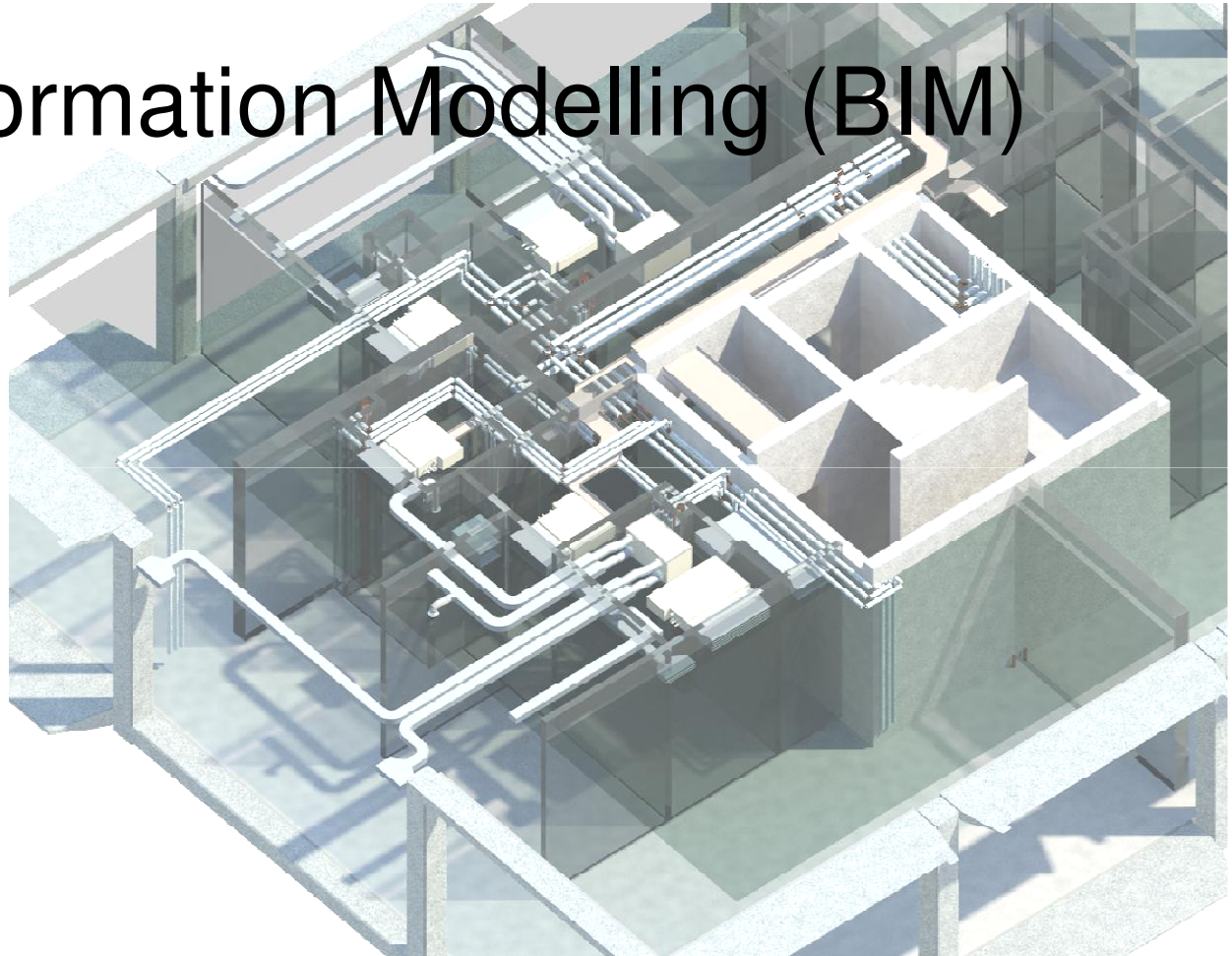


# Building Information Modelling (BIM)

## MEP Services



# Revit MEP - Spaces

**Instance Properties**

Family:  Load...

Type:  Edit Type...

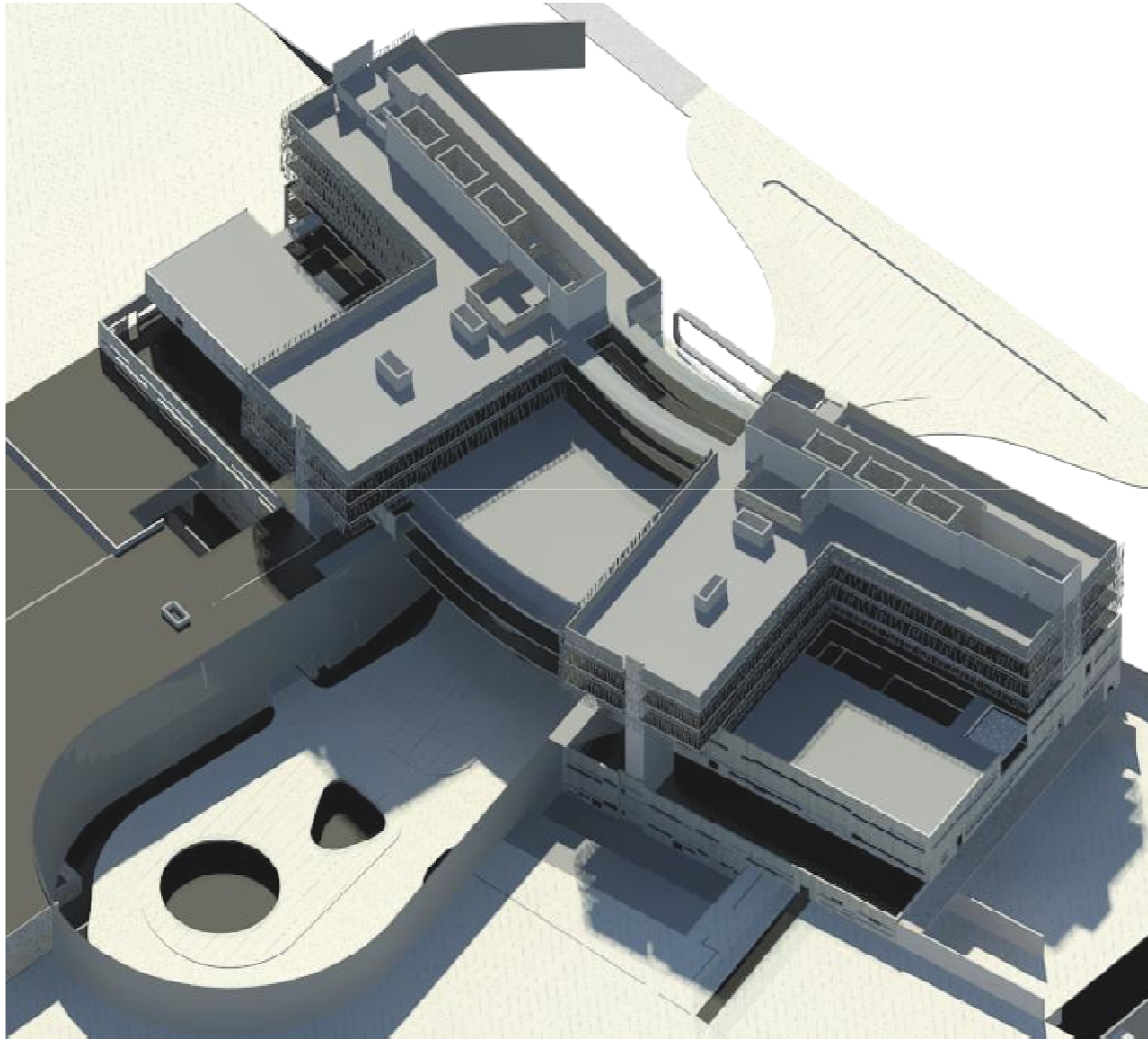
Instance Parameters - Control selected or to-be-created instance

Parameter	Value
<b>Constraints</b>	
Level	LEVEL 00
Upper Limit	LEVEL 01
Limit Offset	0.0
Base Offset	0.0
<b>Electrical - Lighting</b>	
Average Estimated Illumination	580.54 lx
Room Cavity Ratio	2.269356
Lighting Calculation Workplane	762.0
Ceiling Reflectance	0.750000
Wall Reflectance	0.500000
Floor Reflectance	0.200000
Required Lighting Level	500.00 lx
Maximum Illumination Power Density	15.00 W/m²
<b>Electrical - Loads</b>	
Design HVAC Load per area	0.00 W/m²
Actual HVAC Load	0.00 W
Design Other Load per area	0.00 W/m²
Actual Other Load	0.00 W
<b>Mechanical - Airflow</b>	
Specified Supply Airflow	0.00 L/s
Calculated Supply Airflow	Not Computed
Actual Supply Airflow	0.00 L/s
Return Airflow	Specified
Specified Return Airflow	0.00 L/s
Actual Return Airflow	0.00 L/s
Specified Exhaust Airflow	0.00 L/s
Actual Exhaust Airflow	0.00 L/s
<b>Dimensions</b>	
Area	86.036 m²
Perimeter	39786.3
Unbounded Height	3600.0
Volume	270.617 m³
<b>Identity Data</b>	
Number	P05.0.04
Name	General Lab
Room Number	P05.0.04
Room Name	General Lab
Lighting Levels	Workshop / Laboratories
Comments	
<b>Phasing</b>	
Phase	New Construction
<b>Energy Analysis</b>	
Zone	Default
Plenum	<input type="checkbox"/>
Occupiable	<input checked="" type="checkbox"/>
Condition Type	Heated and cooled
Space Type	<Building>
Construction Type	<Building>
People	Edit...
Electrical Loads	Edit...
Calculated Heating Load	Not Computed
Design Heating Load	0.00 W

OK Cancel



# Mubarak Al-Hassawi Medical Complex



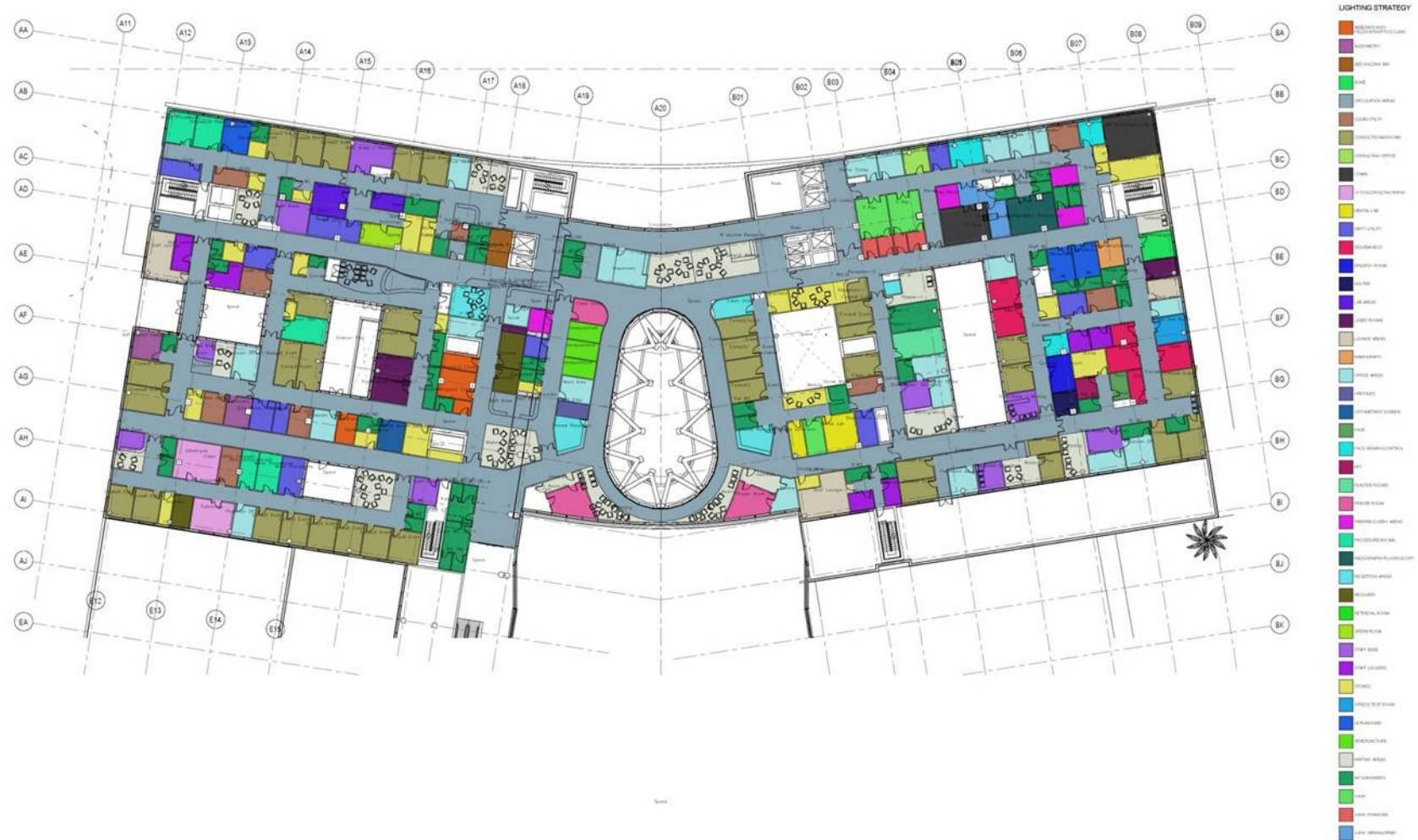


# Lighting Schedule

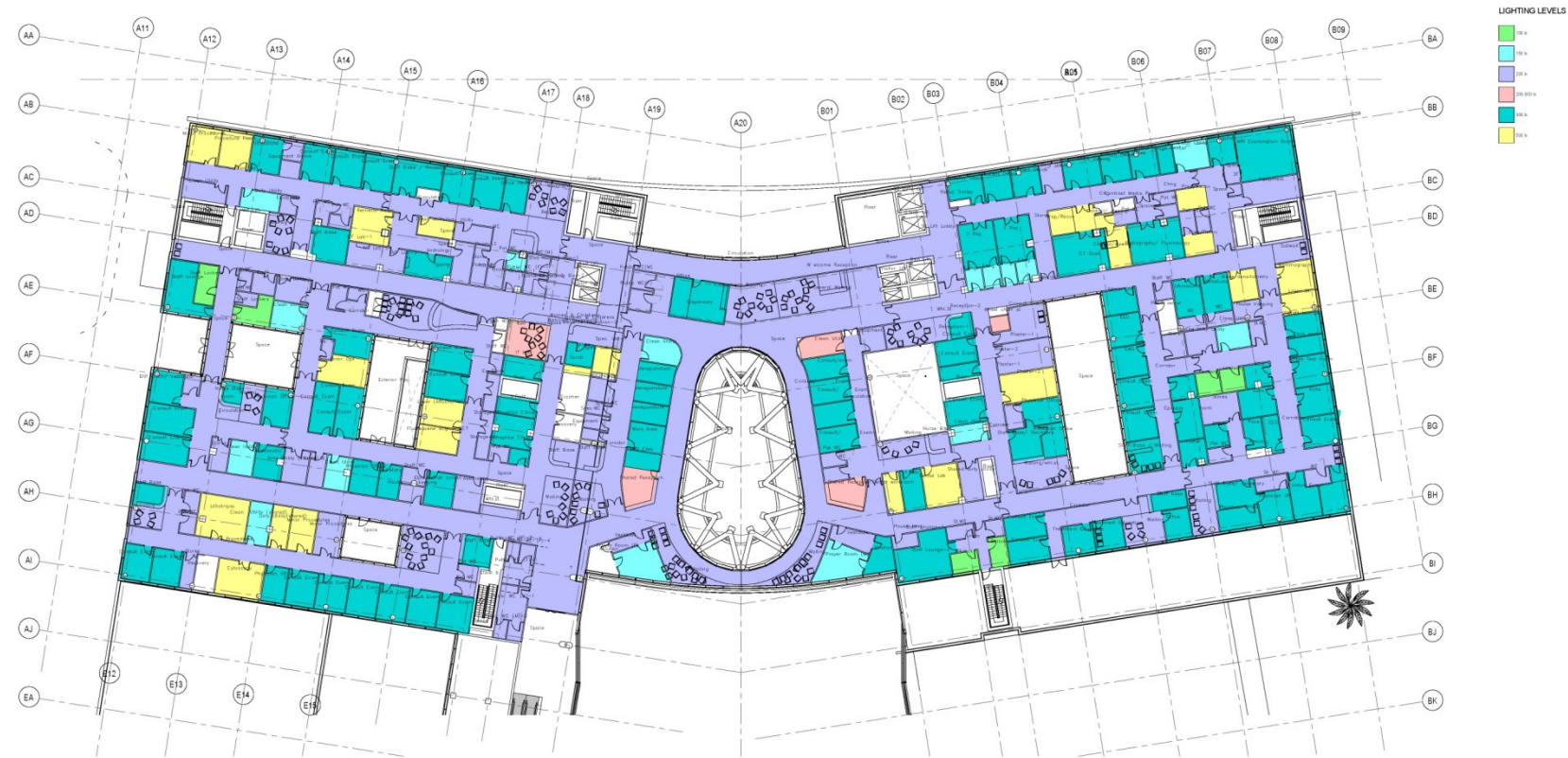
LIGHTING STRATEGY		
KEY NAME	REQUIRED LIGHTING LEVEL	DESCRIPTION
ABBERATIONS/V FIELD/ORTHOPTICS CLINIC	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
AUDIOMETRY	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
BED HOLDING BAY	200 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
BONE	500 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
CIRCULATION AREAS	200 lx	RECESSED SEALED T5 FLUORESCENT LUMINAIRES. RECESSED SEALED LED DOWNLIGHTS.
CLEAN UTILITY	150 lx	RECESSED IP44 SEALED T5 FLUORESCENT LUMINAIRES.
CONSULT/EXAM ROOMS	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
CONSULTING OFFICE	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
CT/MRI	300 lx	DIMMABLE. LOW FERROMAGNETIC TYPE LUMINAIRES.
CYTOSCOPY/LITHOTRIPSY	500 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
DENTAL LAB	500 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
DIRTY UTILITY	200 lx	RECESSED IP44 SEALED T5 FLUORESCENT LUMINAIRES.
EEG/EMG/ECG	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
EPILEPSY ROOM	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
HOLTER	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
HUB ROOM	300 lx	RECESSED SEALED T5 LUMINAIRES.
LAB AREAS	500 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
LASER ROOMS	500 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
LOUNGE AREAS	300 lx	RECESSED LED DOWNLIGHTS.
MAMOGRAPH	500 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
OFFICE AREAS	300 lx	RECESSED MODULAR T5 LUMINAIRES C/W LOUVRE.
ON-CALL ROOM	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
OPD FILES	300 lx	RECESSED MODULAR T5 LUMINAIRES C/W LOUVRE.
OPTOMETRIST SCREEN	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
PACE	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
PACS VIEWING/CONTROL	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
PFT	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
PLASTER ROOMS	500 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
PRAYER ROOM	150 lx	RECESSED LED DOWNLIGHTS. DIMMABLE.
PREP/RECOVERY AREAS	500 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
PROCEDURE ROOMS	500 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
RADIOGRAPHY/FLUOROSCOPY	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
RECEPTION AREAS	200-300 lx	LOCAL - 200 lx, OVER DESK 300 lx. RECESSED SEALED T5 FLUORESCENT LUMINAIRES. RECESSED SEALED LED DOWNLIGHTS.
RECOVERY		RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
RETRIEVAL ROOM	500 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
SPERM ROOM	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
STAFF BASE	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
STAFF LOCKERS	100 lx	IP54 RATED LED DOWNLIGHTS.
STORES	200 lx	SURFACE MOUNTED OR RECESSED T5 LUMINAIRES C/W POLYCARBONATE DIFFUSERS.
STRESS TEST ROOM	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
ULTRASOUND	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
VENEPUNCTURE	300 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
WAITING AREAS	200 lx	RECESSED SEALED T5 FLUORESCENT LUMINAIRES. RECESSED SEALED LED DOWNLIGHTS.
WC's/SHOWERS	200 lx	DECORATIVE IP54 RATED LED DOWNLIGHTS. MIRRORS TO BE BACKLIT. ARCHITECTURAL LED COVE LIGHTING TO BE USED WHERE APPLICABLE.
X-RAY	300 lx	AT 1m AFFL. RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.
X-RAY CHANGING	150 lx	IP54 RATED LED DOWNLIGHTS.
X-RAY VIEWING/PREP	500 lx	RECESSED SEALED T5 LUMINAIRES SUITABLE FOR USE IN A CLEAN ROOM ENVIRONMENT.



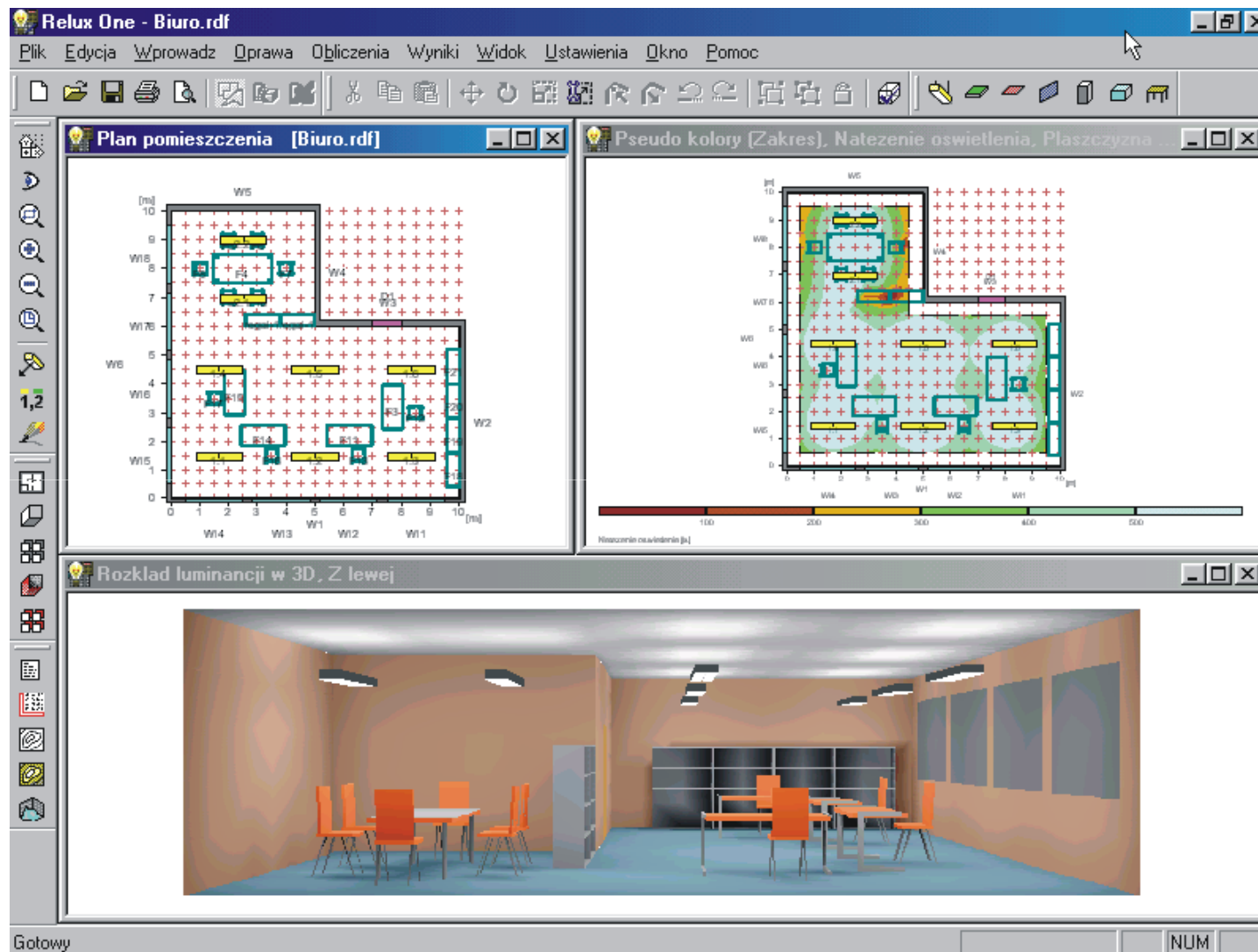
# Lighting Strategy



# Lighting Levels

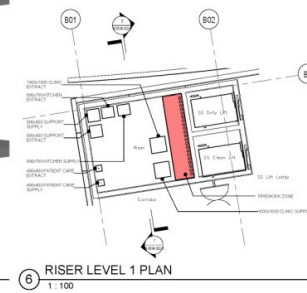
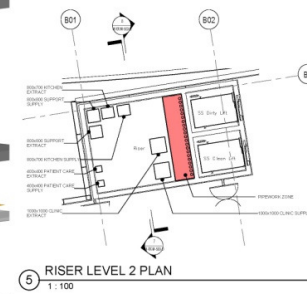
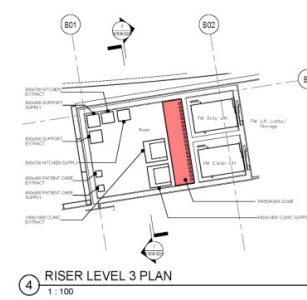
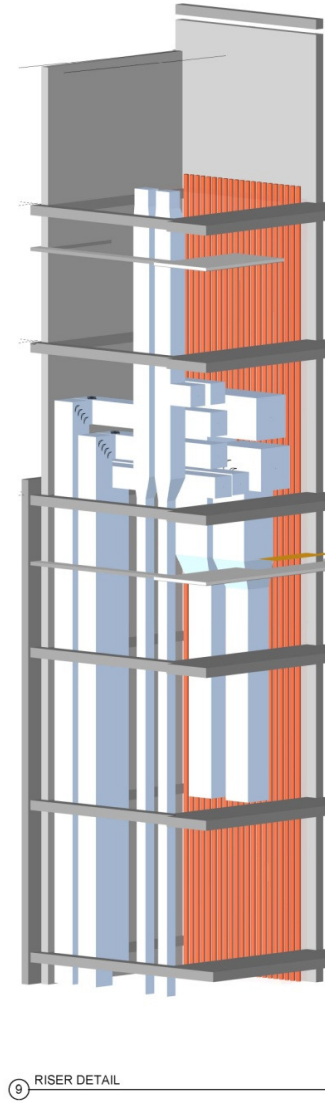
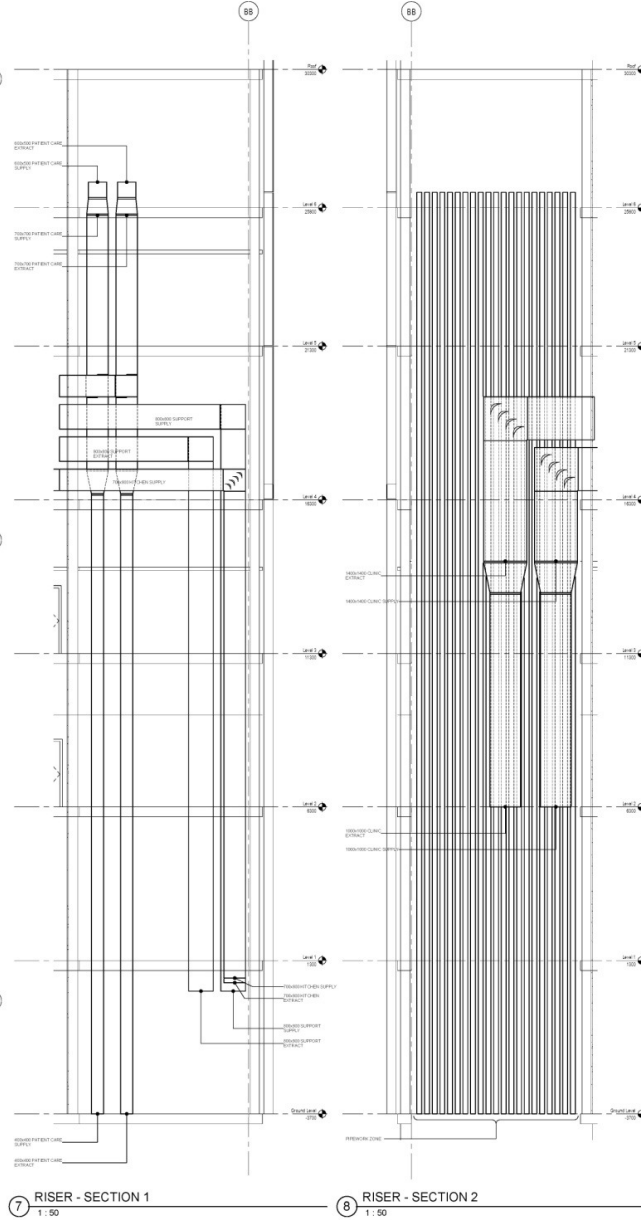
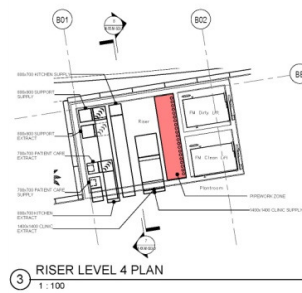
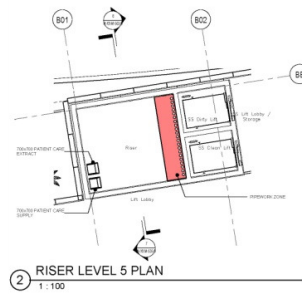
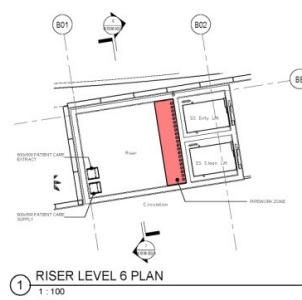


# Lighting Analysis Tools

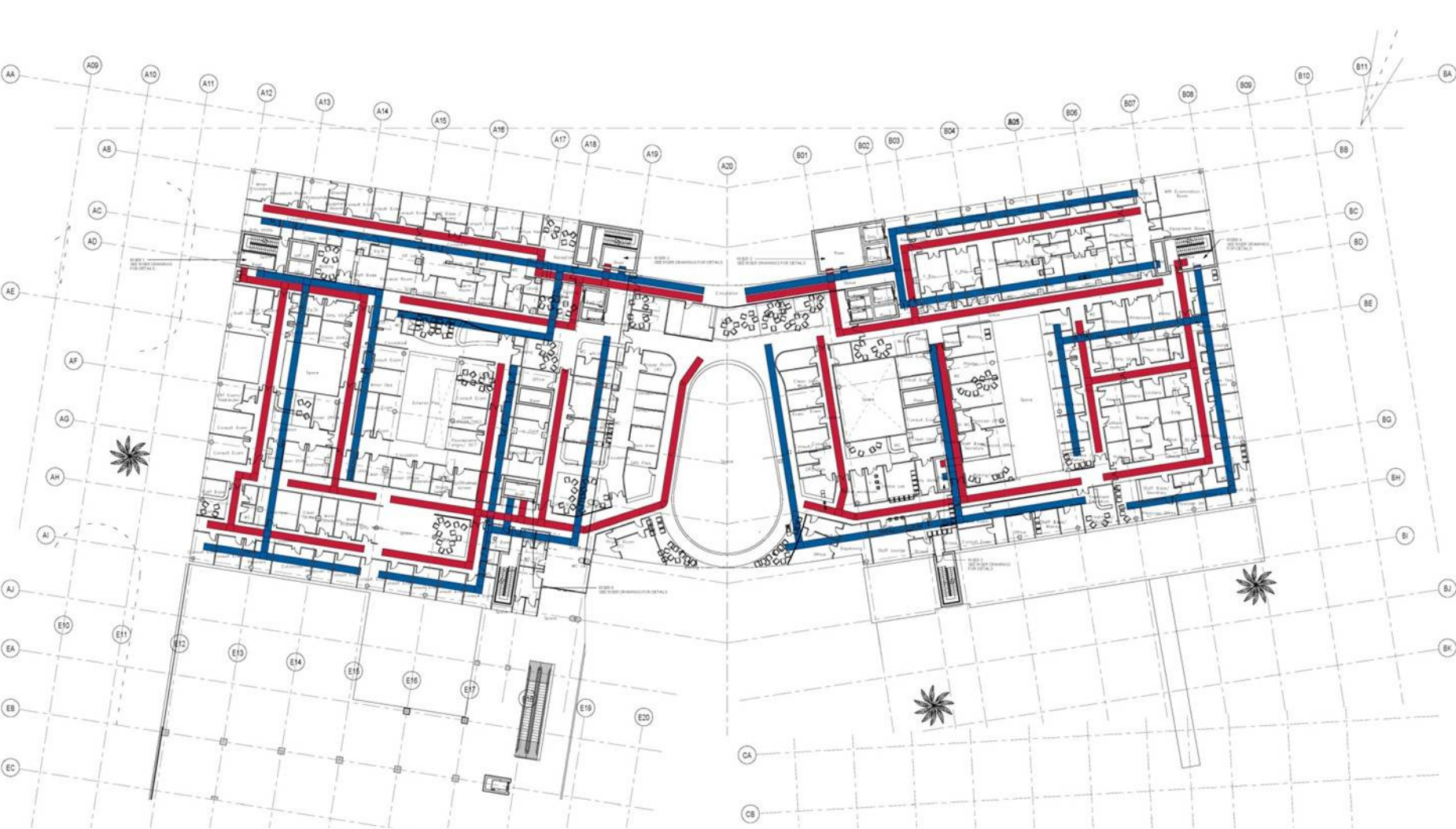




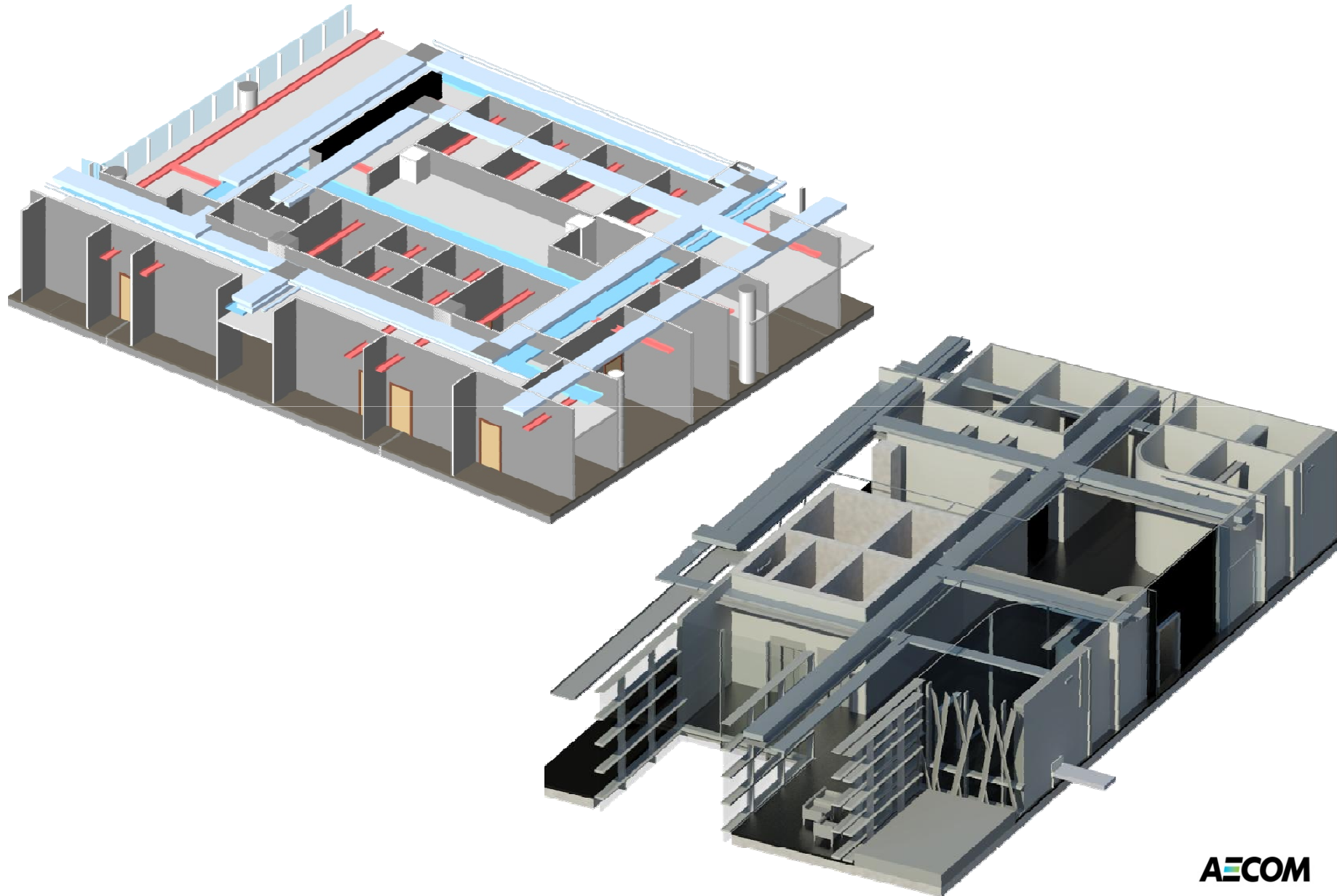
# Risers



# Distribution Routes

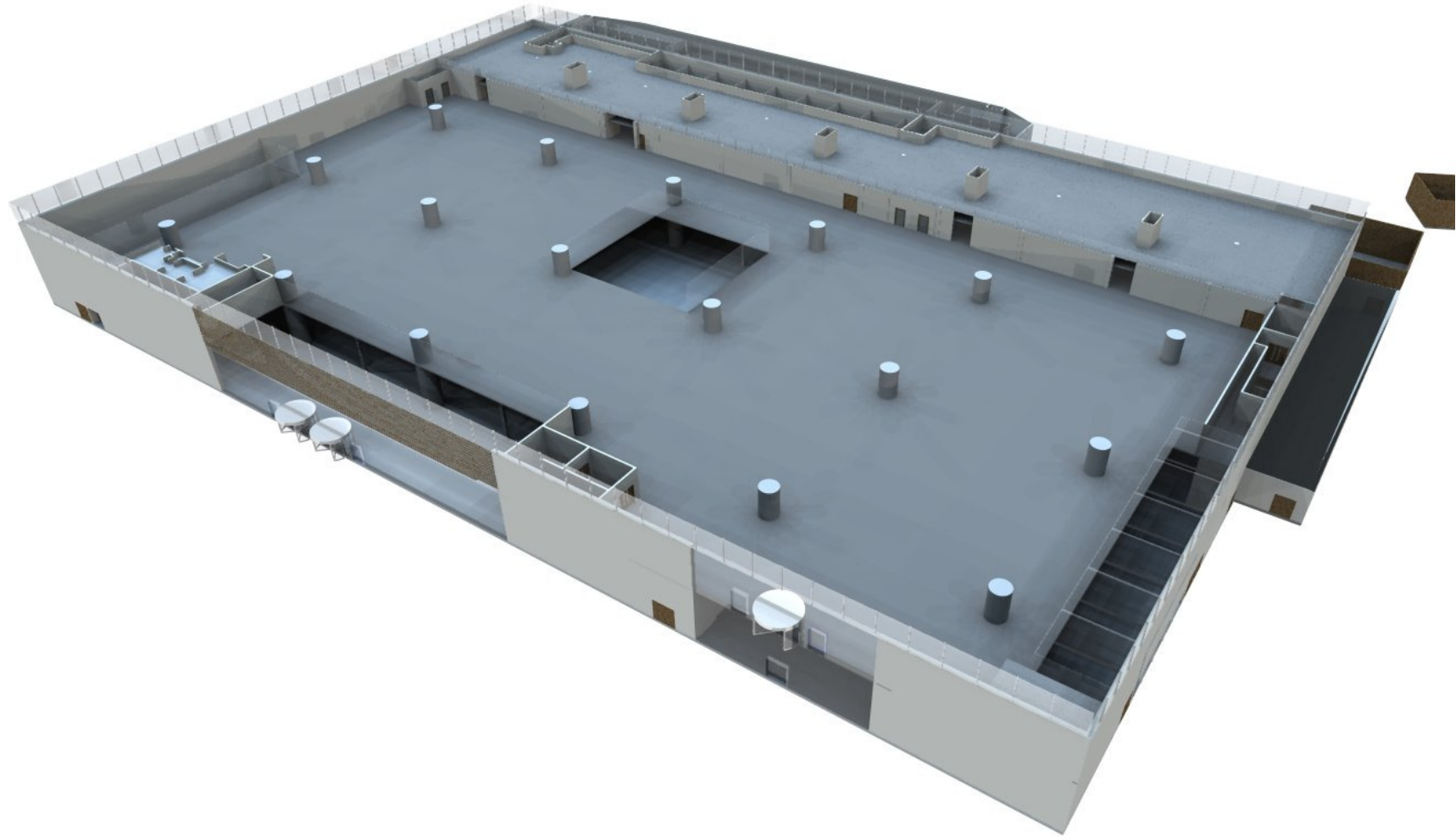


## Views Showing Distribution Routes

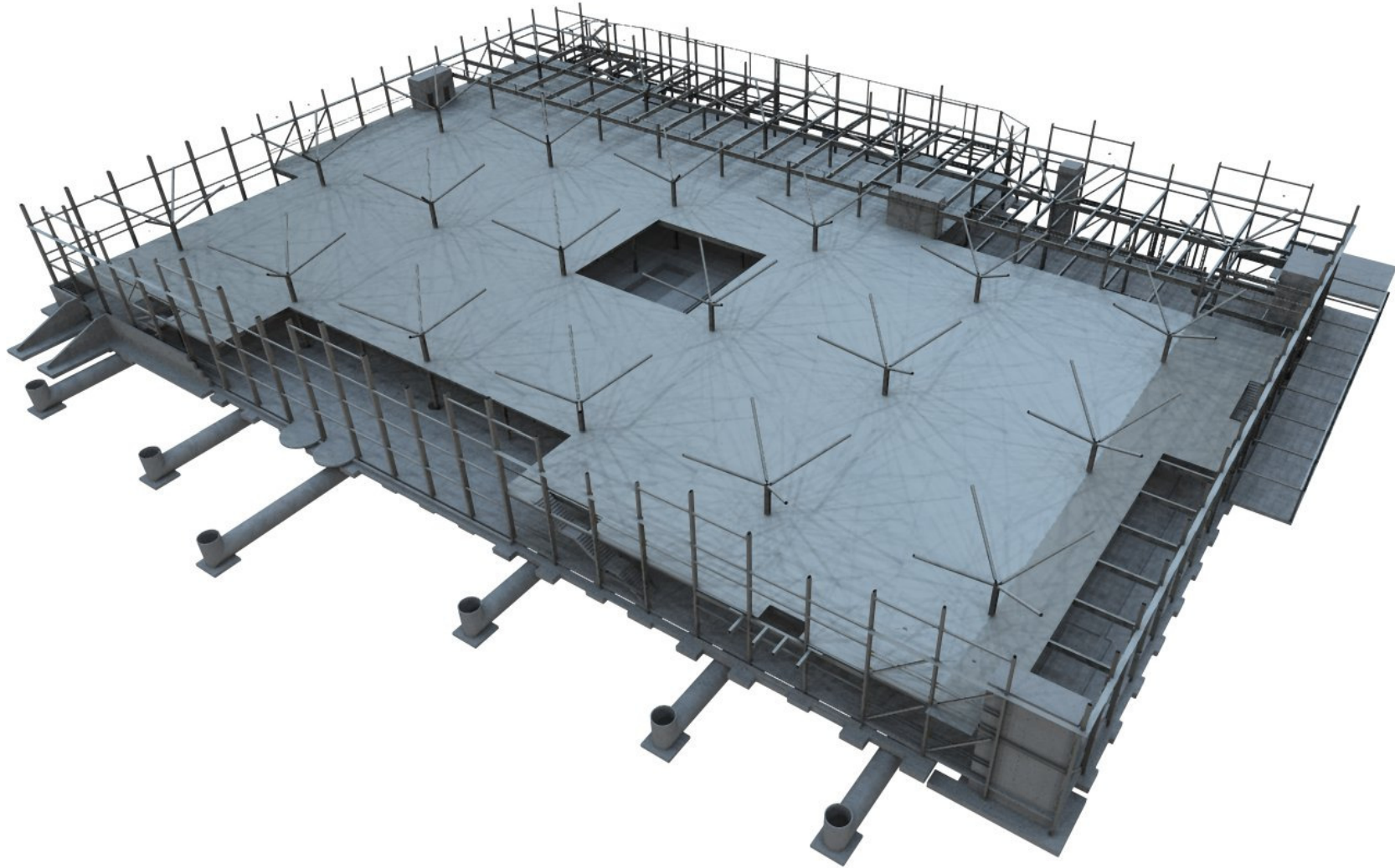




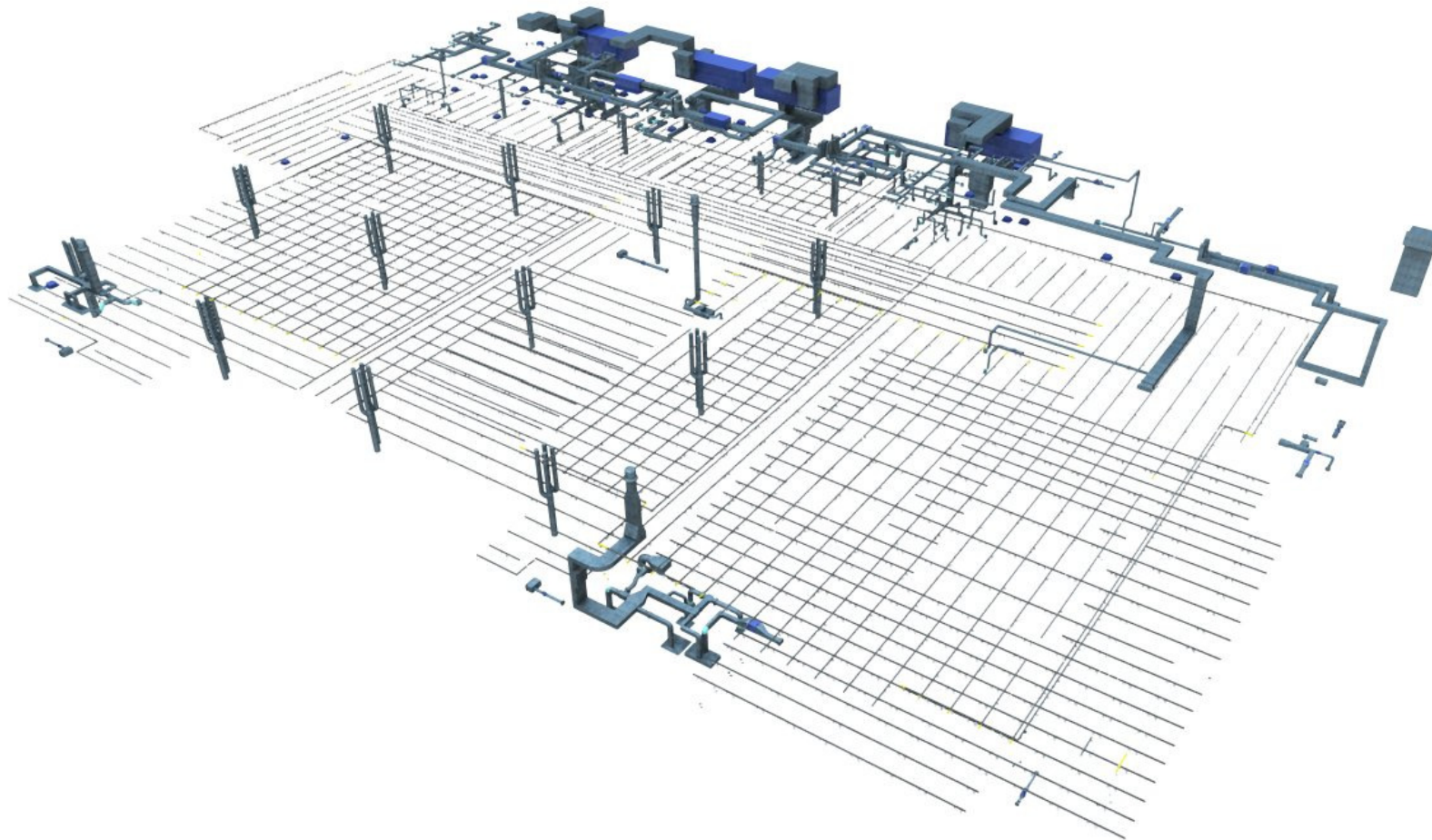
# M&S Cheshire Oaks – Revit Architecture



## M&S Cheshire Oaks – Revit Structure

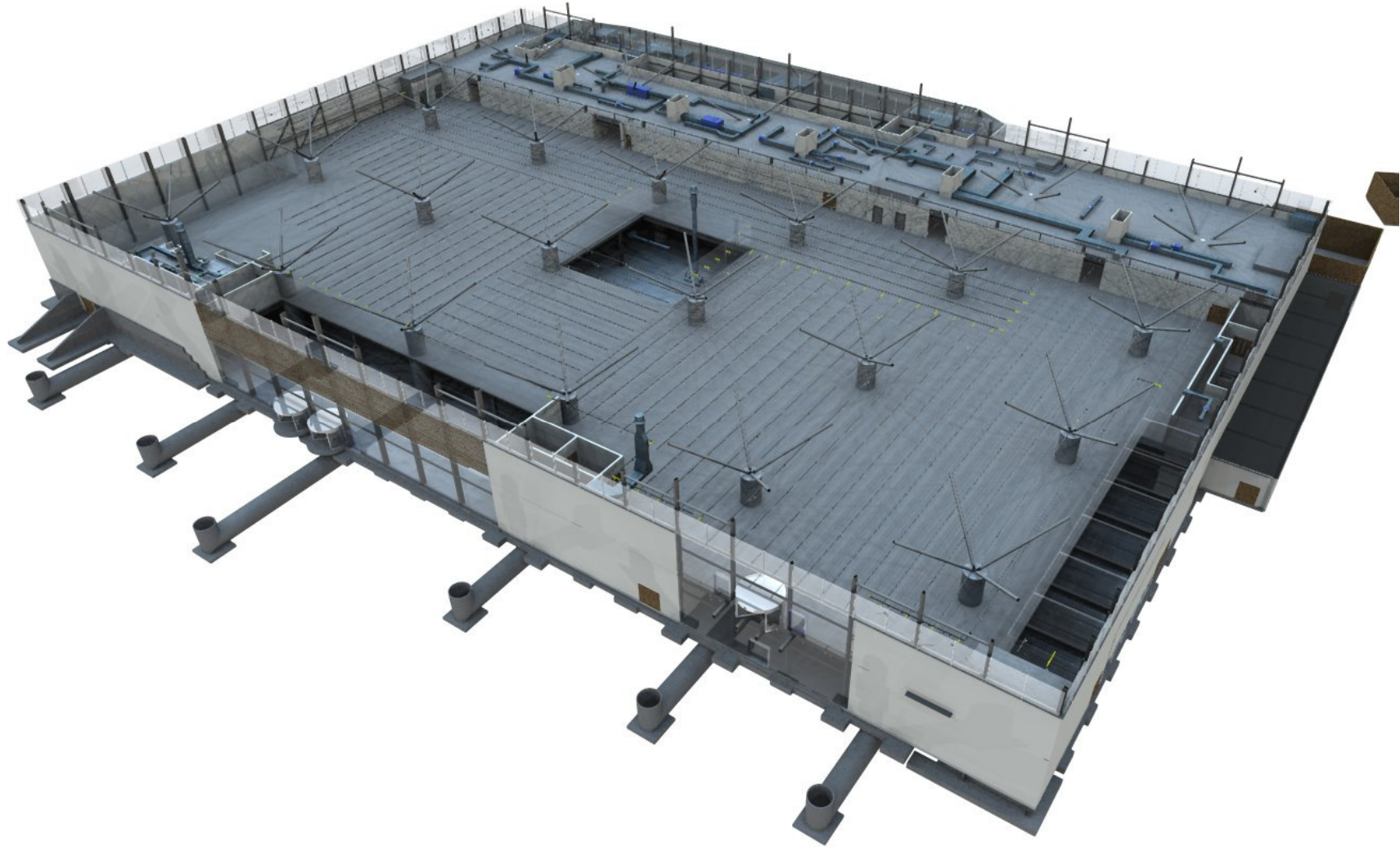


# M&S Cheshire Oaks – Revit MEP

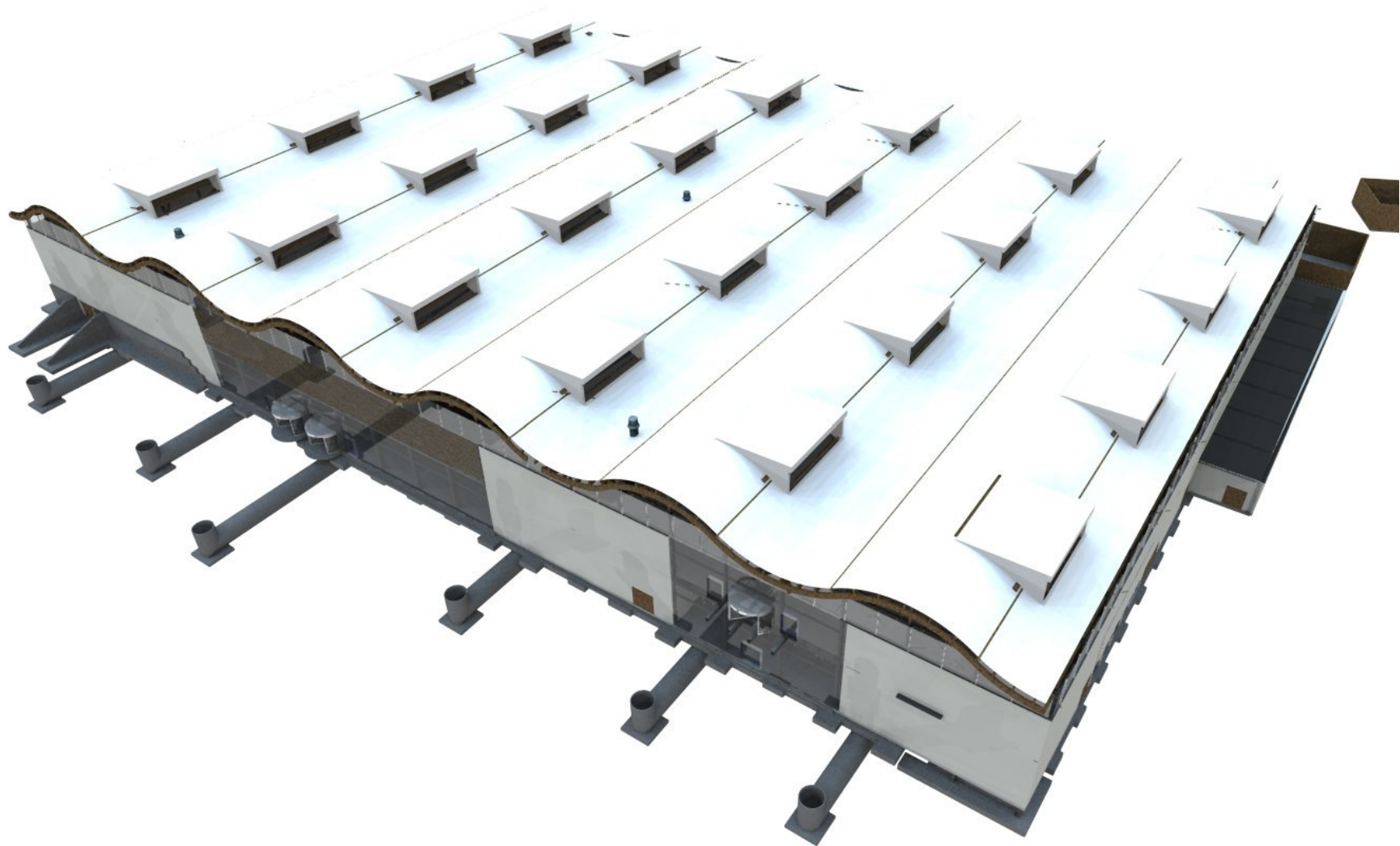




# M&S Cheshire Oaks – Architecture, Structure & M&E

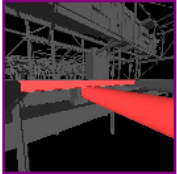


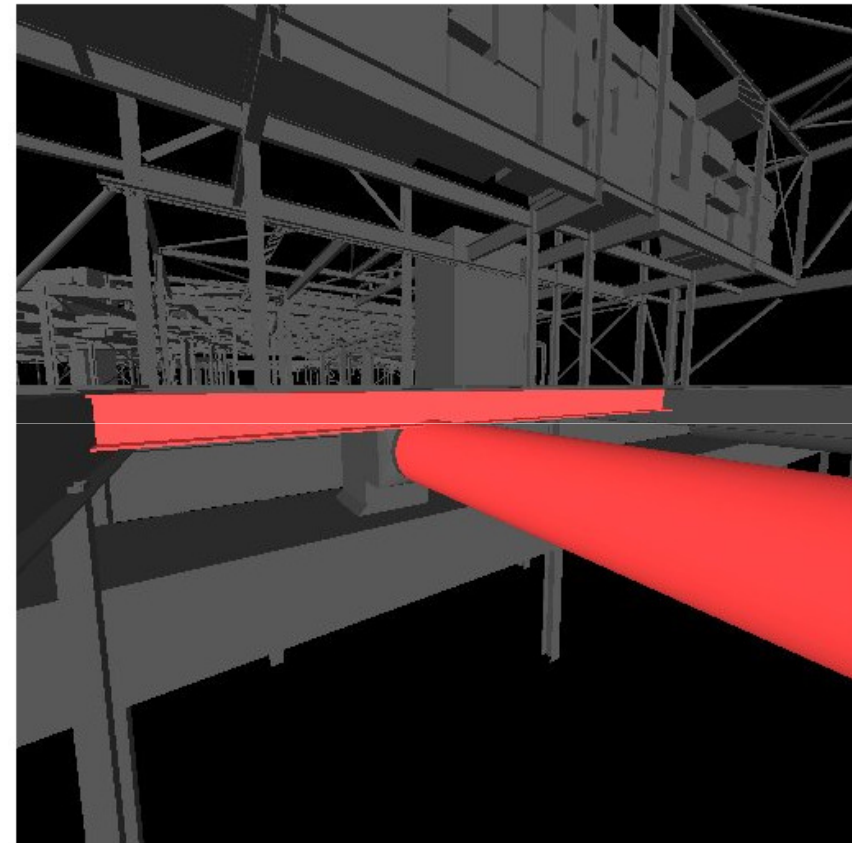
## M&S Cheshire Oaks – Exported to Navisworks



# Clash Detection

## Example of Navisworks Clash detection report

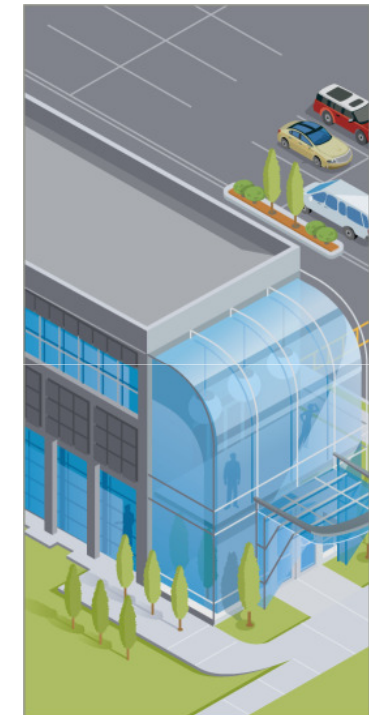
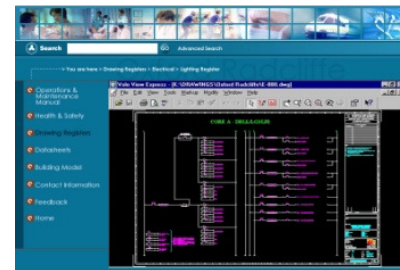
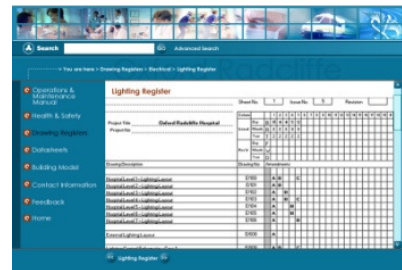
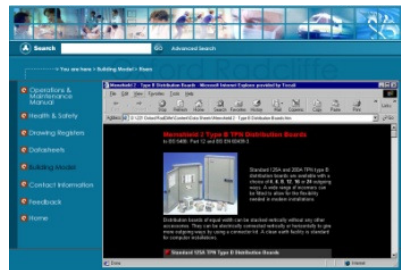
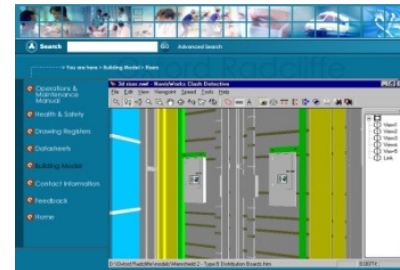
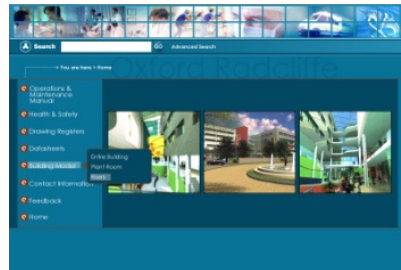
	
Name	Clash72
Distance	-45.73mm
Description	Clearance
Status	New
Clash Point	260097.04mm, -4680.48mm, 3935.90mm
Date Created	2010/5/7 16:01:53
<b>Item 1</b>	
Layer	<No level>
Item Name	DW144 Slip Joint radius bends/taps
Item Type	Solid
<b>Item 2</b>	
Layer	<No level>
Item Name	UC254x254x73
Item Type	Solid



Clash detection dramatically reduces costs by ensuring that problems are resolved early and not once construction has started



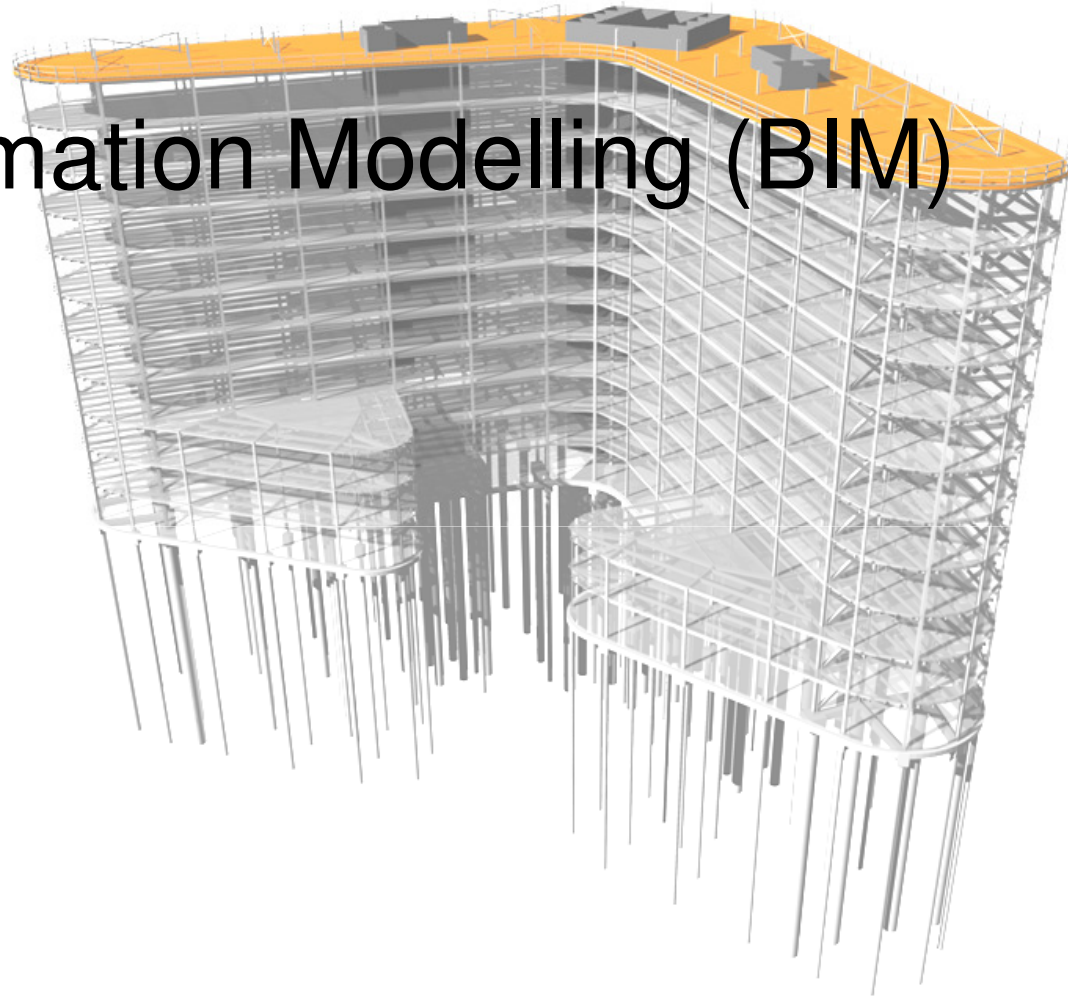
# Intelligent models can be used to provide O&M information



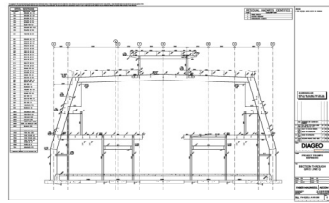
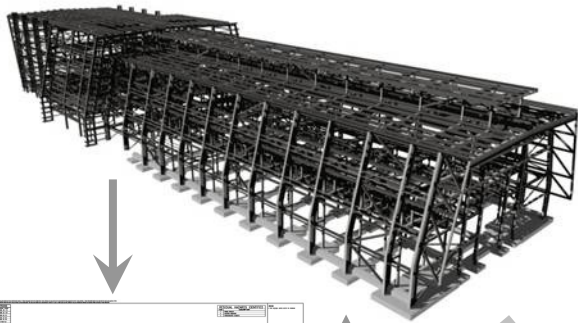
BIM is a powerful post occupancy management tool

# Building Information Modelling (BIM)

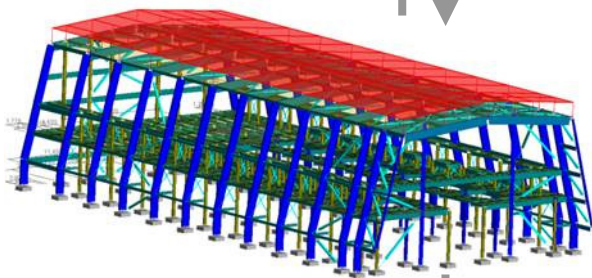
## Summary



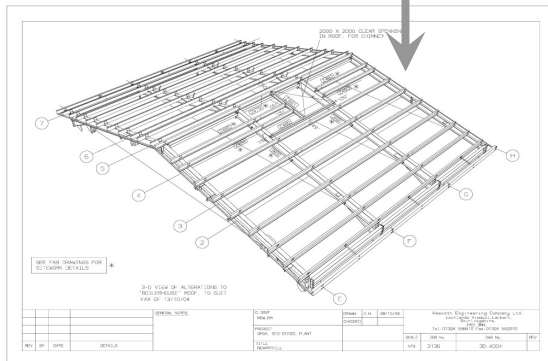
## STRUCTURAL



STRUCTURAL DRAWINGS

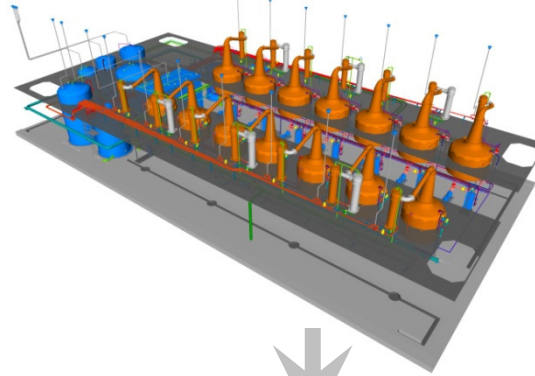


STRUCTURAL ANALYSIS

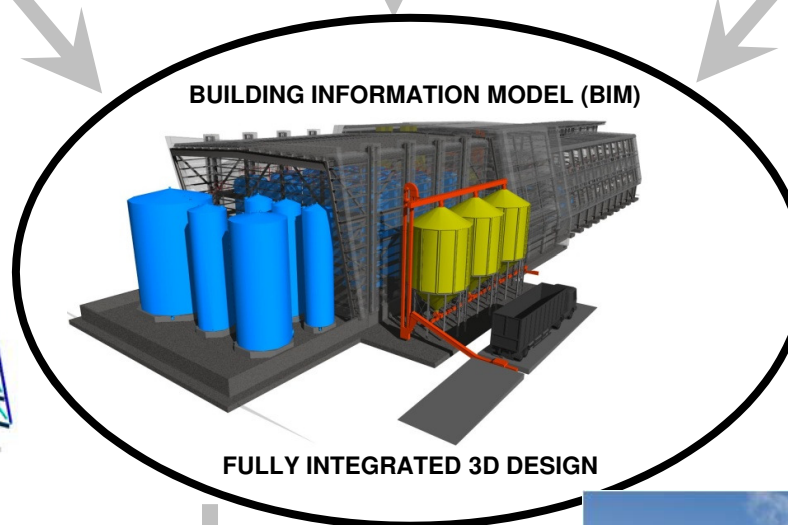
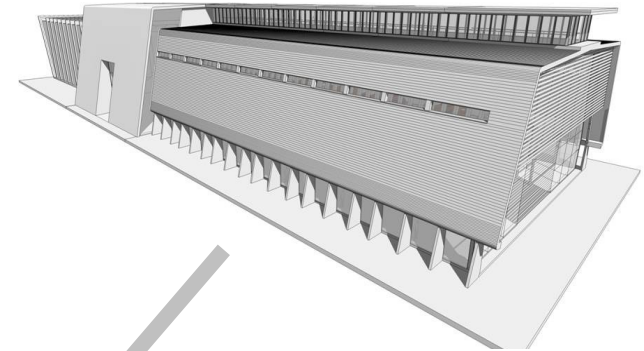


STRUCTURAL FABRICATION

## M&E SERVICES



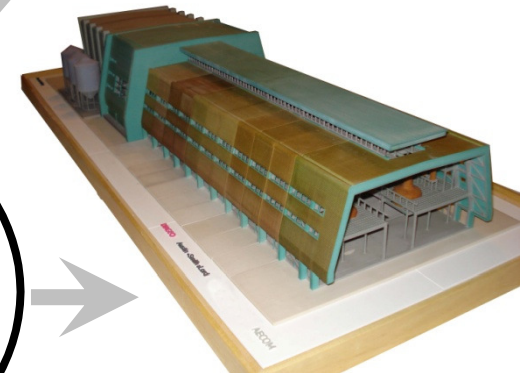
## ARCHITECTURAL



BUILDING INFORMATION MODEL (BIM)

FULLY INTEGRATED 3D DESIGN

RENDERED IMAGES  
ANIMATION  
REAL TIME VIEWING  
CLASH DETECTION  
QUANTITIES  
SEQUENCE  
PROGRAMME – 4D  
COSTING – 5D



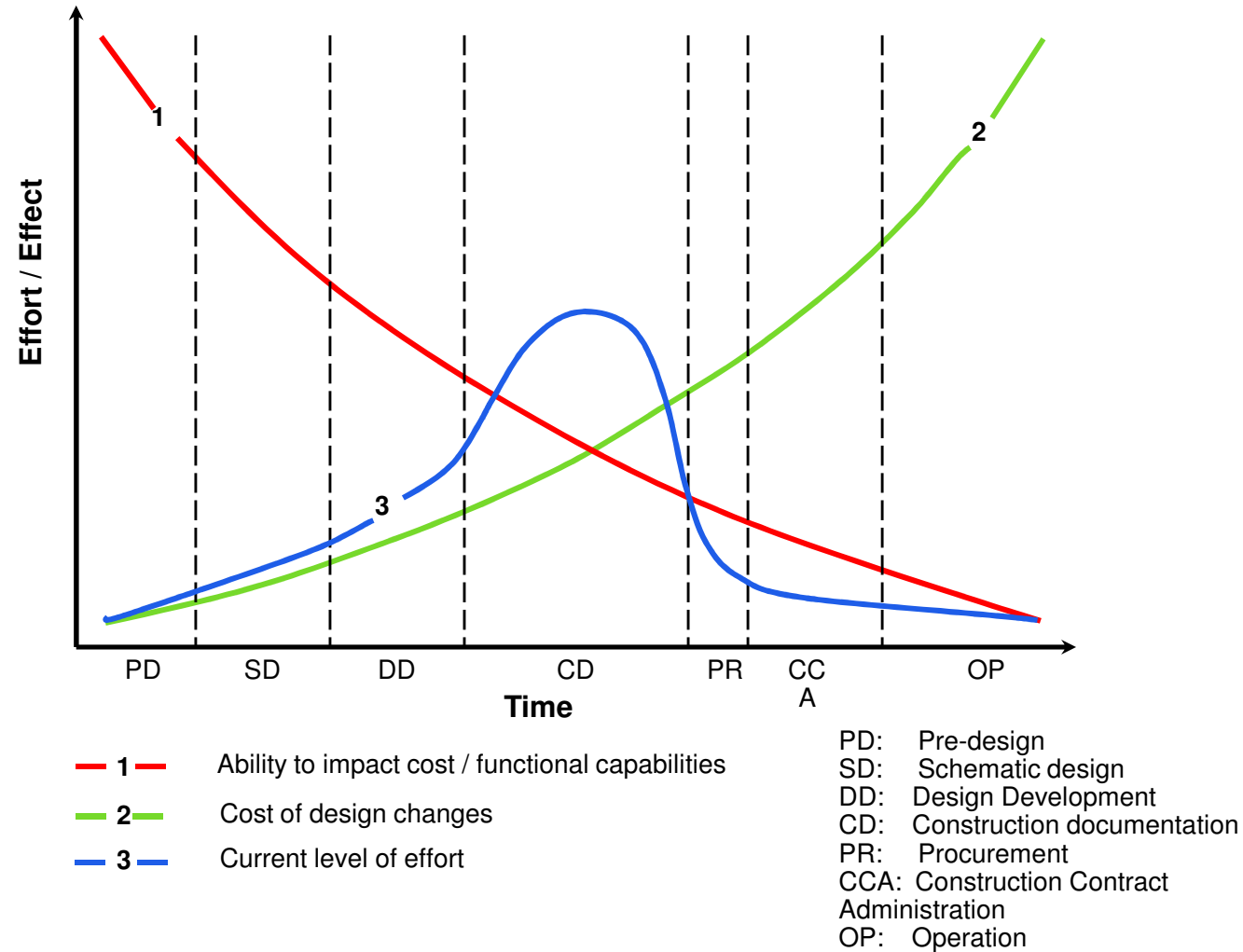
RAPID MODEL PROTOTYPING



FULLY CO-ORDINATED BUILDING TO SITE

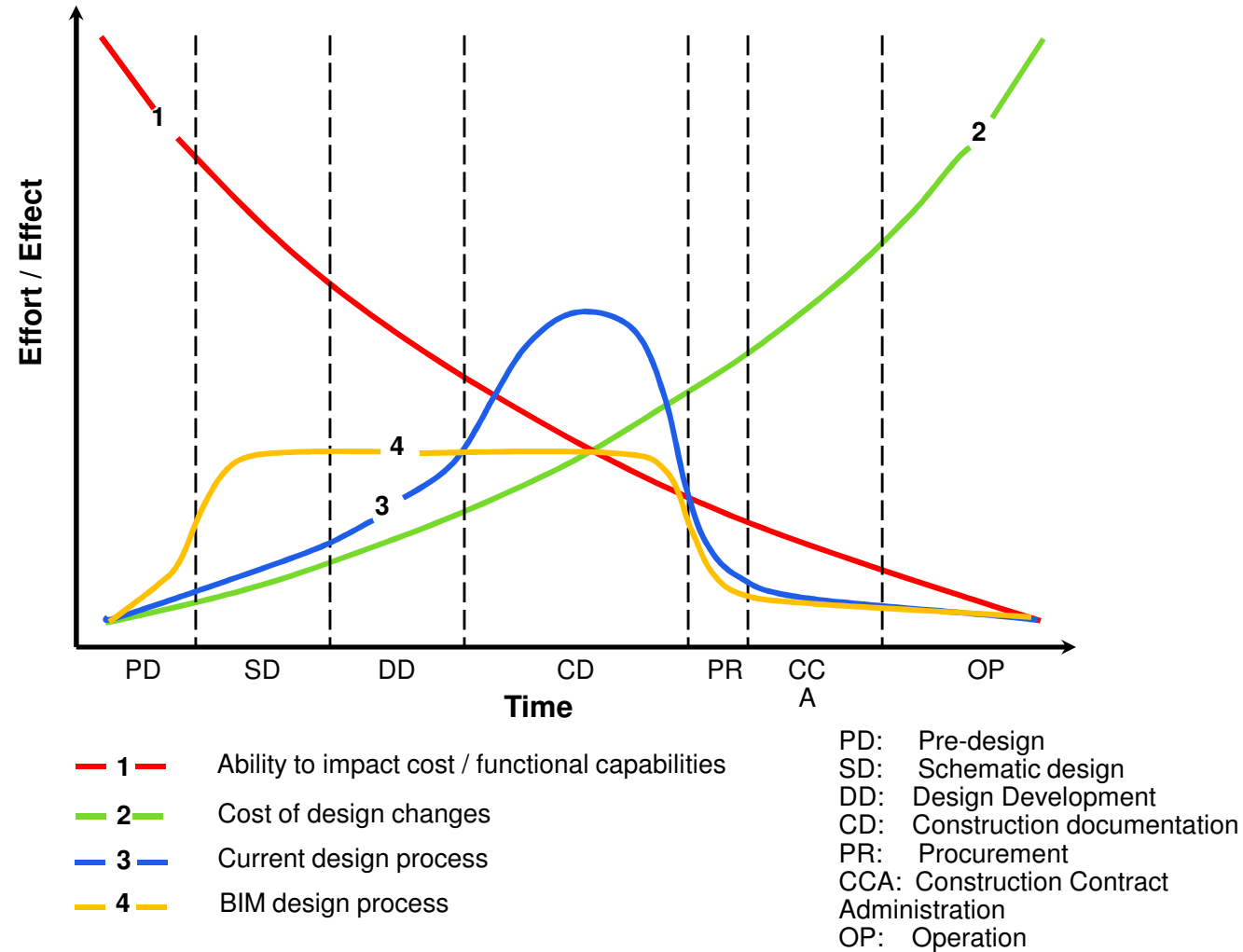


# Traditional Design Process



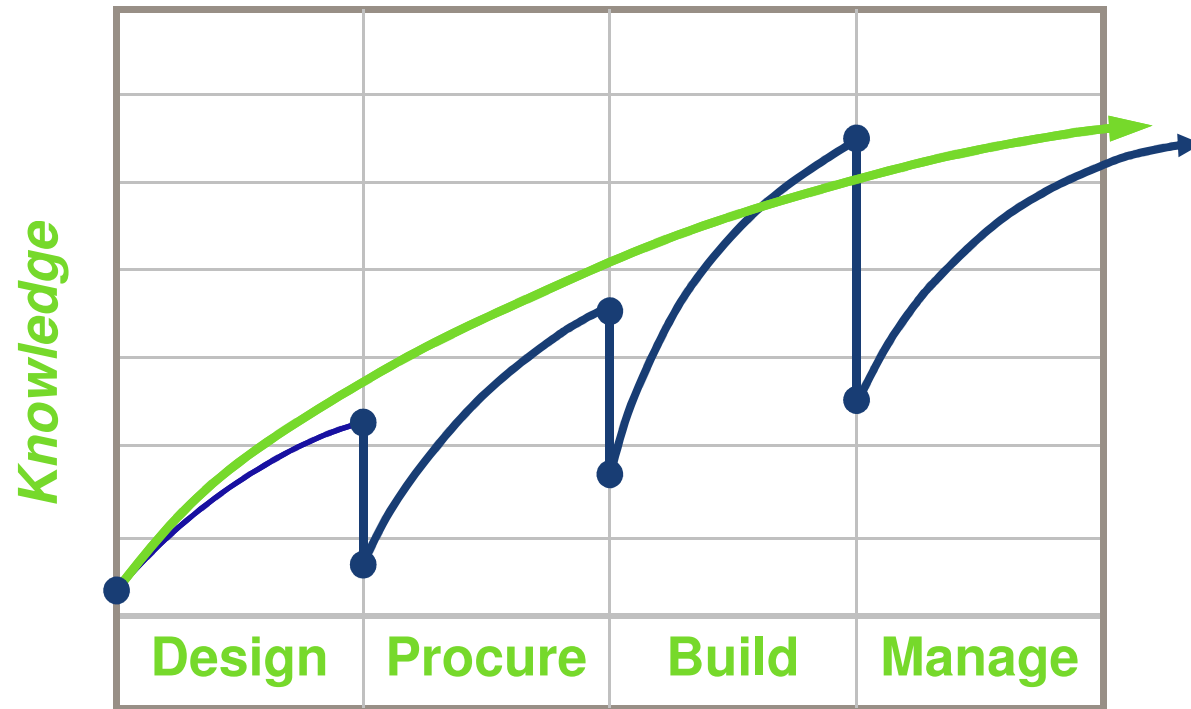
Source: *Construction Users Roundtable BIM report and internal analysis*

# BIM Design Process



Source: *Construction Users Roundtable BIM report and internal analysis*

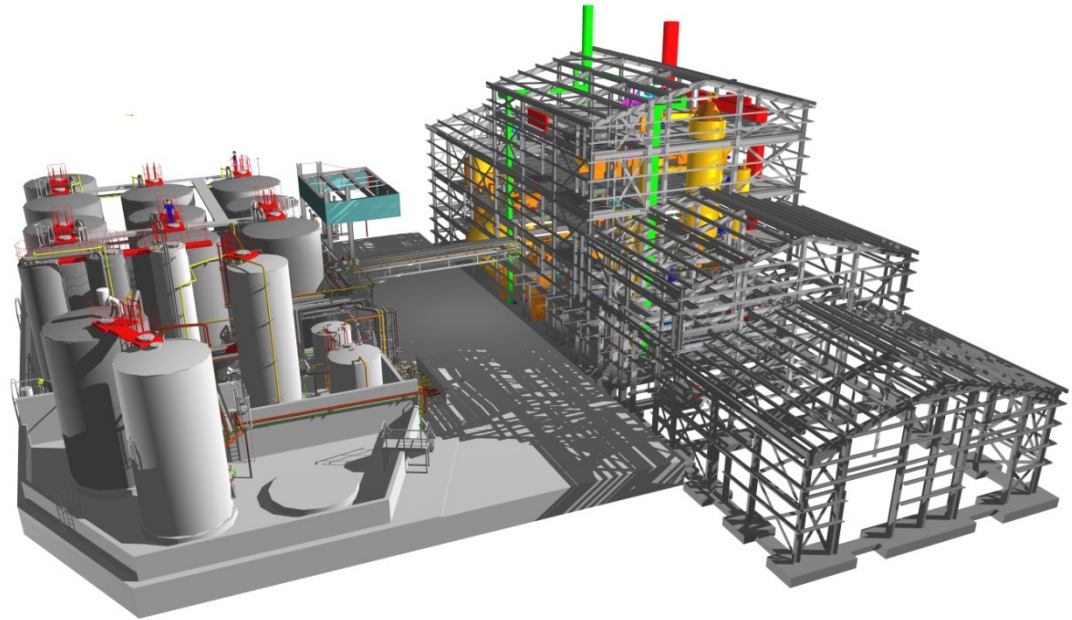
# Issues within the Industry today





# Build Before You Build

- Virtually prototype
- Minimise errors
- Maximise coordination
- Test more solutions
- Realise efficiencies



# Building Information Modelling (BIM)

Questions...?

