The importance of accurate modelling

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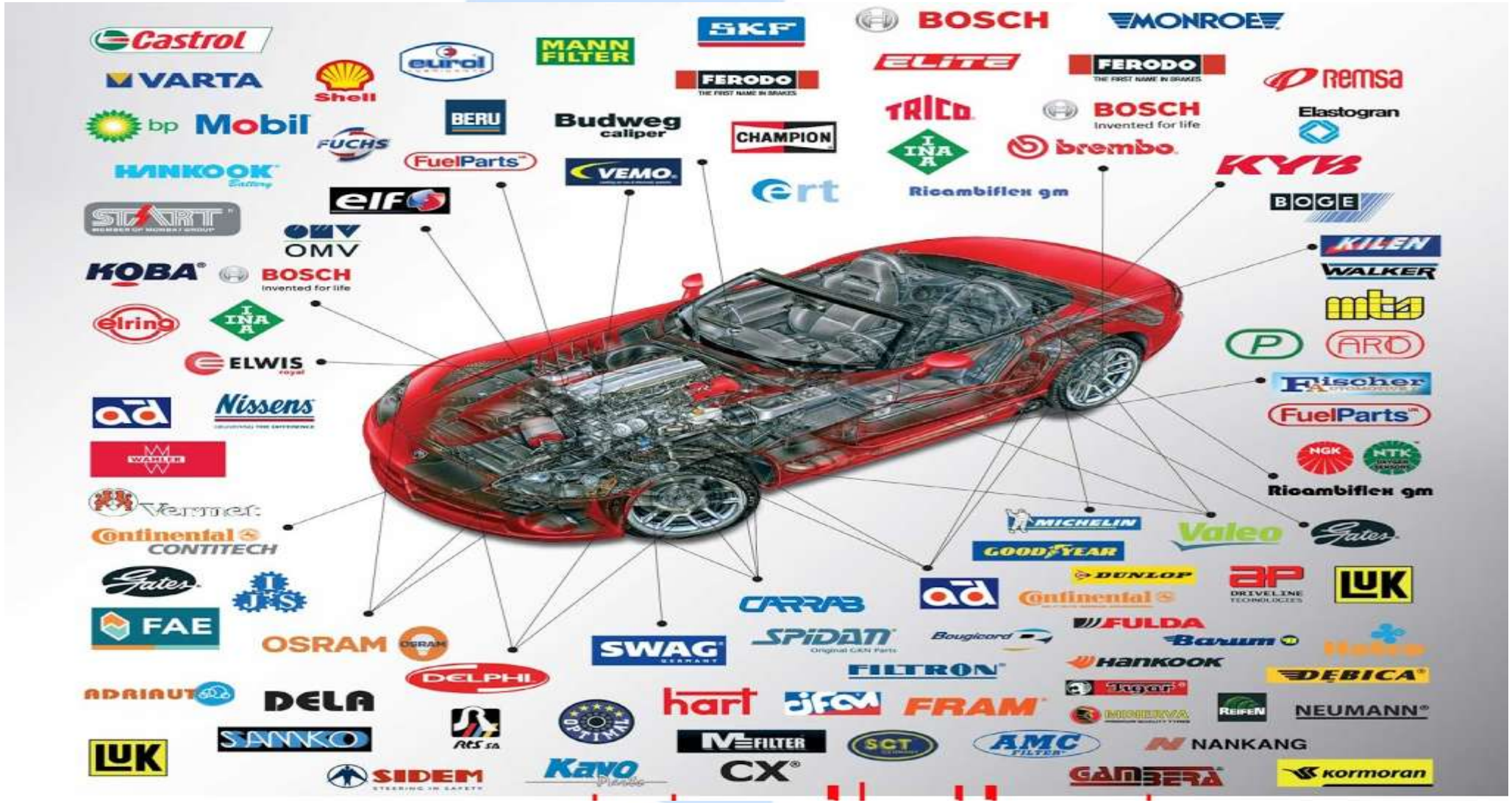
Castrol
VARTA
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eurol
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SKF
FERODO
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MONROE
ELITE
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Remsa
bp
Mobil
BERU
Budweg caliper
TRICO
BOSCH
Invented for life
Elastogram
FUCHS
CHAMPION
INA
brembo
HANKOOK
FuelParts
VEMO
KYB
ert
Ricambiflex gm
elf
BOGE
START
OMV
KILEN
WALKER
KOBA
BOSCH
Invented for life
elring
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ARD
Fischer
Nissens
FuelParts
WAHLER
NGK
NTK
Ricambiflex gm
Vernet
MICHELIN
Valeo
Gates
Continental
CONTITECH
GOODYEAR
DUNLOP
LUK
Gates
CARRAB
FULDA
FAE
OSRAM
SWAG
SPIDAN
Bougicord
Barum
Hella
FILTRON
HANKOOK
DEBICA
DELPHI
ADRIAUTO
DELA
hart
FRAM
NEUMANN
SANKO
SCT
AMC
NANKANG
LUK
SIDEM
Kavo Parts
CX
GAMBERA
kormoran

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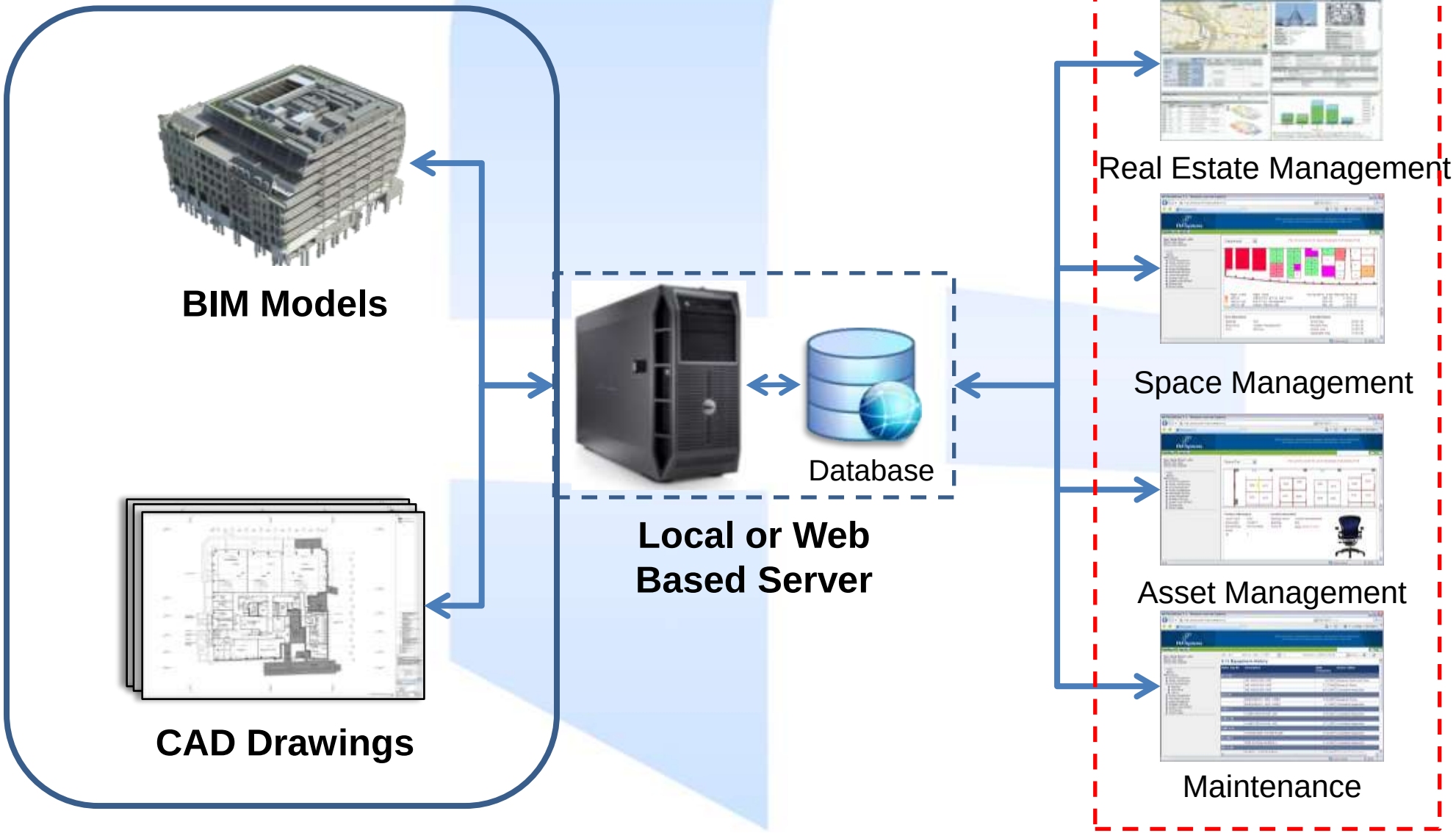
Figure 1: The Toyota Production System

Why Fulcro are presenting.



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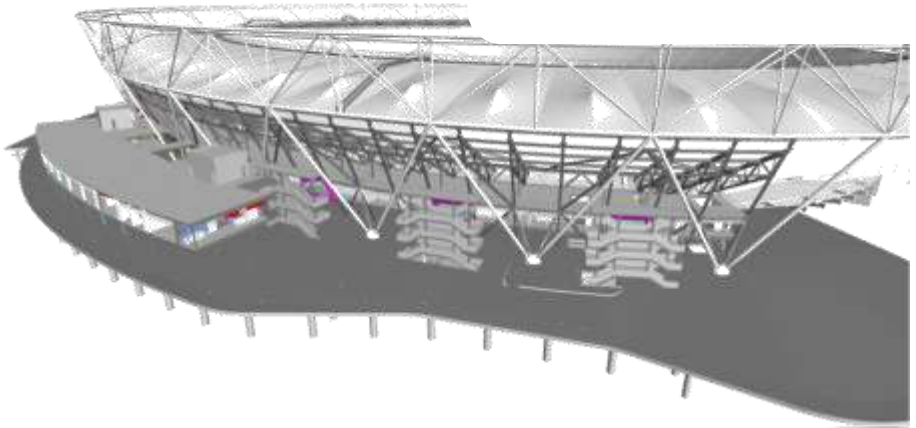
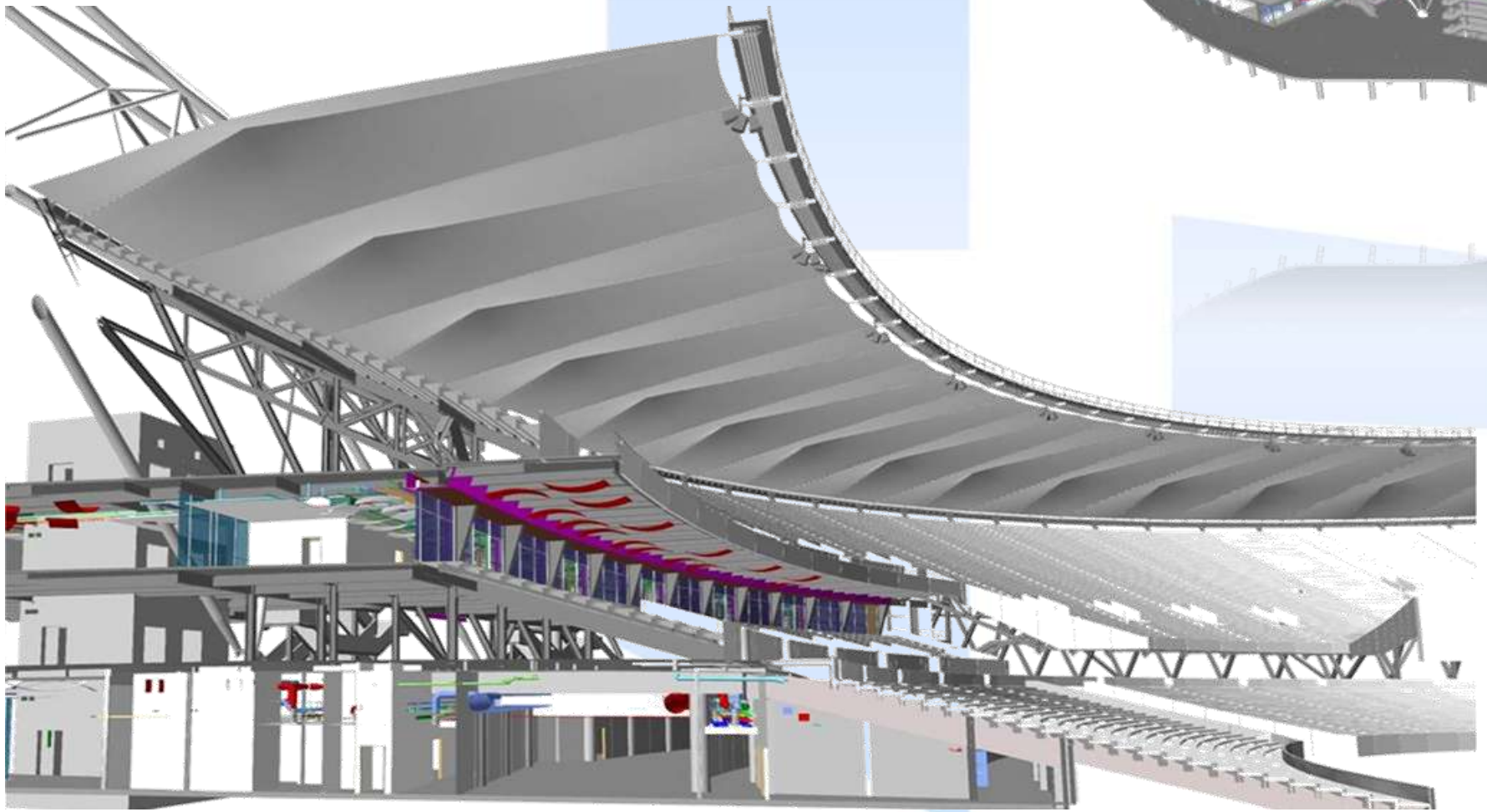
TEAM STADIUM

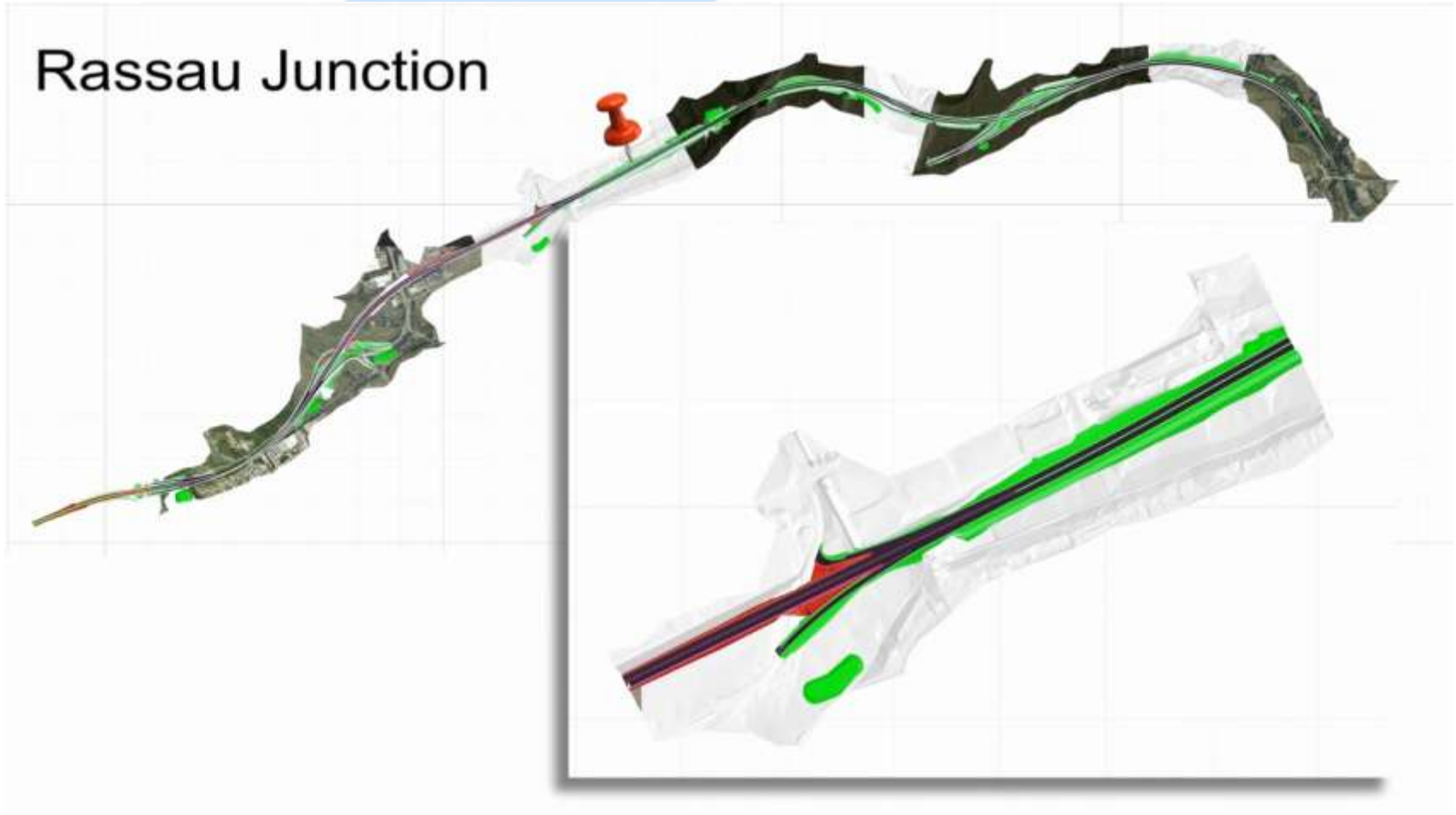
London 2012 Stadium





LAING O'ROURKE
North Staffordshire Hospital
Haywood Building

FULCRO



carillion

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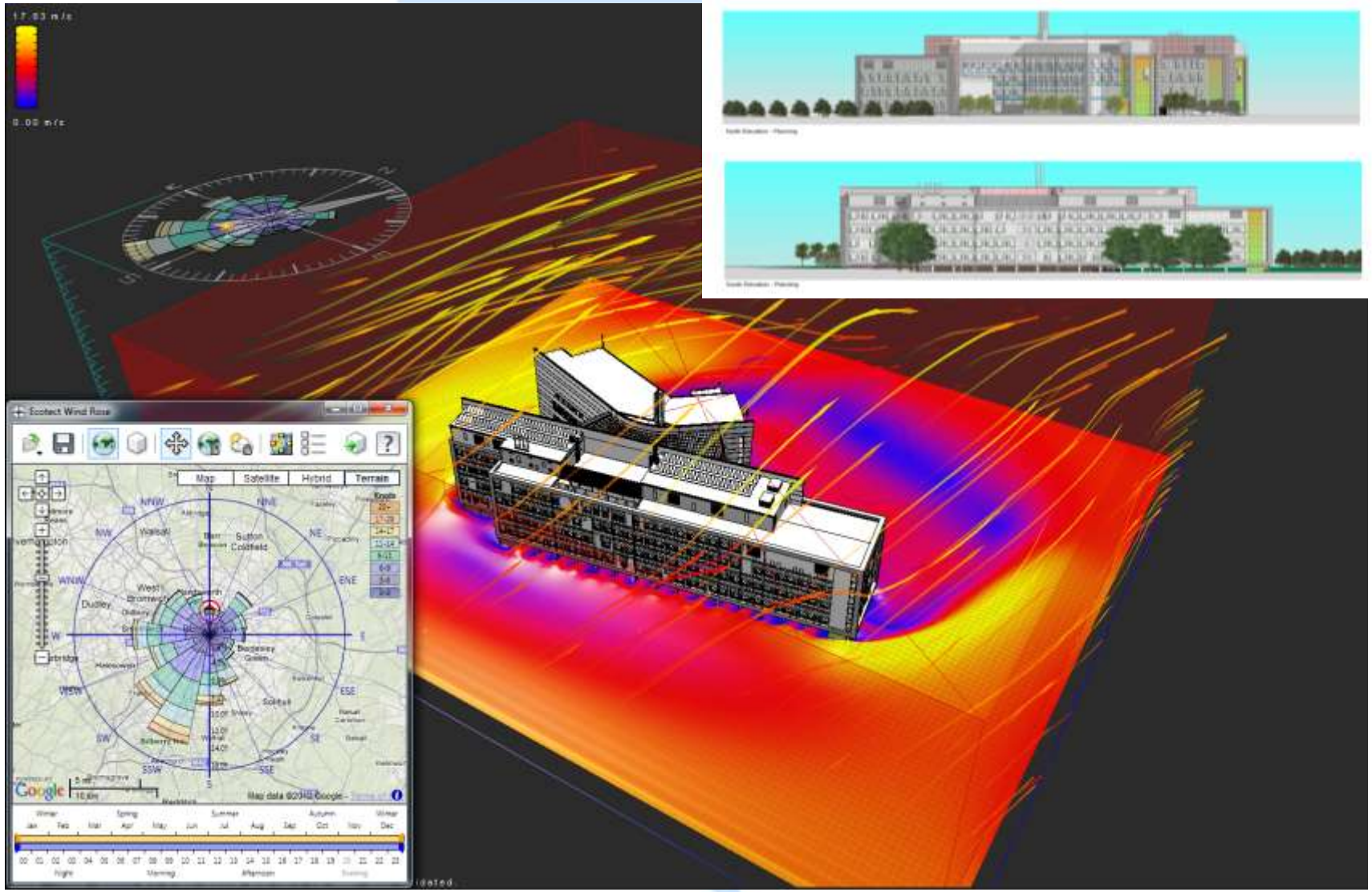
Birmingham Dental Hospital



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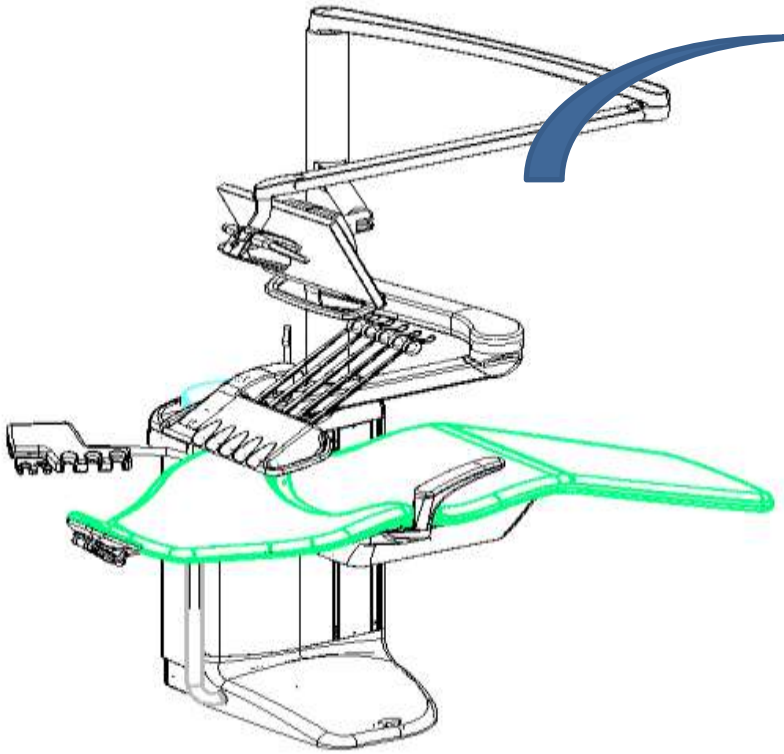
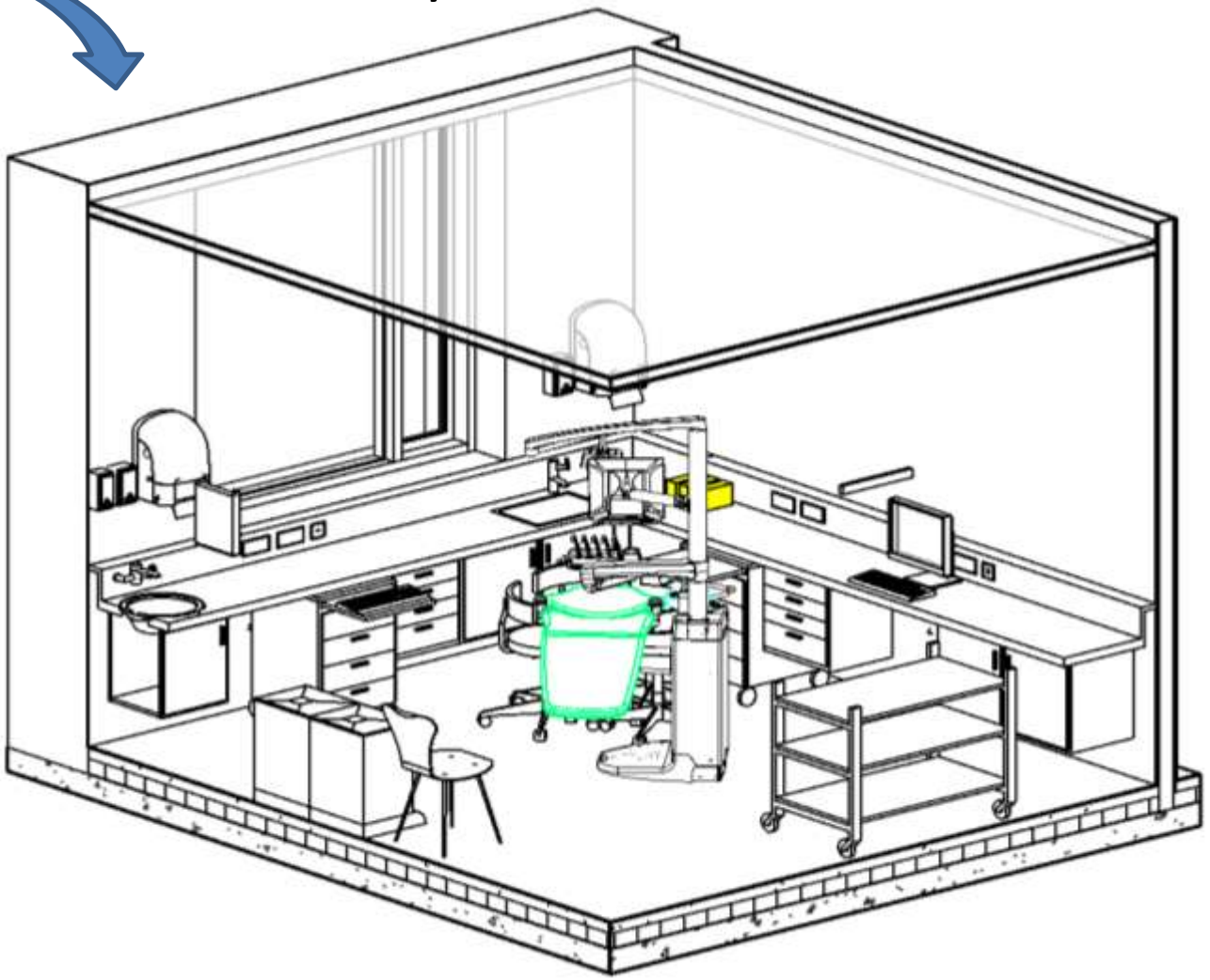
Co-ordinated FFE placed within the Architectural Model creating the typical room layouts



Intelligent 3D FFE loaded with ADB codes



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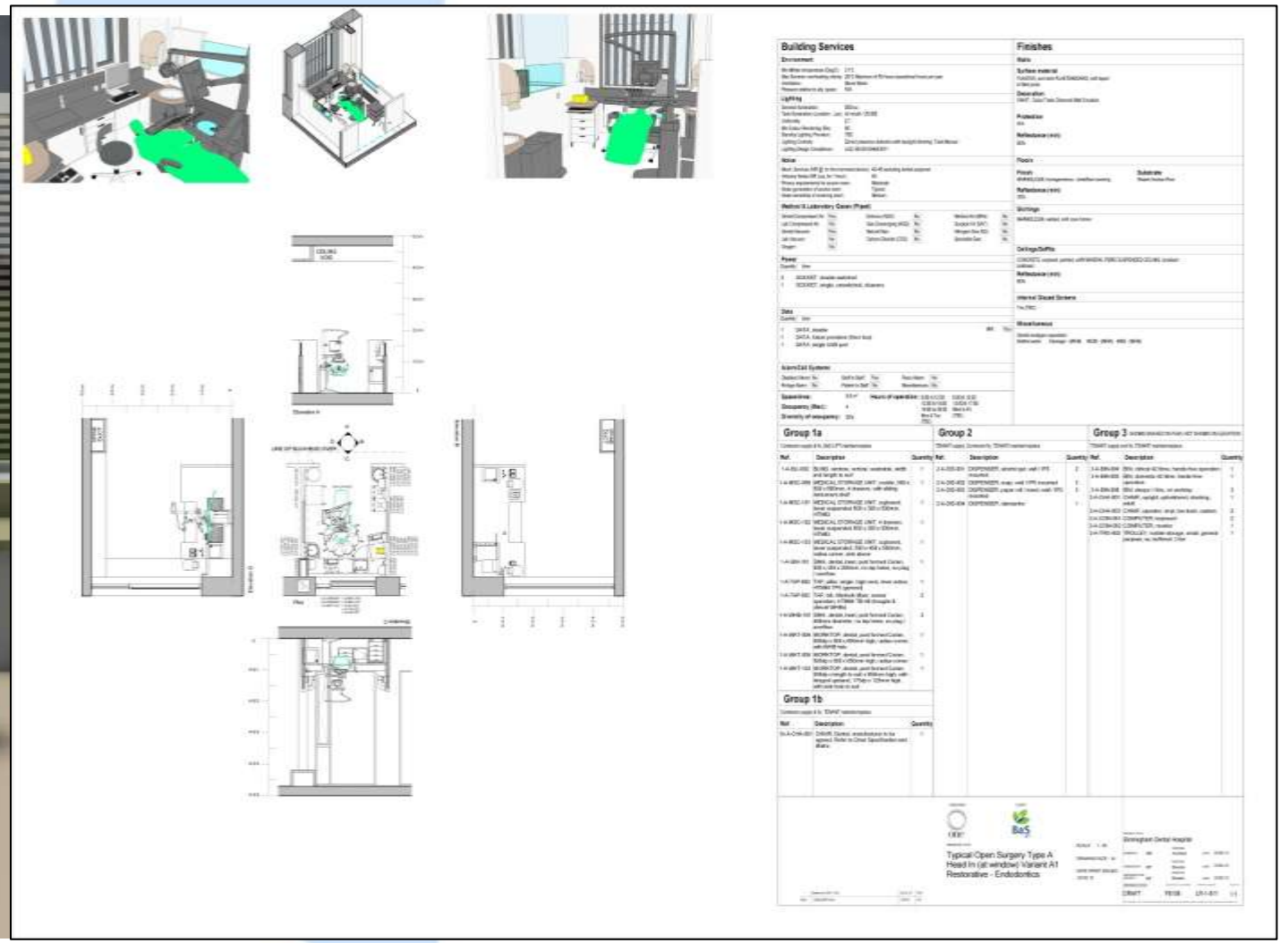
Birmingham Dental Hospital



Building Services

Finishes

Group 1a

Group 2

Group 3

Group 1b

Typical Open Surgery Type A
Head In (at window) Variant A1
Restorative - Endodontics

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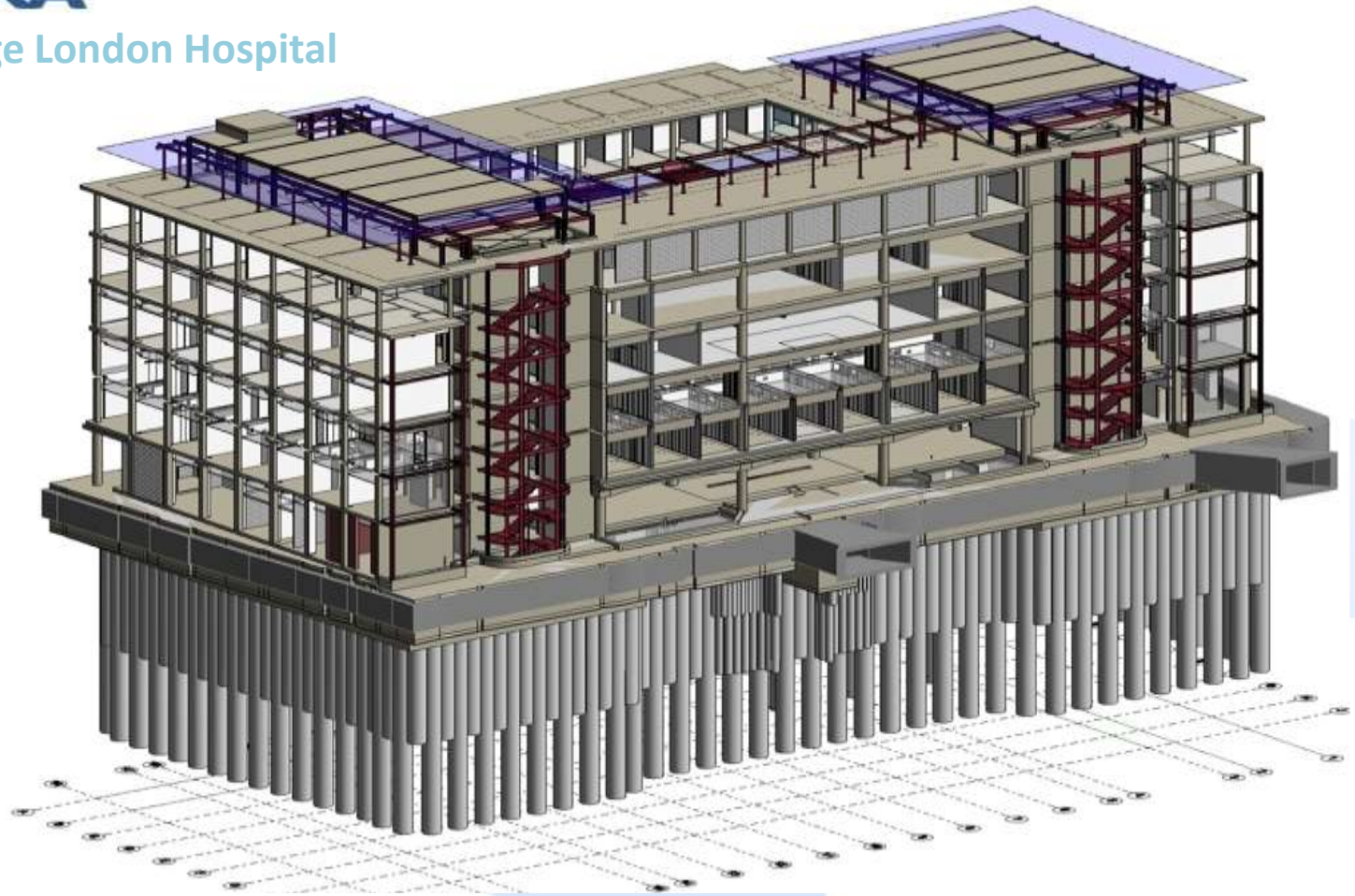
University College London Hospital



Structural and Architectural Co-ordination Model

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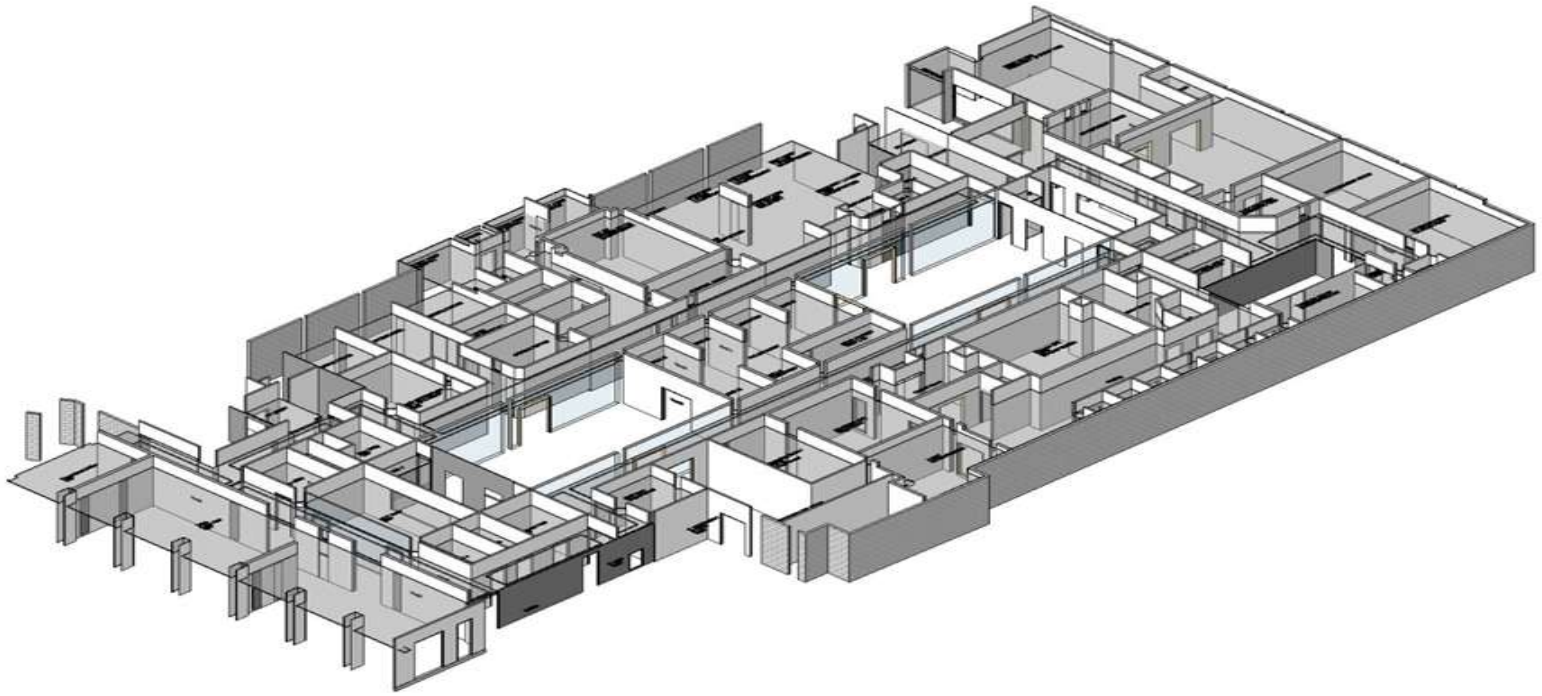

Services Imported and BW holes formed Individual Floorplate of Co-ordination Model

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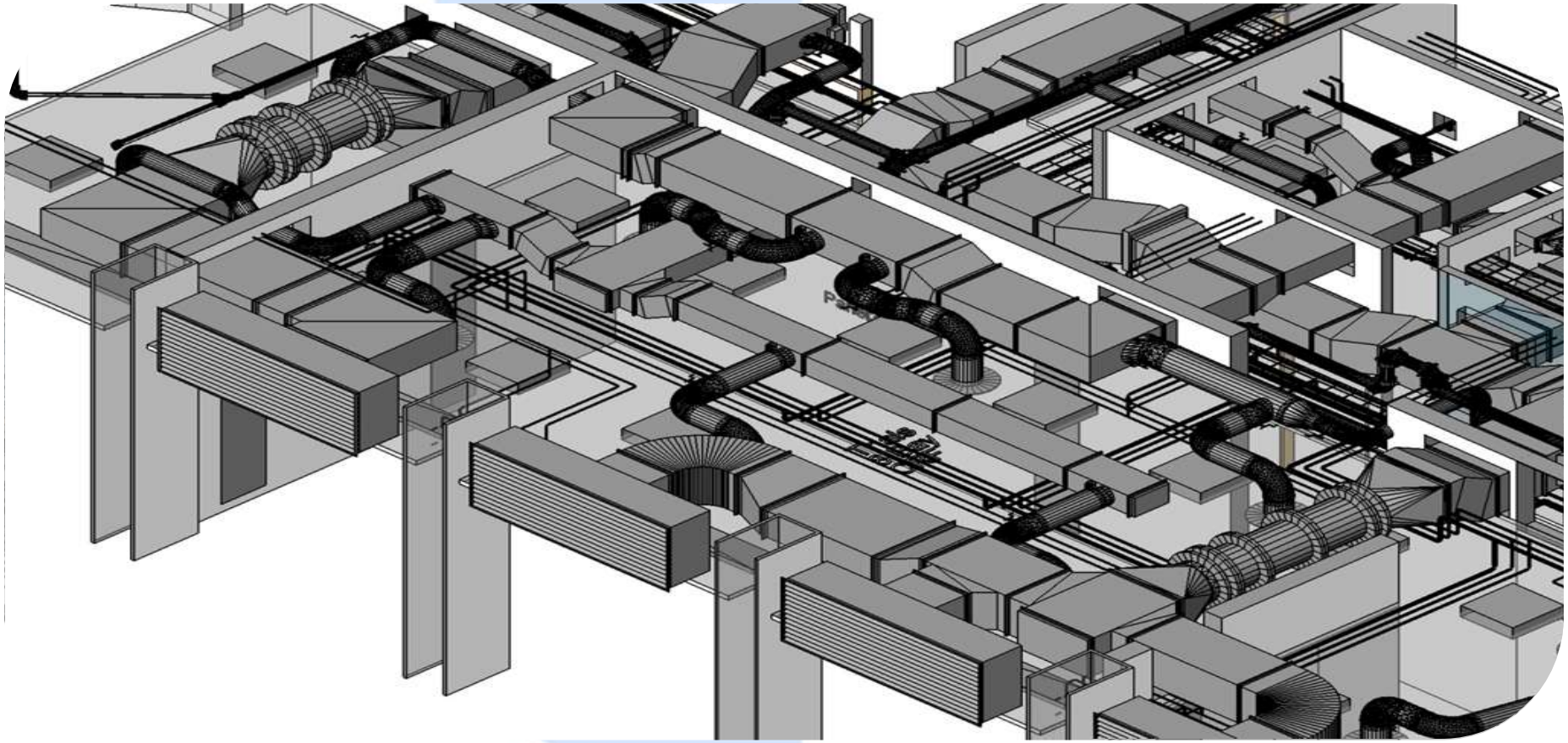
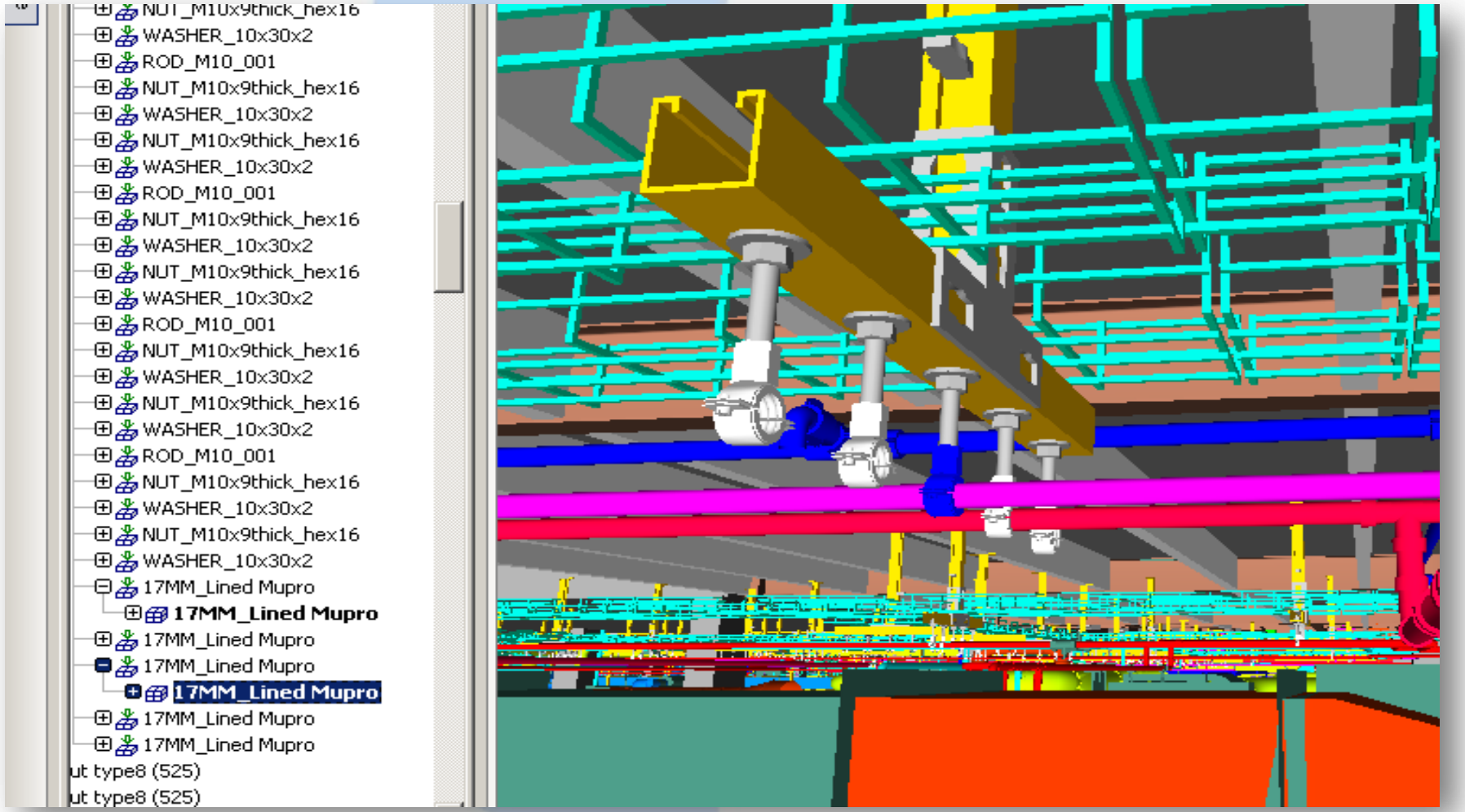
University College London Hospital



Construction Deliverables for site installation


NUT_M10x9thick_hex16
WASHER_10x30x2
ROD_M10_001
NUT_M10x9thick_hex16
WASHER_10x30x2
NUT_M10x9thick_hex16
WASHER_10x30x2
ROD_M10_001
NUT_M10x9thick_hex16
WASHER_10x30x2
NUT_M10x9thick_hex16
WASHER_10x30x2
ROD_M10_001
NUT_M10x9thick_hex16
WASHER_10x30x2
NUT_M10x9thick_hex16
WASHER_10x30x2
ROD_M10_001
NUT_M10x9thick_hex16
WASHER_10x30x2
NUT_M10x9thick_hex16
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ut type8 (525)

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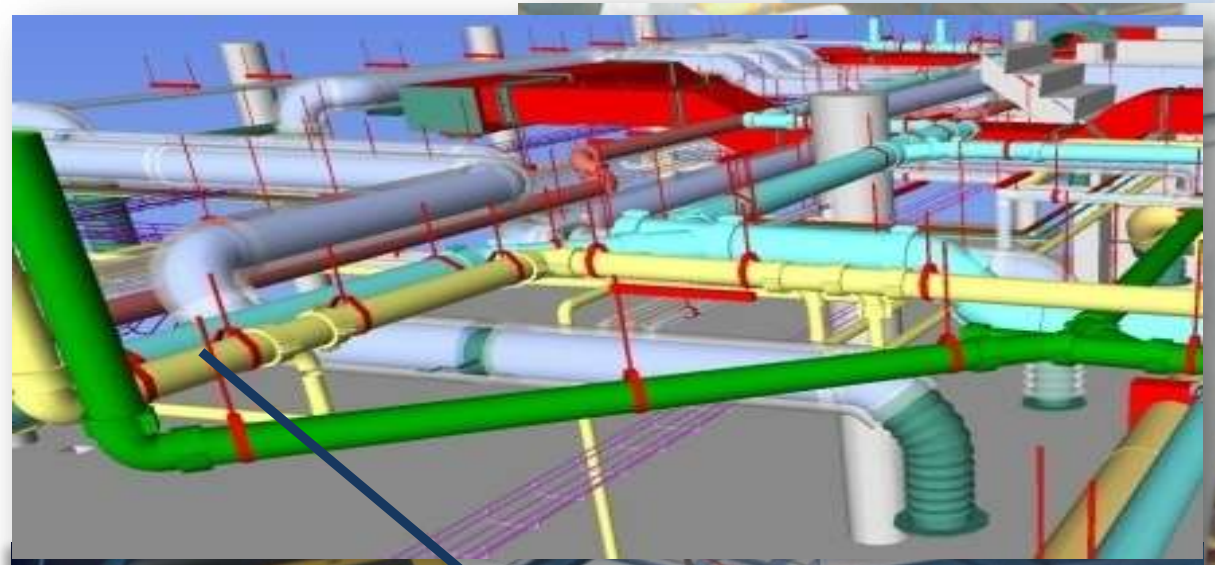

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SKANSKA

University College London Hospital

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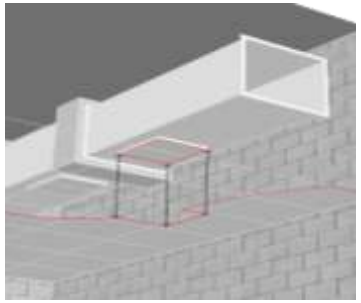
SKANSKA

University College London Hospital



The Outcome:

Information of the right **quality** delivered at the right **time** throughout the design/procurement/construction phase.

Delivered by:

The integrated, planned & managed development of a **digital prototype** asset.

Allowing:

Improved planning, control and management of construction .

Enhanced communication .

Effective resource utilisation and coordination of activities.

Reduction in costs associated with design, construction and fabrication phases.

Reduction in material waste and improved sustainability.

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“NOT Level 3 BIM !! IFC’s, IDM’s , IFD’s !! COBie !! Fmie “

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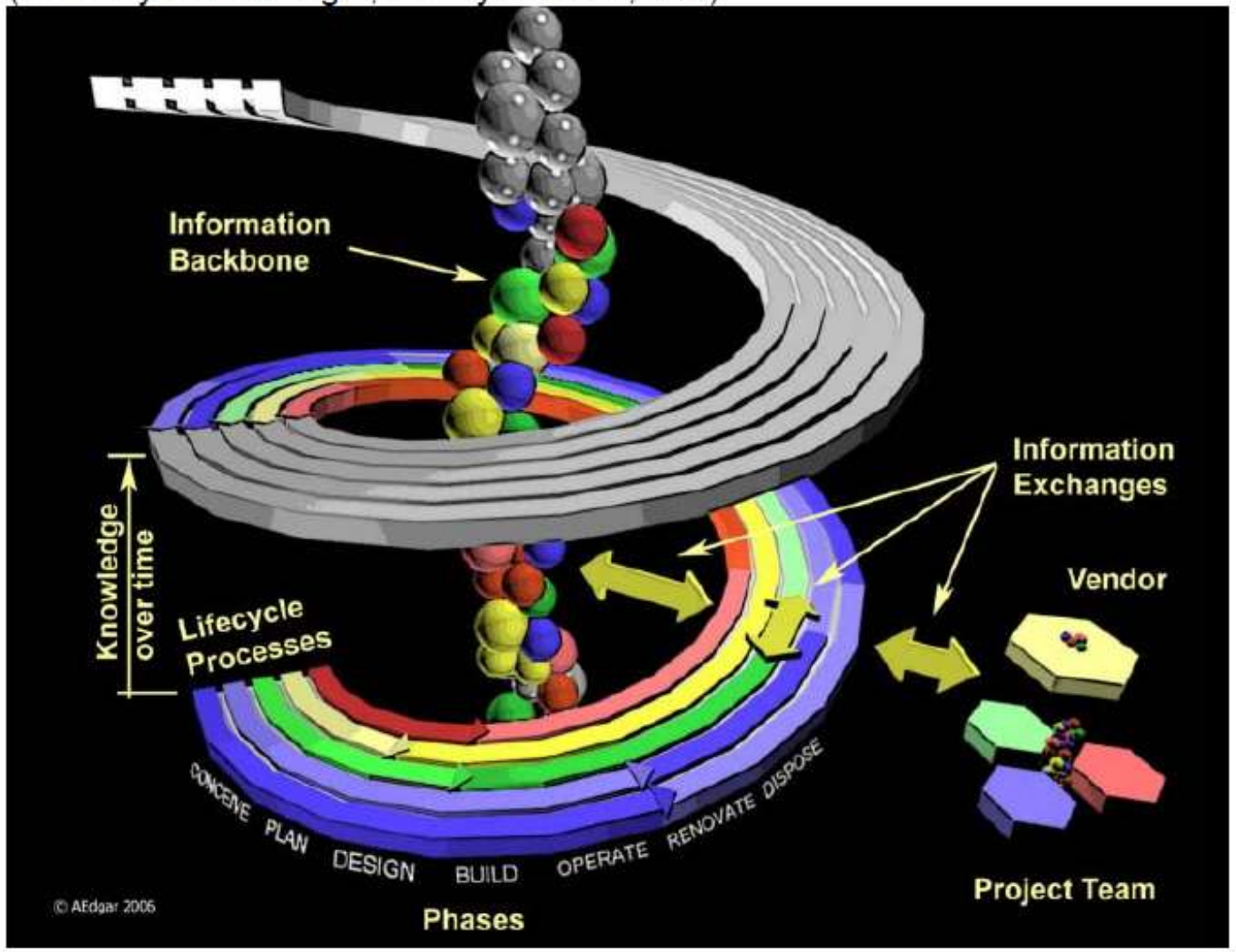
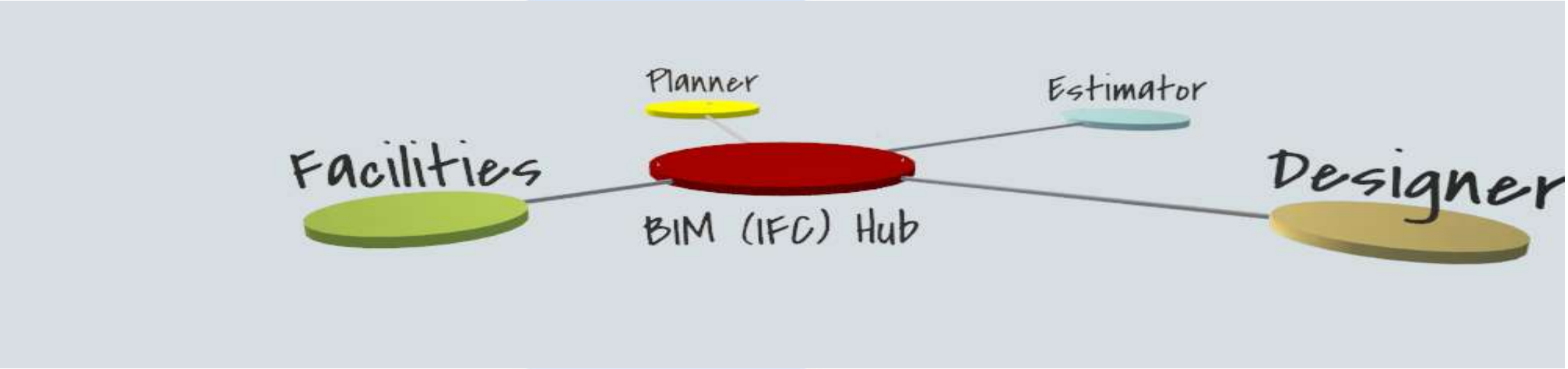
Figure 3.3-1 Facility Lifecycle BIM Repository
(Courtesy of Alan Edgar, FacilityGenetics, LLC)



Technology

Benefit 1 - **Improved Information & process interoperability.**

All parties have access & visibility to common neutral format Information via a Hub or centralised data repository that allows for authoring, consumption, re-used & processing



Overview of system components (Web)

- Hub (BIM Server – Storage, Processing, Simulation)
- Nodes (Delivery roles)
- Spokes (Exchange connection)

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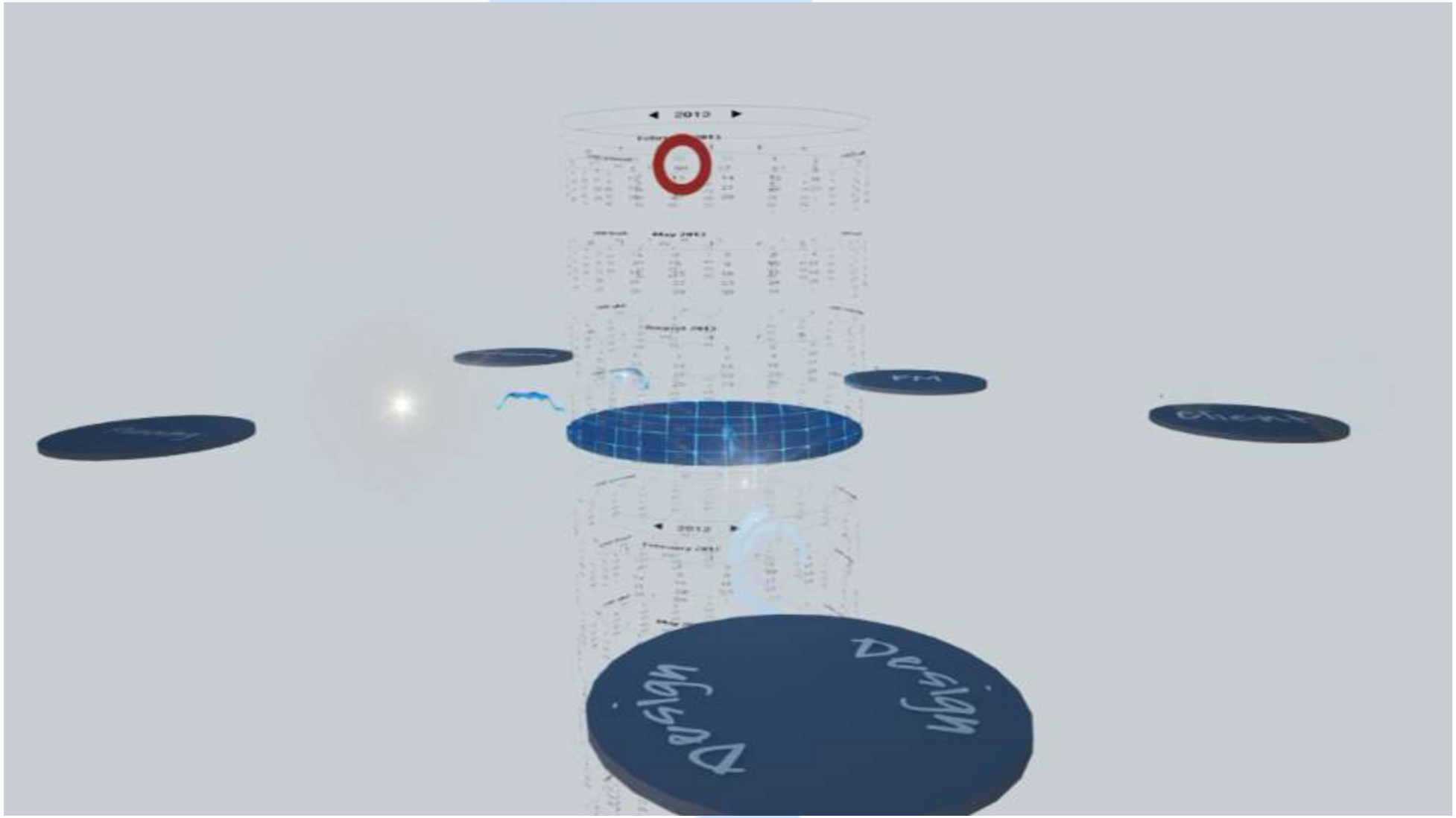
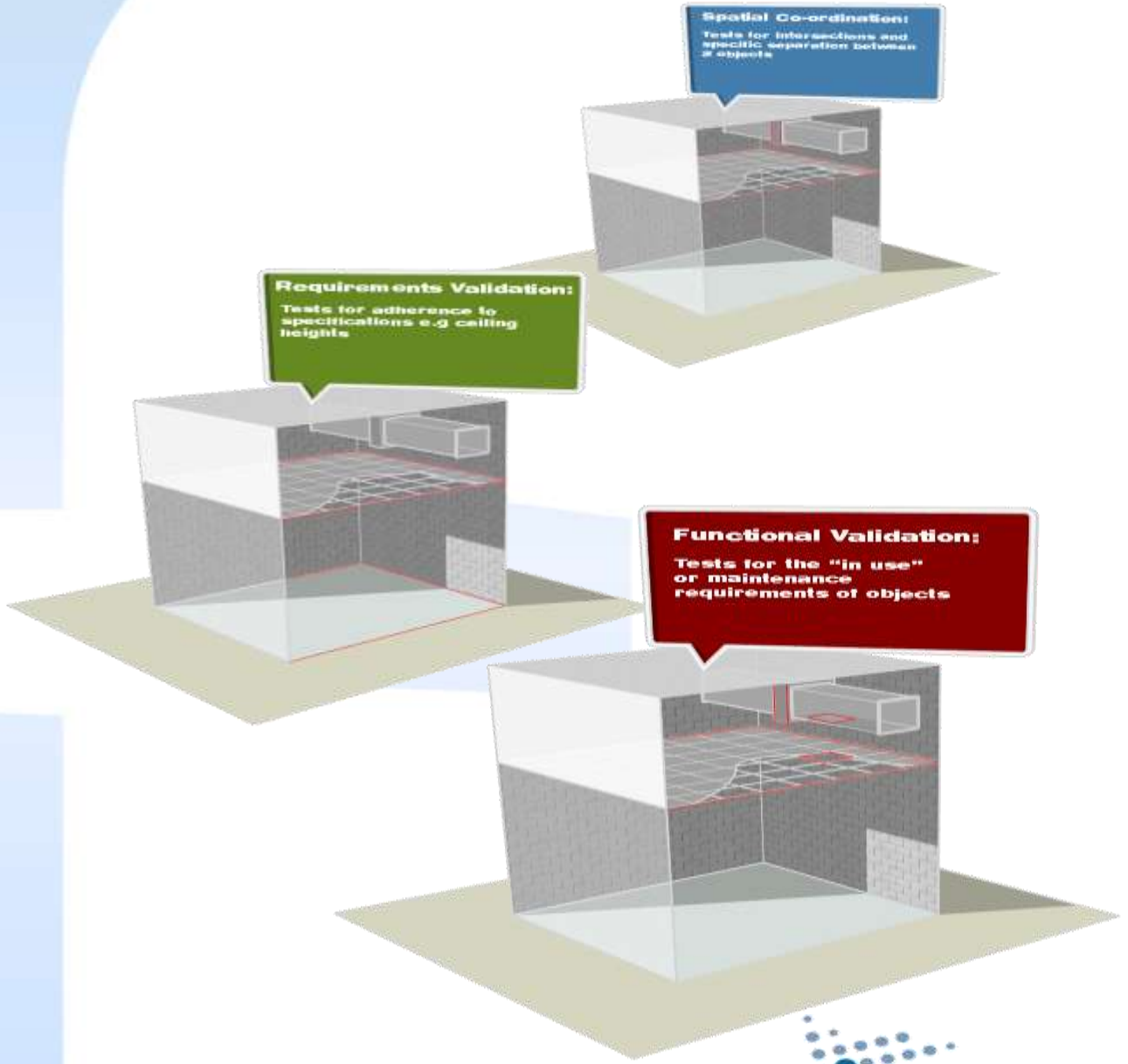


What is functional validation

Spatial Coordination – Tests for intersections and specific separations between 2 or more objects

Requirements Validation– Tests for adherence to specifications e.g. ceiling heights

Functional validation– Tests for the “in-use” or maintenance requirements of objects



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VICIS conformance validation engine

Back

Detailed File Validation Re

Dudley5.IFC

Revision Number 0

Your Validation Results:

Access Panel Proportionality
Access Panel to Damper
Access Panel to Ceiling
Access Panel Clearance

02-04-2013
15:38:34
Current

7

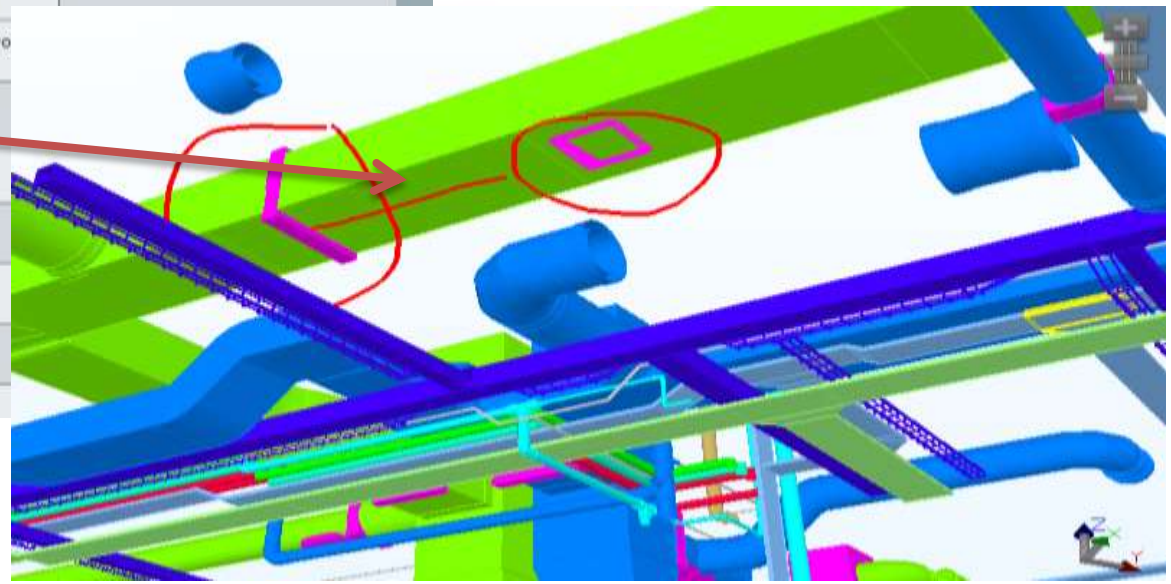
5

Object Reference	Validation Description	Status	Reason
#410503	Access Panel To Damper	Faliure	Found an Access Panel with no Damper within 1000mm
	Grouping Ductwork to Access Panel	Warning	Found an Access Panel with no matching Ductwo

Object Reference	Validation Description	Status	Reason
#414201	Access Panel To Damper	Faliure	Found a Damper with no Access Panel within 1000mm

Object Reference	Validation Description	Status	Reason
#5833	Access Panel To Damper	Faliure	Found a Damper with no Access Panel within 1000mm

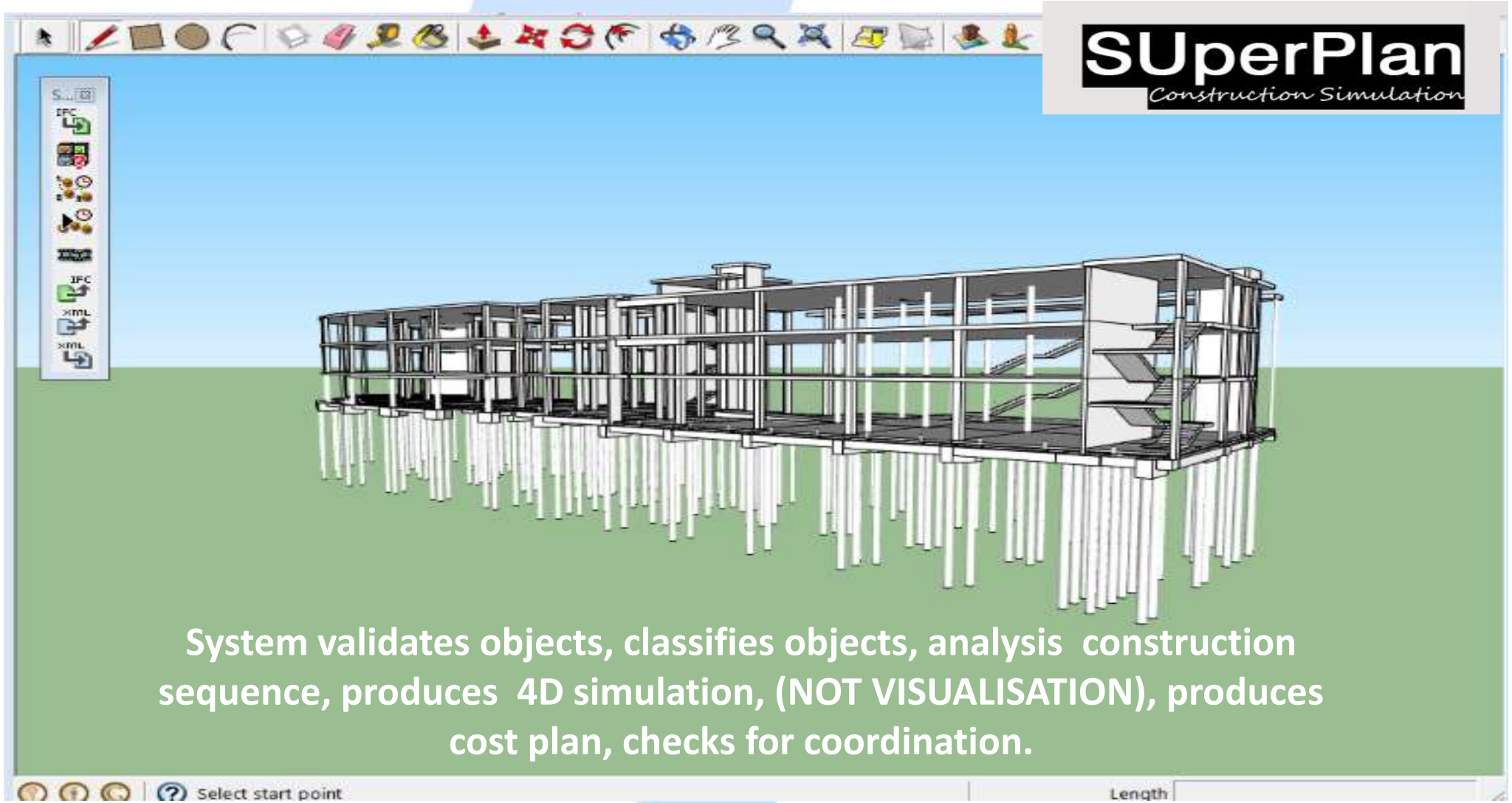
Object Reference	Validation Description	Status	Reason
#3467	Access Panel To Damper	Faliure	Found a Damper with no Access Panel within



VICIS

FULCRO

SUperPlan
Construction Simulation



System validates objects, classifies objects, analysis construction sequence, produces 4D simulation, (NOT VISUALISATION), produces cost plan, checks for coordination.

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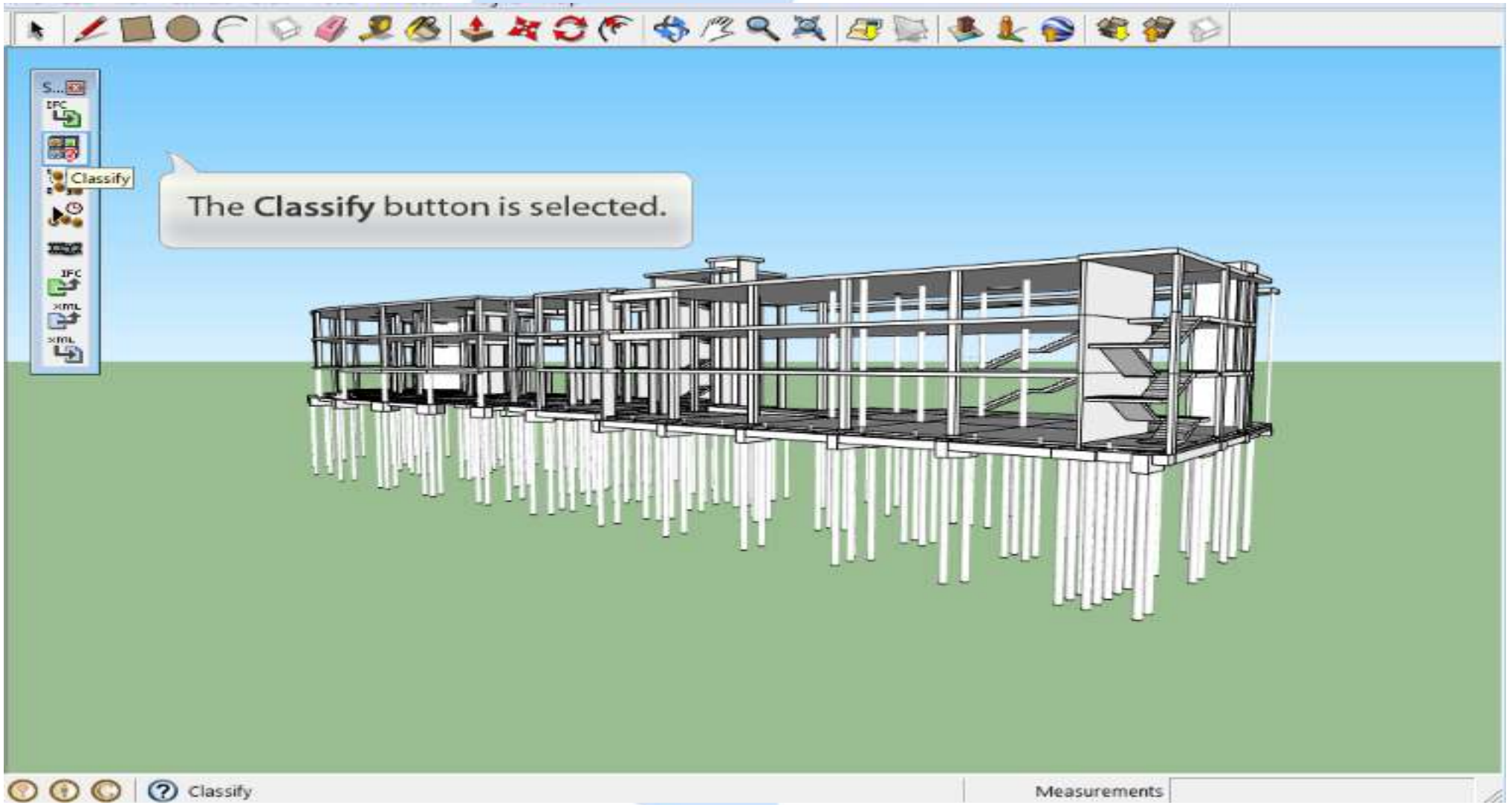
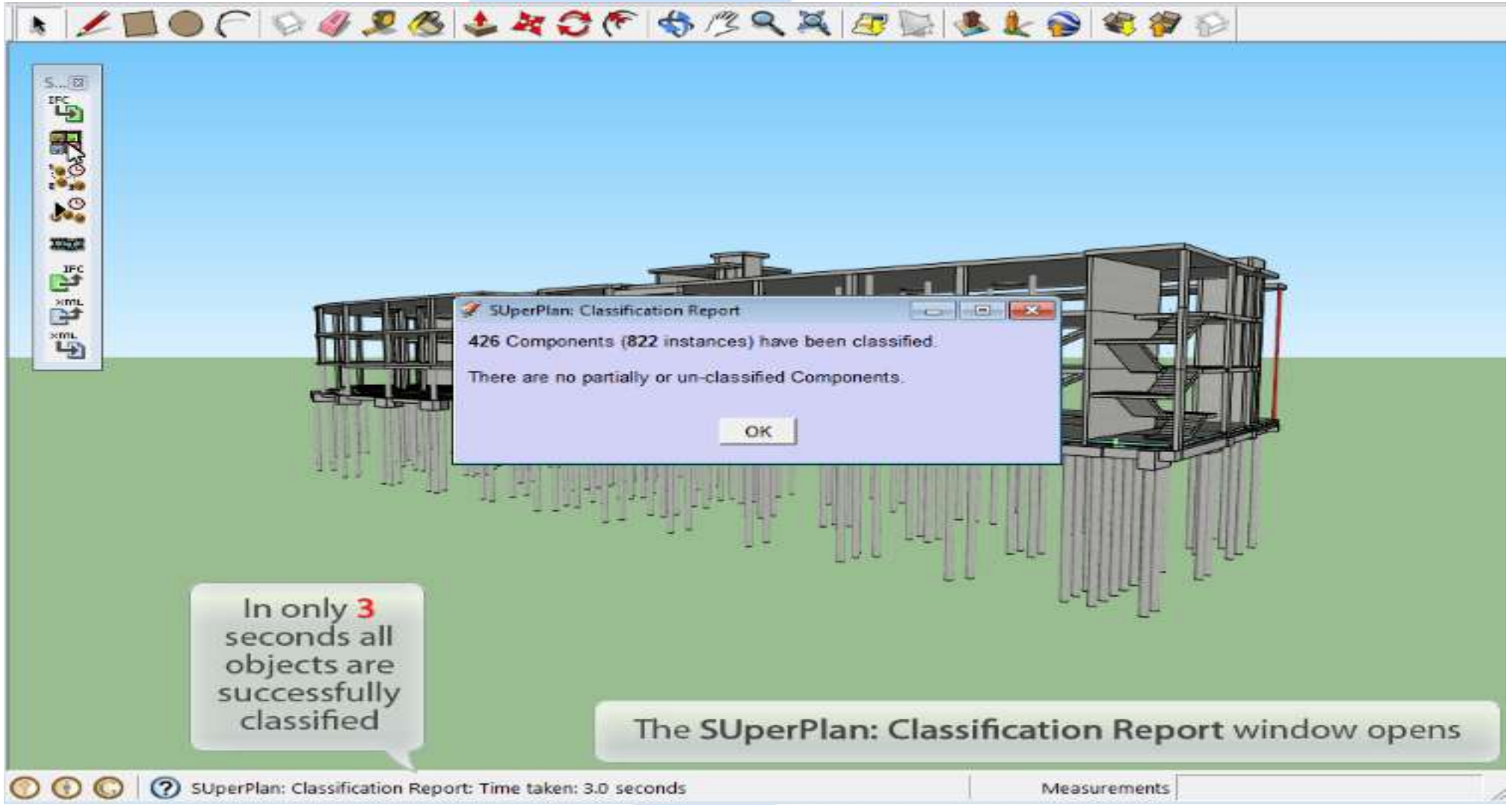
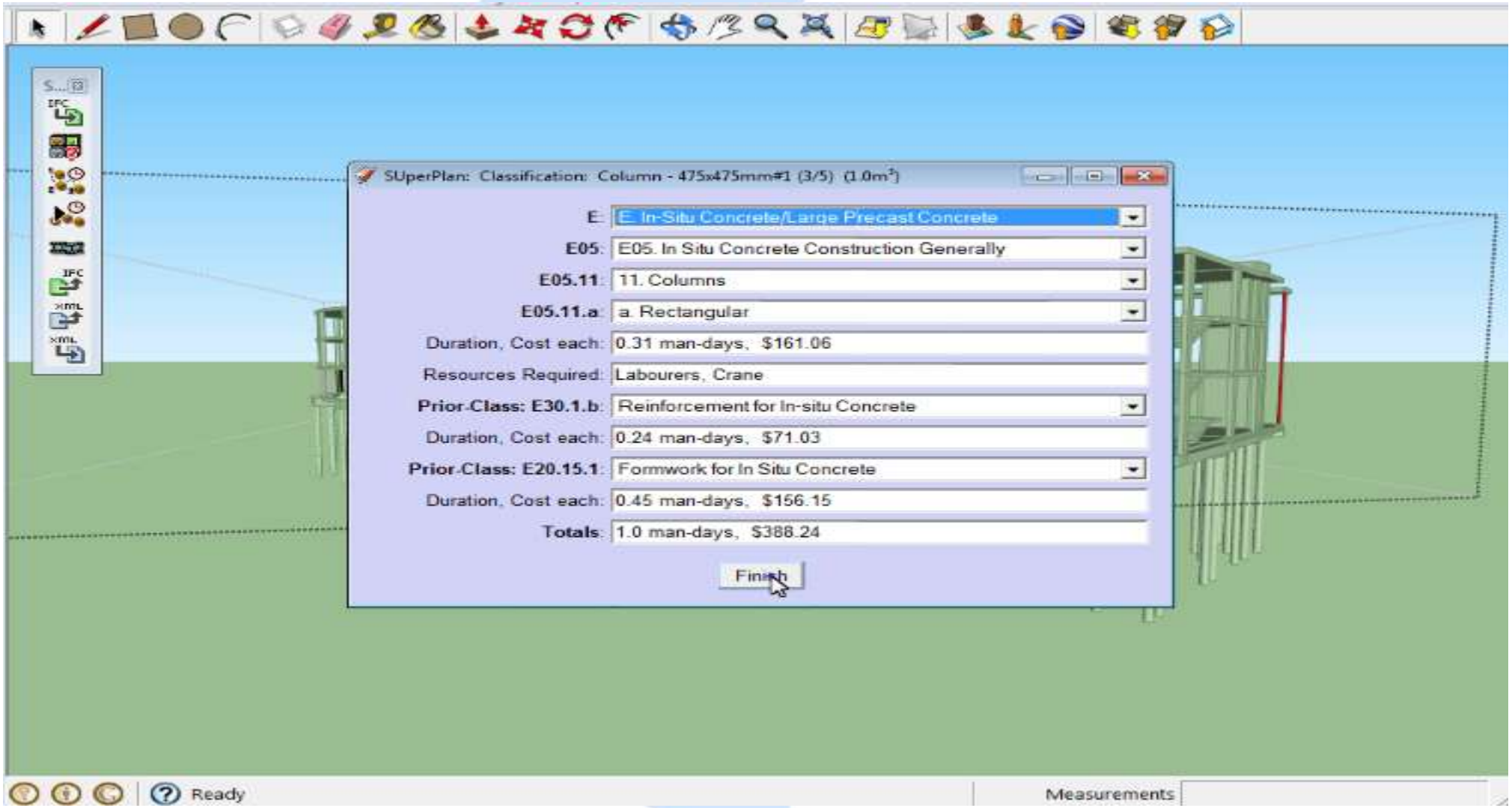

Classify
The Classify button is selected.
IFC
xml
xml
Classify
Measurements

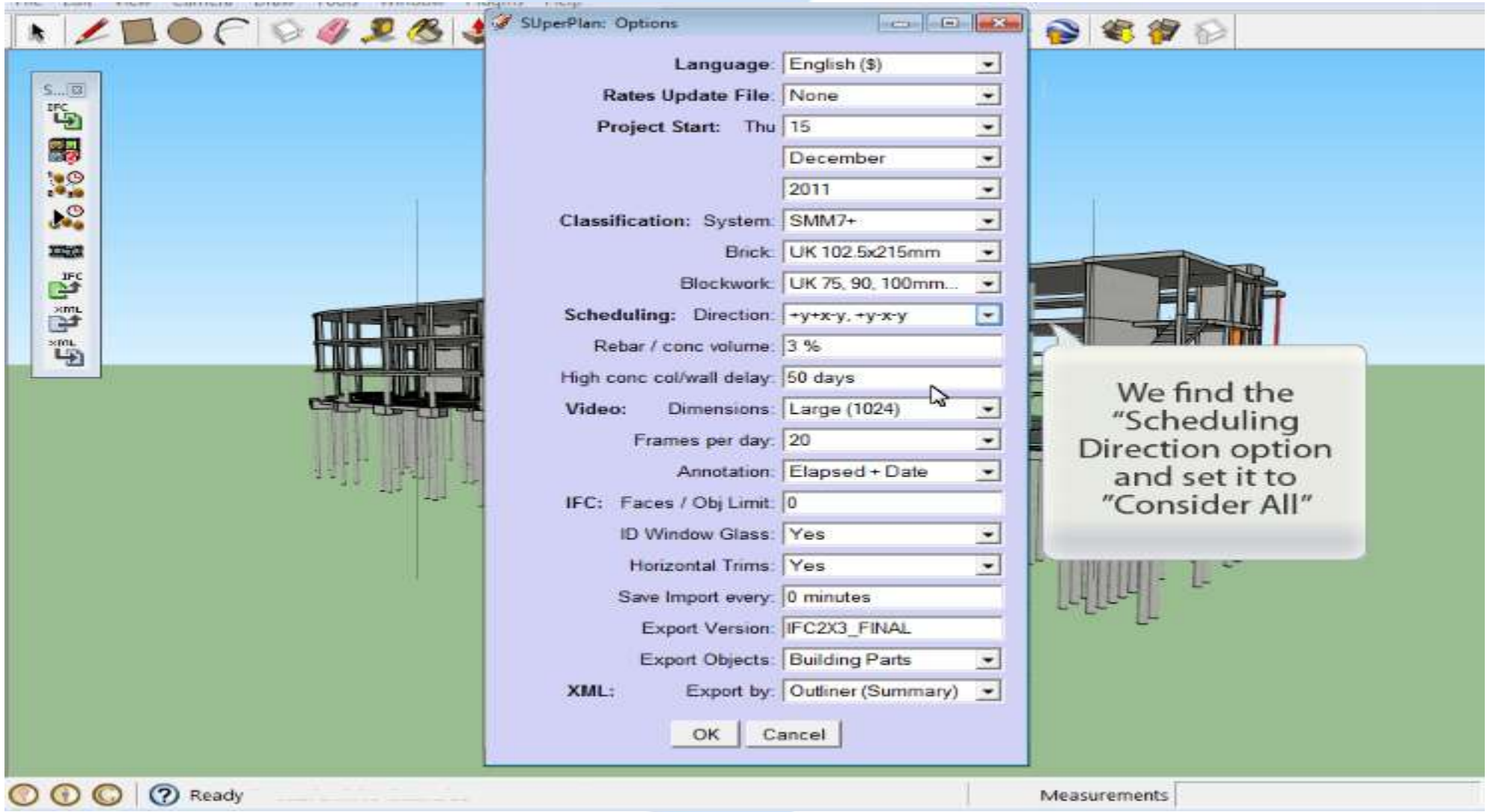
FULCRO


SUperPlan: Classification Report
426 Components (822 instances) have been classified.
There are no partially or un-classified Components.
OK
In only 3 seconds all objects are successfully classified
The SUperPlan: Classification Report window opens
SUperPlan: Classification Report: Time taken: 3.0 seconds
Measurements

FULCRO


SUperPlan: Classification: Column - 475x475mm#1 (3/5) (1.0m³)
E: E. In-Situ Concrete/Large Precast Concrete
E05: E05. In Situ Concrete Construction Generally
E05.11: 11. Columns
E05.11.a: a. Rectangular
Duration, Cost each: 0.31 man-days, $161.06
Resources Required: Labourers, Crane
Prior-Class: E30.1.b: Reinforcement for In-situ Concrete
Duration, Cost each: 0.24 man-days, $71.03
Prior-Class: E20.15.1: Formwork for In Situ Concrete
Duration, Cost each: 0.45 man-days, $156.15
Totals: 1.0 man-days, $388.24
Finish
Ready
Measurements

FULCRO


SUperPlan: Options
Language: English ($)
Rates Update File: None
Project Start: Thu 15
December
2011
Classification: System: SMM7+
Brick: UK 102.5x215mm
Blockwork: UK 75, 90, 100mm...
Scheduling: Direction: +y+x-y, +y-x-y
Rebar / conc volume: 3 %
High conc col/wall delay: 50 days
Video: Dimensions: Large (1024)
Frames per day: 20
Annotation: Elapsed + Date
IFC: Faces / Obj Limit: 0
ID Window Glass: Yes
Horizontal Trims: Yes
Save Import every: 0 minutes
Export Version: IFC2X3_FINAL
Export Objects: Building Parts
XML: Export by: Outliner (Summary)
OK
Cancel
We find the "Scheduling Direction option and set it to "Consider All"
Ready
Measurements

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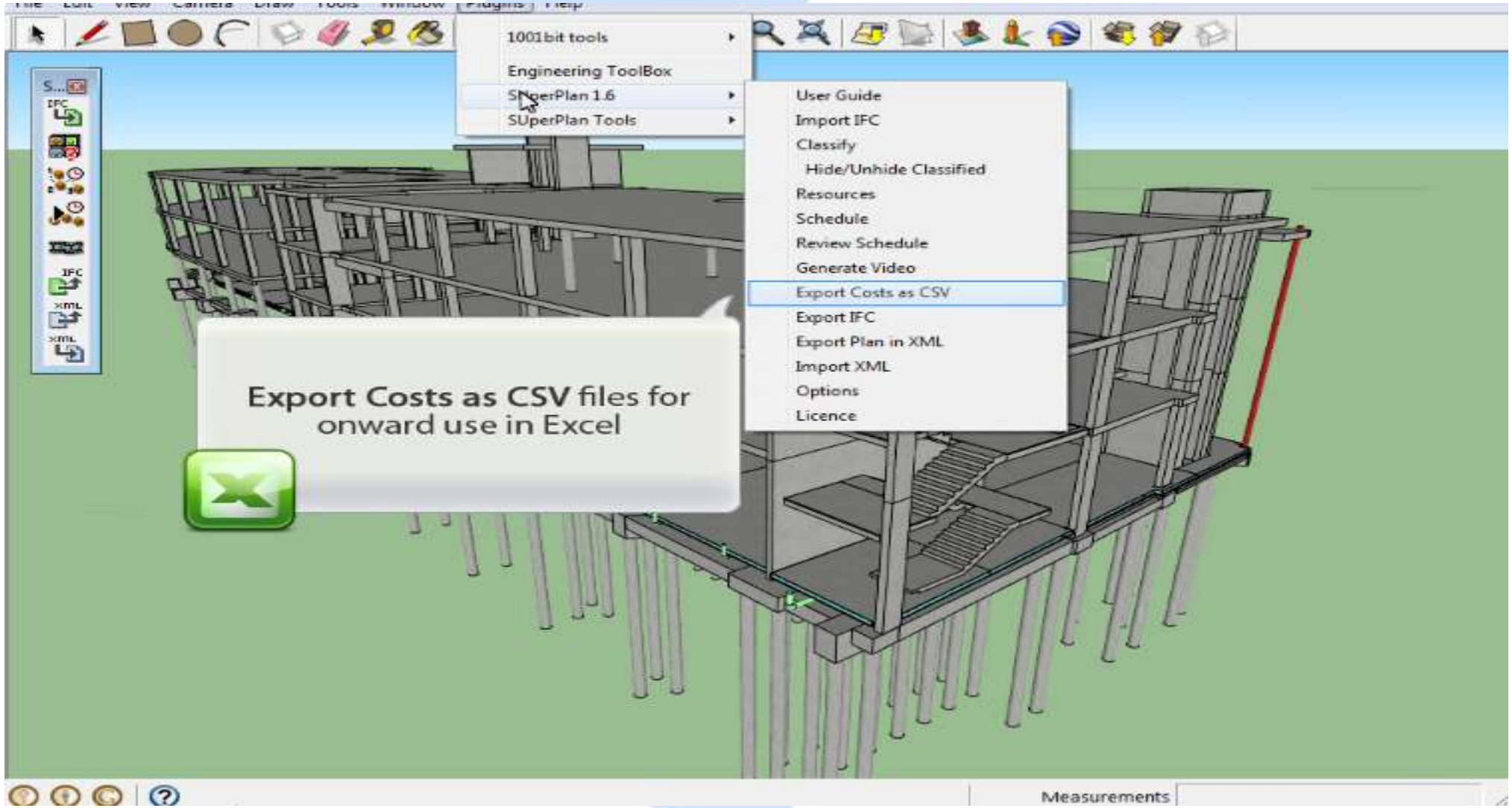
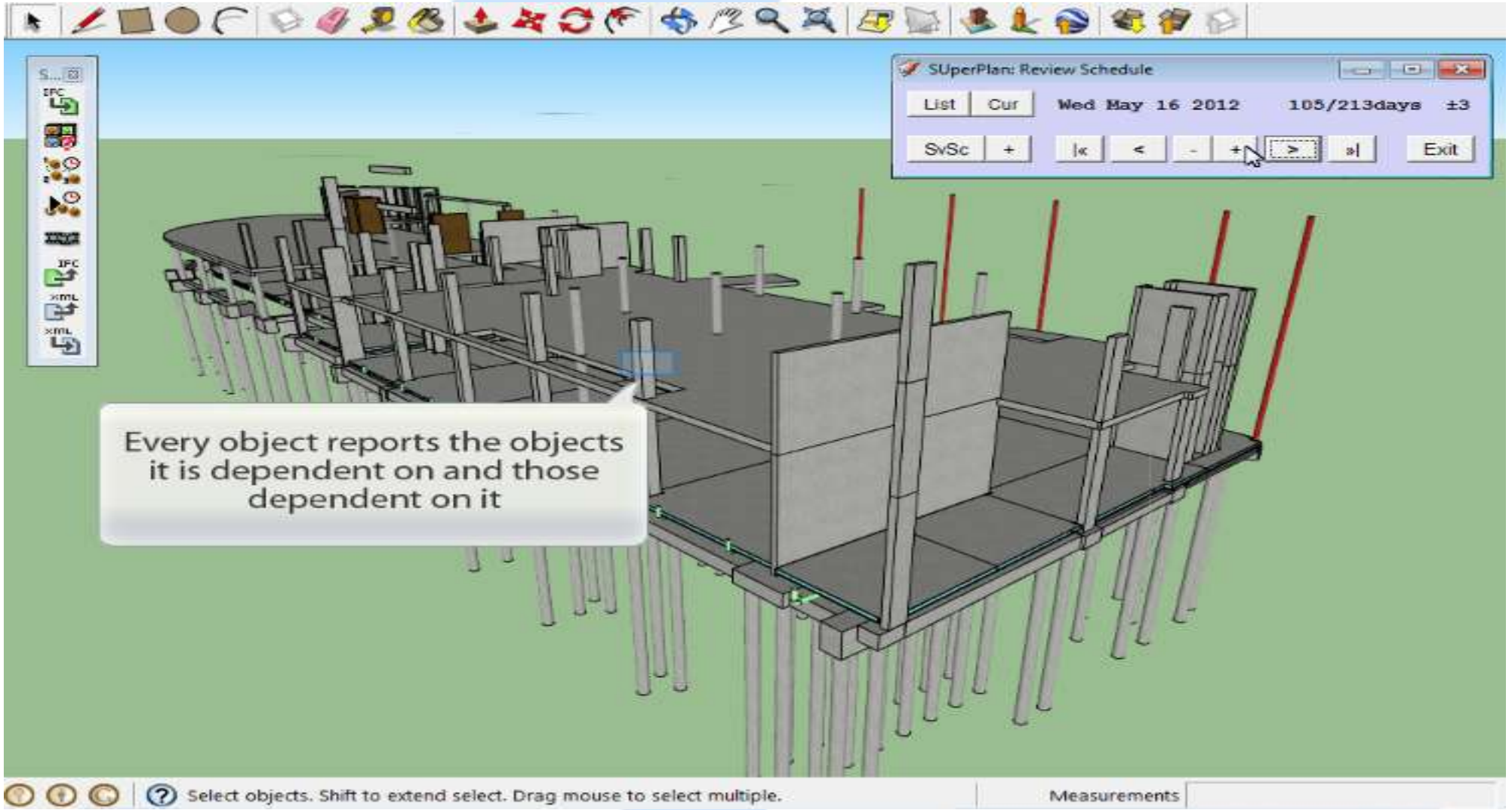

1001bit tools
Engineering ToolBox
SUperPlan 1.6
SUperPlan Tools
User Guide
Import IFC
Classify
Hide/Unhide Classified
Resources
Schedule
Review Schedule
Generate Video
Export Costs as CSV
Export IFC
Export Plan in XML
Import XML
Options
Licence
Export Costs as CSV files for onward use in Excel
Measurements

FULCRO


SUperPlan: Review Schedule
List
Cur
Wed May 16 2012
105/213days
±3
SvSc
+
|«
<
-
+
>
»|
Exit
Every object reports the objects it is dependent on and those dependent on it
Select objects. Shift to extend select. Drag mouse to select multiple.
Measurements

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FULCRO

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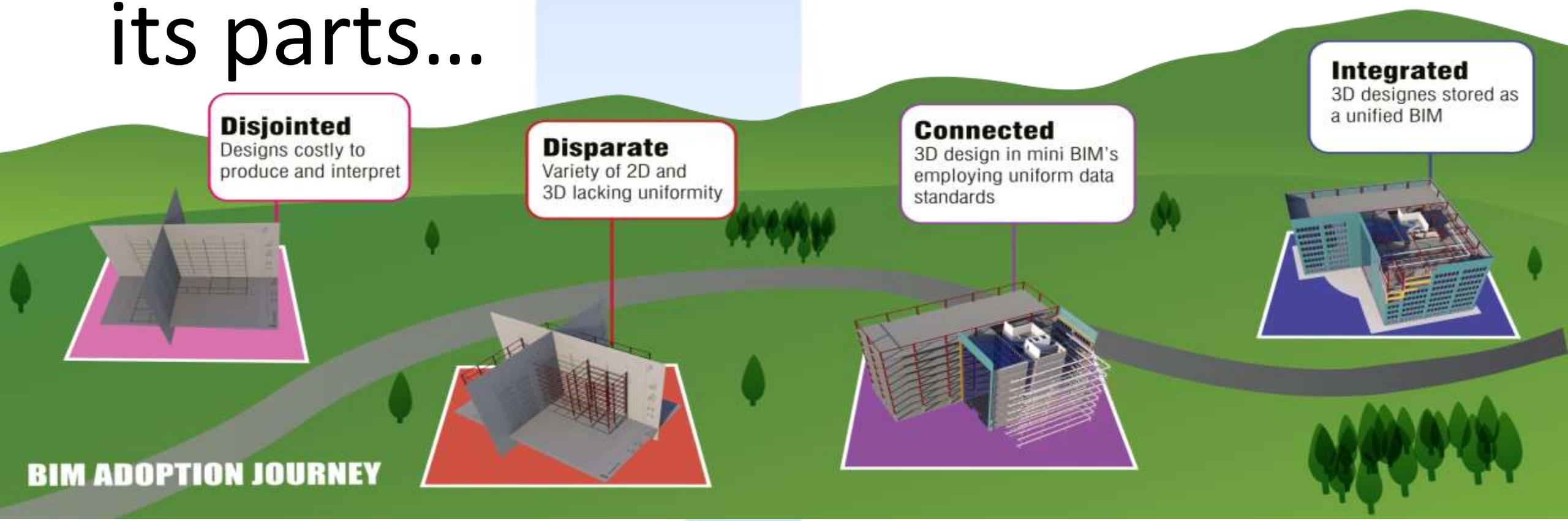
BIM.. greater than the sum of its parts…



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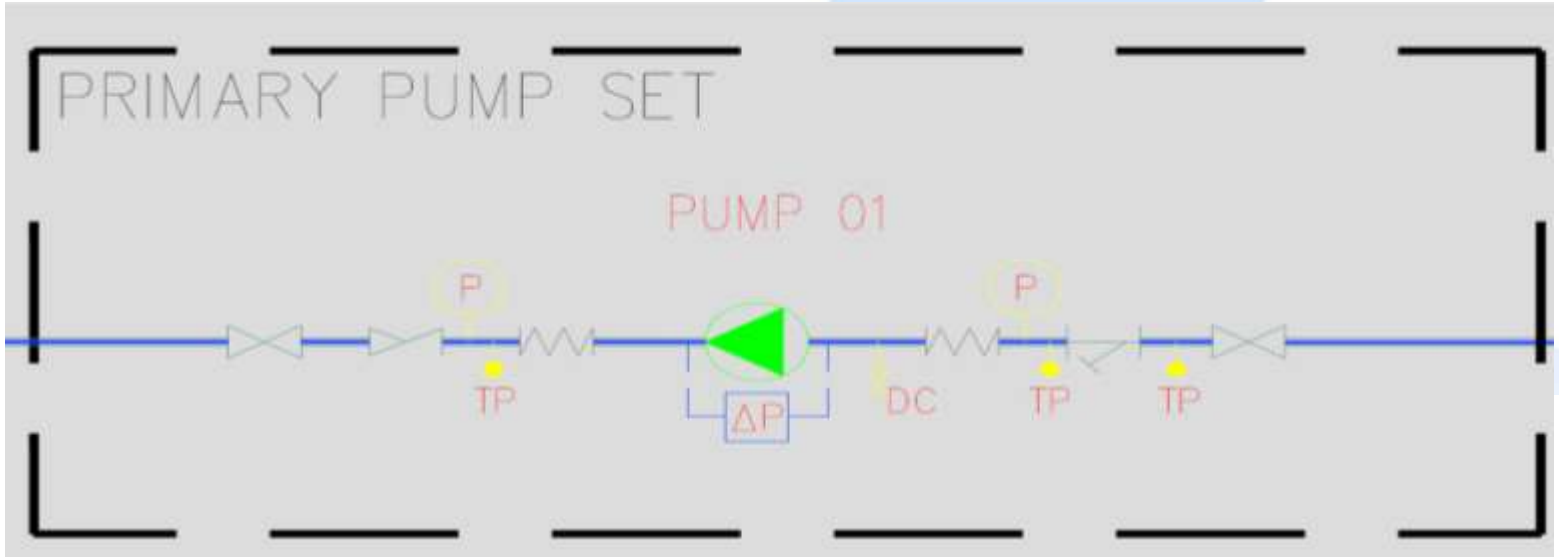
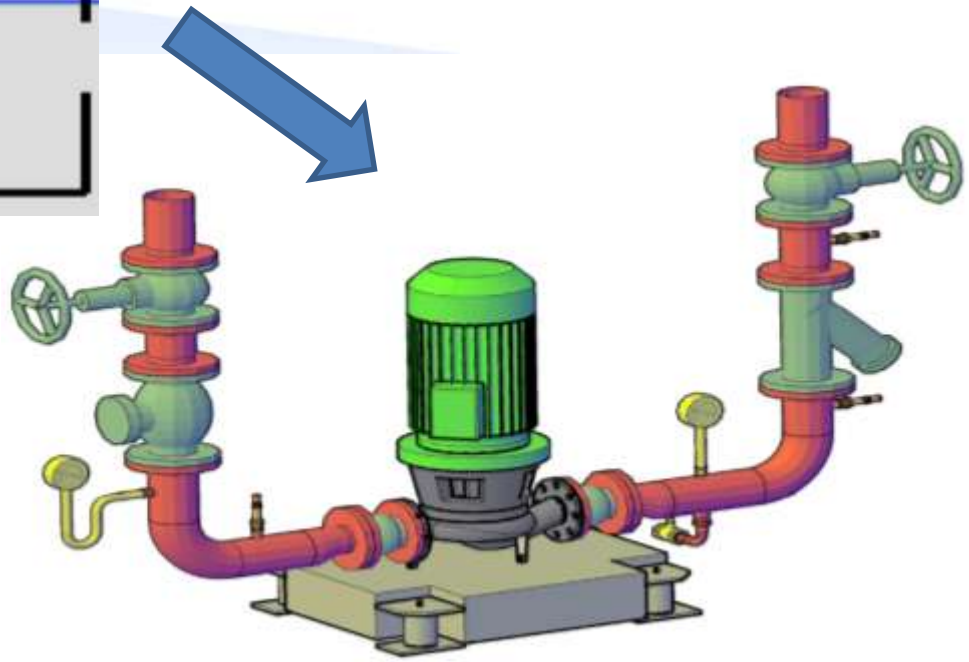
People Process Technology

Sydney Camm joined the Hawker Aircraft Company (later Hawker Siddeley) at Kingston upon Thames as a senior draughtsman

Mitchell worked in the drawing office at Kerr Stuart and studied engineering and mathematics at night school.

Assembly of a Pump Set Information





- Who educates designers why a valve set is placed in vertical
- Space, Access to equipment, do strainers work better in vertical, physical product specification design, etc..

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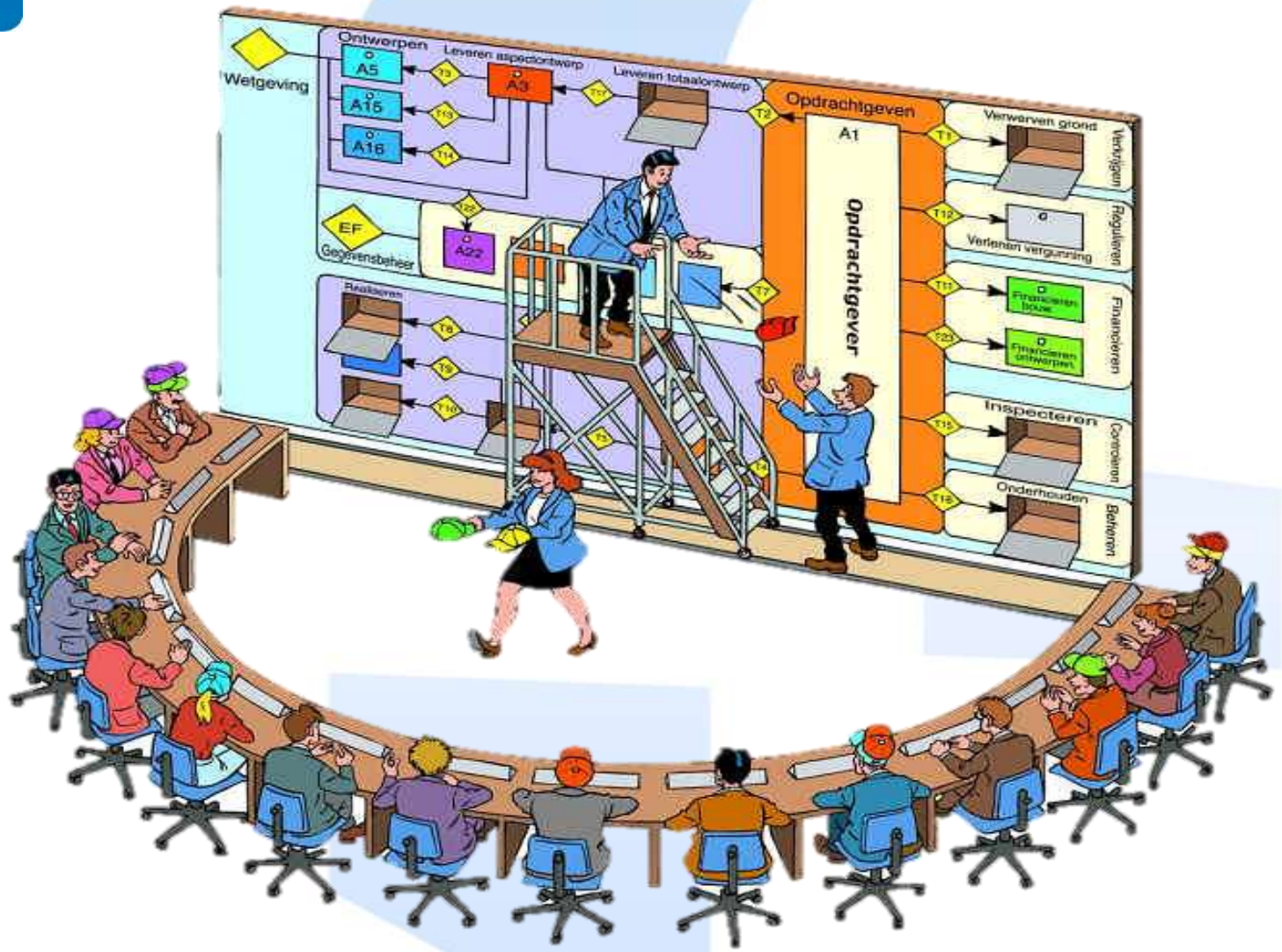
People Process Technology



Moving business processes towards BIM

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“There are no short cuts with BIM, its Business Change”

Ben Haldin

ben.haldin@fulcro.co.uk