Project Controls Expo, Australia – 26th November 2019

Melbourne Cricket Ground, Melbourne

Performance Measurement on a Connected Site

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About the Speakers

Rhys Craigie – Alliance Systems Lead

&

Phil Hendy - Innovation and Continuous Improvement Manager

- Currently work for Western Program Alliance as part of the Level Crossing Removal Projects,
- Work side by side to generate the most value from Connected Sites,
- Both are passionate about changing the construction industry

About the Topic

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About the Topic

Topic outline

In this presentation we'll explain:

- 'What is the Connected Site' and how it started,
- What Connected Site set out to achieve,
- The journey to date and challenges faced,
- What we have created and
- Where we are going next.

The Lead Up

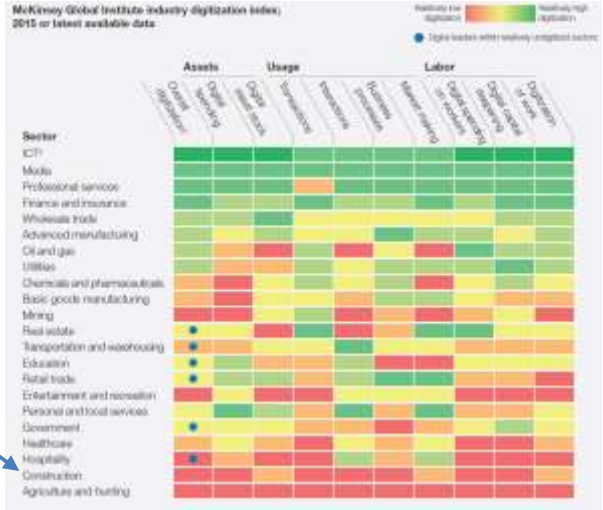
The Lead Up

Why it all started

Is there anything more to say?

Then the facts:

- Resource shortage
- A saturation of work



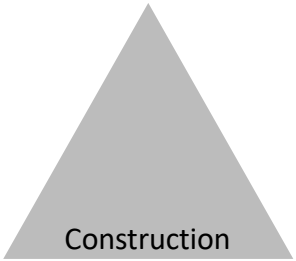
The Lead Up

How it all started

The collaboration of three key elements:

Government (LXRP)

Technology



The Lead Up

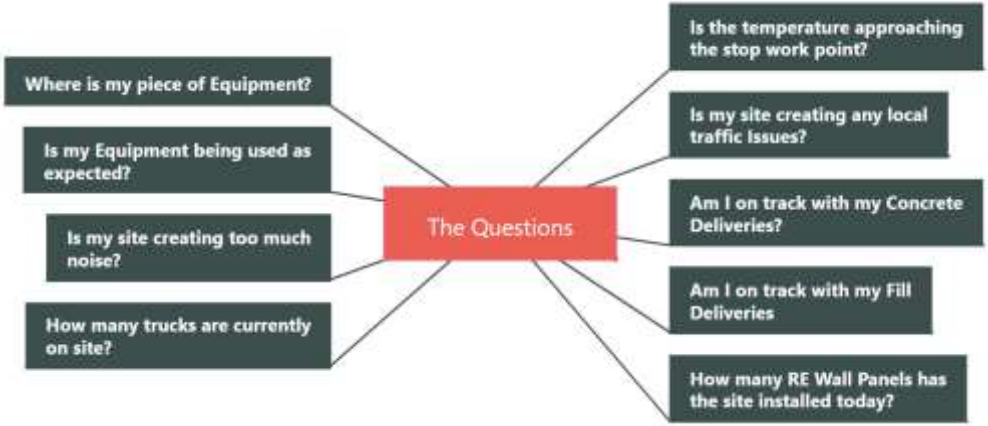
The mantra of Connected Sites was simple:

"A solution that was rapidly deployable, cheap and real-time."

A solution that was Problem First, not Technology led.

The Lead Up

From the holistic idea

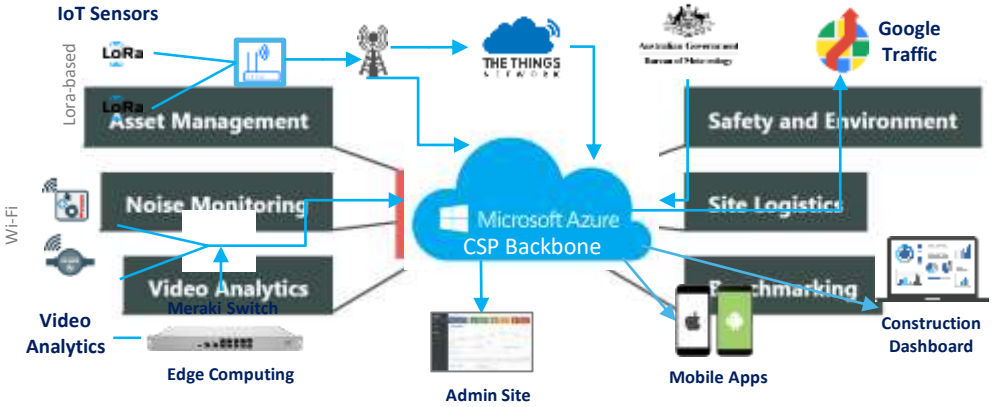


The Lead Up

From the holistic idea through to

The Lead Up

through to the Final Solution



Aviation Road Pilot

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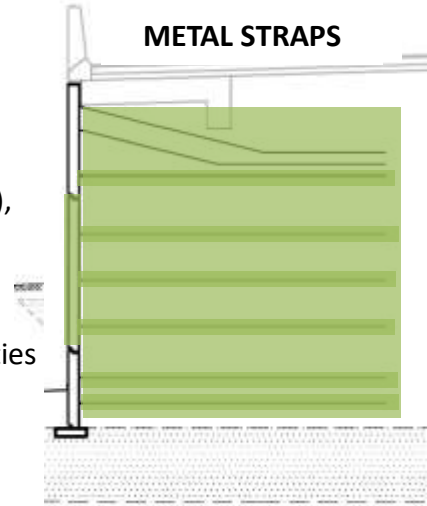
Aviation Road Pilot



What is an 'Reinforced Earth Wall'?

- Structure made of three key elements:
  - Precast Panels (roughly 2x2m and 1.4t each),
  - Fill Material and
  - Metal straps (tying to the precast into the compacted material)
- Relies on the correct sequence of concurrent activities

Why is the 'Reinforced Earth Wall' important?

- Is the Projects critical path activity,
- A delay in that could result in a delay in project completion

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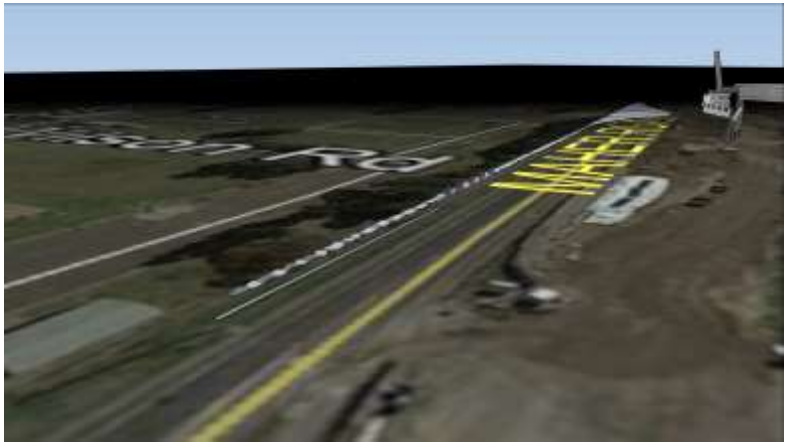
The Northern RE Wall Construction at Aviation Road



Aviation Road Pilot

With the Critical Path in Mind - A New Focus

What problems did we want to solve?

- How much Fill has been placed today vs Planned?
- How many panels have been installed today vs Planned?

Associated KPI's

- Plant Hours per widget,
- Labour Hours per widget,
- Cost per widget.

Aviation Road Pilot

Constraints

- Only 6 weeks left of Pilot
- Infrastructure was just up and running

How?

- Implementing ‘Collaborative Planning’
- Detailed Milestones
- Agreed on Minimal Viable Product

Detailed Planning using a Pull Plan

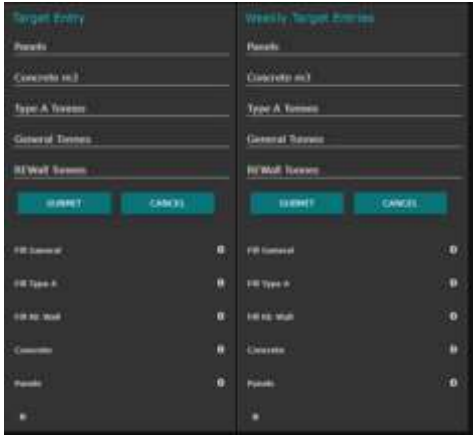
Aviation Road Pilot

What we knew

- Planned vs Actual was the critical measure
- Targets changed frequently

What we needed to allow for

- Ability to add Daily/Weekly Targets
- All Fill Material types need to be tracked
- A distinction between Direct vs Stockpile placement



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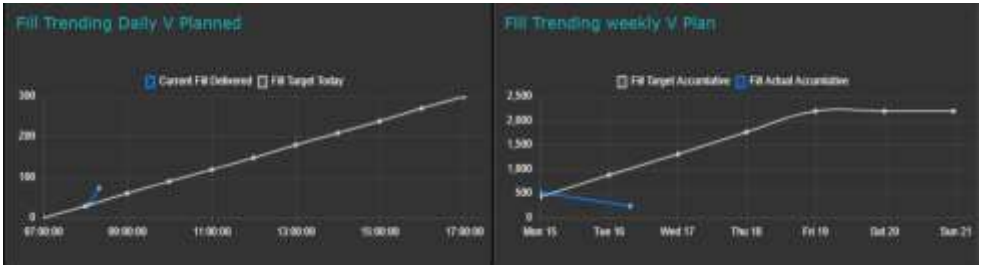
RE Wall Fill Material Tracking – What we did

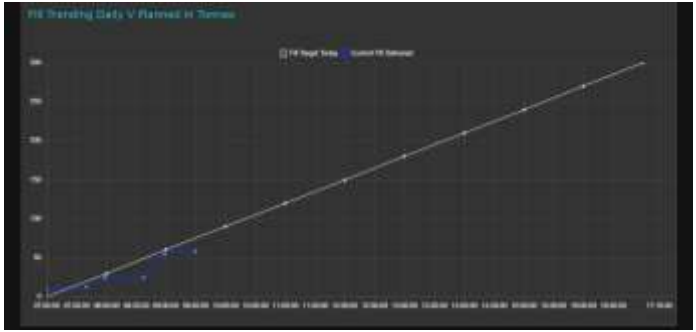
- Created an App
- Gave the Gate Keeper the responsibility
- At each entry, details were logged directly to the system
- Demonstrated Real-Time Tracking of Fill



Aviation Road Pilot

RE Wall Fill Material Tracking - Did it work?

- Fill Material Tracking was a great success
- Several add-on benefits including the removal of some administrative effort
- Instantly shows if there might be any issues through the visuals.



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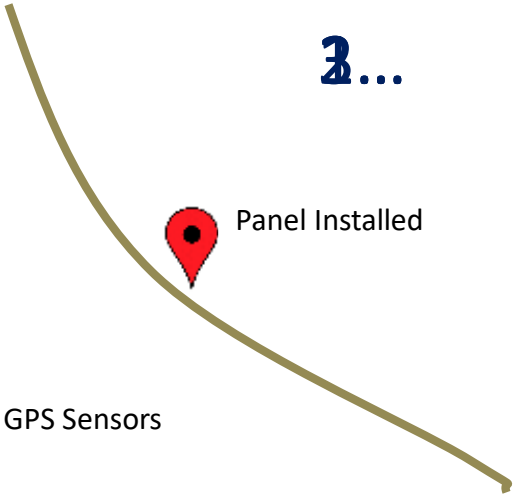
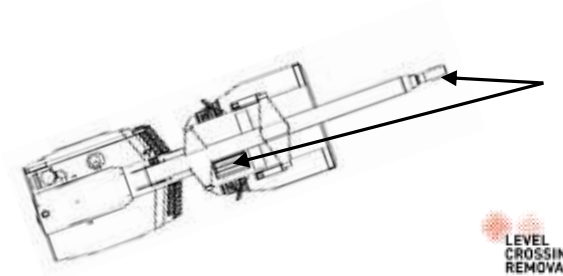
RE Wall Panel Tracking – The Theory

- Overlay of Panel GPS Location (from Model),
- Correlate the position of Installation Crane,
- Assume a stationary crane over the alignment represented an install.





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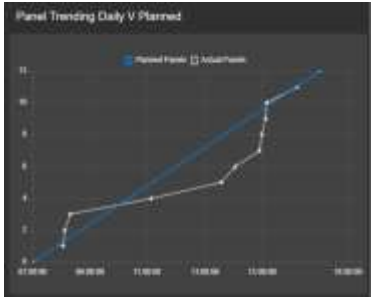
RE Wall Panel Tracking – What we did

- Used existing GPS Sensors
- Increased accuracy and data pack intervals (1 min to 15 sec)
- Placed two sensors on the installation Crane (Body and end of Boom)



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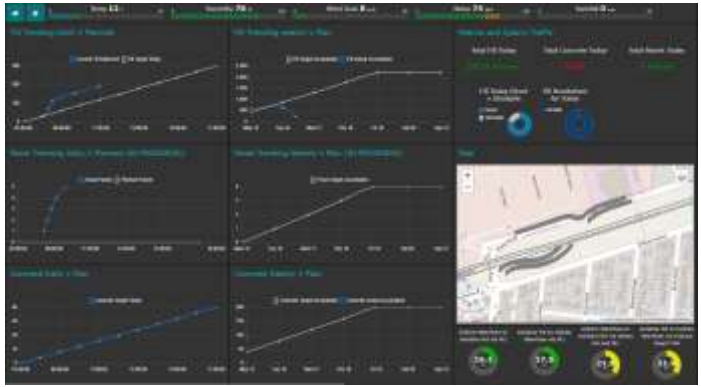
RE Wall Panel Tracking - Did it work?

- No… Why?
- Relied on:
  - GPS sensitivity which had a large scatter, therefore required aggregation, and
  - An algorithm and AI which didn't get to a working solution

- BUT, watch this space!



Exciting Steps Forward

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Exciting Steps Forward

Connected Sites version 2.0

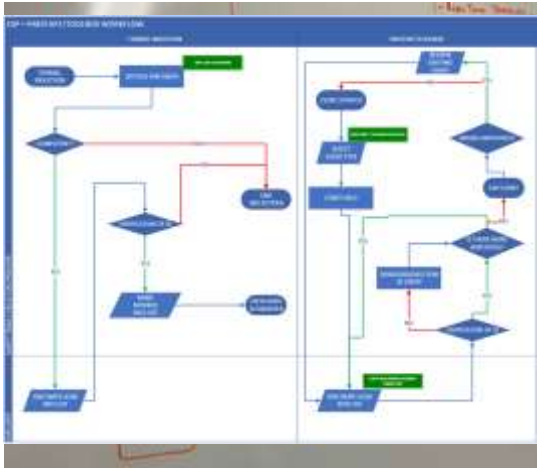
The pilot was a success and will be utilized on the next Project/s

- Expanding the Existing Use Cases through:
  - Geofencing for cost code reconciliation
  - Utilizing Machine Learning
- Developing new Use Cases, including:
  - Prestart and Toolbox attendances,
  - Gate Keeper Processes and
  - Individual Precast Panel Tracking.

Exciting Steps Forward

Prestart and Toolbox attendance

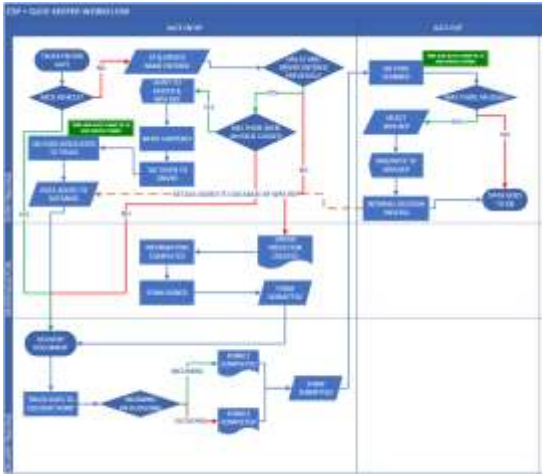
- Removes the paper attendance form,
- Records attendance with a simple scan,
- Uses existing mandatory ID Card,
- Collates meeting content,
- All stored in central location and
- Can be readily reported on.



Exciting Steps Forward

Gate Keeper Processes

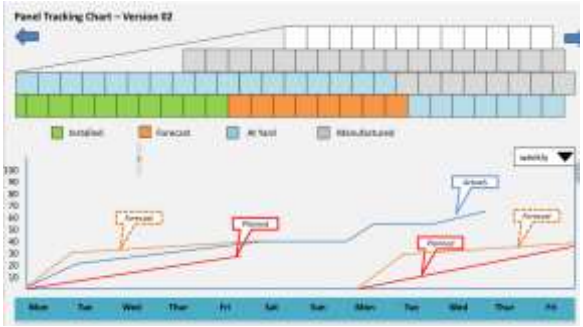
- Major Workflow removes several paper forms, including:
  - Driver Inductions and
  - Dockets
- Records vehicles currently on site,
- Time In and out of site,
- Actual Deliveries made vs Planned,
- Visibility of locations of where deliveries are placed,
- Plus many more.



Exciting Steps Forward

Individual Precast Panel Tracking

- Transforms an entire process through full visibility, by:
  - Including the Supply Chain,
  - Embedding Baseline, Forecast and Actuals for:
    - Cast,
    - Delivery and
    - Installation.
- Associated escalations if Forecast is exceeded and
- Incorporates QA documentation.



Exciting Steps Forward

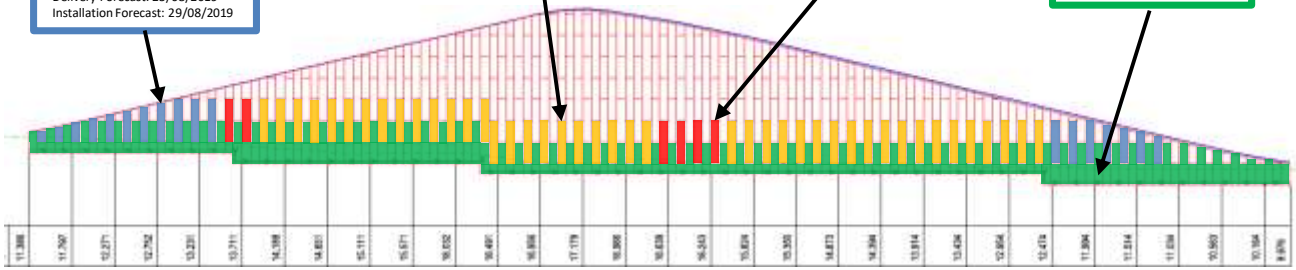
Date: 27/08/2019

Phase: Cast
Panel ID: RA/07
Cast Date: 17/08/2019
Delivery Forecast: 25/08/2019
Installation Forecast: 29/08/2019

Phase: Delivered
Panel ID: RA/05
Cast Date: 15/08/2019
Delivered Date: 22/08/2019
Installation Forecast: 27/08/2019

Phase: **CAST**
Panel ID: RA/06
Cast Date: 14/08/2019
Delivered Date: 21/08/2019
Installation Forecast: 26/08/2019

Phase: Installed
Panel ID: RA/09
Cast Date: 12/08/2019
Delivered Date: 20/08/2019
Installed Date: 25/08/2019



Key	Element Cast	Element Delivered	Element Installed	Element Behind Forecast

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Thank you

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