



# AEC (UK) BIM Standard for Autodesk Revit

*A workable implementation of the AEC (UK) BIM Standard for the  
Architectural, Engineering and Construction industry in the UK.*

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# 1 Introduction

## 1.1 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) BIM Standard was released in November 2009, and this document forms part of that body of work, as a Revit-specific standard which conforms with the platform-generic BIM standard.

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



### *Copyright Notice:*

It is important to note that this standard will only become truly useful if as many companies adopt it as possible. To that extent, it may be freely distributed and used in any format necessary.

## 1.2 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 ( <i>Committee Chair</i> )	Evolve Consultancy
Chris Seymour-Smith ( <i>Bentley Sub-Group Chair</i> )	Nightingale Associates
Paul Woddy ( <i>Revit Sub-Group Chair</i> )	Digital Construction International
Andrew Coombes	Hampshire County Council
Chris Senior	Revit Factory
Chris Tate	BDP
David Light	HOK
Gavin Skidmore	Mott MacDonald
Michael Bartyzel	Buro Happold
Mike Farmer	Haskoll
Joe Stott	Aedas Architects
Ray Purvis	Atkins Global
Scott Grant	Excitech
Chris Hobbs	CADline
Steve Wright	Ramboll UK

For full contact details and further information on the committee, please refer to [www.aec-uk.org](http://www.aec-uk.org).

## 1.3 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.

## 1.4 Scope

**This standard is intended to support all BIM work undertaken within a practice, unless otherwise dictated by the client.**

The AEC (UK) BIM Standard for Revit builds on procedures and methodologies from a broad consensus of experienced users from all disciplines, as well as consultants to BIM and Revit use, in addition to guidelines defined by world-wide standardisation initiatives, including BS1192:2007.

In particular, this standard expands upon the principles defined within the recently developed AEC (UK) BIM Standard 2009. The AEC Standard is developed by a committee of key BIM experts who represent the leading consulting engineering and architectural organisations in the UK, to address industry best practice irrespective of software platform.

This Standard focuses primarily on adaptation of those standards for practical and efficient application of Revit Architecture, Revit Structure and Revit MEP.

Terminology and reference to functionality is based around the Autodesk Revit platform.

The objectives are:

1. To maximise production efficiency through adopting a coordinated and consistent approach to working in BIM.
2. To define the standards, settings and best practices that ensure delivery of high quality and uniform drawing output across an entire project.
3. To ensure that digital BIM files are structured correctly to enable efficient data sharing whilst working in a collaborative environment across multi-disciplinary teams both internally and in external BIM environments.

**When working as a project team, communication is paramount. This Standard looks to ensure that all parties speak the same language.**

## 1.5 Update Procedure

Proposed changes and additions to this standard should be submitted in writing with accompanying examples, discussion, or other supportive material to committee. Feedback will be gathered and continuously reviewed; they will be collated to form new revisions at appropriate intervals.

It is expected that this standard will undergo a relatively rapid evolution process, as the industry adapts to the implications and advantages of BIM methodology.

## 1.6 References

This standard is written with reference to the following documents:

- BS1192:2007
- AEC (UK) BIM Standards 2009
- AEC (UK) CAD Standard 2000
- AEC (UK) CAD Standard Basic Layer Code 2001
- AEC (UK) CAD Standard Advanced Layer Code 2002



## 1.7 Definitions

The following terms define the concepts of BIM and data structures used in this Standard.

<b>Project BIM Co-ordinator</b>	Responsible for setting and implementing Project BIM Strategy, this person would usually be the most experienced Revit user.
<b>BIM</b>	Building Information Modelling (BIM): Data beyond graphics. The creation and use of coordinated, internally consistent, computable information about a building project in design and construction.
<b>Component/Family</b>	A component (known as a family in Revit) is an individual element that can be reused in a number of situations. Examples include doors, stair cores, furniture, façade panels, columns, walls etc. Components are typically inserted and moved/rotated into required position.
<b>Assembly</b>	A collection of components and/or modelled elements arranged to define part or all of a building model such as groups or sub-models in Revit. An assembly typically contains information that can be referenced without repositioning.
<b>Container</b>	An optional 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.
<b>WIP</b>	Work In Progress (WIP): each individual company or discipline's own work. This information has not been approved or verified fit to share across the project team. Reference BS1192:2007.
<b>Shared</b>	Information that has been checked and approved and is made available across the project team such as information for data exchange between BIM software, like gbXML, CIS/2 and IFC files. Reference BS1192:2007.
<b>Published</b>	Published information refers to documents and other data generated from Shared information. Typically this will include contract drawings, reports and specifications. Reference BS1192:2007.
<b>Views/Output files</b>	A generated rendition of graphical or non-graphical information (a plan, section, elevation, schedule, or other view of a project).

## 2 Best Practice

To achieve technical excellence and a successful outcome to a project, it is essential that BIM working and subsequent drawing production output is carefully planned. This must involve explicit attention to management, display and quality of the design data. Below are a number of best practice key principles that will aid efficient, high quality working.

### 2.1 BIM

- A Project BIM Co-ordinator shall be appointed for every project.
- A Project BIM Strategy shall be put in place that identifies key project tasks, outputs and model configuration.
- BIM Project Reviews should be agreed and take place regularly to ensure model integrity and project workflow is maintained.
- Develop clear guidelines for internal and external collaborative working which maintain the integrity of electronic data.
- Identify clear ownership of model elements through the life of the project.
- Understand and clearly document what is to be modelled and to what level of detail. Do not over model.
- Sub-divide models between disciplines, and within single disciplines to avoid file sizes becoming over ~100MB. Refer to Section 5.
- All changes to the model shall be carried out as 3D modifications, rather than 2D 'patches' to maintain the integrity of the model.
- Outstanding warnings shall be reviewed regularly and important issues resolved.
- The Central file shall never be opened, only copied to create local files.
- The Central file should be recreated at regular intervals in order to eliminate redundant data retention.

### 2.2 Drawing Production

- A drawing shall contain design information solely for the purpose of the intended use of the drawing.
- To maximise efficiency a policy of minimum detailing without compromising quality and integrity shall be adopted.
- Numbers of drawings should be kept to an absolute minimum and organised in a logical manner.
- Avoidance of view duplication is essential to ensure drawings maintain their integrity as the iterative design process progresses and amendments are made.
- Efficient minimum detailing and above all the elimination of detail repetition shall be the method adopted.

## 3 Project BIM Strategy

### 3.1 Project BIM Co-ordinator

The Project BIM Co-ordinator shall:

- Develop and implement a Project BIM Strategy document which shall record key information on how BIM will be implemented and used on a project,
- Keep the Project BIM Strategy document updated over the life of the project.
- Ensure all stakeholders (internal and external) are in alignment with the Project BIM Strategy,
- Facilitate / identify appropriate levels of staff training in order to comply with the Project BIM Strategy,
- Take a leading role in planning, setup and maintaining models.

### 3.2 Project BIM Strategy Document

A Project BIM Strategy pro-forma and a complementary Project BIM Strategy Guidance Note are available and shall be used to ensure consistency between projects. Larger and more complex projects may warrant additional clarification; the strategy document will expand accordingly.

The Project BIM Strategy document shall address as a minimum the following key items:

- **Standards:** The BIM standard used in the project and any deviation from that standard
- **Software Platform:** Defines BIM software to be utilised and how interoperability issues will be addressed.
- **Stakeholders:** Identifies project leadership and additional stakeholders and their roles and responsibilities.
- **Project Deliverable:** Defines the project deliverable and the format in which it is delivered and exchanged.
- **Project Characteristics:** Number of buildings, size, location etc. Division of the work and schedule.
- **Shared Coordinates:** Defines the common coordinate system for all BIM data. Details modifications to imported DWG/DGN coordinates.
- **Data Segregation:** Addressing such issues as workset and linked file organisation to enable multi-discipline, multi user access and project phasing as well as ownership of project BIM data.
- **Checking/Validation:** Defines the checking/validation process of drawings and BIM data.
- **Data Exchange:** Defines the communication protocols along with the frequency and form of data exchange.
- **Project Review Dates:** Sets out key dates for reviews of the Revit model which all teams buy in to (both internal to the company and externally with the full design team).

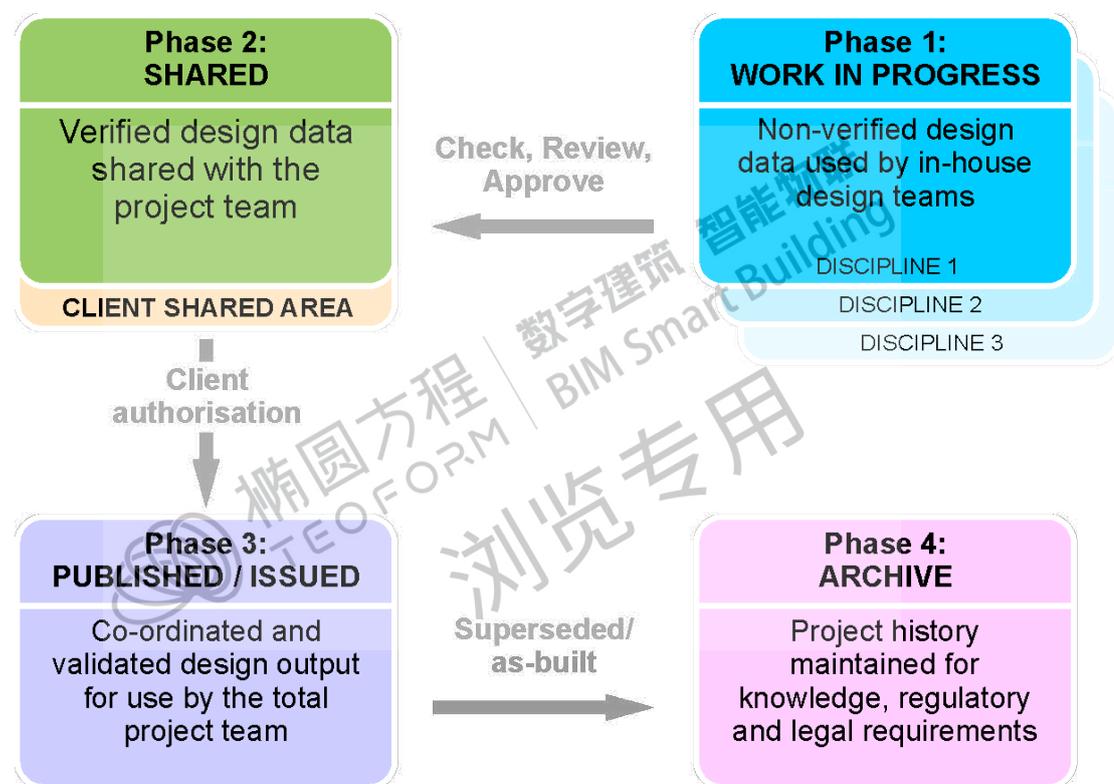
## 4 Collaborative BIM Data Sharing

This Standard is aligned with **BS1192:2007 Collaborative Working**, which defines the process for project collaboration and efficient data sharing. A major constituent of collaborative environments is the ability to communicate, re-use and share data efficiently without loss or misinterpretation.

### 4.1 Common Data Environment (CDE)

A **Common Data Environment (CDE)** approach allows information to be shared between all members of the project team.

There are four phases to **CDE** as illustrated below:



### 4.2 CDE Phase 1: Work In Progress (WIP)

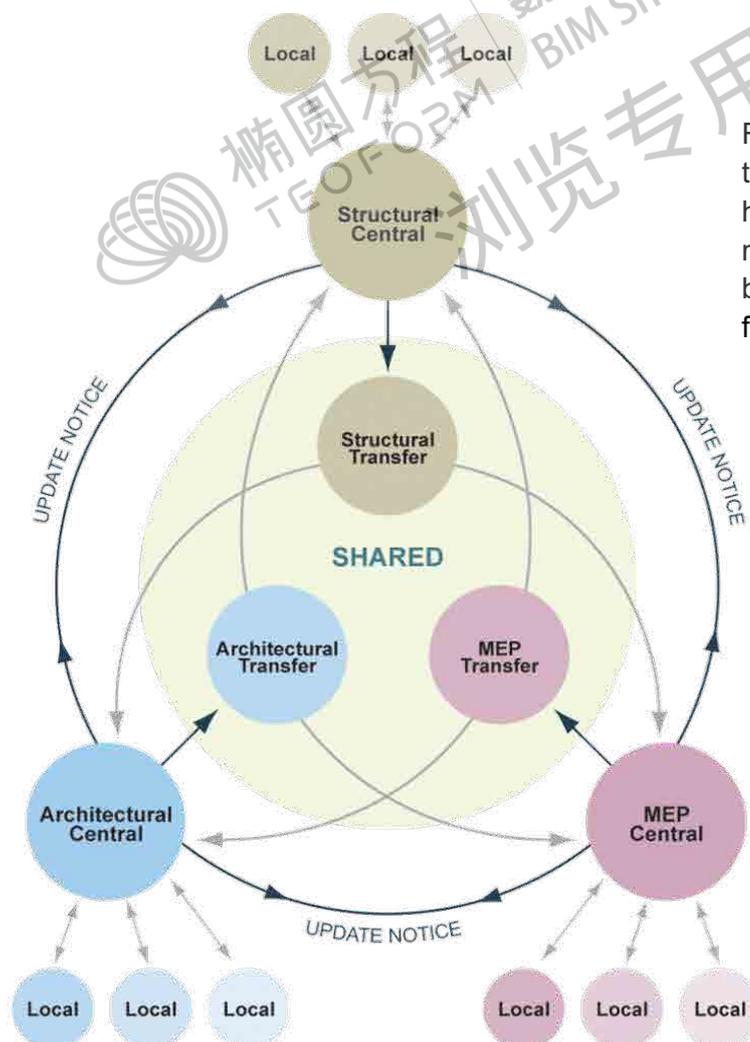
Data described as Work in Progress is that which is currently in production and has not yet been checked and verified for use outside of the authoring team.

- WIP model files shall be developed in isolation and contain information for which each stakeholder is responsible.
- These shall be stored in, and worked on from the team's WIP section of the filing system.

### 4.3 CDE Phase 2: Shared

To facilitate co-ordinated, efficient working, each party shall make their design data available for project-wide formal access through a shared repository or exchange protocol. These files shall be accessible by all from a central location, or replicated in the **Shared Area** of the project folder structure of each party. Prior to sharing, the data shall be checked, approved and validated as ‘fit for co-ordination’ in line with the BS1197 workflow.

- Only BIM files validated ‘fit for co-ordination’ shall be transferred to the Shared Area (see section 4.6 for validation process).
- Sharing of models shall be carried out on a regular basis in order that other disciplines are working to latest validated information as defined in the Project BIM Strategy document.
- Model files shall be issued in conjunction with verified 2D document submissions to minimise the risk of errors in communication.
- The Shared Area shall also act as the repository for formally issued data provided by external organisations that is to be shared across the project.
- Changes to the shared data shall be effectively communicated to the team through drawing issue, change register or other suitable notice, such as e-mail, as defined in the Project BIM Strategy document.



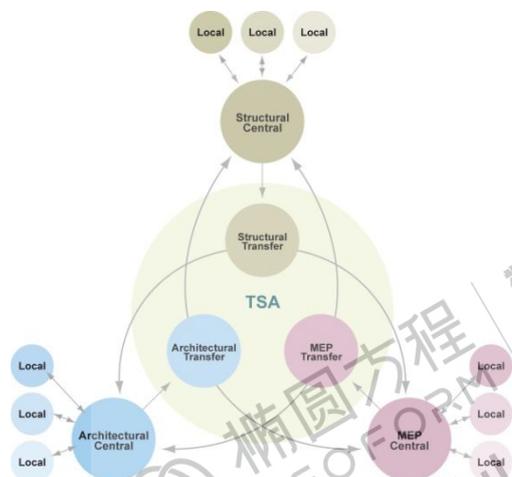
For indicative purposes, the Shared area is shown here as a single shaded region. This may, in truth be synchronised locations for each stakeholder.

### 4.3.1 Inter-Discipline Access to WIP

On occasion, project time-frames do not accommodate the delays associated with the checking and verification of information originating from another discipline or company. Such workflows are non-compliant with the BS1192 workflow, and as such, are not recommended. Where necessary however, protocols which provide access to other party's WIP models may be applicable through either 'Direct Access' (*real-time*) or a 'Temporary Shared Area' (TSA) (*near real-time*).

- Both of these methods carry risk as they involve the use of non-verified data as the basis for design decisions.
- The BIM Co-ordinator, in liaison with the design team, shall decide whether to permit access to the WIP models, and if so whether to utilise *real-time* or *near real-time* data sharing.

#### Access via the "TSA"



#### Medium Risk

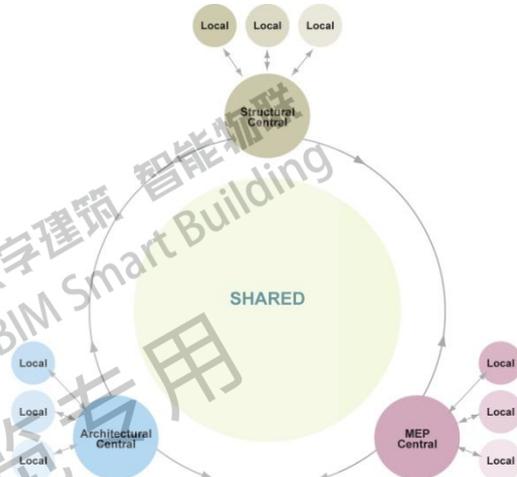
Data is transferred at pre-defined intervals into a repository for linking by other teams.

Allows for an amount of un-official communication of model changes avoids use of rapidly changing data

Internal / external use

The temporary shared area will reside in **WIP** under **WIP\_TSA** repository (see section 8.2 - Project Folder Structure).

#### "Direct Access" via the WIP



#### High Risk

Referenced data is live and subject to fluid design change, without notice or delay.

Used when the time available to a design team is too restrictive to wait for validated information to emerge.

Appropriate only for internal use in multi-disciplined design and engineering practices

This method requires that permissions be granted such that other disciplines can access the WIP.

#### Warning!

Access to model data held within the WIP will contain un-validated data. It will be subject to rapid change and should be used with caution. Neither of these methods are a replacement for the verified sharing of data defined in section 4.3

## 4.4 CDE Phase 3: Publication and Document Issue

2D DWF or PDF drawings and sheets shall be stored in the **Published Area** of the folder structure once formally checked, approved and authorised in accordance with corporate quality procedures.

- Revision/Issue control shall follow the Document Control systems established for the project.
- A record of all issued deliverables shall be maintained in softcopy and hardcopy where appropriate.
- Information within a BIM is inter-dependent and changes in one view may affect other views. As such the BIM files and all associated views shall be treated as **Work In Progress** or shared as un-controlled documents until such time as they leave the BIM environment in a non-editable format.
- Only those drawings which it has been deemed necessary to revise will be re-issued following modification work.

**Note:**

At this stage of the industry's adoption of BIM, contract deliverable will, in general, be a 2D drawing. Issuing of BIM data to external organisations shall be issued with a disclaimer '**ISSUED FOR INFORMATION ONLY**'. No liability is implied for such data and how it is subsequently utilised.

## 4.5 CDE Phase 4: Archiving

- Archiving of all output data from the BIM shall be stored in the Archive section of the project folder, including published, superseded and 'As Built' drawings and data.
- Additionally, at key stages of the design process, a complete version of the BIM data and associated drawing deliverables shall be copied into an archive location.
- Archived data shall reside in logical folder repositories that clearly identify the archive status *e.g. 09-12-11 Stage D Design*.

## 4.6 Validation

Sheets from the BIM shall be published to DWF (preferred), PDF or other non-editable format, where they can be checked, approved, issued and archived as traditional documents.

Validation of the BIM data prior to sharing shall check that:

- All drawing sheets and extraneous views shall be removed from the BIM;
- Model file has been audited, purged and compressed;
- File format and naming conventions conform to project Data Exchange protocols,
- Data segregation conforms to the agreed project BIM methodology,
- Model files are up-to-date, containing all users' local modifications,
- Model files are detached from central file,
- Any linked reference files have been removed and any other associated data required to load the model file is made available,
- Model is correctly assembled through visual inspection,
- Any changes since the last issue are communicated to the project team.

## 4.7 Data Security & Saving

- All BIM project data shall reside on network servers which are subject to regular back-ups.
- Staff access to BIM project data held on the network servers shall be through controlled access permissions.
- Maximum number of Revit back-ups shall be set to 3.
- Revit LOCAL files shall be saved back to CENTRAL hourly.
- Revit save reminder interval shall be set to 30mins.
- A 'Splash Page' is included in the associated templates. These shall be retained and the file information completed. The note may be discarded or replaced with project-specific information if required.
- Users shall open the Splash Page view and close all others when saving in order to improve the efficiency of file opening.

## 4.8 Project Issue Logging and Resolution System

Coordination discrepancies discovered during the collaboration review process shall be logged and managed. These issues shall be communicated to the relevant parties in a report which provides the following as a minimum:

- Specific location of any clash, including 2D and 3D images where possible
- Element ID's of the objects in question, where relevant

- A detailed description of the problem
- Details of the date/revision/origin of the linked information being cross-referenced
- Suggested solutions or actions to be taken, by whom and by what date
- Author of the issue and the distribution list for information or resolution
- Confirmation that the resolution has been tested in the model
- Issue status – pending response / overdue / unsuitable response / closed

Items with an unsuitable response shall be re-logged as a new issue to avoid confusion over whether the issue has been resolved. The original issue shall then refer to a new issue number.

Outstanding issues shall be discussed at the project co-ordination meetings. This process may be aided by using Navisworks on larger projects to keep the 3D information manageable.

## 4.9 Reviewing BIM Data

Untrained users shall not open Revit models directly. Instead, the model shall be exported as a 3D DWF and the freely available Autodesk Design Review software shall be used for interrogation and mark-up.

# 5 Interoperability

## 5.1 Introduction

Interoperability between software products is of paramount importance for successful BIM working. Whether it is output to 2D CAD for subsequent drawing production or output for 3D visualisation or analysis, the preparation and methods adopted to compose the BIM will ultimately determine its successful application within other software packages and technologies.

## 5.2 Incoming CAD/BIM Data Management

- All incoming CAD/BIM data shall be logged in accordance with the project's data management procedures.
- A copy of incoming CAD/BIM data shall be stored in its original format within the project Incoming sub-folder.
- The project BIM Co-ordinator shall verify the suitability of incoming data prior to making available project-wide through the project Shared area.
- Modifications of incoming CAD/BIM data shall be kept to the absolute minimum and only be carried out where the received data format prevents design

progress. Modifications shall only be carried out with the approval of the project BIM Co-ordinator.

- Data shall be cleansed prior to importing or linking to the BIM model to remove any irrelevant or extraneous data which may destabilise the BIM database.
- CAD data may need be shifted to 0,0,0 prior to import – see section 7.4.
- Details of the changes made in cleansing a file shall be fully documented in the Project BIM Strategy.
- Ownership of this cleansed data is transferred from the originator to the cleansing discipline. Cleansed data is stored within the discipline's **WIP** area unless deemed appropriate to share project-wide, in which case it is stored in the Shared area.
- Responsibility for ensuring that cleansed data is current lies with the party making the modifications.

### 5.3 Fit For Purpose Modelling

BIM data shall be prepared 'fit for purpose', taking into account the requirements of any recipient software applications, to ensure that error free, reliable data is exchanged (e.g. link to analysis packages or interface with GIS).

**Example:**

When modelling structural frames, some analysis software may dictate that columns need to be stopped at each floor level regardless of whether, in reality they continue as a single length.

### 5.4 Data Transfer between Packages

Prior to data transfer between packages, the following tasks shall be carried out:

- Requirements and limitations of the target software/hardware system shall be understood in order that BIM data can be prepared appropriately for exchange.
- 2D output from the BIM shall be constructed in a manner that is usable to the team, reasonably complies with project CAD Standards, and allows easy manipulation of the data held within the file, e.g. layering.
- Data exchange protocol between different software/hardware systems shall be verified through sample testing to ensure data integrity is maintained.
- The appropriate export layer tables shall be used during export to CAD

## 6 Data Segregation (worksets & linking)

### 6.1 General Principles

A number of methods exist which enable collaborative working in a BIM environment, including working practices and team management as well as the technological solutions covered by the remit of this document.

This section deals with the principles of subdividing a model for the purposes of:

- multi-user access,
- operational efficiency on large projects,
- inter-disciplinary collaboration.

The terminology refers primarily to the Revit subjects of **Worksets** and **Linking** (sections 6.2 & 6.3), both of which are referred to herein as model sub-division. The following practices shall be followed:

- The methods adopted for data segregation shall take into account, and be agreed by, all internal and external disciplines to be involved in the modelling.
- In line with the model development methodology described in section 7, models shall initially be created as isolated, single-user files. The model will be subdivided as it becomes larger or additional members of the design team are introduced.
- No more than one building shall be modelled in a single file.
- A model file shall contain data from one discipline / project stakeholder only (although exceptions may apply for Building Services where multiple disciplines converge).
- Further segregation of the geometry may be required to ensure that model files remain workable on available hardware. (As a basic guide, files exceeding 50MB shall be reviewed with respect to performance and possible further sub-division. Ideally files shall not exceed 100MB; for projects containing more than 1200 sheets within a single project, the performance of the 'synchronize with central' will dramatically decrease).
- In order to avoid duplication or co-ordination errors, clear definition of the data ownership throughout the life of the project shall be defined and documented. Element ownership may transfer during the project time-line – this shall be explicitly identified in the Project BIM Strategy Document.
- Where multiple models make up a single project, a container model should be considered, whose function is to link the various assemblies together for coordination/clash detection purposes.

Example of Data Segregation:

<b>Discipline (Linking)</b>	<b>Breaks in Design (Linking or Worksets)</b>
Architecture	Floor by floor or groups of floors
Structure	Major geometry splits such as east-wing or west-wing
Mechanical	Construction joints such as podium and tower



Electrical	Work packages and phases of work
Civil	Document sets
	Work allocation such as core, shell and interiors



## 6.2 Worksets

Worksets allow multiple users to simultaneously work on a model file through use of a CENTRAL file and synchronised LOCAL copies. Properly utilised, worksets can significantly improve efficiency and effectiveness on large and multi-user projects.

- Appropriate worksets shall be established and elements assigned, either individually or by category, location, task allocation, etc.
- To improve hardware performance only the required worksets shall be opened. Revit ensures that elements contained in closed worksets are still updated if changes made in open Worksets impact them during model regeneration.
- Once worksets are enabled, filenames shall be suffixed with either **–CENTRAL** or **–LOCAL** as defined in section 8.4.
- A LOCAL copy of the model shall be created by **COPYING** the original onto a local hard-drive via Windows Explorer – **not by opening the CENTRAL file and doing a ‘Save As’**. See section 8.2.1 for local folder structure.

### **Warning!**

At no point after creation should the CENTRAL file be opened or edited directly. All required operations can be, and therefore shall be, performed via the LOCAL files.

- From release 2010 onwards, automated features allow the user to generate a local file with a reduced likelihood of accidental opening of the CENTRAL file. These new tools are to be encouraged, although the above points still apply.

### 6.2.1 Division

- Workset allocation shall be done in a logical manner that allows for other members of the design team to collaborate and/or assist with the model development without recourse to complicated introductions to the project methodology.
- A project shall be broken into a sufficient number of Worksets to avoid congestion in workflow. This also provides the means for adequate control over the efficiency of the model.
- The BIM Co-ordinator shall define how the model is split into worksets, such as described in the above table.
- The BIM Co-ordinator shall manage the borrowing permissions and workset ownership.
- Worksets shall be named following the conventions defined in section 8.5.

## 6.2.2 Saving on Multiuser Projects

- All team members shall 'Save to Central' hourly.
- The Project BIM Co-ordinator shall allocate a pre-defined, unique slot for each team member to 'Save to Central'. This avoids machines hanging whilst several users try to save simultaneously.
- The "Work-sharing Monitor" tool could be used to coordinate 'Save to Central' commands across the team.
- Users shall not leave the save to central process unattended, and shall resolve any issues which arise to avoid delays to other team members.

## 6.2.3 Borrowing or Workset Ownership

Two methods exist for setting permissions which enable multi-user access to a model file through use of worksets:

Two methods exist when using worksets to enable multi-user access to a model file: 'borrowing elements' and 'owning worksets'. Typically, '**borrowing**' shall be used. However, '**ownership**' shall be used when:

- Restricting access of a particular aspect of the building to a single user,
- A user needs to operate away from the network and still be able to work, although caution is required to ensure that only 'owned' worksets are edited,
- Working collaboratively over a slow or remote network.

In practice, these methodologies take the following form:

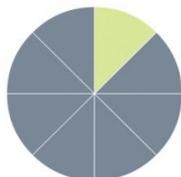
### Element Borrowing

- Users work as though in isolation on a single-user file.
- Permission to modify an element is sought and either given or denied by a live link to the Central file.
- All permissions collated in this manner are relinquished during the 'Save to Central' process.

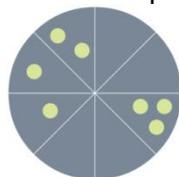
### Workset Ownership

- A user takes ownership of an entire workset.
- The LOCAL file does not need to query the CENTRAL file for permission to modify any element allocated to that workset.

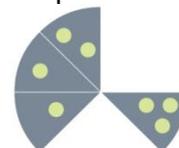
Take **OWNERSHIP** of an entire workset



**BORROW** elements from workset as required



NB/ Users only need to open required worksets



## 6.3 File Linking

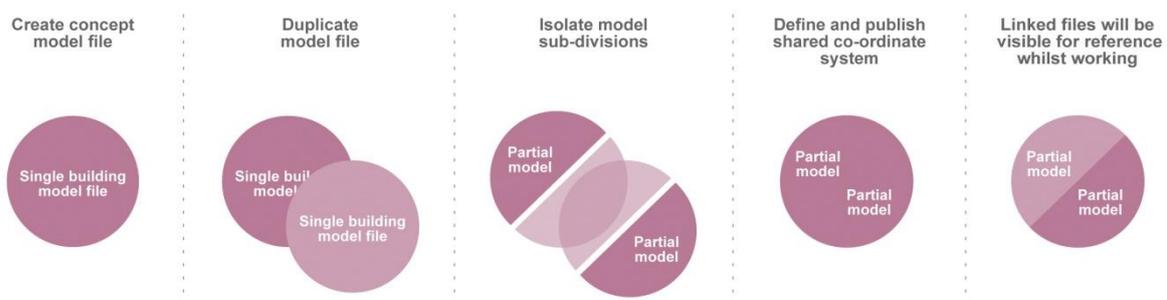
Linking enables additional geometry and data to be referenced into a model. This may be either other parts of a project which are too big to manage in a single file, or data from another discipline or external company.

### 6.3.1 Single Discipline Linked Files

Some projects require that models of single buildings are split into multiple files and linked back together in order to maintain manageable model file size.

In some large projects it is possible that all the linked models may never be brought together as one. Various container files will exist to bring model files together for different purposes.

- Task allocation shall be considered when dividing the model so as to minimise the need for users to switch between models.
- Division shall be determined by the lead architect / engineer in conjunction with the BIM Co-ordinator.
- How and when the model is split shall be defined in the Project BIM Strategy document.
- Model Lines shall be used to create cross-hairs in open space prior to duplication of the model. They then serve as a quick-check to ensure that the sub-models are aligned after Linking.
- When first linking the models back together, '**Origin to Origin**' shall be used as the insertion mechanism.
- Before split and linked models are shared with the rest of the team:
  - The real-world co-ordinates of a point on the project shall be defined and published to all linked models using the 'Shared Coordinate' tools in Revit,
  - Each sub-model shall be reopened and the other sub-models Linked in as required using the '**By Shared Coordinates**' insertion method.
  - The relationship between True North and Project North is correctly established.
- When splitting a file into sub-models the below workflow shall be followed:



### 6.3.2 Inter-Disciplinary Model Linking

Each separate discipline whether internal or external, involved in a project shall have its own model and is responsible for the contents of that model. A discipline can Link in another discipline's Shared model for reference.

- Shared Coordinates and Project North rotation shall be agreed and documented at the outset. No deviation from these shall occur without permission of the BIM Co-ordinator.
- Details of any discipline-specific requirements, such as the difference between Finished Floor Level (FFL) and Structural Slab Level (SSL), shall be fully documented in the Project BIM Strategy.
- The Copy and Monitor tools in Revit shall be used to duplicate and relate Levels and Grids only.
- The Copy Monitor tools shall not be used for other element categories without a full understanding of limitations, such as the creation and update of certain elements is not reflected in the monitoring process.
- Ownership of elements shall be properly communicated and tracked through the project time-line (e.g. floors may be created by the Architectural team, but are then adopted by the Structural team to form part of the load-bearing structure).
- Each discipline shall be conscious that referenced data has been produced from the perspective of the author and may not be modelled to the required specification for other purposes. In this case, all relevant parties, with input from the BIM Manager(s) shall convene to discuss the potential re-allocation of ownership.
- Should a team develop a 'starter model' for a partner discipline, such as defining the structural model in conjunction with the architecture, this shall be done in a separate model which shall then be linked in.
- This starter model may be passed to the partner discipline who shall then assume ownership of it. The partner discipline shall open this starter model and link in, by shared co-ordinates, the originator's model as a reference.
- With models produced for Building Services, several disciplines may be collated in a single model, as a single piece of equipment may require connection to various services. In this scenario, the model may be split in various ways. The BIM Co-ordinator shall be consulted in defining the project-specific strategy.

# 7 Modelling Methodology

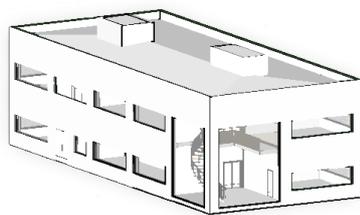
This section defines the methodologies for BIM working that enables efficient use and re-use of BIM data.

## 7.1 Model Development Methodology

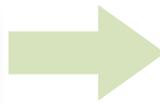
Standard templates have been created to facilitate, a Model Development Methodology which shall be used to develop projects in early stages as it enables rapid model development and allows for very large models to be created with low hardware requirements.

- The templates provide only one example of each element, such as 'Doors'. These concept (Grade 1 - see section 7.2) elements shall be used to form categorised place-holders in the model.
- As the design develops, and precise materials and components are chosen, these concept objects shall be swapped, individually or en-masse, for more specific Grade 2 or Grade 3 variants.
- For Structural Analytical components, sample columns and framing members which are representative of steel or concrete elements shall be provided in the template.
- The frame shall be constructed from these placeholders. If the section size is known from an early stage it can be chosen from the libraries, but no assumptions shall be made by opting for the default section.

**EXCEPTION for MEP System components. Errors can occur in swapping one MEP system component for another and so the above methodology shall be used only on components which are not system related.**



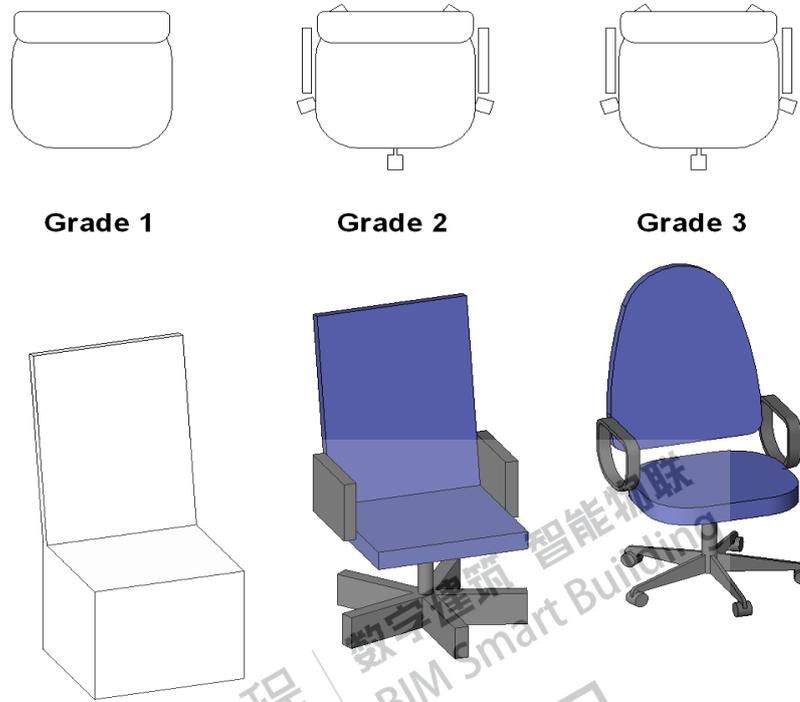
Model initially created using concept grade components.



Concept components substituted for Grade 2 or 3 components as design progresses.

## 7.2 Graded Component Creation

In line with the Model Development Methodology, all components created, or otherwise obtained shall be graded, named and stored accordingly in the project or central folder structure. Elements shall be graded as follows:



### Component Grade 1 – Concept

- Simple place-holder with absolute minimum level detail to be identifiable, e.g. as any type of chair.
- Superficial dimensional representation.
- Generic in terms of manufacturer information and technical data.
- Created from consistent material: either ‘Concept–White’ or ‘Concept–Glazing’.

### Component Grade 2 – Defined

- Contains all relevant meta-data and technical information, and is sufficiently modelled to identify type of chair and component materials.
- Typically contains level of 2D detail suitable for the “Preferred” scale.
- Sufficient for most projects.

### Component Grade 3 – Rendered

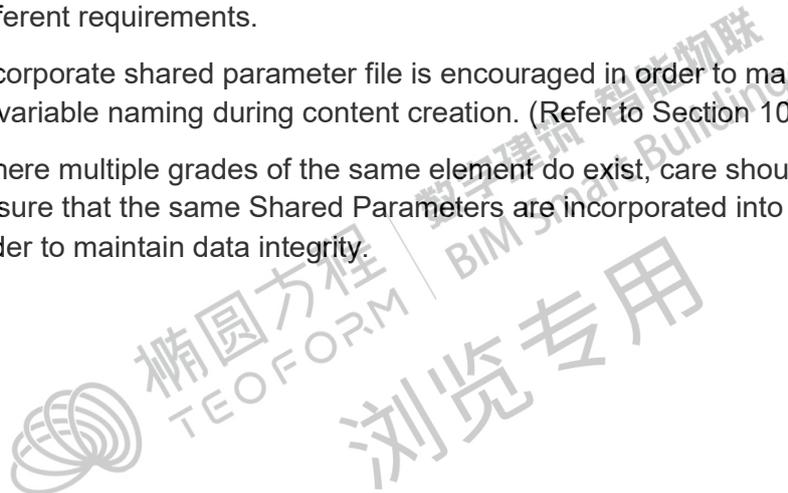
- Identical to the Grade 2 version if scheduled or interrogated by annotation. Differs only in 3D representation.
- Used only when a 3D view at a sufficient scale deems the detail necessary due to the object’s proximity to the camera.

### Important!

When in doubt, users should opt for less 3D geometry, rather than more, as the efficiency of the BIM is largely defined by the performance of the components contained within.

Adherence to the above grading and Model Development Methodology may result in multiple versions of the same element existing at different grades. This is accommodated in the object naming strategy defined in Section 8.6.

- Further purposes of the BIM will lead to additional specifications of the content, which should be built to suit the purposes of the deliverables.
- In addition to the grading, a component may make use of Coarse, Medium and Fine levels of detail to control graphical representation.
- Objects generated in the development of a project will be stored in the WIP area of the project folder structure.
- The BIM Co-ordinator will assess and verify minimum quality compliance before submitting new objects to the corporate library stored in the central resource folder.
- The intended purpose of the components shall be considered and the results checked and verified prior to large scale use. For instance, structural analysis applications may require elements with certain naming conventions or other criteria, without which they will not be recognised. Different applications may have different requirements.
- A corporate shared parameter file is encouraged in order to maintain consistency of variable naming during content creation. (Refer to Section 10.5)
- Where multiple grades of the same element do exist, care should be taken to ensure that the same Shared Parameters are incorporated into the objects, in order to maintain data integrity.

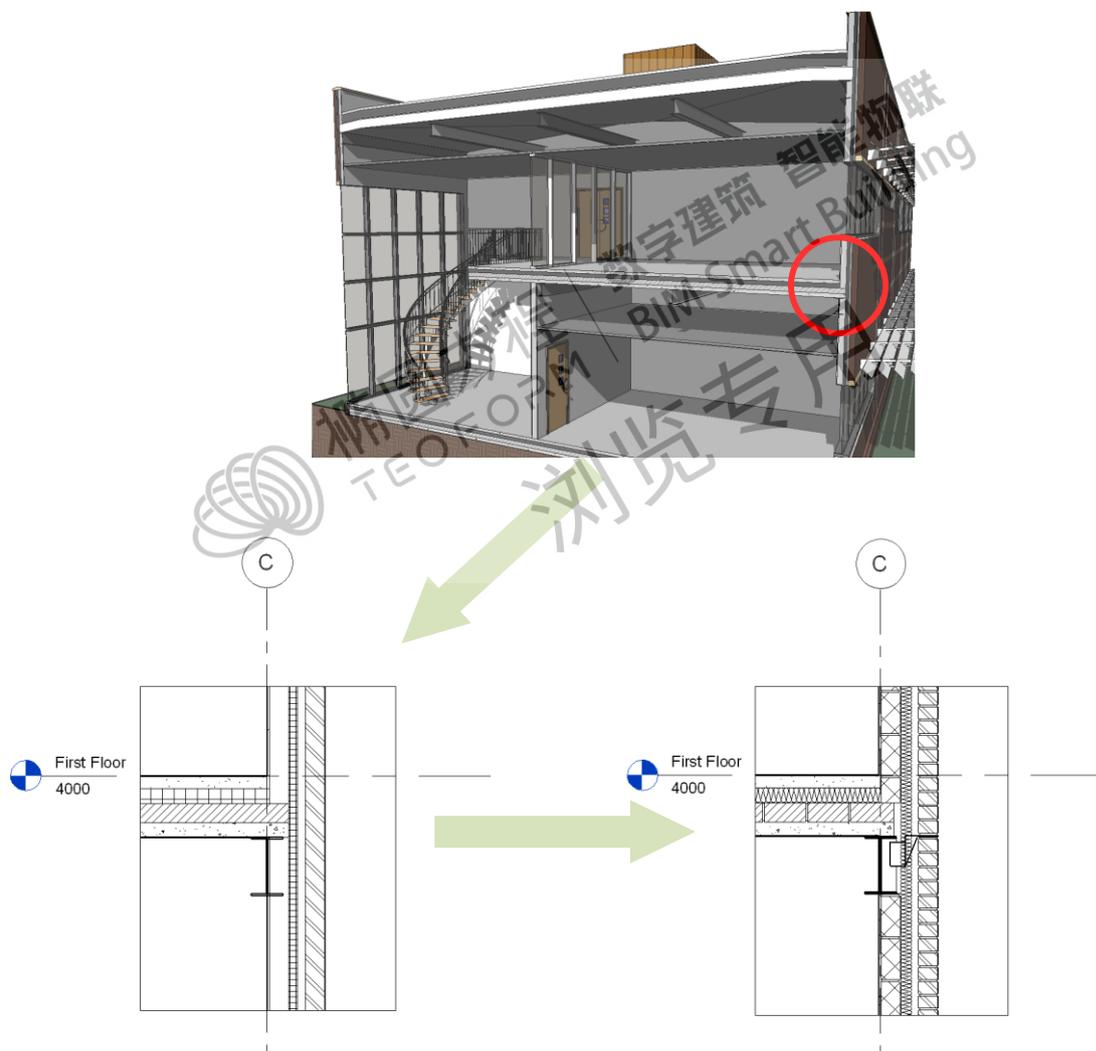


### 7.2.1 Model / Drafting Detail

At the outset of the project, consideration shall be given to the maximum level of detail to be included in the BIM. Too little and the information will not be fit for purpose; too much and the model may become unmanageable and inefficient.

- The BIM Co-ordinator shall dictate the point at which 3D geometry ceases and 2D detailing is utilised to prepare the published output.
- Intelligent 2D linework shall be developed to accompany the geometry and enhance the required views without undue strain on the hardware. 2D linework is not exclusive to detailed/fabrication information.
- Detailing and enhancement techniques shall be used whenever possible to reduce model complexity, but without compromising the integrity of the model.

3D modelling is carried out to an accuracy of approximately 1:50



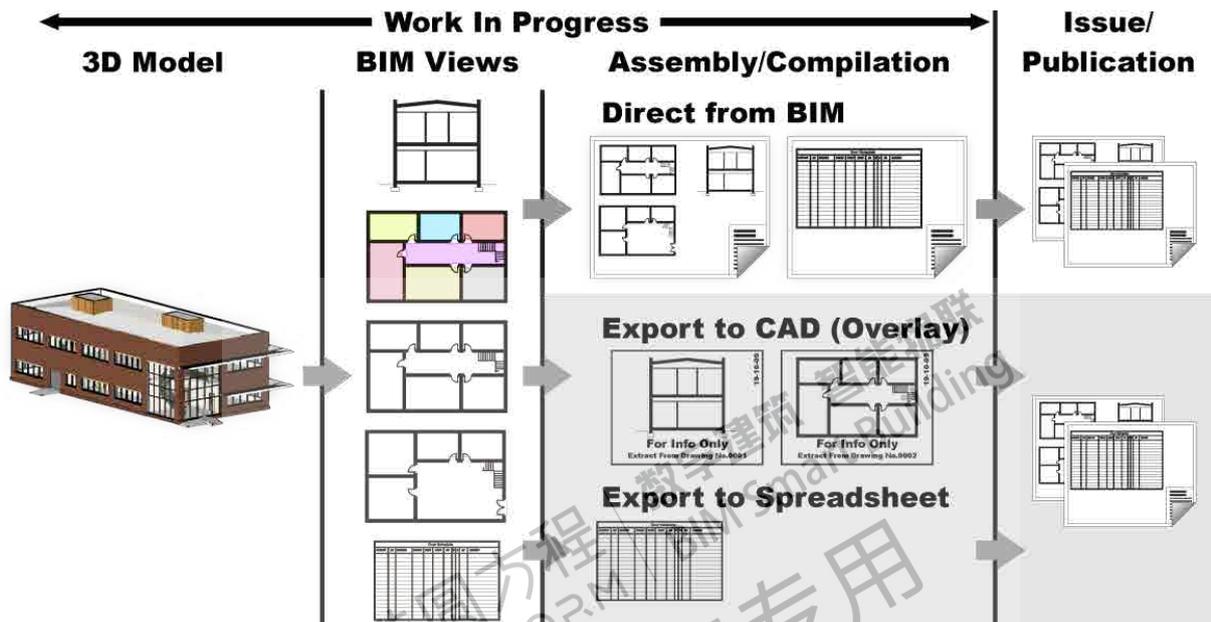
2D information contained within model

Detail Components, Repeating Details, Filled / Masking Regions, Tags, Keynotes, Text and Detail Lines are used to enhance the finished image

## 7.3 Drawing Compilation

Drawing compilation and preparation for publication can be carried out in two ways:

1. Fully assembled compilation of views and sheets within the BIM environment (preferred).
2. Export views in the form of output files for assembly and graphical enhancement using 2D detailing tools within a CAD environment.



- Exporting views in order to 'finish off' in CAD negates the advantages of the BIM data for coordination purposes and should be avoided where possible.
- The BIM Co-ordinator shall decide if the team composition or other factors dictate that the BIM methodology is not appropriate.
- Whichever methodology is chosen, the 3D model shall be developed to the same maximum extent, before 2D techniques are applied.
- When CAD or BIM data is Linked into a project, the design teams shall ensure that the latest validated / checked design information is accessed directly from the Project Shared area when composing drawing sheets.

### 7.3.1 Sheet composition direct from within the BIM

Drawing sheet composition from within a BIM environment shall be established through the linking of views, callouts, elevations and drawing sheets fully within Revit software.

Care shall be taken to ensure that any linked data is available and visible prior to the publication of documentation from the BIM.

### 7.3.2 Sheet composition from Views/Output files

Views exported from the BIM for sheet compilation in CAD, or for use as a background to other drawings in CAD, shall be placed on a plain border which clearly indicates the following:

- The data is provided for information purposes only
- Details of the origin of the data
- The date of production or issue

Where output files are exported from the BIM for further 2D detailing in CAD, originators shall ensure that changes occurring within the BIM are correctly reflected and updated within the CAD files used to produce the final drawing.

If it is a requirement to export data from Revit in 'Real-World' co-ordinates, then the export operation must be performed from a working view (such as a floor-plan) and not from a compiled sheet view.

**Warning:**

The integrity of exported views/output files from within a BIM environment must be checked for accuracy and content prior to drawing compilation.

## 7.4 Spatial Location & Co-ordination

As defined in **BS1192:2007**, BIM projects shall:

- Use real world co-ordinate systems:
- Be produced to true height above project datum.
- Adopt the established Project Shared Coordinate system across all BIM data files to allow them to be referenced without modification.

CAD data modelled more than 1 mile from the origin (in any plane) shall be shifted to 0,0,0 prior to importing into Revit to avoid accuracy issues. This shift shall be agreed, consistent and identified in the Project BIM Strategy document.

**Note:**

Some software (e.g. certain structural analysis software) requires data to be located at 0,0. For export to such software, alternative coordinate systems shall be established within the BIM data.

## 7.5 Units and Measurement

- Models shall use consistent units and measurement across the project. Default **project units** shall be millimetres with two decimal places in order to display accuracy in the temporary dimensions.
- Dimension styles in the accompanying templates utilise defined units which override project settings, so whilst the temporary dimension might read **3000.00** (*project settings*), the permanent dimension will read **3000** (*dimension style in template*).
- 2D input/output files shall conform to the unit and measurement protocols designated for specific drawing types e.g.
  - **1 unit = 1.000 metre** Site layout drawings relating to the project coordinate system to an accuracy of 3 decimal places.
  - **1 unit = 1 millimetre** Elements, details, sections, elevations and building structure outlines to an accuracy of 0 decimal places.
- Switching between Imperial / Metric units shall be avoided where possible in order to maintain proper or conventional measurements, such as 50mm rather than 50.8mm.
- CAD data shall be scaled to the appropriate units prior to linking into the BIM environment.



# 8 Folder Structure and Naming Conventions

## 8.1 Introduction

This section defines storage of BIM data within the project filing system along with the naming conventions associated with aspects of BIM working.

## 8.2 Project Folder Structure

The defined structure follows the principles of **BS1192:2007's** 'Work In Progress (WIP)', 'Shared', 'Published' and 'Archived' segregation of data within a designated set of folders (see section [□](#) - Project Review Dates: Sets out key dates for reviews of the Revit model which all teams buy in to (both internal to the company and externally with the full design team).

Collaborative BIM Data Sharing).

Where a project comprises of a number of separate elements such as multiple buildings, zones or areas, the BIM structure shall be maintained within a set of designated sub-folders representing the various project elements.

All project data (with the exception of a user's Local copy of a Central file) shall be held within the standard project folder structure located on central network servers or appropriate Document Management technology. This includes all WIP components or assemblies.

### 8.2.1 Central Resource Folder Structure

Standard templates, titleblocks, families and other non-project-specific data shall be held within the server based Central Resource Library, with restricted access.

-  <SERVER NAME>\Resource\Autodesk\_Revit
  - +  Titleblocks
  - +  Standards
  - +  Templates
  - +  Families [Refer to Section 8.2.4]

### 8.2.2 Local Project Folder Structure

Local copies of central project models do not need to be backed up as changes are regularly synchronised with the central model. They shall be stored on the user's hard drive – **not in 'My Documents'** – according to the folder structure below.

-  D:\ [Standard local drive]
  -  BIM\_Projects [Storage of Revit local projects]
    -  <Project Name> [Name of project]

### 8.2.3 Project Folder Structure

The following folder structure is provided as an example arrangement, designed to encourage compliancy with the strategies contained within this standard.

-  **[Project Folder]**
  -  BIM [BIM data repository]
    -  **01-WIP** **[WIP data repository]**
      -  CAD\_Data [CAD files (incl. 'Modified')]
      -  BIM\_Models [Design models (incl. 'Modified')]
      -  Sheet\_Files [Sheet/dwg files]
      -  Export [Export data e.g. gbXML or images]
      -  Families [Components created during this project (See 8.2.4)]
      -  WIP\_TSA [WIP Temporary Shared Area (TSA)]
    -  **02-Shared** **[Verified Shared data]**
      -  CAD\_Data [CAD data/output files]
      -  BIM\_Models [Design models]
      -  Coord\_Models [Compilation models]
    -  **03-Published** **[Published Data]**
      - +  YYMMDD\_Description [Sample submission folder]
      - +  YYMMDD\_Description [Sample submission folder]
    -  **04-Archived** **[Archived Data repository]**
      - +  YYMMDD\_Description [Archive folder]
      - +  YYMMDD\_Description [Archive folder]
    -  **05-Incoming** **[Incoming Data repository]**
      -  Source [Data originator]
        - +  YYMMDD\_Description [Incoming folder]
      - +  Source [Data originator]
    -  **06-Resource** **[Project support files]**
      - +  Titleblocks [Drawing borders/titleblocks]
      - +  Logos [Project logos]
      - +  Standards [Project standards]

No spaces are to be used in the folder naming as this can potentially interfere with certain file management tools and collaboration across the internet.

## 8.2.4 Component Library Sub-Folders

All locations for the storage of Family components shall be sub-divided as follows:

-  <b>Families</b>	<b>[Exists in several locations]</b>
+  2009	[The version of the software]
-  2010	[The version of the software]
-  Architecture	[Architectural components]
-  Mechanical_Services	[MEP components]
-  Structure	[Structural components]
-  General	[Non discipline-specific elements]
-  Autodesk_Metric_Library	[Default supplied components]
-  Material_Library	[Textures libraries and images for render output]

The individual disciplines shall then be broken down as follows, with new sub-folders added as required by additional functionality in the software.

### 8.2.4.1 Architecture Components

-  <b>Architecture</b>	
-  Casework	
-  Ceilings	
-  Columns	[Arch non-analytical columns]
-  Curtain_Panel_by_Pattern	
-  Curtain_Wall_Panels	
-  Detail_Components	
-  Doors	
-  Electrical_Fixtures	[Arch versions]
-  Entourage	
-  Floors	
-  Furniture	
-  Generic_Models	
-  Lighting_Fixtures	[Arch versions]
-  Mass_Elements	
-  Mass	
-  Planting	
-  Plumbing_Fixtures	[Arch versions]
-  Profiles	
-  Q_Families	
-  Roofs	
-  Site	
-  Speciality_Equipment	
-  Stairs_and_Railings	
-  Balusters	
-  Sustainable_Design	
-  Walls	
-  Windows	

#### 8.2.4.2 MEP Components

-  **Mechanical Services**
  -  Ceilings
  -  Ducts
  -  Electrical\_Components
  -  Fire\_Protection
  -  Generic\_Models
  -  Mechanical\_Components
  -  Pipe
  -  Plumbing\_Components
  -  Profiles
  -  Speciality\_Equipment
  -  Sustainable\_Design

#### 8.2.4.3 Structural Components

-  **Structure**
  -  Boundary\_Conditions
  -  Columns
  -  Connections
  -  Floors
  -  Foundations
  -  Framing
  -  Generic\_Models
  -  Profiles
  -  Rebar\_Shapes
  -  Retaining\_Walls
  -  Roofs
  -  Speciality\_Equipment
  -  Stiffeners
  -  Trusses
  -  Walls

#### 8.2.4.4 Non Discipline-Specific Components

-  **General**
  -  Annotation [Tags and symbols]
  -  Titleblocks [Drawing frame families]

### 8.3 General Naming Conventions

- Use only letters A-Z, hyphen, underscore and numbers 0-9 for all fields.
- All fields shall be separated by a hyphen character “-” Do NOT use spaces.
- Within a field, either CamelCase or an underscore “\_” shall be used instead of a space to separate words.
- A single period character “.” shall be used to separate the file name from the extension. This character should not be used anywhere else in the file name.
- The file extension shall not be amended or deleted.
- An “XX” shall be used if the file does not refer a single specific zone or level.
- The scheme for zone and level sub-division shall be agreed with the other project professionals at the outset and defined in the Project BIM Strategy document.
- For 2 digit code examples for discipline, zone and level see Appendix 11.1
- Elements where a naming convention is not explicitly defined by this Standard shall adopt the naming convention of existing elements and prefix with a 3-character abbreviation to identify corporate author.

Examples:

Line Pattern Name	Line Style Name	
AEC_Dash-1.5mm	AEC_1-Solid	} Existing elements
AEC_Dash-3mm	AEC_3-Solid	
AEC_Dash-9mm	AEC_5-Solid	
<b>ABC_Dash-12mm</b>	<b>ABC_3-Hidden</b>	— New element

## 8.4 Model File Naming

Naming of model files shall be based on BS1192:2007. For full compliance, recommended character restrictions should be adopted.



Field 1: **Project** (*Recommended 3 characters*)

An abbreviated code or number identifying the project.

Field 2: **Originator Code** (*Recommended 3 characters*)

An abbreviated code identifying the originating stakeholder.

Field 3: **Zone/System** (*Recommended 2 characters*)

Identifier of which building, area, phase or zone of the project the model file relates to if the project is sub-divided by zones).

Field 4: **Level** (*Recommended 2 characters*)

Identifier of which level, or group of levels, the model file relates to if the project is sub-divided by levels.

Field 5: **Type** (*Recommended 2 characters*)

Document type, which will be **M3** for 3D model files.

Field 6: **Role** (*Recommended 2 characters*)

2 character discipline identifier code. Refer to Appendix 11.1.

Field 7: **Description**

Descriptive field to define the type of data portrayed in the file. Avoid repeating information codified in other fields. Can be used to describe any part of the previous fields, or to further clarify any other aspect of the contained data.

**Local / Central** (*mandatory when using worksets*)

In workset enabled files, either –LOCAL or –CENTRAL shall be suffixed to the filename.

Examples:

Model File Name	Description
<b>37232-AAA-Z6-01-M3-ST-Main_Model-LOCAL.rvt</b>	Job No. 37232, Structural drawing of Zone 6, Level 1 – User local file
<b>FTR-ACM-XX-XX-M3-ST-School_Stage_E.rvt</b>	Acme structures model for School project at Stage E – no zones or segregation of floors
<b>102-ACM-Z1-XX-M3-ME-School.rvt</b>	Acme Building Services model for job 102, Zone 1 all levels

## 8.5 Workset Naming

Worksets should be named in a consistent and logical manner to aid navigation through the project.

**Note:**

As these are created, the 'Enabled in All Views' option shall be checked in every case except Furniture. (This cannot be changed later)



Field 1: **Zone** (*Optional*)

Larger projects can be divided horizontal or vertically into zones/levels and so this should be identified in the workset naming where applicable.

Field 2: **Content**

Description of workset content; used in isolation in smaller projects, or in combination with one or both of Zone and Level on larger projects. Should typically be one of the following:

<b>Ceilings</b>	Ceilings and attached components
<b>Cores</b>	Architectural components of core
<b>Furniture</b>	Furniture and equipment
<b>Interiors</b>	Interior walls and doors
<b>Shell</b>	Exterior walls and openings
<b>Slabs</b>	Horizontal elements including roofs
<b>Circulation</b>	Stairs, ramps and landings
<b>Structure</b>	Structural slabs and columns

Examples:

Workset Name	Example of use
<b>L01-Model</b>	Project broken by levels
<b>L01_14-Internals</b>	Multi-Level Internal layout
<b>East_Lvl26-Partitions</b>	Very large project broken into zones, levels and systems
<b>Core</b>	Small project; core span levels
<b>East-Cores</b>	Large project; cores span levels

### 8.5.1 Workset Not Defined

Some elements do not require explicit workset definitions due to the standard behaviour of Revit.

- **Grids** These are included in the Shared Levels and Grids.
- **Areas** View specific and don't require a workset.
- **Annotation** View specific and don't require a workset.

## 8.6 Library Object Naming

To be confirmed in next release.

## 8.7 Parameter Naming

To be confirmed in next release.



## 8.8 View Naming

Conventions in the naming and use of views are necessary to coordinate team activity and prevent inadvertent changes in the output documents.

This standard is limited to draughting views and sheet views (although the Project Browser includes other kinds of elements).

- View naming shall be consistent across all references to that view. Renaming of views shall be carried out with care as any changes will be automatically reflected across all documentation.



Field 1: **Level** (*Optional*)

Concise description of the content and purpose of the view

Field 2: **Content**

Where appropriate, further clarification of the location of information shown

Examples:

Name
LEVEL 1 – FLOOR PLAN
LEVEL 1 – CEILING PLAN
LEVEL 3 – DETAIL PLAN AT ELEVATOR 1
NORTH-SOUTH BUILDING SECTION
WALL SECTION 1
SOUTH ELEVATION

- The Revit functionality that allows for the **Title on Sheet** to be different to the view name **shall not** be used. Exceptions for structural modelling:
  - A view to be used as a substructure or superstructure section. In this instance, the view property "Title on Sheet" shall be renamed to "SECTION".
  - A view to be used as a wall or framing elevation. In this instance, the view property "View Name" shall be similar to "VB-2" and the view property "Title on Sheet" shall be renamed similar to "Framing Elevation – VB-2".
- Level names are spelled out as they need to appear in a room schedule (as well as how they will appear in sections and elevations.) Do not pad the level number with leading zeros.
- Views **shall not** be named in order to make them sort or group more logically in the Project Browser as the grouping and filtering settings take care of that automatically (ie the prefixing of level names by sequential numbers).
- View names shall be written in uppercase.

- Creation of temporary working views is encouraged. The filtering described in Section 8.10 will ensure these remain in the top 'views' section of the project browser.

### 8.8.1 Special Views

Plan views differ in Revit from other views because they can be duplicated (without reproducing their reference mark as is necessary with elevations and sections.) This results in many special-purpose plans that are temporary or maybe never placed on title-sheets.

The following are exceptions to the view naming conventions described above.

View Type	Naming Convention	Examples
<b>Colour Plans</b>	COLOUR - <modifier>	<b>COLOUR – L1</b> <b>COLOUR – LEVEL 1 PRIMARY</b>
Views created in order to communicate a information relating to elements which meet a specific criteria.		
<b>Export Views</b>	EXPORT - <modifier>	<b>EXPORT – L1</b> <b>EXPORT – LEVEL 1 ELECTRICAL</b> <b>BACKGROUND</b>
Special configurations may be required for supplying graphical information which is specific to a particular discussion. These views shall show information relating to the origin and date/time of the extract as described in Section 7.3.2.		
<b>Import Views</b>	IMPORT - <modifier>	<b>IMPORT – L1</b> <b>IMPORT – LEVEL 1 ELECTRICAL</b>
A dedicated view should be used for attaching linked and imported material that needs to be segregated from other views. (This requirement helps to avoid technical problems and make it easier to control visibility.)		

### 8.8.2 Callout Views

Detail views, including views which are used only as a container for a linked AutoCAD detail, are named with the same general conventions as other views.

However, where the view refers to a fabrication detail of a common component, it may be pertinent to adopt a naming convention which refers to the Uniclass code associated with that element.

Examples:

Name
<b>A810 Waterproofing System</b>
<b>A820 Exterior Concrete</b>
<b>A910 Interior Partitions</b>
<b>A915 Interior Firestop-Penetration</b>

## 8.9 View List Scheduling

Two pre-defined schedules are included in the templates to manage the views, namely the **Publication View List** and the **WIP View List**, which contain columns for the following data:

Publication View List				
View Name	Title on Sheet	Scale Value 1:	Sheet Number	Sheet Name

WIP View List		
View Name	Scale Value 1:	Detail Level

Views are grouped by type within both schedules in order to aid navigation. It is recommended that these schedules remain unchanged and that new schedules are created, should the need arise to make this information available externally in a different format.

## 8.10 Project Browser Organisation

The Project Browser in Revit provides an organisational structure to the views and components within the BIM environment. The following rules are defined within the templates to automatically sort **WIP** views from **Publication** views.

- View folders shall be grouped by **Family and Type** and sorted by **Associated Level** in **Ascending** order.
- The Views shall be filtered by **Sheet Name** which should be **Equal to** a value of **None**. View section will now show only views not allocated to a drawing sheet.
- Sheet folders shall be grouped by **Sheet Number** using **1 Leading Character** and sorted by **Sheet Number** in **Ascending** order.
- No filters shall be applied to the Sheets.

## 8.11 Sheet View Naming

Sheet naming shall be based on the Document and Drawing Numbering protocols established for the project. These names automatically match the text as it appears in the titleblock and any schedules.

## 9 Presentation Styles

### 9.1 Introduction

This section defines the criteria which ensure the plotted appearance of drawing output from the BIM is consistent and of the highest quality. These criteria are embedded within the associated discipline-specific template files which accompany this document.

**Note:**

It is not the remit of this standard to dictate aspects covered by existing national draughting standards, and covers only those aspects which are important in delivering high quality, consistent drawing output from within a Revit BIM environment.

### 9.2 Templates

Three discipline-specific Revit project templates are available as part of this Standard. They can be obtained from the [www.aec-uk.org](http://www.aec-uk.org) web site and are maintained by the AEC (UK) BIM committee.

Additionally, a number of family templates are included. These templates provide an alternative basis for new families, consistent with the content of this standard.

Where client requirements deviate from those expressed in this standard, project-specific templates shall be created. These shall be stored within the Project BIM Resource standards folder.

### 9.3 Annotation

Text style shall be **ARIAL NARROW** using font file **ARIALN.TTF**

- The appearance of text shall be consistent across a set of drawings.
- Annotation shall be legible, clear and concise.
- An opaque background should be considered as an aid to clarity.
- Text shall remain legible when drawings are plotted at reduced size. Wherever practical lettering shall not be placed directly on top of lines or symbols.
- Dot style arrowheads shall be used instead of closed filled arrowheads when calling up hatched/shaded areas.

**Note:**

Parametric annotations shall be used wherever possible (e.g. TAGS, KEYNOTES etc.) For example, using the ROOM tools instead of adding text, allows room data to be scheduled to give area plans, finish schedules etc.

## 9.4 Text Assignment

All text shall be restricted to the following sizes:

Text height (mm) Plotted full size	Line Weight Allocation	Usage
1.8	2	General text, dimensions, notes – used on A3 & A4 size drawings
2.5	3	General text, Dimensions notes
3.5	4	Sub-headings,
3.5	5	General text, dimensions, notes – A0 drawings
5.0	7	Normal titles, drawing numbers
7.0	8	Major titles

Alternative text sizes shall not be used without the consent of the BIM Co-ordinator.

## 9.5 Line Weights

Line weights control the graphical display of on-screen data as well as all published output. Line weights assigned to Model elements are scale dependent whilst those associated with Annotation objects are fixed.

There are 16 model line weights. Each can be given a plotted thickness across the range of drawing scales as defined in appendix 11.8.

- Thin Lines mode **shall not** be used as this distorts the production requirements of publication output and promotes over-modelling and over-detailing.
- The plotted appearance of modelled components shall be consistent across the project.
- Line weights are assigned project-wide by category of component and can be overridden by view and by element. Individual lines on elements can also be overridden. Overriding should be kept to a minimum to aid consistency.
- The plotted appearance of modelled components shall be represented in a manner that provides 'depth' to the drawing and allows for adequate differentiation of elements cut in section, profile view and priority elements.

## 9.6 Line Patterns

The supplied templates contain a number of defined Line Patterns for use in all draughting production work. These Line Patterns are defined in Appendix 0 and any additional Line Patterns shall be created by the BIM Co-ordinator and named according to the naming conventions described in Section 8.3.

## 9.7 Line Styles

Line Styles are defined in the supplied templates as a project setting. These styles are documented in Appendix 11.7 and any additional Line Styles shall be created by the BIM Co-ordinator and named according to the naming conventions described in Section 8.3.

## 9.8 Hatching and Filled Regions

- Appendices 11.4 and 0 provide samples of the default Fill Patterns for Model and Draughting usage, which are loaded into the default templates.
- Alternative Fill Patterns shall be used only with the approval of the Project BIM Co-ordinator.
- Hatching/patterning shall be created using the relevant tools available within the software.
- Where possible, hatch patterns should be assigned to the relevant materials for the elements, rather than assigned as 2D patches.
- Care shall be taken to ensure that the draw order and transparency settings of filled regions are appropriate to the situation so as not to cover required graphical information.

## 9.9 View Templates and Filters

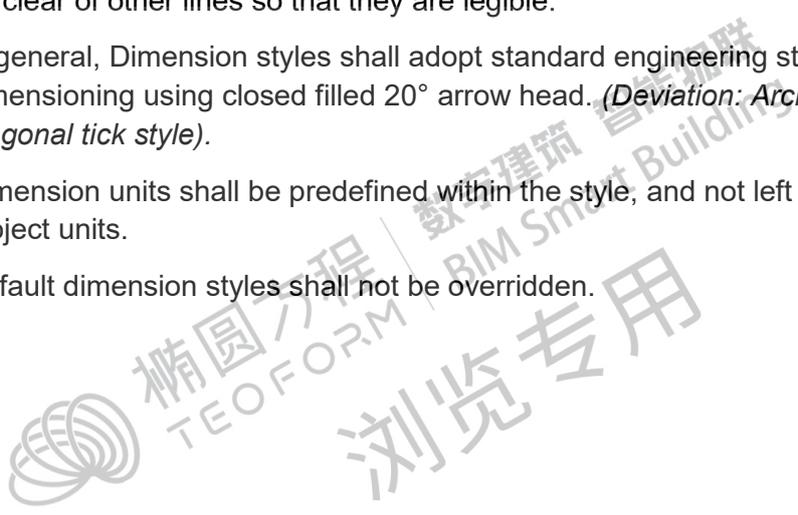
The default templates have a number of pre-defined View Templates and associated View Filters as described in Appendices 11.11 and 11.12.

- View Templates shall be used to maintain consistency across published output.
- Adjustments to the settings of the View Templates shall be carried out only with the agreement of the BIM Co-ordinator.
- Adjusted View Templates must be re-applied to all relevant views in order to propagate changes.

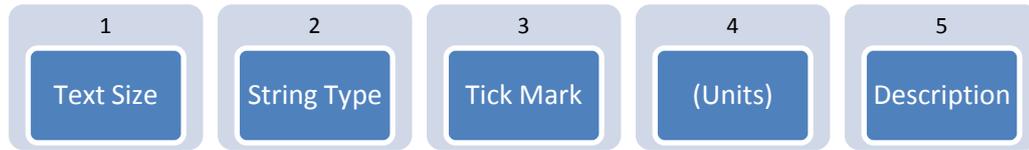
## 9.10 Dimensioning

Default dimension styles exist in the accompanying templates and new styles shall be added only if authorised by the BIM Co-ordinator.

- Where practical, all dimensioning shall be created using relevant software dimensioning tools. The dimension text shall not be exploded or overridden, but can be appended to e.g. “1200 (Typ.)”.
- Where practical avoid duplicate dimensioning either within a drawing or within a set of drawings.
- Where practical, dimension lines shall not be broken and shall not cross other dimension lines.
- In general, dimensions shall be placed on a drawing so they may be read from the bottom or right-hand side of the drawing.
- In general, dimension text shall be placed above the dimension line and shall be clear of other lines so that they are legible.
- In general, Dimension styles shall adopt standard engineering style dimensioning using closed filled 20° arrow head. (*Deviation: Architects may use diagonal tick style*).
- Dimension units shall be predefined within the style, and not left to default to the project units.
- Default dimension styles shall not be overridden.



### 9.10.1 Dimension Style Naming Convention:

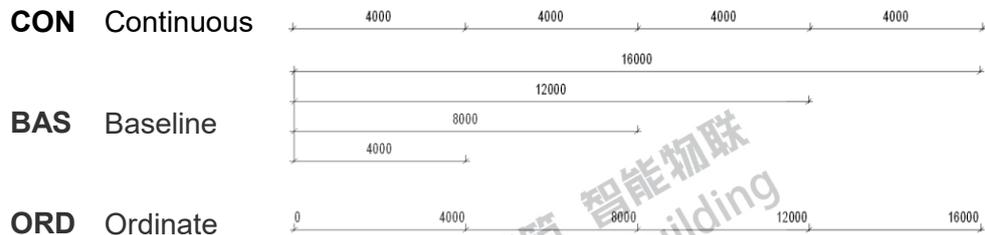


**Field 1: Text Size**

Size of text used on the dimension in the appropriate units. By default this shall be 2.5mm Arial Narrow.

**Field 2: String Type (Optional)**

Dimension String Type



**Field 3: Tick Mark**

Description of the tick mark used on the dimension style such as Dot, Arrow or Diagonal tick marks.

**Field 4: (Units)**

The reporting units of the dimension style.

**Field 5: Description (Optional)**

Provision for distinguishing specific dimension styles

**Examples:**

- 1.8-Con-Arrow-(mm)
- 2.5-Con-Diagonal-(mm)-Centreline
- 2.5-Arrow-(deg)

## 9.11 Titleblocks

- Corporate titleblock are available from the Families area of the central resource folder.
- Alternative client-specific versions may also be available from the same location.
- Project-specific titleblocks shall be created and stored in the Project Resource folder.

## 9.12 Symbology

Standard symbols such as north point, section marks and call-ups are available from within the discipline-specific template files and shall be used by default. See Appendix 11.3 for standard drawing navigation symbols.

### 9.12.1 Section and Detail Marks

Section and Detail marks shall be accessed from within standard template files, Revit's default repository or the Central BIM library.

- Section and Detail marks used shall be as defined in appendix 11.3.
- All **Sections** shall be numerically labelled.
- All **Details** shall be alphabetically labelled.
- Where practical, sections shall be listed consecutively, from left to right and from top to bottom on the drawing on which they are drawn.
- All sections and details shall be correctly cross-referenced in both directions i.e. cross reference to where the section/detail is actually drawn. Drawing cross referencing shall not include the revision code.

## 9.13 Copyright

All drawings, sketches or figures containing copyright information shall display the relevant permission to use that data.

For example with Ordnance Survey mapping:

Maps reproduced by permission of Ordnance Survey on behalf of Her Majesty's Stationary Office © Crown copyright and database right 2009.  
All rights reserved. Ordnance Survey Licence Number 0100048440

# 10 Resources

## 10.1 Introduction

To increase efficiency of BIM working, and to ensure a consistent and high quality output, resources and content shall be shared across the practice.

Certain projects may require deviations from this standard: these shall be defined in the Project BIM Strategy document.

## 10.2 Software

- A consistent software platform will aid the collaboration potential of BIM projects and is recommended. Interoperability between applications should be checked and verified at the outset of the project.
- Where 3rd party applications are used, originators shall ensure the standards defined within this document are complied with, unless situations make this impractical.
- Any potential implementation of software upgrade during the course of a live project shall be reviewed for its appropriateness by the BIM Co-ordinator who shall raise recommendations for upgrade through the relevant senior manager for approval.
- Implementation of any upgrade shall be in line with corporate CAD / BIM software strategy.

## 10.3 BIM Content / Resource Libraries

Content libraries hold families and other items for use within BIM.

- Creation of project-specific content is encouraged but shall be coordinated by the project BIM Manager ensuring content is developed in accordance with this standard and the associated best practice guidelines.
- No content shall be stored on users own hard-drives, but shall be shared in a controlled manner through the Project BIM Resource Library to provide access across the project team.
- Project content shall be reviewed periodically by the BIM Co-ordinator for inclusion in the Central BIM Resource Library which is read-only.
- Revit default family libraries are available through the Central Resource Library as read-only. Any elements from this library which require modification prior to utilisation shall be copied to the Project Resource Library.

### 10.3.1 Project BIM Resource Library

This shall be the repository for the storage of project specific standards where deviation from this standard is required due to project or client requirements.

- Standards, templates, titleblocks, families and other data produced in the process of completing the project shall be held within the Project BIM Resource Library (*see section 8.2 - Project Folder Structure*).
- Additions or modification to content held within this resource shall be carried out in a controlled manner and be at the approval of the BIM Co-ordinator.

### 10.3.2 Central BIM Resource Library

Standard templates, titleblocks, families and other non-project-specific data shall be held within the server based Resource Library, as defined in Section 8.2.1.

- Additions or modification to content held within this resource shall be carried out in a controlled manner and be at the approval of the BIM Co-ordinator.
- Content shall be segregated by software product and version.
- When content is updated for use in newer product version:
  - The original data shall be maintained,
  - The updated version of the content shall be created in the appropriate location for that product & version. This avoids 'forwards incompatibility' when using content with the version of the software for which it was originally created.

## 10.4 Keynotes

- A default Keynote file is included as part of this Standard and can be found in the Standards folder within the Central Resources.
- This file shall be copied to the project's Resource>Standards folder for each new project.
- Modifications to the project-specific version, are to be managed by the BIM Co-ordinator.

## 10.5 Shared Parameters

- The corporate Shared Parameter file is held in the Standards folder within the central resource. This is maintained by the BIM Management Team (App 11.15)
- When the creation of project-specific families requires the definition of shared parameters, a file shall be created within the project's resource folder. Once this content is approved for the corporate library, the associated Shared Parameters will be appended to the central Shared Parameters.

## 10.6 Keyboard Shortcuts

Only approved keyboard shortcuts shall be used (See Appendix 11.13).

# 11 Appendices

## 11.1 Model File Naming Codes

Discipline Codes	
<b>AR</b>	Architects
<b>BS</b>	Building surveyors
<b>CI</b>	Civil engineers
<b>DR</b>	Drainage, Road, Sewer
<b>EL</b>	Electrical engineers
<b>CC</b>	Cable Containment
<b>EL</b>	Electrical Services
<b>FA</b>	Fire Alarms
<b>LP</b>	Lightning Protection
<b>LT</b>	Lighting
<b>SE</b>	Security
<b>SP</b>	Small Power
<b>FI</b>	Fire
<b>FM</b>	Facilities managers
<b>GI</b>	GIS, land surveyors
<b>HS</b>	Health and safety
<b>ID</b>	Interior designers
<b>TE</b>	Telecommunications
<b>CL</b>	Client
<b>LA</b>	Landscape architects
<b>ME</b>	Mechanical engineers
<b>CW</b>	Chilled Water
<b>HT</b>	Heating
<b>ME</b>	Mechanical Services
<b>VT</b>	Ventilation
<b>EN</b>	Environmental
<b>PH</b>	Public health
<b>DR</b>	Drainage
<b>FS</b>	Fire Services
<b>PH</b>	Public Health Services
<b>SR</b>	Sanitation and Rainwater
<b>WS</b>	Water Services
<b>QS</b>	Quantity surveyors
<b>RA</b>	Rail
<b>ST</b>	Structural engineers
<b>TP</b>	Town / Transport planners
<b>CO</b>	Contractors
<b>SC</b>	Sub-contractors
<b>SD</b>	Specialist designers
<b>ZZ</b>	General (non-specific)

Project Zone Code Examples	
<b>01</b>	Building or zone 1
<b>ZA</b>	Zone A
<b>B1</b>	Building 1
<b>CP</b>	Car park
<b>A2</b>	Area Designation 2

Project Level Code Examples	
<b>01</b>	First floor
<b>B2</b>	Basement 2
<b>M1</b>	Mezzanine 1
<b>RF</b>	Roof
<b>PL</b>	Piling
<b>FN</b>	Foundation

## 11.2 Uniclass Table Reference

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

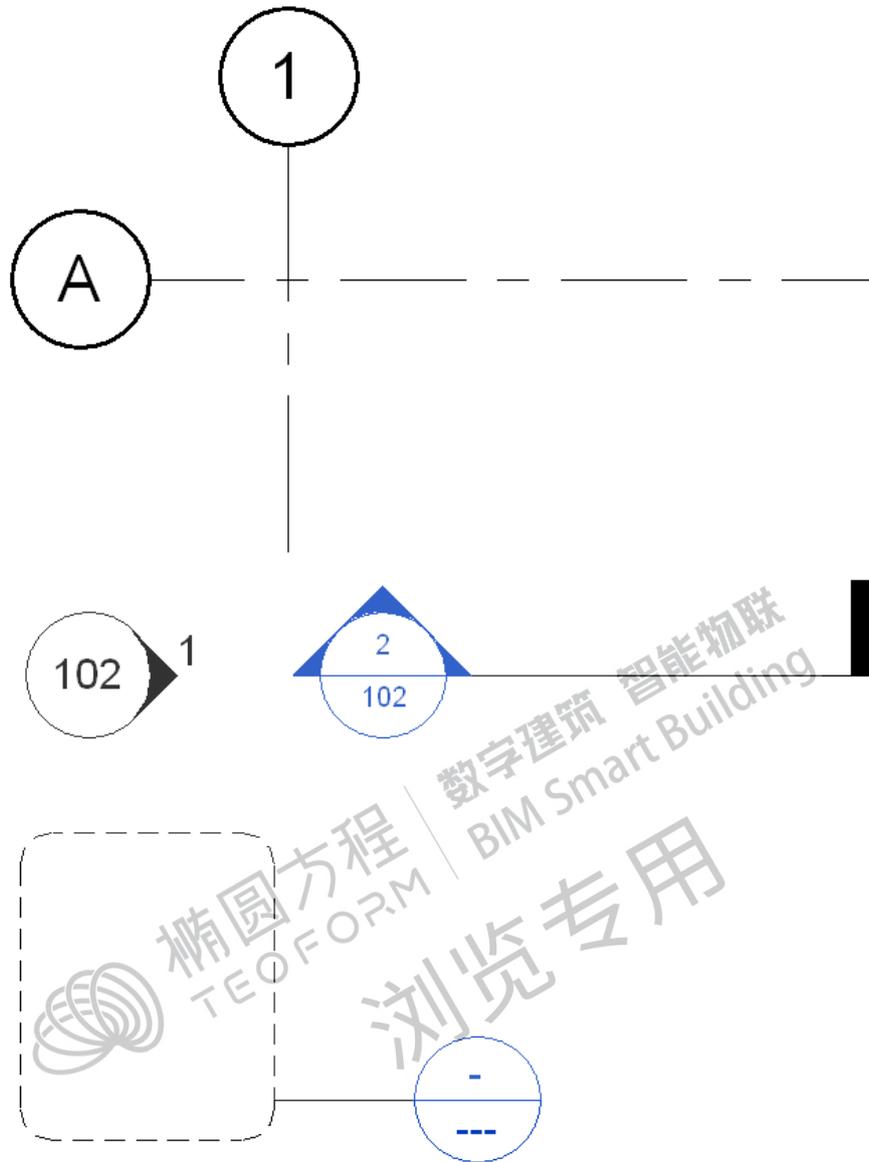
Alternative classification systems to Uniclass, such as CI/FsB have followers within the industry, it is beyond the remit of this standard to suggest which of these is more or less suitable. CI/FsB is no longer maintained and as such it was discounted from promotion herein.

The full Uniclass tables are available on-line at:

[www.cpic.org.uk/en/publications/uniclass-listing.cfm](http://www.cpic.org.uk/en/publications/uniclass-listing.cfm)



### 11.3 Standard Drawing Navigation Symbolology

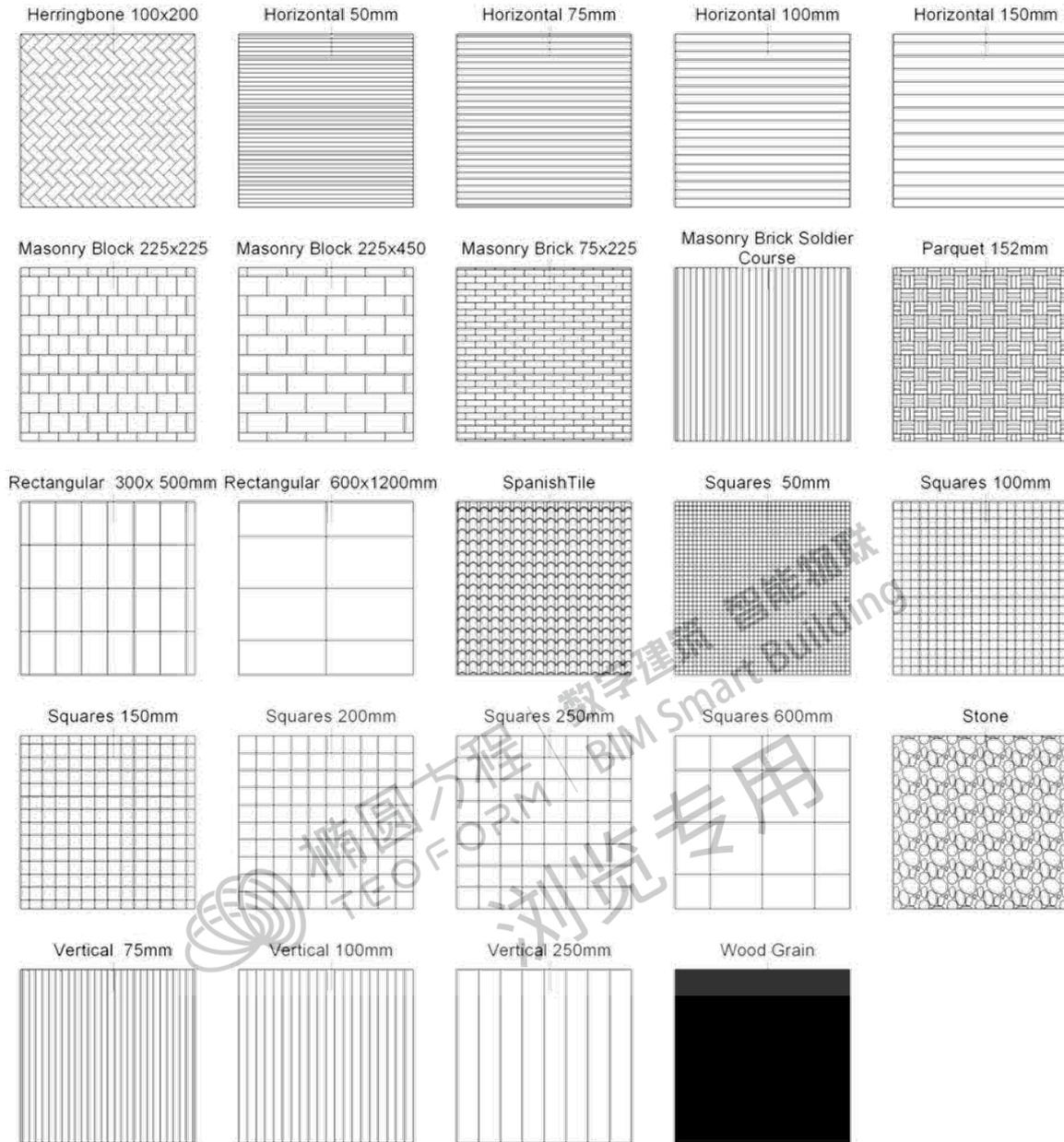


**1** **West Elevation**  
1 : 100

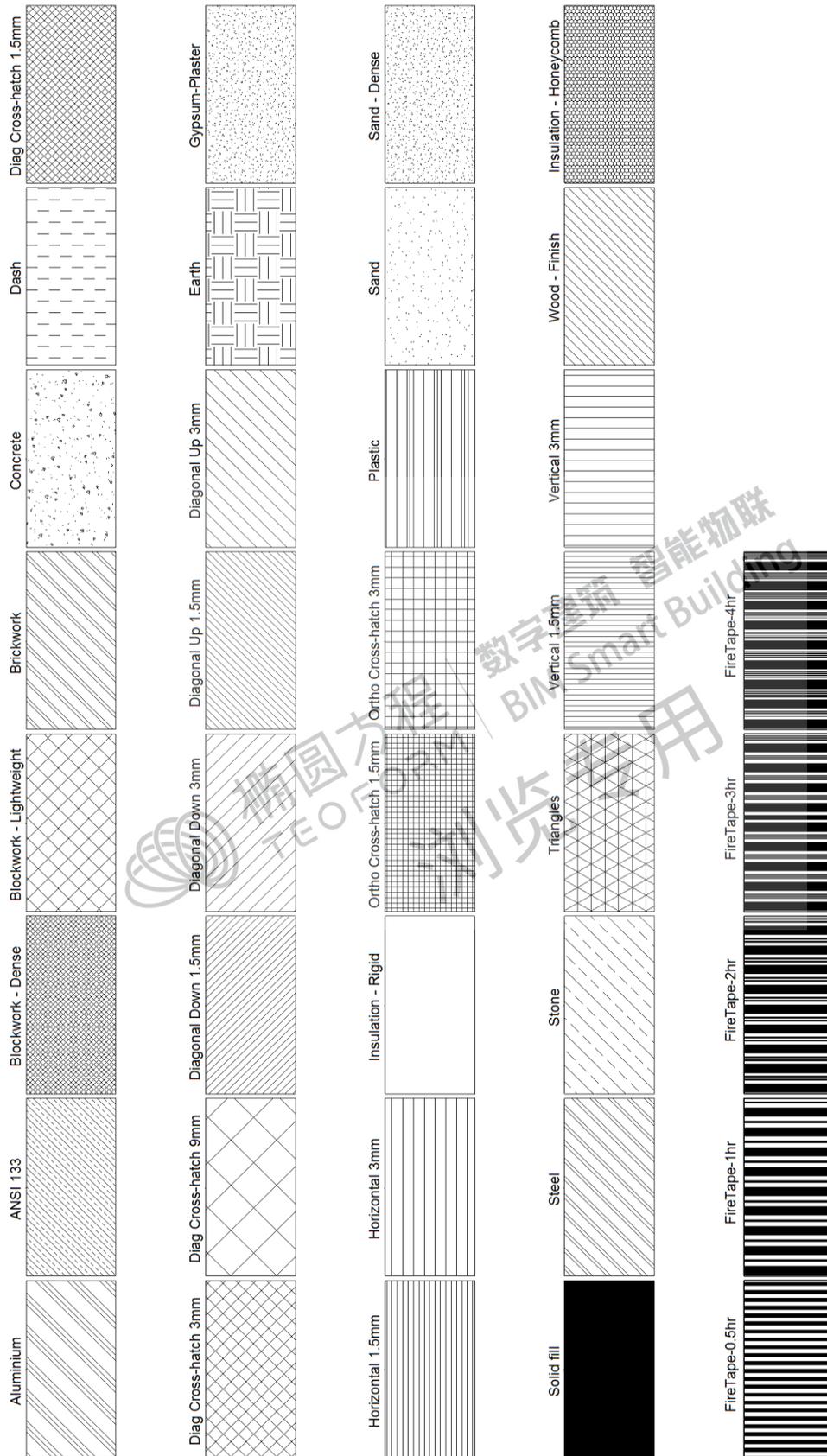
FFL 4.000 m

 **Level 1**

## 11.4 Model Patterns



## 11.5 Drafting Patterns



## 11.6 Line Patterns

Name	Pattern															
	1		2		3		4		5		6		7		8	
	Type	Value	Type	Value	Type	Value	Type	Value	Type	Value	Type	Value	Type	Value	Type	Value
Demolished	Dash	3	Space	1.5												
Elevation Swing	Dash	2	Space	1												
Grid Line	Dash	12	Space	3	Dash	3	Space	3								
Hidden	Dash	4	Space	2												
Overhead	Dash	2.5	Space	1.5												
Window Swing	Dash	6	Space	3	Dash	3	Space	3								
AEC_Centre	Dash	12	Space	4	Dash	4	Space	4								
AEC_Dash 1.5mm	Dash	1.5	Space	1.5												
AEC_Dash 3mm	Dash	3	Space	3												
AEC_Dash 3mm Loose	Dash	3	Space	6												
AEC_Dash 9mm	Dash	9	Space	4												
AEC_Dash Dot 3mm	Dash	3	Space	2	Dot		Space	2								
AEC_Dash Dot 6mm	Dash	6	Space	4	Dot		Space	4								
AEC_Dash Dot Dot 6mm	Dash	6	Space	4	Dot		Space	4	Dot		Space	4				
AEC_Dot 4mm		Dot	Space	4												
AEC_Dot 1mm		Dot	Space	1												
AEC_Dot 2mm		Dot	Space	2												
AEC_Double Dash	Dash	15	Space	4	Dash	6	Space	4	Dash	6	Space	4				
AEC_Hidden 2mm	Dash	2	Space	1												
AEC_Triple Dash	Dash	15	Space	4	Dash	6	Space	4	Dash	6	Space	4	Dash	6	Space	4

## 11.7 Line Styles

Category	Line Weight	Line Colour	Line Pattern
	Projection		
Lines	3	RGB 000-161-000	Solid
Area Boundary	12	RGB 128-000-255	Solid
Beyond	3	Black	Solid
Centreline	3	Black	AEC_Centre
Demolished	3	Black	Demolished
Hidden	3	Black	Hidden
Overhead	2	Black	Overhead
Room Separation	12	Cyan	AEC_Dash 3mm
Sketch	6	Magenta	Solid
Space Separation	12	Green	AEC_Dash 3mm
Axis of Rotation	12	Blue	AEC_Centre
Hidden Lines	3	RGB 000-161-000	AEC_Dash 3mm
Insulation Batting Lines	3	Black	Solid
Lines	3	RGB 000-161-000	Solid
Medium Lines	5	Black	Solid
Thin Lines	1	Black	Solid
Wide Lines	10	Black	Solid
<b>General</b>			
AEC_1-Solid	1	Black	Solid
AEC_3-Solid	3	Black	Solid
AEC_5-Solid	5	Black	Solid
AEC_6-Solid	6	Black	Solid
AEC_7-Solid	7	Black	Solid
AEC_8-Solid	8	Black	Solid
AEC_9-Solid	9	Black	Solid
AEC_10-Solid	10	Black	Solid
<b>Architectural</b>			
AEC_10-DPC	10	Magenta	Solid
AEC_10-DPM	10	RGB 000-128-000	AEC_Double Dash
<b>Structural</b>			
AEC_8-RNF_Mesh	8	Black	AEC_Dash Dot 6mm
AEC_11-Rebar	11	Black	Solid

## 11.8 Line Weights

Pen	1:10	1:20	1:50	1:100	1:200	1:500	Perspective	Annotation
1	0.1300	0.1300	0.1300	0.0600	0.0600	0.0600	0.0600	0.0600
2	0.1500	0.1500	0.1500	0.1300	0.0600	0.0600	0.1300	0.1300
3	0.1800	0.1800	0.1800	0.1500	0.1300	0.0600	0.1500	0.1500
4	0.2000	0.2000	0.2000	0.1800	0.1500	0.1300	0.1800	0.1800
5	0.2500	0.2200	0.2200	0.2000	0.1800	0.1500	0.2000	0.2000
6	0.3500	0.2500	0.2500	0.2200	0.2000	0.1800	0.2200	0.2200
7	0.4000	0.3500	0.3500	0.2500	0.2200	0.2000	0.2500	0.2500
8	0.5000	0.4000	0.4000	0.3500	0.2500	0.2200	0.3500	0.3500
9	0.6000	0.5000	0.5000	0.4000	0.3500	0.2500	0.4000	0.4000
10	0.7000	0.6000	0.6000	0.5000	0.4000	0.3500	0.5000	0.5000
11	1.0000	0.7000	0.7000	0.6000	0.5000	0.4000	0.6000	0.6000
12	1.4000	1.0000	1.0000	0.7000	0.6000	0.5000	0.7000	0.7000
13	2.0000	1.4000	1.4000	1.0000	0.7000	0.6000	1.0000	1.0000
14	3.0000	2.0000	2.0000	1.4000	1.0000	0.7000	1.4000	1.4000
15	4.0000	3.0000	3.0000	2.0000	1.4000	1.0000	2.0000	2.0000
16	5.0000	4.0000	4.0000	3.0000	2.0000	1.4000	3.0000	3.0000

### 11.8.1 ISO Standard Metric Line Widths

The following line widths are ISO compliant and have been incorporated into the above line weights.

0.13mm	
0.18mm	
0.25mm	
0.35mm	
0.50mm	
0.70mm	
1.00mm	
1.40mm	
2.00mm	





















## 11.11 View Templates

Parameter Name	Acoustic Strategy Plan	Architectural Elevation	Architectural GA Plan	Architectural RCP	Architectural Section
<b>View Style</b>	Floor, Structural, Area Plan	Elevation, Section, Detail View	Floor, Structural, Area Plan	Ceiling Plan	Elevation, Section, Detail View
<b>View Scale</b>	1:100	1:100	1:100	1:100	1:100
<b>Display Model</b>	Normal	Normal	Normal	Normal	Normal
<b>Detail Level</b>	Coarse	Coarse	Coarse	Coarse	Coarse
<b>V/G Overrides Model</b>	Switch Off all non-essential items. Half-tone everything else except Doors and Walls.	None	Half-tone: Furniture, Furniture Sys, Mech Equip, Planting, Plumb Fix, Site, Spec Equip	None	None
<b>V/G Overrides Annotation</b>	Switch Off all non-essential items. Half-tone everything else except Door / Wall Tags.	None	None	None	None
<b>V/G Overrides Import</b>	None	None	None	None	None
<b>V/G Overrides Filters</b>	Acoustic - High: RGB 255-128- Acoustic - Low: Cyan Acoustic - None: Half-toned	None	None	None	None
<b>Model Graphics Style</b>	Hidden Line	Hidden Line	Hidden Line	Hidden Line	Hidden Line
<b>Graphic Display Options</b>	None	None	None	None	None
<b>View Range</b>	Top: Ass Lev - 2300 Cut: Ass Lev - 2250 Bottom: Ass Lev - 0 Depth: Ass Lev - 0	Top: Ass Lev - 2300 Cut: Ass Lev - 1500 Bottom: Ass Lev - 0 Depth: Ass Lev - 0	Top: Ass Lev - 2300 Cut: Ass Lev - 1500 Bottom: Ass Lev - 0 Depth: Ass Lev - 0	Top: Lev Above - 0 Cut: Ass Lev - 2300 Bottom: Ass Lev - 2300 Depth: Lev Above - 0	Top: Lev Above - 0 Cut: Ass Lev - 2300 Bottom: Ass Lev - 2300 Depth: Lev Above - 0
<b>Orientation</b>	Project North	Project North	Project North	Project North	Project North
<b>Phase Filter</b>	Show All	Show All	Show All	Show All	Show All
<b>Discipline</b>	Architectural	Architectural	Architectural	Architectural	Architectural
<b>Column Symbolic Offset</b>					
<b>Render Settings</b>					
<b>Depth/Far Clipping</b>	No Clip	No Clip	No Clip	No Clip	No Clip

Parameter Name	Detailing View	Fire Strategy Plan	Site Plan	Site Section	Structural Foundation Plan
View Style	Floor, Structural, Area Plan	Floor, Structural, Area Plan	Floor, Structural, Area Plan	Elevation, Section, Detail View	Floor, Structural, Area Plan
View Scale	1:20	1:100	1:100	1:100	1:100
Display Model	Normal	Normal	Normal	Normal	Normal
Detail Level	Fine	Coarse	Coarse	Coarse	Coarse
V/G Overrides Model	None	Switch Off all non-essential items. Half tone everything else except Doors and Walls.	None Essentials off	None	Structurally Relevant Categories Only
V/G Overrides Annotation	None	Switch Off all non-essential items. Half tone everything.	None	None	Structurally Relevant Categories Only
V/G Overrides Import	None	None	None	None	None
V/G Overrides Filters	None	Fire Rating 30mins: Red Fire Rating 60mins: Green Fire Rating 90mins: Blue Fire Rating 120mins: Magenta Fire Rating None: Halftoned	None	None	None
Model Graphics Style	Hidden Line	Hidden Line	Hidden Line	Hidden Line	Hidden Line
Graphic Display Options	None	None	None	None	None
View Range	Top: Ass Lev - 2300 Cut: Ass Lev - 1500 Bottom: Ass Lev - 0 Depth: Ass Lev - 0 Project North	Top: Ass Lev - 2300 Cut: Ass Lev - 1500 Bottom: Ass Lev - 0 Depth: Ass Lev - 0 Project North	Top: Ass Lev - 100000 Cut: Ass Lev - 100000 Bottom: Ass Lev - 0 Depth: Ass Lev - 0 Project North	Top: Ass Lev - 100 Cut: Ass Lev - 100 Bottom: Lev Below - 0 Depth: Lev Below - 0 Project North	Top: Ass Lev - 100 Cut: Ass Lev - 100 Bottom: Lev Below - 0 Depth: Lev Below - 0 Project North
Phase Filter	Show All	Show All	Show All	Show All	Show All
Discipline	Architectural	Architectural	Architectural	Architectural	Structural
Column Symbolic Offset					0
Render Settings					
Depth/Far Clipping	No Clip	No Clip	No Clip	No Clip	No Clip



Parameter Name	Structural Framing	Structural Framing Plan	Export to Civil Engineering	Structural Section
View Style	Elevation, Section, Detail View	Floor, Structural, Area Plan	3D Views, Walkthroughs	Elevation, Section, Detail View
View Scale	1:100	1:100	1:100	1:50
Display Model	Normal	Normal		Normal
Detail Level	Coarse	Coarse	Coarse	Medium
V/G Overrides Model	Structurally Relevant Categories Only	Structurally Relevant Categories Only	None Essentials off	Structurally Relevant Categories Only
V/G Overrides Annotation	Structurally Relevant Categories Only	Structurally Relevant Categories Only	None	Structurally Relevant Categories Only
V/G Overrides Import	None	None	None	None
V/G Overrides Filters	None	None	None	None
Model Graphics Style	Hidden Line	Hidden Line	Shading with Edges	Hidden Line
Graphic Display Options	None	None	None	None
View Range	Top: Ass Lev - 0	Top: Ass Lev - 0		
	Cut: Ass Lev - 0	Cut: Ass Lev - 0		
	Bottom: Lev Below - 1500	Bottom: Lev Below - 1500		
	Depth: Lev Below - 1500	Depth: Lev Below - 1500		
Orientation	Project North	Project North		
Phase Filter	Show All	Show All	Show All	Show All
Discipline	Structural	Structural	Architectural	Structural
Column Symbolic Offset		0		
Render Settings			None	
Depth/Far Clipping	No Clip	No Clip		No Clip

## 11.12 View Filters

### 11.12.1 Architectural

Name	Categories	Filter By	Criteria	Value
Fire Rating – 30min	Ceilings Floors Doors Walls	Fire Designation	Contains	30
Fire Rating – 60min	Ceilings Floors Doors Walls	Fire Designation	Contains	60
Fire Rating – 90min	Ceilings Floors Doors Walls	Fire Designation	Contains	90
Fire Rating - None	Ceilings Floors Doors Walls	Fire Designation	Does Not Contain	
Acoustic - High	Ceilings Floors Doors Walls	Acoustic Designation	Is greater than or equal to	55
Acoustic - Low	Ceilings Floors Doors Walls	Acoustic Designation	Is less than	55
Acoustic - None	Ceilings Floors Doors Walls	Acoustic Designation	Does Not Contain	

### 11.12.2 Structural

Name	Categories	Filter By	Criteria	Value

### 11.12.3 MEP

Name	Categories	Filter By	Criteria	Value

## 11.13 Keyboard Shortcuts

Shortcuts marked  can be launched using the first character followed by the Spacebar.

### Home Tab

	WA	Build Wall
	DD	Build Door
	WW	Build Window
	CM	Place Component
	RR	Build Roof by Footprint
	RX	Build Roof by Extrusion
	CE	Build Ceiling
	FF	Build Floor
	CG	Define Curtain Grid
	ML	Place Curtain Mullion
	LI	Model Line (Visible in 3D)
	GP	Create Group from Selected Objects
	RA	Build Railing
	ST	Build Stair
	LL	Define Level
	GG	Define Gridline
	RD	Define Room
	RT	Tag Room
	WS	Set Work Plane
	RF	Define a Reference Plane

### Insert Tab

	IL	Link Revit File
	II	Link CAD File
	LO	Load Family in from Library

### Annotate Tab

	DS	Place Aligned Dimension
	EL	Place a Spot Elevation Marker
	DL	Detail Line (2D View Specific)
	DC	Place a 2D Detail Component
	RG	Define a 2D Repeating Detail String
	IO	Draw Insulation Batt-Lines
	TT	Define Text
	F7	Spell-Check Text

### Annotate Tab (Continued)

	TG	Place a Tag by Category
	MT	Place a Multi-Category Tag
	KK	Place a Keynote Tag by Element

### Modify Tab

MD or Esc-Esc	Modify
PL	Paste Aligned - Select Levels by Name
MA	Match Type Information
AA	Align Objects
TR	Trim Objects
SX	Split Objects
OO	Offset Lines or Walls
TM	Measure Between Two References
TA	Measure Along an Element
JJ	Manipulate Wall-Join Configuration
EE	Edit the Cut Profile
LW	Modify Linework Appearance
SF	Split Surface Material
PT	Paint Surface Material

### Collaborate Tab

SS	Quick Synchronise with Central Model
RL or RW	Reload Latest Changes from Central Model
RQ	Relinquish All Worksets / Borrowed Elements
ER	View Outstanding Edit Requests

### View Tab

✦ VP	View Properties
✦ AV	Apply View Template to the Current View
CV	Create View Template from the Current View
VV or VG	Visibility / Graphics Override Control Dialogue
TH	Toggle Thin Lines / WYSIWYG
✦ 3D	Open or Create a Default 3D View
CX	Define a Camera View
✦ CS	Define a Section View
CA	Define a Callout View
QS	Create a Schedule of Quantities
CW	Close all Hidden Views
WC	Cascade the Currently Open Views
WT	Tile the Currently Open Views

**Manage Tab**

SU	Sun and Shadow Settings
MH	Call up the Materials / Textures Dialogue
UN	Modify Project Units

**Contextual Tab**

✳ EP or PP	Element Properties
✳ MM	Move Selected Elements
✳ CO or CC	Copy Selected Elements
RO	Rotate Selected Elements
MI	Mirror Selected Elements
AR	Array Selected Elements
✳ DE	Delete Selected Elements
AP	Add Element to Edited Group
AD	Attach a 2D Detail to the Edited Group
PG	Show Properties of Edited Group
FG	Finish Editing the Current Group
GC	Cancel Editing the Current Group
CR	Create Similar Object to that Selected
EH	Hide Element in this View
VH	Hide Category of Elements in this View
//	Divide Surface
EG	Edit Selected group
UG	Ungroup Selected Group
LG	Convert the Selected Group into a Linked Project
EW	Edit Witness Lines
EU	Unhide Hidden Elements
VU	Unhide Hidden Categories
EX	Exclude the Selected Item from this Group
RB	Restore the Selected Item to this Group
MP	Move Selected Element from Group to Project

**View Control Bar**

WF	Show Model in Wire-Frame
HL	Show Model with Hidden Lines
SD	Show Model Shaded with Edges
GD	Callup the Graphic Display Options Dialogue
RN	Callup the Rendering Dialogue
IC	Temporarily Isolate the Category of Elements
✳ HC	Temporarily Hide the Category of Elements
HI	Temporarily Isolate the Elements
HH	Temporarily Hide the Elements
HR	Reset All Temporarily Hide / Isolate
RH	Toggle Reveal Hidden Elements Mode

### Navigation Bar

☛ ZZ or ZR	Zoom into Region
ZO or ZV	Zoom Out (x2)
ZX, ZE or XF	Zoom to Fit Extents
ZA	Zoom All Current Windows to Fit Extents
ZS	Zoom to Sheet Size
ZC or ZP	Revert to Previous Zoom / Pan

### Snap Overrides

SI	Snap to Intersections
SE	Snap to Endpoints
SM	Snap to Midpoints
SC	Snap to Centres
SN	Snap to Nearest
SP	Snap to Perpendicular
SG	Snap to Tangents
SW	Snap to Work Plane Grid
SQ	Snap to Quadrants
SZ	Close Shape
SO	Turn Snaps Off

### General Purpose

☛ QQ	Open Project, Family or Other Revit File
QR	Create a New Project
☛ NN	Create a New Family
Ctrl-P	Print / Plot
GB	Export Model to gbXML for Energy Assessment
☛ XX	Close File
Ctrl-S or QA	Save
Ctrl-Z	Undo Previous Command(s)
Ctrl-Y	Redo Command(s)
Ctrl-←	Recapture Previous Selection
☛ SA	Select All Similar Instances
F1	Help
Shift-F1	What's This?

## 11.14 Category Abbreviation Codes

Category	Code
Air Terminals	AIR
Ceilings	CLG
Columns	COL
Communication Devices	COM
Casework	CSW
Curtain Wall Mullions	CTM
Curtain Panels	CTP
Curtain Systems	CTS
Data Devices	DAT
Duct Accessories	DCA
Duct Fittings	DCF
Duct Insulations	DCI
Duct Linings	DCL
Ducts	DCT
Detail Items	DET
Doors	DOR
Electrical Equipment	ELE
Electrical Fixtures	ELF
Entourage	ENT
Fire Alarm Devices	FIR
Floors	FLR
Furniture	FRN
Furniture Systems	FRS
Flex Ducts	FXD
Flex Pipes	FXP
Generic Models	GEN
Lighting Devices	LGD
Lighting Fixtures	LGF
Mass	MAS
Mechanical Equipment	MEC
Nurse Call Devices	NRS
Plumbing Fixtures	PLM

Category	Code
Planting	PLN
Pipe Accessories	PPA
Pipe Fittings	PPF
Pipes	PPS
Parking	PRK
Roads	RDS
Railings	RLG
Ramps	RMP
Roofs	ROF
Structural Area Reinforcement	SAR
Structural Beam Systems	SBS
Structural Columns	SCL
Structural Connections	SCO
Security Devices	SEC
Structural Framing	SFA
Structural Foundations	SFO
Shaft Openings	SFT
Site	SIT
Structural Load Cases	SLC
Specialty Equipment	SPC
Sprinklers	SPK
Structural Path Reinforcement	SPR
Structural Rebar	SRB
Structural Stiffeners	SSF
Stairs	STA
Structural Trusses	STR
Telephone Devices	TEL
Topography	TOP
Windows	WDW
Wires	WIR
Walls	WLL

## 11.15 Shared Parameters

Group	Parameter Name	Type
Element Performance	Acoustic Designation	TEXT
	Acoustic Rating	TEXT
	Fire Designation	TEXT
Families	Uniclass	TEXT

