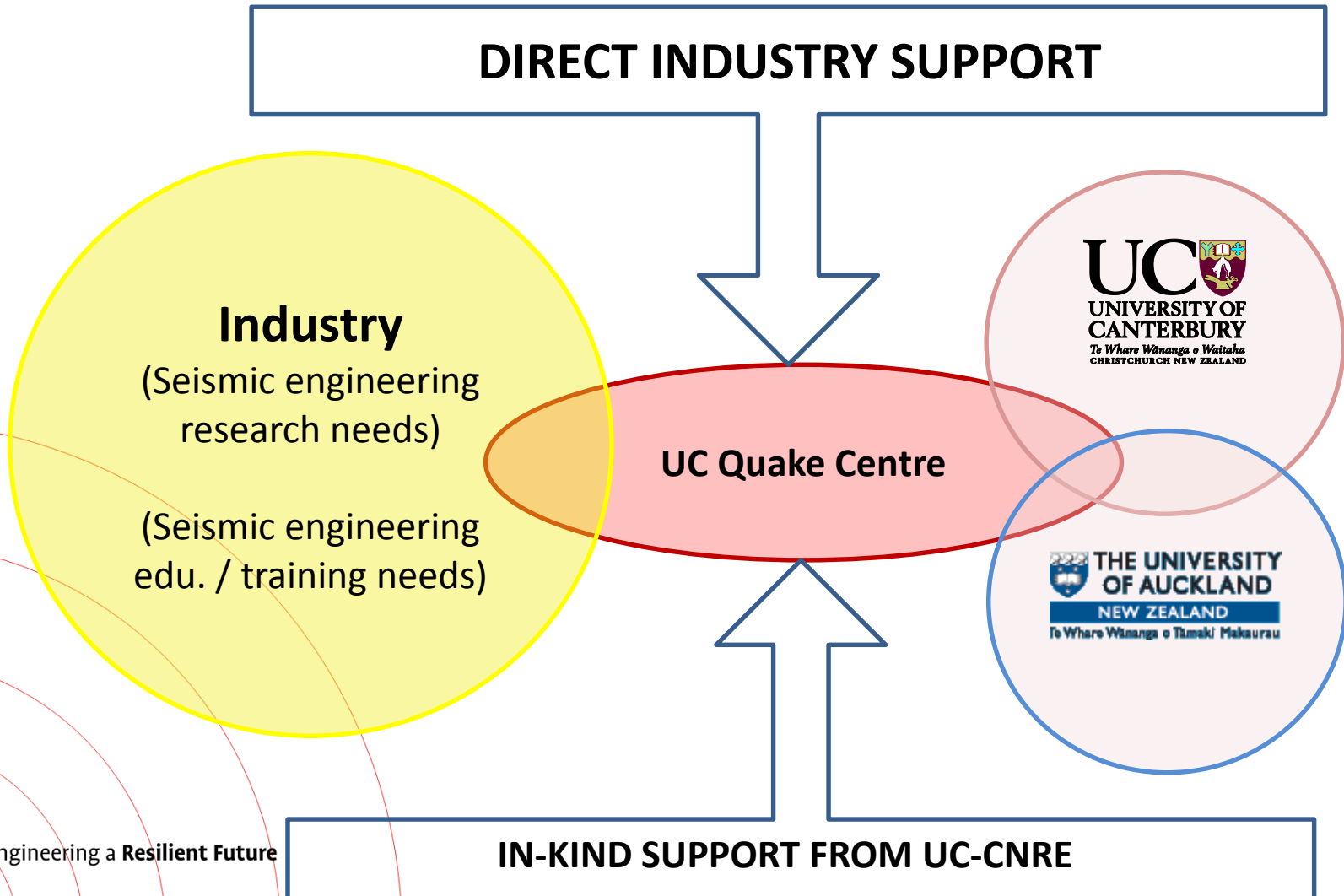
- Lateral spread
- Liquefaction

Ground Damage
Infrastructure Damage

- Liquefaction



UC Response and formation of the QC




UC **QUAKE CENTRE**

Support base for the Quake Centre



EQC
EARTHQUAKE COMMISSION
Kōmihana Rūwhenua



UC
UNIVERSITY OF
CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND



HAWKINS

genesis
ENERGY

Fulton Hogan

Absolutely Positively
Wellington City Council
Me Heke Ki Pōneke



OPUS

Christchurch City Council



Auckland Council
Te Kaunihera o Tāmaki Makaurau



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C. LUND & SON
MAIN CONTRACTORS & BUILDERS




Holcim



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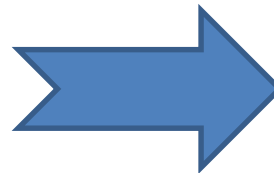
Engineering a **Resilient Future**

What is the purpose of the UC Quake Centre?

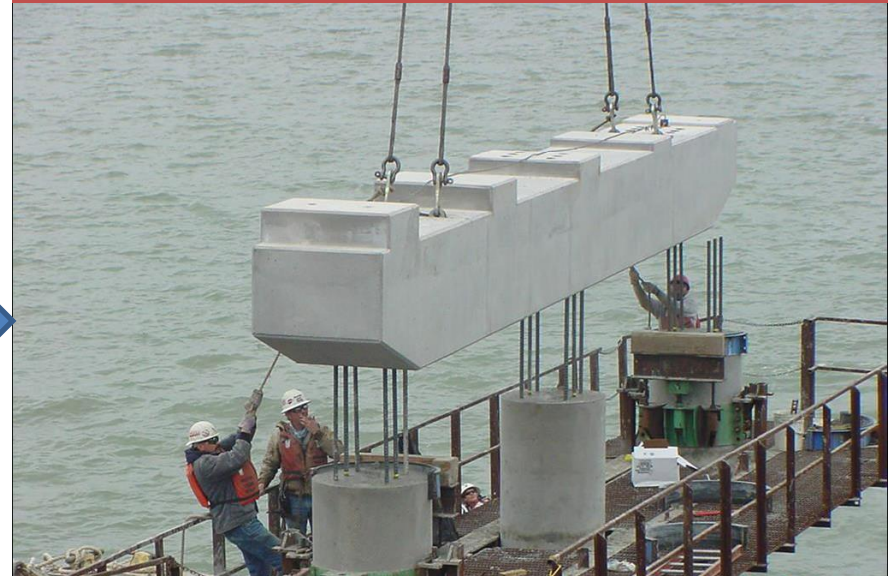
Partner with Industry to:

1. Create & promulgate seismic engineering solutions

Lab development & testing



Industry implementation



What is the purpose of the UC Quake Centre?

Partner with Industry to:

2. Up-skill professionals in earthquake engineering

- Collaborate with learned societies (NZSEE, NZGS, SESOC, NZSOLD)
- Workshops & seminars



- Online courses
- Available on-demand
- Early courses on introduction to seismic engineering
- Can be followed by higher degrees in earthquake engineering

What is the purpose of the UC Quake Centre?

Partner with Industry to:

3. Risk evaluation of structures and lifelines

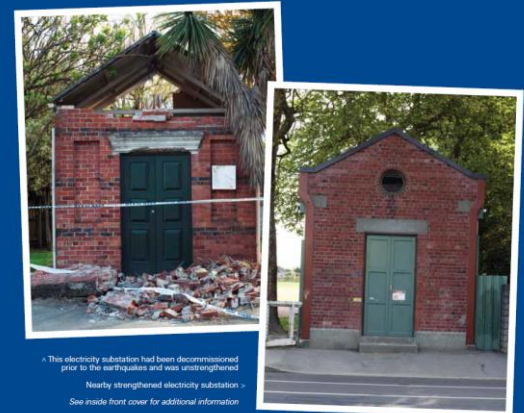


Engineering a **Resilient Future**

 New Zealand
Lifelines

The Value of Lifeline Seismic
Risk Mitigation in Christchurch

Summary Report – June 2012



^ This electricity substation had been decommissioned prior to the earthquake and was unseismically strengthened.
Nearby strengthened electricity substation.
See inside front cover for additional information.

What is the purpose of the UC Quake Centre?

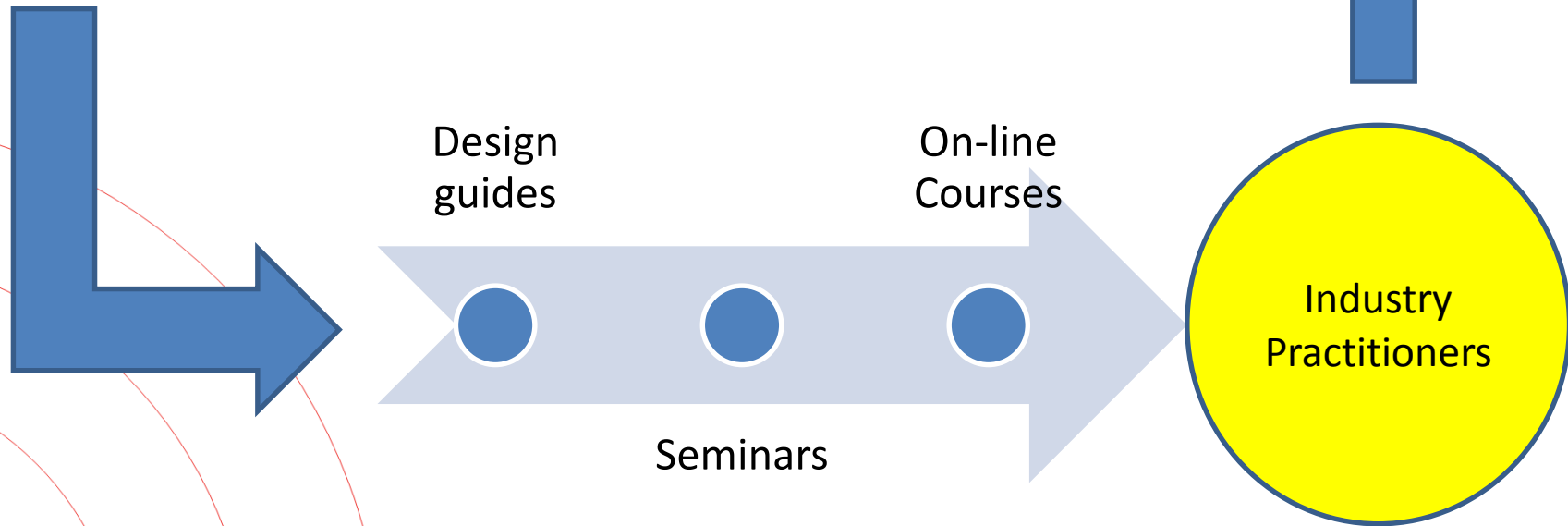
Partner with Industry to:

4. **Community awareness**



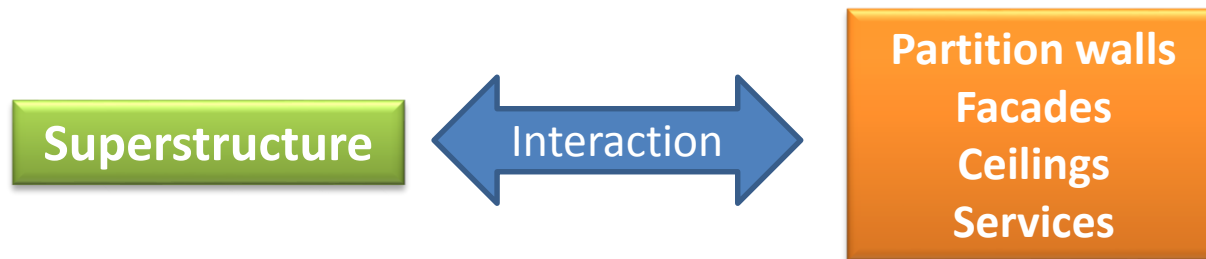
Our operational model

- Research Engineers
- Industry Secondments
- Visiting international experts
- University academics



Current Strategic Initiatives -1

- **Non-structural elements**
 - up to 80% of a building's value can tied-up in non-structural elements!



Current Strategic Initiatives -2

- **Retro-fit of RC buildings**
 - Seismic vulnerability & analysis
 - Possible retro-fit options
 - Collaboration with NZSEE



a)



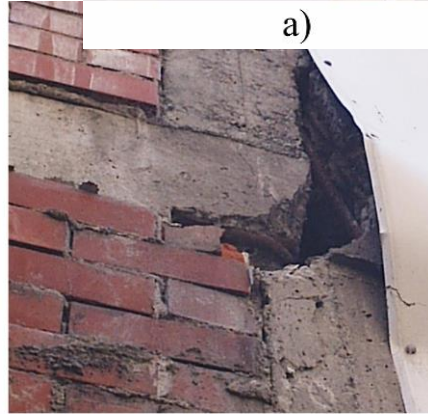
b)



c)



a)



b)

Current Strategic Initiatives -3

- **Seismic response of large earth structures**
 - Dams, levees, road and rail embankments
 - Long term asset management after small or large events
- **Resilient buried water networks**
 - Development of national levels of service performance measures.
 - Collaboration with Opus Research & Watercare NZ

Current Strategic Initiatives -4

- **RC research programme – Address the CERC recommendations**
 - New knowledge relating to the design & specification of:
 - RC shear walls
 - RC floor diaphragms
 - Funded by MBIE



Other Projects & Initiatives

1

On-line / on-demand
Courses



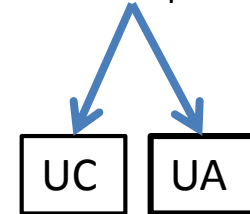
2

SCIRT LL Project



3

QC Post-grad.
Scholarships



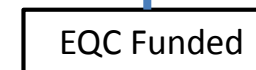
4

Learned Societies
Partnerships



5

Industry Fellowships



Simple View of the Technical Training Path to CPEng

CPEng

PG Degrees

Seminars
etc.

On-line
training

Conferences

Structured CPD
opportunities

Bachelor Degree

Non-seismic trained

Opportunities

- Set the research agenda
- Create applied research positions
- Make a fundamental difference to industry training and practice

Challenges

- Getting the correct short, medium and long term strategy to allow evolution of Centre
- Maintaining support as memory fades
- Volume of work that needs to be done

Thank you

Questions



Need more info – go to www.quakecentre.co.nz