structex

Assessing & incorporating seismic resilience in winery design

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WEA 2018, NAPIER

ACENZ

Agenda

WHAT TO DO ABOUT IT

- Assessment of existing infrastructure
- Options for improvements

HOW TO AVOID THE SAME MISTAKES

- System specification
- Compliance path

Assessing & improving the current stock

Assessing existing infrastructure

WHY

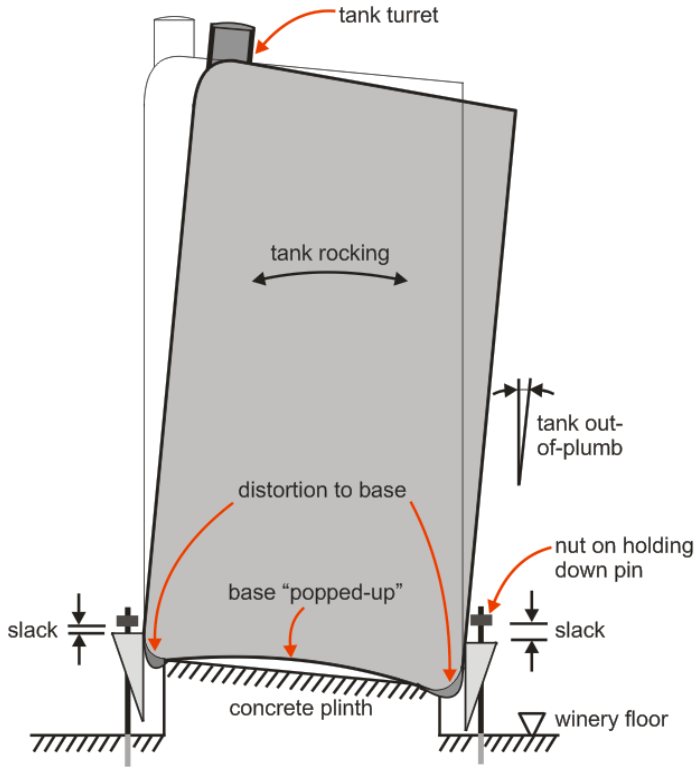
- Because our insurer requested it
- To get the best return in terms of risk reduction for your capital spend

HOW

- Engage a structural engineer with experience in tank design
- Discuss your plans for the near future so they can tailor the assessment

Assessing existing tanks

LOOK AT COMMON ISSUES



Assessing existing tanks

PLINTH TANKS

- Gather together existing drawings
- Site measure of:
  - Tank, particularly wall thickness
  - Slab thickness
  - Anchorage details
- Crunch the numbers

Pay attention to the failure mode, the consequences can be very different

Assessing existing tanks

TANKS ON FRAMES

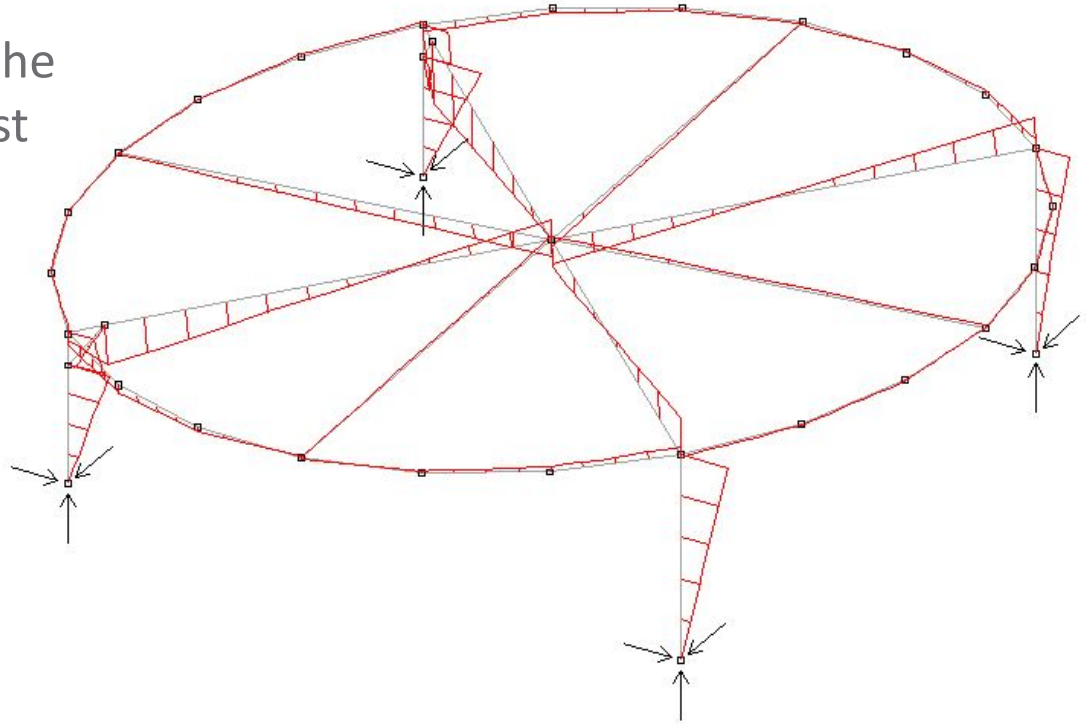
Many different variations

Assessing existing tanks

TANKS ON FRAMES

Many different variations

Results in complexity in the assessment, and thus cost



Assessing existing tanks

TANKS ON FRAMES

DATABASE + KNOWN ISSUES + SITE SPECIFIC

=

SEISMIC GRADE

Making Improvements

WHICH ONES?

- Volume, value, duration, disruption

TO WHAT SPEC?

- IPENZ Practice Note 19 (pressure vessels) suggests 34% current standard as a minimum
- Earthquake prone building analogy = 67% current standard
- What is the current standard, dictated by Importance Levels, 1 or 2?

Making Improvements

DEFINITIONS

Importance Level 1:

- Outbuildings, rural sheds etc
- 50% probability of exceedance over the structures life

Importance Level 2:

- Typical building, home, office
- 10% probability of exceedance over the structures life

	Importance Level 1	Importance Level 2
25 year design life	2% (1 in 50)	0.4% (1 in 250)
50 year design life	1% (1 in 100)	0.2% (1 in 500)

Making Improvements

Associated infrastructure

CATWALKS & SERVICES

Associated Infrastructure

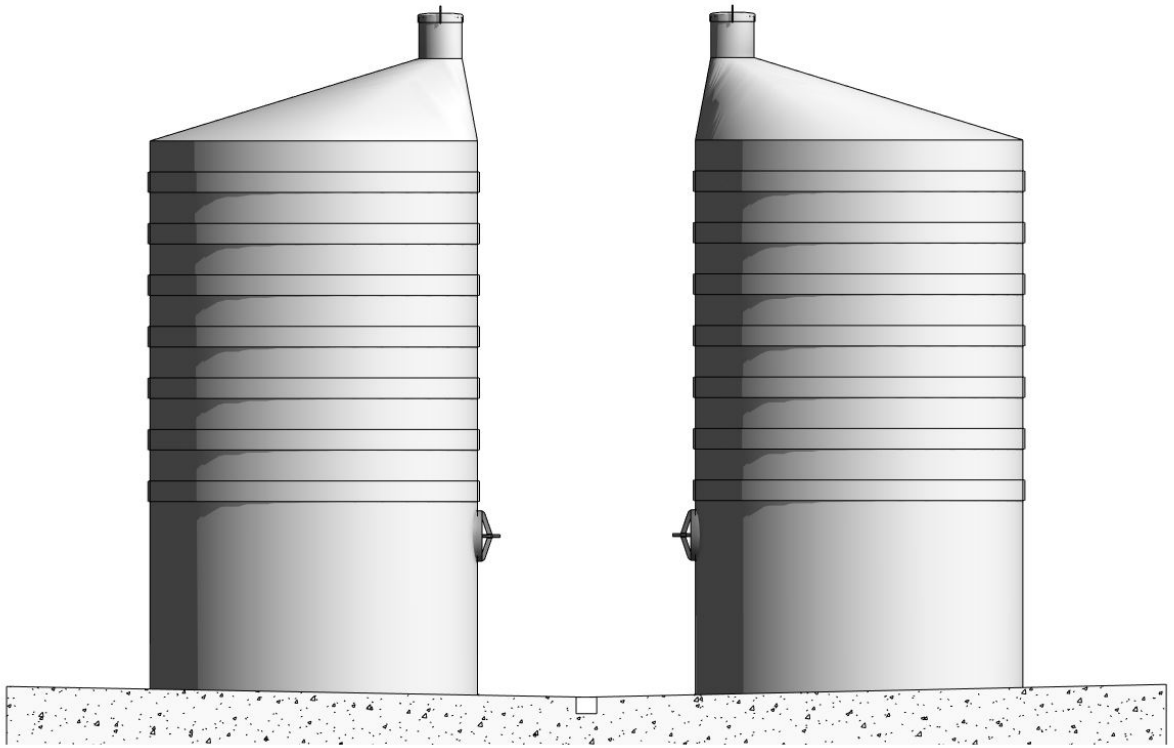
BARREL RACKS

We’ve been lucky so far

Avoiding the same mistakes in the future

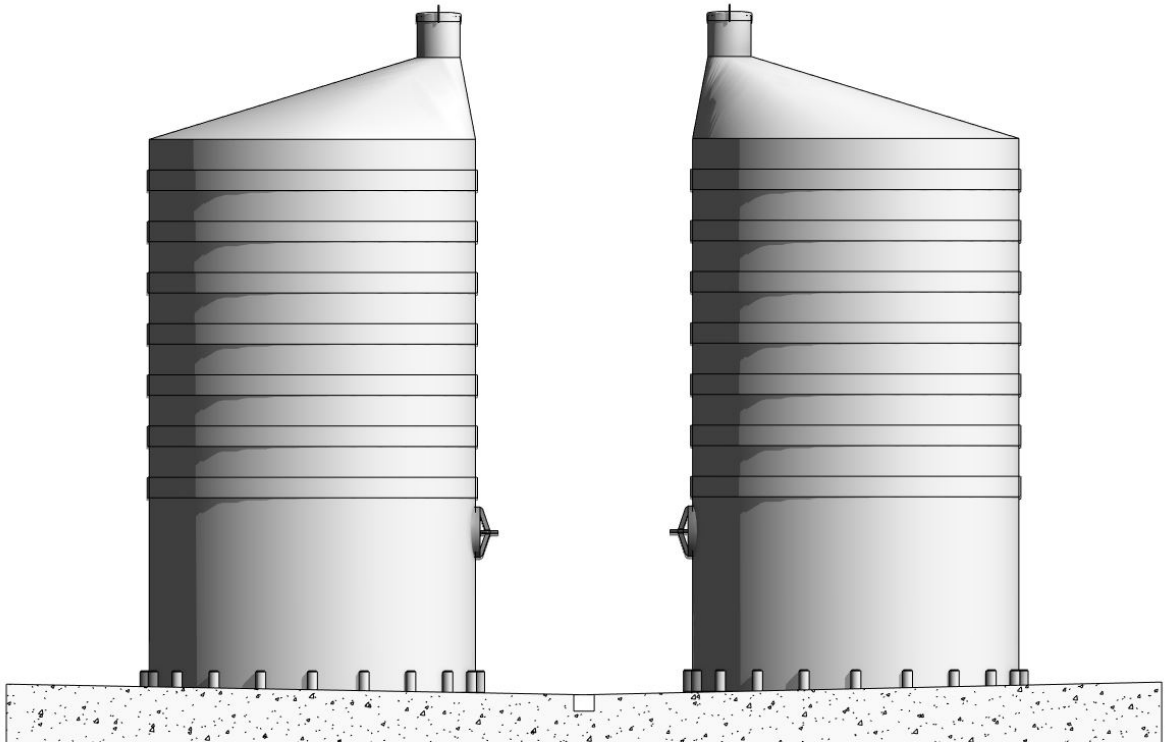
Improving the future

WHAT CAN GOOD LOOK LIKE



Improving the future

WHAT CAN GOOD LOOK LIKE



Improving the future

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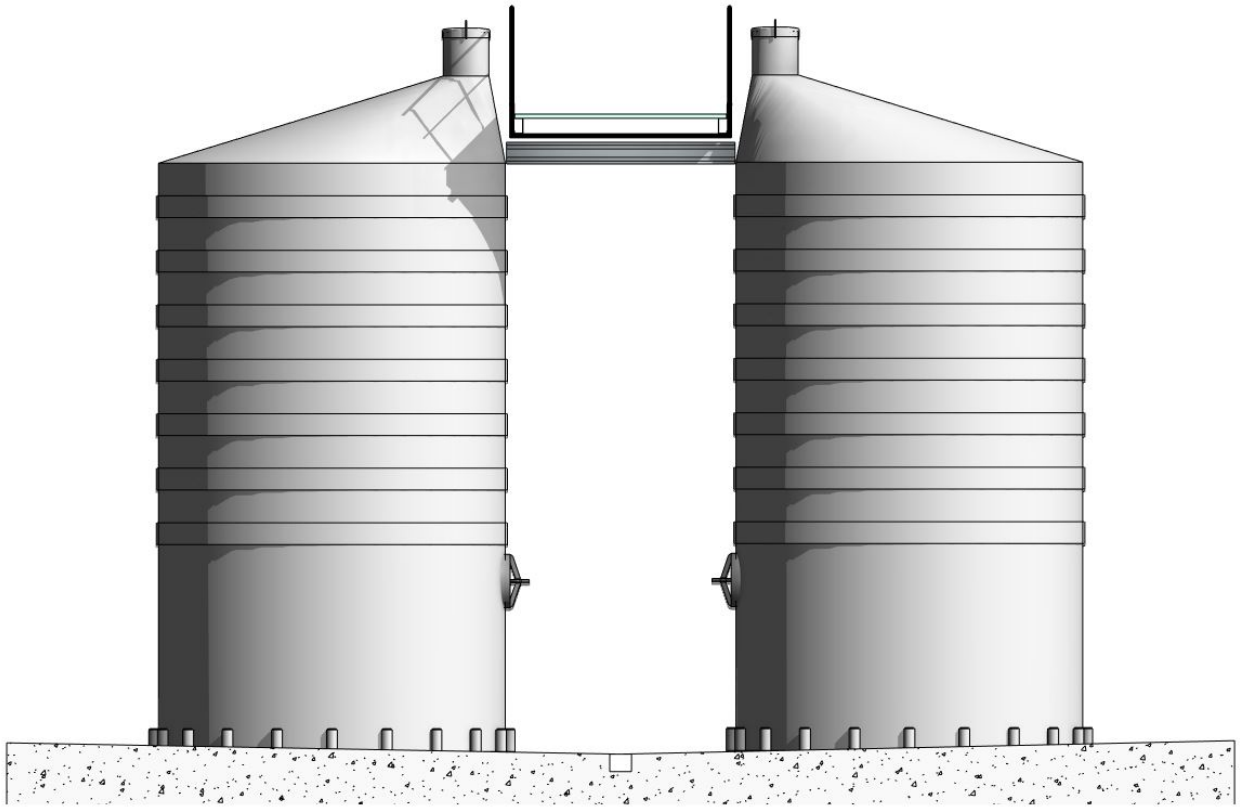

Improving the future

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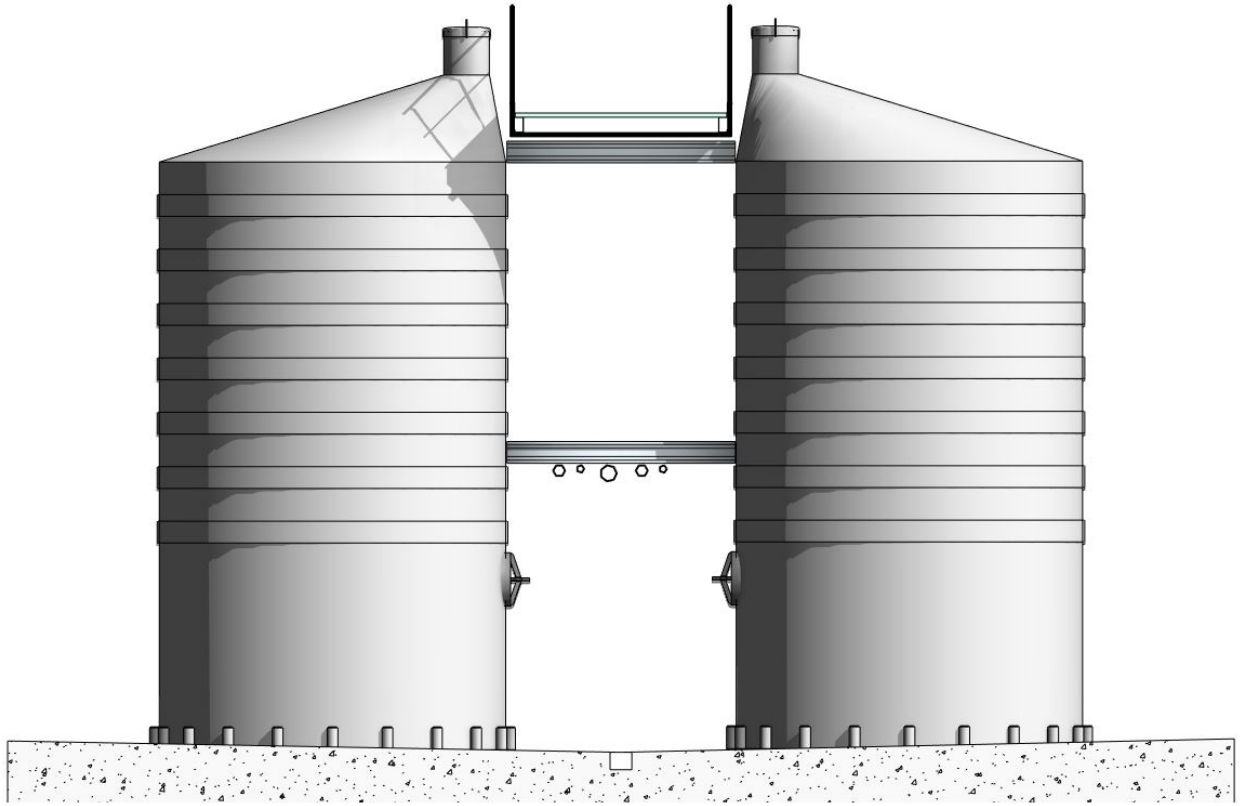

Improving the future

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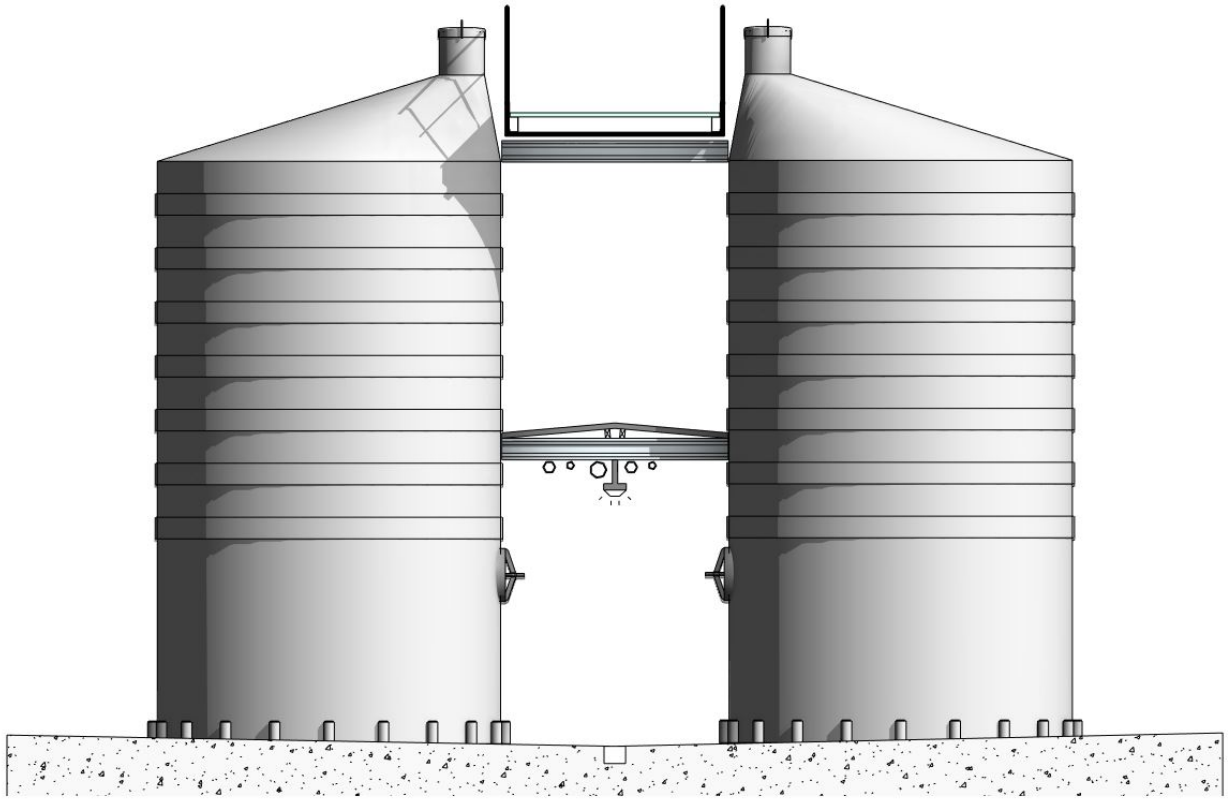


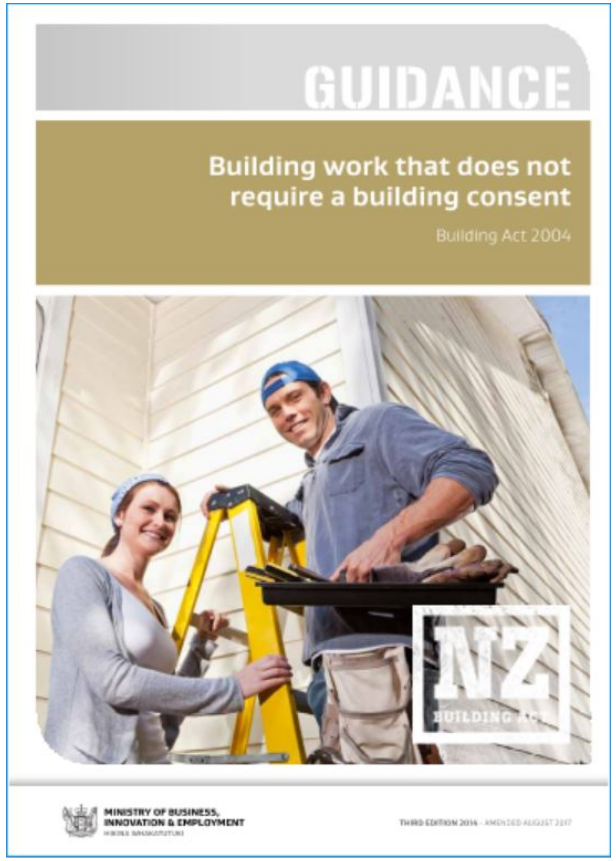
Improving the future

WORKING GROUP

Improving the future

COMPLIANCE & THE COUNCILS ROLE

- Covered by the Building Act & needs to comply with the Building Code
- No appropriate standard referenced in the Building Code
- Several guidance documents available
- Not automatically exempt under Schedule 1 of the Building Act



23. Tanks and pools

Building work in connection with a tank or pool and any structure in support of the tank or pool, including any tank or pool that is part of any other building for which a building consent is required, that:

(a) does not exceed 500 litres capacity and is supported not more than 4 metres above the supporting ground; or

(b) does not exceed 1,000 litres capacity and is supported not more than 3 metres above the supporting ground; or

(c) does not exceed 2,000 litres capacity and is supported not more than 2 metres above the supporting ground; or

(d) does not exceed 4,000 litres capacity and is supported not more than 1 metre above the supporting ground; or

(e) does not exceed 8,000 litres capacity and is supported not more than 0.5 metres above the supporting ground; or

(f) does not exceed 16,000 litres capacity and is supported not more than 0.25 metres above the supporting ground; or

(g) does not exceed 35,000 litres capacity and is supported directly by ground.

Thanks