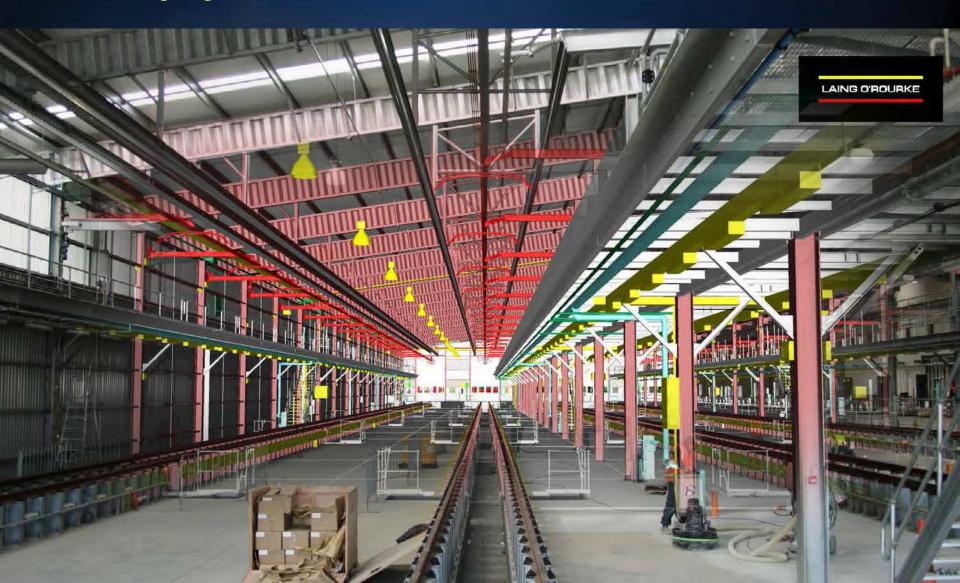
Digital Engineering for Project Delivery Wulkaraka Rolling Stock Maintenance Centre

BrisBIM Gathering – August 2015





Scope:

Design, construction, commissioning and fit out of a maintenance depot to service new 100 car fleet in 6 car configurations, including all necessary depot plant and equipment.

The new depot includes:

- Maintenance Building
- Wheel Lathe Building
- Operator Area/QR Train Crew Facility
- Gatehouse
- Remote Stores Building
- Approx 10km of rail

Client: Bombardier Transportation Australia Pty Ltd (BTA)

Contract Signed: January 2013

Location: Wulkuraka, Queensland

Site Mobilisation Date: 15th January 2014

Practical Completion: 5th Feb 2016



Team Structure

Key Designers Interface

Hyder Structure, Civils, Rail, MEP

NDY Acoustics / Fire

McKenzie BCA and DDA

Mode Architecture and Landscape

Webb Security

LORAC OLE and signaling

All working within a coordinated model environment



Key Subcontractors, Interfaces, ECI with Design

Precast Service Trenches / Pits

Steelwork/ILB

Electrical

Specialist Rail Equipment

Civils

BMS / Security

Cladding





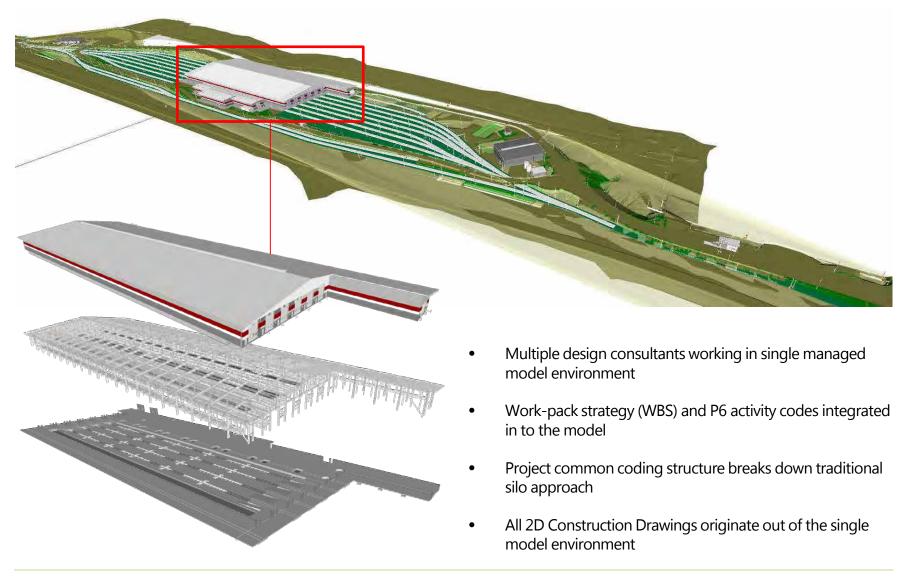


Build Twice – Once Virtually!





Model Strategy



Collaboration

Updated Navisworks model is shared weekly with:

- Bombardier
- Facility Operations Team (A&M)
- Project Co (Qtechtic)
- State (TMR)

Model being utilised for:

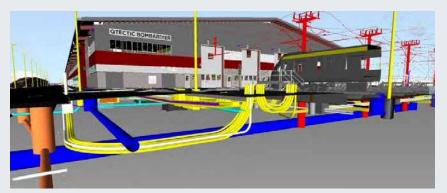
- Safety in Design (SiD)
- Hazards in Operations (HAZOP)
- Operational Strategy (A&M)
- Safety in Operations
- Interface Management
- Integration with New Generation Rollingstock (NGRS)
- Weekly Design Collaboration Meetings with all Stakeholders

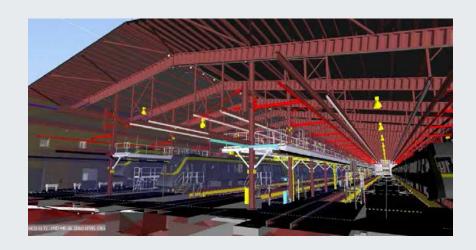




Benefits

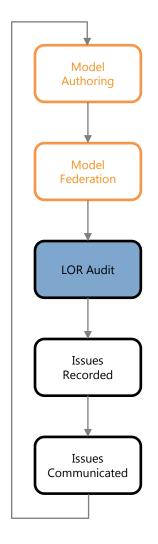
- All construction information co-ordinated in a single model environment, integrating multiple software platforms
- Clash detection and co-ordination, 2000+ clashes resolved prior to construction
- Early DfMA Strategy
- Integration and Interface co-ordination of multiple systems
- Detailed Co-Ordination with evolving Rollingstock design
- Multiple SiD and HAZOP reviews incl. reviews of Operator requirements and Stakeholder Management / User Groups walk throughs (allocation of Equipment).
- P6 Planned vs. Actual reporting / Progress heat mapping
- 5D (Progress Claims / Earned Value)
- Digital Method Statements
- BIM360 construction team access to model

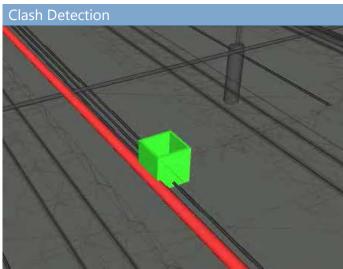


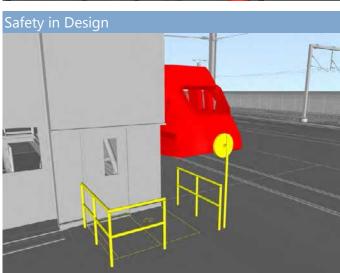




Design Collaboration Workflow



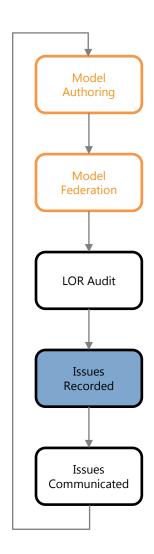


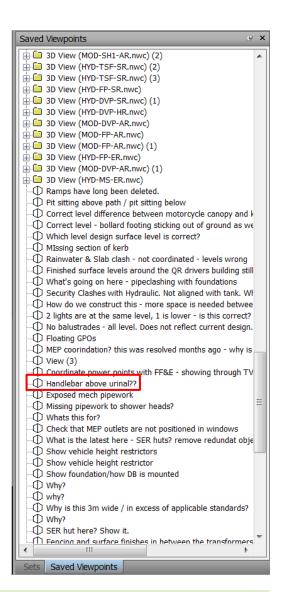




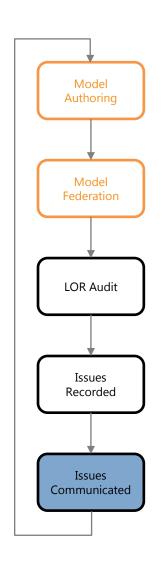
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Design Collaboration Workflow





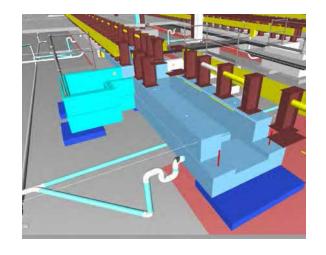
Design Collaboration Workflow





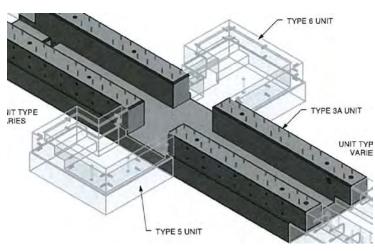


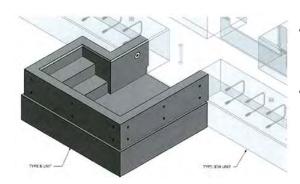
DfMA Thinking



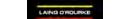




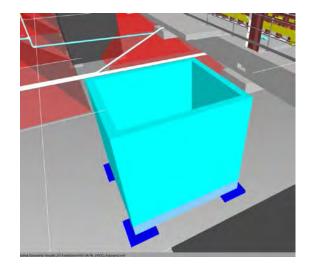


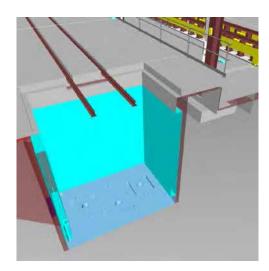


- Design is tested for construction in 3D
- DFMA strategy established in the 3D environment
- Transportation & Install of elements planned in Model



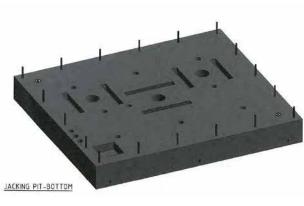
DfMA Thinking

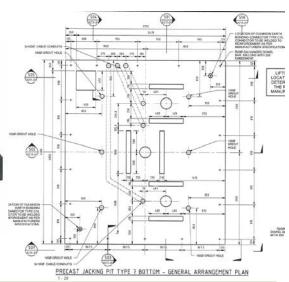






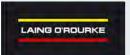






Construction

- Automated machine guidance
- Communication improved through Digital Method Statements
- Generation of Digital Workpacks using BIM 360



Machine Guidance

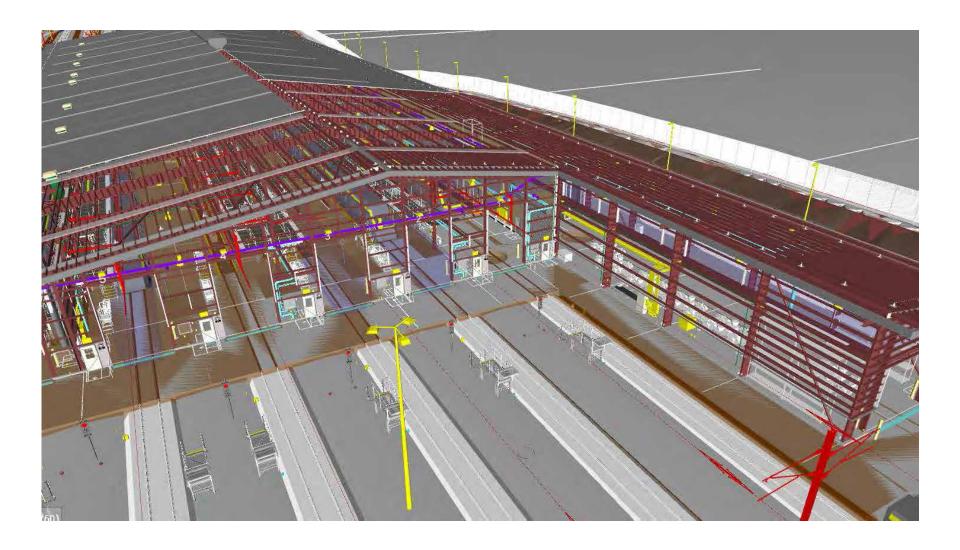








Digital Method Statements

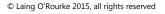




Digital Workpacks

- Supervising staff and engineers can access relevant project data (Work Packs) whilst on site;
 - Drawings
 - Specifications
 - ITR's
 - 3D Model
 - Safety Inspection Sheets
 - Environmental Inspection Sheets
 - Defect Punch List
- Access to task sheets and quality reports on the tablet
- Ability to view and interrogate 3D model in the field.
- Issues can be "pinned" to specific locations on the model.







Digital Workpacks

Digital Work Package – Dashboard

- Notebook or Desktop access to upload, and manage digital workbooks
- Customize Dashboard
- Generate custom reports





Digital Workpacks





Checklists (ITP / ITR)



Work Pack Documents



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