Innovation from Disaster – Applying 3D Laser Scanning Technology to Earthquake Recovery Projects

Andrew Sinclair (New Zealand)

Key words: Deformation measurement; Engineering survey; Laser scanning; Reference frames; Young surveyor; BIM; Modelling

SUMMARY

A large proportion of the survey work to follow the Canterbury Earthquake sequence has been damage assessment so that appropriate repair strategies can be implemented with confidence. The assessment and design process has been aided by the ability of recent measurement technology to capture a large amount of data in a short time.

I have been fortunate to be involved with a new innovative workflow for these projects at a time when 3D Laser Scanning technology has become the new standard in the rebuild. A high resolution 3D point cloud is able to be seamlessly integrated into design software with the coordinate system intact. Modelling and subsequent design can occur and any site fabrication can be set out precisely in terms of the project coordinate system.

Use of 3D Laser Scanning has enabled us to collect more data quickly, present results in greater detail, and afford more confidence in the subsequent analysis, design and fabrication.

I will demonstrate several case studies including:

Early projects – Christchurch Arts Centre, Christchurch Cathedral

Infrastructure repair – brick barrel culvert proximity to rail tunnel repairs

Historic infrastructure as-built – potholing, scanning, modelling, design

Building deformation - building verticality, under floor assessments

Foundation assessment – measurement of existing piles