



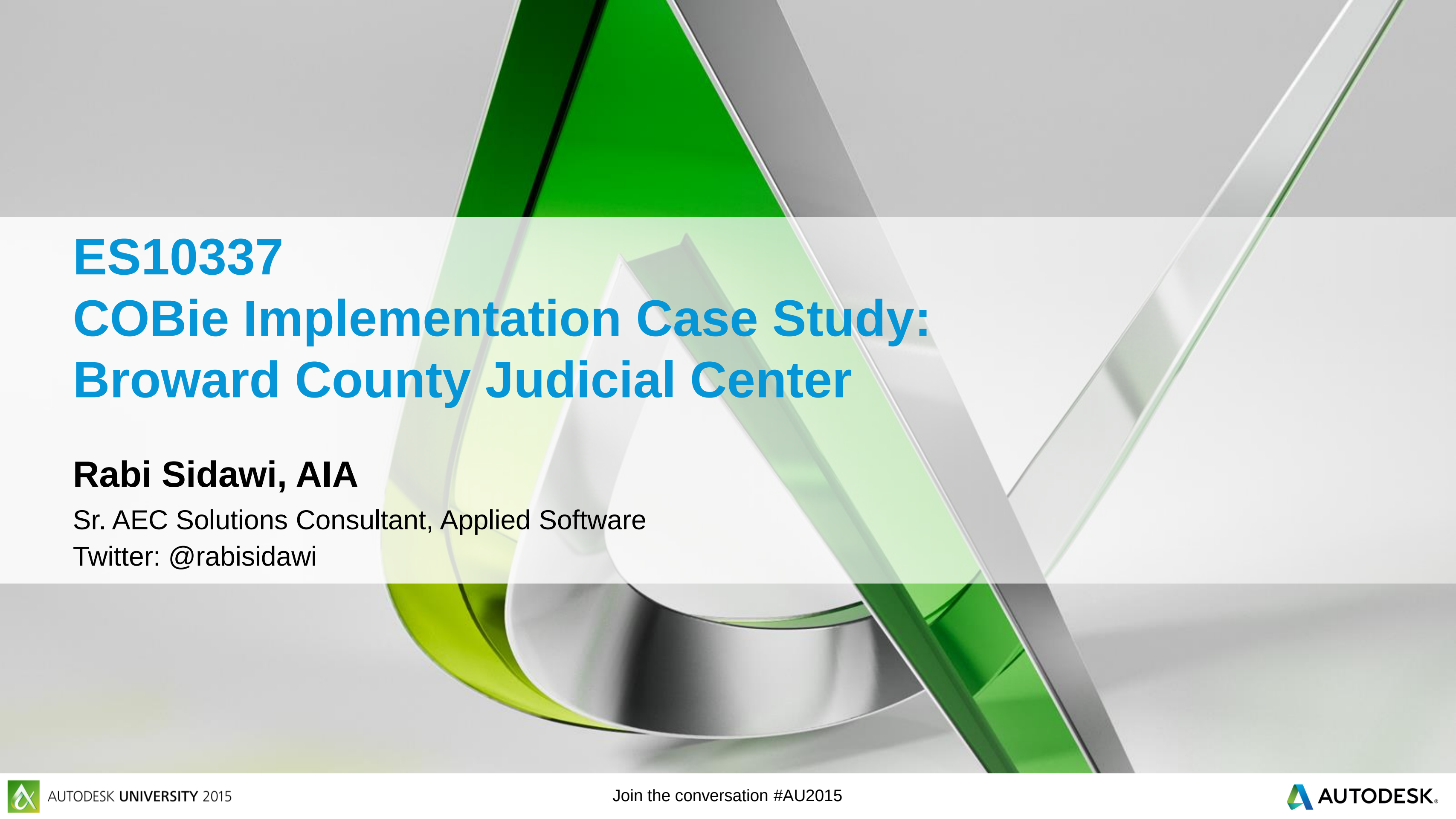
Stop by our booth:
..... 311.....

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free ***Drone & Apple Watch!***



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Applied Software
giving away one **FREE**
LiveLabLearning (LLL) class
...You must be present in this room to win...





ES10337

COBie Implementation Case Study: Broward County Judicial Center

Rabi Sidawi, AIA

Sr. AEC Solutions Consultant, Applied Software

Twitter: @rabisidawi

COBie Implementation Case Study: Broward County Judicial Center

A journey into the real world of COBie delivery.

The Broward County Judicial Center in Ft. Lauderdale, Florida, is a successful example of a commercial BIM remodeling project, delivering COBie both during the Design Phase at LOD 300, and at the end of Construction for LOD 500 as-builts.

You will learn about what were the challenges, solutions and opportunities, and takeaways for your next project.

At the end of this class, you will be able to:

- Take a journey into the real world of COBie delivery
- Learn about a successful example of a BIM remodeling project
- Compare COBie delivery for LOD 300 and LOD 500
- Understand challenges, solutions and opportunities



Rabi Sidawi, AIA

- B. Arch, M. Arch, M.A.
- Senior AEC Solutions Consultant
- Published author
- 25+ Years of AEC Experience
- Autodesk Revit Implementation Certified Expert
- Autodesk Consultative Methodology Certification
- Autodesk Structural Specialization Certification
- Repeat speaker at AU, RTC and AIA events
- Adj. Professor: graduate programs in CM

Back to the Future

Sometimes you may want to take two steps forward



DO
something
TODAY
that your
FUTURE
self will
thank you for



Project Goals

A goal without a plan is just a wish



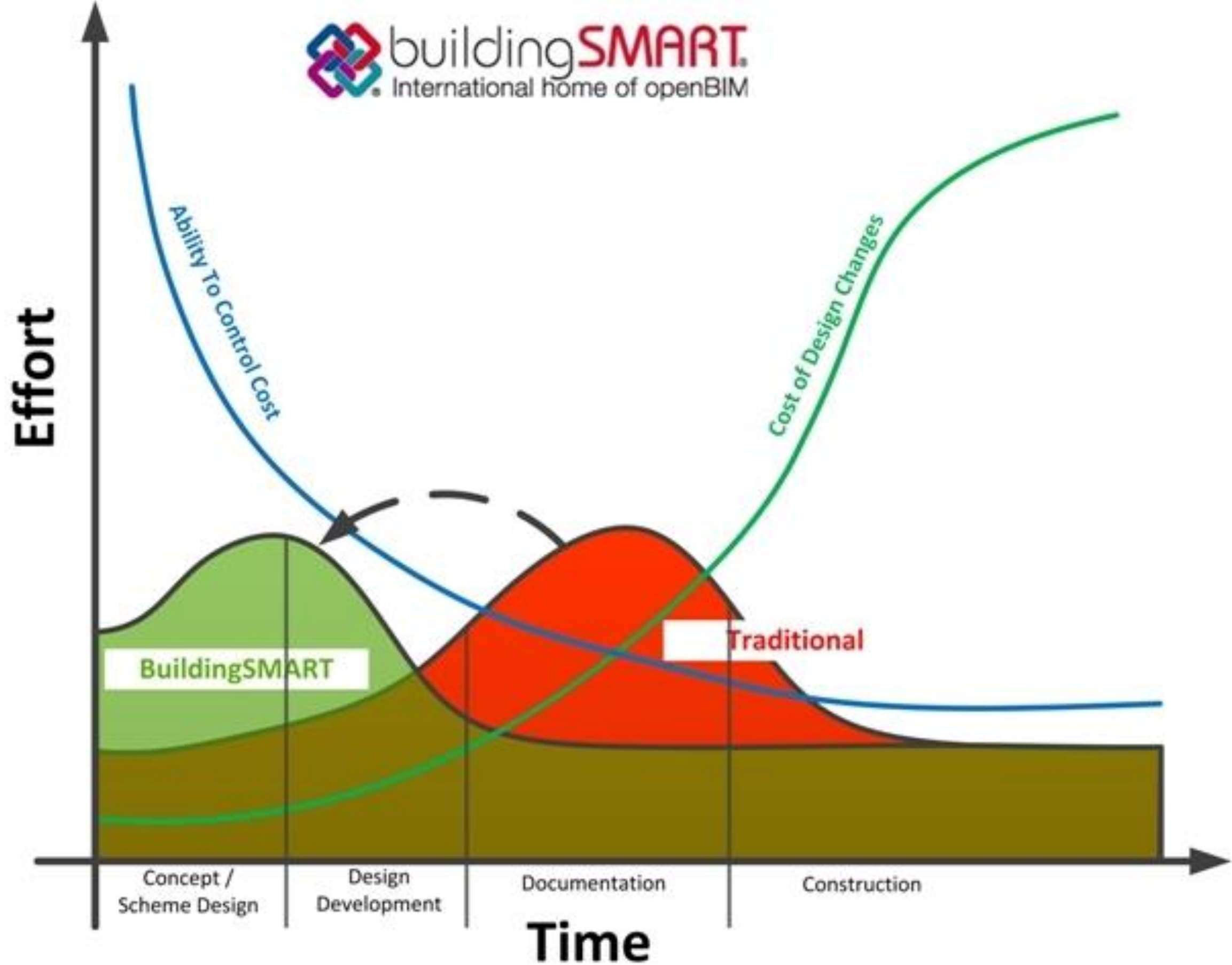
CHALLENGES: Owner-Defined Goals

1. Architect will work with the Owner to confirm selection of maintainable assets to be tracked and matured within the project.
2. Architect to verify that all components anticipated in the model exist and have valid naming.
3. Architect to verify that all components have a proper OmniClass Number/Title.
4. Develop the Data Requirement Schedule (mapping) to reverse engineer the fields required for FM deliverable by adding columns describing the COBie tabs, model component authors, data sources, and Revit parameters.



PLAN AHEAD

MacLeamy Curve . BIM Methodology



#AU2015



AUTODESK UNIVERSITY 2015

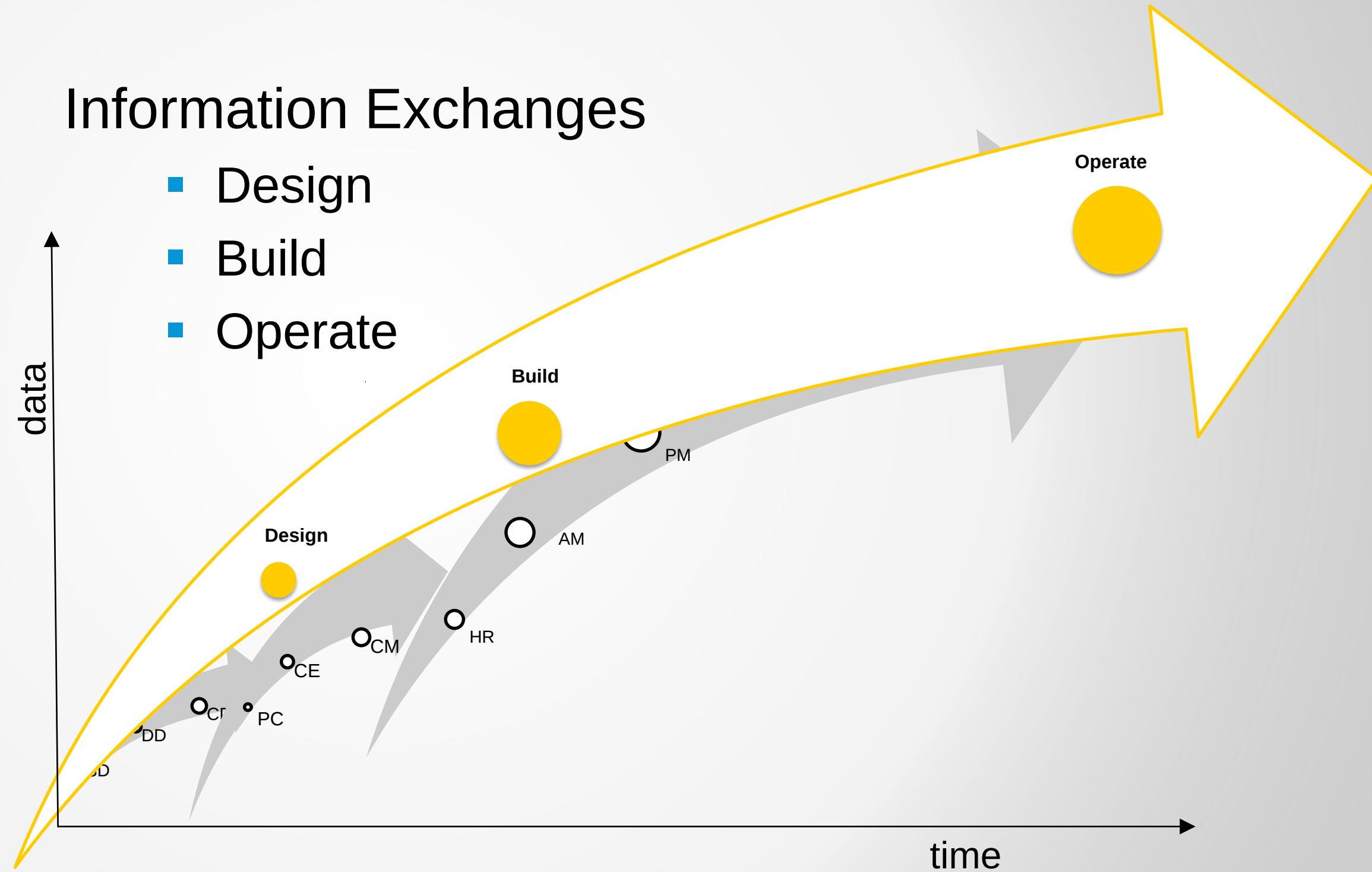
AUTODESK.

Information Exchange

Design . Build . Operate

Information Exchanges

- Design
- Build
- Operate



Facilities Composed of

- Floors
- Rooms/Spaces
- Components

Served by

- Building Systems
- Product types

Described by

- Models
- Documents
- Specifications

Operated by

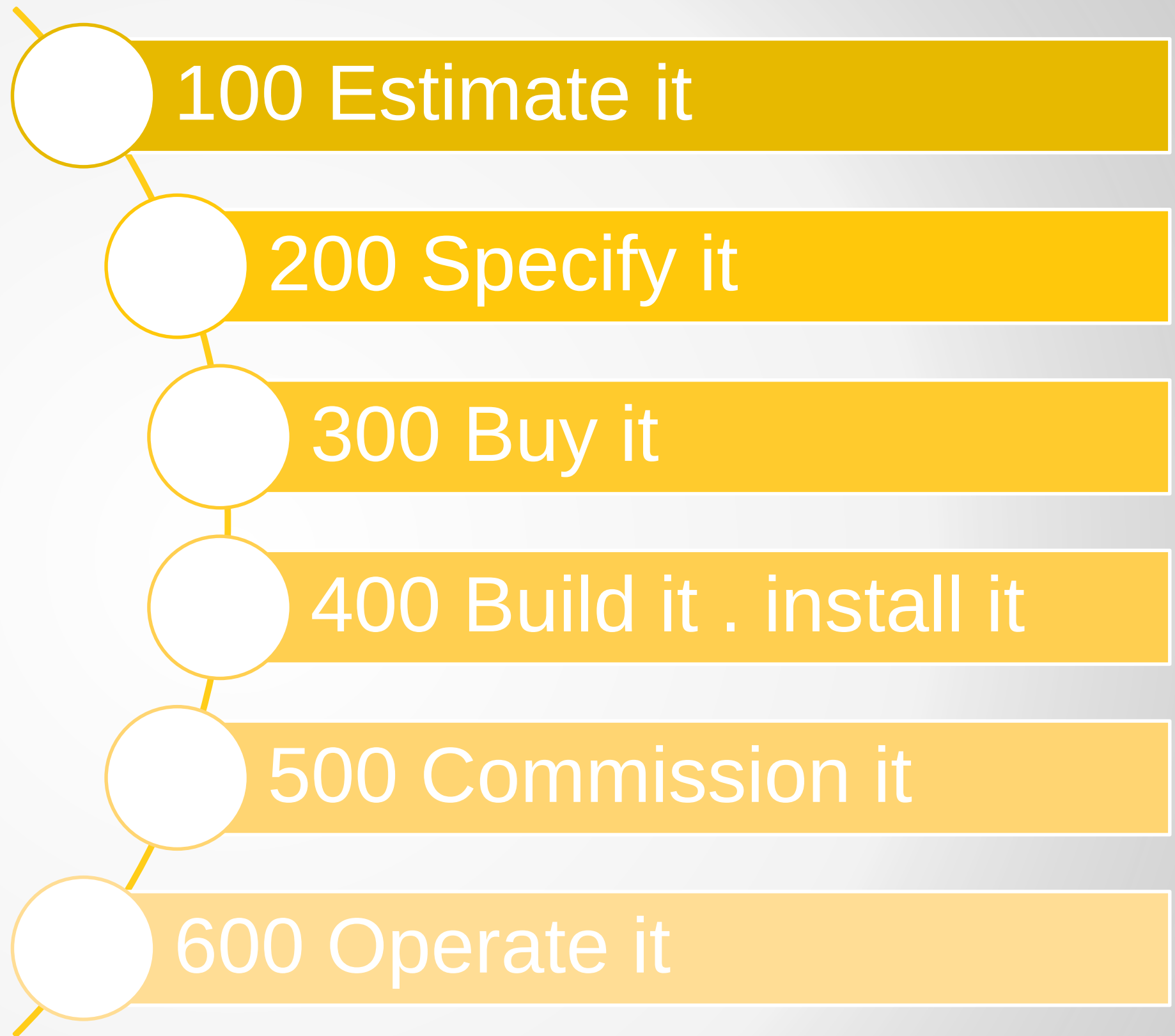
- Job Plans
- Work Orders

Constrained by

- Resources

LOD

- Input: Quantity & Accuracy of Information
- Output: Quality & Reliability of information



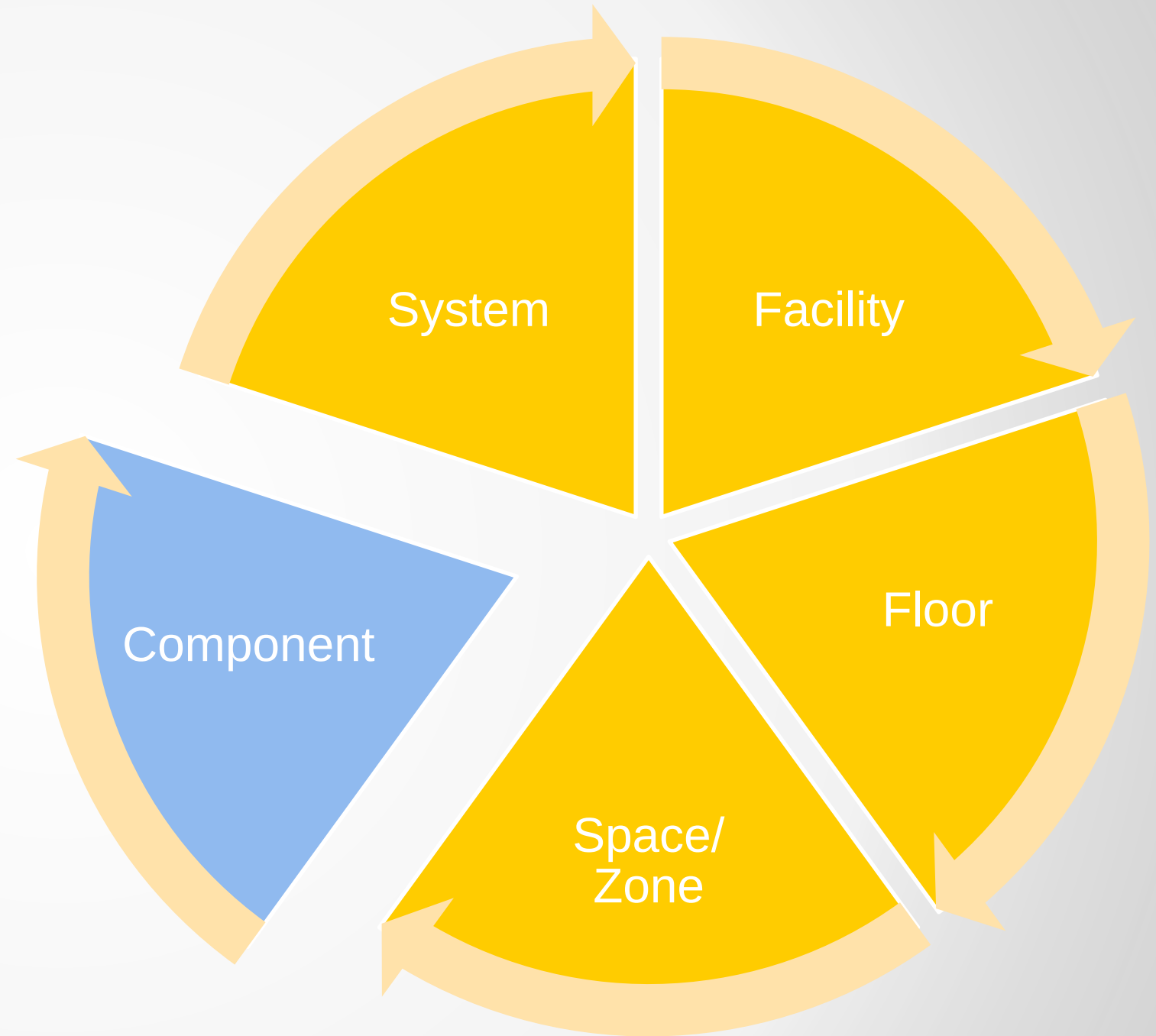
BIM Uses

- Maintainable items
- Assets

Building (Preventative) Maintenance
Scheduling
Building System Analysis
Asset Management
Space Management and Tracking
Disaster Planning
Record Modeling
Site Utilization Planning
Construction System Design
Digital Fabrication
3D Control and Planning
3D Coordination
Design Authoring
Engineering Analysis
Energy Analysis
Structural Analysis
Sustainability (LEED) Evaluation
Code Validation
Programming
Site Analysis
Design Reviews
Phase Planning (4D Modeling)
Cost Estimation
Existing Conditions Modeling

COMPONENT

- Maintainable items
- Assets



What is COBie?

“COBie is the data information exchange of all managed and maintainable assets in a building”

CONSTRUCTION OPERATIONS BUILDING information exchange

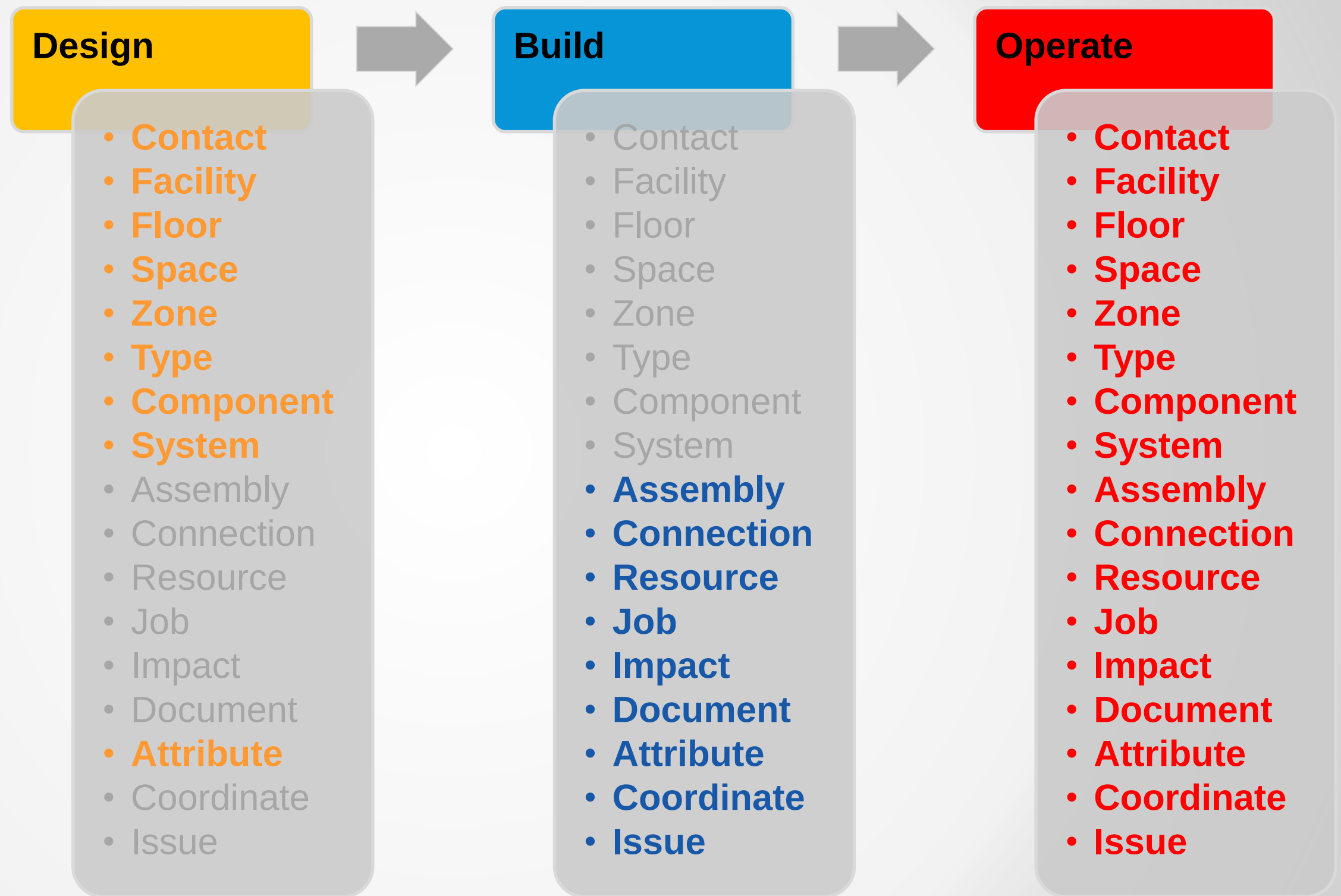
Bill East YouTube

- [COBie4Designers](#)
- [COBie4Owners](#)
- [COBie4Contractors](#)

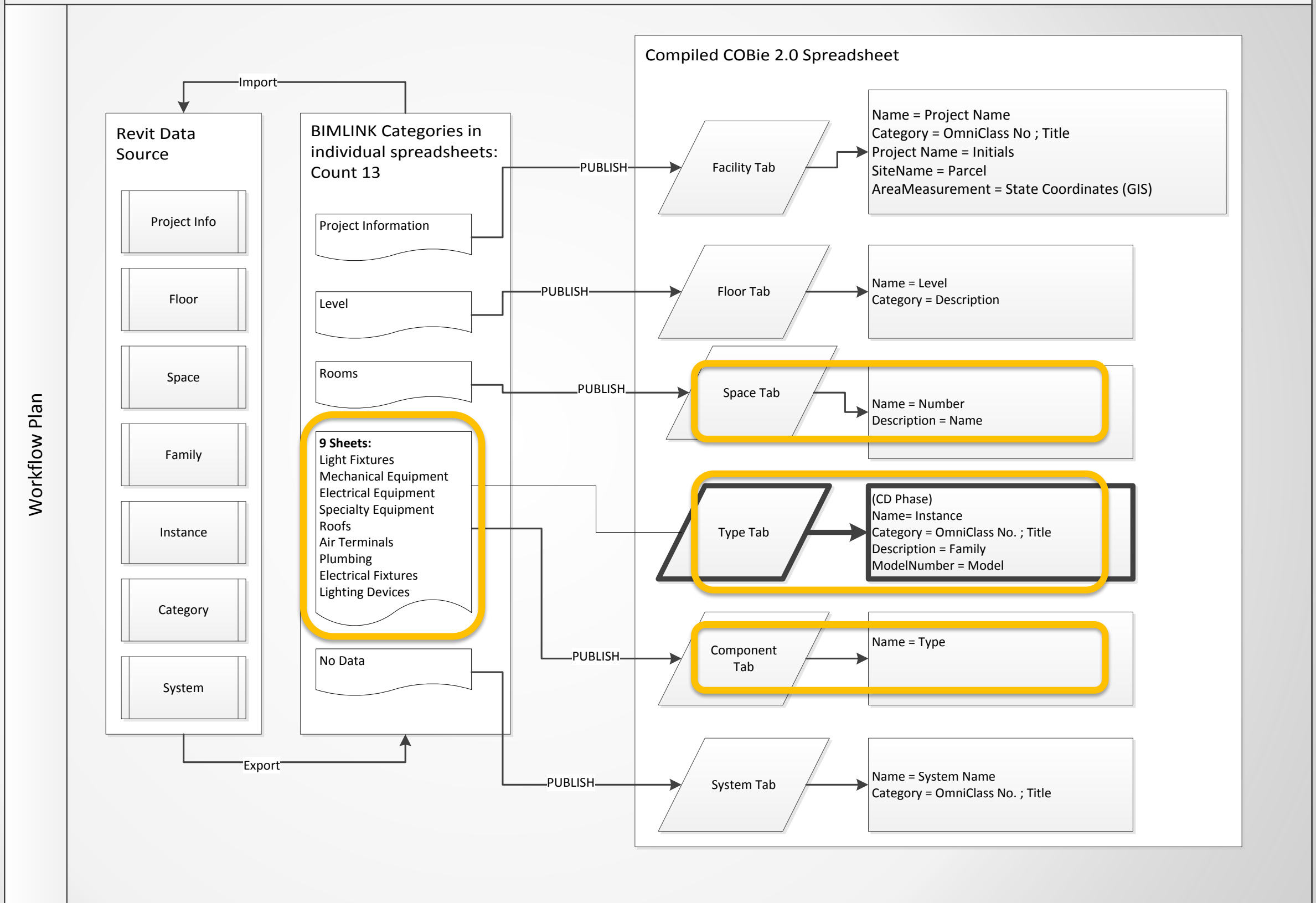
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12 Things

You Should Know About COBie



12 Things You Should Know About COBie



12 Things

You Should Know About COBie

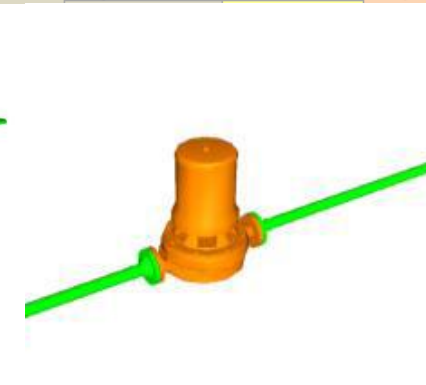
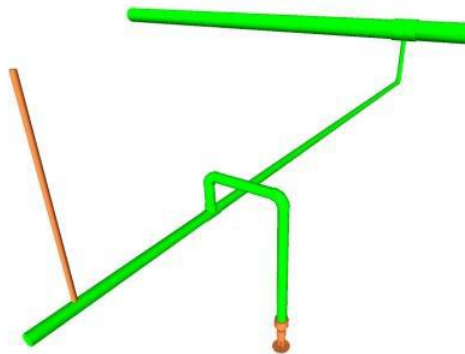
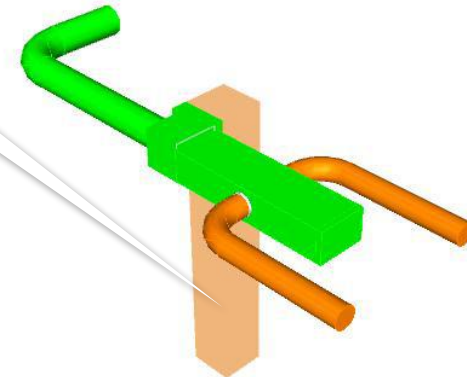
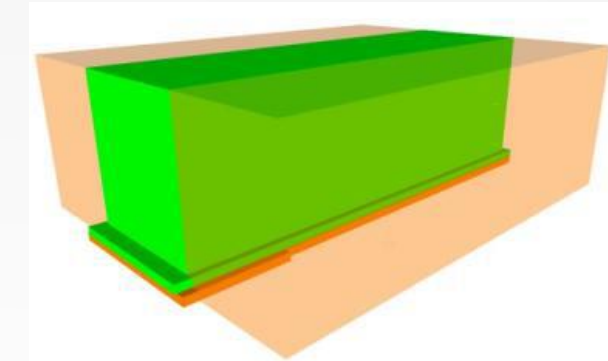
X	23-33 05 15		Heating and Ventilating Units		Type of AHU, without cooling
X	23-33 27 00	Air Humidity Control Equipment			Equipment used in the control of humidity.
?	23-33 31 00	Air Circulators			Products used for the movement of air circulator or circuit.
?	23-33 31 19		Fans		
X	23-33 33 00	HVAC Fan Coil Units			Units consisting of a heating or cooling coil and a fan and controls the temperature of air in a space.
X	23-33 37 00	Refrigerant Condensing Units			Vapor compressors in a refrigeration system, where the refrigerant is liquefied and discharges its heat to the environment.
?	23-33 39 00	Air Conditioning Equipment			Equipment used for air conditioning purposes.
X	23-33 41 00	HVAC Air Terminals			Units at the end of a branch duct through which air is transferred or delivered to the conditioned space.
X	23-33 41 17		Terminal Air Units		
X	23-33 41 17 13			Variable Air Volume Terminal Units	

BIM Component Checklist

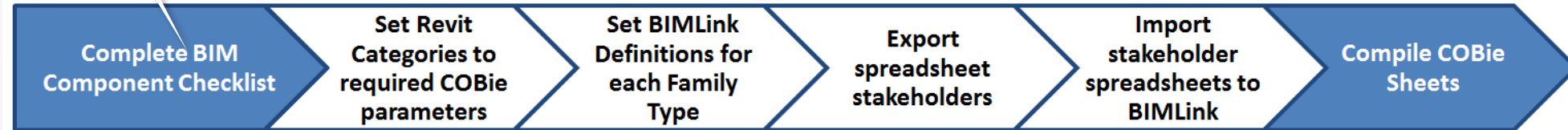
Information Exchange Strategy

LOD 300 MEP defined

BIM-COBie Mapping



Information Exchange

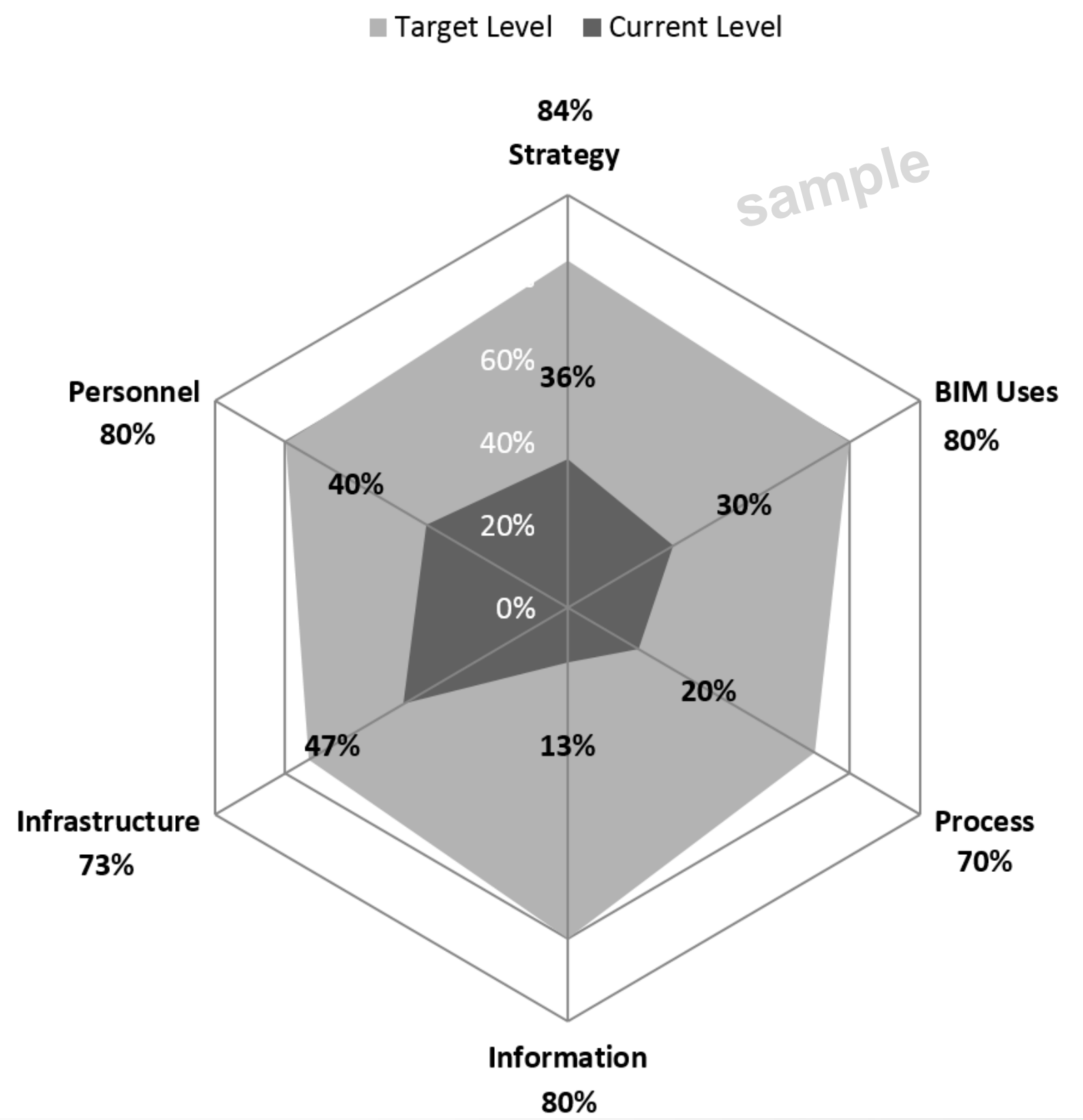


BCJC BIMLink-COBie mapping																				
Revit		BIMLink		COBie		Phase			Model Component Author (MCA)											
Model	Category	Exported Spreadsheets	BIMLink Column Name	COBie Column Name	COBIE Tab	SD	CD	CA	A	E	CM	Cx	OWNER							
ARCH	Project Info	N/A	***	Name	Facility	X			A											
			***	CreatedBy					X	A										
			***	CreatedOn					X	A										
			***	Category					X	A										
			***	ProjectName					X	A										
			***	SiteName					X	A										
			***	LinearUnits					X	A										
			***	AreaUnits					X	A										
			***	VolumeUnits					X	A										
			***	CurrencyUnits																
			***	AreaMeasurement					X	A		CM								
			***	ExtSystem										OWNER						
			***	ExtObject										OWNER						
			***	ExtIdentifier										OWNER						
			***	ExtSiteObject										OWNER						
			***	ExtSiteIdentifier										OWNER						
			***	ExtFacilityObject										OWNER						
			***	ExtFacilityIdentifier										OWNER						
			***	Description									CM							
			***	ProjectDescription									CM							
			***	SiteDescription									CM							
			***	Phase									CM							
			ARCH	Levels					Levels	Name	Name	Floor	X			A				
										COBieCreatedBy	CreatedBy					X	A			
										COBieCreatedOn	CreatedOn					X	A			
COBieCategory	Category	X			A															
RevitExtSystem	ExtSystem						CM													
RevitExtObject	ExtObject						CM													
Unique Id	ExtIdentifier						CM													
COBieDescription	Description						CM													
Elevation	Elevation	X			A															
***	Height						CM													
ARCH	Rooms	Rooms			Number	Name	Space	X								A				
					COBieCreatedBy	CreatedBy										X	A			
			COBieCreatedOn	CreatedOn	X	A														
			OMNIDClass13Value	Category	X	A														
			LevelName	FloorName	X	A														
			Name	Description	X	A														
			COBieCategory	FloorName	X	A														
			COBieRoomTag	Description								CM								
			***	ExtSystem								CM								
			***	ExtObject								CM								
			Unique Id	ExtIdentifier								CM								
			Comments	RoomTag		X			A											
			Limit Offset	UsableHeight		X			A											
			***	GrossArea								CM								
			Area	NetArea	X	A						CM								
ARCH	Roofs	Roofs	Family Name	Name	Componen	X			A											



12 Things You Should Know About COBie

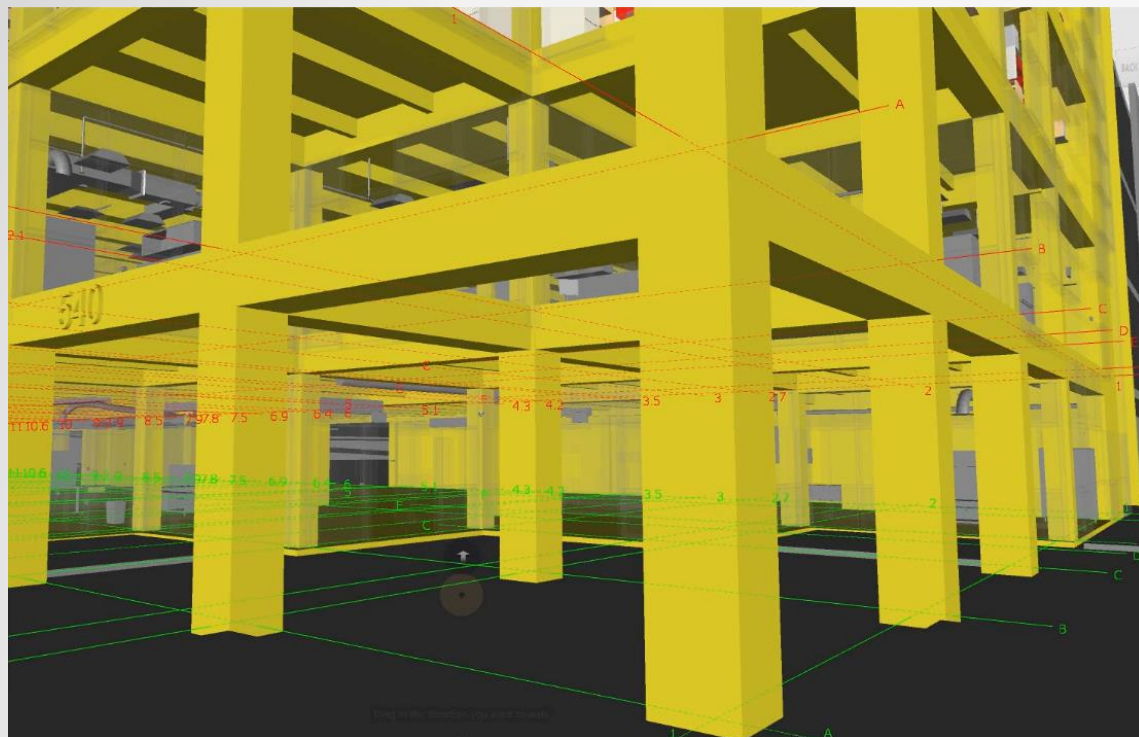
BIM Planning Element	Current Level	Target Level	Total Possible
Strategy	9	21	25
Organizational Mission and Goals	2	4	5
BIM Vision and Objectives	2	4	5
Management Support	2	4	5
BIM Champion	1	5	5
BIM Planning Committee	2	4	5
BIM Uses	3	8	10
Project Uses	2	5	5
Operational Uses	1	3	5
Process	2	7	10
Project Processes	1	4	5
Organizational Processes	1	3	5
Information	2	12	15
Model Element Breakdown (MEB)	1	4	5
Level of Development (LOD)	1	4	5
Facility Data	0	4	5
Infrastructure	7	11	15
Software	4	5	5
Hardware	2	3	5
Physical Spaces	1	3	5
Personnel	10	20	25
Roles and Responsibilities	2	4	5
Organizational Hierarchy	2	4	5
Education	2	4	5
Training	2	4	5
Change Readiness	2	4	5
Totals	33	79	100



Broward County BCJC

Broward County Judicial Center

Fort Lauderdale, FL



SECTION B: PROJECT INFORMATION

- 1) PROJECT OWNER : BROWARD COUNTY
- 2) PROJECT NAME : BROWARD COUNTY JUDICIAL COMPLEX MIDRISE FULL BUILDING RENOVATION
- 3) PROJECT ADDRESS : 540 S.E. 3RD AVENUE, FORT LAUDERDALE, FL 33301
- 4) CONTRACT TYPE : LUMP SUM
- 5) BRIEF PROJECT DESCRIPTION: FULL INTERIOR RENOVATION & CONSTRUCTION FIT OUT (ALL FOUR FLOORS) OF THE EXISTING MIDRISE BUILDING
- 6) PROJECT NUMBER : 060-2013-001(SA – Project Number) & RLI M1102907R1 (BC Number)

SECTION C: KEY PROJECT CONTACTS

ORGANIZATION	CONTACT NAME	ROLE	EMAIL ID	PHONE #
• BC	Rob Dennis	Project Manager	rodennis@broward.org	954-357-647
BC	Brian Kraus	Facilities Maint.	bkraus@broward.org	954-357-531
SA	Chirag Thaker	President	chirag.thaker@rdaep.com	954-537-913
•SA	Albino Rios	Project Manager	albino.rios@rdaep.com	954-537-913
SA	Hernan Pagan	BIM Coordinator	hernan.pagan@rdaep.com	954-537-913
S&F	Sri Srinathan	Principal	sri@sfengineers.com	954-938-007
•S&F	Donata Williams	Project Manager	donata@sfengineers.com	954-938-007
S&F	Laura Sotomayor	BIM Coordinator	laura@sfengineers.com	954-938-007
FE	Keith Mote	Project Engineer	kmote@flynnengineering.com	954-522-100
AA	Brian Kitchens	Project Manager	bkitchens@archall.net	954-764-887
SG	Jonathan Burges	LEED Project Manager	jonathan@thespinnakergroupinc.com	754-800-310
SG	Jessica Stanley	LEED Project Manager	jessica@thespinnakergroupinc.com	954-366-827
DG	George San Juan	Principal	gsanjuan@deltag.net	954-527-117
•DG	Steeve Robitaille	HVAC / MEP Project Manager	steeve@deltag.net	954-527-117
DG	Jorge Banamonde	Fire Protection	jorgeb@deltag.net	954-527-117
DG	Igor Loncarevic	Plumbing	igor@deltag.net	954-527-117
DG	Jermaine Williams	Electrical	jermaine@deltag.net	954-527-117
ASTI	Rabi Sidawi	COBie Consultant	rsidawi@asti.com	404-564-187
PC / GC	Gary Pirtle	Vice President	gary@pirtleconstruction.com	954-343-607
•PC / GC	Jeff Miles	Director of ops.	jeff@pirtleconstruction.com	954-343-540
PC	Elaine Choe	BIM Coordinator	Elaine@pirtleconstruction.com	954-343-607

BIM EXECUTION PLAN

VERSION 3.0 FOR

BROWARD COUNTY JUDICIAL COMPLEX MIDRISE FULL BUILDING RENOVATION


SINGER ARCHITECTS
A RUSSELL AND DAWSON COMPANY

915 MIDDLE RIVER DRIVE, SUITE 404
FORT LAUDERDALE, FLORIDA 33304
TEL. 954-537-9136


DELTA G CONSULTING ENGINEERS, INC.


S&F Engineers, Inc.

2925 W. Cypress Creek Rd., ste. 200
Fort Lauderdale, Florida 33309
p:954.938.0020 f:954.938.0468
e:sfe@sfengineers.com C.A.# 8852
www.sfengineers.com

BROWARD COUNTY JUDICIAL COMPLEX MIDRISE FULL BUILDING RENOVATION

CONTENT:

- SECTION A BIM PROJECT EXECUTION PLAN OVERVIEW
- SECTION B PROJECT INFORMATION
- SECTION C KEY PROJECT CONTACTS
- SECTION D PROJECT GOALS / BIM USES
- SECTION E ORGANIZATIONAL ROLES / STAFFING
- SECTION F BIM PROCESS DESIGN
- SECTION G BIM AND FACILITY DATA REQUIREMENTS
- SECTION H COLLABORATION PROCEDURES
- SECTION I QUALITY CONTROL
- SECTION J TECHNOLOGICAL INFRASTRUCTURE NEEDS
- SECTION K MODEL STRUCTURE
- SECTION L PROJECT DELIVERABLES
- SECTION M REVIT MODEL OWNERSHIP & COBIE RESPONSIBILITY SEQUENCE/ STRATEGY
- SECTION N BIM ROLES AND RESPONSIBILITIES DURING CONSTRUCTION
- SECTION O ATTACHMENTS
- SECTION P GLOSSARY

What Assets to Track?

1. Project Info
2. Levels
3. Rooms
4. Light Fixtures
5. Mechanical Equipment
6. Electrical Equipment
7. Specialty Equipment
8. Floors
9. Roofs
10. Electrical Fixtures
11. Lighting Devices
12. Plumbing Fixtures

ORGANIZATION DETAILSa

SA – Singer Architects (Architecture) S&F – S & F Engineering (Structure) PC - Pirtle Construction
 FE – Flynn Engineering (Civil) SG – Spinnaker Group (LEED Consulting)
 DG – Delta G Consulting Engineers (MEP) ASTI – Applied Software (COBIE Consultant)

SECTION D: PROJECT GOALS / BIM USES

ORGANIZATION	USES
SA	Design Authoring, Design Coordination, Drawing Production, Clash Detection & COBie implementation Asset Management, Design Reviews, Space Management & Tracking, Record Modeling, Code Validation, Programming, Design Reviews, Existing Conditions Modeling.
S&F	Design Authoring, Code Validation Design Reviews, Design Coordination, Drawing Production & Clash Detection, Engineering Analysis, Structural Analysis
FE	Drawing Production, Design Reviews
DG	Design Authoring, Design Coordination, Drawing Production, Clash Detection (MEP specific) & COBie implementation, Space Management and Tracking, Engineering Analysis, Code Validation, Programming, Design Reviews, Existing Conditions Modeling.
PC	To be determined by Construction team.

Clash Detection Schedule

Internal Periodic Clash Detection sessions to be held within each phase as needed for coordination between all teams:

To occur as detailed below:

- 100% Schematic Design & Design Development Phase
- 50% Construction Documentation Phase
- Before 100% Construction Documents are issued
- 100% CD
- Bidding/ Permitting

Clash Detection Meeting

- Typically, meetings will be internal coordination sessions between the A/E design & project team.
- Construction team's (GC) attendance, up to permitting phase, is welcome but not mandatory.
- If the County's involvement is needed to resolve any issues, a notification will be provided to the owner for follow up meetings or input.
- Each discipline must submit a clean *.RVT file minimum 3 days before the meeting.

SECTION G: BIM AND FACILITY DATA (COBie) REQUIREMENTS

Refer to attachment: 1. "BCJC BIM Component COBie Checklist – Omniclass Table 23".
2. "BCJC COBie Model Component Author" (Attachment A) for a phase by phase description of COBie items and the responsibilities of each team member.

SECTION H: COLLABORATION PROCESS

Meeting Procedure

MEETING TYPE	PROJECT STAGE	PARTICIPANT	FREQUENCY	LOCATION
KICK-OFF	Notice to Proceed	Entire Project Team	Once	COUNTY GOV.CNTR
DESIGN COORDINATION	Pre Design/DD/CD	Team Leaders	Weekly	Conference Call
BIM MEETINGS	Pre Design/DD/CD	BIM Managers	Weekly / As required	Conference Call

Note - BIM meetings mainly involve the participation of BIM Managers & Project Managers for coordination. However, the County & other interested parties may join if requested and a physical meeting can be scheduled accordingly and if required.

Model Delivery Schedule (Revit and CAD)

INFORMATION EXCHANGE	DESIGN TEAM	FREQUENCY	DUE DATE	NATIVE FILE TYPE
DESIGN AUTHORIZING	Architect	Weekly	Friday (By 5 PM)	.RVT & PDF
	Structural Engineer	As Requested & Based on Development		.RVT & PDF
	MEP-FP Engineer	Weekly	Friday (By 5 PM)	.RVT & PDF
	Civil Engineer	As Requested & Based on Development		.DWG
	Landscape Architect	As Requested & Based on Development		.DWG

BROWARD COUNTY JUDICIAL COMPLEX MIDRISE FULL BUILDING RENOVATION

**LOD Definitions**

Based on Government Services Administration (GSA) Standards

LOD 100

Overall building massing indicative area, height, volume, location, and orientation may be modeled in three dimensions or represented by other data.

The Model Element may be graphically represented in the Model with a symbol or other generic representation, but does not satisfy the requirements for LOD 200. Information related to the Model Element (i.e. cost per square foot, tonnage of HVAC, etc.) can be derived from other Model Elements.

LOD 200

Model elements are modeled as generalized systems or assemblies with approximate quantities, size, shape, location, and orientation. Non-geometric information may also be attached to Model Elements. Partitions and furniture models shall be included in this phase.

LOD 300

Model Elements are modeled as specific assemblies accurate in terms of quantity, size, shape, location, and orientation. Non-geometric information may also be attached to Model Elements and equivalent to 100% construction documents.

LOD 300 (MEP)

Modeled as design-specified size, shape, spacing, and location of fixtures, equipment, pipe, valves, fittings, and insulation for risers, mains, and branches; approximate allowances for spacing and clearances required for all specified anchors, supports, vibration and seismic control that are utilized in the layout of equipment; actual access/code clearance requirements modeled and equivalent to 100% construction documents.

BROWARD COUNTY JUDICIAL COMPLEX MIDRISE FULL BUILDING RENOVATION

Facilities Maintenance Coordination	Broward County	Revit, AiM, AssetWorks	2014-2015	
COBie Implementation	Broward County	AiM, AssetWorks	2015	
Construction Management/ COBie	GC	Revit	2015	
3D Coordination / Clash Detection	ALL	Navisworks Manage	2014-2015	
COBIE Export	ALL	COBie Extension Revit add-in	2014-2015	
Construction Administration (RFIs etc)	ALL	BIM 360 Glue & Field	2015	

All Revit models will be converted to Revit 2015 at the end of permitting phase.

SECTION K: MODEL STRUCTURE

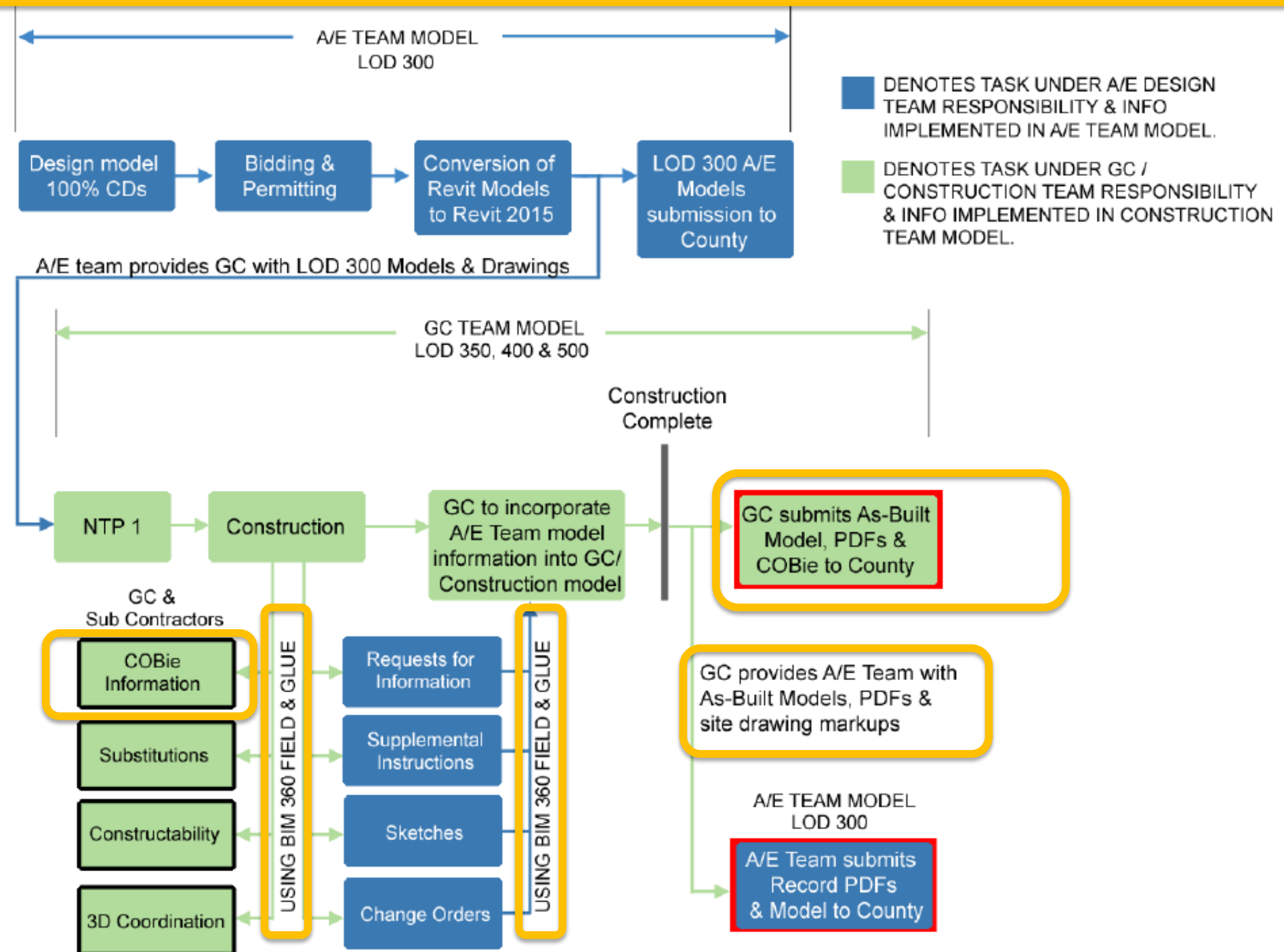
FILE NAMING CONVENTION	
ProjectNumber_Discipline_Central_Version.RVT	(Should a file be upgraded to another version of Revit, the original name will remain as is, in order to preserve links & file references.)
Architecture Model	0602013001_ARCH_CENTRAL_2014.RVT
Furniture Model	0602013001_FURN_CENTRAL_2014.RVT
Structure Model	0602013001_STRUC_CENTRAL_2014.RVT
Mechanical Model (HVAC)	0602013001_MECH_CENTRAL_2014.RVT
Electrical Model	0602013001_ELEC_CENTRAL_2014.RVT
Plumbing Model	0602013001_PLUM_CENTRAL_2014.RVT
Fire Protection Model	0602013001_FIRE PROTECTION_CENTRAL_2014.RVT
LOD 350/400/500 models	TBD BY GC

Project Units

The model unit system is Imperial

Tolerance in Revit will be set to 1/16" and the dimension styles will round to the appropriate increment depending on the scale.

SECTION M: REVIT MODEL OWNERSHIP & COBIE RESPONSIBILITY SEQUENCE/ STRATEGY



Construction Phase Guidelines

1. Model Sharing
2. LOD can vary by element
3. Mandate BIM 360 Glue and BIM 360 Field
4. Prequalify Subcontractors based on BIM Proficiency
5. Supplemental Instructions shall be incorporated into the BIM models
6. Coordination meetings
7. COBie delivery
8. Record vs. As-built models

4. Latest Revit models shall be provided to the GC after permits are approved and at issuance of NTP1 to GC, for development of the LOD 350/400/500 models (shop drawings) as defined by BIM forum and as required by County.
5. Not all items may need to be developed to LOD 350/400. GC shall coordinate with County and develop MEP-FP, Architectural & Structural items to LOD level required for each discipline as directed by County.
6. Once construction begins, the GC shall be responsible for all LOD 350/400/500 Revit model developments and any changes to COBie data based on field verification, constructability, final product selection & installation.
7. The GC shall use BIM 360 Field & Glue for the gathering of COBie field data from Construction Manager/ Superintendent and all sub-contractors in order to integrate all information into the BIM models throughout construction.
8. GC shall review subcontractors BIM proficiency and qualifications.
9. For instances where drawing modifications are required from A/E team to provide sketches, Supplemental Instructions, etc. This information shall be implemented into the Revit models via use of BIM 360 Field & Glue Collaboration. The A/E team will also submit PDFs of all changes to the GC.
10. Construction team (GC) shall be responsible to provide a location and access for the upload/ download of the latest Revit models by A/E teams / sub-contractors to add information, answer RFI's, etc. Construction team (GC) shall keep daily backups of all models Should the GC give ownership of the same model to multiple subcontractors, the GC shall be responsible for organizing and merging all new information into one model including but not limited to: shop drawing sheets, views, updated Revit components, COBie information, etc.
11. The construction team shall schedule virtual coordination meetings as necessary for coordination with Owner and/or A/E team.
12. At the end of construction phase, the GC shall provide COBie deliverables to the Owner for Facilities Maintenance (FM)/ Operations & Maintenance (O&M) as required by the County.
13. At the end of construction phase, the GC shall provide as-built full size drawings and PDFs and transfer the latest Revit models to the A/E team for Review.
14. The A/E team will review as-built information relevant to the development of record drawings and produce a record model & PDFs for delivery to owner.
15. The GC shall also deliver a construction model (LOD 350, 400, 500) to the Owner for FM / O&M use at end of construction.

COBie Process

1. Confirm selection of maintainable assets to be tracked and matured within the project.
2. Verify that all components anticipated in the model exist and have valid naming.
3. Verify that all components have a proper OmniClass Number and Title.
4. Provide Level of Development (LOD) per model component author (MCA) and project phase coordinated with each component and space Object via OmniClass
5. Export spreadsheet to stakeholders
6. Import stakeholder spreadsheets to BIMLink
7. Single category export to BIMLink, map Sheet to COBie Template TAB

BIM-COBie Best practices

- Assign the proper Revit Category to each component
- Assign the proper Component Family Name and Type Name
- Eliminate the use of Revit in-place families
- Minimize the use of Model Groups

COBie Workflow

1. Populating the BIM Component Checklist
2. Identify Revit Categories and Family Types to be tracked
3. Map Revit data to COBie spreadsheet tabs
4. Assign OmniClass table 23 codes to component and system families
5. Assign OmniClass table 13 space types to rooms
6. Create & Maintain BIMLink Links for Exporting Revit data to Excel Spreadsheets
7. Edit/Add information to the Excel spreadsheets
8. Import, Update & Export COBie data to/from Revit via BIMLink to Excel
9. Map BIMLink data to COBie spreadsheet tabs

COBie Process

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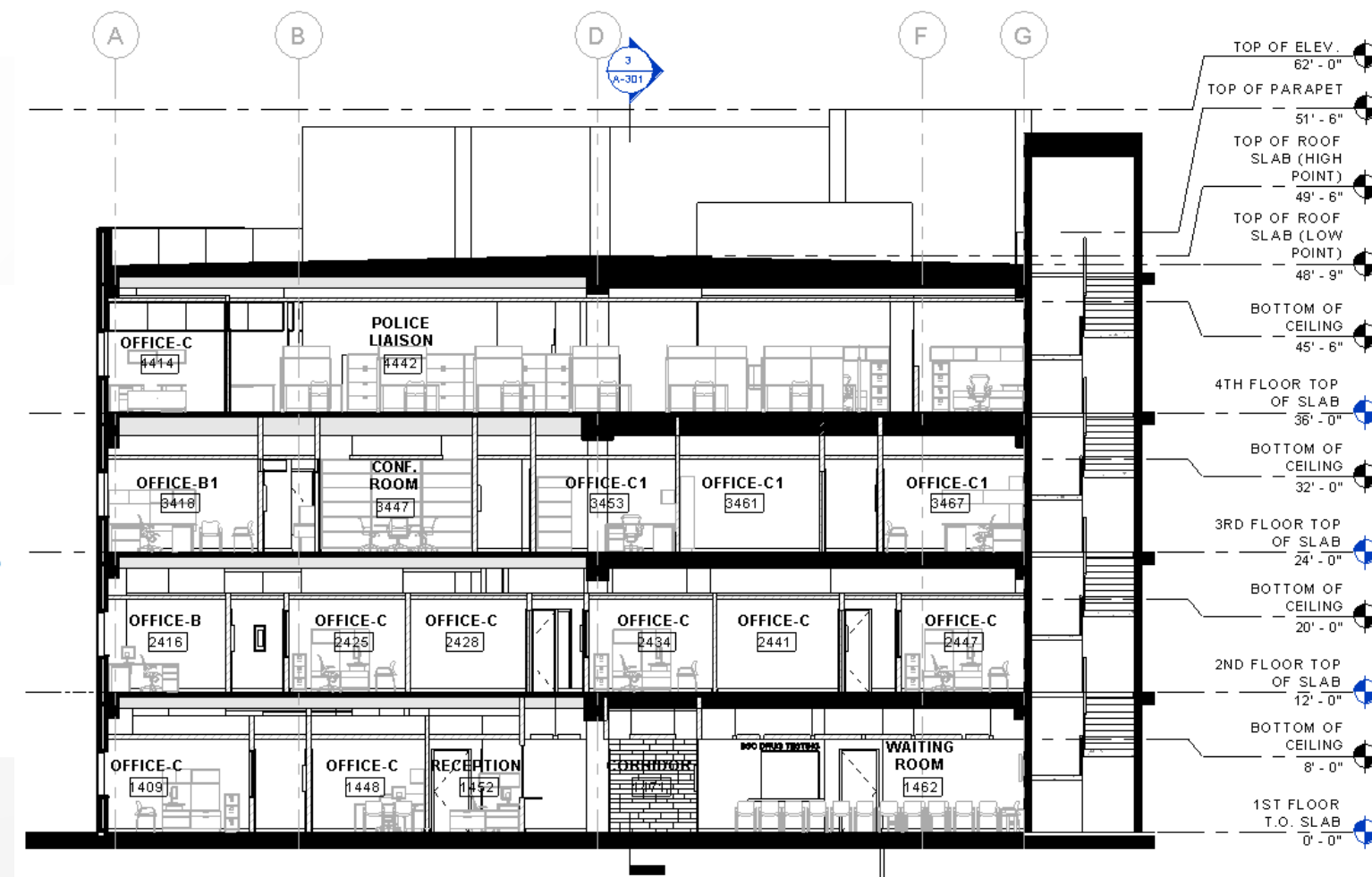
Conclusion

Family component level of development is appropriate for 100% SD Phase. **Omniclass COBie design data exists for most model elements** identified in the BIM Component Check List, as approved by the owner.

The BIM Component Checklist which is represented in the **COBie2-ComponentsToSchedule** is NOT utilized in this phase. This issue remains to be discussed, as it may be substituted by another tool.

We have found some Revit families in the BIM with no family **category**, unidentified family name or **type** name. **Groups** have improved greatly especially in regards to system furniture. Some Revit families and **materials** have **unassigned Unformat Assembly Codes** and most have **unassigned OmniClass codes**. Some elements do not have an associated material or are not associated with a **manufacturer**. In the case of **Rooms**, we have found that some rooms are unplaced, or redundant. Some rooms have invalid **volume** information, ceiling heights not defined, **planned area**, associated **floor finish**, **style**, **department** or **occupancy**. Modeling for Existing conditions has improved. The inability of Revit to schedule "groups" has been replaced by the use of "placeholder" families to schedule system furniture cubicle types, is a great improvement.

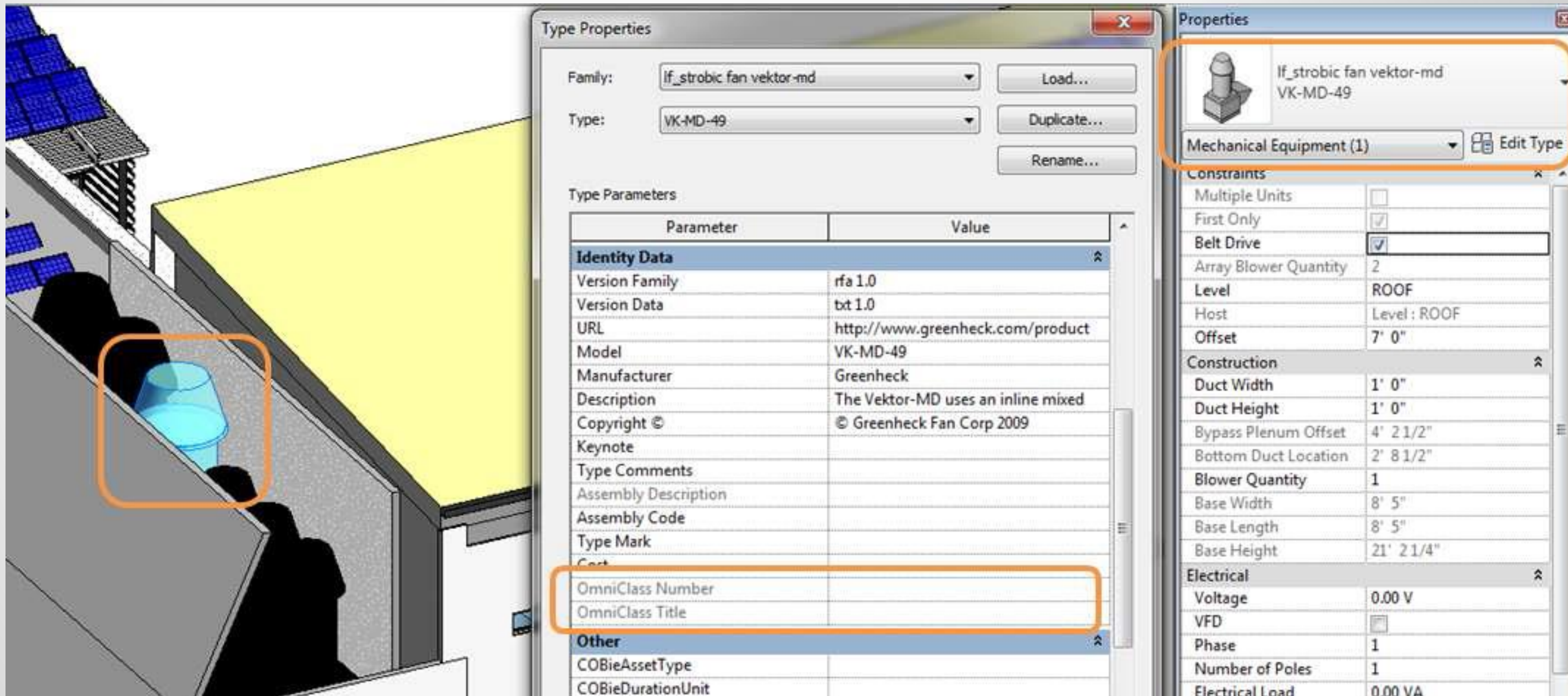
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- 0602013011_STRUC_CENTRAL_2014.RVT
- 0602013011_MECH_CENTRAL_2014.RVT
- 0602013011_ELEC_CENTRAL_2014.RVT
- 0602013011_PLUM_CENTRAL_2014.RVT
- 0602013011_FIREPROTECTION_CENTRAL_2014.RVT
- 0602013011_FURN_CENTRAL_2014.RVT



What about Omniclass?

For Autodesk Revit

- LOD 150. Define Unifomat II Classification as assemblies
- LOD 200. Generate cost estimates based on assemblies
- LOD 250. Define CSI Master-Spec Material classification
- LOD 250. Generate cost estimates to be based on count and material take-offs
- LOD 300. Define Omniclass Classification for Asset Tracking



BIM Proficiency
@ 100% SD's

BIM Proficiency Score

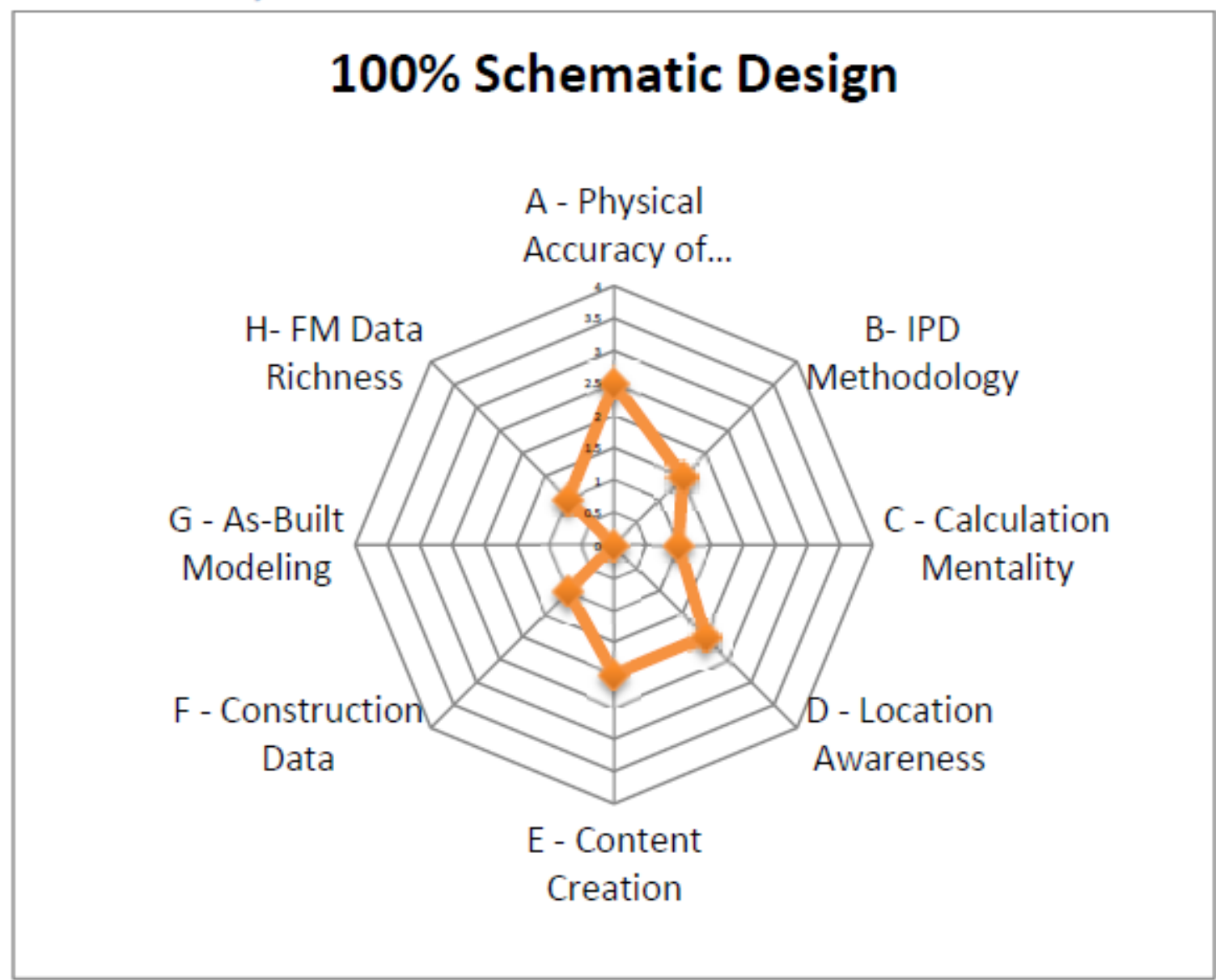


Figure 1 – BCJC BIM Proficiency Diagram at 100% SD Phase BIM Peer Review

A - Physical Accuracy of Model	2.5
B- IPD Methodology	1.5
C - Calculation Mentality	1
D - Location Awareness	2
E - Content Creation	2
F - Construction Data	1
G - As-Built Modeling	0
H- FM Data Richness	1
Max Score of 4 at each	11

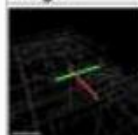
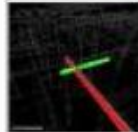
Figure 2 - BCJC BIM Proficiency Score

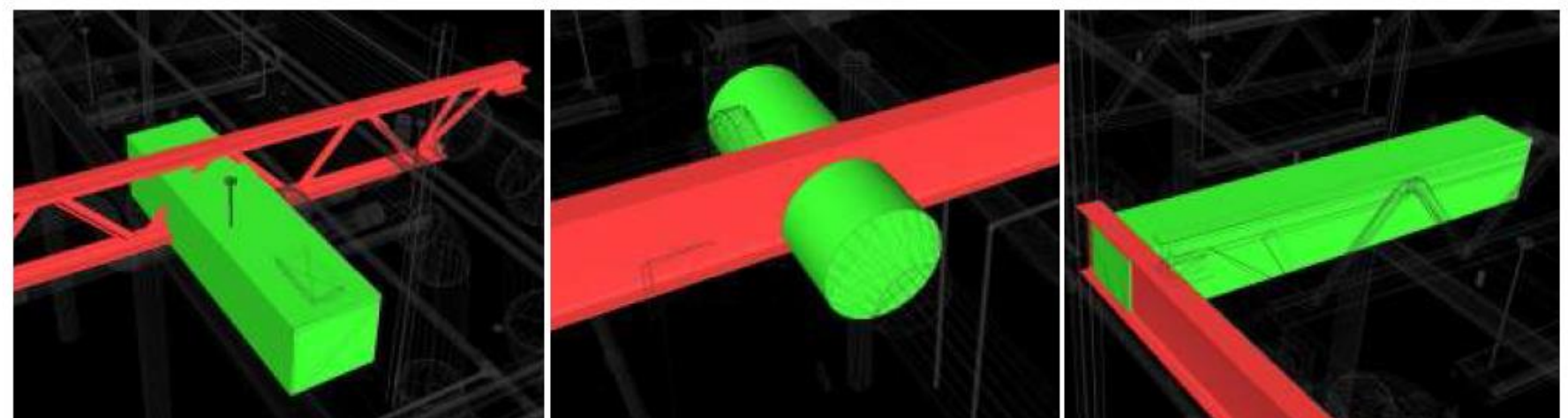
Autodesk® Navisworks®

Clash Report

.mht

BCJC Structural Framing vs. Ducts	Tolerance	Clashes	New	Active	Reviewed	Approved	Resolved	Type	Status
	0.08ft	62	62	0	0	0	0	Hard	OK

Image	Clash Name	Status	Distance	Grid Location	Date Found	Item 1			Item 2		
						Item ID	Category Name	Element Type	Item ID	Category Name	Element Type
	Clash1	New	-0.48	D.2.5 : FOUNDATION PLAN	2014/5/16 13:57.12	Element ID: 261987	Structural Framing	W16X36	Element ID: 842341	Ducts	Taps / Short Radius
	Clash2	New	-0.47	F-9.2 : FOUNDATION PLAN	2014/5/16 13:57.12	Element ID: 268771	Structural Framing	W16X26	Element ID: 911805	Ducts	Taps / Short Radius



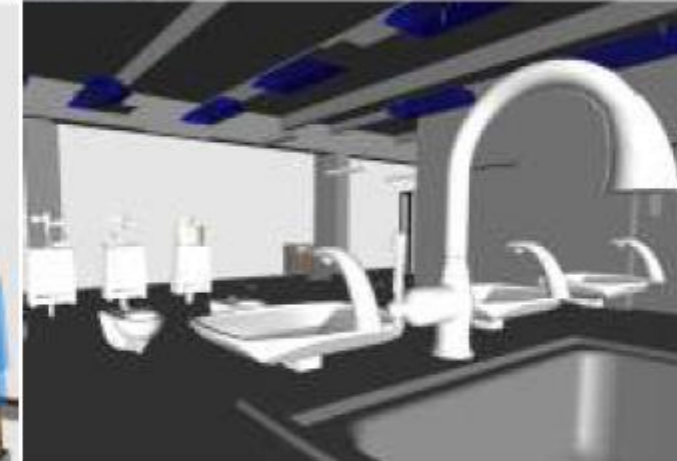
BCJC Clash Detection Matrix

Clash Detection Results - by Category	NO. OF CLASHES - MHT REPORTS							
	28.05.2014	29.05.2014	04.06.2014	09.06.2014	10.06.2014	12.06.2014	17.06.2014	19.06.2014
MECH vs. ELEC_LIGHT FIXTURES_PANELS_EQUIP	101	97	9	5	93	93	5	5
MECH vs. ARCH_CEILINGS	464	490	489	276	436	136	137	137
MECH+PLUM vs. ELEC	101	99	9	5	95	95	6	6

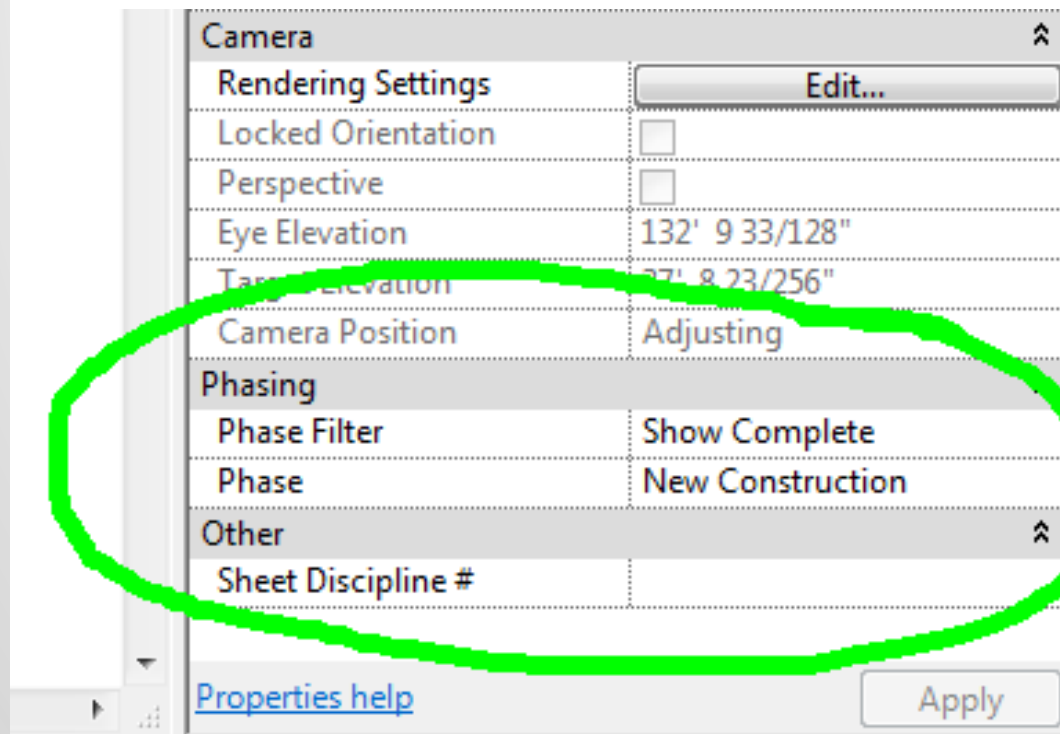
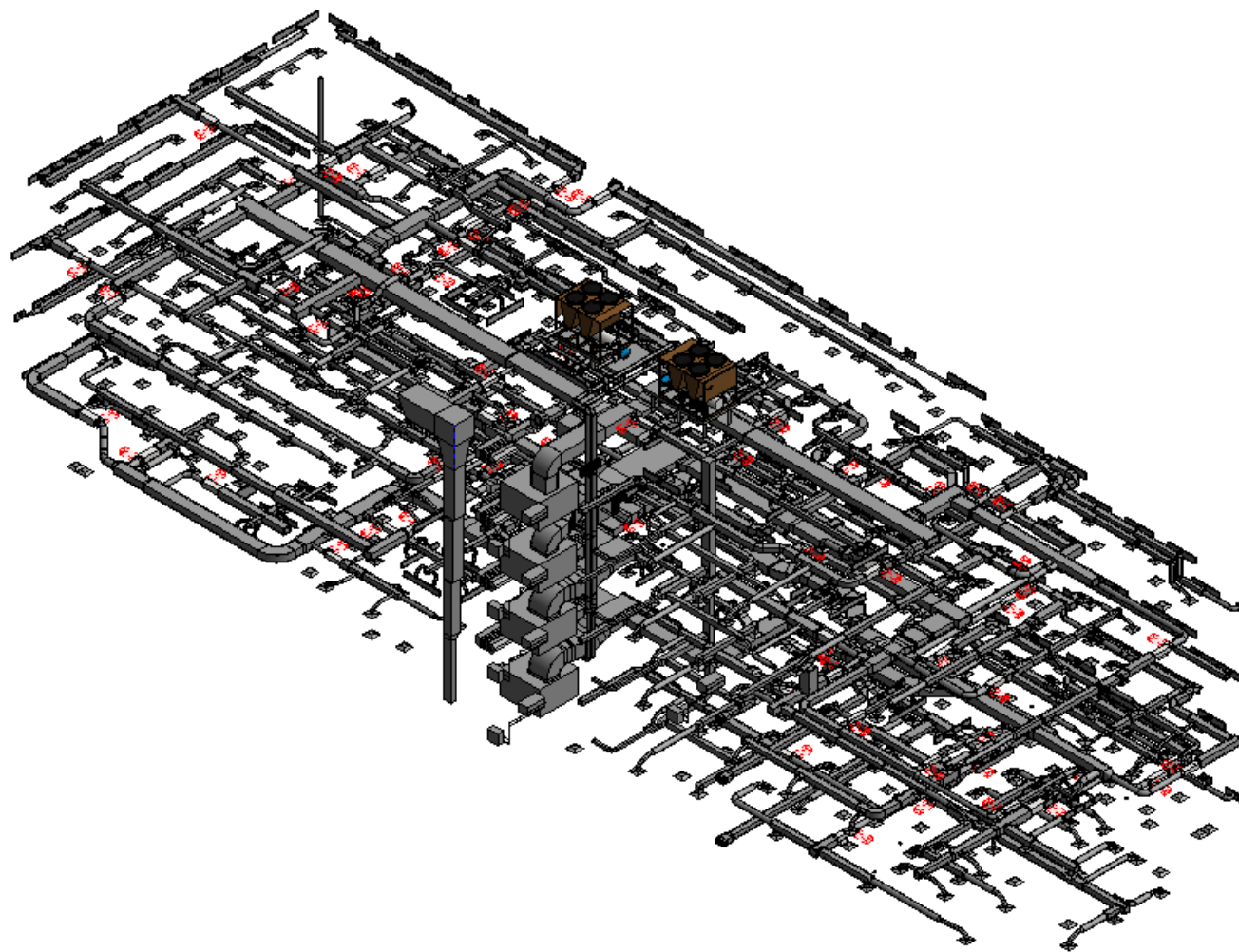
BIM Peer
Review
@ 100% SD's

Autodesk
BIM 360 Glue

Visualization
BIM 360 Glue



A	B	C	D	E	F	G	H
Level	Category	Unifomat		OmniClass		Room	
		Assembly Code	Assembly Descripti	OmniClass Nu	OmniClass Tit	Room: Num	Room: Name
Generic Models							
	Generic Models						
	Generic Models						
Generic Models: 8							
Lighting Fixtures							
	Lighting Fixtures						
	Lighting Fixtures						
Lighting Fixtures: 12							
Casework							
1ST FLOOR	T.	Casework	C1030400	Fabricated Cabinets &	23.40.35.17.47.	Kitchen Casew	
1ST FLOOR	T.	Casework	C1030410	Cabinets	23.40.35.17.47.	Kitchen Casew	1408 BREAK RM



COBIE EXPORT SETUP INSTRUCTIONS

Before you Start

- Detach & Save as Central File
- Create a 3D View
- Merge Phase 2 & 3 (Use combine with next)
- Merge Phase Existing & Phase 1 (Use combine with previous)

COBie Extension Contacts

- Import Contacts from XML
- Change contact information
- Export as XML File
- Save & Close

COBie Extension Settings

- Import Settings from XML
- Check "United States" Check "Global Unique Identifier (GUID)"
- Uncheck "append Arch or MEP to each"
- **"Component in system" checkbox must be checked or file will be invalid-"Each component listed in its own row"**
- Mark element ID./Family _Type_Type Mark
- Check items to track by Room or Spaces
- Check all applicable items to track
- Save & Export Settings to XML File

COBie Extension Modify

- Select elements to be exported
- Select: 'Ungroup & set parameter'
- Batch modify other fields to be exported
- Ungroup and set parameters
- Select to update "all" parameters (first run)
- Select "Blank" or "all" if **any** items updated
- Export & Uncheck coordinates

Autodesk Building
Solutions YouTube

[COBie Toolkit
for Autodesk
Revit](#)

Rich Mitrenga
T.J. Meehan

COBie 2.4
For Autodesk Revit

COBie Extension

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COBIE WITH REVIT

DOCUMENTATION ▾

COBie Extension for Autodesk Revit

GETTING STARTED GUIDE



About COBie

Learn the basics about the COBie data exchange standard, including information about deliverables and the overall worksheet structure.

[Learn More »](#)



COBie with Revit

Discover how specific Autodesk Revit features align with the COBie data exchange format and what considerations should be made prior to exporting data from a model.

[Learn More »](#)



Documentation

Procedurally outlines how to setup, configure, utilize, and export COBie data from Revit Models using the COBie Extension for Autodesk Revit.

[Learn More »](#)

COBie 2.4

For Autodesk Revit

GUID

General
These settings affect all elements across multiple COBie worksheets.

Locality
☒ United States (US)
☐ United Kingdom (UK)

Type Category
First Priority: OmniClass
Second Priority: Assembly Code (UniFormat)
Third Priority: Keynote
Fourth Priority: Use 'n/a'

Identifier
☐ Revit Element ID
☒ Global Unique Identifier (GUID)

Type Description
☒ Family : Type
☐ Description Parameter from Type Properties

Units
Specify which units will be used when you export to a COBie spreadsheet.

Linear
☒ Revit Project Default
☐ Inches (in.)
☐ Feet (ft.)
☐ Millimeters (m)
☐ Meters (M)

Area
☒ Revit Project Default
☐ Square Feet (SF)
☐ Square Miles (mi²)
☐ Square Meters (m²)
☐ Square Kilometers (K²)

Volume
☒ Revit Project Default
☐ Cubic Feet (CF)
☐ Cubic Meters (m³)

Currency

Area Measurement Standard
Revit Default Area Calculation Method

Names
Choose how the 'Name' column, which allows each row to be unique in a COBie spreadsheet, will be determined.

COBie Space
Revit Room / Space: Number_Name
☐ Append 'Arch' or 'MEP' to each

COBie Type
Revit Family Type: Family_Type_Type Mark
☒ Append Element ID

COBie Component
Revit Doors: Mark_ElementID
Revit Windows: Mark_ElementID
Revit Families: Mark_ElementID

Components in Systems
☐ All components listed in one row (comma separated)
☒ Each component listed in its own row
☒ Export the Components and their corresponding Types that are part of each system

Rooms
Choose whether or not Revit elements are located by Rooms or Spaces.

	Room	Space
Air Terminals	Room	Space
Cable Tray Fittings	Room	Space
Cable Trays	Room	Space
Casework	Room	Space
Ceilings	Room	Space
Columns	Room	Space
Communication Devices	Room	Space
Conduit Fittings	Room	Space
Conduits	Room	Space
Curtain Panels	Room	Space
Curtain Wall Mullions	Room	Space
Data Devices	Room	Space
Doors	Room	Space
Duct Accessories	Room	Space
Duct Fittings	Room	Space
Ducts	Room	Space
Electrical Equipment	Room	Space
Electrical Fixtures	Room	Space
Fire Alarm Devices	Room	Space

Spaces
Choose whether or not Revit elements are located by Rooms or Spaces.

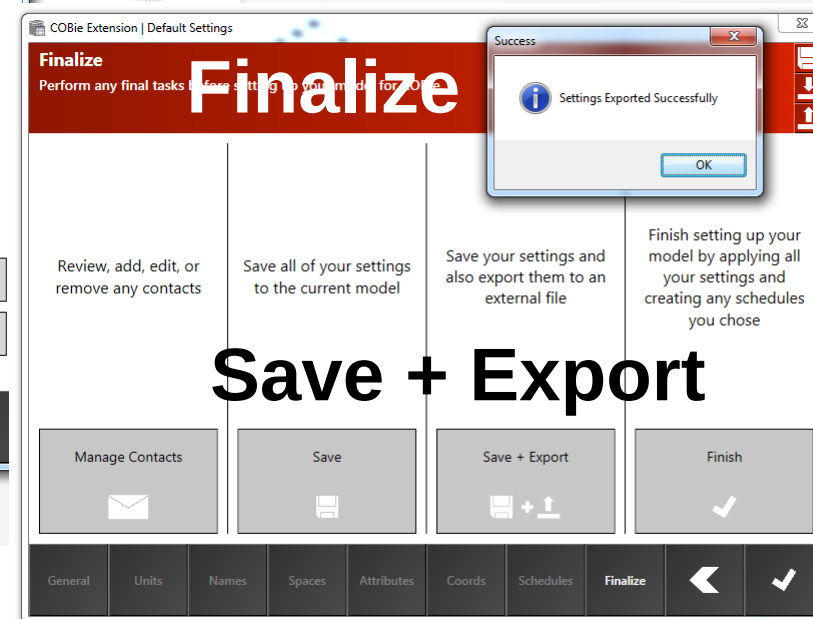
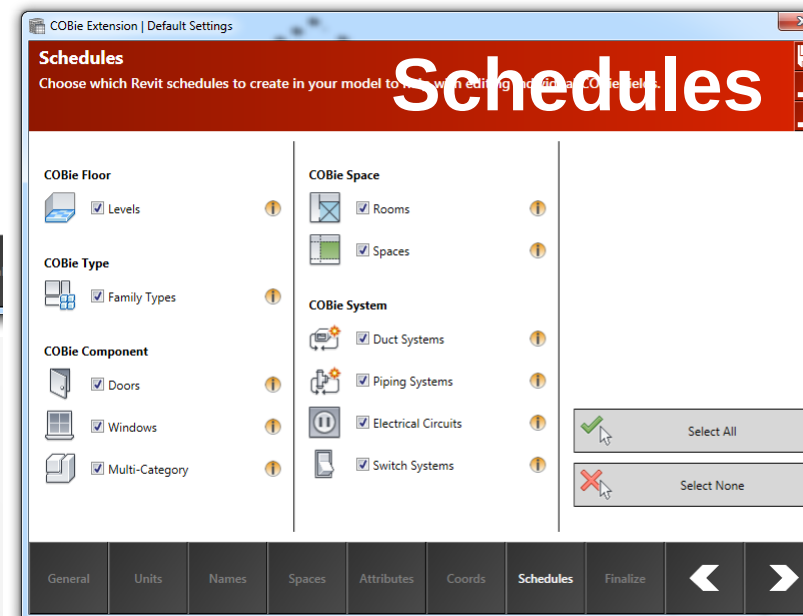
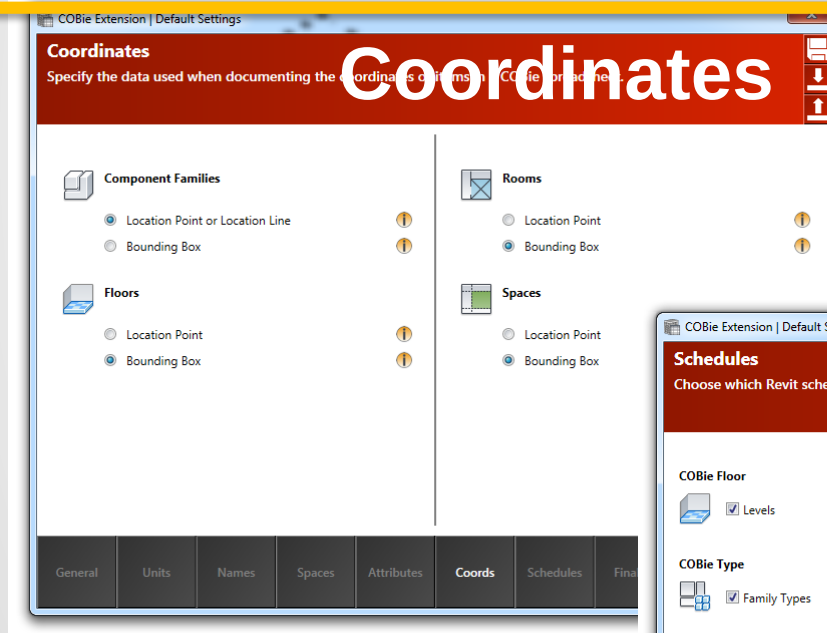
	Room	Space
Fire Alarm Devices	Room	Space
Flex Ducts	Room	Space
Flex Pipes	Room	Space
Floors	Room	Space
Furniture	Room	Space
Furniture Systems	Room	Space
Generic Models	Room	Space
Lighting Devices	Room	Space
Lighting Fixtures	Room	Space
Mass	Room	Space
Mass Exterior Wall	Room	Space
Mass Floor	Room	Space
Mass Glazing	Room	Space
Mass Interior Wall	Room	Space
Mass Roof	Room	Space
Mass Skylight	Room	Space
Mechanical Equipment	Room	Space
Nurse Call Devices	Room	Space
Parking	Room	Space



COBie 2.4

For Autodesk Revit

Do Not Use Coordinates .. if

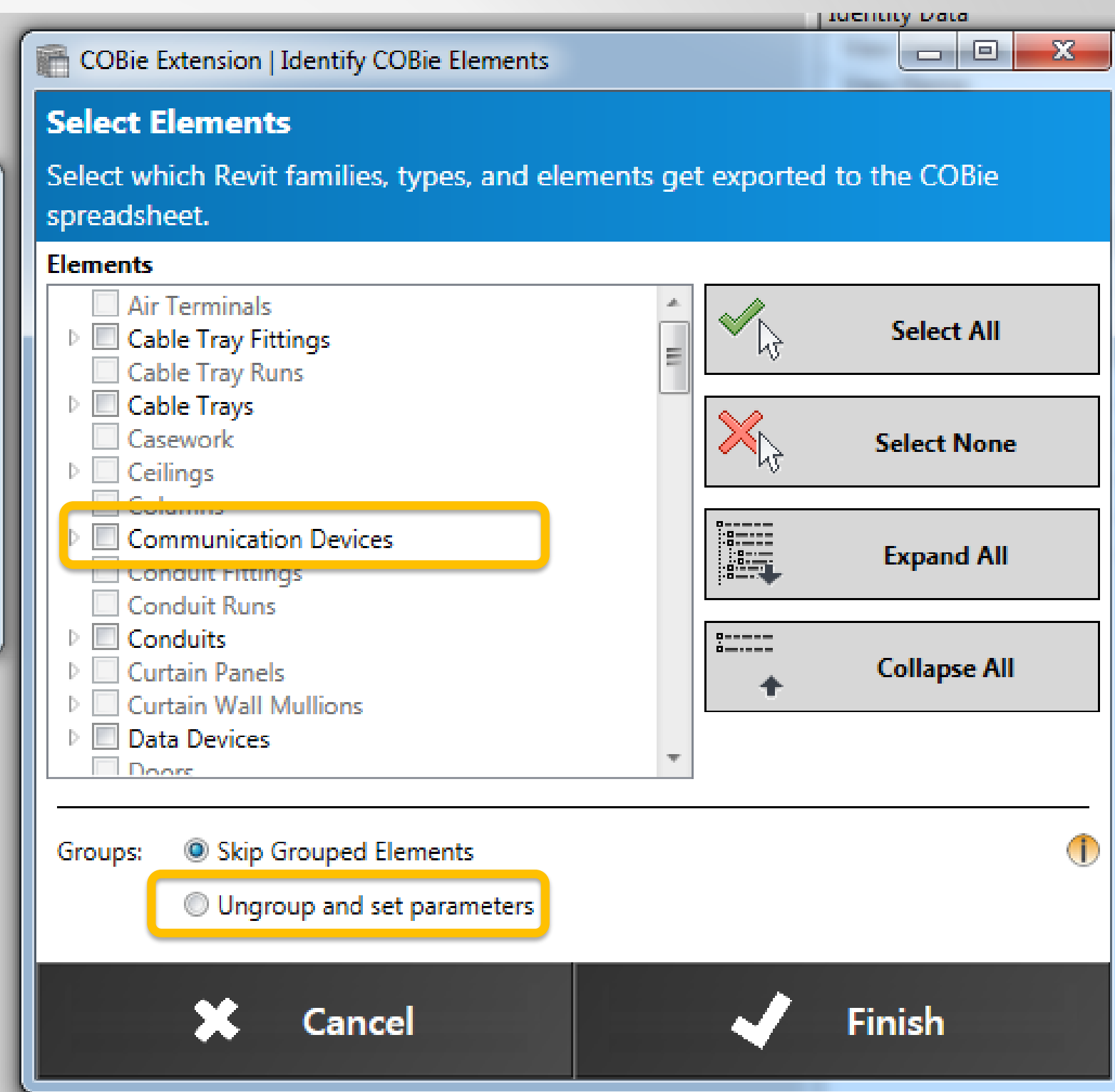
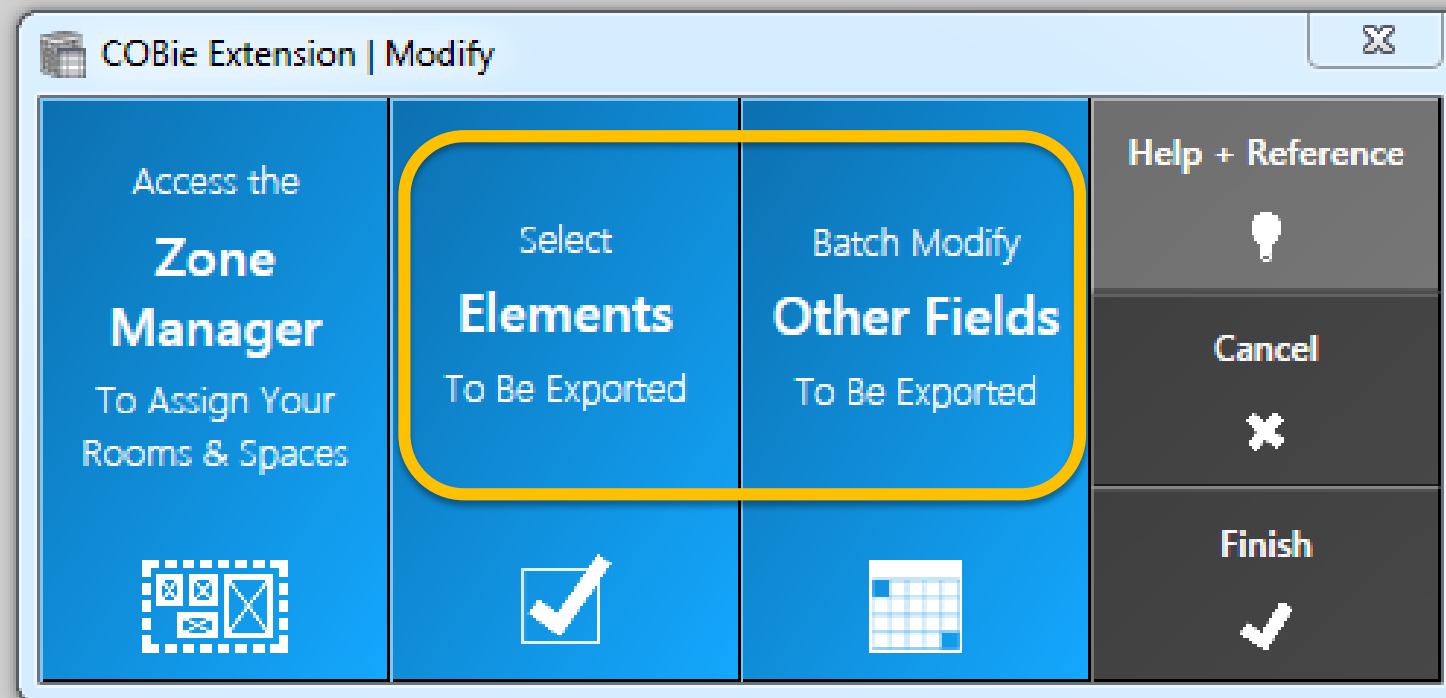


Save + Export

#AU2015

COBie 2.4

For Autodesk Revit



General

- Use COBie 2.4 formatted spreadsheet
- Use the BIM Project Execution Plan (PxP)
- Does NOT import data back into Revit
- Does NOT read linked files
- Does NOT work with Design Options
- Does NOT work with Phasing
- Integration with Broward County FM System:
What FM System does Broward County use (Assetworks AiM)?
- Is AiM compatible with COBie 2.4?
- Owner's Expectations for COBie:
Track Assets for O&M

BCJC

- BIM Uses defined by Broward County
- Model Component Author (MCA)
- Who will lead each discipline?
- Transfer Data Custodian role from Singer Architects to Pirtle Const. for at 100% CD
- Early Participation of all stakeholders
- Pirtle Construction role in COBie
 - Do you have a BIM/COBie process?
 - Will there be another as-built model LOD 400-500?
 - What data will be gathered and tracked?
 - How will data embed into as-built model?
- Delta-G 's role (MEP Engineer)

Best Practices

- Delete redundant rooms and spaces
- Do not export to COBie coordinates tab
- Do not append (_MEP) to space names
- Attribute tab contain the custom parameters
- Do not use COBie zones & system tabs

General

- Use COBie 2.4 formatted spreadsheet
- Use the BIM Project Execution Plan (PxB)
- Does NOT import data back into Revit
- Does NOT read linked files
- Remove Design Options & Phasing before you start
- Integration with Broward County FM System:
What FM System does Broward County use (Assetworks AiM)?
- Is AiM compatible with COBie 2.4?
- Owner's Expectations for COBie: Track Assets for O&M

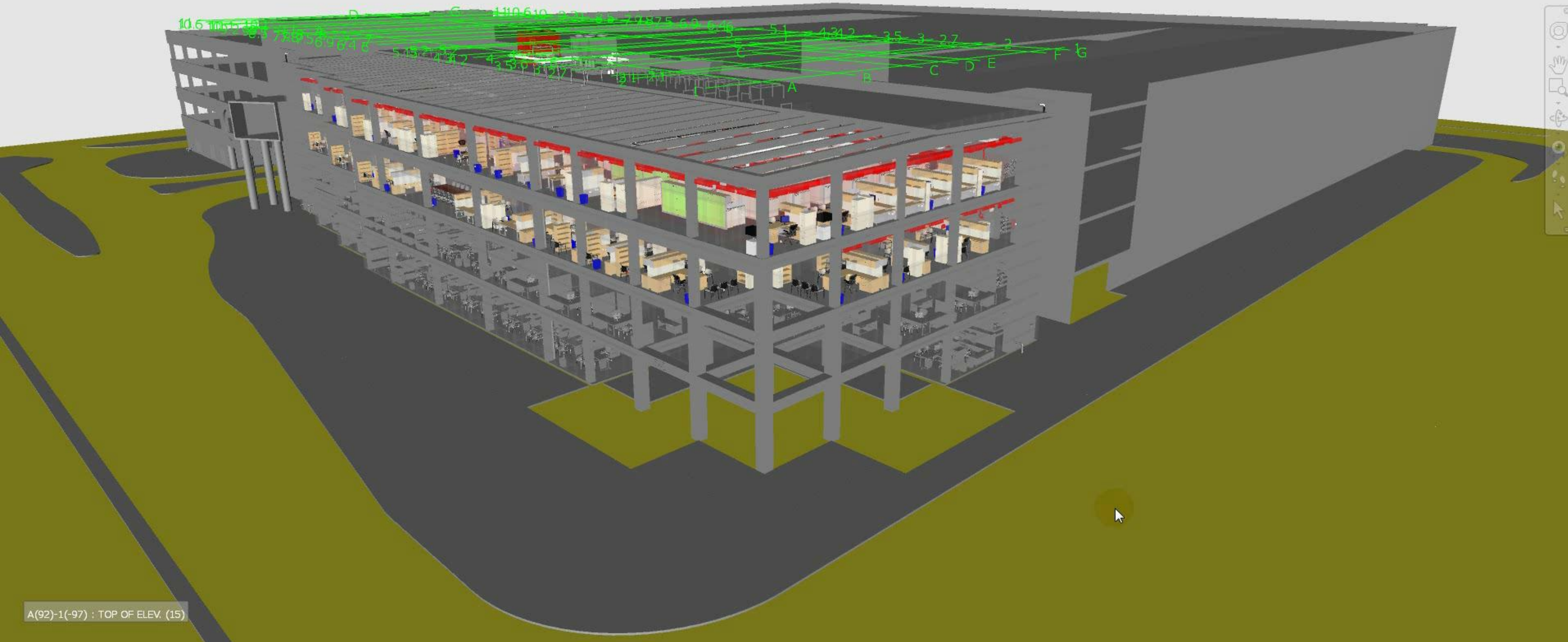
BCJC

- BIM Uses defined by Broward County (Owner)
- Define the Model Component Author (MCA)
- Transfer Data Custodian role from AE Team to Construction Team at 100% CD
- Early Participation of all stakeholders
- Construction Team role in COBie:
 - Do you have a BIM/COBie process?
 - Will there be another as-built model LOD 400-500?
 - What data will be gathered and tracked?
 - How will data embed into as-built model?
- Who will lead each discipline & what is their role?

Best Practices

- Delete redundant rooms and spaces
- Do not export to COBie coordinates tab
- Do not append (_MEP) to space names
- Attribute tab contain the custom parameters
- Do not use COBie zones & system tabs





A(92)-1(-97) : TOP OF ELEV. (15)



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giving away one **FREE**
LiveLabLearning (LLL) class
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