BEST PRACTICE ASSET MANAGEMENT
BIM – Pyrmont Bridge Case Study

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• The Asset
• Heritage
• Why BIM?
• Model Specification
• Application
• Reporting
• Lessons Learnt
• The Future
• World’s oldest surviving electrically operated swing span bridge
• Commissioned 1902
• National engineering landmark 1992
• NSW State Heritage listing 2002
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OWNERSHIP:

• NSW Roads, DMR
• DHA - Bi-Centennial Development Project - 1984 (Dept Public Works)
• SHFA ongoing
A New Approach to Asset Management

BIM (Building Information Modelling) is a process involving the generation and management of digital representations of physical and functional characteristics of built assets.
Benefits of BIM:

- Supports decision-making about an asset’s operational life by providing a single database for all data to reside
- Open protocol format
- System integration
- Start of long-term, archival, intelligent asset record for the bridge
- Supports the Burra Charter (Heritage Conservation Guideline)
Objective:

- to support the development of a minimum sustainable Building Information Model for the asset management of Pyrmont Bridge
- ...which will in turn support the minimum data set for the intelligent operation, maintenance and refurbishment of the Bridge
Tender Brief:

- **Clear description of project objectives**, what deliverables are required at handover
- **NATSPEC National BIM Guide**
  - Establishes key elements of a BIM-based project.
  - IFC and COBie standards specified.

**Tenderers to:**

- Submit a Building Management Plan (BMP)
- BMP is a formal document defining “how the project will be executed, monitored and controlled with regard to BIM”.
Asset Specification:

- **Asset nomenclature**
  - BIS standards
  - Pyrmont Bridge Documentation

- **Compliance Context**
  - Structural compliance, heritage significance, operations

- **Asset Information**
  - Reporting and analysis
  - Strategic planning

- **Inspection Methodology**
  - Condition Assessment - data collection, data entry
early modelling
Pyrmont Bridge Model Auditing:

• **Model Quality**
  • is model assembled and exported correctly?
  • is modeller consistent in modelling?
  • does model contain the correct scope of objects?
  • do objects have all data requirements satisfied?

• **Model Auditing**
  • Regular quality check
    – Defined milestones
Application of the Model

A software-based tool for capturing and analysing condition assessment data, managing operational and preventative maintenance.

Procurement of a pilot Software as a Service (SaaS) to provide:

- User friendly interface
- Portability
- NSW Government Guidelines compliance
Challenges:

• Not undertaken previously, let alone to this scale (7,343 elements assessed)
• Manual data entry to digital – cultural change
• Customisation of the iPad, customisation of screens for data entry, shortcuts, and download
Pyrmont Bridge Reporting:

- Original / non-original fabric vs deterioration over time
- Works package development – lineal metre, surface area estimates
- Exception reporting – reliability/accuracy
- Management reporting holistic view to condition assessment
Pyrmont Bridge Reporting:

Orientation to weathering Hanging Rods span 7-12 Paint Condition
Lessons Learnt

Contract Specification:

• Model too detailed. Nuts / bolts / Plates. LOD 500 – now reduced for usability / efficiency.

• IFC export file size 927 MB, Solibri Optimizer > 545 Meg> Zuuse Optimizer 400 Meg. Need to break model down into manageable sections. Identity data to be clearly defined at onset.

• Contract required Condition Assessment data be captured as a part of Model Construction Contract.

• Cobie Format - Internationally adopted spec for information exchange suitable for buildings / not Bridges. Better definition for electrical and mechanical components.

• Nomenclature not specific enough in relation to a number of attributes.

• Lidar Scan
Lessons Learnt

**Condition Assessment:**

- Data preload
- iPad too big in particular areas for photographing, inability to take photos from photos already taken
- No flash available on iPad
- Moving platform, glare settings, battery recharge facility
- Tablet navigation
THE FUTURE

1. Pyrmont Bridge

• Progressive Data Capture – Bridge Health Index / Element Remediation / Model correction

• Model efficiency

• Work Package Development

• Operational / Preventative Maintenance
PYRMONT BRIDGE BIM

Operations functionality
Work Package Development
THE FUTURE

2. Organisational

• To implement BIM on a precinct wide basis incorporating public domain and building assets (particularly heritage) for Asset Management.
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