LIABILITIES FOR DESIGN DEFECTS IN A COLLABORATIVE, INTEGRATED DIGITAL AGE

A presentation on the UK experience
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“…essentially value creating collaboration through the entire life-cycle of an asset, underpinned by the creation, collation and exchange of shared 3D models and intelligent, structured data attached to them.” UK Government Task Group
What does that mean?

The key feature of BIM is the bringing together of information from all members of the BIM team to produce a database of the building objects comprising the project. The database, generally known as a “federated model”, is capable of interacting with many other BIM processes and applications and can be used by the project professionals in an automated format to guide and develop a project from its conception and early design stages through to completion and the monitoring of its subsequent performance throughout its life cycle.
THE ROAD TO BIM IN THE UK

- From the drawing board – 2D representations prepared manually
- Early 1980s: “AutoCAD” – computer aided design tools in 2D, then also 3D capabilities
- 2007: included improved 3D modelling and editing features which enabled far greater modelling of curves, surfaces and solids.
THE ROAD TO BIM IN THE UK

To advanced CAD –

- 2010 AutoCAD became available as a mobile web and cloud-based application.
- Recent developments include social collaboration tools, time-saving enhancements, live maps, and reality capture capabilities.
CAD in the UK today

- 2014 release is said to comprise:
  - “…robust 3D tools that can create almost any shape imaginable, AutoCAD helps you create stunning designs. It offers innovations that can help increase design efficiency and speed documentation, and enables you to more smoothly share designs with colleagues. Connect with the cloud to collaborate on designs and access them from your mobile device. With these capabilities and more, AutoCAD delivers the power and flexibility you need to take documentation and design further.

- AutoCAD software is used by architects, CAD technicians, designers, engineers, project managers, and CAD/IT managers in a variety of industries, including the manufacturing, building, civil, and mapping industries.”
Disadvantages of CAD

- Drawings produced by professionals, interpreted manually, and updated manually or by redlining software;
- Scope for human error = disputes.
- Blame culture, each professional responsible for their own design;
- Design clashes
Contemporaneous Developments on the Contracting Side

“Constructing the Team”: was the title of the Latham Report of July 1994: commissioned by the UK Government to review procurement and contractual arrangements in the UK construction industry. In which Sir Michael Latham urged the reform of the construction procurement process and advocated partnering and collaboration by construction companies.
Contracting Initiatives

New Engineering Contract of 1993

- Championed a collaborative and integrated approach to procurement.
- Endorsed by the Latham Report
- NEC 2 released in 1995, adding new documents for professional services and adjudication
- NEC3 revisions published in 2013, including “How to use BIM with NEC3 contracts”.
The endorsement of NEC 3

The OCG stated:

“This edition of the NEC (NEC3) complies fully with the AEC principles. OGC recommends the use of NEC3 by public sector construction procurers on their construction projects.’

The Government’s objective: substantial savings on expenditure on public property and infrastructure.
BUILDING INFORMATION MODELLING

- The focus on the design process:
- BS1192:2007 titled “Collaborative Production of Architectural, Engineering and Construction Information”.
- Purpose: to establish the methodology for managing the production, distribution and quality of construction information, including that generated using CAD systems.
BIM LEVELS 0-3

- Level 0: Unmanaged CAD, in 2D, with paper (or electronic paper) data exchange.
- Level 1: Managed CAD in 2D or 3D format with a collaborative tool providing a common data environment with a standardised approach to data structure and format.
BIM LEVELS 0-3

- Level 2: (the UK Government’s target for 2016) this involves the presentation of data in specific databases which might also include information about costs, or programming/time lines, but without one single database for all information.

- Level 3: A fully integrated and collaborative process enabled by 'web services' and compliant with emerging Industry Foundation Class (IFC) standards. This level of BIM will utilise 4D construction sequencing, 5D cost information and 6D project lifecycle management information.
THE UK GOVERNMENT INITIATIVE


- 2012: One Year On Report – All 7 major Government Departments that procure construction engaged by the end of 2013. Eg – MOJ - Cookham Wood Prison – BIM employer requirements with tender.
THE UK GOVERNMENT INITIATIVE

- mid 2012, the structured digital data exchange format known as “COBie UK 2012”
- links were being forged with complimentary programmes for developing private and public-private sector collaborations on BIM for retail, rail and developers.
- EGs: Balfour Beatty: Heathrow Terminal 2B; M25; Mott MacDonald: £700m Victoria Underground Station in London; Adelaide Oval, Australia.
- Crossrail – largest construction project in Europe – 42km of underground tunnels across London.
THE UK GOVERNMENT INITIATIVE

2013 - The BIM Task Group and the Construction Industry Council (CIC) has produced a BIM Protocol in response to the Government’s BIM Strategy that is designed for use on all common construction contracts intended to support BIM working at level 2: CIC/BIM Pro, First Edition 2013. [To be used as a contract document].

- documents setting out the Scope of Services for Information Management that provides details of the Information Management role that is fundamental to BIM delivery on a project, and a Best Practice Guide for Professional Indemnity Insurance when using BIM.

A framework document from which other have/will be produced. Not currently a British Standard, but is a Code of Practice. The purpose of PAS 1192-2/2013 is to provide guidance about the information management requirements for projects which are to be delivered using BIM.
DATA CORRUPTION AND IP ISSUES

- If Employer is to take ownership of IP rights, Protocol will need to be amended.
- The Government’s Construction Strategy and BIM Level 2 is not intended to alter IP rights.
CONCLUSION

- Rapid strides in the UK with full government backing.
- Progress most advanced in the public sector, drives now to promote take-up in the private sector.
- Transfer from BIM Level 2 to BIM Level 3 is expected to be gradual and [hopefully] seamless.