
a presentation by Evolve Consultancy
and Bond Bryan Architects
IFC
DANIEL HESELWOOD
THE GOOD
AND THE BAD
THE UGLY
NIGEL DAVIES
ROB JACKSON

THE GOOD THE BAD AND THE UGLY

Starring

ROB JACKSON ..... ARCHICAD

NIGEL DAVIES ..... AECOSIM BUILDING DESIGNER

DANIEL HESELWOOD ..... REVIT

With Special Guest

IFC ..... AS ITSELF

PRESENTATION CONTENT

- Introduction
- Preparation and planning
- Graphisoft ArchiCAD
- Bentley AECOsim
- Autodesk Revit
- Conclusion
- Questions

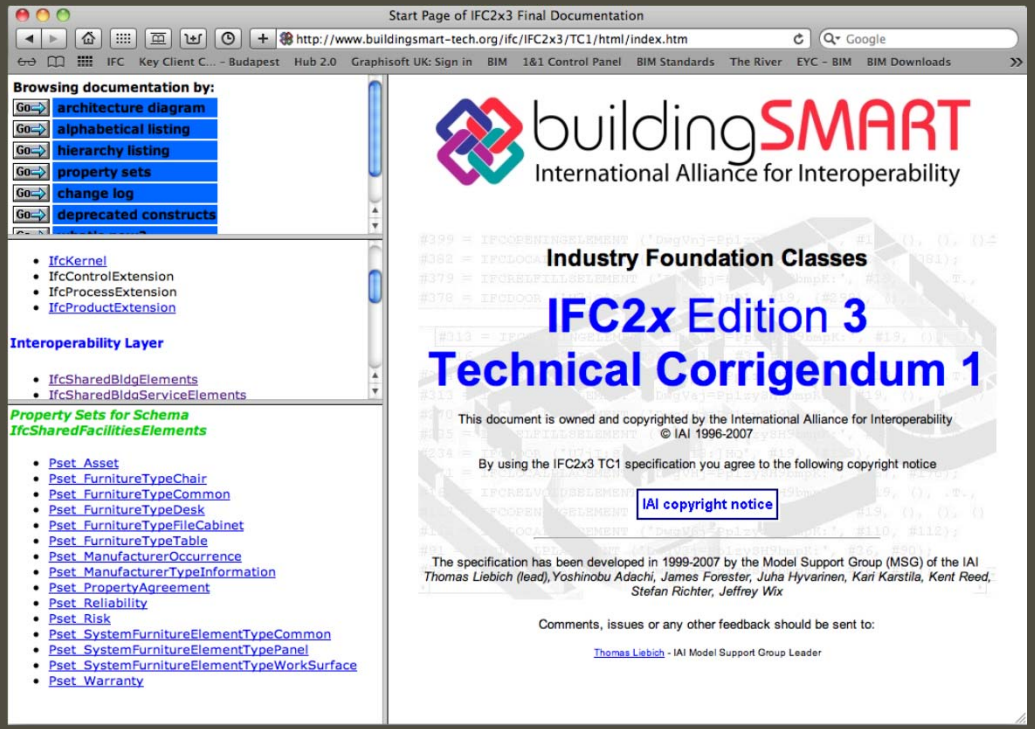
LEARNING OBJECTIVES

- Identify and list key areas for success and failure both in terms of graphics and metadata exchange
- Demonstrate IFC best-practice workflows and solutions to known issues
- Describe the actual technicalities of BIM exchange between major BIM software
- Set options for optimal IFC export and import

IFC AND OPEN BIM

- IFC stands for Industry Foundation Class
- IFC is an international standard - ISO16739
- Current release is IFC4 (Match 2013)
- Current version in day-to-day use is **IFC2x3**
- IFC is authored / maintained by buildingSMART
- Formerly known as the International Alliance for Interoperability (AIA)
- buildingSMART UK is run by the Building Research Establishment (BRE)
- Aim is to improve the exchange of information between software applications used in the construction industry

www.buildingsmart-tech.org



IFC AND OPEN BIM

www.buildingsmart-tech.org/certification/ifc-certification-2.0/ifc2x3-cv-v2.0-certification/participants

buildingSMART International home of openBIM

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Participants

Filed under: Certification

Participants of the official buildingSMART IFC2x3 Coordination View V2.0 certification process

Software Developer	Software Application	Exchange Requirement	Export/Import	Status
Archimen	Active3D	- (*)	Import	in progress
Autodesk	AutoCAD Architecture	Architecture	Import & Export	in progress
Autodesk	AutoCAD MEP	BuildingServices	Export	in progress
Autodesk	Revit Architecture	Architecture	Import & Export	**Export: certified** Import: in progress
Autodesk	Revit MEP	BuildingService	Import & Export	**Export: certified** Import: in progress
Autodesk	Revit Structure	Structural	Import & Export	**Export: certified** Import: in progress
Autodesk	Revit LT	Architecture	Import & Export	in progress
Bentley Systems	AECOsim Building Designer	Architecture	Import & Export	in progress
Cad-Quality	CADiE [illegible]			
	[illegible] / Pscad	Architecture	Import & Export	in progress
Gehry Technologies	Digital Project	Architecture	Import & Export	in progress
Graphisoft	ArchiCAD	Architecture	Import & Export	**Export: certified** **Import: certified**
International Training Institute ITI	Benchmark	BuildingService	Export	in progress

Certification

- Certification details
- Understand certification
- Importance to users
- Service to developers
- IFC Certification 2.0
  - IFC2x3 CV V2.0 Certification
    - How to participate
- IFC2x certification

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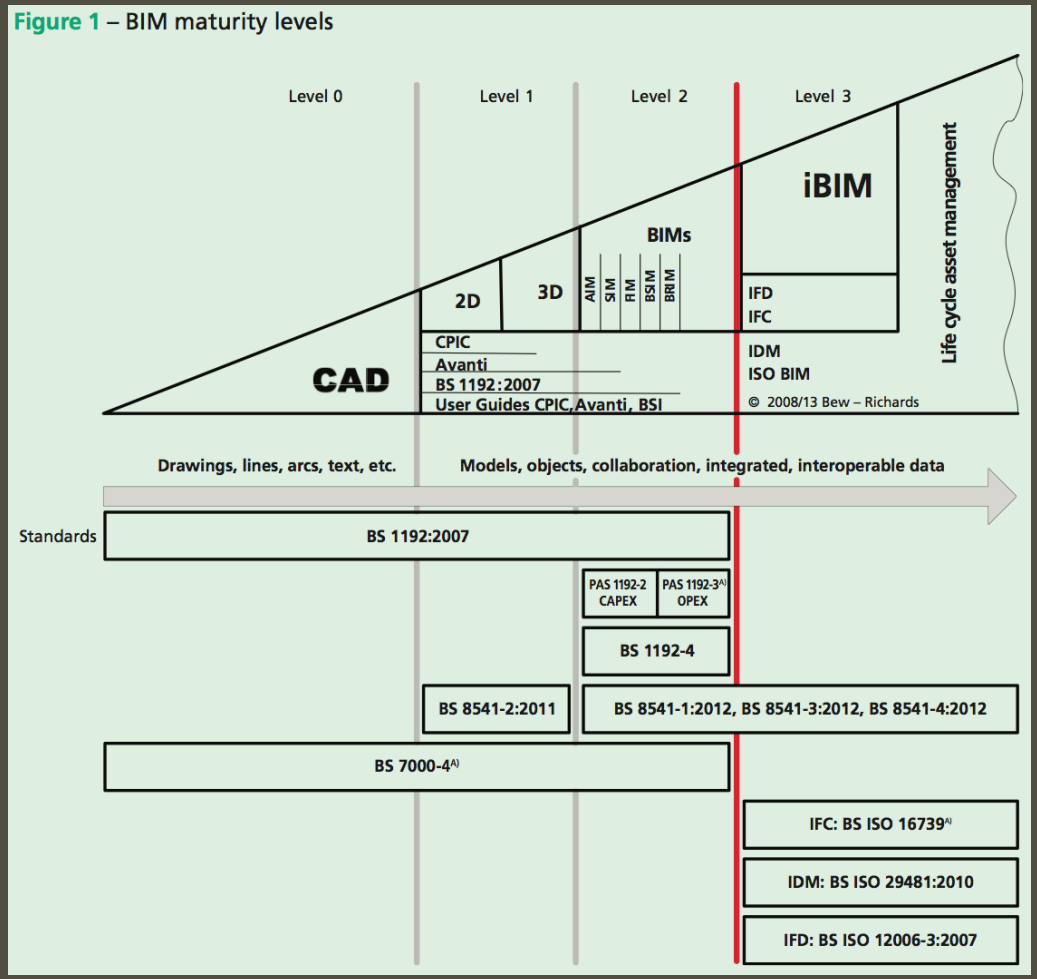
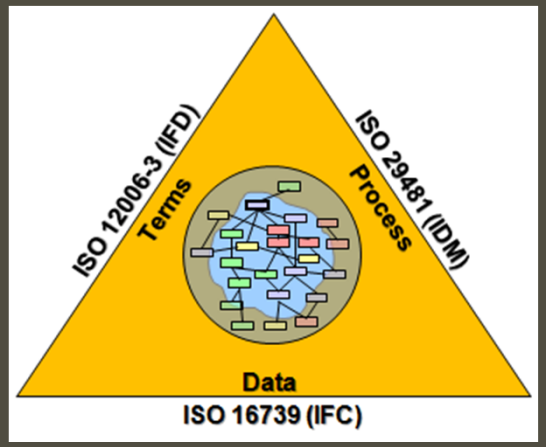
IFC AND OPEN BIM

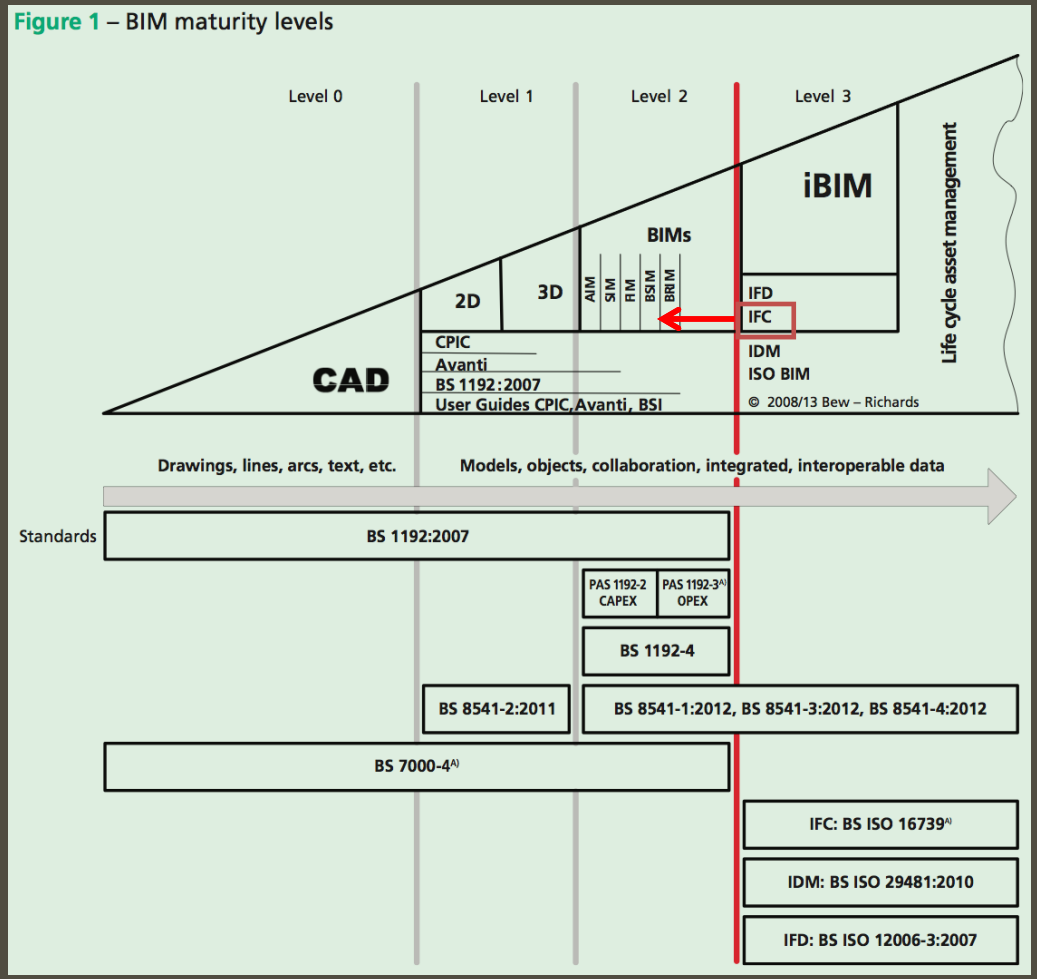


- UK government demonstrate that IFC along with IDM and IFD are the proposed standards for Level 3 BIM

- IFD = International Framework for Dictionaries
- IDM = Information Delivery Manual



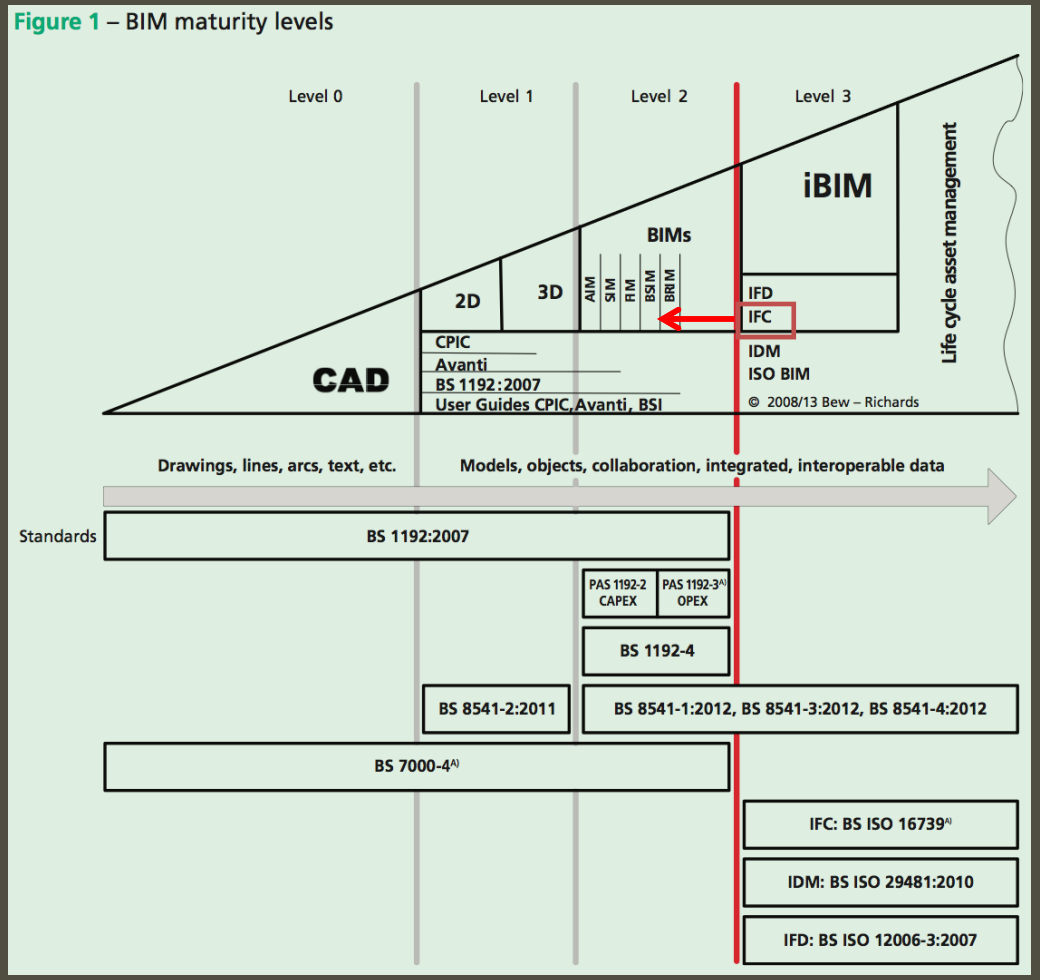
IFC AND OPEN BIM



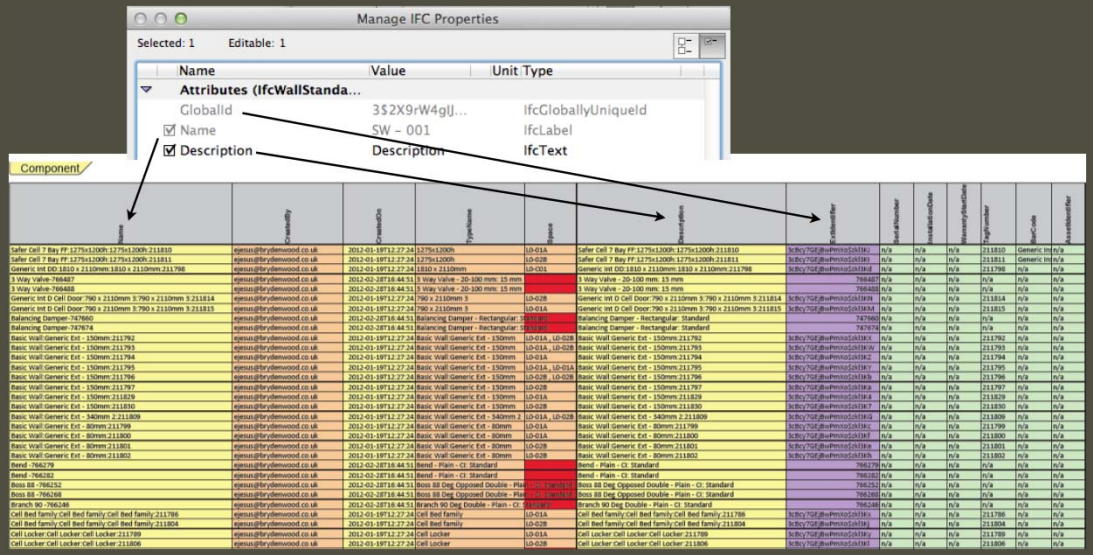
- UK government demonstrate that IFC along with IDM and IFD are the proposed standards for Level 3 BIM

- For many IFC is required at Level 2
- BIM Level “2.5”

IFC AND OPEN BIM



- COBie (the UK Government data requirement) is a subset of IFC



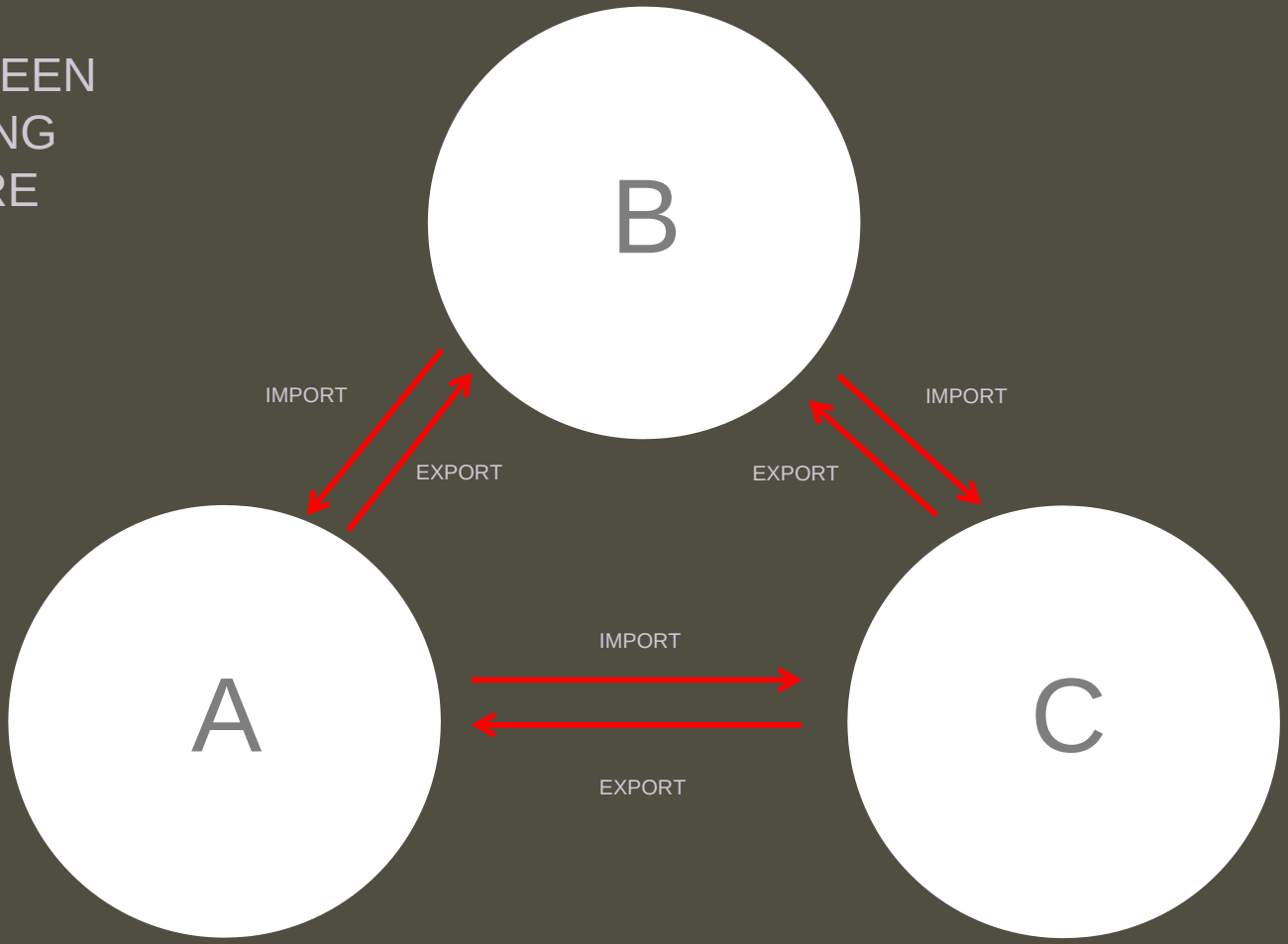
IFC AND OPEN BIM

Autodesk Revit – Bentley AECOsim – Graphisoft ArchiCAD – Solibri Model Checker and Viewer – Tekla BIMsight – Autodesk Navisworks – Bentley Navigator – Tekla Structures – Vico Office – Nemetschek Vectorworks – Nemetschek Allplan – 4MSA – ArTrA – Datacubist simplebim – Design Data Systems DDS-CAD – Kykloud – Synchro Professional – Gehry Technologies – Nemetschek Scia – Trimble Sketchup Pro – Constructivity – Bentley Microstation – Autodesk AutoCAD – Causeway BIMmeasure – 4projects – Asite cBIM – Bentley RAM – Bentley STAAD – ArchiBus – Innovaya – M-SIX VEO –Tekla BIMsight – Vintocon – Autodesk 360 Glue – Autodesk 360 Field – EcoDomus – Graphisoft BIMx – Exactal CostX – MagiCAD – AceCad – dRofus – Asta PowerProject – Tekla CM – Trimble Layout Solutions – Prolog Mobile – Modelogix – WinEst – Graytec Advance Design – Bentley Hevacomp – Onuma System – FM:Systems FM:Interact – xBIM – IES – Bluebeam – Oasys – etc etc

IFC: SCHRODINGER'S EXCHANGE FORMAT?

IFC AND OPEN BIM

IFC BETWEEN AUTHORING SOFTWARE



IFC AND OPEN BIM

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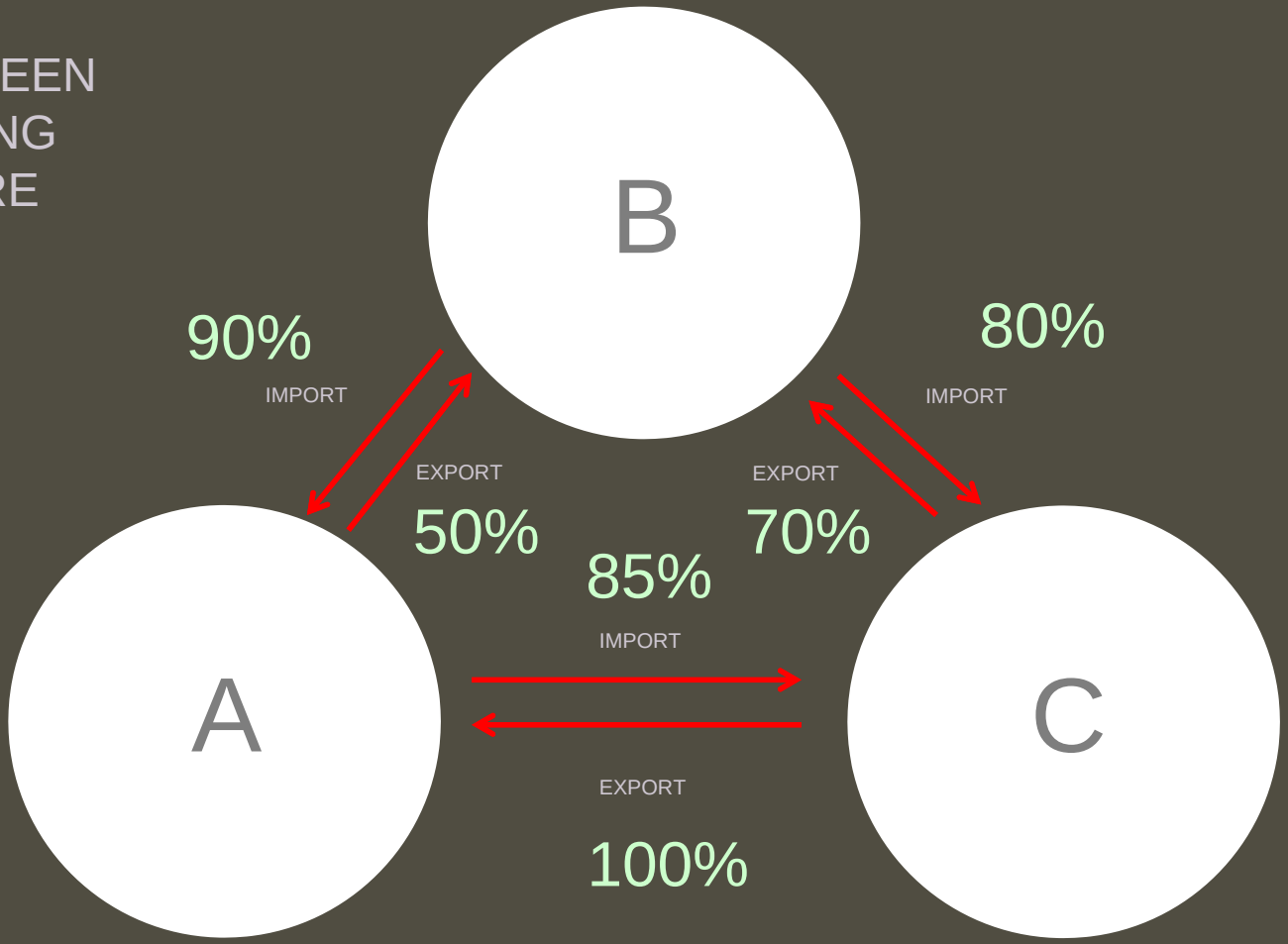
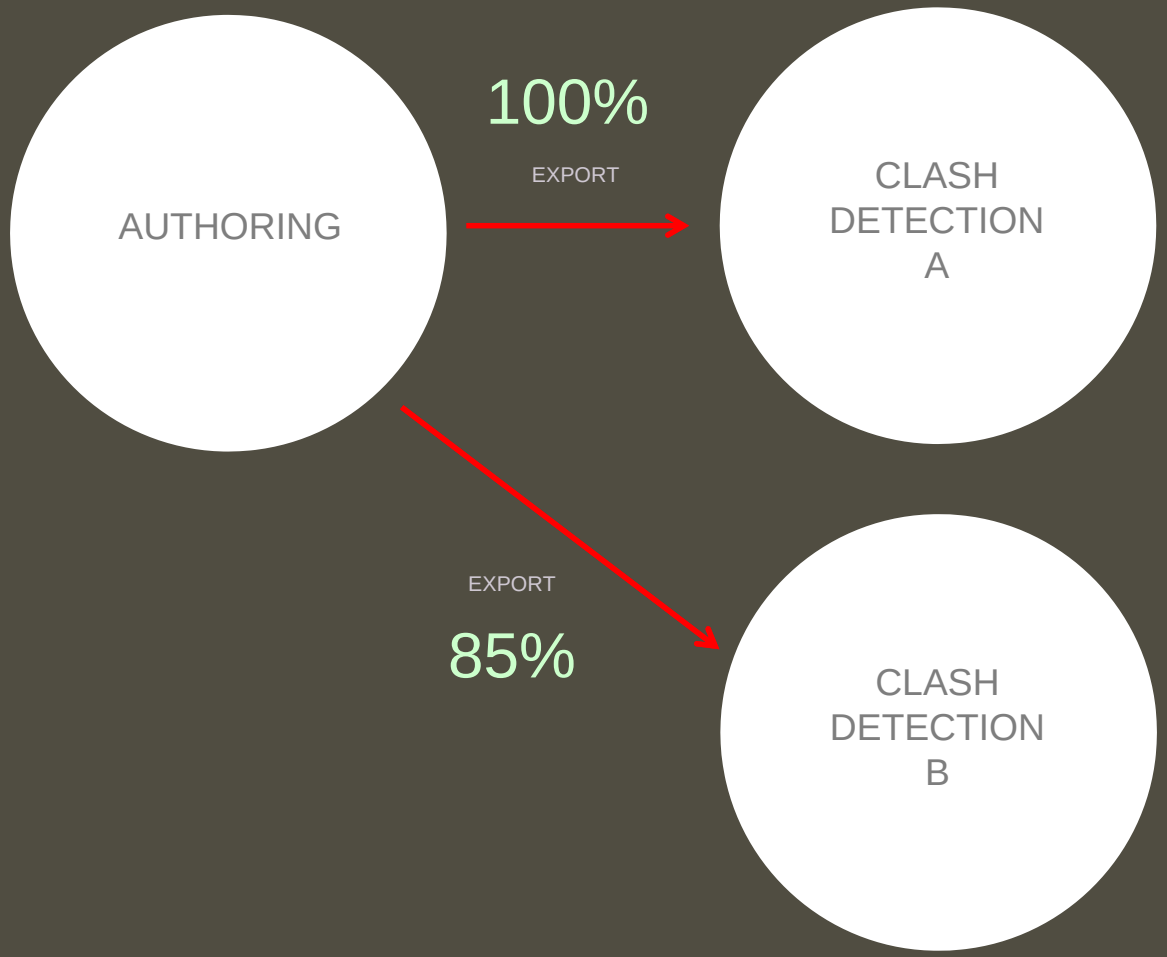


IFC AND OPEN BIM

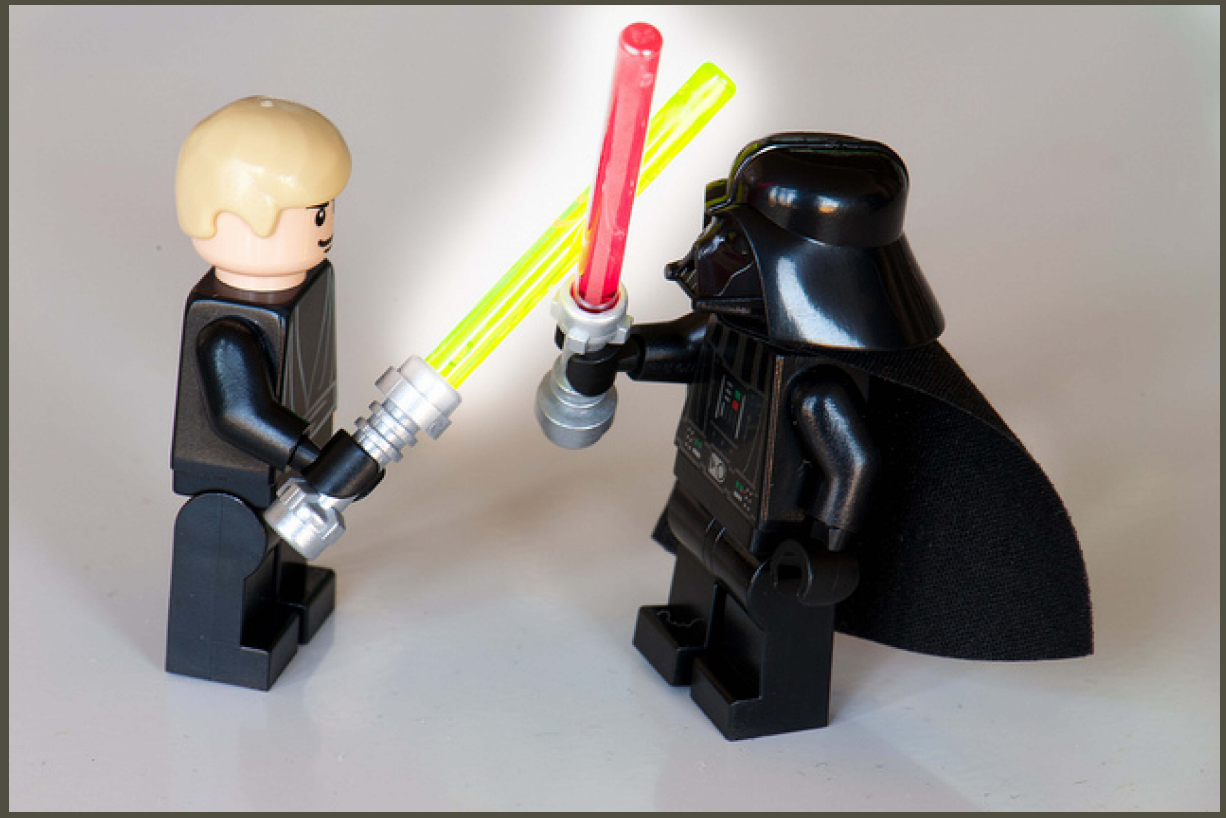
IFC BETWEEN AUTHORING AND SPECIALIST SOFTWARE

E.G.
CLASH DETECTION
COST
SEQUENCING
ANALYSIS
ETC.



IFC AND OPEN BIM

OPEN BIM vs Closed BIM



“IFC DOESN’T WORK”

"IFC DOESN'T WORK"

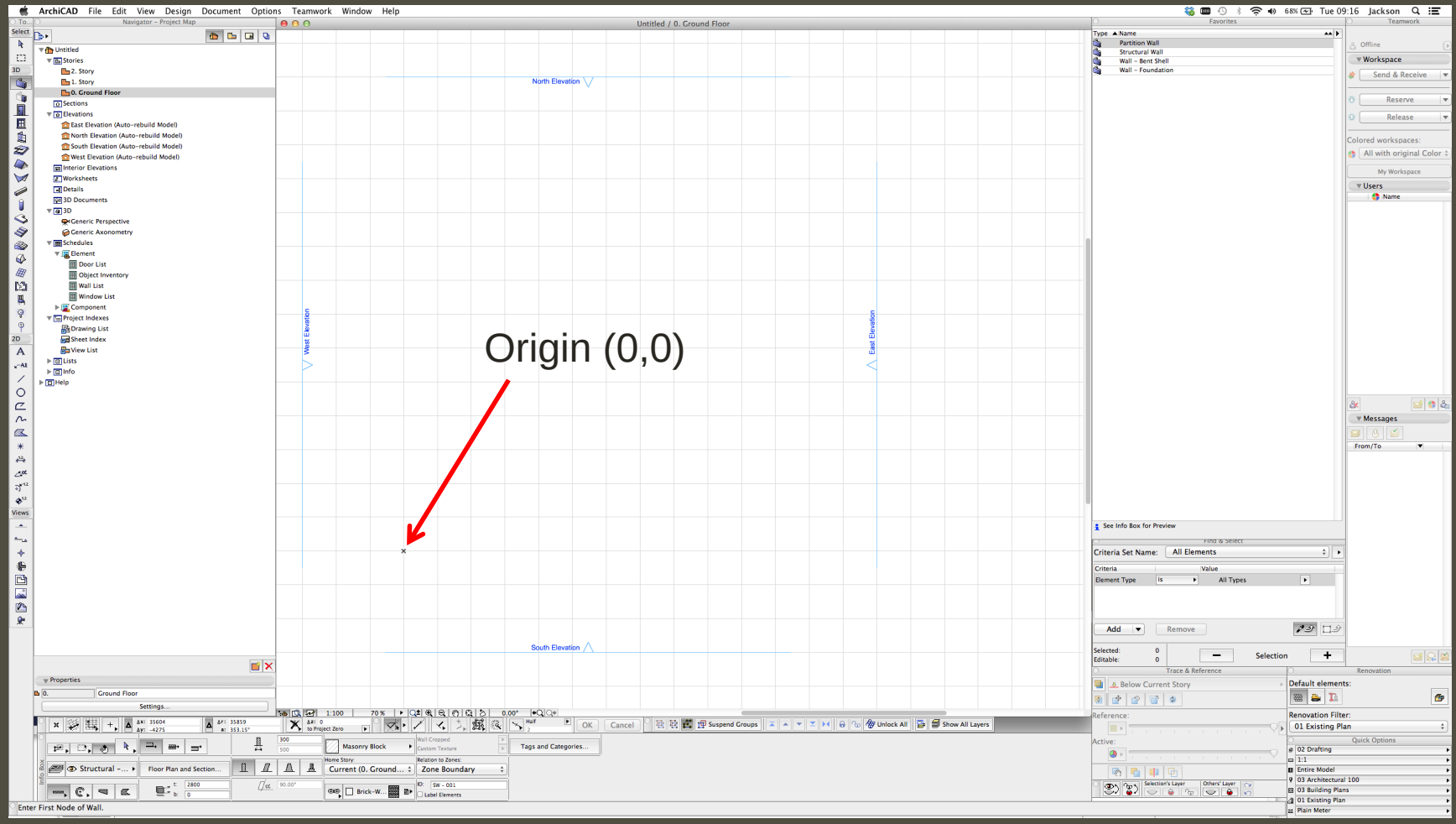
PREPARATION & PLANNING

- Understanding the needs of the project
  - Plan your exchange requirements
  - IFC should never be the de facto exchange format
  - Relevant country standards e.g. PAS1192, AIA E202
  - AEC (UK) BIM Protocols
- BEP
  - Technical considerations for effective communications
  - Milestones
  - Intended BIM uses at each stage
  - Level of Development, Detail and Information
  - Standards, naming conventions

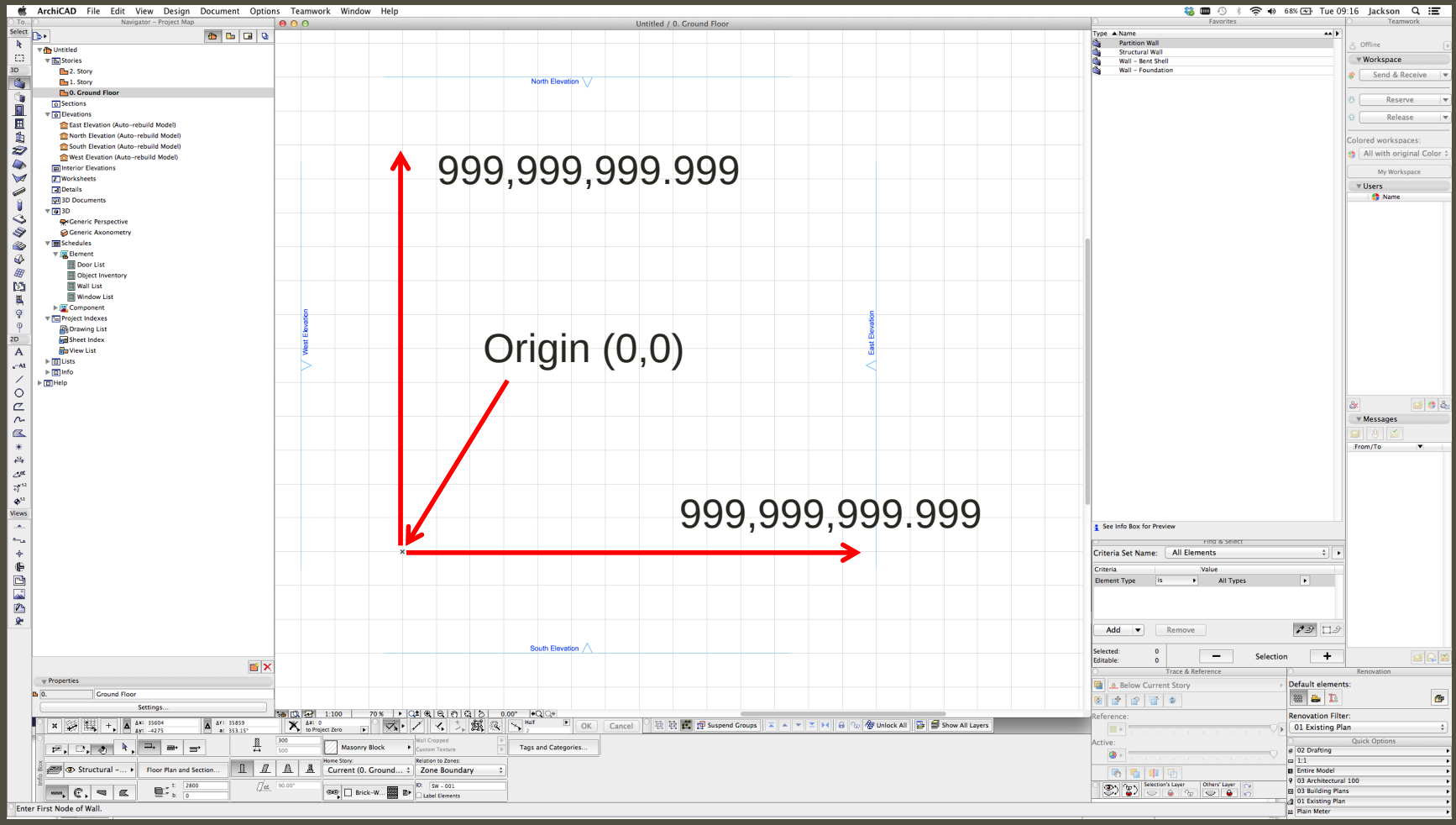
PREPARATION & PLANNING


GRAPHISOFT ArchiCAD

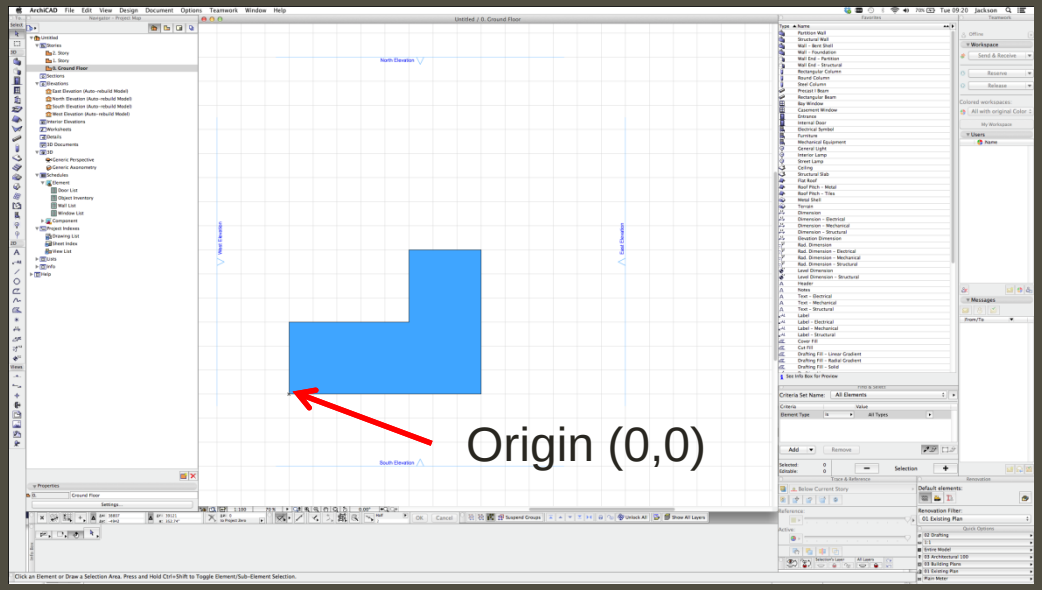
COORDINATING COORDINATES



COORDINATING COORDINATES

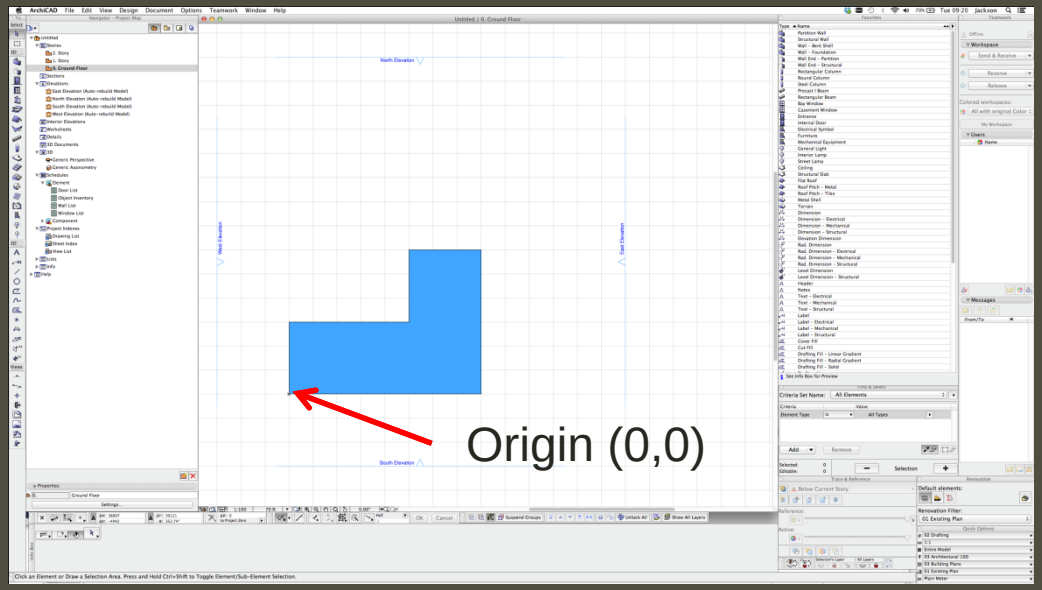


COORDINATING COORDINATES



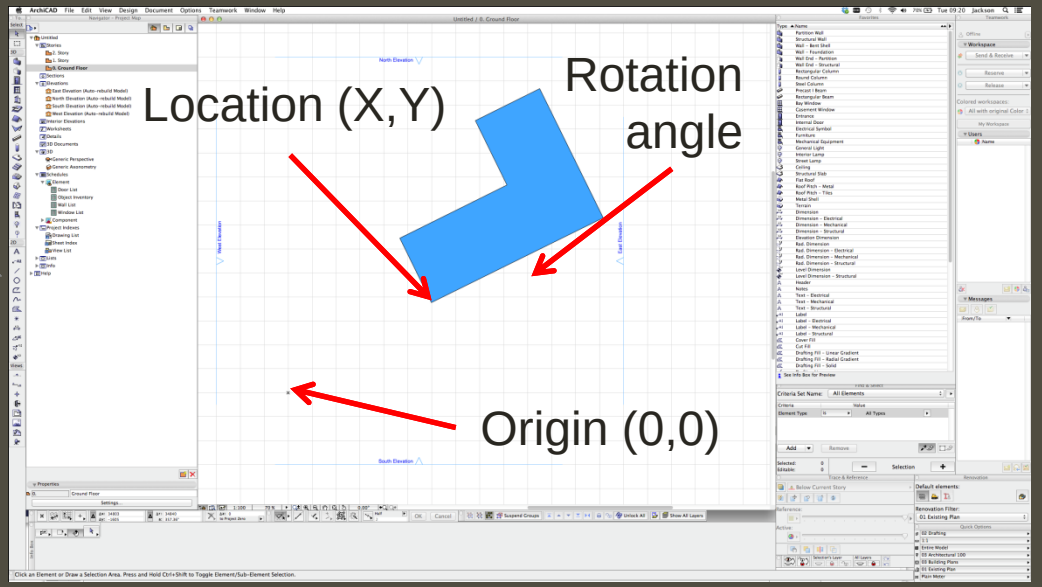
Building Model

COORDINATING COORDINATES



Building Model

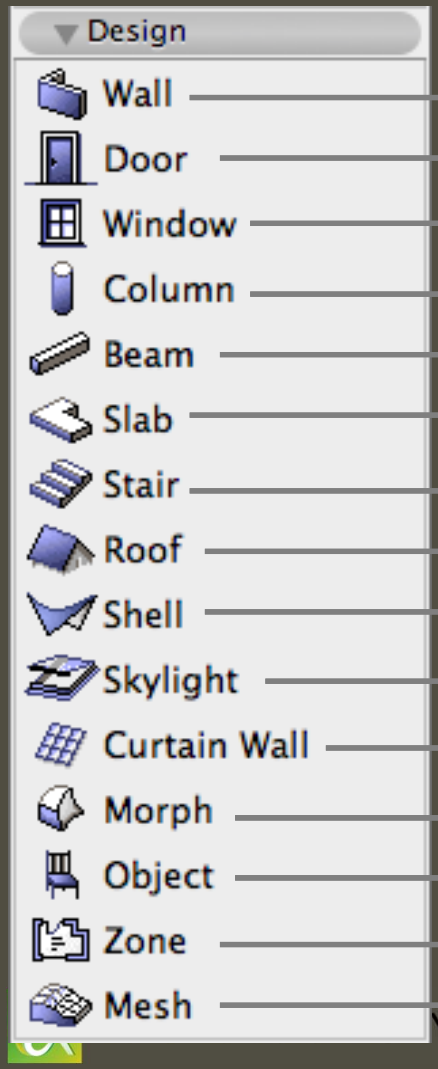
Site Model



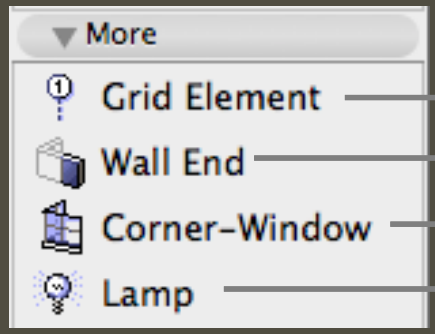
THE UGLY

ArchiCAD IFC to simplebim

MODELLING FOR IFC EXCHANGE

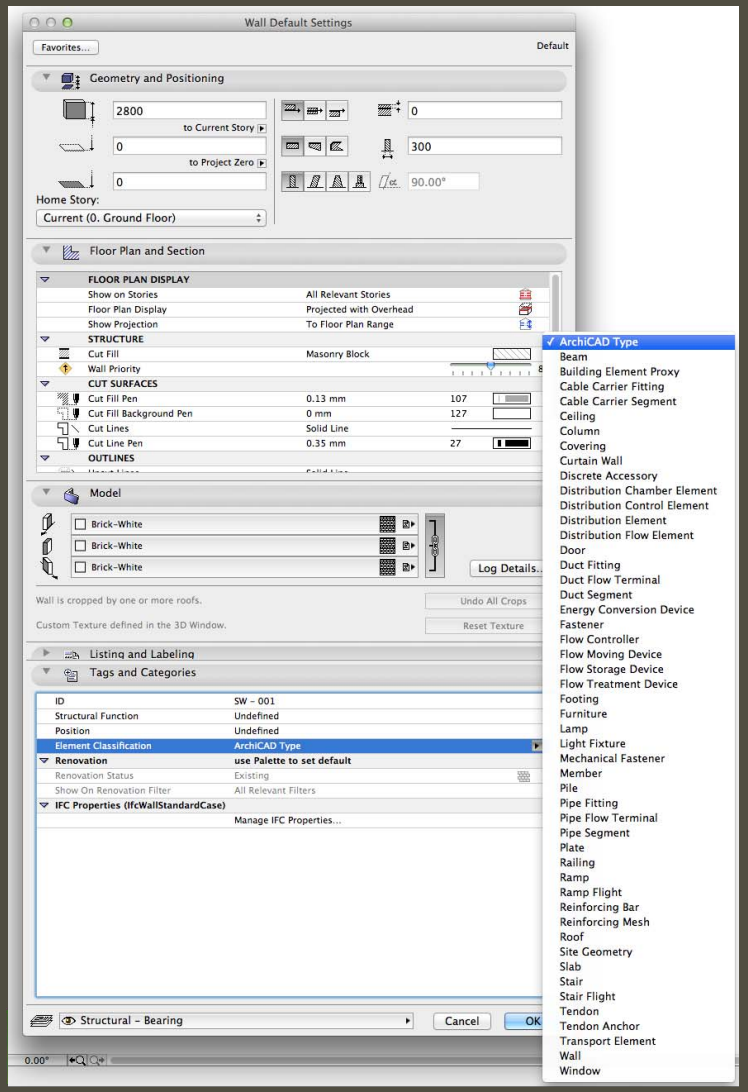


- Wall → IfcWall
- Door → IfcDoor
- Window → IfcWindow
- Column → IfcColumn
- Beam → IfcBeam
- Slab → IfcSlab (FLOOR)
- Stair → IfcStair
- Roof → IfcSlab (ROOF)
- Shell → IfcSlab (ROOF)
- Skylight → IfcWindow
- Curtain Wall → IfcCurtainWall including IfcPlate (for panels) and IfcMember (for mullions and transoms)
- Morph → IfcBuildingElementProxy
- Object → *Varies depending on object selected*
- Zone → IfcSpace
- Mesh → IfcSiteGeometry



- Grid Element → IfcGridAxis
- Wall End → IfcWall
- Corner-Window → IfcWindow
- Lamp → IfcFlowTerminal

MODELLING FOR IFC EXCHANGE



No specific tools

e.g.

Ceiling

Footing

Floor finish

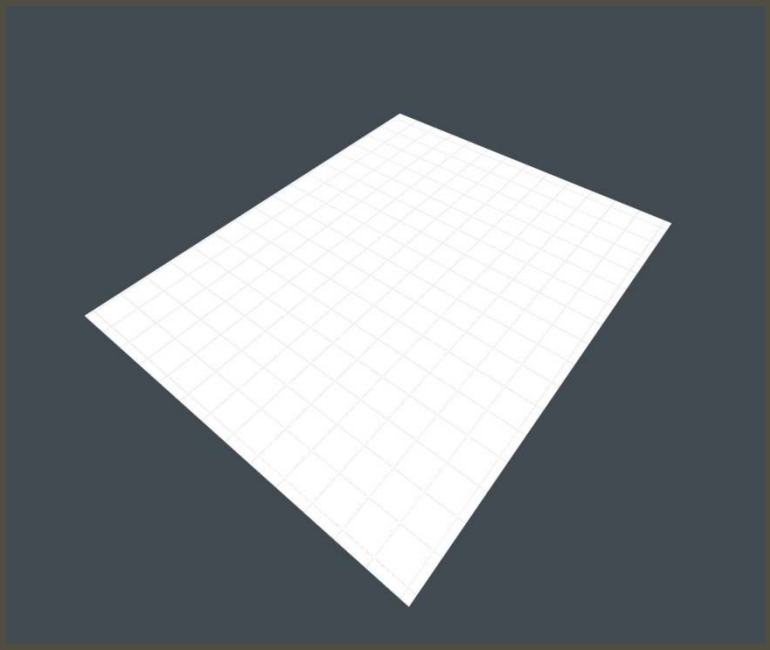
Lift

Pile

Railing

Ramp

Reinforcement

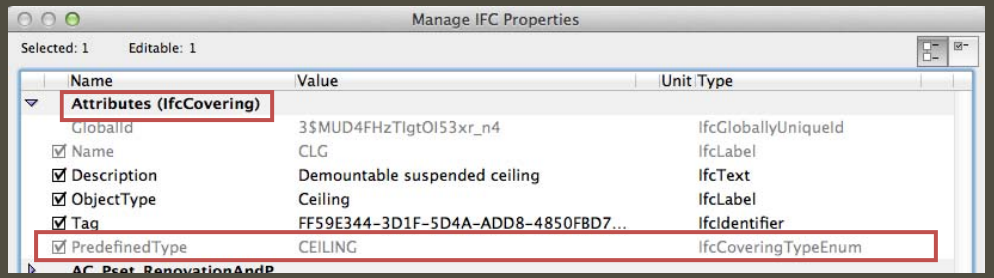


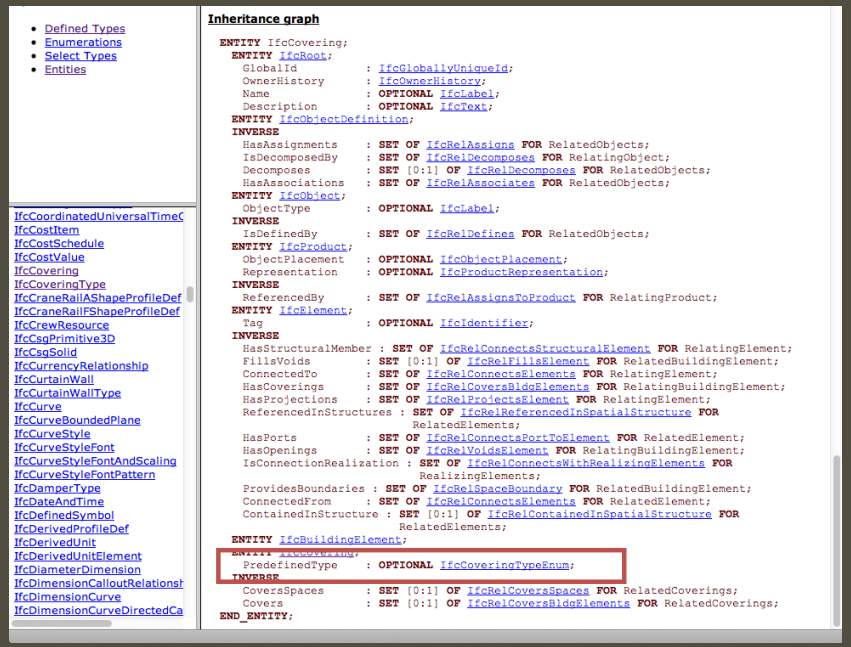
Ceiling could be modelled with the Slab tool

MODELLING FOR IFC EXCHANGE

Predefined Types - IfcCovering

- IfcCovering (CEILING)
- IfcCovering (CLADDING)
- IfcCovering (FLOORING)
- IfcCovering (INSULATION)
- IfcCovering (MEMBRANE)
- IfcCovering (ROOFING)
- IfcCovering (SLEEVING)
- IfcCovering (WRAPPING)
- IfcCovering (NOT DEFINED)
- IfcCovering (USER DEFINED)

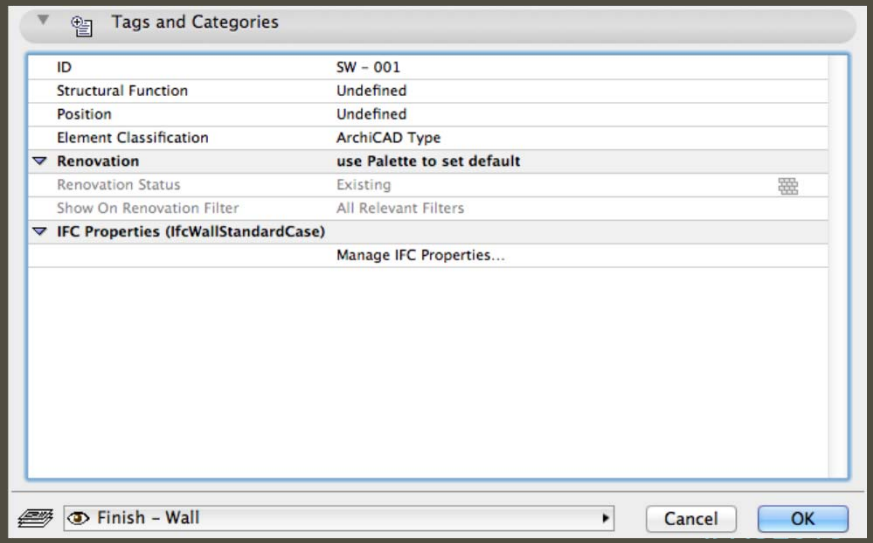




MODELLING FOR IFC EXCHANGE

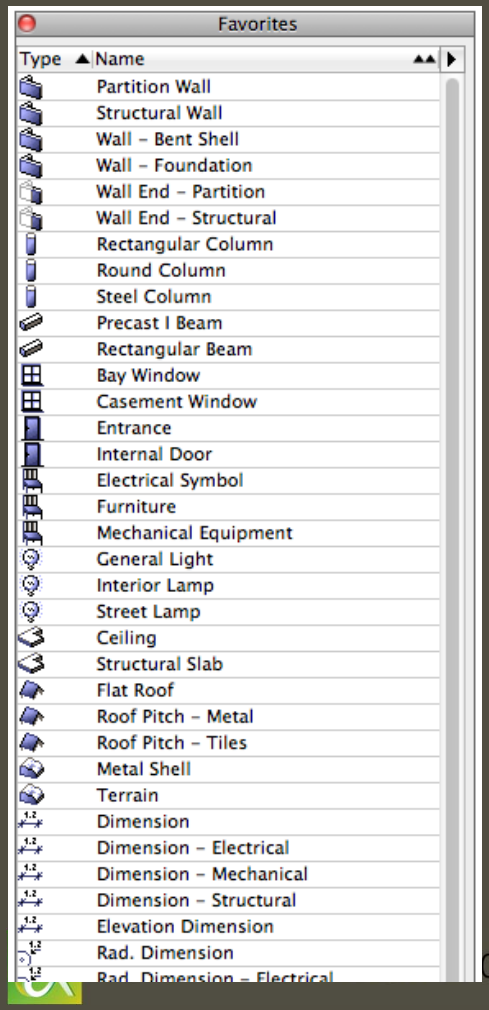
- Default information
  - GlobalId (or GUID)

- Minimum for geometry exchange
  - Geometry
  - Location
  - Surface colour
  - Structural Function (LoadBearing)
  - Position (IsExternal)
  - Element Classification
  - Renovation Status
  - Layer



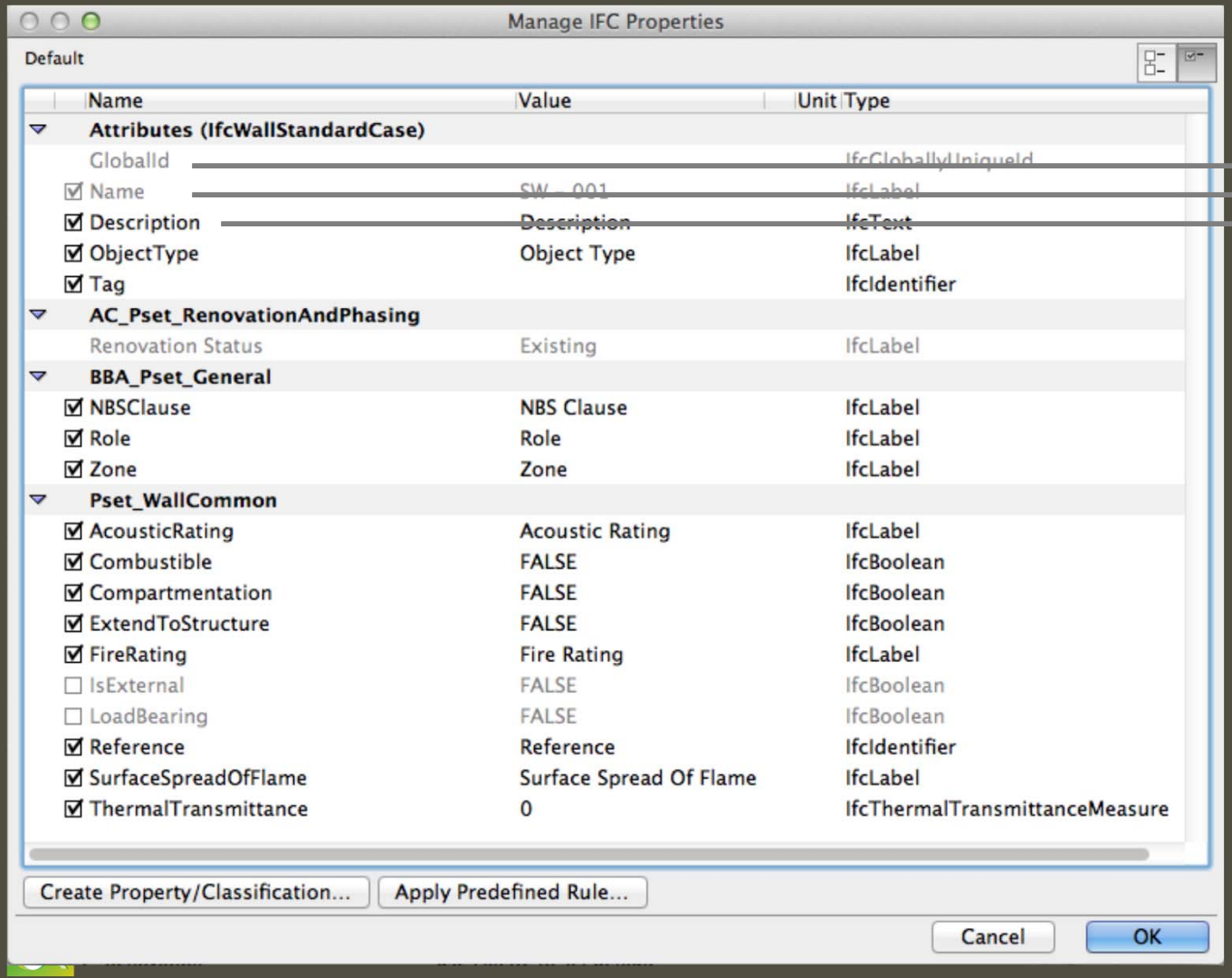
MODELLING FOR IFC EXCHANGE

Favourites



- Surface colour
- Structural Function (LoadBearing)
- Position (IsExternal)
- Element Classification
- Renovation Status
- Layer
- ID (or Name)
- Material (fill in ArchiCAD)
- Description
- Data – IFC
- Data – Custom
- Classification (e.g. Uniclass/CAWS or Uniclass2, NRM etc)

MODELLING FOR IFC AND COBIE EXCHANGE



COBie

ExtIdentifier

Name

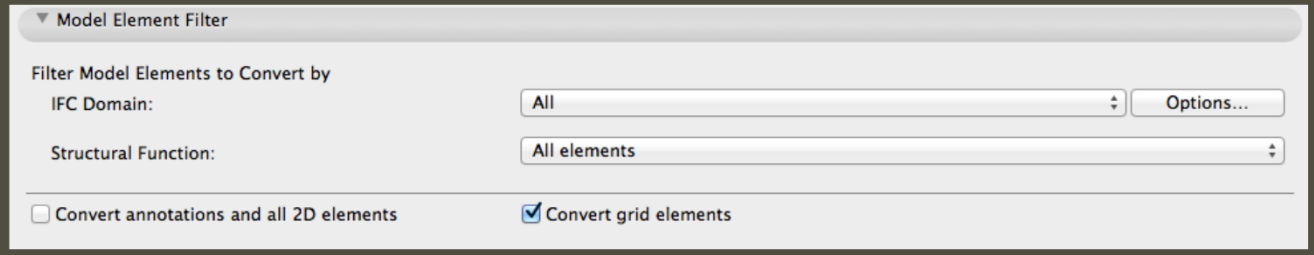
Description

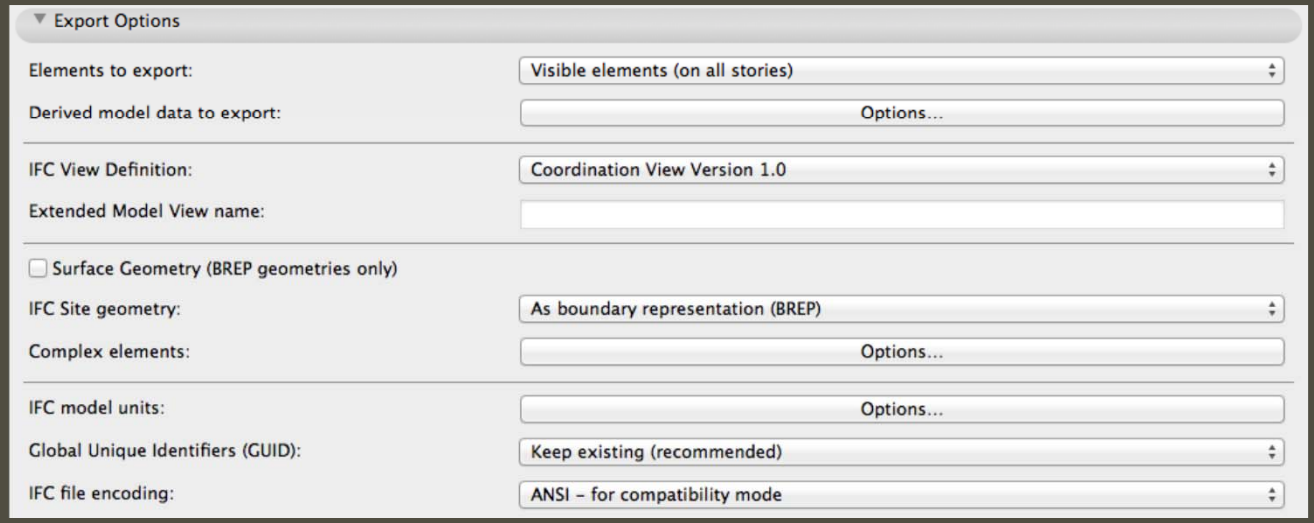
THE BAD

ArchiCAD language		IFC language	
GlobalId	=	GUID	
ID	=	Name	(Revit 2014 – NameOverride)
Fill (cut)	=	Material	
Position	=	IsExternal	
Project Name	=	Building Name	
Reference	=	Type	
Storey	=	Floor	
Structural Function	=	LoadBearing	
Tag	=	BATID (Solibri)	
Zone	=	Space	

EXPORT OPTIONS – ARCHICAD

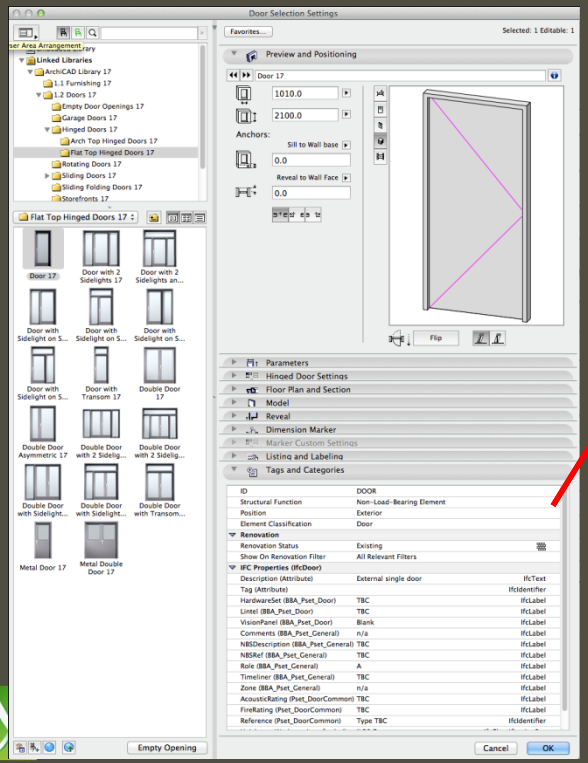
- Format
  - IFC2x3
  - IFC2x3 XML
  - IFC 2x3 compressed
  - IFC 2x3 XML compressed
  - IFC Coordination View v1 & v2

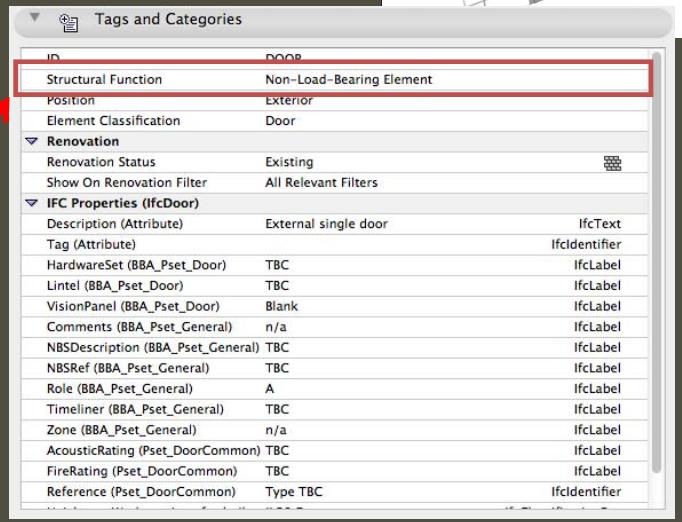


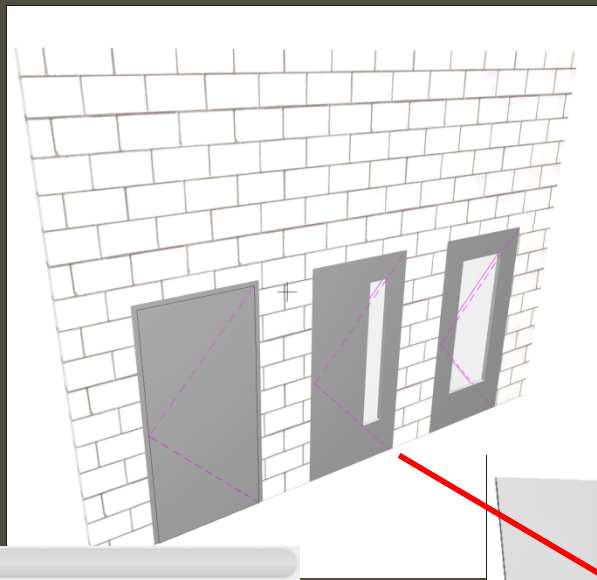


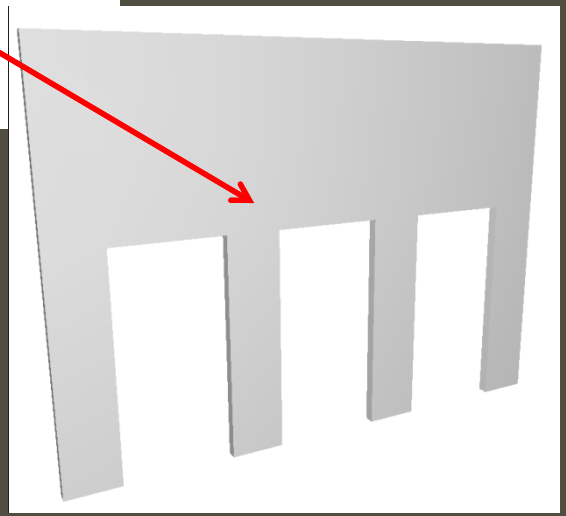
MODELLING FOR IFC EXCHANGE

- Structural Function (LoadBearing)
  - Load-Bearing Element
  - Non-Load-Bearing Element
  - Undefined

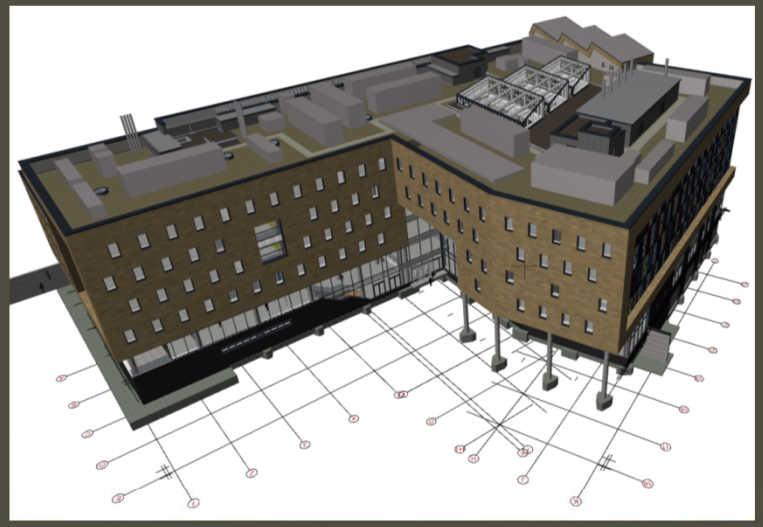








TECHNICALITIES



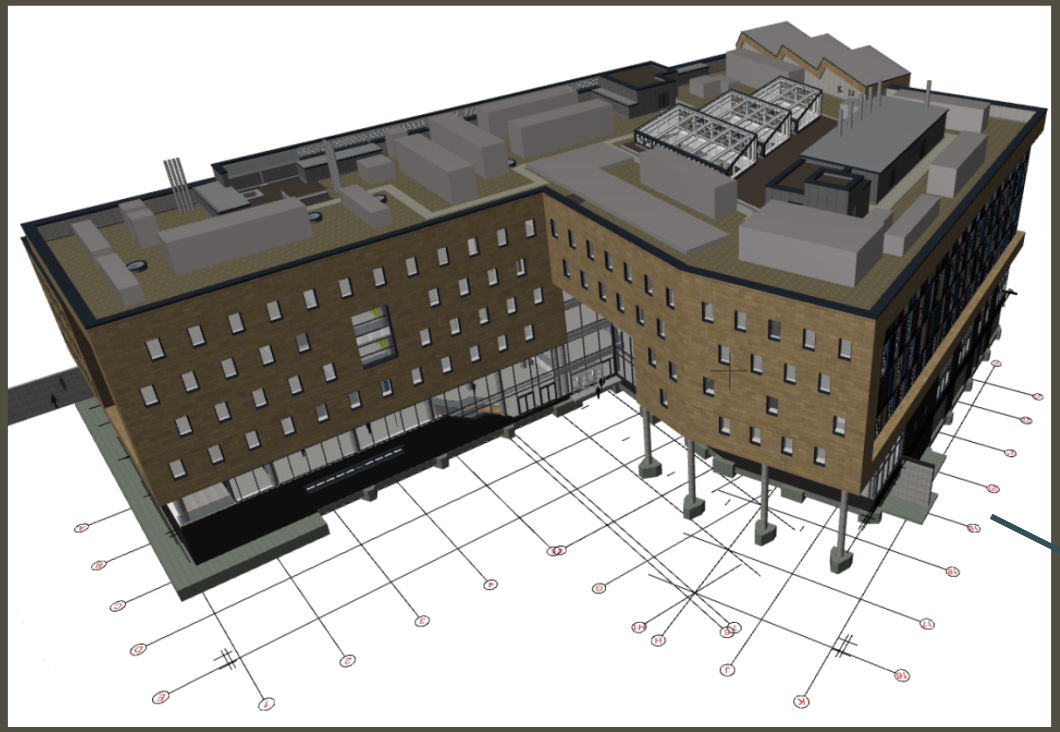
Bradford College bam

AUTODESK **UNIVERSITY** 2013

IFC THE GOOD THE BAD THE UGLY

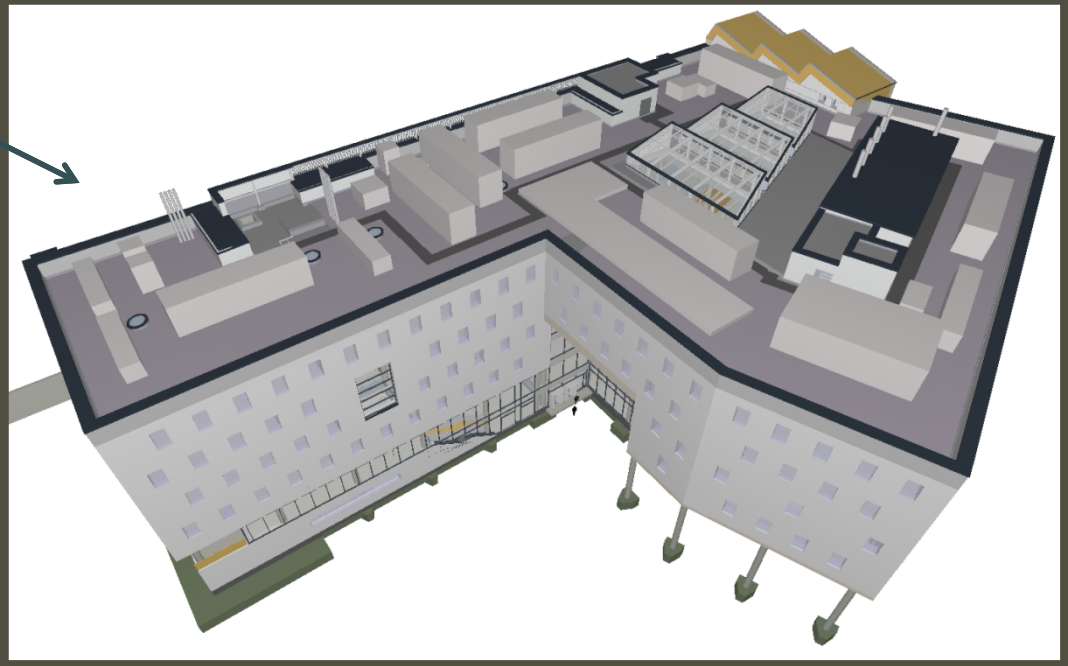
#AU2013

TECHNICALITIES

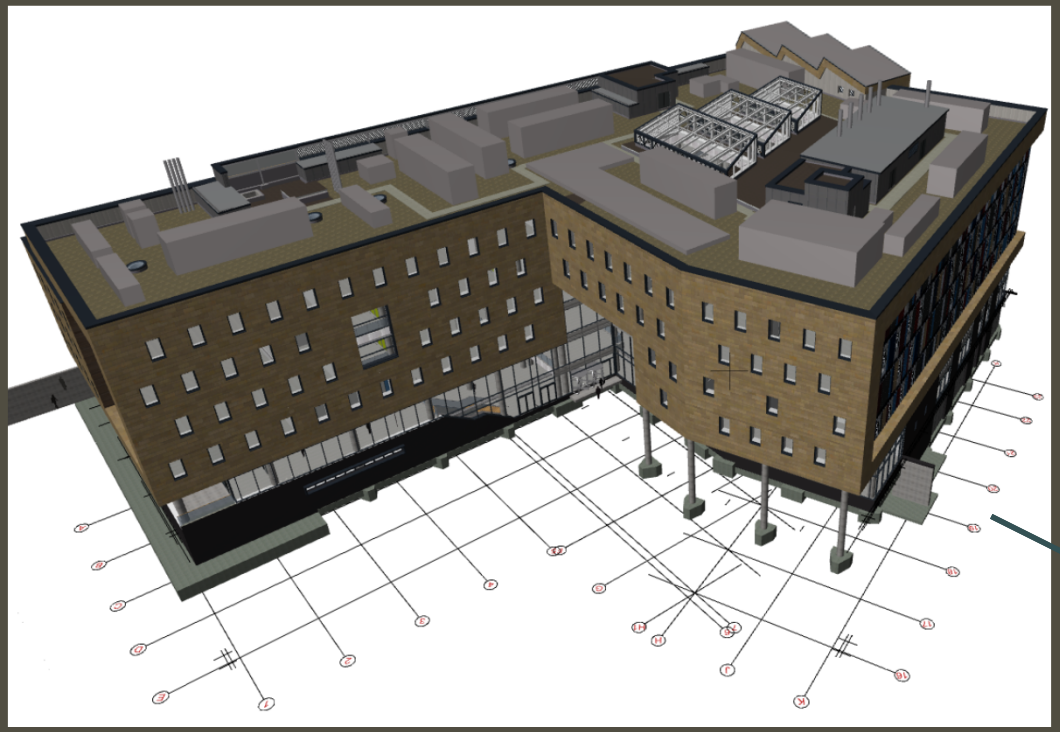


ArchiCAD 16

Solibri Model Viewer v7

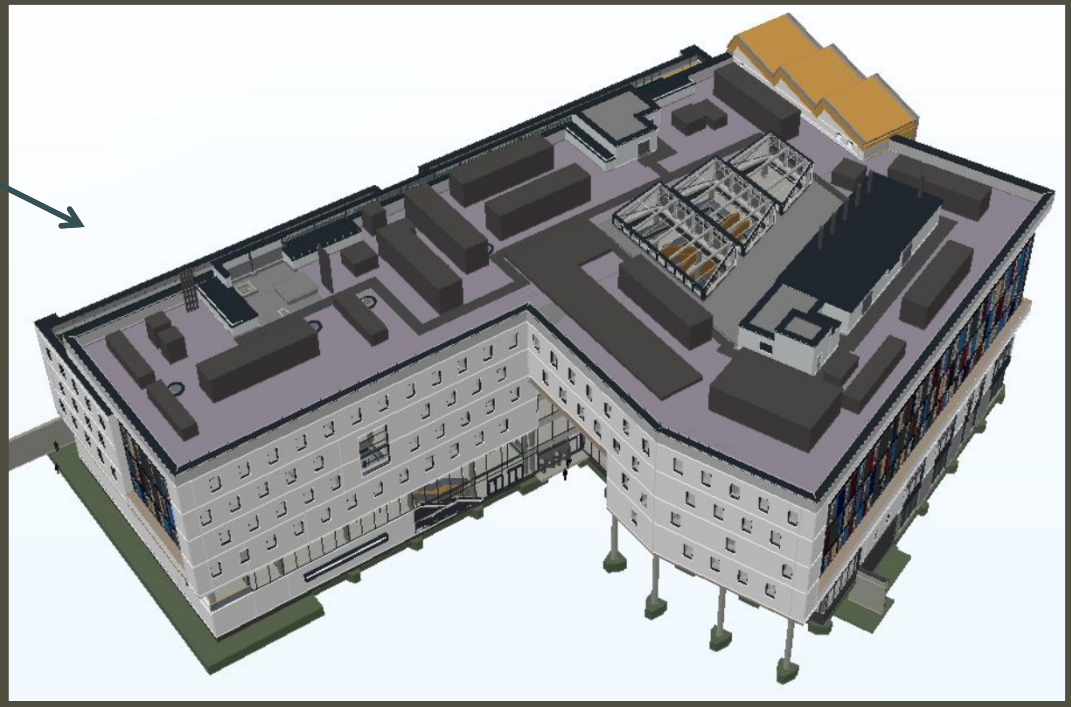


TECHNICALITIES



ArchiCAD 16

Tekla BIMsight v1.7.1



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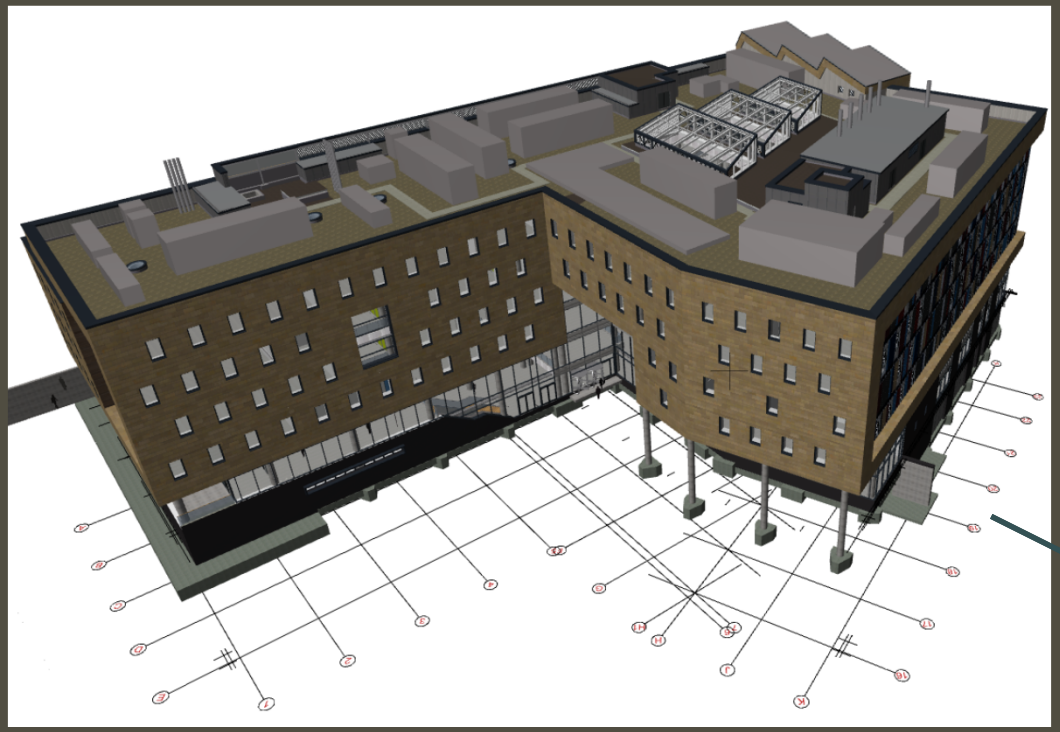
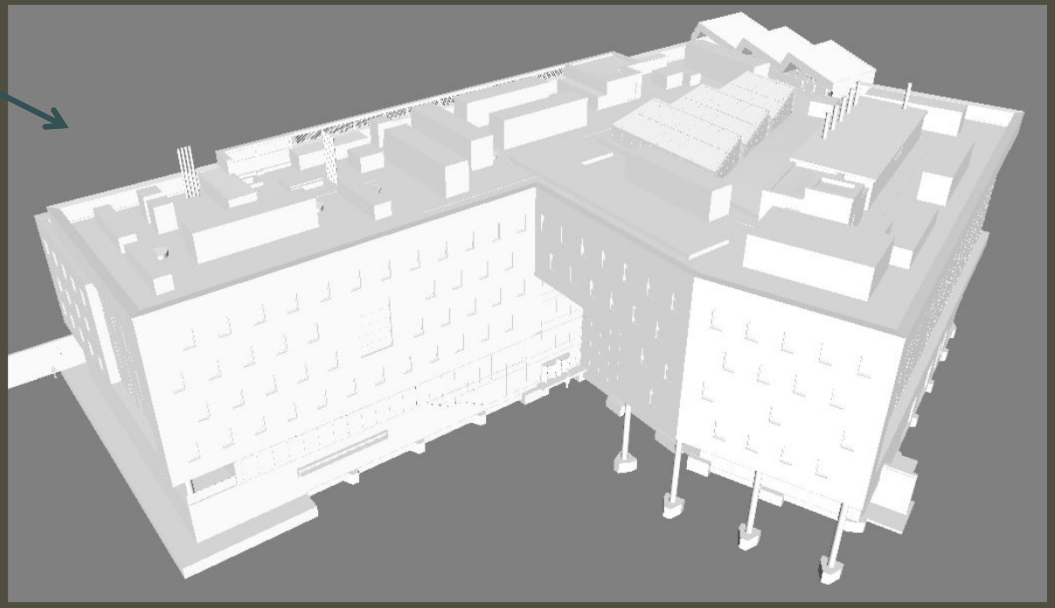
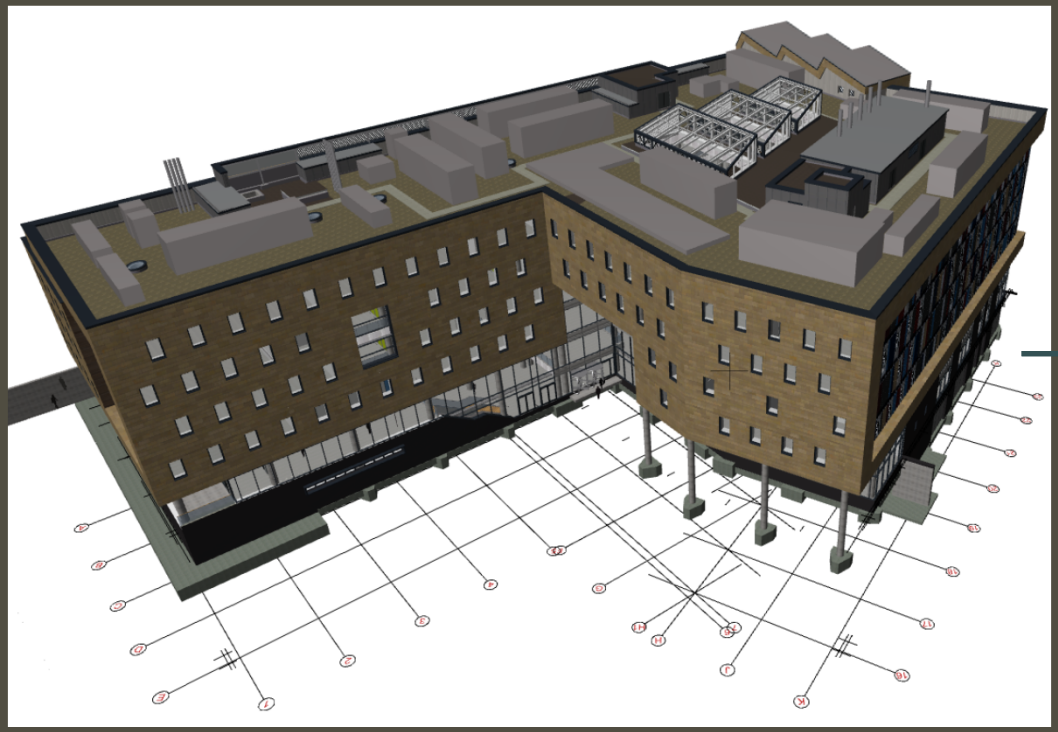


ArchiCAD 16

Navisworks 2013

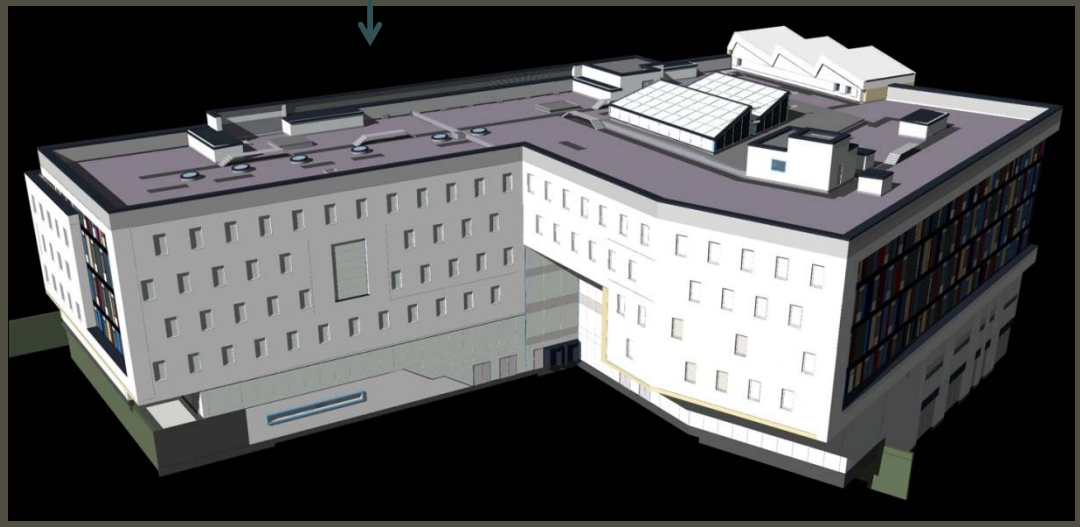


TECHNICALITIES



ArchiCAD 16

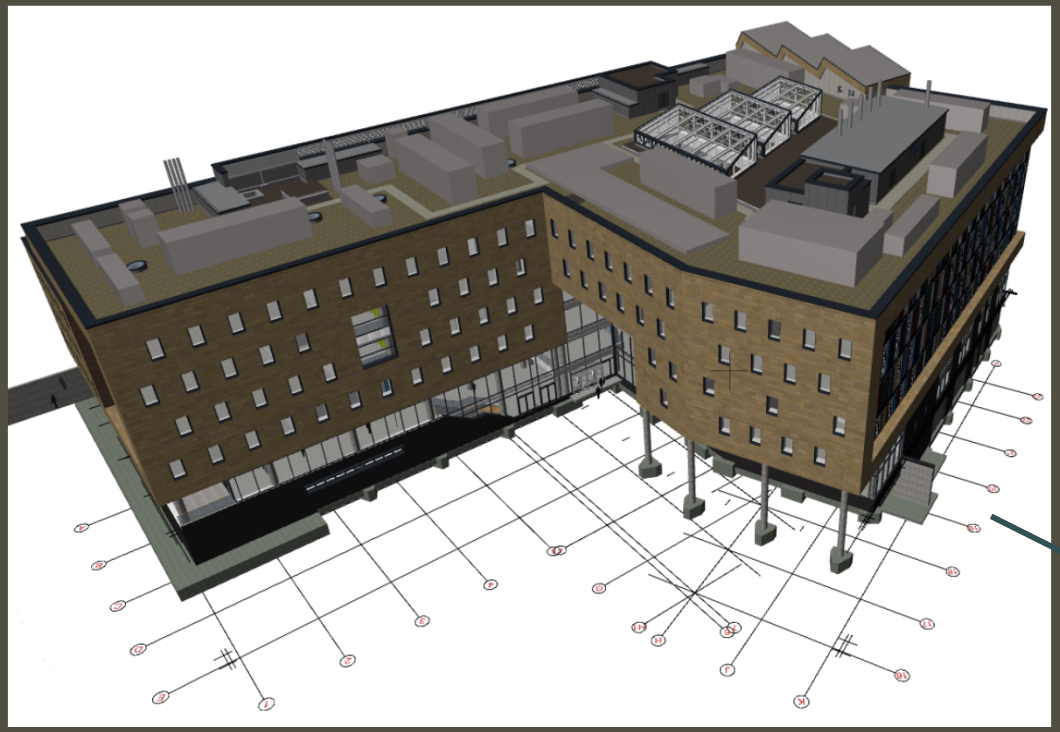
Datacubist
simplebim



Navisworks 2013
via simplebim

Adam Ward
@Revitspace
#ukbimcrew

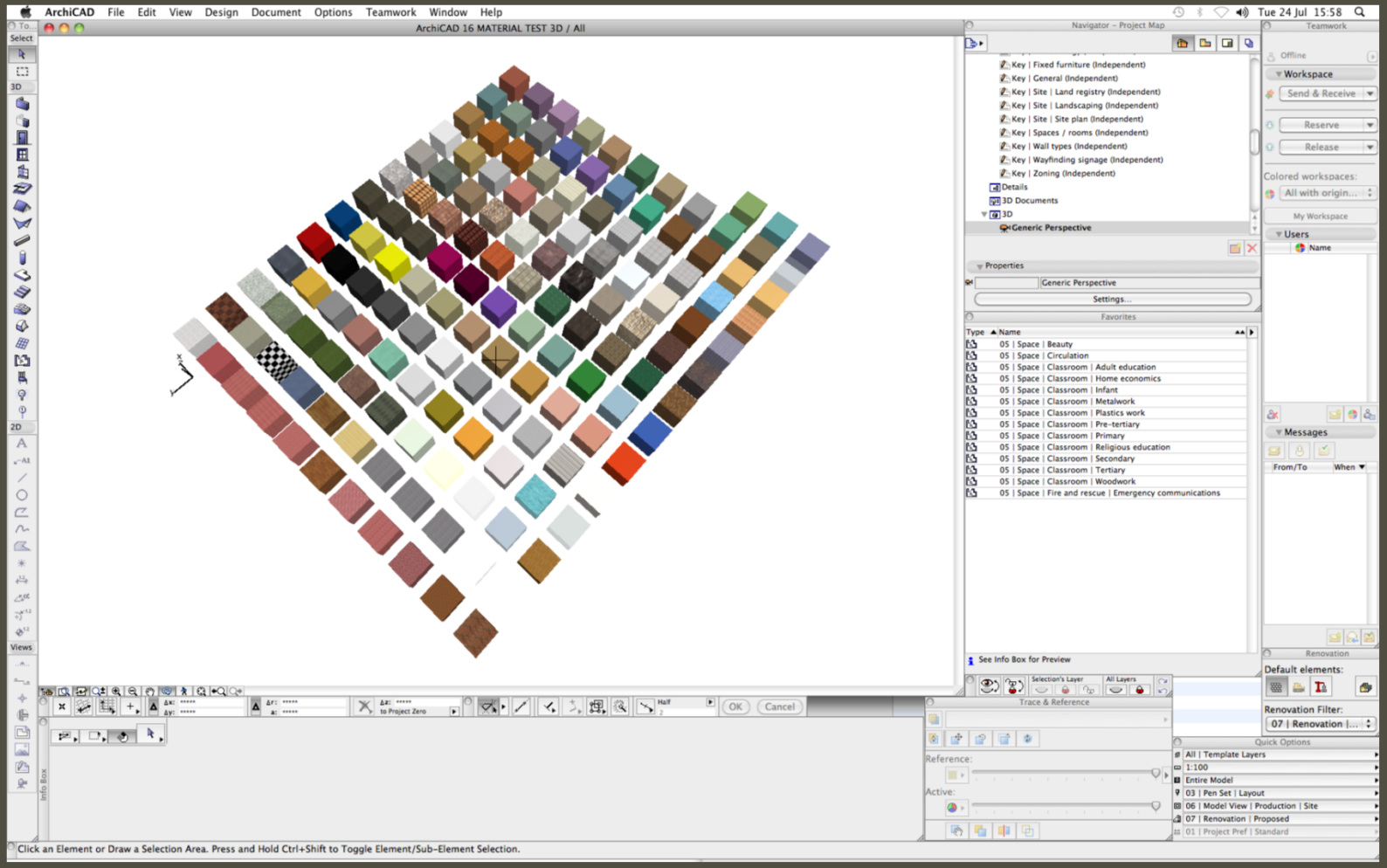
TECHNICALITIES



ArchiCAD 16

Navisworks 2014

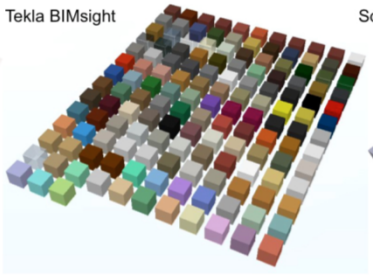
TECHNICALITIES



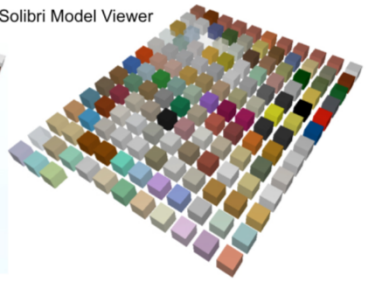
TECHNICALITIES

Graphisoft ArchiCAD

Tekla BIMsight

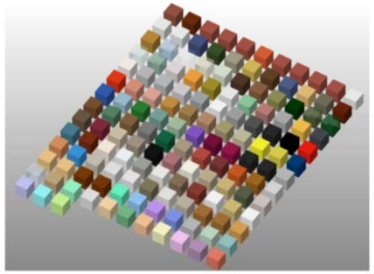


Solibri Model Viewer



DDS-CAD

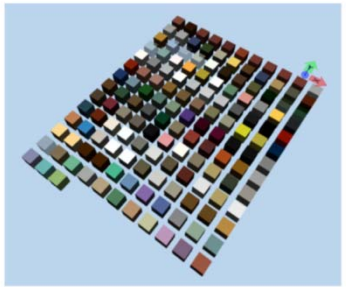
Datacubist simplebim



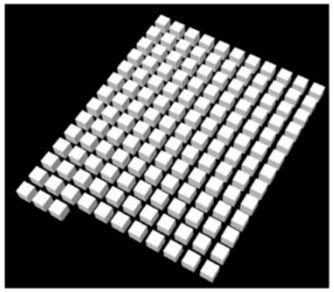
Vico

AWAITING IMAGE

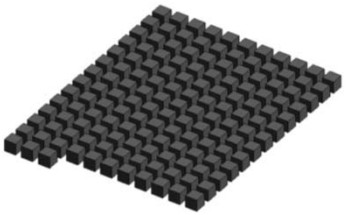
Bentley Navigator



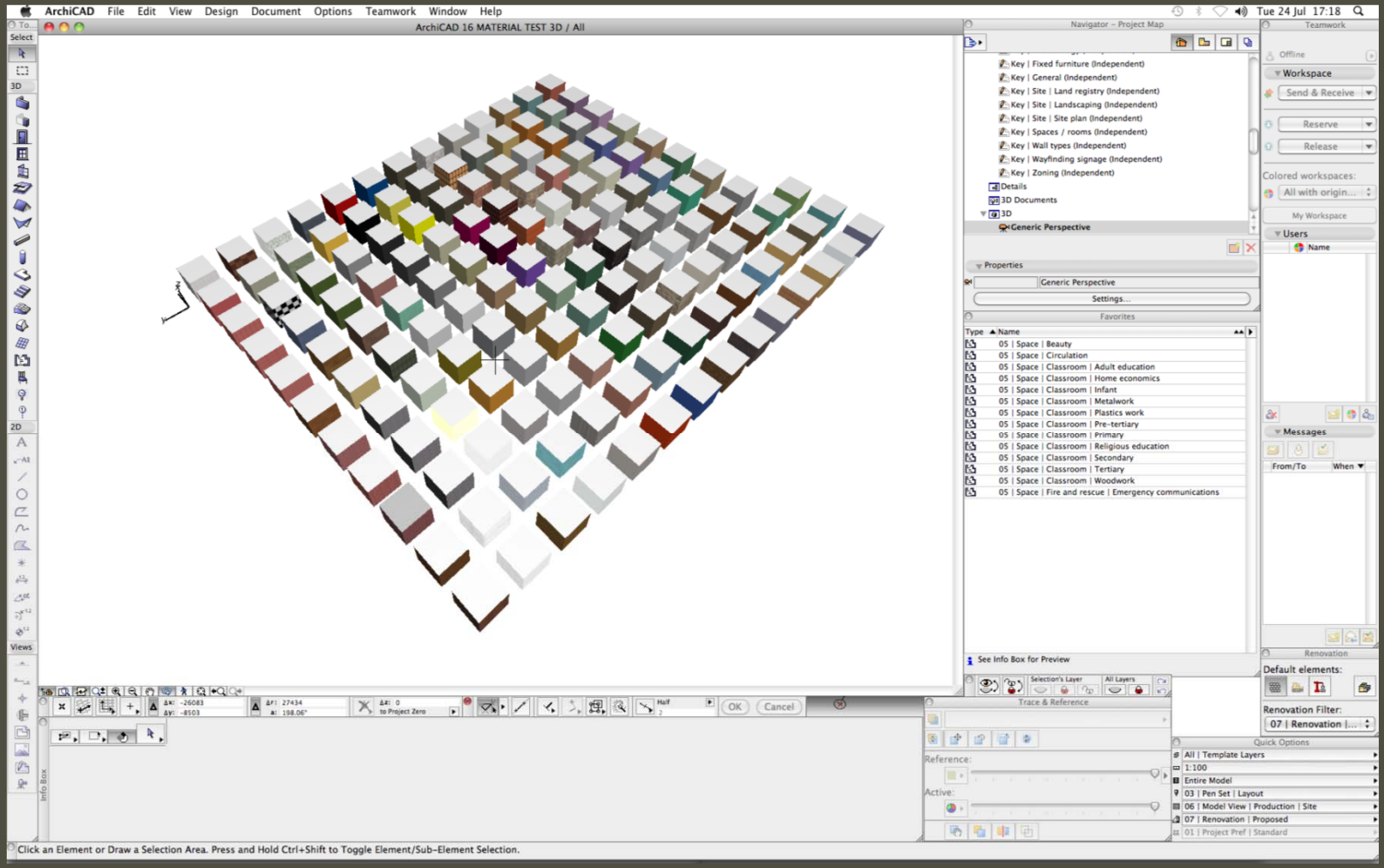
Autodesk Navisworks



Autodesk Revit



TECHNICALITIES



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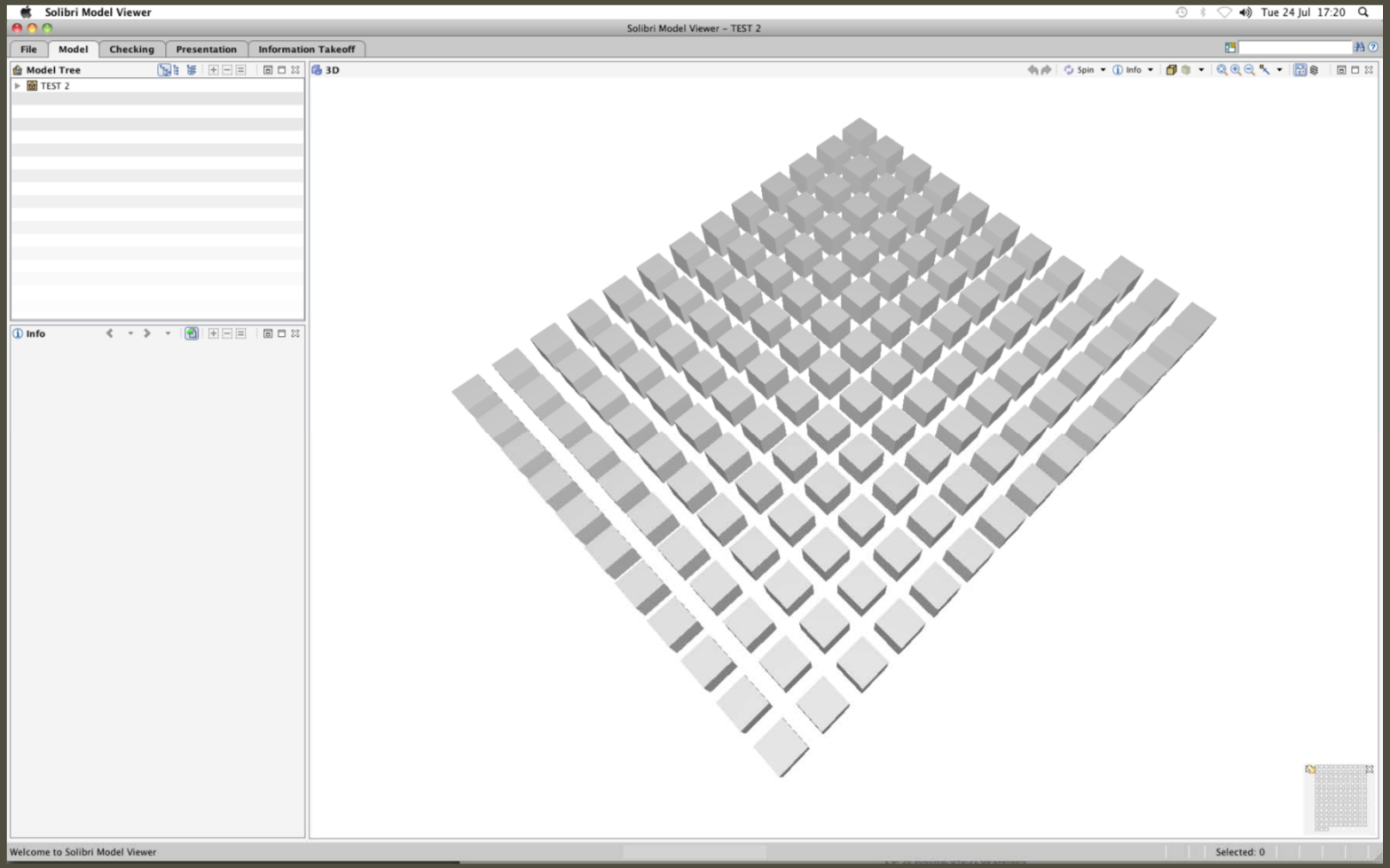

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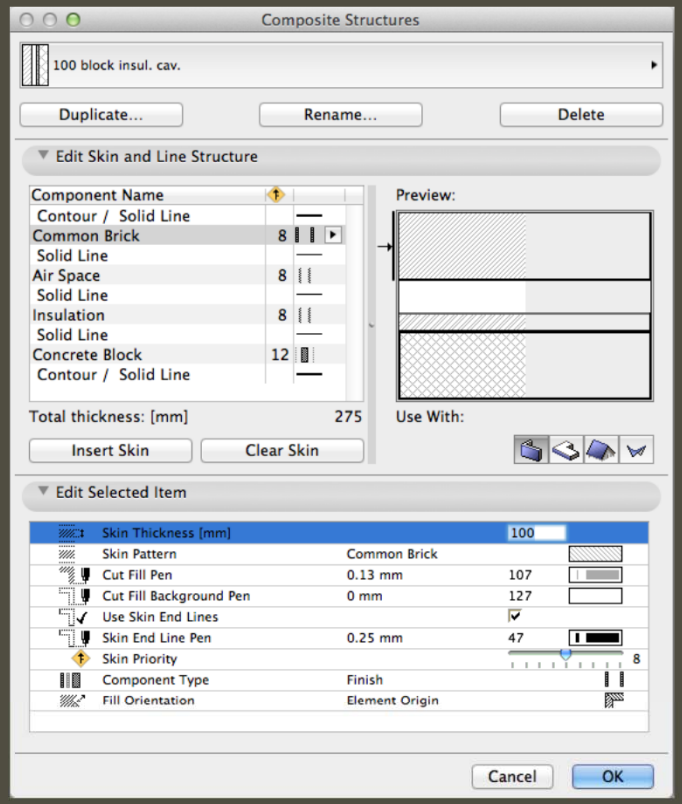

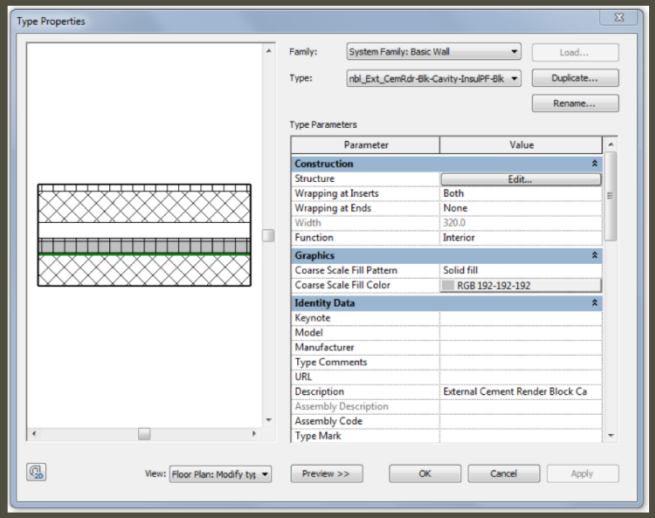

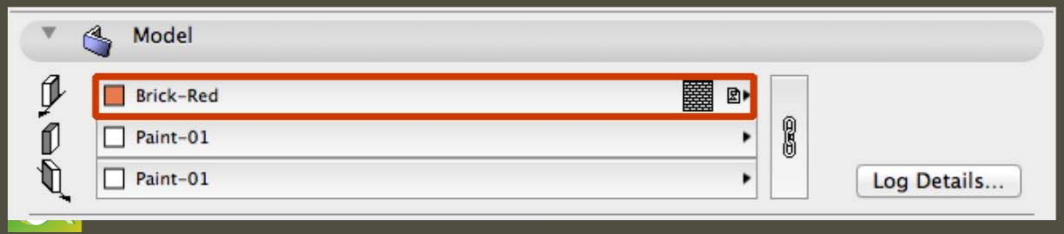

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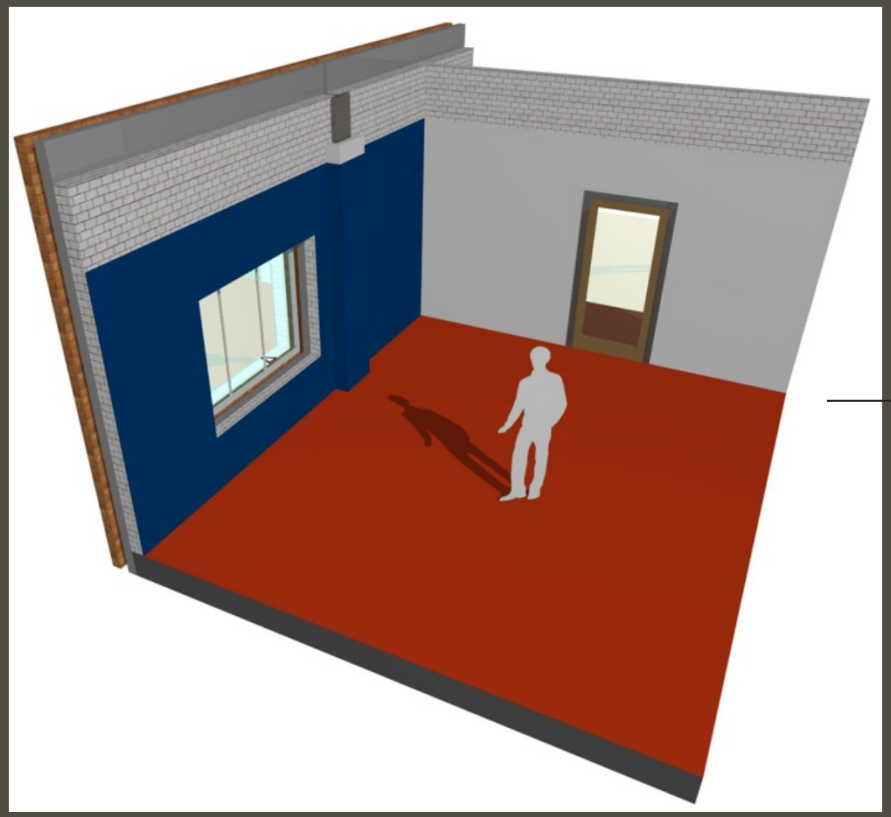
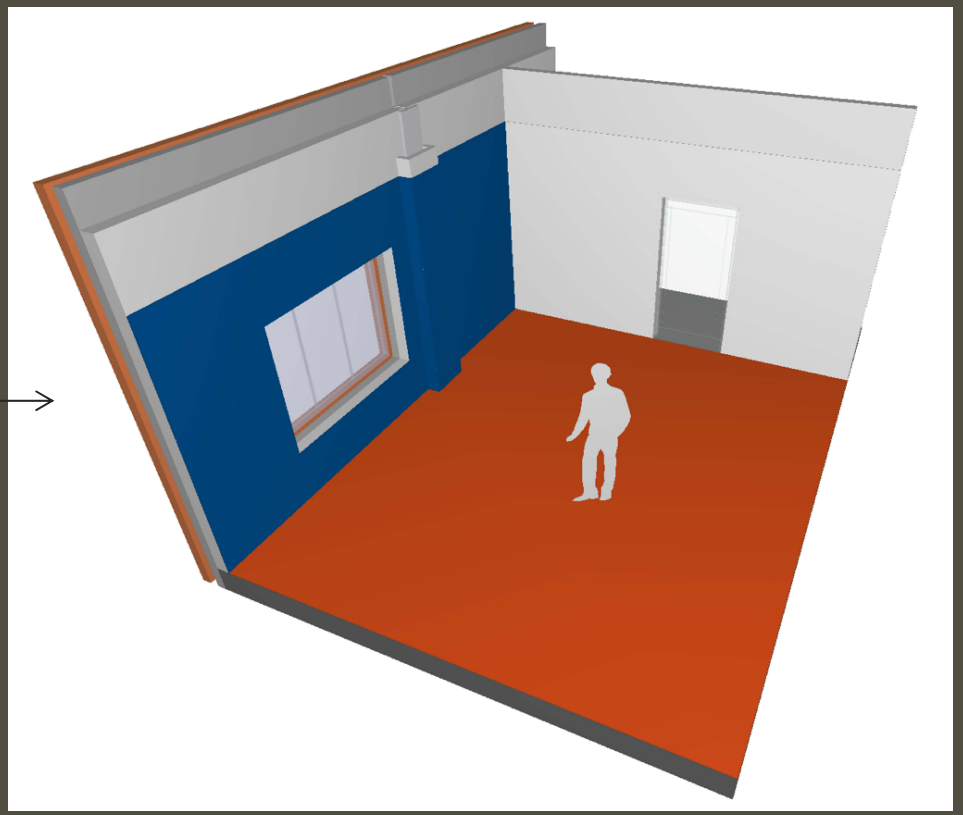
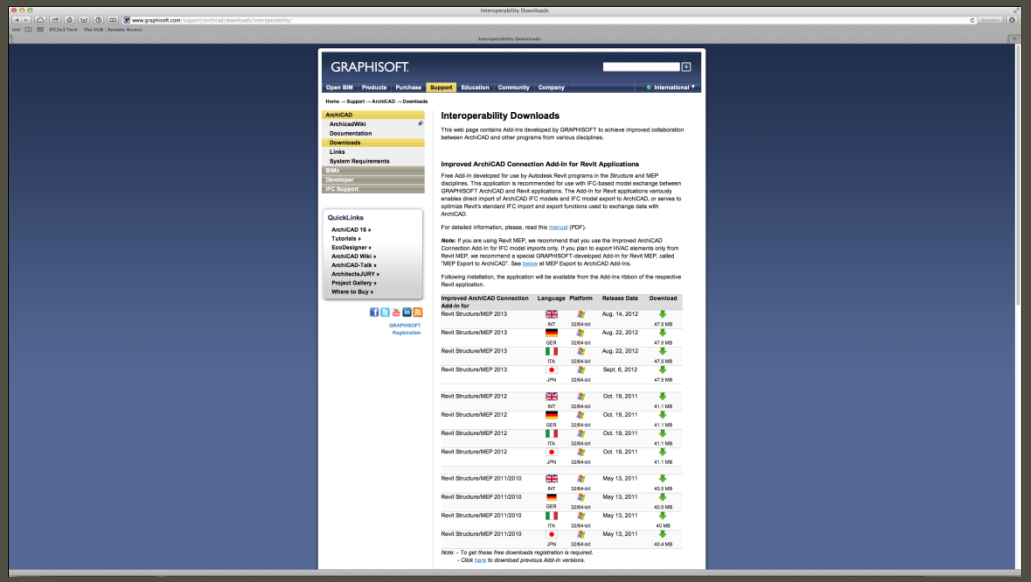


GRAPHISOFT ArchiCAD 16

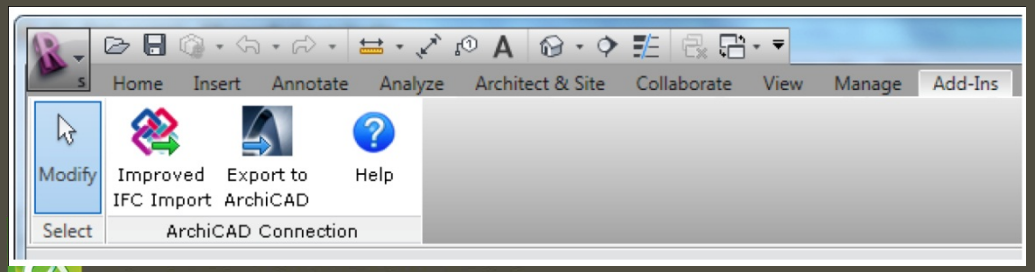


Solibri Model Viewer

ARCHICAD TO REVIT

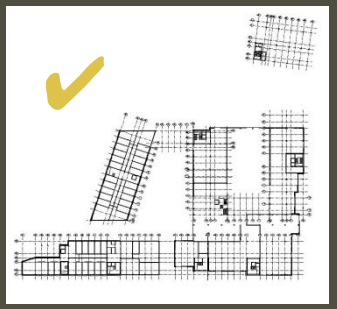


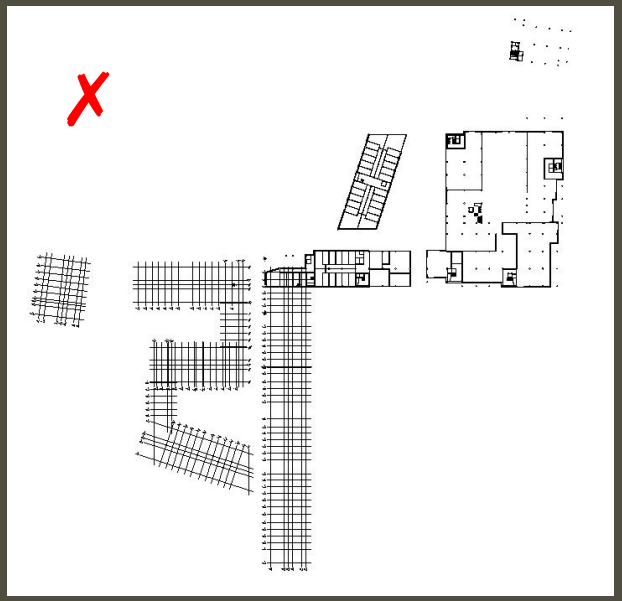
http://www.graphisoft.com/support/archicad/downloads/interoperability/



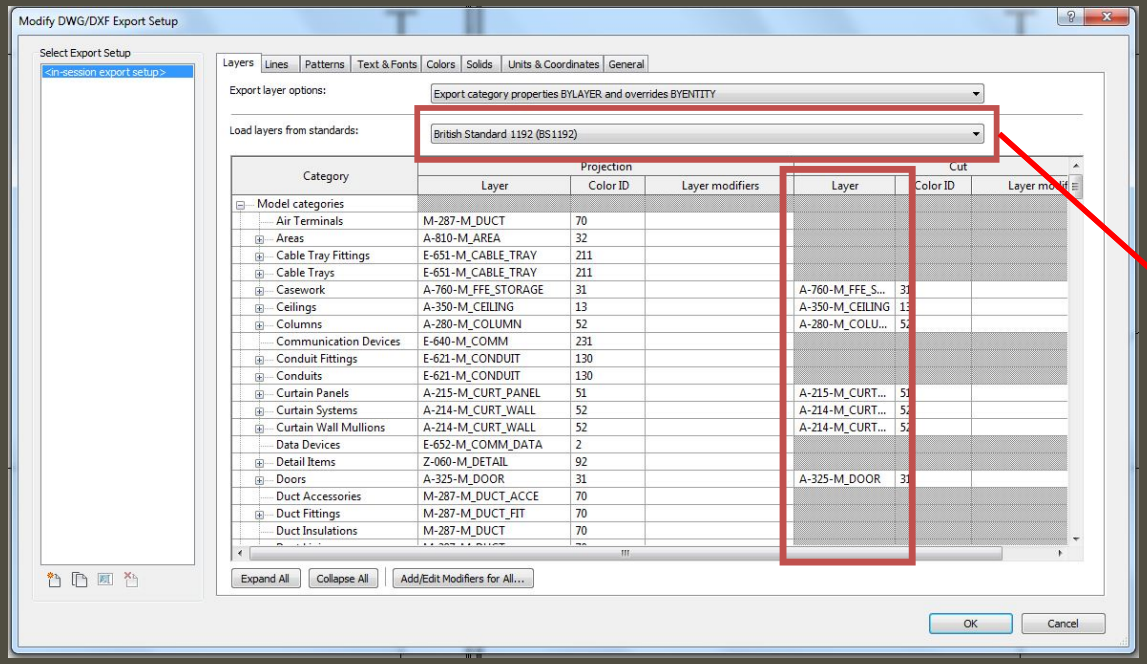
Add-in fixes –

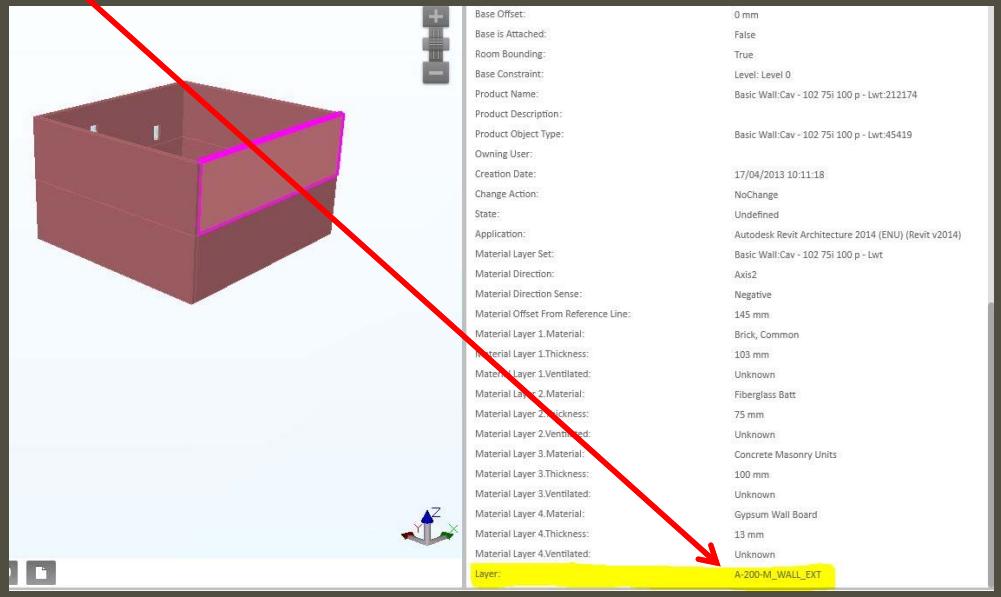
- IFC GUIDs
- Grids
- Load-bearing slabs
- Renovation status



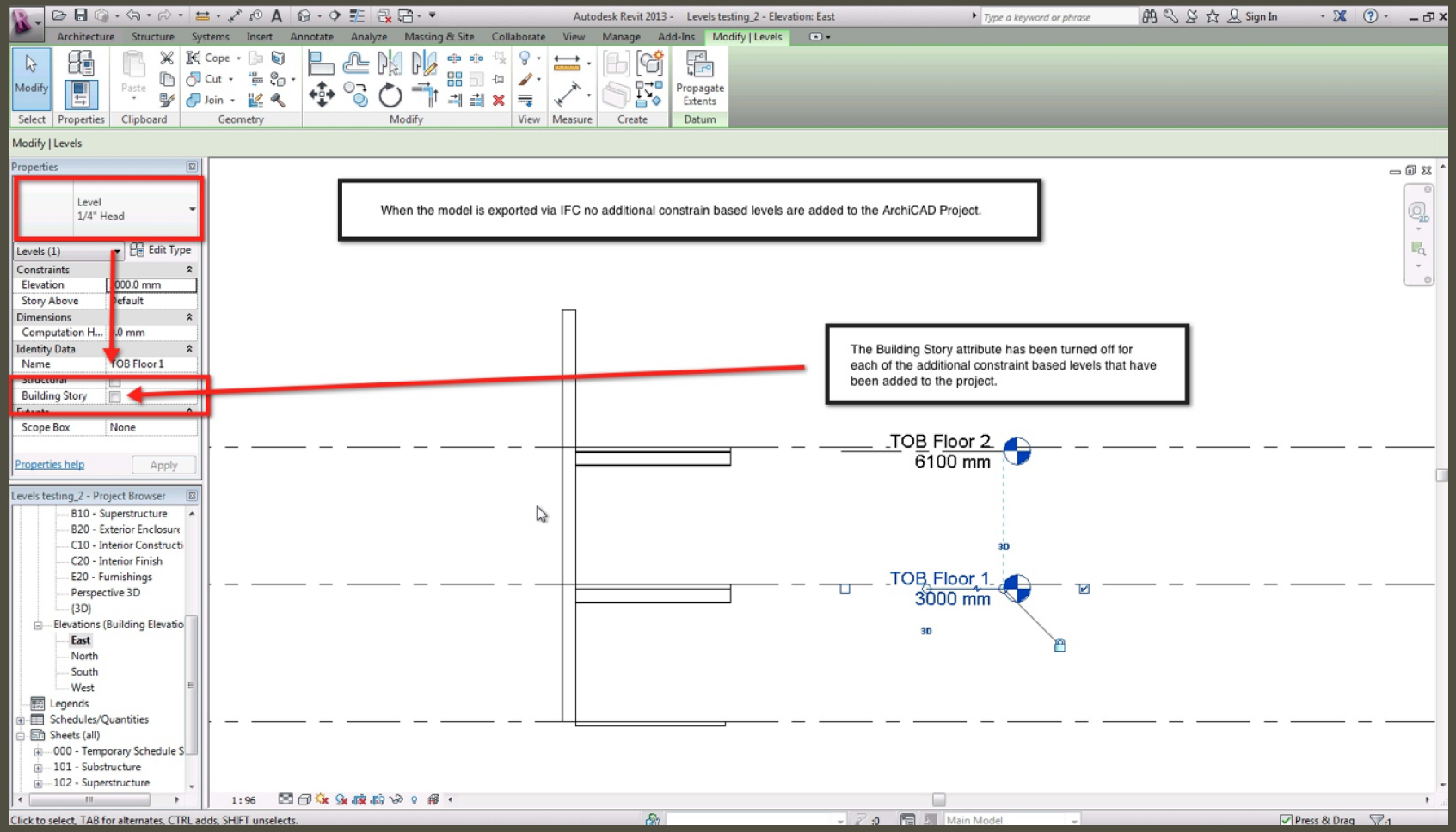


REVIT TO ARCHICAD - GENERAL

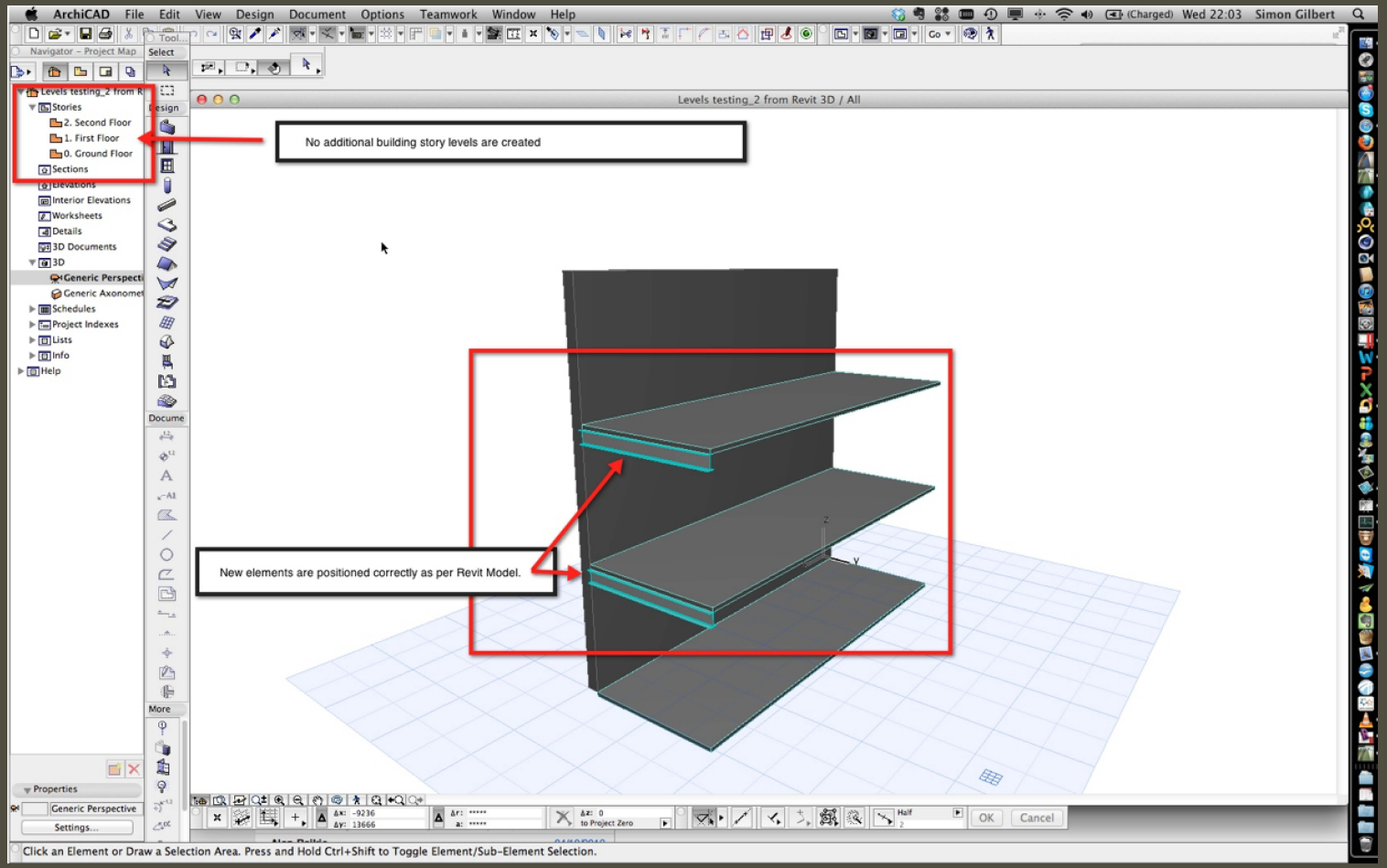




REVIT TO ARCHICAD - STRUCTURES

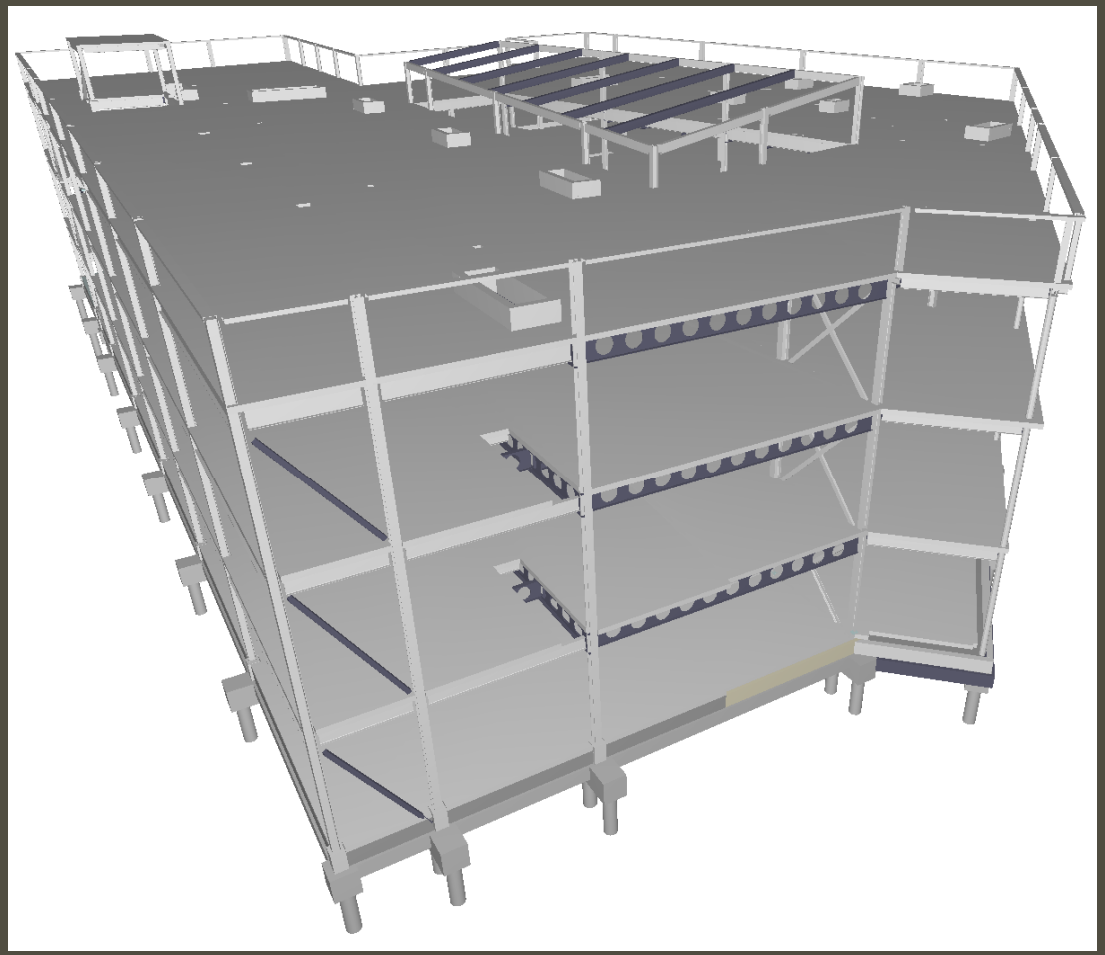


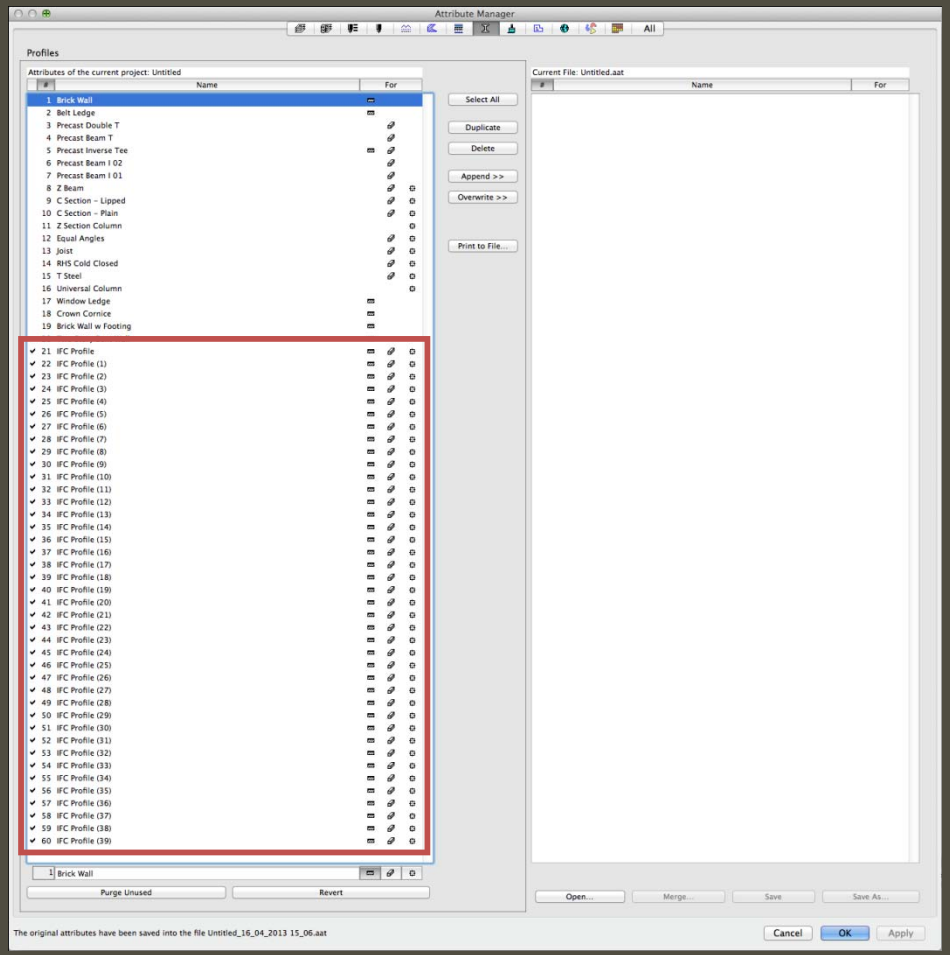
REVIT TO ARCHICAD - STRUCTURES



IFC from Autodesk REVIT 2013

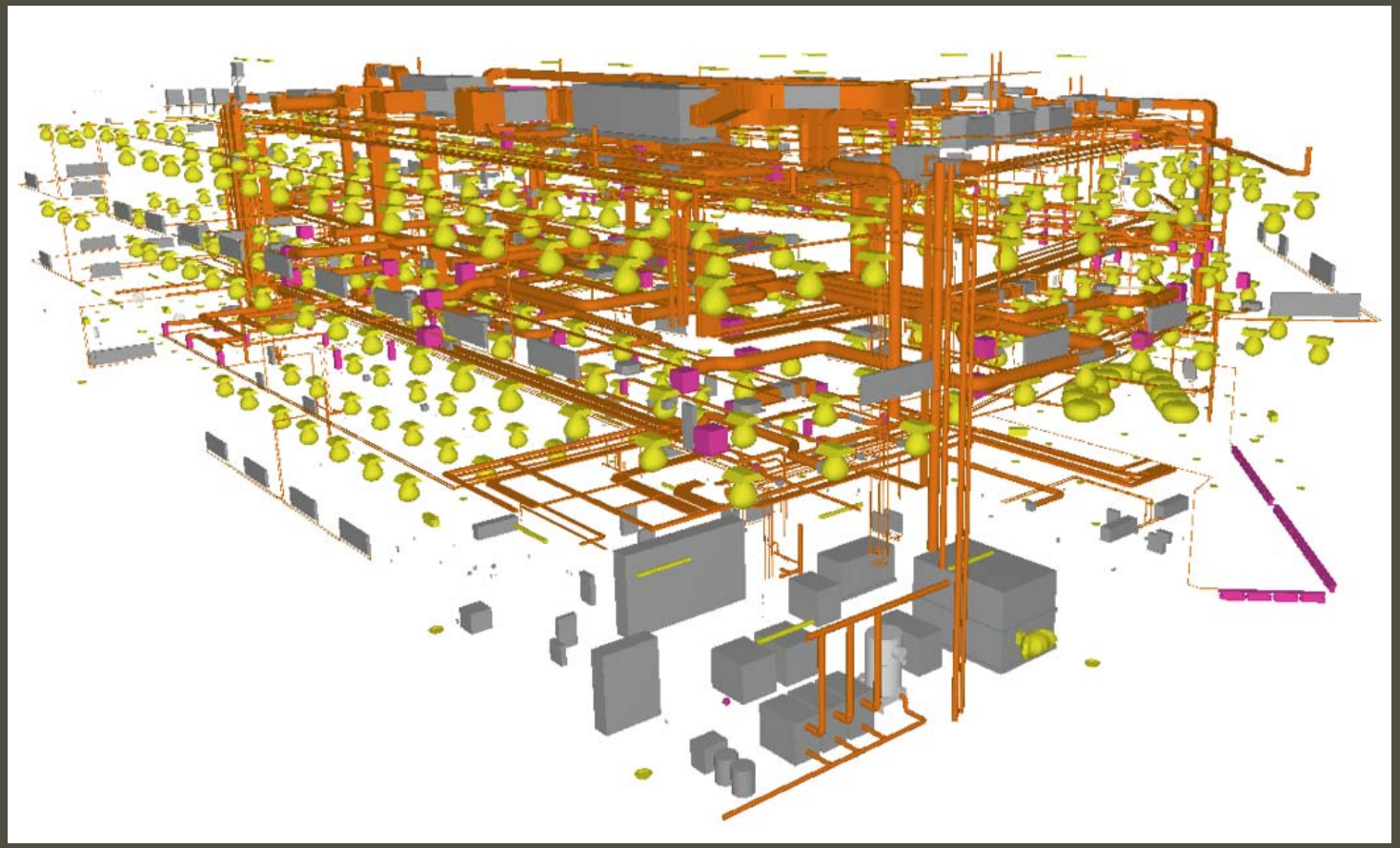
REVIT TO ARCHICAD - STRUCTURES





IFC from Autodesk REVIT 2013

REVIT TO ARCHICAD - MEP



BUCKINGHAMSHIRE University Technical College

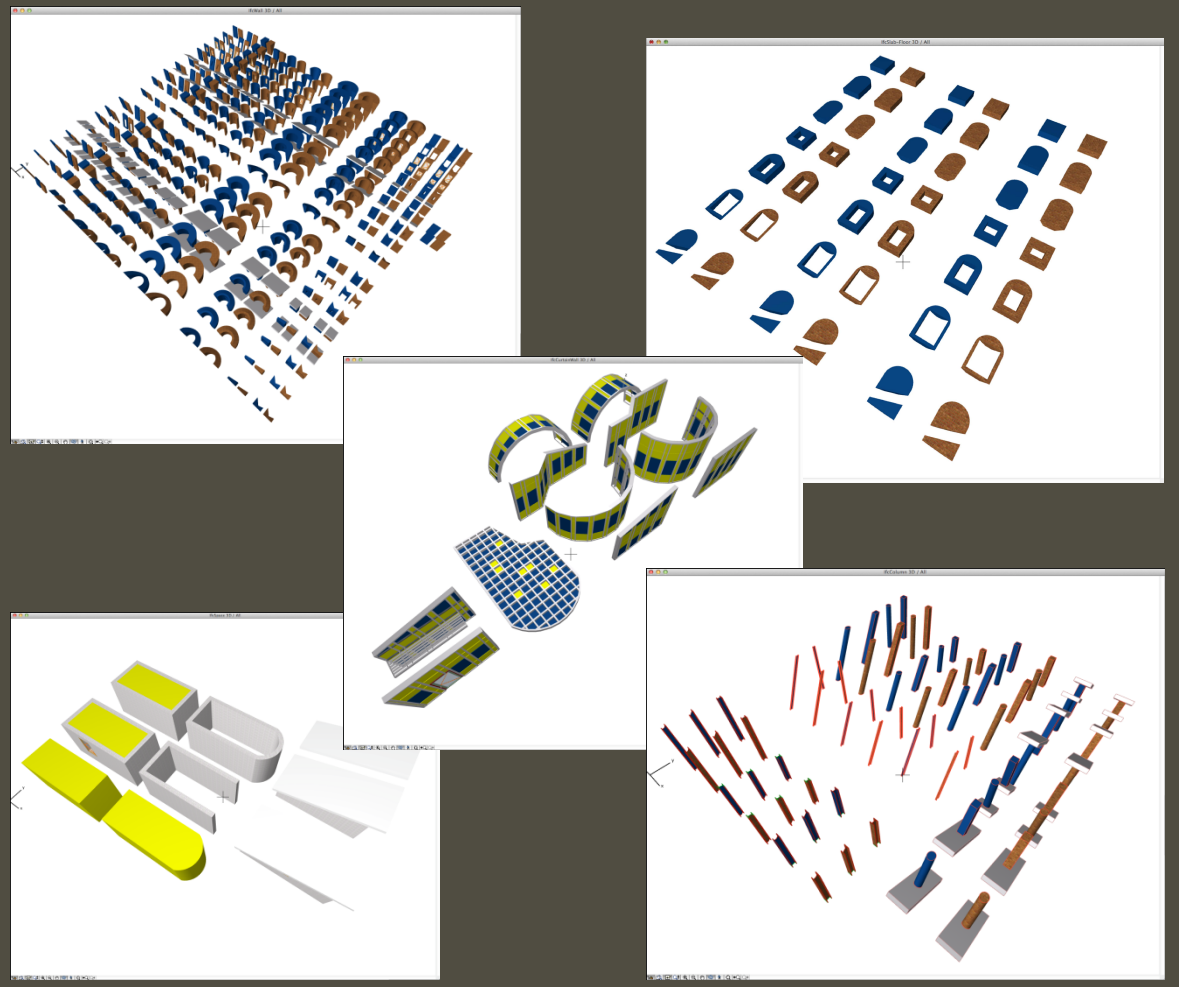
bam

IFC from Autodesk REVIT 2013

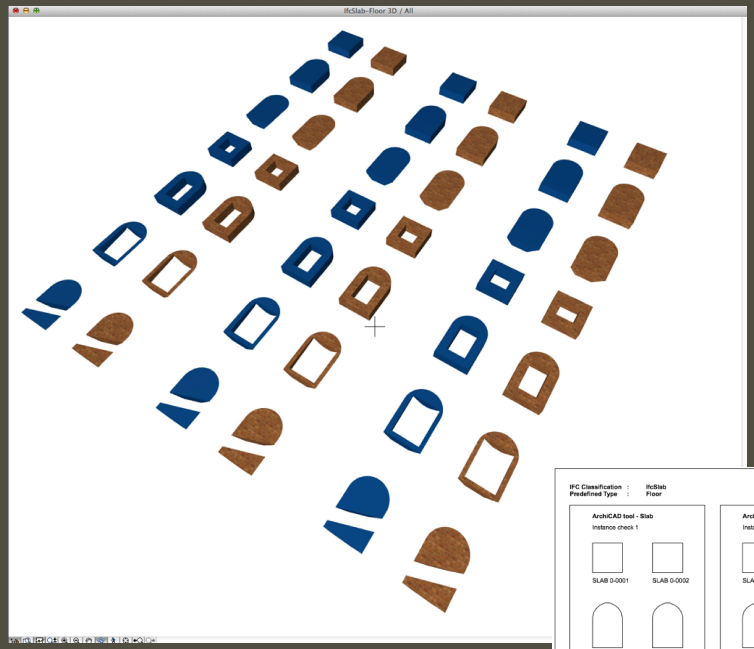
TESTING – GOOD, BAD OR UGLY?

- What we have tested to date
  - Columns (70)
  - Curtain Walls (11)
  - Slabs (42) – includes ceilings, floor finishes and flat roofs
  - Spaces (11)
  - Walls (364) - includes some opening types

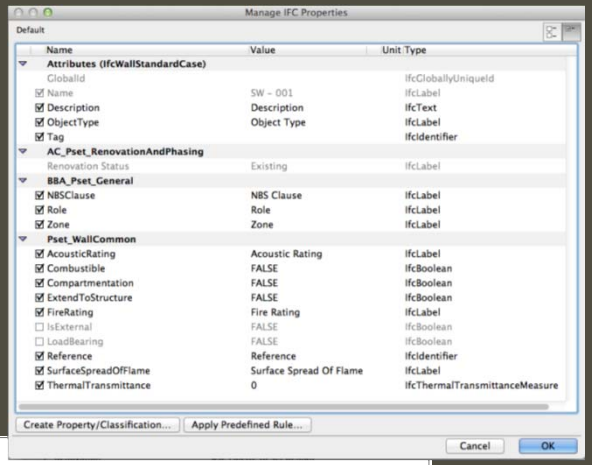
  - Total – 498 elements x 3 translators x 6 software solutions x 39 lines of data

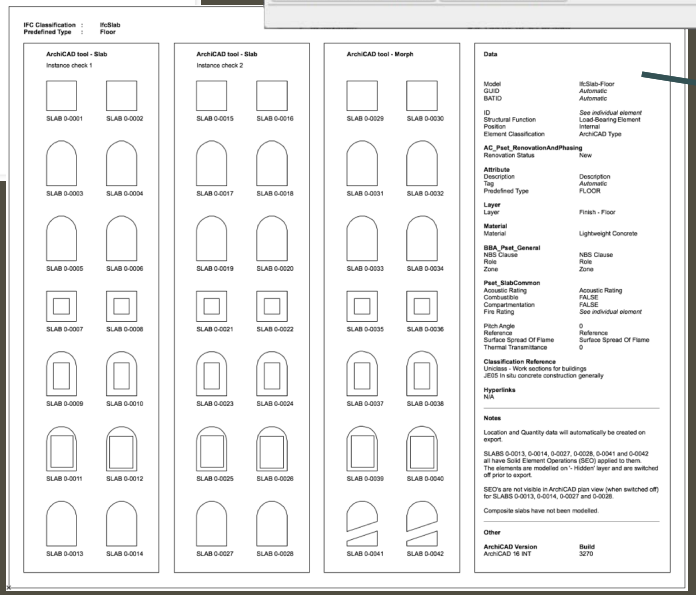


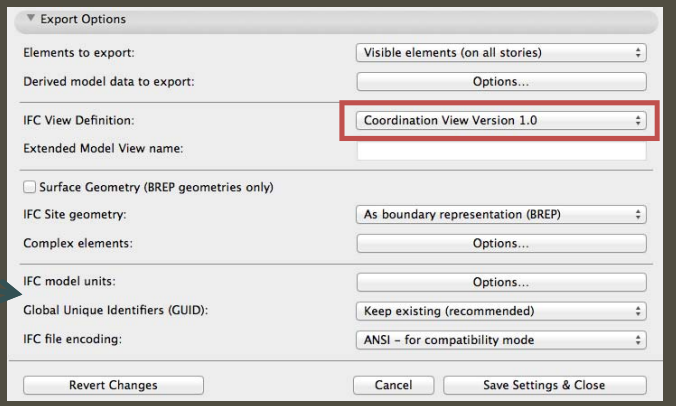
TESTING – GOOD, BAD OR UGLY?



Graphisoft ArchiCAD 16

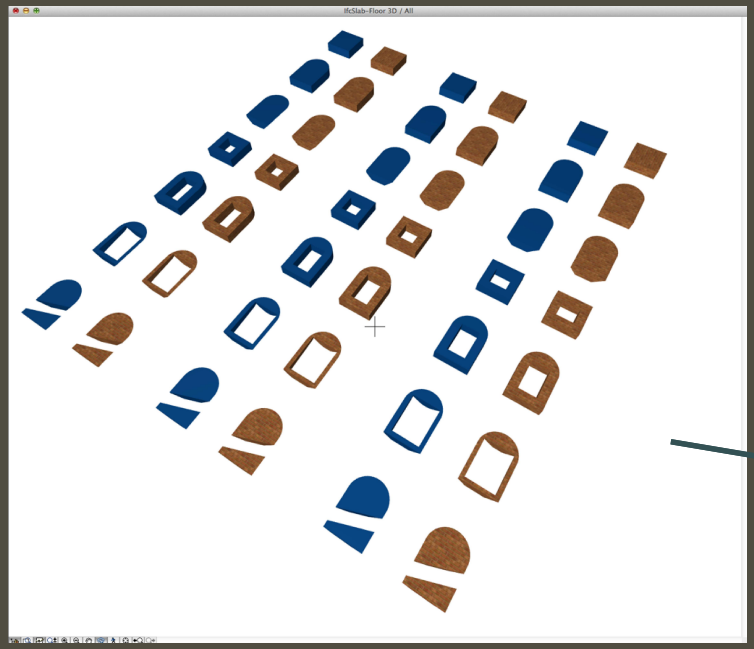






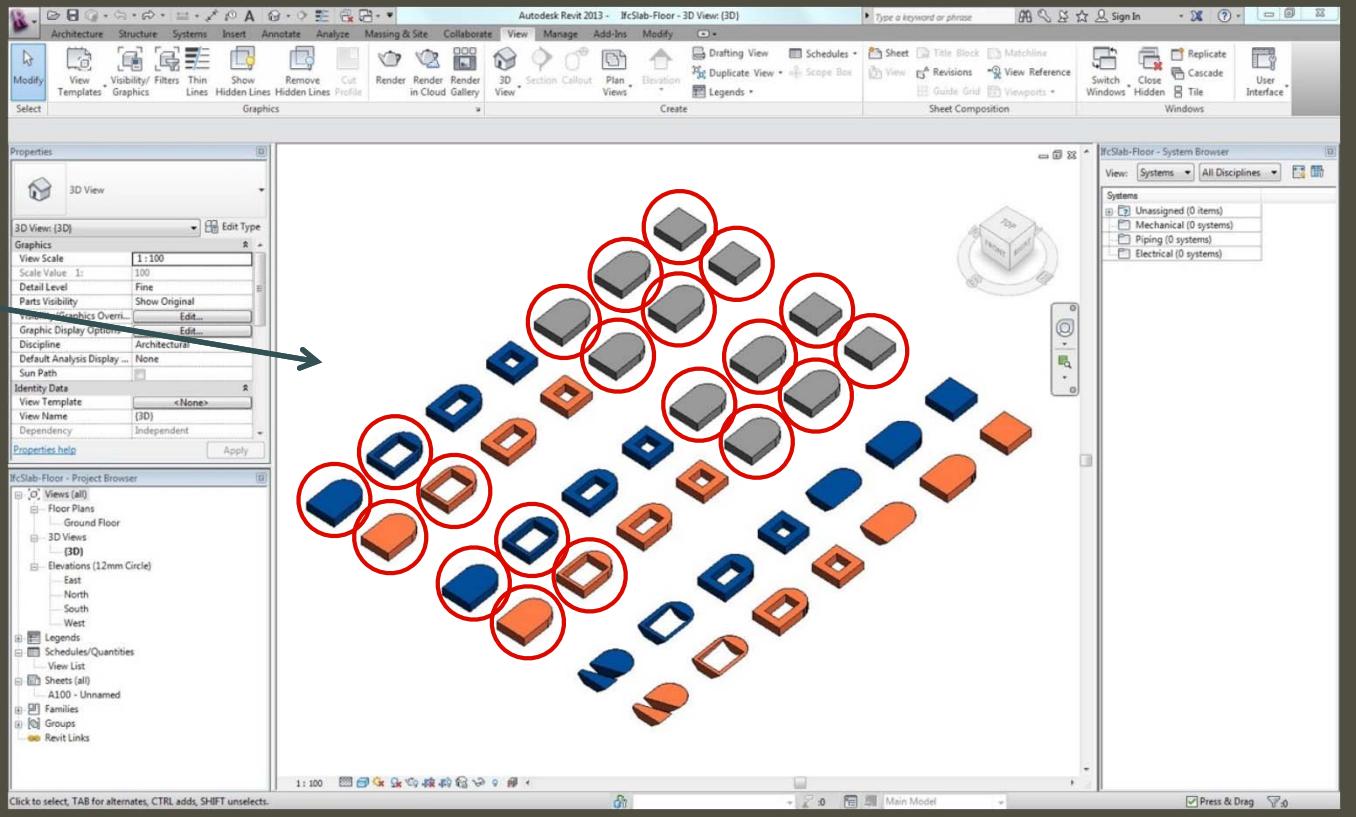
Translator

TESTING – GOOD, BAD OR UGLY?

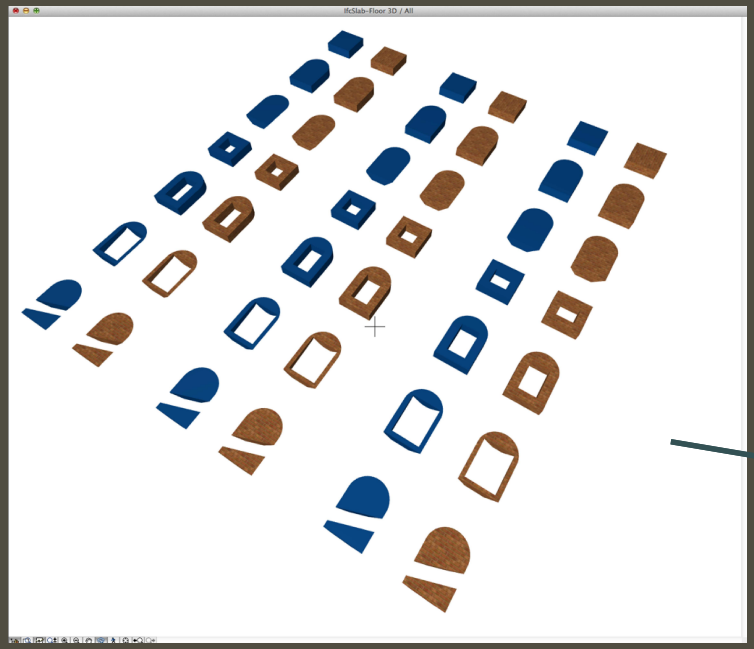


Graphisoft ArchiCAD 16

Autodesk Revit 2013

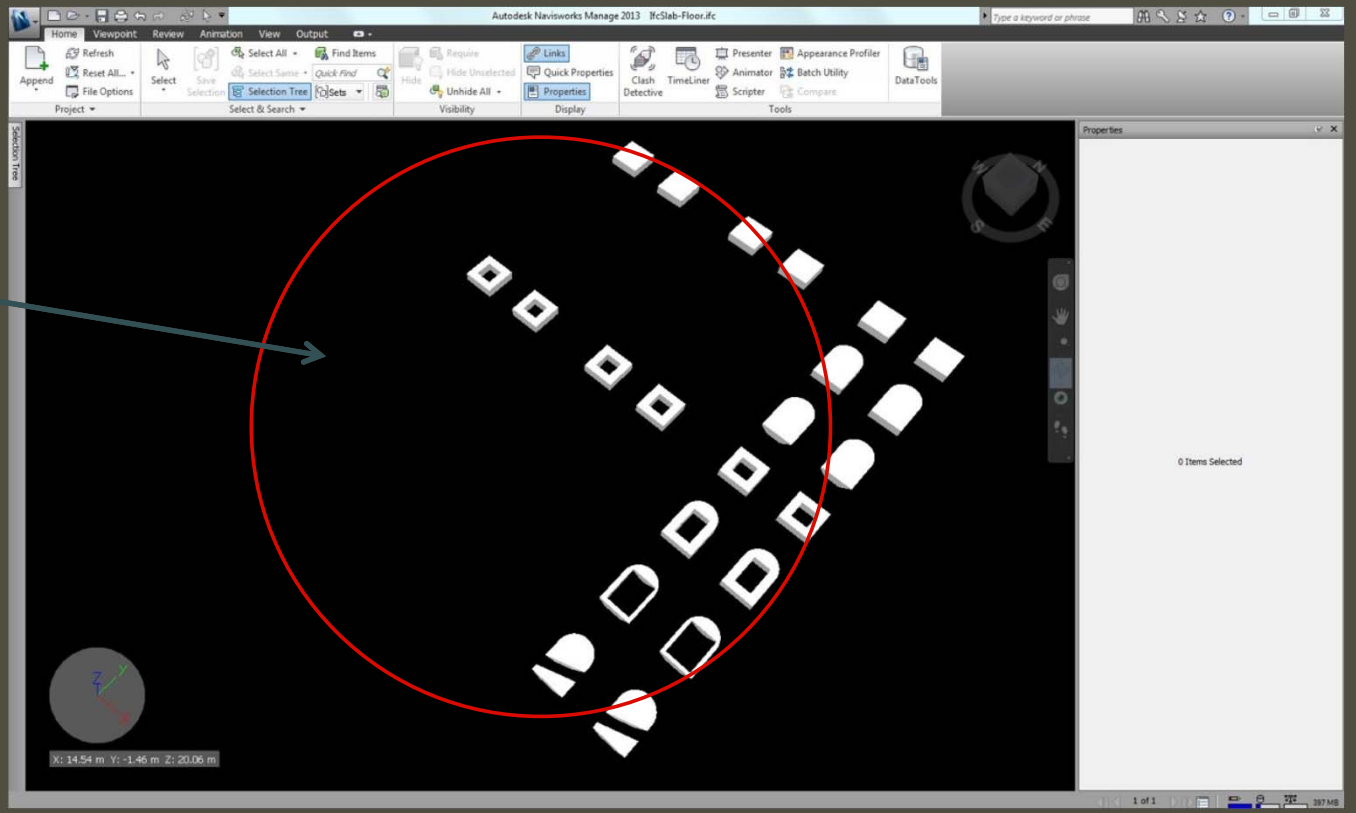


THE BAD

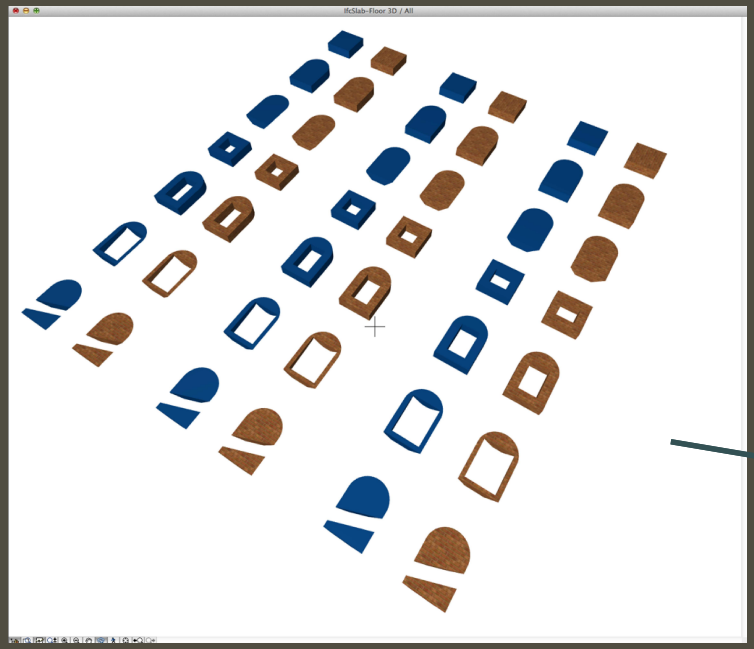


Graphisoft ArchiCAD 16

Autodesk Navisworks 2013

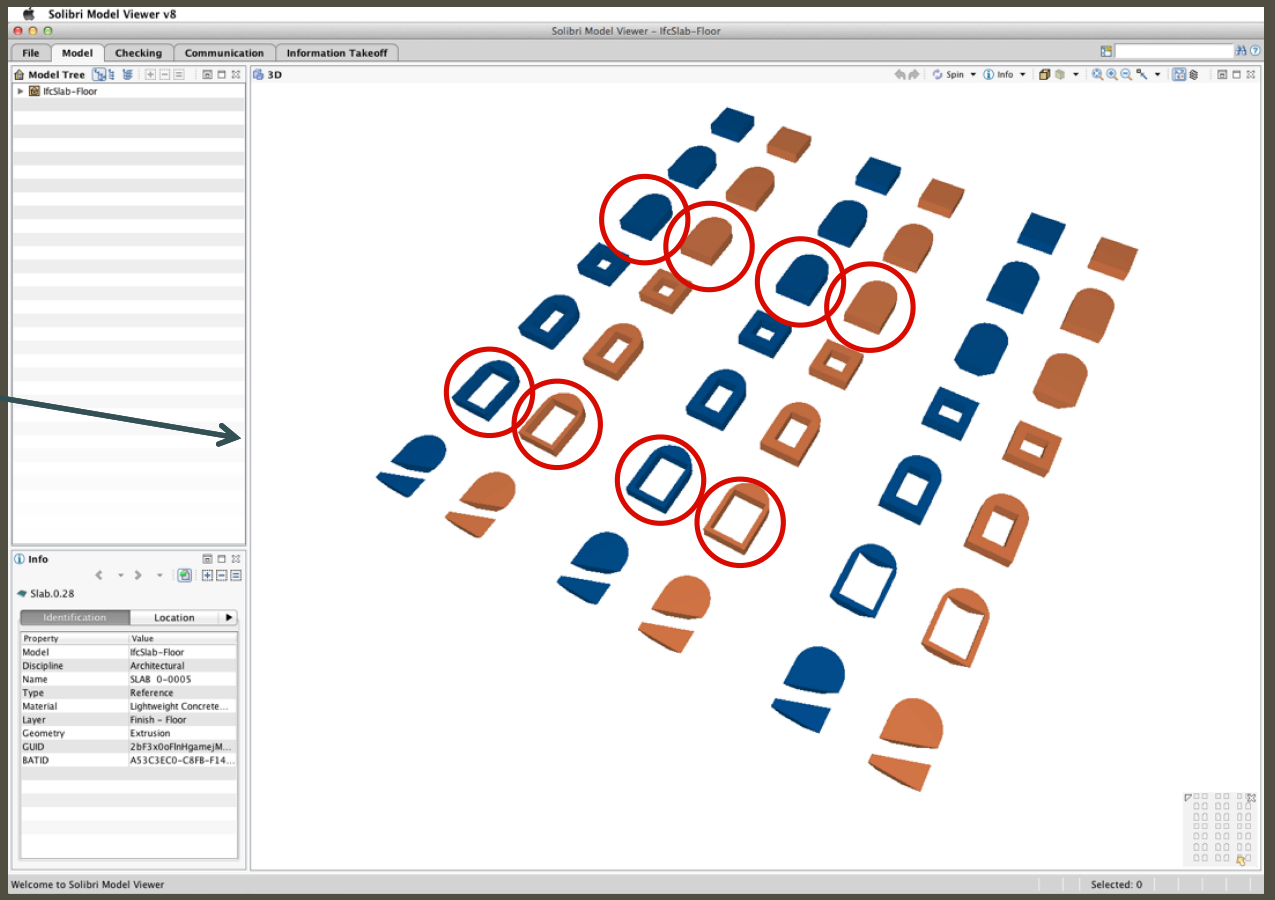


THE BAD

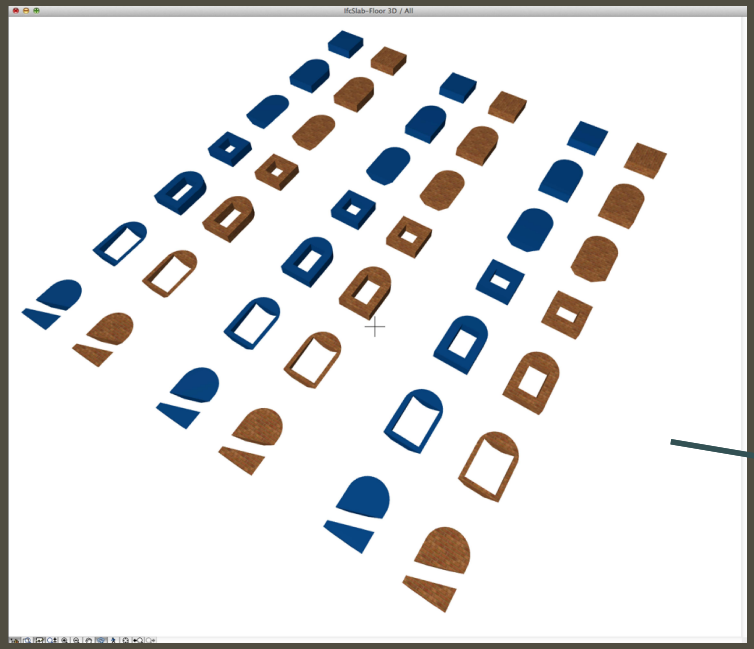


Graphisoft ArchiCAD 16

Solibri Model Viewer v8

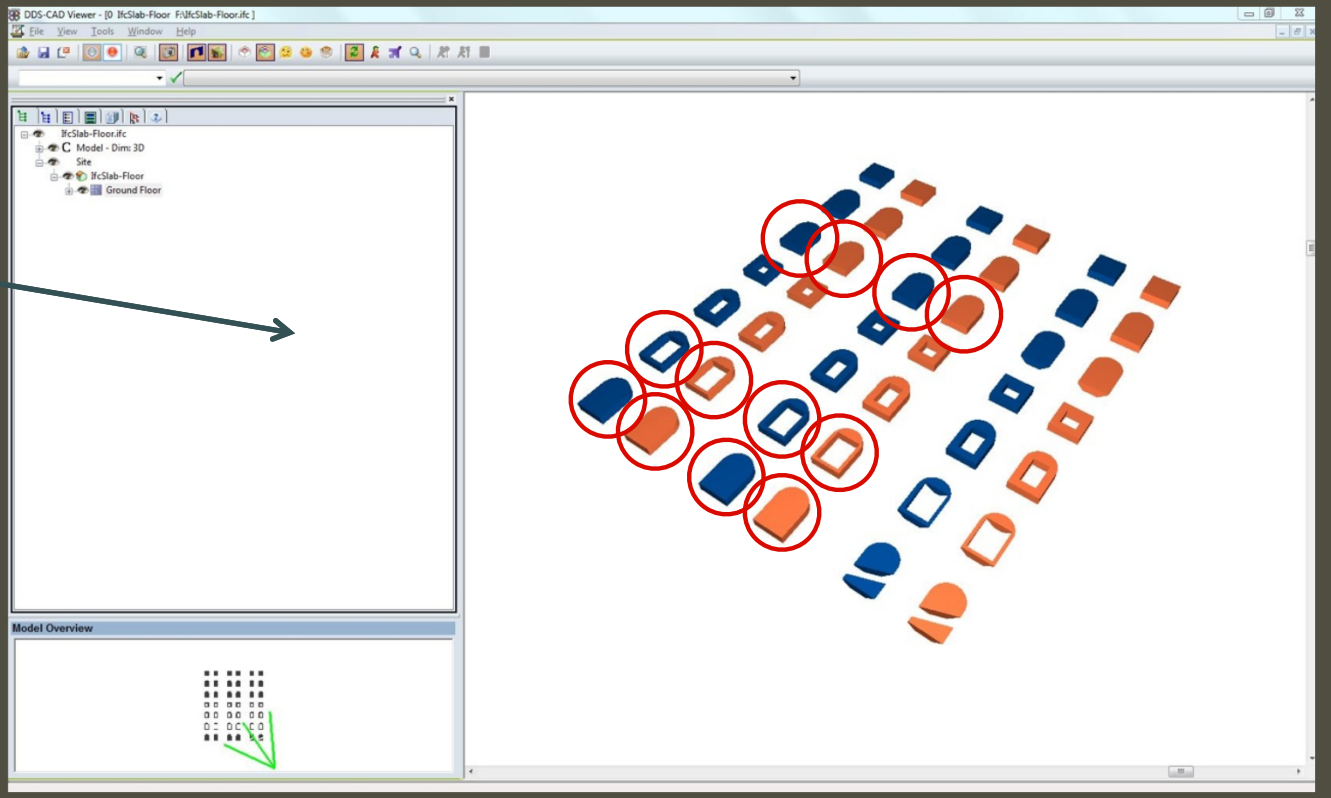


THE BAD

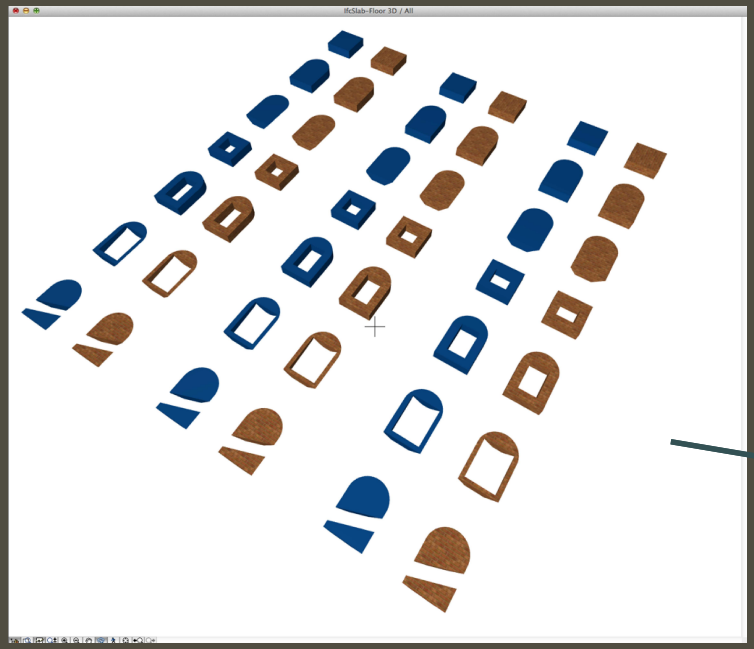


Graphisoft ArchiCAD 16

DDS-CAD Viewer

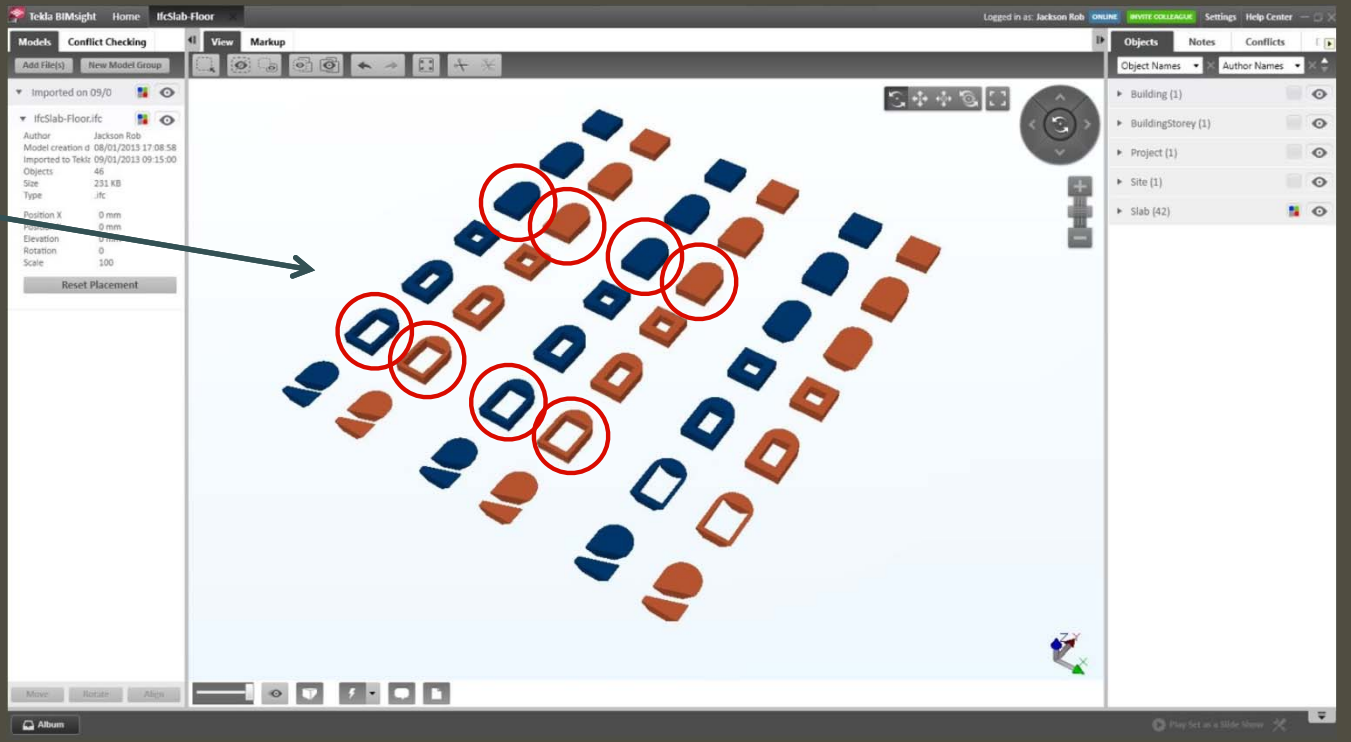


THE BAD



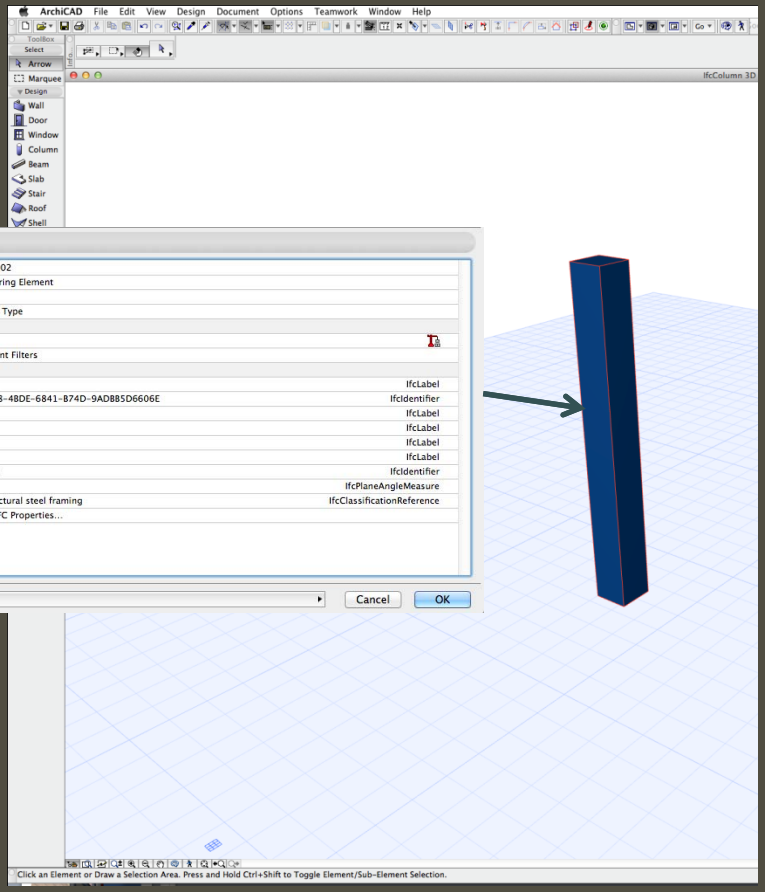
Graphisoft ArchiCAD 16

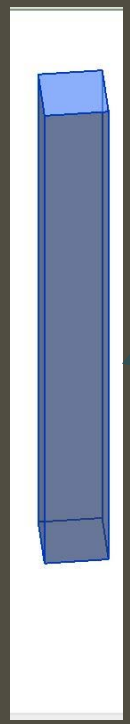
Tekla BIMsight v1.7.1

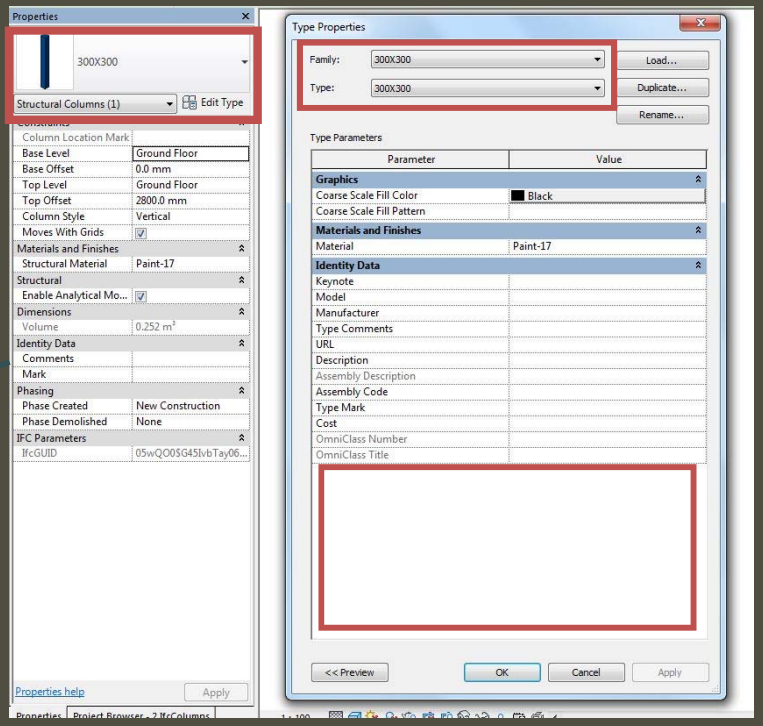


THE UGLY

Columns (and beams)



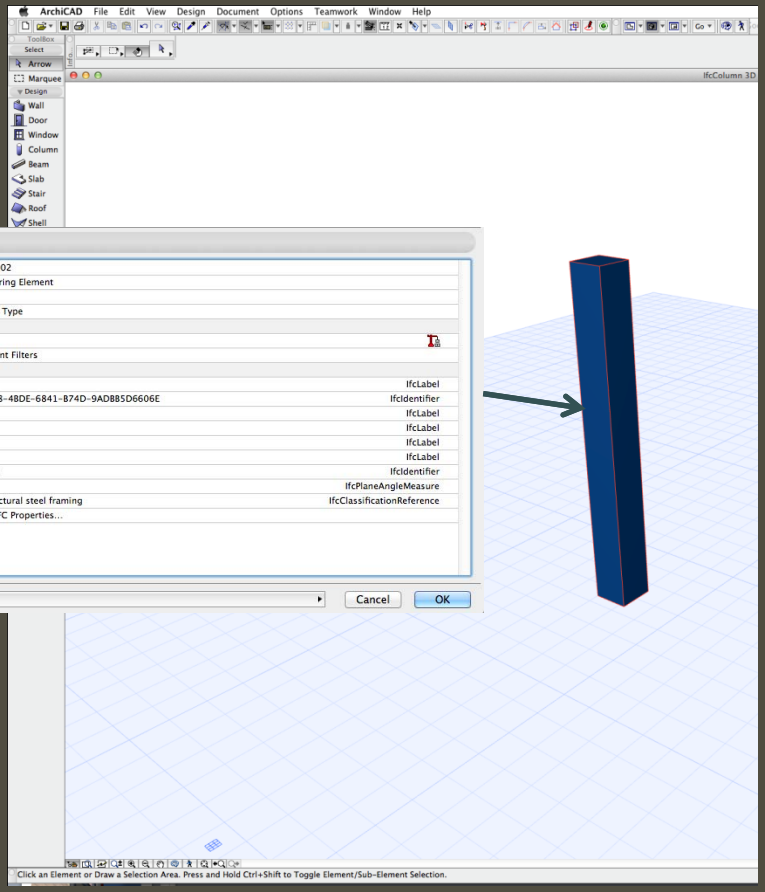


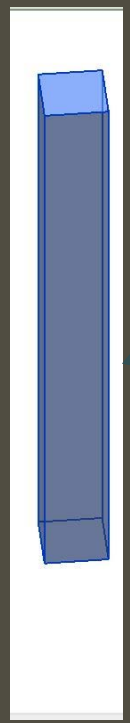


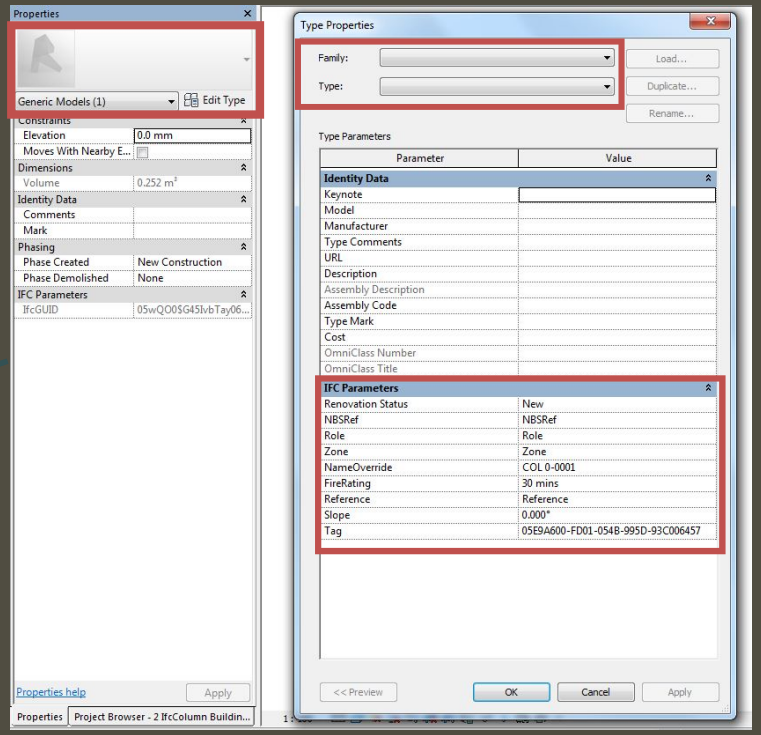
Autodesk REVIT 2014

THE GOOD

Columns (and beams)

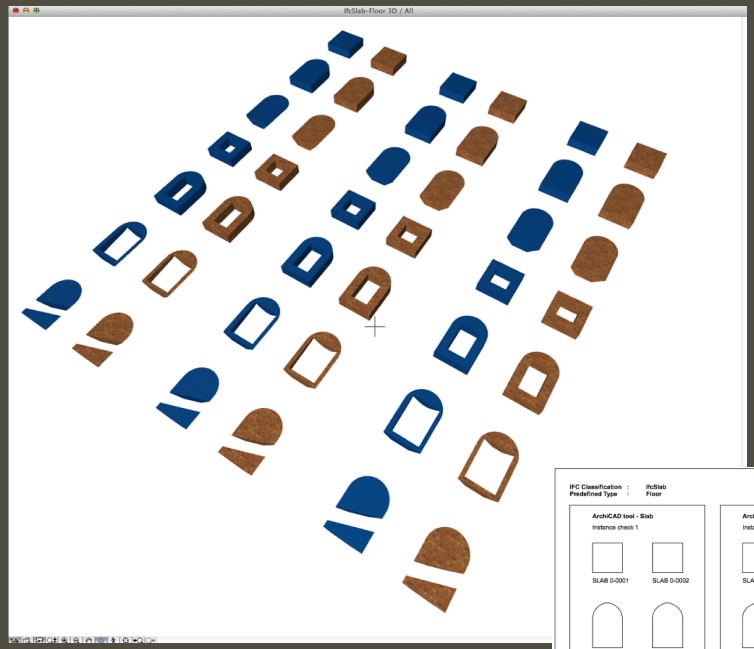




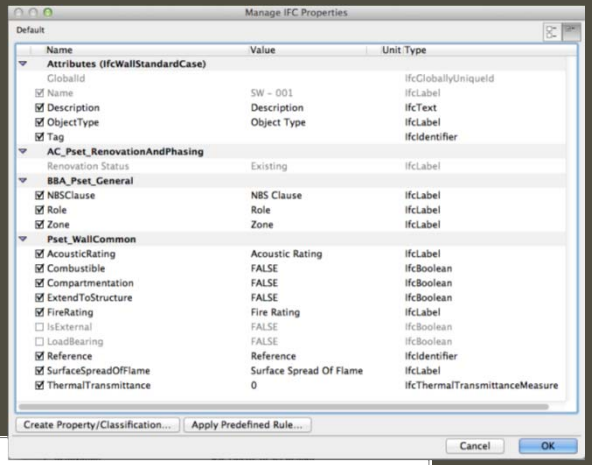


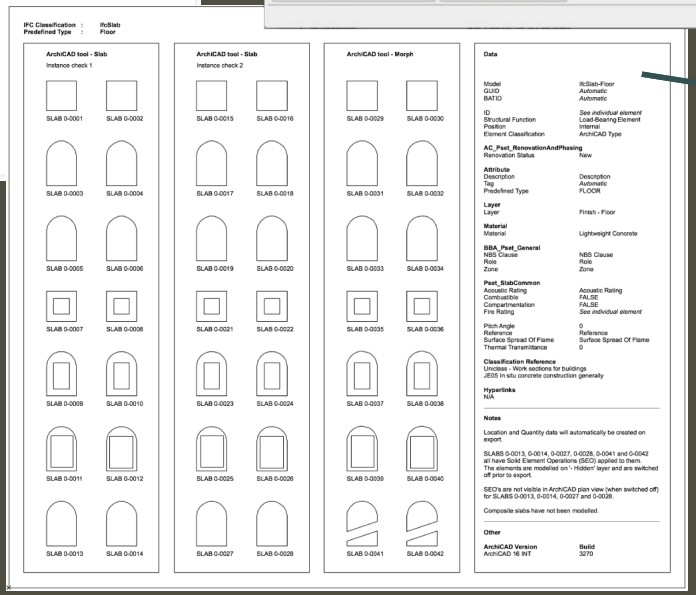
Autodesk REVIT 2014

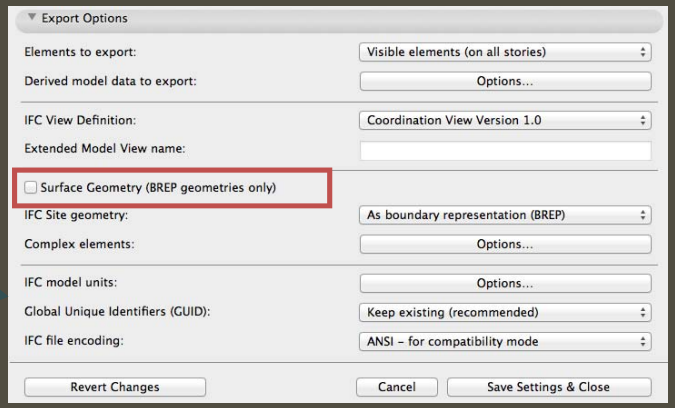
TESTING – GOOD, BAD OR UGLY?



Graphisoft ArchiCAD 16

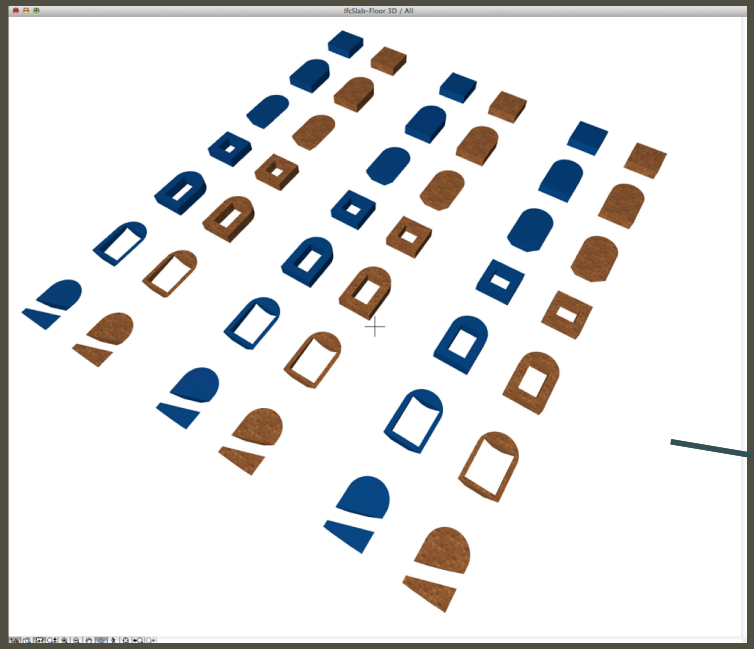






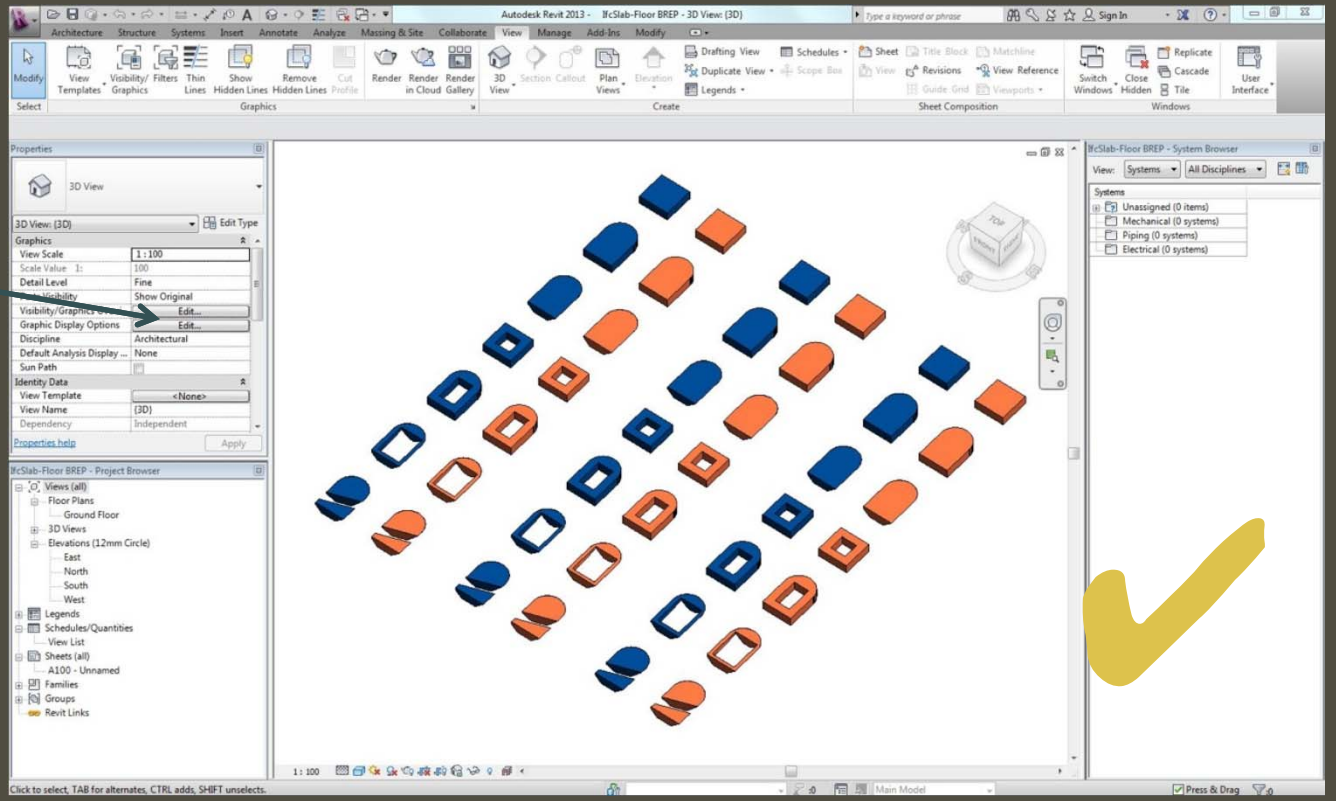
Translator

THE GOOD

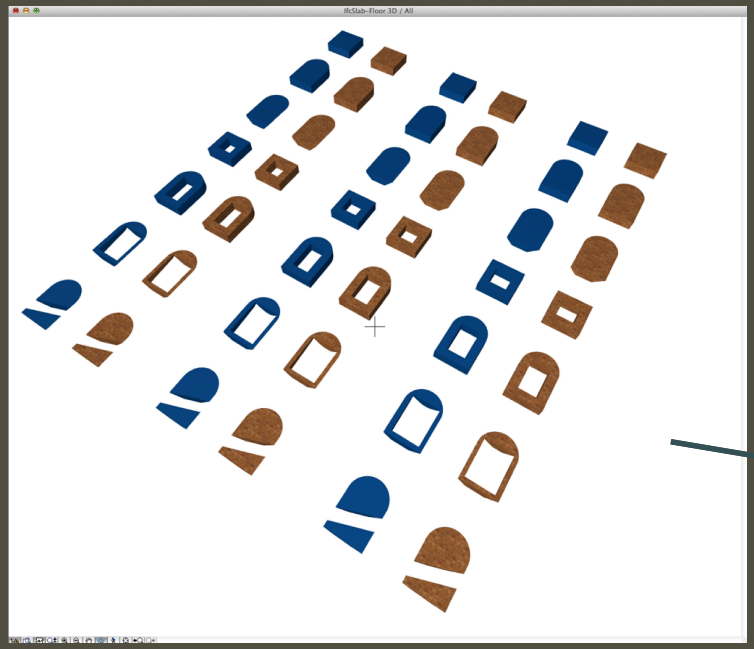


Graphisoft ArchiCAD 16

Autodesk Revit 2013

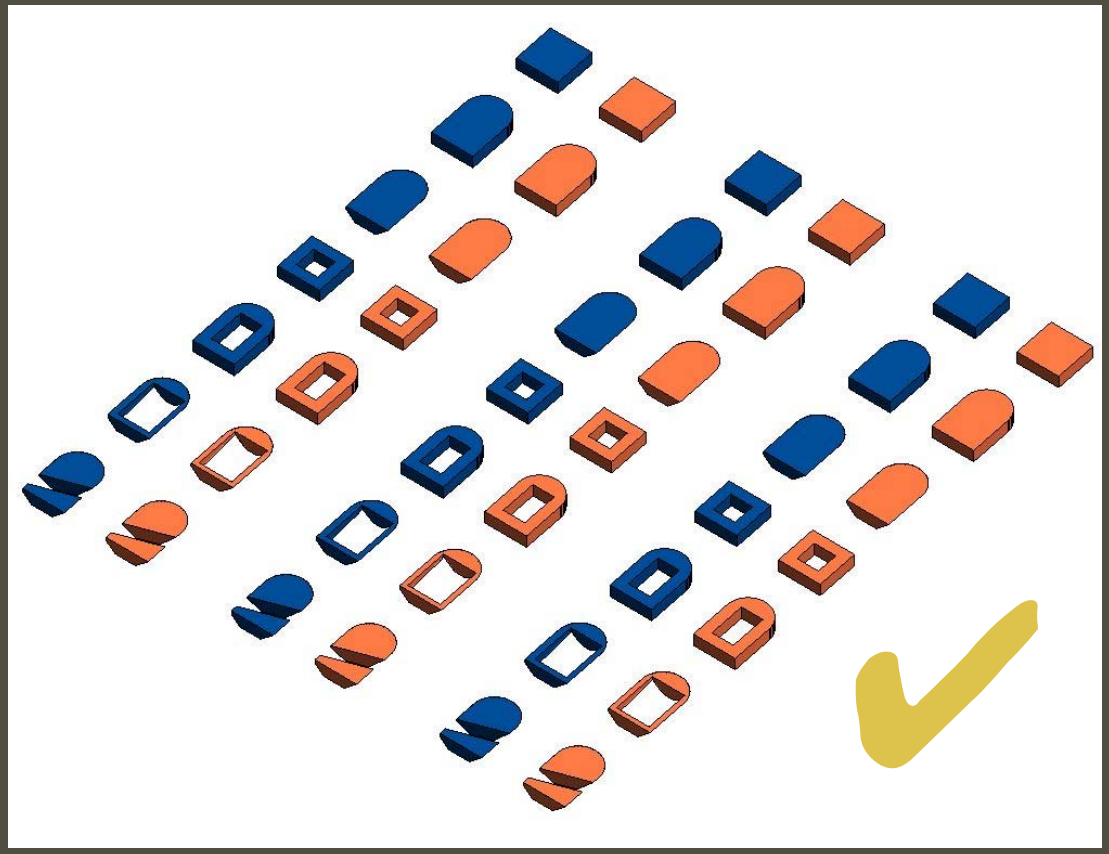


THE GOOD

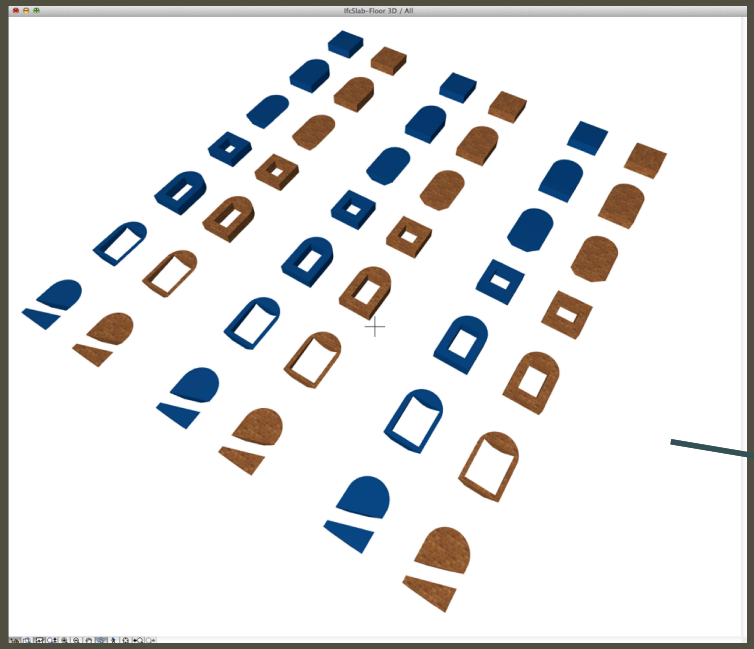


Graphisoft ArchiCAD 16

Autodesk Revit 2014

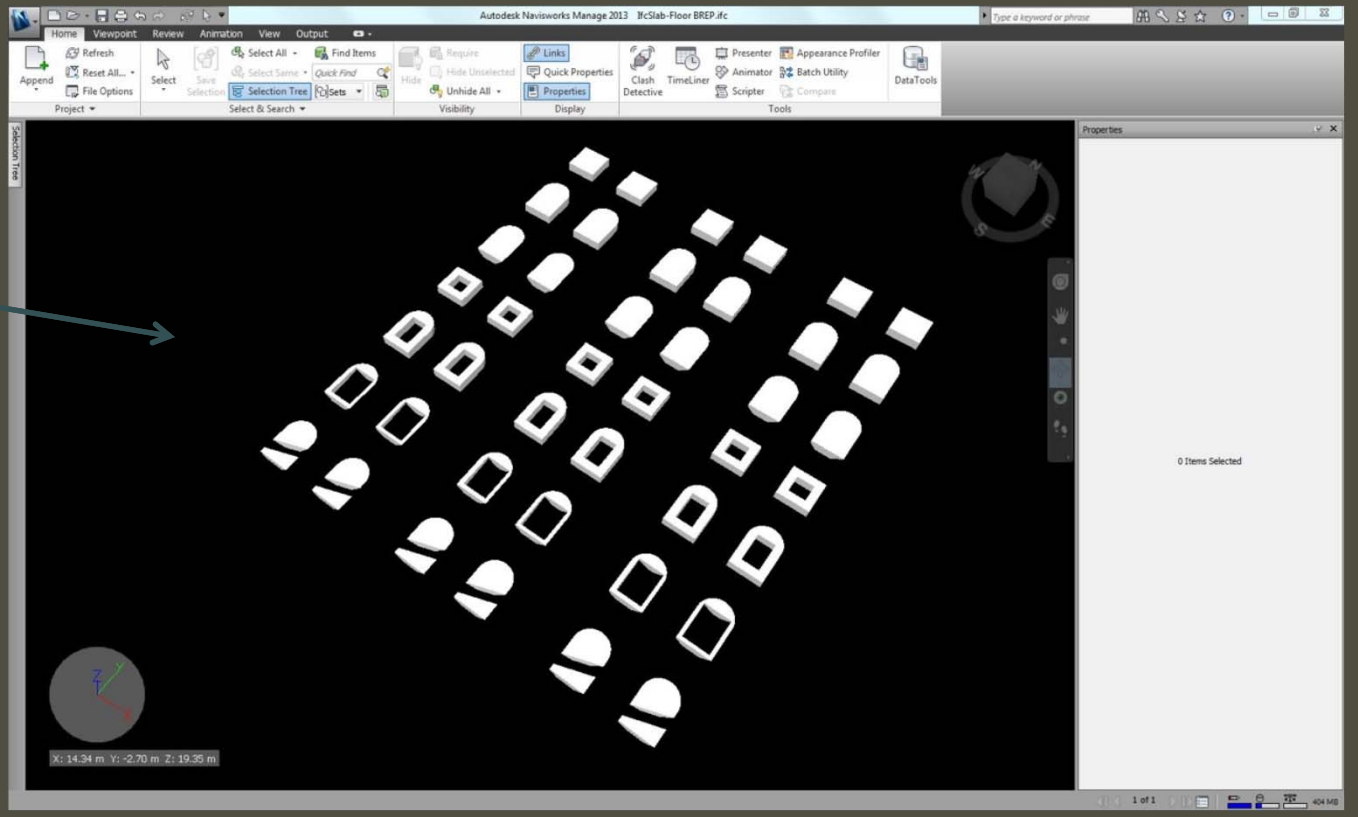


THE GOOD (ALMOST)

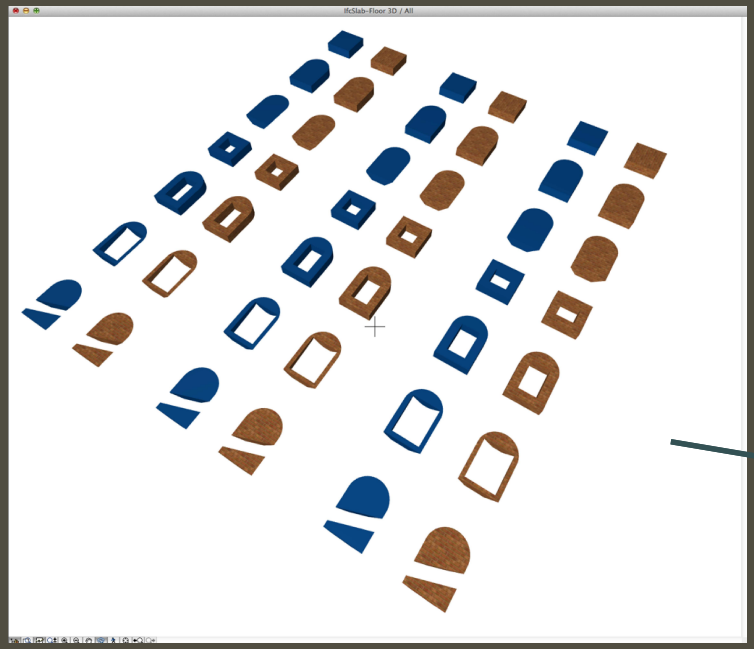


Graphisoft ArchiCAD 16

Autodesk Navisworks 2013

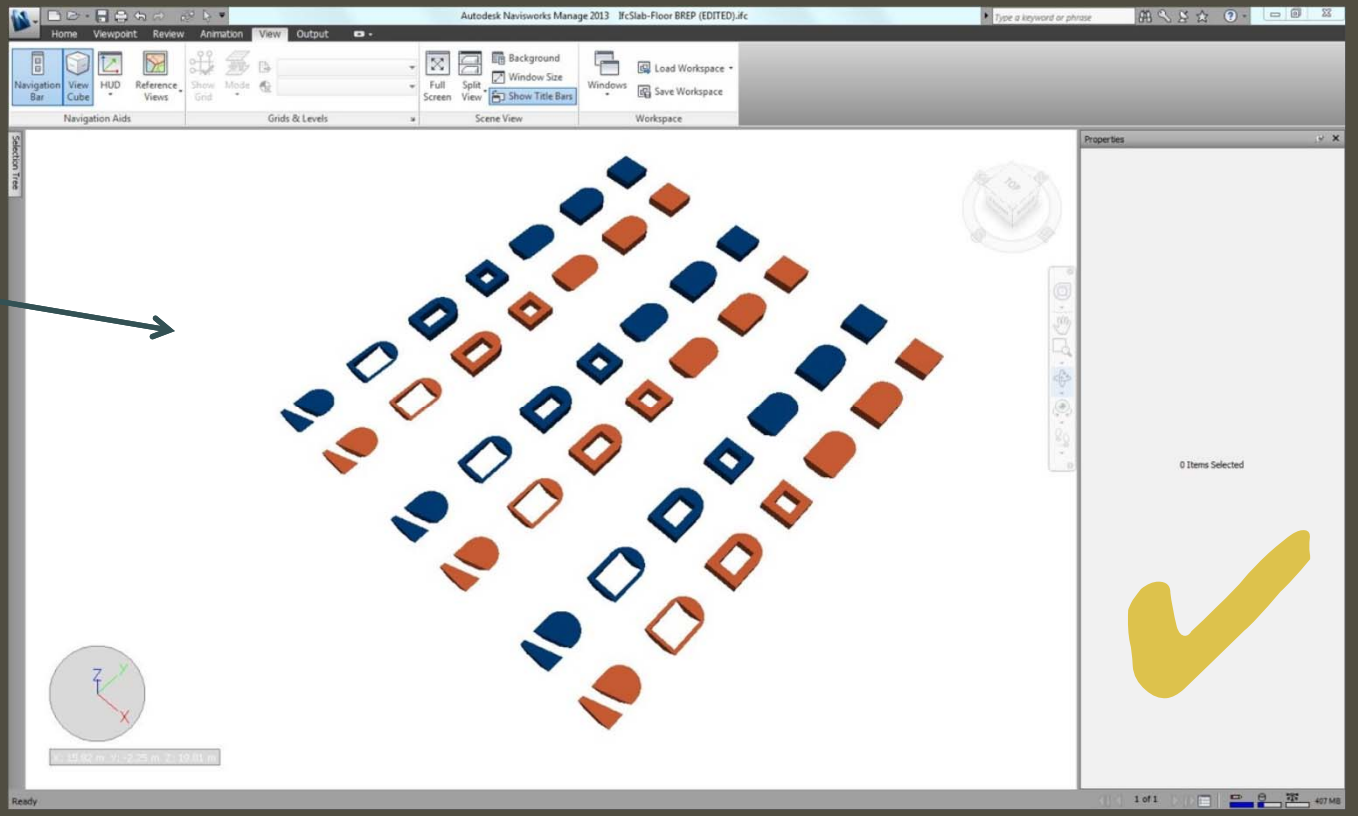


THE GOOD

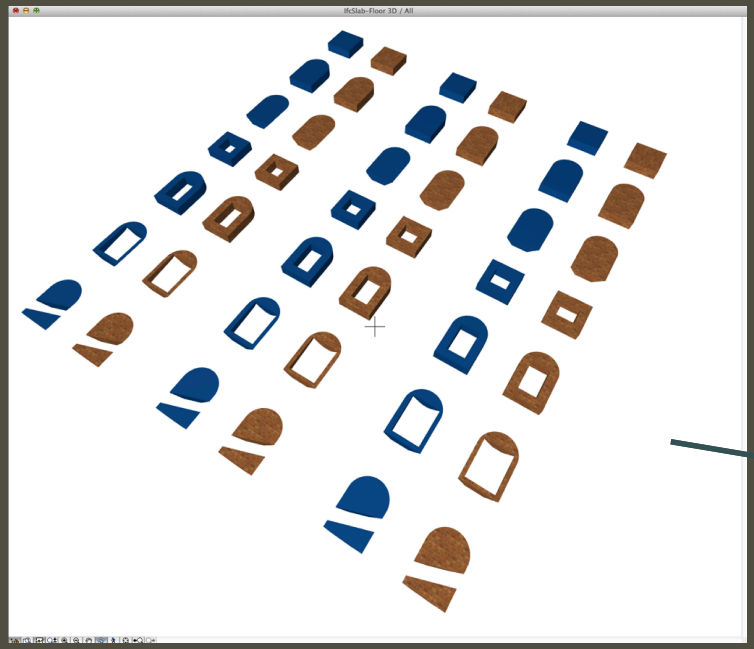


Graphisoft ArchiCAD 16

Autodesk Navisworks 2013 (via Datacubist simplebim)

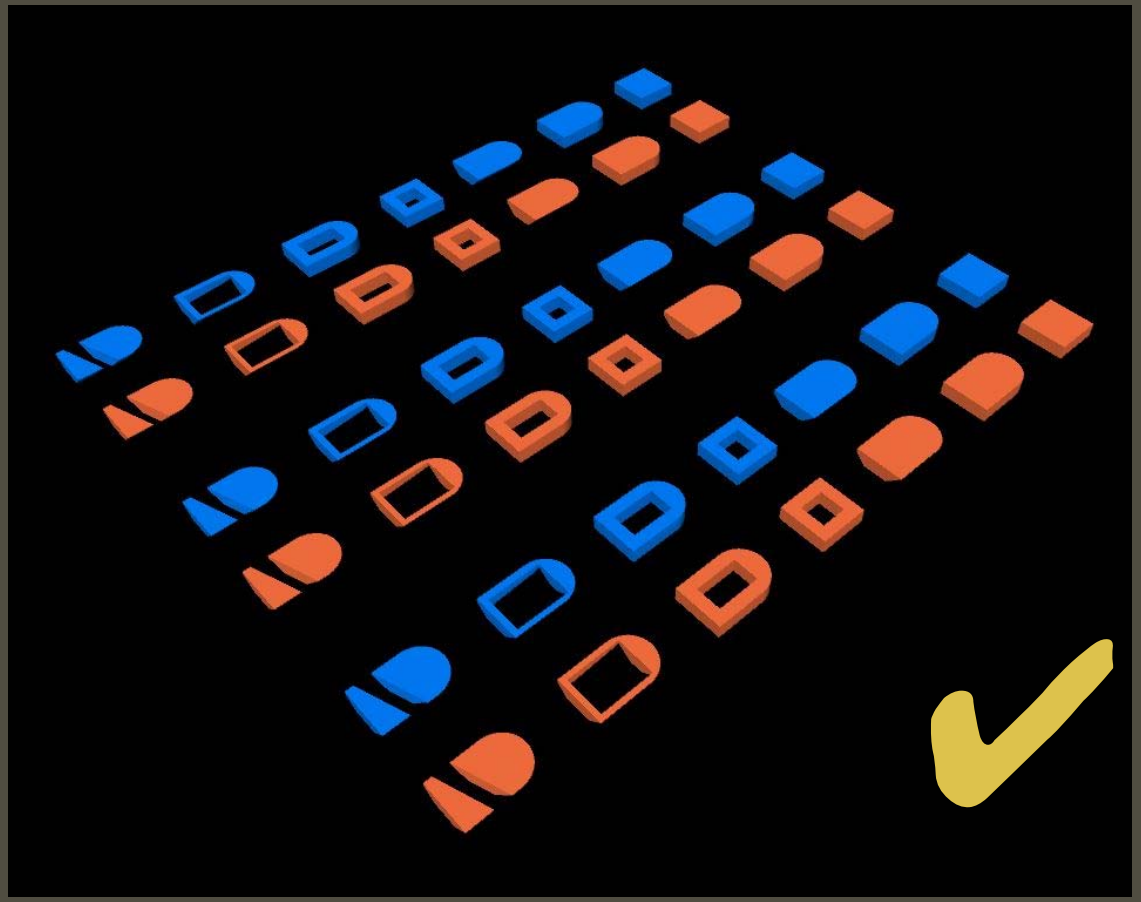


THE GOOD

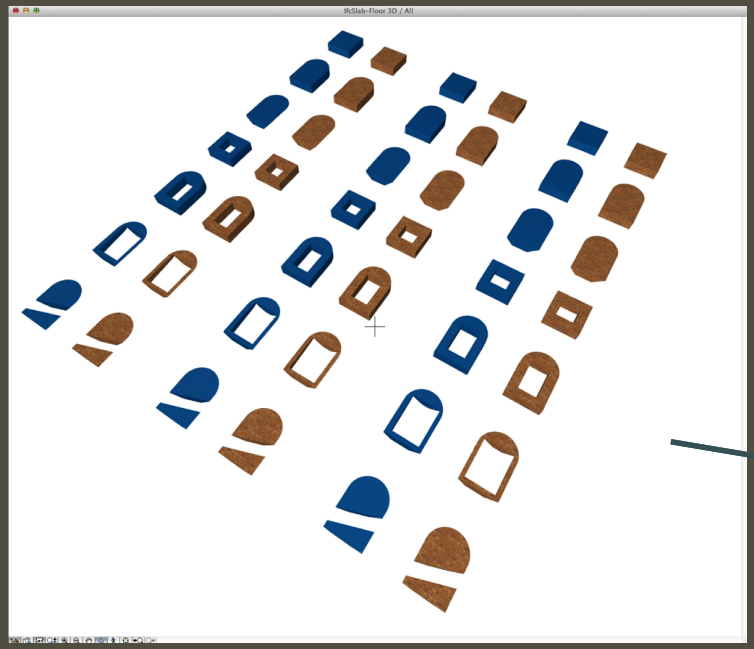


Graphisoft ArchiCAD 16

Autodesk Navisworks 2014

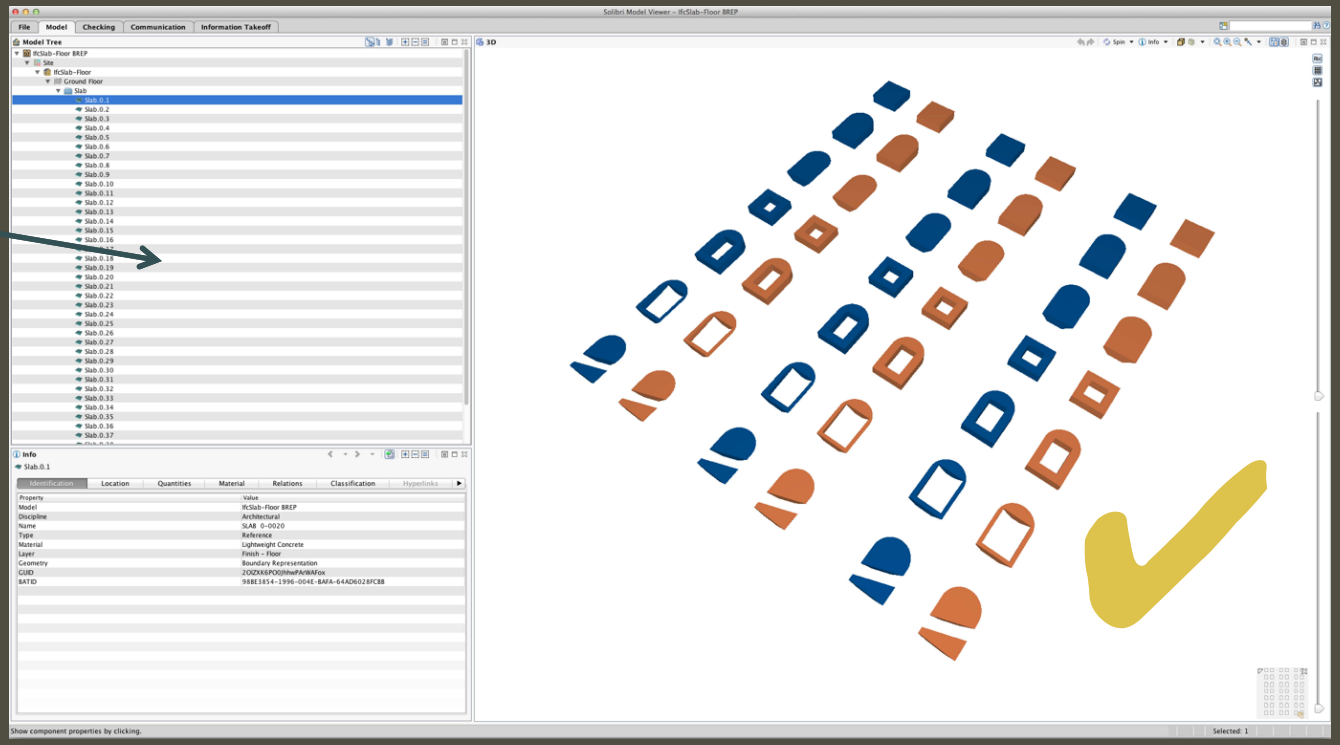


THE GOOD

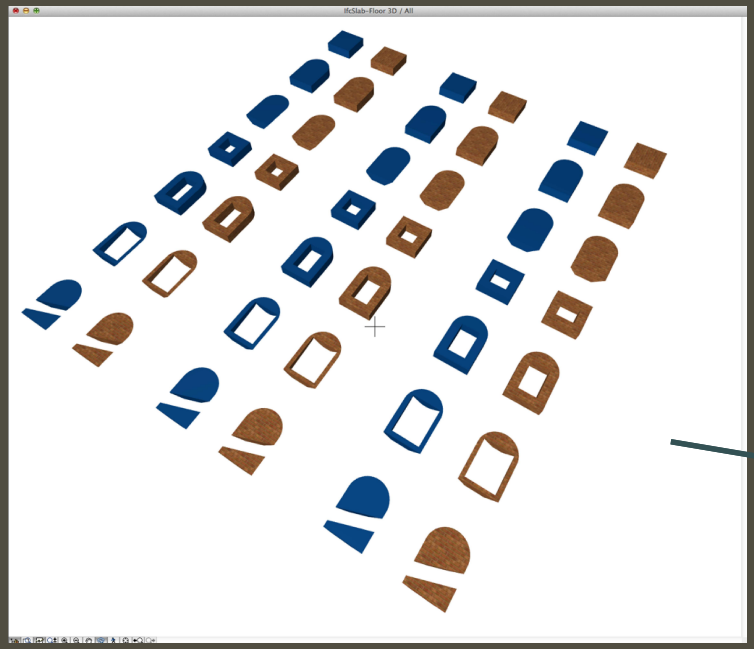


Graphisoft ArchiCAD 16

Solibri Model Viewer v8

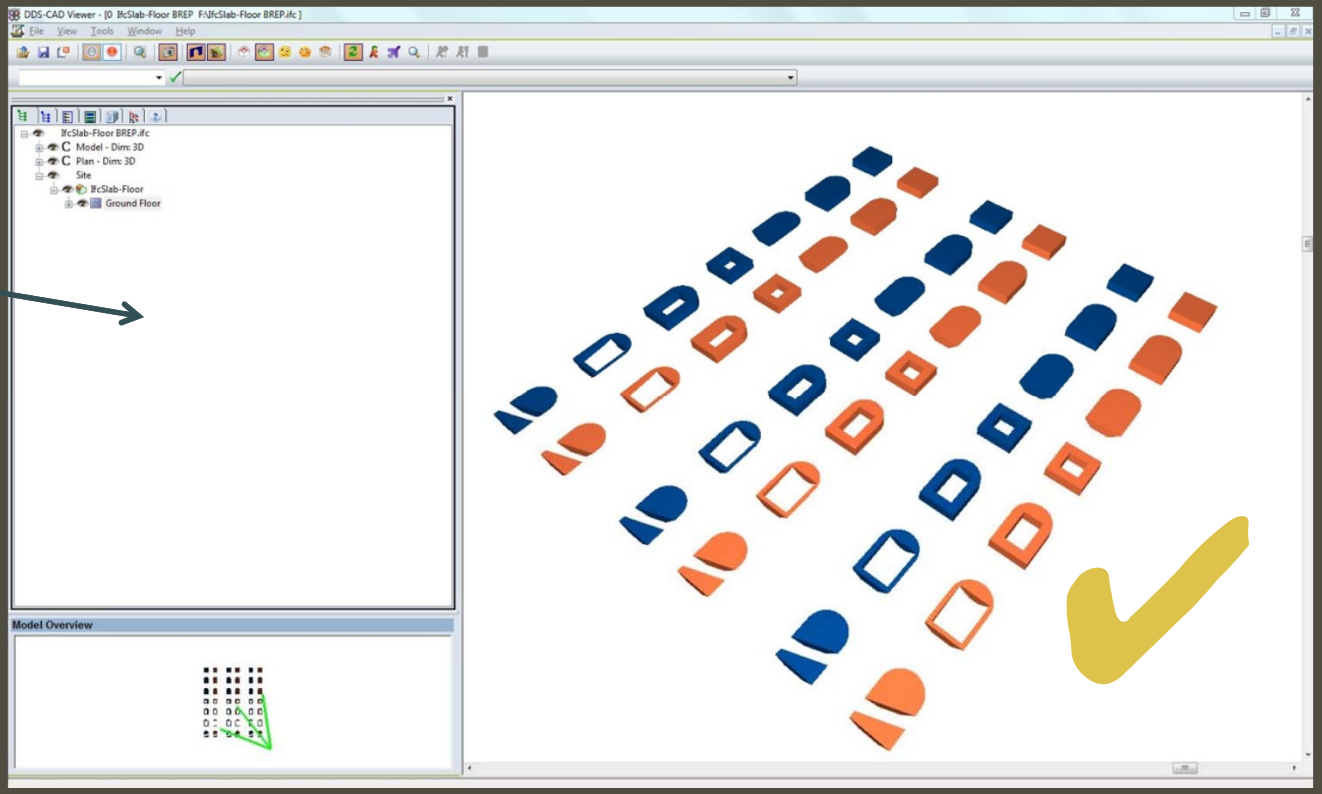


THE GOOD

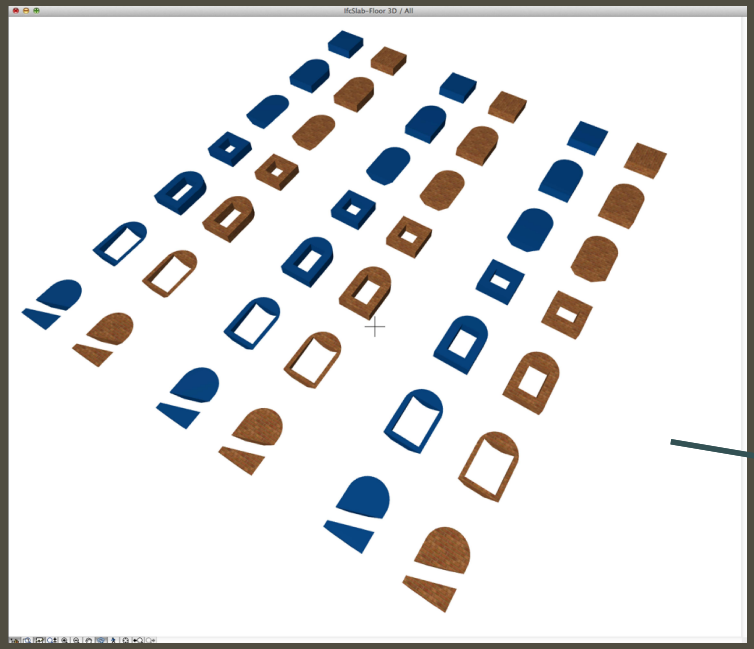


Graphisoft ArchiCAD 16

DDS-CAD Viewer

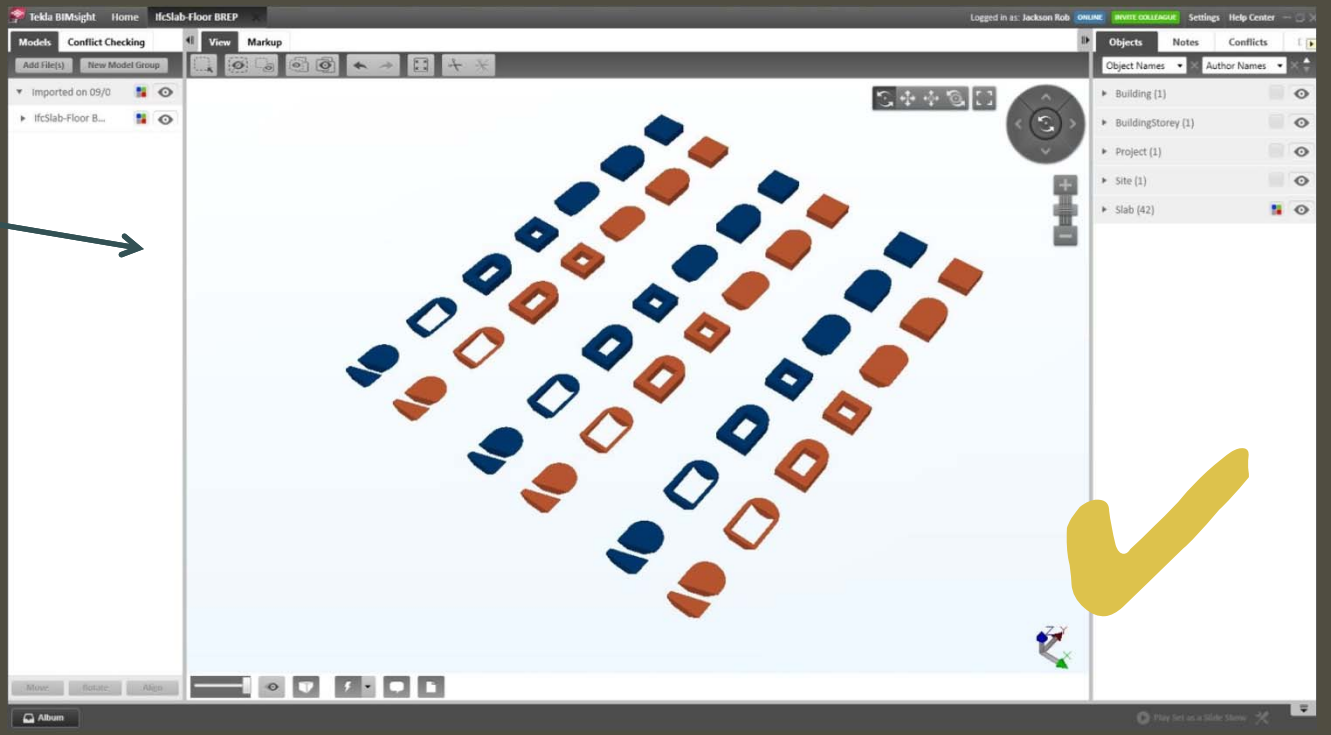


THE GOOD



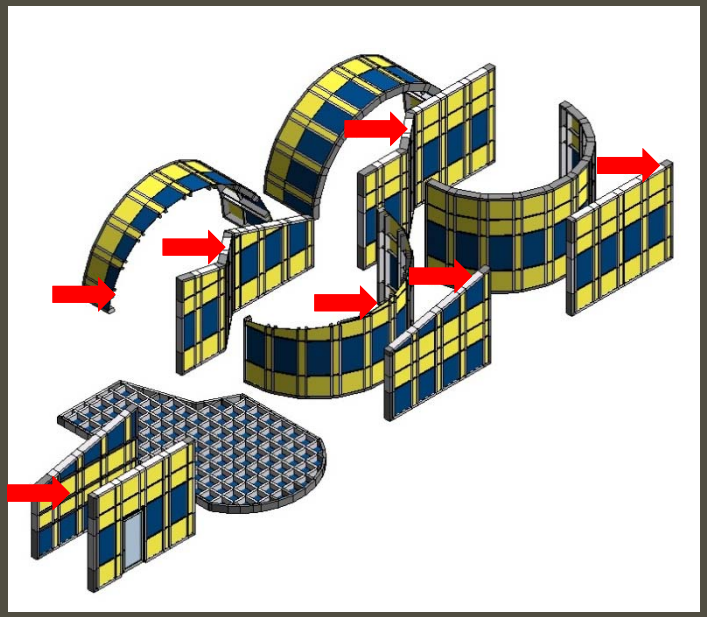
Graphisoft ArchiCAD 16

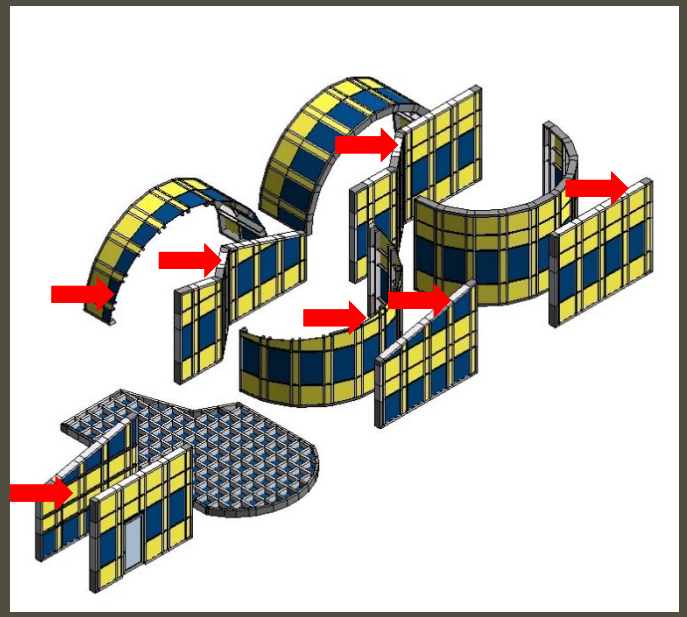
Tekla BIMsight v1.7.1

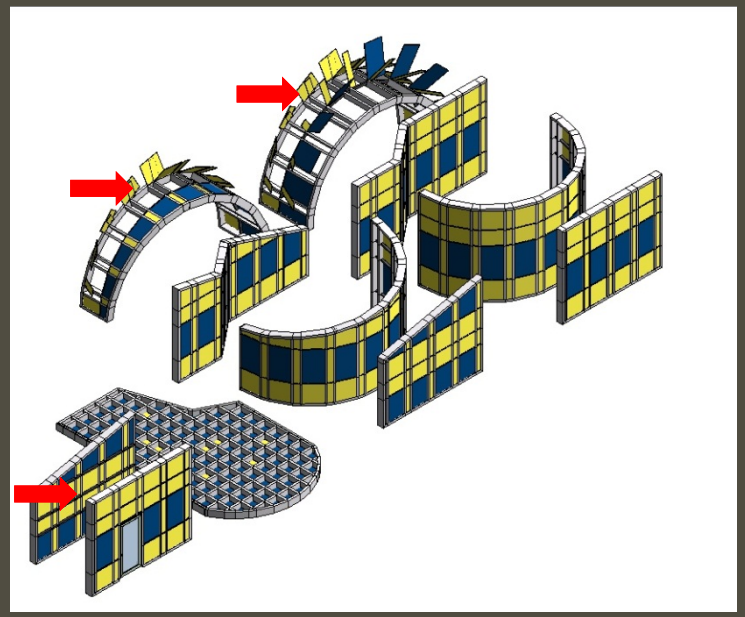


THE UGLY AND THE BAD

Curtain Wall – 3 different translators



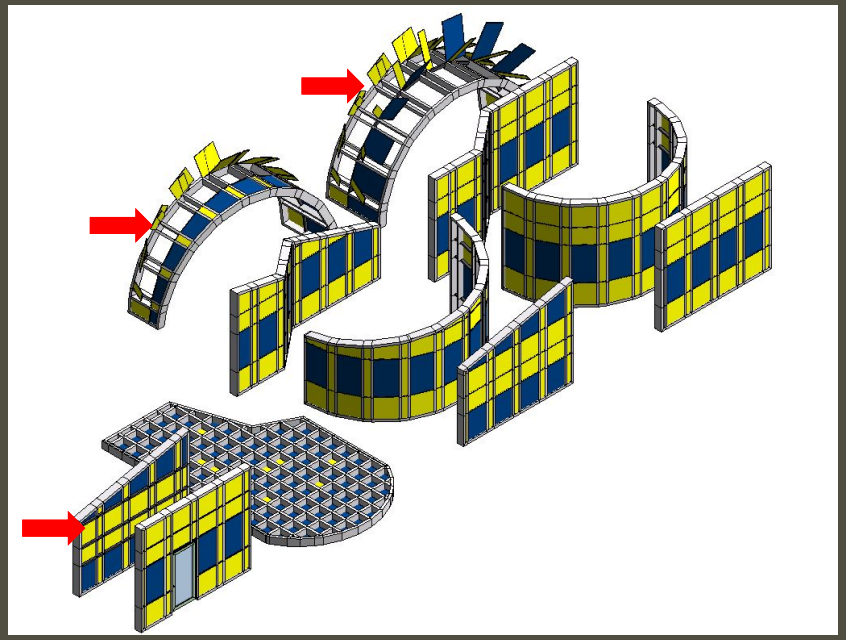




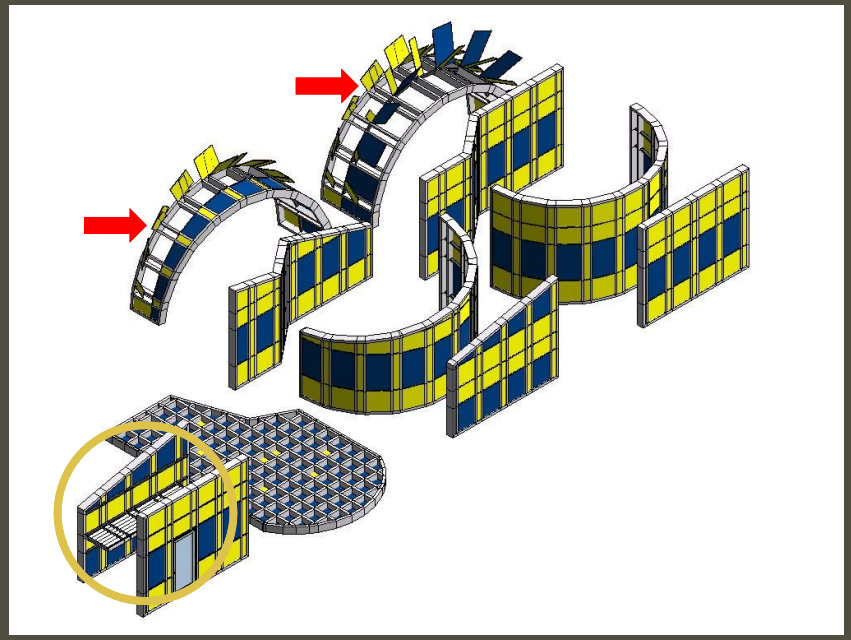
Autodesk Revit 2013

THE BAD BECOMING GOOD

Curtain Wall



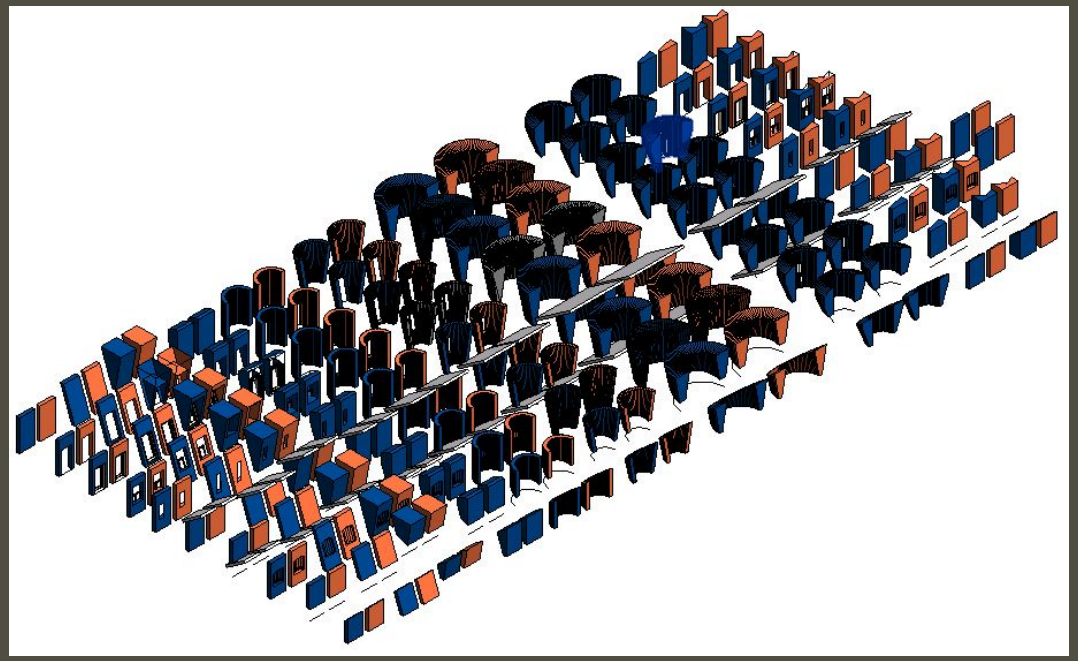
Autodesk Revit 2013



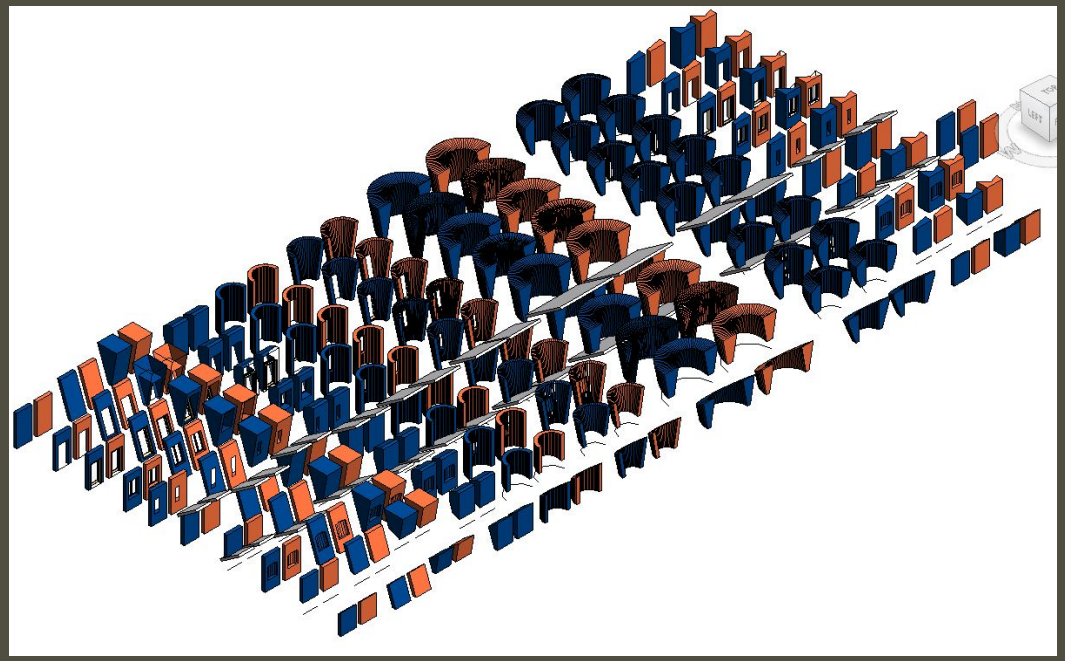
Autodesk Revit 2014

THE BAD

Walls



Autodesk Revit 2013

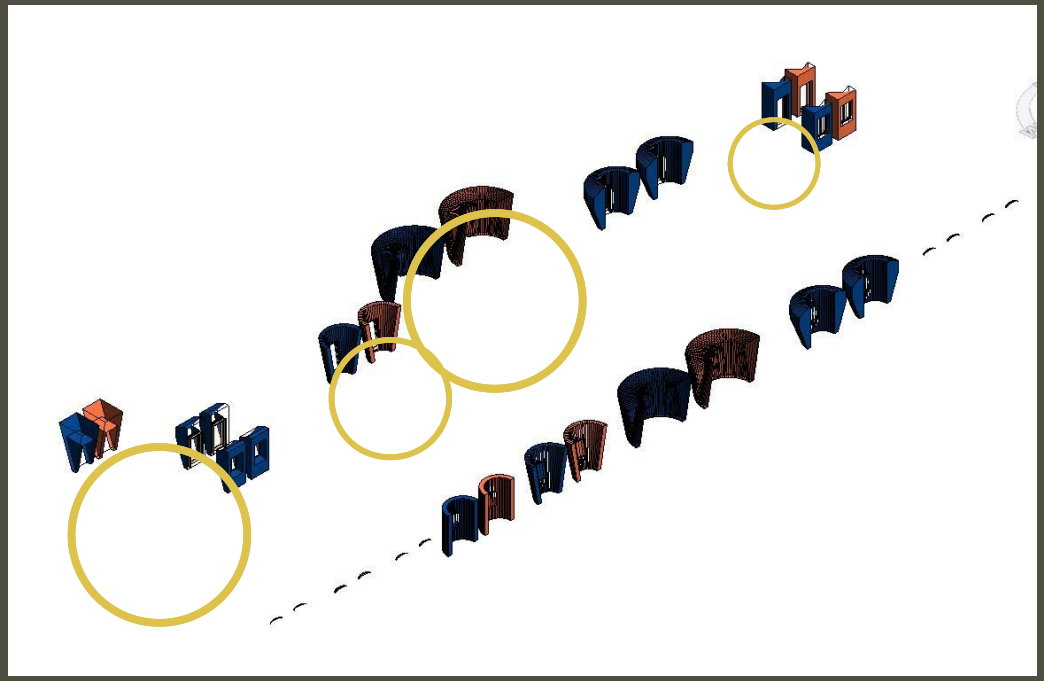


Autodesk Revit 2014

THE BAD BECOMING GOOD

Walls

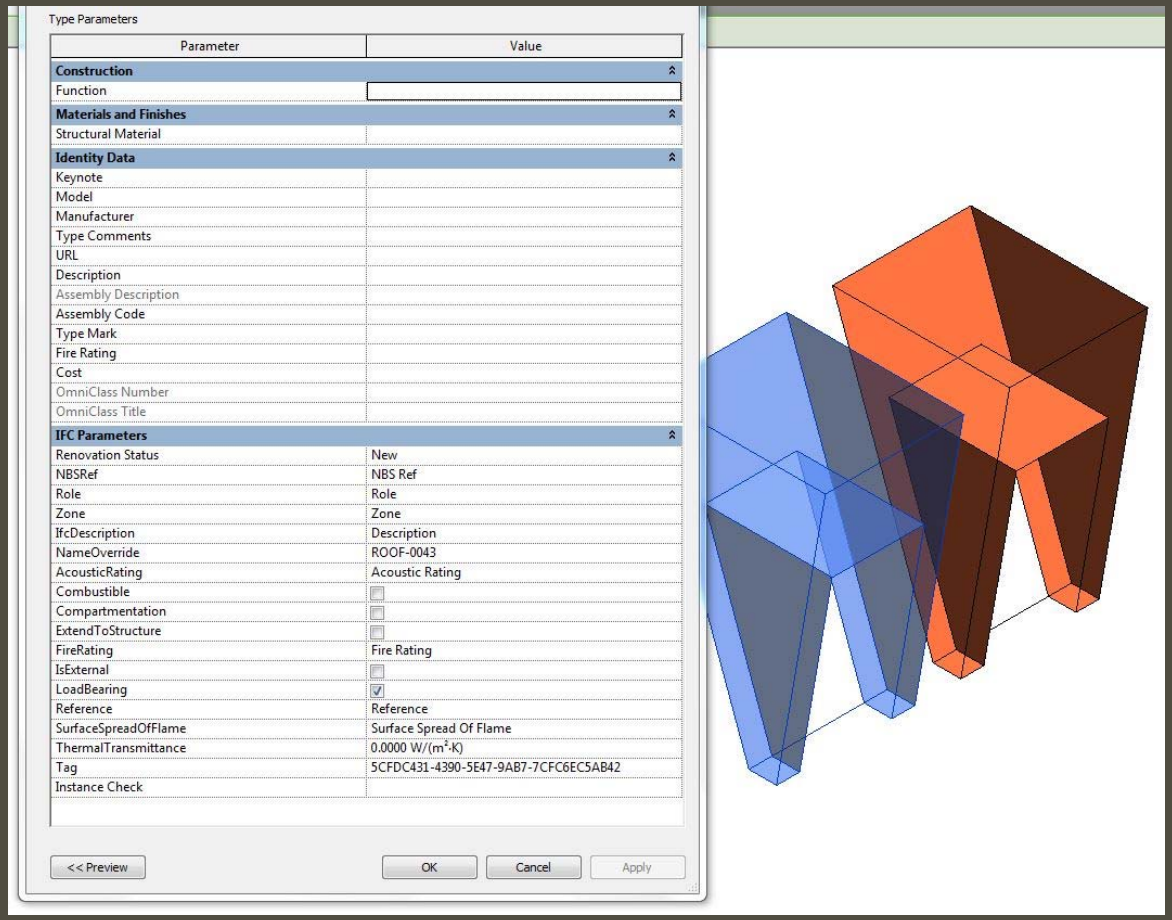
Autodesk Revit 2013



Autodesk Revit 2014

THE BAD / THE GOOD

Walls



Geometry not 100% although geometry exists

Data is OK

Autodesk Revit

THE BAD BECOMING GOOD

Data

IFC Parameters	
Renovation Status	New
NBSRef	NBS Ref
Role	Role
Zone	Zone
AcousticRating	Acoustic Rating
Combustible	☐
Compartmentation	☐
ExtendToStructure	☐
FireRating	Fire Rating
IsExternal	☐
LoadBearing	☑
Reference	Reference
SurfaceSpreadOfFlame	Surface Spread Of Flame
ThermalTransmittance	0.0000 W/(m²·K)
Instance Check	

Autodesk Revit 2013

IFC Parameters	
Renovation Status	New
NBSRef	NBS Ref
Role	Role
Zone	Zone
IfcDescription	Description
NameOverride	ROOF-0097
AcousticRating	Acoustic Rating
Combustible	☐
Compartmentation	☐
ExtendToStructure	☐
FireRating	Fire Rating
IsExternal	☐
LoadBearing	☑
Reference	Reference
SurfaceSpreadOfFlame	Surface Spread Of Flame
ThermalTransmittance	0.0000 W/(m²·K)
Tag	2F014521-A36C-494E-8846-29F69D9B1CFD
Instance Check	

Autodesk Revit 2014

SUCCESSFUL IFC EXCHANGE - ARCHICAD

	Revit 2014	Navisworks 2014	Solibri	DDS-CAD	Tekla BIMsight
• Geometry	✔	✔	✔	✔	✔
• Colour	✔	✔	✔	✔	✔
• Instance check	partial	✔	✔	✔	✔
• Material	✗	✔	✔	✔	✔
• Classification	✗	✔	✔	✔	✗
• Renovation status	✔	✔	✔	✔	✔
• ID or Name	✔	✔	✔	✔	✔
• GlobalId or GUID	✗ *	✔	✔	✔	✔
• Description	✔	✔	✗	✔	✔
• Tag or BATID	✔	✔	✔	✔	✗
• Predefined Type	✔	✔	✔	✔	✔
• IFC Property Set	✔	✔	✔	✔	✗
• BBA Property Set	✔	✔	✔	✔	✔
• Base Quantities	✔	✔	✔	✔	✗
• Layer	✗ **	✗	✔	✗	✔

IN SUMMARY - ARCHICAD

- Issues across all platforms
  - Base quantity data using ArchiCAD morph tool
  - Inconsistent colour behaviour with complex curved walls
  - Material data (layer and thickness) – not available using BREP method
  - Description field for Curtain Walls

IN SUMMARY - ARCHICAD

- Autodesk Revit 2013

  Geometry

  - Barrel vaulted curtain walls and curtain walls with accessories
  - Windows in slanted, double slanted and complex walls and wall geometry
  - Niches
  - Openings in trapezoid and polygon walls

  Data

  - ID (Name), Classification, Description, Layer and Tag not transferred
  - Property Sets for curtain walls
  - Renovation status for spaces
  - Elements converted to families and types (e.g. columns)

  2D

  - 2D display of wall element intersections and some door elements

IN SUMMARY - ARCHICAD

- Autodesk Revit 2014

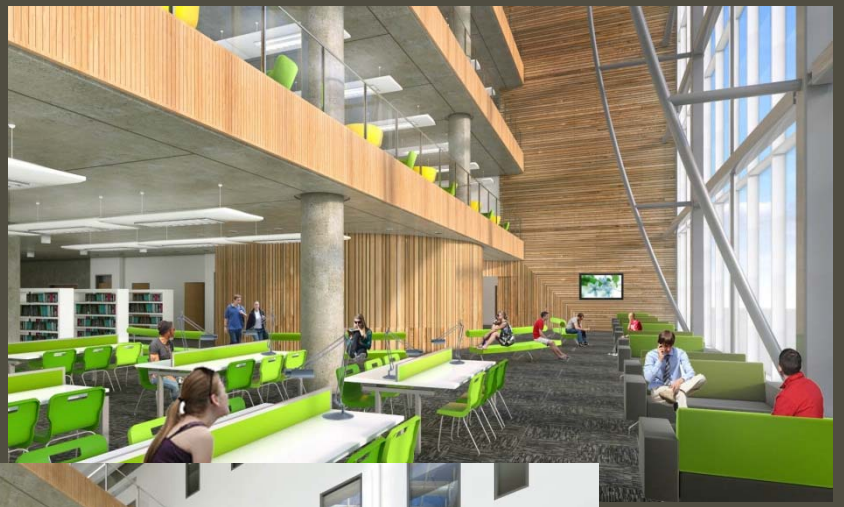
  Geometry
  - Barrel vaulted curtain walls
  - Niches
  - Double slanted, curved and curved slanted walls

  Data
  - Classification and Layer not transferred
  - Property Sets for curtain walls
  - Renovation status for spaces
  - Elements converted to families and types (e.g. columns and beams)

  2D
  - 2D display of wall element intersections and some door elements

IN SUMMARY - ARCHICAD

- Autodesk Navisworks 2013
  - Colour transfer of objects with more than one body colour
  - GUID data not transferred
  - Classification
  - Space geometry in 3D



- Autodesk Navisworks 2014
  - Layer displayed as floor level
  - Profile wall colour using BREP

IN SUMMARY - ARCHICAD

- DDS-CAD
  - Layer
  - Structural Function (LoadBearing) for Curtain Walls
- Exactal CostX
  - Classification not transferred
- Tekla BIMsight
  - IFC Property Sets, Tag and Classification not transferred

IN SUMMARY - ARCHICAD

- Solibri
  - Colour transfer of objects with more than one body colour
  - Niche quantification data incorrect
  - Description not transferred
  - Composition Type for Spaces

IN SUMMARY

Tools for successful data exchange with ArchiCAD

1. Favorites
2. Review models
3. Translators

1. Understand geometry / data exchange issues
2. Ensure the receiving party understands how to open the file

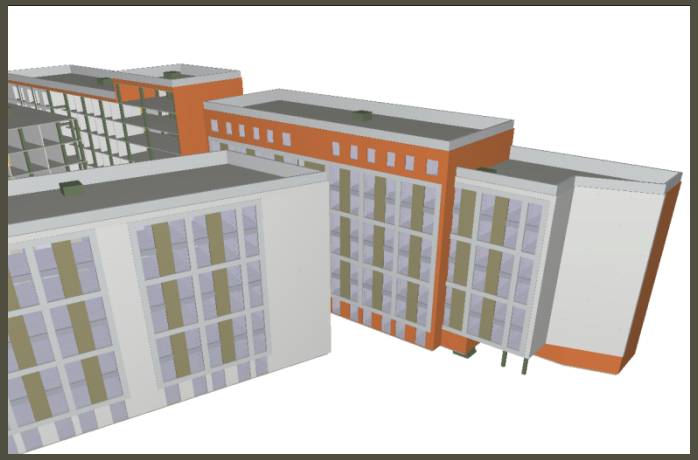
ONE FINAL SLIDE...OUR 'REVIT' PROJECT

Lend Lease

IFC reopened in GRAPHISOFT ArchiCAD 16

Autodesk REVIT 2014

Autodesk Navisworks 2014



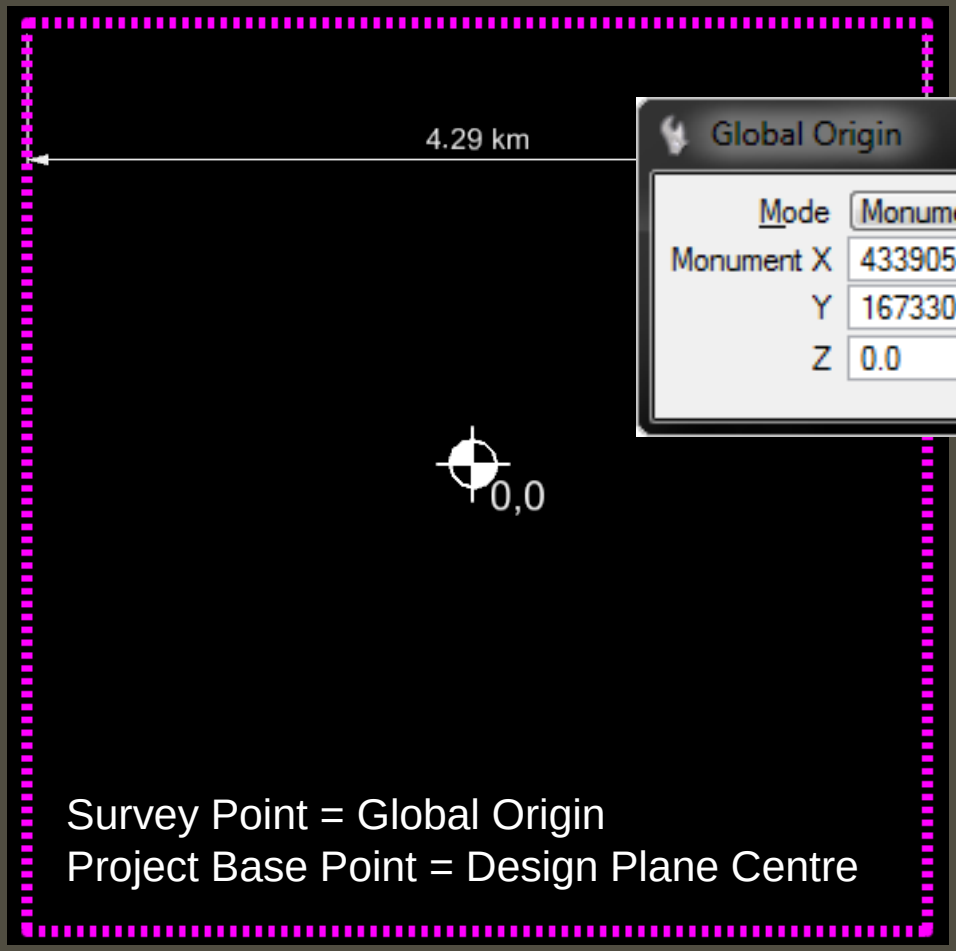
Solibri Model Viewer v8

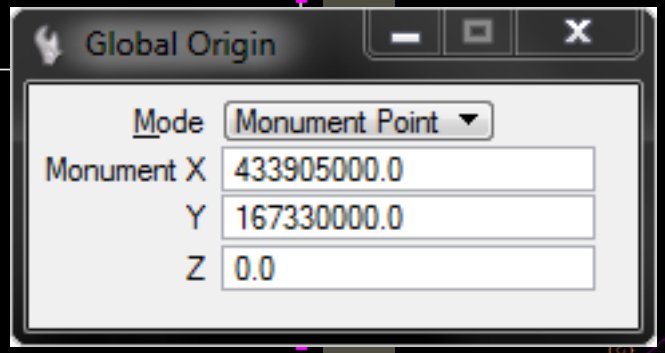
Tekla BIMsight v1.7.1

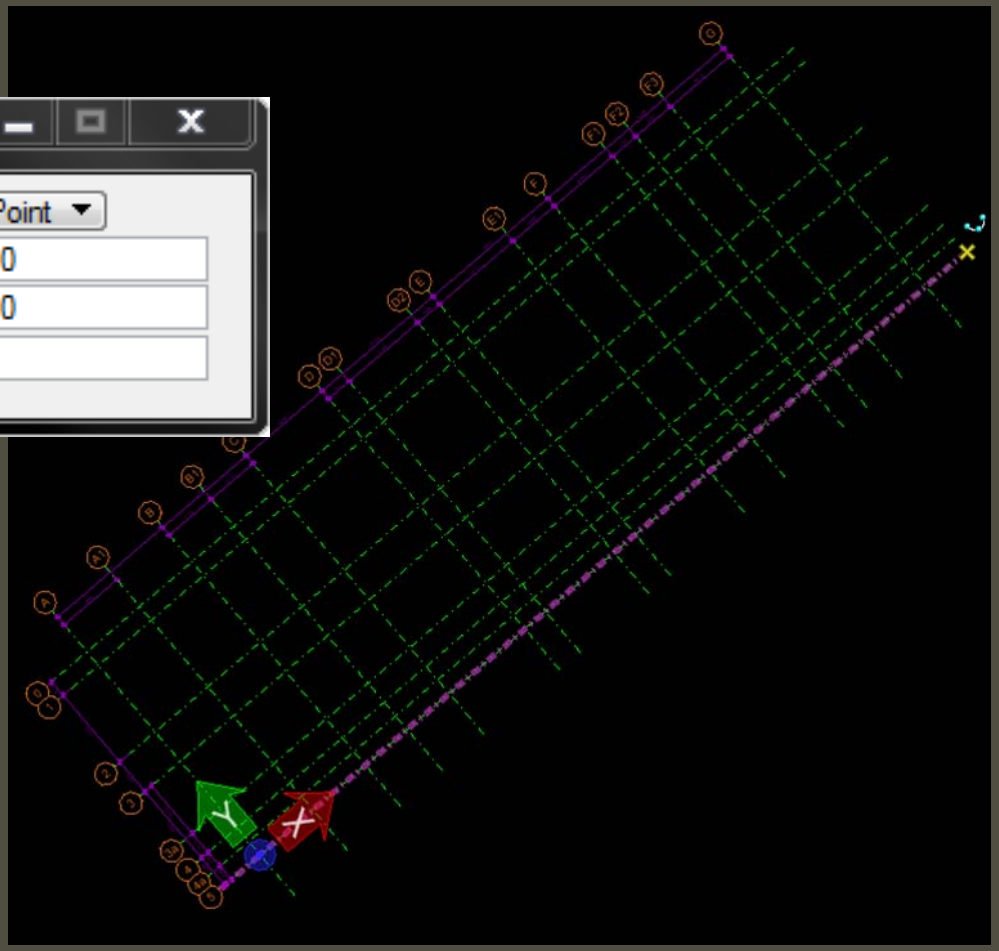
DDS-CAD Viewer


Bentley AECOsim Building Designer

AECOSIM BUILDING DESIGNER: COORDINATING COORDINATES

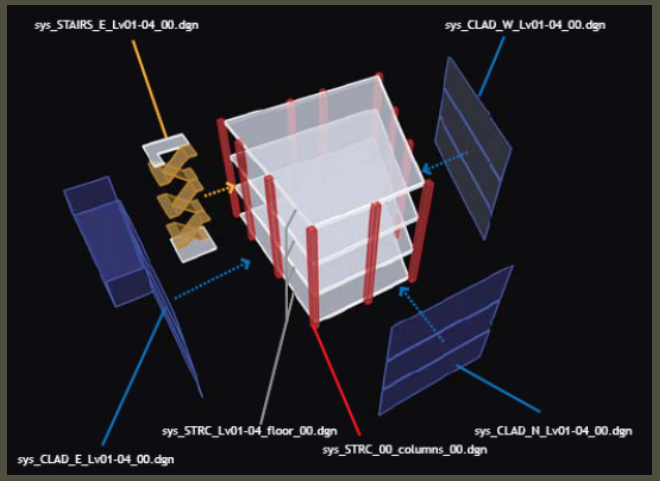


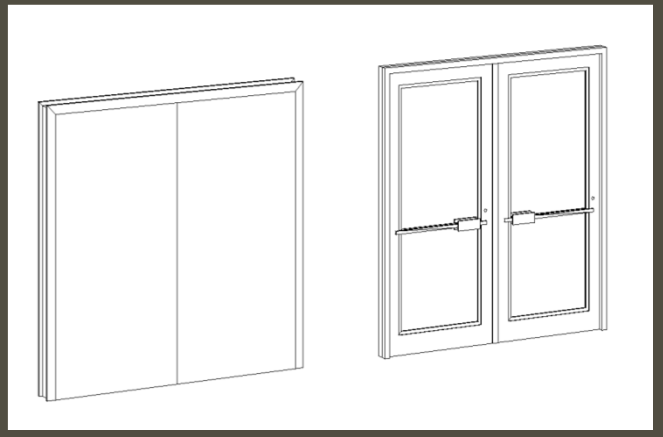




MODELLING METHODOLOGY

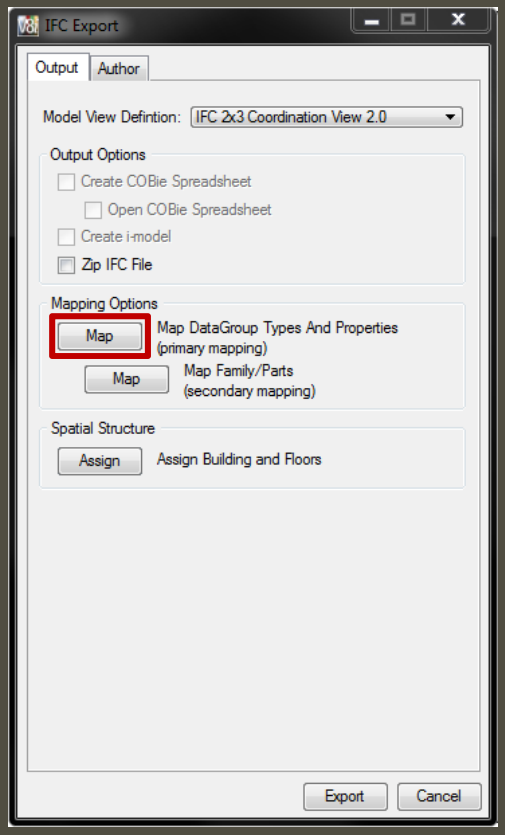
- Modelling for effective data exchange may be different to a “closed BIM” approach
- Breakdown of models
- Components
- Level of Definition (Development)
  - Level of Detail
  - Level of Information
- Understand the reason for your model

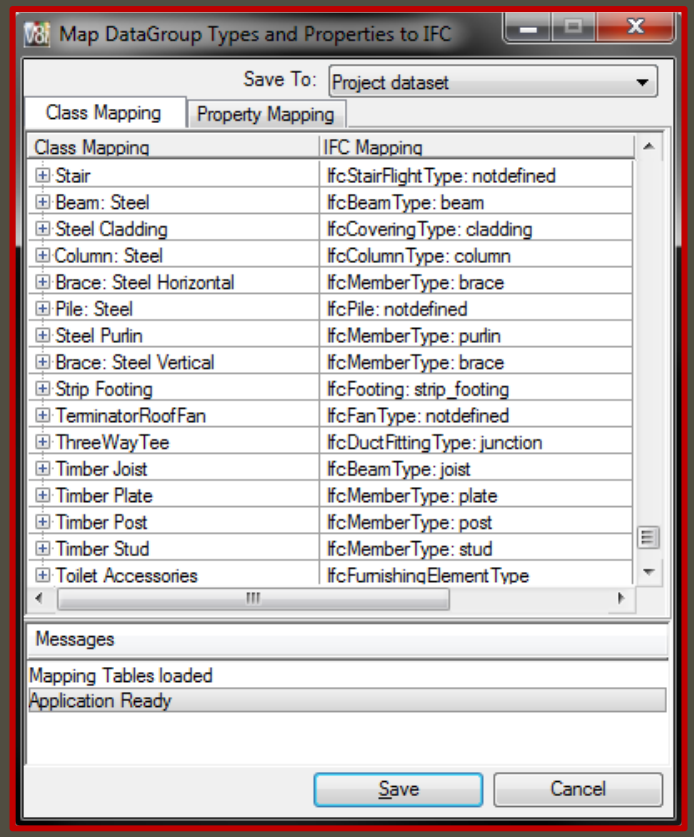




EXPORT OPTIONS: AECOSIM BUILDING DESIGNER

- How it works

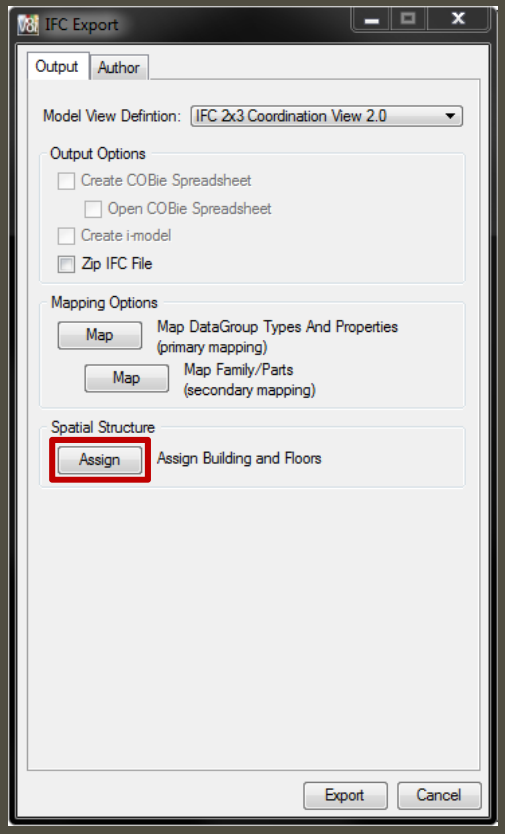


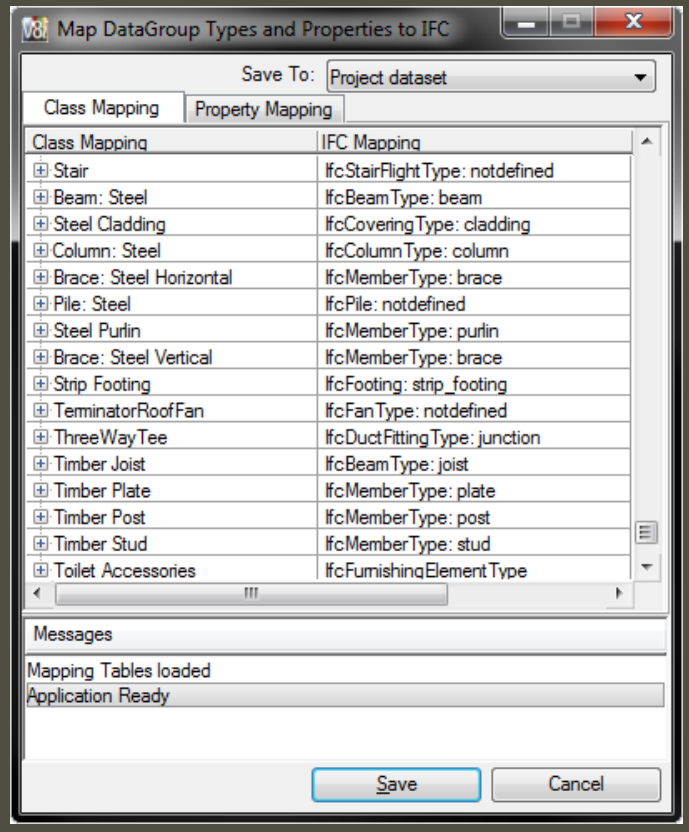


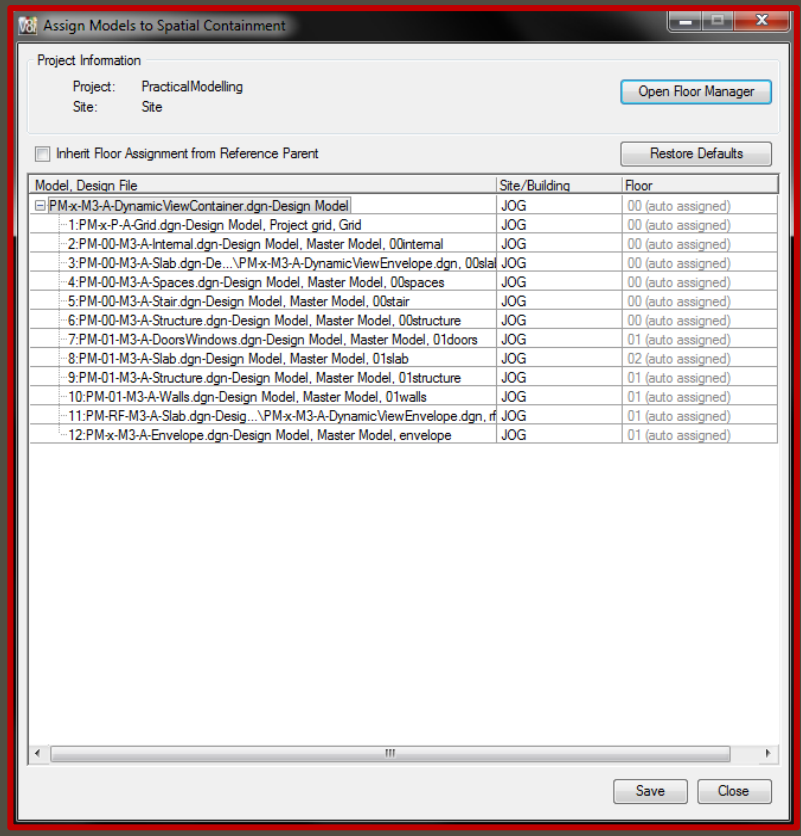
- Be aware that mappings are not always applied as you specify them!
  e.g. IfcWallStandardCase

EXPORT OPTIONS: AECOSIM BUILDING DESIGNER

- How it works

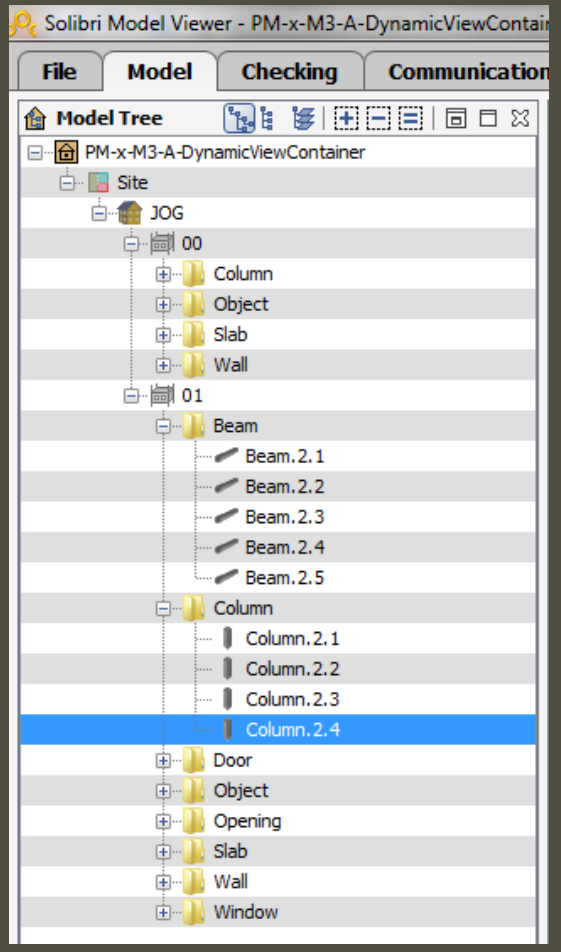






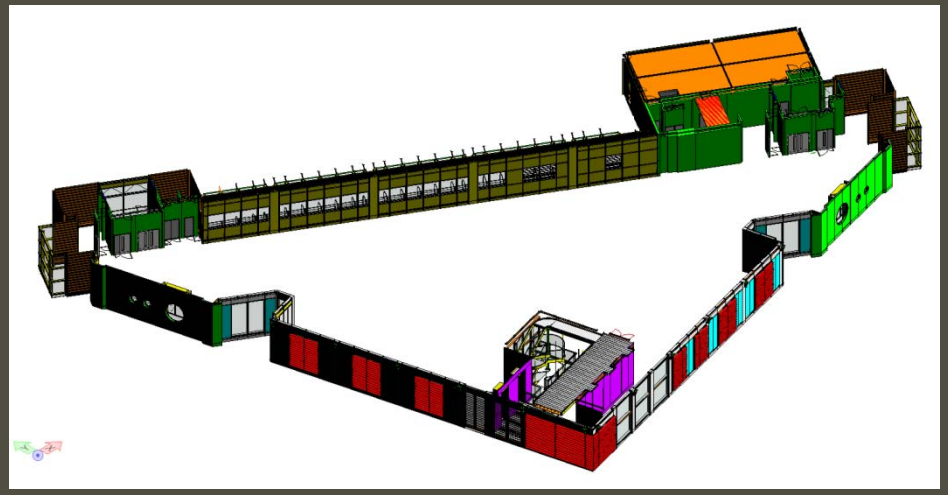
EXPORT OPTIONS: AECOSIM BUILDING DESIGNER

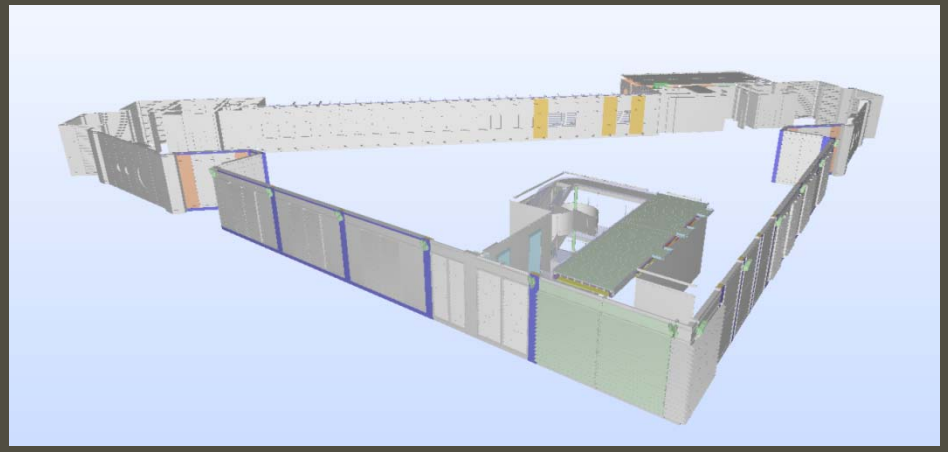
- The good
  - Geometry is accurate & in precise location
    - Location: Global X & Y
  - Floor assignment is automatic and is file-based
    - Floor Manager
    - Allows “fine-tuning”
  - Data is organised correctly
  - Classification supported
    - Classification: Classification
  - Custom properties are honoured
  - Direct COBie export
  - Round-trips perfectly



EXPORT OPTIONS: AECOSIM BUILDING DESIGNER

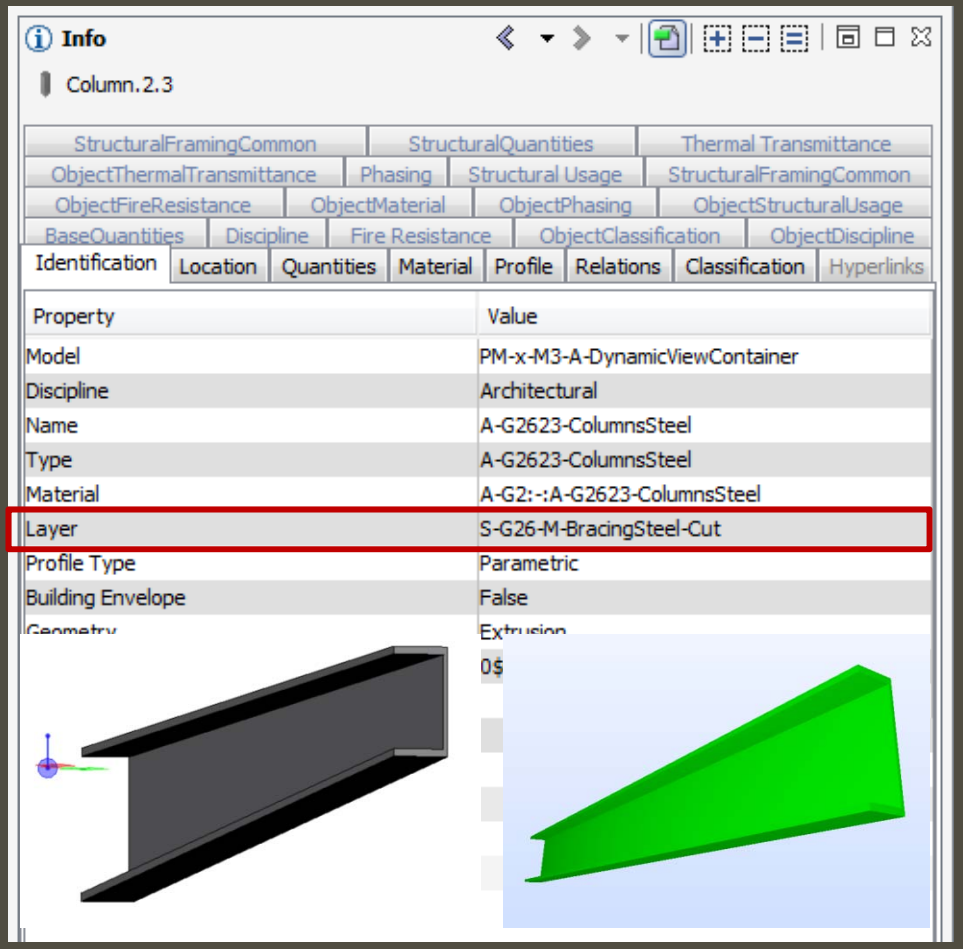
- The bad
  - Can be very slow
  - Crashes are (were) common
    `IFC_RECOVERY = 1`
  - File sizes can be very large
    - 31MB DGN = 199MB (exploded) / 99MB
    - Optimised = 34MB
  - Colours incorrect (due to layer mapping)





EXPORT OPTIONS: AECOSIM BUILDING DESIGNER

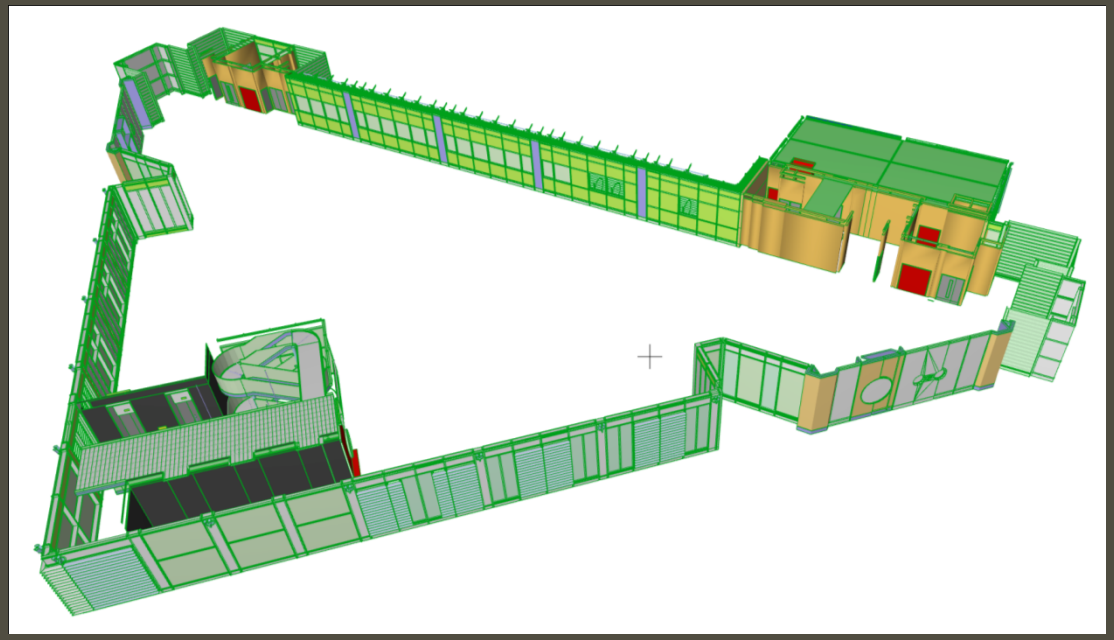
- The ugly
  - Incorrect layer mapping
  - Tapered members not supported



EXPORT OPTIONS: AECOSIM BUILDING DESIGNER

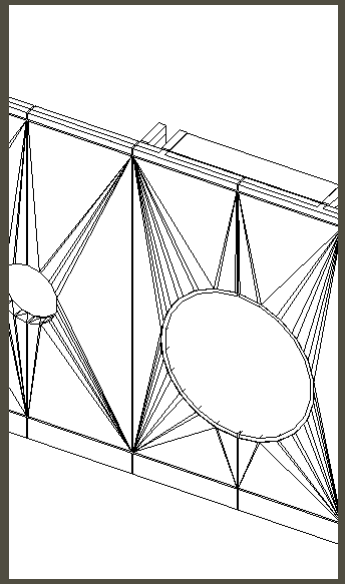
Results in ArchiCAD

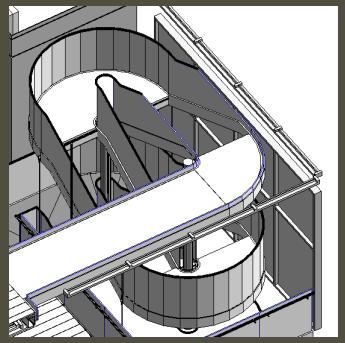
- The Good
  - Layers come in “correctly”
  - Data is complete
- The Bad
  - 2D display is pretty bad
  - Grids as objects; OK in 3D
  - Default IFC colours
  - Floors can be confusing (if mapping not carried out correctly)
- The Ugly
  - Door frames missing



EXPORT OPTIONS: AECOSIM BUILDING DESIGNER

IFC Class Name	Category
IfcCovering	Ceilings
IfcCurtainWall	Ruled Curtain System
IfcDamperType	Generic Models
IfcDiscreteAccessory	Generic Models
IfcDistributionChamberElement	Generic Models
IfcDistributionChamberElement	Generic Models
IfcDistributionControlElement	Generic Models
IfcDistributionElement	Generic Models
IfcDistributionFlowElement	Generic Models
IfcDoor	Doors
IfcDuctFittingType	Generic Models
IfcDuctSegmentType	Generic Models
IfcDuctSilencerType	Generic Models
IfcElectricalEquipment	Generic Models
IfcElectricApplianceType	Generic Models
IfcElectricDistributionPoint	Generic Models
IfcElectricFlowStorageDeviceTy	Generic Models
IfcElectricGeneratorType	Generic Models
IfcElectricHeaterType	Generic Models
IfcElectricMotorType	Generic Models
IfcElectricTimeControlType	Generic Models
IfcElementAssembly	Generic Models
IfcEnergyConversionDevice	Generic Models





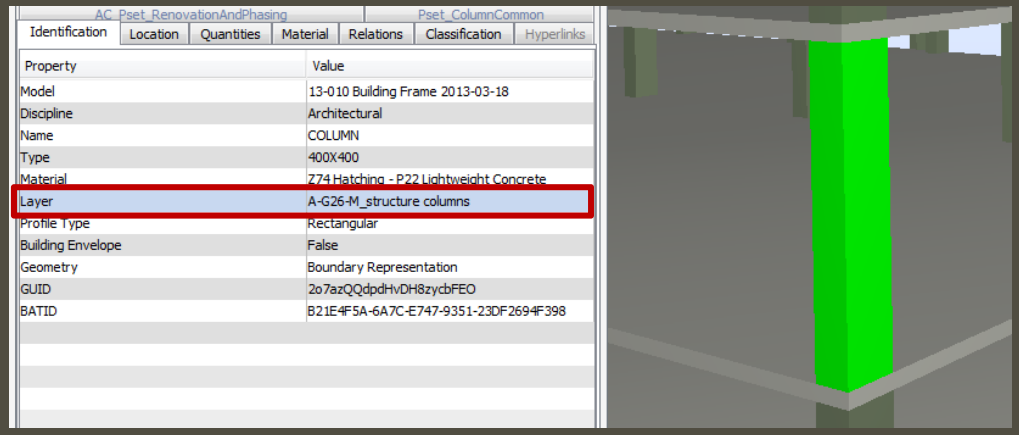
Results in Revit

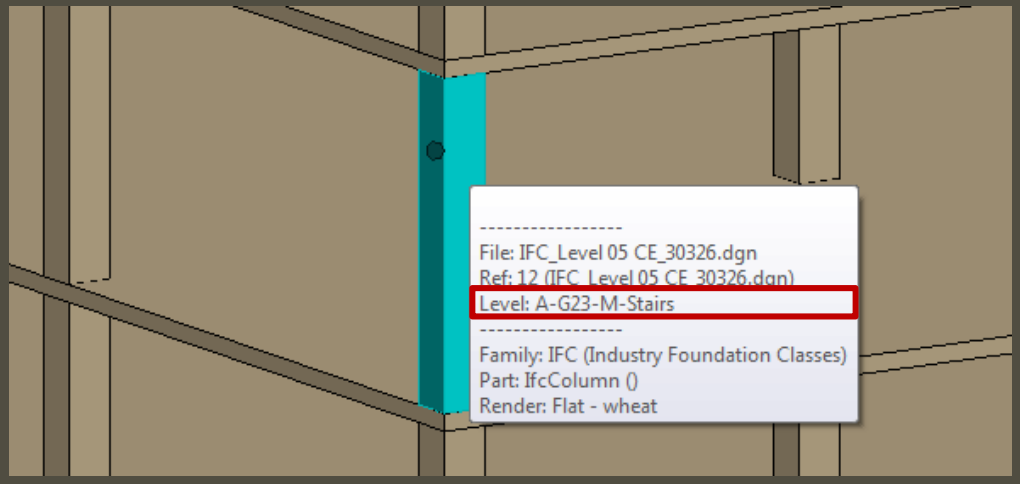
- The Good
  - Information is clear
  - Data supported: Type properties
- The Bad
  - The initial view can be misleading
  - Remapping necessary to avoid everything coming through as Generic Models
    - But you don't know what you've got till you've opened it!
  - Import does not like Real World Coordinates
    - Relocate model to 0,0,0, assign Site Coordinates later
    - Collaboration needs real world
  - Meshed panels (IFC issue but display in Revit)
- The Ugly
  - Stairs can be problematic

IMPORT: IFC FROM ARCHICAD

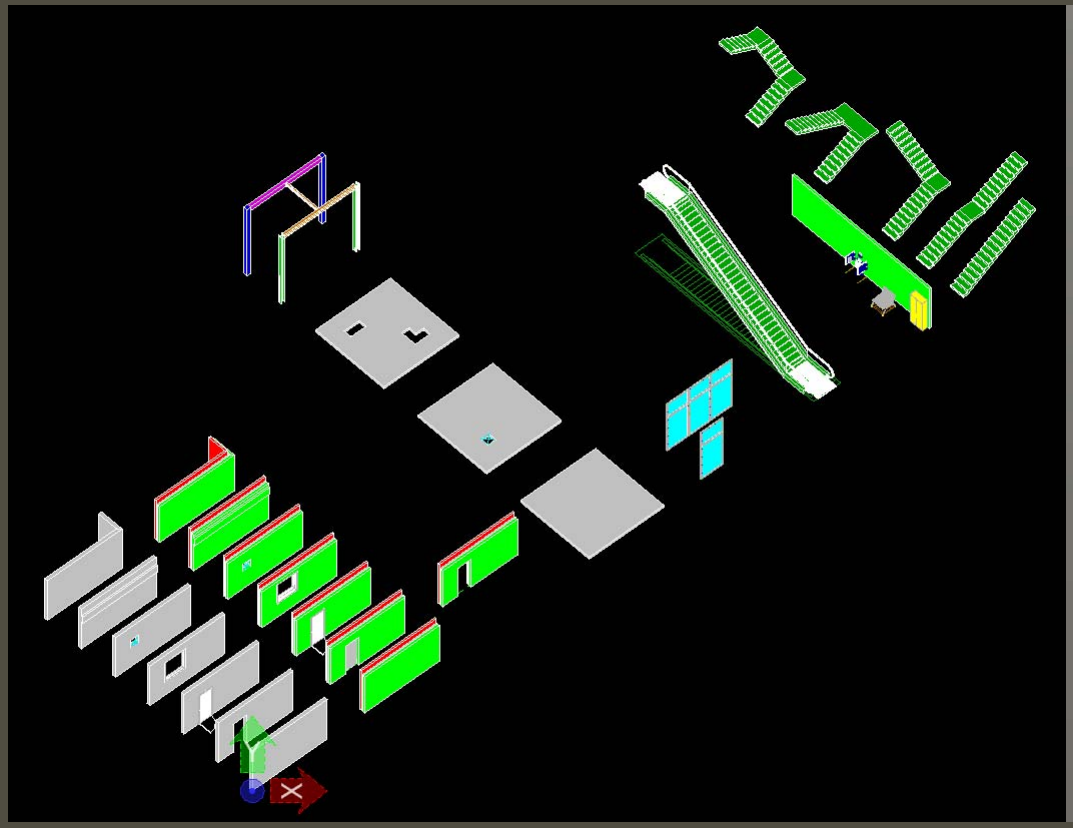
Results in AECOsim Building Designer

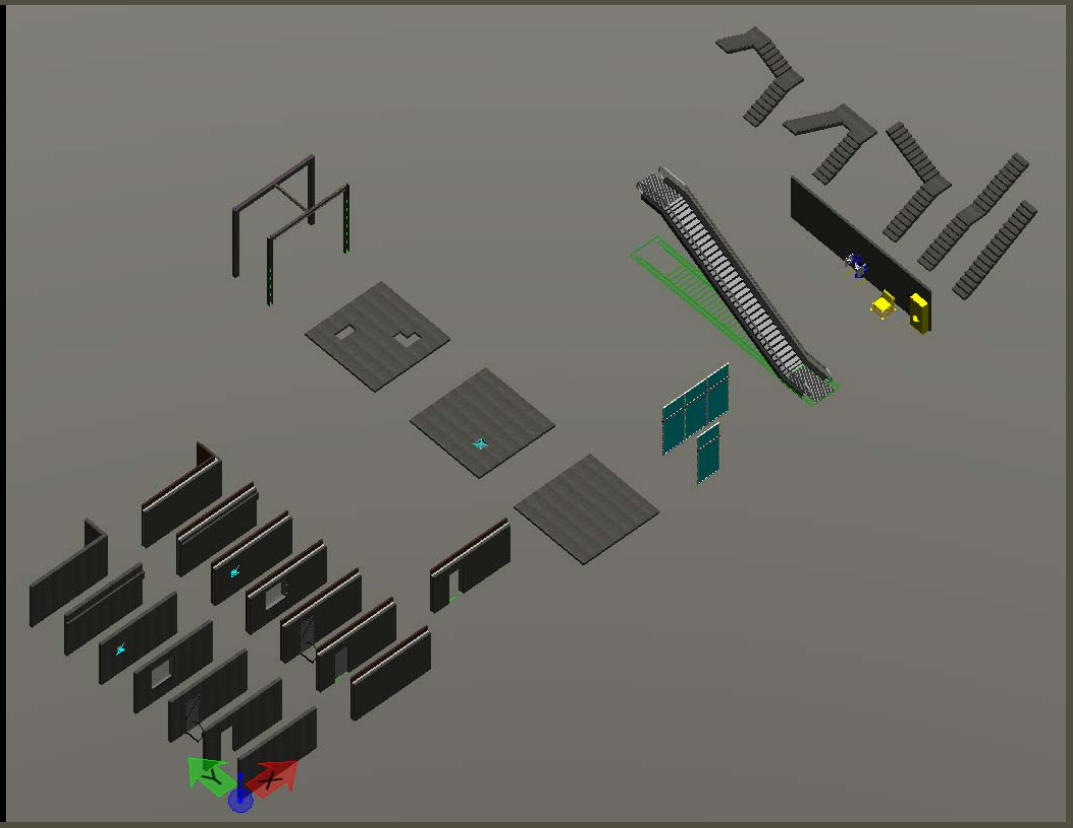
- The Good
  - Geometry is accurate
  - Data is complete
  - (Model not orientated to North)
  - Layers honoured when importing (but…)
- The Bad
  - Import options not available when opening an IFC or referencing
  - Open does not honour layers
  - Referencing creates layers based on object type
- The Ugly
  - “Import”
    - Creates multiple IFC references per floor
    - Import converts layers incorrectly
    - Do not use unless you move everything into a separate folder!





AECOSIM BUILDING DESIGNER: THE RESULTS



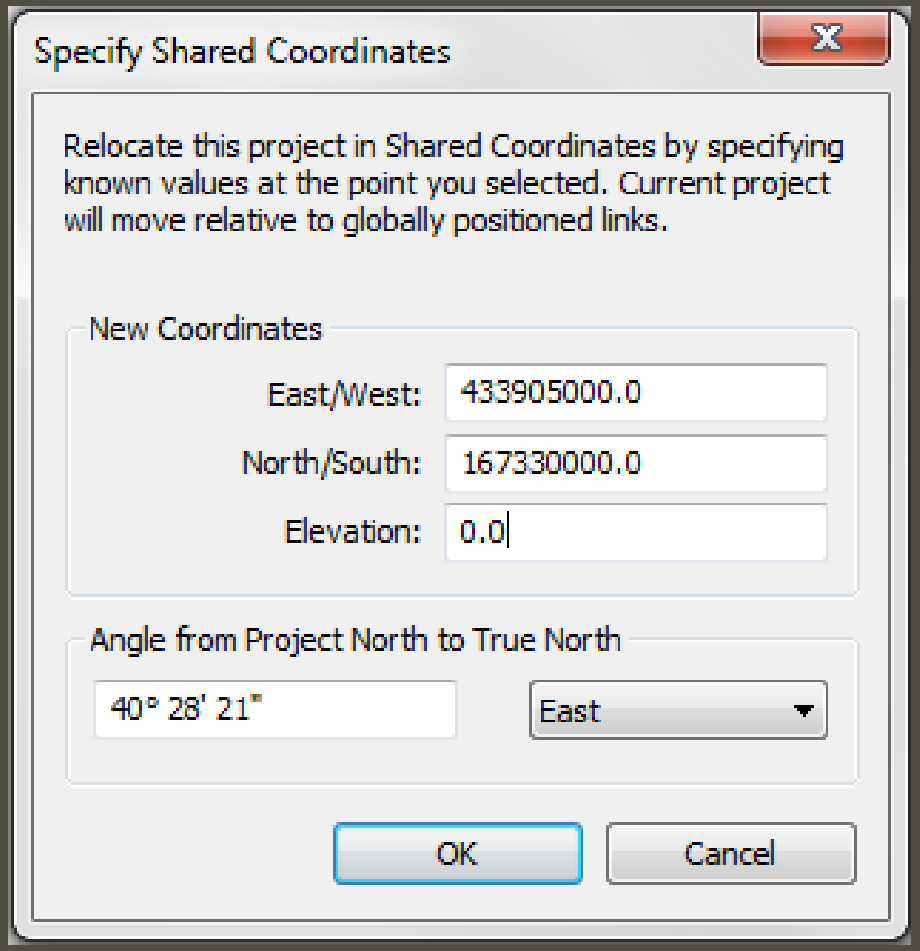


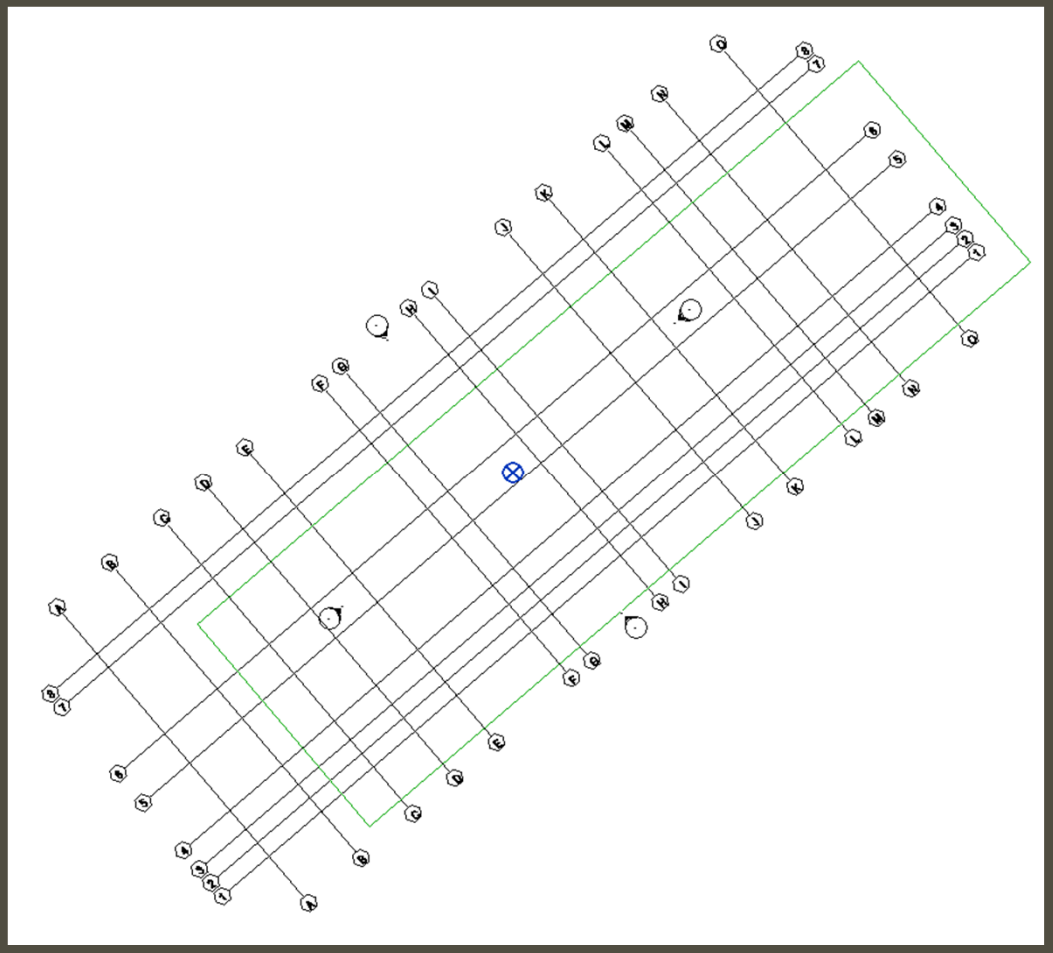
AECOSIM BUILDING DESIGNER: THE RESULTS

	Revit 2014	Navisworks 2014	Solibri	DDS-CAD	Tekla BIMsight
• Geometry	✔	✔	✔	✔	✔
• Colour	✔	✔	✗	✗	✔
• Material	✔	✔	✔	✗	✔
• Classification	✔	✔	✔	✔ ✔	✔
• ID or Name	✔	✔	✔	✔	✔
• GlobalId or GUID	✔	✔	✔	✔	✔
• Description	✔	✔	✔	✗	✔
• Predefined Type	✔	✔	✔	✔	✔
• IFC Property Set	✔	✔	✔	✔	✔
• Base Quantities	✔	✔	✔	✔	✔
• Layer	✗	✗	✔	✗	✔


Autodesk REVIT

COORDINATING COORDINATES: REVIT



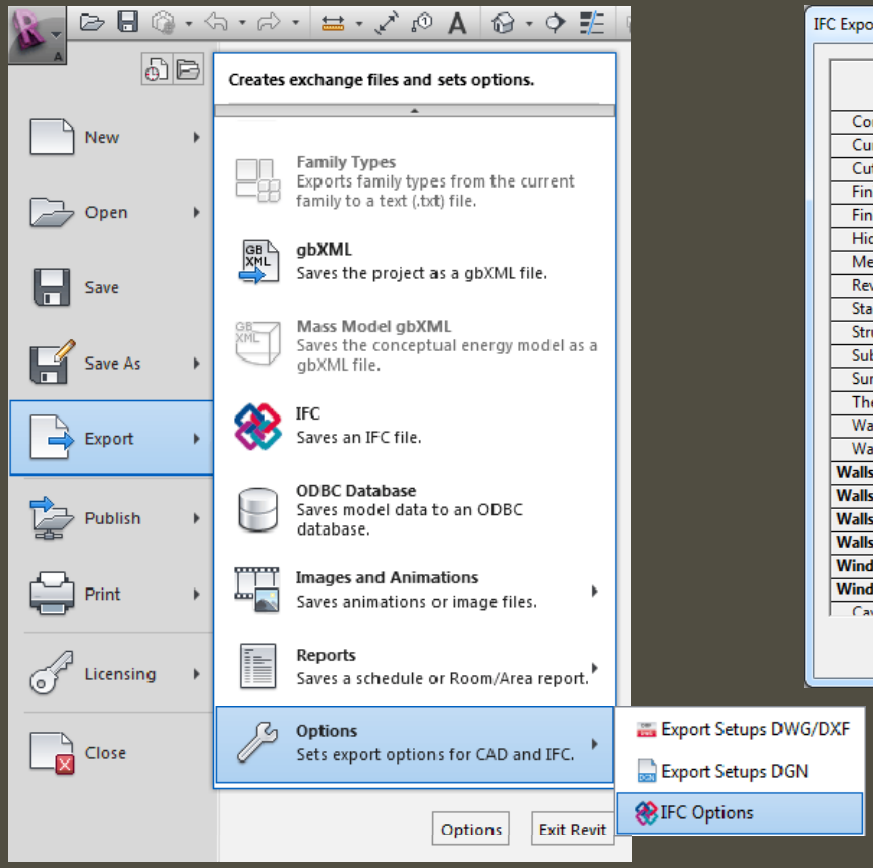


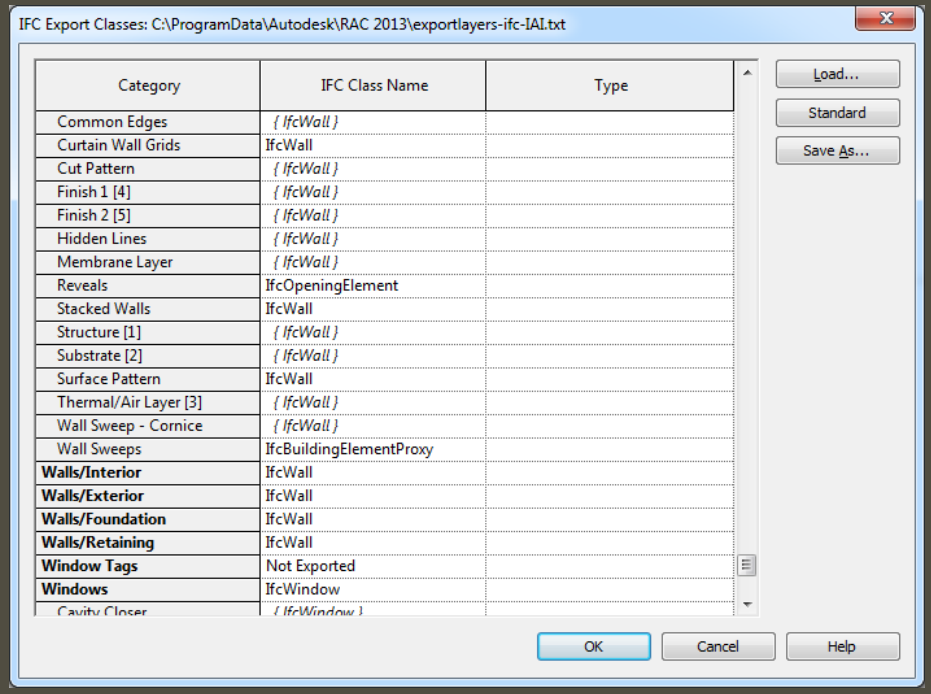
MODELLING METHODOLOGY

- Revit's approach being very much centred around the single model environment
- Families
- Level of Definition (Development)
  - Level of Detail
  - Level of Information
- Understand the reason for your model
  - IFC export formats (coordination, FM, cost, etc)

EXPORT OPTIONS: REVIT

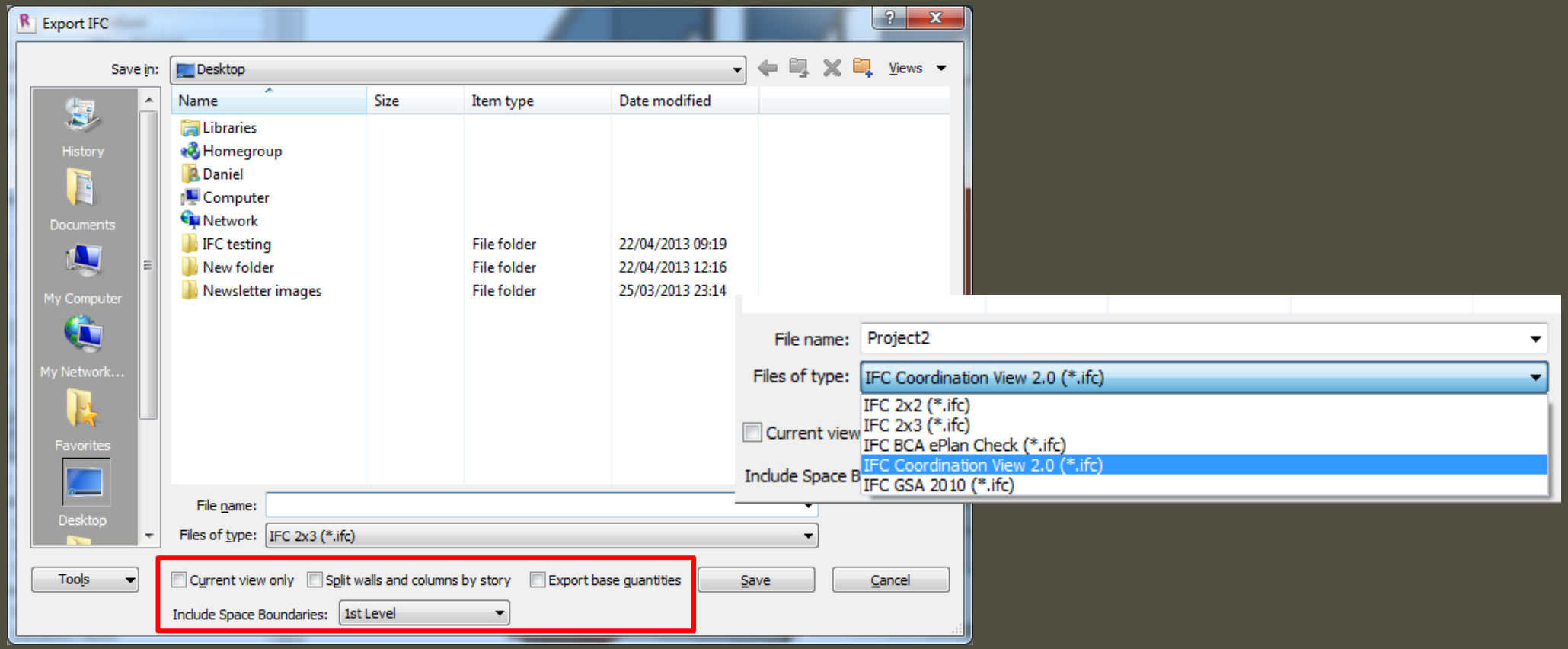
- How it works





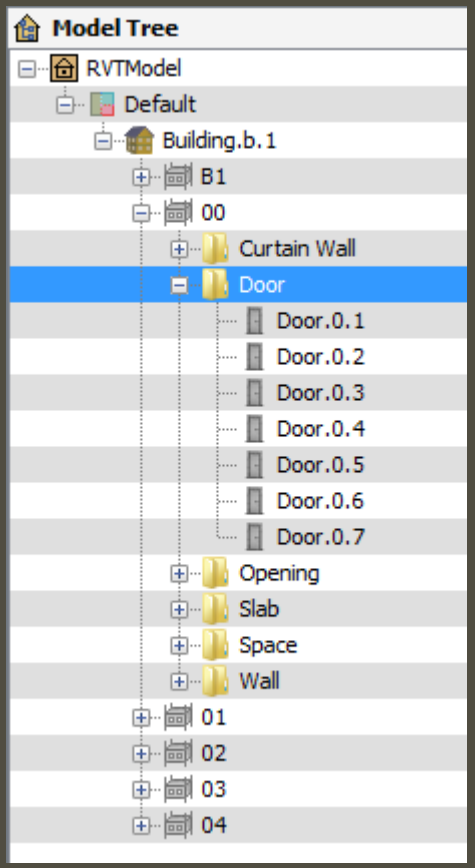
EXPORT OPTIONS: REVIT

- How it works



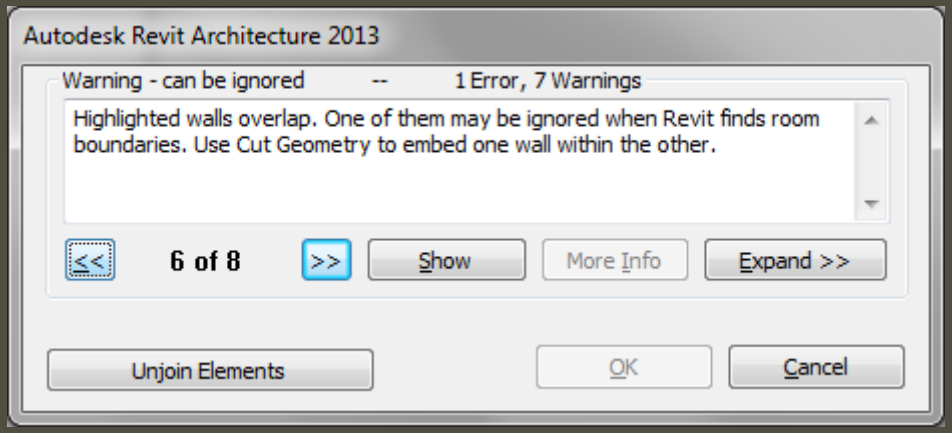
EXPORT OPTIONS: REVIT

- The Good
- Geometry is accurate including curved elements without much faceting
- Floor assignment is automatic and assigned to each object, correctly
- Data is organised correctly
- Objects are categorised correctly*
- Both Instance and Type parameters are honoured
- Exported IFC files are quite small



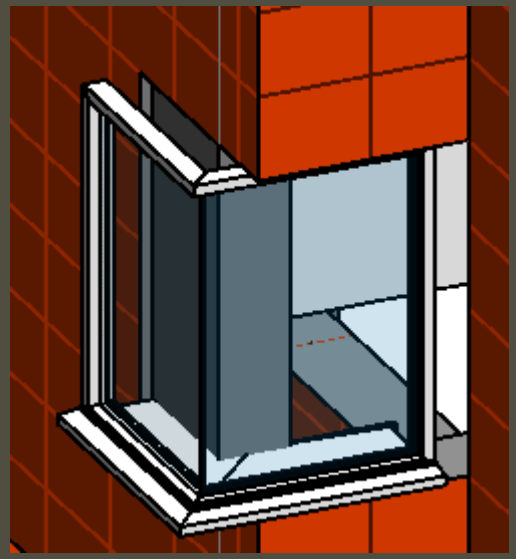
EXPORT OPTIONS: REVIT

- The Bad
- Revit doesn't seem to be able to export the correct coordinate system.
* Categorisation does not support IFC "predefined types"
  e.g. IfcBeam:Joist, IfcCovering:Ceiling
- If an object isn't hosted properly as Revit expects it will be deleted although, an opening will remain.
- Wall joins often have to be broken because Revit doesn't understand the relationship correctly.
- Constraints are lost when IFC is opened such as floor links and parametric elements



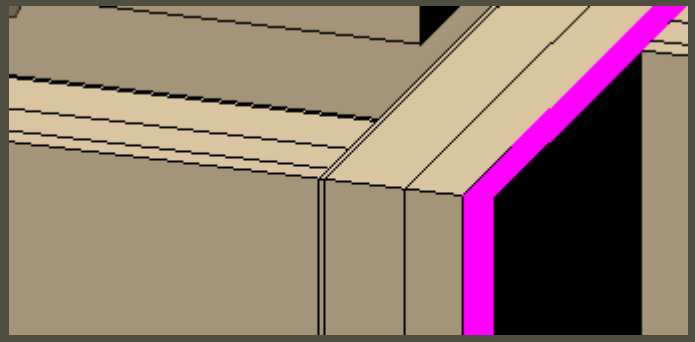
EXPORT OPTIONS: REVIT

- The Ugly
- Objects often ‘shuffle’ from their original location, especially when they are hosted in multiple objects.
- Objects containing multiple materials often take on the appearance of the overall material instead of the relevant materials
- Families are converted into dumb objects that can’t be edited.



EXPORT OPTIONS: REVIT

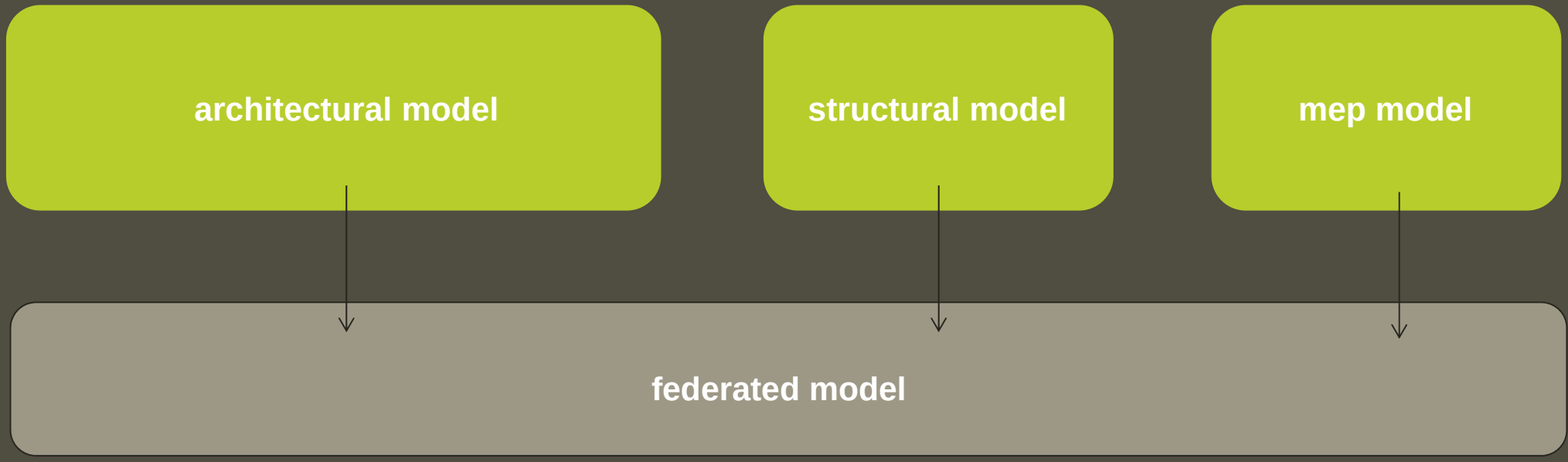
Results in AECOsim Building Designer



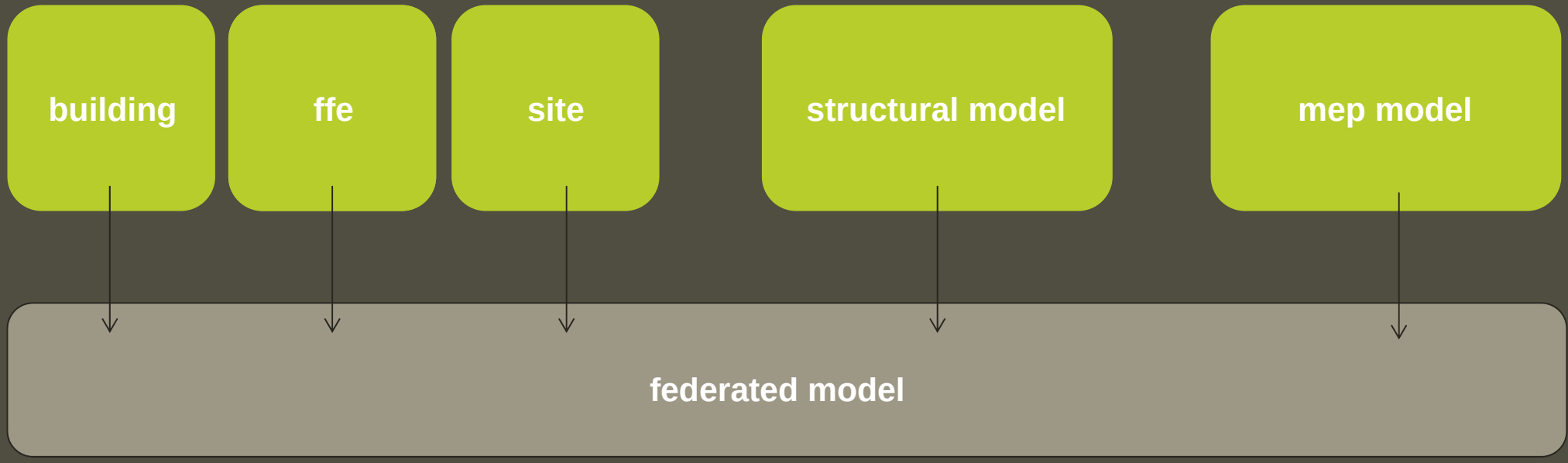
- The Good
  - Geometry accurate
  - Spaces import correctly
  - Orientation and location import correctly
- The Bad
  - Attribute information missing including door and window marks
  - Wall junctions break to show incorrect geometry.
- The Ugly
  - Info
  - Information can be confused; resymbolises in model views to show plan representation
  - Family and Part use the IFC Family and Part.


CONCLUSION

LARGE IFC FILES

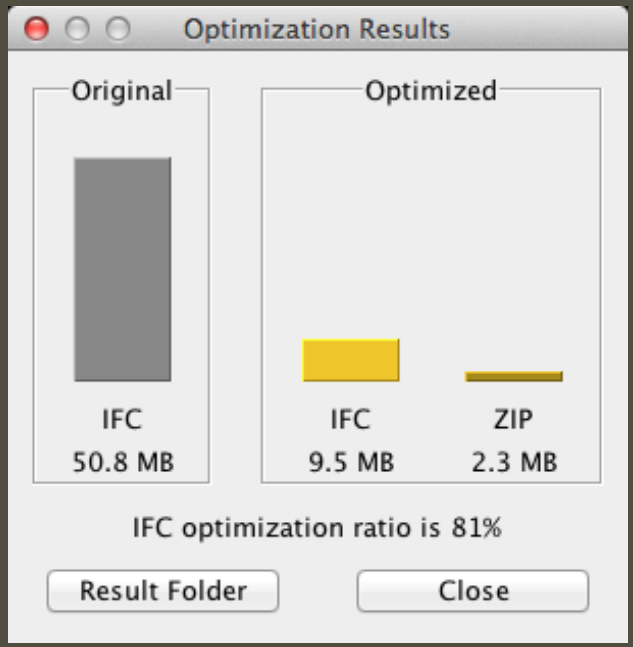


LARGE IFC FILES



LARGE IFC FILES

- Solibri IFC Optimizer (or Datacubist simplebim)



CONCLUSION

- Level 01
  - Fully parametric elements and parametric objects
- Level 02
  - Fully parametric elements and static objects
  - Extruded geometry
- Level 03
  - Mix of parametric and static elements and static objects
  - Mix of extruded geometry and boundary representation (BREP)
- Level 04
  - Static elements and objects
  - Boundary representation (BREP)

CONCLUSION

- Level 01
  - Fully parametric elements and parametric objects

IFC4

- Level 02
  - Fully parametric elements and static objects
  - Extruded geometry

IFC2x3

- Level 03
  - Mix of parametric and static elements and static objects
  - Mix of extruded geometry and boundary representation (BREP)
- Level 04
  - Static elements and objects
  - Boundary representation (BREP)

Suitable for co-ordination, clash detection, costing, time lining

CONCLUSION

- Level 01
  - Fully parametric elements and parametric objects

IFC4

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Suitable for co-ordination, clash detection, costing, time lining

CONCLUSION

Successful exchange requires consideration of -

- export capabilities
- import capabilities
- user error
- limitations of the format (particularly complex modelling)

CONCLUSION

Things to note -

- not always the appropriate or best method for file exchange
- required at BIM Level 2 (which is…?)
- almost impossible to use a fully proprietary solution throughout a whole project

CONCLUSION

IFC implementation takes understanding and knowledge -

- modelling for IFC exchange requires specific approach
- preparation and planning
- requires understanding of the intricacies of software – and not just your own
- requires skill and understanding by users to implement

CONCLUSION

IFC is not perfect -

- however as a format it is NOT broken
- implementation of the standard by ALL software vendors requires more work
- approval process needs to be tougher
- issues need to be reported by users to vendors

CONCLUSION

IFC 2x3 can and does work on the vast majority of projects

and fundamentally....

WE MUST ALL BE ABLE TO USE THE SOFTWARE OF OUR CHOICE


QUESTIONS