

BIM Management Plan Template

NATSPEC BIM Management Plan Template

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NATSPEC welcomes comments or suggestions for improvements to the *NATSPEC BIM Management Plan Template* 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.

Contact us via email at bim@natspec.com.au.

You can also discuss issues in the BIM Forum at bim.natspec.org.

NATSPEC BIM Position Statement

NATSPEC believes that digital information, including 3D Modelling and Building Information Modelling will provide improved methods of design, construction and communication for the Australian construction industry. Further, NATSPEC supports open global systems. This will result in improved efficiency and quality.

Acknowledgements

The *NATSPEC BIM Management Plan Template* was distributed to over 300 individuals during the development phase. In particular, NATSPEC acknowledges the contribution of comments and suggestions by the following organisations:

| | |
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Text formatting used in the NATSPEC BIM Management Plan Template

The boxed green text is 'Hidden text' which serves as *Guidance* for the BMP writer. This is how it should appear:

Guidance text is not intended to be seen by the final recipients of the document and is turned off or deleted prior to the issue of the completed BMP. As the *Guidance* is quite extensive, it can be useful to turn it off every now and again to see what the finished document will look like.

To show this *Guidance* text in the document:

- **Word 2003** users: Go to the **Tools** menu, choose **Options** (last item), click on the **View** tab and make sure that **Hidden text** is ticked (under the **Formatting marks** heading).
- **Word 2007** users: Click on the **Office button**, choose **Word options** (last item), click on **Display** and make sure that **Hidden text** is ticked.
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If you still have problems viewing *Guidance*, please contact NATSPEC on 02 9321 7200.

Dark red text followed by: [complete/delete] indicates that information prompted by the text should be entered after the colon. If the wording of the item is not appropriate for the project, it can be edited to suit. If the item is not relevant, it can simply be deleted.

Normal italicised text, e.g. *NATSPEC National BIM Guide* indicates the name of a document or standard.

Bold text, e.g. **BIM meeting schedule** indicates a cross reference to a Section, clause or schedule elsewhere in the document.

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*.

Template application

This *Template* can be used to create a BIM Management Plan (BMP). A BMP is a formal document that defines how a project will be executed, monitored and controlled with regard to BIM. One of its main purposes is to make clear what members of the project team can expect from each other. The *Template* can be downloaded as an editable Word file from www.natspec.com.au. Click on the NATSPEC BIM logo.

NATSPEC National BIM Guide clause 3.1 requires that a BMP be developed to provide a master information/data management plan and to assign roles and responsibilities for model creation and data integration at project initiation.

This *Template* can be used to document either a Design BMP or a Construction BMP in conformance with *National BIM Guide* clause 3.2 or 3.3 respectively. It is formatted to produce a Design BMP as the default. Variations required to produce a Construction BMP are noted in *Guidance*.

Customise this *Template* to suit the specific requirements of the project and respond to the requirements recorded in the *Project BIM Brief* that accompanies the *National BIM Guide*.

See *National BIM Guide* clause 1.3 for a description of its supporting documents including:

- *Project BIM Brief*
- *NATSPEC BIM Reference Schedule*
- *NATSPEC BIM Object/Element Matrix*.

The *NATSPEC BIM Object/Element Matrix* can be used as an aid to the development of the BMP. Download from www.natspec.com.au. Click on the NATSPEC BIM logo. See Resources/Downloads.

BMP scope and relationship to other documents

The BMP addresses the BIM management of a project only. It does not specifically address issues surrounding the competency and capacity of project team members to implement it. It is taken as understood that team members will only include provisions in the BMP that they know they can adequately address. Issues of competency and capacity should be addressed during the team member selection process and documented separately.

An important principle to keep in mind during the development of a BMP is that anything that alters original contractual agreements should be addressed in the *Project BIM Brief* and/or Contract, not the BMP. Apart from being more appropriate, recording amendments in these locations makes them easier to track. Any amendments should be agreed after notification and consultation with all parties.

Notes on using the BIM Management Plan (BMP) Template

A record of agreement: The BMP is a record of agreement between members of the project team rather than a prescriptive specification by any one party. Its contents should reflect the outcome of issues discussed and negotiated before completing the Template.

A living document: The BMP is required to be reviewed and updated throughout the project. There are some things that cannot be defined in any meaningful way when formulating the initial BMP. Agree what is sensible at that time and note items that need to be reviewed or resolved in more detail in a later BMP.

A framework – not a straightjacket: The BMP Template provides a framework for documenting team agreements about the execution of the project, and is an aid to the management of a project, not an end in itself. Do not feel compelled to fill in every schedule or prompt. Use your professional experience and judgement to modify and edit it as you see fit to suit the requirements of the project.

Create and maintain an office master: The first time you complete the BMP Template is likely to be the most time-consuming – it will become quicker with practice. One approach to streamlining the process is to create an office master from a completed BMP. This avoids starting from scratch each time and provides a vehicle for refining the document in response to your experiences and preferences. Office masters should be amended to align with BMP Template updates issued by NATSPEC. Your custom *Guidance* text can be differentiated from NATSPEC *Guidance* by font colour, symbols, etc.

Edit to suit the project: To make it useful for a wide range of projects the BMP Template includes extensive content. Delete any content that is not applicable to your specific project or simplify it to suit. Not doing so only leads to a bulky document and confusion for its readers. Extensive material that interferes with the flow of the document or detailed guidelines, more likely to be referred to on a regular basis during the project, may be better located in appendices. An outline list of project guidelines is included in **Appendix A**.

Suggested approach to editing the BMP Template

1. Delete the pages before the Table of Contents.
2. Customise headers and footers to suit your project, including version/issue number and date.
3. Delete all uses of BIM listed under **SPECIFIC USES OF BIM** not applicable to the project.
4. Complete or delete prompts and schedules as required.
5. Complete or delete Appendices as required.
6. Turn off the *Guidance* text when it is no longer required or, better still, delete it altogether.
7. Update the Table of Contents (place your cursor anywhere in the Table of Contents, right click and select **Update Field** from the menu) or delete it if you do not consider it necessary for the size of the document.
8. Add project-specific front and back covers if you wish.

Useful references

The following references could be of assistance when developing a BMP:

- *BIM Project Execution Planning Guide (BPEPG)* Computer Integrated Construction Research Program (CIC) at the Pennsylvania State University 2009. Download from <http://bim.psu.edu/Project/resources/default.aspx>
- *National Guidelines for Digital Modelling (NGDM)* Cooperative Research Centre (CRC) for Construction Innovation 2009. Download from <http://buildingsmart.org.au/digital-modelling-guidelines-dmg-new-review>

To aid their use, cross references to relevant clauses are included in *Guidance*. These are prefaced by the designations *BPEPG* and *NGDM* respectively.

A list of all documents referenced in the BMP Template is located in *Guidance* at the end of the document, before the Appendices.

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1 PROJECT INFORMATION

Edit details as required to suit the project.

1.1 Identification

Project name: [complete/delete]

Project identification code: [complete/delete]

Address: [complete/delete]

Client: [complete/delete]

1.2 Project team contacts

Contact details: Refer to the *Project BIM Brief*.

Changes to project team: As recorded in the *Project BIM Brief*.

Record all changes to personnel and their roles or contact details in the **BIM Project Team** list in the *Project BIM Brief*. This ensures that this information, which can have contractual implications, is consolidated in a single constant location.

1.3 Project team responsibilities

Status: Unless noted otherwise in the *Project BIM Brief*, the responsibilities associated with each role are those defined in the *NATSPEC National BIM Guide*.

For smaller projects where individuals often perform multiple roles, it may be simpler to just clearly describe their roles.

Changes to responsibilities of project team members: As recorded in the *Project BIM Brief*.

Record all changes to the responsibilities of team members in the *Project BIM Brief*. This ensures that this information, which can have contractual implications, is consolidated in a single constant location.

1.4 Project procurement

Project procurement strategy: Refer to the *Project BIM Brief*.

2 BIM MANAGEMENT

2.1 General

Description: This BMP defines the execution, monitoring and control of BIM for this project.

Align the BMP with the requirements of the contract documents, *Project BIM Brief*, project procurement strategy, Program for Design (PFD), client technical standards, team member skills, construction industry capability, and technology maturity.

See *National BIM Guide* clause 3.1.

Application of this BMP: [complete/delete]

Specify the type of BMP based on the project procurement strategy, e.g. Design only, Construction only, Design and Construction. See *National BIM Guide* clause 2.1.

For DBB (traditional) develop separate BMPs for both design and construction. Pay specific attention to model and data handover from the design team to the construction team.

For D&C or IPD, develop a BMP that addresses both design and construction activities.

Authors of this BMP: [complete/delete]

List the names and roles of the BMP authors here. Refer to *National BIM Guide* Table 4.1 for project team member roles and their responsibilities associated with the development of a BMP.

BMP review and update strategy: [complete/delete]

Describe how the BMP will be reviewed and updated to make sure the project remains on schedule and meets the brief requirements. Include the proposed method for facilitating this, e.g. scheduled review meetings. Include review meetings in the **BIM meeting schedule**.

3 COMMUNICATION, COLLABORATION AND COORDINATION PROCEDURES

3.1 General

Communication and collaborative information management strategy: [complete/delete]

Document any amendments to the collaboration procedures included in the *National BIM Guide* or the *Collaborative Information Management Standard* included in the *Project BIM Brief* Reference Documents.

See *National BIM Guide* Part 6 and *BIM Project Execution Planning Guide* Chapter 5, Part 6.

3.2 Meetings

Meeting program: Meetings will be held as shown in the **BIM meeting schedule**.

3.3 Coordination

Coordination strategy: [complete/delete]

Describe the overall approach to coordination including team protocols. If using BIM for clash detection, refer to the **Clash detection schedule** which details the order in which items are to be coordinated.

3.4 Coordination facilities

Provider of facilities for conducting coordination meetings: [complete/delete]

Name the company or organisation providing the facilities.

Refer to the *Project BIM Brief* for a description of the facilities to be provided for coordination meetings.

4 MODELLING

4.1 General

Amendments to the project spatial coordinates: [complete/delete]

Record any changes to the spatial coordination (coordinates) of the master BIM file set at the beginning of the project. Only change with mutual consent of the team and the Client's Project Manager. Record the changes and the name of the person responsible for implementing them (generally the BIM Manager – see *National BIM Guide* clause 4.2) in the meeting minutes.

Once the design coordinate system is agreed upon, convert any model(s) of existing buildings relevant to the project into the coordinate system used for each designed building. Delete the prompt if no changes have been made.

Strategy for importing Program for Design (PFD) information: [complete/delete]

Describe who will be responsible, when and how PFD information is to be imported into the model.

Where information is to be imported from applications such as Affinity or Codebook, describe what measures will be taken for compatibility with the BIM software being used on the project. Describe procedures for making sure that parameters/properties in imported data schedules align with those attached to model objects.

List any standards or practice guidelines that will be adopted.

Strategy for migrating the BIM model(s) used for design/documentation to those used for construction: [complete/delete]

Describe who will be responsible and outline procedures for migration, including handover and sign-off protocols.

Address how this can be done effectively with the minimum effort.

Legal status of the Design Model for construction: [complete/delete]

e.g. Binding, Informational, Reference, Reuse. Refer to the **Glossary** in the *NATSPEC National BIM Guide* for definitions of these terms. Make sure that the legal status of the Design Model has been covered in the contract documents. Consider indemnification for use of digital files. Seek legal advice as required. State whether the model is an Integrated or Federated model as this will affect intellectual property (IP) issues and legal responsibilities.

Strategy for updating and coordinating changes made during construction into the final BIM model deliverable files: [complete/delete]

Describe who will be responsible and how the model is to be updated and coordinated. Outline procedures for capturing changes, incorporating them in the model and verifying their correctness, including sign-off protocols.

4.2 Model quality control

Strategy for maintaining model quality standards for the project: [complete/delete]

Describe the model quality standards to be adopted for the project (e.g. for objects being added to models) and the procedures for disseminating, implementing and updating them. Describe model checking and auditing protocols. Identify those responsible for these activities. See *National BIM Guide* Part 10, *National Guidelines for Digital Modelling* clauses 1.3 & 2.1 and *BIM Project Execution Planning Guide* Chapter 5, Part 8.

5 MODEL SHARING

5.1 Model exchange

Requirement: Exchange model files with the BIM Manager at the intervals documented in the **Model exchange schedule**.

Edit this clause to refer to the Design BIM Manager or Construction BIM Manager, as appropriate. See *National BIM Guide* clauses 5.1 to 5.3. Refer to **INFORMATION TECHNOLOGY, Data sharing** for details of the IT system required to support model exchange,

5.2 CAD exchange

Requirement: Exchange CAD files with the BIM Manager at the intervals documented in the **CAD exchange schedule**.

Edit this clause to refer to the Design BIM Manager or Construction BIM Manager, as appropriate.

5.3 Model element responsibilities

Responsibilities: Model Element Authors (MEA) are responsible for the creation, editing and placement of the model elements assigned to them in the **Model element responsibilities schedule** for the duration of the periods shown.

Note: This clause and the **Model element responsibilities schedule** may not be considered necessary, depending on the complexity of the project and preferences of the project team. See *Guidance* associated with the schedule.

5.4 Modelling permissions

Rules: Model Element Authors (MEA) are permitted to act on the model elements assigned to them in the **Modelling permissions schedule**, only to the extent indicated.

5.5 Model development

Collaborative model development: Model Element Authors (MEA) are responsible for developing each Model Element, at the end of each phase of the project, to the Level of Development (LOD) shown in the **Model collaboration matrix**.

For an overview of model development and Levels of Development (LOD) of model elements see *National Guidelines for Digital Modelling* clauses 1.6 & 1.7. See also the *National BIM Guide* Glossary for an explanation and definition of LODs.

5.6 Model development protocols

Protocols for model development: [complete/delete]

e.g. Conform to *AIA Document E202*. It is preferable to reference an existing standard or standard with agreed amendments than to include purpose-written text in this location.

Include protocols for the checking, approval and sign-off of Model Elements. See also **MODELLING, Model quality control**.

Federated model management: [complete/delete]

Describe the form of federated model, e.g. entire project or defined subsets of the project model such as individual levels, sectors or zones. Define the federated models to be produced and how they will be segmented. Describe the protocols for coordinating their development. Detail procedures for notifying team members of changes to the model and methods for presenting the information. See also **SPECIFIC USES OF BIM, Clash detection/coordination**.

6 SPECIFIC USES OF BIM

6.1 General

Project requirements: Refer to the *Project BIM Brief* for uses of BIM applicable to the project.

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

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.

Changes to uses of BIM: As recorded in the *Project BIM Brief*.

Changing uses of BIM during the project changes the scope of service previously documented. Always recording the changes in the *Project BIM Brief* ensures that this information, which can have contractual implications, is consolidated in a single constant location.

6.2 Modelling existing conditions (NBG clause 7.1.1)

Methods for modelling existing conditions: [complete/delete]

e.g. 3D laser scanning. Reference guidelines and/or standards to be adopted, e.g. *GSA BIM Guide 05*, 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 *NGDM* clause 3.1.1 and *BPEPG* Appendix B, Item 25.

6.3 Site analysis (NBG clause 7.1.2)

Approach to site analysis: [complete/delete]

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

See *NGDM* clause 3.2 and *BPEPG* Appendix B, Item 21.

6.4 Space and equipment validation (NBG clause 7.1.3)

Space and equipment validation method: [complete/delete]

e.g. reports generated by architectural programming software, spreadsheets, colour coded plans, models.

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

See *NGDM* clause 3.2 & Appendix 1 and *BPEPG* Appendix B, Item 20.

Space and equipment validation submissions: [complete/delete]

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

6.5 Architecture – spatial and material design models (NBG clause 7.2.1)

Approach to architectural modelling: [complete/delete]

Outline the general types of architectural models proposed and the level of geometric detail and material representation of each. See *NGDM* clause 3.2 and *BPEPG* Appendix B, Items 12 and 22.

6.6 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: [complete/delete]

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

See *NGDM* clause 3.2 and *BPEPG* Appendix B, Items 12 and 22.

6.7 Design visualisation for functional analysis (NBG clause 7.2.2)

Methods for showing functionality of occupants' requirements: [complete/delete]

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 *NGDM* clause 3.2 and *BPEPG* Appendix B, Item 22.

Methods for showing circulation paths for the delivery, supply, processing and storage of materials: [complete/delete]

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: [complete/delete]

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

6.8 Code checking (NBG clause 7.2.3)

Strategy for code checking: [complete/delete]

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. Nominate the model checking software to be used.

See *NGDM* Appendix 1 and *BPEPG* Appendix B, Item 19.

6.9 Sustainability evaluation (NBG clause 7.2.4)

Strategy for sustainability evaluation: [complete/delete]

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 *NGDM* clause 3.4 and *BPEPG* Appendix B, Item 18.

6.10 Structural modelling and analysis (NBG clause 7.3)

Strategy for structural modelling and analysis: [complete/delete]

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 *NGDM* clause 3.3 and *BPEPG* Appendix B, Item 14.

6.11 Energy analysis (NBG clause 7.4.1)

Strategy for energy modelling: [complete/delete]

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 **Model collaboration matrix**.

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

See *NGDM* clause 3.4 and *BPEPG* Appendix B, Item 13.

6.12 Virtual testing and balancing (NBG clause 7.4.2)

Strategy for virtual testing and balancing: [complete/delete]

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 *NGDM* clause 3.4 and *BPEPG* Appendix B, Item 16.

6.13 Lighting analysis (NBG clause 7.4.3)

Strategy for lighting modelling: [complete/delete]

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 *NGDM* clause 3.4 and *BPEPG* Appendix B, Item 15.

6.14 Other engineering analysis (NBG clause 7.4.4)

Strategy for other engineering modelling: [complete/delete]

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 *NGDM* clause 3.4 and *BPEPG* Appendix B, Item 17.

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

Approach to quantity take-off and cost planning: [complete/delete]

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 *NGDM* clause 3.5 and *BPEPG* Appendix B, Item 24.

6.16 Clash detection/coordination (NBG clause 7.6.1)

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

Clash detection procedures: [complete/delete]

Describe clash detection procedures including organisation, obligations of different team members, workflows to be used, timing, reporting processes and formats, status tracking (New, Active, Resolved, etc), resolution and sign-off.

See *NGDM* clause 3.6 & Appendix 1 and *BPEPG* Appendix B, Item 11.

Clash detection rules: [complete/delete]

Describe modelling rules for clash detection purposes including elements excluded from the clash sets, clashes to be ignored, e.g. power outlets in walls, attributes attached to elements necessary to make clash rules work, e.g. penetrations in partitions, and definition of service zones and associated rules.

Clash detection colours: [complete/delete]

e.g. Conform to the *Project BIM brief*.

Clash selection sets: Conduct clash detections between sets of elements in the order shown in the **Clash detection schedules**.

It may not be possible to define all clash detection sets in detail when drafting the initial BMP at project inception. If they cannot be defined in any meaningful way, postpone inclusion of **Clash detection schedules** until a later revision of the BMP.

6.17 Construction system design (NBG clause 7.6.2)

Strategy for construction system design: [complete/delete]

Purpose of using BIM for this, e.g. for planning by the contractor only, for communicating with subcontractors to improve constructability, productivity or safety. Describe what will be modelled, including level of detail and method of communication.

See *NGDM* clause 3.6 and *BPEPG* Appendix B, Item 8.

6.18 Digital fabrication (NBG clause 7.6.3)

Strategy for digital fabrication: [complete/delete]

Identify elements to be digitally fabricated. Specify documentation and file formats to enable digital fabrication. Outline collaboration arrangements between the contractor, fabricators, designers and modellers to maximise its value.

See *NGDM* clause 3.6 and *BPEPG* Appendix B, Item 9.

6.19 Planning construction scheduling and sequencing – 4D (NBG clause 7.6.4)

Strategy for planning construction scheduling and sequencing: [complete/delete]

Purpose of using BIM for this, e.g. for planning by the contractor only, for building occupants. 4D can even be used for conceptual design to show massing during the progressive development of a multi-stage project. Describe what will be modelled, including level of detail and method of communication, e.g. animated models. Detail who will be given 4D information. Describe the method of linking the model to the project program. Reference guidelines to be adopted, e.g. *GSA BIM Guide 04*.

See *NGDM* clause 3.6 and *BPEPG* Appendix B, Item 23.

6.20 Communication of construction scheduling and sequencing – 4D (NBG clause 7.6.5)

Strategy for communication of construction scheduling and sequencing: [complete/delete]

See *Guidance* for previous item.

6.21 Site utilisation planning (NBG clause 7.6.6)

Strategy for planning site utilisation: [complete/delete]

Purpose of using BIM for this, e.g. for planning by the contractor only, for communicating with site personnel to improve productivity or safety. Describe what will be modelled, including level of detail and method of communication. Outline collaboration arrangements between the contractor, site personnel, designers and modellers to maximise its value.

See *NGDM* clause 3.6 and *BPEPG* Appendix B, Item 7.

6.22 Lift planning (NBG clause 7.6.7)

Strategy for lift planning: [complete/delete]

Describe what will be modelled, including level of detail and method of communication. Outline collaboration arrangements between the engineer, contractor and site personnel to maximise its value. See *NGDM* clause 3.6 and *BPEPG* Appendix B, Item 10.

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

Strategy for integration of Facility Management information: [complete/delete]

Note: As-built models do not necessarily contain information suitable for FM purposes. State the purpose for which the model is to be used. 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. See *NGDM* clause 3.7 and *BPEPG* Appendix B, Items 1 – 4 and 6.

6.24 Security assessment and planning (NBG clause 7.7.3)

Strategy for security assessment and planning: [complete/delete]

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 *BPEPG* Appendix B, Item 5.

7 INFORMATION TECHNOLOGY**7.1 Data sharing**

System for hosting, transfer, and access of data between technical disciplines: [complete/delete]

Describe the proposed system. Options include:

- Shared file server.
- Online collaboration system, e.g. Aconex, Buzzsaw, ProjectCentre.
- Web based file sharing system, e.g. Box, Dropbox.

Explain how the technical specification of the Information Technology (IT) system match the size and complexity of the project.

Strategy for establishing and managing the Information Technology (IT) system: [complete/delete]

Include who will be responsible for setting up and maintaining the IT system and providing access to the Design/Construction Team and various project stakeholders. Include proposed program.

Outline the strategy for model exchange and handover. Address issues such as permitted uses, access rights, security provisions, data backup and data restoration in the event of system failures.

7.2 Project software

Software: The software to be used by each discipline for specific BIM uses on the project is shown in the **Project software schedule**.

7.3 Software compatibility testing

Requirement: Test BIM software that will exchange files on the project for compatibility and record the results in the **Software compatibility testing schedule**.

The purpose of this testing is to identify problems or limitations with compatibility **before** fully deploying software on the project. If the project team has used the same software together before without issues and consider testing unnecessary, they can choose to delete this clause and the testing schedule.

7.4 Software updating

Strategy for updating software: [complete/delete]

The strategy for updating software needs to be arrived at by consensus of the whole project team. Record the agreed strategy here, e.g. within 30 days of a new release by the vendors, for the duration of the project.

Outline procedures for coordinating updates throughout the project team, and members' roles and responsibilities in this.

Outline procedures for ensuring the ongoing compatibility of the different software applications throughout the project.

Issues to be addressed:

- Backward compatibility of software releases.
- The upgrade process for archived files created with previous software releases.

7.5 File formats

Model file format: [complete/delete]

e.g. ArchiCAD (.pln), Microstation (.dgn), Revit (.rvt).

CAD file format: [complete/delete]

e.g. ArchiCAD (.pln), Autocad (.dwg), Microstation (.dgn).

File naming conventions: [complete/delete]

e.g. BS 1192, ANZRS, nominated office manual. It is preferable to reference an existing standard or one with agreed amendments than to include purpose-written text in this location. Include file naming conventions for Template files.

7.6 File exchange

File exchange protocol standard: [complete/delete]

e.g. BS 1192, nominated office manual. It is preferable to reference an existing standard or standard with agreed amendments than to include purpose-written text in this location.

8 DELIVERABLES

8.1 General

Requirement: Provide deliverables as documented in the **Deliverables schedule**.

Conform to the client's submission instructions. Align with project program. See *National BIM Guide* clause 10.10.

8.2 Deliverables formats

Digital deliverable file formats: [complete/delete]

In addition to the native file formats, provide deliverables in the formats specified in clause 2.5 of the *NATSPEC National BIM Guide*, e.g. List or schedule formats including version here.

Physical deliverables formats: [complete/delete]

Specify format, e.g. printed drawings, physical models. Specify number and size, e.g. A1. List or schedule items here.

8.3 Submission response period

Period in which the deliverables recipient has to advise the deliverables author/s of non-compliance with documented requirements: [complete/delete]

Generally specify the number of working days. Alternatives include the time before a program date or event such as a meeting.

9 SCHEDULES

9.1 BIM meeting schedule

| Meeting type | Frequency | Participants |
|----------------------|-----------|--------------|
| Design meeting | | |
| Coordination meeting | | |
| BIM model meeting | | |
| BMP Review meeting | | |

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 *BPEPG* Chapter 6 for suggested agendas for the initial series of meetings.

9.2 Model exchange schedule

| Discipline | Establishment | Schematic Design | Design Development | Contract Documentation | Construction | Facility Management |
|---------------|---------------|------------------|--------------------|------------------------|--------------|---------------------|
| Architectural | | | | | | |
| Structural | | | | | | |

| Discipline | Establishment | Schematic Design | Design Development | Contract Documentation | Construction | Facility Management |
|------------|---------------|------------------|--------------------|------------------------|--------------|---------------------|
| Mechanical | | | | | | |
| Other | | | | | | |

This schedule gives each discipline an indication of the expected frequency of model exchange at each project phase so they can plan their resources. Add or delete disciplines and/or project phases as required.

Insert the required interval for each exchange, e.g. weekly, fortnightly, monthly, every Monday, on request of BIM Manager.

Edit the project phases to suit the BMP type and scope of service being provided, e.g. for a Design BMP, include only those phases from Establishment to Design development or Contract documentation.

Rather than trying to prescribe fixed intervals between exchanges, you may prefer to decide this on an as-needed basis at regular meetings. Alternatively, you could omit the schedule from the initial BMP and include it when available information allowed.

9.3 CAD exchange schedule

| Discipline | Establishment | Schematic Design | Design Development | Contract Documentation | Construction | Facility Management |
|---------------|---------------|------------------|--------------------|------------------------|--------------|---------------------|
| Architectural | | | | | | |
| Structural | | | | | | |
| Mechanical | | | | | | |
| Other | | | | | | |


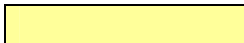

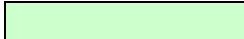
This schedule gives each discipline an indication of the expected frequency of CAD exchange at each project phase so they can plan their resources. Add or delete disciplines and/or project phases as required.

Insert the required interval for each exchange, e.g. weekly, fortnightly, monthly, every Monday, on request of BIM Manager.

Edit the project phases to suit the BMP type and scope of service being provided, e.g. for a Design BMP, include only those phases from Establishment to Design development or Contract documentation.

Rather than trying to prescribe fixed intervals between exchanges, you may prefer to decide this on an as-needed basis at regular meetings. Alternatively, you could omit the schedule from the initial BMP and include it when available information allowed.

9.4 Legend for Model element responsibilities schedule

| | | | |
|---|--------------------------------|--|-----------------------|
|  | MEA discipline Architecture |  | MEA discipline MEP |
|  | Structural |  | Other |

Legend: Use the colours shown or assign a tone or fill pattern to each discipline who will be a MEA for use with the **Model element responsibilities schedule**.

Using the **Model element responsibilities schedule**:

Apply the colours representing the MEA discipline to each Model element row to indicate the period for which they will be responsible for that element. For example, you can indicate that the architect will be responsible for locating loadbearing walls up to the end of Schematic Design and that the structural engineer would take prime responsibility for them from that point on by the application of colours in the 'Walls – loadbearing' row. When completed, the schedule gives the appearance of a Gantt chart. Add or delete rows for model elements. Edit the project phases to suit the BMP type and scope of service being provided, e.g. for a Design BMP, include only those phases from Conceptual Design to Design development or Contract documentation. Add columns for additional project phases or subdivisions of phases, as required.

Note: This schedule can be used as a precursor to the **Modelling permissions schedule** and/or **Model collaboration matrix**. That is, it can be used as an early planning tool to rough out overall team responsibilities before transposing them to these schedules which contain more detail. For a simple project, or where the team has worked together on similar projects before, a Model element responsibilities schedule may be all that is required. Likewise, if the team is familiar with Modelling permissions schedules, etc, they might start working on them directly without using this schedule as an intermediate step at all.

9.5 Model element responsibilities schedule

| Model element | Project Phase | Notes |
|---------------|---------------|-------|
|---------------|---------------|-------|

| | Conceptual Design | Schematic Design | Design Development | Contract Documentation | Construction | Facility management | |
|---------------------------|-------------------|------------------|--------------------|------------------------|--------------|---------------------|--|
| | CO | SD | DD | CD | CN | FM | |
| SPATIAL | | | | | | | |
| Site boundaries, setbacks | | | | | | | |
| Grids | | | | | | | |
| Levels | | | | | | | |
| Zones | | | | | | | |
| Spaces, rooms | | | | | | | |
| SITE | | | | | | | |
| Topography | | | | | | | |
| Excavation | | | | | | | |
| Stormwater | | | | | | | |
| Services | | | | | | | |
| Roads | | | | | | | |
| Parking | | | | | | | |
| Paths, paving | | | | | | | |
| Walls, fencing | | | | | | | |
| Soft landscaping | | | | | | | |
| SUBSTRUCTURE | | | | | | | |
| Footings | | | | | | | |
| Retaining walls | | | | | | | |
| Subsoil drainage | | | | | | | |
| STRUCTURE | | | | | | | |
| Floor structures | | | | | | | |
| Beams | | | | | | | |
| Shaft openings | | | | | | | |
| Stair & ramp structures | | | | | | | |
| Walls – load bearing | | | | | | | |
| Columns | | | | | | | |
| ENCLOSURE | | | | | | | |
| Roofing | | | | | | | |
| Cladding | | | | | | | |
| Column claddings | | | | | | | |
| Curtain walls | | | | | | | |
| Windows | | | | | | | |
| External doors, openings | | | | | | | |

| Model element | Project Phase | | | | | | Notes |
|------------------------------|-------------------|------------------|--------------------|------------------------|--------------|---------------------|-------|
| | Conceptual Design | Schematic Design | Design Development | Contract Documentation | Construction | Facility management | |
| | CO | SD | DD | CD | CN | FM | |
| INTERIOR | | | | | | | |
| Partitions | | | | | | | |
| Internal doors, openings | | | | | | | |
| Ceilings | | | | | | | |
| Flooring | | | | | | | |
| Balustrading | | | | | | | |
| F, F & E | | | | | | | |
| Casework, joinery | | | | | | | |
| Fixtures | | | | | | | |
| Fittings | | | | | | | |
| Equipment (non-service) | | | | | | | |
| Furniture | | | | | | | |
| Signage | | | | | | | |
| MECHANICAL | | | | | | | |
| Plant & equipment | | | | | | | |
| Ductwork | | | | | | | |
| Pipework | | | | | | | |
| HYDRAULIC | | | | | | | |
| Plant & equipment | | | | | | | |
| Sanitary fixtures | | | | | | | |
| Pipework | | | | | | | |
| Fire services | | | | | | | |
| ELECTRICAL | | | | | | | |
| Electrical fixtures | | | | | | | |
| Power outlets | | | | | | | |
| Switch & distribution boards | | | | | | | |
| Cable trays, ducts | | | | | | | |
| Lighting | | | | | | | |
| Communications | | | | | | | |
| Security | | | | | | | |
| CONVEYING | | | | | | | |
| Lifts, escalators | | | | | | | |

9.6 Legend for Modelling permissions schedule

Y May change **N** May not change **P** May change with permission from the MEA and BIM Manager.

MEA Model Element Author **C/M** Copy/monitor **CHK** Check for changes (manually only)

Legend: Amend 'BIM Manager' to 'Design BIM Manager' or 'Construction BIM Manager' to suit the project procurement strategy.

Using the **Modelling permissions schedule**:

Model element: Replace '**Element**' with a model element group, e.g. Grids, walls, floors. Then under each element replace 'Action' with typical model editing actions associated with each element, e.g. change thickness, add openings.

Arch, Struct, MEP: Insert 'MEA' in the appropriate cell to indicate the Model Element Author responsible for each element at each project phase, For example, insert 'MEA' in the cell at the intersection of the 'Element' row and the 'Arch' columns to indicate that the architect is the MEA for that element. Add C/M or CHK (See the Legend above) in the other cells in the 'Element' row, as required, to assign these permissions to other disciplines. Then enter 'Y', 'N' or 'P' (See the Legend above) in the 'Action' cells to assign editing permissions to each discipline.

Colour coding cells and/or the fonts can make the schedule easier to read, e.g. green for 'Y', red for 'N', yellow for 'P', blue for 'MEA'.

Edit the project phases to suit the BMP type and scope of service being provided, e.g. for a Design BMP, include only those phases from Conceptual Design to Design development or Contract documentation. Add columns for additional project phases or disciplines, and additional rows for elements and actions, as required.

Note: If the **Model element responsibilities schedule** has been completed, transpose the MEA for each element at a given project phase into the **Modelling permissions schedule** so they are aligned. See the *Guidance* before the **Model element responsibilities schedule** which explains how they can be used together.

9.7 Modelling permissions schedule

| Model element | Schematic design | | | Design Development | | | Contract Documentation | | | Notes |
|---------------------|------------------|--------|-----|--------------------|--------|-----|------------------------|--------|-----|-------|
| | Arch | Struct | MEP | Arch | Struct | MEP | Arch | Struct | MEP | |
| SPATIAL | | | | | | | | | | |
| Element | | | | | | | | | | |
| Action | | | | | | | | | | |
| Action | | | | | | | | | | |
| SITE | | | | | | | | | | |
| Element | | | | | | | | | | |
| Action | | | | | | | | | | |
| Action | | | | | | | | | | |
| SUBSTRUCTURE | | | | | | | | | | |
| Element | | | | | | | | | | |
| Action | | | | | | | | | | |
| Action | | | | | | | | | | |
| STRUCTURE | | | | | | | | | | |
| Element | | | | | | | | | | |
| Action | | | | | | | | | | |
| Action | | | | | | | | | | |
| ENCLOSURE | | | | | | | | | | |
| Element | | | | | | | | | | |
| Action | | | | | | | | | | |

| Model element | Schematic design | | | Design Development | | | Contract Documentation | | | Notes |
|---------------------|------------------|--------|-----|--------------------|--------|-----|------------------------|--------|-----|-------|
| | Arch | Struct | MEP | Arch | Struct | MEP | Arch | Struct | MEP | |
| Action | | | | | | | | | | |
| INTERIOR | | | | | | | | | | |
| Element | | | | | | | | | | |
| Action | | | | | | | | | | |
| Action | | | | | | | | | | |
| F, F & E | | | | | | | | | | |
| Element | | | | | | | | | | |
| Action | | | | | | | | | | |
| Action | | | | | | | | | | |
| MECHANICAL | | | | | | | | | | |
| Element | | | | | | | | | | |
| Action | | | | | | | | | | |
| Action | | | | | | | | | | |
| HYDRAULIC | | | | | | | | | | |
| Element | | | | | | | | | | |
| Action | | | | | | | | | | |
| Action | | | | | | | | | | |
| ELECTRICAL | | | | | | | | | | |
| Element | | | | | | | | | | |
| Action | | | | | | | | | | |
| Action | | | | | | | | | | |
| CONVEYING | | | | | | | | | | |
| Element | | | | | | | | | | |
| Action | | | | | | | | | | |
| Action | | | | | | | | | | |

9.8 Legend for model collaboration matrix

| Project Phase | MEA | Model Element Author | LOD | Level of Development |
|----------------------------------|----------|-------------------------------|------------|----------------------|
| CO Conceptual Design | A | Architect | 100 | Conceptual |
| SD Schematic Design | C | Contractor | 200 | Approximate geometry |
| DD Design Development | E | Electrical Engineer | 300 | Precise geometry |
| CD Contract Documentation | M | Mechanical Engineer | 400 | Fabrication |
| CN Construction | P | Plumbing (Hydraulic) Engineer | 500 | As-built |
| FM Facilities Management | S | Structural Engineer | | |

Note: If the **Model element responsibilities schedule** has been completed, transpose the MEA for each element at a given project phase into the **Model collaboration matrix** so they are aligned. See the *Guidance* before the **Model element responsibilities schedule** which explains how they can be used together.

Using the **Model collaboration matrix**:

Determine the LOD required for each Model Element at the end of each phase, and the Model Element Author (MEA) responsible for developing it to that LOD. Record these decisions by inserting the appropriate abbreviations from the Legend in the cells of the matrix. Refer to *AIA Document E202* for definitions of each LOD including authorised uses, model management protocols, responsibilities, etc. Project-specific amendments to these definitions should be documented here.

Modify the matrix to suit the requirements of the project. For example:

- Edit Model Elements to suit the project. Those listed can be merged for simple projects, or another classification scheme substituted as required, e.g. Revit Family categories. See **Appendix B – Model collaboration matrix (UniFormat alternative)** for a matrix with elements organised by UniFormat classification.
- If more than one author will be developing an element, add additional rows and enter the LOD each will be responsible for.
- If two authors are required to collaborate closely in the development of an element throughout the project, e.g. an architect and a structural engineer coordinating door and window openings in structural walls, indicate this by entering the abbreviations for both in the same MEA cell, e.g. A + S.
- Subdivisions of LODs can be defined, e.g. LOD225, 250, 275, to indicate the percentage of work required to be complete within each LOD. This allows the introduction of additional program milestones and more precise control of model development.
- Edit the project phases to suit the BMP type and scope of service being provided, e.g. for a Design BMP, include only those phases from Conceptual Design to Design development or Contract documentation. Project phases can be subdivided to show a finer gradation of model element development. Refer to ISO 22263 or Omniclass Table 31 for more detailed subdivision of project phases.
- To make commitments more specific, program dates (when agreed) can be substituted for the project phase abbreviations shown in the heading of the matrix.
- Because of the limited space available for comments in the notes column it will generally be more effective to enter a note number in the cells and provide a separate numbered list of notes below the matrix.
- Shading or colour coding of LODs, MEAs or project phases can assist legibility of the matrix and interpretation of information.

9.9 Model collaboration matrix

| Model Element | MEA | Project Phase | | | | | | Notes |
|---------------------------|-----|-------------------|------------------|--------------------|----------------------------|--------------|---------------------|-------|
| | | Conceptual Design | Schematic Design | Design Development | Construction Documentation | Construction | Facility Management | |
| | | CO | SD | DD | CD | CN | FM | |
| SPATIAL | | | | | | | | |
| Site boundaries, setbacks | | | | | | | | |
| Grids | | | | | | | | |
| Levels | | | | | | | | |
| Zones | | | | | | | | |
| Spaces, rooms | | | | | | | | |
| SITE | | | | | | | | |
| Topography | | | | | | | | |
| Excavation | | | | | | | | |
| Stormwater | | | | | | | | |
| Services | | | | | | | | |
| Roads | | | | | | | | |
| Parking | | | | | | | | |
| Paths, paving | | | | | | | | |
| Walls, fencing | | | | | | | | |

| Model Element | MEA | Project Phase | | | | | | Notes |
|--------------------------|-----|-------------------|------------------|--------------------|----------------------------|--------------|---------------------|-------|
| | | Conceptual Design | Schematic Design | Design Development | Construction Documentation | Construction | Facility Management | |
| | | CO | SD | DD | CD | CN | FM | |
| Soft landscaping | | | | | | | | |
| SUBSTRUCTURE | | | | | | | | |
| Footings | | | | | | | | |
| Retaining walls | | | | | | | | |
| Subsoil drainage | | | | | | | | |
| STRUCTURE | | | | | | | | |
| Floor structures | | | | | | | | |
| Beams | | | | | | | | |
| Shaft openings | | | | | | | | |
| Stair & ramp structures | | | | | | | | |
| Walls – load bearing | | | | | | | | |
| Columns | | | | | | | | |
| Roof structures | | | | | | | | |
| ENCLOSURE | | | | | | | | |
| Roofing | | | | | | | | |
| Cladding | | | | | | | | |
| Column claddings | | | | | | | | |
| Curtain walls | | | | | | | | |
| Windows | | | | | | | | |
| External doors, openings | | | | | | | | |
| INTERIOR | | | | | | | | |
| Partitions | | | | | | | | |
| Internal doors, openings | | | | | | | | |
| Ceilings | | | | | | | | |
| Flooring | | | | | | | | |
| Balustrading | | | | | | | | |
| F, F & E | | | | | | | | |
| Casework, joinery | | | | | | | | |
| Fixtures | | | | | | | | |
| Fittings | | | | | | | | |
| Equipment (non-service) | | | | | | | | |
| Furniture | | | | | | | | |
| Signage | | | | | | | | |

| Model Element | MEA | Project Phase | | | | | | Notes |
|------------------------------|-----|-------------------|------------------|--------------------|----------------------------|--------------|---------------------|-------|
| | | Conceptual Design | Schematic Design | Design Development | Construction Documentation | Construction | Facility Management | |
| | | CO | SD | DD | CD | CN | FM | |
| MECHANICAL | | | | | | | | |
| Plant & equipment | | | | | | | | |
| Ductwork | | | | | | | | |
| Pipework | | | | | | | | |
| HYDRAULIC | | | | | | | | |
| Plant & equipment | | | | | | | | |
| Sanitary fixtures | | | | | | | | |
| Pipework | | | | | | | | |
| Fire services | | | | | | | | |
| ELECTRICAL | | | | | | | | |
| Electrical fixtures | | | | | | | | |
| Power outlets | | | | | | | | |
| Switch & distribution boards | | | | | | | | |
| Cable trays, ducts | | | | | | | | |
| Lighting | | | | | | | | |
| Communications | | | | | | | | |
| Security | | | | | | | | |
| CONVEYING | | | | | | | | |
| Lifts, escalators | | | | | | | | |

9.10 Clash detection schedules

See *Guidance* at **Clash detection/coordination** about the limitations on defining clash detection sets in detail when drafting the initial BMP at project inception.

Using the **Clash detection schedules**:

- Substitute the names of the pairs of disciplines to be coordinated for the headings 'Discipline A' and 'Discipline B', e.g. 'Structural' and 'Mechanical'. The abbreviations used for the Model Element Authors in the **Model collaboration matrix** can also be used for this purpose. Provided a legend for the abbreviations adjacent the schedules if considered necessary.
- In each row under these headings enter descriptions of specific Model Elements within the discipline models that are to be checked for clashes, e.g. Beams, Supply air (ducts), All.
- Copy the schedule for each Clash Set as required and renumber, e.g. Clash Set 2, Clash Ref. No. 2.01, 2.02, 2.03, etc.
- The Clash Ref. No. can be cited in reports, or the **Clash detection schedules** can be used for reporting purposes by adding additional columns for results and comments.

Show completion dates for each Clash Set on the project program to place them in context and facilitate reference.

| Clash Set 1 | | | |
|----------------|--------------|----|--------------|
| Clash Ref. No. | Discipline A | vs | Discipline B |
| 1.01 | | | |
| 1.02 | | | |

| Clash Set 1 | | |
|----------------|--------------|--------------|
| Clash Ref. No. | Discipline A | Discipline B |
| 1.03 | | |

9.11 Project software schedule

| Discipline | BIM use | Software | Version |
|------------|---------|----------|---------|
| | | | |
| | | | |
| | | | |

Refer to **BIM Software** in the *Project BIM Brief* for the Client’s software requirements. Document compatible BIM software chosen for use on the project by each discipline. See *National BIM Guide* clause 9.1

Discipline: e.g. architectural, structural, MEP.

BIM use: e.g. cost estimating, energy analysis.

Software: Full proprietary name of software.

Version: e.g. build number, release number or date.

9.12 Software compatibility testing schedule

| Software application 1 | Software application 2 | Test date | Notes |
|------------------------|------------------------|-----------|-------|
| | | | |
| | | | |
| | | | |

Software application 1 and 2: Name and version, or build number of software applications being tested for compatibility.

Test date: DD/MM/YY.

Notes: Results of testing (compatible or incompatible) and relevant comments such as qualifying remarks, limitations, testing protocols used.

Show compatibility testing dates on the project program to place them in context and facilitate reference.

9.13 Deliverables schedule

| Item | Required | Description | Features included | Resolved | Recipient |
|------|----------|-------------|-------------------|----------|-----------|
| | | | | | |
| | | | | | |
| | | | | | |

Item: e.g. Progress Model 1, As-built model, Printed drawings, Physical model.

Required: Date, program or contractual event, or project phase, e.g. DD/MM/YY, Practical Completion, Design Development.

Description: Additional information as required, e.g. Model View Definition (MVD), size, e.g. A1, scale, e.g. 1:100, quantity.

Features included: e.g. load bearing structures only, spaces without furnishings, window construction details.

Resolved: Yes or No. This shows if an item is expected to be fully resolved at a given time and helps set priorities.

Recipient: e.g. client, contractor.

Show delivery dates on the project program to place them in context and facilitate reference.

REFERENCED DOCUMENTS

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

| | | |
|--------------------|------|---------|
| National BIM Guide | 2011 | NATSPEC |
| Project BIM Brief | 2011 | NATSPEC |

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

| | | |
|--------------------|---------|--|
| ACMM | Various | Australian Institute of Quantity Surveyors Australian Cost Management Manual |
| ANZRS | 2011 | Australian and New Zealand Revit Standards |
| ASMM | | Australian Institute of Quantity Surveyors Australian Standard Method of Measurement |
| ASTM E2807 | 2011 | Standard Specification for 3D Imaging Data Exchange |
| AIA Document E202 | 2008 | American Institute of Architects Building Information Modeling Protocol Exhibit |
| AIQS Book of Areas | | Australian Institute of Quantity Surveyors Book of Areas |
| 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 |
| COBie | | Constructions Operations Building Information Exchange |
| GSA BIM Guide 02 | 2007 | GSA BIM Guide for Spatial Program Validation |
| GSA BIM Guide 03 | 2009 | GSA BIM Guide for 3D Imaging |
| GSA BIM Guide 04 | 2009 | GSA BIM Guide for 4D Phasing |
| GSA BIM Guide 05 | 2009 | GSA BIM Guide for Energy Performance |
| ISO 22263 | 2008 | Organization of information about construction works - Framework for management of project information |
| NABERS | | National Australian Built Environment Rating Scheme |
| NGDM | 2009 | National Guidelines for Digital Modelling by the Cooperative Research Centre (CRC) for Construction Innovation |
| Omniclass Table 31 | 2006 | Omniclass Construction Classification System Table 31 – Phases |
| UniFormat | 2010 | Building Element Classification System |

10 APPENDICES

These **APPENDICES** provide supplementary information that you may find useful. Delete if not required.

Other material can also be appended here, including:

- Material that is likely to be edited on a regular basis. This saves editing and printing the whole document.
- A project program that includes all the dates and time dependent requirements noted in the BMP and relates them to other project milestones. This aids reference by consolidating time related items in one place.
- Extensive or detailed information such as project guidelines and protocols that is likely to be referred to regularly.

10.1 Appendix A – Project Guidelines checklist

Generally, as much as possible, project guidelines should be specified by reference to existing standards by using the **Reference Documents** list in the *Project BIM Brief*, read in conjunction with the *NATSPEC National BIM Guide*. See *National BIM Guide* clauses 10.1 – 10.9 and 12.1 – 12.2. In practice though, variations to these standards or custom standards agreed by the project team often need to be documented. Check proposed custom standards for their alignment with standards previously agreed to avoid conflict or duplication. Below is a list of items for consideration:

Generally applicable items

- Definitions: Defines terms used in the guidelines.
- Project filing structure: Details the filing structure of the central storage location for model and document sharing.
- Project object library organisation: Details the filing structure of the object library, access and modelling permissions and version control.
- Issue file types: Defines the file types to be issued electronically.
- Units of measurement and dimensional accuracy: Details units to be used and the dimensional accuracy required for models.
- Space/Brief validation: Defines terms and standard methods of measurement associated with the calculation of areas.
- Room and space naming: Details the naming conventions and protocols for rooms and spaces.
- Element naming: Details the naming conventions and protocols for elements such as walls, floors, roofs and ceilings.
- Element classification system: Details the system used for identifying, classifying, sorting and filtering model elements.
- MEP system naming: Details the naming conventions and protocols for mechanical, electrical and plumbing (MEP) systems.
- MEP equipment naming: Details the naming conventions and protocols for services plant and equipment.
- FFE naming: Details the naming conventions and protocols for furniture, fixtures and (non MEP plant) equipment (FFE).
- Material naming: Details the naming conventions and protocols for materials.
- Drafting object naming: Details the naming conventions and protocols for drafting objects such as line types, hatch and fill patterns, and annotation fonts.
- Parameter naming: Details the naming conventions and protocols for object parameters.

Project-specific items

- Document naming: Details the naming conventions and protocols for documents used on the project.
- Model setup: Details project Templates to be used.
- Model naming: Details the naming and referencing conventions and protocols for models.
- Location and orientation: Defines the project's site origin, location and elevation, and project north.
- Levels and grids: Defines and identifies floor levels, ceiling levels and major structural grids.
- Site segmentation: Defines how the site is to be segmented and zoned.
- Levels of Development (LOD): Defines the expected content and resolution of different model elements for each LOD.

- Modelling compromises: Details the approach to excluding or modifying objects to avoid tedious modelling while providing adequate representations of them on drawings.
- Asset naming: Details the naming conventions for Facility Management (FM) asset IDs on the project.
- Visualisation requirements: Details requirements for the visualisation of project models.
- Stakeholder model structure: Details the breakup and number of base and control models.
- Federated model structure: Details the breakup and number of federated models.
- Object parameters: Defines the information attached to each model object and the associated parameters.

Application-specific items

- Provide detailed guidelines and protocols specific to each application used on the project, such as those for modelling, e.g. Revit Family and View naming, Bentley Layer naming.
- For each item:
 - Explain its purpose or intended outcome.
 - Clearly explain the underlying principles of the guidelines.
 - Where possible, provide a prepared standardised list of the item as a ready reference for project team members.

10.2 Appendix B – Model collaboration matrix (UniFormat alternative)

This model collaboration matrix can be substituted for the one in the main document if you wish to organise model elements by UniFormat classification.

| Model Element by CSI UniFormat™ classification | | | | MEA | Project Phase | | | | | | Notes |
|--|-------|----------------------|--|-----|-------------------|------------------|--------------------|------------------------|--------------|---------------------|-------|
| | | | | | Conceptual Design | Schematic Design | Design Development | Contract Documentation | Construction | Facility Management | |
| | | | | | CO | SD | DD | CD | CN | FM | |
| A SUBSTRUCTURE | | | | | | | | | | | |
| A10 Foundations | A1010 | Standard foundations | | | | | | | | | |
| | A1020 | Special foundations | | | | | | | | | |
| | A1030 | Slab on grade | | | | | | | | | |
| A20 Basement construction | A2010 | Basement excavation | | | | | | | | | |
| | A2020 | Basement walls | | | | | | | | | |
| B SHELL | | | | | | | | | | | |
| B10 Superstructure | B1010 | Floor construction | | | | | | | | | |
| | B1020 | Roof construction | | | | | | | | | |
| B20 Exterior enclosure | B2010 | Exterior walls | | | | | | | | | |
| | B2020 | Exterior windows | | | | | | | | | |
| | B2030 | Exterior doors | | | | | | | | | |
| B30 Roofing | B3010 | Roof coverings | | | | | | | | | |
| | B3020 | Roof openings | | | | | | | | | |
| C INTERIORS | | | | | | | | | | | |
| C10 Interior construction | C1010 | Partitions | | | | | | | | | |
| | C1020 | Interior doors | | | | | | | | | |
| | C1030 | Fittings | | | | | | | | | |
| C20 Stairs | C2010 | Stair construction | | | | | | | | | |

| Model Element by CSI UniFormat™ classification | | | MEA | Project Phase | | | | | | Notes |
|--|-------|-------------------------------------|-----|-------------------|------------------|--------------------|------------------------|--------------|---------------------|-------|
| | | | | Conceptual Design | Schematic Design | Design Development | Contract Documentation | Construction | Facility Management | |
| | | | | CO | SD | DD | CD | CN | FM | |
| | C2020 | Stair finishes | | | | | | | | |
| C30 Interior finishes | C3010 | Wall finishes | | | | | | | | |
| | C3020 | Floor finishes | | | | | | | | |
| | C3030 | Ceiling finishes | | | | | | | | |
| D SERVICES | | | | | | | | | | |
| D10 Conveying | D1010 | Elevators and lifts | | | | | | | | |
| | D1020 | Escalators and moving walks | | | | | | | | |
| | D1030 | Other conveying systems | | | | | | | | |
| D20 Plumbing | D2010 | Plumbing fixtures | | | | | | | | |
| | D2020 | Domestic water distribution | | | | | | | | |
| | D2030 | Sanitary waste | | | | | | | | |
| | D2040 | Rainwater drainage | | | | | | | | |
| | D2090 | Other plumbing systems | | | | | | | | |
| D30 HVAC | D3010 | Energy supply | | | | | | | | |
| | D3020 | Heat generating systems | | | | | | | | |
| | D3030 | Cooling generating systems | | | | | | | | |
| | D3040 | Distribution systems | | | | | | | | |
| | D3050 | Terminal and package units | | | | | | | | |
| | D3060 | Controls and instrumentation | | | | | | | | |
| | D3070 | Systems testing and balancing | | | | | | | | |
| | D3090 | Other HVAC systems & equipment | | | | | | | | |
| D40 Fire protection | D4010 | Sprinklers | | | | | | | | |
| | D4020 | Standpipes | | | | | | | | |
| | D4030 | Fire protection specialties | | | | | | | | |
| | D4090 | Other fire protection systems | | | | | | | | |
| D50 Electrical | D5010 | Electrical service and distribution | | | | | | | | |
| | D5020 | Lighting and branch wiring | | | | | | | | |
| | D5030 | Communications and security | | | | | | | | |
| | D5090 | Other electrical systems | | | | | | | | |
| E EQUIPMENT & FURNISHINGS | | | | | | | | | | |
| E10 Equipment | E1010 | Commercial equipment | | | | | | | | |
| | E1020 | Institutional equipment | | | | | | | | |
| | E1030 | Vehicular equipment | | | | | | | | |
| | E1090 | Other equipment | | | | | | | | |
| E20 Furnishings | E2010 | Fixed furnishings | | | | | | | | |
| | E2020 | Moveable furnishings | | | | | | | | |
| F SPECIAL CONSTRUCTION & DEMOLITION | | | | | | | | | | |
| F10 Special construction | F1010 | Special structures | | | | | | | | |

| Model Element by CSI UniFormat™ classification | | | MEA | Project Phase | | | | | | Notes |
|--|-------|-------------------------------------|-----|-------------------|------------------|--------------------|------------------------|--------------|---------------------|-------|
| | | | | Conceptual Design | Schematic Design | Design Development | Contract Documentation | Construction | Facility Management | |
| | | | | CO | SD | DD | CD | CN | FM | |
| | F1020 | Integrated construction | | | | | | | | |
| | F1030 | Special construction systems | | | | | | | | |
| | F1040 | Special facilities | | | | | | | | |
| | F1050 | Special controls & instrumentation | | | | | | | | |
| F20 Selective build. demo | F2010 | Building elements demolition | | | | | | | | |
| | F2020 | Hazardous components abatement | | | | | | | | |
| G BUILDING SITEWORK | | | | | | | | | | |
| G10 Site preparation | G1010 | Site clearing | | | | | | | | |
| | G1020 | Site demolition and relocations | | | | | | | | |
| | G1030 | Site earthwork | | | | | | | | |
| | G1040 | Hazardous waste remediation | | | | | | | | |
| G20 Site improvements | G2010 | Roadways | | | | | | | | |
| | G2020 | Parking lots | | | | | | | | |
| | G2030 | Pedestrian paving | | | | | | | | |
| | G2040 | Site development | | | | | | | | |
| | G2050 | Landscaping | | | | | | | | |
| G30 Site civil/mech. utilities | G3010 | Water supply & distribution systems | | | | | | | | |
| | G3020 | Sanitary sewer systems | | | | | | | | |
| | G3030 | Storm sewer systems | | | | | | | | |
| | G3040 | Heating distribution | | | | | | | | |
| | G3050 | Cooling distribution | | | | | | | | |
| | G3060 | Fuel distribution | | | | | | | | |
| | G3090 | Other civil/mechanical utilities | | | | | | | | |
| G40 Site electrical utilities | G4010 | Electrical distribution | | | | | | | | |
| | G4020 | Site lighting | | | | | | | | |
| | G4030 | Site communications and security | | | | | | | | |
| | G4090 | Other electrical utilities | | | | | | | | |
| G50 Other site construction | G5010 | Service tunnels | | | | | | | | |
| | G5090 | Other site systems and equipment | | | | | | | | |