

BIM Project Inception Guide

This NATSPEC BIM Paper assists clients working with their Lead BIM Advisor to clarify and define their BIM requirements at project inception for the purpose of engaging the project team, with the goal of maximising the value of BIM to the project. It is designed to be used with the NATSPEC Project BIM Brief template and NATSPEC National BIM Guide.

The clear definition of BIM requirements prior to engagement allows consultants to scope and price their services more accurately when preparing bids, reducing the risk of having to renegotiate them later.

NATSPEC BIM Project Inception Guide

First published 2014

v1.0

Publisher: Construction Information Systems Limited ABN 20 117 574 606

Copyright

This Document is protected by Copyright © 2014. You may use this Document for your own purposes. You may distribute this Document to other persons provided that you attribute the Document as having been generated by NATSPEC and that the document is available free of charge at www.natspec.com.au. Click on the 'NATSPEC BIM' logo.

Disclaimer

The *NATSPEC BIM Project Inception Guide* and associated documents is intended for use by professional personnel competent to evaluate the significance and limitations of its content and able to accept responsibility for the application of the material it contains.

NATSPEC and its contributors hereby disclaim all warranties and conditions with regard to this information and related graphics, including all implied warranties, fitness for a particular purpose, workmanlike effort, title and non-infringement. In no event shall NATSPEC be liable for any direct, indirect, punitive, incidental, special, or consequential damages or damages for loss of profits, revenue, data, down time, or use, arising out of or in any way connected with the use of the Document or performance of any services, whether based on contract, tort, negligence, strict liability or otherwise. NATSPEC disclaims any responsibility to update any information, including with respect to any new legal, business, or technology developments. If you are dissatisfied with any portion of the Document, or with any of these terms of use, your sole and exclusive remedy is to discontinue using the Document.

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.

Formatting conventions used in the *NATSPEC BIM Project Inception Guide*

Text type	Example	Indicates
Normal italicised text	<i>Project BIM Brief</i>	The name of a specific document or standard.
Grey bold text	BIM uses	A cross reference to a Section, Clause, Table, Diagram, etc, in this document.
Blue text	www.natspec.com.au	Hyperlink/weblink

Notes

In this document:

- 'The *Inception Guide*' shall be taken to mean the *NATSPEC BIM Project Inception Guide*.
- The numbering of Tables, Diagrams and Figures is derived from the Clause in which they appear.

Comments

NATSPEC thanks the many people and organisations that have assisted in the development of this document.

NATSPEC welcomes comments or suggestions for improvements to the *NATSPEC BIM Project Inception Guide* 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.

Website: www.natspec.com.au

TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	Purpose.....	1
1.2	Inception processes.....	1
2	BIM PROJECT INCEPTION PHASE.....	1
2.1	Inception roles.....	1
2.2	BIM project team engagement process.....	2
2.3	Inception documents.....	3
3	BIM REQUIREMENTS DEFINITION.....	4
3.1	Definition process.....	4
3.2	Procurement strategy.....	4
3.3	Client information requirements.....	4
3.4	BIM uses.....	4
3.5	BIM use selection.....	5
3.6	Deliverables.....	6
3.7	Packaging and programming deliverables.....	6
3.8	How far to take requirements definition?.....	7
4	CONSULTANT AND CONTRACTOR SELECTION.....	7
4.1	Bid assessment.....	7
4.2	Recommendation and approval.....	8
4.3	Contractual provisions and fees.....	8
5	REFERENCES.....	8



The *BIM Project Inception Guide* assumes familiarity with BIM and associated concepts.

For more information on BIM visit the NATSPEC BIM Portal. See Resources > [Introduction to BIM](#) and Resources > [Glossary](#).

Key points of the NATSPEC BIM Project Inception Guide

- The ability to influence whole of life costs is greatest during the earliest stages of the project.
- A clear brief and thorough project planning is critical for a successful outcome.
- Engage a well-qualified Lead BIM Adviser at the beginning of the project.
- Follow a structured process for defining BIM requirements and engaging the project team, as outlined in the *Inception Guide*.
- Use a structured process to select BIM uses that support project goals and objectives.
- Clearly define client information requirements and deliverables for each phase of the project, particularly for facility management, and document them in the Project BIM Brief prior to issuing Requests for Proposals for project team members.
- One of the key advantages of BIM is the ability to effectively capture data that will be useful during the operational phase of the project – take a whole of lifecycle approach.
- Contractors provide valuable project experience and deliver the bulk of facilities management information – involve them in project planning and design phases as early as possible.
- Base consultant and contractor selection on their demonstrated capabilities with respect to the requirements documented in the Project BIM Brief, rather than on marketing-style statements.
- Consultant and contractor bids should follow the format requested in Requests for Proposals to assist comparison and assessment based on stated performance criteria.

1 INTRODUCTION

1.1 PURPOSE

The *Inception Guide* is to assist the client and Lead BIM Adviser clarify and define their BIM requirements at project inception for the purpose of engaging the project team, with the goal of maximising the value of BIM to the project.

1.2 INCEPTION PROCESSES

The *Inception Guide* outlines two processes:

1. The BIM project team engagement process. See **Figure 2.1**. It also provides guidance about what should be included in Requests for Proposals (RFP). It prompts the client and Lead BIM Adviser to make key strategic decisions regarding model use and deliverables prior to requesting proposals from consultants and contractors.
2. The BIM requirements definition process. Investing effort in the early definition of requirements reduces the risk of abortive work and loss of direction later in the project. It is crucial to the team engagement process because it allows consultants and contractors to scope and price their services more accurately when preparing bids, reducing the risk of having to renegotiate them later. BIM requirements can be documented using the *NATSPEC Project BIM Brief template*.

2 BIM PROJECT INCEPTION PHASE

2.1 INCEPTION ROLES

The roles associated with the project inception phase included in the *Inception Guide* are summarised below:

Client	Lead BIM Adviser	Consultants & Contractors
<p>The organisation or individual procuring the building or infrastructure development. Although the client may be different to the employer or owner, this term has been adopted for the role described in this document.</p> <p>Day-to-day functions during inception may be performed by client's agents or representatives.</p> <p>The client enters into a contractual relationship with the Lead BIM Adviser early in the inception process and consultants and contractors at the end of the consultant & contractor selection process.</p>	<p>The organisation or individual responsible for assisting the client to define their BIM requirements for the project and coordinating the selection and engagement of the project team. They facilitate liaison between the client and prospective consultants and contractors.</p> <p>The role may be performed by an organisation or individual with expertise in construction project management supported by a BIM expert or experts.</p> <p>For this document the title applies to the role played up to the point of team engagement.</p> <p>The same organisation or individual may continue in a similar executive role, e.g. Lead Consultant, Design Lead, Construction Lead after this point or pass these responsibilities on to others.</p>	<p>Professional organisations or individuals to be appointed by the client to perform expert tasks on a project such as design, documentation and management.</p> <p>For the purpose of this document it also includes the contractor in the following roles:</p> <ul style="list-style-type: none"> • Executive: e.g. managing the design team under a D & C contract. • Advisory: e.g. providing advice and/or direction on buildability or constructability. • Information provider: e.g. as the party nominated to provide as-built data during construction and commissioning.



The NATSPEC BIM Portal includes a client – Lead BIM Adviser discussion checklist which summarises some of the issues that need to be considered during initial meetings.
See Resources > [Templates, proforma & checklists](#).

2.2 BIM PROJECT TEAM ENGAGEMENT PROCESS

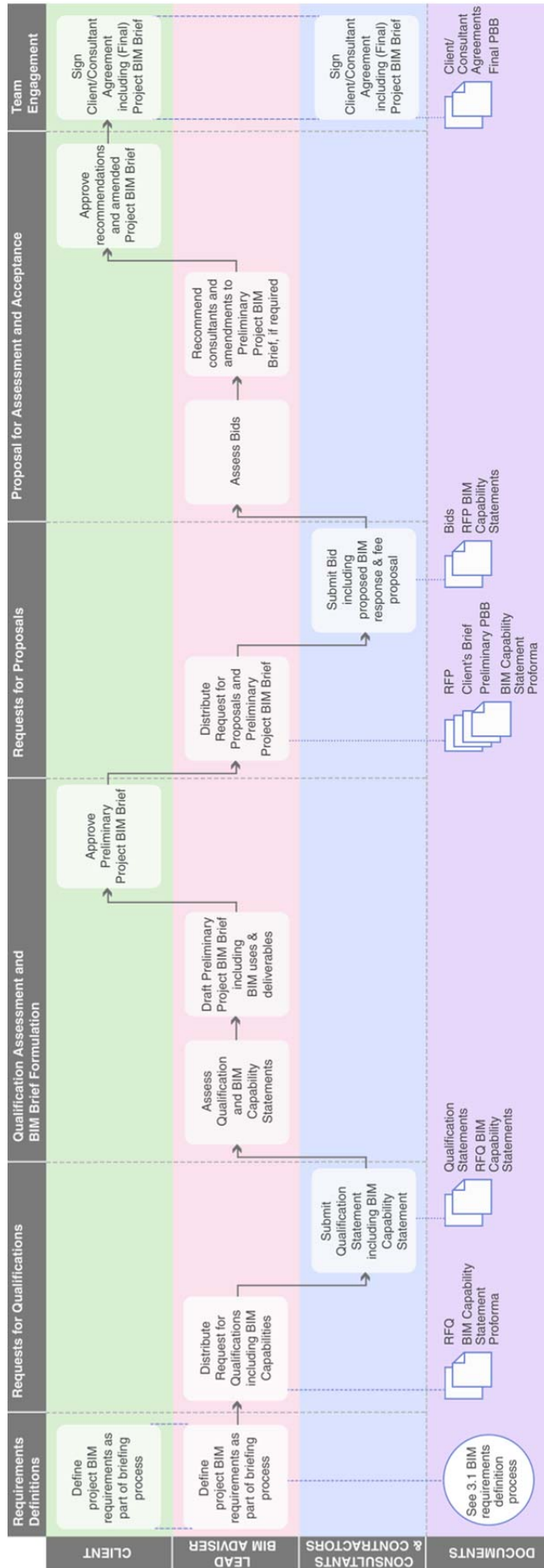


Figure 2.2 BIM project team engagement process

Features of the BIM project team engagement process

Assumptions: That constraints associated with the project such as budget and planning approval conditions have been sufficiently investigated to determine the project's feasibility and it is sensible to start assembling the project team.

Start point: During initial discussions between the client and Lead BIM Adviser.

End point: Signing of Client/Consultant agreements for the project team.

Key process deliverable: Project BIM Brief.

Primary outcome: Engagement of the core project team.

Supporting documents: Refer to 2.3 Inception documents for details.

2 stage BIM capability assessment:

- Request for Qualification (RFQ) stage: A general statement of capability, unrelated to any specific project, requested from potential consultants.
- Request for Proposal stage: BIM Capability Statements in this instance address the specifics of the project and the BIM uses identified in the Preliminary Project BIM Brief.

2.3 INCEPTION DOCUMENTS

The consultant and contractor engagement process is supported by a number of documents. Refer to **Figure 2.2** to see how they relate to it.



For templates of some of the above documents visit the NATSPEC BIM Portal.
See Resources > [Templates, proforma & checklists](#).

The *NATSPEC Project BIM Brief template* has the advantage of being aligned with the *NATSPEC National BIM Guide*. See NATSPEC BIM Documents > [National BIM Guide](#).

For a template of a Client Brief visit the Australian Institute of Architects [Acumen](#) website.
See Project > Project inception > [Brief](#).

3 BIM REQUIREMENTS DEFINITION

3.1 DEFINITION PROCESS

Figure 3.1 below summarises the BIM requirements definition process. It shows the main elements requiring definition, which are examined further in this section.

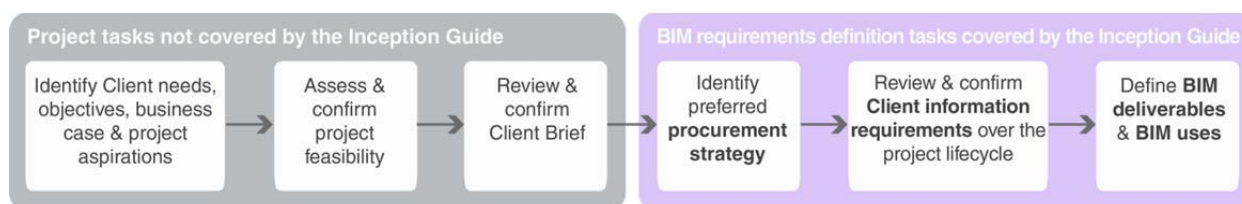


Figure 3.1 BIM requirements definition process

3.2 PROCUREMENT STRATEGY

High priority should be given to determining the project procurement strategy, e.g. Design-Bid-Build (DBB) (traditional method), Design and Construct (D&C), Early Contractor Involvement (ECI), Managing Contractor (MC), Alliancing. The procurement strategy directly influences the selection of project team members and BIM processes such as model development.

Contracts supporting the procurement delivery system will need to define:

- The integration or separation of risk and responsibilities for the design and construction contracting entities, and therefore,
- The division of responsibilities for model development. There may, for example, be only one BIM Manager throughout the project if D&C or ECI is used, and potentially two, a Design and a Construction BIM Manager if DBB is used.
- This will also influence model development. It will determine whether there are separate design and construction models, developed sequentially, or whether they can be developed in parallel or combined. How design responsibilities are distributed for major subcontract packages also directly influences the extent to which the design of building elements is resolved by one party before being passed onto another for finalisation.

The procurement strategy will also determine the level of client involvement at each project stage. The commitments demanded by each procurement strategy should be clearly understood by the client when considering options.



For more information on procurement strategies and their selection visit www.natspec.com.au. See Technical Resources > TECHreports > TR 06 Procurement Past and Present. APCC also has free references on procurement. See www.apcc.gov.au > Publications.

3.3 CLIENT INFORMATION REQUIREMENTS

The client's primary responsibility at project inception is to clearly define and articulate their project and information requirements. However, not all clients will be able to articulate them to the extent necessary to define detailed BIM requirements – the Lead BIM Adviser may need to assist.



References and templates that can assist the definition of client information requirements can be found at www.bimtaskgroup.org/bim-eirs/

3.4 BIM USES

Many of the difficulties associated with implementing BIM stem from not adequately defining how it is to be used. A crucial early step during project inception is to identify which BIM uses are appropriate for realising project goals.

BIM uses are deliberately not presented as being intrinsically linked to project phases. It is much more appropriate to select BIM uses that support project goals at the beginning of the project and then plan how they will be deployed during different phases of the project.

With BIM, the effective management of data is essential for anything beyond basic geometrical modelling. Each specific BIM use has significant datasets associated with it which have to be managed over extended periods of time. Each additional use multiplies the effort required to manage a model. Including non-essential data only makes finding required information more difficult – select uses carefully, and before adding any data to the model, always ask the question: “Who will need this information, and what are their requirements?” Once BIM uses have been finalised, many aspects of planning the implementation of BIM can be resolved with greater certainty.

BIM uses included in the NATSPEC National BIM Guide

Depending on how they are defined, the list of uses for BIM is almost endless. The *NATSPEC National BIM Guide* identifies the following 24 BIM uses:

1. Modelling existing conditions.
2. Site analysis.
3. Space and equipment validation.
4. Architecture – spatial and material design models.
5. Design visualization for communication and functional analysis.
6. Documentation.
7. Code checking.
8. Sustainability evaluation.
9. Structural Modelling and Analysis.
10. Energy analysis.
11. MEP virtual testing and balancing.
12. Lighting analysis.
13. Other engineering analysis.
14. Quantity Take-off and Cost Planning - 5D.
15. Clash detection/coordination.
16. Construction system design.
17. Digital fabrication.
18. Construction scheduling and sequencing - 4D.
19. Site utilisation planning.
20. Lift planning.
21. Digital set out.
22. COBIE/commissioning.
23. Other FM information handover/commissioning systems.
24. Security assessment and disaster planning.

See *NATSPEC National BIM Guide Part 7: Requirements for using BIM* for more detailed descriptions of these uses.



The NATSPEC BIM Portal includes a BIM uses checklist as an aid to defining the extent of BIM implementation and scope of consultant and contractor services on a project.

See Resources > [Templates, proforma & checklists](#).

3.5 BIM USE SELECTION

Use a structured process to select BIM uses that support project goals and objectives, and align them with the capabilities of available consultants and contractors.

Goals of BIM implementation: Goals should be based on stated performance criteria, for example:

- Reducing project duration.
- Reducing reworks.
- Improving quality or safety.
- Improving building operability/maintainability.

At the outset of the process, define performance measurement methods for the purpose of comparing alternative options. Some criteria may be difficult to quantify realistically so more qualitative methods such as rating, ranking and weighting may need to be devised.



The *BIM Project Execution Planning Guide* by the Computer Integrated Construction Research Program, Penn State University (*Penn State BIM Guide*) is a useful resource for planning the execution of BIM projects.

It describes a method for the selection of BIM uses based on project goals and objectives.

It includes supporting worksheets, checklists, templates and worked examples.

Download a copy from www.engr.psu.edu/ae/cic/bimex/download.aspx

3.6 DELIVERABLES

Deliverables and BIM uses are two sides of a coin – BIM uses represent the tool or process – deliverables represent the output. For this reason, deliverables directly influence the selection of BIM uses for a project. Deliverables also directly influence model content. To extract the required deliverables from a model, the relevant data has to be inputted, e.g. data about doors to generate door schedules. Working out the deliverables required is best done from a whole of project lifecycle perspective. This includes identifying the information the client and team needs for decision making purposes at key points in the project. Identifying the information required during the operational phase of a building and working back through the construction and design phases – “*Beginning with the end in mind*” – will also help the definition of deliverables. This highlights the value of involving the building’s operators and the contractor early in the project so that they can contribute effectively to the process. It should be borne in mind that the contractor usually delivers the bulk of information the client needs for facility management purposes.

3.7 PACKAGING AND PROGRAMMING DELIVERABLES

Once the required deliverables have been identified, it is useful to subdivide them into defined packages (data drops) based on:

- who will have primary responsibility for providing them; and
- at what point in the project programme they are required. See **Figure 3.7**.

This assists the preparation of Requests for Proposals and the assessment of consultants’ bids.

As part of the process it is also important to decide which deliverables will be derived directly from models, and which will be produced by other means.

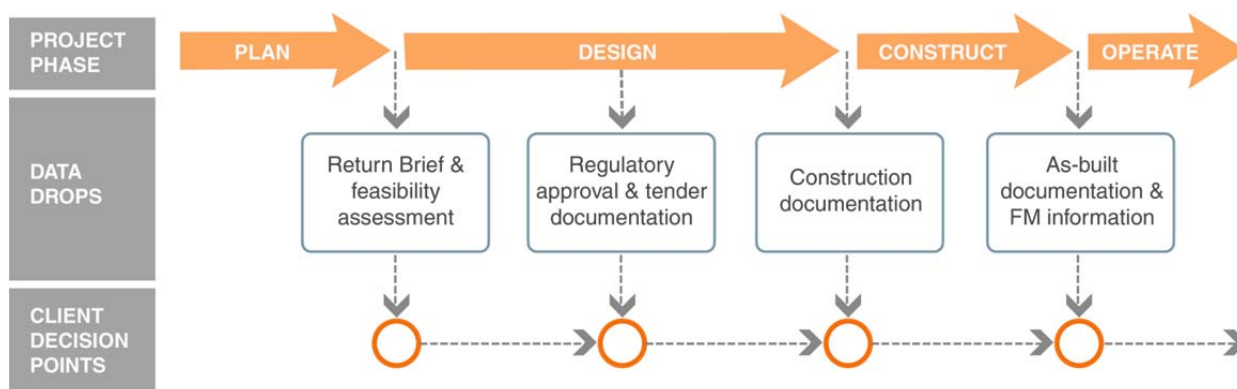


Figure 3.7 Examples of deliverables over the project lifecycle

Figure 3.7 shows the relationship between data drops and the project lifecycle. Data drops include information which assists effective decision making by the client and project team about the project.



A sample data drop specification can be found at <http://www.bimtaskgroup.org/cobie-data-drops/>

Categories of deliverables by type

The definition of deliverables can be assisted by further categorising them for different purposes, for example:

Project description and documentation: These are deliverables required internally by the project team to progress the project’s design and construction. They include briefing documents, spatial programs,

room data sheets, design development models and drawings, analysis and simulation studies, design, coordination and cost planning reports, documentation for consenting authority approval, tendering and construction, construction sequencing and site utilisation studies, as-built or record models and drawings, commissioning and handover information.

These are deliverables created in response to the brief. They include items not necessarily explicitly specified by the client, but which imply, at a minimum, standard industry practice. The use of BIM and other innovations can provide benefits such as improved coordination, better cost control and design optimisation through simulation; offering new opportunities to raise project standards of quality and performance.

Project management: These are deliverables required internally by the design team for the collaborative planning, management and administration of the project. They include BIM management plans, programs, minutes of meetings, RFIs and reports on project planning, execution, progress and coordination.

Client: These are deliverables additional to those noted above which may be required to satisfy client review and approval processes, e.g. special visualisations or reports for stakeholder consultation or marketing. Reporting requirements can vary significantly from client to client and entail significant effort, so it is important that the client's expectations in this area are well defined. Procurement strategies which involve lower levels of direct client involvement in the project may result in more time spent on formal report preparation.

Apart from content, the client may have technical requirements associated with their existing IT systems, software platforms and management systems, e.g. data exchange formats, co-ordinate systems, compliance plans, delivery strategies for asset information.

Unless the client specifies other standards, deliverables should conform to the requirements of the *NATSPEC National BIM Guide, Clause 10.10: Final BIM Deliverables*.

As-built and Facility Management information: These deliverables also need special attention because there is little industry consensus about what scope is appropriate, and client requirements can vary significantly. The interpretation of terms used to describe this group of deliverables, e.g. as-built drawings, record model, can also vary, so expectations associated with them need to be clearly spelt out. Some options include:

- The construction model updated with fabrication models and documented changes.
- As above with dimensional or location changes verified by on-site measurement or laser scans.
- Facility management data embedded in the model.
- Facility management data provided as a separate file or database in a pre-agreed format referenced to the model, e.g. Construction Operations Building Information exchange (COBie) spreadsheets.

3.8 HOW FAR TO TAKE REQUIREMENTS DEFINITION?

How far should you take the BIM requirements definition process prior to engaging the project team? At the outset of the process set goals and parameters appropriate for the circumstances of the project. A trade-off between the desired level of definition and available time often has to be made – the time invested in early requirement definition has to be weighed up against the risks of additional costs and delays later in the project resulting from an inadequate process.

4 CONSULTANT AND CONTRACTOR SELECTION

4.1 BID ASSESSMENT

Consultant and contractor selection is based on the assessment of bids submitted in response to Requests for Proposals (RFP). Refer to **2.3 Inception documents** for details of these documents. Clarifications provided in response to queries by any consultant or contractor should be circulated to all. To simplify assessment, consultant and contractor bids should follow the format of the RFP. Assessment should be based on their compliance with the Preliminary Project BIM Brief, and assessment of capabilities should be based on demonstrated, verifiable experience for each requirement in the RFP, rather than general assertions or marketing-type statements.



The *Inception Guide* does not provide a detailed methodology for assessing consultant BIM capability. Tools for assessing BIM capability and maturity can be found in the Penn State *BIM Planning Guide for Facility Owners* (see <http://bim.psu.edu>) and on the BIM Excellence website www.BIMexcellence.net.

Following assessment, it is possible that some of the BIM uses in the Preliminary Project BIM Brief will need to be modified – the required capability may not be available for some uses, or there may be opportunities to take advantage of a consultant’s capabilities that the Lead BIM Adviser was not aware of, or the Preliminary Project BIM Brief had not foreseen.

Ideally, the Lead BIM Adviser should continue in an executive BIM role such as Information Manager or Design BIM Manager. If this is not the case, priority should be given to selecting an individual/s for the role/s, based on the (final) Project BIM Brief.

4.2 RECOMMENDATION AND APPROVAL

After assessment, the Lead BIM Adviser’s recommendations, including any amendments to the Preliminary Project BIM Brief, are sent to the client for evaluation and approval. When the client is satisfied with the Lead BIM Adviser’s recommendations, a Client/Consultant Agreement, with the (final) Project BIM Brief appended, is signed by both the client and consultant/contractor.

4.3 CONTRACTUAL PROVISIONS AND FEES

All of the elements of definition noted previously influence the scope of services for project team members which, in turn, directly influence contractual provisions and fees. BIM processes generally involve the investment of a greater proportion of resources early in the project which realise greater efficiencies and improved outputs later. Fee proposals should reflect this redistribution of effort.



For more information on contractual provisions and fees visit the NATSPEC BIM Portal. See Resources > BIM Topics > [Protocols, contracts & addenda](#)

While the *Inception Guide* assists in the development of documents that can be referenced by agreements and contracts, it is not itself intended to be referenced by them.

5 REFERENCES

ACIF & APCC, 2010, *A Guide to Project Initiation* Available at www.acif.com.au

ACIF & APCC, 2014, *Project Team Integration* Available at www.acif.com.au

BIM Task Group 2013, *Employer’s Information Requirements - Core Content and Guidance Notes* Version 07 28.02.13

Available at www.bimtaskgroup.org >Resources > Commercial > BIM EIRs - Overview

Construction Industry Council, 2013, *Building Information Model (BIM) Protocol*, First Edition Available at <http://cic.org.uk> > Shop

Pennsylvania State University - Computer Integrated Construction Research Program, 2013 *BIM Planning Guide for Facility Owners* Version 2.0. Available at <http://bim.psu.edu>

Pennsylvania State University - Computer Integrated Construction Research Program, 2010, *BIM Project Execution Planning Guide* Available at <http://bim.psu.edu>

RIBA, 2013, *Guide to Using the RIBA Plan of Work 2013*, RIBA Publishing Available from www.ribabookshops.com

Sinclair, Dale, 2013, *Assembling a Collaborative Project Team: Practical Tools including Multidisciplinary Schedules of Services*, RIBA Publishing Available from www.ribabookshops.com

CORPORATE INFORMATION

NATSPEC is the trading name of Construction Information Systems Limited, ABN 20 117 574 606.

NATSPEC, founded in 1975, is a national not-for-profit organisation that is owned by the design, build, construct and property industry through professional associations and government property groups. It is impartial and is not involved in advocacy or policy development.

NATSPEC's major service is the provision of the comprehensive national specification systems endorsed by government and professional bodies. NATSPEC, the National Building Specification, is for all building structures, with specialist packages for architects, interior designers, landscape architects, structural engineers, service engineers and domestic owners. AUS-SPEC is the Local Government specification system for the life-cycle management of assets. Packages include Urban and Open Spaces, Roadworks and Bridges, Public Utilities, and Maintenance. NATSPEC is also the publisher of the National BIM Guide and associated documents.

NATSPEC's objective is to improve construction quality and productivity of the built environment through leadership of information.

STAKEHOLDERS

// Air Conditioning and Mechanical Contractors'
Association of Australia

// Australian Council of Built Environment Design
Professions

// Australian Elevator Association

// Australian Institute of Architects

// Australian Institute of Building

// Australian Institute of Building Surveyors

// Australian Institute of Quantity Surveyors

// Chief Minister, Treasury and Economic Development
Directorate (ACT)

// Construction Industry Engineering Services Group

// Consult Australia

// Department of Finance (Federal)

// Department of Finance (WA)

// Department of Housing and Public Works (QLD)

// Department of Infrastructure (NT)

// Department of Planning, Transport and Infrastructure
(SA)

// Department of Treasury and Finance (TAS)

// Department of Treasury and Finance (VIC)

// Engineers Australia

// Master Builders Australia

// Office of Finance and Services (NSW)

// Standards Australia

CONTACT INFORMATION

NATSPEC//

PHONE	1300 797 142
FAX	1300 797 143
EMAIL	mail@natspec.com.au
WEB	www.natspec.com.au