



AEC (UK) BIM Protocol for Autodesk Revit

Additional detail and enhancements for implementation of the AEC (UK) BIM Protocol for Autodesk Revit users.

Version 2.0

September 2012

Re-published as a supplementary document to the generic AEC (UK) BIM Protocol

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Contents

1	Introduction	4
1.1	<i>Background</i>	4
1.2	<i>The Committee</i>	5
1.3	<i>Disclaimer</i>	6
1.4	<i>Scope</i>	6
1.5	<i>Update Procedure</i>	6
1.6	<i>References</i>	6
1.7	<i>Definitions</i>	7
2	Best Practice	7
2.1	<i>BIM</i>	7
2.2	<i>Drawing Production</i>	7
3	Project BIM Execution Plan	7
3.1	<i>Roles and Responsibilities</i>	7
3.2	<i>Project BIM Execution Plan</i>	7
3.3	<i>Project BIM Meetings</i>	7
4	Collaborative BIM Working	7
4.1	<i>Common Data Environment (CDE)</i>	7
4.2	<i>Preparation for publication</i>	7
4.3	<i>Legal Stuff</i>	8
4.4	<i>Data Security & Saving</i>	8
4.5	<i>Reviewing BIM Data</i>	8
5	Interoperability	8
5.1	<i>Introduction</i>	8
5.2	<i>Incoming CAD/BIM Data Management</i>	8
5.3	<i>Intended Use of Model</i>	9
5.4	<i>Data Transfer between Packages</i>	9
6	Data Segregation	9
6.1	<i>General Principles</i>	9
6.2	<i>Division</i>	10
6.3	<i>Referencing</i>	11
7	Modelling Methodology	14
7.1	<i>Model Development Methodology</i>	14
7.2	<i>Graded Component Creation</i>	14
7.3	<i>Drawing Compilation</i>	14
7.4	<i>Spatial Location & Co-ordination</i>	15
7.5	<i>Units and Measurement</i>	16
8	Folder Structure and Naming Conventions	16

8.1	<i>Introduction</i>	16
8.2	<i>Project Folder Structure</i>	16
8.3	<i>General Naming Conventions</i>	17
8.4	<i>Model File Naming</i>	17
8.5	<i>Division Naming</i>	17
8.6	<i>Library Object Naming</i>	18
8.7	<i>Object Property Naming</i>	18
8.8	<i>View Naming</i>	18
8.9	<i>View List Scheduling</i>	20
8.10	<i>Data Organisation</i>	20
8.11	<i>Sheet Naming</i>	20
9	Presentation Styles	21
9.1	<i>Introduction</i>	21
9.2	<i>AEC (UK) Compliant Materials</i>	21
9.3	<i>Annotation</i>	21
9.4	<i>Text Assignment</i>	21
9.5	<i>Line Weights</i>	21
9.6	<i>Line Patterns</i>	22
9.7	<i>Line Styles</i>	23
9.8	<i>Hatching and Filled Regions</i>	24
9.9	<i>View Templates</i>	24
9.10	<i>Dimensioning</i>	25
9.11	<i>Drawing Borders and Title Blocks</i>	25
9.12	<i>Symbology</i>	25
9.13	<i>Copyright</i>	26
10	Resources	26
10.1	<i>Introduction</i>	26
10.2	<i>Software</i>	26
10.3	<i>BIM Content / Resource Libraries</i>	26
10.4	<i>Keynotes</i>	26
10.5	<i>Custom metadata</i>	27
10.6	<i>Keyboard Shortcuts</i>	27
11	Appendices	27
11.1	<i>Model File Naming Codes</i>	27
11.2	<i>Project Folder Structure</i>	27

1 Introduction

1.1 Background

The AEC (UK) BIM Standard was released in November 2009.

Version 2.0 of the AEC (UK) BIM Protocol was published in September 2012 to improve the process of design information production, management and exchange.

This re-published supplement provides specific application of those protocols for Revit Architecture, Revit Structure and Revit MEP.

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, provided credit is given to the committee.

1.2 The Committee

The Bentley sub-committee 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.

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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.

None of the recommendations in this document are intended as a replacement for companies who already have an AEC (UK)-based or BS1192-compliant system.

1.4 Scope

This supplement is intended to support all BIM work undertaken using Autodesk Revit across a practice, or on a specific project, unless otherwise dictated by the client.

The AEC (UK) BIM Protocol for Autodesk Revit builds on the procedures and methodologies defined in the AEC (UK) BIM Protocol and should be read in conjunction with that document.

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

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 the Bentley sub-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
- PAS1192-2:2012
- BS8541-1 and BS8541-2:2011
- AEC (UK) BIM Protocol v2.0
- AEC (UK) CAD Standard for Layer Naming v3

1.7 Definitions

2 Best Practice

2.1 BIM

- 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

3 Project BIM Execution Plan

3.1 Roles and Responsibilities

3.2 Project BIM Execution Plan

3.3 Project BIM Meetings

4 Collaborative BIM Working

4.1 Common Data Environment (CDE)

4.1.1 Work In Progress (WIP)

4.1.2 Shared

4.1.3 Publication and Document Issue

4.1.4 Archiving

4.2 Preparation for publication

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.

Key Points

- Are Sheets and Views to be included?

Notes

- Detaching the model file from Central is very important, if the recipient of the model works on the same network as the issuer, and if the model has not been detach, the model will be treated as a local copy and the recipient will be able to update the issuer's model.
- If contractually pressured to deliver a model containing sheets then the sheet borders should be swapped for a transmittal border.
- If Design options and phasing are contained within the model a detailed explanation of these is required.
- Update the "Project Issue Date" and "Project Status" Parameters to record version issue.

4.3 Legal Stuff

4.4 Data Security & Saving

- 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.
- The starting view within all model files is to be set to a non-schedulable Sheet View. The starting view title block has been included in the associated templates. These shall be retained and the file information completed for each model issue.
- Users shall open the Splash Page view and close all others when saving in order to improve the efficiency of file opening. It is recommended to utilise the Revit 2012 feature to force this.

4.5 Reviewing BIM Data

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.

5 Interoperability

5.1 Introduction

5.2 Incoming CAD/BIM Data Management

5.3 Intended Use of Model

5.4 Data Transfer between Packages

6 Data Segregation

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 **Error! Reference source not found.** & **Error! Reference source not found.**), 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 sub-divided 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, on a machine built to the Autodesk recommended hardware specification, files exceeding 100MB shall be reviewed with respect to performance and possible further sub-division. Ideally files shall not exceed 200MB; 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 Execution Plan.

- 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.

6.2 Division

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.
- Due to potential data degradation, the local file should be created each time you close down the local file. It is considered bad practice to return to an old local file.
- A LOCAL copy of the model shall be created by **COPYING** the original onto a local hard-drive via Windows Explorer – **not by allowing Revit to automate the process**. 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.

- Workset allocation shall be carried out 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 model shall be split into worksets, such as described in the above table.
- The borrowing permissions and workset ownership shall be managed.

Worksets shall be named following the conventions defined in section 8.5.

- All team members shall 'Save to Central' hourly.
- The Project Coordinator 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.

6.3 Referencing

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:

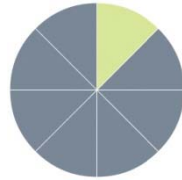
Element Borrowing

- 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.

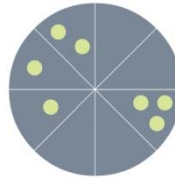
Workset Ownership

- 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.

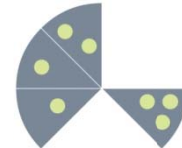
Take **OWNERSHIP** of
an entire workset



BORROW elements
from workset as required



NB/ Users only need to
open required worksets



6.3.1 Inter-Disciplinary Model Referencing

When working within a Multi-discipline environment / large complex projects it is advised to break down the model into a number of sub-models, the extents of which are to be agreed with the project team and documented within the BIM Execution Plan. A Model Matrix see the supporting document AEC(UK)BIMProtocol-ModelMatrix-v2.0 will be required to explain and communicate the linking methodology with a key diagram to assist.

Linking model files 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.

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.

Key points to consider when linking files are:

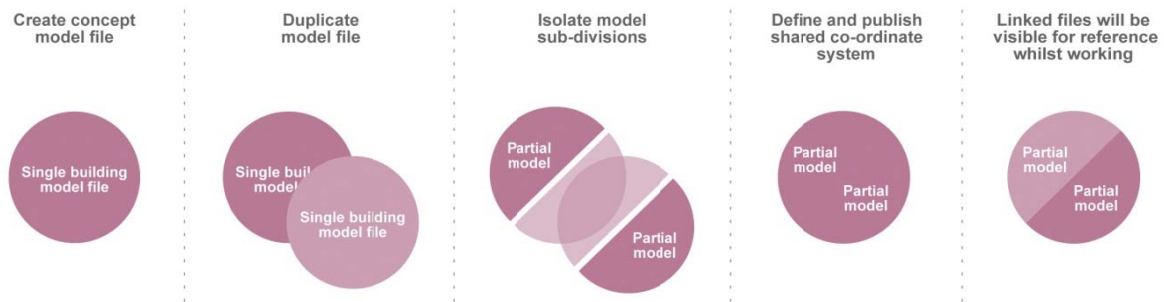
- Task allocation shall be considered when dividing the model so as to minimise the need for users to switch between models.
- Division shall be determined by the lead architect / engineer in conjunction with the Coordinator.
- Model Lines shall be used to create cross-hairs in open space prior to duplication 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.

- 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:



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 Coordinator.
- 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 Execution Plan.
- 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 Coordinator shall be consulted in defining the project-specific strategy.

7 Modelling Methodology

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 0*) elements shall be used to form categorised place-holders in the model.

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.

7.2 Graded Component Creation

- In addition to the grading, a component may make use of Coarse, Medium and Fine levels of detail to control graphical representation.
- A corporate shared parameter file is encouraged in order to maintain consistency of variable naming during content creation. (Refer to Section **Error! Reference source not found.**)
- 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.

7.3 Drawing Compilation

- 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:

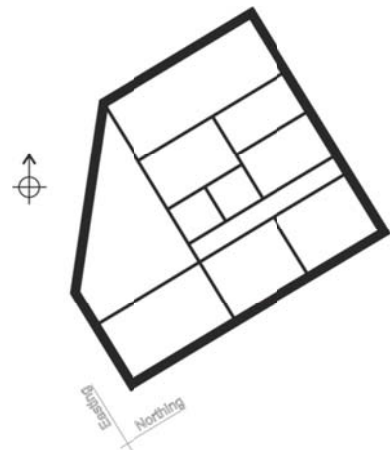
The integrity of exported views/output files from within a BIM environment must be checked for accuracy and content prior to drawing compilation.

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.

Whilst the above rules are sacrosanct, Revit workflow dictates that individual building models are always created orthogonal to the screen and at zero elevation. The location of the building in terms of real-world co-ordinates, true heights and shared co-



ordinate systems are all established and managed within the site model.

CAD files that use real-world co-ordinates whereby data is more than 1 mile from the origin (in any plane) need to be modified prior to import into Revit and information shall be shifted closer to 0,0,0. This shift shall be agreed, consistent and documented in the Project BIM Execution Plan.

Real-world co-ordinates are then re-established in the Revit environment and site / true locations are managed within.

Data exported from Revit can then be either real-world or local and whilst the majority of data will need to be delivered in OS co-ordinates for the purposes of collaboration and cross-referencing, some software (e.g. certain structural analysis software) requires data to be located at 0,0. For export to such software, local coordinate systems can be utilised.

7.5 Units and Measurement

8 Folder Structure and Naming Conventions

8.1 Introduction

8.2 Project Folder Structure

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 **Error! Reference**

source not found.]

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

```
- Families
    + 2009
    - 2010
        - Architecture
        - Mechanical_Services
        - Structure
        - General
```

[Exists in several locations]

[The version of the software]

[The version of the software]

[Architectural components]

[MEP components]

[Structural components]

[Non discipline-specific elements]

-  Autodesk_Metric_Library [Default supplied components]
-  Material_Library [Textures libraries and images for render output]

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]

8.3 General Naming Conventions

8.4 Model File Naming

8.5 Division 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: **Description**

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:

- | | |
|------------------|----------------------------------|
| Ceilings | Ceilings and attached components |
| Cores | Architectural components of core |
| Furniture | Furniture and equipment |

Interiors	Interior walls and doors
Shell	Exterior walls and openings
Slabs	Horizontal elements including roofs
Circulation	Stairs, ramps and landings
Structure	Structural slabs and columns

Examples:

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

8.7 Object Property Naming

8.8 View Naming

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

- 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 **Error! Reference source not found.** 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
Colour Plans	COLOUR - <modifier>	COLOUR – L1 COLOUR – LEVEL 1 PRIMARY
Views created in order to communicate a information relating to elements which meet a specific criteria.		

Export Views	EXPORT - <modifier>	EXPORT – L1 EXPORT – LEVEL 1 ELECTRICAL BACKGROUND
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.		

Import Views	IMPORT - <modifier>	IMPORT – L1 IMPORT – LEVEL 1 ELECTRICAL
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.)		

8.9 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 Data 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 Naming

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.

9.2 AEC (UK) Compliant Materials

Three discipline-specific Revit project templates are available as part of this Standard. They can be obtained from the 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.

9.3 Annotation

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

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 below.

- Thin Lines mode **shall not** be used as this distorts the production requirements of publication output and promotes over-modelling and over-detailing.
- 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.

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

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 below and any additional Line Patterns shall be created by the Coordinator and named according to the naming conventions described in Section 0.

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

9.7 Line Styles

Line Styles are defined in the supplied templates as a project setting. These styles are documented below and any additional Line Styles shall be created by the Coordinator and named according to the naming conventions described in Section 0.

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	Dashed
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
General				
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
Architectural			
AEC_10-DPC	10	Magenta	Solid
AEC_10-DPM	10	RGB 000-128-000	AEC_Double Dash
Structural			
AEC_8-RNF_Mesh	8	Black	AEC_Dash Dot 6mm
AEC_11-Rebar	11	Black	Solid

9.8 Hatching and Filled Regions

Default Fill Patterns for Model and Draughting, which are loaded into the default templates, should be used.

- Alternative Fill Patterns shall be used only with the approval of the Coordinator.
- 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

The default templates have a number of pre-defined View Templates and associated View Filters as described below.

- 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 Coordinator.
- Adjusted View Templates must be re-applied to all relevant views in order to propagate changes.

Name	Categories	Filter By	Criteria	Value
Fire Rating – 30min	Ceilings Floors Doors Walls	Fire Designation	Contains	30
Fire Rating – 60min	Ceilings Floors Doors	Fire Designation	Contains	60

	Walls			
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	

9.10 Dimensioning

No supplementary information is required.

9.11 Drawing Borders and Title Blocks

- 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 Symbolology

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.

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.

9.13 Copyright

10 Resources

10.1 Introduction

10.2 Software

10.3 BIM Content / Resource Libraries

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 (refer to Appendix 11.2).

10.3.2 Central BIM Resource Library

- 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 Coordinator.

10.5 Custom metadata

The corporate Shared Parameter file is held in the Standards folder within the central resource. This is maintained by the BIM Management Team

- 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 delivered Autodesk Revit keyboard shortcuts shall be used

11 Appendices

11.1 Model File Naming Codes

11.2 Project Folder Structure