AEC (UK) Protocol for Layer Naming

Practical implementation of layer naming for the UK Architectural, Engineering and Construction (AEC) industry.

Version 4.0.2 January 2016

Revised for updated Uniclass 2015 conventions

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Contents

Background

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

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

The AEC (UK) CAD Standard Basic Layer Code was originally released in 2001; this update is provided to align with the main BIM Protocol and the release of Uniclass 2015.

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 (*Committee Chair*)	Evolve Consultancy
Lewis Wenman	Murphy Group
Paul Woddy	White Frog
Ray Purvis	Atkins Global
Rob Clarke	Excitech
Rob Jackson	Bond Bryan Architects
Stephen Shorter	Stephen Shorter

Contributors

Martyn Horne	Computers Unlimited
Stephen Holmes	Foster & Partners

For full contact details and further information on the committee, please refer to aecuk.wordpress.com.

Disclaimer

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

Scope

The AEC (UK) protocols define procedures and methodologies from a broad consensus of experienced users from all disciplines, as well as consultants, who represent the leading consulting engineering and architectural organisations in the UK, to address industry best practice irrespective of software platform, in addition to guidelines defined by world-wide standardisation initiatives, with close alignment to BS1192:2007+A1:2015.

In particular, this protocol expands upon the principles defined within the recently updated Uniclass conventions and requests driven by the AEC (UK) Protocols use in the workplace.

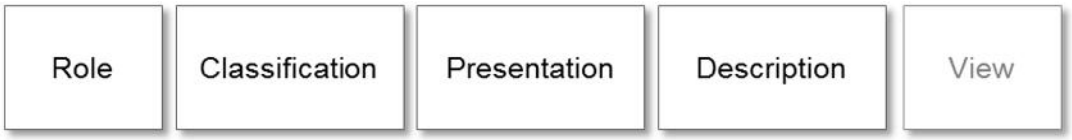
The AEC (UK) Protocol for Layer Naming builds on the guidelines defined in BS1192:2007+A1:2015, and the complimentary AEC (UK) BIM Technology Protocols, providing a base starting point for a unified CAD & BIM layering standard that can easily be adopted “as is” or developed and adapted for implementation within companies that have specific requirements for the structuring of their digital production data. This document provides platform-independent guidelines for layer naming.

The Layer Naming Standard

Layers are used to logically group sets of similar elements. When grouping elements in this manner, it is imperative that the groups can be identified quickly and easily by anyone who needs to access or use the information. This means that the layer names should conform to a consistent naming convention so that everyone always knows where to look for the information they require to “communicate, re-use, and share data efficiently without loss, contradiction or misinterpretation”.

Layer naming should be common throughout all types of digital production data. It should not differ for 2D or 3D elements – that is picked up by the filename.

The AEC (UK) Protocol for Layer Naming provides five fields separated by a hyphen or dash[1], to classify a layer based on the conventions outlined in BS1192:2007+A1:2015 for container naming within a file. Viewed complete, it provides a unique reference to a logical collection of elements:



Field 1: Role

1-2 char, required

The AEC (UK) adopts this field but expanding it to 2 characters in line with ISO13567. Additional standard disciplines have been added that are missing from BS1192:2007+A1:2015.

Refer to the

Field 1: Role section, page 9.

Field 2: Classification

5+ char, required

This is the critical field for identification on the content of the layer. The actual code value is taken from the Uniclass 2015 system, tables Ee, Pr, SL, and Ss.

A typical set of layers is provided in the accompanying spreadsheet appendices but full listings can be obtained from https://toolkit.thenbs.com/articles/classification#classificationtables.

An additional table, Zz Non-physical Elements is defined below in the Field 2: Table Zz (Non-physical Elements) section, page 11.

Field 3: Presentation

1 char, required

The adoption of this field is revised from earlier versions of the AEC (UK) CAD Standard to comply with BS1192:2007+A1:2015.

Refer to Field 3: Presentation, page 18

The above are mandatory in BS1192:2007+A1:2015, the following are optional:

Field 4: Description

Variable length (recommended 40 chars maximum[2]), required

The Description field is adopted using Uniclass 2015 definitions.

Guidelines are provided in section Field 4: User Description on page 19.

Field 5: View

3 char, optional

Not provided in BS1192:2007+A1:2015, the optional View suffix defines how the element is viewed i.e. whether it is shown in elevation, section or hidden. The order of this field after the Description is important to allow custom layers to be grouped together.

Definitions are listed in section Field 5: View on page 20.

Notes

1 For strict BS1192:2007+A1:2015 compliance, an underscore should be used prior to the description. The AEC (UK) does not follow this convention, as the underscore is a non-breaking character, contrary to other field-based naming standards, and confusing now that Uniclass 2015 utilises underscores between categories. Using an underscore does not contravene the AEC (UK) conventions and may be used if necessary.

2 To maintain legibility and compatibility with all CAD systems, it is recommended that the total layer name length, including field dividers, is limited to 64 characters.

Field 1: Role

The letters A to Z define the author, or owner, of the data. This allows various disciplines to use the same Classification codes.

Discipline Codes BS1192:2007+A1:2015 standard codes shown in **bold**	
A	**Architects**
B	**Building surveyors**
C	**Civil engineers**
CB	Bridge engineers
CR	Road / highway engineers
CW	Water / dam engineers
D	**Drainage**
E	**Electrical engineers**
EC	Cable Containment
EF	Fire Alarms
EL	Lighting
EP	Protection
ES	Security
F	**Facilities Manager**
G	**GIS, land surveyors**
GA	Aerial surveyors
H	**Heating and Ventilation**
I	**Interior designers**
K	**Client**
L	**Landscape architects**
M	**Mechanical engineers**
ME	Combined Services
MW	Chilled Water
MH	Heating
MV	Ventilation
P	**Public health**
PD	Drainage
PF	Fire Services
PH	Public Health Services
PS	Sanitation and Rainwater
PW	Water Services
Q	**Quantity surveyors**
R	Rail
RS	Railways signaling
RT	Railways track
S	Structural engineers
SF	Façade engineers
SR	Reinforcement detailers
T	**Town & country planners**

Cont…	
W	**Contractors**
X	**Sub-contractors**
Y	**Specialist designers**
YA	Acoustic engineers
YE	Environmental engineers
YF	Fire engineers
YL	Lighting engineers (non-Building Services)
Z	**General (non-specific)**

Field 2: Classification

The Classification code describes the design component and is the most important field in identifying the component.

It uses a Uniclass 2015 value from the follow tables:

SL Spaces / Locations

Ee Elements

Ss Systems

Pr Products

and the additional AEC (UK) table:

Zz Non-physical Elements

Note: Generic vs specific
The tables are broadly hierarchical and should be used to define an element as precisely as possible. Where the exact type of element is not known or not required, a generic code should be used from the Ee Elements table in preference to the exact type from Ss Systems or Pr Products.

- Ee_25_10 would be used for walls when a more detailed definition is not known (for example in the early stages of design), as opposed to Ss_25_10_20 for Curtain Walls.
- Ee_50_70 may be used for general drainage locations in an architectural model, whereas Ss_50_30_08_30 would provide the more specific details of the foul waste water pipes in an engineering model. Pr_65_52_63_61 might then be used for engineering details where the exact pipe and fittings are specified.

In simple architectural terms, Ee might be used for CAD work, where many specific layers are not required, Ss for detail work or components that designed as part of a system for construction onsite, and Pr for fit out or components that are procured.

Field 2: Table Zz (Non-physical Elements)

The AEC (UK) classifications below expand and revise Uniclass Table Z (originally adopted from the AEC (UK) documentation), providing a more structured provision specifically for non-physical, CAD- or BIM-based elements.

Red text = edited from Uniclass 2015

Green text = additions to Uniclass 2015

Code	Classification Title	Layer Description
Zz_10	Drawing Sheet	DrawingSheet
Zz_10_20	Drawing Frame	DrawingFrame
Zz_10_20_25	Drawing Frame Outline	DrawingFrameOutline
Zz_10_20_45	Logo	Logo
Zz_10_20_85	Title Block	TitleBlock
Zz_10_20_95	Viewports	Viewport
Zz_10_40	Hold Clouds And Notation	HoldCloudAndNotation
Zz_10_70	Revisions	Revision
Zz_10_70_05	Revision Annotation	RevisionAnnotation
Zz_10_70_10	Revision Linework	RevisionLinework
Zz_10_70_20	Clouds And Notations	CloudAndNotation
Zz_10_80	Status Stamps	StatusStamp
Zz_10_90	Watermarks	Watermark
Zz_20	Textual Content	TextualContent
Zz_20_10	Annotation	Annotation
Zz_20_10_40	Keynotes	Keynote
Zz_20_10_45	Labels	Label
Zz_20_10_50	Leaders	Leader
Zz_20_10_55	Notes	Note
Zz_20_10_70	Reference	Reference
Zz_20_10_70_05	Accessory Reference	AccessoryReference
Zz_20_10_70_08	Area References	AreaReferences
Zz_20_10_70_10	Ceiling Reference	CeilingReference
Zz_20_10_70_20	Door Reference	DoorReference
Zz_20_10_70_30	Finish Reference	FinishReference
Zz_20_10_70_32	Fire Reference	FireReference
Zz_20_10_70_35	Floor Reference	FloorReference
Zz_20_10_70_38	Furniture Reference	FurnitureReference
Zz_20_10_70_40	Lighting Reference	LightingReference

Zz_20_10_70_55	Partition Reference	PartitionReference
Zz_20_10_70_60	Room Description	RoomDescription
Zz_20_10_70_65	Room Number	RoomNumber
Zz_20_10_70_68	Room Reference	RoomReference
Zz_20_10_70_70	Signage Reference	SignageReference
Zz_20_10_70_75	Stair Reference	StairReference
Zz_20_10_70_90	Wall Reference	WallReference
Zz_20_10_70_92	Wall Cladding Reference	WallCladdingReference
Zz_20_10_70_95	Window Reference	WindowReference
Zz_20_10_85	Tags	Tags
Zz_20_10_90	Text	Text
Zz_20_20	Dimensions	Dimensions
Zz_20_30	General Masking	GeneralMasking
Zz_20_30_50	Masks	Masks
Zz_20_30_95	Wipeouts	Wipeouts
Zz_20_40	Hatching & Area Fill	HatchingAreaFill
Zz_20_40_05	Outlines	Outline
Zz_20_40_35	Hatching	Hatching
Zz_20_40_60	Patterning	Patterning
Zz_20_40_80	Area Fill	AreaFill
Zz_20_40_80_30	Colour Fill	ColourFill
Zz_20_40_80_80	Solid Fill	SolidFill
Zz_20_70	Redlining	Redline
Zz_20_70_20	Comments	Comment
Zz_20_70_50	Linework	Linework
Zz_20_80	Symbols	Symbol
Zz_20_80_10	Barscales	Barscale
Zz_20_80_15	Cross References	CrossReference
Zz_20_80_40	Key Plan	KeyPlan
Zz_20_80_50	Legends	Legend
Zz_20_80_55	North Point	NorthPoint
Zz_20_90	Title Annotation	TitleAnnotation
Zz_20_90_30	Copyright	Copyright
Zz_20_90_60	Notes	Note
Zz_30	Insertions	Insertion
Zz_30_20	Blocks And Cells	BlockAndCell
Zz_30_30	External References	ExternalReference

Zz_30_40	Images	Image
Zz_30_60	Objects	Object
Zz_30_90	Tables And Schedules	TableAndSchedule
Zz_30_90_10	Schedules	Schedule
Zz_30_90_10_05	Annotation	ScheduleAnnotation
Zz_30_90_10_40	Headings	ScheduleHeading
Zz_30_90_10_45	Linework	ScheduleLinework
Zz_30_90_10_90	Text	ScheduleText
Zz_30_90_60	Tables	Table
Zz_30_90_60_05	Annotation	TableAnnotation
Zz_30_90_60_40	Headings	TableHeading
Zz_30_90_60_45	Linework	TableLinework
Zz_30_90_60_90	Text	TableText
Zz_35	Setting Out	SettingOut
Zz_35_10	Alignments And Super Elevations	AlignmentsAndSuperElevation
Zz_35_10_40	Horizontal Alignment	HorizontalAlignment
Zz_35_10_80	Super Elevation	SuperElevation
Zz_35_10_90	Vertical Alignment	VerticalAlignment
Zz_35_20	Centrelines	Centreline
Zz_35_30	Geospatial Control Points	GeospatialControlPoint
Zz_35_40	Gridlines	Gridline
Zz_35_40_20	Ceiling Grid	CeilingGrid
Zz_35_40_20_45	Ceiling Grid Labels	CeilingGridLabel
Zz_35_40_45	Grid Labels	GridLabel
Zz_35_40_60	OS Grid	OSGrid
Zz_35_40_60_45	OS Grid Labels	OSGridLabel
Zz_35_40_80	Structural Grid	StructuralGrid
Zz_35_40_80_45	Structural Grid Labels	StructuralGridLabel
Zz_35_40_85	Secondary Structural Grid	SecondaryStructuralGrid
Zz_35_40_85_45	Secondary Structural Grid Labels	SecondaryStructuralGridLabel
Zz_35_60	Points	Point
Zz_35_60_80	Setting Out Points	SettingOutPoint
Zz_35_80	Survey Control Points	SurveyControlPoint
Zz_35_80_20	Bench Mark	BenchMark
Zz_35_80_20_60	OS Bench Mark	OSBenchMark
Zz_35_80_20_80	Site Bench Mark	SiteBenchMark
Zz_35_80_20_90	Temporary Site Bench Mark	TemporarySiteBenchMark

Zz_35_80_30	Control Station	ControlStation
Zz_35_80_30_60	OS Trigonometrical Station	OSTrigonometricalStation
Zz_35_80_30_80	Site Survey Control Station	SiteSurveyControlStation
Zz_40	Topography	Topography
Zz_40_15	Contours	Contour
Zz_40_15_50	Major Contours	MajorContour
Zz_40_15_55	Minor Contours	MinorContour
Zz_40_20	Cuttings And Embankment Indicators	CuttingsAndEmbankmentIndicator
Zz_40_50	Level Indicators	LevelIndicators
Zz_50	Zoning and Boundaries	ZoningandBoundary
Zz_50_10	Boundaries	Boundary
Zz_50_10_10	Site	Site
Zz_50_10_15	Adjoining Land	AdjoiningLand
Zz_50_15	Access	Access
Zz_50_15_05	Access Outlines	AccessOutline
Zz_50_15_05_30	Existing Access	ExistingAccess
Zz_50_15_05_35	Existing Access to be Extinguished	ExistingAccesstobeExtinguished
Zz_50_15_05_40	Existing Access to be Retained	ExistingAccesstobeRetained
Zz_50_15_05_55	New Access	NewAccess
Zz_50_15_05_90	Temporary Access	TemporaryAccess
Zz_50_20	Areas	Area
Zz_50_20_10	Area Outlines	AreaOutline
Zz_50_20_20	Room Outlines	RoomOutline
Zz_50_20_30	External Areas	ExternalArea
Zz_50_20_30_40	Gross External Area	GrossExternalArea
Zz_50_20_30_80	Private External Areas	PrivateExternalArea
Zz_50_20_30_88	Public External Areas	PublicExternalArea
Zz_50_20_35	Internal Areas	InternalArea
Zz_50_20_35_40	Gross Internal Area	GrossInternalArea
Zz_50_20_35_55	Net Internal Area	NetInternalArea
Zz_50_30	Complexes	Complex
Zz_50_30_20	Complexes Outlines	ComplexOutline
Zz_50_30_30	Entities / Facillities / Buildings Outlines	Outline
Zz_50_30_30_05	Existing Entities / Facilities / Buildings to be Altered Outlines	ExistingAlteredOutline
Zz_50_30_30_30	Existing Entities / Facilities / Buildings Outlines	ExistingOutline

Zz_50_30_30_35	Existing Entities / Facilities / Buildings to be Demolished Outlines	ExistingToBeDemolishedOutline
Zz_50_30_30_40	Existing Entities / Facilities / Buildings to be Retained Outlines	ExistingToBeRetainedOutline
Zz_50_30_30_55	New Entities / Facilities / Buildings Outlines	NewOutline
Zz_50_30_30_57	New Extension to Entities / Facilities / Buildings Outlines	NewOutline
Zz_50_50	Lots	Lot
Zz_50_60	Parcels	Parcel
Zz_50_90	Volumes	Volume
Zz_50_95	Zones	Zone
Zz_60	Drawing Symbols	DrawingSymbol
Zz_60_20	Detail Call Ups	DetailCallUp
Zz_60_30	Fall Indicators	FallIndicator
Zz_60_40	Joint Lines	JointLine
Zz_60_40_15	Construction Joints	ConstructionJoint
Zz_60_40_20	Contraction Joints	ContractionJoint
Zz_60_40_30	Expansion Joints	ExpansionJoint
Zz_60_45	Levels	Levels
Zz_60_45_20	Datum	Datum
Zz_60_45_60	Original Ground Level	OriginalGroundLevel
Zz_60_45_70	Regrade Ground Level	RegradeGroundLevel
Zz_60_50	Markers	Marker
Zz_60_50_10	Break Marks	BreakMark
Zz_60_50_20	Callout Marks	CalloutMark
Zz_60_50_30	Elevation Marks	ElevationMark
Zz_60_50_60	Plan	Plan
Zz_60_50_80	Section Marks	SectionMark
Zz_60_50_85	Span Direction Markers	SpanDirectionMarker
Zz_60_50_90	Void And Opening Markers	VoidAndOpeningMarker
Zz_60_55	Match Lines	MatchLine
Zz_70	Views	View
Zz_70_05	3D Views	3DView
Zz_70_20	Details	Detail
Zz_70_30	Elevations	Elevation
Zz_70_60	Plans	Plan
Zz_70_80	Sections	Section

Zz_70_90	Visualisations	Visualisation
Zz_80	Presentation	Presentation
Zz_80_30	Entourage	Entourage
Zz_80_45	Lines	Line
Zz_80_60	People	People
Zz_80_85	Trees And Planting	TreesAndPlanting
Zz_80_90	Vehicles	Vehicle
Zz_80_90_85	Turning Circles	TurningCircle
Zz_85	Generic 3D	Generic3D
Zz_85_05	3D Solids	3DSolid
Zz_85_05_60	Paths	Path
Zz_85_05_80	Solids	Solid
Zz_85_05_85	Solid Voids	SolidVoid
Zz_85_20	Concept	Concept
Zz_85_20_20	Concept Massing	ConceptMassing
Zz_85_20_50	Mass Group	MassGroup
Zz_85_20_55	Mass Slice	MassSlice
Zz_90	Readme And Plotting Lines	ReadmeAndPlottingLine
Zz_90_20	Construction Lines	ConstructionLine
Zz_90_30	External Reference Information	ExternalReferenceInformation
Zz_90_55	Non-plotting	Non-plotting
Zz_90_70	Readme	Readme

Note: Use of annotation
The provision of layers for annotation is broken down into annotation types. This means there can be repetition. In these cases, refer to the parent classification for guidance:

- Zz_20_10_55 is used for general annotation notes. This might include clarification of a construction detail or notes related to a design element.
- Zz_20_90_60 is specifically title annotation notes, which should be used for drawing notes on a drawing sheet, for example “Do not scale from this drawing”.

Note: Use of outlines
Table Zz provides a number of layers for linework and outlines for draughting and modelling. At first it can appear that there is a certain amount of overlap between elements in Table Zz classifications and SL Spaces / Locations. The intention for usage for certain classifications is as follows:

1. Hatching & Area Fill vs Zoning / Outlines
   The two sections, Zz_20_40 Hatching & Area Fill and Zz_50 Boundaries have two distinct uses:

- Zz_20_40 is an annotative section; it should be used for adding hatching, solid fill or colour fills over a design. Zz_20_40_05 would be used for the shape that contains hatching or fill if it needs to be defined as a separate layer to the fill (so it can be turned off independently).
- Zz_50 is specifically for identifying physical, legal and design boundaries.

2. Room Outlines vs Rooms
   Table SL Spaces / Locations defines specific usage of rooms and should be used when the occupancy type needs to be specified.

   - SL_20_50_28 should be used for defining an Executive Office.

   For the earlier stages of design, it may be necessary to distinguish between the overall usage of an area or zone and also show the intended room layouts within that area or zone:

   - SL_20_64 would define a retail space
   - The rooms within that retail may be defined as Zz_50_20_20 before their exact use (e.g. office space, showroom, secure areas) is known.

Note: Use of trees and planting
Table Zz provides a layer for trees and planting which can be confused with the extensive tree classifications in Pr Products and flora in Ee Elements.

- Zz_80_85 should only be used for trees and planting where this is used for purely aesthetic presentation or enhancement work on a drawing or model. An example of this would be tree outlines on an architectural elevation or visualisation model.
- Table Ee's entry, Ee_45_40 Flora, might be used for generic plants in a design, i.e. if there is a responsibility for the design and procurement of the plants.
- Table Pr Products would then be used when defining detailed vegetation layouts or landscaping works.

Field 3: Presentation

Presentation indicates the type of data associated with the layer.

Code	Description
D	Dimensions
H	Hatching, Shading, Fill, Patterning
M	Model-related elements
P	Paper-related elements
T	Text
X	Existing

Field 4: User Description

Used to describe any part of the previous fields or any other aspect of the CAD data. Usually used as an English text string to clarify the Element codes used in Field 2. It is advised to use “CamelCase” (i.e. each word begins with a single capital, the remainder in lowercase and any words are concatenated without spaces) for clarity and comprehension.

Note: Plurals
It is recommended that only singular descriptions are used for consistency:

- Use Wall instead of Walls
- Lift instead of Lifts
- CommunicationCable instead of Communications Cables

Note: Non-existent classifications
Where Uniclass 2015 does not provide a classification, additional layers may be created using a higher level Uniclass value and a unique description field:

- For brise soliel use Ss_25_50_45 with a description of BriseSoliel.
- For builder’s work holes, use either Zz_60_50_90 with a description of BuildersWorkHole or use the system to which they relate, e.g. Ss_30_75 for floor drainage.
- For HVAC use Ss_65 with a description of HVAC.
- For timber roof purlins, use Ss_30_10_30_85 with a description of TimberPurlin.
- Vertical steel bracing is not defined as a specific structural engineering item. It is therefore best to use an extended layer description and a related classification. Ss_20_10_75_35 is used for steel framing systems, in which bracing would be included, allowing related layers to be viewed together, rather than use Pr_20_85_84_88. The equivalent layer might therefore be: S-Ss_20_10_75_35-M-BracingSteelVertical.

Field 5: View

Common to many practices, and added as part of the User Description field, although not covered in BS1192:2007+A1:2015, the optional View field allows a user to define whether the elements are shown as cut (as a wall in section or a column in plan), forward (as a window in elevation), hidden (as beams below a slab) or reflected (as anything shown behind the direction of view, such as any part of a reflected ceiling plan).

This can be especially useful when defining layers of varying properties for 2D views from 3D models.

Code	Description
Cut	Information lying on the cut line. e.g. walls in plan or floors in a section.
Fwd	Elements viewed forward of the section cut line. e.g. a kerb edge or floor outline in plan; walls in an elevation.
Hid	Elements hidden from view by another object, but still shown. e.g. a structural beam below a floor or buried drainage runs.
Rfl	Reflected information above the section cut line. e.g. ceiling layouts.

Note: Using the View field as opposed to extending the Presentation field
In certain cases, recommendations have been authored to extend the presentation field using MC, MF, MH and MR. The AEC (UK) recommends against this to ensure that layers are grouped according to their contents, not their view. This is especially noticeable in the cases of many custom layers.

For example, considering a detailed breakdown of a concrete wall types listed in logical groupings using AEC (UK) View conventions

S-Ss_25_11_16-M-ConcreteWallCore
S-Ss_25_11_16-M-ConcreteWallCore-Cut
S-Ss_25_11_16-M-ConcreteWallCore-Fwd
S-Ss_25_11_16-M-ConcreteWallCore-Hid
S-Ss_25_11_16-M-ConcreteWallExternal
S-Ss_25_11_16-M-ConcreteWallExternal-Cut
S-Ss_25_11_16-M-ConcreteWallExternal-Fwd
S-Ss_25_11_16-M-ConcreteWallExternal-Hid
S-Ss_25_11_16-M-ConcreteWallInternal
S-Ss_25_11_16-M-ConcreteWallInternal-Cut
S-Ss_25_11_16-M-ConcreteWallInternal-Fwd
S-Ss_25_11_16-M-ConcreteWallInternal-Hid

The layers are grouped sensibly so that all concrete wall types are listed together.

Examples

To help clarify the use of these conventions, the examples below demonstrate some applications of the AEC (UK) protocol to everyday items:

Layer name	Description
A-Ee_30_40-M-Floor	An architect's floor outline.
S-Ss_30_12_85_18-M-Slab	A structural engineer's slab outline.
S-Ss_30_12_85_18-M-Slab-Cut	A structural engineer's slab outline showing cut elements.
I-Pr_40_50_21_21-M-Desk	An interior designer's desk.
M-Ss_65-M-HVAC-Fwd	A mechanical engineer's HVAC duct in elevation or plan.
A-Zz_20_20-D-Dimension	An architect's dimension layer.

Appendices

Best practice guides for implementing layer naming

Autodesk AutoCAD

Layer creation & management can be achieved in many different ways. The implementation that is best for you depends on your existing methods for controlling AutoCAD standards: if you use Design Center, create a file to store your required layers that can be added to your working DWG files; if you use custom menus*, continue to use those, although this may not be the most flexible or adaptable.

We would advise against building a standard template of all possible layer names. This will result in a large and unwieldy file which would have many layers unused.

Aside from using custom tool development, defining a library in Design Center will most likely be the easiest.

Always remember to utilise the layer description to allow users to order layers and search using English terms.

* an example command used might be:

```
-layer;make;E-Ss_70_10-M-ElectricalPowerGeneration;;-
layer;color;yellow;;;-color bylayer;-layer;ltype;continuous;;;-
linetype set bylayer;;-layer;lweight;0.25;;;-lweight;bylayer;-
layer;pstyle;0.25mm;;;
```

Autodesk Revit

As Revit does not utilise layers in the same way as other CAD packages, it can be easy to forget the importance of layers in data exchange. Exchanging files with CAD systems, including DWG and DGN, as well as BIM data exchanges using IFC require you to have developed mapping tables to map categories to layers.

The important file to ensure matches the layers defined in this document is:

C:\ProgramData\Autodesk\<product>\exportlayers-dwg-BS1192.txt

Autodesk as yet do not provide a Uniclass 2015 version. The AEC (UK) team is working on providing one free of charge in the near future, but for now, editing a copy of this (i.e. exportlayers-dwg-Uniclass2015.txt) to match the Uniclass 2015 layers should be high on your priority list.

Bentley MicroStation & AECOsim Building Designer

Level creation and management in Bentley tools should be carried out using a dgnlibs with your standard set of levels pre-defined. Revisit your standard list of levels and identify the Uniclass 2015 code most suited to your requirements. Do not create new levels simply because they are now available, but instead work using your existing levels to maintain continuity for your users. Keep your lists as short and simple to use as is possible.

Develop your dgnlibs using Excel and save the file as a .csv to import directly into a dgnlibs rather than build each level using Level Manager. This allows you to cut & paste items from the NBS Uniclass listings or to download complete tables and work with them. If you are unsure of the correct formatting needed for the CSV file, open any dgn containing levels and from Level Manager, go to File > Export and select Excel CSV Files in the “Save As Type” option. That will give you a file to start from with the correct formatting.

Always remember to utilise the level description to allow users to order layers and search using English terms. It is good practice to build level filters as well to allow users to reduce the list of levels they have to work with. If using filters, use wildcards rather than fixed level groups (e.g. `"A-Ss_25*"` to pick up all architectural Wall systems).

In AECOsim, it is additionally advisable to create Families and Parts to match the levels. Parts are the “visual representation” of any component, and so are directly linked to level symbology. This allows a simple one-to-one mapping for new (& experienced) users to understand which Part relates to which level. It also means most of your Part definitions can simply be set to ByLevel, and users can still employ Level Overrides if they need to adjust one part on one sheet without having to create new parts.

Once the dgnlibs is defined, to load it automatically into all projects and files, add the path and file name into your standards.cfg using

```
MS_DGNLIBLIST > path\filename.dgnlib.
```

Nemetschek Vectorworks

The following is offered as an option for a more workable and software specific solution for Vectorworks users implementing BS1192 or AEC layer naming in Vectorworks and in particular Uniclass 2015 coding.

Notwithstanding the notion that in the BS1192:2007+A1:2015 construct for layer naming the Uniclass 'code' should be read as one 'field' with underscores, i.e. A-Xx_YY_ZZ-M_Description, the use of the underscore does not make best use of some of the features recently added to design software and Vectorworks is no exception.

The recommendation is to use the hyphen throughout in lieu of the underscore.

By adopting the hyphen throughout, arguably the software appears more consistent, and avoids confusion: the hyphen is used throughout the software as a separator, and not a placeholder, or substitute for a space or other character. This is in addition to making better use of the hierarchical class lists in the Navigation and Organisation palette, or the historical use of the hyphen to create pop-up menus when looking for classes in the Object Information Palette or Class Menu.

Implementation

It is intended that a set of basic element class standard file will become available through the AEC website. A more advanced set, containing SL, Ss, and Pr table, plus specific material hatches will be available via the Nemetschek VSS portal.

Refer to the AEC UK CAD Standards v4.0 for more information on the fields to be used. Refer also to https://toolkit.thenbs.com/articles/classification.

Within this document, we recommend classes are named using the following fields, as a minimum:

Author-UniclassTable-Group-SubGroup-Section*-Object*-Presentation-UserDescription-View

Benefits

Classes are displayed in many windows in Vectorworks. They appear when we create a class, or assign a class to an element during its creation, e.g. a Wall 'Style', or Symbol. These tend to display as a list irrespective of the preference to turn off the hierarchical or pop-up menus.

The main class creation and editing windows tend to display them slightly differently. These are the primarily the Navigation and Organisation palettes.

In the Navigation Palette (Window>Palettes>Navigation) and Organisation Dialogue (Tools>Organisation), the hyphen can optionally be used to generate a hierarchical list or a simple alphanumeric list. (Use the Hierarchy button in the dialogue to control this option).

In the Class Pop up menu (above the ruler), the hyphen creates a sub-menu. Again, this can be turned off to display a simple list. (Vectorworks Preferences > Session > Display classes in pop-up menus hierarchically)

By changing the underscore to a hyphen, the Uniclass code is still legible, and the software is easier to use and closer to how the hierarchical menu was designed to be used.

It is also recommended that within any one Uniclass table, you should use the same number of number sequences so that classes list correctly. If you adopt Group, and Sub-Group for some classes but only Group for others, those with Group only will list below those with both group and Sub-Group. A-Ee-25-M-Wall, lists below A-Ee-25-10-M-Wall.

Descriptions
All descriptions used in Uniclass 2015 should be used as found in most instances, or as suggested by the AEC documentation.

However, where a description found in Uniclass 2015 refers to multiple elements, e.g. A-Ee-2580-M-DoorsWindows, you should duplicate the class and divide the elements into two or more classes,

e.g. A-Ee25-80-M-Door

and A-Ee25-80-M-Window.

Resources
We would recommend the same be adopted when naming all library content, i.e. Symbols, Hatches, Walls, Slabs, Record Formats, Worksheet, and Image Fills. Refer also to the Vectorworks AEC UK BIM Standards section on naming Library Content.