 

v2.0 – March 2016

**Design BIM Management Plan**

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| Project Reference: |  |
| Project name: |  |
| Project address/location: |  |
| Brief project description: |  |
| Client: |  |

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| Revision | Date | Prepared by | Approved by | Comments |
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**NATSPEC BIM Management Plan Template**

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**Document references**

In this document:

* The ‘*BMP Template’* or ‘*Template*’ means the *NATSPEC BIM Management Plan Template*.
* The ‘*BIM Plan’* or ‘*BMP*’ means the *BIM Management Plan* (for a specific project).
* The ‘*National BIM Guide’* or ‘*Guide*’ means the *NATSPEC National BIM Guide*.

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**Comments**

NATSPEC welcomes comments or suggestions for improvements to this document and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. NATSPEC also encourages users to share their experiences of applying it on projects with us. The input of industry stakeholders helps keep NATSPEC documents relevant to current practice and useful.

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# Project Information

## General project details

Refer to the *BIM Management Plan Executive Summary* for details of:

* Project team members.
* Roles and responsibilities.
* Project goals.
* Project procurement.
* Project schedule.

Align the items listed above with those in the *BIM Management Plan Executive Summary*.

# BIM Management

## BIM Management Plan overview

Refer to the *BIM Management Plan Executive Summary* for details of:

* Purpose of the BIM Management Plan.
* Application of the BIM Management Plan.
* BIM Management Plan development.
* Updating the BIM Management Plan.

Align the items listed above with those in the *BIM Management Plan Executive Summary*.

# Collaboration Procedures

## Collaborative information management

Collaborative information management strategy:

Options include:

* Reference the *Collaborative Information Management Standard* included in the *Project BIM Brief* **Client-specified** **Reference Documents**; or
* reference *National BIM Guide* clauses **6.2 Collaboration Standards** and **6.3 Management of Standards**; and
* describe how the requirements set out in these clauses will be addressed.

Note any amendments to the collaboration procedures included in the *National BIM Guide* or the nominated *Collaborative Information Management Standard*. See *BIM Project Execution Planning Guide* Chapter 5, Part 6.

## Meeting schedule

Meetings will be held as shown in the table below.

Refer to the *BIM Management Plan Executive Summary* for details of the BIM meeting strategy.

| Meeting type | Frequency | Convenor | Participants |
| --- | --- | --- | --- |
| Client BIM briefing |  |  |  |
| Consultants BIM kick-off meeting |  |  |  |
| Modeller BIM Management Plan induction meeting |  |  |  |
| Model coordination meeting |  |  |  |
| Modelling progress review |  |  |  |
| BIM Management Plan review |  |  |  |

Include only meetings specifically about BIM-related matters. Coordinate with other project meetings scheduled elsewhere.

**Meeting**: Add or delete meeting types as required.

**Frequency**: e.g. weekly, fortnightly, monthly, 1st Tuesday of each month. If required, this column can be subdivided into project phases to show different frequencies at each.

**Participants**: e.g. Project Architect, Design BIM Manager.

The date of the next meeting, its location, agenda, etc can all be agreed beforehand.

See *BIM Project Execution Planning Guide* Chapter 6 for suggested agendas for the initial series of meetings.

**Participants**: e.g. Project Architect, Design BIM Manager.

## Model coordination meetings

Model coordination meetings will be conducted by the following means. They correspond to those found in the NATSPEC National BIM Guide, and can be identified by the clause and subclause reference number.

| Required (Yes/No) | Clause No. | BIM coordination meetings conducted: | Provided by: |
| --- | --- | --- | --- |
|  | 6.5 a. | In a suitably equipped room at a location agreed by the BIM Team. |  |
|  | 6.5 b. | In a BIM Coordination Room. |  |
|  | 6.5 c. | Using web conferencing. |  |

Note any amendments to the wording of the *National BIM Guide* clauses noted in the table. Include the whole amended clause.

If coordination facilities are not required, i.e. if only the last option is selected, delete the **Coordination facilities** clause.

## Collaboration resources

The details of the project’s collaboration resources are documented in the table below.

| Collaboration resource | Details | Provided by: |
| --- | --- | --- |
| Wide Area Network (WAN) |  |  |
| Online project collaboration system |  |  |
| Online document management system |  |  |
| Common Data Environment (CDE) |  |  |

**Details:** e.g. Online document management system: Aconex

Common Data Environment (CDE): Refer to BS 1192 and PAS 1192-2 for details.

**Provided by:** e.g. Client.

If collaboration resources or their providers will change between design and construction phases, document the changes here, including responsibilities and procedures for migrating information from one system to another.

Refer to *BIM Management Plan Technical Appendix* for procedures for using resources.

## Coordination facilities

The details of the project’s coordination facilities are documented in the table below.

| Item | Details |
| --- | --- |
| Room |  |
| Equipment | Computer:  Software:  Display:  Smartboard/Interactive whiteboard: |

**Room:** e.g. address, location, room number, dimensions. Consider attaching a location plan and/or a room plan showing thelayout of equipment.

**Equipment:**

* **Computer:** Nominate manufacturer and model or provide specification, e.g. processor speed, hard drive size, RAM, graphics card, to run all software required and handle expected file sizes efficiently.
* **Software:** e.g. operating system, BIM authoring software, CAD software, model review software, e.g. Navisworks in versions necessary to open agreed file types.
* **Displays:** e.g. LED monitor, Ultra-short-throw projector. Nominate manufacturer and model or provide specification.
* **Smartboard/Interactive whiteboard:** Nominate manufacturer and model or provide specification. Include multi-colour pens for mark-ups.

If coordination facilitiesor their providers will change between design and construction phases, document the changes here, including responsibilities and procedures for relocation.

# Modelling Requirements

## Model geographic location

Requirement: Before modelling commences, the surveyor shall establish a Model Geo-reference Point. Refer *National BIM Guide* clause 10.3 Model Geographical Location. Align all models with the Model Geo-reference Point documented in the *Technical Appendix*.

A Model Geo-reference Point is a point used to associate locations in the model with those in the real world. It is a generic term for various terms used in different modelling applications, e.g. Project Base Point in Revit. Define the Model Geo-reference Point’s position relative to a physicalSurvey Point marked on site. Select locations that can be preserved throughout the construction period. (It is possible the Model Geo-reference Point will be disturbed during construction but its position can be determined relative to the Survey Point.)

Strategy for aligning models with the Model Geo-reference Point:

e.g. Model Geo-reference Point and/or 3D grids provided by BIM Manager. If models created by different modelling applications are to be shared, outline procedures for aligning them to the same Model Geo-reference Point.

## Discipline modelling standards

Strategy for establishing modelling standards:

Describe the strategy for establishing modelling standards which are to be included in the *Technical Appendix*. Reference any standards specified by the client in the *Project BIM Brief* **Client-specified Reference Documents**. Describe any additional standards required. Adopt existing industry standards, e.g. ANZRS where possible. Another option is to adopt standards developed by team member organisations. Consider how the *NATSPEC BIM Object/Element Matrix* is to be used.

## Model quality control

Strategy for establishing model quality control measures:

Describe the strategy for establishing model quality control measures including standards and procedures which are to be included in the *Technical Appendix*.

# Model Structure, Sharing and Development

## Project object library

Library establishment strategy:

If it is agreed a project library will be required, describe how it will be established and hosted, and who will be responsible for the tasks involved.

Library management strategy:

Describe how content will be added and managed and object quality maintained. Describe management responsibilities, access rights and permissions. Coordinate with protocols for users included under **Project object library** in the *Technical Appendix.*

## Model sharing protocols

Model sharing and federation protocol establishment:

Describe the strategy for establishing model sharing and federation protocols for the project which are to be included in the *Technical Appendix*.

## Design Model and Existing Conditions Model handover

Strategy for migrating the model(s) used for design/documentation to those used for construction:

Outline procedures for migration, including handover and sign-off protocols and identify those responsible. Address how this can be done effectively with the minimum effort.

Permissible uses of Design Models and Existing Conditions Models for construction:

Define the status of information in Design Models and Existing Conditions Models. Summarise what it can, and cannot, be relied on for during the construction phases of the project. Reference contract documents as appropriate.

# Specific Uses of BIM

## Project requirements

The uses of BIM applicable to the project, including the scope of their application, are described in the following clauses. Relevant *NATSPEC National BIM Guide* (NBG) clause numbers are shown in brackets.

Edit the following Section to reflect the uses for BIM on the project recorded in the *Project BIM Brief* (Delete uses not listed there).They are listed in the same order as those in the *Project BIM Brief* and the relevant *National BIM Guide* clause number is given for each.

Changing uses of BIM during the project changes the scope of service previously agreed and documented, and has contractual implications. To reduce the risk of disputes, manage changes in conformance with the terms and conditions of agreements and contracts and keep a cumulative record of agreed changes in a constant location, e.g. the *Project BIM Brief*. Agree where they will be recorded during the development of the *Project BIM Brief.*

Each edition of the *BIM Management Plan* should highlight changes agreed since the issue of the previous edition.

The *National Guidelines for Digital Modelling (NGDM)* and *BIM Project Execution Planning Guide (BPEPG)* could assist you to complete the prompts. References to relevant clauses are provided for this purpose.

## Modelling existing conditions (NBG clause 7.1.1)

Methods for modelling existing conditions:

e.g. Modelling based on laser scanned point cloud information. Specify the Levels of Development (LOD) of Model Elements required. See *BIMForum LOD Specification* for definitions of LOD for a number of model elements. Reference guidelines and/or standards to be adopted, e.g. GSA *BIM Guide 03,* ASTM E57 3D file format (Refer ASTM E2807). Refer to the *Project BIM Brief* for details of the extent of existing conditions to be modelled, what is to be modelled and the level of detail required. If not already defined in the *Project BIM Brief*, define them here.

See *National Guidelines for Digital Modelling* clause 3.1.1 and *BIM Project Execution Planning Guide* Appendix B, Item 25.

## Site analysis (NBG clause 7.1.2)

Approach to site analysis:

Detail the scope of site analysis and how the results will be represented, reported and used.

See *National Guidelines for Digital Modelling* clause 3.2 and *BIM Project Execution Planning Guide* Appendix B, Item 21.

## Space and equipment validation (NBG clause 7.1.3)

Brief validation method:

e.g. reports generated by architectural programming software, spreadsheets, colour coded plans, models. Coordinate details with the *Technical Appendix* clause **MODELLING REQUIREMENTS, Discipline modelling standards**, Strategy for importing PFD information*.*

Reference standards to be adopted, e.g. GSA *BIM Guide 02* and methods of measurement, e.g. AIQS *Book of Areas*.

See *National Guidelines for Digital Modelling* clause 3.2 & Appendix 1 and *BIM Project Execution Planning Guide* Appendix B, Item 20.

Brief validation submissions:

List or schedule the dates or program stage at which validation reports will be issued. If these items have been included in the *Technical Appendix* **Deliverables schedule**, reference it here.

## Spatial and material design models (NBG clause 7.2.1)

Approach to modelling:

Outline the general types of models proposed, e.g. architectural, structural, MEP. A more detailed description can be provided in the *Technical Appendix* **LOD table** if required.

See *National Guidelines for Digital Modelling* clause 3.2 and *BIM Project Execution Planning Guide* Appendix B, Items 12 and 22.

## Design visualisation for communication (NBG clause 7.2.2)

Methods for communicating the design intent of the building to the client(s) and/or occupants:

e.g. rendered images, simulated videos, augmented reality. Coordinate items listed with those included in the **Deliverables schedule**.

See *National Guidelines for Digital Modelling* clause 3.2 and *BIM Project Execution Planning Guide* Appendix B, Items 12 and 22.

## Design visualisation for functional analysis (NBG clause 7.2.2)

Methods for showing functionality of occupants’ requirements:

List the items to be shown, e.g. proximity of spaces, walking distances, sightlines.

Describe the methods to be used for each item, e.g. marked up plans, perspectives, physical models, BIM models, walk/fly-throughs of models, animated models.

See *National Guidelines for Digital Modelling* clause 3.2 and *BIM Project Execution Planning Guide* Appendix B, Item 22.

Methods for showing circulation paths for the delivery, supply, processing and storage of materials:

Describe the methods to be used, e.g. marked up plans, physical models, BIM models, walk/fly-throughs of models, animated models.

Methods for showing major building equipment space clearance reservations for operations, repair, maintenance and replacement:

Describe the purpose of models, e.g. operation, maintenance, safety, and the methods to be used, e.g. marked up plans, physical models, BIM models, walk/fly-throughs of models, animated models.

## Code checking (NBG clause 7.2.3)

Strategy for code checking:

Describe the codes the model will be assessed against, code items that will be checked and the rules used. Define the stages of model development at which it will be checked. Specify the checking method including any model checking software to be used.

See *National Guidelines for Digital Modelling* Appendix 1 and *BIM Project Execution Planning Guide* Appendix B, Item 19.

## Sustainability evaluation (NBG clause 7.2.4)

Strategy for sustainability evaluation:

Specify the performance required or proposed, e.g. Green Star Office 5 stars, and the validation protocol that will be used.

Describe methods for assigning parameters/properties to model objects to facilitate analysis and reporting.

See *National Guidelines for Digital Modelling* clause 3.4 and *BIM Project Execution Planning Guide* Appendix B, Item 18.

## Structural modelling and analysis (NBG clause 7.3)

Strategy for structural modelling and analysis:

Identify the elements to be modelled. Outline methods for coordinating the modelling of structural elements where modelling responsibilities are shared between the structural engineer and other disciplines, e.g. loadbearing walls also being modelled by the architect. Nominate the structural analysis software to be used.

See *National Guidelines for Digital Modelling* clause 3.3 and *BIM Project Execution Planning Guide* Appendix B, Item 14.

## Energy analysis (NBG clause 7.4.1)

Strategy for energy modelling:

Detail the scope of energy analysis, e.g. passive design, mechanical systems, Life Cycle Analysis (LCA).

Specify the performance required or proposed, e.g. NABERS for Offices 5 stars, and the validation protocol that will be used.

Detail the energy modelling software to be used and its compatibility with the BIM software being used on the project.

Describe what will be modelled, by whom and when. Coordinate this information with the *Technical Appendix* **LOD table**.

Reference guidelines or methodologies to be adopted, e.g. GSA *BIM Guide 05.*

See *National Guidelines for Digital Modelling* clause 3.4 and *BIM Project Execution Planning Guide* Appendix B, Item 13.

## Virtual testing and balancing (NBG clause 7.4.2)

Strategy for virtual testing and balancing:

Detail the scope of virtual testing and balancing. Nominate the MEP modelling software and file formats to be used. Outline procedures for reporting the results of testing and progressively refining the design in response.

See *National Guidelines for Digital Modelling* clause 3.4 and *BIM Project Execution Planning Guide* Appendix B, Item 16.

## Lighting analysis (NBG clause 7.4.3)

Strategy for lighting modelling:

Detail the scope of modelling, e.g. daylighting and shading, artificial lighting, emergency evacuation lighting. Nominate the modelling software. Outline procedures for reporting the results of testing and progressively refining the design in response.

See *National Guidelines for Digital Modelling* clause 3.4 and *BIM Project Execution Planning Guide* Appendix B, Item 15.

## Other engineering analysis (NBG clause 7.4.4)

Strategy for other engineering modelling:

Detail what other engineering systems will be modelled, e.g. active fire control systems, and the standard to which they are to comply. Nominate the modelling software. Outline reporting and design procedures.

See *National Guidelines for Digital Modelling* clause 3.4 and *BIM Project Execution Planning Guide* Appendix B, Item 17.

## Quantity take-off and cost planning – 5D (NBG clause 7.5)

Approach to quantity take-off and cost planning:

Define the scope of quantity take-off and cost planning, e.g. quantities and cost only, 5D.

Specify the element and/or Bill of Quantities classification system to be used, e.g. UniFormat, ACMM, ASMM, Quantity Surveyor Identifier (QSID). Nominate the software to be used.

See *National Guidelines for Digital Modelling* clause 3.5 and *BIM Project Execution Planning Guide* Appendix B, Item 24.

## 3D coordination (NBG clause 7.6.1)

Minimum requirements: Conform to the *NATSPEC National BIM Guide*.

Model coordination strategy:

Describe the overall approach to model coordination. A coordination strategy encompasses more than clash detection alone, e.g. agreeing general zones for services, structure and penetrations before detail design begins. Explain what you trying to achieve at each stage in the process to advance the development of the design. “Resolve problems, not clashes”.

If using BIM for clash detection, describe procedures including the obligations of those involved, workflows to be used, timing, reporting processes and formats, status tracking (New, Active, Resolved, etc), resolution and sign-off. It is preferable to reference existing standards and formats for these processes, e.g. [*BIM Collaboration Format*](http://www.buildingsmart-tech.org/specifications/bcf-releases) *(BCF)*,

Refer to the **Clash detection schedule** in the *Technical Appendix* which can be used to detail the order in which items are to be coordinated.

See *National Guidelines for Digital Modelling* clause 3.6 & Appendix 1 and *BIM Project Execution Planning Guide* Appendix B, Item 11.

Clash detection rules, sets and colours: Refer to *Technical Appendix.*

## Facilities Management/As-built models (NBG clauses 7.7.1 & 7.7.2)

Strategy for integration of Facility Management information:

**As-built models**

Note: As-built models do not necessarily contain information suitable for FM purposes.

Define the type of As-Built model required. For example:

* As documented plus approved changes during construction.
* As surveyed (on site by scanning, etc.).
* As commissioned. (One of the above plus commissioning data).

Define the data required for FM purposes. *GSA BIM Guide 08* defines model types and three scopes of data (Tier 1, 2 and 3).

State the purpose for which the model is to be used and define the dimensional accuracy required. See *USIBD Level of Accuracy (LOA) Specification Guide*.

**FM data**

The ideal conditions for the effective collection of FM data, i.e. clearly defined client requirements at project inception and early contractor involvement are not always in place. If the client is uncertain about what information they require, options include:

* Eliciting further information from the client / assisting them to define their requirements; or
* Allowing for the collection of the sort of information typically called for in the specification, e.g. submission of product information, operating manuals, warranties.

Whichever approach is decided it should be agreed and documented.

Describe the standard or format for integrating FM information, e.g. Construction Operations Building Information Exchange (COBie). Describe the method of recording and exchanging information, e.g. spreadsheets, COBie compliant software. Describe who will be responsible and outline procedures for capturing and recording information and verifying its correctness, including sign-off protocols. *The COBie Guide* specifies common requirements applicable to all projects using COBie and an appendix for documenting client-specific requirements.

See *National Guidelines for Digital Modelling* clause 3.7 and *BIM Project Execution Planning Guide* Appendix B, Items 1 – 4 and 6.

## Security assessment and planning (NBG clause 7.7.3)

Strategy for security assessment and planning:

Describe what will be modelled, including level of detail and method of communication. Outline collaboration arrangements between the Facility Manager, building occupants and security and emergency service providers to maximise its value. Outline methods for developing and documenting emergency response procedures and making sure they are distributed to the relevant parties.

See *BIM Project Execution Planning Guide* Appendix B, Item 5.

**REFERENCED DOCUMENTS**

**The following documents are incorporated into this BIM Management Plan by reference:**

National BIM Guide 2011 NATSPEC

Project BIM Brief 2016 NATSPEC

**The following documents are mentioned only in the *Guidance* text:**

ACMM Various Australian Institute of Quantity Surveyors Australian Cost Management Manual

ANZRS\_V3 2012 Australian and New Zealand Revit Standards

ASMM Ed. 5 1990 Australian Institute of Quantity Surveyors Australian Standard Method of Measurement

ASTM E2807 2011 Standard Specification for 3D Imaging Data Exchange

AIQS Book of Areas Australian Institute of Quantity Surveyors Book of Areas

BCF 2014 BIM Collaboration Format. See [www.buildingsmart-tech.org/specifications/bcf-releases](http://www.buildingsmart-tech.org/specifications/bcf-releases)

BPEPG 2009 BIM Project Execution Planning Guide by the Computer Integrated Construction Research Program (CIC) at the Pennsylvania State University (PSU)

BS 1192 2007 Collaborative production of architectural, engineering and construction information - Code of Practice

The COBie Guide 2013 The Constructions Operations Building Information Exchange (COBie) Guide v05

GSA BIM Guide 02 2015 Spatial Program Validation v2.0

GSA BIM Guide 03 2009 3D Laser Scanning v1.0

GSA BIM Guide 05 2015 Energy Performance v2.1

GSA BIM Guide 08 2011 Facility Management v1.0

LOA Specification 2014 U.S. Institute of Building Documentation (USIBD) Level of Accuracy (LOA) Specification Guide

LOD Specification 2015 BIMForum LOD Specification

NABERS National Australian Built Environment Rating Scheme

NGDM 2009 National Guidelines for Digital Modelling by the Cooperative Research Centre (CRC) for Construction Innovation

PAS 1192-2 2013 Specification for information management for the capital/delivery phase of construction projects using building information modelling

UniFormat 2010 Building Element Classification System