New Zealand BIM Handbook

July 2014

A guide to enabling BIM on building projects

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BUILDING AND CONSTRUCTION PRODUCTIVITY PARTNERSHIP
building value

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FOREWORD

Few things have the potential to impact as positively on the performance of New Zealand's building and construction sector as BIM or Building Information Modelling. Of all the improvement initiatives investigated by the Productivity Partnership, BIM is the only one that holds the promise of a step-change, rather than an incremental, gain in productivity.

Because it is key to achieving this significant increase, accelerating the use of BIM in the construction process has become a priority. Our aim is to capture its many benefits, helping to provide affordable, quality buildings and infrastructure for New Zealanders at a time of high construction demand.

BIM adds value to the whole life of a built asset from pre-design to operation. It is a tool that allows the latest in digital technologies to be applied to the building management process. However, like all tools, it needs to be used well to get the best result. That is where the New Zealand BIM Handbook comes in.

The BIM Handbook provides a solid framework for deciding whether to use BIM – there are 21 defined uses – and outlines processes to operate it efficiently. Importantly, it also introduces a common language around BIM. The establishment of a consistent approach to using BIM across New Zealand, underpinned by a common language, is a significant achievement of which all the contributors to this Handbook can be justly proud.

The genesis of this Handbook was an industry workshop initiated by the Productivity Partnership where 50 representatives of most parts of the construction industry were asked what should be in a BIM Handbook. NATSPEC's Australian BIM Handbook provided an excellent starting point and we are grateful for all of their assistance.

Developed in partnership with industry at every step, this Handbook is very much anchored in New Zealand. It draws on the best of best BIM practice from around the world, but is tailored to the specific needs of New Zealand's building and construction sector.

The intention is that the New Zealand BIM Handbook will be a living document. Revisions will take place as any deficiencies or opportunities for improvement are highlighted by its use in practice.

We hope that the New Zealand building and construction industry will find this BIM Handbook provides valuable assistance in unlocking the significant benefits that BIM has to offer. Our thanks go to all of those who have been involved in creating it.

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1 INTRODUCTION

1.1 What is BIM?

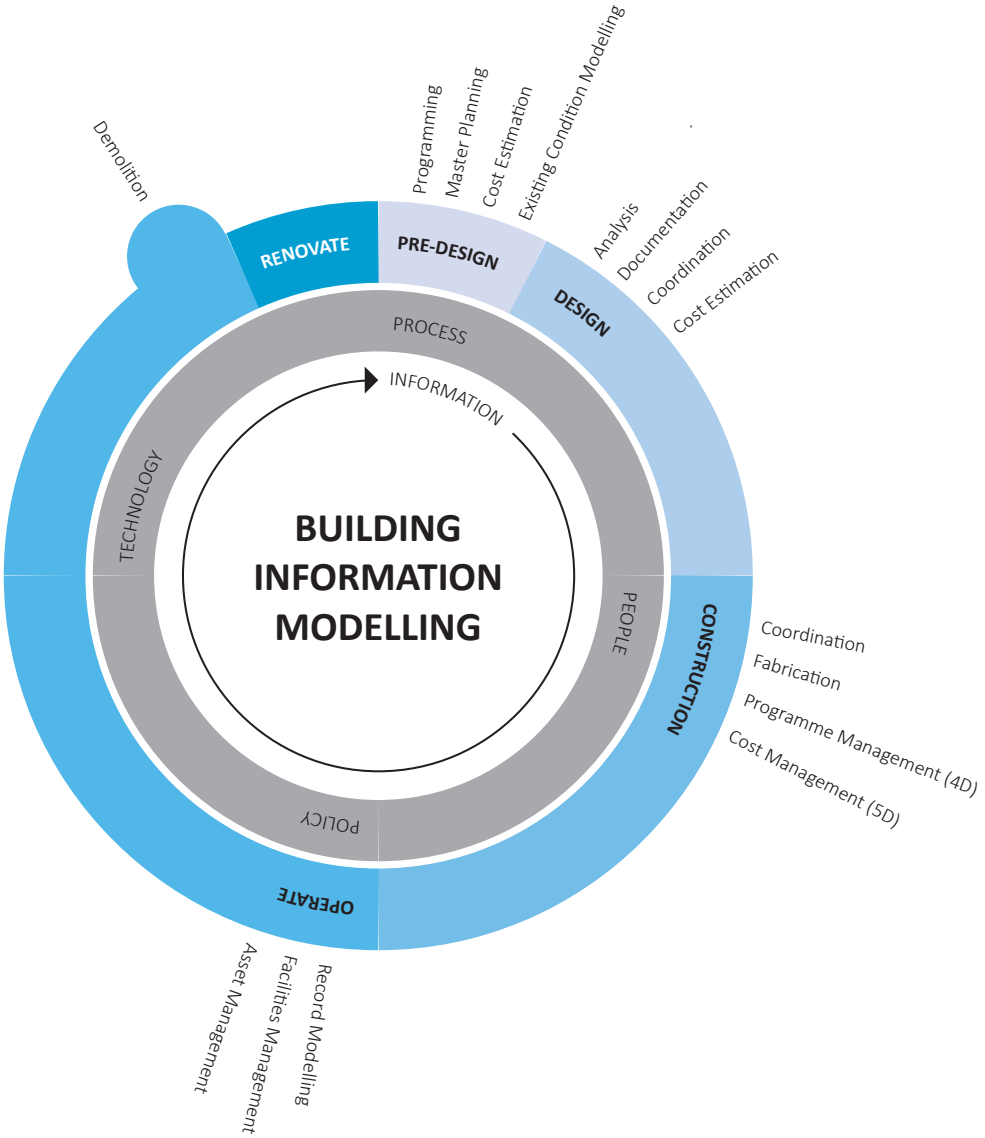
BIM is the sharing of structured information.

There are many definitions of BIM (Building Information Modelling). The focus will vary from designers to constructors and operators. BuildingSmart defines it as follows:

"BIM is a digital representation of the physical and functional characteristics of a building. As such, it serves as a shared knowledge resource for information about a building, forming a reliable basis for decisions during its life cycle from inception onward."

The key principal is that BIM is not any single act or process. It is not creating a 3D model in isolation from others or utilising computer-based fabrication. It is being aware of the information needs of others as you undertake your part of the process.

A BIM model can contain information/data on design, construction, logistics, operation, maintenance, budgets, schedules and much more. The information contained within BIM enables richer analysis than traditional processes. Information created in one phase can be passed to the next for further development and reuse.



The project life cycle

1.2 How the Handbook is structured

The Handbook follows the normal progression of a project:

- pre-design/briefing
- design
- construction
- handover
- operation.

The appendices contain examples of BIM planning documents. It is suggested that the reader refers to these whilst reading the main body of the document.

This document does not duplicate information contained within the NZ Construction Industry Council (NZCIC) Design Documentation Guidelines. The NZCIC document defines design phases and deliverables. It is intended that Handbook be used in conjunction with the NZCIC guidelines. The two documents may be combined in the future.

1.3 Benefits of adopting the BIM process

BIM delivers benefits within each section of the design, construct, operate life cycle. These benefits are enhanced when the process is considered as a whole and the information/data requirements are coordinated. They can be summarised as:

Coordination

- Models show the spatial relationships of building elements and, just like real buildings, virtual models are comprised of virtual components and elements.
- Relationships between elements are updated as the modeller modifies the model.
- Drawings are derived from the model by viewing it from whatever vantage points are required, including slicing it to produce floor plans and sections.
- Models can be combined into a single “federated model”; the sharing of this information tends to reduce errors in the documentation.

Communication

- 3D models/images can be grasped immediately by most people and are less susceptible to misinterpretation than 2D images.
- BIM improves communication between designers and anyone relying on, or affected by, the proposed building including clients, building assessors, local communities and contractors.
- BIM provides an opportunity to engage clients, contractors and other stakeholders much earlier in the design process when the greatest value can be derived from their input.

Data management

- Generates graphical representations of building elements.
- Modelling software manages data associated with each element of the building. This data is updated automatically as changes are made to the model.
- Reports produced at any time will reflect the current state of the model.
- Being digital, BIM data can be easily stored and transmitted, and rapidly searched, sorted and filtered, as required.

Analysis and simulation

The relative ease of accurately recalculating performance following changes to the model allows different design options to be explored and optimised. Data associated with the model can be used for:

- quantity take-off and costing
- simulation of various aspects of the proposed building's behaviour such as structural, thermal, acoustic, lighting and fire performance.

Improved productivity during construction

BIM improves construction quality, improves on-site safety, shortens construction programmes and reduces costs by allowing:

- better planning of site activities and optimisation of the construction sequence
- quicker and more accurate set out
- more prefabrication off site as building elements can be modelled, documented and manufactured with greater precision
- possible linkage to computer controlled machinery using digital model files.

Better information for Facilities Management

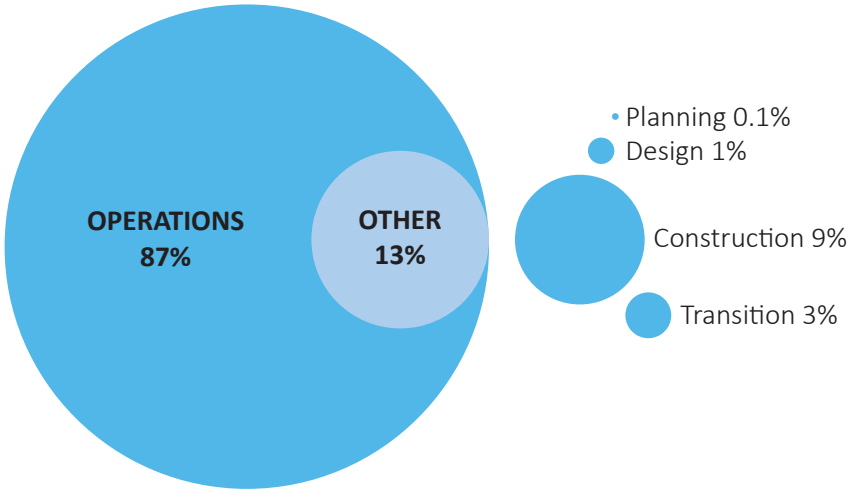
Data generated during design and construction can be readily passed on to Facility Managers to assist them in operating and maintaining buildings more effectively. With appropriate procedures in place, capturing this data is easier than with traditional paper based methods.

1.4 Purpose of the Handbook

The creation of this Handbook has been driven by the Productivity Partnership and the Ministry for Business Innovation and Employment. Their aim has been to create a New Zealand-centric document that:

- promotes the use of BIM throughout the project life cycle
- creates a common language for the industry to use
- clarifies the briefing process for designers and constructors
- improves the level of coordination in both design and construction phases
- promotes a more proactive approach to Facilities Management
- creates a clear path for the future development of the industry.

The Handbook does not cover every aspect of BIM in detail. Its primary focus is on the design and construction phases of the building life cycle. To realise the maximum benefits of BIM, the information/data created during the design and construction phases must be fed into facilities and asset management systems.



Proportional split of whole of life costs of an asset

A BIM philosophy can be applied to creating and operating all types of assets: buildings, industrial facilities or civil infrastructure. In fact, industrial and civil projects have been utilising digital modelling and shared data for more than ten years. To simplify the language used, the Handbook is focused on building type projects.

The geospatial data provided from survey tools is a key input into BIM. The production and formatting of 3D survey information for use in BIMs is outside the scope of this edition of the Handbook.

Future editions will provide more details on BIM for Facilities Management, BIM for industrial/civil projects and integration with digital survey data.

1.5 BIM in New Zealand

New Zealand architects and structural engineering firms have been progressively moving towards documenting in 3D over the past five to six years. This has been driven primarily by a desire to document projects more efficiently. The tools for building services engineers to efficiently design and document in 3D have really only become mature enough for use over the last two to three years.

On most significant/complex building projects, design teams are now documenting in 3D. This is delivering the benefits of improved coordination. Coordinated 3D modelling is only one aspect of the BIM process. Over the past one to two years there has been a push to expand BIM from design into construction and to provide data for Facilities Management.

An increasing number of projects are requiring the contractor to maintain the BIM model throughout the construction phase and provide an As-Built or Record Model at handover.

This Handbook aims to aid the further development of this process by:

- increasing clients' understanding of the benefits of BIM so that they can better brief their design teams
- creating a common language so that owners, designers and constructors understand what they are being asked to provide
- outlining the process that should be followed to efficiently implement BIM on a project
- providing a framework so that those new to BIM can understand what is involved and decide if/how they could benefit from adopting BIM.

Further work needs to be done in developing a legal framework to build BIM requirements into both design and construction contracts. The Productivity Partnership BIM Acceleration Committee is working with industry to develop these.

The New Zealand Government is following the lead of countries like the UK, Australia and Singapore and is moving towards mandating the use of BIM for government construction projects. The driver behind this is the up to 20% productivity increase that is reported to be delivered through BIM. To achieve this, client stakeholders, designers and constructors need to firstly embrace the processes outlined in this Handbook, then develop them to maximise the efficiency and effectiveness of their particular part of the industry in New Zealand.

2 BIM BASICS

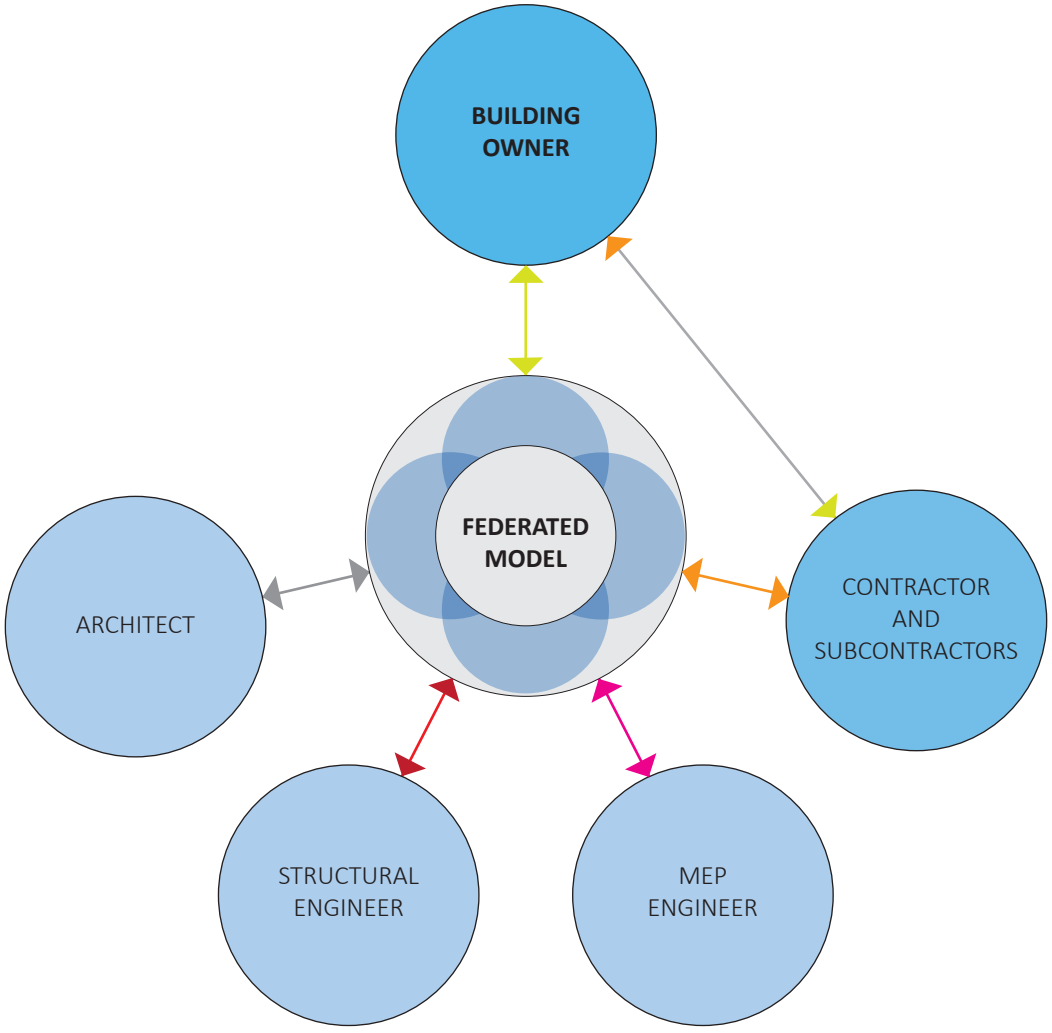
2.1 Definitions

A complete glossary of BIM terminology is provided in Section 7 of this document. Following are some key definitions to aid the reader with interpreting the next sections and to provide an overview of how the key documents and roles in BIM relate to each other.

Models and federation

For the majority of projects, each designer or sub-trade will produce their own model. These models can be then combined or "federated" to create a single shared model. Interdisciplinary coordination is confirmed in the federated model. Required changes are made in the individual discipline models.

On large projects discipline models may be split into multiple, smaller models to make file sizes more manageable.



Model federation diagram

Project BIM Brief

The Project BIM Brief is developed by the client prior to engaging the consulting team. It provides an outline of the project and the goals and benefits that the client wants to achieve from BIM. It should include sufficient detail to allow the consultants to adequately assess the commercial and programme implications of the client's BIM expectations. Refer Appendix E.

Project BIM Execution Plan

This is the key document for successfully implementing BIM on a project. An expansion of the Project BIM Brief, it is developed collaboratively by the project team after they have been engaged and prior to commencing the design. It is a live document and can be updated throughout the design and construct phases. It expands on each of the client goals and how they are to be achieved. The Project BIM Execution Plan allocates key responsibilities and defines the processes, procedures and tools to be used.

At the completion of the design phase, the Project BIM Execution Plan will be passed from the design team to the construction team who will modify and supplement it with construction phase BIM activities.
Refer Appendix F.

BIM Uses

BIM covers a number of processes or tasks, e.g., design authoring and coordination. To create a common language this Handbook lists these as "BIM Uses". Most international BIM guides contain a similar listing of Uses. For this Handbook, 21 separate Uses have been identified. These have been taken from the Penn State BIM Execution Planning Guide with minor terminology changes to match the New Zealand context. Some of the Uses will be commonly used on projects; others are an indication of where BIM may be applied in the future. For each Use an outline definition is provided.
Refer Appendix D.

BIM Manager

The person engaged by the client (either independently or as an extension to another consultant's role). They lead the production of the Project BIM Execution Plan and coordinate the input of the other project participants. Their focus is combining/federating the various models into a single, coordinated model that contains consistent and structured information/data.

The BIM Manager may be engaged for the entire project or separately for the design and construction phases.

Discipline BIM Coordinator

The lead modeller from each of the design disciplines. Discipline BIM Coordinators are responsible for ensuring that their models comply with the BIM Execution Plan. They lead the coordination activities for their respective teams. During the construction phase each sub-trade that is inputting to the Construction BIM should have a BIM Coordinator. This role is sometimes referred to as a Model Manager.

2.2 BIM and project management

The implementation of BIM on a project does not replace the project management function. The Project Manager must retain overall control of the project programme, deliverables and communication. The Project BIM Brief and Project BIM Execution Plan should be supplements to the project management documentation. In creating the BIM plans the aim should be not to duplicate what is contained within the overall project plans.

2.3 Legal implications of BIM

Consultant selection

The Project BIM Brief should be provided to the consultants along with other project information as a part of the Request for a Proposal (RFP) process. The RFP must clearly outline what the client's BIM expectations of the consultant are. The expectations should focus on the specific BIM goals and benefits that the client has identified. The inclusion of BIM activities that are for the benefit of the consultant (e.g., analysis) is secondary.

As with the other parts of the RFP, the Project BIM Brief will form a part of the consultant engagement contract when it is executed. In assembling the contract, care must be taken to avoid contradictions between the various documents. A clear order of precedence must be provided.

It must be clearly detailed in the RFP how the BIM process will be managed and what each individual will be responsible for. It is recommended that the role of the BIM Manager be specifically detailed and not combined with the general "Lead Consultant" role description. The functions may be performed by the same organisation, but the requirements and skills required of the roles are separate.

If, during the development of the Project BIM Execution Plan, the scope or responsibilities of an organisation are changed, this should be treated in the same way as any other scope change under the contract.

The consultant's responsibilities with respect to timeliness, completeness and quality of deliverables are no different under a BIM delivery method. The contract (including the Project BIM Brief and/or Project BIM Execution Plan) must clearly state what is to be produced and by when. However, with a BIM process there may be far more interdependencies that need to be included. These must be considered when developing the delivery programme.

Contractor engagement

The Request for Tender (RFT) process must clearly outline the client's BIM expectations of the contractor. The expectations should focus on the specific BIM goals and benefits that the client has identified. The inclusion of BIM activities that are for the benefit of the contractor (e.g., scheduling) are secondary.

The key BIM information that needs to be provided in the RFT is:

- what models will be provided to the contractor from the design team
- whether the design phase BIM Manager will be retained during the construction phase or if the contractor will be required to provide one
- what format and what level of detail are required of handover models.

Intellectual Property and model disclaimers

With a BIM process there is far more interdependency between the documentation of the design disciplines during the design phase and sub-trades during the construction phase. The exchange of models is the very basis of the BIM process. All users need to understand the level of reliance that they can place on the models they are receiving. The issuer of a model must clearly define what it can (and cannot) be used for, e.g.:

- work in progress – issued for ongoing coordination
- developed design issue
- detailed design issue for consent and contractor pricing
- issued for construction – for production of shop drawings, not for fabrication
- issued for construction – suitable for fabrication.

Models can contain far more information that traditional electronic deliverables. To maximise the benefits of BIM this information must be freely available for others to use. Most standard forms of contract cover the ownership of Intellectual Property.

Following is a description of how the Conditions of Contract for Consulting Services 2009 can be applied to the copyright of BIM documents.

- All models created for the project are “New IP” and are jointly owned by the client and the consultant. Each grants the other an unrestricted royalty free license to use the model. The client can make the complete models available to the project team for any use.
- Specific element details and libraries are “Pre-existing IP” and ownership remains with the consultant. The consultant grants the client an unrestricted royalty free license to use the specific element details and libraries “to the extent reasonably required to enable the Client to make use of the Service”.

The client can use the models created for whatever purpose they want, but can only use the specific element details as required to complete the specific project.

The above commentary is provided for guidance only. Contracts are developed on a project-by-project basis and specific legal advice should be sought. The Productivity Partnership BIM Acceleration Committee plans to produce further guidance on legal and IP issues.

3 PROJECT BIM BRIEF

The Project BIM Brief is developed by the client prior to engaging the consultant team. Unless the client is experienced in BIM it is recommended that they do this in consultation with the Project Manager, Lead Consultant or BIM Manager.

In developing the Project BIM Brief the client should look at the overall goals and objectives of the project and consider how a BIM approach can aid in the achievement of these goals. For each goal, the specific BIM Uses that relate to achieving that goal can be identified. In finalising the uses to be specified, the client should consider both the benefits and likely costs associated with the use.

A template and example Project BIM Brief is contained in Appendix E. The Project BIM Brief contains the following information:

- project Information
- key project contacts
- project goals
- BIM Use competency requirements
- client specific requirements
- project deliverables
- reference documents and standards.

The Project BIM Brief should identify construction phase and operation phase BIM Uses required by the client, even if only the design phase services are being procured. The requirements of later phases may impact on what the consultants need to produce.

In responding to the RFP the consultants should address how they will implement the specified BIM Uses that fall within their scope.

If the project is being procured on a Design and Build basis, the consultant/contractor responses to the RFP should clearly illustrate who will address each BIM Use and their specific competence in it.

4 PROJECT BIM EXECUTION PLAN

The Project BIM Execution Plan will be developed by the BIM Manager after the consultants have been engaged and before design documentation has commenced. It is a collaboratively produced document with each Discipline BIM Coordinator ensuring that their specific requirements are included.

It is an expansion of the Project BIM Brief.

A template and example Project BIM Execution Plan are provided in Appendix F.

The project BIM Execution Plan contains the following information:

- project information
- key project contacts
- project goals
- BIM Uses
- information management and exchange
- collaboration
- project deliverables
- quality control
- model element responsibilities
- reference documents and standards.

The Project BIM Execution Plan should be considered a live document. It should be updated if project drivers change.

A construction phase BIM Execution Plan should be prepared as soon as the contractor has been engaged.

A BIM Manager may be engaged for the entire project or separately for the design and construction phases. This can be two different parties. If the latter, those parties should work together to develop the construction phase BIM Execution Plan.

The contractor and trade sub-contractors need to clearly understand the stage to which the design models have been taken. The project deliverables should include all of the client's requirements for the handover models and data.

5 MODELLING AND DOCUMENTATION PRACTICE

Appendix A provides some detailed guidance on modelling and documentation best practice. The following are the key considerations.

5.1 Planning the modelling process

All projects have slightly different drivers and all companies will have different modelling standards and protocols. It is not the intention of this handbook to try and make all projects and companies the same. This is both impractical and would inhibit innovation.

The collaborative development of the BIM Execution Plan is where the standards, processes and procedures for the project are aligned.

5.2 Model location and orientation

Models should be located with real world coordinates and elevations. These should be confirmed in the BIM Execution Plan.

5.3 Naming conventions and structures

The ability to efficiently reuse data throughout the life of the model and the asset it relates to is one of the greatest benefits of BIM. In discussion with the client and other stakeholders the BIM Execution Plan should define:

- how spaces are defined and named
- the granularity and naming conventions for elements
- specific parametric requirements for elements.

Even if the end use of the model/data has not been confirmed, the data must be created in a structured and consistent way for future translation if needed.

5.4 Level of Development (LOD)

The use and importance of LODs is one of the most misunderstood aspects of the BIM process. There are numerous documents on the subject, the most complete being the 2013 LOD Specification produced by the BIM Forum (https://bimforum.org/lod/).

LOD is a scale that can be used to show the reliability of content that is expected to be included for specific model elements at different times during model development. The main purpose of LOD when incorporated in LOD Tables and BIM Execution Plans is to give clarity to each member of a design/ construction team as to what they are required to author in their models at each stage and to what extent others can rely on them.

A summary of LODs is provided in Appendix C.

5.5 Model coordination

One of the key benefits of the BIM process is the ability to coordinate modelled elements. Significant savings can be made on site by resolving coordination issues in the modelled environment.

Each Discipline BIM Coordinator is responsible for ensuring that the models they are responsible for are coordinated both within themselves and with the other disciplines. Main coordination issues should be resolved prior to models being federated and run through clash detection programmes.

5.6 Model handovers

When issuing a model, the Discipline BIM Coordinator should include a model description document (MDD) that includes crucial information about the model. The MDD should be named so that it can be readily

associated with the correct model and describe the contents of the model and explain its purpose and limitations.

The format and content of the MDD should be agreed and documented as a part of developing the BIM Execution Plan.

5.7 BIM deliverables

The Project BIM Brief should clearly outline what deliverables are required. Currently, contracts are based on 2D paper documents (drawings, schedules and specifications). As the BIM process matures all this information could be provided within the BIM model.

If the model is to be part of the handover documents (either from the design team to the contractor or from the contractor to the client/operator) then the following should be confirmed:

- separate models or combined
- format/file type
- what is (and isn't) included in the model.

Where 2D deliverables have been generated from the model, they should accurately represent the view of the model and not be modified in their 2D format.

6 ENABLING FACILITIES MANAGEMENT VIA BIM

This edition of the Handbook has not aimed to provide a comprehensive guide to enhanced Facilities Management (FM) and Asset Management (AM). However, it is the operational phase of the building that has the greatest overall costs and offers the greatest possibilities for improvement.

The As-Built/Record Models produced by the contractors at the completion of the project contain a huge amount of information. To provide the best benefit for ongoing FM/AM this information should be:

- focused on the data needed to maintain the facility
- consistently structured to allow direct or easy translation into the client's FM/AM systems
- include any design information relevant to FM/AM.

To maximise the likelihood of the above being achieved the concept of "starting with the end in mind" should be applied throughout the project. The FM/AM team should have input to establishing the Project BIM Brief and should review the Project BIM Execution Plan.

The type of information that should be provided to the design and construction teams could include:

- space naming conventions
- asset naming conventions
- granularity of information required.

The design phase of the project is very graphically focused. While the overall efficiency of the transfer of data through to FM/AM will be improved by incorporating the attribute structure into the design models, it is important to ensure that the As-Built or handover models are correctly formatted.

7 GLOSSARY

The following are terms used in this Handbook or in common usage in discussion about BIM.

4D BIM – a 3D model linked to time or scheduling data. Model objects and elements with this data attached can be used for construction scheduling analysis and management. 4D BIM can also be used to create animations of project construction processes.

5D BIM – usually a 4D BIM linked to cost data. The time data adds another dimension to cost data, allowing expenditure to be mapped against the project programme for cash flow analysis, etc.

BIM Brief – a document developed by a client to outline their BIM requirements when engaging designers or design and build teams.

BIM Coordination Room – a purpose-designed room set up to facilitate the coordination of digital models by members of the BIM Team. It includes IT infrastructure such as cabling, projectors and/or Smart Boards that allow the room's occupants to view models together for coordination, collaborative design, etc.

BIM Execution Plan (BEP) – a formal document that defines how a project will be executed, monitored and controlled with regard to BIM. A BEP is developed at project initiation to provide a master information/data management plan and to roles and responsibilities for model creation and data integration throughout the project.

BIM Information Manager – same as BIM Manager.

Building Information Management (Data Definition) – Building Information Management supports the data standards and data requirements for BIM use. Data continuity allows for the reliable exchange of information in a context where both sender and receiver understand the information.

Building Information Model (BIM) (Product) – an object-based digital representation of the physical and functional characteristics of a facility. The Building Information Model serves as a shared knowledge resource for information about a facility, forming a reliable basis for decisions during its life cycle from inception onward.

Building Information Modelling (BIM) (Process) – a collection of defined model uses, workflows, and modelling methods used to achieve specific, repeatable, and reliable information results from the model. Modelling methods affect the quality of the information generated from the model. When and why a model is used and shared impacts on the effective and efficient use of BIM for desired project outcomes and decision support.

BIM Management Plan (BMP) – same as BEP.

BIM Manager – leads and coordinates the BIM processes for the project.

BIM Use – a unique task or procedure on a project which can benefit from the application and integration of BIM into that process.

Computer Aided Facilities Management (CAFM) – an IT system that supports Facilities Management. CAFM systems focus on space management issues, asset information, maintenance history and equipment documentation.

CBI – Co-ordinated Building Information system of New Zealand. The classification system that can be used to organise specifications and for structuring information libraries, classification of generic and branded product information, and classification of BIM objects.

Construction BIM Execution Plan – a BIM Execution Plan for the construction phase of a project.

Construction Operations Building Information Exchange (COBie) – a system for capturing information during the design and construction of projects that can be used for Facilities Management purposes including operation and maintenance. A key element of the system is a pre-formatted Excel spreadsheet used for recording this information.

Deliverables – the product of engineering and design efforts to be delivered to the client as digital files and/or printed documents. Typically, these would be the concept submittal and the corrected final design. A deliverable may have multiple phases.

Design and Build (D&B) – the project procurement method in which the client enters into one contract for the design and construction of a project with an organisation, generally based on a building company which provides all project management, design, construction and project delivery services.

Design-Bid-Build (DBB) –the project procurement method in which the client enters into separate contracts for the design and construction of a building or project. Design and documentation services are generally provided by a professional design consultancy, the documents are used for bidding (tendering) purposes and the successful bidder, generally a building company, enters into a contract with the client to build the project.

Design BIM Execution Plan – a BIM Execution Plan for the design phases of a project.

Design BIM Coordinator – the BIM leader for each design discipline or sub-trade.

Facilities Management (FM) – the process of managing and maintaining the efficient operation of facilities, including buildings, properties and infrastructure. The term is also applied to the discipline concerned with this process.

Federation – the combination of multiple models into single model for review or coordination.

Geographic Information System (GIS) – a system that integrates hardware, software and data for capturing, managing, analysing and displaying all forms of geographically referenced information.

gbXML – Green Building Extensible Markup Language (XML). A digital file format for exchanging sustainability information in simulation applications.

Globally Unique Identifier (GUID) – a unique code identifying each object/space. A GUID should not be confused with “code” in “room code,” “equipment code,” or “space code.” The GUID assigned by the BIM authoring tool persists through room name changes and various other modifications, allowing the object/space to be tracked throughout the project execution process.

Industry Foundation Class (IFC) – a system of defining and representing standard architectural and construction-related graphic and non-graphic data as 3D virtual objects to allow data exchange among BIM tools, cost estimation systems, and other construction-related applications in a way that preserves the ability to perform analysis on those objects as they move from one BIM system to another.

Integrated Project Delivery (IPD) – the project procurement method in which the client enters into a contract with a number of organisations, including design consultants and building contractors at the earliest stages of the project to create an integrated team. It is characterised by an expectation that the team will work collaboratively to deliver a product that meets the client’s requirements.

Interoperability – the ability of two or more systems or components to exchange information and to use the information that has been exchanged.

Level of Development (LOD) – the Level(s) of Development (LOD) describes the level of completeness to which a model element is developed.

Model Description Document (MDD) – issued with a model to describe what it contains and identify any limitations of use.

Model Geographic Location (MGL) – the situation of the model on the earth in terms of its latitude and longitude.

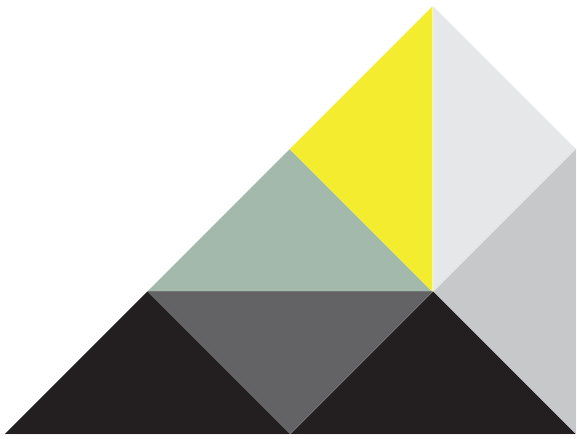
Model Manager – same as Discipline BIM Coordinator.

Model View Definition (MVD) – a MVD defines a subset of the IFC Schema providing implementation guidance for all IFC concepts (classes, attributes, relationships, property sets, quantity definitions, etc.) used within this subset. It represents the software requirement specification for the implementation of an IFC interface to satisfy the exchange requirements.

OmniClass – the OmniClass Construction Classification System is a classification system for the construction industry, developed by the Construction Standards Institute (CSI) and is used as a classification structure for electronic databases.

Request for Information (RFI) – a documented request for information on a matter from one party to another. It is usually managed through formal procedures agreed by members of the project team.

Uniformat – a classification system for building elements (including designed elements) that forms the basis of Table 21 of the Omniclass system. A product of the Construction Specifications Institute (CSI) and Construction Specifications Canada (CSC).



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