BIM Training Workshop for Quantity Surveyors
BIM Legal and Contractual Implication

BIM Centre, 12/F., Block 3, HA Headquarters

Prepared and presented by

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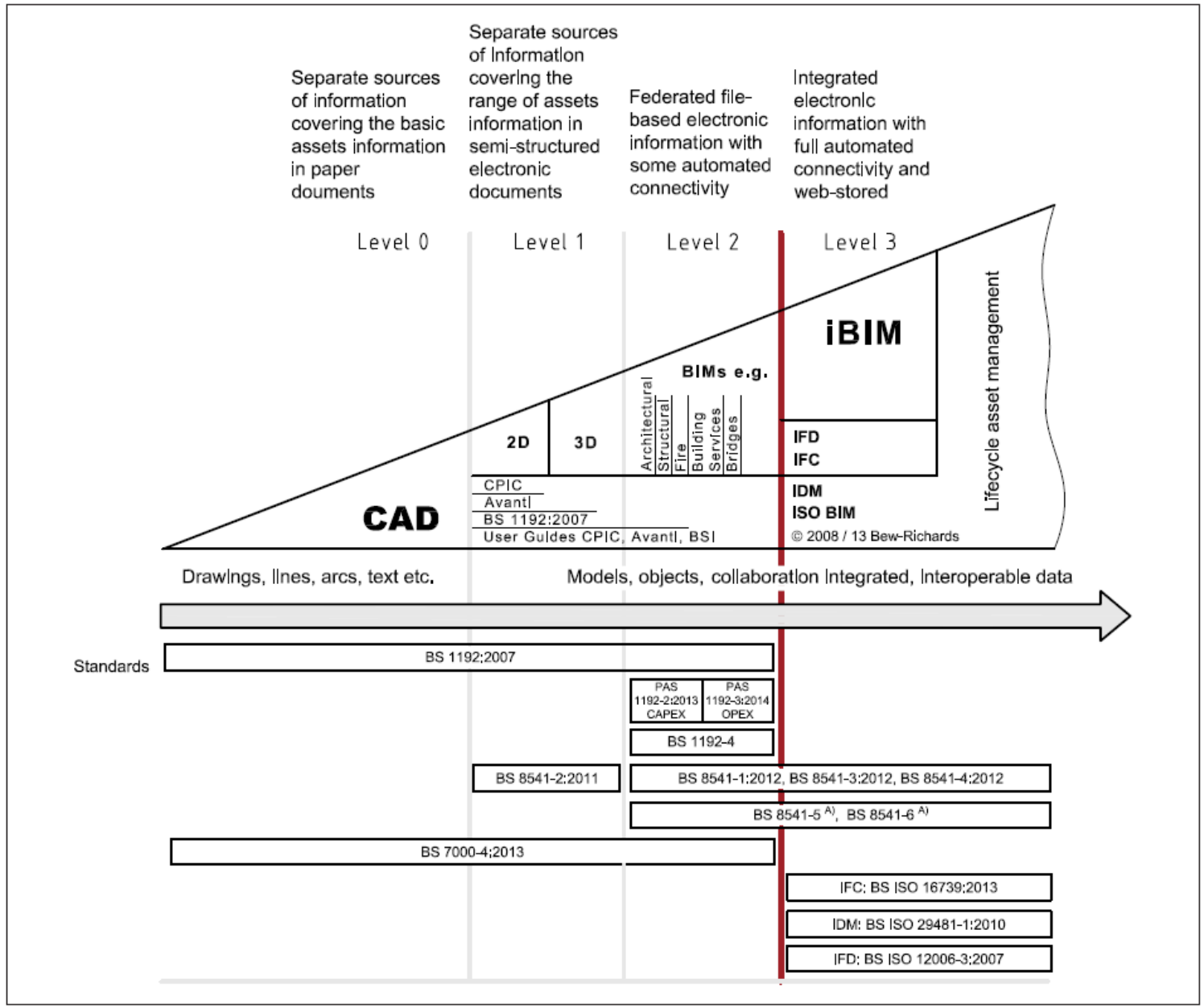
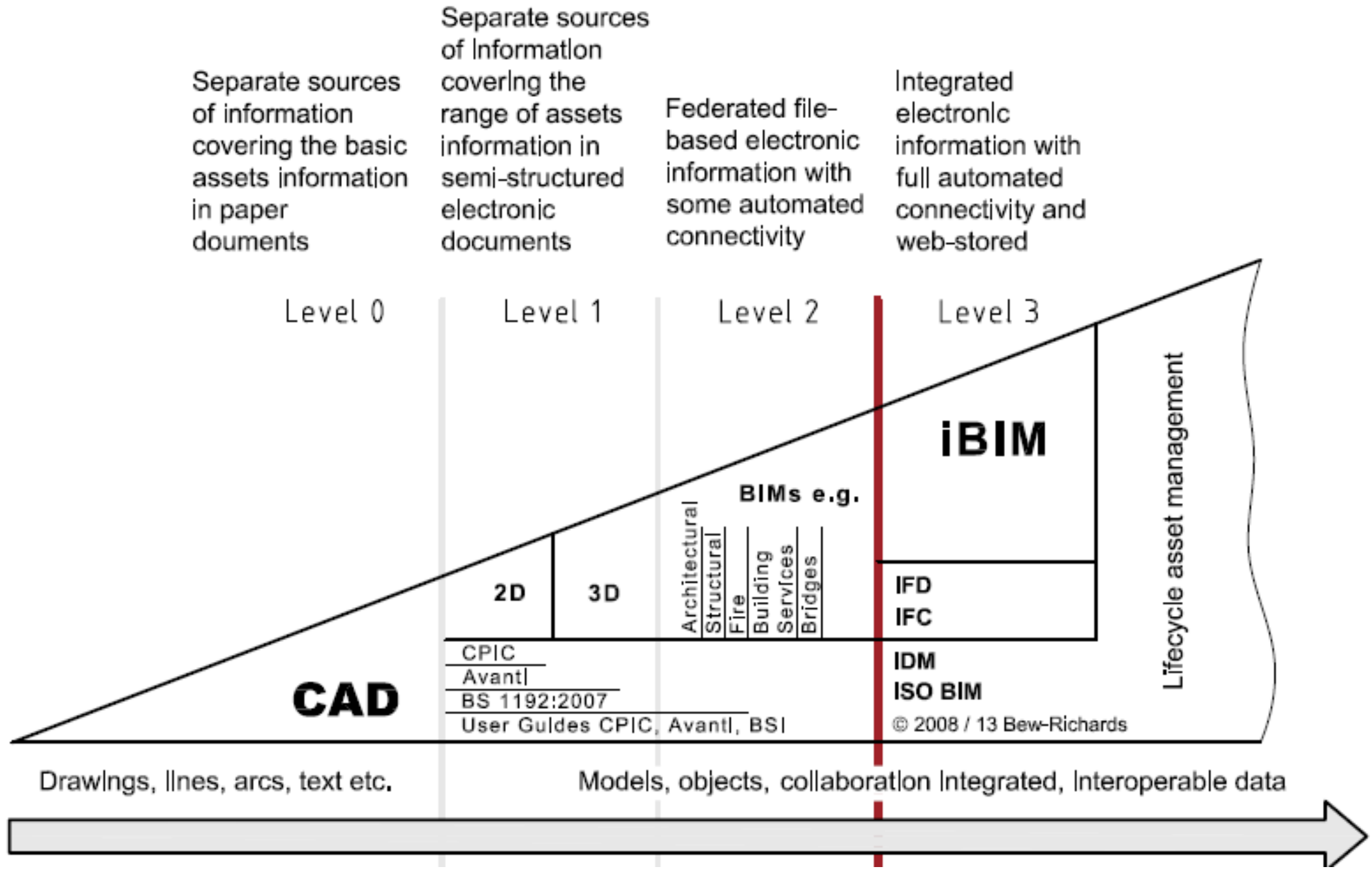
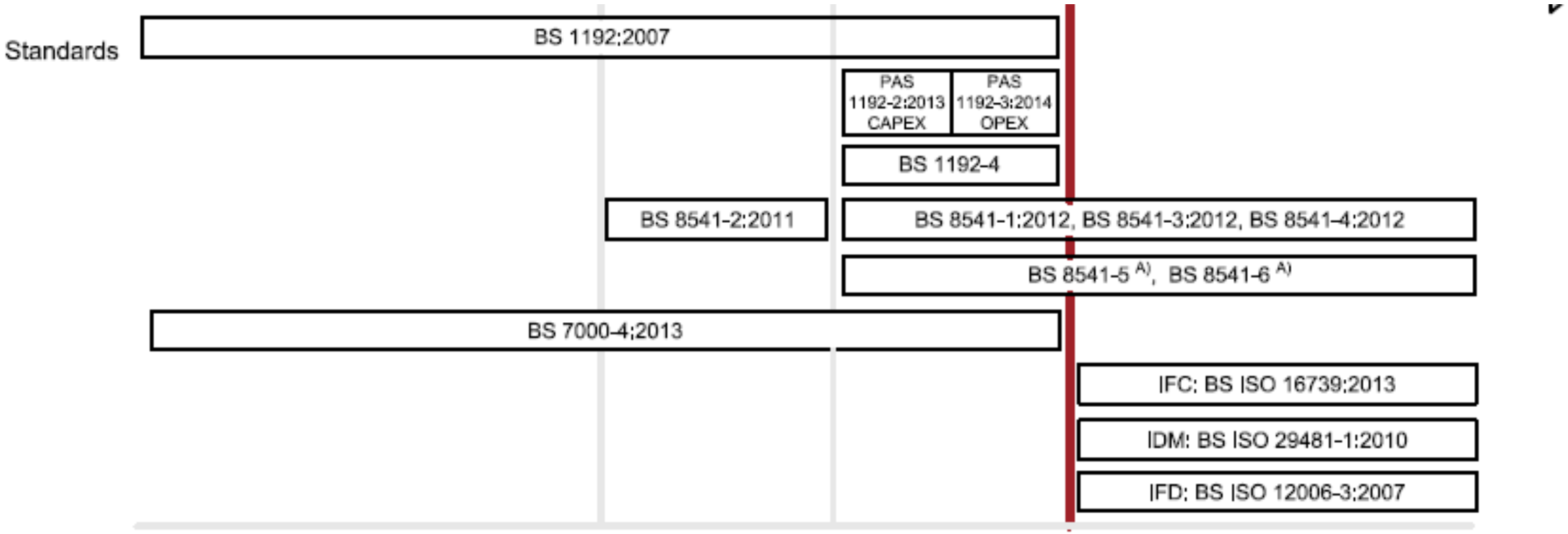
Figure 1 **Core maturity model**




Separate sources of information covering the basic assets information in paper douments
Separate sources of Information coverlng the range of assets information in semi-structured electronic documents
Federated file-based electronic information with some automated connectivity
Integrated electronlc information with full automated connectivity and web-stored
Level 0
Level 1
Level 2
Level 3
iBIM
BIMs e.g.
Architectural
Structural
Fire
Building Servlces
Bridges
2D
3D
IFD
IFC
IDM
ISO BIM
CPIC
Avantl
BS 1192:2007
User Guldes CPIC, Avantl, BSI
CAD
© 2008 / 13 Bew-Richards
Lifecycle asset management
Drawlngs, llnes, arcs, text etc.
Models, objects, collaboratlon Integrated, Interoperable data


Standards
BS 1192:2007
PAS 1192-2:2013 CAPEX
PAS 1192-3:2014 OPEX
BS 1192-4
BS 8541-2:2011
BS 8541-1:2012, BS 8541-3:2012, BS 8541-4:2012
BS 8541-5 A), BS 8541-6 A)
BS 7000-4;2013
IFC: BS ISO 16739:2013
IDM: BS ISO 29481-1:2010
IFD: BS ISO 12006-3:2007

BIM Legal and Contractual Implication

Enabling BIM Through Procurement and Contracts

A Research Report by the Centre of Construction Law and Dispute Resolution, King's College London

How does BIM affect legal liability?

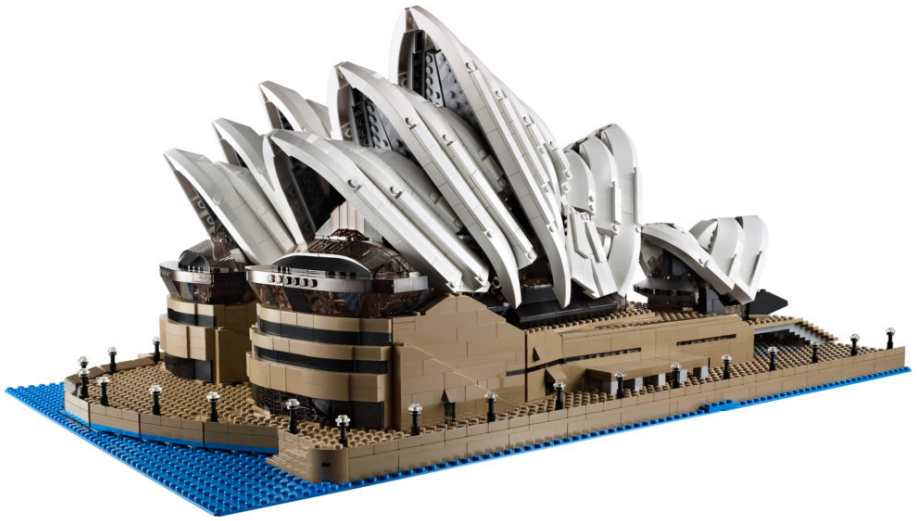
- Reasonable skill and care
- Duty to review designs

Reasonable skill and care

- The duty of a consultant to use “reasonable skill and care” in creating a design or providing other advice, and its duty to produce a design that is buildable, should not be affected by the adoption of BIM.

Reasonable skill and care

- Likewise, the risk of raising a consultant's duty of care to "fitness for purpose" in respect of what a design or other advice will achieve, with the consequent concern that this will not be supported by professional indemnity insurance, should not occur by reason of adopting BIM.



Reasonable skill and care

- Understanding your design duty – “reasonable skill and care” vs. “fitness for purpose” – mutually incompatible or comfortably coexistent?
- http://www.fenwickelliott.com/research-insight/annual-review/2014/understanding-design-duty
- In either case, any change to the consultant’s duty of care occurs only by agreement of additional contractual commitments. [not by adoption of BIM]

Reasonable skill and care

- a consultant, in its approach to BIM, as in any other activity, is expected “not to lag behind other ordinarily assiduous and intelligent members of his profession in knowledge of the new advances, discoveries and developments in his field”. This means keeping up with the profession, firstly in advising on the benefits and risks of adopting BIM, and secondly in applying BIM to the design process and to related costing, programming and project management services.

Reasonable skill and care

- when advising a client on the adoption of BIM for the first time, “architects who are venturing into the untried or little tried would be wise to warn their clients specifically of what they are doing and to obtain their express approval”, and should be aware that “the law requires even pioneers to be prudent”.

Reasonable skill and care

- the professional knowledge and practices relating to BIM are continually evolving and a consultant is entitled to claim that it applied "the state of the art" at the time of giving its advice, although this defence will be judged by reference to the guidance and publications available to the profession as a whole at that time.

Reasonable skill and care

- a contractual commitment to comply with statutory obligations relevant to BIM will influence the duty of care, for example under the CDM Regulations 2015 which provide that a designer has a duty when "preparing or modifying a design" to "eliminate, so far as is reasonably practicable, foreseeable risks to the health and safety of any person" or otherwise to reduce or control those risks, and "to take all reasonable steps to provide, with the design, sufficient information about the design, construction or maintenance of the structure to adequately assist the client, other designers and contractors to comply with their duties".

Reasonable skill and care

- Summary of duties under Construction (Design and Management) Regulations 2015 (CDM 2015)
- http://www.hse.gov.uk/construction/cdm/2015/summary.htm

Duty to review designs

- increased access to BIM data emerging throughout the life of a project could increase the likelihood that a designer has become aware, or should become aware, of the need to reconsider an earlier design.
- increased access through BIM to other team members' designs could affect a designer's duty to warn of errors or problems it notices in another team member's work.

Duty to review designs

- contractors should keep in mind the common law duty to check, and even to validate, the designs provided by a consultant
- In the case of Cooperative Insurance Society Ltd v Henry Boot Scotland Ltd and others [2002] EWHC 1270 (TCC) Judge Seymour stated: “Someone who undertakes… an obligation to complete a design begun by someone else agrees that the result, however much of the design work was done before the process of completion commenced, would have been prepared with reasonable skill and care”.

Duty to review designs

- However, note also the US “Spearin” doctrine implying a duty on a design consultant to ensure that documents passed to a contractor are “free from defect”.
- There is concern in the USA that more collaborative processes and early contractor involvement through BIM could remove this protection from contractors. For example Consensus Docs 301 BIM addendum clause 5.1 states that: “Each Party shall be responsible for any contribution it makes to a model or that arises from that party’s access to that model.”

Duty to review designs

- ***United States v. Spearin*** (248 U.S. 132) or **Spearin doctrine**
- https://en.wikipedia.org/wiki/United_States_v._Spearin
- The owner impliedly warrants the information, plans and specifications which an owner provides to a general contractor. The contractor will not be liable to the owner for loss or damage which results solely from insufficiencies or defects in such information, plans and specifications.

Duty to review designs

- a duty to review and work to a design is likely to include an enforceable obligation to use BIM models if made available.
- for example the US legal case Matthews D. (2011) concerning a life sciences building where the mechanical and electrical engineer did not inform the contractor about ventilation ducting the construction sequence. The main contractor worked off 2D drawings despite the availability of a BIM model, and ran out of space with only 70% of the sequence complete

How is BIM treated in standard form contracts?

- Standard form BIM provisions
- Integration of building contracts and consultant appointments
- Standard forms and collaborative working

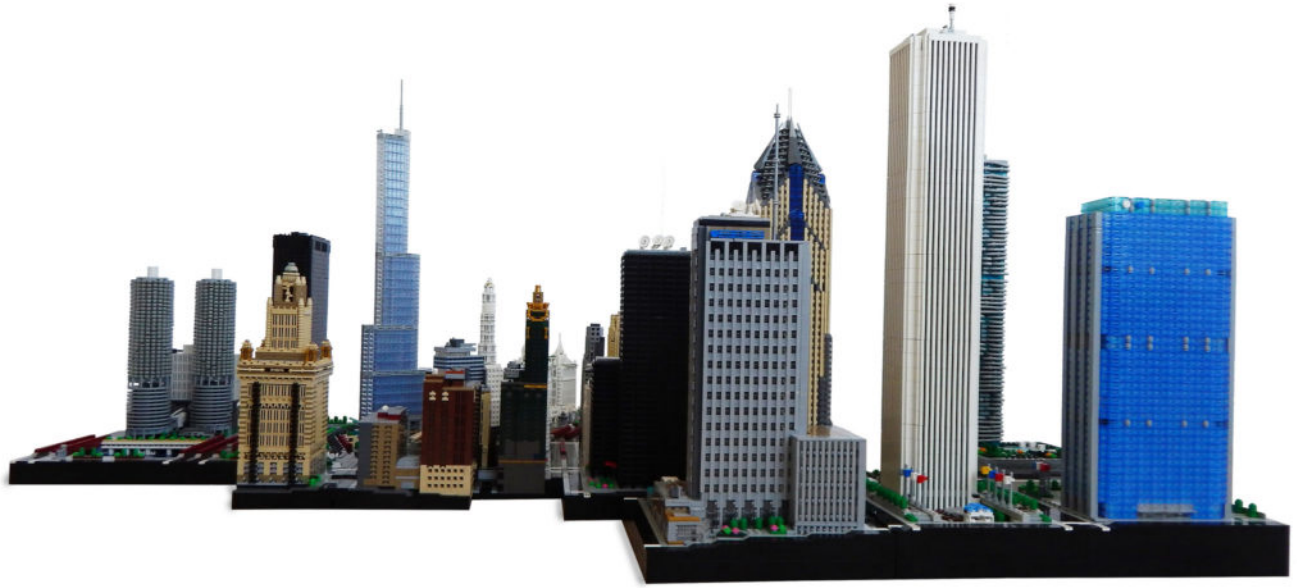
How is BIM treated in standard form contracts?

- Before looking at contract forms the place to start is in the scope of a contractor's project brief or a consultant's schedule of services. The following key points should be checked:

Seoul

How is BIM treated in standard form contracts?

- Does the contract contain a clear set of obligations as to how the consultant or contractor will be expected to implement BIM, including for example whether this will start with the project procurement process and also continue into post-completion operation?



How is BIM treated in standard form contracts?

- Are there clear statement of a consultant's or a contractor's promised level of BIM experience and expertise?

- Is it made clear what effect the use of BIM will have on the consultant's or contractor's specific duties in respect of design, costing, programming, project management, construction and asset management?

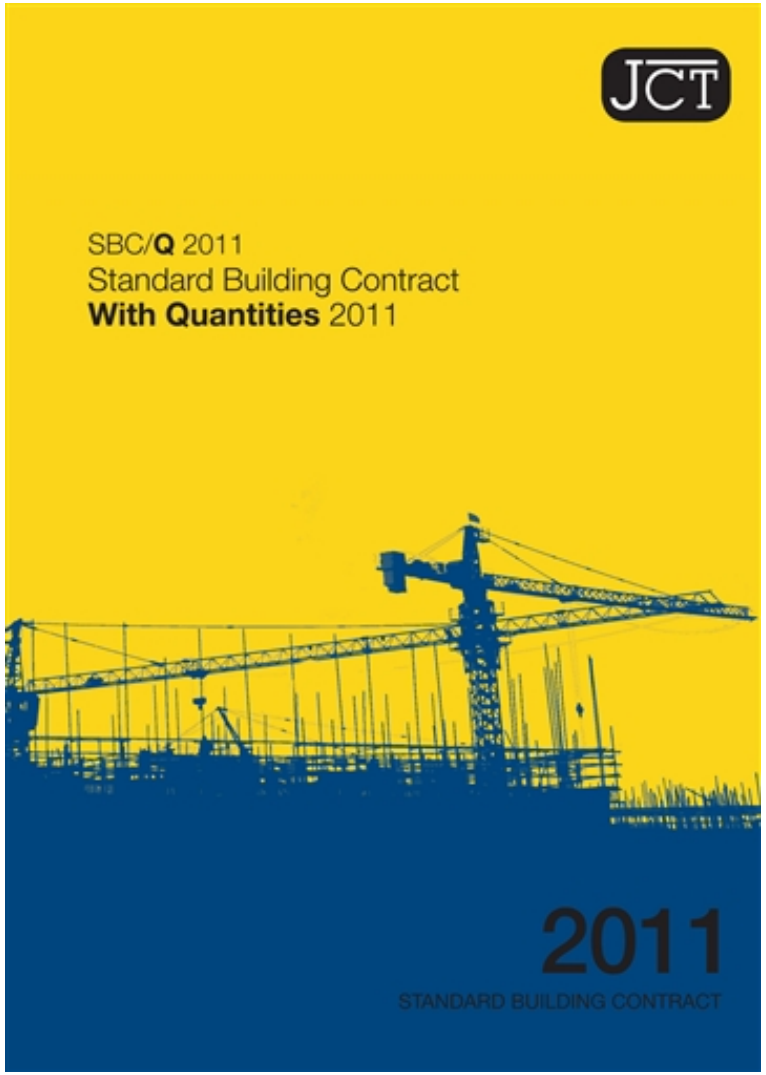
How is BIM treated in standard form contracts?

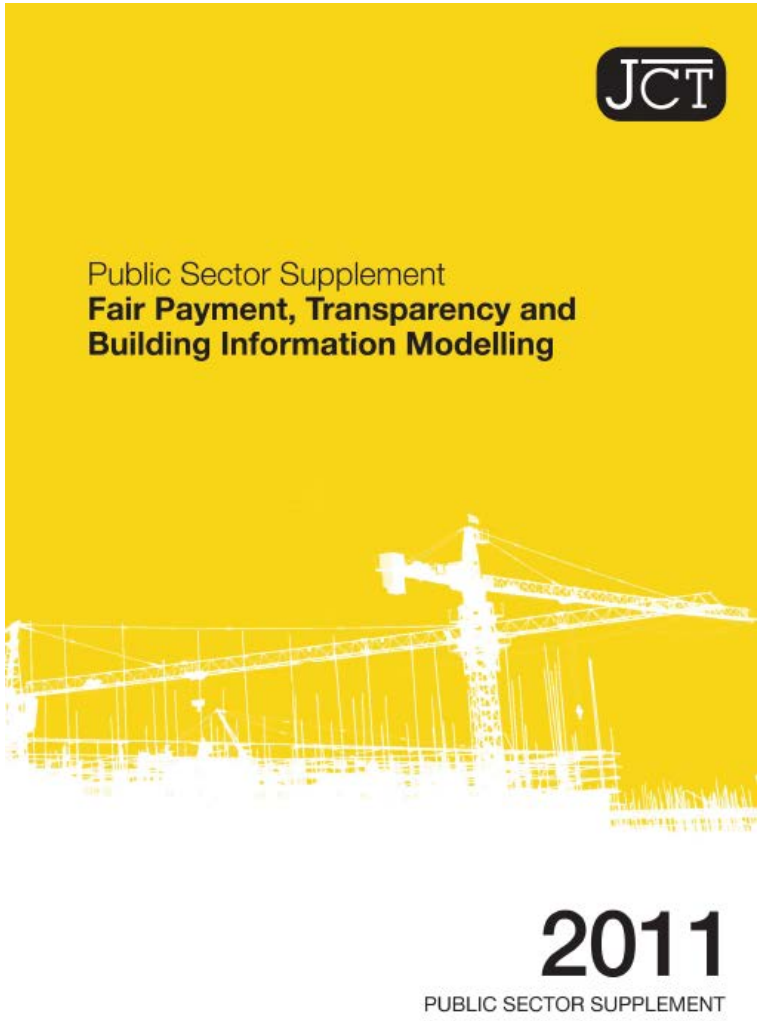
- Do all parties understand who will be the BIM Information Manager, what duties this role will comprise and how these duties will interface with those of the design lead and the project manager so as to avoid gaps or duplications?

Standard for BIM provisions

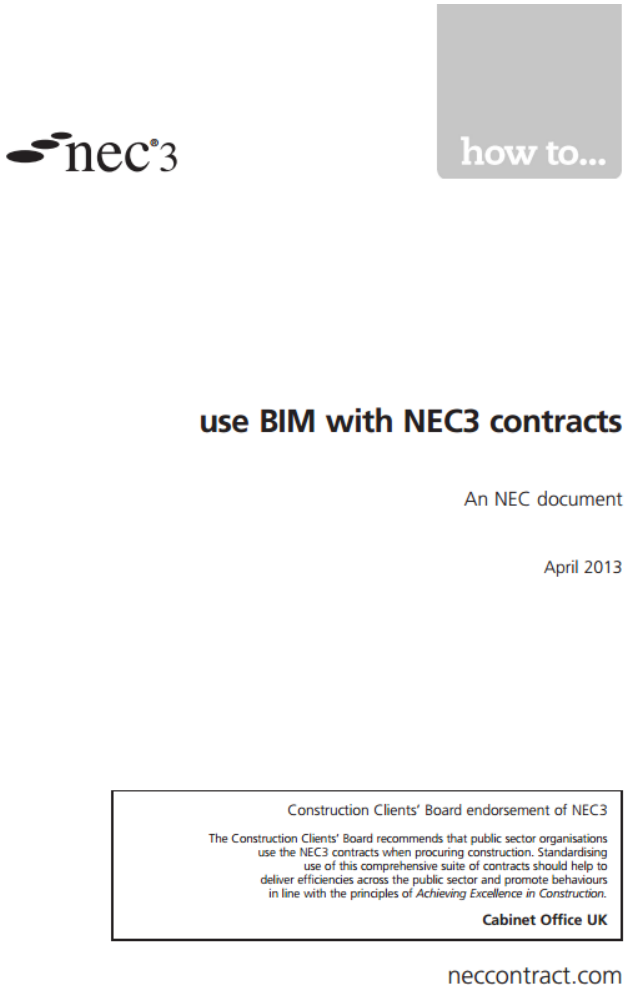
- JCT Public Sector Supplement
- How to use BIM with NEC3 Contracts
- Other standard forms such as FIDIC are silent on BIM
- Most standard form consultant appointments are also silent on BIM
- Some refer in their guidance to the CIC BIM Protocol

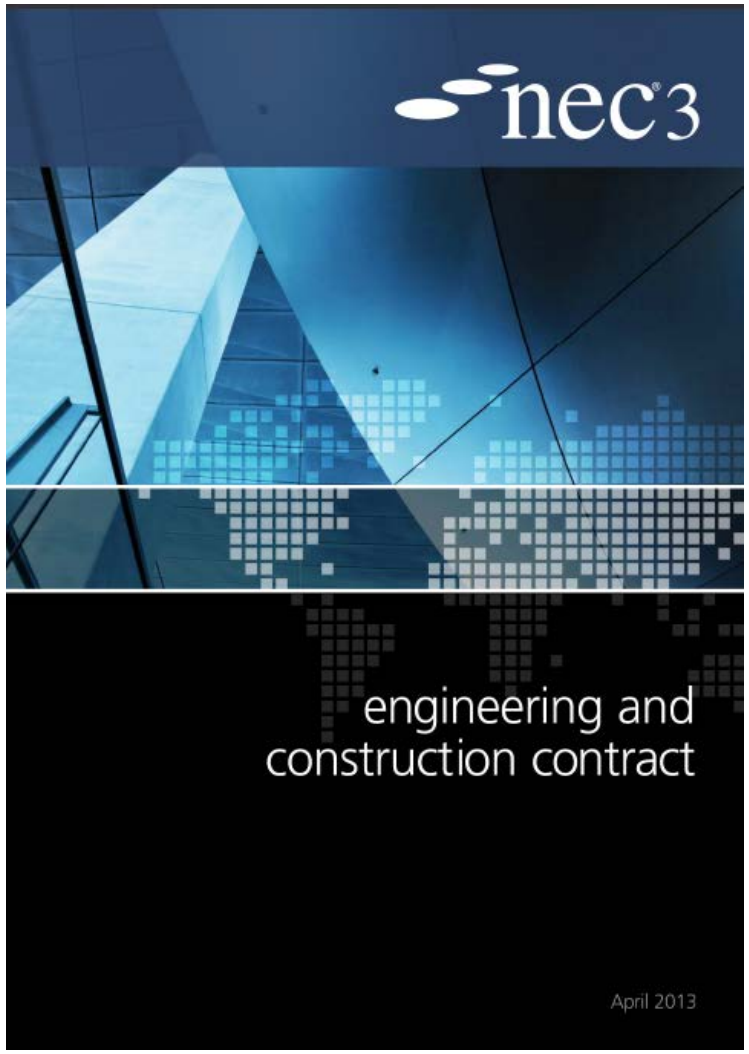
JCT Supplement for BIM



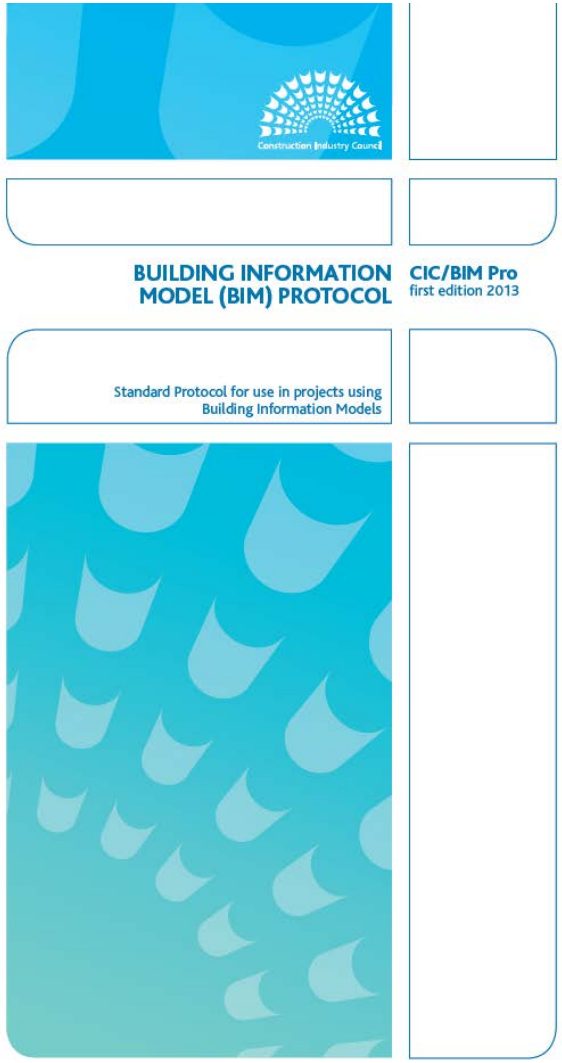


How to use BIM with NEC3 Contracts





Building Information Model (BIM) Protocol



The CIC acknowledges the technical input and leadership provided by the BIM Task Group in support of the production of CIC BIM documentation.

The BIM Protocol has been drafted by Beale and Company on behalf of the CIC and the BIM Task Group

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Standard for BIM provisions

- Agreement of deadline and interfaces in respect of submission and approval of design information and other date
- Clash detection, early warning and risk management
- Mutual agreement of intellectual property right

Standard for BIM provisions

- The need for clarity as to the status of documents that enable BIM
- The need for reliance on BIM software
- The need for clarity as to the responsibilities of the BIM Information Manager

Integration of building contracts and consultant appointment

- It is arguable that BIM requires a set of contracts which integrate all the team members' roles and which do not focus only on the responsibilities of the main contractor.
- Without corresponding consultant appointments and sub-contracts, it is difficult to see how any building contract can support a team in adopting and implementing BIM.

Integration of building contracts and consultant appointment

- Standard forms that provide contracts covering the appointment of all team members include:
- FIDIC offers corresponding forms of consultant appointment, main contract and sub-contract.
- JCT 2011 offers corresponding forms of consultant appointment (limited to the public sector), main contract and sub-contract.
- NEC3 offers corresponding forms of consultant appointment, main contract and sub-contract.

Comparison summarizing provisions relevant to the treatment of BIM in FIDIC, JCT2011 & NEC3

	FIDIC	JCT 2011	NEC 3
BIM provisions in contract terms	No	Yes, in 2011 Public Sector Supplement	Yes, in 2013 How to use NEC3 with BIM
Requires addition of CIC BIM Protocols to all contracts	Not stated	Refers to unspecified protocols and JCT contracts taking precedence	Yes, with amendments
Early warning system to support BIM clash detection	No	No	Yes
Direct mutual intellectual property licences among team members	No	No	No

Comparison summarizing provisions relevant to the treatment of BIM in FIDIC, JCT2011 & NEC3

	FIDIC	JCT 2011	NEC 3
Provision for early contractor involvement to bring in pre-construction phase BIM contributions of main contractor and sub-contractors/suppliers	No	Yes, using Pre-Construction Services Agreement with separate construction contract	Yes, using ECI clause added November 2015
Agreed mutual deadlines for specific activities	No	Yes, in optional Information Release Schedule	Yes, in Accepted Programme and Key Dates
Link to asset management through corresponding repair and maintenance contract	No	Yes	Yes

Comparison summarizing provisions relevant to the treatment of BIM in FIDIC, JCT2011 & NEC3

	FIDIC	JCT 2011	NEC 3
Provision for collaborative working	No	Yes, if optional Schedule 8 is used	Yes, if Option X12 is incorporated
Provision for role of BIM Information Manager	No	No	No
Corresponding main contract, sub-contract and consultant appointment forms	Yes	Yes, JCT2011 Consultant Appointment is only for public sector clients	Yes

Standard forms and collaborative working

- BIM enables collaborative working, for example through the use of BIM models to assist joint working by design consultants and through the improved ability to explain design proposals to the client.
- The foundations for effective collaborative working through BIM are provided by a clear and integrated contractual framework.

Standard forms and collaborative working

- Contract provision that can support BIM through encourage a collaborative culture include mutual agreement to act in good faith or otherwise in a collaborative manner

Standard forms and collaborative working

- JCT 2011: provision for “good faith” in optional Appendix 8 but no equivalent commitment in the JCT Consultant Agreement (Public Sector)
- NEC3: provision for “mutual trust and co-operation” in clause 10.1 of all building contracts and consultant appointments
- No equivalent provisions in FIDIC

Standard forms and collaborative working

- Specific contract provisions that support collaborative working through BIM are not necessarily expressly collaborative.
- These include for example the agreement of deadlines and interfaces for model production, delivery, comment and approval, and provisions for team members to resolve issues through clash detection, early warning and a forum for joint risk management.

Standard forms and collaborative working

- Effective collaborative working can also be developed through a procurement model that brings all BIM contributors onto the team at the optimum time, that uses BIM to build reliable shared data and mutual confidence and that considers the operational impact of BIM on those who will repair, maintain and operate the completed capital project.

Singapore BIM Particular Conditions

1. DEFINITIONS
2. GENERAL PRINCIPLES
3. BIM MANAGEMENT
4. BIM EXECUTION PLAN
5. RISK ALLOCATION
6. INTELLECTUAL PROPERTY RIGHTS
7. ELECTRONIC DATA EXCHANGE
8. TERMINATION, RESCISSION OR EXPIRY OF PRINCIPAL AGREEMENT

PARTICULAR CONDITIONS FOR BUILDING INFORMATION MODELLING

1. DEFINITIONS

1.1. **BIM** means building information modelling and is the process and technology used to create a Model.

1.2. **BIM Guide** refers to the guide on use of BIM which is specified in the Principal Agreement. If the Principal Agreement does not mention a guide to be used, then the Building and Construction Authority Singapore BIM Guide (current as at the date of the Principal Agreement) shall be used.

1.3. **BIM Particular Conditions** means this document.

1.4. **BIM Execution Plan** means the latest plan outlining the procedures and modelling protocol prepared in accordance with Clause 4.

1.5. **BIM Manager** means the person, firm or corporation appointed by the Employer in accordance with Clause 3 to be the BIM Manager.

1.6. **Contribution** means the expression, design, data or information that a party in the Project creates or prepares, and shares with other parties in the Project for use in or in connection with a Released Model. Contribution includes a Released Model.

1.7. **Designer** refers to any party in the Project who is responsible for the design of the whole or some part of the Project.

1.8. **Drawings** means two dimensional representations, hand sketches, perspective views or other graphical outputs printed physically or electronically.

1.9. **Employer** means the party named as "the Employer" in the main building contract for the Project

1.10. **Model** means a digital representation of the Project or part of the Project, and used to describe a two dimensional representation, three dimensional representation, as well as other data representations, including Drawings, as identified in the BIM Execution Plan.

1.11. **Released Model** means a Model identified as such and released by the Model Author from time to time as agreed in the BIM Execution Plan.

1.12. **Model Author** means the party responsible for developing the specific content of a Model to the level of detail required for a particular purpose of the Project. **Model Authors** are identified in the BIM Execution Plan.

BIM Particular Conditions Version 2

1.13. **Model User** means any party authorised to use a Model in the Project, such as for analysis, estimating or scheduling or for development of other Models, and includes subsequent or other Model Authors.

1.14. **Principal Agreement** means the agreement or contract for services, supply and/or construction which a party has entered into for the Project.

1.15. **Project** means the project referred to in the Principal Agreements.

2. GENERAL PRINCIPLES

2.1. The Principal Agreement for any party who is carrying out BIM shall include the BIM Particular Conditions.

2.2. Any party to the Project who has the BIM Particular Conditions in its Principal Agreement shall, by a term in the relevant agreement or contract, include the BIM Particular Conditions in the respective agreement or contract with all of its subconsultants, suppliers and subcontractors who will be involved in carrying out BIM for the Project.

2.3. The benefit of the BIM Particular Conditions shall accrue to every party in the Project who has the BIM Particular Conditions in its Principal Agreement.

2.4. Unless otherwise expressly provided in the BIM Particular Conditions, the BIM Particular Conditions do not change any contractual relationships or shift any risk of the parties in a Project which has been agreed in the respective Principal Agreements. In particular:

2.4.1. Nothing in the BIM Particular Conditions shall relieve a Designer from its obligation, nor diminish the role of the Designer, as the person responsible for and in charge of the design of the Project or any part of the Project.

2.4.2. Participation of a contractor, its subcontractors and/or suppliers in carrying out BIM shall not constitute performance of design services unless the contractor, its subcontractors and/or suppliers had assumed design responsibility under their respective Principal Agreements.

2.5. In the event of any inconsistency between the BIM Particular Conditions and the relevant Principal Agreement, the BIM Particular Conditions shall prevail.

2.6. With regard to the Models, the following principles shall apply:

2.6.1. A Released Model is not intended to provide the level of detail needed in order to extract materials, specifications or quantities unless this is required in the BIM Execution Plan.

2.6.2. All dimensions in a Model shall be verified on site where possible and applicable before commencing any construction.

2.6.3. If any party to the Project discovers any discrepancy between the latest version of a Released Model by one Model Author and that by another Model Author, or any contract document in any Principal Agreement, that party shall immediately inform the BIM Manager who shall facilitate resolution of the discrepancy.

3. BIM MANAGEMENT

3.1. The Employer shall appoint one or more BIM Managers for the Project. All compensation and related costs for the BIM Manager shall be paid by the Employer unless otherwise agreed between the parties in the Project.

3.2. The role and responsibilities of the BIM Manager shall be as provided in the BIM Guide unless agreed otherwise in the BIM Execution Plan.

4. BIM EXECUTION PLAN

4.1. As soon as practicable and from time to time as required, the BIM Manager shall call all parties to the Project involved in the execution of BIM to confer and agree upon the terms of or modifications to the BIM Execution Plan. The parties involved shall use their best efforts to agree upon the terms of or modifications to the BIM Execution Plan.

4.2. The BIM Execution Plan shall be developed in accordance with the BIM Guide.

4.3. The BIM Manager shall maintain a history of all Released Models.

4.4. The BIM Manager shall schedule and facilitate all meetings concerning BIM. In the event of any disagreement on the terms of or modifications to the BIM Execution Plan, the BIM Manager's decision shall be final and conclusive. In the event that more than one BIM Manager has been appointed, then the decision shall be the joint decision of the BIM Managers failing which, the Employer shall decide and his decision shall be final and conclusive.

4.5. If under the BIM Execution Plan, any party is required to perform or carry out any work which is beyond its scope of work under its Principal Agreement, such work shall be treated as additional works or variations under its Principal Agreement. The party carrying out the additional works or variations shall, before commencing any such

BIM Particular Conditions Version 2

work, obtain the prior written consent of the counter party(ies) to its Principal Agreement, whichever is applicable.

4.6. The BIM Manager shall report to and keep the Employer informed on all matters and the BIM Execution Plan, as updated from time to time, shall be subject to the approval of the Employer.

5. RISK ALLOCATION

5.1. The Contribution of each Model Author is intended to be shared with Model Users throughout the course of the Project.

5.2. Subject always to Clause 6, in contributing content to the Model, the Model Author does not convey any ownership right in the content provided or in the software used to generate the content. Any subsequent Model User's right to use, modify, or further transmit the Model is specifically limited to the design and construction of the Project (including authorities' submissions, where required), and nothing contained in the BIM Particular Conditions conveys any other right to use the Model for another purpose.

5.3. It is understood that while specific content of a Released Model may include data that exceeds the required level of detail specified in the BIM Execution Plan, Model Users may rely on the accuracy and completeness of a Released Model only to the extent required for the level of detail specified in the BIM Execution Plan.

5.4. Any use of, or reliance on, content of a Released Model that exceeds the level of detail specified in the BIM Execution Plan by Model Users shall be at their own risk and without liability to the Model Author. Model Users shall indemnify and defend the Model Author from and against all claims arising out of or in relation to that Model User's unauthorised modification to, or use of, the Model Author's content.

5.5. Should any Released Model be included as part of the contract documents in any Principal Agreement, parties may rely upon the accuracy of information in that Released Model only to the extent specified in the BIM Execution Plan.

5.6. The standard of care applicable to each Model Author regarding its Contribution shall be in accordance with that party's Principal Agreement. If the standard of care is not specified, the standard of care shall be the applicable degree of skill, care and diligence expected of a competent person involved in execution of BIM in Singapore, carrying out the same role or scope of work as that Model Author on the Project.

5.7. Each party in the Project shall use its best efforts to minimize the risk of claims and liability arising out of or in relation to the use of or access to its Released Models. Such efforts may include reporting forthwith to the relevant party and the BIM Manager any errors, inconsistencies or omissions it discovers in its Released Model or Contribution.

5.8. No Model Author shall be responsible for costs, expenses, liabilities, or damages which may result from use of its Contribution beyond the uses stated in the BIM Execution Plan.

6. INTELLECTUAL PROPERTY RIGHTS

6.1. Each Model Author warrants that it owns the copyright to its Contribution or is licensed by the holders of copyright in the Contribution to make the Contribution and grant such licence as enumerated under sub-Clause 6.3.

6.2. Subject to sub-Clause 5.8, each Model Author agrees to indemnify the Model Users against claims of third parties for infringement or alleged infringement of copyrights contained in that Model Author's Contribution.

6.3. Each Model Author grants to the Model Users a limited, non-exclusive licence to reproduce, distribute, display or use the Contribution of that Model Author for the sole purpose of carrying out BIM in the Project. The limited licence granted in this sub-Clause shall include any archival purposes permitted in these BIM Particular Conditions or in the Principal Agreement of that Model Author. In this regard, after final completion of the Project, the non-exclusive licence shall be limited to keeping an archival copy of Project-related Contributions.

6.4. The Employer's right to use any Released Models and Contributions after completion of the Project shall be governed by the Principal Agreement(s) of the Model Author of the relevant Released Model and Contribution.

6.5. In the absence of express language to the contrary in the Principal Agreement or in the BIM Particular Conditions:

6.5.1. nothing in the BIM Particular Conditions, and

6.5.2. no act by any party in the Project in furtherance of the BIM Particular Conditions,

shall limit, transfer or otherwise affect any of the intellectual property rights that a party may have with respect to any Contribution. Other parties, persons or entities

that provide Contributions to a Model shall not be deemed to be co-authors in the Contributions of other parties to the Project.

7. ELECTRONIC DATA EXCHANGE

7.1. Each party does not warrant the integrity of any electronic data delivered in accordance with the BIM Particular Conditions other than as expressly provided, if any, in the BIM Execution Plan or the Principal Agreement.

7.2. Each party shall not be liable for any corruption or unintended amendment, modification or alteration of the electronic data in any Model produced by that party which occurs after the said Model has been transmitted by that party except where the corruption or unintended amendment, modification or alteration was due to the failure of that party to comply with the BIM Particular Conditions or the BIM Execution Plan.

8. TERMINATION, RESCISSION OR EXPIRY OF PRINCIPAL AGREEMENT

8.1. Clauses 1, 2, 5 and 6 of the BIM Particular Conditions shall continue to apply following the termination, rescission or expiry of the Principal Agreement.

5. Risk allocation – 5.1

- The Contribution of each Model Author is intended to be shared with Model Users throughout the course of the Project.

5. Risk allocation – 5.2

- Subject always to Clause 6, in contributing content to the Model, the Model Author does not convey any ownership right in the content provided or in the software used to generate the content. Any subsequent Model User's right to use, modify, or further transmit the Model is specifically limited to the design and construction of the Project (including authorities' submissions, where required), and nothing contained in the BIM Particular Conditions conveys any other right to use the Model for another purpose.

5. Risk allocation – 5.3

- It is understood that while specific content of a Released Model may include data that exceeds the required level of detail specified in the BIM Execution Plan, Model Users may rely on the accuracy and completeness of a Released Model only to the extent required for the level of detail specified in the BIM Execution Plan.

5. Risk allocation – 5.4

- Any use of, or reliance on, content of a Released Model that exceeds the level of detail specified in the BIM Execution Plan by Model Users shall be at their own risk and without liability to the Model Author. Model Users shall indemnify and defend the Model Author from and against all claims arising out of or in relation to that Model User's unauthorised modification to, or use of, the Model Author's content.

5. Risk allocation – 5.5

- Should any Released Model be included as part of the contract documents in any Principal Agreement, parties may rely upon the accuracy of information in that Released Model only to the extent specified in the BIM Execution Plan.

5. Risk allocation – 5.6

- The standard of care applicable to each Model Author regarding its Contribution shall be in accordance with that party's Principal Agreement. If the standard of care is not specified, the standard of care shall be the applicable degree of skill, care and diligence expected of a competent person involved in execution of BIM in Singapore, carrying out the same role or scope of work as that Model Author on the Project.

5. Risk allocation – 5.7

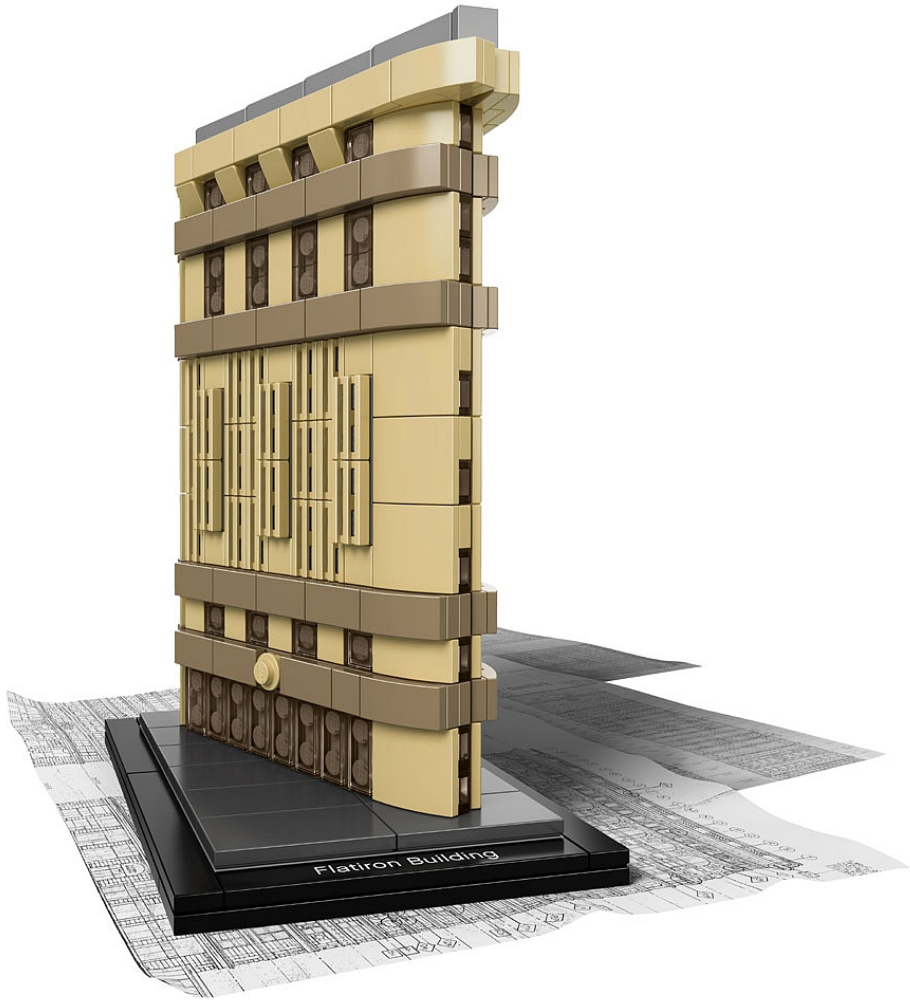
- Each Party in the Project shall use its best efforts to minimize the risk of claims and liability arising out of or in relation to the use of or access to its Released Models. Such efforts may include reporting forthwith to the relevant party and the BIM Manager any errors, inconsistencies or omissions it discovers in its Released Model or Contribution.

5. Risk allocation – 5.8

- No Model Author shall be responsible for costs, expenses, liabilities, or damages which may result from use of its Contribution beyond the uses stated in the BIM Execution Plan.

How does the CIC BIM Protocol work?

- Overriding effect
- Licensing of models
- Limits of liability
- CIC BIM Protocol Appendices
- Duty of care
- Client concerns



Overriding effect

- NEC3 suggests that parts of the CIC BIM Protocol should be “additional conditions of contract”, including clause 2 regarding its overriding effect in the event of discrepancies, but also suggests that other parts such as clauses 3 and 4 should be including in the NEC3 “Works Information”.

Overriding effect

- This leaves unclear, for example, how the wording of clause 4 in relation with events outside a team member's "reasonable control" will be reconciled with the detailed "compensation events" described in NEC3 clause 60.

Overriding effect

- JCT2011 refers to protocols in general terms and suggests that a protocol should be additional “Contract Document” or should be included as part of the ”Employer’s Requirements”.
- Neither of these options clarifies the status of a protocol where it clashes with the JCT contract conditions, for example as between clause 4 of the CIC BIM Protocol and JCT “Relevant Events” giving rise to extension of time.
- It is therefore relevant to note JCT Practice Note 2016 which states that, in the event of conflict with a protocol, the relevant JCT contract should take precedence.

Licensing of models

- The provisions of the CIC BIM Protocol and its supporting guidance set out a reasonably balanced approach to the licensing of BIM models, including:
- The grant of a non-exclusive licence for the client to transmit, copy and use models for the agreed project-related purposes for which they were prepared (clause 6.3);
- The right for the client to grant equivalent sub-licences and for team members to grant equivalent sub-sub-licences (clause 6.3, 6.6, 6.7);

Licensing of models

- Exclusion of the right to amend models except for agreed purposes (clause 6.5.1) and exclusion of the right to reproduce models for the purpose of project extensions (clause 6.5.2)
- Mutual obligations on the client and project team members to procure licences as required to meet their agreed licence obligations under the protocol (clauses 6.9, 6.10)

Limits of liability

- The CIC BIM Protocol includes the following limits on a project team member's liability:
- No warranty as to integrity of electronic data transmission, and no liability for corruption or alteration occurring after transmission (clause 5)

Limits of liability

- Cross-reference to a right to revoke or suspend a licence to use models in the event of non-payment (clause 6.4)
- No liability for the modification, amendment, transmission, copying or use of BIM models other than for agreed purposes (clause 7)

Appendices

- Appendix 1: The Model Production and Delivery Table, setting out the Levels of Detail to be achieved in respect of each BIM model by each project team member at each stage.

Appendices

- Appendix 2: Details of the BIM Information Manager, and details of the Employer's Information Requirements, setting the Common Data Environment created through BIM including agreed software and formals plus cross-reference to the BIM Execution Plan and related project procedures.
- These documents need to be integrated with consultant services schedules, the contractor's project brief and the project programme in each consultant appointment, main contract and sub-contract.

Levels of Detail and the Model Production and Delivery Table

The Levels of Detail are as follows:

LOD 1 _____
LOD 2 _____
LOD 3 _____
LOD 4 _____
LOD 5 _____
LOD 6 _____
LOD 7 _____

The Stages are as follows:

STAGE 1 _____
STAGE 2 _____
STAGE 3 _____
STAGE 4 _____
STAGE 5 _____
STAGE 6 _____
STAGE 7 _____

This is a framework for a Model Production and Delivery Table. The parties may choose any other appropriate format and attach it to this Appendix.

An editable version of the BIM Protocol Appendices are provided on the BIM Task Group Website: **www.bimtaskgroup.org**

Specimen Model Production and Delivery Table

Showing models required at different project stages

LOD definitions (from PAS 1192)

1 Brief
2 Concept
3 Developed Design
4 Production
5 Installation
6 As constructed
7 In use

Stage definitions (from APM)

0 Strategy
1 Brief
2 Concept
3 Definition
4 Design (production information)
5 Build & Commission
6 Handover & Closeout
7 Operation and end of life

Model Originators identified by name

	Drop 1 Stage 1		Drop 2a Stage 2		Drop 2b Stage 2		Drop 3 Stage 3		Drop 4 Stage 6	
	Model Originator	Level of Detail	Model Originator	Level of Detail	Model Originator	Level of Detail	Model Originator	Level of Detail	Model Originator	Level of Detail
Overall form and content										
Space planning	Architect	1	Architect	2	Contractor	2	Contractor	3	Contractor	6
Site and context	Architect	1	Architect	2	Contractor	2	Contractor	3	Contractor	6
Surveys							Contractor	3		
External form and appearance			Architect	2	Contractor	2	Contractor	3	Contractor	6
Building and site sections					Contractor	2	Contractor	3	Contractor	6
Internal layouts					Contractor	2	Contractor	3	Contractor	6
Design strategies										
Fire			Architect	2	Contractor	2	Contractor	3	Contractor	6
Physical security			Architect	2	Contractor	2	Contractor	3	Contractor	6
Disabled access			Architect	2	Contractor	2	Contractor	3	Contractor	6
Maintenance access			Architect	2	Contractor	2	Contractor	3	Contractor	6
BREEAM					Contractor	2	Contractor	3	Contractor	6
Performance										
Building	Architect	1	Architect	2	Contractor	2	Contractor	3		
Structural	Architect	1	Str Eng	2	Contractor	2	Contractor	3		
MEP systems	Architect	1	MEP Eng	2	Contractor	2	Contractor	3		
Regulation compliance analysis							Contractor	3	Contractor	6
Thermal Simulation							Contractor	3	Contractor	6
Sustainability Analysis							Contractor	3	Contractor	6
Acoustic analysis							Contractor	3	Contractor	6
4D Programming Analysis										
5D Cost Analysis										
Services Commissioning							Contractor	3	Contractor	6
Elements, materials components										
Building			Architect	2	Contractor	2	Contractor	3	Contractor	6
Specifications			MEP Eng	2	Contractor	2	Contractor	3	Contractor	6
MEP systems					Contractor	2	Contractor	3	Contractor	6
Construction proposals										
Phasing							Contractor	3		
Site access							Contractor	3		
Site set-up							Contractor	3		
Health and safety										
Design							Contractor	3		
Construction							Contractor	3		
Operation							Contractor	3	Contractor	6

This is a framework of a generic Information Requirements. Parties may choose to include further detail if they require.

An editable version of the BIM Protocol Appendices are provided on the BIM Task Group Website: **www.bimtaskgroup.org**

Information Requirements

1. Standards

The following standard(s) shall apply: _____

2. Parties

2.1 The parties involved in the Project are:

2.2 The role of Information Manager shall be performed by the following person or persons for the following stages:

Stages	*Person*
_____	_____
_____	_____

3. Employer's Information Requirements

3.1 The Common Data Environment shall be _____

3.2 The Models shall be developed using the following versions of the following software:

_____

3.3 The Models shall be delivered by the persons listed below in the following formats:

Person	*File format*
_____	_____

3.4 Files and layers shall be named and numbered in accordance with

_____

3.5 The following units, annotation, dimensions, abbreviations and symbols shall be used in developing a Model

_____

3.6 The following co-ordinate system shall be used

_____

3.7 The zoning requirements are as follows

_____

3.8 Data drops shall take place in accordance with the [Employer's Information Requirements/ Execution Plan]. To the extent that the [Employer's Information Requirements/Execution Plan] requires a particular piece of information to be extracted from a Model in more than one format at any particular Stage, all such formats shall be extracted from the same Model.

4. Project Procedures

4.1 The following protocols/procedures shall apply to the Project:

4.1.1 Spatial Co-ordination protocol;

4.1.2 Model approval/information exchange protocol;

4.1.3 Archiving procedures;

4.1.4 Security requirements and access rights procedures;

4.1.5 [Other]

4.2 Resolution of conflicts

_____

specify any circumstances in which information extracted from a Model will take precedence over the Model.

Duty of care

- The obligation on project team members to produce models in accordance with agreed Levels of Detail specified in the Model Production and Delivery Table is limited to “reasonable edeavours” which is a lower, less clear duty of care than the accepted standard of reasonable skill and care (clause 4).

Duty of care

- Also a team member's compliance with the Model Production and Delivery Table and the Information Requirements is stated to be "subject to events outside its reasonable control" (clause 4), a generic exception which overrides the detailed provisions for extension of time contained in most standard form of building contracts.

Client concerns

- The absolute obligations on the client to secure protocols in substantially the same form from all other project team members, and to update the Information Requirements and the Model Production and Delivery Table (clause 3), should also be made clear to clients before the CIC BIM Protocol is adopted.

What contractual provisions support BIM?

- Treatment of deadlines and interfaces
- Clash detection, early warning and risk management
- Intellectual property licences

Treatment of deadlines and interfaces

- The efficient development of BIM models requires clarity as to when each LoD will be provided in each BIM model at each stage of design, supply and construction required to deliver a project.

Treatment of deadlines and interfaces

- In order to obtain the benefits of BIM the team members need deadlines supporting the agreed commitments by all team members (including the client):
- To produce and deliver their BIM models to the agreed level of Definition by agreed deadlines at each stage;
- To provide comments and approvals by agreed deadlines at each stage;
- To specify what matters may prevent agreed deadlines being met.

Treatment of deadlines and interfaces

- BIM deadlines at each stage of a project need to be spelled out in the applicable contract documents.
- Standard form consultant and building contract provisions that can embody agreed deadlines in respect of BIM include:

Treatment of deadlines and interfaces

- The JCT Information Release Schedule, although this only relates to the construction phase and only commits the client to procure release of designs to the main contractor by stated dates.
- It appears only in the JCT 2011 building contract forms, with no corresponding commitment in the JCT Consultant Appointment (Public Sector).

Treatment of deadlines and interfaces

- NEC3 provision for Key Dates, which appear both in the NEC3 Building Contract and in the NEC3 Professional Services Contract.
- The recommended templates for BIM Execution Plans published by the CIC include agreements to agree successive layers of timing details.

Clash detection, early warning and risk management

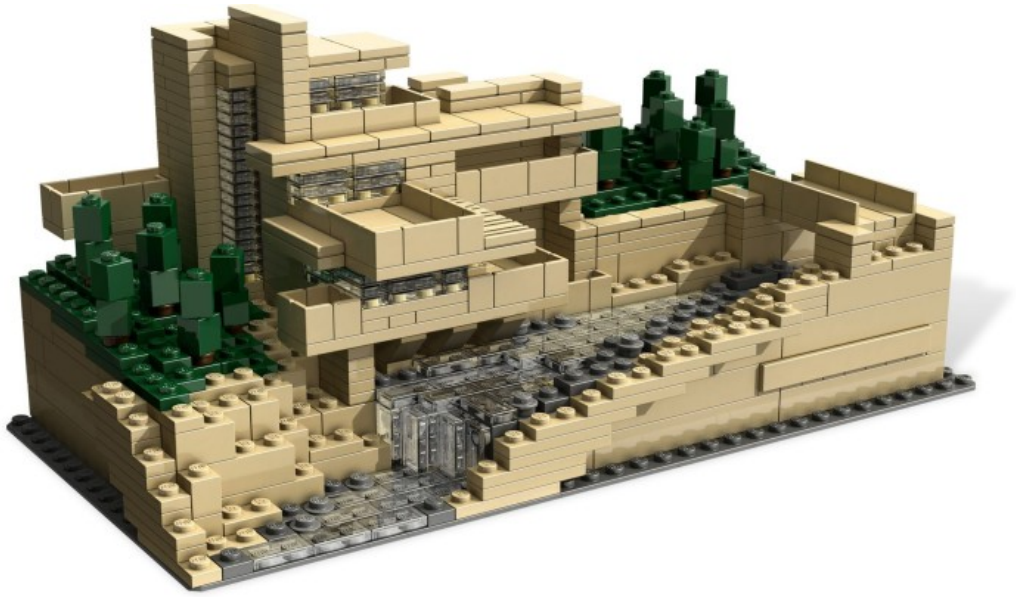
- BIM enables design inconsistencies to be revealed through clash detection, but clashes can give rise to additional work (possibly for no additional fee) whenever a project team member amends its BIM model in order to resolve the clash.
- In order to avoid this giving rise to disputes there needs to be a contractual mechanism to determine what action the team members are required to take in respect of clashes that are detected and notified but that cannot be resolved by agreement in a design team meeting.

Clash detection, early warning and risk management

- This mechanism could be a forum tasked with seeking a constructive solution to BIM clashes.
- NEC3 Option X12 provides for a “Core Group” which could act as a forum but further detail needs to be added in respect of its meeting and decision-making procedures.
- Also NEC3 clause 16 provides for an “early warning” system linked to “risk reduction meetings” which can act as a forum for notifying and resolving BIM clashes.

Clash detection, early warning and risk management

- JCT 2011 and FIDIC do not provide an early warning system or a forum for resolving BIM clashes.
- The CIC BIM Protocol does not provide an early warning system or a forum for resolving BIM clashes.



Intellectual property licences

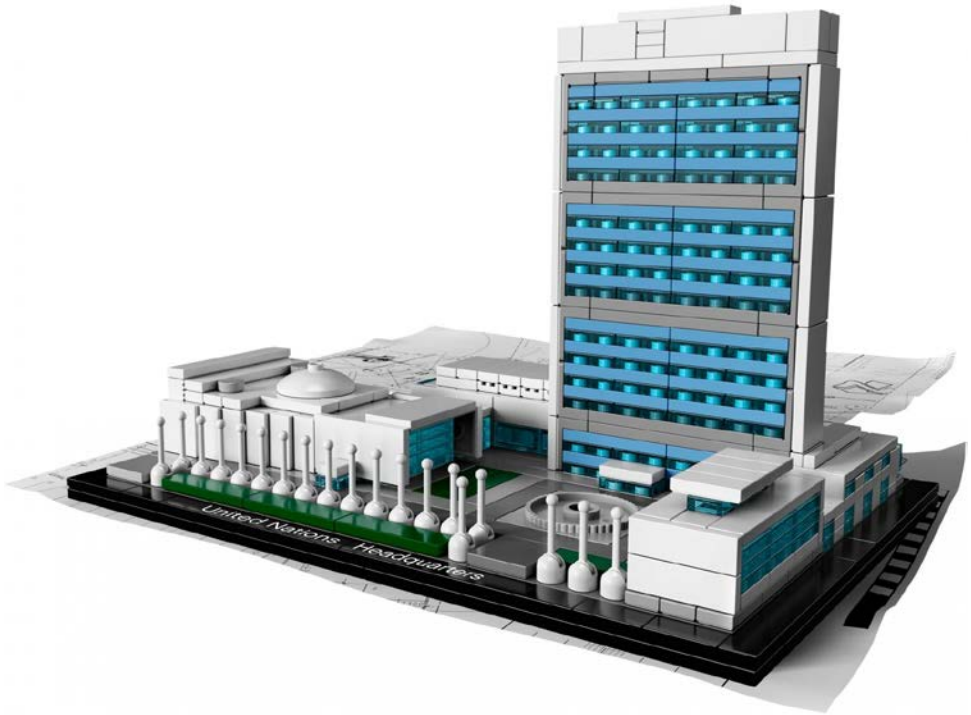
- Existing statutory copyright protection already covers graphic and non-graphic design work plus “computer programs” and “preparatory design material for a computer program”.
- Contributions to BIM models can be traced to their authors.
- For the purposes of BIM it is important that team members can reply on each other’s ownership of intellectual property in their respective BIM contributions and that those rights are licensed in the way that supports completion, use and operation of the project.

Intellectual property licences

- Intellectual property right are treated as follows in the standard form contracts:
- FIDIC: two party licence under clause 1.10;
- JCT 2011: two party licence under 2.4.1;
- NEC3: two party licence under 22.1
- CIC BIM Protocol offers a balanced approach

What is the contractual status of BIM documents?

- BIM protocol and/or amended contract terms
- Employer’s Information Requirements
- BIM Execution Plans



BIM protocol and/or amended contract terms

- A BIM protocol and/or schedule amendments to contract terms in consultant appointments, main contracts and sub-contracts set out the parties' contractual roles and responsibilities if these are not already covered by the contracts.
- These roles and responsibilities are described in the BIM Execution Plan or in PAS 1192:2-2013.

BIM protocol and/or amended contract terms

- The protocol and/or amended contract provisions may also annex or refer to other relevant documents such as, in the case of the CIC BIM Protocol, agreed applicable “BIM standards”, the Employer’s Information Requirements, the BIM Execution Plan and the “Project Procedures” each of which should be defined and identified as tender/contract documents.

BIM protocol and/or amended contract terms

- All relevant standards should form part of the client's brief issued to any consultant or contractor at tender stage, and should also form part of the their respective contracts.

BIM protocol and/or amended contract terms

- The term “Project Procedures” in the CIC BIM Protocol described processes for matters such as spatial coordination, model approval, archiving, information security and resolution of conflicts.
- The CIC BIM Protocol envisages these as a separate set of terms but they are closely related to the Employer’s Information Requirements and, in relation to conflict resolution, they are closely related to the contract terms.

Employer’s Information Requirements

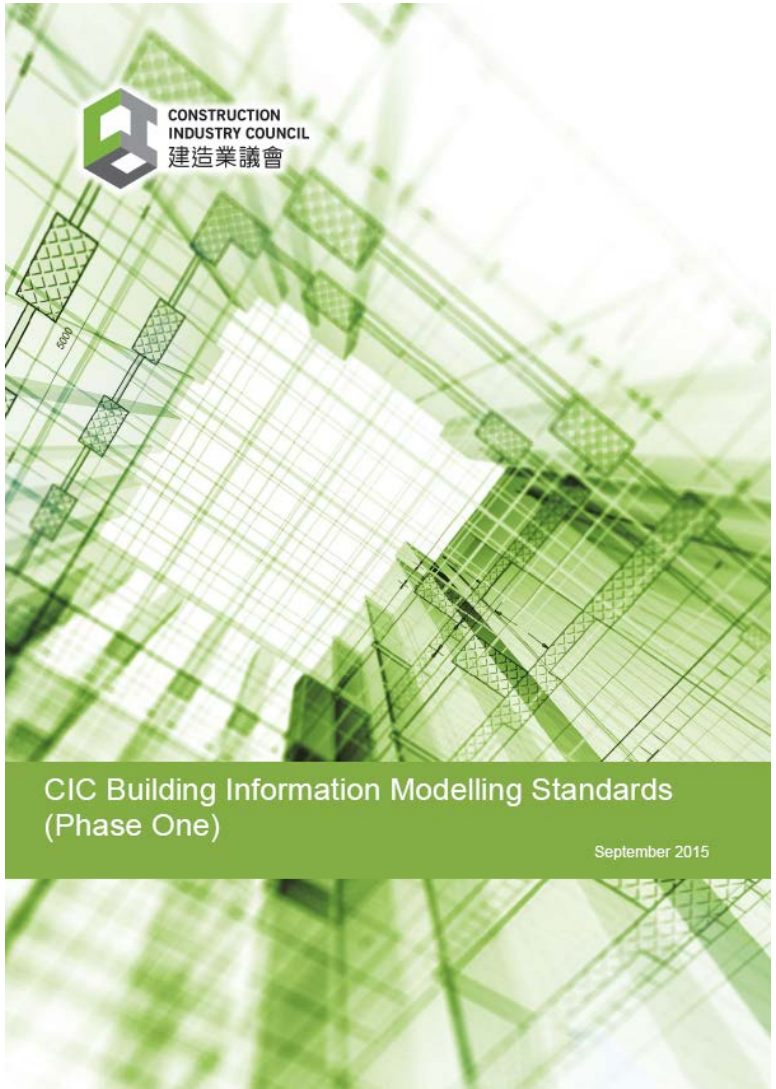
- The Employer’s Information Requirements set out the Employer’s BIM requirements and/or specifications and should form part of the client’s brief to any consultant or contractor at tender stage, and part of their respective contracts.
- They set out the details of the Common Data Environment created through BIM, including agreed software and formats, and cross-refer to the BIM Execution Plan and related project procedures.

BIM Execution Plans

- The BIM Execution Plan formulates each consultant's and contractor's intended processes to fulfil and achieve the Employer's Information Requirements, and should form part of the commitments offered by each party in their respective tender submissions and in their contracts.
- The BIM Execution Plan may also set out the timing of each party's BIM contribution.

Hong Kong Standard Form of Building Contract

CIC Building Information Modelling Standards (Phase One) September 2015



Membership List of
the Task Group on Establishment of Industry Standard

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Mr. LAM Kuen	Development Bureau (DevB)
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Convenor and Secretary
CIC Secretariat

Membership List of the Task Group on Establishment of Industry Standard

HK Case #1 At the Risk of the Contractor

- The Contractor will be given design stage LOD 300 BIM models. The Contractor shall note that the design models may not reflect the final contractual information and it is for reference only.
- It is the Contractor's liability to verify the correctness of the design stage BIM models. The application of the BIM model shall be at the risk of the Contractor and no claims of whatsoever arising out of any discrepancies, errors or omissions due to inaccurate information or particulars in the BIM models will be allowed.

HK Case #2 Design BIM Model may be provided

- A design BIM model may be provided by the Contract Manager (CM).
- In the case where a design BIM model is provided by the CM, the initial BIM model(s) may be based on the design BIM model and updated with the design information of drawings produced by the Sub-Contractors, including all NSCs, Suppliers, Direct Contractors, Government Departments, Utility Undertakers and the CM, and is subject to approval by the CM.

HK Case #3 For reference only and no Claim Whatsoever

- The design BIM model provided by the CM is for reference only without limiting the Contractor's obligations and liabilities under the Contract.
- The Contractor's shall verify the design model(s) with contract drawings issued by the CM. No claim whatsoever will be entertained on account of any errors, discrepancies and insufficiency in relation to the information provided in the design BIM model.

HK Case #4 Project Execution Plan Standard

- The Contractor is required to submit a Project Execution Plan within 2 weeks of awarding the contract to outline BIM process.
- The format of the guideline shall follow the BIM Project Execution Planning Guide highlighted as described in the following link: http://bim.psu.edu/

HK Case #5 Project BIM Execution Plan

- The BIM Manager (BM) is responsible to prepare, review, and update the Project BIM Execution Plan (PxP).
- Contract Manager (CM) might pass on a PxP, whether complete or incomplete, to Contractor within 2 weeks after the initial contract meeting for follow up action.
- BM shall review the PxP, consolidate inputs from Project Team, and advise CM on the technical aspects for the optimum use of the BIM technology in the Project, and distribute the latest PxP to the Project Team in colour digital format.

What reliance can be placed on BIM software?

- Reliance on data and communication
- Exclusions of liability

What reliance can be placed on BIM software?

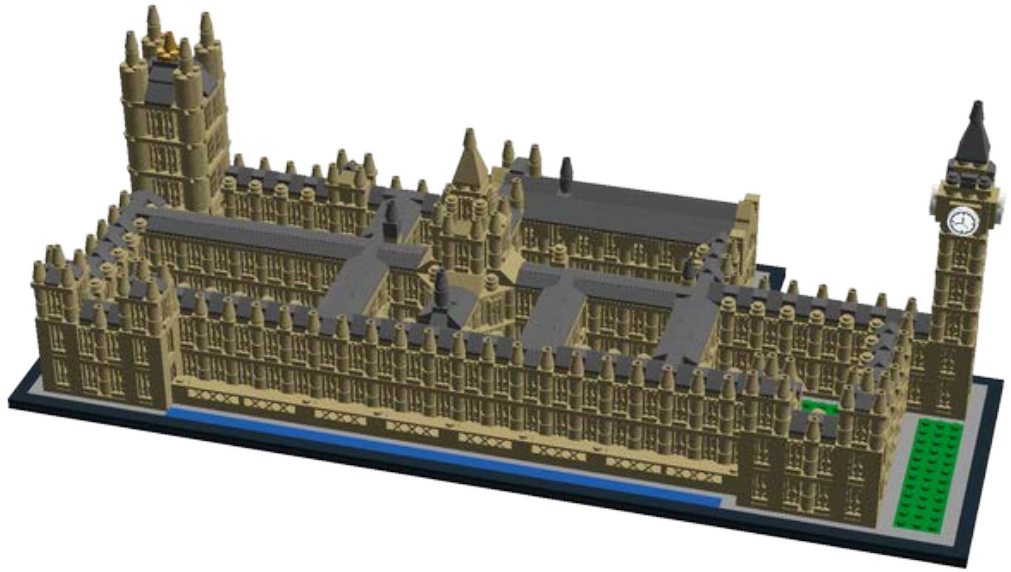
- The fundamental requirement for producing information through a collaborative activity is to share information early and to trust the information that is being shared as well as the originator of that information.
- BIM is not about software, but a more collaborative way of working.

Reliance on data and communication

- Electronic communication is a ubiquitous phenomenon not confined to BIM, and is widely used on contraction projects without contract exclusions as to the risk of data security in transmissions.
- Contract documents need to clarify BIM-related software processes and provide for balanced risk allocation, bearing in mind that clients will expect a reasonable level of protection.
- Standard form construction contracts and appointments have not typically limited or excluded liability for the accuracy of two dimension drawings or computer-aided three dimensional designs. Hence, contractual silence on this issue is the starting point in FIDIC, JCT and NEC3 standard forms.

Exclusions of liability

- CIC BIM protocol excludes any warranty as to the integrity of electronic data transmission, and also excludes any liability for corruption or alteration occurring after transmission.
- These exclusions place all the excluded risks with the client, and do not require project team members to pass any liability at all to BIM software providers.



Exclusions of liability

- The standard Autodesk License and Services Agreement limits any warranty to a 90-day period (or the licence term if shorter) and limits Autodesk's liability (to the extent permitted by law) to "attempt to correct or work around errors" or to "refund the license fees".
- This is accompanied by extensive disclaimers including the exclusion of any warranty that "the operation or output of the licensed materials will be uninterrupted, error-free, secure, accurate, reliable or complete".
- Autodesk also excludes liability for any "incidental, special, indirect, consequential or punitive damages, for loss of profits, use, revenue or data; or for business interruption".

Exclusions of liability

- If exclusions of this type are accepted without question and are passed on to clients, there is the risk that clients will question whether these exclusions dilute the benefits obtained from the adoption of BIM.

What is the role of the BIM Information Manager?

- The key with BIM is realizing value from our digital assets through clear and consistent ways of defining data requirements, consistency in data management and improved data procurement, which gives us greater provenance and assurance in the quality of data we receive.

Reliance on expertise

- Requirements for the BIM Information Manager to:
- Initiate, agree and implement the Project Information Plan and Asset Information Plan;
- Enable integration of information within the Project Team and co-ordination of information by the Design Lead;
- Provide the services to host the Common Data Environment.

Reliance on expertise

- The Information Manager has a key role in setting up and managing the Common Data Environment (CDE). The CDE is a key tool for effective collaboration, quality control and avoidance of waste.
- The Information Manager has no design related duties. Clash detection and model coordination activities associated with a “BIM coordinator” remain the responsibility of the design lead.

Reliance on expertise

- BIM consultants typically undertake coordination and clash detection in connection with models;
- Employers are advised to avoid blurring responsibility through the direct appointment of BIM consultants to undertake model coordination.
- Use of sub-consultancy appointments under an existing design consultant appointment will maintain the existing allocation of design responsibility.

Need for clarification

- There is a lack of clarity as to who should take on the role of BIM Information Manager and how this interfaces with the role of the design lead as party responsible for BIM model coordination.
- As long as these roles are not fully understood and as long as team members each reply primarily on their own staff, or on BIM Consultants who are not themselves members of the team with clear services, there will be limits on the extent to which BIM can support integrated teams.

End of Presentation