

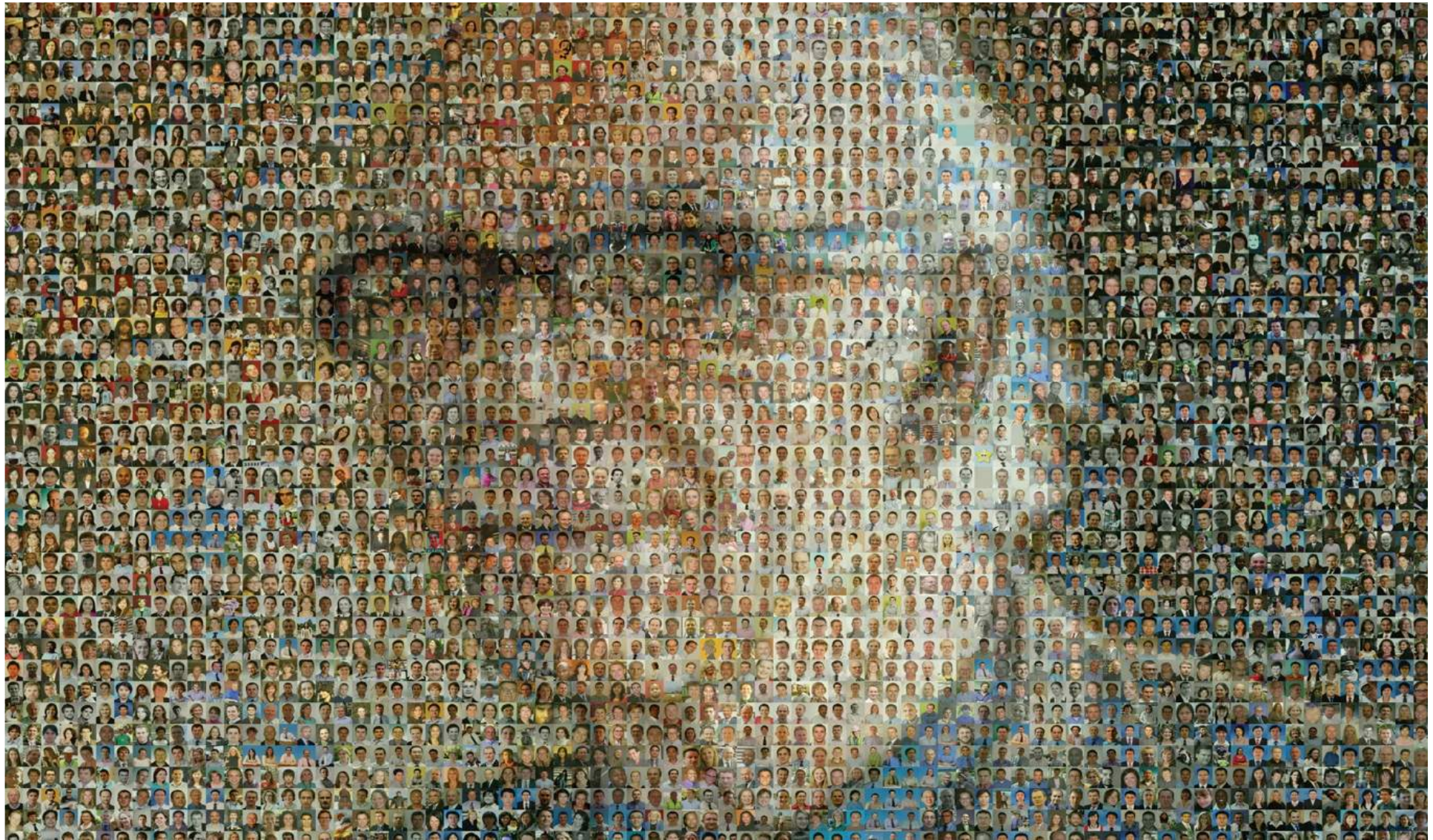


Building Information Modeling технологии В проектировании и последующей эксплуатации зданий

Круглый стол | 3D моделирование в строительстве.

Сергей Луценко
1 Декабря 2017

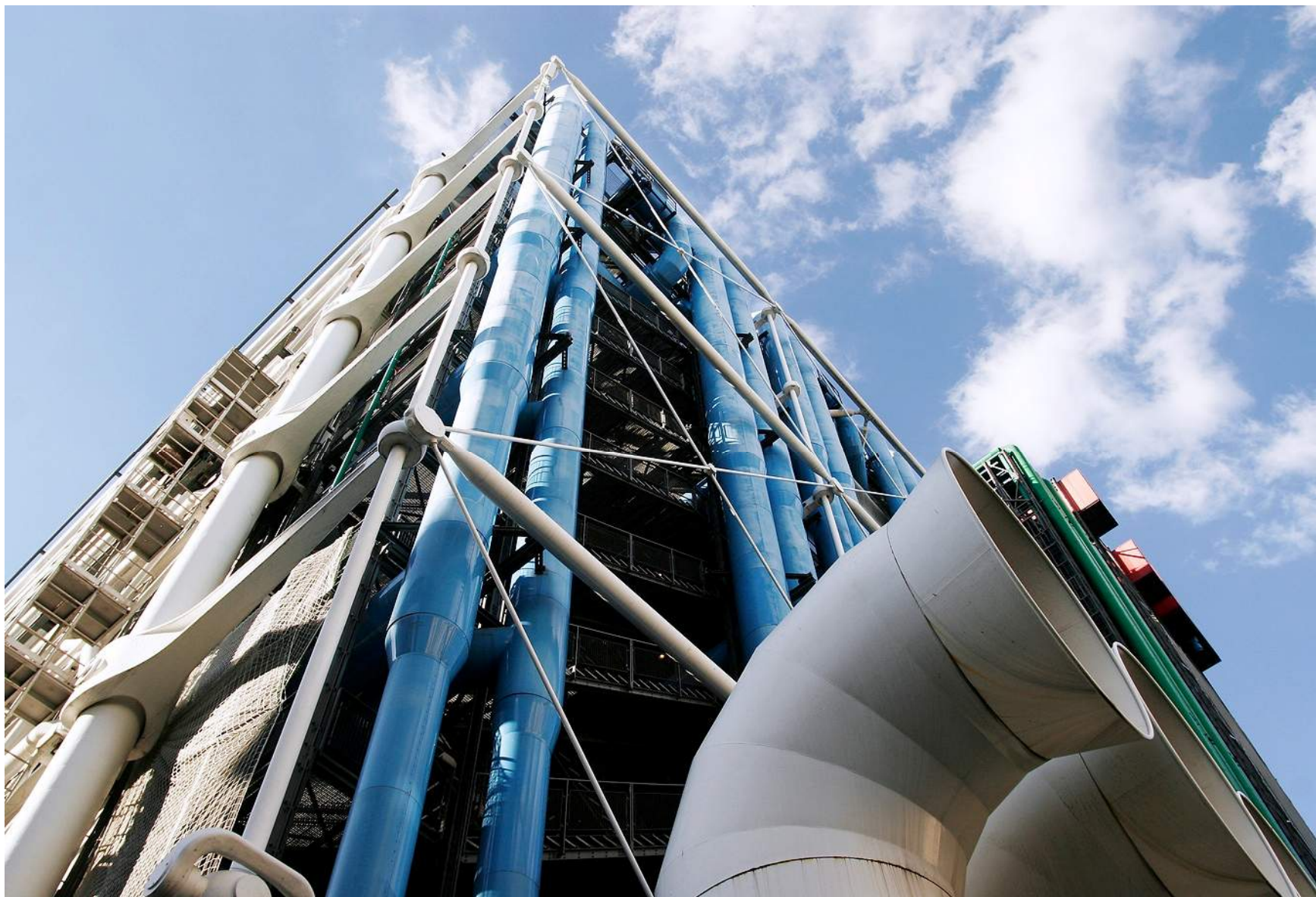
ARUP



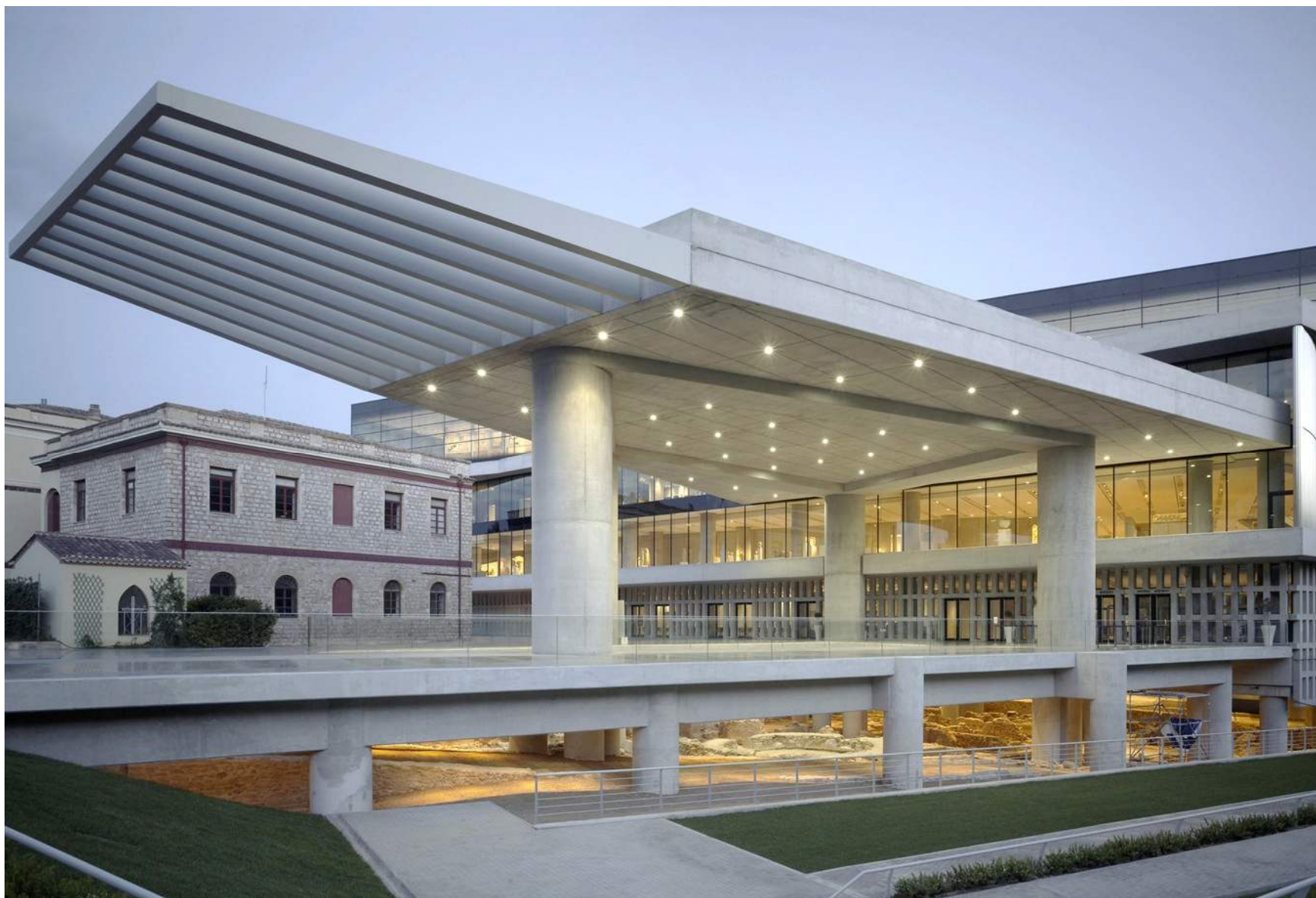
Sir Ove Arup - philosopher, painter, writer...
...and a structural engineer founded the company in 1946



Sydney Opera House, Australia



Pompidou Centre, France



New Acropolis Museum, Athens, Greece



Heathrow Terminal 5, UK



CCTV Headquarters, Beijing, China



30 St Mary Axe (The Gurkin), London, UK

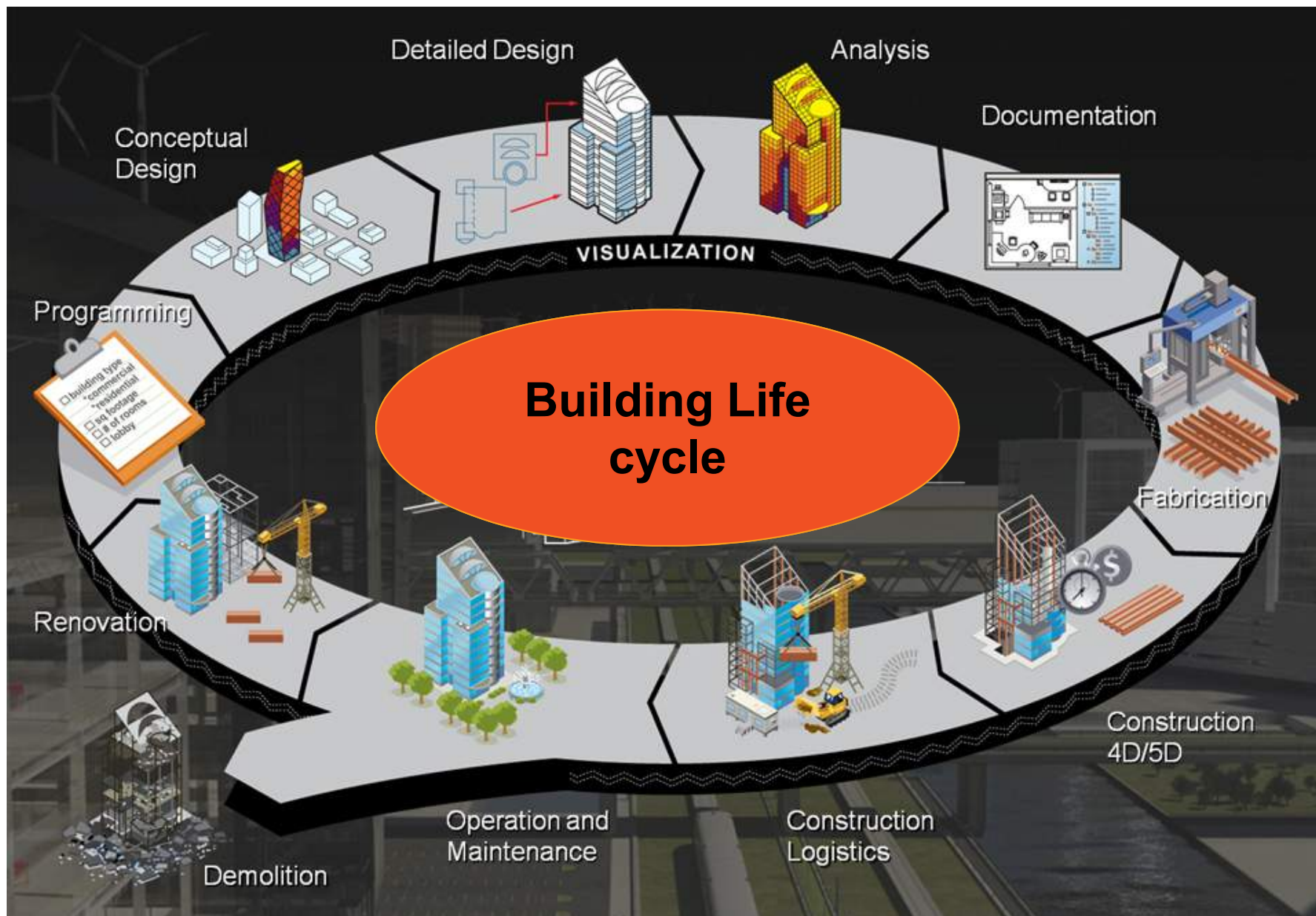


Guangzhou IFC, China

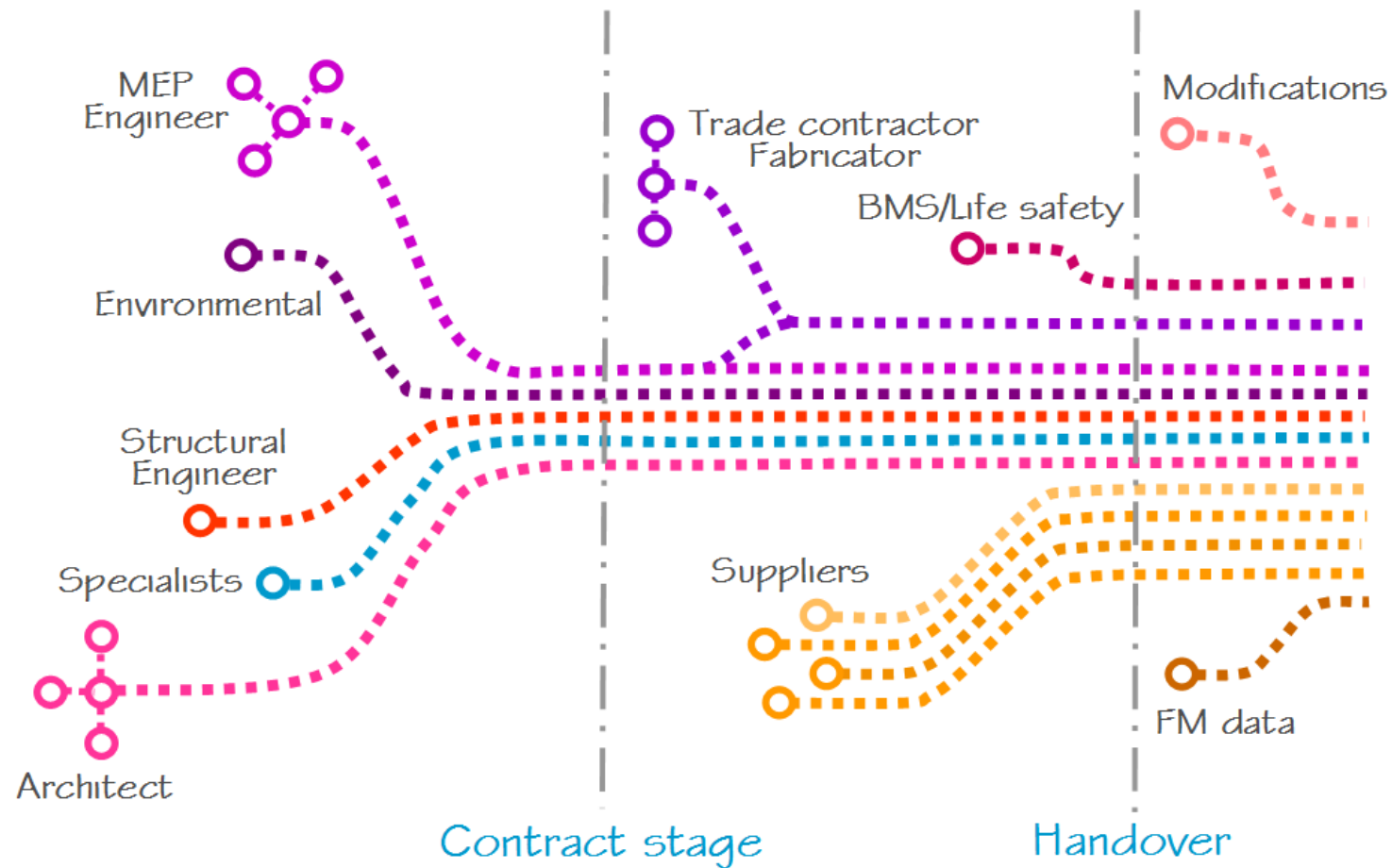
BIM. Introduction

How has the building industry changed?





The Design - An integrated process

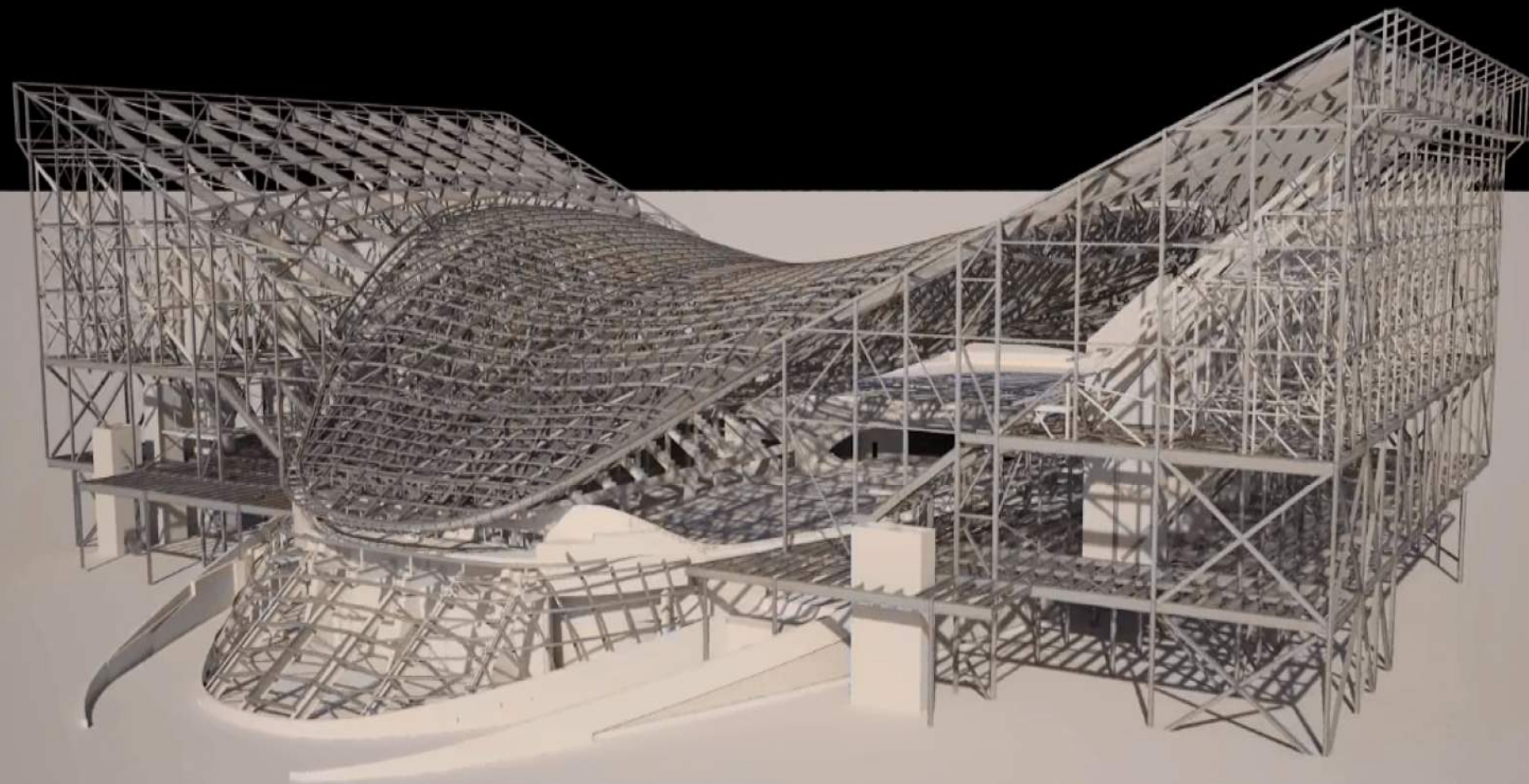


...but we have **B**uilding **I**nformation **M**odeling (**BIM**)...

But what is **BIM*** ???

Is it a Tool? Is it a Process? Do we need it?

- * **BIM** - информационное моделирование здания
(информационная модель здания)



ARUP

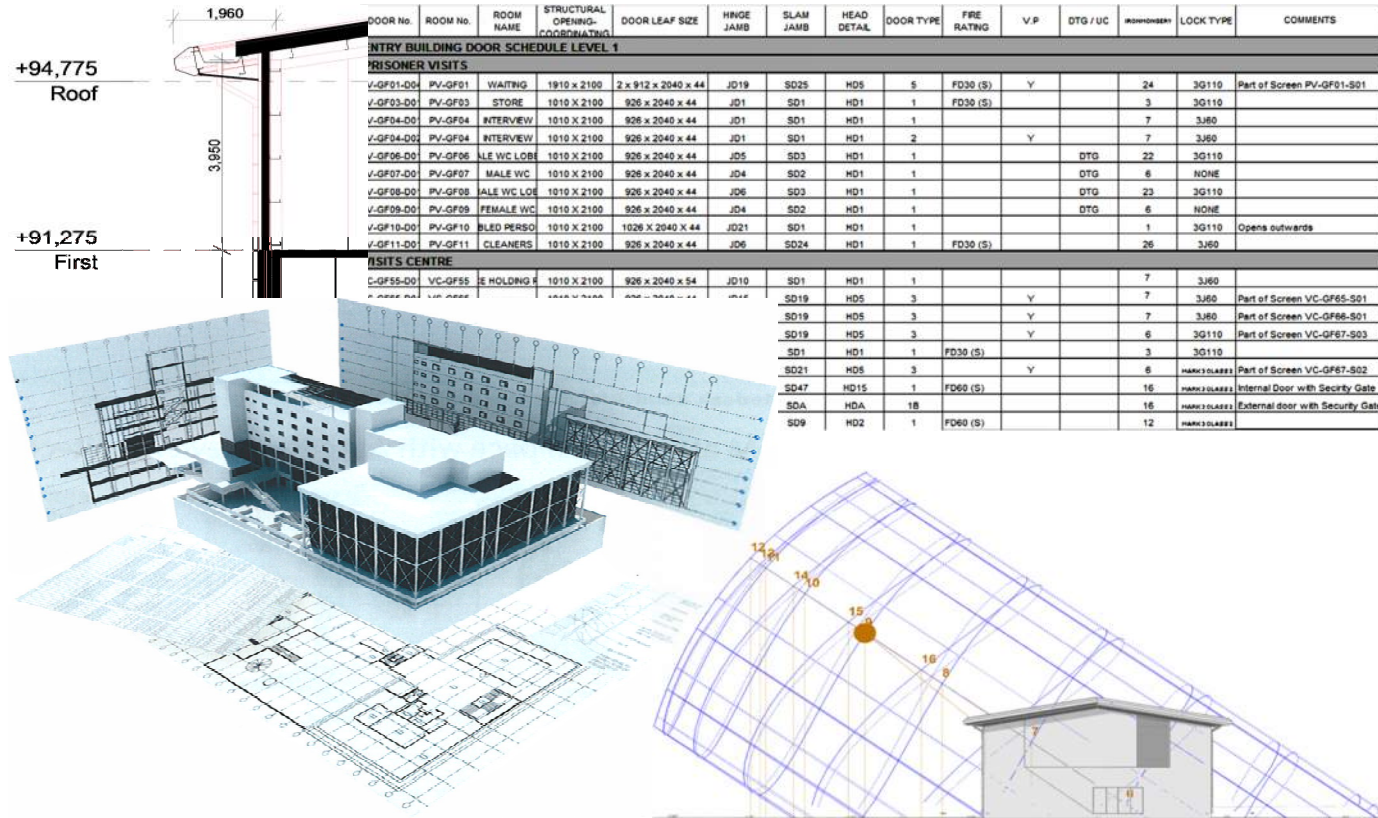


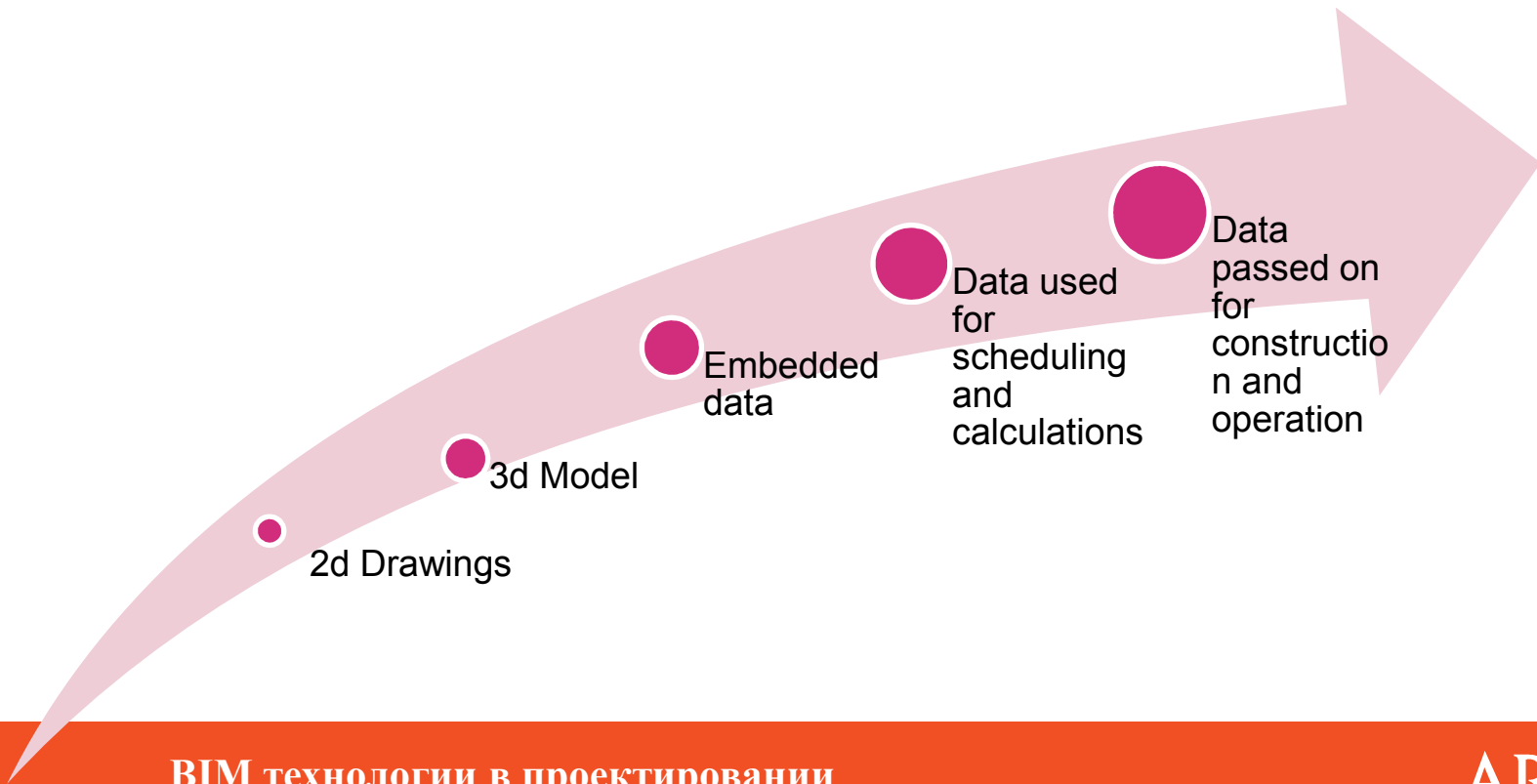
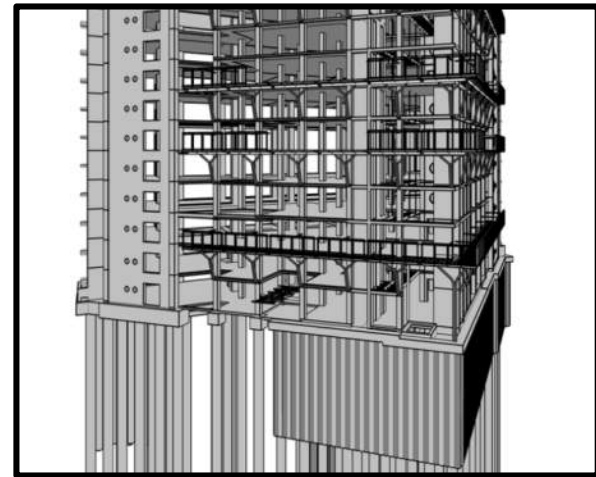
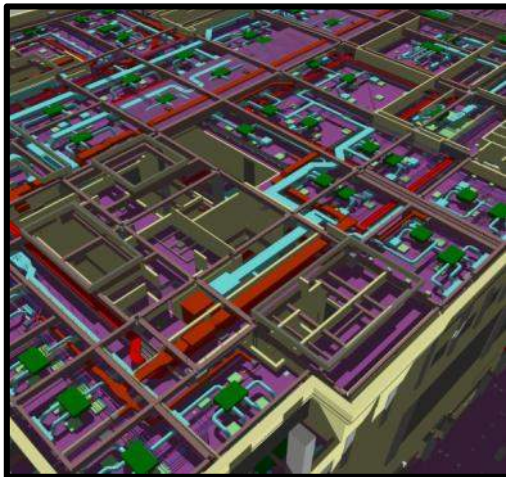
BIM explained

BIM is a descriptive term for technologically advanced, collaborative and information-centric processes in built environment design, construction and operation.

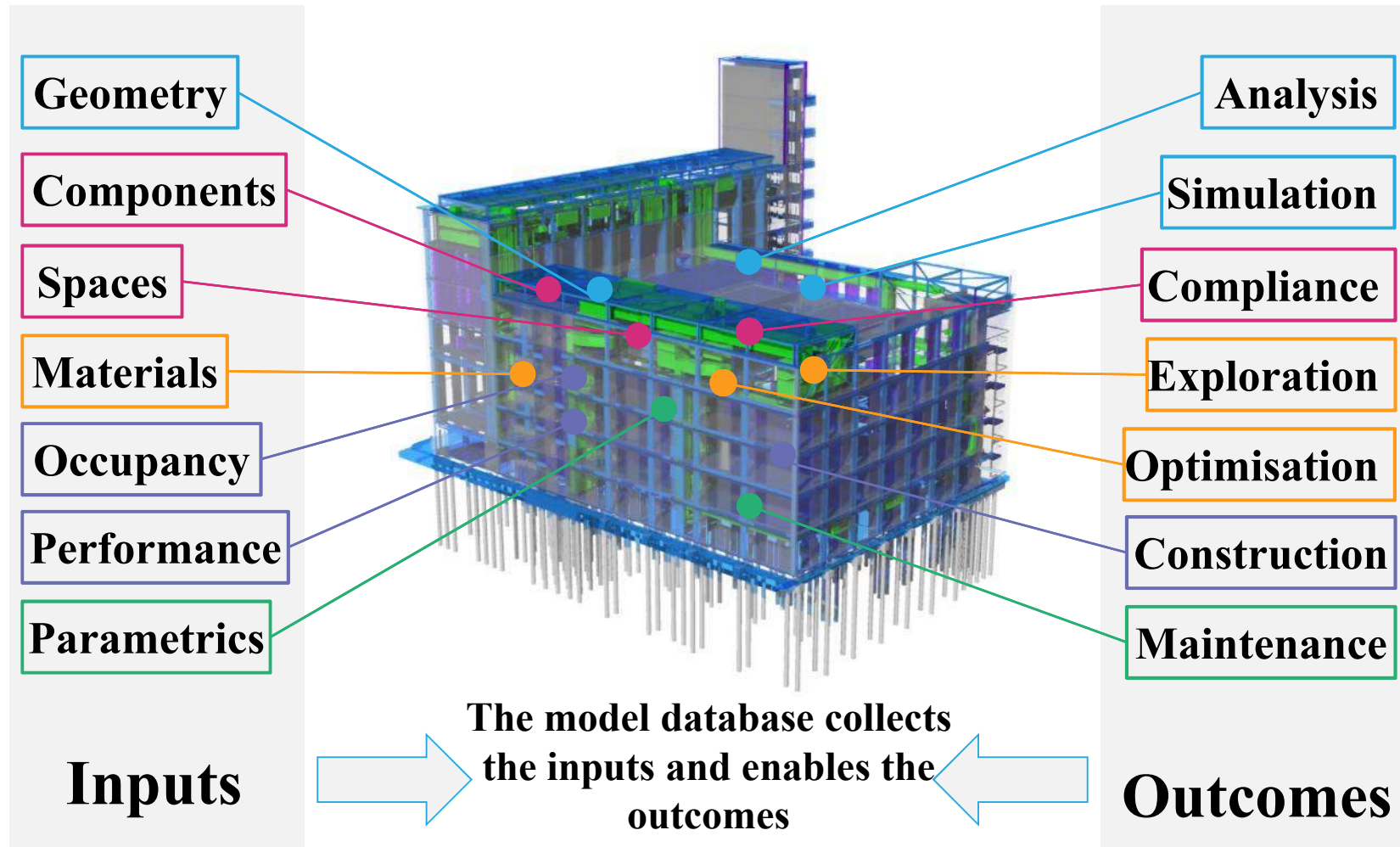
BIM — это подход к возведению, оснащению, обеспечению эксплуатации и ремонту здания (к управлению жизненным циклом объекта), который предполагает сбор и комплексную обработку в процессе проектирования всей архитектурно-конструкторской, технологической, экономической и иной информации о здании со всеми её взаимосвязями и зависимостями, когда здание и все, что имеет к нему отношение, рассматриваются как единый объект.

The Virtual Building

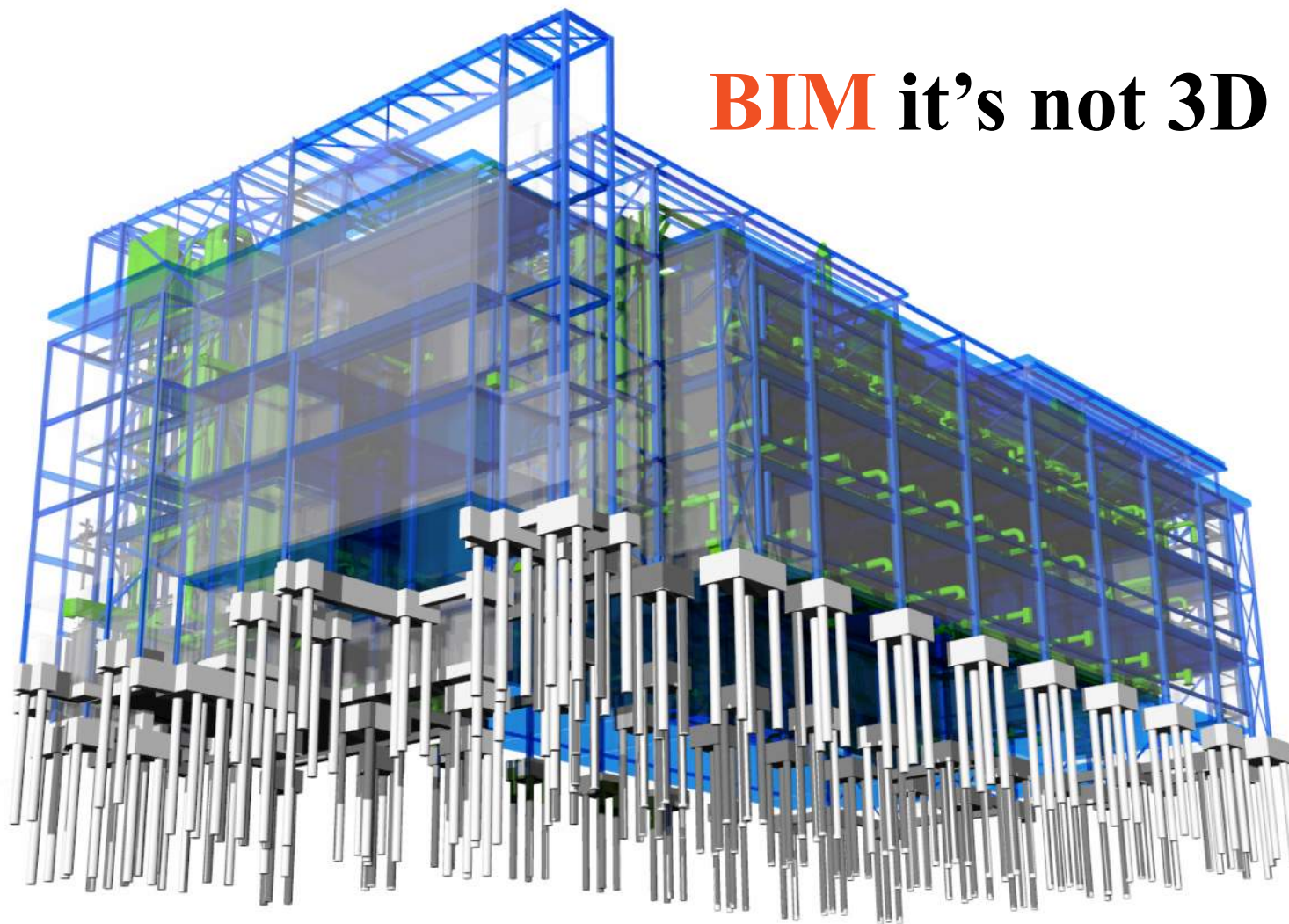




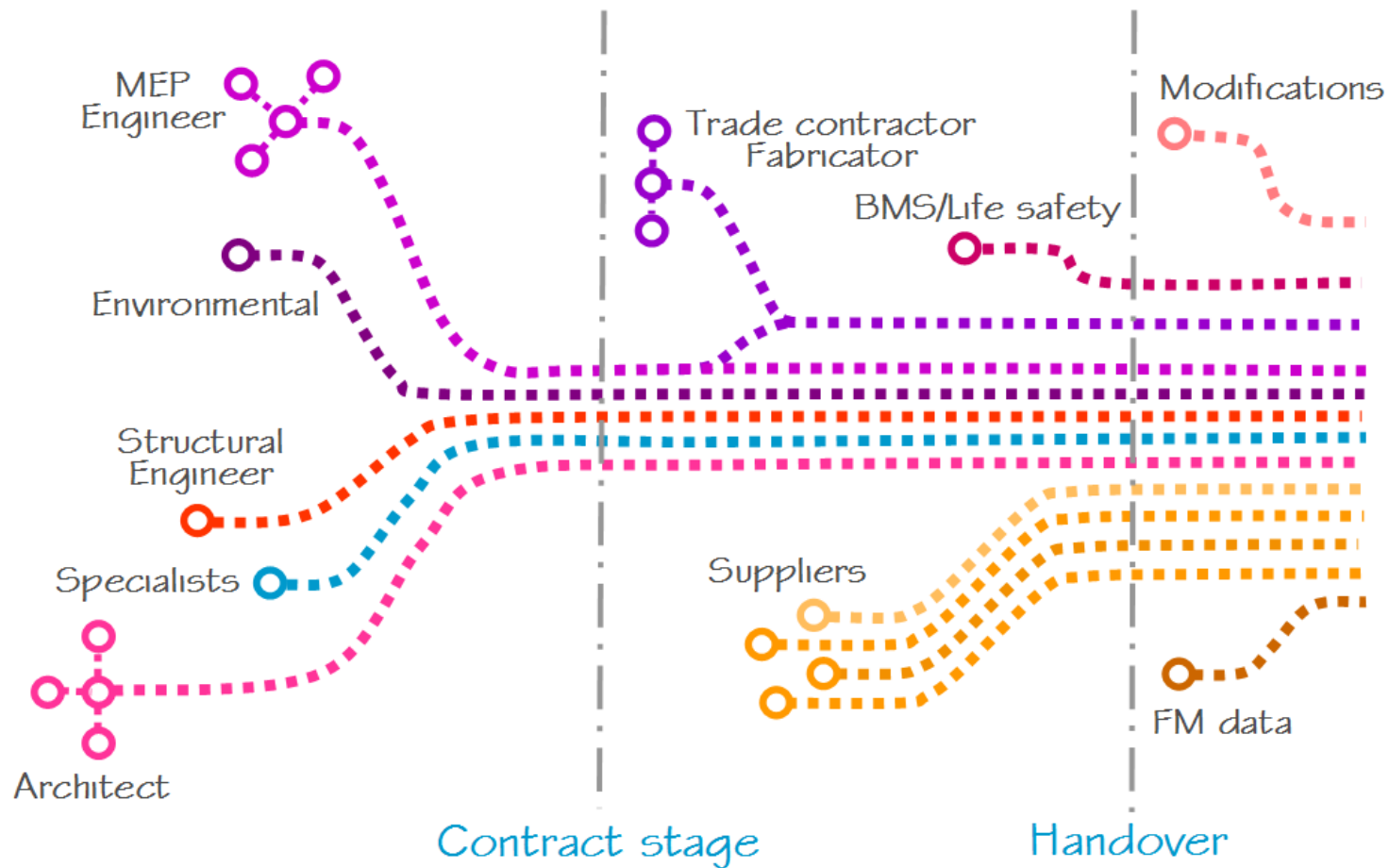
Introduction | The virtual building



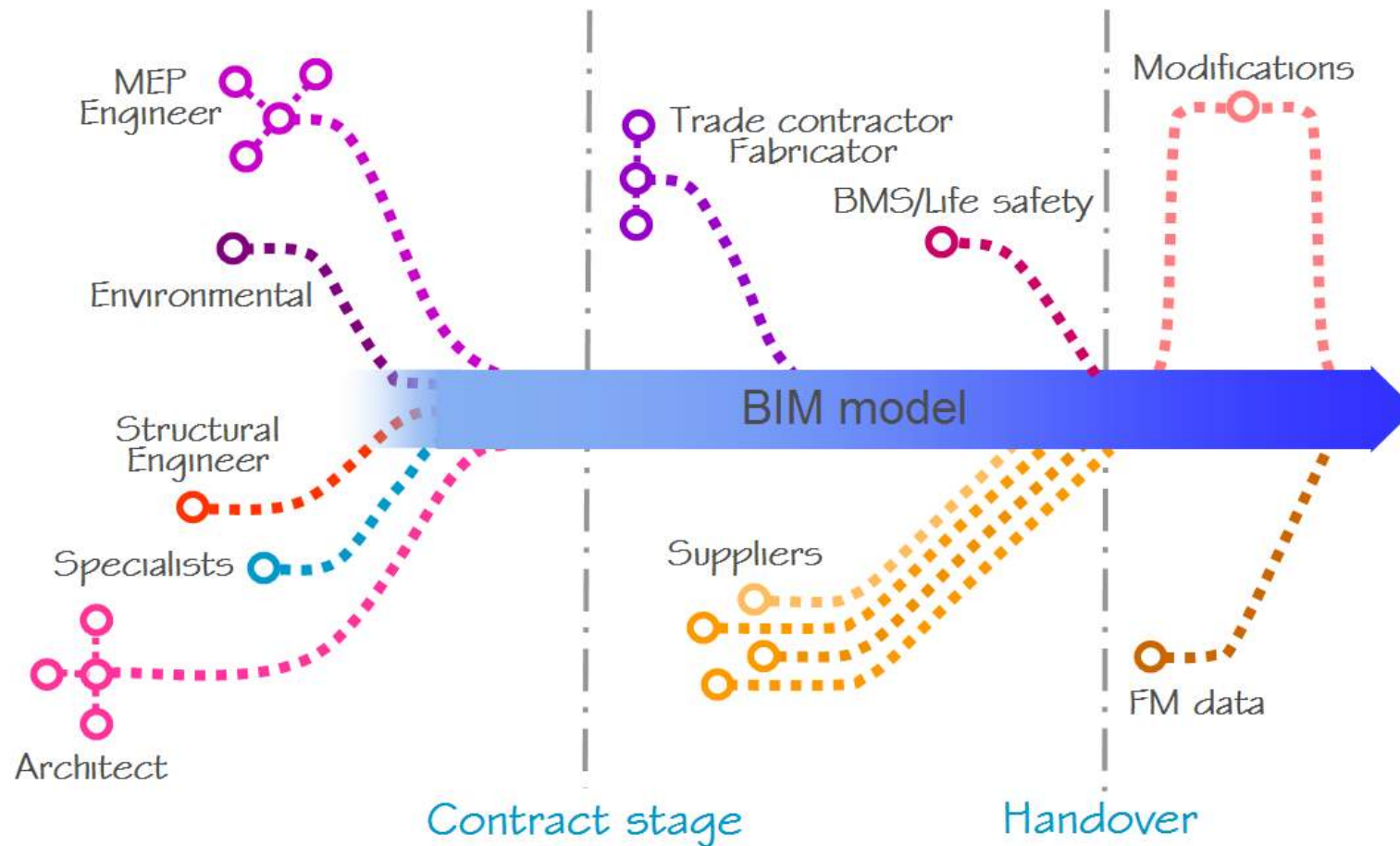
BIM it's not 3D CAD



The Design - An integrated process



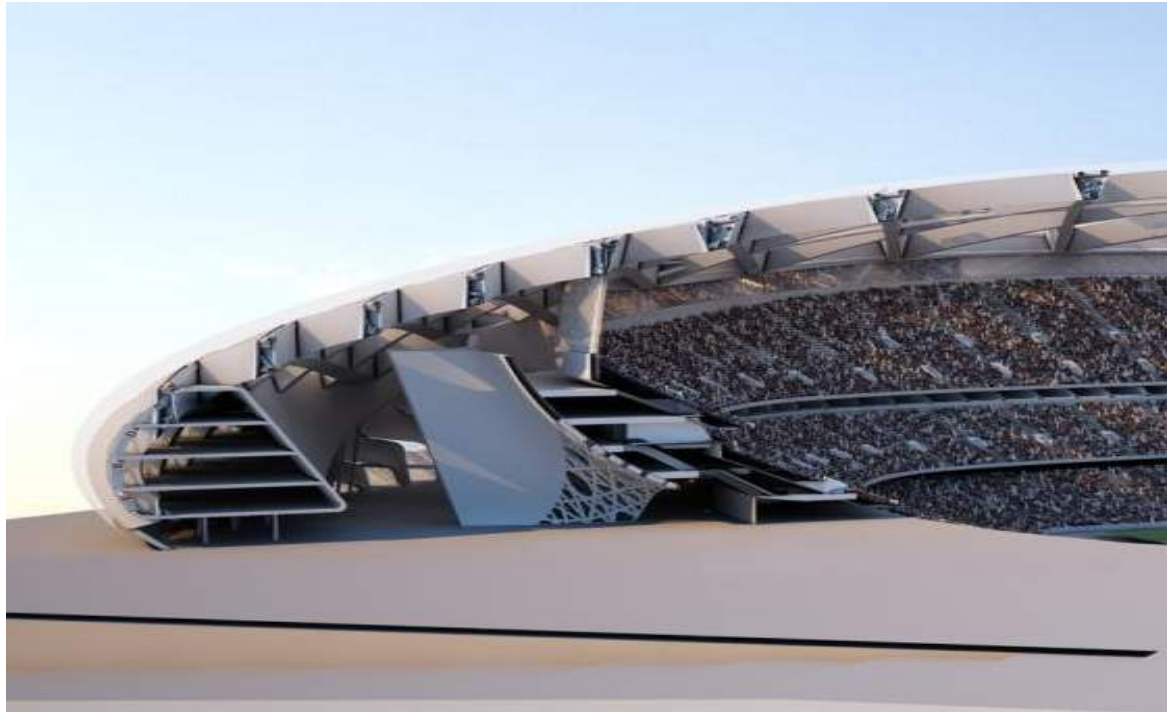
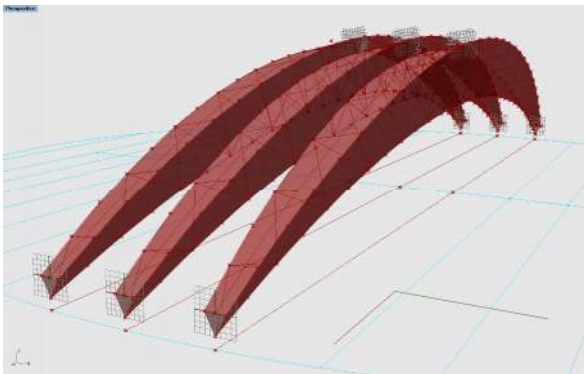
Introduction | An integrated process



What are the BIM advantages?

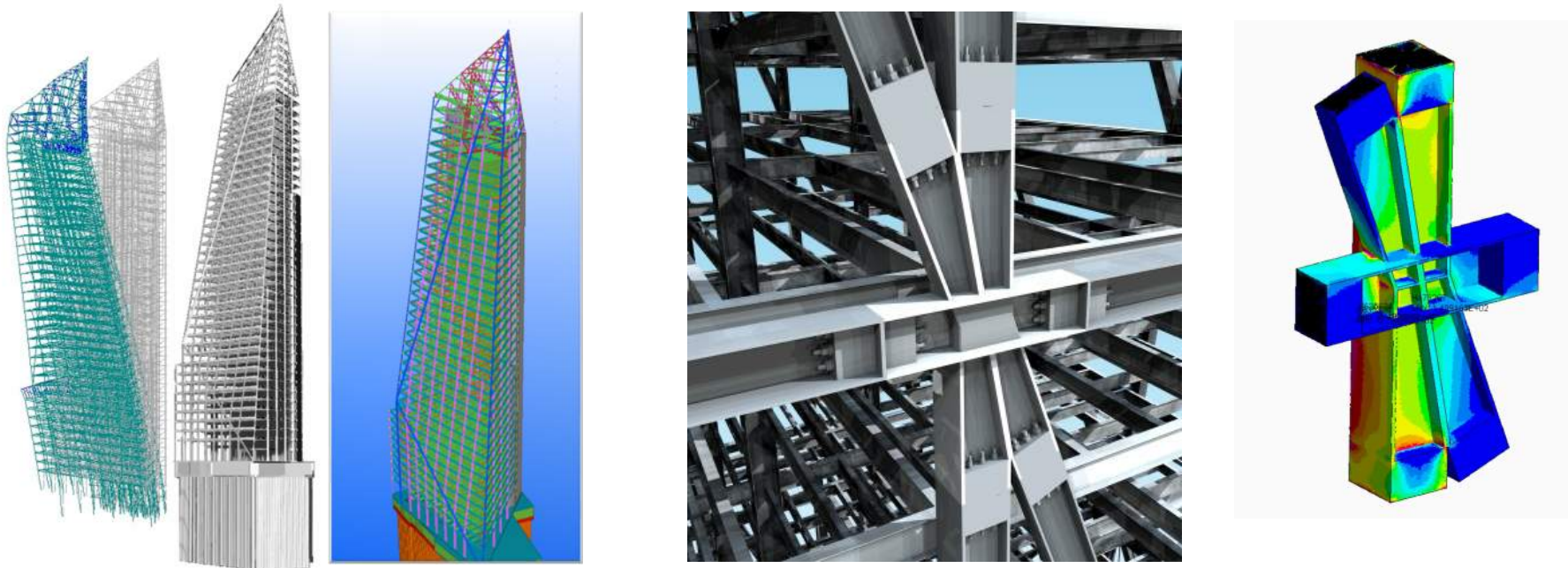
What we could do with BIM?

BIM Project | Concept development



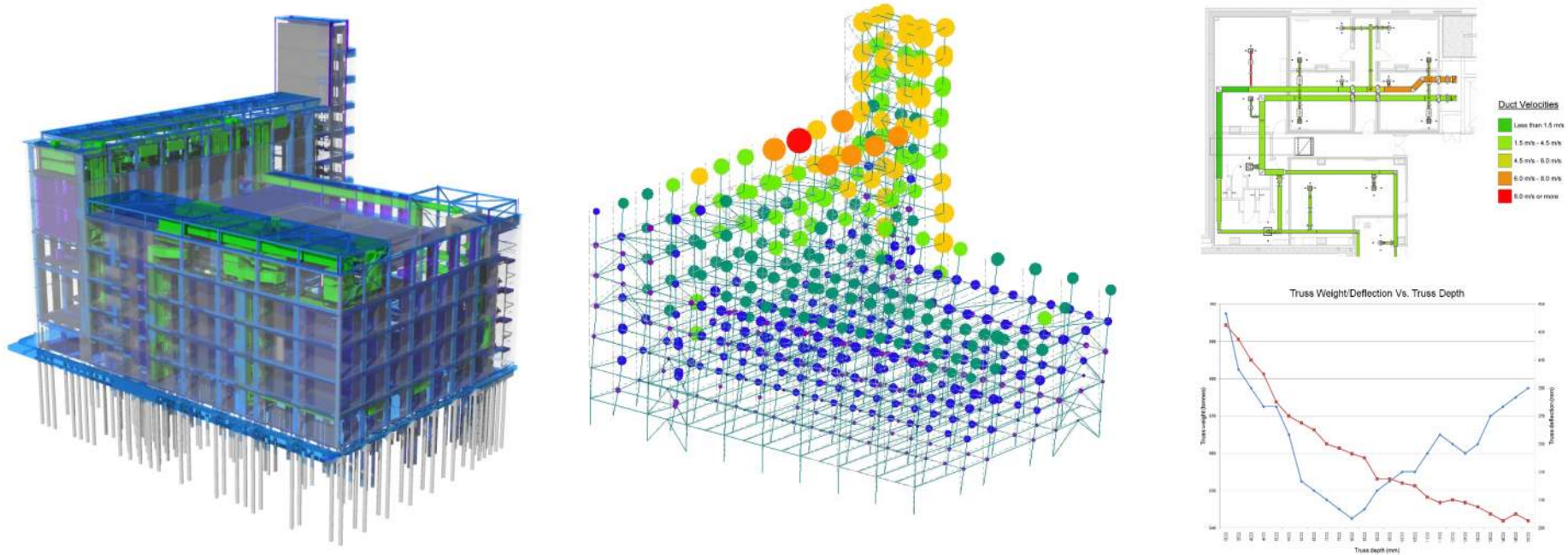
Better communication of complex building forms

BIM Project | Analyse & Design



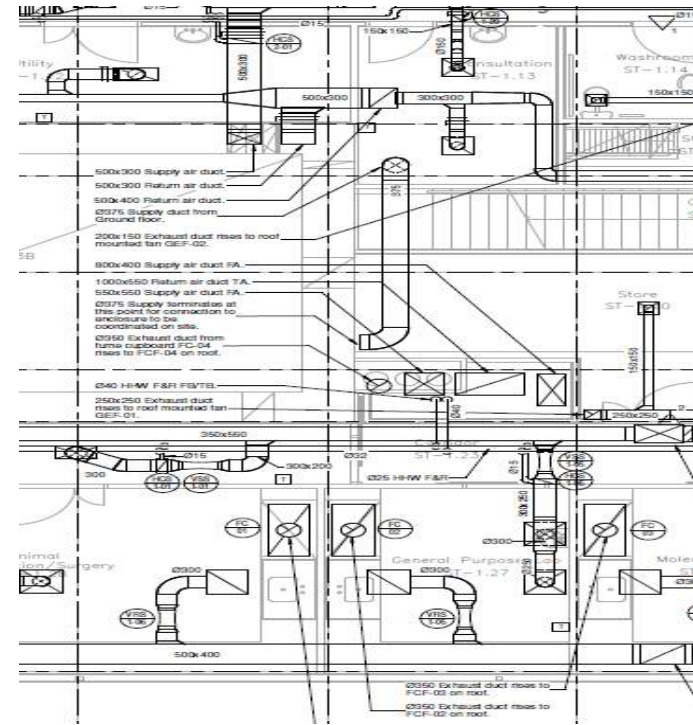
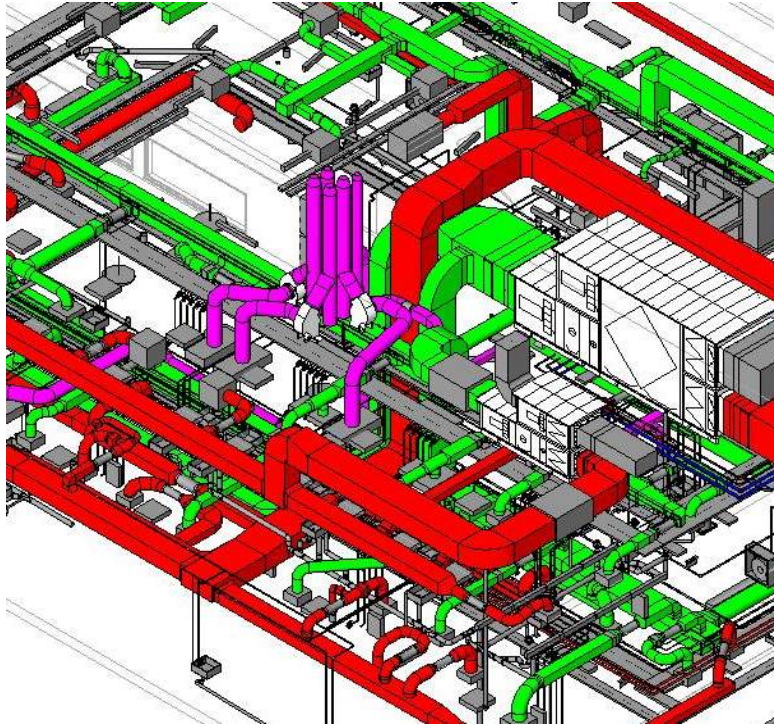
Interoperability with Analysis & Design

BIM Project | Design and optimisation



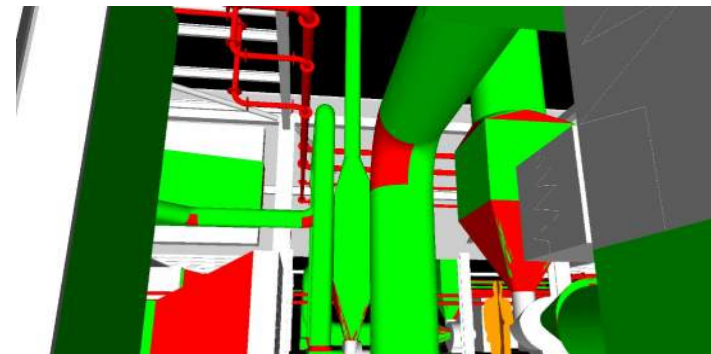
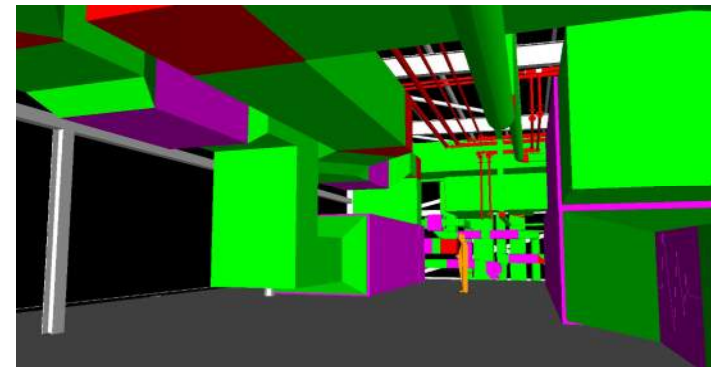
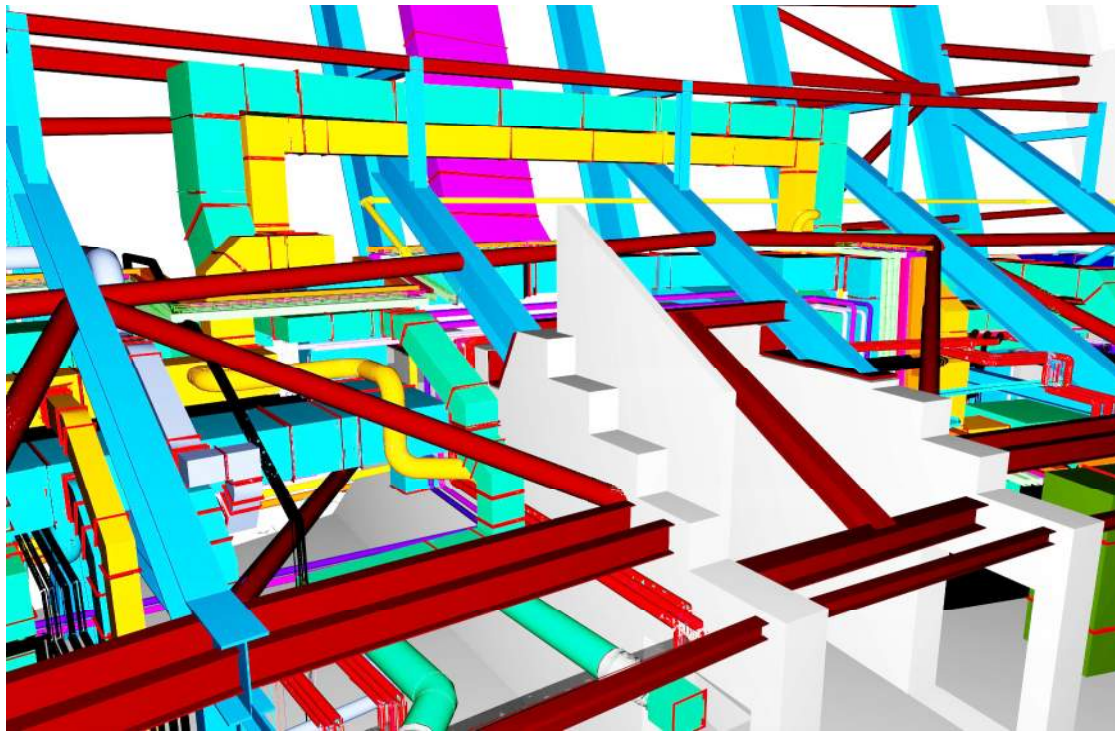
Less duplication of information between tasks

BIM Project | Documentation



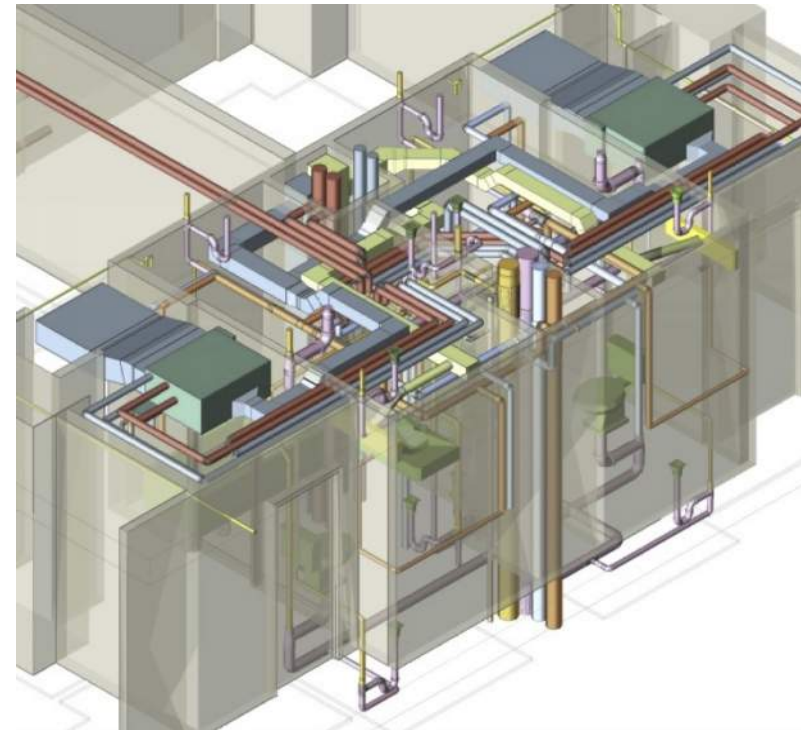
Automated and synchronised output data

BIM Project | Coordination



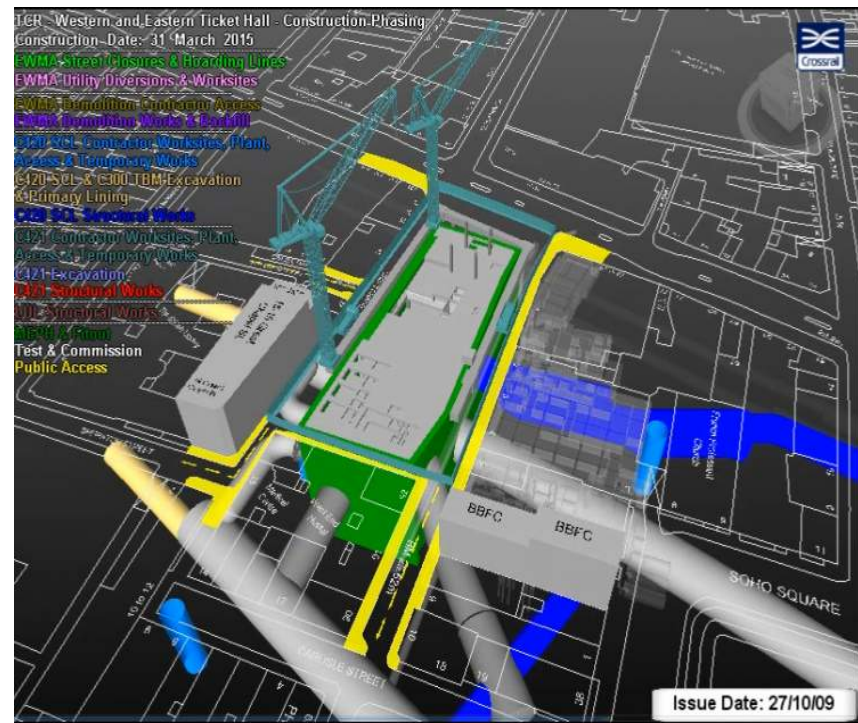
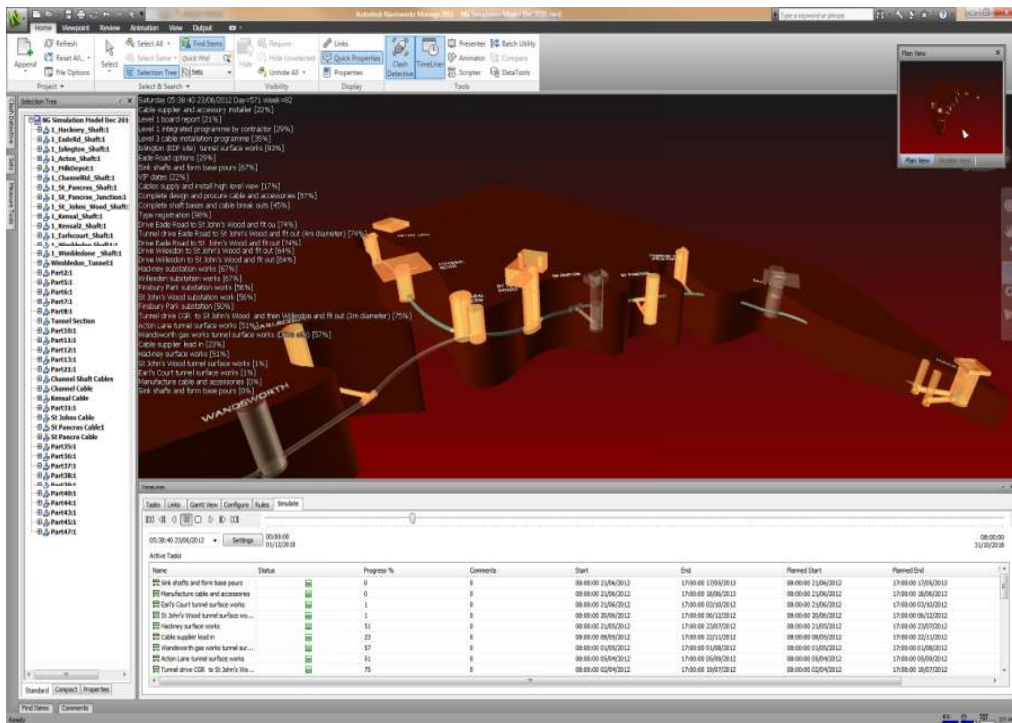
Shared understanding of coordination issues

BIM Project | Clashes



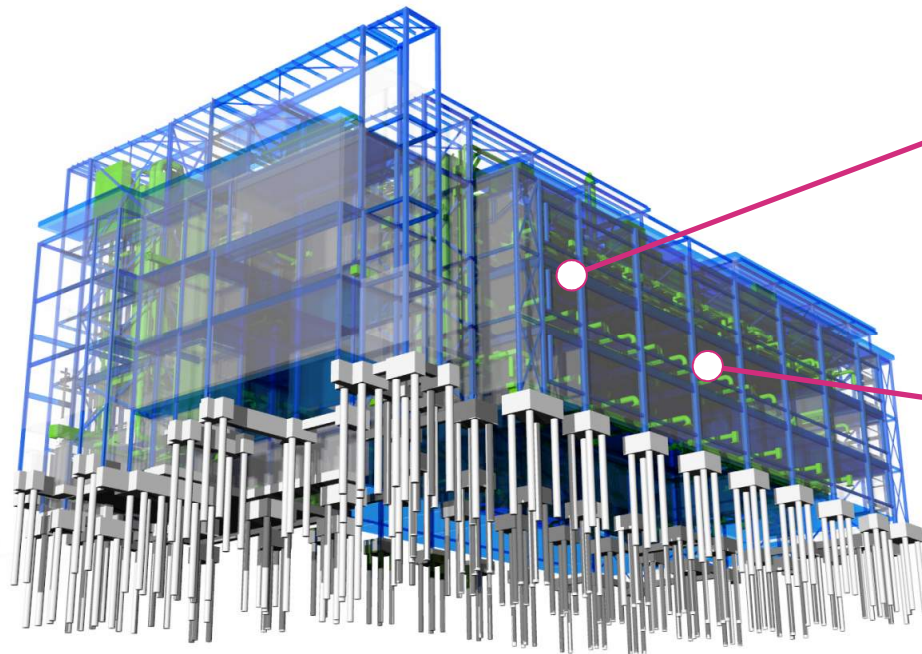
Earlier opportunities to resolve issues

BIM Project | 4D modelling



Clear appraisal of phasing and sequencing

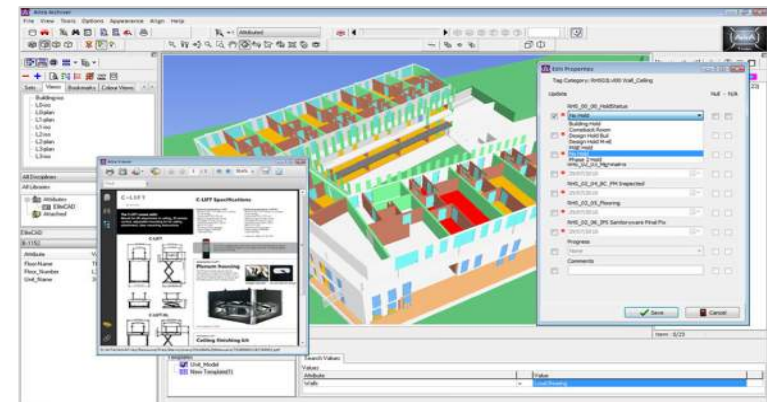
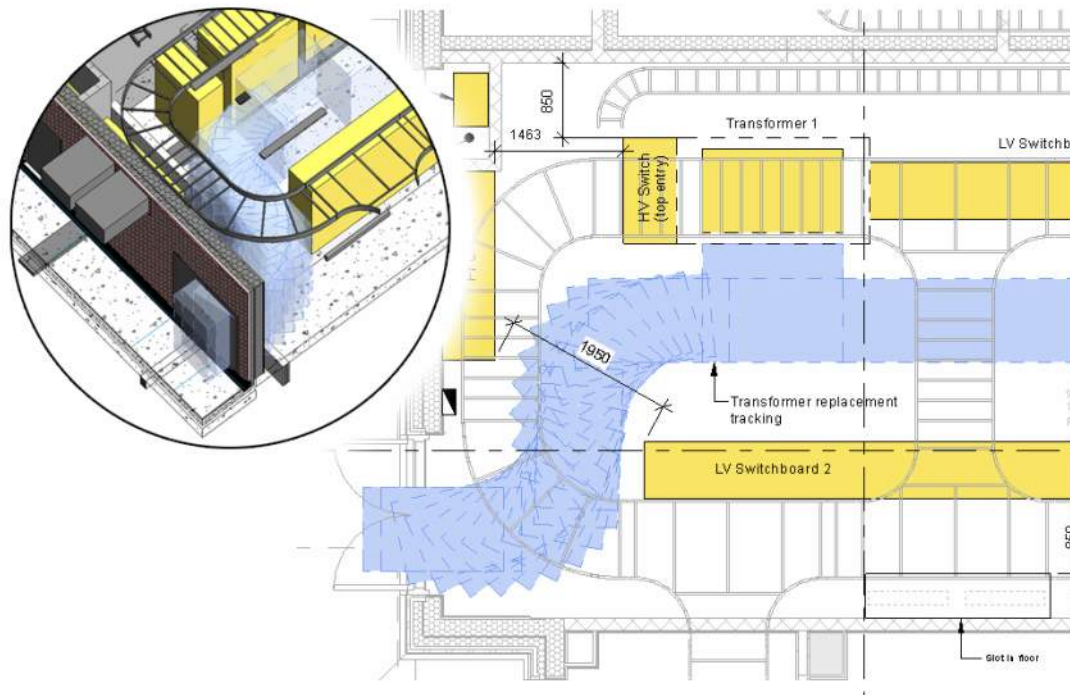
BIM Project | Quantity take off



Zone Summary - Default								
Inputs								
Area (m²)	232							
Volume (m³)	872.69							
Cooling Setpoint	23 °C							
Heating Setpoint	21 °C							
Supply Air Temperature	12 °C							
Air Volume Calculation Type	Central Heating Radiators							
Relative Humidity	50.00% (Calculated)							
Psychrometric Message	None							
Calculated Results								
Peak Cooling Load (W)	11,457							
Peak Cooling Month and Hour	July 3:00 PM							
Peak Cooling Sensible Load (W)	11,005							
Peak Cooling Latent Load (W)	452							
Peak Cooling Airflow (L/s)	640.0							
Peak Heating Load (W)	11,718							
Peak Heating Airflow (L/s)	622.7							
Checks								
Cooling Load Density (W/m²)	49.39							
Cooling Flow Density (L/s/m²)	3.62							
Cooling Flow / Load (L/s/kW)	73.32							
Cooling Area / Load (m²/kW)	20.25							
Heating Load Density (W/m²)	50.52							
Heating Flow Density (L/s/m²)	2.68							
Default Spaces								
Space Name	No. Off.	Type Ref	Type	Length	Volume	Weight (t)	Family	Design Airflow (L/s)
1 Bathroom	2	B13x57	UB356x171x57	9021	0.06 m³	0.48	UB-Universal Beams	55.6
2 Bedroom	30	B12x59	UB406x140x59	102711	0.47 m³	3.66	UB-Universal Beams	78.6
3 Kitchen	6	B12x46	UB406x140x46	39655	0.22 m³	1.75	UB-Universal Beams	101.3
4 Dining Room	1	B11x60	UB406x176x60	6315	0.05 m³	0.36	UB-Universal Beams	160.8
5 Lounge	4	B11x67	UB406x176x67	41790	0.34 m³	2.66	UB-Universal Beams	226.1
	5	B10x52	UB457x152x52	34683	0.22 m³	1.74	UB-Universal Beams	
	4	B9x67	UB457x191x67	41790	0.34 m³	2.65	UB-Universal Beams	
	1	B9x89	UB457x191x89	10291	0.12 m³	0.91	UB-Universal Beams	
	3	B8x92	UB533x210x92	28104	0.30 m³	2.37	UB-Universal Beams	
	1	B6x101	UB533x210x101	6315	0.06 m³	0.81	UB-Universal Beams	
	1	B7x125	UB810x225x125	7464	0.11 m³	0.89	UB-Universal Beams	
	1	B4x197	UB762x267x197	10291	0.26 m³	1.94	UB-Universal Beams	
	17	C6x23	UC152x152x23	75704	0.21 m³	1.62	UC-Universal Columns	
	6	C6x30	UC152x152x30	21324	0.08 m³	0.60	UC-Universal Columns	
	19	C5x46	UC203x203x46	63278	0.47 m³	3.71	UC-Universal Columns	
	9	SFB5x46	UC203x203x46 Slimflo	37469	0.21 m³	1.62	UC-Universal Columns	
	3	C5x52	UC203x203x52	11350	0.07 m³	0.55	UC-Universal Columns	
	1	C5x60	UC203x203x60	6834	0.05 m³	0.39	UC-Universal Columns	
	5	C4x73	UC254x254x73	28720	0.25 m³	1.98	UC-Universal Columns	
	3	C4x89	UC254x254x89	20347	0.22 m³	1.72	UC-Universal Columns	
	1	SFB4x89	UC254x254x89 Slimflo	6377	0.07 m³	0.54	UC-Universal Columns	
	1	C4x107	UC254x254x107	6780	0.09 m³	0.69	UC-Universal Columns	
	16	C3x97	UC305x305x97	102447	1.19 m³	9.37	UC-Universal Columns	
	2	SFB3x97	UC305x305x97 Slimflo	13224	0.15 m³	1.21	UC-Universal Columns	
	4	C3x118	UC305x305x118	25260	0.36 m³	2.82	UC-Universal Columns	
	2	C3x137	UC305x305x137	12630	0.21 m³	1.64	UC-Universal Columns	
Grand total:	926			4817596	13.99 m³	109.70		

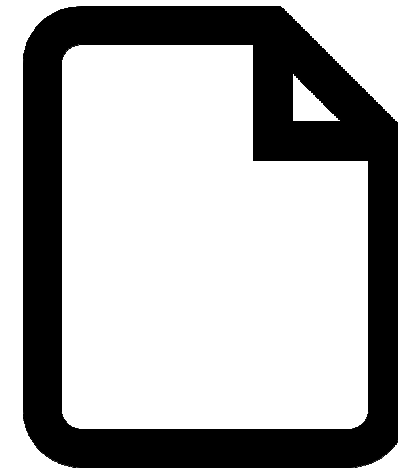
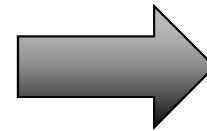
Using the data embedded in the model

BIM Project | FM information



Communication of design intent to operators

BIM in Facility Management



Preventive
Maintenance Modeling

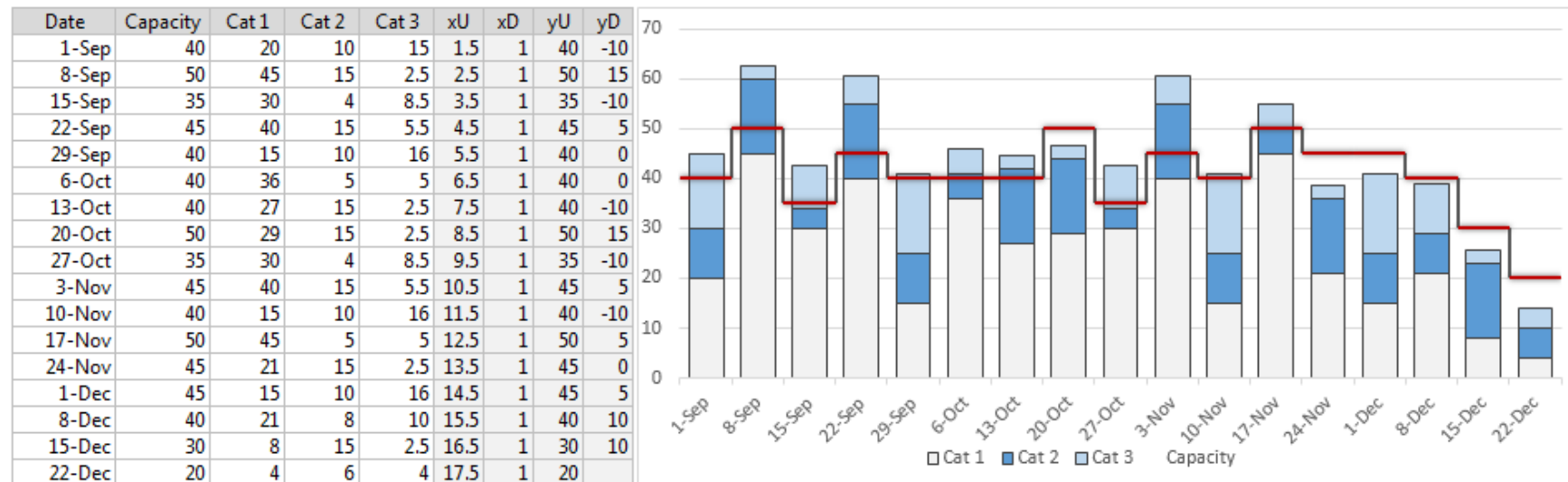


Energy Efficiency Analysis

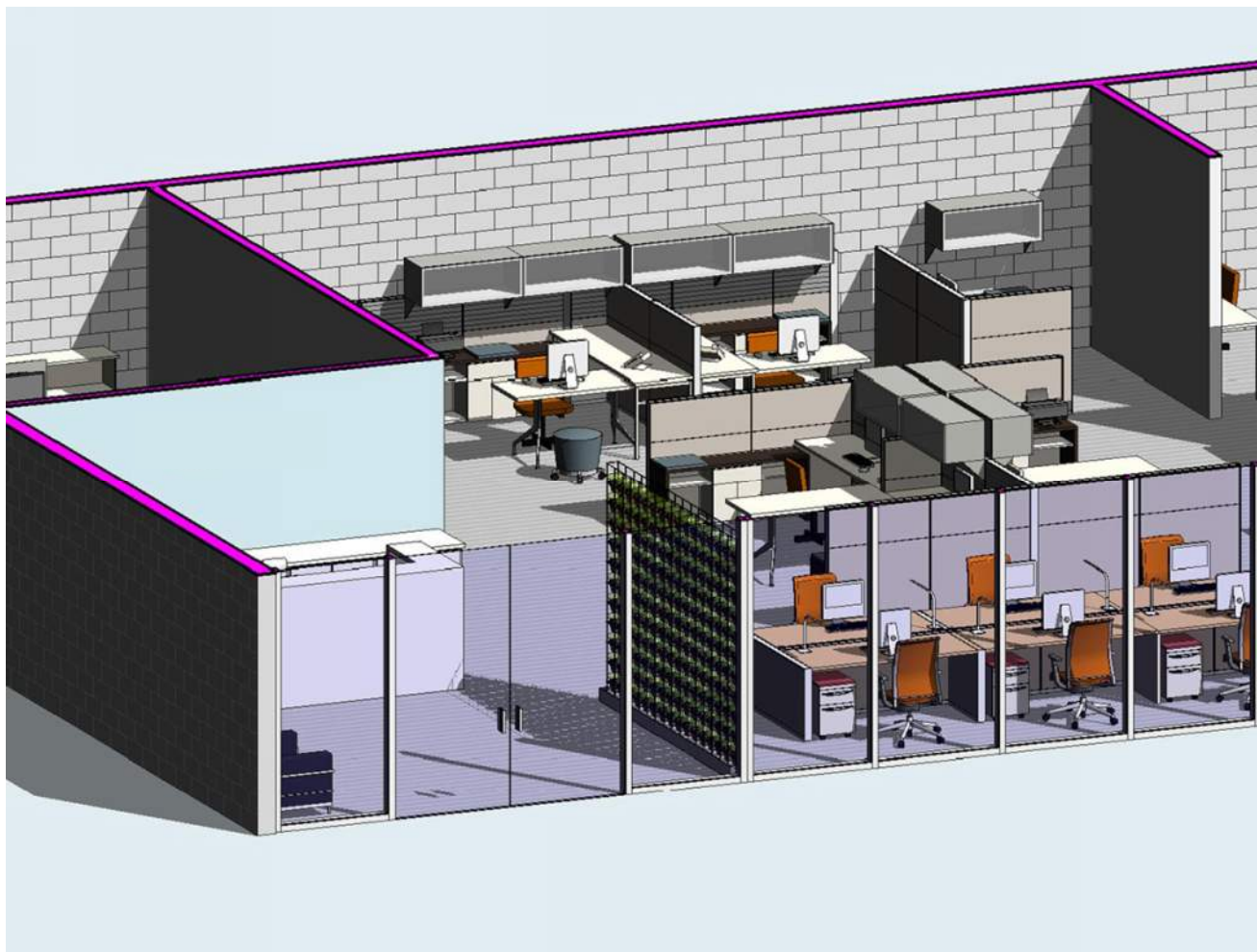
[Project Title] - Resource / Capacity Planning & Forecast

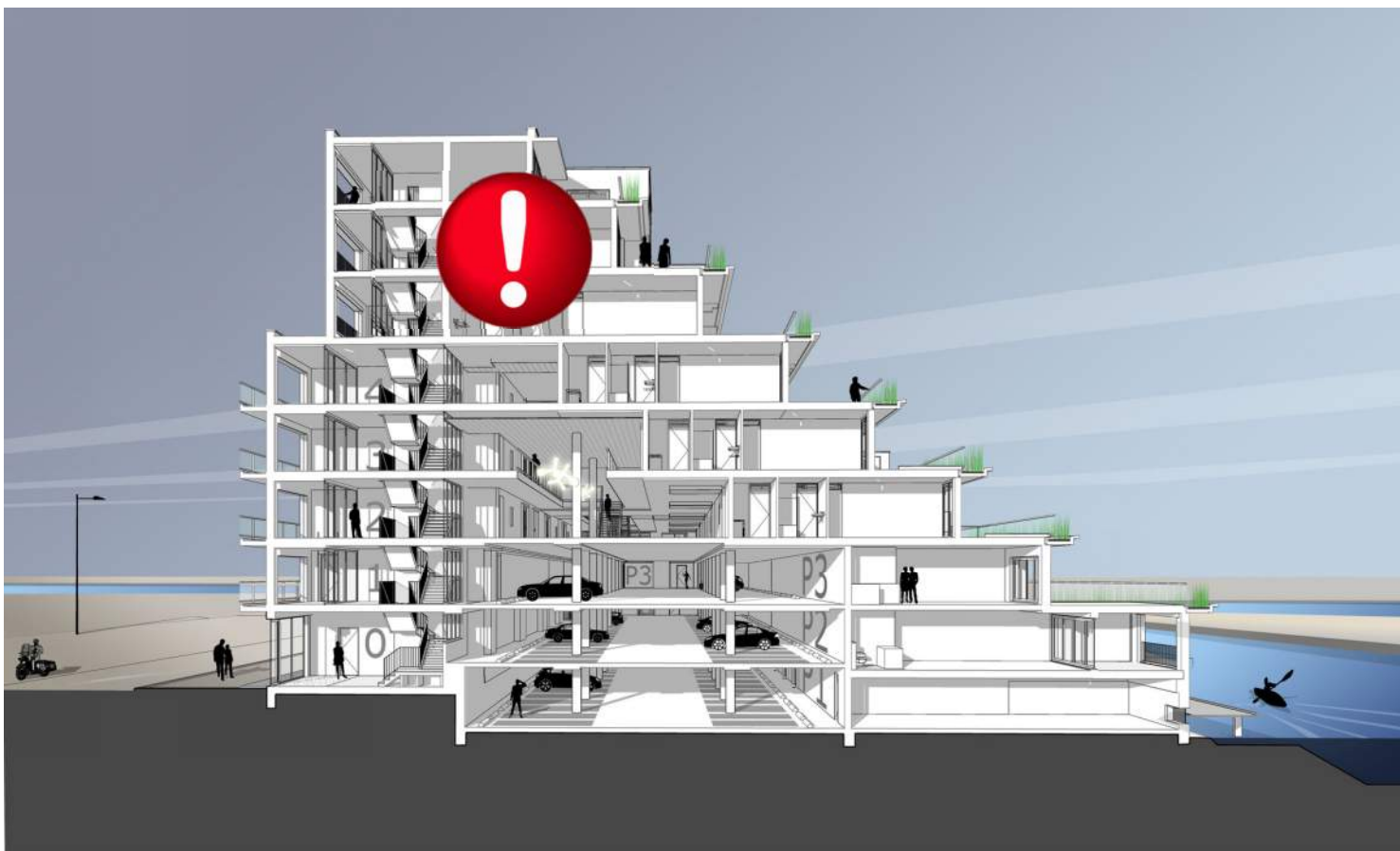
[Project Manager, Title]

Last Updated: [Date]



Management of
Spatial Requirements







Thank you for your attention

Спасибо за внимание

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