How to plan for an earthquake event: Essential data collection approaches for underground infrastructure condition Assessment

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“sometimes it does us a power of good to remind ourselves that we live on two volcanic rocks where two tectonic plates meet, in a somewhat lonely stretch of windswept ocean just above the Roaring Forties. If you want drama - you’ve come to the right place”

Sir Geoffrey Palmer
Living where two tectonic plates meet
Living where two tectonic plates meet
A tale of two events

Rupture time 0:01

Peak ground velocity (cm/s)
A tale of two events

2016 M7.8 Kaikoura Earthquake

Ground velocity (cm/s)
Visible damage
Non-Visible Damage
A spectrum in population size

Km of WW Piped Reticulation (Excluding Watercare 8000km)

- **Chch 1825 Km**
- **Rotorua 530 Km**
- **Kaikoura 30 Km**
- **Wairoa 37 Km**

- **22 Staff**
- **1.5 AM FTEs**
- **4 librarians**
Changing BAU data collection processes

Post-disaster assessment more efficient

Better integrated into response
Visual Condition Assessment - Manhole inspections

Date of Inspection: 30/11/2016
Hydratech Drainage
Manhole Inspection
MH ID: 6169

- Estimate of MH prior to EQ: [Good/Risk]
- Manhole Top Lid - Vertical Displacement: [Level]
- Approximate change +/-...
- Riser - Alignment Skewed: [No]
- Cracking - Structure: [No]
- Base: [No]
- Joints and Seals intact: [Yes/No]
- Infiltration/Water coming in: [No]

MH ID: 6167

MH ID: 6169

Depth: 2.5m

450 DIA

MH ID: 6935

69 Beach Road
Visual Condition Assessment - Manhole inspections

Survey123 for ArcGIS
Smarter Forms, Smarter Field Work
munted
adj (1) used to describe severe levels of damage in Christchurch earthquake.
(2) used to avoid offending others by saying f**ked in the context above...
Origin, Christchurch NZ February 2011...
Repair records
Data Storage

Emergency Response

Data analysis

Operations centre

Repair & recover
Asset Management in the age of acceleration
Towards better integration of post disaster asset assessment - Geospatial Platforms
CCC Case of study - 3W AAIF

Water NZ Metadata standards

Multi-criteria Assessment

Renewal Candidate List

Inform LTP

Council Data And Systems

Condition

Criticality

RO & Main.

Risk

Vulnerability

Repairs, O&M

Criticality

Condition

Score 1-5

Score 1-5

Score 1-5

Score 1-5

Candidate for renewal

Low

Continue to maintain

Lowest

High

View

Infonet

SAP

GIS

Design, Financial & Service Performance

Capacity

Utilisation

Resilience

Score 1-5

Score 1-5

View Council Data And Systems Water NZ Metadata standards Multi-criteria Assessment Renewal Candidate List Inform LTP

Candidate for renewal Low Continue to maintain Lowest High

Score 1-5
CCC Facility Rating and WW Criticality
Take Home Messages

Improvement in underground infrastructure data collection should be implemented and tested during BAU

Reasons to do this include

• Improved efficiency in current BAU processes
• Geospatial condition assessment enable improved decision-making
• Comprehensive and detailed data collected in response are key for disaster recovery
• Provision of detailed performance data is crucial for post event research
Train the way you fight because you will fight the way you have been trained
Questions?