AEC (UK) BIM Standard

A practical & pragmatic BIM standard for the Architectural, Engineering and Construction industry in the UK.

Version 1.0	November 2009	First release

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Contents

Background

The AEC (UK) CAD Standards Initiative was formed in 2000 to improve the process of design information production, management and exchange. Initially the initiative addressed CAD layering conventions as the primary concern for users of design data. As design needs and technology has developed, the initiative has expanded to cover other aspects of design data production and information exchange.

The committee was re-formed in 2009, including new members from companies and consultancies highly experienced in BIM software and implementation, to address the growing need within the UK AEC industry for a unified, practical & pragmatic BIM standard in a design environment.

The AEC (UK) CAD Standard Basic Layer Code was released in 2001, with an Advanced Code released in 2002.

The Committee

The group has representatives from architectural, engineering and construction companies in the UK, large and small, hence the adoption of the AEC (UK) moniker. The BIM committee is working together to realise a unified, usable, co-ordinated approach to Building Information Modelling in a design environment.

Committee Members

Nigel Davies (Chair)	Evolve Consultancy
Andrew Coombes	Hampshire County Council
Chris Senior	Revit Factory
Chris Seymour-Smith	Nightingale Associates
Chris Tate	BDP
David Light	HOK
David Moyes	Evolve Consultancy
Derek Murray	Mott MacDonald
Karen Fugle	Evolve Consultancy
Michael Bartyzel	Buro Happold
Mike Farmer	Haskoll
Paul Woddy	Digital Construction International
Ray Purvis	Atkins Global
Scott Grant	Excitech
Steve Wright	Ramboll UK

For full contact details and further information on the committee, please refer to www.aec-uk.org.

Disclaimer

All the advice outlined in this document is for information only. The authors and contributing companies take no responsibility for the utilisation of these procedures and guidelines. Their suitability should be considered carefully before embarking upon any integration into your current working practices.

Scope

The AEC (UK) BIM Standards builds on the guidelines defined by world-wide standards initiatives, including BS1192:2007, the US National BIM Standard (NBIMS) and existing, proven internal company procedures. It is aimed at providing a **base starting point** for a unified BIM standard that can easily be adopted “as is” or developed and adapted for implementation within projects that have specific requirements for the structuring of their BIM data.

This document intends to provide platform-independent guidelines for BIM for designers.

Wherever possible the standards in this document have been built upon the existing AEC (UK) CAD Standards to provide **a robust and achievable path from existing CAD Standards to integrated BIM Standards**.

There are areas that are not currently addressed in this version of the BIM Standards, including Integrated Project Delivery (IPD), legal issues and risk mitigation. These areas, while important to BIM, are covered in more detail by other committees and in other documents. The AEC (UK) BIM Standard is intended as a BIM software production standard and provides only basic guidance to these issues, noting cross-references wherever required.

This document does not provide implementation advice as internal situations vary too greatly to determine a conclusive approach. Instead we recommend analysing your own internal requirements before adopting all or part of this standard, consulting with similar companies, professional consultants, user groups or project teams.

All information contained in this document should be read in conjunction with the published AEC (UK) Content Libraries. Refer to “Content Library” chapter.

Definitions

The terms below help to define the concepts of BIM models and data structures used in this manual.

“BIM”	Building Information Modelling and Management. The effective collection and reuse of project data in order to reduce errors and increase focus on design and value.
“Component”	A Component is an individual building element that can be reused. Examples include doors, stair cores, furniture or internal room layouts, façade panels, etc. Components are typically inserted and moved/rotated into the required position.
“Assembly”	An Assembly is a composition or collection of components and/or modelled elements arranged to define part or all of a building model, structure or site. An Assembly typically contains information that can be referenced without repositioning.
“Container”	A Container is an optional “parent” repository which can be used to compile assemblies and components for specific purposes including export and publication. A Container can exist for each individual profession/discipline or for multiple disciplines, for buildings or for a complete project.
“WIP”	Work In Progress: each individual company or discipline’s own work. This is information that has not been issued or shared with other parties. Refer to BS1192:2007.
“Shared”	Information that has been checked / approved and is available to other parties. Refer to BS1192:2007.
“Published”	Documents & other data outputted from Shared information. Typically this will include contract drawings, reports and specifications but can also include information for data exchange between BIM software, such as gbXML, CIS2, IFC files. Refer to BS1192:2007.
“Output file”	A generated rendition of graphical or non-graphical information (a plan, section, elevation, schedule, table or other view of a project).

Principles and Structure of BIM Resources

Resources

For any BIM deployment to be successful it has to provide flexibility. It is critical that office- or company-wide resources are provided to ensure all teams are working to the same conventions. At the same time projects may need to vary from those conventions, within defined guidelines which should be confirmed between your design team members - internally and externally - and the results documented and maintained throughout the life of the project in a BIM strategy document. The principles of a BIM strategy document will be detailed in version 2.0 of this standard.

Templates, standards, object definitions and other data which is required by all offices, teams or individual staff to produce deliverables to the minimum required quality should be held centrally. It is generally advised that access to these files or folders is restricted to read-only for the general user-base.

Project-specific versions of these standards, including title-blocks with client or partner logos and any material produced in the process of completing the work should be held in a project resource folder structure.

It can be important to segregate information clearly by product and version and to maintain an archive of older template and library data. This is because certain applications may not be *backwards-compatible* meaning that files created with one version of the software may not be used by another. It is not always advisable to upgrade a project during production stages. The result can often be that various projects can be running simultaneously within an office, using different versions of the BIM products and all requiring a version-sensitive library of resources.

Refer to the relevant product sections appended to this standard for details of the specific recommendations for the main BIM tools.

Project Resources

Project resources should be included within each project. Examples of suggested folder structures for project resources will be provided with the Product Libraries. Reference should also be made to the AEC (UK) Model File Naming Handbook “Project Folder Structures” for further details of recommendations.

Wherever possible the software should be configured to refer to these folders in preference to the central resources to avoid operator error and inconsistency of compliance to project standards.

Compliance check: Principles and Structure of BIM resources

- Internal team has access to shared office resources including object libraries, templates and drawing borders.
- Project resources are available to, and have been coordinated throughout, the wider design team. These resources are listed in the project BIM strategy manual.
- Models are broken into suitable sub-divisions and noted in the project BIM strategy manual.

Data segregation

The project BIM models should be constructed in a manner that allows for other members of the design team to collaborate and/or assist with the model without recourse to complicated introductions to the project methodology.

It is important when planning your BIM work that consideration is given to the requirements of each stage of your project. A single model should be broken out into separate files, during the scheme, design development and construction documentation phases, to enable multiple designers to work on the information and construct the full model using repetitive references. Avoid splitting the model into multiple references too early in a project until there is a need for file sharing or if the level of detail becomes too great.

- On a project with multiple structures on a site, each structure will, at minimum, be created in one file. At no stage should several structures be detailed in one file. That is not to say that various structures will not be compiled in an assembly or container to show site layout or overall scheme design.

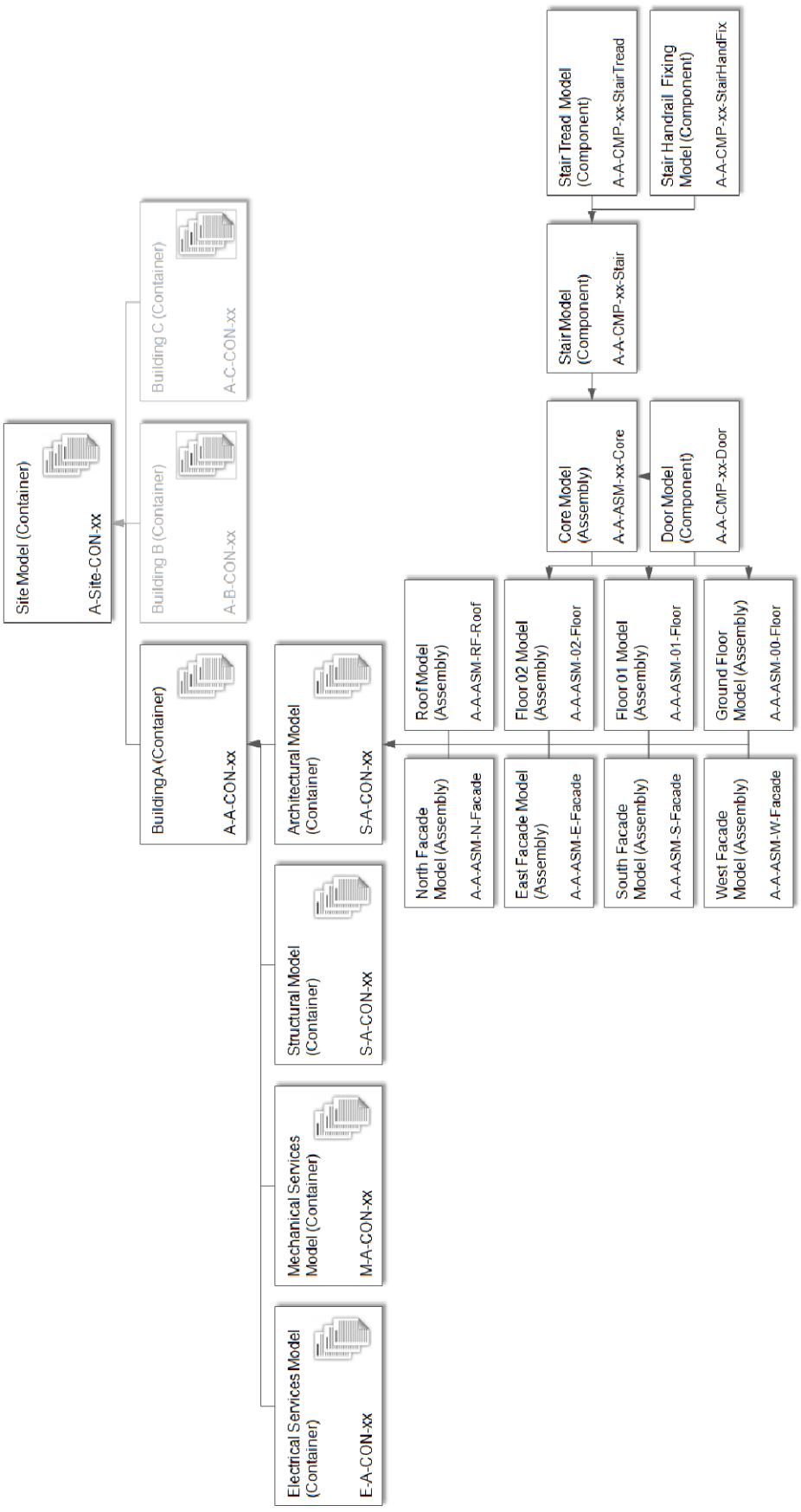
The BIM software in use will have a major impact on how the model is to be broken down, but in all cases, some form of sub-division is required to maintain workable project files using appropriate hardware.

In large single structures, a number of techniques can be utilised to break the model up into manageable pieces, including:

- physical or contractual breaks in the design, such as:
  - floor by floor (or groups of similar floors in mixed-use buildings where floors are allocated to different occupants)
  - parcels of work (e.g. cladding, steelwork, plantroom or MEP system)
  - construction joints
  - phases
  - common room types
  - task allocation
- “arbitrary” or convenient portions of the structure, such as:
  - east wing, west wing
  - vertical zones (e.g. North, East, South and West facades, atrium, cores)
  - abutments, foundations and culverts
  - track alignments, powerlines
- Software solutions providing multi-user access to the model.

There are many factors in deciding if and how a model should be sub-divided and regardless of the technique(s) used, the various models can be linked together to form holistic interrogations of the BIM and to co-ordinate design information. Whichever splitting methodology is chosen, it is important to always document and communicate the principles to the entire team. This is done through a project BIM strategy document which should available to all members of the design team internally and externally.

The diagram below shows how a complete project model might be composed at detailed design or construction phase of a project.


Site Model (Container)
A-Site-CON-xx
Building A (Container)
A-A-CON-xx
Building B (Container)
A-B-CON-xx
Building C (Container)
A-C-CON-xx
Architectural Model (Container)
S-A-CON-xx
Structural Model (Container)
S-A-CON-xx
Mechanical Services Model (Container)
M-A-CON-xx
Electrical Services Model (Container)
E-A-CON-xx
Roof Model (Assembly)
A-A-ASM-RF-Roof
Floor 02 Model (Assembly)
A-A-ASM-02-Floor
Floor 01 Model (Assembly)
A-A-ASM-01-Floor
Ground Floor Model (Assembly)
A-A-ASM-00-Floor
North Facade Model (Assembly)
A-A-ASM-N-Facade
East Facade Model (Assembly)
A-A-ASM-E-Facade
South Facade Model (Assembly)
A-A-ASM-S-Facade
West Facade Model (Assembly)
A-A-ASM-W-Facade
Core Model (Assembly)
A-A-ASM-xx-Core
Door Model (Component)
A-A-CMP-xx-Door
Stair Model (Component)
A-A-CMP-xx-Stair
Stair Tread Model (Component)
A-A-CMP-xx-StairTread
Stair Handrail Fixing Model (Component)
A-A-CMP-xx-StairHandFix

Naming

Model Naming

Even with BIM systems, the importance of model and file naming cannot be overstated. It is any designer's first contact with building information, and a clear and concise convention is critical to the successful identification of BIM data. A naming convention is required to ensure that all files created on a project can be identified quickly, accurately and without ambiguity. Ownership, location, type of file and a unique number are all of paramount importance when identifying the content of a CAD file.

This standard defines guidance for a model naming convention suitable for multi-discipline and multi-functional project working. It is based on the AEC (UK) Basic Model File Naming system that uses specific codes in designated fields.

Where the AEC (UK) Basic Model File Naming convention is not suitable for the requirements of a project, the Full Model File Naming convention should be employed instead. Refer to the AEC (UK) Model File Naming Handbook for details.

BIM Model File Naming Convention

Discipline	Zone	Type	Level	Content

Even though a number of the fields below are optional the minimum compliance is to be able to identify the contents of the models easily and consistently. Variations to this convention, either additions or simplifications, should be noted in the project BIM Strategy document.

Field 1: Discipline (2 char max)

This is a simple list of single or double character codes identifying the owner of the file.

Code	**Description**
A	Architect
AL	Landscape Architects
B	Building Surveyors
C	Civil Engineers
CB	Bridge Engineers
CD	Drainage, Sewage & Road Engineers
CW	Water/Dam Engineers
D	Spare
E	Electrical Engineers
F	Facilities Managers
G	GIS Engineers & Land Surveyors
H	Heating and Ventilation Engineers
I	Interior Designers
J	Telecommunications
K	Client
L	Lift Engineers
M	Mechanical Engineers
ME	Combined Services
N	Spare
P	Public Health Engineers
Q	Quantity Surveyors
R	Railways
RS	Railways Signalling
RT	Railways Track
S	Structural Engineers
SF	Façade Engineers
SR	Reinforcement Detailers
T	Town & Country Planners
U	Spare
V	Spare
W	Contractors
X	Sub-Contractors
Y	Specialist Designers

YA	Acoustic Engineers
YF	Fire Engineers
YL	Lighting Engineers (Non-Building Services)
YS	Sustainability
Z	General (Non-Disciplinary)

Where necessary this field should include an Originator code to help identify the owner of the contents. For example on larger projects where two architects are involved, it may be necessary to add the company's initials before the discipline:

e.g.	ABC-A-	ABC Architects
	XYZ-A-	XYZ Architects

Field 2: Zone (Optional)

If a project is split into specific areas, buildings, zones or phases, this field may be used to identify which segment of the project the data relates, easing the presentation and tracking of information.

The scheme for sub-division should be agreed with the other project professionals and then explained clearly in the project BIM strategy document. Typically this will refer to project or client terminology. i.e. if the buildings are referred to as "Building A" and "Building B" a Zone code of "A" and "B" might be utilised instead of "Z1" and "Z2".

Example Codes

Zone	**Description**
01	Building or zone 1
02	Building or zone 2
A	Building or zone A
B	Building or zone B
B1	Building 1
BA	Building A
Central	Central zone
CP	Car park
Line2	Railway line 2
MP	Masterplan
Off	Office building
P1	Phase 1
Ret	Retail
South	Southern zone
Z1	Zone 1
ZA	Zone A
…	…

Field 3: Type (3 char)

This field identifies the type of file and helps inform the project team what the purpose of the data is. Refer to "Data Segregation" for more information.

Code	Description
CON	Container
ASM	Assembly
CMP	Component

Field 4: Level (2 char) (Optional)

If a project or building is horizontally divided for floor plans and vertically divided for sections, this field should distinguish those divisions. It is recommended that even in a BIM Model an individual file should contain information pertinent to a single level/floor to aid audit trails, tracking of data and constructability. Whenever possible BIM information should be modelled as it would be constructed. The Level field is used to distinguish those divisions.

A model may contain one level or a group of levels within a building.

The scheme for levels should be agreed with the other project professionals and then indicated in a project BIM strategy document. If the content relates to no specific floor, and it is decided that the length of the file name needs to be maintained, “xx” should be used.

Example Code	Description
B2	Basement 2
B1	Basement 1
PL	Piling
FN	Foundation
00	Ground
01	First
M1	Mezzanine 1
M2	Mezzanine 2
02	Second
03	Third
…	…
RF	Roof
N	North Façade
E	East Façade
S	South Façade
W	West Façade

Field 5: Content

This field defines the type of CAD data portrayed in the file and can be used to describe any part of the previous fields or to further clarify any other aspect of the CAD data.

We suggest use of either the AEC (UK) Descriptive or Uniclass codes (from tables F Spaces, G Elements for Buildings, H Elements for Civil Engineering or J Work Sections for Buildings) to ensure continuity with the AEC (UK) layer standards.

Refer to the AEC (UK) CAD Standard for Layer Naming for descriptive codes.

Refer to Uniclass documentation for full Uniclass codes.

Note: Revit

For Revit, provision must be made for identifying a file as being either Central or Local. To this end, the filename should be additionally suffixed with –Central or –Local.

Note: File Extensions
The file extension is used by the computer's operating system to denote the application that controls or is used to open a file.
We recommend strongly that extensions are not altered from the defaults provided by the CAD software (DGN, RVT, etc).

General Notes
Only use letters A-Z, numbers 0-9 for all fields of file naming.

A single period character "." should be used to separate the file name from the extension. This character should not be used anywhere else in the file name.

All fields should be separated by a hyphen character "-" to distinguish between the fields and aid comprehension. Do NOT use spaces.

An "x" should be used if the contents of a file do not refer a single specific Type or Level and it is decided that the fields should still be used to maintain identical file name lengths.

e.g.

A-CON-xx-Project-Central.rvt	Compiled model of the complete architectural data
A-ASM-01-Local.rvt	Architectural model of the complete first floor
A-ASM-01-Part.dgn	Architectural model of the first floor partitions
A-ASM-01-G252.dgn	Architectural model of the first floor partitions (using Uniclass classifications)

Compliance check: Naming

- All BIM models conform to the AEC (UK) "BIM Model File Naming Convention". This requires models to be identified using:
  - Discipline identifier (and optional originator prefix)
  - Zone (if the project model is split for zones)
  - Type
  - Level (if the project model is split for levels)
  - Content
- Library objects can be identified using, at minimum, the:
  - Uniclass classification
  - AEC (UK) alias
- Variations from this convention are listed in the project BIM strategy document.

Library Objects & Non-Graphical Metadata

Library objects are the Families or Parts you apply to your Assembly and Component models. All objects should follow a consistent naming convention to logically “group” sets of similar objects in a hierarchical manner. It is recommended that Uniclass classifications are used to provide this grouping.

Discipline is not used for library objects. The ownership is identified by the file a definition is used in.

Field 1: Uniclass classification

Refer to Uniclass documentation for full details. Typically the codes will be taken from a suitable Uniclass table to identify intent and purpose.

Uniclass Table	**Used for**
F	Definitions of “spaces”
G	Building objects (normally physical/graphical)
H	Civil engineering objects
J	Detailed classification of non-graphical objects used for specification
P	Non-specific material definition

e.g.

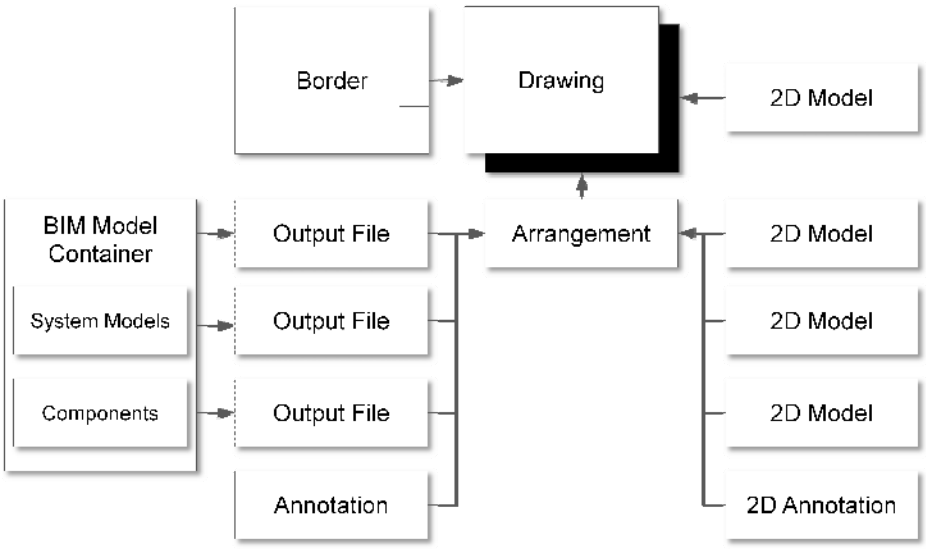
F2-Office	Room, office
G25-Wall	Wall, general
G251-WallInt-Block	Wall, internal, blockwork
G251-WallInt-Acme-7	Wall, internal, Acme type 7 (refer to manufacturer’s wall type catalogue)
G252-WallExtl	Wall, external
G251-WallExtl-RainScrn-Blue+Blwk	Wall, external, blue rainscreen with blockwork
G251-WallExtl-RainScrn-Black+Tile	Wall, external, black rainscreen with tiles
G26-ColConc	Column, concrete
G26-ColSteel-Acme-203UC86	Column, steel, Acme-made 203x203x86UC
P223-ConcInsitu	Concrete, in-situ

Drawing production

CAD / BIM workflow

Unless BIM software and working methods have been adopted 100% throughout the project, it is critical to ensure contractual documents can be accessed, viewed, revised and printed at all times by all the necessary people. To ensure this, and provide integration with existing CAD processes, drawings should be produced in the appropriate format and always backed up with an immutable format such as PDF, DWF, or similar.

Note: when information is converted or exported from a BIM system it should be checked thoroughly to ensure the structure, including layers, colours and technical content, is as intended.



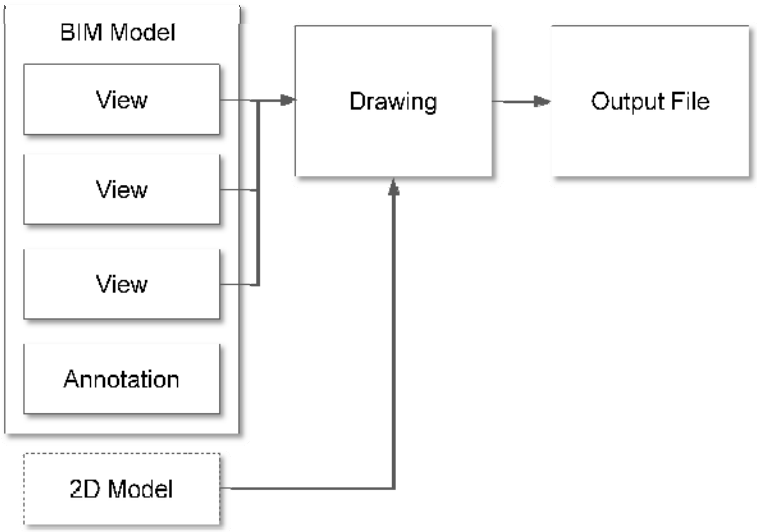
In the diagram above, the Output files are created from the BIM model to allow integration with the 2D CAD system. The drawing is then compiled in the 2D CAD system so that all designers have access to view and print the drawings, even if they do not have the BIM software installed.

Exported Views should always be used for QA/Design Freeze purposes, along with an internal published record copy (i.e. PDF, DWF or other non-editable format).

In all cases the layer display needs to be checked prior to the issue and printing of finished drawings. Conversion issues may arise between a BIM application and a DWG/DGN formatted CAD file. Always be sure that the information is portrayed as intended before distribution.

100% BIM workflow

In a 100% BIM workflow, it may not be necessary to construct the drawings using extracted view files. Consideration should be given to the internal and external requirements of data access and exchange before agreeing to any drawing composition workflow.



In the 100% BIM Workflow diagram, all views and annotation are created from within the BIM system. Additional 2D references may be attached as required. Output files are then exported from the drawing sheet for integration with 2D CAD systems or issue to external parties.

Compliance check: Drawing Production

- In a mixed BIM/CAD project, all drawings can be regenerated from the “lowest common denominator” system.
- Outputted information is checked and approved for drawing standards, design intent and usability.

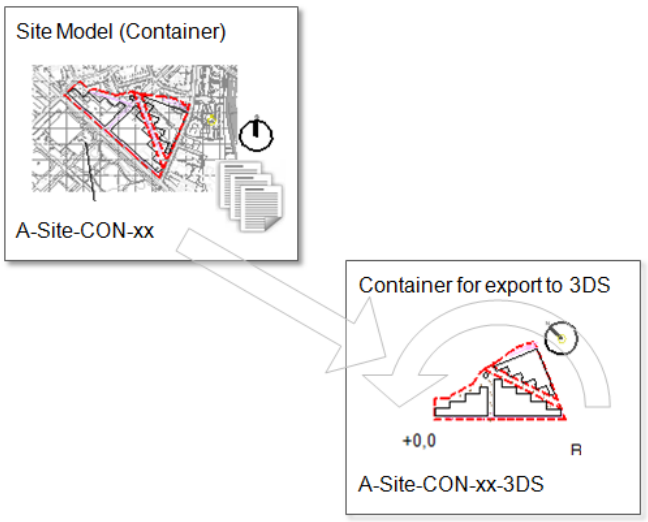
Modelling Standards

Spatial Location & Co-ordination

The co-ordinate space used for BIM projects is critical. Unlike CAD systems where projects can be orientated around 0,0 for convenience, in all BIM projects real world co-ordinate systems should be used as defined in BS1192:2007 and the CPIC Production Information code.

- All data used for collaborative purposes will be produced at full size (1:1), coincidentally and using the same co-ordinate systems to allow all files to be referenced without modification. The co-ordinate/grid systems should be agreed at the outset of a project, using real-world co-ordinates wherever possible.
- All BIM data should be produced to true height above site or ordnance datum.

Note:
For software that requires modelled information or components to be located at 0,0 (e.g. certain structural analysis software, 3ds Max) a container model should be created specifically for the purpose of export to this software. The relevant assembly files will be referenced, moved and re-orientated specifically for this purpose.



Scale Factor

The scale factor of a BIM model needs to be considered before commencement of production work. Model with too little detail and the information will not be suitable for its intended purpose; too much detail and the model may become unwieldy, unstable and increase the risk of delayed delivery. The table below highlights common requirements of a BIM model and recommends the level of detail that should be included for an equivalent drawing scale.

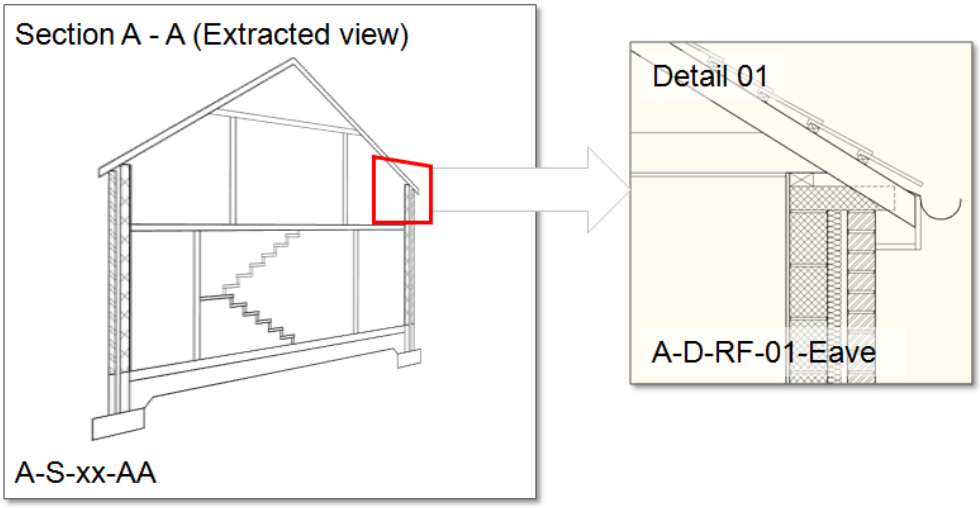
Purpose of BIM model	**Typical scale(s)**	**Preferred**	**Maximum**
Component fabrication	1:200 - 1:50	1:100	1:50[1]
Construction sequencing	1:1000 - 1:100	1:200	1:100
Co-ordination / Clash detection	1:1000 - 1:100	1:100	1:50[2]
Detail drawing production	1:200 - 1:100	1:100	1:50[3]
Energy analysis	1:500 - 1:200	1:200	1:100
GA drawing production	1:200 - 1:100	1:100	1:50[3]
Illustration / Design reports	1:200 - 1:100	1:100	1:50[3]
Quantification	n/a[4]		
Rendering/visualisation	1:1000 - 1:100	1:200	1:50[1]
Schedule production	1:200 - 1:100	1:100	1:50
Structural analysis/design	1:500 - 1:100	1:200	1:100
Structural frame fabrication	1:500 - 1:100	1:100	1:50[1]

Notes

1. Where greater detail is required, the general BIM model should not be used to provide the information. A specific, stand-alone detailed model to the level of detail required should be produced, using the general BIM model as background data.

2. Where a higher level of co-ordination is required, a separate model should be created to the level of detail required. This model should only incorporate detail from the individual area necessary to co-ordinate using the general BIM model as background data. Examples of this may include form design and investigation, structural/architectural co-ordination for bespoke steel connections, façade interfaces or plantroom co-ordination.

3. Information above the maximum should be drawn in 2D using views from the BIM model as background data.



In the above example, the View for section A-A is used as a background for the production of the detail A-D-RF-01-Eave to provide a level of co-ordination and speed up the production process. Depending on the extent of BIM adoption internally and externally on the project, this can either be achieved within the BIM production software or as an exported output file from the BIM model into a suitable CAD format (DWG/DGN) as A-S-xx-AA. That file is then referenced into the 2D detail model file, A-D-RF-01-Eave.

4. Detailed quantification data should be added as non-graphical information and therefore should not affect the level of detail modelled.

A note regarding “Fit For Purpose” modelling

Prior to production of a BIM model the requirements of the output expected from the BIM model should be specified. The approach to the modelling should then reflect that need.

For example in the case of modelling structural concrete frames it is important to consider the construction of the concrete frame otherwise quantities, and potentially analysis output, could be incorrect. Vertical structure may need to be stopped below the soffit of the slab and restarted above the slab surface.

Future versions of this document will expand on these conventions in detail.

Compliance check: Modelling Standards

- All data is modelled coincidentally and to the correct geographical location. The project co-ordinate system should be noted in the project BIM strategy document.
- The level of detail contained in a BIM model is not above the maximum scale factor.
- Each component should have low- medium- and high-resolution versions.

Component Grade

In order to produce information to the required scale, as with 2D CAD files, additional detail should be created in separate model files. Where a Component is being used for multiple instances of the same object, the component should be created in three “grades”: low, medium and high resolution. Modelling in this way allows easier component management and simple “swapping” of the grades should additional, or less detail be required. It also ensures the most efficient use of PC processing power at any particular stage.

The project BIM strategy document should look at the naming conventions for components, types, parameters, materials, etc. and the QA and filing of such elements. It should give guidance on using downloaded content and ensuring that the quality of the corporate library is kept high.

Making a distinction between the 2D and 3D requirement of the element can also be important to this process as is the use of 3D line work (Model Lines) to simplify or replace geometry.

“Low resolution” Component grade	**“Medium resolution” Component grade**	**“High resolution” Component grade**
Simple place-holder with absolute minimum (outline) level of detail. 1:500-1:200	General modelling version of the component. Typically this would include the level of detail suitable for the “Preferred” scale (refer to Scale Factor above). 1:200-1:50	Level of detail required for detailed output. This would be to the “Maximum” scale noted in Scale Factor above, but in some exceptional instances may include detail as high as 1:5 or 1:1.

Data Exchange

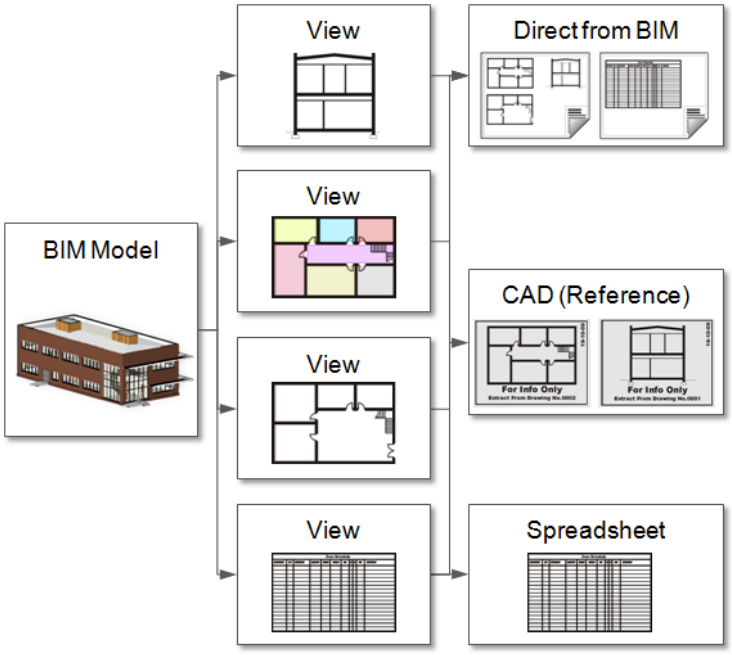
The most suitable format should be selected for data exchange, based on the overall project requirements. It is recommended that a detailed questionnaire, as exemplified by the PIX protocol, be employed to ascertain design team capabilities. It may not always be necessary to exchange fully intelligent BIM data, the geometry may be sufficient. Exchanging information intelligently rather than exchanging intelligent information should be the rule of thumb.

The principles of data exchange, regardless of software or platform, are already best explained in the AEC (UK) Drawing File Management Handbook and BS1192:2007's references to the Common Data Environment.

Output files

For export of 2D information only.

Constructing a 3D model and extracting plans, sections and elevations is one of the basic premises of BIM. While the extractions or "Views" in this document's software-independent terminology, may not be print-ready drawings, they are used as the basis for the production of 2D documentation and drawings.



Output files should be named according to the AEC (UK) conventions as defined in the AEC (UK) Model File Naming Handbook. e.g.

A-P-01	Architectural plan of the 1st floor
A-P-01-Colour	Architectural plan of the 1st floor showing colour fill
M-S-01-HVAC	Mechanical services section showing the 1st floor ductwork
S-P-FN-Pile	Structural plan of the piling layout
S-S-xx-AA	Structural full building section A-A

Note:

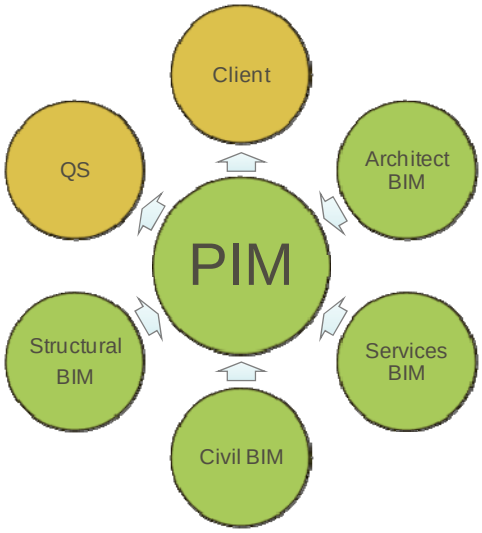
Internally to certain BIM software, the naming of Views in this manner may be detrimental to the integration of section markers and call-outs. In these instances when the model file naming is not practical to follow, the View naming should be simple, concise and clear, and read in conjunction with the containing file name.

e.g.

Model file name	A-CON-xx-Project
Ground floor plan View	00
1st floor plan View	01
Section A-A	A
North Elevation	N

Project Integration Model

The original BIM theory suggested a “single repository” that all parties extracted the information they needed from. It should now be assumed that this one single repository isn’t in fact practical. Each discipline requires their own BIM model to be able to deliver their contractual obligations. A BIM model doesn’t need to include every possible piece of data; a BIM model can deliver against a single specific task, for example, the design of the structural frame, environmental performance analysis, the plantroom/ductwork design. Each of these then feed into the central *project* shared working area, where the benefits of a co-ordinated solution can begin to be realised as a “PIM” (Project Integration Model).



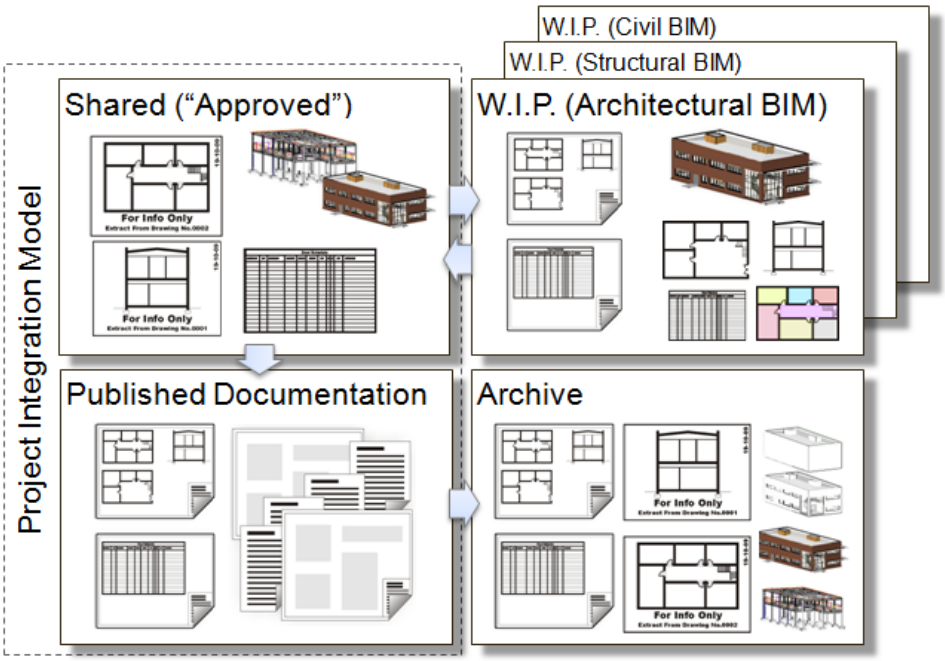
The Project Integration Model

Compliance check: Data Exchange

- Data exchange protocols conform to AEC (UK) Drawing File Management Handbook conventions and BS1192:2007’s Common Data Environment. Agreed project procedures should be noted in the project BIM strategy document.
- Any output file is named to a minimum standard of:
  - Discipline identifier (and optional originator prefix)
  - Zone (if the project model is split for zones)
  - View (plan, section, elevation, etc)
  - Level (if the project model is split for levels)
  - Content
- Project conventions are clarified in the project BIM strategy document.

Common Data Environment

The principles of BS1192:2007 apply extremely well to a BIM workflow. The diagram below simplifies BS1192:2007's idea of a Common Data Environment with respect to BIM data exchange.



Information for each discipline is created in their own Work In Progress (WIP) area. This is typically located on the data (or projects) server within each company's own unique Local Area Network. No-one has access to any BIM data in the WIP areas apart from the content owner.

Once checked, approved and signed-off, the individual BIM models are released to the Shared, or "Approved" area. This is where the Project Integration Model resides - a composite of the various disciplines' data. Information necessary for progression of any WIP should always be referenced directly from the Shared area.

Published documents and additional data should then be produced only from the Shared area. This includes drawings, schedules, quantities and additional file formats, such as gbXML.

Any superseded or revised documents should finally be moved to the Archive area for review.

Content Libraries

NOTE: *A number of content libraries are currently being prepared for use by companies and individuals to aid in the implementation of a BIM-enabled workflow and standards based on AEC (UK) guidelines and best practices. Initially this includes Autodesk Revit and Bentley Building products. Expanded as and when further involvement is possible... Content libraries will be made available through the aec-uk.org website.*

The content libraries have two main areas:

Content
This area provides items such as standard Families and Parts, objects and items for use within the model.

Configurations
This area provides examples of configuration settings for BIM products to support hierarchical data structures as described within this document.