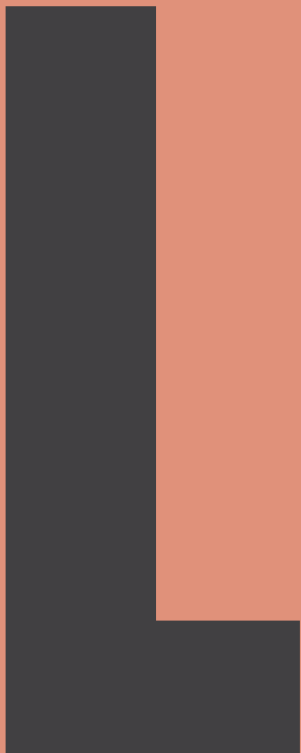


BIM, Legal & Procurement

L *BIM, Legal & Procurement*



BIM IN PRACTICE



Australian
Institute of
Architects

BIM, Legal & Procurement

L BIM, Legal & Procurement

Contributors:

Peter Scuderi (Chair), Arup
Richard Barton, Australian Institute of Architects
Sam Bassilious, Rider Levett Bucknall
Warren Birchall, HASSELL
Chris Canham, Lend Lease
Andrew Chew, Corrs Chambers Westgarth
Fergus Hohnen, Woods Bagot
Kiri Parr, Arup
Wendy Poulton, Planned Professional Risk Services
Philippa Sutton, Laing O'Rourke
Claudelle Taylor, Leightons / Nexus Point Solutions

L BIM, Legal & Procurement

- L1 BIM and Intellectual Property
- L2 Professional Indemnity Insurance
- L3 Stakeholders' Responsibilities
- L4 Viable Options – Encouraging Collaboration and 'No Blame'

L BIM Legal & Procurement [Version 1 – August 2012]

Disclaimer:

This document is jointly published by the Australian Institute of Architects and Consult Australia and contains information prepared by the joint Australian Institute of Architects and Consult Australia BIM/IPD Steering Group and its Workgroups. The Australian Institute of Architects and Consult Australia make no representations, either jointly or severally, about the content and suitability of the material, for any purpose. It is provided 'as is' without express or implied warranty, including any warranties of merchantability or fitness. In no event will the Australian Institute of Architects or Consult Australia be liable, whether in contract, negligence or other action arising out of or in connection with the material, or for any special, indirect or consequential damages or any damages whatsoever resulting from loss of use, data or profits.

All material in this document is copyright to:

- either, or jointly, the Australian Institute of Architects and Consult Australia; or
- a third party, from whom the material is licensed for inclusion on this site.

No reproduction of the material is authorised unless written permission is first obtained from both the Australian Institute of Architects and Consult Australia.



Australian
Institute of
Architects

PREFACE

At the request of the AIA/Consult Australia BIM Steering Committee, a working group was convened to consider Legal issues in the context of BIM enabled procurement models. A group of practitioners was identified to represent the value chain from project strategy/inception, design, construction and operations. Four areas were considered important:

- Intellectual Property,
- Professional Indemnity,
- Stakeholders’ Responsibilities,
- Viable Procurement Options.

A rich intellectual input was offered by the practitioners as they represented BIM Consultancy, architects, engineers, quantity surveyors, constructors, legal (including in-house counsel) and professional indemnity insurers. All contributed to the discussion and general consensus obtained.

Legal and procurement issues are seen as barriers by the design disciplines in particular as there is a perception that Professional Indemnity Insurance will be made void and that loss of intellectual property is likely in a BIM environment. The working group has highlighted ways in which these risk can be mitigated and in the main, strategies around clarity of brief, responsibilities and scope of services articulated in a robust professional service agreement should result in positive outcomes for all parties. This series of documents provide guidance to assist practitioners in establishing success factors early in the design and procurement process. The working group also highlights that a key to any successful BIM enabled Procurement is collaboration. With collaboration the parties are more likely to create integrated workflows that promote sharing of data while retaining responsibility for the accuracy of their input in their individual discipline model or part of a models. The guidance notes also highlight viable procurement options that enable collaboration and contribute to a more integrated way of delivering projects across the building lifecycle.

The working group looks forward to experiencing change in the industry as practitioners embrace BIM as an enabler for improved efficiencies of work processes and quality of outputs from our industry.



Peter Scuderi (Arup)
Chair: BIM, Legal & Procurement
Working Group

BIM, Legal & Procurement

L1 *BIM & Intellectual Property*



BIM IN PRACTICE



Australian
Institute of
Architects

BIM, Legal & Procurement

L1 BIM & Intellectual Property

Contributors:

Peter Scuderi (Chair), Arup
Richard Barton, Australian Institute of Architects
Sam Bassilious, Rider Levett Bucknall
Warren Birchall, HASSELL
Chris Canham, Lend Lease
Andrew Chew, Corrs Chambers Westgarth
Fergus Hohnen, Woods Bagot
Kiri Parr, Arup
Wendy Poulton, Planned Professional Risk Services
Philippa Sutton, Laing O'Rourke
Claudelle Taylor, Leightons / Nexus Point Solutions

L BIM, Legal & Procurement

L1 BIM and Intellectual Property

L2 Professional Indemnity Insurance

L3 Stakeholders' Responsibilities

L4 Viable Options – Encouraging Collaboration and 'No Blame'

L.1 BIM and Intellectual Property [Version 1 – August 2012]

Disclaimer:

This document is jointly published by the Australian Institute of Architects and Consult Australia and contains information prepared by the joint Australian Institute of Architects and Consult Australia BIM/IPD Steering Group and its Workgroups. The Australian Institute of Architects and Consult Australia make no representations, either jointly or severally, about the content and suitability of the material, for any purpose. It is provided 'as is' without express or implied warranty, including any warranties of merchantability or fitness. In no event will the Australian Institute of Architects or Consult Australia be liable, whether in contract, negligence or other action arising out of or in connection with the material, or for any special, indirect or consequential damages or any damages whatsoever resulting from loss of use, data or profits.

All material in this document is copyright to:

- either, or jointly, the Australian Institute of Architects and Consult Australia; or
- a third party, from whom the material is licensed for inclusion on this site.

No reproduction of the material is authorised unless written permission is first obtained from both the Australian Institute of Architects and Consult Australia.



Australian
Institute of
Architects

INTRODUCTION

This guidance note refers to the intellectual property (IP) of content in BIM. It discusses who should own it, how IP in models can be regulated, and different ways of working from traditional business as usual. Ownership of IP can relate to many things including the embedded data in the model/s, workflow processes used in the collaboration processes, technology developed or the design intent.

WHO SHOULD OWN CONTENT IN BIM?

There are three alternatives to ownership:

1. The end user/owner
2. Each contributor retains rights over their contribution to the shared model (refer to the approach endorsed by the American Institute of Architects E2o2 Document)
3. Third party (eg, contractor, facilities management organisation) assumes ownership of a completed model

The following points/issues are worth noting in relation to IP ownership

- IP should be defined in the Professional Services Agreement and the BIM Management Plan (also: Project BIM Plan or Project Execution Plan), roles and responsibilities, liabilities, Intellectual Property and moral rights should be clearly expressed.
- There is often a disagreement between the parties relating to data that is not maintained, and who is in the best position to maintain it (eg, the creator, or end user)?
- How the model is used in the long term is a key question. What are the authorised uses of a model? Is the model issued on a license basis for a period of time, or for a particular use, with the original authors retaining IP?
- There is a line of thinking that IP such as 'Smart Objects' created by the design consultant to describe the project, should remain the property of the author. This is to protect the authors from having competitors (such as other consultants) use their 'Smart Objects'. Downstream model users have little interest in the smart objects. The requirement of the contractors differs from the designers. The contractors will be swapping out consultants design objects and substituting manufacturers' models and they intend to create generic designers' objects that are swap-compatible with manufacturer-specific object models.
- Alternatively to this view, there are some who promote the sharing of content in order to produce an open library of objects. In time the need for consultant-developed libraries will diminish.
- When working on an aggregated model, it is particularly important to seek the advice of specialist intellectual property advisors as attributing copyright is complicated where models are built jointly by several parties.

HOW CAN IP ON MODELS BE REGULATED?

Forms of agreement are used to regulate the IP by licensing of data. Although BIM provides a greater level of data richness the IP issues are similar to those for 2D and so provided that ownership, liabilities etc, are clearly articulated in the Professional Services Agreement, adequate coverage should be provided to protect the author. It is important to be clear in the agreements to allocate the rights for such things as reproduction, use, access, distribution for particular purposes such as operations or disputes.

The data formats of models provide different levels of IP protection for the authors. For example:

1. Read-only formats like Autodesk Navisworks, dwf, Solibri model checker
 - allow data extraction, but not modification of data
 - minimal loss of IP for creators
2. Editable, open-standards based formats like buildingSMART developed open standard known as Industry Foundation Classes (IFC)
 - capable of incorporation into a wide variety of systems
 - makes data accessible
3. Native file formats such as Autodesk Revit™, Graphisoft Archicad™, Tekla™
 - greatest loss of IP for creators
 - relies on end-user having access to original authoring software

Note that using IFC as a means of sharing data amongst the design consultants allows for the protection of each individual's data. Sharing models using read-only formats (described above) offers a way to share data whilst protecting your inputs.

The key question is: what IP are you seeking to protect? The IP created for the project, which is unique to the project, or the IP you have used to automate your design production?

BIM authors need to look beyond the design phase. Within the design phase there is a sharing of models for a number of reasons. One reason is co-ordination, but another is where one party undertakes work using the other's models – eg, an engineer runs an energy simulation using the architect's model of the building.

Then the BIM is passed to the construction team. Manufacturers' objects are substituted for design objects, and constructability objects are inserted for detailed installation and fabrication. The design data contained in the original model will be swapped for as-built and commissioning data. Consequently, little of the original IP is still intact. There will be two models – the designer's model and the contractor's as-built model.

The contractor's as-built model then gets taken over by the Facilities Management (FM) party, who maintains the data to reflect various changes made on site. Alternatively the client may ask for a specific FM model that contains data specific to the operations of the building.

Which model will the designers use to detail their design changes and issue an instruction? Currently the designer will not issue a modified design drawing based on a shop drawing.

IS IT ANY DIFFERENT TO THE TRADITIONAL WAYS IN WHICH WE WORK?

Using an integrated BIM is not different to traditional 2D environments. It is however more collaborative. The Level of Detail (LOD) is more data rich and assuming the author clearly defines what the purpose for the model is and its suitability then little has changed.

Arguably handing over a model conveys considerably more information than would traditionally have been the case with paper drawings, and considerably more than 2D digital drawings. To a client or supply chain user, the extra information conveyed (eg, cost, performance and other attributes) is invaluable. For a competitor obtaining a copy of a native format model, there is the distinct possibility that they may be able to derive methods, know-how or copy model content, with little chance of preventing this. So if IP is an issue then it is not advisable to hand over a native format file.

Looking at a different perspective, while handing over a digital model provides a wider range of opportunities for re-use, it also increases the risk that information may be used for purposes that were never intended. Sharing models using read-only formats limits the potential of the information being misused for other unrelated projects without the permission of the author.

Other issues which may need considering depending on the circumstances include the potential for joint authorship in a copyright context and reviewing requirements for software licensing.

CONCLUSIONS

The issues of intellectual property ownership in BIM projects stem from how well they are dealt with in the Professional Services Agreement. Clarity is required around roles and responsibilities about who enters what data at what time and who is then responsible for its maintenance. It is also necessary to articulate what the model will be used for – design, construction, operations etc. The ownership of the models is then being placed with the ultimate users. For example, if it is a combined model, the ownership should rest with the owner or user of the building.

Forms of agreement are used to regulate the IP by licensing of data. Although BIM provides a greater level of data richness the IP issues are similar to those for 2D. It is important to be clear in the agreements to allocate the rights for such things as to reproduce, use, access, distribute for particular purposes such as operations or disputes. Data formats used to develop models provide different levels of IP protection. Read-only and open standards provide less IP leakage compared to native formats.

While handing over a digital model provides a wider range of opportunities for re-use, it also increases the risk that information may be used for purposes that were never intended. Sharing a copy of a native format model provides the possibility that another user may derive methods, know-how or copy model content. As there is little chance of preventing this it is not advisable to hand over a native format file if IP is an issue.

Summary

- Ownership of IP can relate to many things including the embedded data in the model/s, workflow processes used in the collaboration processes, technology developed or the design intent.
- Who should own IP – the creator or the end user?
- What the model's going to be used for has an impact on ownership.
- How IP in models can be regulated through Professional Service Agreements and through model file formats.
- Is working with BIM different from traditional business as usual?

BIM, Legal & Procurement

L2 *Professional Indemnity
Insurance*

L2

BIM IN PRACTICE



Australian
Institute of
Architects

BIM, Legal & Procurement

L2 Professional Indemnity Insurance

Contributors:

Peter Scuderi (Chair), Arup

Richard Barton, Australian Institute of Architects

Sam Bassilious, Rider Levett Bucknall

Warren Birchall, HASSELL

Chris Canham, Lend Lease

Andrew Chew, Corrs Chambers Westgarth

Fergus Hohnen, Woods Bagot

Kiri Parr, Arup

Wendy Poulton, Planned Professional Risk
Services

Philippa Sutton, Laing O'Rourke

Claudelle Taylor, Leightons / Nexus Point
Solutions

L BIM, Legal & Procurement

L1 BIM and Intellectual Property

L2 Professional Indemnity Insurance

L3 Stakeholders' Responsibilities

L4 Viable Options – Encouraging Collaboration
and 'No Blame'

L2 Professional indemnity insurance [Version 1 – August 2012]

Disclaimer:

This document is jointly published by the Australian Institute of Architects and Consult Australia and contains information prepared by the joint Australian Institute of Architects and Consult Australia BIM/IPD Steering Group and its Workgroups. The Australian Institute of Architects and Consult Australia make no representations, either jointly or severally, about the content and suitability of the material, for any purpose. It is provided 'as is' without express or implied warranty, including any warranties of merchantability or fitness. In no event will the Australian Institute of Architects or Consult Australia be liable, whether in contract, negligence or other action arising out of or in connection with the material, or for any special, indirect or consequential damages or any damages whatsoever resulting from loss of use, data or profits.

All material in this document is copyright to:

- either, or jointly, the Australian Institute of Architects and Consult Australia; or
- a third party, from whom the material is licensed for inclusion on this site.

No reproduction of the material is authorised unless written permission is first obtained from both the Australian Institute of Architects and Consult Australia.



Australian
Institute of
Architects

INTRODUCTION

This information provides professional indemnity insurance guidance for practitioners working within a BIM environment. It is not intended to provide legal advice, but will raise issues for consideration when making decisions on how to structure commissions and Professional Service Agreements. Issues discussed relate to whether a consultant needs to advise their PI insurance provider of BIM commissions and what information should be given relating to the project. The document also considers what BIM activities or scope might take the consultant outside its PI policy provisions such as sharing data, providing services outside the specific area of expertise and offering guarantees outside of scope. Finally this information also refers to what to consider when dealing with a single project insurance policies.

DOES PI INSURANCE COVER CONSULTANTS FOR WORK USING BIM?

When an individual consultant relies on their own professional indemnity policy:

- Professional indemnity policies do not usually contain any specific exclusion clause that would exclude cover merely on the basis of using BIM.
- Although no claims which confirm this have come to light, it is likely that professional indemnity insurance would generally cover BIM, with the proviso that some BIM scenarios which would trigger common policy exclusions are noted in the section below titled “What activities risk taking consultants outside the cover of PI insurance?”, and that coverage will always depend on the individual policy terms.
- Consultants should inform their insurance broker that they are using BIM systems (eg, discipline specific-model, aggregated model, federated model). Some insurers’ proposal forms may specifically ask whether the consultant is using BIM, but if there is no specific question, consultants should make a specific notification.

When a party is not in a discipline which requires professional indemnity insurance:

- Parties without professional indemnity insurance should seek advice from an insurance broker before working on projects using BIM. For instance, the usual insurances obtained by a building contractor, such as contract works insurance, will not usually cover claims arising out of design. However, BIM work such as virtual design coordination or contribution to design intent may expose the building contractor to liability for design, so a professional indemnity policy may need to be obtained.

When a consultant relies on project specific policies:

- It is important to check the project specific policies with specialist insurance advice. For example, the policies need to: include a professional indemnity component to cover the specific design discipline, provide cover that includes the consultant’s profession; resolve the usual issues of multi-party policies such as clarifying which consultants are covered under it; and include appropriate waivers of subrogation rights.

On all BIM projects:

- Before executing the Professional Services Agreement the consultants should check that the other consultants contributing to the BIM have professional indemnity insurance to cover their own input, and consider the impact of any contractual limits of liability obtained by the other consultants. Otherwise, it may be difficult or impossible to have the other consultants contribute to any BIM related claims to which their errors have contributed. The decision to proceed or not is a commercial decision and one that needs to be carefully considered.
- Loss of documents cover should be investigated, to cover the cost of restoring documents if the BIM system should fail. Loss of documents cover may be included in the professional indemnity or general office insurance of each consultant, or the parties could investigate obtaining a project-specific loss of documents policy. It is also noted that software suppliers often rely on limitation of liability clauses and it should not be assumed that the supplier will pay for the consequences of any software failure.
- Address the question of whether any of the consultants will play the role of BIM Coordinator and, if so, whether their respective PI policies will cover that work.
- Clients should consider the inclusion of a BIM Coordinator on any mid- to large-scale project using BIM. The scope of the BIM Coordinator is to act as facilitator. The party trusted with this role does not warrant any of the work produced in a federated model, nor does it undertake any coordination resolution role. However a BIM Coordinator will be producing clash detection reports, ensuring that parameters across the federated model are correctly defined in order to produce a clash report.

WHAT ACTIVITIES RISK TAKING CONSULTANTS OUTSIDE THE COVER OF PI INSURANCE?

Agreeing to share with other parties the risks relating to the BIM

- Consultants agreeing to share liability or risk of errors in a shared BIM means that they are undertaking liability for other parties' errors as well as their own. This runs a strong risk of infringing the 'assumed liability' exclusion common in professional indemnity policies, which states that the policy does not cover liability assumed solely under a contract and which would not have applied at common law.
- Risk-sharing agreements are most likely to be found on projects being run on an IPD (Integrated Project Delivery) basis, using a federated BIM.
- The various contracts between the parties should make it clear whether there is to be formal sharing of risk. If the contracts contemplate risk sharing, there are two choices:
 1. Remove the references to risk sharing so that the consultant is only liable for their own fault, which is covered under their own professional indemnity policy; or
 2. Set up the project along the lines of an alliance and obtain a separate first-party project specific alliance policy to cover all the parties (see 'Alliance Contracting' in document '**L4 - Viable Options - Encouraging Collaboration and 'No Blame'**' document for more detail).

Operating outside the insured profession

- Professional indemnity insurance covers civil liability for claims arising out of the practice of the profession specified in the policy schedule, for example, architecture. The policy may (but usually does not) seek to define that profession more specifically.
- Although there will always be differences of opinion on the boundaries of a given profession, if, for example, on a BIM project, an architect took on responsibilities that were clearly not architectural, these responsibilities would not be insured. Examples are:
 - cost estimating or construction sequencing obligations that could arise out of 4D or 5D BIMs which include cost and sequencing information
 - a consultant being required to model the design requirements of another specialist sub-consultant, where the other sub-consultant lacks the BIM ability to do their own modelling
- Some measures for managing the risk include:
 - having a clear scope of services
 - using disclaimers stating that the use of a BIM does not render the consultant liable for providing advice on any matters that would not normally be considered a usual part of the consultant's profession, such as cost estimating or construction sequencing
 - when modelling details or assumptions relating to another specialist consultant's expertise, have that other consultant approve the modelling in writing

Providing warranties, guarantees etc

- Professional indemnity insurance typically excludes cover for liability assumed under a contract that exceeds the consultant's usual common law liability. Guarantees, broad indemnities and fitness for purpose warranties are common examples of clauses which risk triggering this exclusion and rendering the consultant uninsured for the additional liability assumed under the clause.
- These kinds of obligations should be avoided in a BIM context as in any aspect of professional work. Consultants may seek the advice of their broker to ascertain the sorts of clauses likely to be excluded from their policy.
- There is a need to be cautious of a requirement to warrant the accuracy of any models provided by consultants. Sub-contractors are increasingly relying on laser based set-out on site for construction. These will be taken directly from 3D models of the project. They will be seeking warranties from the builder that any architectural and structural models are warranted as accurate. The builder will need to warrant that it is being built to a level of accuracy against the model, and in turn will require the designers to warrant the accuracy of the design model they are creating.

Specific software exclusions

- Although not commonly seen in the policies of architects and building engineers, some professional indemnity policies contain broad exclusions for claims arising out of software failures. Such exclusions may limit or exclude cover arising out of BIM use.
- Consultants should check their policy to ensure that there is no software or IT exclusion that would compromise their cover for BIM work.
- Those sharing models collaboratively need to consider software version upgrades throughout the duration of the planning process. If collaborators use different releases of their software, this can render individual parties' project files out of date. In some cases models may be unable to be upgraded to the latest release. Selected BIM authoring and coordination software works under a policy of "cliff upgrade" with no backward compatibility. The use of open standards such as IFC can avoid these issues in part as they provide interoperability without reliance on native format file models.
- As an example: A project team authored BIMs in version 2009 and agrees to provide models for the sub-contractors use. The design progresses and the sub-contractors many years later decide to document in version 2012. It is important to agree who is undertaking to upgrade the files from 2009 to 2012 and to check and rectify any errors introduced to the model as a consequence of the upgrade process.

WHAT IS THE IMPACT OF BIM RELATED CLAIMS ON A COMPANY'S PI INSURANCE?

It is in the interests of the profession as a whole and the individual consultant to minimise BIM related claims. A large number of claims, or some significant very large claims, could increase premiums for professional indemnity insurance, or see insurers attempt to limit or exclude their exposure to BIM claims.

WHAT IS HAPPENING IN OTHER PARTS OF THE WORLD WHERE THERE IS A GREATER UPTAKE OF BIM? HOW ARE THE INSURANCE COMPANIES HANDLING MATTERS THERE?

It appears that the USA is where the market-leading developments are most likely to occur. Internationally, 'integrated project insurance' (which is likely to be another name for a single project insurance policy) may be available.

SINGLE PROJECT INSURANCE

- On large projects, a single project insurance policy may be obtained to provide cover to all the main parties working on the BIM.
- However, due to the cost and complexity of the policy, and the need to involve several insurers to cover its high limit of indemnity, single project insurance tends to be feasible only on very large projects, typically for government clients.
- Insurers would charge a single (usually high) premium for a single policy which covers all parties.
- Shared liability and no blame can thus be supported by obtaining a single project insurance policy.

- However, obviously problems may occur that are not covered by insurance. And even for problems that fall within insurance cover, a single project insurance policy will have a high excess (\$1 million is typical) that the insured parties must contribute to every claim. Obtaining a single project insurance policy is not therefore a complete solution. Underlying the insurance arrangements, the parties must carefully negotiate their respective liabilities and set them out in a formal contract. Importantly, they must decide whether they are partnering, or entering into an alliance – the two have very different risk and liability implications. They must also decide and record in their formal contract how the excess on the single project insurance policy will be apportioned between them for any claims.

CONCLUSIONS

Professional indemnity policies do not usually contain any specific exclusion clause that would exclude cover merely on the basis of using BIM. However, it is advisable to notify your PI insurance provider of the specific project and your role and responsibilities in developing the model. Your insurer will be interested to know if the model is discipline specific, who will be relying on the data provided, who will own the model after your role has completed and whether other parties contributing to the model have adequate PI insurance.

As with operating in the traditional 2D environment, consultants should avoid working outside their respective area of expertise, providing guarantees for others inputs or relying solely on software outputs.

In some instances particularly with very large projects, the client elects to provide a single project insurance policy. Though the cost of single project insurance policies is high, caution and consultation with your own insurance provider are recommended.

Summary

Professional indemnity policies do not usually contain any specific exclusion clause that would exclude cover merely on the basis of using BIM:

- When a party is not in a discipline which requires professional indemnity insurance.
- When a BIM Coordinator is included on project.

What to consider before executing the Professional Services Agreement:

- Agreeing to share with other parties the risks relating to the BIM
- Operating outside the insured profession.
- Single project PI policies.
- Software exclusions in PI policies
- What is the impact of BIM related claims on a company's PI insurance?

BIM, Legal & Procurement

L3 *Stakeholders'
responsibilities*

L3

BIM IN PRACTICE



Australian
Institute of
Architects

BIM, Legal & Procurement

L3 Stakeholders' responsibilities

Contributors:

Peter Scuderi (Chair), Arup
Richard Barton, Australian Institute of Architects
Sam Bassilious, Rider Levett Bucknall
Warren Birchall, HASSELL
Chris Canham, Lend Lease
Andrew Chew, Corrs Chambers Westgarth
Fergus Hohnen, Woods Bagot
Kiri Parr, Arup
Wendy Poulton, Planned Professional Risk Services
Philippa Sutton, Laing O'Rourke
Claudelle Taylor, Leightons / Nexus Point Solutions

- L BIM, Legal & Procurement
- L1 BIM and Intellectual Property
- L2 Professional Indemnity Insurance
- L3 Stakeholders' Responsibilities**
- L4 Viable Options – Encouraging Collaboration and 'No Blame'

L3 Stakeholders' responsibilities [Version 1 – August 2012]

Disclaimer:

This document is jointly published by the Australian Institute of Architects and Consult Australia and contains information prepared by the joint Australian Institute of Architects and Consult Australia BIM/IPD Steering Group and its Workgroups. The Australian Institute of Architects and Consult Australia make no representations, either jointly or severally, about the content and suitability of the material, for any purpose. It is provided 'as is' without express or implied warranty, including any warranties of merchantability or fitness. In no event will the Australian Institute of Architects or Consult Australia be liable, whether in contract, negligence or other action arising out of or in connection with the material, or for any special, indirect or consequential damages or any damages whatsoever resulting from loss of use, data or profits.

All material in this document is copyright to:

- either, or jointly, the Australian Institute of Architects and Consult Australia; or
- a third party, from whom the material is licensed for inclusion on this site.

No reproduction of the material is authorised unless written permission is first obtained from both the Australian Institute of Architects and Consult Australia.



Australian
Institute of
Architects

INTRODUCTION

What needs addressing in teaming Professional Services Agreements and BIM Management Plans to ensure the stakeholders maintain responsibility for the accuracy of their input such as design/construction detail, level of detail, geometry, intelligence etc. in their individual discipline model or part of a model?

WHO ARE THE BIM AUTHORS?

BIM authors are potentially multiple stakeholders (designers, consultants, contractors, trades, client); anyone who produces information relevant to the design, construction, operation and/or maintenance of a building. Authors change over time and may vary as the model progresses from design model to construction model and lastly to as-built model.

WHAT ARE THE INDIVIDUAL AUTHORS' INPUTS?

The following includes inputs the author is regularly responsible for:

- Description of the built form and components of a building in progressively higher levels of detail during the design and construction of a project.
- Level of detail (LOD)
- Geometry/data
- Object intelligence, the 'I' in BIM – how much?, what purpose?

WHAT ARE THE AUTHORS DELIVERING?

Anticipated or desired input by particular authors should be included in the Professional Services Agreement and the BIM Management Plan. The following include deliverables by the various authors of BIM:

- Outputs from a model (eg, 2D drawings, 3D views, schedules, images, fly-throughs, other model formats like IFC, 3D DWG)
- Extraction of basic building areas and volumes for space planning and massing studies
- Dynamically linked 2D/3D information (considering if/when dynamic links will be broken)
- Federated models, aggregated models
- BIMs as the basis for building performance simulation and analysis (eg, energy)
- Models suitable for 4D (scheduling) animation
- Models suitable for 5D cost scheduling
- The generation of 'as-construct models' for fabrication and assembly
- Output data that is relevant for operation and maintenance by facility managers

WHEN DO AUTHORS HAVE RESPONSIBILITY & LIABILITY FOR THEIR CONTENTS?

The responsibility and liability of each author's content is defined by a model progression specification (also known as a BIM specification). The responsibility shifts over time; eg, architect produces design intent column; engineer adds additional detail including reinforcement, material attributes; contractor defines formwork to produce the required column.

Responsibilities will be determined by terms of use of the model during the design/construction process, and the whole of life. The development of a project specific BIM Management Plan will ensure all designers are aligned and agree to the plan. The nominated BIM Coordinator will update as things change/progress on the design.

AUTHOR IDENTIFICATION IN AGREEMENTS & BIM MANAGEMENT PLAN

BIM authors should ideally be defined in the Professional Services Agreements and the Project BIM Plan (also known as the BIM Management Plan or the Project Execution Plan). The BIM purpose/usage should be defined and agreed in the BIM Management Plan. Roles and responsibilities, liabilities, intellectual property and moral rights should be clearly expressed. If a model developed for facilities management purposes is required then the outcomes/deliverables should and must be articulated at the design stage. The lead consultant's responsibilities and liabilities should be defined, as should the BIM Coordinator's (also known as the BIM Model Manager) role, responsibilities and liabilities.

RESPONSIBILITIES WHEN SHARING PROJECT INFORMATION THROUGH BIM

There is little difference between BIM projects and projects designed and documented in 2D CAD as far as responsibility for content. If a BIM Management Plan is used to give clarity to who is responsible for content, then it also follows that clarity of ownership of each element of the model is also achieved¹.

A couple of examples:

- If an authorised use is to produce photo-realistic renders and fly-throughs of the model, then the BIM Management Plan may impose a requirement to include material definitions to a required level. This may impact the scope of the architect's work.
- If it is a requirement to include AIQS or Unifomat codes against all objects, then this may impact scope.

1 Refer to the *BIM Protocol Exhibit Document E202 – 2008*. It is the basis of a contract document by the US AIA. Issues such as level of development (LoD) define a contractual obligation, and further define the deliverables associated with that LoD. In addition a BIM Management Plan will need to define deliverables in order to define authorised uses of the model.

- Federated model requirements can significantly impact the scope of the consultants' work in that it may define how the model is created, or additional work required to suit the federated model. Federated model requirements to colourise by service, discipline or system for example, can have a significant impact on the services designers are modelling. A requirement to accommodate 4D will impact the model construction as it will need to be broken down into components that reflect construction scheduling.

In order to be able to agree to a collaborative BIM Management Plan, all stakeholders should have in place strong BIM guidelines within their organisation to define their standards for the production of a BIM project, or simply to define their current modelling standards applied to deliverable production.

These guidelines serve a number of functions:

1. They set out the internal standards the organisation works to, and the assumptions it makes regarding the use, or restrictions on use, of any models or information it provides as part of normal project delivery.
2. They provide an immediate and informed response to a client announcing that it requires a project to be delivered as a BIM project, and to a client presenting a project team with a BIM Management Plan for their project.
3. They can be used as a tool when negotiating a BIM Management Plan to assist in aligning in-house standards to the requirements of a project.

THE LEGAL CONTEXT TO BIM MANAGEMENT PLANS

The BIM Management Plan should cover the procedure for directing, monitoring and controlling the use of BIM on the project. The BIM Management Plan may also include a BIM protocol which sets out technical details such as software requirements.

BIM authors should note the legal relationship between parties is contained in the Professional Services Agreement (PSA), while the BIM Management Plan is an administrative document and may not have binding contractual force even if in some instances it may be part of the contractual requirements. If the parties wish to give the BIM Management Plan binding contractual force, the PSA of each party involved in the model would need to make reference to the BIM Management Plan. The parties also need to discuss and clarify the legal impact of the BIM Management Plan – eg, whether it affects the risk allocation/liabilities set out in the contract. Consideration should also be given to other legal risks such as an action in tort or under the Competition and Consumer Act 2010 (Cth)².

Ownership and responsibility of models are not issues to be considered in isolation but together with related matters of IP ownership and insurance. Legal liability and risk allocation should be set out in each party's PSA. To avoid uncertainty, the BIM Management Plan should be consistent with the parties' PSA and should not contradict it.

Considering the above, the BIM Management Plan needs to be produced either before the PSA or concurrent with it. Many aspects of a BIM Management Plan can redefine or expand on the definition of deliverables in a PSA. If it is produced after the event, revisiting the PSA to have it amended may not be practical.

A detailed list of topics to be considered in a BIM Management Plan can be found in Document P2 that forms part of this series.

RISKS – FROM A CONSULTANT PERSPECTIVE

From a consultant's perspective, there are some concerns about the use of BIM data by other stakeholders.

How is intellectual property loss mitigated (also refer to Document L1 - BIM and Intellectual Property)

Native BIM files contain significant embedded intellectual property in the form of:

- content (eg, objects, families).
- guidance on internal processes (eg, written guidance for staff using the template).
- uncontrolled data (dynamic schedules, editable drawings, sheets, working views etc).

For some firms, the loss of intellectual property resulting from the issue of native format files is a concern. Approaches to reducing this risk generally include removing as much information as possible from native files prior to issue. This follows a well-established principle of issuing only data that is required by the recipient.

A second approach is to use non-native (eg, IFC), or read-only (eg, DWF, Navisworks) file formats for data exchange with third parties. Both provide a layer of abstraction between the original source data, and the data exposed to third parties, thereby protecting some of the raw intellectual property.

How to avoid inappropriate use of data

Data issued by the consultant team may be used in a variety of ways, and by a variety of parties. Given that a BIM contains more information than traditionally included in 2D paper or digital files, there is the potential for some of the data contained in the BIM to be used for purposes for which it is not suitable. Examples include:

- use of the model for energy analysis, where only certain elements have energy data associated with them.
- inconsistent levels of development of different areas of a model (eg, lower levels to LoD 200, but upper levels to LOD 100 only), leading to inaccurate calculations during analysis.

If we move towards a position where parties rely more heavily on the BIM as opposed to a set of contract drawings, should the recipient be able to rely more heavily on how fit for purpose the data is? This would appear to require more care on the part of the consultant when issuing data, or very specific guidelines for use.

² <http://www.comlaw.gov.au/Details/C2012C00490>

How to avoid data being used against the consultant

BIM provides opportunities for the overall team to improve the design/construction outcome, but also creates some risks for the consultant team.

Examples:

- A contractor carries out a clash detection analysis of a BIM, but does not notify the consultant team of clashes identified. Instead, the contractor uses the clash report to identify potential variations.
- A party uses analysis to determine how fit for purpose or complete a BIM is in order to argue that the design is inadequate or negligent.
- Assuming that a BIM issued during the course of a project is a work in progress, another member of the consultant team argues for delay on the basis that parts of the model were incomplete or unresolved at the time of issue.

There would appear to be a need for sharing of the risks/rewards resulting from the use of a BIM.

Increased duty of care can be achieved through use of BIM

BIM may increase the duty of care required of a consultant in the following ways:

- An expectation that BIM, clash detection etc represent a reasonable standard of care.
- By issuing more data (compared to paper or traditional 2D), there may be greater onus to check how fit for purpose that data is prior to issue.³

3 References: <http://www.forconstructionpros.com/article/10283787/bim-emerging-as-constructions-legal-standard-of-care>
Is the recent US case relevant to the Australian region? <http://archrecord.construction.com/news/2011/05/110519-BIM-Lawsuit-1.asp>

CONCLUSION

BIM authors are multiple stakeholders – designers, consultants, contractors, trades, clients and others who produce information relevant to the design, construction, operation and/or maintenance of a building. Authors change over time and may vary as the model progresses from design model to construction model and lastly to as-built model. At each step of the way, the inputs by each stakeholder have an impact on the team as a whole and the BIM deliverable. The responsibilities and liabilities of each stakeholder's input should be defined in the BIM specification to provide clarity as the responsibilities change over time.

There is little difference between BIM projects and projects designed and documented in 2D CAD as far as responsibility for content. If a BIM Management Plan is used to give clarity to who is responsible for content, then it also follows that clarity of ownership of each element of the model is also achieved. The BIM Management Plan should cover the procedure for directing, monitoring and controlling the use of BIM on the project. The BIM Management Plan may also include a BIM protocol which sets out technical details such as software requirements. Ownership and responsibility of models are not issues to be considered in isolation but together with related matters of IP ownership and insurance issues.

From a consultant's perspective, there are some concerns about the use of BIM data by other stakeholders:

- How is intellectual property loss mitigated?
(also refer to **L1 - BIM and Intellectual Property**)
- How to avoid inappropriate use of data.
- How to avoid data being used against the consultant.
- Increased duty of care can be achieved through use of BIM.

Summary

- Who are the BIM Authors?
- What are the individual authors' inputs?
- What are the authors delivering?
- When do the authors have responsibility and liability for their respective content?
- Responsibilities when sharing project information through BIM.
- Author identification in an agreement and BIM Management Plan.
- The legal context to BIM Management Plans.
- Risks from a consultant perspective.

BIM, Legal & Procurement

L4 *Viable Options –
Encouraging Collaboration
& ‘No Blame’*

L4

BIM IN PRACTICE



Australian
Institute of
Architects

BIM, Legal & Procurement

L4 *Viable Options – Encouraging Collaboration & ‘No Blame’*

Contributors:

Peter Scuderi (Chair), Arup
Richard Barton, Australian Institute of Architects
Sam Bassilious, Rider Levett Bucknall
Warren Birchall, HASSELL
Chris Canham, Lend Lease
Andrew Chew, Corrs Chambers Westgarth
Fergus Hohnen, Woods Bagot
Kiri Parr, Arup
Wendy Poulton, Planned Professional Risk Services
Philippa Sutton, Laing O’Rourke
Claudelle Taylor, Leightons / Nexus Point Solutions

- L BIM, Legal & Procurement
- L1 BIM and Intellectual Property
- L2 Professional Indemnity Insurance
- L3 Stakeholders’ Responsibilities
- L4 Viable Options – Encouraging Collaboration and ‘No Blame’**

L4 Viable options – encouraging collaboration & no blame [Version 1 – August 2012]

Disclaimer:

This document is jointly published by the Australian Institute of Architects and Consult Australia and contains information prepared by the joint Australian Institute of Architects and Consult Australia BIM/IPD Steering Group and its Workgroups. The Australian Institute of Architects and Consult Australia make no representations, either jointly or severally, about the content and suitability of the material, for any purpose. It is provided ‘as is’ without express or implied warranty, including any warranties of merchantability or fitness. In no event will the Australian Institute of Architects or Consult Australia be liable, whether in contract, negligence or other action arising out of or in connection with the material, or for any special, indirect or consequential damages or any damages whatsoever resulting from loss of use, data or profits.

All material in this document is copyright to:

- either, or jointly, the Australian Institute of Architects and Consult Australia; or
- a third party, from whom the material is licensed for inclusion on this site.

No reproduction of the material is authorised unless written permission is first obtained from both the Australian Institute of Architects and Consult Australia.



Australian
Institute of
Architects

INTRODUCTION

Traditional approaches to project procurement (such as design, bid-build) do not necessarily allow project teams to tap into the full potential of collaborating in BIM. Is it possible to create a legal instrument that binds the design and construction team behaviour and encourages shared liability and a 'no blame' culture? This information provides a response to the above question by investigating legal and procurement factors that can contribute to a more integrated way of delivering projects across the building lifecycle.

RISK SHARING & NO BLAME CULTURE

Many hope that BIM will be part of a new, more collaborative working style, which is only to be encouraged. However, terms such as 'risk sharing' and 'no blame' should be used cautiously, if at all.

Setting up formal risk sharing or no blame agreements requires careful preparation and advice. Otherwise, the safer approach is not to use terms like 'risk sharing' or 'no blame'.

For a more collaborative working relationship, there are two very different alternatives to consider:

- Collaboration (including collaborative umbrella agreements, strategic partnerships and framework agreements) – a collaborative agreement on a single project or across many projects where the parties agree to work collaboratively but with each party remaining liable only for its own work and risks.
- Alliance contracting – a different form of project procurement where the parties to a single project agree to share risk and reward under a painshare/gainshare arrangement, so that each party shares the risk of the other parties' errors.

COLLABORATION

The aim is for risk to be managed collaboratively by the whole project team and when a problem is encountered, the whole project team works together to resolve or mitigate that problem. (However, this does not change the ultimate liability of team members if the problem is not resolved or mitigated.) Effective collaboration depends upon client leadership, selection of project partners, collaborative forms of contract and suitable commercial arrangements, including early supply chain engagement.

Collaborative umbrella agreements, strategic partnering agreements and framework agreements set out mandatory consultation and collaboration processes, but they do not usually impose a formal system of risk sharing, and each party usually remains liable only for its own work and conduct. These forms of working would therefore usually remain within the terms of standard professional indemnity insurance policies and would not require special arrangements.

Collaborative umbrella agreements:

A collaborative umbrella agreement is an overarching formal commitment that sits above the main contract and Professional Service Agreements. The collaborative umbrella agreement commitment includes:

- Outline the collaborative values the project team wishes to work to
- Identifies common goals and objectives
- Creates a common sense of purpose and shared vision
- Aligns the behaviours of individuals
- Promotes transparency and trust
- The commitment is signed by each design/project team member

This partnering ethos provides assurance to all involved and is essentially useful in maintaining and binding team efforts.

Strategic partnering/framework agreements:

Refer to the UK *Strategic Forums Collaborative Tool Kit* (ie: candidate selection, evaluation and appointment)

The creation of team partners and a truly collaborative culture is essential to the success of a collaborative approach. The key to partnering is quality of leadership, transparency, clarity and cooperation.

- A partnering structure which allows greater collaboration between key parties often produces greater efficiency and productivity gains.
- Partnering ensures a shared value system, pre-arranged management plans and collaboratively developed processes, tools, systems and practices.
- These agreements are negotiated with individual companies to establish an agreed method of working together and a commitment to first work opportunities.
- Partnerships usually include one senior individual being the direct group contact in the event of a performance or compliance failure. (Again, this collaboration does not alter the ultimate allocation of responsibility and liability for the consultant's own contribution.)

Early supply chain engagement:

Early supply chain engagement (two-staged, negotiated, framework/alliancing or design portion) allows the preferred supply chain to actively engage in the design process from the earliest design stages.

- The preferred supply chain can initially advise on: a) cost, b) buildability, c) innovation, d) prototypes, e) detailed design, f) risk and value management, and g) safety in design.

The supply chain is encouraged to take early design documentation responsibility to:

- Remove duplication in the design process.
- Minimise omissions, errors, defects and potential onsite redesign.
- Streamline information into CAD/CAM automated fabrication and manufacturing process.

Early supply chain involvement must be carefully mapped out with clear definition of design consultants' handover and ongoing responsibilities, including design liability risk. Early supply chain engagement is the key to single point insurance, as it can reduce overall project cost.

ALLIANCE CONTRACTING

Alliance contracting is a different form of procurement which may be adopted for a single project. Because of the very different risk, and the liability and insurance implications, 'shared risk', 'no blame' or alliance contracts should only be entered into after specific legal and insurance advice has been sought. The parties to an alliance (eg, a government client, a building contractor and a lead design consultant) enter into a single contract, usually including a painshare/gainshare regime and a formal agreement to share risk and a legally binding 'no blame' agreement. Because risk sharing means that each party undertakes joint liability for other parties' work and conduct, liability under an alliance agreement will usually not be covered by each party's own professional indemnity insurance.

On any alliance project, a single project insurance policy tailored to the alliance should be obtained (see the section headed 'Single project insurance' under **L2 - Professional indemnity Insurance**).

Alliance contracting is likely to be suitable only for large projects for government clients, as it requires a high level of legal advice to set up and the premiums on first-party insurance are usually also high.

Consultants on alliance projects would also need to consider issues such as:

- whether they are in the alliance or are sub-consulting to one of its participants
- whether they have the protection of a no-blame agreement
- whether the terms of the policy provide them adequate protection (project specific policies of this kind typically provide cover only for a fixed period, such as seven or 10 years)

- the risk of claims by third parties, for which the alliance participants cannot contractually exclude liability, such as liability to a person injured on the project which is due to a design or other negligent error on the part of project participants

On an alliance project eg, Public Private Partnership (PPP), there is still a requirement to agree between the team members most of the aspects of the early supply chain engagement.

Even though the parties are bought together to collectively put in a project bid, they are engaged using the traditional processes, and the demarcation and responsibilities for the respective parties remain the same.

It also needs to be remembered that the procurement by the builder will likely be along traditional lines. The reality of our market place is that whilst a builder can lock in a design team consortium for a bid, they are unlikely to be able to lock in sub-contractors. There simply are not enough to go around. Hence for myriad reasons, the construction part of alliance will not be subject to any single project insurance policy. It may be subject to a separate alliance and shared risk agreement. If that is the case there will be an interface and demarcation to agree between the two alliances, which in some cases will have organisations in common with both.

HOW DO WE SET UP COLLABORATIVE TEAMS TO ENSURE THERE IS A COLLABORATIVE CULTURE?

How do we make existing procurement systems work for collaborative working in BIM?

Client and senior management buy-in is required and a client's ability to deal with a change in risk profile must be established from the outset. Business objectives and value systems must clearly define a commitment to collaborative working. Internal legal teams must first assess the group's collaborative risk profile and arrangements must be agreed with external insurance companies. Solicitors must be engaged to draft contracts, especially on alliance projects. The following is a list of success factors in establishing any collaborative environment.

Hierarchy of documents:

Collaborative work practice, supporting a collaborative culture, is set out in a hierarchy of documents promoting trust and transparent relationships:

- Collaborative umbrella agreement
- Framework Agreements/Professional Service Agreements
- Scope of service and responsibility matrix
- BIM Management Plans
- Tools and processes

Collaborative main contract clauses – BIM:

- BIM is an enabler of collaboration in the way in which information and data is presented in a highly transparent manner.
- Key areas of BIM risk and liability need to be identified in main contracts. Contracts should include issues or restrictions that may exist in terms of interoperability for integrated data being exchanged. (Electronic data management platforms allow for the open exchange of data and reduce the need for co-location of design/project teams.)
- Highly collaborative contracts with proper risk allocation and commercial incentivisation, need to take advantage of:
 - New interoperability and high functionality of available technologies
 - Collaborative BIM Management Plans, protocols and standards

Transparent 5D cost models provide a high level of transparency and clear cost structures. Therefore the client has the power to interrogate cost breakdowns and to see if this relates to the allocation of resources and work plans. This provides new levels of assurance around project management. This will only work if the modelling requirements to support 5D have been defined at the outset (in a BIM Management Plan).

- Changes in vocabulary, copyright, ownership of objects in 3D libraries, ownership of the model, software provision and training, may be addressed.
- Contracts need to reflect the intention to work collaboratively. This promotes and permits collaborative consultation and resolution of risk. (An example of a collaborative contract is found in the UK NEC National Engineering Contract, with extensive risk management activities)

Two-staged collaborative Professional Service Agreements:

- Professional Service Agreements should be established in two-stages. Initially in a simple agreement or modified short form, to cover the team while the following is collaboratively formulated and agreed: a) scope of service and responsibility matrix, b) BIM Management Plan, c) collaborative tools and processes and d) collaborative workshops.
- A two-staged procurement of professional services provides the whole team sufficient time and information to assess their risk and buy-in to project delivery, ensuring long term ownership of project outcomes.
- The short form is subsequently replaced with a standard retrospective Professional Services Agreement reflecting the collaborative values and wording set out in the overarching collaborative umbrella agreement, including procedures for collaborative working. (An example of a collaborative Professional Services Agreements is found in the UK NEC National Engineering Contract suite.)

(a) Collaborative scopes of service and responsibility matrix

- BIM Management Plan
- The production of a collaborative BIM design solution affects roles and responsibilities, resources and fee payment structures.
- Scopes of service crucially establish complete clarity and understanding of the new roles and responsibilities within the BIM modelling team (ie, who does what).
- New levels of resources or responsibility may be needed in the early stages in order to ensure integrity of information. As a generic statement, the scope of service should ideally reflect changes in design activities necessitated by a rapid BIM design process (eg, order and sequence of work, consultant engagement, deliverables requirement, program durations, compliance verification, management and change management processes, etc)
- A matrix of responsibility transparently identifies roles and responsibilities and must be collaboratively agreed with the team. The matrix must incorporate new BIM roles and job titles, vocabulary, activities (eg, clash detection versus coordination, or responsibility for generating a federated BIM model etc).
- Only by bringing a suitably balanced team together can a client expect to succeed.
- Consider how these roles extend through the construction process into the federated model handover.

(b) BIM Management Plans

- The BIM Management Plan, project BIM plan, design management plan and project execution plan should all communicate the same message and outline collaborative activities and strategies that support a collaborative culture. This requires greater focus on risk management by the team as an entity.
- The BIM Management Plan with project standards and protocols strengthens and augments the spirit of coordination and provides many of the tools to ensure success.

(c) Collaborative tools & processes

- Each tool, process or standard used to monitor, manage, record, approve or check for compliance within the design process, must be aligned with the collaborative value system, collaborative activities, roles and responsibilities and plans of work.

(d) Collaborative workshops

- A key milestones workshop should be arranged to ensure the whole project is fully reviewed by multi-disciplinary consultants, specialist knowledge, supply chain and delivery team, clients, stakeholders, authorities, operators, facilities manager, third parties and end users. This permits:
 - timely decision making in a rapid 3D design process
 - timely risk and value management
- overall transparency to ensure the whole project team is aware of and addresses the same issues at the same time (ie, right information at right time)
- effective change management, to ensure the whole project team understands why decisions are made (ie, less likely to make unnecessary changes at a late stage)

CONCLUSIONS

The main theme of this paper is to consider collaboration as the key to viable options for BIM enabled procurement processes. It has considered the legal and procurement factors that can contribute to a more integrated way of delivering projects across the building lifecycle using BIM. There are two alternatives to be considered. The first being collaboration (including collaborative umbrella agreements, strategic partnerships and framework agreements) and the second less common approach is alliance contracting with each party sharing the risk of the other parties' errors.

Collaborative agreements include collaborative umbrella agreements, strategic partnering/framework agreements and early supply chain engagements with the key success factor in each being to establish the ground rules early and generating a culture and willingness to collaborate as part of a team. Alliance agreements are based on parties to an alliance (eg, a government client, a building contractor and a lead design consultant) entering into a single contract, usually including a painshare/gainshare regime and a formal agreement to share risk and a legally binding 'no blame' agreement. This model is considered applicable to very large projects.

Regardless of the procurement options used, client and senior management buy-in is required and a client's ability to deal with a change in risk profile must be established from the outset. Business objectives and value systems must clearly define a commitment to collaborative working.

Summary

- Traditional approaches to project procurement (such as design, bid-build) do not necessarily allow project teams to tap into the full potential of collaborating in BIM.
- For a more collaborative working relationship, there are two very different alternatives to consider:
 - Collaboration - a collaborative agreement on a single project or across many projects where the parties agree to work collaboratively but with each party remaining liable only for its own work and risks
 - Alliance contracting - each party shares the risk of the other parties' errors
- Client and senior management buy-in is required and a client's ability to deal with a change in risk profile must be established.
- Success factors to consider for any collaborative arrangement:
 - Hierarchy of documents
 - Collaborative main contract clauses - BIM
 - Two-staged collaborative Professional Service Agreements including collaboratively formulated and agreed: a) scope of service and responsibility matrix, b) BIM Management Plan, c) collaborative tools and processes and d) collaborative workshops.