BIM Management Training Course
One Day Course on the fundamentals of BIM Management

ciobacademy.org
Agenda

The importance of BIM?

What is BIM Management?

Tasks and Daily Activities for BIM Management

Summary of Skills and Responsibilities for BIM Management

Processes – Project and Organisational

Summary
Why?

- Influential professional body
- Worldwide influence
- Industry Demand
- Skills shortages
- Continual Learning
- Support
- Recognition
- BIM Knowledge
Themes

Module 01: Strategic BIM Management
Module 02: Project Management
Module 03: BIM Skills and Training
Module 04: BIM Processes & Procedures
Course Structure
Course Summary

Module 01: Strategic BIM
Key Learning Criteria:
- Organisational Goals
- BIM Strategy – Business Case
- BIM Policy
- BIM and Prequalification
- Collaborative forms of contract.

Module 02: BIM Standards and Project Management
Key Learning Criteria:
- BIM Standards
- BIM Briefing
- DIR’s / AIR’s / EIR’s
- BIM Execution Planning.
- LOD
- Supplier Tasks

Module 03: BIM Skills and Training
Key Learning Criteria:
- Roles & Responsibilities (PAS 1192-2)
- Skills Assessment
- Knowledge and capability
- Monitoring and maintaining BIM related Skills
- Training Strategy

Module 04: BIM Procedures and Processes
Key Learning Criteria:
- BIM Technologies Overview
- Data drops and deliverables
- Information Exchanges
- Terminology (LOD, MPDT, TIDP and a BIM Execution plan).
- Information Delivery Cycle
Tutor Introduction

Rebecca De Cicco FCIOB, Chartered Construction Manager.

RICS Certified BIM Manager

MBA Certified Construction Professional.

BIM Regions/ WIB / UK BIM Alliance

Autodesk Expert Elite/ Feedback / Marketplace Service Provider.

Building Smart International
Delegate Introductions
Background & Context

What is BIM?

Challenges of BIM

Information Management

Why BIM?

BIM Benefits
What is BIM?
The ‘I’ in BIM
Terms

3D Models

Creation and Collation of Graphical Data

Collaboration At all Stages.

Structured Information through non-Graphic Data

Collation of Data over Entire Lifecycle
A Staged Approach

- Strategic Briefing
- Design
- Construction
- Operation
- Maintenance & Care
Requirements for Success

- **Client Information**
  - Requirements Defined

- **A clearly defined and managed process**

- **Delivery of information is monitored and checked.**
Process

- Defining BIM Deliverables
- Client Needs
- Information Exchange
- Asset Life Cycle
- Structured Sharing

BIM
Terminology – BIM

- Graphical Data
- Non-Graphical Data
Graphical Data

- 3D Models
- 2D Drawings
- Spatial Diagrams
- Visualisations
- 3D Diagrams
Non - Graphical Data

- Asset Data
- Calculations
- Room Data Sheets
- Schedules
- Operation & Maintenance Manuals
Why BIM?

- Policy Driven - E.g. Government (globally)
- Productivity
- Client Driven
- Industry Push
Why BIM?

- Information Clarity
- Identify of Errors/Issues
- Collaboration through Entire Life.
- Health & Safety
- Visibility & Transparency
- Design Success
- Cost Clarity
- Effective Handover
- Operational Benefits.
Benefits – Whole Life

- As Constructed to Asset
- Better Information
- Clear Requirements
- Design & Coordination
- Materials & Construction
- Record Gathering
- Collection and structured Sharing
- Consolidated Information
Benefits - Organisational

- More Control
- Easy access to information
- Cost savings
- Business opportunities
- International Context
- Scale of Projects
- Greater Visibility
- Intelligent Modelling
Challenges of BIM

- Cultural
- Digital Methods
- Skills & Education
- Perceived Costs
- Client/Owner Knowledge
- Information Management
Technical Challenges

Technology Advancements

Terminology Consistency

Buildings Versus Infrastructure
UK & Global Challenges

Skills Demand & Education throughout Industry

Learning Curve & Investment in Training

Time & Cost of Implementation

Challenges with Global Variations in Terminology
01
Strategic BIM
Overview

Organisational Goals

Contractual Implications of BIM

BIM and Prequalification

BIM Policy

BIM Strategy – Business Strategy
Organisational Goals

- Strategic Approach
- Wider Business Objectives
- Growth / Development
Strategy

Strategy / Why?

Skills Gap Assessment

Develop Implementation plan / Organisation or Project
BIM Policy

Lionweld Kennedy Flooring / Access Design & Engineering are the industry’s most experienced provider & installer of metalwork solutions. Its core value is to give clients satisfaction from design to installation, peace of mind & value engineering with safety ensured.

Lionweld Kennedy Flooring / Access Design & Engineering are fully committed to the deployment of Building Information Modelling (BIM) on its projects. We have already invested in BIM technologies that align with our design to manufacturing processes, invested in staff technical and management training and are engaging with our Customers so we can help them achieve their aspirations and align with their BIM workflows in a collaborative manner.

On projects where BIM is implemented, we work closely with the project team to ensure that the agreed benefits are achieved; also we capture all lessons learned to drive continuous improvement across our entire group of companies for the benefit of our Customers future projects.

Lionweld Kennedy Flooring / Access Design & Engineering have developed an in-house capability to meet the UK Government’s deployment strategy for Level 2 BIM and are currently progressing BIM Certification to reinforce our capabilities and expertise.

For and on behalf of Lionweld Kennedy Flooring / Access Design & Engineering

Signed

Lionweld Kennedy Flooring / Access Design & Engineering Managing Director
Date: July 2016
Objectives of Business

Productivity
Open & Collaborative Culture
Innovation & Technology
Profitability
Growth
Implementation Strategy

New Skills

Knowledge Growth

Education

Local Drivers
Implementation Structure

- Strategic
- Management
- Technical
Pilot Projects

What are Pilot Projects?

Successfully mapping BIM against a Pilot

Benefit Realisation

Record Lessons Learnt
Existing Client Work (e.g. Government)

- BIM Strategy
- BIM Inception
- Organisation and Asset specific Information
- Employers Information Requirements
Clarity on BIM Use

Why?

Processes in Place

Clear and thorough understanding

What BIM Uses are we needing?

BIM Process
BIM Uses

- Gathering
- Generating
- Analysing
- Communicating
- Realising
BIM Uses

- **Design**
  - Modelling existing
  - Capturing Site
  - Site Analysis

- **Construction**
  - Health and Safety
  - Logistics Planning
  - Clash detection

- **Operation**
  - FM Integration
  - Creation of Asset Model
  - 3D Spatial Handover
Skills and knowledge

- Analyse Existing Skills
- Review Training Strategy
- Implement Targeted Training / Education
Well Defined Process

1. Team Appointed
2. Information Delivered and shared
3. Suppliers Assessed
4. Information Requirements Defined
5. Project information to asset information
Recommendations

Model Use
Client Strategy
Roles and responsibilities
Rewards
Collaborative Working
Discussion Point

Components of a BIM Strategy
Skills & Knowledge – Project Specific (PAS1192-2)
Selection Process

Prequalify
- Via selected questions relating to all project specific requirements

Review Supplier Assessment
- Assess BIM capability and knowledge

Contract Award
- Appoint selected team and share BIM Brief / EIR.
Pre-Qualification Process

1. Proof of Capability
2. Experience in BIM
3. Customised Questions
Pre-Qualification

Set of questions for pre-qualification

‘Optional’ BIM module

Recommended for UK Government Projects.
### Table 8 – Optional Question Module O4: Building information modelling, policy and capability

**NOTE** This will be used for UK Government procured projects for Departments that have commenced implementation of the BIM Strategy and may be used by other clients adopting a similar path.

<table>
<thead>
<tr>
<th>Exemption</th>
</tr>
</thead>
<tbody>
<tr>
<td>The questions in this module need not be completed if your organization holds a third party certificate of compliance with BS PAS 1192-2:2013 (due for publication in 2013) from an organization with a related UKAS accreditation, or equivalent.</td>
</tr>
<tr>
<td><strong>Exemption Claimed</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Please provide copy of certificates or other supporting information.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q. No.</th>
<th>Question</th>
<th>Description of Information in support of response, which will be taken into account in assessment</th>
<th>YES</th>
<th>NO</th>
<th>Supplier's unique reference to relevant supporting information</th>
</tr>
</thead>
<tbody>
<tr>
<td>O4-Q1</td>
<td>Do you have the capability of working with a project using a “Common Data Environment” as described in PAS 1192-2:2013?</td>
<td>You will be expected to demonstrate that your organization understands the concept of a “Common Data Environment” as described in PAS 1192-2:2013 and is able to exchange information between supply chain members in an efficient and collaborative manner. If you have delivered a project in this way, you may use this to demonstrate your capability. Your explanation should be clear and concise.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O4-Q2</td>
<td>Do you have documented policy, systems and procedures to achieve “Level 2 BIM” maturity as defined in the government’s BIM Strategy? (See note to this Table)</td>
<td>You will be expected to provide evidence that you or your organization has a policy authorized by the Chief Executive or equivalent and regularly reviewed. The policy and procedures should be able to be applied to both large and small projects efficiently.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pre-Qualification
Project Implementation Plan

SCCS

Supplier IT Assessment

Supplier Resource Assessment

Supplier BIM Resource Assessment
Supplier Assessment

Supply Chain Capability Summary Form

This is the summary of all assessment forms which form part of the overall selection process once reviewed.

Supplier BIM Assessment Form

- General BIM questions
- Area of BIM projects may support
- BIM project experience
- BIM capability questionnaire
Supplier Assessment

Supplier IT Assessment Form

- General production and distribution of information policies.
- Team Information
- Drawing and CAD management
- Document numbering Systems
- Experience with Web Based Project Tools.
- PI Policies
- Email & Internet Policies
- Technical Information on Software & Systems

Supply Resource Assessment Form

- Resources to deliver project and experience
- Organisation and Team information
BIM & Contractual Obligations

AIA Guidance
Supports the USA in how BIM affects contracts and any recommendations to suppliers.

UK Guidance
The BIM Protocol used for clients to append to existing contracts. No major changes to existing contracts.
AIA Documents

AIA E203-2013
BIM & Digital Data

AIA G201-2013
Project Digital Data Protocol

AIA G202-2013
Project BIM Protocol Form
The BIM Protocol

Levels of Detail and the Model Production and Delivery Table

<table>
<thead>
<tr>
<th>Levels of Detail (LOD)</th>
<th>Stages</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOD 1</td>
<td>STAGE 1</td>
</tr>
<tr>
<td>LOD 2</td>
<td>STAGE 2</td>
</tr>
<tr>
<td>LOD 3</td>
<td>STAGE 3</td>
</tr>
<tr>
<td>LOD 4</td>
<td>STAGE 4</td>
</tr>
<tr>
<td>LOD 5</td>
<td>STAGE 5</td>
</tr>
<tr>
<td>LOD 6</td>
<td>STAGE 6</td>
</tr>
<tr>
<td>LOD 7</td>
<td>STAGE 7</td>
</tr>
</tbody>
</table>

Information Requirements

1. Standards
   The following standard(s) shall apply:

2. Parties
   2.1 The parties involved in the project are:
   2.2 The role of Information Manager shall be performed by the following person or persons for the following stages:

<table>
<thead>
<tr>
<th>Stages</th>
<th>Person</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Overview – Risks

COMMERCIAL IMPLICATIONS – RISKS AND LIABILITIES

- Deliverables
- Model Ownership
- Clear Communication
- Knowledge & Skills
Guidelines

1. Project details
2. Nature of services
3. Role of Info Manager
4. Additional coordination activities
5. Sub-consultant appointment
6. Hosting a BIM environment (CDE)
PI - Guidelines

Role of IM

Sub consultants

LOD v MPDT

Too much design
PI - Guidelines

Status

Model checking

Software licenses
02
BIM Standards & Project Management
Overview

BIM Standards

The importance of LOD.

BIM Technology requirements (project based).

What are BIM Uses and understanding their relevance.

BIM Briefing

The importance of an EIR.
Standards Supporting BIM

- Briefing for Soft Landings/FM – BS 8536-1:2015
- Capital/Delivery Phase - PAS 1192-2:2013
- Operational Phase - PAS 1192-3:2014
- COBie - BS 1192-4:2014

Collaborative Processes

Document Issue and Management

Standard Methods Procedures

CDE Management
Standard method and procedure

Roles and responsibilities should be agreed

Naming conventions should be adopted

Arrangements for project-specific codes should be in place

A CDE approach should be adopted

An information hierarchy should be adopted
PAS 1192-2:2013

- Capital Delivery Phase
- BEP, TIDP, MIDP, MPDT, EIR
- Roles and Responsibilities
- Project Information Model
PAS 1192-3:2014

- Asset Information Management
- CDE & the AIM
- Roles and Responsibilities
- Managing the Information Exchange into occupation
BS 1192-4:2014

- Requirements for COBie
- Information Exchange
- COBie Structure
- COBie Worksheets
- Process of Delivery
PAS 1192-5:2015

The Build Asset Security Strategy – development

Process of developing the BASMP

Working with suppliers

Asset management process
PAS 1192-6 and 7?

- PAS 1192-6 Health and Safety
- PAS 1192-7 Product Data Dictionary
International Standards
ISO 9001:2008

- Quality Management
- BIM Systems Internally
- Proof of capability
- Customer needs
ISO 55000

- Asset Management Strategy
- Use of Asset Management
- Roles and responsibilities
- Structure
ISO 19650 – Part 1 and 2

- International standard for BIM
- Covering Design, Construction and Operation
- A development from PAS1192-2 & 3
- Regional Annexes
Challenges - Standards

- General Usage
- Confusion
- Consistency
- Global Differences
- Support?
Client Guidance and Process

Understanding of BIM  A Strategic Approach  Developing a Framework
What is the process?

DIR  AIR  EIR
Client – What are OIR’s?

ORGANISATIONAL INFORMATION REQUIREMENTS (OIR)
The Shared Estates Service (SES) Cluster: Project Control Framework

STD/BIM/P002 (G0300)

A strategic overview of MoJ data requirements and intended uses
For Building Information Modelling and Management
Client – What are OIR’s?

- Legacy data
- Dynamic Metering
- Asset Replacement
- Benchmarking
- Areas
- Validation
Client – What are AIR’s?

ASSET INFORMATION REQUIREMENTS
The Shared Estates Service (SES) Cluster Project Control Framework

STD/BIM/P004, P004.1, P004.2, P004.3 (G0500)
Information Delivery Plan (IDP) and Data Specification for Building Information Modelling & Data Sets

Project: [E.g. Cluster_Conference_Room_Pilot (HMP Custodial Kitchen_Project)]

e-PIMS: 000000 BPRN: 0000
Client EIR – Project Specific

EMPLOYER’S INFORMATION REQUIREMENTS (EIR)
The Shared Estates Service (SES) Cluster: Project Control Framework

STD/BIM/P005 (G0200)
Information Requirements for Building Information Modelling & Data-Sets
EIR – Pre Contract BEP

PRE CONTRACT BEP

- PIP
- GOALS FOR COLLABORATION
- PROJECT MILESTONES
- PIM DELIVERY STRATEGY
EIR – Post Contract BEP

- MANAGEMENT
- PLANNING AND DOCUMENTATION
- STANDARD METHODS
- IT SOLUTIONS
- DELIVERY PLANS (TASK SPECIFIC)
EIR - Components

Information Requirements

- Level of Detail (Definition)
- Training
- Planning of work
- Data segregation
- Collaborative Requirements
- Security requirements
- Schedule of specific information
- Information model details
- Compliance plan
- Co-ordinate system
- Technical requirements
- HSE or CDM
EIR - Components

- Details of the competence assessment that bidders must respond to
- Any changes to the tender documentation
- BIM tender assessment details
EIR - Components

- Exchange of information
- Clients purpose
- File Formats
- Strategy
- Responsibility matrix for information Management
- Schedule of standards and guidance documents to be used
- Requirements for roles and responsibilities
Supplier Tasks

- Supplier Task
- Information Deliverables
- Task specific deliverables
- BIM deliverables
- Existing Deliverables
Task Information Delivery Plan

<table>
<thead>
<tr>
<th>File identifier</th>
<th>Model/drawing title</th>
<th>Delivery dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
<td>Originator</td>
<td>Milestone 1</td>
</tr>
<tr>
<td>Volume</td>
<td>Level</td>
<td>Milestone 2</td>
</tr>
<tr>
<td>File type</td>
<td>Disciplines</td>
<td>Milestone 3</td>
</tr>
<tr>
<td>Discipline</td>
<td>Number</td>
<td>Etc.</td>
</tr>
</tbody>
</table>

Based on file naming structure defined by the client.

Dates for delivery.
# Task Information Delivery Plan

<table>
<thead>
<tr>
<th>Project</th>
<th>Originator</th>
<th>Volume</th>
<th>Level</th>
<th>File Type</th>
<th>Role (Discipline)</th>
<th>Number</th>
<th>Model/Drawing Title (or Description)</th>
<th>Delivery Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR1</td>
<td>XYZ</td>
<td>00</td>
<td>00</td>
<td>DR</td>
<td>A</td>
<td>0001</td>
<td>00 GROUND FLOOR GA PLAN</td>
<td>2016-03-04</td>
</tr>
<tr>
<td>PR1</td>
<td>XYZ</td>
<td>00</td>
<td>01</td>
<td>DR</td>
<td>A</td>
<td>0002</td>
<td>01 FIRST FLOOR GA PLAN</td>
<td>2016-05-05</td>
</tr>
<tr>
<td>PR1</td>
<td>XYZ</td>
<td>00</td>
<td>02</td>
<td>DR</td>
<td>A</td>
<td>0003</td>
<td>02 SECOND FLOOR GA PLAN</td>
<td>2016-05-06</td>
</tr>
<tr>
<td>PR1</td>
<td>XYZ</td>
<td>00</td>
<td>03</td>
<td>DR</td>
<td>A</td>
<td>0004</td>
<td>03 THIRD FLOOR GA PLAN</td>
<td>2016-05-07</td>
</tr>
<tr>
<td>PR1</td>
<td>XYZ</td>
<td>00</td>
<td>04</td>
<td>DR</td>
<td>A</td>
<td>0005</td>
<td>04 FORTH FLOOR GA PLAN</td>
<td>2016-05-08</td>
</tr>
<tr>
<td>PR1</td>
<td>XYZ</td>
<td>00</td>
<td>05</td>
<td>DR</td>
<td>A</td>
<td>0006</td>
<td>05 FIFTH FLOOR GA PLAN</td>
<td>2016-05-09</td>
</tr>
<tr>
<td>PR1</td>
<td>XYZ</td>
<td>00</td>
<td>06</td>
<td>DR</td>
<td>A</td>
<td>0007</td>
<td>06 SIXTH FLOOR GA PLAN</td>
<td>2016-05-10</td>
</tr>
<tr>
<td>PR1</td>
<td>XYZ</td>
<td>00</td>
<td>07</td>
<td>DR</td>
<td>A</td>
<td>0008</td>
<td>07 SEVENTH FLOOR GA PLAN</td>
<td>2016-05-11</td>
</tr>
<tr>
<td>PR1</td>
<td>XYZ</td>
<td>00</td>
<td>08</td>
<td>DR</td>
<td>A</td>
<td>0009</td>
<td>08 EIGHTH FLOOR GA PLAN</td>
<td>2016-05-12</td>
</tr>
</tbody>
</table>
Master Information Delivery Plan

- Architectural
- Structural
- Landscape
- Specialist supplier
- Interior
- MEP
- Civil
- Surveyor
Master Information Delivery Plan
Overview

Clarity
Between all suppliers and team members

Time
Deliverables can be checked against project programme.

Issues / Conflicts
Can be resolved quickly if a supplier is not delivering on what they contractually agreed to.

Validation
That information is accurate and correct and delivered as agreed.
Supplier Process

- What is a BIM Use?
- Terminology - LOD
- BIM Execution Planning
The importance of LOD

- Terminology
- Reference
- Understanding
Progress/ History

LOD

LOI

LOa

LOd

LOx

LOC
History of LOD

- Largely geometry driven
- Not specific to other regions
- Aligns to work stages
- Not detailed enough
- No clarity
- Defines information requirements
- More detailed
- Developing
Discussion Point – Time Dependent

How can we train and support other project team members or staff members on the importance of LOD?
BIM Execution Planning
BIM Execution Planning

- Critical to BIM Success
- Supports the EIR
- Updated regularly
- Aligns to Strategic Vision of BIM
Responsibilities

Ownership

Transfer to other parties

Contractual Responsibilities

Archiving
Contents

Overview /Purpose
The importance of the BEP, details of how and why it is to be used.

Project Details
Specific details relating to the project

Management
Roles, requirements, approvals and milestones

Planning
Project processes, BIM Uses, information exchanges and Deliverables

Collaboration
Meetings, roles and requirements
Contents - Purpose

- Strategy
- Purpose
- Application
- Development
- Update
Contents – Project Details

- Project name
- Address
- Number
- Milestone dates
- Description
Contents – Management

- Roles responsibilities and authorities
- Project information model delivery strategy
- Survey strategy (use of point clouds)
- Existing legacy data use
- Approval of information
- Authorisation process
- Standards
Contents – Planning
(Documentation)

- Revised PIP confirming the capability of supply chain
- Agreed project processes for collaboration and information modelling
- Agreed matrix of responsibilities across supply chain
- Task information delivery plan’s
- Master information delivery plan
Contents – Planning
(Standard Method and Procedure)
Contents – Planning
(IT Solutions)

- Software Use relating to specific BIM use
- Exchange Formats
- File Formats
- Processes and any file management
- CDE Management Solution
BIM Uses

- Project Requirements
- BIM Uses / Strategy
- Regularity
- Exchange formats
- Code Checking
Contents – Collaboration

- Collaborative information management
- BIM Initiation Meeting
- BIM Coordination Meetings
- Design Team Meetings
- Client Engagement BIM meetings
Supplier Tasks

- Supplier Task
- BIM deliverables
- Information Deliverables
- Task specific deliverables
- Existing Deliverables
Overview

Clarity
Between all suppliers and team members

Time
Deliverables can be checked against project programme.

Issues / Conflicts
Can be resolved quickly if a supplier is not delivering on what they contractually agreed to.

Validation
That information is accurate and correct and delivered as agreed.
BIM Roles, Skills and Training
Overview

Roles and Responsibilities

Information Delivery Cycle

Assessment of Skills

Training Strategy

Understanding of Staff knowledge and capability
Task Team Management

- Task specific Management (BIM Lead?)

Task Team Information Management
- Task specific Information management - checking and validation

Interface Management
- Coordination / QA & checks through critical milestone dates.
Task Team Management

Leadership

- Tasks should be managed. These can overlap with existing Tasks.

Role Specific

- Each task should manage their own information.

PAS 1192-2 Recommended

- This role is mandated for BIM Level 2
Task Team Information Management

**Quality**
- In order to ensure suppliers understand the importance

**Regularity**
- A timeline for regular model audits shared and known by all parties.

**Checklist**
- A list of model checks shared and made available to all team members.
Interface Management

Coordination Role

- Checks coordination and Clash Detection

QA

- Ensures Task Team is Coordinating and checking information alongside Project Programme.
Task Team Management/ QA
Task Team Management - Design

- **Spatial**
  - Against Brief
  - Asset Type

- **Environmental**
  - Location
  - Sustainable

- **Existing Condition**
  - Vehicles / People
  - Solar Impacts
Task Team Management - Construction
Task Team Management - Operation

- Transfer of data
- Updates to model
- FM integration
- Construction Data
Roles - Client

- Client Representative
- Data / Information Manager
- Security Manager
- Project Managers
- Soft Landings Champion
Roles - Client

**Client Representative**
- Supports creation of BIM Brief
- Supports and manages procurement
- Manages Pre-Qualification and Appointments
- Supports Soft Landings Champion

**Information Management**
- Manage information deliverables
- Support client in defining information deliverables
- Validate information
Roles - Client

Security Management

- Defines the Security Strategy for the Asset
- Supports the Security information requirements
- Manages and governs any secure information

Project Management

- Client Appointed role
- Manages the Project processes and budget
- Retains existing responsibilities of Project management – BIM Knowledge Required.
Roles - Client

Soft Landings Champion

- Defines the Soft Landings initiative at Strategy Stage
- Supports project team
- Monitors the strategy during all stages
- Supports the handover stages of a given project.
A client is responsible to appoint a relevant party to undertake the role of Information Management.
Roles – Project Team

- Existing Supplier Roles (e.g. Architect / Engineer)
- Information Manager – Task Specific
- BIM Coordinator
- BIM Technician
- BIM Manager
Roles – Project Team

**Architect/ Engineer/ Contractor**
- Original roles
- Delivers in line with their contractual obligations
- Supports the BIM process and assigns internal teams
- Keeps up to date with industry changes and technologies.

**Task Information Manager**
- Manage information deliverables on behalf of their task
- Create and support information deliverables for their task.
- Check, audit and control information being shared across a project relevant to their specific task.

**BIM Manager**
- Manages all BIM related queries on a project or in the organisation.
- Manages internal standards in regard to BIM
- Trains and supports Organisational BIM implementation
- Supports project specific BIM areas on behalf of organisation.

**BIM Coordinator**
- Coordinates information on behalf of their role (e.g. architect)
- Federates all supplies information (e.g. arch/struct/ MEP)
- Reports back any coordination issues.
- Attends BIM Coordination Workshops / meetings

**BIM Technician**
- Supports project specific BIM deliverables
- Creates project models
- Creates BIM objects
- Shares any BIM technical queries to organisation or teams.
Roles – Project Team

Architect/Engineer/Contractor

Original roles
Delivers in line with their contractual obligations
Supports the BIM process and assigns internal teams
Keeps up to date with industry changes and technologies.

Task Team / Information Manager

Manage information deliverables on behalf of their task
Create and support information deliverables for their task.
Check, audit and control information being shared across a project relevant to their specific task.
Roles – Project Team

BIM Manager - Organisational

Manages all BIM related queries on a project or in the organisation.
Manages internal standards in regard to BIM
Trains and supports Organisational BIM implementation
Supports project specific BIM areas on behalf of organisation.

BIM Manager - Project

Reviews and documents any project specific BIM requirements
Responds and supports any BIM related queries on a project.
Attends all BIM related meetings on behalf of project.
May support client side on BIM deliverables by all suppliers.
Roles – Project Team

**BIM Coordinator**
- Coordinates information on behalf of their role (e.g. architect)
- Federates all supplies information (e.g. arch/ structural / MEP)
- Reports back any coordination issues.
- Attends BIM Coordination Workshops / meetings

**BIM Technician**
- Supports project specific BIM deliverables
- Creates project models
- Creates BIM objects
- Shares any BIM technical queries to organisation or teams.
Roles – Asset Management

- Asset Manager
- Facilities Manager
- Security Manager
- Technical Support
- Data Manager
- POE Manager (Soft Landings Champion)
Roles – Asset Management

**Asset Management**
- Manages the Asset Information
- Provide a framework for the Asset Information model
- Reviews Asset specific financial implications

**Facilities Management**
- Manages the specific facility
- Manages how the facility runs through its life
- Ensures policies and procedures for FM are established
- Updates to the Asset as time passes

**Security Management**
- At handover ensures any sensitive data is stored securely
- Allows access to asset
- Updates any information specifically related to security

**Data Management**
- Manages any data to be embedded into the FM system
- Supports the storage and safe keeping of the data
- Manages any supplier needing to embed new data
- Supports the FM team

**POE Management**
- Monitors the POE Process
- Defines the information to be collated across the POE stages
- Shares the data during yearly intervals with the asset owner / client.
Role – Information Management

A client is responsible to appoint a relevant party as an Information Manager (Under the guise of BIM Level 2 in the UK).
Skills Assessment
Skills Gap Assessment

- Internal Knowledge
- Documentation
- Digital Skills
Assess Current Skills

- Technology
- Investment
- Information Management
- Processes
- Current Conditions
Capability

<table>
<thead>
<tr>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills</td>
</tr>
<tr>
<td>Experience</td>
</tr>
<tr>
<td>People</td>
</tr>
<tr>
<td>Proof</td>
</tr>
</tbody>
</table>
Technology

BIM Technology Implementation
Strategic Goals
Choice of Technology
Training Strategy
Current Process Review
Technology Skills

Task Driven ➔ BIM Enabled ➔ Process Required
Assess / Review

- Strategic
- Management
- Technical

**BIM vision**
**Training strategy**
**Technical processes**

**Indoor responsibilities**
**Plan of action**
**Technical training**

Informs
Informs
Informs
Progress / Performance

Monitor
Capture
Feedback
Example Assessment Tools

- KnowledgeSMART
- Global eTraining
- ARUP
- lynda.com
Project BIM Implementation

- Understanding of Organisational Implementation
- Clear Client Guidance
- Training regarding project specifics (regional requirements)
Project BIM Implementation

- Reviewing Information Requirements
- Creating Key Documents
- Sharing BIM learning across teams from projects
- Understanding Whole Life
- Implementing across tiers of company
Benefits Realisation

- Organisational
- Project Specific
- Individual Staff
Competence

Competency Rule 01: Via Organisational Specific Requirements

Competency Rule 02: Based on Project specific requirements

Competency Rule 03: Created in line with Industry Best practice.
Suggested Internal Roles - Organisational

- BIM Technician
- BIM Coordination
- Task Team Information Management/Interface
- BIM Manager Organisation/Project
Training Strategy

BIM for Leaders Training
- Procurement
- Fees
- Staffing

BIM Management
- Standards
- Training
- Project support

BIM Technical
- Software
- Process
- Online Sharing / Documentation
Organisational BIM Manager

- Software
- Standards
- Management
- Support
- Training
- Project Support
- Marketing

BIM MANAGER RESPONSIBILITIES
04
BIM Processes & Procedures
Overview

BIM Technology Overview

Terminology (LOD, MPDT, TIDP and a BIM Execution plan).

Innovative practices

Information Exchange Schema's

CAFM systems

Data drops and deliverables
## Systems - Tech.

### Autodesk recommendations

<table>
<thead>
<tr>
<th>Modest Workload</th>
<th>AutoCAD LT</th>
<th>AutoCAD</th>
<th>Revit / Revit LT</th>
<th>Navisworks Manage/Simulate</th>
<th>3DS Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROCESSOR</td>
<td>3.3GHz 4 Core i7</td>
<td>Quad Core 3.3GHz Intel Xeon</td>
<td>Quad Core 3.3GHz Intel Xeon</td>
<td>3.3GHz Core i5677Xeon</td>
<td>3.3GHz Core i5677Xeon</td>
</tr>
<tr>
<td>RAM</td>
<td>8GB 2133MHz</td>
<td>8GB 2133MHz</td>
<td>8GB 2133MHz</td>
<td>8GB 2133MHz</td>
<td>8GB 2133MHz</td>
</tr>
<tr>
<td>GRAPHICS</td>
<td>NVIDIA Quadro K420</td>
<td>NVIDIA Quadro K420</td>
<td>NVIDIA Quadro K2200</td>
<td>NVIDIA Quadro K620</td>
<td></td>
</tr>
<tr>
<td>DISK</td>
<td>512GB SATA SSD</td>
<td>512GB SATA SSD</td>
<td>512GB SATA SSD</td>
<td>512GB SATA SSD</td>
<td></td>
</tr>
<tr>
<td>OS</td>
<td>Windows 7/10.1 Pro 64-bit</td>
<td>Windows 7/10.1 Pro 64-bit</td>
<td>Windows 7/10.1 Pro 64-bit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average Workload</th>
<th>Average Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>3.3GHz 4 Core i7</td>
</tr>
<tr>
<td>RAM</td>
<td>8GB 2133MHz</td>
</tr>
<tr>
<td>GRAPHICS</td>
<td>NVIDIA Quadro K820</td>
</tr>
<tr>
<td>DISK</td>
<td>512GB SATA SSD</td>
</tr>
<tr>
<td>OS</td>
<td>Windows 7/10.1 Pro 64-bit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Demanding Workload</th>
<th>Large Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>3.5GHz 4 Core i7Xeon</td>
</tr>
<tr>
<td>RAM</td>
<td>16GB 2133MHz</td>
</tr>
<tr>
<td>GRAPHICS</td>
<td>NVIDIA Quadro K5200</td>
</tr>
<tr>
<td>DISK</td>
<td>512GB SSD</td>
</tr>
<tr>
<td>OS</td>
<td>Windows 7/10.1 Pro 64-bit</td>
</tr>
</tbody>
</table>

### Reference
Information Deliverables

3D Models

Data Format

Traditional Drawings/Schedules
BIM Authoring

- Structural
- Architectural
- Electrical
- Mechanical
- Plumbing
BIM Authoring – Architectural

AUTHORING

MODELLING

DATA EXTRACT

DELIVERABLES

INFORMATION
BIM Viewing Technology

- 3D DWF
  - Autodesk Design Review
  - Autodesk Navisworks
  - Freedom
- 3DS
  - 3D Repo
  - Autodesk A360
- BIMX
  - BIMx Desktop Viewer
  - BIMx and BIMx Pro
BIM Coordination/ Interface Management
Exchange Formats

- Clearly Defined
- Managed and created according to project specifics
- Used and shared with all parties
- Common Standard
Data Drops

Data Drop 01  →  Data Drop 02  →  Data Drop 03  →  Data Drop 04  →  Data Drop 05
COBie?
Structure of COBie

Scope of exchange

- Spatial groupings
- Intermediate address
- Common specifications
- Functional groupings
  - Spatial location
  - Equipment occurrence
From COBie to CAFM

<table>
<thead>
<tr>
<th>Information</th>
<th>COBie Worksheets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spaces and Equipment</td>
<td>Space, Type, Component</td>
</tr>
<tr>
<td>PM Schedules</td>
<td>Job</td>
</tr>
<tr>
<td>Safety Procedures</td>
<td>Job</td>
</tr>
<tr>
<td>Systems</td>
<td>System</td>
</tr>
<tr>
<td>System Procedures</td>
<td>Job</td>
</tr>
<tr>
<td>Materials, Tools, Training</td>
<td>Resource</td>
</tr>
<tr>
<td>Associated Documents</td>
<td>Document</td>
</tr>
<tr>
<td>Replacement Parts</td>
<td>Spare</td>
</tr>
<tr>
<td>Space and Equipment Properties</td>
<td>Attribute</td>
</tr>
<tr>
<td>Space Zones</td>
<td>Zone</td>
</tr>
</tbody>
</table>
Example CAFM Solutions

- ARCHIBUS
- MAXIMUM AG TECHNOLOGIES
- Bentley
- ecodomus
- ONUMA SYSTEM
- FM:Systems
- VINTOCON
Model Production Delivery Table (MPDT)

| Information | Use and value | DPoW relationship | Responsibilities | LOD v LOI |

### Core Models

<table>
<thead>
<tr>
<th>Originator</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>ARC</td>
</tr>
<tr>
<td>Structural</td>
<td>CSE</td>
</tr>
<tr>
<td>MEP</td>
<td>MEP</td>
</tr>
<tr>
<td>Contractor</td>
<td>CON</td>
</tr>
</tbody>
</table>

Additional Models

- e.g. Landscaping: e.g. LAR

### LOD v LOI

<table>
<thead>
<tr>
<th>Preparation &amp; Brief</th>
<th>LOD</th>
<th>LOD</th>
<th>RCP Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Substructure</td>
<td>1</td>
<td>1</td>
<td>CSE</td>
</tr>
<tr>
<td>2 Superstructure</td>
<td>1</td>
<td>1</td>
<td>ARC</td>
</tr>
<tr>
<td>3 Exterior</td>
<td>1</td>
<td>1</td>
<td>ARC</td>
</tr>
<tr>
<td>4 Stairs and ramps</td>
<td>1</td>
<td>1</td>
<td>CSE</td>
</tr>
<tr>
<td>5 External walls</td>
<td>1</td>
<td>1</td>
<td>ARC</td>
</tr>
<tr>
<td>6 Windows and external doors</td>
<td>1</td>
<td>1</td>
<td>ARC</td>
</tr>
<tr>
<td>7 Internal walls and partitions</td>
<td>1</td>
<td>1</td>
<td>ARC</td>
</tr>
<tr>
<td>8 Internal doors</td>
<td>1</td>
<td>1</td>
<td>ARC</td>
</tr>
</tbody>
</table>
NBS BIM Toolkit - Introduction

The BIM Toolkit seeks to assist employers to procure digital data. This could be a client as employer forming the project team or a designer or contractor as employer leading the team as the project progresses.

The concept of the digital plan of work is embedded in the BIM Toolkit and evolved to enable employers to define what data they require at each work stage.

To support collaboration it was considered necessary to start by adopting a unified set of work stages against which digital deliverables could be defined.

To support employers it was considered necessary to provide editable templates to assist in the creation of their Plain Language Questions (PLQ) and Employer’s Information Requirements (EIR).

Across industry sectors it was required to provide default listings of the geometry and information for the deliverables required at each work stage.

As a starting point the listings would address the classification categories for complexes, entities, spaces systems, elements and products.

The above content was to be delivered via the function of an editable tool that enables the employer to customise their requirements.
Digital Plan of Works

- **ELEMENT DEFINITIONS**: Levels of Detail and Levels of Information options
- **COMPONENT TYPES**: 100's of components within toolkit
- **WORK STAGES**: Based on 7 stages (CIC) work stages
- **RESPONSIBILITIES**: Model Element Authors (MEA’s)
Information Delivery Cycle
Summary
Course Summary

Module 01: Strategic BIM
Key Learning Criteria:
- Organisational Goals
- BIM Policy
- BIM Strategy
- BIM and Prequalification
- Security and BIM
- Collaborative forms of contract.

Module 02: Project Management
Key Learning Criteria:
- What are BIM Standards?
- BIM Briefing
- The importance of an EIR.
- BIM Execution Planning.
- The importance of LOD.
- Supplier Tasks

Module 03: Skills, Training and Development
Key Learning Criteria:
- Internal BIM Standards
- Modelling Guidelines
- Roles and Responsibilities
- Assessment of Skills
- Understanding of Staff knowledge and capability
- Monitoring and maintaining BIM related Skills

Module 04: Technology Solutions
Key Learning Criteria:
- Hardware and software requirements
- Innovative practices
- CAFM systems
- Data drops and deliverables
- Information Exchange Schema’s
- Terminology (LOD, MPDT, TIDP and a BIM Execution plan).
Questions?