CIF DIGICON 2020
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eProcurement - Building Information Modelling (BIM)
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Agenda

- Introduction
- Overview of Capital Works Management Framework (CWMF)
- Building Information Modelling (BIM)
- Why BIM Works - Standards
- BIM and CWMF
- Implementation Strategy
Introduction

In Ireland, public infrastructure procurement is governed by the Capital Works Management Framework (CWMF) using Public Works Contracts (PWC)

In 2014 a Review of the Public Works Contracts was prepared for the Government Construction Contracts Committee

• Some Key Findings:
  • Poor definition of the works requirements
  • Insufficient identification of risk
  • Inappropriate risk allocation

• BIM was recognised by the GCCC as a powerful risk management tool.
  • Digitalisation of the Information Requirements for Public Works projects
The Construction Policy Unit of the Office of Government Procurement have the responsibility of supporting the Irish Construction Sector when they engage with the CWMF.

Team of 9 people (and growing) manage the CWMF which has 4 Pillars:

Pillar 1: PWC’s -11 Contract types, supported by,
20 Model Forms, 9 ITT’s, 13 Form of Tenders and Schedules, Authorised Bonding Business, Arbitration Rules, Weather Events, Information note on GDPR.

Pillar 2: Conditions of Engagement
2 Standard Conditions of Engagement, 6 Model Forms, 4 ITT’s (Services), 2 Form of Tenders and Schedules (Services), Arbitration Rules, Information note on GDPR.

Pillar 3: Cost Planning/ Control and Suitability Assessment
6 Standard forms for Cost Planning and Control, 6 Suitability Assessment Questionnaire's

Pillar 4: Guidance Notes and Glossary
28 Guidance Notes, 1 Glossary,

Totals: 103 Documents – 1000’s of pages of Guidance Notes
Overview of CWMF

- Procurement is a complex process engaging Clients, End Users, Administrators, Technical Professionals, Works Contractors, Suppliers, Construction Specialists, and Facility Managers.

- Public Spending Code, CWMF Rules, Government Initiatives
  - GCCC Position Paper (2017), BIM-Adoption-Strategy-Statement-of-Intent, CPP 01/17
  - National Bim Council (2017), Roadmap to Digital Transition For Ireland’s Construction Industry 2018-2021

- Government policy objectives from CWMF:
  - Cost certainty at tender award stage
  - Better value for money (VFM), and
  - More efficient delivery of public works projects
The Construction Policy Unit of the OGP are undertaking a review of the CWMF.

Potential Digital Solutions that can streamline the procurement process include:

- Construction Procurement Portal (Potential National CDE for Public Procurement)
  - Contracting Authority Registry
  - Construction and Construction Related Service Passport
  - Project Management
- Streamlined procurement strategy
  - Contract selection
  - Supporting contract documentation
- Compliance with the Public Spending Code and CWMF
- Complete once approach
- User profiles
- Project tracking
- Process flow management
- Smarter Contracts
- Less time to prepare Procurements
- Less time to prepare Bids
- Less time to prepare Tender Analysis
- Digital Assets

Future of CWMF

PAPER VS. DIGITAL

It seems as though one cannot escape a BYOD workplace or the abundance of enterprise adopted applications. Every aspect of business has been impacted by this transition, but the question still remains: has print been replaced by a digital medium?

Paper Benefits
- Easily locate files
- Enablement for thorough editing
- Paper cannot be edited by a third party
- No ability to be hacked

Digital Benefits
- 53% easier to send than paper
- 47% more efficient than paper
- 50% more environmentally-conscious
- Half the cost of paper

 OGPGOV.IE
Building Information Modelling (BIM)

BIM and the Public Procurement Process

Collaboration
Building Information Modelling (BIM)

**Drawings**
- Plans
- Sections
- Elevations
- Details
- Room Data Sheets

**Schedules**
- Room/Area Schedules
- Door Schedules
- Windows Schedules
- FF&E Schedules

**Analysis/Visualisations**
- Computer Generated Imagery (CGI)
- Shadow Studies, Thermal Analysis (IES)
- Clash Detection – Hard and Soft

**CWMF Procurement**
- Administration
- Pre Tender Stage Milestones
- Contract Wizard
- Contract Documentation
- Contract Award
- Management and Handover

**Models**
- Architect
- Structural Engineer
- Services Engineer
- Other Designers

**Data Integration**
- Specification
- Quantities
- Design Data
- Construction Data
- Operational Data

[Diagram showing linked data and processes]
Building Information Modelling (BIM)

Federated Model
Building Information Modelling (BIM)

- Architecture
- Structure
- Services

Federated Model
Building Information Modelling (BIM)

- Plantroom Level
- First Floor Level
- Ceiling above Ground Floor Level
- Ground Floor Level
Building Information Modelling (BIM)

- Mechanical Equipment and Ducts
- Electrical Equipment
- Piping
- Services
Building Information Modelling (BIM)

Systems and Components

- Smoke Detector
- Duct
- Ceiling
- RC Column
- RC Wall
- Waste Pipe
- Cable Trays
- Access Hatch
- Insulated Render
- Domestic Hot and Cold Water
- Hand Dryers
- Double Gang Socket
- Foundations
Building Information Modelling (BIM)
Building Information Modelling (BIM)

Traditional Deliverables - but better coordinated
Why BIM Works - Standards

Traditional Approach

- Drawings constructed by Lines by CAD or hand.
- Plans, Elevations, Sections and Details are completely independent and rely upon individuals from all designers to ensure geometry and information is coordinated.
- Specification is manually referenced in drawings.
- Schedules created in a spreadsheet.
- CGIs created using a model based on drawings.

BIM Approach

- The building is modelled in 3D by all designers using components and systems.
- 2D Plans, Elevations, Sections and details are generated from the federated models.
- Data is either integrated into the model elements or referenced through links.
- Computer Generated Imagery (CGI's) are created from the BIM model.
Why BIM Works - Standards

UK standards

BS 1192

PAS 1192-2

Q1 2019

International standards

BS EN ISO 19650-1 + National Foreword

BS EN ISO 19650-2 + National Annex

PD 19650-0 Guide to BS EN ISO 19650

IS EN ISO 19650-1:2018 and IS EN ISO 19650-2 are available at https://shop.standards.ie/
BIM and CWMF

BIM Risks

1. Standards are great but SMEs don’t have time to apply the standards correctly.

2. There are mixed interpretations of standards across professions and organisations which has been a limiting factor in the success of BIM adoption.

3. Clients don’t have sufficient knowledge to procure in BIM.

4. Important for industry professionals to determine how we adopt standards and technology — otherwise someone else will do it.

By digitising the CWMF Procedures utilising the BIM process, standards will be applied to the information structure from Concept to Asset Management. This will develop better outcomes for asset delivery with a greater emphasis on quality, risk management, programme and cost certainty. NSAI are developing BIM implementation templates for the Private and Public Construction sectors in Ireland.

STANDARDISING THE PROCUREMENT PROCESS THROUGH DIGITALISATION
HAVING THE RIGHT INFORMATION AT THE RIGHT TIME AND RIGHT STAGE OF THE PROCUREMENT PROCESS
BIM and CWMF

Business Case

Organisation Information Requirements (OIR)

Asset Information Requirements (AIR)

Project Execution

Pre-contract

Employers Information Requirements (EIR)

Pre-contract BIM Execution Plan and Project Implementation Plan (PIP)

BIM Protocol including Responsibility Matrix, Information Particulars and optional Security Requirements

Appointment

Post-contract

Post-contract BIM Execution Plan

Responsibility:

Employer  Bidders  Successful Bidder
BIM and CWMF

- Standards
- Minimum requirements for BIM Information Exchange
- Outline of BIM process
- Organisation Information Requirements
- Plain Language Questions
- Asset Information Requirements
- Roles and Responsibilities
- Employers Information Requirements
- BIM Protocol
- BIM Execution Plan
- Common Data Environment
- Project Information Model
- Information Exchanges
- Asset Information Model
Implementation Strategy

- Public Sector BIM adoption strategy
  - Government mandate
    - The Government is planning to Mandate BIM on a phased basis
      - 1) to ensure that public bodies invest the necessary resources to adopt BIM in line with the strategy and
      - 2) to impose standards for delivery across the public sector.
      - 3) to develop BIM skills over a 4 year period for all Public Works Contracts
        - Firstly for Clients and Consultancy
        - Secondly for Contractors and Supply Chain
        - Initially on high value contracts where most of the BIM Skillset resides
        - Gradually introduced on lower value contracts
  - New European Standards are in development and publication
    - e.g. EN ISO 19650-1 and 2 – Series in Publication 3 and in development 4,5,6
  - Certification of BIM Capability through NSAI – (Can be applicable as part of a quality assessment for tender evaluation)
Indicative phasing concept from GCCC Position paper. BIM implementation is to be phased to accommodate the training and knowledge base in the Irish Construction Sector.
Implementation Strategy

As a Member of the European Union there are International Standards such as EN ISO 19650 series, (currently been published), that will have an impact on a Digital Transition of the Construction Sector in Ireland

The EU BIM Taskgroup have produced the “Handbook for the Introduction of Building Information Modelling by the European Public Sector - Strategic action for construction sector performance: driving value, innovation and growth”

The Handbook is aimed at

- Public policy user Involved in the development of policy for infrastructure or construction sectors
- National or local public client/procurer user Primarily concerned with procurement of services
- Operator user Responsible for the on-going management and operation of the built asset or environment
Implementation Strategy

Definition the Digital Life Cycle of a Project from concept through to end of life (Current CWMF).

- **Stage 1** - Define the need, Concept, – A system to manage the decision making process – Brief Outline
- **Stage 2** – Procurement – Definitive Brief, Design – Definition i.e. Pre Contract BIM Execution Plan (Pre-contract BEP)
- **Stage 3** – Contract Award – Post Contract BIM Execution Plan (Post Contract BEP)
- **Stage 4** – Construction – Build and Commission
- **Stage 5** – Handover – Handover and Close Out
- **Additional Stage**
- **Stage 6 – Operations – Maintenance and Operation**
Implementation Strategy

What the Irish Construction Sector needs to do!
• Appropriately define the BIM requirements (Asset Registers to comply with ISO 55000).
• Manage Risk (Follow CWMF procurement rules)
• Define a Digital Plan of Works – Produce the right information in the right format at the right time throughout the entire project.
• Define a Classification System
• Systemise efficiencies
• Develop new professional skills – Training and Resources
• Provide an IT infrastructure for Clients to engage in a collaborative Procurement Process (Cloud Based)
• Centralise open resources

Engage with Professionals, Client’s and Government Agencies to develop user friendly BIM toolkits which will benchmark BIM in the Irish Construction Sector and provide opportunities for all stakeholders
Thank You For Your Time

Questions or RFI’s!!!!!
References

- National Bim Council (2017), Roadmap to Digital Transition For Ireland’s Construction Industry 2018-2021
- GCCC Position Paper (2017), BIM Adoption Strategy Statement of Intent, CPP 01/17
- Mr. Michael Earley DipArch(Tech) BSc(Comp Sci) MICS MRIAI(Tech) Presentation for the launch of RIAI BIM Pack 2019
Delivering Sustainable Procurement Solutions

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