

# 2013 COBie Challenge for Designers

Building Innovation 2013

The National Institute of Building Sciences



# Tested Product

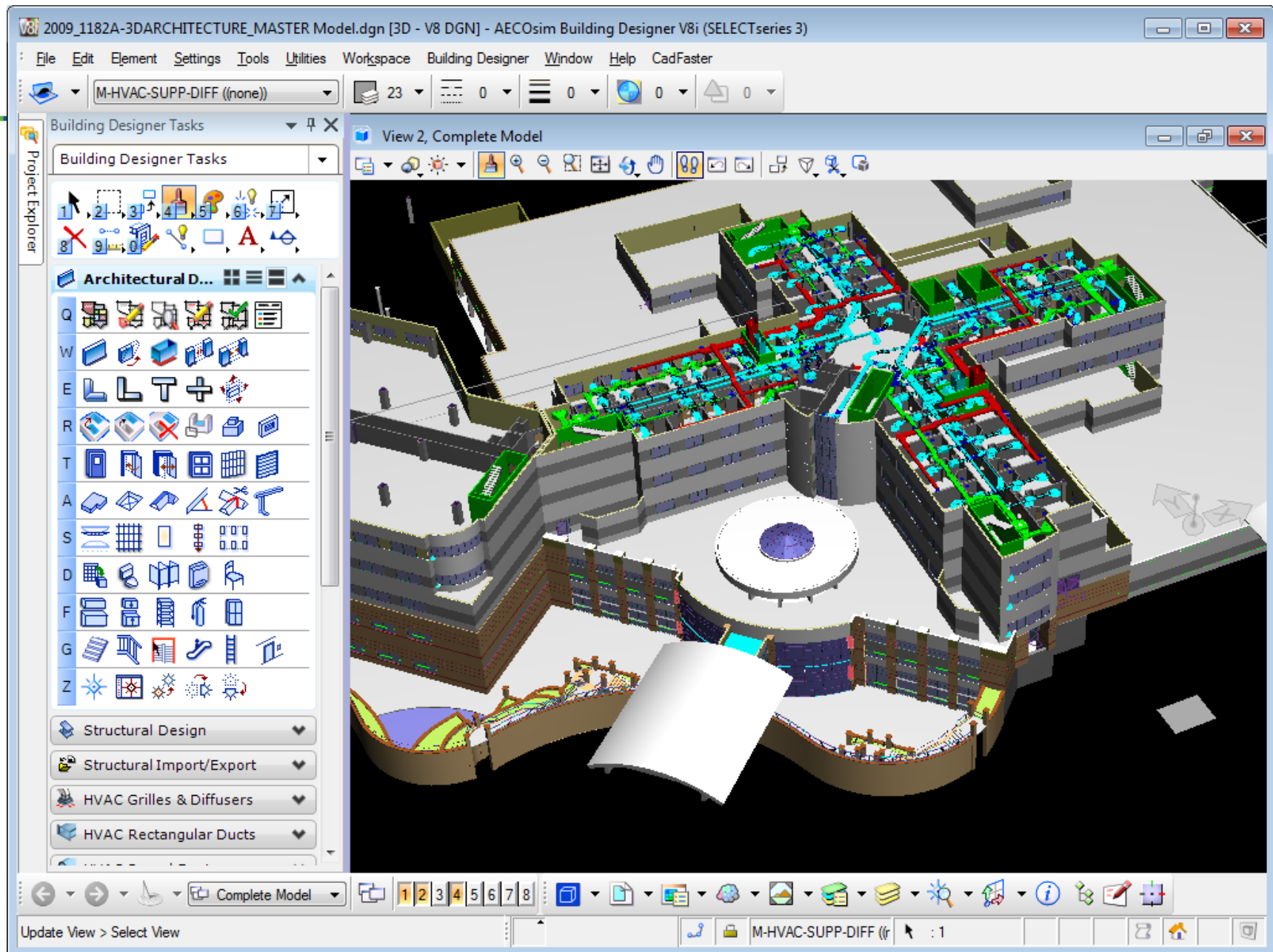


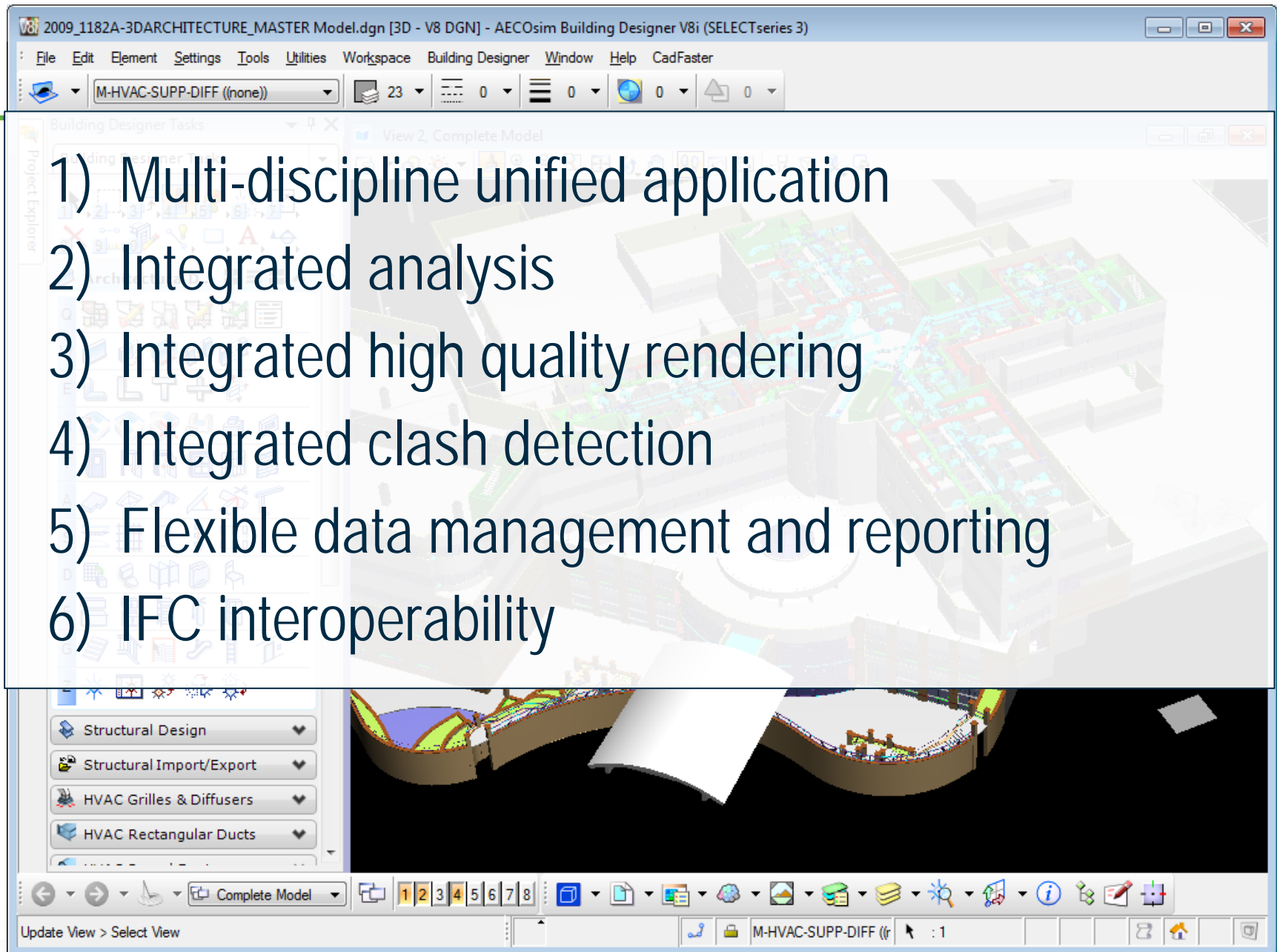
Product name:

Product version: 08.11.09.5xx (1Q13)

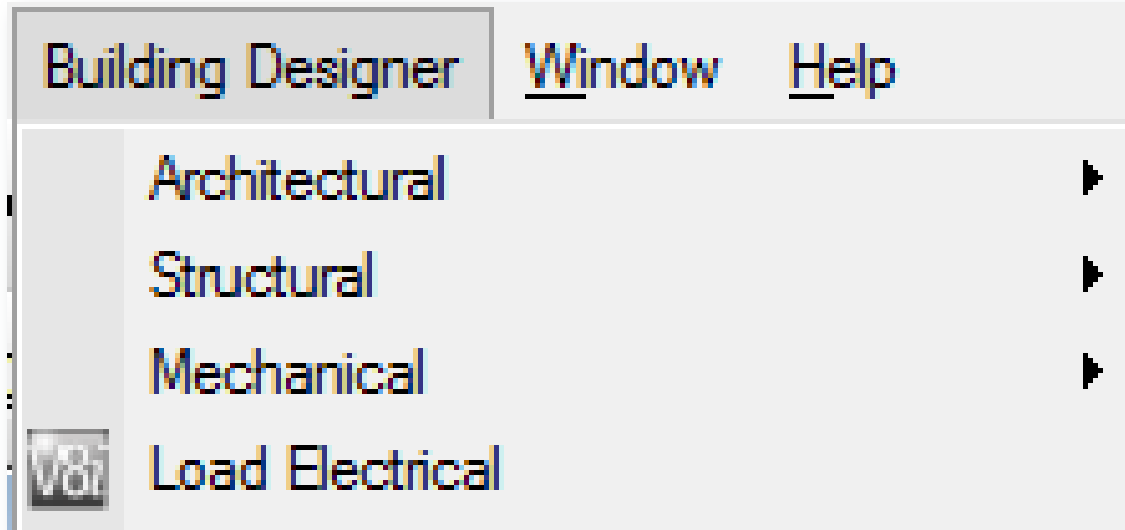
PC or Cloud: Desktop App (+ ProjectWise)

Website: [www.bentley.com/AECOsim](http://www.bentley.com/AECOsim)

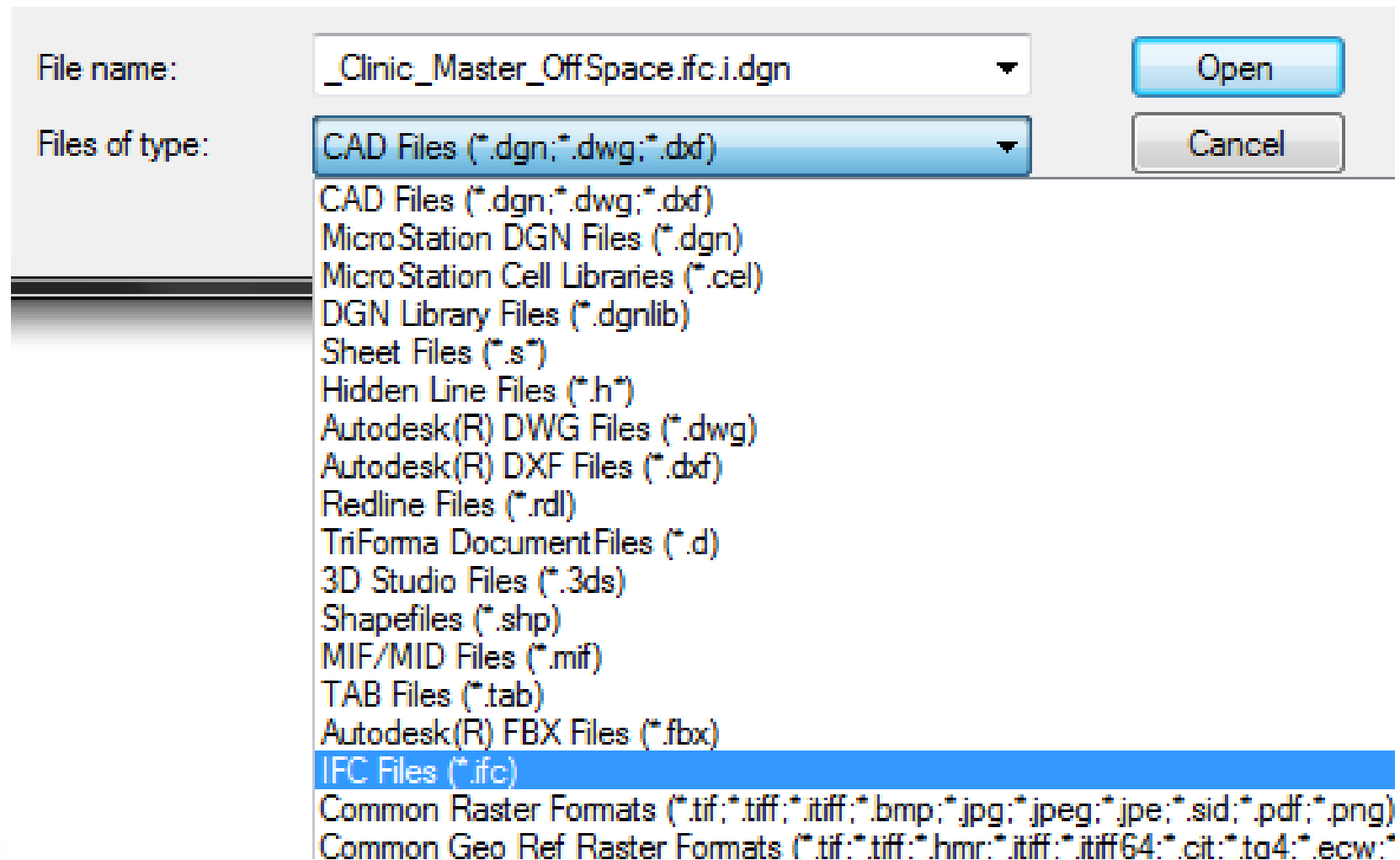




# Discipline Specific Points of Entry



# IFC File Support





# BIM for the Project Lifecycle



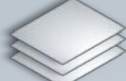
Spatial  
Databases



Building  
Information  
Models



Civil Works  
Information  
Models



Maps and  
Drawings



Specifications



Data Files

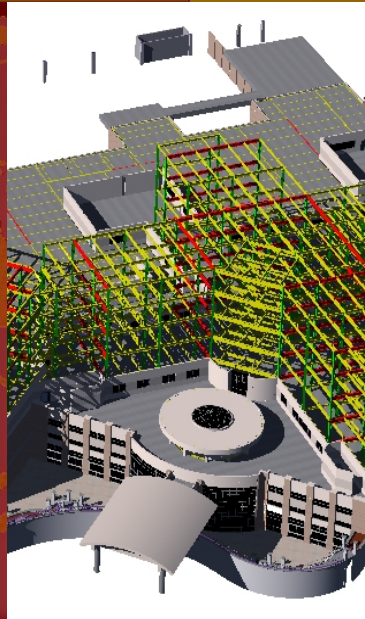
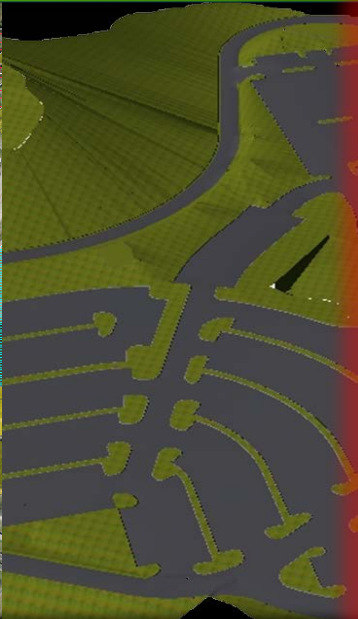
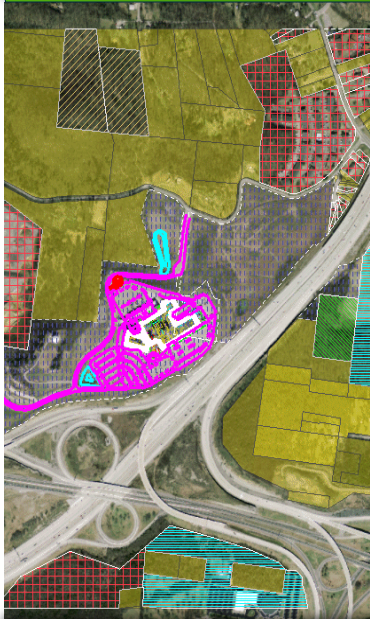


Photos



Office  
Documents

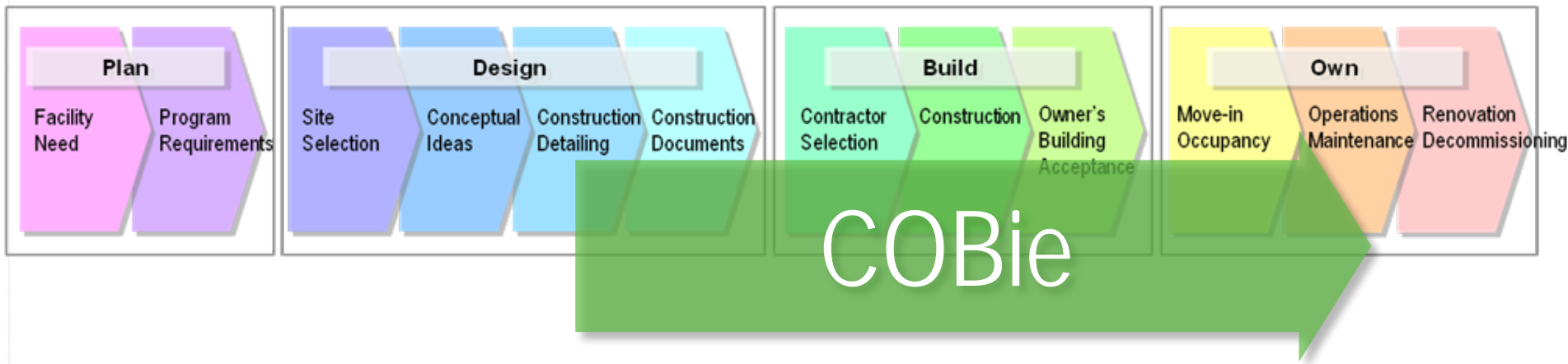
**ProjectWise /Geospatial Server**



**AssetWise/eB Insight Services**

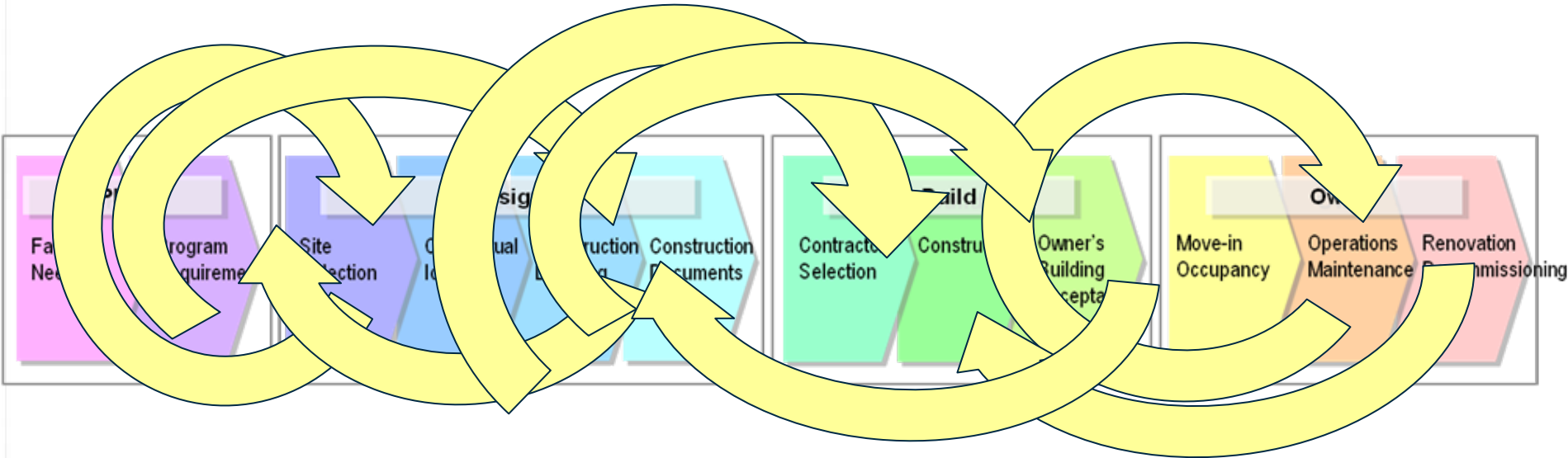
**MicroStation**

# Most Recognized “Traditional” Handover





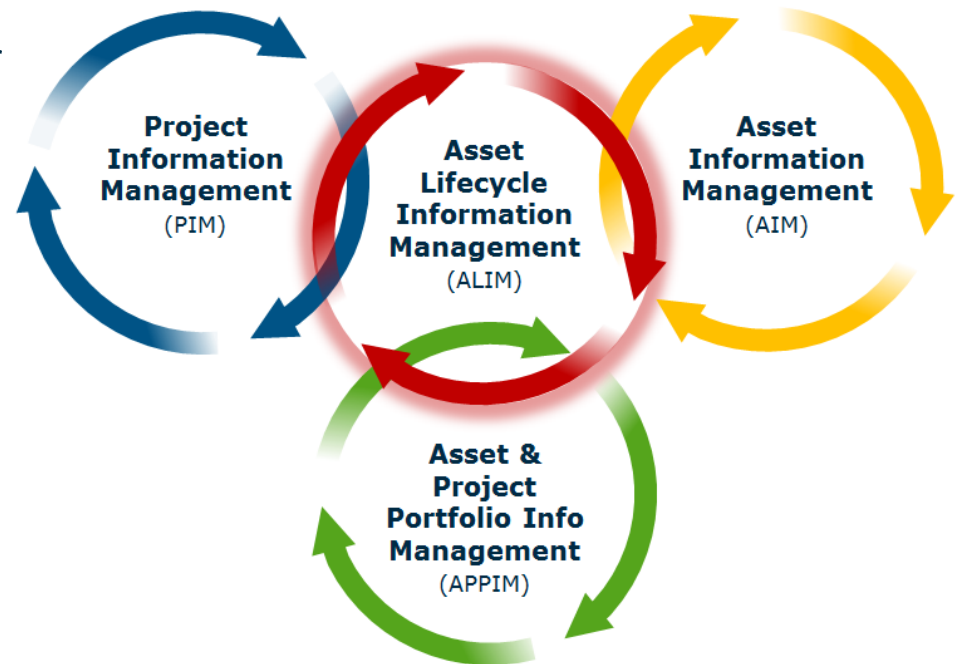
# Continuous Lifecycle Data Handover



# Asset Lifecycle Information Management

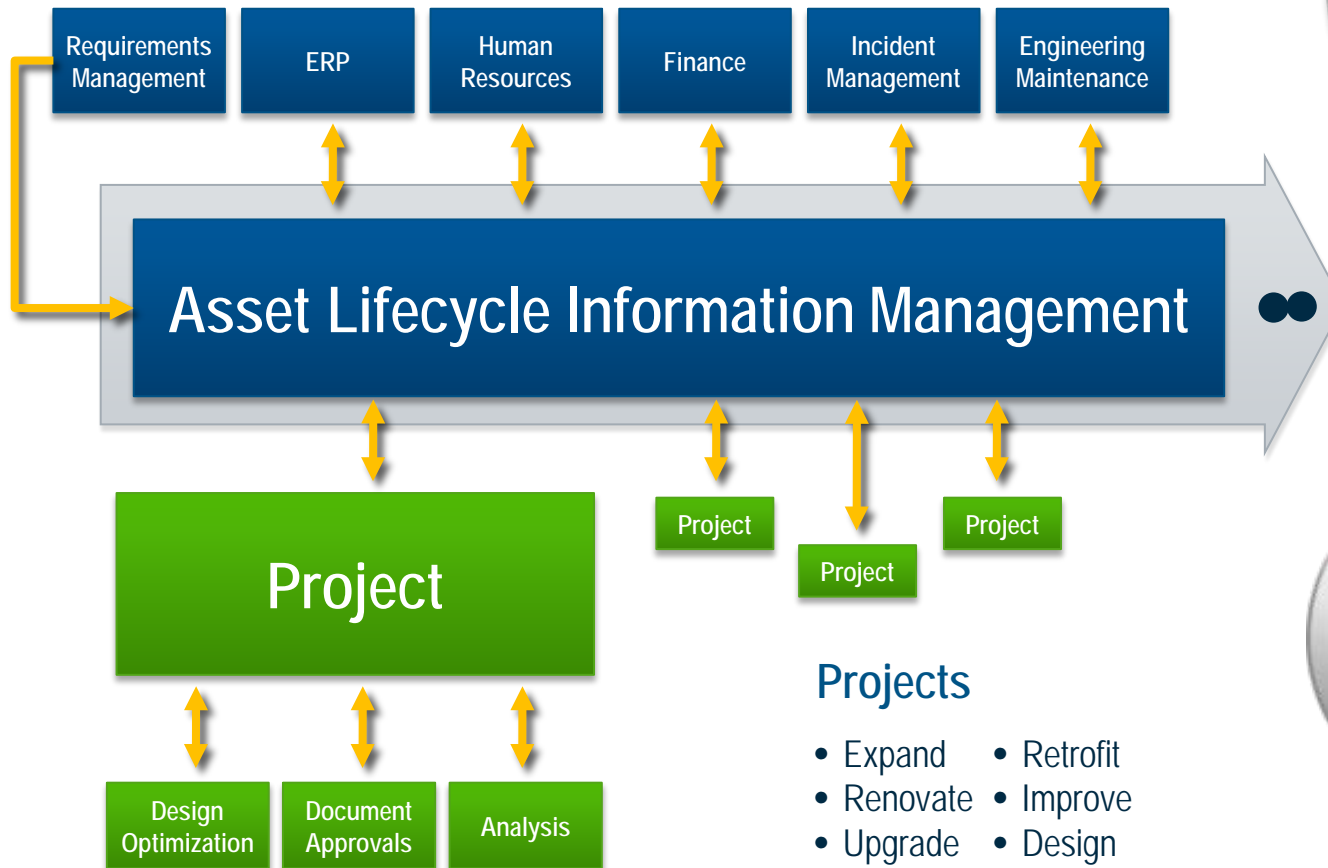
## Ensuring trustworthy information throughout the lifecycle of infrastructure

- Continuous managed handover
- Configuration management
- Change management
- Records management
- Knowledge management
- Workflow processes
- Compliance



## Asset Operations

- Maintain
- Repair
- Compliance
- Safety
- Inspect
- Replace



## Projects

- Expand
- Renovate
- Upgrade
- Retrofit
- Improve
- Design

# Bentley Users



## 20 of the Top 20 in:

- General Building
- Transportation
- Power
- Manufacturing
- Water
- Sewer/Waste

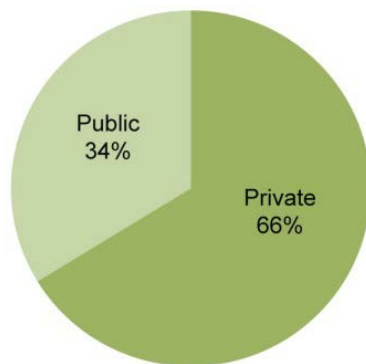
## 19 of the Top 20 in:

- Industrial Process/Petroleum
- Telecommunications
- Hazardous Waste

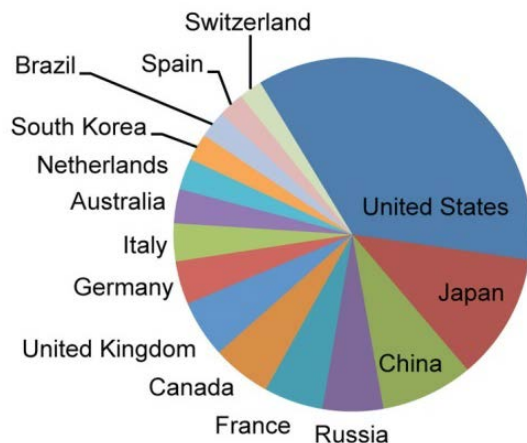
47 of the Top 50 Designers in International

97 of the Top 100 Pure Design Firms

## Owners' Infrastructure Value by Sector



## Owners' Infrastructure Value by Country



## 2012 Bentley Infrastructure 500 Top Owners Ranking



The Bentley Infrastructure 500 is a ranking of the top 500 infrastructure owners in the world, based on the total value of infrastructure assets owned and managed by the company. The ranking is based on the total value of infrastructure assets owned and managed by the company, measured in millions of U.S. dollars. The ranking is based on the total value of infrastructure assets owned and managed by the company, measured in millions of U.S. dollars.

# 234 of Bentley Infrastructure 500

US\$15 billion, exceeds the U.S. GNP for 2011 and is close to the combined annual GNP of China, Japan, and Germany. Bentley is committed to enhancing ROIs through leveraging information modeling in integrated projects to create more intelligent infrastructure on behalf of owner organizations.

Rank	Company Name	Headquarters Country	Infrastructure Value* (millions USD)
1	UNITED STATES GOVERNMENT	United States	343,200
2	EXXON MOBIL CORP	United States	214,664
3	STATE GRID CORPORATION OF CHINA	China	209,727
4	OPEN JOINT STOCK COMPANY GAZPROM	Russia	208,677
5	PETROLEO BRASILEIRO S.A. - PETROBRAS	Brazil	184,133
6	HIGHWAYS AGENCY	United Kingdom	173,148
7	ROYAL DUTCH SHELL PLC	Netherlands	152,081
8	ELECTRICITE DE FRANCE SA - EDF	France	144,875
9	NIPPON TELEGRAPH AND TELEPHONE CORPORATION	Japan	126,110
10	CHEVRON CORPORATION	United States	122,608
11	THE TOKYO ELECTRIC POWER COMPANY INCORPORATED	Japan	121,579
12	BP PLC	United Kingdom	119,214

[www.bentley.com/500](http://www.bentley.com/500)

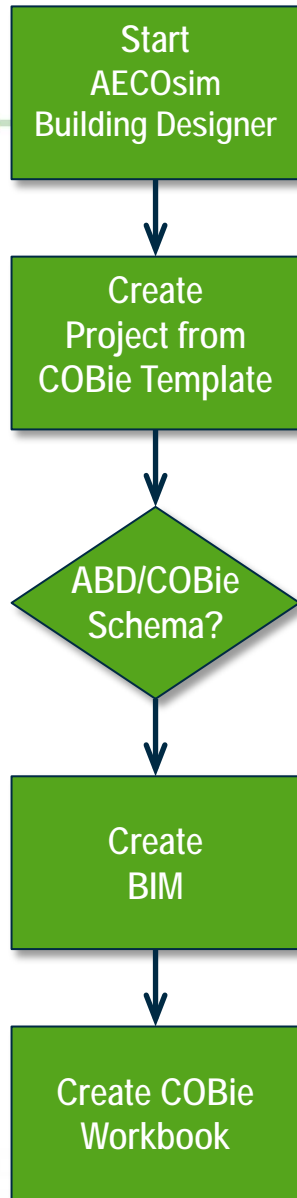


# Designers' COBie Challenge Scope

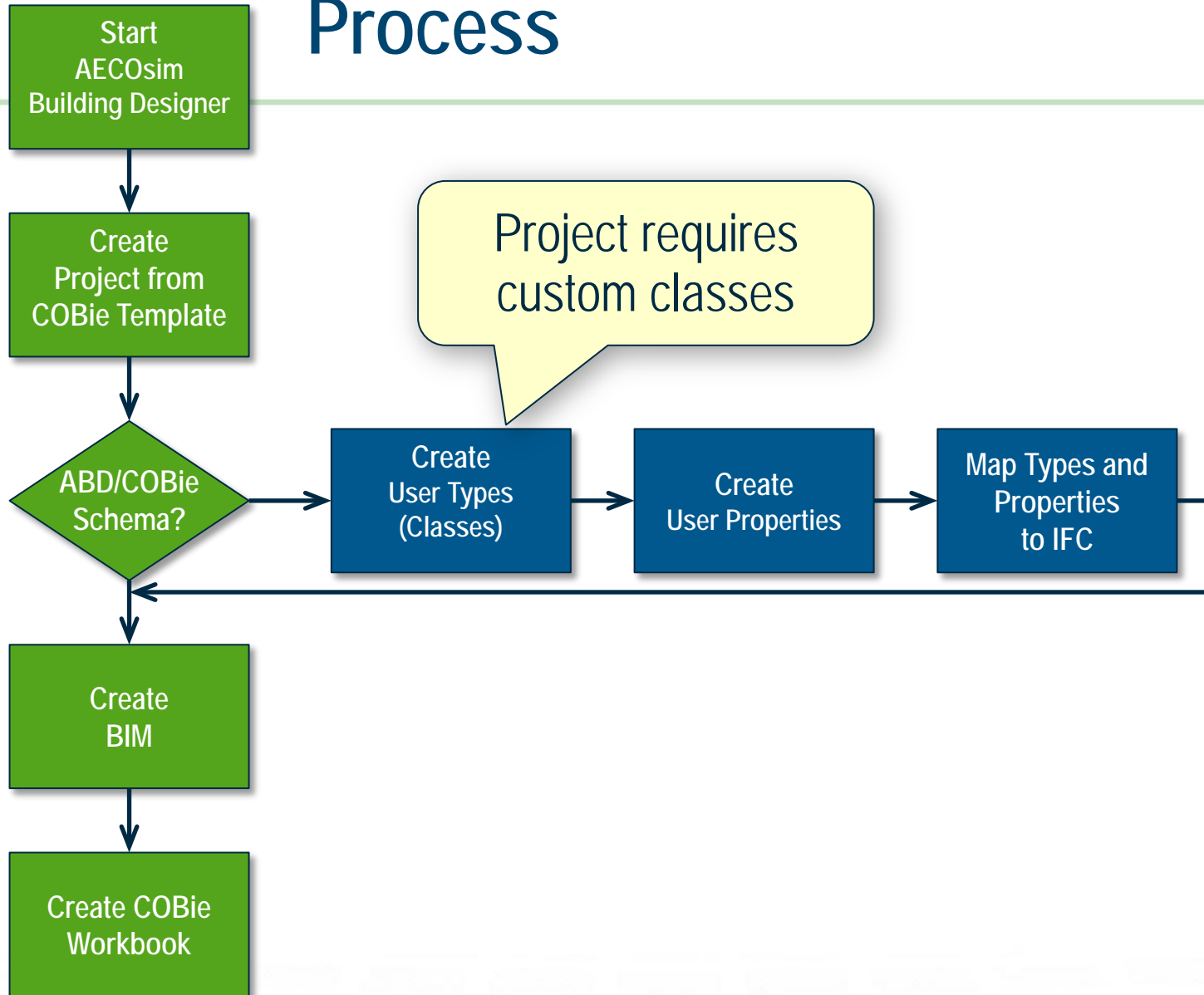
Information	COBie.Sheet	Exported
Spaces and equipment	Space, Type, Component	☑
Space and equipment properties	Attribute	☑
Spatial zones	Zone	☑
Equipment systems	System	☑ *

\* geometry and properties are exported to IFC, but not modeled and tested for COBie Challenge

# Process

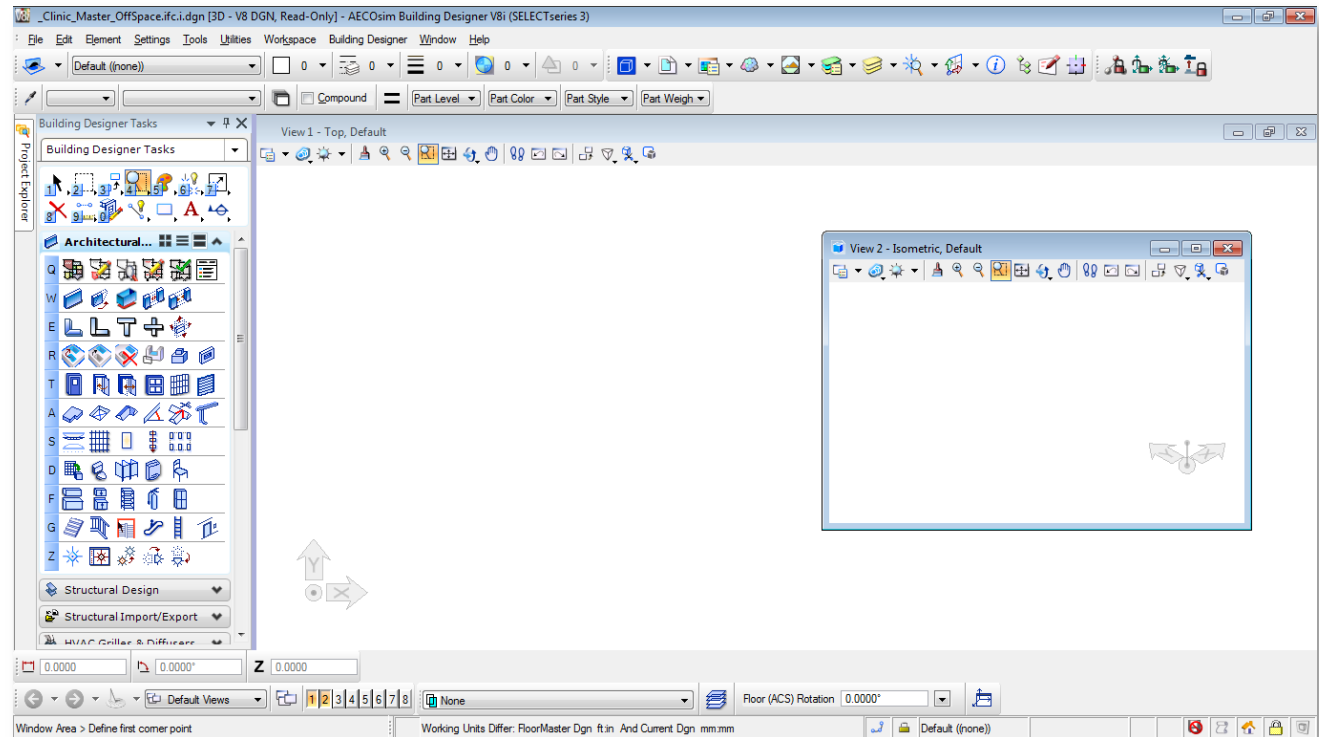


# Process



Start  
AECOsims  
Building Designer

# Start AECOsims Building Designer



# Create Project from COBie Template

Start  
AECOSim  
Building Designer



Create  
Project from  
COBie Template

Create New Project

Seed Project: COBieTemplate\_US

Name:

Description:

☐ Create Directories Only

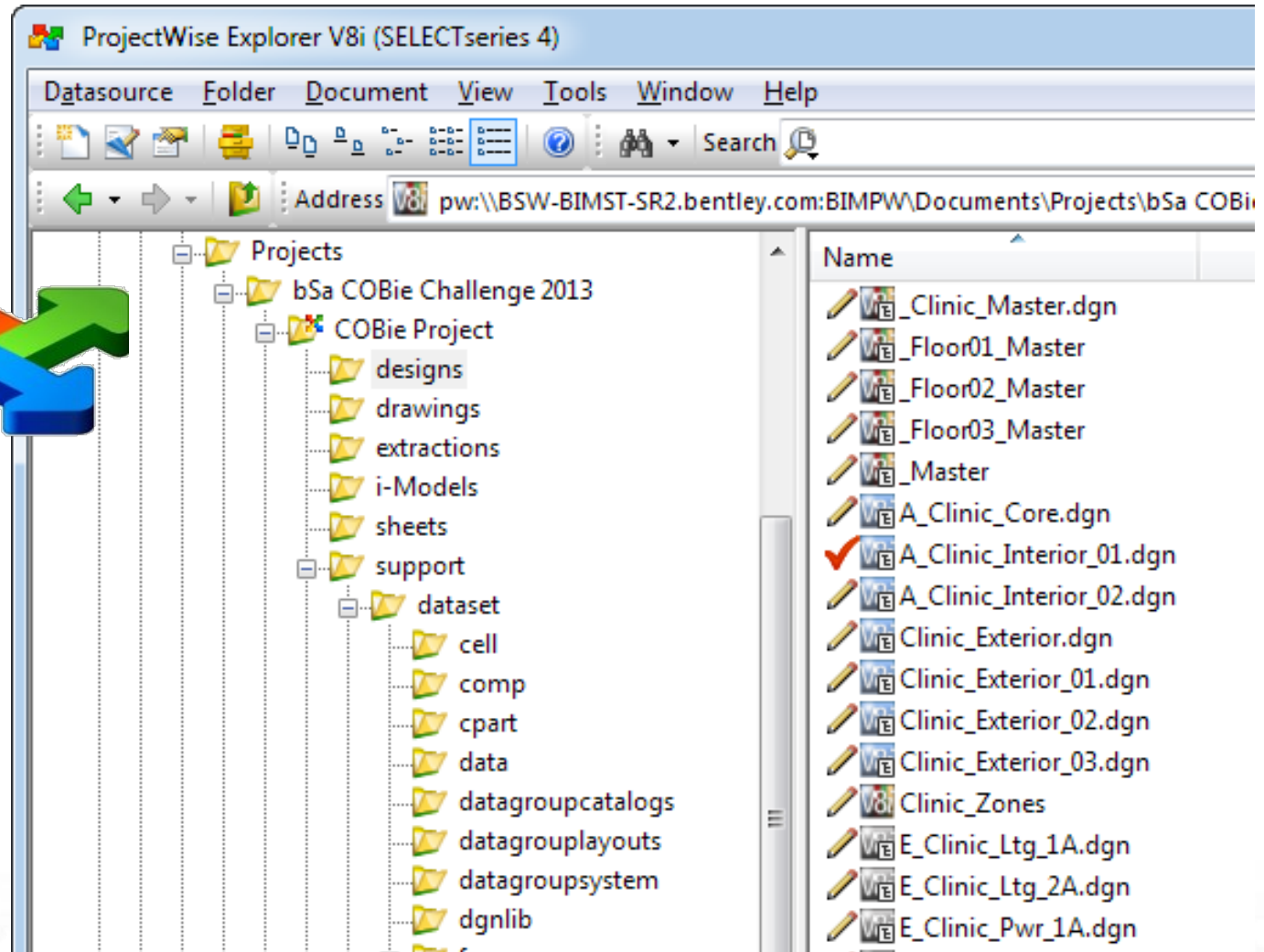
OK Cancel



# ProjectWise Collaboration

Start  
AECOSim  
Building Designer

Create  
Project from  
COBie Template



# Design

Architecture

Structural

Interiors

Mechanical  
Electrical  
Plumbing

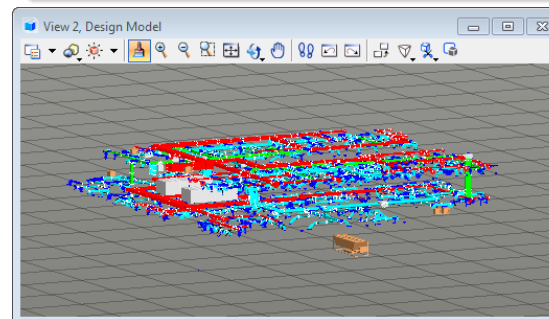
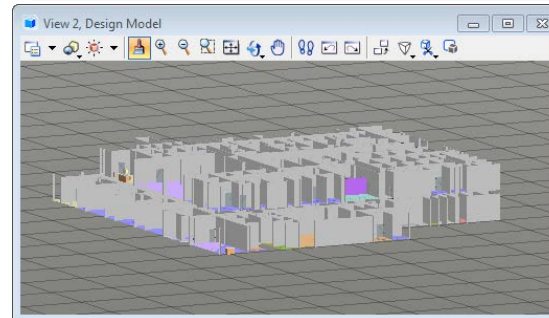
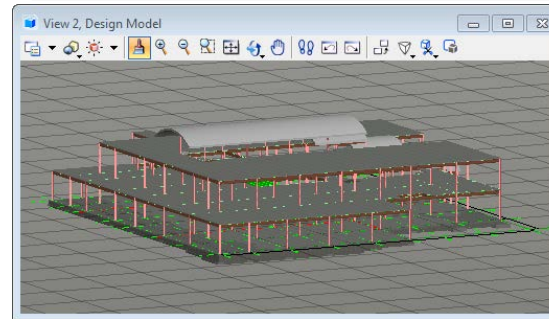
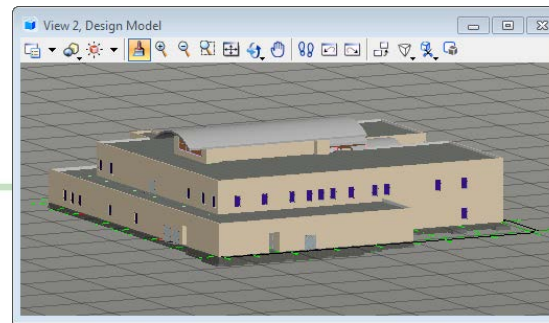
Start  
AECOs  
Building Designer

Create  
Project from  
COBie Template

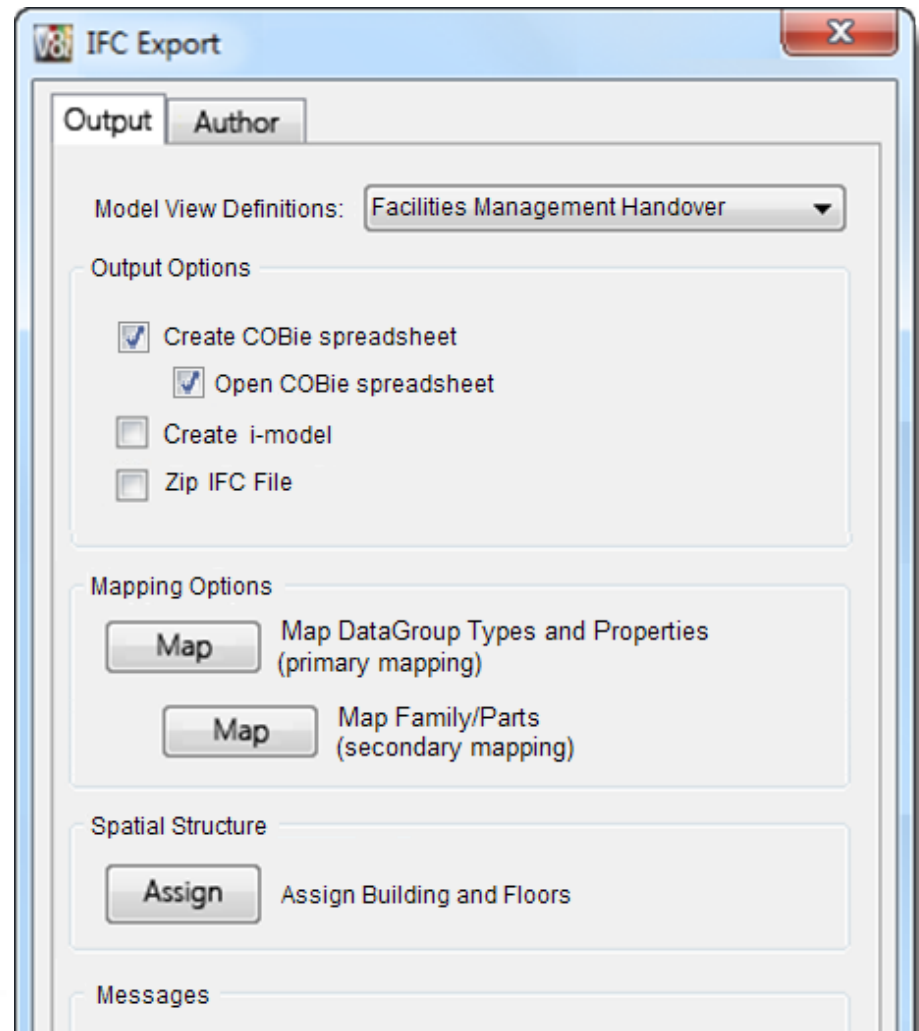
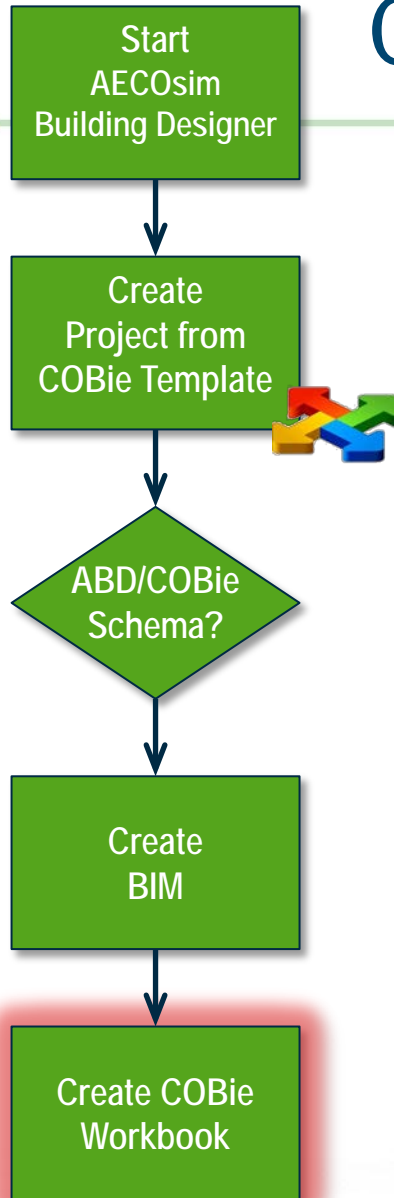


ABD/COBie  
Schema?

Create  
BIM



# Create COBie Workbook



# Create COBie Workbook

Start  
AECOSim  
Building Designer

Model View Definitions: IFC2x3 Coordination View 2.0

Model View Definitions: Facilities Management Handover

Create  
BIM

Create COBie  
Workbook



COBie.xml - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Developer Add-Ins

Clipboard Font Paragraph Styles Cells Editing

Start AECOSim Building Designer

Create Project from COBie Template

ABD/COBie Schema?

Create BIM

Create COBie Workbook

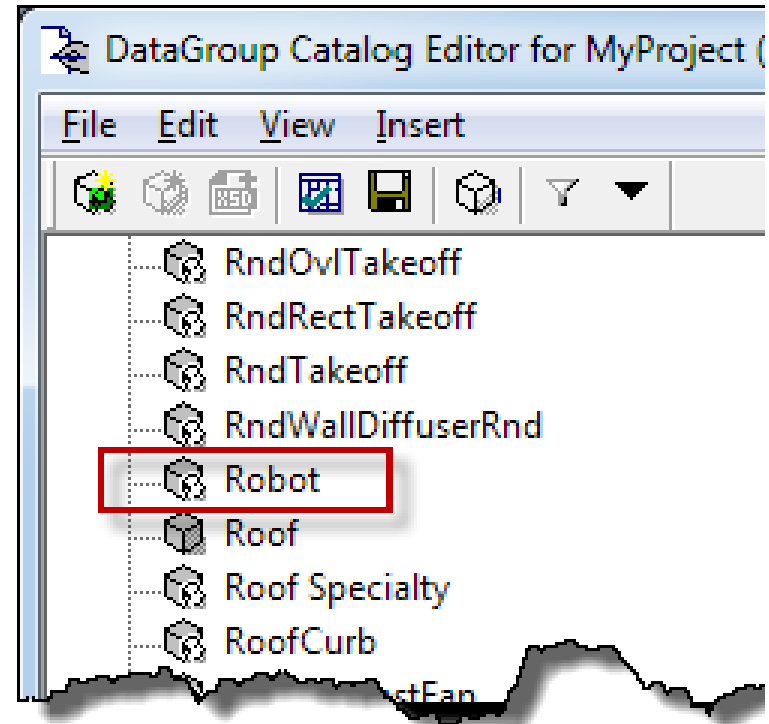
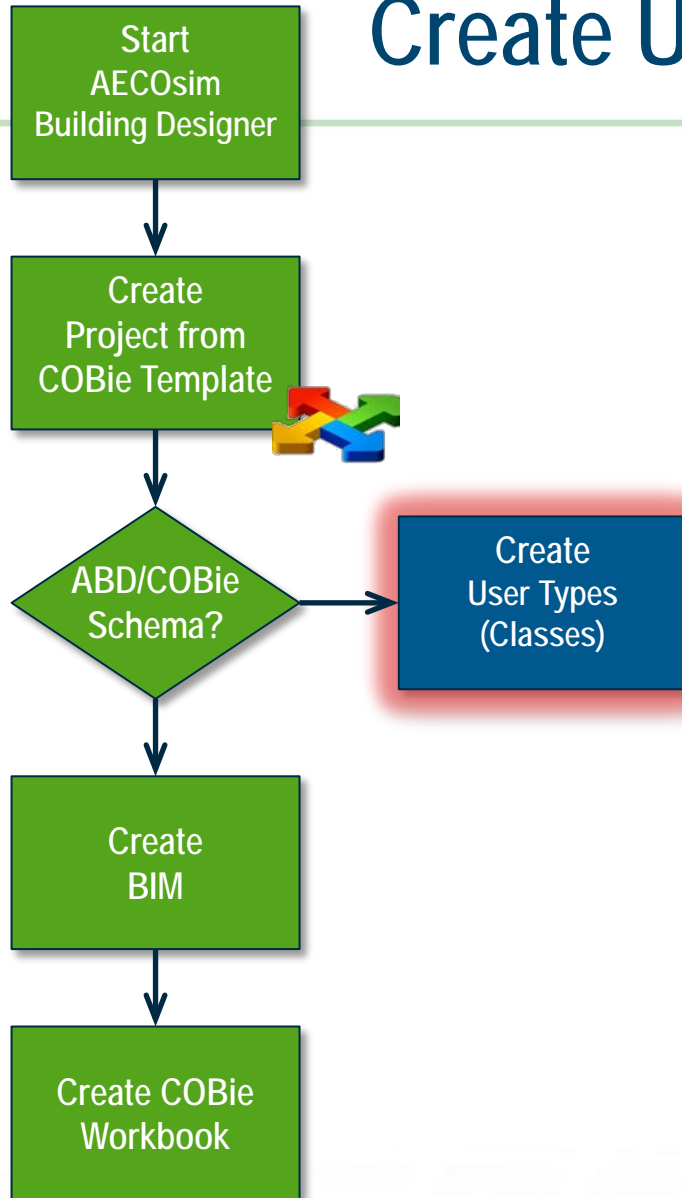
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Ready

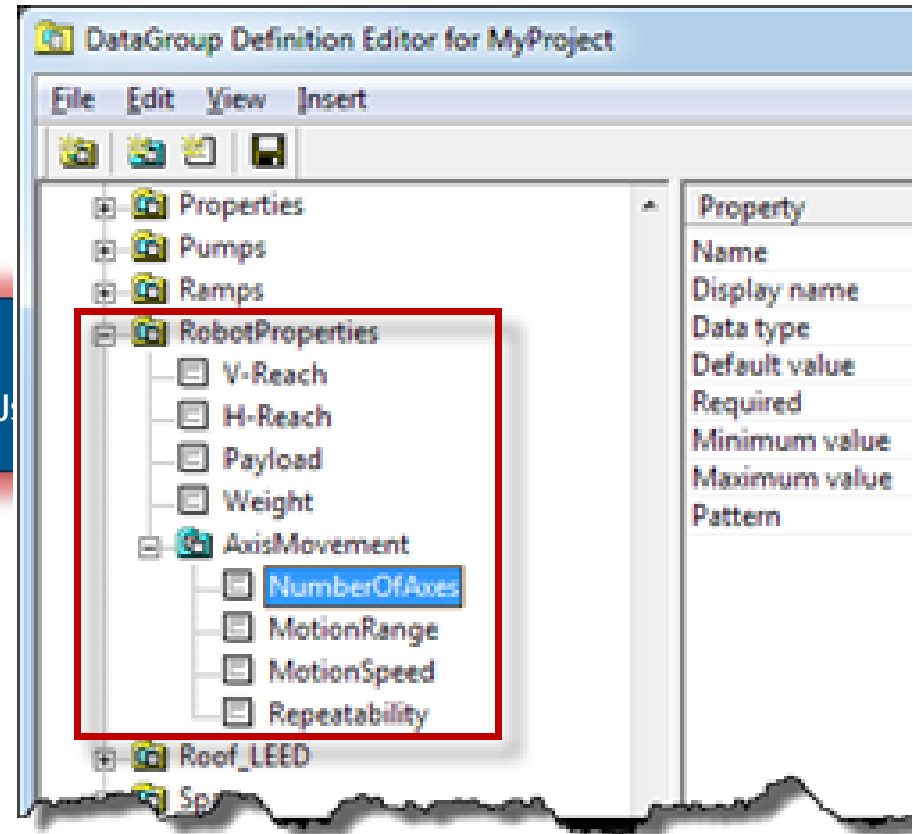
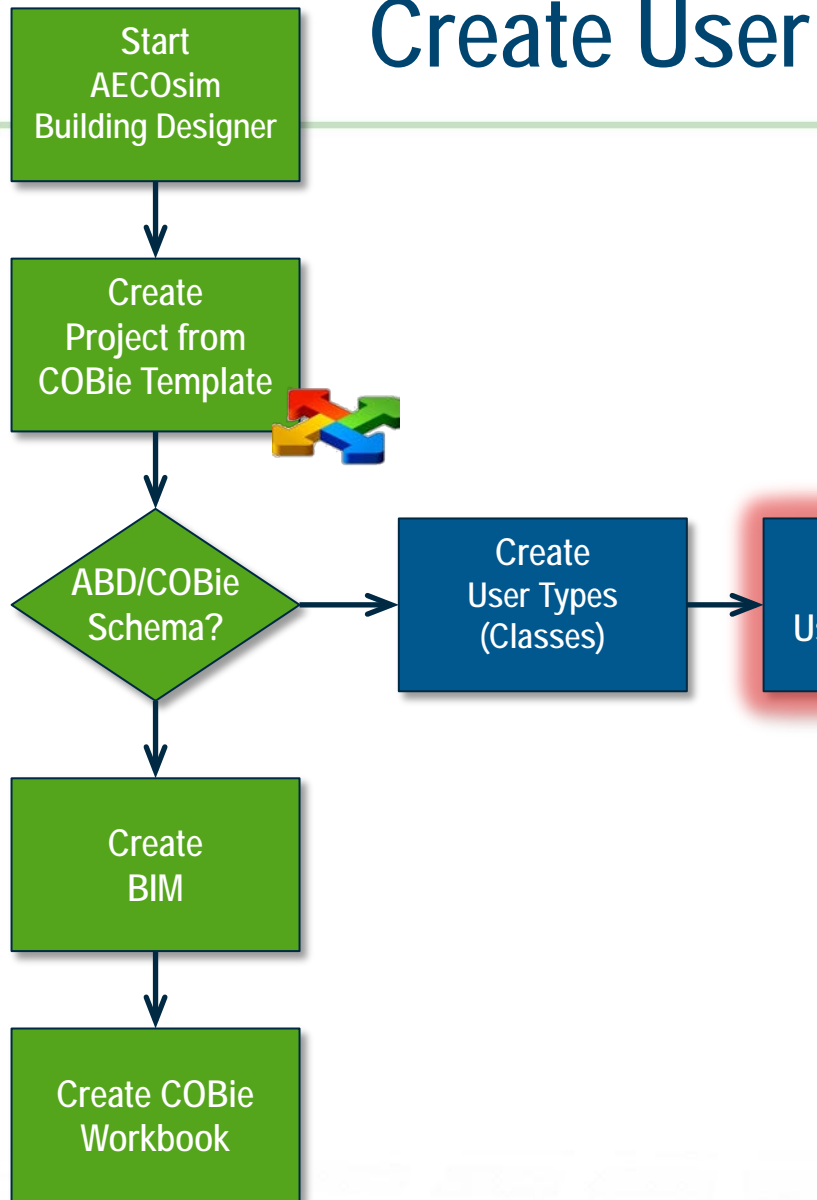
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# Create User Types (Classes)



# Create User Properties



# Map to IFC

Start  
AECOs  
Building Designer

Create  
Project  
COBie Template

ABD/COBie  
Schema

Create  
BIM Model

Create COBie  
Workbook

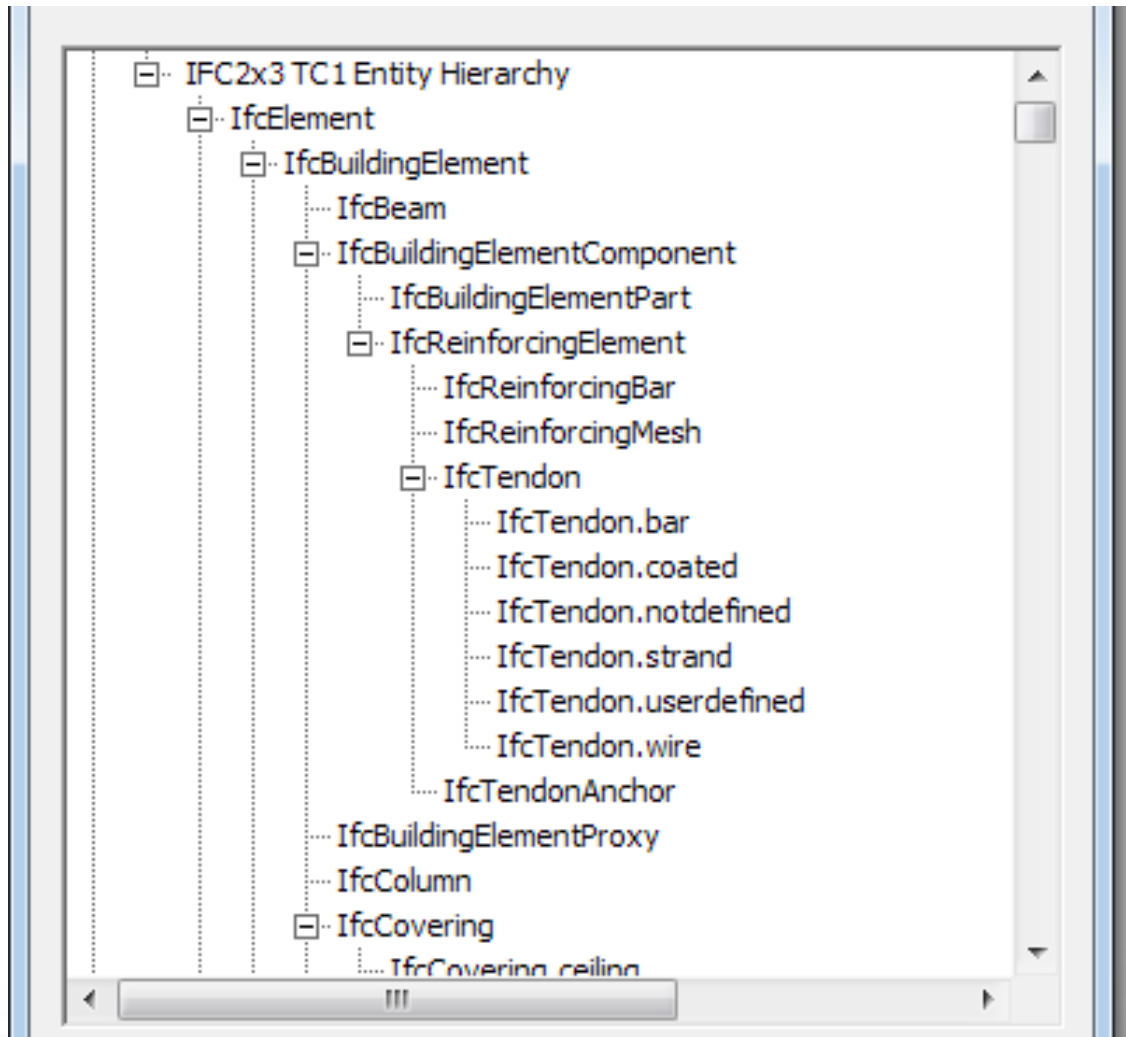
Map DataGroup Types and Properties to IFC

Type Mapping | Property Mapping

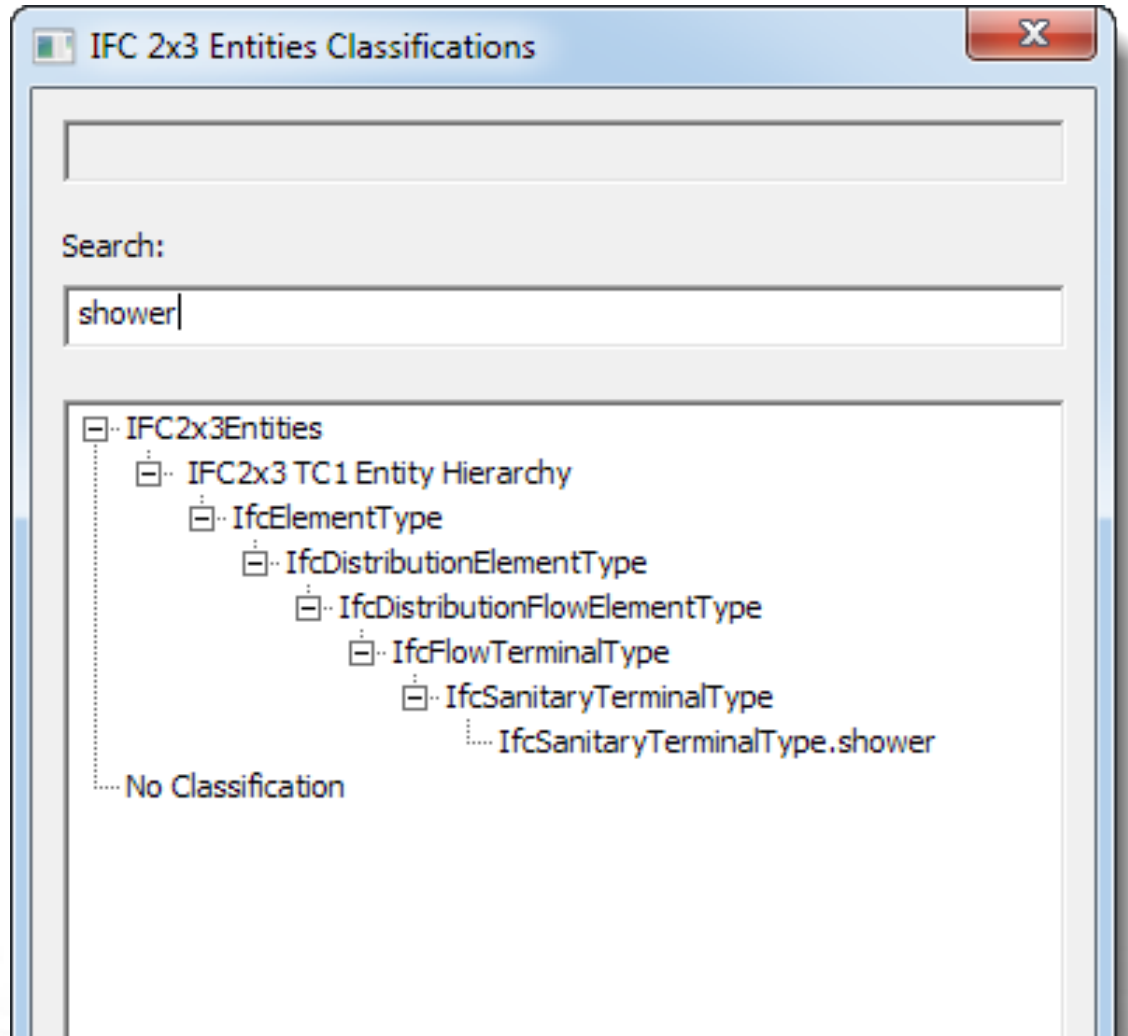
Filter | ☐ Display only unmapped items

DataGroup Catalog	IFC Mapping
BMP_BathTub	IfcFlowTerminal.IfcsanitaryTerminalType.BATH
BMP_Sink	IfcFlowTerminal.IfcsanitaryTerminalType.SINK
BMP_TwinSink	IfcFlowTerminal.IfcsanitaryTerminalType.SINK
BMP_Urinal	IfcFlowTerminal.IfcsanitaryTerminalType.URINAL
BMP_PumpBaseMounted	IfcFlowMovingDevice.IfcpumpType.NOTDEFINED
BMP_SprinklerHead	IfcFlowTerminal.IfcfiresuppressionTerminalType.SP
BMP_PumpSump	IfcFlowMovingDevice.IfcpumpType.SUMPPUMP
BMP_PumpDiaphragm	IfcFlowMovingDevice.IfcpumpType.NOTDEFINED
BMP_PumpMotorMounted	IfcFlowMovingDevice.IfcpumpType.NOTDEFINED
BMP_PumpVerticalSplitCoupled	IfcFlowMovingDevice.IfcpumpType.NOTDEFINED
HospitalEquipment	

# Navigating the IFC Schema

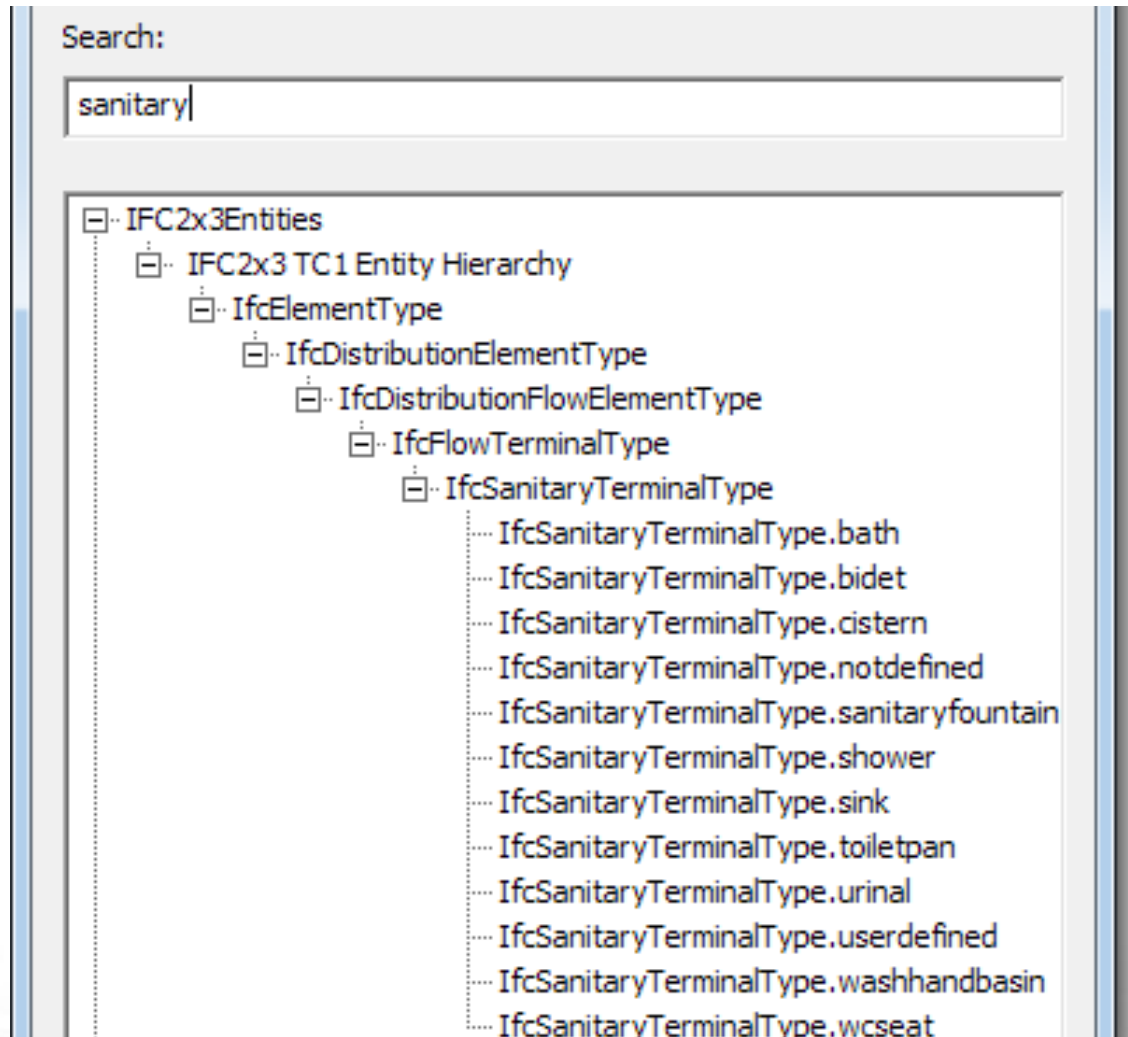


# Searching for Specific Classifications



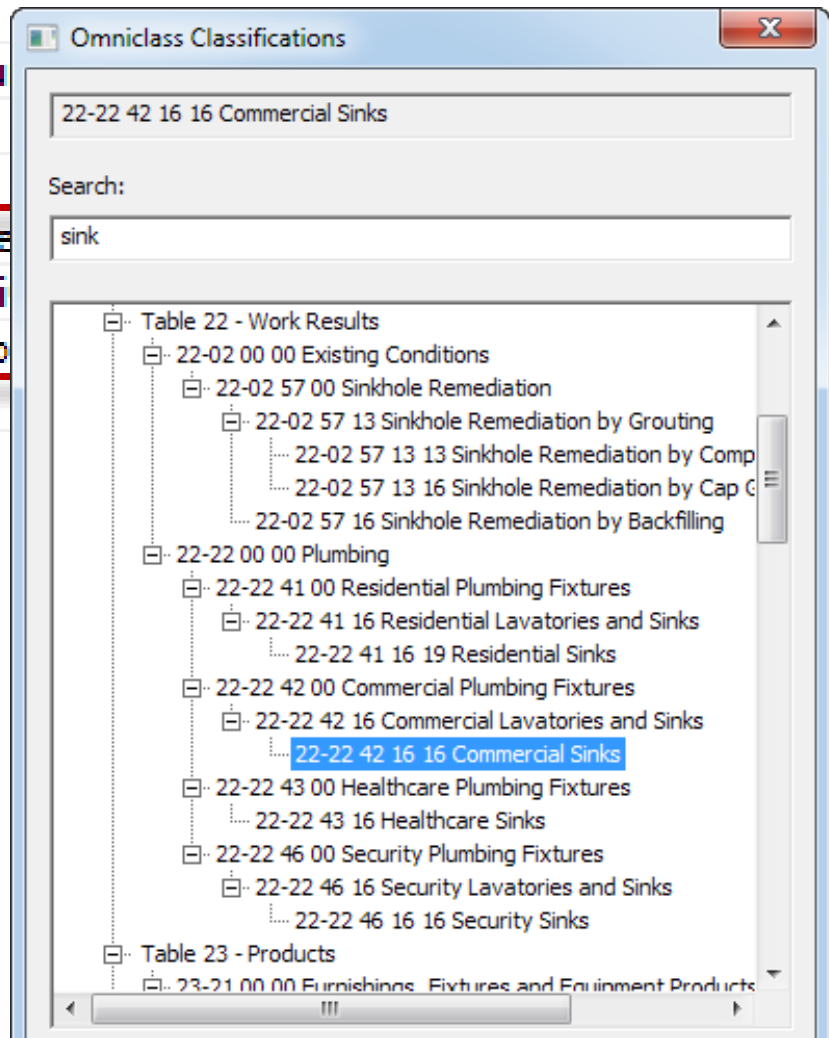


# Searching for Specific Classifications



# Managing Multiple Standards

ObjectManufacturer	Product   Manufactu
ObjectManufacturer	Product   Model
ObjectManufacturer	Product   URL
ObjectClassification	Classification   Master
ObjectClassification	Classification   Omni
ObjectClassification	Classification   UniFo
ObjectPhasing	Phasing



# AECOsim Building Designer

## COBie Use

revision: 12 Dec, 2012 - 05

AECOsim Building Designer V8i COBie Use

## AECOsim Building Designer V8i COBie User Guide

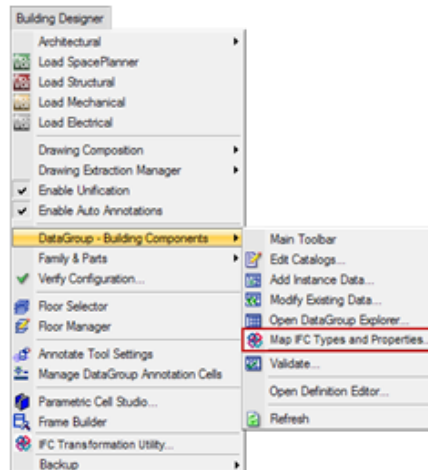
- ❑ click 'Save' to save the catalog items.

### 2.11 Map DataGroup to IFC

#### 2.11.1 Map DataGroup types to IFC Entities/Classes

DataGroup types must be mapped to a corresponding IFC entities/class, otherwise they are recognized as IfcBuildingElementProxy and filtered out for COBie export. AECOsim Building Designer provides a tool to map DataGroup types to their corresponding IFC Class, Type and Predefined Type.

- ❑ Open the 'Map DataGroup Types and Properties to IFC' dialog box from the Building Designer dropdown menu > DataGroup – Building Components > Map Types and Properties



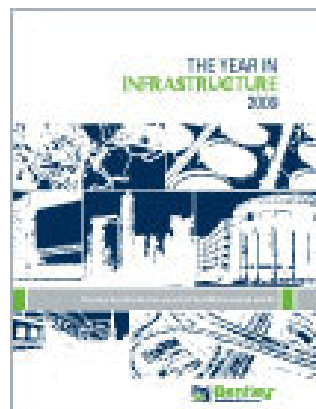
- ❑ Alternatively, the 'Map DataGroup Types and Properties to IFC' dialog box can be open from the 'IFC Export' dialog.

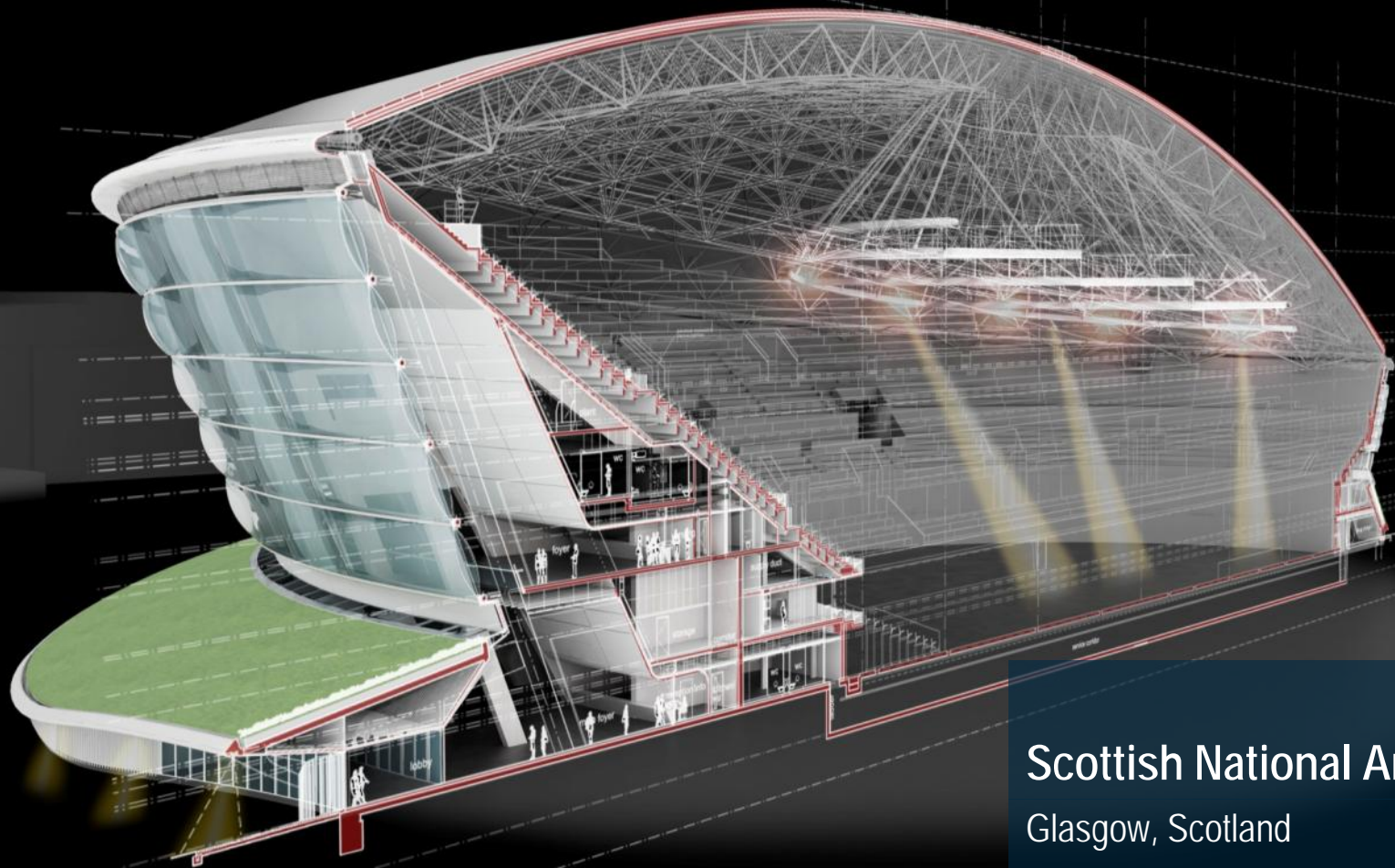
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## The Year in Infrastructure

The Be Inspired Awards program recognizes the world's most outstanding infrastructure projects. The projects are submitted by Bentley's software users and judged by a jury of independent experts, who adhere to the highest standards in determining which of the projects exemplify innovation, superior vision, and an unwavering commitment to exceptional quality and productivity. Bentley shares the innovation in best practices among the infrastructure professionals who make these projects possible by featuring their outstanding achievements across the globe in *The Year in Infrastructure* series of publications and special editions.





# Scottish National Arena

Glasgow, Scotland

Foster + Partners





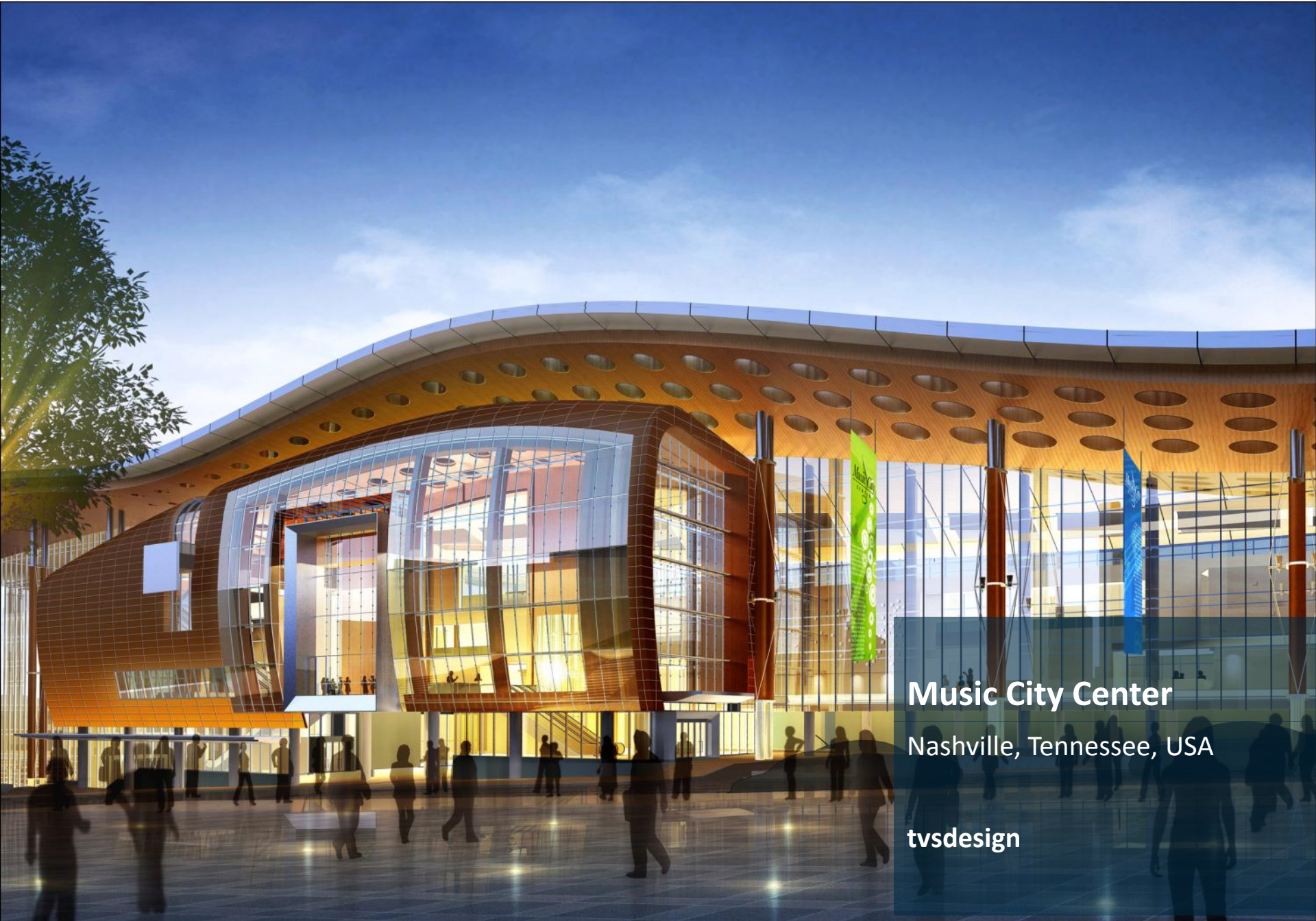
## EEA & Tax Offices

Groningen, Netherlands

UNStudio

2011 © AEROPHOTO EELDE





**Music City Center**  
Nashville, Tennessee, USA

**tvdsdesign**





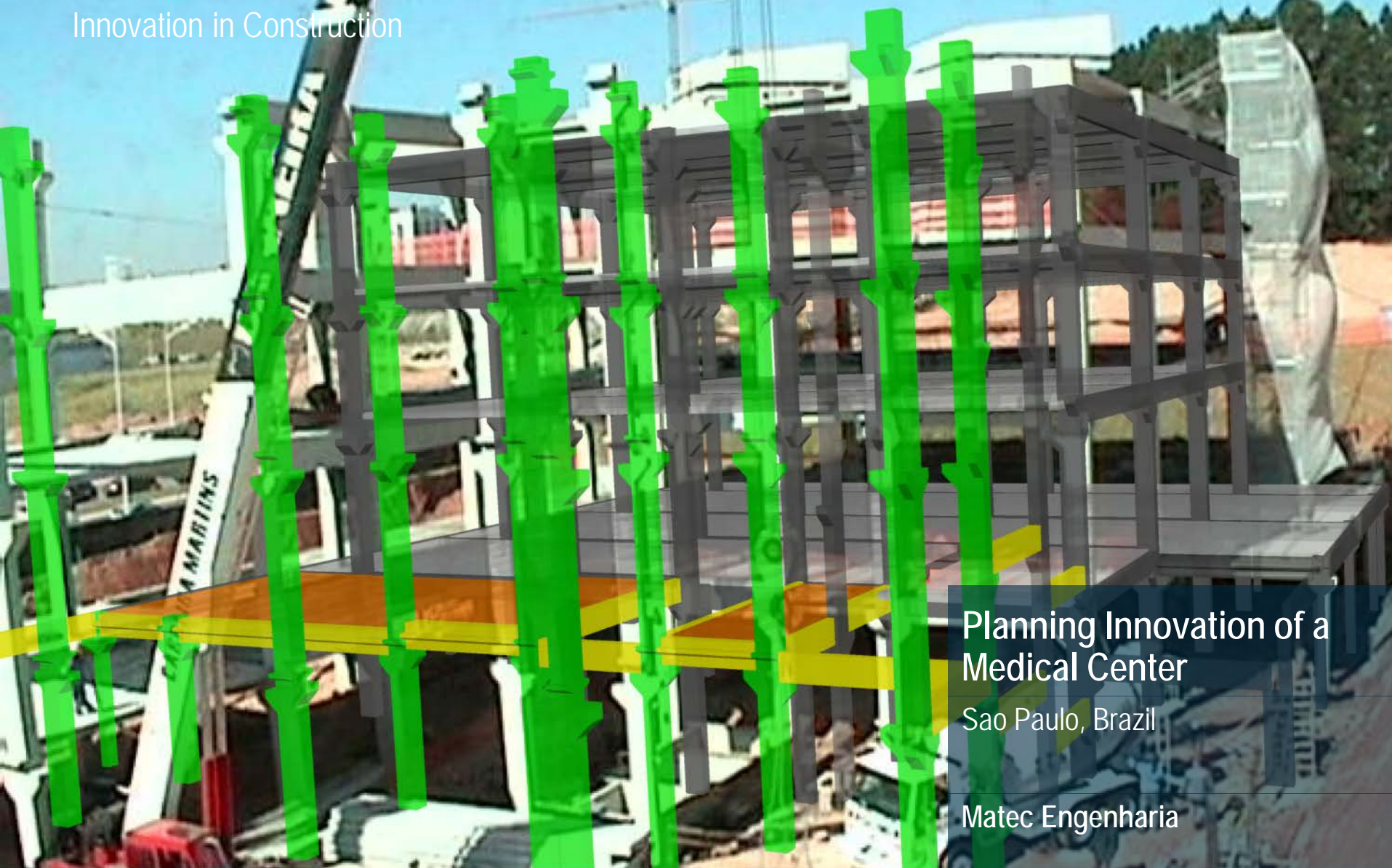
## The Francis Crick Institute

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HOK - PLP Architecture



## Innovation in Construction



### Planning Innovation of a Medical Center

Sao Paulo, Brazil

Matec Engenharia

A1130

Montagem da estrutura pré-moldada - Etapa A (eixos 0 ao 4)

Montagem da estrutura pré-moldada - Etapa A (eixos 0 ao 4)

FIRST STEP

# COBie Support

Name:

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