



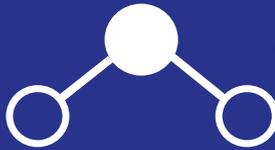
THE WINFIELD ROCK REPORT

OVERCOMING THE LEGAL AND CONTRACTUAL BARRIERS OF BIM

MAY WINFIELD AND SARAH ROCK

FEBRUARY 2018





CONTENTS

Message from the UK BIM Alliance Chair	5	Appendix One Interviewee List	42
Foreword by David Philp MSc BSc FICE FRICS FCIOB FCInstES FGBC	6	Appendix Two Online Survey Findings	44
Introduction	8	Appendix Three Non-Exhaustive Terminology Reference	48
Executive Summary	10	Appendix Four BIM Legal Questions: A Checklist	50
BIM Level 2: What is it and is there a 'legal' definition?	14	Appendix Five Suggested Further Reading	51
What standard of BIM are you?	18	Appendix Six Bibliography	52
Standard Form Contracts – Why the BIM Terms Matter	22	Appendix Seven Credits	58
BIM Project Specific Documents	28		
The Legal Community's BIM Awareness/ Knowledge – Do the Lawyers get it?	34		
Where Do We Go From Here – The Need for Clarity and Next Steps	38		

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May has spoken worldwide regarding BIM, is author of various articles on legal issues of BIM, digitisation and innovation in construction, and author of the award winning Society of Construction Law paper, 'Building Information Modelling: The Legal Frontier – Overcoming Legal and Contractual Obstacles'. She was one of the panel members of the King's College report, 'Enabling BIM through Procurement & Contracts'. May is chair of BIM 4 Legal, committee member of Women in BIM, committee member of BIM 4 FM and a core team member of the 4D BIM Group. She is also actively assisting in the management of the UK BIM Alliance Projects Group.

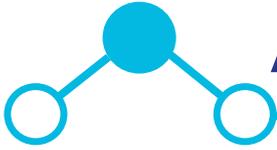


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Prior to becoming a solicitor, Sarah spent 9 years in industry working as a contracts manager for an electrical contractor. During this time Sarah qualified and worked as a CAD engineer. Sarah is now a Senior Associate in the construction and engineering team at global law firm Gowling WLG (UK) LLP. Sarah specialises in transactional construction law with a particular focus on projects incorporating digital construction. Sarah has advised numerous clients with regard to all aspects of incorporating BIM within contracts and appointments and has drafted various bespoke BIM documents.

As well as contributing to the BIM clauses in the CIOB Complex Projects Contract (now termed the Time and Cost Management Contract) Sarah has written extensively on BIM for various publications including a chapter published in the Construction Manager's BIM Handbook and has spoken at various conferences nationwide. Sarah was awarded the ICES Publishing Prize for 2017 for her article '*Trant v Mott MacDonald: BIM in court*'. Sarah is the co-chair of the London BIM Region, is vice chair of BIM 4 Legal and is an active member of Women in BIM.

MESSAGE FROM THE UK BIM ALLIANCE CHAIR



The UK BIM Alliance was formed in 2016 to respond to the need for industry leadership and focus on BIM Level 2.

Our objective is to enable widespread implementation of BIM Level 2 across the built environment industry by 2020.

We are growing and already have the support of many leading organisations.

Our purpose is to provide research, tools and support which will help break down the barriers that prevent progress and which will facilitate the next stage of the digital transformation, through to BIM Level 3 and beyond.

This report by May Winfield and Sarah Rock supported, with our thanks, by Gowling WLG (UK) LLP is an exemplar of our intentions in this regard.

It is an independent report by two of the leading BIM legal exponents in our industry, which sets out current perceptions and addresses not only the challenges we face but also the routes to potential solutions.

I would like to take this opportunity to thank both of them for their energy, enthusiasm and commitment in pulling this valuable report together - and look forward to taking the next steps with them.

The UK BIM Alliance Projects Stream will continue to work along these lines across the wider context of our mission, producing the support that industry needs - "For the industry, by the industry".

We will work with any like-minded people and organisations that have similar values and direction of travel. May I invite you to consider becoming involved as supporters, in our working groups and projects, and - at an organisational level - as patrons.

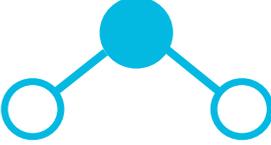
Further information can be found on our website www.ukbimalliance.org about latest news, resources and how to get involved. You can also subscribe to our newsletter and be kept up to date on developments. Enjoy!

Dr Anne Kemp

Chair

UK BIM Alliance





FOREWORD



Innovation and change are becoming essential ingredients for today's built environment businesses who are competing in a landscape that is seeking radical efficiencies and healthier levels of productivity across the entire asset life-cycle.

One of the key levers in unlocking these objectives has been the process of digitising the built environment which has fostered significant momentum in the last decade. Building Information Modelling (BIM) has been a central plank in this shift and is already altering the UK construction industry; arguably driving more collaborative behaviours and better information sharing. The UK Government's intervention in 2016 with its BIM Level 2 mandate pulled tightly on the thread of the traditional ways of creating and caring for our built assets.

Typically a huge percentage of similar digital change initiatives fail to achieve their objectives; it is noteworthy therefore that the combined partnership of Government and UK Industry in the development and implementation of BIM has had such a profound impact, becoming a trigger for better and more collaborative behaviours. This behavioural change is mirrored in the collaborative nature of this report. I don't think we have seen lawyers come together and provide honest comments on this scale and be willing to assist and share in this way previously. People wanted to help and be involved – not a view that the general preconception of lawyers would lend itself to! The inconvenient truth is that we very much need our lawyers and commercial communities positively engaged with BIM to help industry navigate the various obligations, liabilities and limitations presented in the world of BIM Level 2. Engaging and upskilling the legal community on the requirements of BIM is vital if we are to move to technology enabled, less adversarial ways of working.

The definition of BIM maturity or Level 2 was originally developed as part of the UK Government BIM strategy in 2011 and the BS BIM Level 2 suite, PAS1192-2 et al, offered fundamental principles in the production and management of information models in a secure and collaborative environment. The BIM Level 2 suite and the adoption of managed methods of working has evolved significantly since inception and further changes can be expected this year (2018) with the publication of PAS1192-6 and ISO19650 parts 1 & 2. For this

reason, British Standards Institution (BSI) never formally defined BIM Level 2 maturity and this is recognisable as the people interviewed in the creation of this report generally gave a different response to the request for them to define BIM Level 2. Some of the definitions echoed the interviewee's view of the world i.e. some lawyers gave a legal definition whilst some designers reflected design terminology in their definition. The relevance of this finding is that the contract needs to reflect all parties' understandings of the deliverables (whatever that may be) and all parties need to have the same understanding. They need to talk to each other!

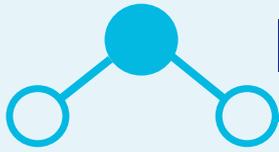
In addition to looking at the definition of BIM Level 2 and the PAS1192 suite of standards, this report offers a comprehensive review of the current standard form building contracts and BIM specific documents in use in industry. Finally, the authors have held a mirror up to their own profession and looked at the industry's view of BIM awareness and knowledge within the legal community.

Interestingly, whilst all those interviewed for this report had some BIM experience or expertise, almost all felt they were unqualified to be interviewed on this subject which reflects the journey that we are all on. There is a common misconception that 'others know more than I do' which the authors and I would like to attempt at least to break down with this report and to encourage people not be afraid to ask questions especially the "why?" and "how?"

As BIM Level 2 grows in maturity and becomes increasingly a contractual requirement this report reflects upon the need for better understanding by lawyers whether through self-driven learning or coming together. BIM 4 Legal was set up in response to this and aims to bring lawyers together and to facilitate further discussion. Importantly this report also includes a brief checklist of questions intended to assist a lawyer new to BIM to gain clear instructions from their client. Both initiatives are intended to continue the collaboration and learning started by this report.

This report enshrines the energy and optimism associated with continuous and sustained improvement in our industry and demonstrates that we really can make change happen when we remove the blockages that often impede our journey and collaborate – happy reading!

David Philp



INTRODUCTION



The aim of this report is not to set out or repeat discussions on the appropriate BIM contractual framework or provide a detailed analysis of the standard form contracts, which have already been canvassed comprehensively elsewhere.¹ Rather, the aim of this report is to consider the present understanding of BIM legal and contractual issues among the legal community and those who instruct them.

Further, it is intended to fill the existing and significant gap for a digestible-but-comprehensive 'state of the nation' review, to assist the (new to BIM) legal community in the commencement of their journey of understanding the wider impact of BIM terms in both the standard form contracts and BIM specific documents; the risks; the opportunities, and the support that can be offered by those in the legal community to their clients. To achieve this, in this report we assess the impact of the use of BIM levels of maturity, how these are defined and how this terminology is being used in the industry. We also look at some of the standards being used by the industry in delivering BIM, how these are perceived and how these are changing.

It is important for the legal community to understand about the commonly used BIM contract documentation, as well as to learn about and understand the technical aspects sufficiently to be able to advise on the same (and to be aware of what contract terms are required to mitigate the risks arising from these technical processes).

The research for this report began with an online survey. 158 participants provided feedback as to use of BIM on projects and the documents used to facilitate this. The statistics gathered are used throughout the report and the full survey data can be found at Appendix Two. The authors are very grateful for this feedback and thank all who participated in this stage of the project.

The next stage of the research was to conduct one-on-one interviews with key industry players. We were fortunate enough to have 44 people kindly offer their time and views and thank each one of them for this. The full list of interviewees can be found at Appendix One and consists of a mix of industry contributions including clients,

contractors, consultants, academics, and both in-house and private practice lawyers. The comments from this stage of the research make up the bulk of this report and have been, in the large part, anonymised to facilitate a full, frank and honest state of the nation review of BIM and the law at this present time.

Finally, the authors reviewed the online statistics and interview feedback and have made two recommendations to assist in driving forward the understanding of this crucial movement in the construction industry and legal community. These being a checklist of questions designed to assist lawyers, which can be found at Appendix Four, and the launch of the BIM 4 Legal community group.

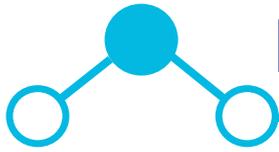
The authors would like to thank all of the contributors for their time and for sharing their invaluable experience and knowledge. There was a common response amongst the interviewees when initially approached for comment that they did not feel they were 'expert' enough to contribute anything. It transpired that this was a complete fallacy and virtually all of the interviewees were on a par with one another in terms of involvement and awareness. This humbleness perhaps reflects the modesty prevalent in our industry generally, and the misconception that everyone else is a 'BIM expert' when in fact, other parties would benefit from the real time shared experience and knowledge we all have.

Finally the authors would like to acknowledge the collaborative nature of this report. Without the participants being willing to share and contribute to this report this project would never have taken off. It was a real pleasure to be a part of bringing industry players together. In particular it has been refreshing to see lawyers coming together and this displays that, whilst maintaining client confidentiality, lawyers can in fact collaborate and work together for a common purpose.

May Winfield and Sarah Rock

February 2018

¹ See Mosey, Bahram, Winfield etc., 'Enabling BIM through Procurement and Contracts' (King's College 2016) and Winfield M, 'BIM: The Legal Frontier – the legal and contractual obstacles of BIM (Society of Construction Law 2015)



EXECUTIVE SUMMARY

“It is no longer an advantage to know how to do BIM it is a disadvantage to not know.”

Interview response February 2018

INTRODUCTION

This report is divided into six main sections; BIM Level 2: What is it and is there a 'legal' definition?; What standard of BIM are you?; Standard Form Contracts – Why the BIM Terms Matter; BIM Project Specific Documents; The Legal Community's BIM Awareness/Knowledge – Do the Lawyers get it?; and Where Do We Go From Here – The Need for Clarity and Next Steps.

BIM Level 2: What is it and is there a 'legal' definition?

BIM is often defined through levels of maturity, currently thought of as BIM Level 0 up to BIM Level 3. The UK Government mandate which required 'fully collaborative 3D BIM (with all project and asset information, documentation and data being electronic) as a minimum by 2016² has been widely accepted to imply or mean achieving BIM Level 2.

Each of the industry recognised BIM experts interviewed for this project provided a different definition of BIM Level 2. No two people gave the same response. On interviewing parties with contrasting expertise and involvement in projects it was clear that this contrary perspective and engagement affects how BIM is viewed and therefore defined. In addition to BIM meaning different things to different people, what is considered generally to be BIM has developed and moved in recent years. New standards are being produced almost year by year and BIM documents continue to evolve and be re-issued.

Both authors of this report have seen contracts which contain something akin to the magical phrase 'The Project shall be delivered to BIM Level 2'. More importantly, both authors have seen such clauses included without any clarity or discussion of what that actually means in terms of parties' obligations, rights and deliverables. Our research found this was an all too common experience amongst the participants and was a real cause for concern due to the inevitable resulting misunderstandings regarding roles, responsibilities and deliverables.

²Cabinet Office, Government Construction Strategy May 2011 2.32

Our interviewees considered the high level use of the levels of maturity to be helpful, acting as something of a hook to pin BIM on to. However, the main consensus was that the definition of the level or even the term BIM itself generally needed to be assessed on a project by project basis. Therefore where there is a requirement to "achieve BIM Level 2", as is relatively frequently seen in tender and contractual documents, it is in all parties' interests to discuss and agree what this will actually involve from a project specific risk allocation, services and liability perspective to avoid potential disputes arising from differing expectations.

What standard of BIM are you?

BIM has been shaped in large part by the development of the PAS1192 suite of standards. The authors recognise the importance and use of other standards but for the purposes of this report have focussed solely on the 1192 suite. The 1192 suite contains documents which were developed at an initial stage in the development of BIM and some of the standards are currently going through a process of being updated.

Use of the 1192 suite of standards was seen by our interviewees in equal measure as being helpful but carrying with it the potential to be applied incorrectly or inappropriately. Our research showed an inconsistent approach to application of the standards with some interviewees experiencing the ill effects of an overly zealous and rigid interpretation whilst others felt the suite was being used too flexibly with some project participants picking and choosing the standards that suited.

Some contributors felt the 1192 suite was hard to read containing conflicting terminology and an excessive use of guidance notes which confused the flow of the reader. In contrast, several interviewees felt the suite was something for the UK to be proud of and welcomed the prospect of ISO19650 which builds on 1192 and takes this solid building block out to the world.

As with the application of the levels of maturity, the standards were seen as a helpful starting position and a good high level guide towards what can be achieved. However, the majority of the contributors again

felt that the most pragmatic way to utilise the 1192 suite of documents was to consider their use and application on a project by project basis.

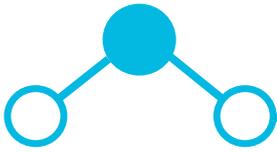
Standard Form Contracts – Why the BIM Terms Matter

The UK construction industry has a well-established and accepted history of using standard form building contracts. Our online survey showed that the most commonly used standard form contracts for a BIM-enabled project were the JCT Design and Build, JCT traditional, NEC Option C and NEC Option A.

JCT and NEC have both launched new suites of their standard forms in recent years and both suites have incorporated drafting to allow for use of BIM. The bodies have taken slightly different approaches to this, for example JCT allows for the use of a BIM Protocol whereas NEC does not, opting instead to include all legal issues in the main contract with technical scope only sitting outside. JCT described their approach as ensuring flexibility. NEC commented that they had tried to use language that people can understand.

The inclusion of BIM within the standard form contracts was welcomed by our interviewees. There were however differing opinions about the approaches taken by the standard forms in including BIM terms. Some contributors considered the amendments to be light touch whilst others felt they accurately reflected what had actually been happening in practice previously. In addition, some criticised the differing terminology used whilst others welcomed the simplistic language used. The removal of the Protocol was applauded by some whilst others felt it was a crucial document which could not be eradicated. You really can't please all of the people all of the time!

One final point raised by many consultants interviewed was that requests were being made of them on projects to provide native model files (versions of their designs which are editable). The consultants felt that this changed the position regarding intellectual property rights as it allowed other parties the ability to access and manipulate the data provided. This situation, rightly or wrongly, seemed amongst our interviewees to be becoming more prevalent and perhaps ought to be addressed, one way or another, in the contract drafting.



BIM Project Specific Documents

In addition to the BIM specific amendments to the standard form documents discussed above, there are a set of BIM specific documents used on a BIM-enabled project. These will usually comprise of (a) Employer's Information Requirements ("EIR"); (b) BIM Execution Plan ("BEP"); and (c) BIM Protocol.³

Apart from the Protocol, for which there is the standard form CIC BIM Protocol as a starting point, there do not appear to be accepted standard precedents for the EIR and BEP. Those interviewed noted that the EIR was the important and fundamental starting point for a BIM project as it set out what the employer actually requires. The contributors could not necessarily provide a sample or an approved industry explanation of what a good EIR looks like, but they all agreed that an EIR needs to be clear and reflect what an employer actually wants. A common problem discussed was a lack of information in the EIRs or no EIR provided at all.

There were differing and strongly held views amongst the contributors as to whether the BEP is and/or should be a contract document. Similarly, there was reported to be a lack of clear understanding and/or consistent interpretation of its contractual enforceability. On this point, note it is by nature an incomplete and changing document at the time of execution of contracts and the lack of awareness of this fact – in making reference to it in contract documents – could run the risk of falling foul of the 'agreement to agree' principles. Some contributors felt the BEP was simply a plan and to make it a contract document could potentially lead to a contract administration nightmare.

As mentioned above, the only standard form Protocol currently available is the CIC BIM Protocol. The CIC BIM Protocol was both criticised and applauded by our interviewees. We received a number of concerns about its content and comments about the need to add to or amend it. This arguably reflects the fact it is some years old, having been issued in 2013, and the industry's understanding of BIM has moved on some way since then. A new version is due to be issued, however, there is currently no timeline for this with one of the drafters, Andrew Croft (Associate, Beale & Company Solicitors LLP), telling us that it would be "soon".

A common thread amongst comments on the CIC BIM Protocol related to priority of documents with interviewees at odds as to whether the Protocol or the underlying contract should take priority. Interestingly, both JCT and NEC were of the view that the main contract took priority. Another point raised was that there is only one style of CIC BIM Protocol, with some interviewees struggling to see how this single form is intended to work with the many differing methods of procurement available.

The Legal Community's BIM Awareness/Knowledge – Do the Lawyers get it?

We questioned the interviewees about how they perceived the level of BIM knowledge/awareness within the legal community. One comment that was repeatedly given was that there seemed to be a disconnect between lawyers and technical people. Lawyers were perceived to have little grasp of the working of BIM projects and to fail to understand how BIM documents relate to the other contract documents and terms. The perception that lawyers becoming involved created a heightened sense of fear of risk was mentioned by some interviewees. Whilst others commented that they felt lawyers had been jumping on 'BIM band wagons' without adding anything of real substance.

Existing legal principles may need to adapt to accommodate BIM, but BIM also brings with it a shift in how the construction industry works so adapting to new, as yet un-trialled principles is also required. It was positive to hear from some interviewees that they had seen an upturn in the number of lawyers attending technical conferences to enhance their own understanding.

There was some sympathy for lawyers having to wade through endless jargon and for being expected to keep pace of constantly moving innovations. Most lawyers interviewed were in agreement that the best course of action around BIM was to ask as many questions as possible of their client allowing them to ascertain the clearest possible instructions. This point was reflected on by both lawyers and non-

³ For readers unfamiliar with these documents further explanation is set out at page 28 BIM Project Specific Documents

lawyers who commented that where the client's understanding is little better than the lawyers own, clarity of instructions can be difficult to obtain. The issue of lawyers not asking enough questions was stated by many of our interviewees to be a problem and they wondered if there was an air of embarrassment around asking BIM questions. The fear of looking like the only person in the room who doesn't understand something was touched upon. However, all of the contributors who mentioned this said they would welcome questions and wished that lawyers would ask more.

Where Do We Go From Here – The Need for Clarity and Next Steps

There appears to be a general consensus amongst the interviewees that a potential source of BIM-related disputes relates to lack of sufficient clarity of BIM obligations, rights and risk allocation. For example, one experienced legal interviewee explained that issues arose due to uncertainty or ambiguity as to what an employer was actually asking for; the employer fails to clearly enunciate what they want within the requirements and consequently do not get what they wanted – conversely the project team were never aware of the requirements in the first place due to lack of clarity in the documentation.

Another common issue appears to arise as a result of parties failing to set out the BIM specifications and expected deliverables and roles in sufficient (or, at times, any) detail at the outset – going back to the magic one-line specification still often seen in tender documents to "Achieve BIM Level 2" or simply, "Do BIM". Again, the results of the BIM process may not be what at least one of the parties had intended. In a similar account, another interviewee recalled a dispute where the contract was "plastered" with BIM but with no definition and/or detail, leading to disagreements as to the required form and format of deliverables. An interviewee noted, slightly despairingly, that BIM seemed to be sometimes "shoe horned" into contracts, which was unhelpful and expensive (e.g. due to the resulting errors, reworking, and disputes).

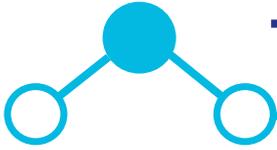
Other accounts of issues illustrated the same problems that could arise in the event of a vague, ambiguous or unclear contract. The case of *Trant v Mott MacDonald*⁴ highlights the need for greater understanding of the technical processes and associated risks involved not only with BIM projects but also with increased use of technology in the construction industry generally.

A couple of interviewees floated the suggestion that Blockchain and smart contracts may be the way forward to remedy some of the concerns encountered, such as avoiding the need to go into concise contractual detail about security and access to data, and the allocation of the real risks of these going wrong. However, all such new innovations and technologies bring new risks and untested potential legal issues, particularly bearing in mind that Blockchain and smart contracts are still at fledgling or proof-of-concept stage in many areas.

To summarise, it is important for the legal community to understand about the commonly required BIM contract documentation, as well as to learn about and understand the technical aspects sufficiently to be able to advise on the same (and be aware of what contract terms are required to mitigate the risks arising from these technical processes). We hope that our list of suggested reading assists as a starting point for readers to carry out further reading into BIM legal and contractual matters. In addition, attached at Appendix Four is a series of non-exhaustive questions which have been compiled based on the responses received from our survey, interviewees, research and experience. This checklist is intended as an initial guide for a lawyer new to BIM, to assist them in asking questions to gain clearer instructions from their client as to what drafting is required to cover BIM. The authors have also established a group, BIM 4 Legal. The aim is that lawyers involved in BIM and/or interested in the area can meet and interact to exchange experiences, raise questions, have the opportunity to speak with technical experts and co-operate in developing the understanding and increasing clarity in the interest of all parties.

⁴*Trant Engineering Ltd v. Mott MacDonald Ltd* [2017] EWHC 2061 (TCC)

BIM LEVEL 2: WHAT IS IT AND IS THERE A 'LEGAL' DEFINITION?



'The government has recognised that the process of moving the construction industry to 'full' collaborative working will be progressive, with distinct and recognisable milestones being defined within that process, in the form of 'levels.'

Quote from NBS website⁵

Introduction

BIM is often defined through levels of maturity, currently thought of as BIM Level 0 up to BIM Level 3. The level number associated with the use of BIM on a project can be thought of on one hand as reflecting the project's level of collaboration with Level 0 being the least collaborative and Level 3 meaning the project is using fully collaborative working methods. The level numbers also indicate the level of technology used and the ability to exchange information digitally on a particular project. A Level 0 project will use 2D CAD which is passed between the project team members most likely on pieces of paper. In contrast, a Level 2 project will use 3D models which contain both design and information and are likely to be passed between the project team members using a digital exchange such as an online platform termed a common data environment. Distinction between the levels is somewhat blurred in practice and there is some debate about the exact definition of each level.⁶

'it is comparatively easy to make computers exhibit adult level performance on intelligence tests or playing checkers, and difficult or impossible to give them the skills of a one-year-old when it comes to perception and mobility.'

Hans Marovec

Marovec's paradox from the field of artificial intelligence ("AI") is a concept that reflects upon tasks which are hard for humans but can be easily explained to and carried out by computers e.g. multiplying 111,111,336,777 by 498,777,231,557. In comparison tasks which are, on the whole, easy for humans are sometimes hard to explain to and therefore have carried out by computers e.g. responding to another human being with the correct level of humour and decorum in a given social situation. The number of ways one human being could deal with, process and complete the social situation example is plentiful.

⁵ <https://www.thenbs.com/knowledge/bim-levels-explained>

⁶ Alongside the level number associated with a BIM project there may also be a dimension number which indicates the type of data linked to a model. For example a 3D model contains three dimensional data, a 4D model contains three dimensional data plus sequencing and a 5D model contains three dimensional data plus cost data. The levels and dimension numbers therefore do different things but are often confused. A Level 2 model can be 3D, 4D or 5D.



Explaining the number of ways and the reasoning for each one to a computer can be very difficult, let alone explaining how five, ten or twenty different people would approach the situation and then asking the computer to carry out the task.

How would you define BIM Level 2?

Reviewing the industry’s understanding of the definition of BIM Level 2 reminded the authors of Marovec’s paradox. Everyone involved in the BIM world knows what they mean by “BIM Level 2” but often cannot explain the concept in a succinct, easy to understand soundbite. Each of the industry recognised BIM experts interviewed for this project provided a different definition of BIM Level 2. No two people gave the same response. As one consultant interviewed put it, “We have a battle at the beginning of every project trying to define BIM Level 2 first because without doing that you’re struggling with that the whole way through the project”. An in-house lawyer echoed this point stating that their team is instructed to “define what is meant by BIM as soon as it comes up in conversation”. Over recent years numerous diagrams, roadmaps, pillars and explanations have been produced by both Government organisations and various respected bodies and individuals to provide clarity and move this point forward. However, as of February 2018 there appears to still be no standardised definition of BIM Level 2. The UK Government mandate which required ‘fully collaborative 3D BIM (with all project and asset information, documentation and data being electronic) as a minimum by 2016⁷’ has been widely accepted to imply or mean achieving BIM Level 2 but the wording quoted is also accepted to not in itself provide a definition of what is required for or meant by BIM Level 2.

It seems important to note again – no two industry experts interviewed for this report gave the same definition of BIM Level 2. Each person interviewed understood what they meant by the term and each definition made sense to the interviewer, however they were all different. One leading private practice lawyer commented “I remember...trying to find a way to define it and searching it and you get about sixteen different types, definitions as to BIM Level 2”.

Why is there such disparity in the definitions and why does this matter?

Despite being born out of the advancements from CAD, technical drawing, data work flows, collaboration and system processes BIM still appears to be deemed to be a new concept and a revolution in the construction industry by some parties. One interviewee felt that this presumption was a fallacy, stating that they have in fact been "doing BIM' for years". Other individuals and speakers from the industry have noted that the technology involved in BIM has in fact existed for some time. However, whether or not one has been engaged in processes and technology akin to BIM previously, one thing that cannot be argued against is that the Government BIM mandate and recent surge of interest in this topic has brought it to general attention. This new prominence of BIM has brought with it greater use, greater interest and greater developments, the latter point being of most interest here. What is considered to be BIM has developed and moved in recent years.

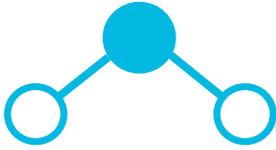
The eight pillars of BIM Level 2

One interviewee, a senior expert at a major consultancy practice, stated that BIM Level 2 required various components to be in place including "adoption of the PAS 1192 suite of standards" and "a uniform classification system". These components form part of what many see as the eight pillars of BIM Level 2⁸:

- 1 PAS 1192-2,
- 2 PAS 1192-3,
- 3 BS 1192-4,
- 4 PAS 1192-5,
- 5 Government Soft Landings,
- 6 Digital Plan of Work,
- 7 Classification (Uniclass 2015), and
- 8 CIC BIM Protocol

⁷ Cabinet Office, Government Construction Strategy May 2011 2.32

⁸ Eynon J, Construction Manager’s BIM Handbook (John Wiley & Sons Ltd 2016), chapter 9



Defining BIM Level 2 in this way therefore requires each of the pillars to be implemented in order for a project to achieve Level 2. The reader will have noted from the list that Classification refers to Uniclass which is dated 2015. Further, BS 1192-4 was published in 2014 and PAS 1192-5 in 2015. What therefore equated to BIM Level 2 prior to these dates (and the dates of the other pillars as they were produced) has been developed and superseded by their respective publications. One legal expert interviewed reflected on this when commenting "the eight pillars of BIM Level 2 don't sing in harmony together". A definition of BIM Level 2 from a mere four years ago would obviously be different and include fewer pillars than a definition produced today. In fact with one further document to shortly enter into the PAS 1192 suite relating to health and safety a definition developed today may well be out of date before the reader gets to the end of this report!

Progression

This movement forward should however be seen as positive. Production of standards, guidance and processes are all beneficial for BIM adoption, (even though there is still no universally agreed definition of BIM Level 2). The rapidly developing nature of BIM has made it difficult to apply a static definition which holds true as the technology and processes evolve as well as the updating and re-issuing of the existing pillars. PAS 1192-2 and PAS 1192-3 are currently being updated. In fact the current version of PAS1192-2 states itself that "it can be anticipated that the definition of BIM Level 2 practice will continue to evolve and that the scope of information sharing and exchange will vary from project to project. For this reason, around the core principle of the shared use of individually authored models in a common data environment"⁹. The CIC BIM Protocol is also scheduled to be updated with revision two to be issued "soon"¹⁰.

Different perspective, different view

Running in parallel to the evolving nature of what BIM is understood to be is another line of thought which has added to the difficulty of making a universal definition hard to pin down. BIM is not just a design tool, it is not just a collection of computer generated objects. BIM involves, amongst other things, information, workflows, programming and graphical representation. To quote one interviewee: "it's not a deliverable...it's a process". On interviewing parties with differing expertise and differing involvement in projects it was clear that this differing expertise and involvement affects how BIM is viewed and

therefore defined. As put by one private practice lawyer, "It means different things to different people". For example, one legal BIM expert interviewed presented a very legalistic definition, "Each party owns its own model and feeds into a client held model when instructed to". In contrast a BIM lead for a consultancy practice stated "it's all about innovating the design process". Another legal expert applied a more holistic view stating that BIM Level 2 was about "providing information in a digital format to assist in creating an overall picture of a project". One consultant interviewed commented that they felt BIM Level 2 was "as defined in the documentation of PAS1192-2. It's clearly defined". One client remarked "within different industries and for different stages of that life cycle and different roles it does mean different things".

But why does this matter?

If we know what we mean and we can deliver the end product why focus so much on providing a definition? This question goes to the very core of the reasoning for carrying out this research and producing this report in the first place. Both authors of this report have seen contracts which contain something akin to the magical phrase 'The Project shall be delivered to BIM Level 2'. More importantly, both authors have seen such clauses included without any clarity or discussion of what is actually meant or intended in terms of parties' obligations, rights and deliverables. One private practice lawyer echoed this point when recounting a previous situation, "There was no definition. It was not understood what was required...do BIM Level 2, there you go. That was it, with no instruction". Do all contracting parties have identical understandings of BIM Level 2? It seems unlikely.

A universally agreed definition of BIM Level 2 could provide some certainty here but the authors do not believe that that alone would solve this issue. Each project is unique, as is each client and each brief. As each project is different, so its requirements from BIM will differ. A BIM lead for a high profile engineering consultancy stated "It's about getting the process right for an individual project". The most common piece of guidance provided by the interviewees on this point mirrored this comment; that it was for the parties involved to assess each project on its merits. One private practice lawyer stated that they ask their clients "what does it mean to you or what are you expecting", explaining that they "then...draw back from there" and work out a project suitable definition. Another private practice lawyer suggested that the definition should "be more properly set out in the Employer's

⁹ Emphasis added

¹⁰Andrew Croft, Associate, Beale & Company Solicitors LLP in interview 2017

Information Requirements" allowing the employer to state what they expect to be delivered for that particular project.

The interviewees felt that there was a need for an umbrella term with one interviewee describing BIM Level 2 as a "kind of latch...which...has some utility". One consultant interviewed commented that "we should just see (BIM Level 2) as an acronym for change" suggesting that "digital transformation" may be a better, more easily understood term. As one lawyer interviewed pointed out, the meaning or aim of BIM Level 2, fundamentally, is the promotion of effective collaboration and a more effective and efficient use of information. Perhaps removing the term BIM altogether and replacing it with a more general term, like Digital Construction, may indeed lead to less confusion around the terminology. Removing the mystique around the term BIM could lead to easier conversations and less misunderstanding around what the parties actually mean and want to achieve by the term. One consultant gave the following analogy "in this country we've got about three words for snow and I believe that Eskimos have about 50 different words for snow because they see so many different varieties of it and we could have almost done with more definitions of what BIM is, there could almost have been more". "It would be better to drop the levels entirely because...everyone has different definitions, different understandings" and to actually do "what you have agreed...In the technical requirements of the particular project", was the pragmatic view of one private practice lawyer.

Moving to the next level

"Do you think the term BIM Level 2 is actually unhelpful?"

"Not nearly as much as Level 3"

Interview question and response November 2017

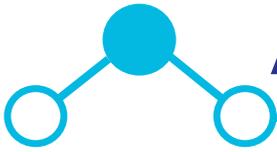
The above quote is indicative of a wave of our interviewees who expressed frustration with some of the issues which the 'level' definitions bring with them. Love them or hate them, the levels are crucial to the Government's ongoing strategy to encourage use of BIM, use of data across a built asset's lifecycle, the Internet of Things and collaboration. In February 2015 the UK Government published Digital Built Britain Level 3 Building Information Modelling Strategic Plan, designed to build 'on the achievements of the Level 2 BIM programme'. This strategy has developed to become the Centre for Digital Built Britain hosted by the University of Cambridge.

Digital Built Britain states that it 'seeks to digitise the entire life-cycle of our built assets finding innovative ways of delivering more capacity out of our existing social and economic infrastructure, dramatically improving the way these assets deliver social services to deliver improved capacity and better public services'. This statement shows the high level nature of this important endeavour which was reflected upon in some interviewee comments by one private practice lawyer that, "I think there is a way to go before anybody other than the real outliers are ready to do Level 3".

It is important to note, however, that the UK Government strategies have been immensely powerful in bringing forward change and adoption of change. One interviewee commented that "within the Government (the BIM requirements) are very well defined and that means they have to comply to (those requirements) to really say that they are Level 2. However, the rest of the industry can pick and choose the bits that are relevant to them". The same interviewee discussed the documents which the Government supported BIM Task Group produced to assist uptake of BIM as "acting as a checklist so these are the things (the Government) would encourage you to ask for". The interviewee continued, "it's not perfect but it's all very good and structured in the Government and on big projects...they're in a good place. The reality is when we start scaling it on smaller projects it's at that point that it starts to fall apart because BIM is very much designed (for) and easily implemented on those bigger projects".

The move forward towards Level 3 was welcomed by one consultant interviewed: "Level 3 pushes it on to the next level and helps everyone look at using technology at the next level so I think Level 3 is massively important and just keeps the momentum going". A lawyer interviewed suggested that Level 3 requires much more focus on the holistic aspects, namely the cultural and other changes required to facilitate a Level 3 environment. The move forward towards Level 3 was welcomed by one consultant interviewed; "BIM Level 3 is likely a zoom out from BIM and will also encompass other themes from telemetry, data analytics and advanced manufacture. Central to any Level 3 model will be the secure sharing or unification of data across different systems and end markets to develop better understanding of how built assets are working and how we can optimise the outcomes to enhance service provision" David Philp, Global BIM Consultancy Director at AECOM notes "before we can move into Level 3 we first need to optimise the capabilities offered in both BIM Levels 1 and 2 to ensure solid and accurate data sets to build from". To the next level...

WHAT STANDARD OF BIM ARE YOU?



“If you just list a standard you can interpret that standard in any which way you like as long as you say well I have complied to that, I have seen that quite a few times people saying I complied to the standard. Yes, but you are not complying to it the way that we interpret it.”

Interview response January 2017

Introduction

From a purely design point of view BIM can be seen as an advancement from technical drawing with pen and paper through to Computer Aided Design (CAD) at 2D and 3D levels and beyond. BIM brings together 3D models from each design discipline but incorporates a layer of information which makes the 3D model intelligent. The objects (windows, doors, bricks, chairs etc.) contain information about what they are and clicking on the objects can reveal this information. But this explanation is too basic to really be true to BIM. BIM is also about managing information and collaboration between the project team members who use a virtual environment (Common Data Environment or 'CDE') to share information.

One legal expert we interviewed described BIM as “a process...to increase or improve the co-ordination of project information and to help the employer get the information they want at the end of the project so they can use it to operate the asset”. BIM allows for clash detection and co-ordination within the model at the design stage of a project but also allows for the built asset to then be operated

and managed using that model. One client referred to the facilities management possibilities of BIM as being its most crucial ‘using the cloud to eliminate the chaotic, time consuming ways of working (in FM) is fantastic’.

1192 suite

BIM in this jurisdiction has been shaped in large part by the development of the PAS1192 suite of documents. The 1192 suite grew from BS1192 which was first released in 1990 as a guide to structuring computer graphic information, the standard subsequently being updated in 1998. The third edition of this document was released in 2007 changing focus slightly to provide a comprehensive code of practice for collaborative production of architectural, engineering and construction information. This shift toward providing standards for collaborating in a CDE, the document stating itself that ‘use of this standard is particularly applicable where technology enabled processes are used to support projects’, was later developed further into what we now know as the 1192 suite of documents¹¹.

¹¹The authors recognise the existence of other standards but for the purposes of this report have focused solely on the 1192 suite.

The 1192 suite contains the following documents¹²:

- BS1192-2007+A2:2016 Collaborative production of architectural, engineering and construction information – code of practice (standards for collaboration in a common data environment)
- PAS1192-2:2013 Specification for information management for the capital/delivery phase of construction projects using building information modelling (standards for incorporating BIM at the capex/design and construction stage of a project)
- PAS1192-3:2014 Specification for information management for the operational phase of assets using building information modelling (standards for incorporating BIM at the opex/FM stage of a project)
- BS1192-4:2014 Collaborative production of information Part 4: Fulfilling employer's information exchange requirements using COBie – code of practice (standards for incorporating COBie (Construction Operations Building information exchange) which is a form of structuring data for exchanging between the parties)
- PAS1192-5:2015 Specification for security-minded building information modelling, digital built environments and smart asset management (standards for cyber security)¹³

British Standard or Publically Available Specification?

The 1192 suite contains a mixture of British Standards and Publically Available Specifications. The distinction is concisely provided by the NBS¹⁴:

'Publicly Available Specifications (PAS) are rapidly-developed standards, specifications, codes of practice or guidelines.

*A PAS is developed to meet an immediate market need and follow guidelines set out by the British Standards Institution (BSI). After two years PASes are reviewed to determine if they require revision, should be withdrawn or become formal British or international standards.'*¹⁵

By definition the suite therefore contains documents which were developed at an initial stage in the development of BIM. As one professional team member interviewed put it, the standards were created when "there wasn't much going on at that point in time" by "smart people" but who had "limited experience". One contractor acknowledged this fact also stating that the suite was "written in haste out of necessity". This point is reflected both in the updating of certain documents within the suite and in the fact that the suite itself continues to evolve, expand and develop.

Reliance

One criticism levied by a design consultant interviewed was not at the suite itself but at how it can be incorrectly relied upon, interpreted and used to force through unnecessary or unhelpful processes, "standards have a role but not necessarily to dictate the kind of processes that people should use". In the same way that the all-encompassing definition of BIM Level 2 is seen by some as helpful¹⁷ but not applicable to every project, the same consultant felt that the 1192 suite was helpful but could not possibly be applicable to all types of project stating "it's very easy for information to be submitted to somebody and for them to absolutely say 'so you're not conforming to PAS 1192' but actually we would like to be judged on how well the projects were delivered". This view was echoed by another consultant who commented that "any reference to the PAS standards (leads inexperienced project team members) to think (they) have to do absolutely everything under the sun and there is very little room for negotiations (in terms of what is actually applicable)". A further point made by another consultant reflected the picking and choosing of which of the standards to apply "I have said (to a contractor) one of the standards says this and they will say well that doesn't work and it is (only) a code of practice so I can change that if I want". Another consultant would prefer a more rigid approach changing the 1192 suite from "just being guidance, to setting standardised deliverables".

¹² Note we have included the official title and in brackets a non-BIM alternative description

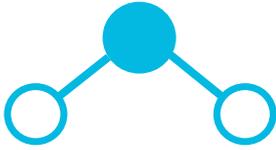
¹³ In addition to the above, PAS1192-6 (collaborative sharing and use of structured health and safety information using building information modelling) is currently being produced to further add to the suite.

¹⁴ <https://www.thenbs.com/knowledge/what-is-the-pas-1192-framework>

¹⁵ Emphasis added

¹⁶ Ravenscroft T 'Updates and Revisions to PAS 1192-2 in Consultation until 31 August' (BIM+ 13 August 2015) <<http://www.bimplus.co.uk/news/updates-and-revisions-pas-1192-2-consultation-unti/>>

¹⁷ See page 14 BIM Level 2: What is it and is there a 'legal' definition?



Use

One interviewee commented that the PAS 1192 suite was intended to be high level and was therefore “flexible in its language” “allowing the market to sort itself out in flowing down” the standards through the supply chain. This view was echoed by a consultant who suggested “if they were overly prescriptive then it would make smaller projects too bureaucratic and overly robust”. This comment may enrage some strict 1192 advocates but arguably makes sense in a pragmatic commercial world. A legal expert working predominantly with SMEs commented that they had seen “less than 10 contracts which even mentioned BIM” as it was not seen as feasible at that level of the supply chain. Requiring strict adherence with standards at certain levels of the supply chain makes no commercial sense and a pragmatic approach appears to have been adopted by industry. One consultant interviewed countered this view; stating that the suite was too loose, lacking a consistent approach, “they are a standard and open to interpretation...to me it is only (therefore) a standard to the people who are interpreting it”.

Content

One consultant interviewed commented on the lack of actual meat on the bones of the suite stating that “PAS 3 when you look at it, it is something like 30 pages long but the first ten are pretty standard pages and the last ten are appendices so there are only about six pages of content”. Whilst another reflected on how they felt the order of release of 1192 distorted the importance of BIM at the operational stage of the asset “I think that (1192) just came out in the wrong order, so everybody is so much focussed on capital construction because part 2 came out first”. One interviewee commented that detailed knowledge of the suite was held by some in industry as some sort of status symbol “a mark for belonging to a club”. A contractor commented that the 1192 suite brings with it “new acronyms for things which already had acronyms” and “this (suite) produced new names (for processes which already existed) which singles out BIM as an add on” rather than being an evolution of business as usual.

From the feedback we have received, despite some criticisms and sometimes excessively strict approaches to the 1192 suite, the importance of these documents cannot be ignored. By providing a

standardised methodology applicable to BIM the suite paves the way for anybody setting out on their BIM journey. On the whole it seems the industry has adopted and is using the guidance set out within them and awaits eagerly the publication of the revised versions. However, the NBS BIM Survey 2017 reported that only 38% of respondents said they used the PAS1192:2 standard. One consultant queried this statistic stating “I think it would be impossible to find a firm that isn’t complying with at least one clause from that document even if they have never read it and the problem is that when people are asked that question they will be considering are they wholly complying with it”.

ISO19650

One consultant referred to the 1192 suite as something for the UK “to be really, really proud of”. Reflecting on this and building internationally on the 1192 suite is the development of ISO19650. One consultant asked about this could not praise it enough, “It really is very encouraging to see.... collaboration on a global scale...that is absolutely wonderful”. The standard is in two parts: ISO 19650-1 Part 1 deals with concepts and principles and applies to the whole life cycle of a built asset; and ISO 19650-2 Part 2 deals with the delivery phase of assets and enables the client and/or appointing organisations to establish their requirements for information during the delivery phase of assets.

The team behind ISO19650 stated that the standard was intended to apply down the supply chain but the principles are to be applied proportionately – addressing the size of the projects and the participants. ISO19650 aims to use simple language and a logical order to its contents. These two points will be welcomed by the consultant who commented that “you more or less need a degree in a number of subjects to understand the (PAS1192) part 4”. ISO 19650 is also written purposefully avoiding footnotes where possible. This last point comes presumably in response to the criticism levied at the 1192 suite for what one consultant referred to as “too many notes and clarification... almost every clause comes with about five or six informative notes”. The standard reflects the international differences by using the term Information Modelling as opposed to BIM (akin to NEC4’s approach). Watch this space...



ISO19650 STAGES

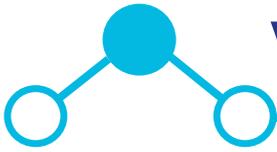
PART 1:

deals with concepts and principles and applies to the whole life cycle of a built asset.

PART 2:

deals with the delivery phase of assets and enables the client and/or appointing organisations to establish their requirements for information during the delivery phase of assets.

STANDARD FORM CONTRACTS – WHY THE BIM TERMS MATTER



“...little change is required in the fundamental building blocks of copyright law, contracts or insurance to facilitate working at Level 2 of BIM maturity. Some essential investment is required in simple, standard protocols and services schedules to define BIM-specific roles, ways of working and desired outputs.”

Government Construction Client Group
Strategy Paper, March 2011

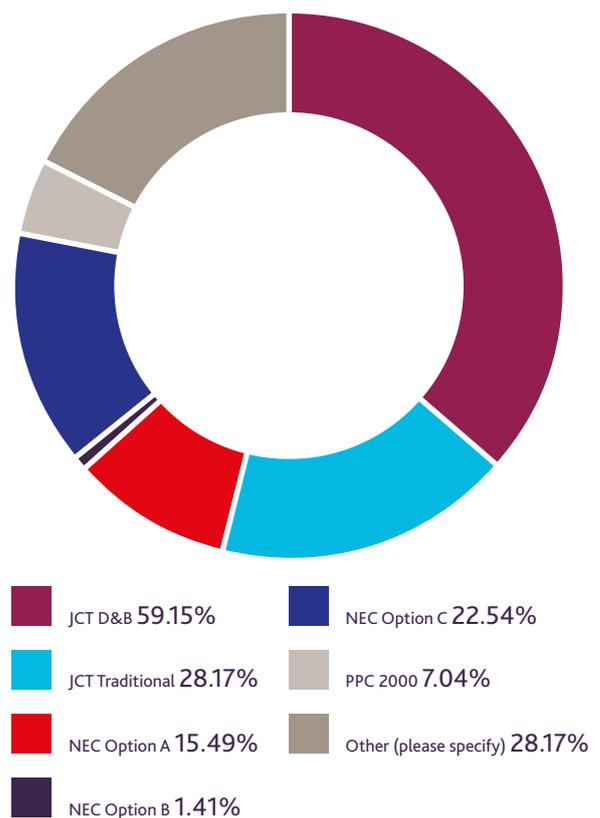
Introduction¹⁸

The UK construction industry has a well-established and accepted history of using standard form building contracts. The forms used have developed over the years as issues have arisen and new problems have required solutions. There is now a well-established body of case law surrounding standard forms and their use arguably minimises the time and cost of negotiations as the terms and conditions are well known to players in the market.

In reality, the majority of building contracts used in today's market consist of amended versions of a few commonly used standard form contracts. These amendments reflect project or party specific positions. One question in our online survey asked which standard forms are most often used on projects which incorporate BIM. The feedback was that the most common were the JCT Design and Build, JCT traditional, NEC Option C and NEC Option A. Other parties referenced using PPC 2000 and FIDIC.

¹⁸ The authors acknowledge the availability and use of other standard form building contracts and appointments but for the purposes of this report have focused solely on the JCT, NEC, PPC2000, FIDIC and CIOB suites.

Q7 Which procurement routes have you seen used for BIM design/construction projects? Please tick all that apply



JCT

Prior to the release of its 2016 suite the JCT did not include specific BIM terms in its contracts. However, in 2011 the JCT introduced a Public Sector Supplement: Fair Payment, Transparency and Building Information Modelling containing limited BIM terms, which could equally be applicable to public sector contracts and non-public sector contracts. This Supplement suggested the insertion of a "BIM Protocol" that would contain all the necessary BIM terms and guidance and encouraged the use of the CIC BIM Protocol (see below) for this purpose. In 2016 JCT also published a practice note – 'Building Information Modelling (BIM), Collaborative and Integrated Team Working' designed to provide an understanding of BIM to those new or unfamiliar with the concept. This helpful note sets out a great detail of background and further resources for learning but did not suggest means of incorporating BIM and presumably would need to be read with reference to the particular JCT contract intended to be used.

The JCT 2016 Suite goes further, containing detailed amendments to incorporate the BIM process. Provision is made for inclusion of a BIM Protocol. The JCT do not prescribe use of the only available standard form Protocol published by the CIC so it is open to the parties to use this standard form or to opt for a bespoke Protocol. Richard Saxon, Chairman of JCT commented "all JCT contracts currently contain BIM provisions and are designed to be as flexible as possible so that any Protocol can be used". In the D&B form, the BIM Protocol is included as a Contract Document and so the Contractor is therefore obliged to carry out the Works in accordance with the BIM Protocol.

Standard form drafting states that the Agreement and the Conditions shall not be overridden by anything contained in a Contract Document (and therefore the BIM Protocol). The CIC BIM Protocol states that in the event of a conflict or inconsistency between the Protocol and any document forming part of the agreement (i.e. the building contract) the Protocol takes priority. This creates an obvious clash or contradiction in the priority of the documents.

The definition of 'Contractor's Design Documents' is extended to include 'information' provided by the Contractor. This reflects the common understanding that a BIM model contains both design and

information relating to the built asset. The definition of Contractor's Design Documents goes on to ascertain that it also includes any other design documents or information to be provided by the Contractor under the BIM Protocol. This change captures any BIM specific design or information which is to be provided in line with the technical appendices of the CIC BIM Protocol or the technical requirements contained within any bespoke Protocol.

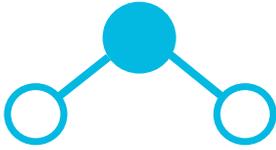
The new definition of the Design Submission Procedure is stated to be the procedure contained in the BIM Protocol or, if no BIM Protocol is applicable, the procedure set out in the JCT standard form. This new definition gives priority to the BIM Protocol for the design submission procedure and removes the standard form procedure where BIM is utilised. This is presumably intended to prevent ambiguity, inconsistency and overlap between the traditional submission procedure and any procedure allowed for in the BIM Protocol.

In line with the requirement under the CIC BIM Protocol the standard form requires replication of any applicable BIM Protocol in any sub-contracts as necessary.

Saxon commented that the JCT's approach to BIM "is a measured approach, to ensure flexibility, maximise use and reflect feedback from our member bodies". Looking forward, Saxon reflected that "the JCT BIM Working Group monitors the use, adoption and development of BIM practice and will continue to keep contracts under review to meet the needs of the industry".

NEC

The NEC issued guidance in 2013, 'How to Use BIM with NEC3 Contracts' on the incorporation of BIM terms which, like the JCT 2011 Supplement, proposed limited amendments to incorporate BIM into a contract. In summary, the guidance advised that the technical and procedural elements should be inserted into the Works Information, and the roles and liabilities terms should be inserted into the Z clauses, thereby ensuring that parties will need to mutually agree to alter the risks, roles and liabilities (given that Works Information can be amended unilaterally by the employer/PM).



Like the JCT, the NEC has now included BIM specific terms within its latest revision. Released in June 2017, the NEC4 suite includes an Option X10: Information Management to cover the BIM process. NEC4 Contract Board member, Peter Higgins stated that "there has to be a link between ownership and responsibility and that's what we try to do with X10". The NEC4 endeavours to use neutral language, Higgins stated in interview that the NEC "philosophy there is to avoid the legalistic terms so we always try and use language that people can understand". Some of the terminology in the NEC4 differs from the common terminology currently in use within the industry, intended to provide a more neutral terminology for use across different jurisdictions. For example, the NEC4 refers to an "Information Model", rather than the more common phrases of Project Information Model ("PIM"), Asset Information Model ("AIM") or "Building Information Model" ("BIM"), and "Information Model Requirements", rather than "Employer's Information Requirements" ("EIR").

The NEC4 does not include provision for use of the BIM Protocol. Higgins commented that it is intended that included within X10 are "the legal issues that NEC consider are important in terms of liability and ownership and obligation in terms of production, and then we linked these to what we call the scope", meaning that all the employer "need produce is the scope - the detailed information requirements that they want the supplier to apply".

Given the brevity of the NEC4 Option, it may be worthwhile looking at a standard BIM Protocol, and considering what other terms could or should be inserted into the Z Clauses and/or Works Information as would have been done for an NEC3 contract. To this end, during our interview process, Higgins advised that there is an intention for guidance to be issued on how to use the Option X10 and the CIC BIM Protocol together in an NEC4 contract stating that "the industry recognises the CIC Protocol so we should explain how to use it, not how to avoid using it. So our guidance will be how to make it work". However, the NEC will retain the line of priority of documents adopted by the NEC in all their contracts. Higgins commented that to prioritise the Protocol over anything else "is completely against the whole of the ethos of the way everything (NEC) works"; "we can't give the Protocol priority over everything else in the contract".

FIDIC

FIDIC released the second edition of the 1999 Rainbow Suite, Red, Yellow and Silver Books in late 2017. The Suite does not contain BIM-specific terms. Instead, their BIM Advisory Note highlights the issues to be considered when using BIM on a FIDIC project. The truly international nature of FIDIC makes it somewhat tricky to incorporate specific terms or indeed a particular Protocol as differing types are in use across different jurisdictions. It is therefore for the drafting team to decide what to incorporate and what to cover. Further guidance is due to be issued by FIDIC, notably a "Technology Guideline" and a "Definition of Scope Guideline Specific to BIM".

PPC2000

We turn to the multi-party standard form contract, PPC2000. According to its author, David Mosey, PPC2000 was used un-amended in respect of BIM and without a supplementary BIM Protocol by the Ministry of Justice in the £20m BIM-enabled Government trial project at Cookham Wood and was used in combination with a Two-stage Open Book procurement model. This project reported 20% savings and Mosey confirmed that the same contract was used on the North Wales Prison Government trial project which reported agreed savings of 26%. Mosey confirmed that "the Ministry of Justice continues to use PPC2000 un-amended and without a separate BIM Protocol".

PPC2000 issued a 2013 BIM Supplement which, similar to the JCT and NEC3, contains a limited set of amendments and guidance on incorporating BIM into the contract. Like the JCT 2011 and NEC3 and indeed current common industry practice, the amendments in the Supplement primarily provide for the incorporation of and compliance with a BIM Protocol, albeit no sample has been provided. There are also parties' obligations regarding a "Building Information Model" (in the singular); could this lead to confusion or need for additional differentiation between the obligations and rights as regards one's own models and others' models?

The PPC2000 2013 BIM Supplement also provides an alternative to making such amendments to the contract. It explains that instead, parties could complete PPC2000 so that the Lead Design Consultant Services Schedule includes the role, expertise and responsibilities of the BIM Co-ordinator; the Partnering Timetable and Project Timetable incorporate all of the inputs, timings and responsibilities that are contained in the BIM Protocol; and the BIM Model (the three dimensional electronic building information model) is included as part of the Project Proposals.

CIOB

In 2013 the CIOB launched a new standard form contract, initially termed the Complex Projects Contract and subsequently revised to be the Time and Cost Management Contract. Intended for complex international projects the CIOB state "The Contract is most suitable for those projects which cannot be effectively managed intuitively and which require for their success a more scientific approach to time and cost risk management than is usual on more simple projects."¹⁹ The contract was unique at the time of launch in that it was the only standard form which contained drafting specifically to deal with BIM.

The contract requires that a BIM Protocol be used and if no project specific Protocol is identified the American Institute of Architects (E202-2008) BIM Protocol is the default option. The CIOB state that this Protocol is 'more detailed and extensive than that published by the CIC'. With regard to priority the CIOB have taken the following approach – 'the Federated model (and any information derived from it) comes after the Contract Appendices and before the Drawings in the order of priority of documents'. Despite it taking such a hands on approach to incorporating BIM, in our online survey only one respondent reported using the CIOB standard form on a BIM-enabled project.

Discussion Summary

"It's all too easy to see (BIM) as 'CAD on steroids' but BIM is an entirely different thing. It's much more than CAD."

Interview response February 2018

The approaches made to include BIM within the standard form contracts were welcomed by our interviewees. One comment from a technical BIM expert noted how long it took for the BIM drafting to be released; "I've got to admit a bit of surprise...JCT and the NEC hadn't moved as quickly". There were however differing opinions about the approach taken by the standard forms in including BIM terms.

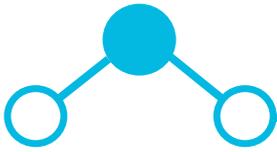
JCT

One lawyer commented that the minimal changes made by JCT in their 2016 suite reflected the stance they had previously taken with their amendments used to incorporate BIM into the 2011 suite in that "they are enabling and they leave the production of the technical documents and so forth to those who are better qualified". This was echoed by a private practice lawyer who stated that the JCT BIM amendments "are pretty much in line with what we are putting into trade contracts". Another lawyer more negatively suggested that it seemed that JCT "wanted to do the least possible iterations to accommodate BIM". This apparent view that the JCT BIM-amendments in both the 2011 and 2016 iterations were light touch, was echoed by another lawyer who felt this approach was unhelpful - "are you going to use BIM, tick box yes or no" - further suggesting that this displayed "no emphasis, no drive and without that people aren't going to use it and people aren't going to use it properly". Another lawyer went so far as to opine that the BIM clauses "don't do an awful lot and don't allow for much flexibility for technical documentation". JCT's inclusion of requirements to flow down the BIM Protocol into sub-contracts as necessary was welcomed by one technical BIM expert who commented that contractors "probably don't realise how much risk they're taking on by not having a Protocol down the chain".

¹⁹ <http://www.ciob.org/insight/time-and-cost-management-contract-suite>

²⁰ http://www.ciob.org/sites/default/files/CPC_FAQs.pdf

²¹ Ibid



NEC

The NEC's approach was gently criticised by a lawyer who felt frustration with yet more terminology; "they couldn't call it BIM could they?". This point was echoed by another lawyer interviewed who felt that the new terms were "actually taking a step back from standardising BIM across the board". One in-house lawyer favoured the basic approach "keep it simple...you've got (people) who have administered the contract and it's hard, you know the day job is hard enough and we're having to look through complex convoluted language in the T&C's and then struggle the way through the various schedules looking for a related Protocol – it doesn't help". There was however some praise for the fact that the NEC was bringing the BIM terms into the body of the contract, rather than as a separate appended Protocol. One in-house lawyer felt this approach was "absolutely right, totally agree with that".

Treatment of the Protocol

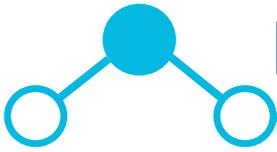
This issue in fact showed something of a divide amongst interviewees i.e. whether to include a BIM Protocol or to include the BIM specific clauses in the contract itself. One lawyer interviewed welcomed the removal of a separate Protocol containing legal clauses stating "I agree these things should be dealt with in the contract itself". A consultant also favoured the removal of the Protocol in favour of "the appointments and main building contract....taking up those appropriate clauses". In contrast, another lawyer took the view that the stand alone Protocol was a helpful thing; "having it as a standalone document is a reminder to everyone that it is there and it's important that it is understood how it is dealt with". Another designer commented that in their drafting they try to "reduce as many of the BIM references in the main appointment as possible", preferring instead to include all BIM terms within the Protocol. As one consultant observed regarding this division of opinion, "what we really need is to take those words (from the CIC BIM Protocol) out and put them into the contract but if we didn't have the BIM Protocol we wouldn't really know what is needed to go into the contract".

IPR

One point that was raised in a lot of interviews was that of intellectual property rights (IPR) and whether BIM Level 2 changes the current market standard position regarding IPR. The common industry position is for the designer to own and be responsible for their designs and input information (as is the case for non-BIM projects) and usually the designer owns their models with a licence to relevant parties to use it for various pre-defined activities, or sometimes the ownership in the models transfers to the employer with relevant exclusions of liability on the part of the designer for third party changes. The NEC4 takes a considerably different approach, with ownership in both the model and the data input into the model (arguably including the designs) transferring to the employer, with the employer bearing liability for the model apart from negligent errors by the contractor/model author.

One consultant commented that their company's market position was to grant a licence to use their designs and they didn't see this changing at BIM Level 2 but "what has changed is the ability to access that data and potentially the ability to manipulate (that data)". This was echoed by another consultant who found they were also "expected to deliver native model files" (native model files are versions of the design model which are editable by others). The issue here was explained by one design consultant "the client will say "Well, I want to own those models", and I say "No, no, you're licensing access to those models for design, construction and operation", and they'll say "No, I want a clause building into my appointment with my designer because that's what I've always had", and it's very difficult for them to understand that no, that's not what they've had – it's just that the ability to manipulate this data and to use it more freely has been presented because of the provision of native model files". Design consultants interviewed felt that this IPR issue had not been fully addressed and they really required "some clarity around that issue".





BIM PROJECT SPECIFIC DOCUMENTS

“By using the BIM commercial documents in combination, employers will benefit from greater efficiency and will encourage the adoption of collaborative behaviours that will further increase the value obtained from BIM.”

Quote from BIM Level 2 website²²

Introduction

In addition to the BIM specific amendments to the standard form contracts discussed above there are a set of BIM specific documents used on a BIM-enabled project. These will usually comprise of:

- (a) Employer’s Information Requirements (“EIR”);
- (b) BIM Execution Plan (“BEP”); and
- (c) BIM Protocol

EIR

The Employer’s Information Requirements (“EIR”) is a document which details the employer’s instructions for use of BIM on a project. The EIR contains three types of information: technical; commercial; and management. The technical section is intended to set out requirements such as the software to be used and the level of definition each model is to be produced to. The commercial section is intended to detail, amongst other things, the employer’s strategic purposes and any BIM competency assessments they require members of the project team to achieve. Finally the management section is intended to include the roles and responsibilities of the team, the level of security required, the

collaboration process to be implemented and the clash detection and co-ordination requirements. The EIR is intended to be included as a contract document making its requirements contractually binding on the suppliers.

The EIR is the employer’s opportunity to lay down clear instructions to the BIM team detailing the processes to implement, the models and information to be delivered and the deadlines for doing so. This document can best be thought about utilising an analogy from the JCT D&B form in that the EIR acts as the Employer’s Requirements for BIM. It sets out to the team what is required to fulfil the BIM element of the project. In reply to the Employer’s Requirements on a JCT D&B project the contractor provides the Contractor’s Proposals. On a BIM project, in response to the EIR the project team provide the BEP.

BEP

The BIM Execution Plan (“BEP”) is defined in PAS 1192-2:2013 as a ‘plan prepared by the suppliers to explain how the information modelling aspects of a project will be carried out’. Having read and digested the EIR the BIM supplier sets out in the BEP how the requirements of the employer will be delivered. At tender stage the BEP allows the employer to assess the capability of the supplier. Once appointed the supplier then submits a post-contract BEP confirming the supply

²² <http://bim-level2.org/globalassets/pdfs/bim-level-2-introduction-to-commercial-documents.pdf>

chain's capabilities and providing further detail on responsibilities and procedures.

The BEP is a moving document intended to be amended throughout the project. For this reason some in the industry do not believe that it should be a contract document. However, by not making the BEP a contract document the parties are not legally bound to conform to it. Specific drafting can arguably be incorporated to deal with the evolving nature of the BEP.

BIM Protocol

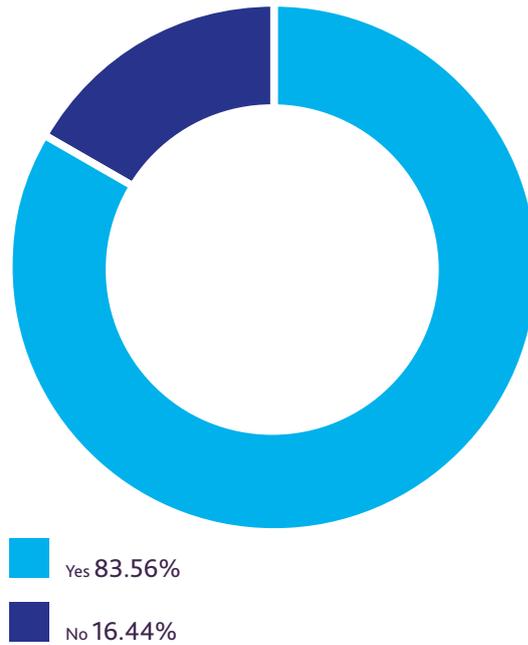
A BIM Protocol is intended to facilitate consistent contractual BIM terms across the design team for a project, such as with regard to the structure, coordination and use of project information. The Protocol sets out various aspects for the running of a BIM-enabled project, such as software choice, ownership or licences of models and data, filing naming conventions and provision of the common data environment ("CDE"). The Protocol enables contractual incorporation of BIM terms, allowing for legal implementation of the processes and procedures required to produce a model that adheres to the requirements of the EIR and BEP. It is intended to be incorporated into the building contract, as well as relevant appointments and sub-contracts.

The CIC BIM Protocol launched in 2013 provides the UK's first and only standard form Protocol. Various practical requirements, such as the model production and delivery table, choice of software and so on, are contained within the two appendices. Over 80% of our online survey respondents had used a BIM Protocol on a project with the most common form used being the un-amended CIC Protocol.

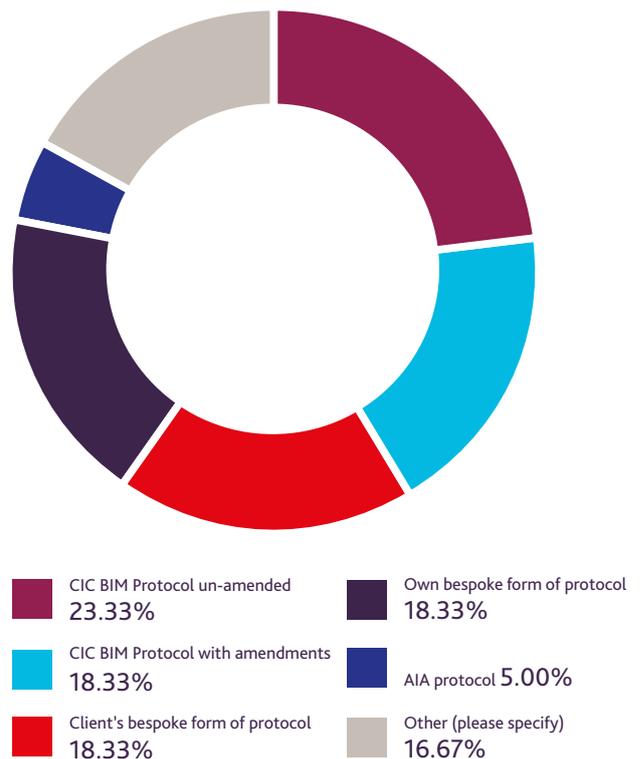
BIM Documents: a lack of clarity?

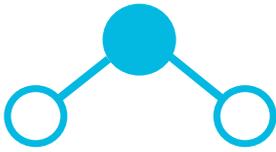
Several interviewees observed that the status and content of BIM documents can currently be somewhat woolly or unclear. Concern was expressed about inconsistencies and discrepancies between the BIM documents and the other contract terms, sometimes only discovered when a query or dispute arises. One lawyer reported "In one project, the EIR mentioned a requirement to use the CIC Protocol, but the contract didn't mention any of that". Others felt that it was the detail inserted into the standard BIM contract documents themselves which caused problems, such as in the Appendices to the CIC BIM Protocol, sometimes including unreasonable timelines or requirements. One interviewee felt that the distinction between lawyers and technical advisers came into play here "I think lawyers understand law, it is not a

Q8 Have you used a BIM protocol on a project?



Q9 Which form of BIM protocol was used?





problem, and they can take the Protocol but they should not be taking the Protocol and writing the requirements. They should actually be just taking it from the relevant people within their organisations or others and that is a problem because there is not a huge number of what I call competent information managers".

EIR

A common problem discussed was a lack of information in the EIRs or no EIR at all, with one consultant commenting "the client will often not have an EIR even or any idea beyond...we want BIM". This situation was worsened in the consultant's view, when there can be "immediate pressure to get the appointment...done and dusted" without this missing document and associated information being addressed.

Consultants and contractors seemed often to find themselves helping "the client to develop their EIR". One consultant commented that this had happened on one project but only after their appointment had been entered into in "good faith that we would comply with the agreed EIR once it was developed but the thing was...the fee (was) already agreed". The resulting additional obligations placed on the consultant through the EIR with no change to the fee resulted in a stalemate. One legal expert interviewed felt there were a lack of examples out there, "there are not enough (EIR) templates for people to say 'that's how you do it'" whilst a consultant felt the EIRs they had seen "had different degrees of focus: if they've been authored by somebody that is familiar with authoring models, you tend to find that they're very technical around the modelling approach".

In a more positive experience, one client interviewed stated that they engaged their employer's agent to draft the EIR which they then tested within the business asking if they required "the functionality which is supported by those processes and they say well we are not going to use it for that anyway so what is the point of paying for it if you are not going to use it". Another forward thinking client discussed using a "framework EIR" which functioned "so the contractors can produce a standard top level bit and then individual bits where they show variations on every contract". An in-house lawyer reported positively that they had seen "more and more EIRs relatively early in the process". One consultant described the EIR and BEP as "the most vital documents to the process".

BEP

The detailed roles and expectations of the BIM process are often located in the BEP. We have been told by some interviewees that the BEP is sometimes not a binding contractual document meaning that the parties are not legally bound to adhere to it. One technical expert commented that one "can't make the BEP a contract doc as it changes so much" whilst another consultant concurred referring to this as creating an "administrative nightmare". A contractor observed that the BEP is not a contract document as it is "merely a plan for delivery". One in-house lawyer commented that their preferred method was to see the EIR as the BIM brief which their team then responded to in the scope. Their view was that these two documents (EIR and scope) should contain all of the BIM terms leaving the BEP to simply "flesh out the scope and detail co-ordination" in which case it need not be a contract document. They did acknowledge, however, that where the BIM terms are within the BEP it is best placed as a contract document. One consultant stated that the BEP "should be a contract document but with appropriate measures incorporated for change control". Where parties are hesitant to make the BEP a contract document, one lawyer suggested that a "stripped down" version of the BEP, containing only those fundamental technical terms that the parties wish to be binding, could be inserted as a contract document.

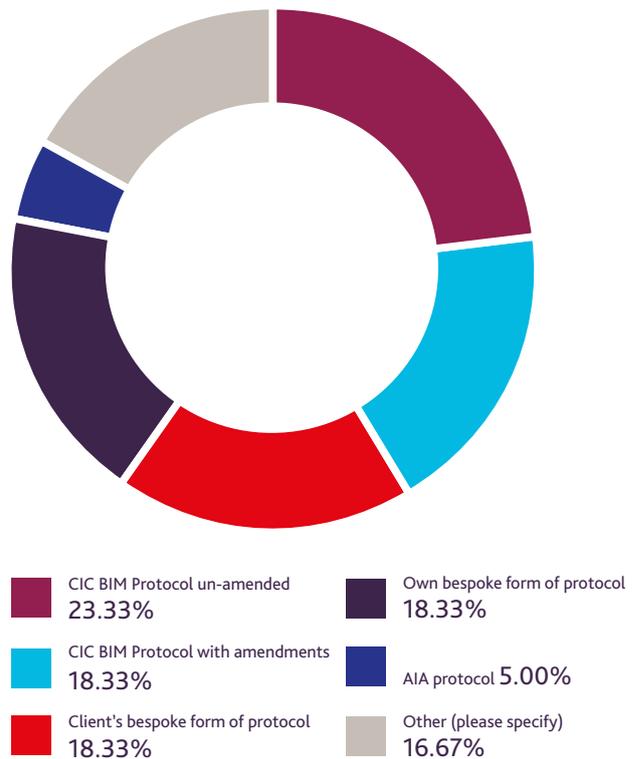
It's not protocol to like the Protocol

The CIC BIM Protocol was both criticised and applauded by our interviewees. One phrase by an interviewee that sums up some of the sentiments, was that it was "pleasingly but misleadingly simple", with the interviewee going on to suggest that it was a good start but needed more detailed provisions or "a lot more thought". Of the supporters one consultant commented "I kind of follow it...it's easier to read than most legal documents I read in all honesty", whilst another consultant stated "I think it's fine for what it needs (to do)". Of the naysayers, one consultant commented that "I do not think that the person writing this in the first place really grasped the importance of information compared to 3D pretty pictures" whilst another stated it was "very model focused and written as if all information is buried in models".

The majority of our interviewees felt that the CIC BIM Protocol was drafted at a time when BIM was largely theoretical and there was general consensus that the CIC BIM Protocol remains a good "starter for ten". As BIM-enabled projects have increased so too has knowledge of the requirements for them. The CIC form provided a sound building block to bring to the fore the legal requirements of BIM. One client interviewed commented "at the time the Protocol was written it was needed because there was lots of interpretations and ways that people were doing it and again it was already about standardising that approach to ensure that some principles were put into those projects as such". An in-house lawyer stated that they had adopted "the CIC form of Protocol as our basis, as our starting point" for their own bespoke Protocol. Another lawyer interviewed commented that "whilst you have to start somewhere", the CIC BIM Protocol puts a helpful framework in place but "the more you look at it, the less useful it becomes particularly in relation to the supply chain", citing the intellectual property clauses as an example of provisions that require bolstering to be suitable for supply chain contracts.

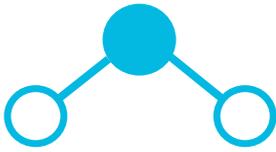
The mixed response of interviewees regarding use of the CIC BM Protocol was also reflected in the online survey. Nearly a quarter of respondents had used the CIC form un-amended, with 18% using it but in an amended form. 35% of respondents claimed to have used either their client's or their own bespoke form of Protocol. One consultant interviewed stated that they had seen the standard form CIC BIM Protocol in use but it was "modified quite heavily" and likened this to the JCT form rarely being used "straight out of the box". A private practice lawyer had only seen bespoke forms used but stated "you can recognise the (form of) CIC Protocol in it but it is mostly bespoke". Another private practice lawyer detailed using the CIC Protocol but "amended to provide (a) better balance of risk". One lawyer felt there was confusion as to who was responsible for the Protocol "many lawyers know a Protocol needs to be inserted, but are not sure what actually needs to be inserted in it or how it is used". Another legal expert felt there was a "lack of confidence" in the CIC form.

Q9 Which form of BIM protocol was used?



Priority of documents

A common thread amongst comments on the CIC BIM Protocol related to priority of documents. One private practice lawyer commented that it was important to "ensure the Protocol doesn't cut across what is said at the front end in terms of contract conditions, we need to tie the two together". Another legal expert stated that "the CIC says it overrides the contract where there is a divergence. That's not ideal". Whilst one private practice lawyer felt the priority should sit with the Protocol "I think that from a general Protocol point of view BIM related stuff should take precedence over the rest of the contract just because that seems the best way to avoid conflict later on".



Intellectual Property Rights

The CIC BIM Protocol gives a right to a designer to suspend the IPR licence in their models for non-payment. This term appeared to consistently cause the most concern among those interviewed, although one of the authors of the CIC BIM Protocol explained that this concern stemmed from a widespread misunderstanding of the clause – this right of suspension only arose if a similar right existed in the main contract terms. Exercising the right to suspend and causing a lack of access to the BIM models could have a severe impact on a project, causing delay and additional costs as illustrated in the recent, first BIM-related court case, *Trant Engineering Ltd v Mott MacDonald*²³. One interviewee went so far as to call the provision allowing IPR licence suspension for non-payment “disgraceful” as it destroyed the whole concept of working under a BIM process. In any case, the authors understand from various sources that this clause is likely to be deleted in the next version of the CIC BIM Protocol.

Roles and Responsibilities

Where BIM is used on a project, the parties ultimately will need to agree who is responsible for which element of the process, who owns what and how risk is allocated. Some concern was expressed that the BIM contract terms commonly in use do not provide one single point of responsibility for custody of the model and can lack sufficient clarity as to ownership of the model, such as the extent of copyright actually being assigned or licenced in a BIM model. One in-house lawyer took this point further stating that they had concerns regarding what the model could be used for and what it could be relied upon for “it may state that it can be used for costings but you didn’t create it to be relied on for costings”.

Procurement

A further point was raised by one BIM technical expert who commented that the BIM documents were written toward a “form of procurement of early contractual engagement where a client will go and engage an entire supply chain as it were in one go”. This interviewee was making the point that not all parties to a BIM project are engaged at the same time and this can lead to problems within the

BIM documents identifying who takes which responsibilities and when. Projects can become disjointed if employers are “slowly building a team over time and not really starting the formalised BIM process until half way through (RIBA) stage 2 and even into 3 that things start to tumble apart a little bit”. One in-house lawyer commented on the one size fits all approach to procurement in the CIC BIM Protocol, referring to a “pretty unique arrangement” regarding design risk allocation on one project where “a few clauses in the standard CIC document conflicted, absolutely clashed, with the terms and conditions of the main contract”.

Schedules and appendices

There is also the issue highlighted by interviewees and mentioned above, of whether any BIM contract schedules are properly completed and whether they contain contradictory vocabulary and/or terms with the remaining contract documents. According to some interviewees it is not an uncommon occurrence that the CIC BIM Protocol is inserted into a contract with incomplete Appendices, leading to unnecessary confusion and dispute. One of the Protocol’s standard Appendices is the Model Production Delivery Table (“MPDT”), which sets out responsibilities for the models. It was stated that this may sometimes be incomplete or contradictory to the Responsibility Matrix schedule of the contract. Could this be because the legal drafter was not aware of the MPDT’s existence, but simply that a ‘BIM Protocol’ was being inserted? It is widely rumoured that the MPDT will not feature as an Appendix to the next iteration of the CIC BIM Protocol, possibly as a result of this ongoing discrepancy and confusion.

The standard form BIM terms and commonly compiled BIM Protocols and documents arguably may not yet take into account the impact of the recent case, *MT Højgaard A/S v E.On Climate & Renewables UK Robin Rigg East Limited and another*²⁴. It is not uncommon for BIM documents to contain strict obligations. However, according to interviewees lawyers commonly do not review a contract’s BIM-related schedules, regarding them as “technical matters”. Would an awareness of this risk, and the need to have at least a preliminary review of all BIM-related contract documents, reduce such risks of uninsured and unintended liabilities?

²³Trant Engineering Ltd v. Mott MacDonald Ltd [2017] EWHC 2061 (TCC).

²⁴MT Højgaard A/S v E.On Climate & Renewables UK Robin Rigg East Limited and another [2017] UKSC 59

Insurance

Finally, there is also the issue of whether undertaking BIM, and any new BIM-specific roles (e.g. as a BIM Information Manager) raises any insurance coverage issues. We understand some insurers have taken active steps to consider this; for example one interviewee advised that the WREN has a BIM Forum. In any case, the CIC Best Practice Guide for Professional Indemnity Insurance When Using Building Information Models (1st Edition 2013) confirmed that, "the overarching response to the consultation from insurers has been that there are no issues with BIM Level 2 which are sufficiently serious as to require coverage restrictions for consultants which use it, nor will its use, all things being equal, materially alter the risk profile presented by a consultant, and therefore the premium implications will be minimal". However, given the changing nature of the BIM roles, processes and scope of work, would it be sensible for parties to inform their insurers of their use of BIM anyway in the abundance of caution? Indeed, the Best Practice Guide itself recommends that, the first time a party enter into a contract which utilises BIM Level 2, they make contact with their PI broker to ensure that they (and insurers) are comfortable with what BIM Level 2 involves and that there are no policy terms which could cause problems.

Trant Engineering Ltd v. Mott MacDonald Ltd [2017] EWHC 2061 (TCC)

Facts

Trant Engineering Ltd ("Trant") was engaged by the Ministry Of Defence in respect of the construction of a power station in the Falkland Islands. Trant had in turn engaged Mott MacDonald Ltd ("Mott MacDonald") to provide design services and to act as BIM coordinator.

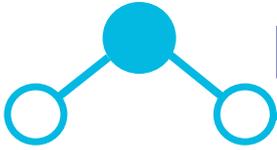
Following a dispute regarding fees, Mott MacDonald suspended its services and prevented Trant from accessing the common data environment ("CDE") for the project, known as 'ProjectWise'. This action effectively brought the project to a halt and led Trant to apply for an interim injunction to compel Mott MacDonald to provide access to the CDE to Trant.

Decision

In the first reported case on BIM, the Technology and Construction Court granted Trant the injunction on the basis that there was a serious case to be tried, that damages would not be an adequate remedy and that there was a high degree of assurance that Trant was entitled to the design data that was sitting in the public database area of ProjectWise (as a matter of contractual interpretation).

Whilst the courts resolved the issue on this occasion, this decision should lead those engaged in BIM construction projects to consider which party is best positioned to host the CDE and to therefore effectively act as gatekeeper for the design for the entire project. Ultimately this will be driven by the specifics of the project in hand and factors such as size, value, risk allocation, capabilities and technical expertise; a 'one size fits all' approach will not work in this area. What is clear however is that the underlying contract needs to ensure that the parties are adequately protected and that data contained in the CDE cannot be used to hold other parties to ransom at a later stage.

THE LEGAL COMMUNITY'S BIM AWARENESS/KNOWLEDGE – DO THE LAWYERS GET IT?



“I think there's just a real lack of knowledge out there which includes clients and designers and everyone really, the whole industry in terms of what we should be doing legally. It's all out there about BIM Level 2 but there's no-one out there that's actually said in a really well put together document to say that how the BIM process should be put together legally...”

Interview response December 2017

Introduction

Contracts are intended to reflect the commercial agreement between the parties, the “legal tail” should not wag the “commercial dog”²⁵. Without an understanding of the commercial reasons and operational processes of BIM, it is difficult for lawyers to be aware of what risks and opportunities BIM presents and to then draft relevant and pertinent clauses to mitigate these risks and exploit these opportunities.

Do lawyers get BIM?

One interviewee reflected on a number of experiences of lawyers believing that BIM is a form of “fancy CAD” (or querying how it differs from CAD), whilst one lawyer bemusedly noted in their interview that BIM is a “very fancy” form of CAD as it shifts the paradigm in various ways. One other interviewee noted that there is a “disconnect” between those in the “BIM world” and those in the “legal and contractual world”. A lawyer suggested that lawyers were “bamboozled” by how BIM documents are described, with a failure to understand how BIM documents relate to the other contract

documents and terms. Another private practice lawyer suggested that whilst most lawyers realised by now that they needed to mention BIM in a contract for a BIM-enabled project, the BIM terms often didn't have any meat or substance to them as the drafting lawyer may not have sat down and considered or understood what the risks may be. One interviewee noted that smaller companies do not consult lawyers for advice on BIM instead favouring trade associations which perpetuates the problem that lawyers do not encounter and/or are made aware of the BIM issues in live contracts, to learn from. Lawyers react to a client's instructions and if a client doesn't raise specific BIM queries/requests, the lawyer consequently does not raise issues of BIM (or realise they need to).

Does instructing a lawyer mean the project carries more risk?

The perception that lawyers were too involved, creating fear, was mentioned by some interviewees. One private practice lawyer stated “whenever it is seen that the legal industry is driving the implementation of the use of BIM, people then think right OK well maybe this isn't something I want to be involved in if lawyers have to be involved in this well then there is more risk, it is going to up the price (it is) something I need to either avoid or really clue up on”. A consultant compounded this notion “we shouldn't need to be changing

²⁵ Cole A and Rock S 'The Legals of BIM' (BIM+ 31 January 2017) <<http://www.bimplus.co.uk/management/le1g3als-bi5m/>>

contracts and stuff because obviously then it just becomes the fact that the lawyers win". Another private practice lawyer felt that members of their own profession had not helped themselves stating that BIM "was one of those band wagons that lawyers sort of jumped on and made a lot of noise about for a while but there were very few who were saying anything terribly interesting about it".

BIM: whose job is it anyway?

It may be the case that many lawyers view BIM (and its documents) as technical matters. One experienced private practice lawyer said he had even been told by other lawyers that the EIR was "too technical" for them to look at. However, various commentators have asserted that the *MT Højgaard A/S v E.On Climate & Renewables UK Robin Rigg East Limited and another*²⁶ case arguably makes it clear that lawyers can no longer afford to take the stance of leaving the technical documents/requirements in a contract solely for the client's technical team to peruse and approve. This equally applies to the BIM technical documentation. As use of BIM develops so too do the technical documents detailing its use on projects. One BIM-specialist private practice lawyer sympathised that within the BIM world "there is definitely way too much jargon...the jargon around BIM is horrific". Some of the documents, such as the MPDT attached to the CIC BIM Protocol, look fiendishly complicated until one delves deeper and understands the process and purposes of each document and the similarity with existing documentation. One lawyer gave, as an example, the MPDT being essentially a responsibility matrix; the EIR being Employers Requirements and the BEP being Contractor's Proposals (utilising a JCT D&B analogy). One client supported this point saying "BIM-ology and all the new acronyms are overkill" their preferred approach being to "just accept the fact that whether you call a scheduled deliverable, a delivery schedule...whatever, it is understanding what that really means" that was important.

Don't ask, don't get

One consultant expressed sympathy for the legal community, noting that it may be hard for lawyers to quickly understand BIM given that it was largely to do with innovating the design process and "to easily understand the design process, you ideally need to be a designer".

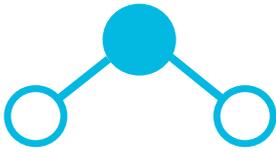
This could arguably be resolved by understanding the technical side better, in particular the BIM process, which would enable BIM contract drafting that was more relevant and suitable for the issues being encountered in reality. One private practice lawyer agreed with this notion stating "if you do not understand you ask...however stupid you look because you are the person responsible for putting the ideas down on paper and if you do not understand it, you are not going to do it". Another took the same approach, "whenever it gets too technical I hold my hands up and say look I do words, you explain to me how it works". One consultant reassuringly informed us that lawyers they had dealt with weren't afraid to ask questions "if they are not sure they generally ask". Conversely, another lawyer observed that there appeared to be an element of "passing the buck", with lawyers failing to get fully up to speed on BIM as it was seen "primarily as a technical thing".

Are lawyers catching up?

There is a widespread perception that the legal community lacks true understanding or realisation of the meaning of BIM and consequently, its risks, issues and opportunities. As mentioned above, one consultant interviewed described this "disconnect between the BIM world and the legal and contractual world in business" perhaps being a result of "BIM...still being seen as special so until it is normal there will be an issue". Another consultant when asked if they felt they had worked with BIM-knowledgeable legal teams replied "not so much". One private practice lawyer felt that the pre-conceptions that come with being a lawyer added to the problem "If I introduce myself as a solicitor they take a step back and become a little more standoffish...the industry sees solicitors trying to drive the use of BIM because they think it is somewhere that profit can be made". Countering this notion the lawyer continued "in actual fact I see it as an evolution of the construction (industry) for how things will be built and it should not be the lawyers leading the industry, it should be the industry leading what BIM is going to be and the lawyers to plug the holes and say 'this is how we will protect our clients'".

Existing legal principles may need to adapt to accommodate, but BIM also brings with it a shift in how the construction industry works so adapting to new, as yet un-trialled principles is also required. One

²⁶ *MT Højgaard A/S v E.On Climate & Renewables UK Robin Rigg East Limited and another* [2017] UKSC 59



in-house lawyer commented that from their experience "construction lawyers generally have a poor understanding of how the industry actually operates and that is not just specific to how BIM operates". Use of "template schedules (of amendments)" with "no thought given to...what kind of job is it, what are each of the parties interests...it is almost like one size fits all...and I think that aspect continues to BIM as well" suggests that one lawyer feels that lazy practices from the pre-BIM world were adding to the problem. One contractor referred to this as an "adapt or die" stage for construction lawyers.

Engagement is key

We have received confidential comments that some in-house legal teams, even in fully BIM-enabled companies, do not anticipate actively looking at BIM matters and documents unless they receive queries from the commercial side of the business and that such queries have yet to materialise. It has been acknowledged by a number of people that this reactive stance is a problem waiting to happen, probably in the middle of the project when the parties pull out their contract to examine what BIM rights and obligations are bestowed by it to find that the terms do not - from a legal and contractual interpretation - do what they thought or intended they would. In contrast, it was refreshing to hear from one engaged client that they asked their employer's agent to draft their technical BIM documents, which they then tested within the business asking if they required "the functionality which is supported by those processes and they say well we are not going to use it for that anyway so what is the point of paying for it if you are not going to use it".

Facilitating not impeding BIM

Various interviewees rightly pointed out that a lawyer cannot engineer their client's instructions; they are limited by the scope of their instructions regarding BIM. One leading legal expert took this further commenting "when the clients aren't sure what they were trying to do the lawyers look to how they protect them from things that could go wrong". The same interviewee suggested that if clients had a thorough grasp of BIM "the lawyers would then help to work towards helping that happen rather than perhaps putting obstacles in the way to protect the client from it going wrong". Others argue that it must be for the lawyers to raise the pertinent questions of their client to ascertain what the client is seeking to achieve from BIM, this can then

be fully reflected in the contract. Arguably, this is particularly the case for clients who are inexperienced or unsophisticated regarding BIM, as one lawyer commented "there are some...clients who are pretty good on this, but on the whole there are not a lot" which can make it difficult to obtain crucial instructions. Going further, the interviewee stated "I struggle with it because I am just trying to think what does the client want to do in this situation... I can give you it in basic terms but I can't tell you what it is that you want to do, what you want to use it for". Another private practice lawyer agreed "we can only advise and ultimately implement their (the client's) decisions but I think there is a real, real lack of awareness of the potential ramifications of getting the use of BIM and contracts done right".

Some positive views of BIM knowledge in the legal profession were expressed, with one interviewee stating that the understanding of BIM in the legal community had "drastically improved...in the last year". Another reflected on having "seen an increase in lawyers at BIM events learning" as being a good step forward. Others felt that there were "pockets of excellence" and when asked if there was a gap in BIM knowledge in the legal community one interviewee stated "no, I don't".

One lawyer observed that the more BIM-aware lawyers tend to be younger, i.e. non-partner lawyers, with "no partners leading on this". A logical observation from one interviewee was that lawyers tended to take a legalistic approach, trying to rigidly apply historical, established legal principles "without applying any independent thought", rather than looking at BIM and accepting that it is a new way of working. However, refreshingly one private practice lawyer commented that their knowledge of BIM was born from being "incredibly interested in it" rather than taking the approach of "I don't need to know about it at the moment" and ignoring it.

One senior in-house legal representative noted that they had, as a personal endeavour, attempted to gain further knowledge on BIM given that the projects of their company were all BIM Level 2 projects. They found that the rest of their team lacked an interest in this, and similar to the other experiences mentioned above, the BIM contract documents were largely regarded as matters for the technical teams. They found that it was in fact quite difficult to find digestible, clear commentary and guidance on BIM in a form that would be useful and understandable to a lawyer. There is no readily available 'BIM-

For-Lawyers', either in the form of training or guidance. If the legal community do need to increase their awareness and expertise in this area, as is suggested from our research, what are they to do?

Recommendations

The first step may be simply to be aware of and willing to acknowledge this current gap in expertise and understanding. Alongside this, lawyers should be aware of the lack of standardisation in the drafting of BIM documents or accepted definitions or terminology (and therefore the additional clarification terms/definitions that may be needed to ensure continued understanding between the parties). In-house lawyers could reach out to BIM-specialist lawyers for in-house talks or a steer on available, helpful guidance documents. The BIM team within the company or client is another excellent resource who can explain what the current risks and issues are that need to be addressed in the contract and/or regarding which they have encountered disputes and misunderstandings previously. They live and breathe this area and are often enthusiastic at the chance to provide assistance and explanation for the benefit of everyone concerned in mitigating risk and improving understanding. One consultant positively described having gone through this process, "our legal counsels were involved...so there was a degree of upskilling within their own business to help them get to understand it and they were very quick in taking it and absorbing it into documents".

We need to break down the divide between the BIM "tech" people and the lawyers. In response to the findings of this report its authors have formed a cross-industry group, BIM 4 Legal ²⁷. This group is intended to assist the legal community and those who instruct them to exchange experiences, knowledge and gain contacts about the legal and contractual aspects of BIM. As one consultant commented "the better equipped they (the lawyers) are with some technical experience then the more effective they are going to be". It is hoped that this will provide a forum for the legal community to ask questions, share ideas and obtain information about BIM and its related issues. One consultant welcomed the idea stating that it would enable "interaction with the great and worst without their stopwatch running!".

²⁷ Twitter: @BIM4Legal

MT Højgaard A/S v E.On Climate & Renewables UK Robin Rigg East Limited and another [2017] UKSC 59

Facts

E.On appointed MT Højgaard to carry out the design, fabrication and installation of the foundations of 60 wind turbine generators at an offshore windfarm. Shortly after the completion of the foundations serious failures in their grouted connections incorporated therein came to light.

E.On commenced proceedings against MT Højgaard for the purposes of recovering the cost of remedial works to the foundations. E.On alleged that MT Højgaard was liable by reason of:

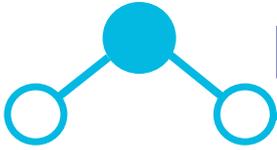
- failing to properly apply the applicable industry standard; and
- breaching its warranty that the design of the foundations would ensure that they would have a 20 year lifetime (and thus failing to ensure that the foundations were fit for purpose).

Decision

The Supreme Court unanimously agreed with E.On's claim that MT Højgaard had failed to ensure that the works were fit for purpose. Whilst the provision which imposed this obligation was contained in a technical annexure to the contract (significantly one which would not typically be subject to legal review or negotiation) the Supreme Court held that the "natural interpretation" of the relevant provision was that the foundations would have a 20 year lifetime and that their subsequent failure breached this warranty.

This decision is widely regarded as imparting the clear message that parties will be bound by the terms of their contracts and that the courts will strive to give effect to the natural meaning of the words used, no matter where the relevant clauses appear. This will potentially reverberate throughout the construction industry, where contracts routinely incorporate various schedules and technical annexures (including BIM) with often limited harmonisation in respect of legal responsibility for design and workmanship. The impetus is on parties to construction contracts to ensure that their contracts are clear in terms of the applicable standards, and as to which documents are paramount when considering issues such as design and workmanship.

WHERE DO WE GO FROM HERE – THE NEED FOR CLARITY AND NEXT STEPS



"We've had quite a few interactions with the legal world but they just didn't seem to grasp how it works in practice."

Interview response December 2017

GENERAL

BIM needs to be better integrated into contract documentation as standard. One lawyer interviewed went so far as to proclaim that the lack of sufficient standardisation of BIM documents had, from his experience, led to a "ruination of many projects". As a starting point, our research self-evidently demonstrates the urgent need to increase and ensure continuing development of an understanding of the different types of required BIM documentation (including standard Appendices, how to complete them and their purpose), processes (with consequent necessary rights and duties) and the main category of terms required for a standard BIM-supportive contract. A fresh approach to thinking in this area could assist, one consultant queried, for example, why we do not yet have a 'defects liability period built into the contract for the digital twin perspective – has anyone thought about that'?

One interviewee suggested that, to oblige parties to pay attention to BIM and comply with its processes and requirements, BIM deliverables should be linked with the payment mechanisms of the contract which, in the interviewee's view, would overcome the ongoing problem that BIM gets left to the side or to the end and then forgotten about.

It is also apparent from the interviews and survey, as summarised in our report above, that the high level use of 'levels' as milestones of BIM maturity has caused confusion and arguably may be leading to hyperbolic claims of advancement or dissatisfaction arising from misunderstandings and mismatched expectations. Several interviewees felt that the levels of maturity had a place in the BIM world but required project specific thought on application and definition. Whether or not the use of the 'levels' terminology is welcomed, there must always be clear definitions of scope, deliverables and parties' expectations within the binding contractual documents supplemented by open discussions between the parties. This could be assisted by the issue of standard form documents covering the main BIM

documentation beyond the BIM Protocol, in particular BIM scopes of services²⁸, EIRs and BEP.

One interviewee noted that "the only way you can go forward on serious BIM levels is some form of alliancing (which) is essential". Given the importance of collaboration to the success of BIM and viability of obtaining its reported benefits, it seems inevitable that the industry may move towards more collaborative forms of contracting. There already appears to be movement in that direction. The NEC4 is due to publish a multi-party, collaborative contract following a consultation process which closed on 30 November 2017, and bespoke alliancing contracts are in use, for example, by some organisations in the rail industry.

Use of standards was seen by our interviewees in equal measure as being helpful at high level but carried with it the potential to be applied incorrectly. Application of the standards is presently not a legal requirement unless the contract states that is so. However, whether a BIM team member would be exercising the appropriate level of skill, care and diligence in performing their role without adherence to the standards currently in place is arguable.

Blockchain and smart contracts

One lawyer interviewee noted that the use of BIM is merely an evolution of the construction industry, giving the analogy of society moving from a typewriter to a word processor – and eventually no one wants to be left behind using outdated technology. In a similar vein, it would seem sensible to look at what other emerging technologies can be used to improve the ongoing issues encountered with BIM documentation and risk allocation. A couple of interviewees floated the suggestion that Blockchain and smart contracts may by the way forward to remedy some of the concerns encountered, such as avoiding the need to go into concise contractual detail about security and access to data, and the allocation of the real risks of these going wrong.

By their nature, Blockchain and smart contracts have the real potential to increase security and access speed, whilst making fraud more difficult to perpetuate. The availability of a real-time, change-resistant

and hack-resistant record of data with trustworthy time entries increases the reliability, integrity and transparency of the data. This in turn has a positive effect of increasing trust and collaboration between the parties; collaboration being a necessary and integral part of a successful BIM process.

However, all such new innovations and technologies bring new risks and untested potential legal issues, particularly bearing in mind that Blockchain and smart contracts are still at a fledgling or proof-of-concept stage in many areas.

Whilst having great potential to assist with some areas of BIM, there are various aspects to these technologies that need to be refined before widespread use in the industry²⁹. The use of Blockchain and smart contracts is therefore not a panacea to all of the difficulties encountered with BIM, and would still have the same issue of requiring clear and express contract terms and other mitigation measures to reduce the risk of parties inadvertently taking on unintended (and possibly uninsured) obligations, as well as the occurrence of disputes.

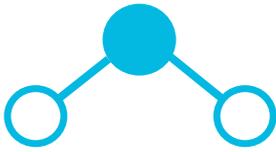
Supporting the Legal Community

Our research and interviews demonstrated that there is a growing awareness of BIM among the legal community. One interviewee involved in dispute resolution and legal training explained that, whilst he wouldn't say lawyers were particularly "on top" of BIM, there is an interest. He opined that "lawyers are smart and know it's important", although he cautioned that despite this, lawyers are still not yet proactively involved with BIM. Another interviewee recounted that "We went to speak to a (Professional Support Lawyer) group of City firms. They all asked the same question – what do we need to do to our contracts to accommodate BIM?"

One problem highlighted by some interviewees was the lack of written resources or training on the legal aspects of BIM, with one lawyer suggesting that consequently, BIM is often viewed as a technical matter by lawyers with the legal issues of BIM overlooked. Training on the basics of BIM could be a useful tool to enable the legal community to get up to speed. However, there will first need to be an acceptance

²⁸ The authors acknowledge the existence of The Outline Scope of Services for the role of Information Manager <https://www.landscapeinstitute.org/PDF/Contribute/Outline-Scope-of-Services-for-the-Role-of-Information-Management.pdf>

²⁹ Winfield M 'The Legal Frontier: Blockchain and Smart Contracts' (BIM+ 31 January 2018) <<http://www.bimplus.co.uk/management/legal-frontier-blockchain-and-smart-contracts/>>



and awareness that such skillset and knowledge is currently lacking and required. One interviewee explained that a BIM legal conference was a "struggle" as there was a distinct lack of interest or enthusiasm from private practice firms, even though many of these firms would have been encountering contracts for BIM-enabled projects. Things are however changing, with some City firms bringing in a BIM specialist to provide training or seminars on this area to facilitate their understanding. Some leading interviewees went so far as to suggest that BIM should be a CPD requirement for construction solicitors.

To summarise, it is important for the legal community to understand about the commonly required BIM contract documentation, as well as to learn about and understand the technical aspects sufficiently to be able to advise on the same (and be aware of what contract terms are required to mitigate the risks arising from these technical processes). One suggestion from an interviewee to achieve this was for lawyers to engage with the BIM technical lead at their client or within the business, as the case may be. A lawyer interviewee cautioned that some in the legal community may not pay attention to BIM until claims, losses and/or case law occurs, at which time the importance of clear BIM contract terms will become apparent.

There are regular articles and reference material regarding the legal issues of BIM available on BIM-centric websites, which lawyers may not be aware of. We hope that our list of suggested reading assists as a starting point for readers to carry out further reading into BIM legal and contractual matters. It would likely also assist for legal journals to publish papers on this topic, for a wider dissemination of information and awareness.

All of this however is prefaced on the basis that those who instruct lawyers do require the use of BIM, understand what this means and inform or instruct their legal advisors accordingly. Many of our interviewees from the legal community observed that lawyers are inevitably limited by the instructions they receive, with one suggesting that this consequently meant that the real drive for progress in BIM (including in the documentation) needed to come from the industry. As one lawyer involved in BIM contract drafting observed, there will likely also be a significant element of the BIM-aware lawyers educating

their clients, i.e. pointing out that BIM is not as straightforward as it appears and encouraging their clients to consider the issues involved and provide instructions accordingly.

BIM Legal Questions: A Checklist

Attached at Appendix Four is a series of questions which have been compiled based on the responses received from our survey, interviewees, research and experience. The checklist is intended as an initial guide for a lawyer new to BIM to assist them in asking questions to gain clearer instructions from their client as to what drafting is required to cover BIM. The idea of such a checklist was generally met with enthusiasm by the interviewees.

The checklist is not an exhaustive list, but one that we hope and believe will prove to be a helpful reference and important starting point for a legal representative faced with reviewing or drafting a BIM-enabled contract/project documentation. Adopting the words of one interviewee, these are "the (key) clauses that you need to consider because these are the things that are going to affect your contract".

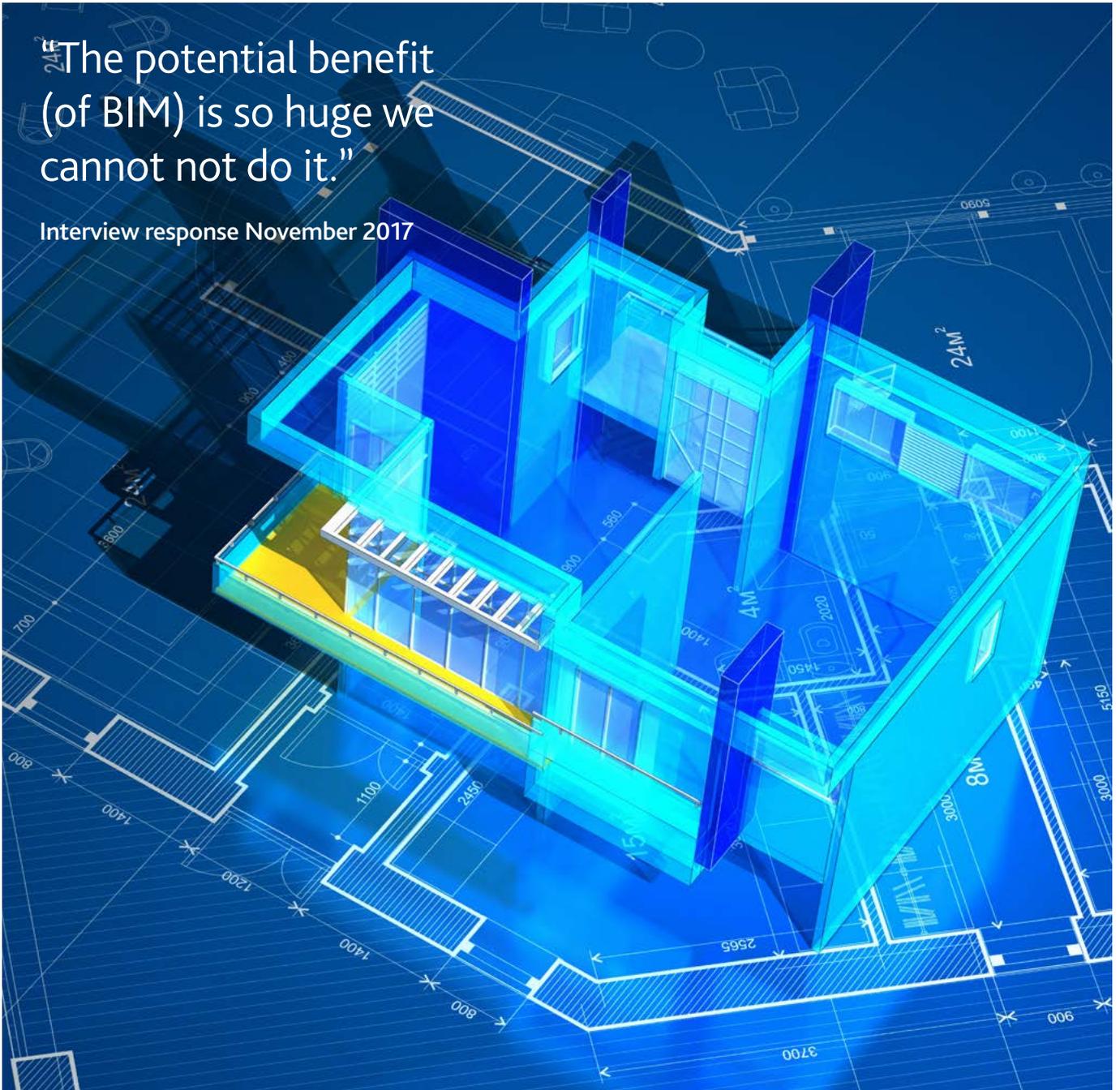
BIM 4 Legal

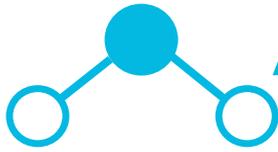
Given the understandably fledgling development of BIM as a legal area and as a response to the need outlined by our interviewees for greater BIM understanding in the legal community, we have established a group, BIM 4 Legal. The aim is that lawyers involved in BIM and/or interested in the area can meet and interact to exchange experiences, raise questions, have the opportunity to speak with technical experts and co-operate in developing the understanding and increasing clarity in the interest of all parties (including parties' insurers). The myth that lawyers are not willing to speak to one another or cannot due to client confidentiality issues has been well and truly blown out of the water by the response to call for input to this report.



“The potential benefit
(of BIM) is so huge we
cannot not do it.”

Interview response November 2017





APPENDIX ONE: INTERVIEWEE LIST

Will Ardill,
Technical Director, KSS

Nohman Awan,
BIM Project Manager,
Carillion

Valmai Barclay,
Solicitor and Company Secretary,
Thames Tideway Project

Richard Begbey,
Director, Construction Solutions,
FTI Consulting

Rob Charlton,
CEO,
Space Group

Andrew Croft,
Associate,
Beale & Company Solicitors LLP

Lucas Cusack,
Project BIM Manager,
Westfield Europe

Andrew Cuthbert,
Senior Commercial Lawyer,
HS2 Ltd

Richard Dartnell,
Legal Director,
Pinsent Masons LLP

**Sarah Davidson BSc (Hons)
MSc FRICS RICS Cert**
BIM Manager, Director – Head of R&D,
Gleeds Corporate Services Ltd

Rhian Deakin,
General Counsel, Partner,
Foster + Partners

Rob Driscoll,
Director of Legal and Commercial,
Building Engineering Services Association

Steve Faulkner,
Associate Director,
Elliott Wood Partnership Ltd

Daryn Fitz,
Principal Consultant,
Excitech

Ciaran Garrick,
BIM Manager,
Allies and Morrison

Dr David-John Gibbs,
BIM Advisory and Dispute Resolution,
HKA

Jeremy Glover,
Partner,
Fenwick Elliott LLP

Chris Hallam,
Partner,
CMS Cameron McKenna Nabarro Olswang LLP
and Fellow of the Chartered Institution of Civil
Engineering Surveyors

Dr Stephen Hamil,
Director Research and Innovation,
NBS

Peter Higgins CEng FICE,
Director, pdConsult and New Contract
Board member,
NEC

Vicki Holmes,
BIM Manager,
Multiplex Construction Europe Ltd and Women
in BIM core team member

Alistair Kell,
Principal: Information, Technology and Process,
BDP

Anne Kemp,
Director, Atkins and Chair,
UK BIM Alliance

Jamie Key,
Senior Associate,
RPC

Martin Lenihan,

Legal Counsel (Commercial),
Skanska

Simon Lewis,

Partner, Construction and Engineering team,
Womble Bond Dickinson LLP

Adrain Malleson,

Head of Research,
NBS

Vicky McCombe,

Managing Associate, Construction
and Engineering Team,
Womble Bond Dickinson LLP

David McNiece,

Senior Associate,
Quigg Golden

Mags Mernagh,

Director of Infrastructure and Estates,
Leicester City Football Club

Iain Miller,

Senior Construction Lawyer,
Battersea Power Station Development
Company

Ann Minogue,

Senior Consultant,
Macfarlanes LLP

Iain Miskimmin,

Digital Asset Advisor,
BIM Advancement Academy,
Bentley

George Mokhtar,

Associate Director - Technology, Head of BIM,
Turner & Townsend

Professor David Mosey,

Professor of Law & Director of Centre of
Construction Law and Dispute Resolution,
Kings College London

Matt Olsen,

BIM Architectural Lead,
Allies and Morrison

David Philp

MSc BSc FICE FRICS FCIQB

FCInstES FGBC,

Global BIM/MIC Consultancy Director –
i3 by AECOM, Chair Scottish BIM Delivery
Group, Centre for Digital Built Britain
(Core team)

Dan Rossiter MCIAT,

Senior BIM Communicator, BRE

Richard Saxon CBE,

Chairman of Joint Contracts Tribunal,
RIBA Client Advisor, Client advisor at
Consultancy for the Built Environment

Dale Sinclair,

Director of Technical Practice,
Architecture responsible for EMEA, AECOM
and Ambassador for Collaboration and
Technical, RIBA

Mark Stodgell,

Associate Director,
PCSG Limited

Babak Tizkar,

Head of BIM UK + MENA, BENOY

Peter Vale,

Engineering Information Manager,
Thames Tideway Project

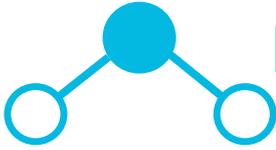
Jason Whittall RIBA APMP –

RICS Certified

BIM Manager, Director,
One Creative Environments Ltd



APPENDIX TWO: ONLINE SURVEY FINDINGS



The online survey was open to all participants who wished to contribute. 158 responses were ultimately recorded.

Q1 The split of professions was recorded as 20% lawyers, 22% design consultants and 12% contractors. An interesting statistic was the percentage of participants who considered themselves to be BIM consultants at 29%, suggesting this new specialism of consultant were keenest to participate in this research.

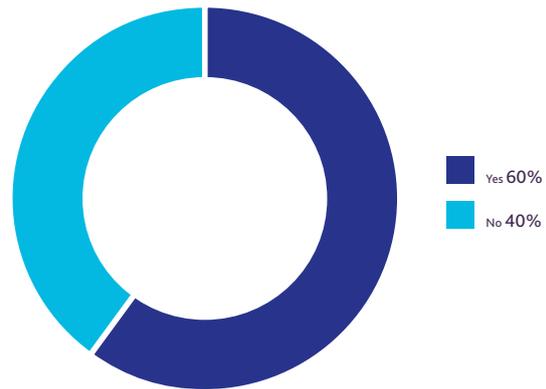
Q1 Please select the title which most closely aligns with your job role



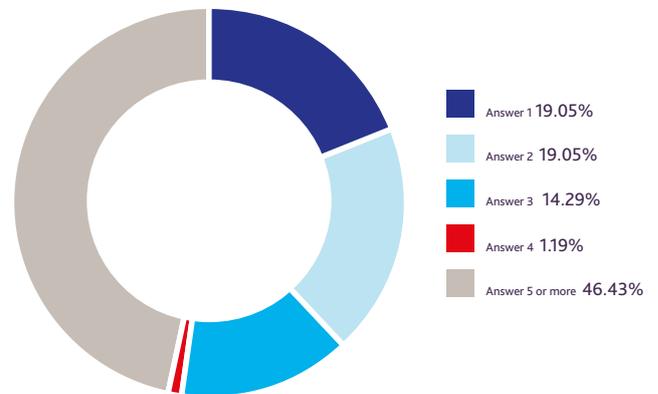
- Lawyers 20.39%
- Contractor 12.50%
- Sub-Contractor 2.63%
- Design Consultant 22.37%
- Non Design Consultant 6.58%
- BIM Consultant 28.95%
- Client 6.58%

Q2/3/4 84 respondents recorded having drafted BIM documents or contract terms for their company or client with almost half of these having drafted or negotiated BIM documents or contract terms on 5 or more projects. Somewhat unsurprisingly, the vast majority of these projects were design and construction focussed. Only 13 respondents recorded having drafted BIM documents or contract terms for facilities management projects.

Q2 Have you drafted or negotiated BIM legal documents or contract terms for your current firm or company for a project which has used or is currently using BIM?

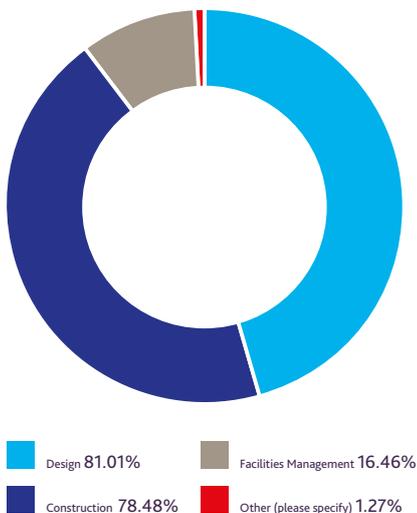


Q3 How many BIM projects have you drafted or negotiated BIM legal documents or contract terms for?



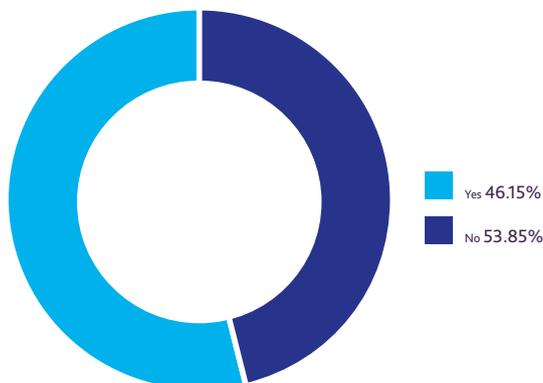


Q4 What type of project were the BIM legal documents or contracts used for?
Please tick all that apply



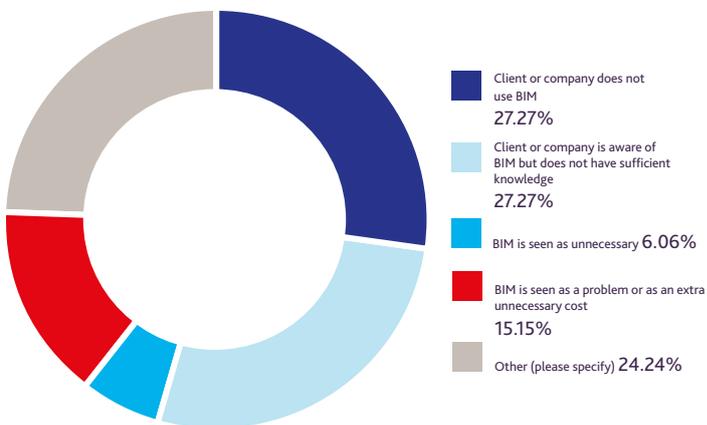
Q5 Only 24 respondents recorded that their client or company had participated in BIM projects without BIM contract terms or documents in place.

Q5 Has your client or company participated in a BIM project without specific BIM legal documents or contract terms?



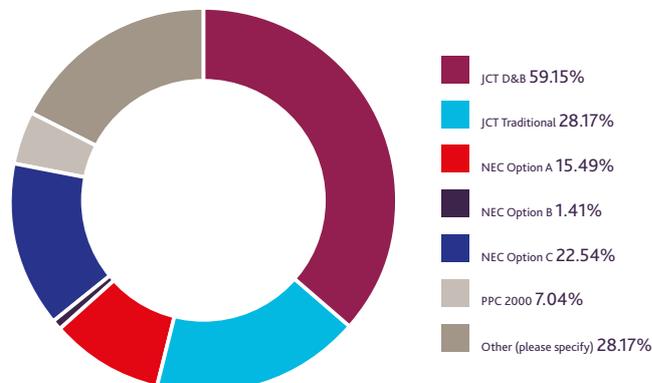
Q6 Of the 33 respondents who were asked why their client or company had not used BIM, just over a quarter recorded that this was because there was insufficient knowledge around BIM. 15% recorded that BIM was seen as a problem or an unnecessary cost.

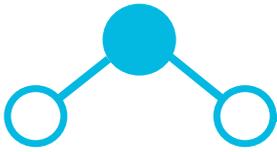
Q6 Are there reasons that your client or company has not engaged in a BIM project?



Q7 The most popular standard form building contract form used on a BIM project was JCT Design and Build with 59% (42 respondents) of those asked selecting this. 28 respondents noted using one of the forms of contract from the NEC suite.

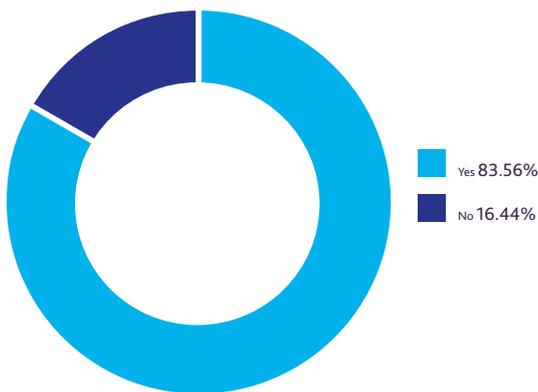
Q7 Which procurement routes have you seen used for BIM design/construction projects?
Please tick all that apply



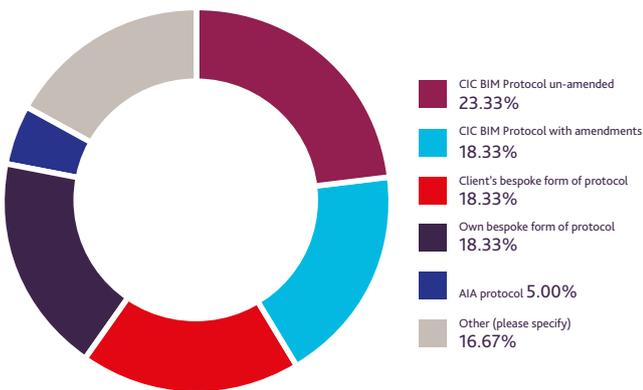


Q8/9 83% of respondents reported using a BIM Protocol on a BIM project. There was a fairly even response to the type of Protocol used suggesting that there is no stand out preferred industry form at this time – 14 participants used the CIC BIM Protocol un-amended, 11 used the CIC BIM Protocol amended, 11 used their client’s bespoke form of Protocol and 11 used their own bespoke Protocol.

Q8 Have you used a BIM protocol on a project?

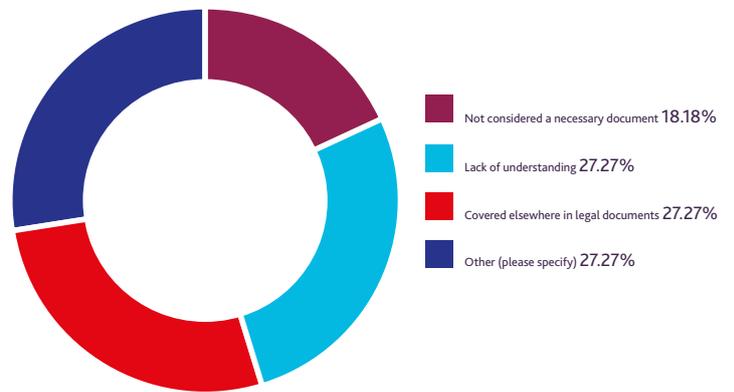


Q9 Which form of BIM protocol was used?



Q10 Of those who had not used a Protocol just over a quarter stated that this was because this was covered elsewhere in the legal documents. The same amount stated that a Protocol was not used due to a lack of understanding, whilst 18% felt it was an unnecessary document.

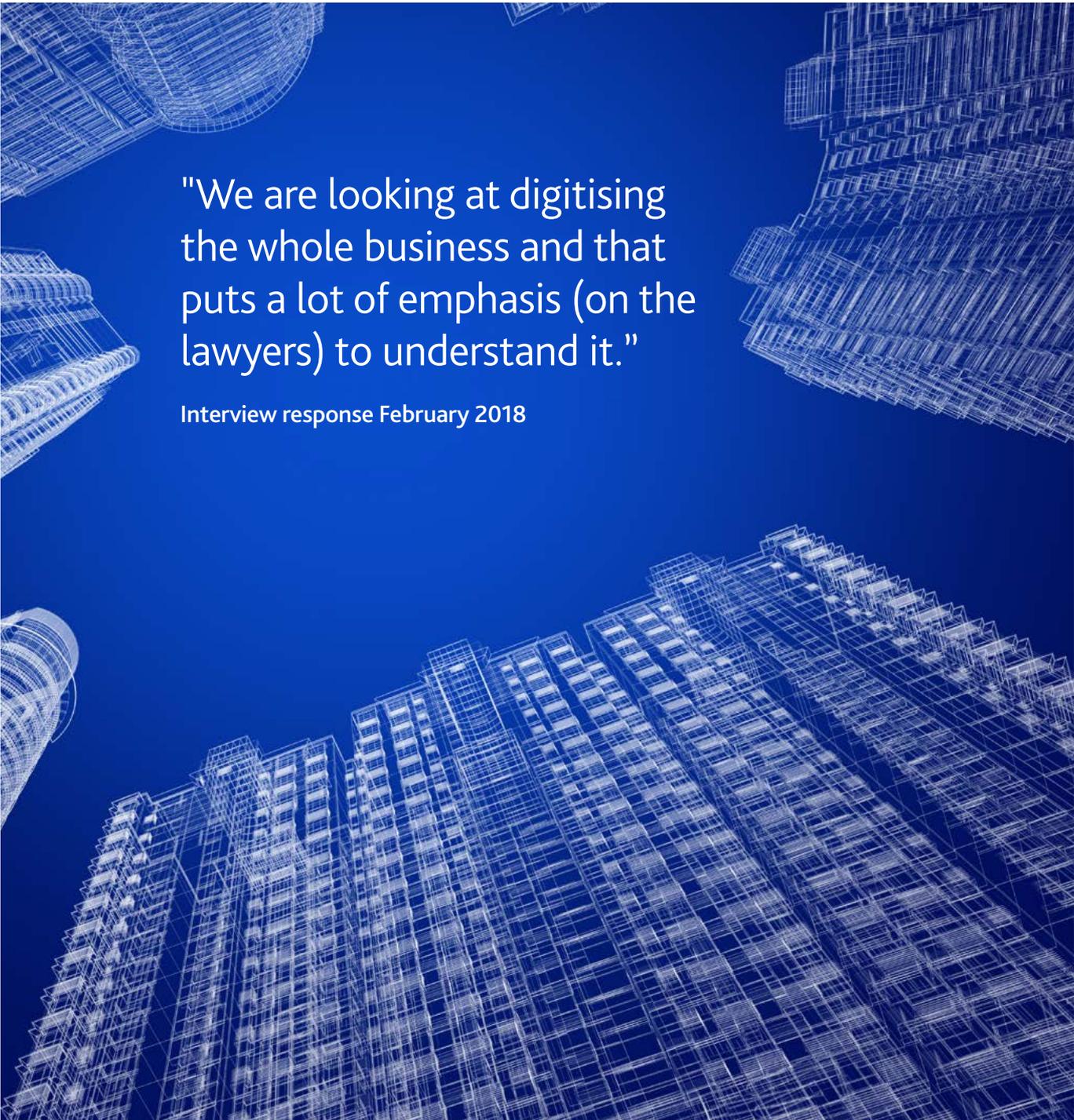
Q10 What were the reasons for not using a BIM protocol?



Q11 Reflecting our findings at interview stage very few respondents had been involved in any form of dispute involving BIM, just 16 respondents.

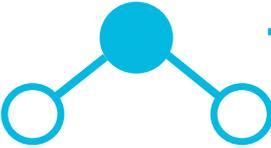
Q11 Have you represented a client or has your company been involved in a dispute involving BIM (whether in adjudication, arbitration, litigation, mediation or pre-dispute negotiation)?





"We are looking at digitising the whole business and that puts a lot of emphasis (on the lawyers) to understand it."

Interview response February 2018



APPENDIX THREE: NON-EXHAUSTIVE TERMINOLOGY REFERENCE

Whilst many of these terms lack standard industry definitions, we provide some plain language descriptions to assist the understanding of the legal community readers who are unfamiliar with BIM in their review of this report and subsequent discussions with and advice for their clients. This list is not intended to be an exhaustive or definitive list of BIM terminology or imply the accepted descriptions of the terms in question; we have however taken into account the commonly used standard documentation, BIM standards and upcoming ISO 19650 in providing this short reference list.

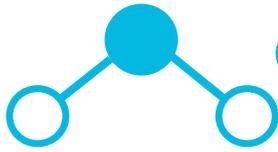
Building Information Modelling ("BIM")	Use of a shared digital representation of a built asset/facility to facilitate design, construction and operation processes to form a reliable basis for decisions
BIM Co-ordinator	A project manager, who is responsible for managing compliance with the BIM procedures and processes. This may consist of one of the project team or be a third party.
BIM Information Manager	The information manager has a role in facilitating the management of the federated model and the production of project outputs. The information manager is also responsible for managing the operation, standards and culture of the common data environment. ³⁰
BIM Execution Plan ("BEP")	There is a "Pre Contract BEP" which sets out the response to the EIRs, i.e. it is akin to Contractor's Proposals. There is then a "Post Contract BEP" which sets out the agreed, contracted details of this delivery of the BIM aspects of the project.
Common Data Environment ("CDE")	Online digital location acting as the agreed single source of information for any given project or asset or collecting, managing and disseminating documentation, the models and other data to the whole project team.
COBie	Construction Operations Building Information Exchange, consisting of data provided in a spreadsheet data format and is provided at handover or completion of the project for use during the operational phase. It was apparently originally devised by the US Army Engineering Corps. The Government's BIM mandate requires COBie-compliant information exchange. BS 1192-4 sets out the best practice for the implementation of COBie.
Data drop	Important information delivery stage referred to in the BIM Industry Working Group's Strategy Paper for the Government Construction Client Group, and also the CIC BIM Protocol. Note that PAS1192-2 uses slightly different terminology, referring instead to 'data delivery' and 'information exchange'.
Employer's Information Requirements ("EIRs")	Employer's requirements or specifications for what, when, how and for whom the data and models are to be produced. There is currently no standard form for this document.
Federated model	Amalgamation of several different models (e.g. the architecture and engineering models). This can be compared to a number of tracing paper sheets laid on top of each other, forming one pile that is the 'federated model'.

³⁰ <http://bimblog.bondbryan.com/client-bim-briefing-note-information-management-role/>



Levels (e.g. Level 2; Level 3)	This research paper explains in some detail about the absence of an accepted meaning for the Levels. However, for general understanding, the degree of maturity or adoption of BIM has been split up into milestones called 'Levels'.
Level of Detail ("LOD") and Level of Information ("LOI")	<p>'Level of definition' is defined in PAS 1192-2 as the "collective term used for and including 'level of model detail' and the 'level of information detail'". 'Level of model detail' is the description of graphical content in models at each of the stages defined, for example, in the CIC scope of services. The 'level of model information' is the description of non-graphical content in models at each of these stages. BS 8541 defines level of detail for BIM objects as:</p> <ul style="list-style-type: none"> • Schematic • Concept • Defined <p>BS 8541-3 is the code of practice for the shape and measurement of BIM objects.</p> <p>Level of information defines how much detail is required at each of these stages – i.e. whether spatial, performance, standard, workmanship, certification etc.³¹</p>
Model Production Delivery Table ("MPDT")	Akin to a responsibilities matrix, for the BIM deliverables specifically. Contained in Appendix 1 of the current version of the CIC BIM Protocol.
Master Information Delivery Plan ("MIDP")	Primary plan for the preparation of the project information, e.g. listing deliverables and setting out when project information is to be prepared, by whom and using what protocols and procedures for each stage of the project.
Protocol	Supplementary legal agreement, usually included as a schedule to a BIM-enabled contract or appointment, setting out the parties rights, duties and risk allocation for the BIM process. The only standard form for this document is the CIC BIM Protocol.
Project Information Model ("PIM")	Information model relating to the design and construction phase
Asset Information Model ("AIM")	Information model relating to the post-construction, i.e. operational, phase., containing the data needed to assist in the operation and management of the completed asset/facility
4D; 5D; 6D	BIM with additional linked information or data, e.g. costs (4D), time/programming (5D) or facilities management (6D)

³¹<https://www.thenbs.com/knowledge/the-20-key-bim-terms-you-need-to-know>



APPENDIX FOUR: BIM LEGAL QUESTIONS: A CHECKLIST

1. The BIM Process

- a. Does my client have standard BIM processes that must be implemented by the supply chain and/or their employer?
- b. Who are the parties/individuals responsible for managing and coordinating the BIM process?
- c. What BIM deliverables and aims/objectives are required by my client and/or specified by their employer?
- d. Who will host, control and have access to the CDE, i.e. the electronic data storage facility for BIM data? Will the same parties perform these roles throughout the design process? Does my client have the right of access in the event of a payment or other contractual dispute and/or termination?

2. BIM Documentation

- a. Does the tender documentation contain queries regarding BIM capability? Do any of the responses need to be incorporated as binding obligations? Is there any requirement that the individuals delivering the project have the same BIM capability as in the party's tender responses?
- b. Are there EIRs, a BEP and a BIM Protocol?
- c. Has all BIM terminology been defined within the documents and all Appendices inserted/completed?
- d. What BIM documents have been received and/or issued by my client? Which of these need to be binding on the parties, i.e. incorporated into the contracts?
- e. Does my client have any in-house standard documents or specifications/requirements that they want to be used/implemented?

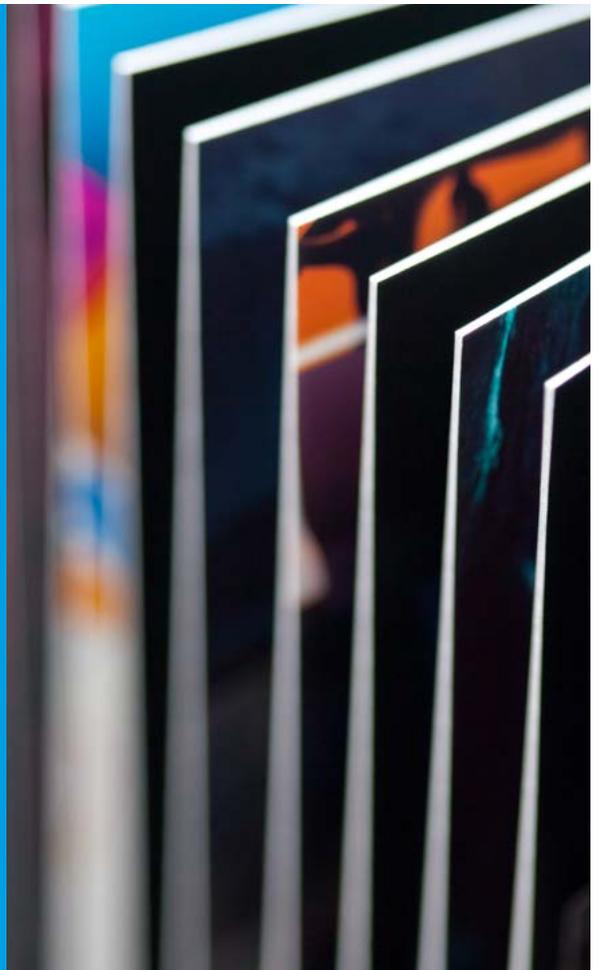
- f. Does the employer want to use the BIM models/data post-completion for operation and maintenance? Have they provided BIM FM requirements/specifications and can/should the employer's FM contractor provide input on the format and content of BIM models and data required?
- g. Have the BIM specific documents been checked against the non-BIM specific documents to ensure consistency and prevent gaps?

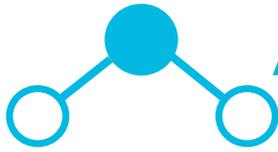
3. Project/Client specific considerations

- a. Are there any particular security or confidentiality issues for this project (e.g. due to the identity of the employer or nature of project) that require special or extra requirements about the handling and storage of BIM data?
- b. Are the BIM technical team aware of any site or design-specific risks that could make the BIM process more complicated and/or time-consuming? Have these additional risks been allocated?
- c. Will there be an Information Manager? Who will this be and what will their role include?
- d. Are any standards required to be contractually binding?
- e. Has the client disclosed any BIM-specific role to their broker/insurers? Have they checked with their broker/insurers that they are covered for their BIM services, loss of data and cyber risks?

APPENDIX FIVE: SUGGESTED FURTHER READING

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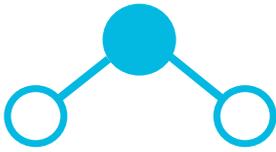


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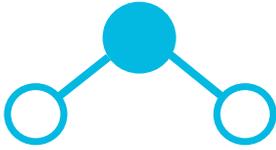
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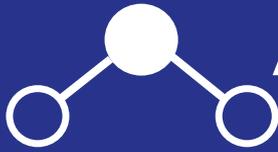


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