

TS06D - LASERSCANNING

SILK ROOM 1

ADDINGTON RACEWAY

LEVEL 2

*Presented at the FIG Working Week 2016,  
May 2-6, 2016 in Christchurch, New Zealand*

# Vanda Kadlecikova and Rowan Hallam

# HIGH DEFINITION SCANNING

## What's the Buzz?



# FIG Working Week 2016

CHRISTCHURCH, NEW ZEALAND 2-6 MAY 2016

Recovery

from disaster

Organised by



Platinum Partners



Diamond Partner



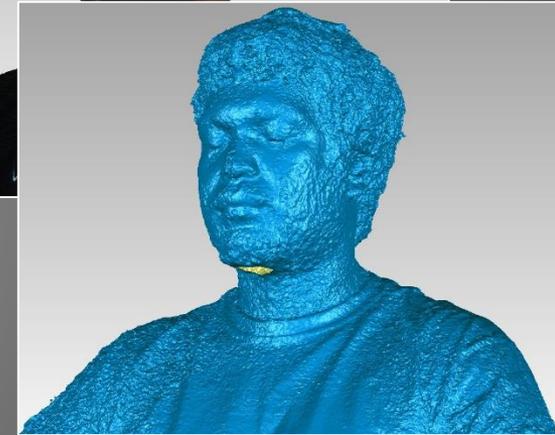
# HIGH DEFINITION SCANNING – WHATS THE BUZZ?

## WOODS

- 100 Employees, approx. 35 surveyors
- Surveyors, Planners, Engineers, Urban Designers
- Two Scanners, Scan station P20 and P40
- 8 years of laser scanning

## CHRISTCHURCH REBUILD BUZZ

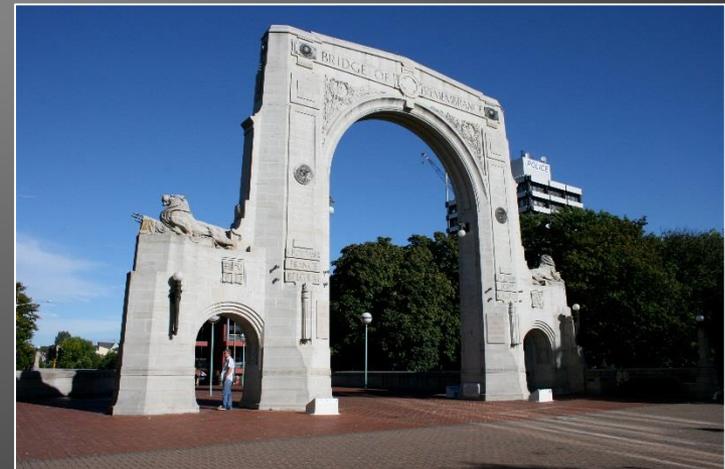
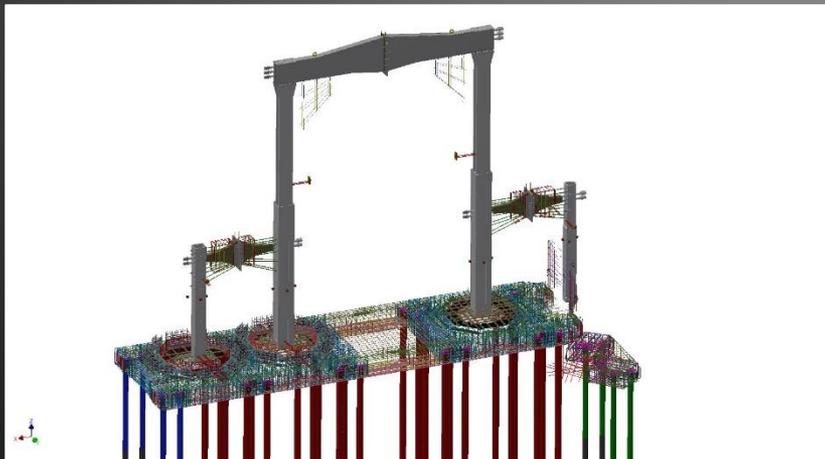
## SCANNING DIVERSITY BUZZ



# CHRISTCHURCH REBUILD – WHATS THE BUZZ?

## TRIUMPHAL ARCH – BRIDGE OF REMEMBRANCE

- Structurally damaged, historical significant
- Strengthening required, but flexible
- Internal structural design
- Complex accurate relationship between internal cavities and external shape
- Plan, scan of 1-2 consecutive days
- Actual, 3 visits over 3-4 months



# CHRISTCHURCH REBUILD – WHATS THE BUZZ?

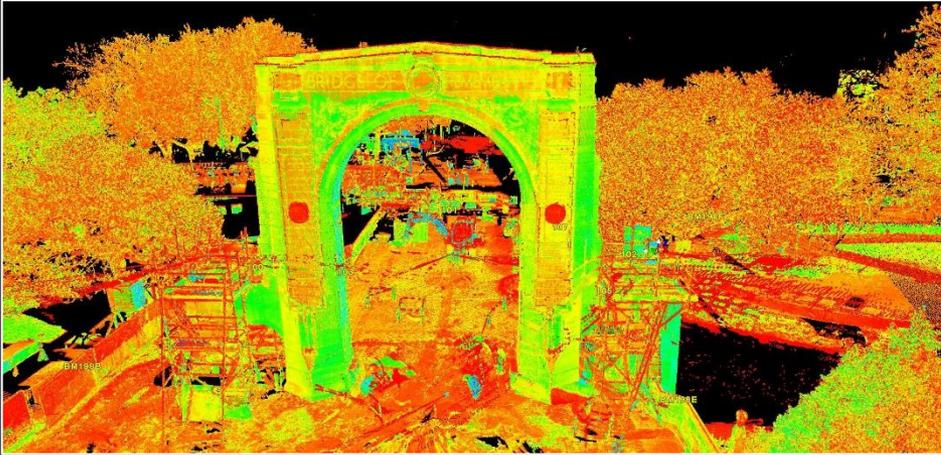
## TRIUMPHAL ARCH – BRIDGE OF REMEMBRANCE

- VISIT 1 - Primary External Scanning and outer arch cavities
- VISIT 2 - Secondary cavity scanning from top
- VISIT 3 - Scan from cavity bases

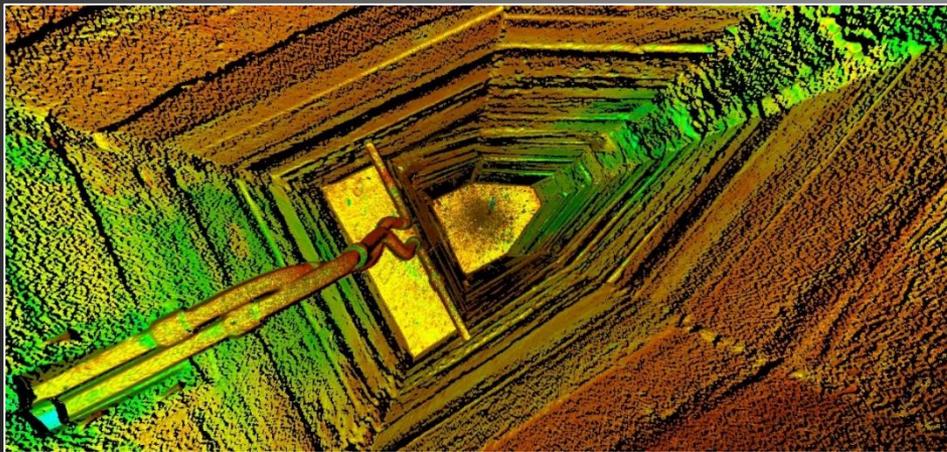


# CHRISTCHURCH REBUILD – WHATS THE BUZZ?

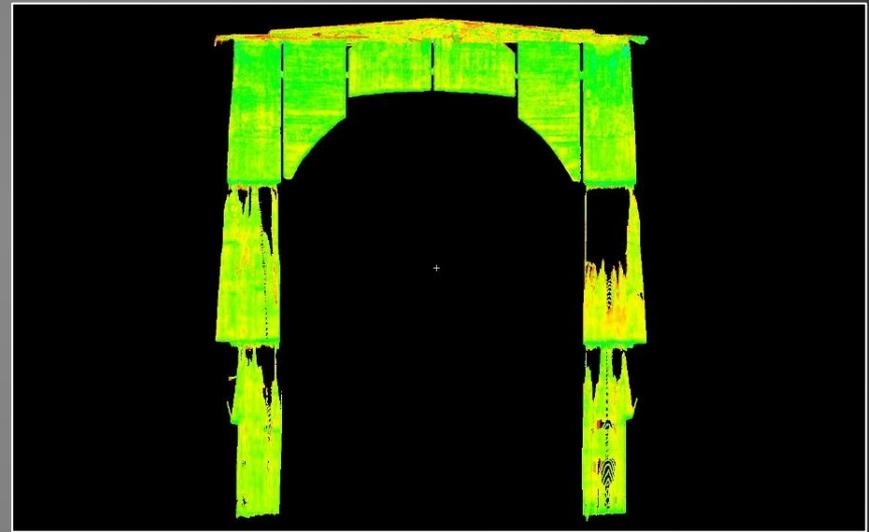
## TRIUMPHAL ARCH – BRIDGE OF REMEMBRANCE



POINT CLOUDS – EXTERNAL FACADES



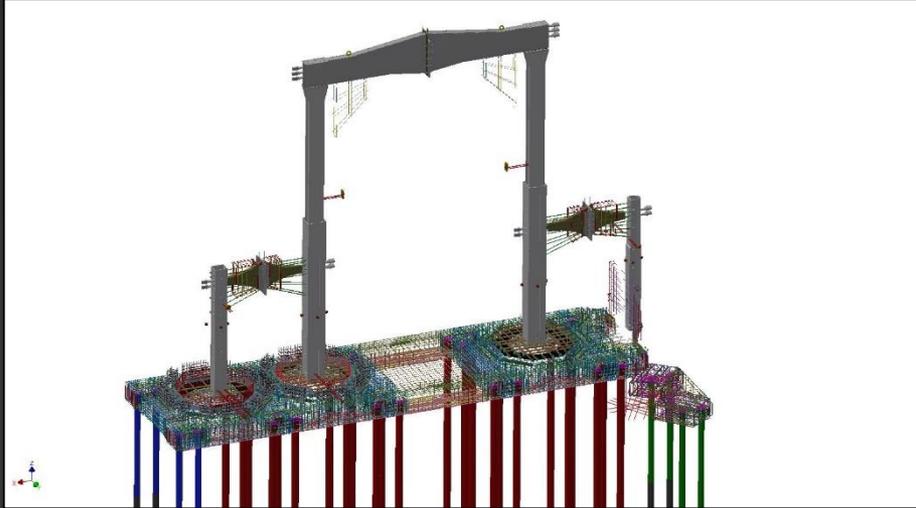
POINT CLOUD – LOOKING DOWN CAVITY



POINT CLOUDS –  
LARGE ARCH INTERNAL CAVITIES

# CHRISTCHURCH REBUILD – WHATS THE BUZZ?

## TRIUMPHAL ARCH – BRIDGE OF REMEMBRANCE



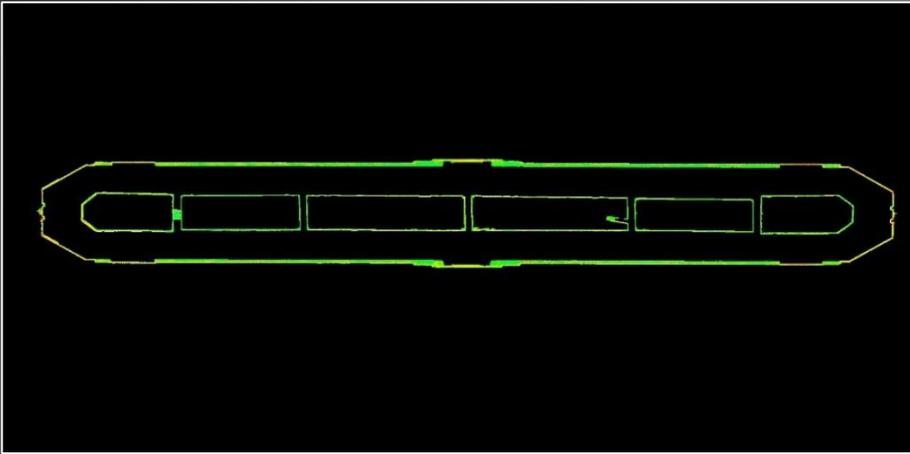
STRUCTURAL STEEL WORK FOR  
POSITIONING INSIDE ARCH  
CAVITIES

STRUCTURAL STEEL MODEL INSIDE  
REVIT MODEL FROM SCAN DATA

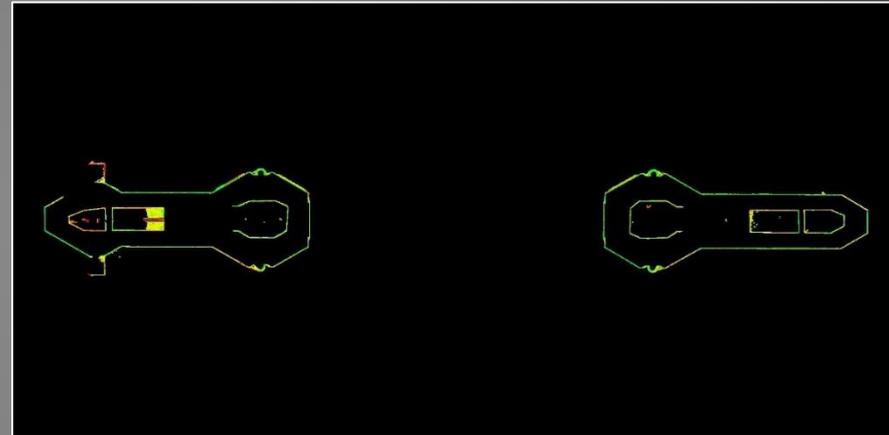


# CHRISTCHURCH REBUILD – WHATS THE BUZZ?

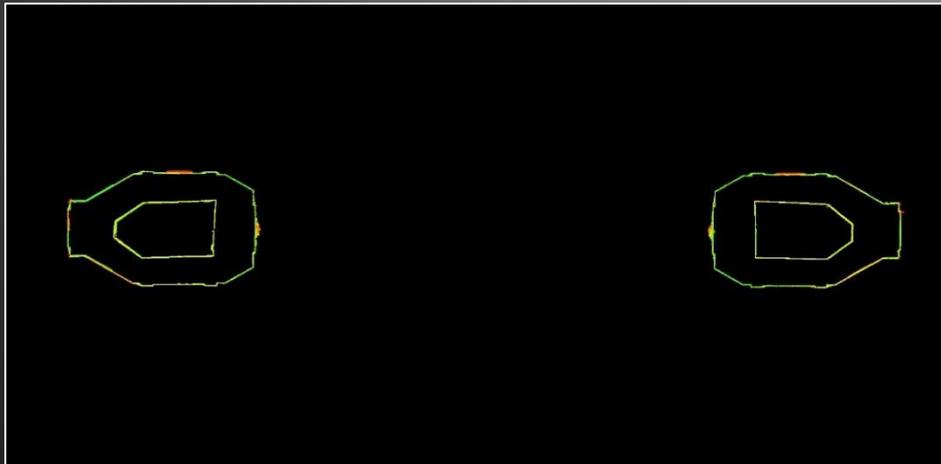
## TRIUMPHAL ARCH – BRIDGE OF REMEMBRANCE



POINT CLOUDS SECTION – MAIN ARCH



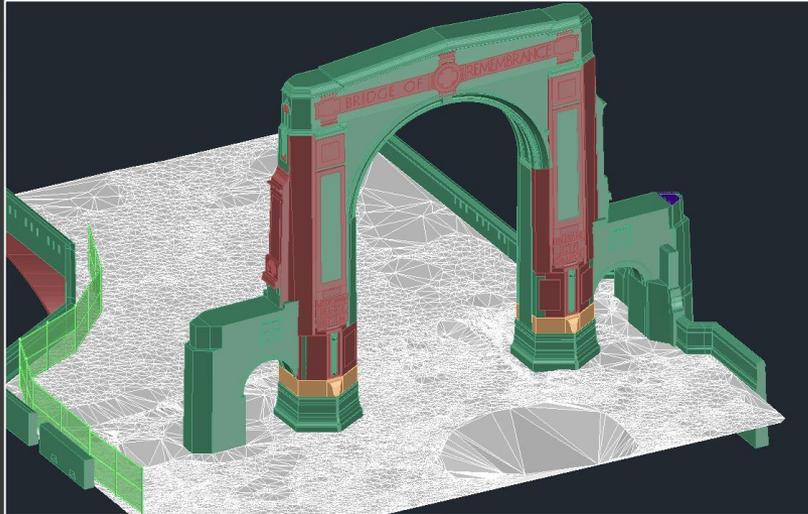
POINT CLOUDS SECTION  
OUTER ARCH SECTIONS



POINT CLOUD SECTION – MAIN ARCH

# CHRISTCHURCH REBUILD – WHATS THE BUZZ?

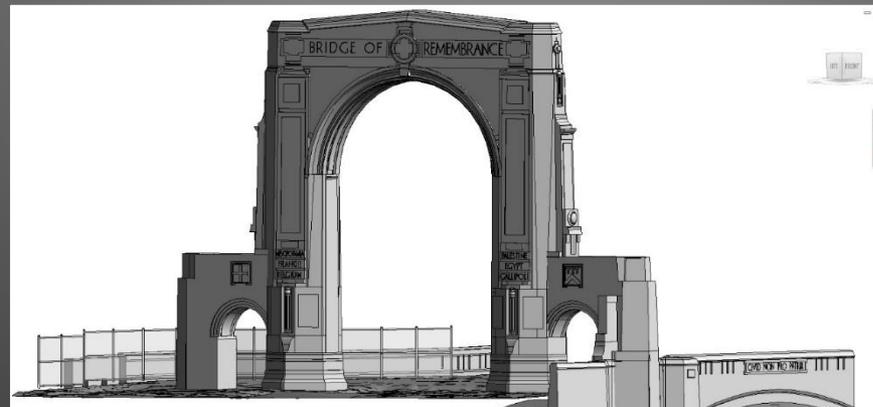
## TRIUMPHAL ARCH – BRIDGE OF REMEMBRANCE



**CAD MODEL (DWG)**



**MESH MODEL**

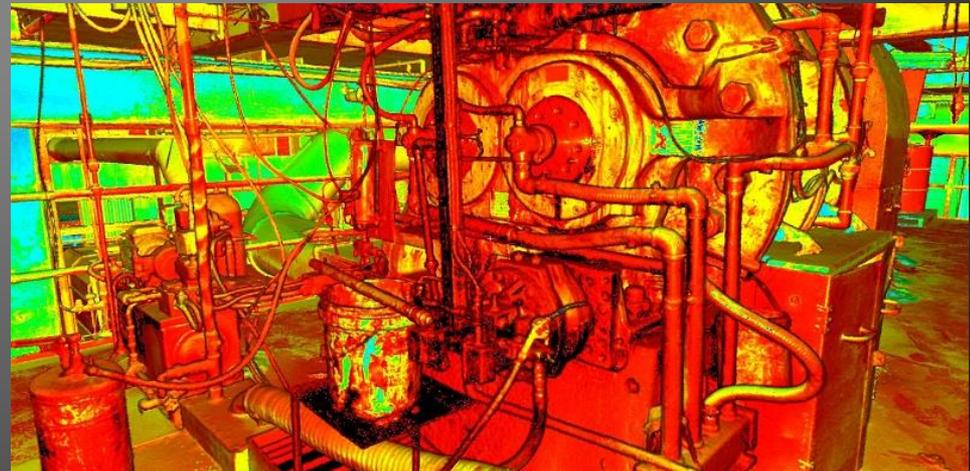
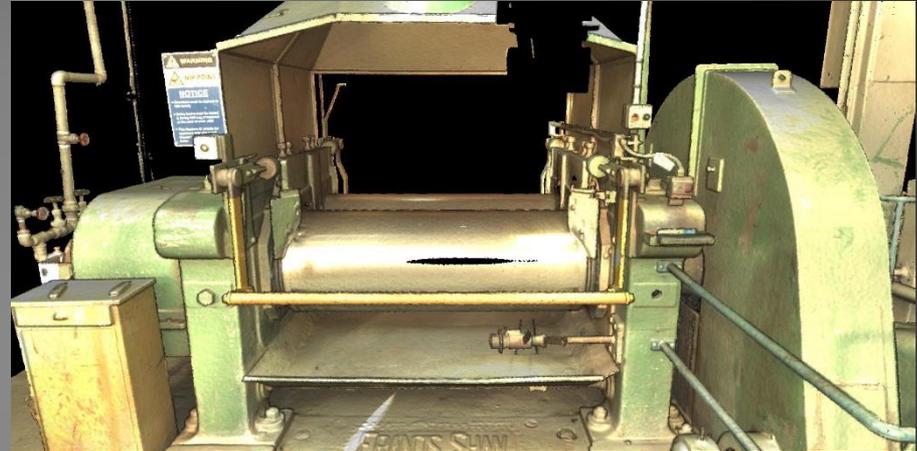


**REVIT MODEL**

# CHRISTCHURCH REBUILD – WHATS THE BUZZ?

## INDUSTRIAL PLANT RELOCATION

- NEW INDUSTRIAL 3D PLANT DESIGNED AND BUILT
- RELOCATION OF EXISTING PLANT TO NEW LOCATION
- MINIMAL PLANT DOWNTIME
- PLANNING FOR SPATIAL MANEUVERING IN 3D
- BASIC 3D PLANT MODELS CREATED



# CHRISTCHURCH REBUILD – WHATS THE BUZZ?

## CHRISTCHURCH SEWER PUMP STATIONS

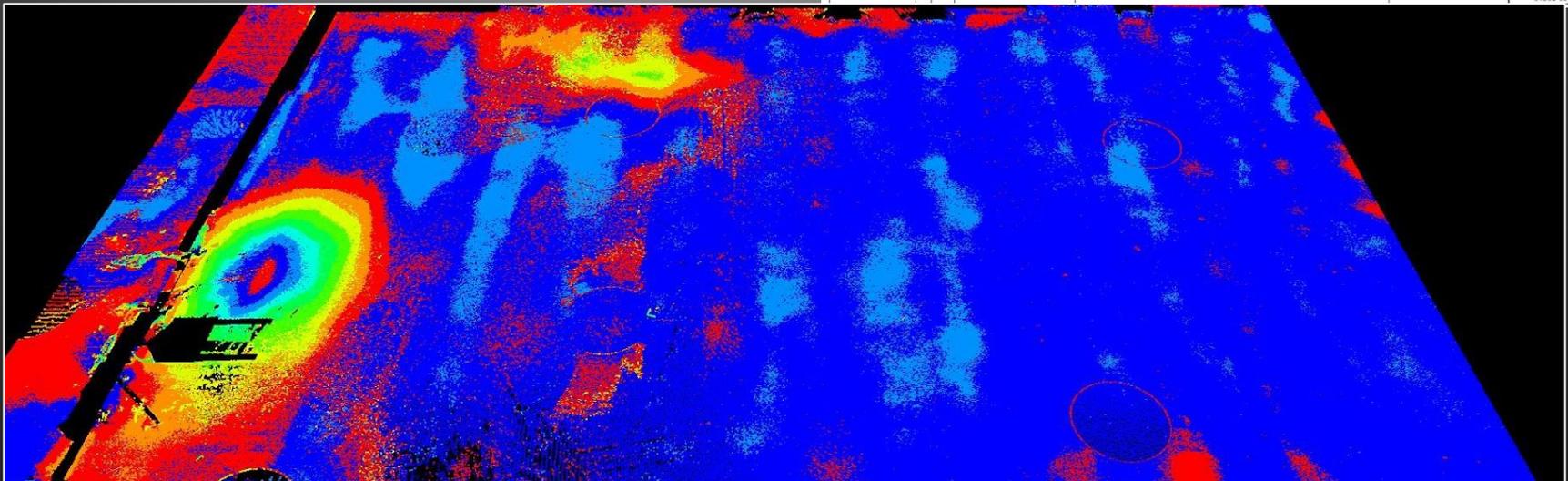
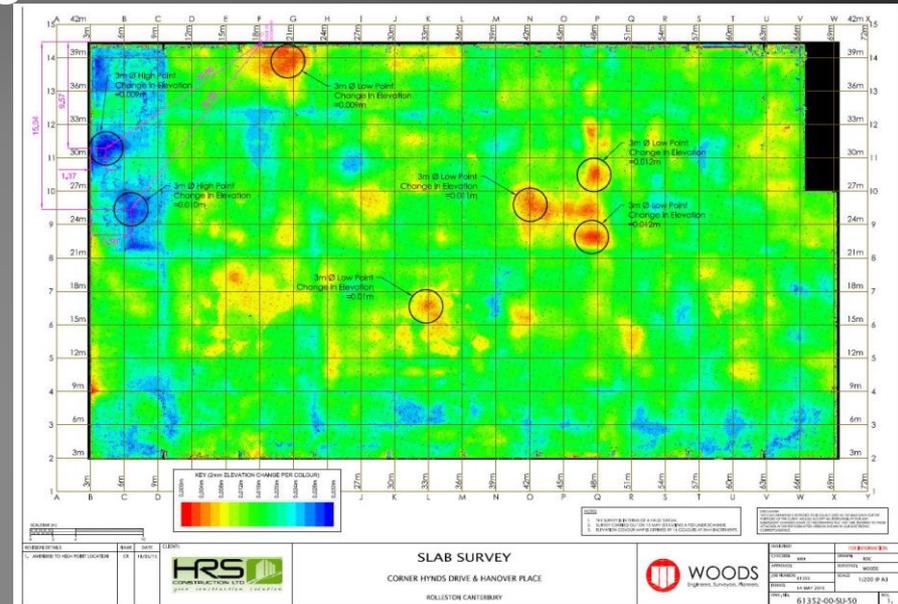
- 100 PUMP STATIONS FEED 5 TERMINAL STATIONS
- NO TO CONVENTIONAL SURVEY OF 5 TERMINAL STATIONS
- YES TO SCAN AND MODEL
- MORE COMPLETE PICTURE OF EACH SITE INCLUDING SURROUNDING CLIFFS



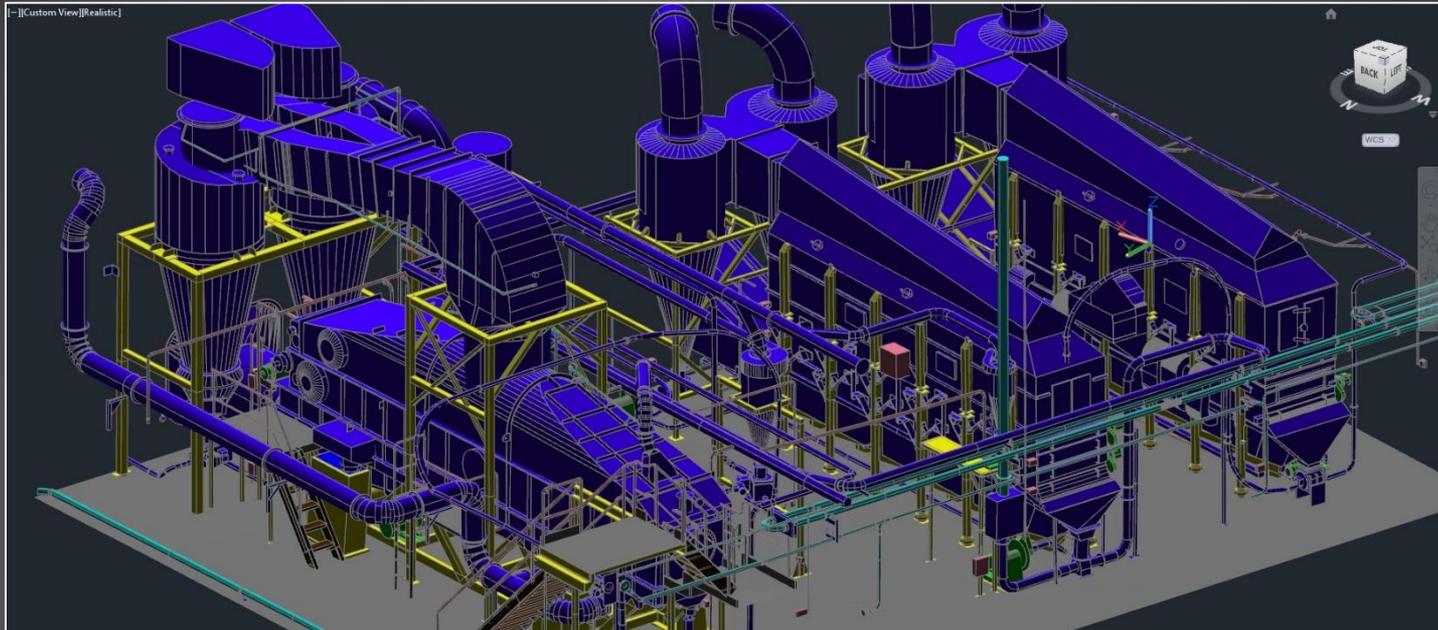
# CHRISTCHURCH REBUILD – WHATS THE BUZZ?

## WALL VERTICALITY/SLAB FLATNESS

- NOT ONLY VERTICALITY OR HORIZONTAL DIFFERENCE
- HUMPS AND HOLLOW
- DAMAGED SURFACES



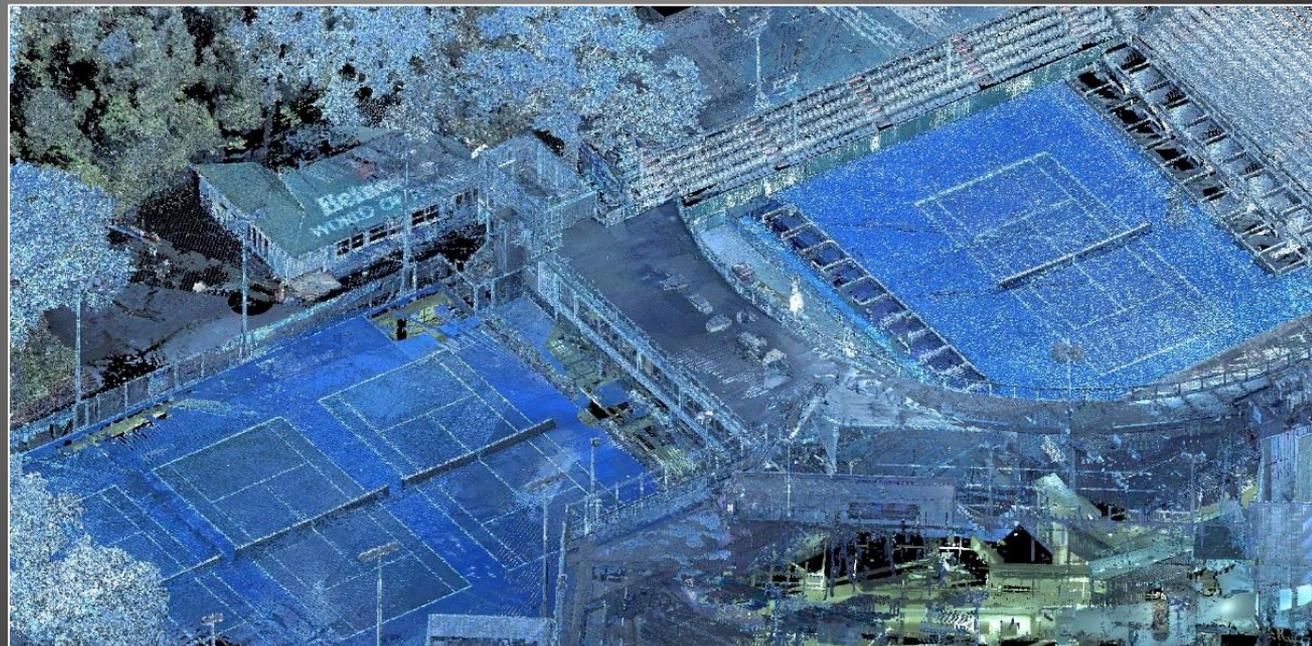
## FONTERRA PLANT



- ONE OF NZ PRIME EXPORTS
- FOOD SAFETY STANDARD AND THE HIGHEST QUALITY
- SCANNING AND MODELLING
- MAINTANANCE AND REPLACEMENTS REGULARY
- INDUSTRIAL STANDARD



## ASB Tennis Centre

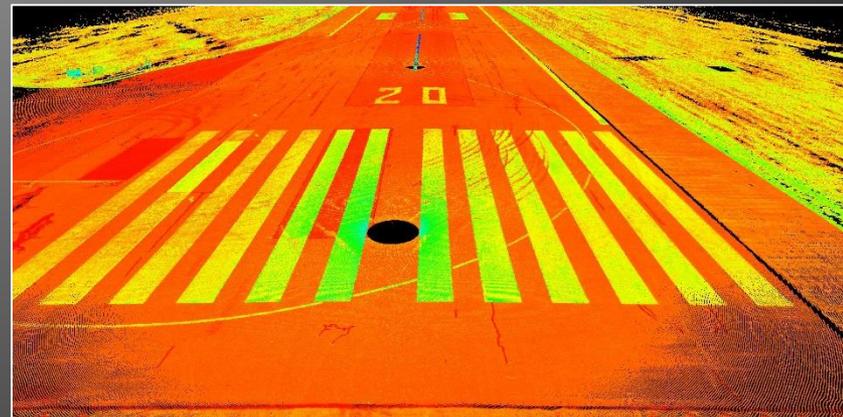


- ASB CLASSIC AND HEINEKEN OPEN
- CAPTURED TENNIS FACILITIES, NEIGHBORING TREES AND THEIR CANOPY

## AVIATION



- RUNWAY SURVEY AT 5 DIFFERENT PACIFIC ISLANDS
- ONE FLIGHT PER WEEK BACK HOME
- AIR NEW ZEALAND PLANES SCANNING
- DESIGN MAINTANANCE FACILITIES

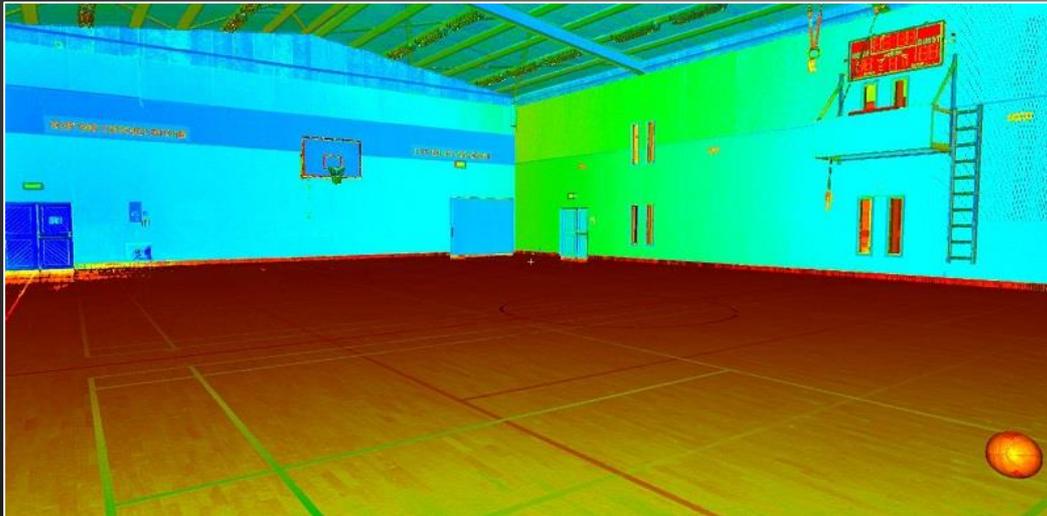


## AVIATION



## TV Commercial

### SKY TV – ‘THE ZONE’

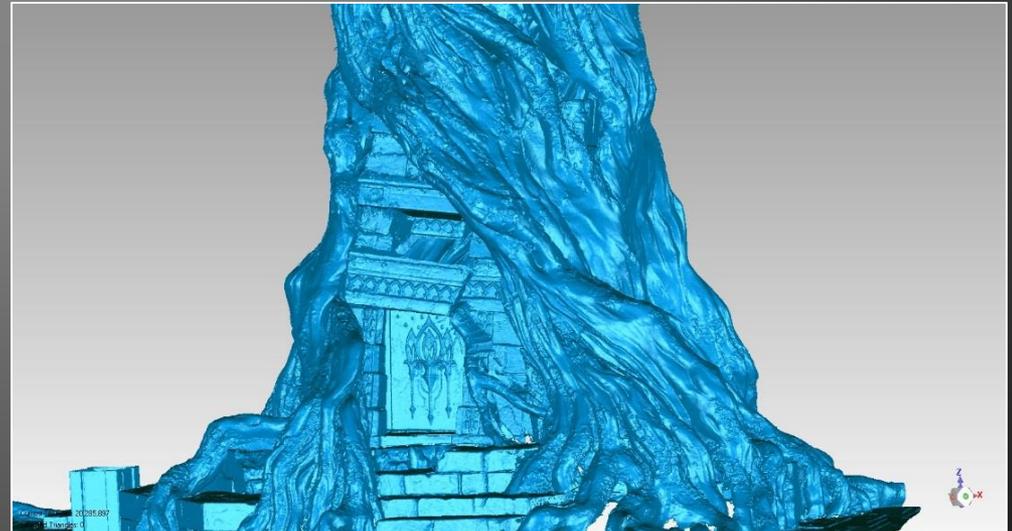
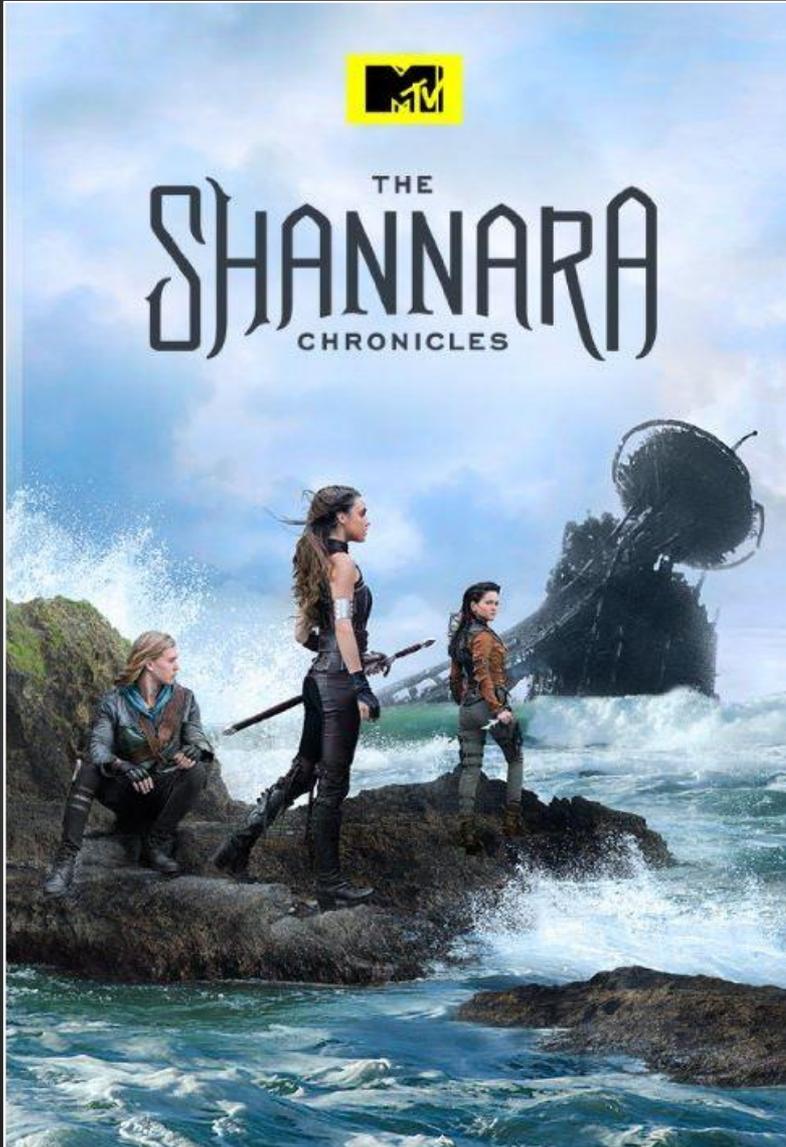


- 5 SCENES IN DIFFERENT LOCATIONS
- SYNCHRONIZE CAMERA AND SCANNER
- SPATIALLY ACCURATE MESH MODELS

## MOVIE INDUSTRY

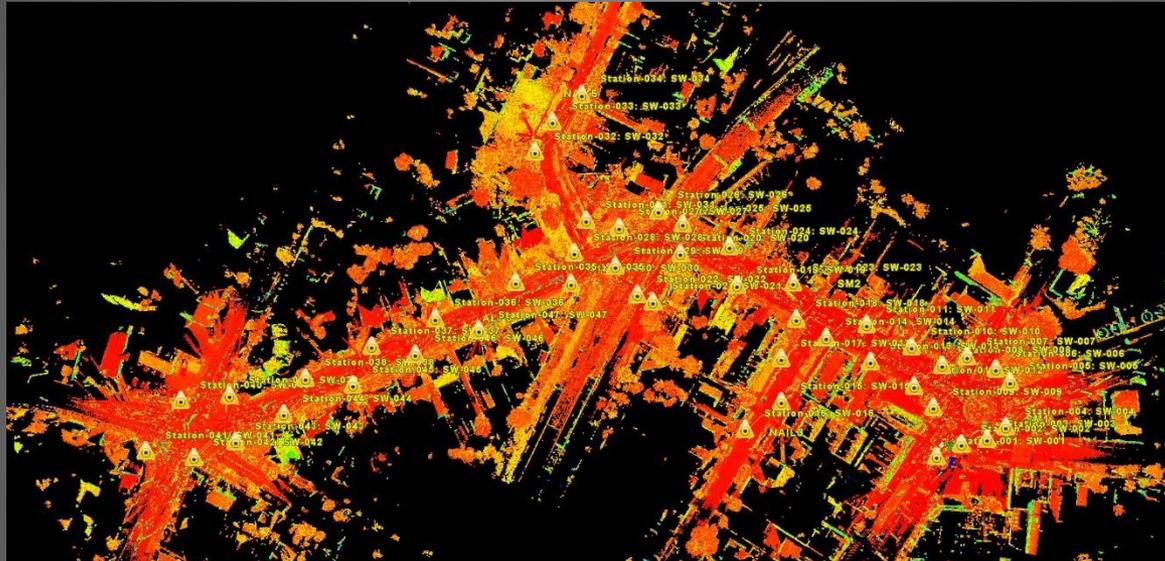


## Movie Industry

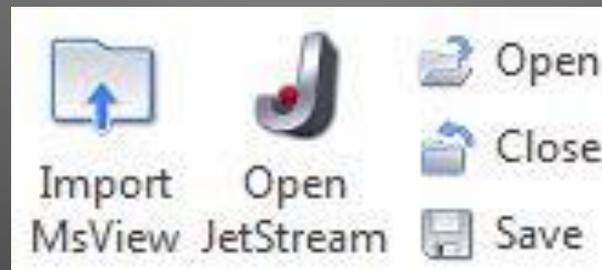


## Technology Advantages

**Visual Alignment** – SPEED UP OUR REGISTRATION PROCESS AND FIELD WORK 4 TIMES



**Jet Stream** – NO MORE “cwregen” COMMAND



## Conclusion

- **LASER SCANNING CREATES A BUZZ**
- **INTRODUCED NEW BUSINESS TO WOODS**
- **SURVEYORS ARE WELL PLACED TO APPLY LASER SCANNING TO A VARIETY OF INDUSTRIES AND TASKS**
- **COMPUTERS AND SOFTWARE ARE MORE ACCEPTING AND COMPATIBLE**
- **MANY PREVIOUS LIMITATIONS HAVE BEEN REMOVED ALLOWING A WORLD OF APPLICATIONS**



# THANK YOU

## WOODS

### LASER SCANNING

Engineers . Surveyors . Planners

Urban Designers . Architects

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