

«Μην είσαι τόσο Μηχανολόγος, ρε παιδάκι μου!».  
Thinking outside the Box.

Energy Efficiency in Buildings Conference 2024

Μέλος & Εκπρόσωπος:

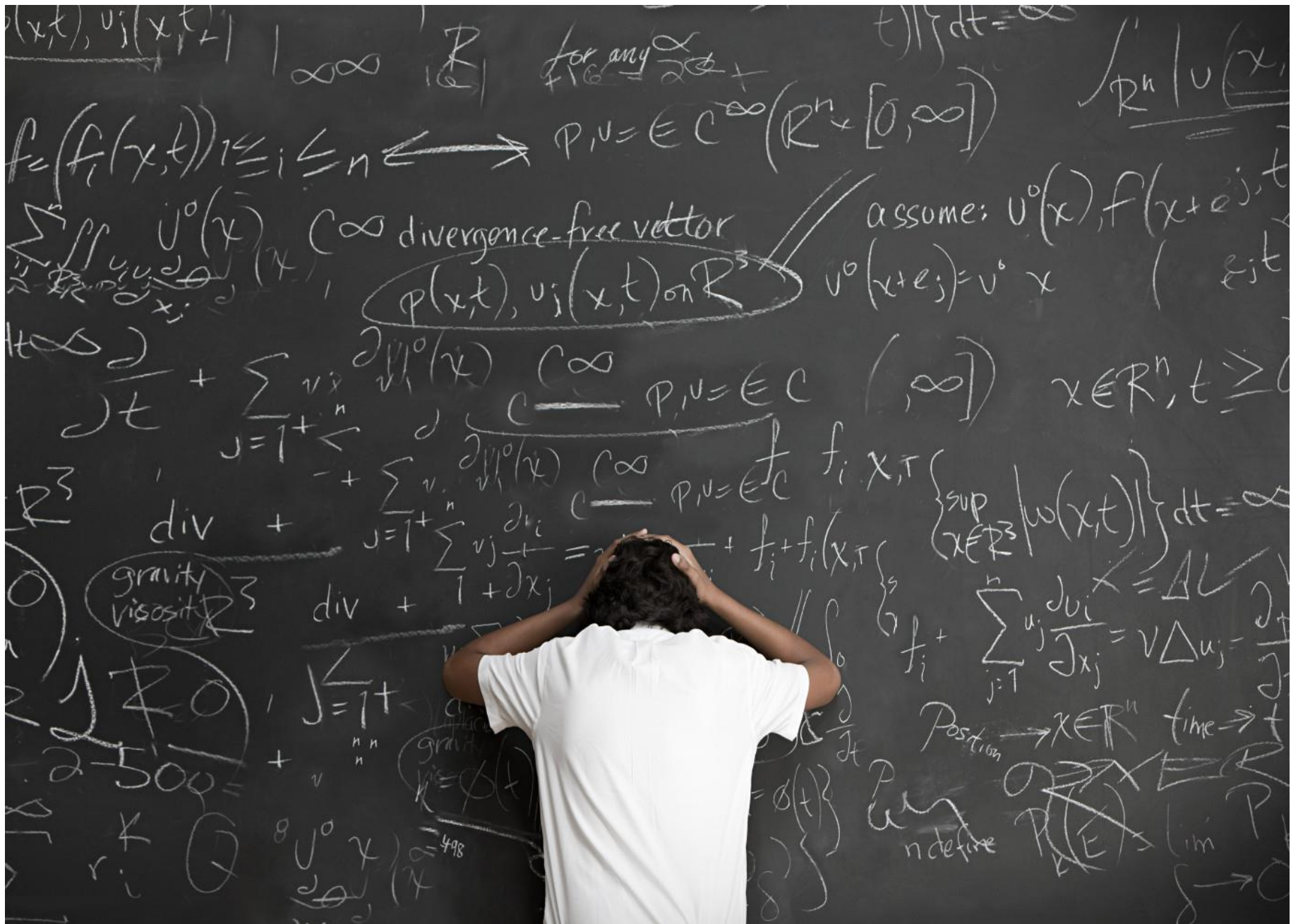


Prepared by Ioannis Ladopoulos  
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MSc in Renewable Energy Systems Technology  
MA in Lighting Design – Architectural lighting and Design Management  
DEKTIS CONSULTANT ENGINEERS SA  
VICE PRESIDENT OF HELLASCO BOARD



Δεν  
πληρώνομαι  
ΑΡΚΕΤΑ  
για αυτά  
που ζω...





INSTEAD OF RISKING ANYTHING NEW,  
LET'S PLAY IT SAFE BY CONTINUING OUR  
SLOW DECLINE INTO OBSOLESCENCE.























# THE END OF BUSINESS AS USUAL



# THINK OUTSIDE *the* BOX



*Idiom meaning:* To creatively think in new ways rather than the usual or expected way of thinking.

# PUSH THE ENVELOPE

[americanenglish.state.gov](http://americanenglish.state.gov)

## definition

to push or stretch the boundaries of what is possible or acceptable; to go further (in any field) than anyone has done before



## example

This architect is always pushing the envelope with his designs. The buildings he makes are always very unique.



It doesn't matter how many resources you have.



If you don't know how to use them,  
it will never be enough.

## Beyond KENAK (i.e LEED and other Certification Systems )

- Insulation and Windows
- LEDs high Efficacy
- KNX/DALI/Litecom
- Constant Light Control (CLC)
- Automation/BMES/Sensors
- Energy Monitoring/Recording/CO2 Monitoring
- Water fixtures of low Consumption
- Water Consumption Meters
- ASHRAE 90.1
- Enhanced Commissioning
- Electromobility/Load Control
- Smoke Control /Jet Fans
- Rainwater Management
- PV Net Metering
- Innovation
- Latest Technology IT and AV



# WELL the extra step

- Circadian Lighting –Human Centric Lighting
- Carbon Filters/Air Quality
- Water coolers
- Moisture management
- Reuse of non-potable water
- Active Workstations
- Acoustics





## Prodea Offices in Athens

This is the first Building in Greece pursuing both LEED and WELL certification. All MEP designs for the Schematic- Permitting stage, Detailed Design and Tendering Stage including the Substation of the building were carried out by our office.

### MEP Services

Power Networks and Substation Design, Lighting Installation and Automation, HVAC, Fire Fighting, Plumbing, Audio Visual, BMS, KNX automation, Low Currents, irrigation.

**MEP deliverables included preparing all MEP LEED and WELL documentation for the Consultant to submit.**



**Location: Athens, Greece**

**Year: 2018-2020**

**Total Area:  $\approx 3.000\text{m}^2$**

**Architectural Office: USP (Urban Soul Project)**

**Chief Architect: Tasos Georgantzis,**

**Participating Architects: Simos Antoniadis, Kostas Floros,  
Dimitra Giannou**

**Lighting Design: Reflect Lights**

**Structural Team: Christoforos Kolyvas, Christos Karnavezos**

**MEP PM: Panagiotis Zaharias**

**Acoustic Design: Timagenis**

**Photo Credits: Yiorgis Yerolymbos**



- **Acoustic problems with HVAC. CFD for VRFs in uncovered atriums. Relocation of units due to poor performance in extremely hot days.**
- **Substation and Generator Problems**
- **Changes of the interior during Construction Design**
- **First time WELL**
- **Protected Façade**
- **Low Ceiling spaces**
- **Existing Beams**



# MEP Systems

- Insulation and Windows
- LEDs high Efficacy
- KNX/DALI/
- Constant Light Control (CLC)
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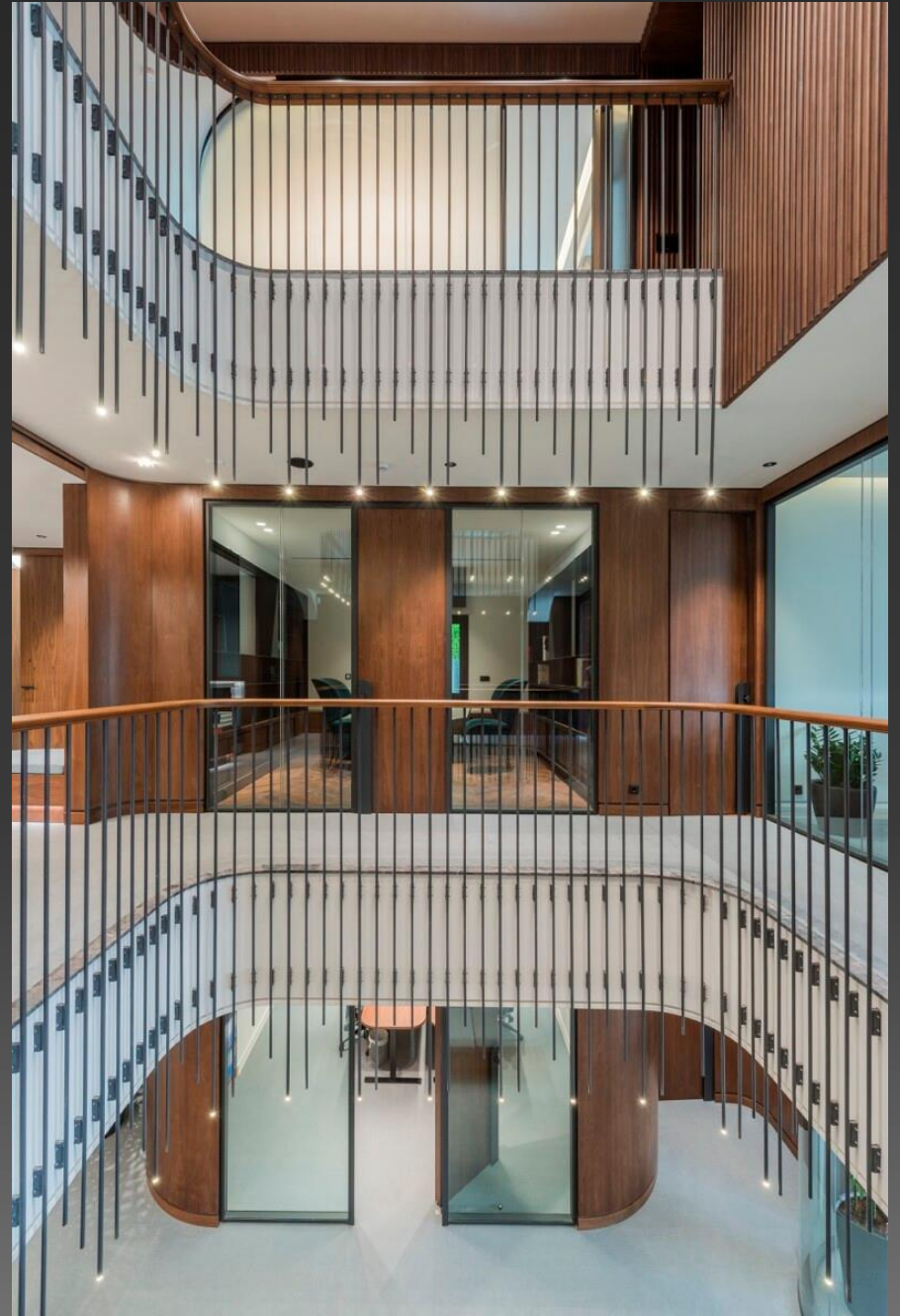








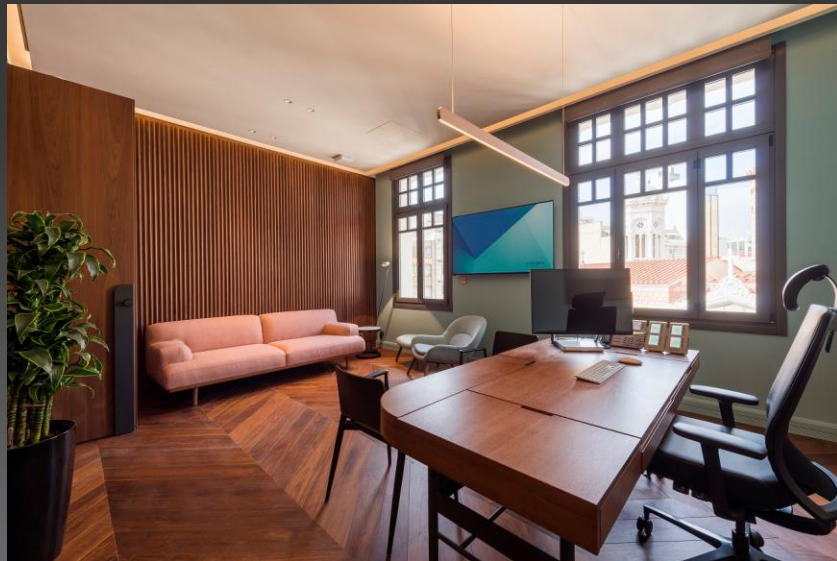












## Renovation of the Historic “Eletherotypia” Building



This is a major renovation of the historic “Eletherotypia” Building. All MEP installations are designed from scratch.

The Electrical Substation and Fire Fighting Pump station are also part of the SOW. Sustainability Design, Energy Study included. The building got LEED Gold certification.

**MEP deliverables included preparing all MEP LEED documentation for the Consultant to submit.**



**Location: Athens, Greece**

**Year: 2019-2021**

**Architectural Office: TPA Inc**

**Chief Architect: S. Christopoulos**

**Senior Architect: Eri Nikoloudi, G.**

**Psarras**

**MEP PM: Panagiotis Zaharias**

**Client: TPA Inc, Grivalia, Dimand**



# Challenges

- Design Time limit
- Existing Building
- Budget limitations.
- Continuous Value Engineering.
- Change of User right after Permit Design
- Very strict review control in terms of LEED
- Open Ceilings
- High user numbers in the open spaces (Call center)
- Existing Structural Elements posed a challenge
- Additional Requirements for Insurance Company in terms of Lightning Design

# MEP Systems

- Insulation and Windows
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## Athens Heart Offices in Athens

The project includes the full refurbishment of the Athens Heart Mall Building pursuing LEED Gold Certification and the change of use to an Office building . An additional 3000sqm Admin building was added to the SoW. All MEP designs for the Preliminary, Schematic- Permitting stage, Detailed Design and Tendering Stage were carried out by our office.

### MEP Services

Power Networks Lighting Installation and Automation, HVAC, Fire Fighting, Plumbing, Audio Visual, BMS, KNX automation, Low Currents, irrigation, PV, EV charging were part of the SoW of MEP services.

**A&S**  
ARCHITECTS

**PREMIA**  
*Propeties*

**Location: Athens, Greece**

**Year: 2022-Ongoing**

**Total Area: ≈47.000m<sup>2</sup> (including basements)**

**Architectural Office: A&S ARCHITECTS**

**Chief Architect: Anna Assana**

**Participating Architects: Anastasia Tsikli, Nikos Siapkaras**

**Lighting Design: LUUN**

**Structural Team: Panos Vafiopoulos**

**MEP PM: Thanos Kalakos, Panos Katsaros**

**Client: Sterner Stenhus, PM: addValue**



## Challenges

- **Change of use of Building from Mall to Office Building**
- **Design Time limit and Construction Time Limit**
- **Budget limitations**
- **Continuous Value Engineering**
- **Existing and New Building**
- **Existing Structural Elements posed a challenge**
- **Smoke Control of Atrium was very complicated**
- **Tender Design to happen in Schematic and not Detailed Design**
- **Change of HVAC supplier between stages**
- **Change of client's requirements during construction**
- **Fire Detection of Space frame**

# MEP Systems

- Insulation and Windows
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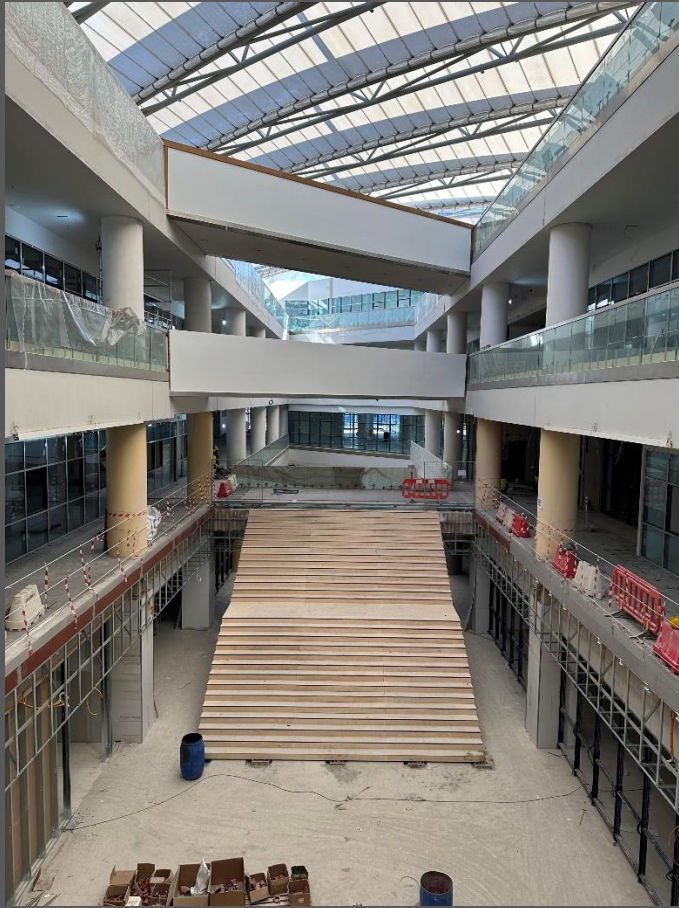














# What's Next?

- Variable Air Volume (VAV) HVAC system
- VRFs with R32
- Propane Air Cooled Chillers
- Energy Storage
- 30% more Air Supply for better Air Quality
- Lifts :
  1. with Permanent Magnet Motors
  2. Energy Saving operation-Allocation Control
  3. Regenerative braking
- FTTO (Fiber to the office)
- Demand Response

# SYSTEMS AND DIGITAL TRANSFORMATION

- Integrated Energy Management
  - Monitoring and Alarming of Electric Distribution
  - Capacity Management
  - Back power testing
  - Power Quality Monitoring
  - Power Quality Correction
  - Energy Benchmarking
  - Energy Consumption Analysis
  - Power Factor correction
  - GREENHOUSE GAS reporting
  - Cybersecurity IEC 62443
- IOTs-Smart Devices
- Software Platform (OTs)
- Big Data” analytics
- Artificial intelligence (AI)
- Cloud computing



# From NZEBs to PEBs

Are NZEBs the answer;  
PEBS (Positive Energy Buildings)



U·rb atelier in collaboration of AWA, Granada Spain



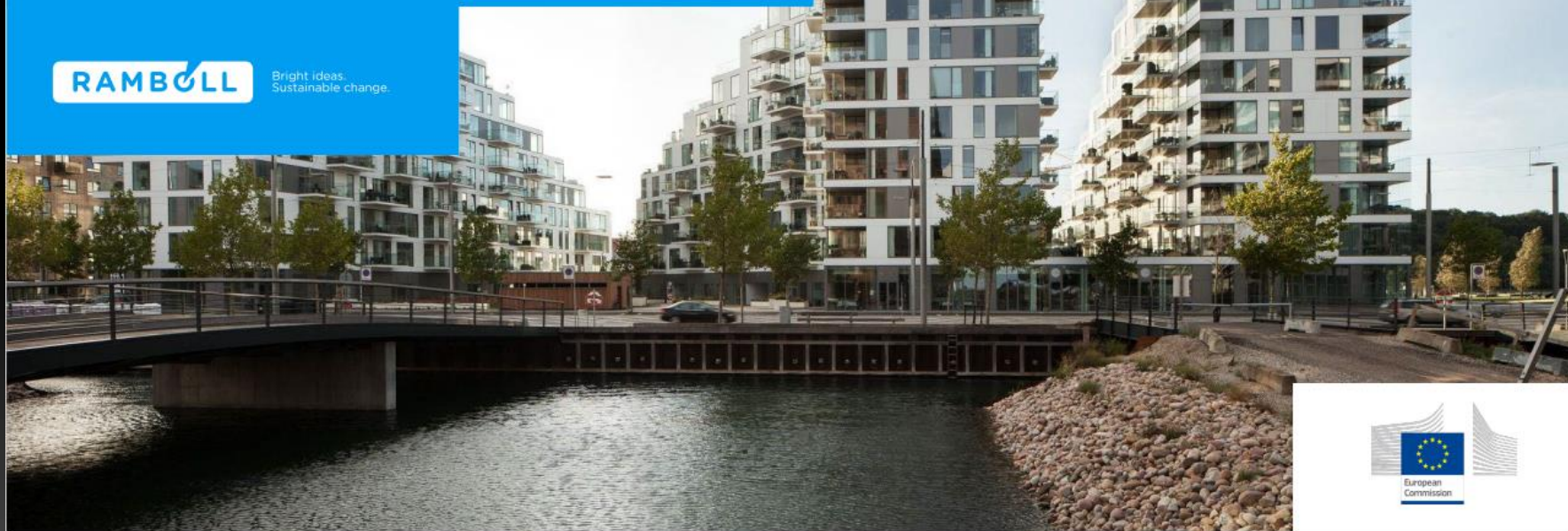
# ADAPTATION OF BUILDINGS AND REGULATIONS TO CLIMATE CHANGE

## EU-Level Technical Guidance on adapting buildings to Climate Change

Expert Panel Workshop #2

**RAMBOLL**

Bright Ideas.  
Sustainable change.





# Overview

PROJECT WORKSTREAMS

## POLICY & STANDARDS REVIEW

### European Policy & Standardization Environment Adaptation Review

Review of EU and member state national policies and regulations relevant to the adaptation of buildings for climate change.



### Climate Resilience in Structural Design Review

Review of the structural design of buildings to the Eurocodes and national regulations relevant to designing for climate resilience in buildings.



## RISK ASSESSMENT & RATING REVIEW

### Climate Vulnerability & Risk Assessment Methodology

Review of Climate Vulnerability & Risk Assessment methodology for buildings and blocks of buildings from existing methodologies.



### Climate Resilience Rating Approach

Review of rating approaches for climate resilience for buildings, exploring the criteria, approach type, and link to CVRA methodology.



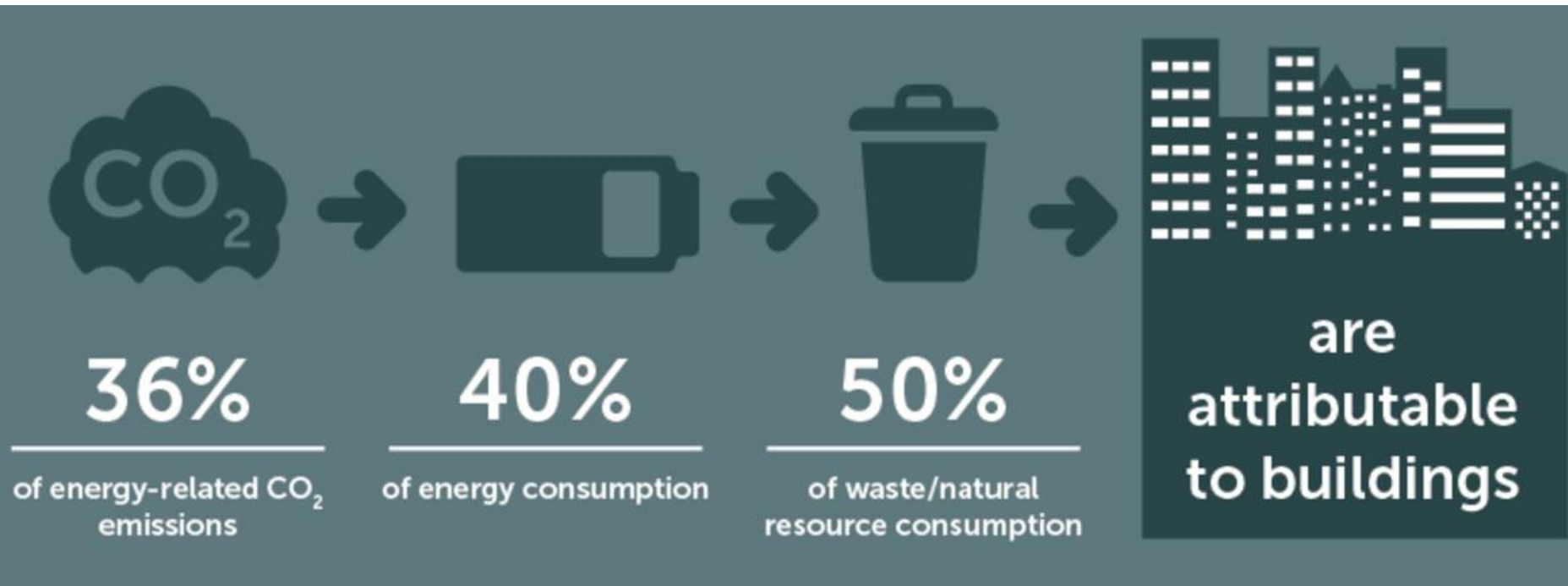
## BEST PRACTICE GUIDANCE

### Best Practice for enhancing Climate Resilience

Assembly of best practice climate resilience guidance for buildings and as integrated into the local environment. Best practice case studies will be categorised by climatic hazards with supporting guidance given in reference to the different processes or priorities by climatic zone, project stage and building sector actor.



Expert Panel for EU-level technical guidance for adapting buildings to Climate Change



What role will buildings play in the future in terms of sustainability?  
(Source: European Commission, Energy Efficiency of Buildings)



Modular information for the different life cycle stages of the building

## Information on Building Assessment



### Information on the life cycle of the building



A 1–3  
Production  
phase



A 4–5  
Construction  
phase



B 1–7  
Operational  
phase



C 1–4  
Disposal  
phase



Additional  
information not  
related to the  
building cycle



D  
Benefits and  
strains that  
exceed the  
system limits



A 1 A 2 A 3  
Raw material procurement  
Transportation  
Production



A 4 A 5  
Transportation (scenario)  
Construction/Installation (scenario)



B 1 B 2 B 3 B 4 B 5 B 6 B 7  
Operation  
Maintenance (scenario)  
Repair (scenario)  
Replacement (scenario)  
Modernization  
Energy consumption in operation (scenario)  
Water consumption in operation (scenario)

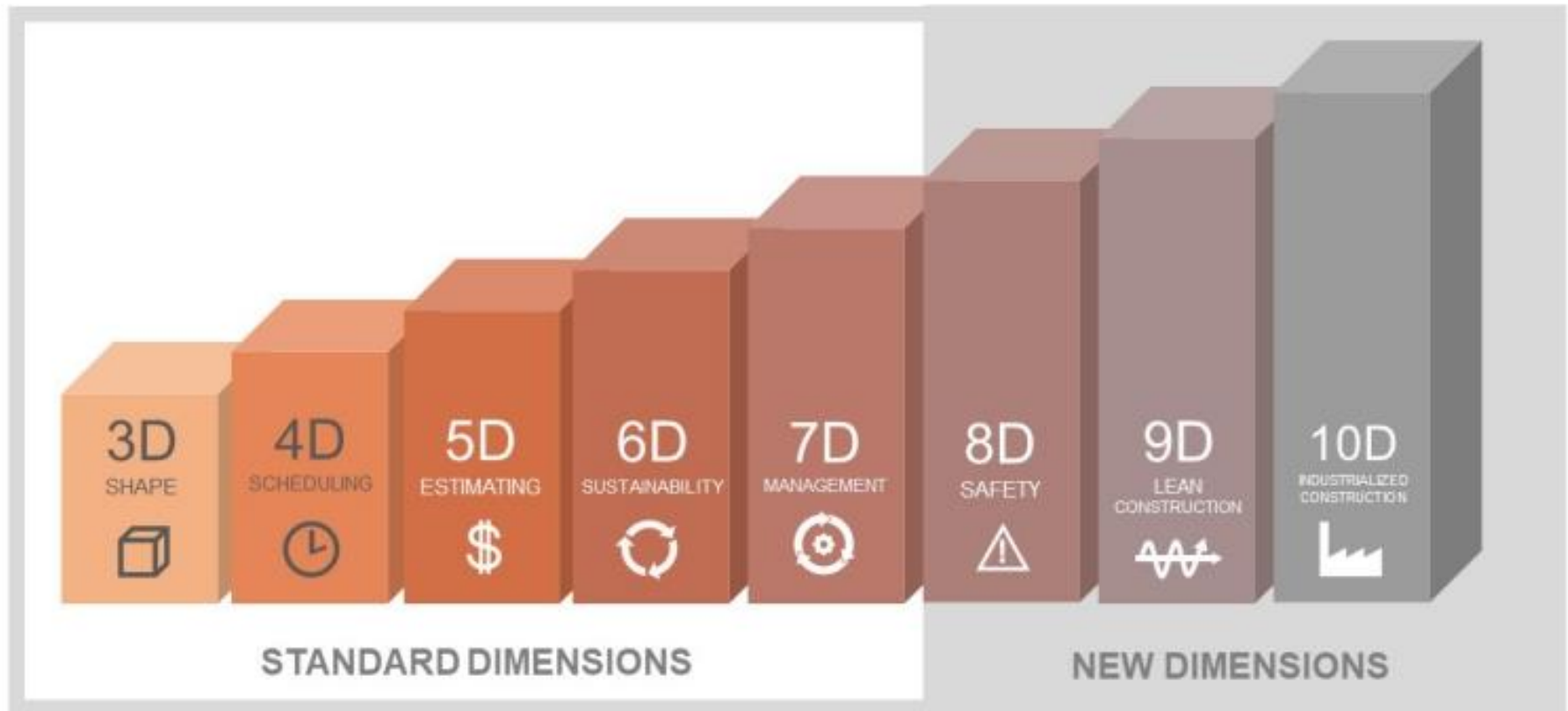


C 1 C 2 C 3 C 4  
Dismantling/demolition (scenario)  
Transportation (scenario)  
Waste treatment (scenario)  
Disposal (scenario)

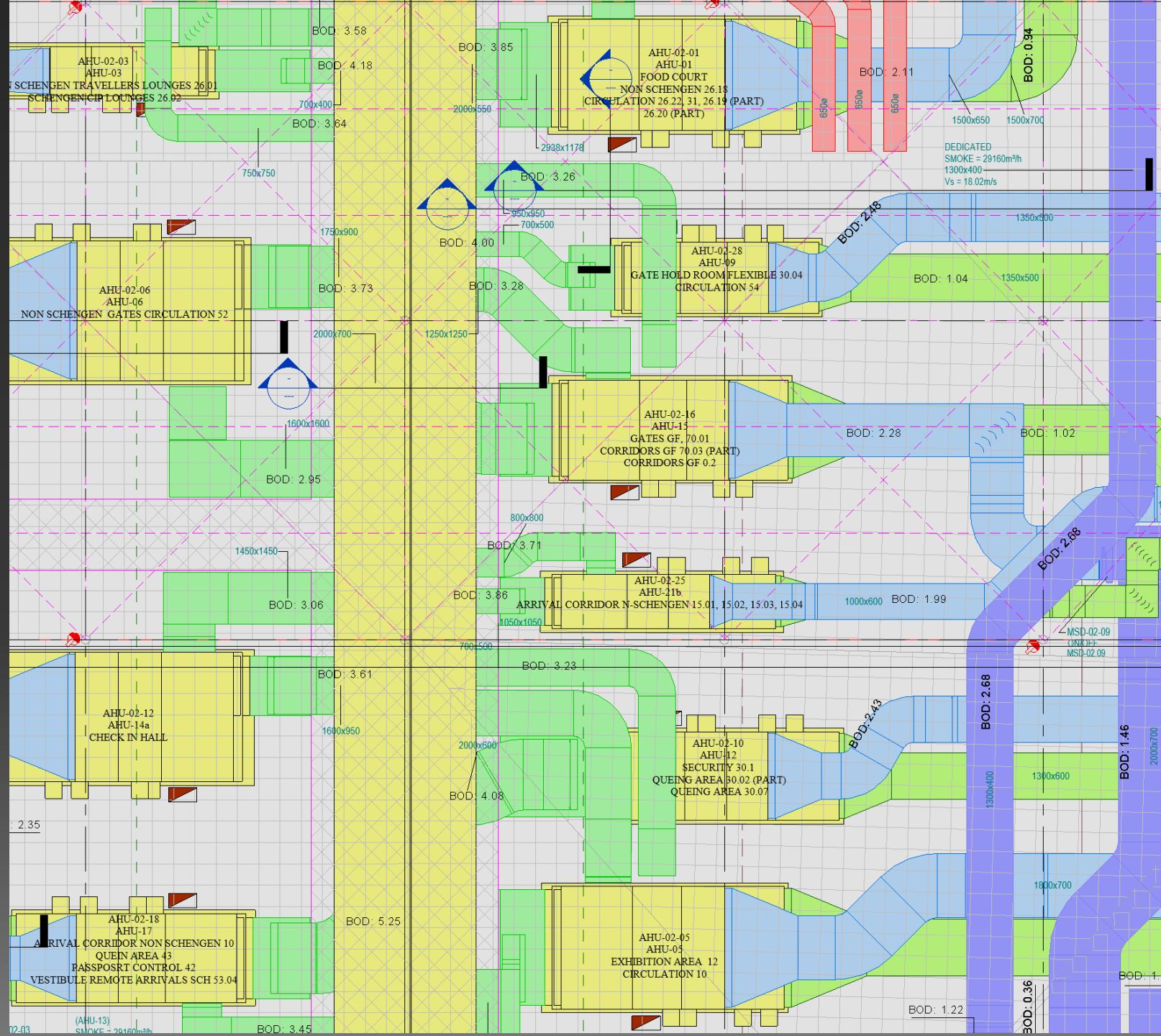


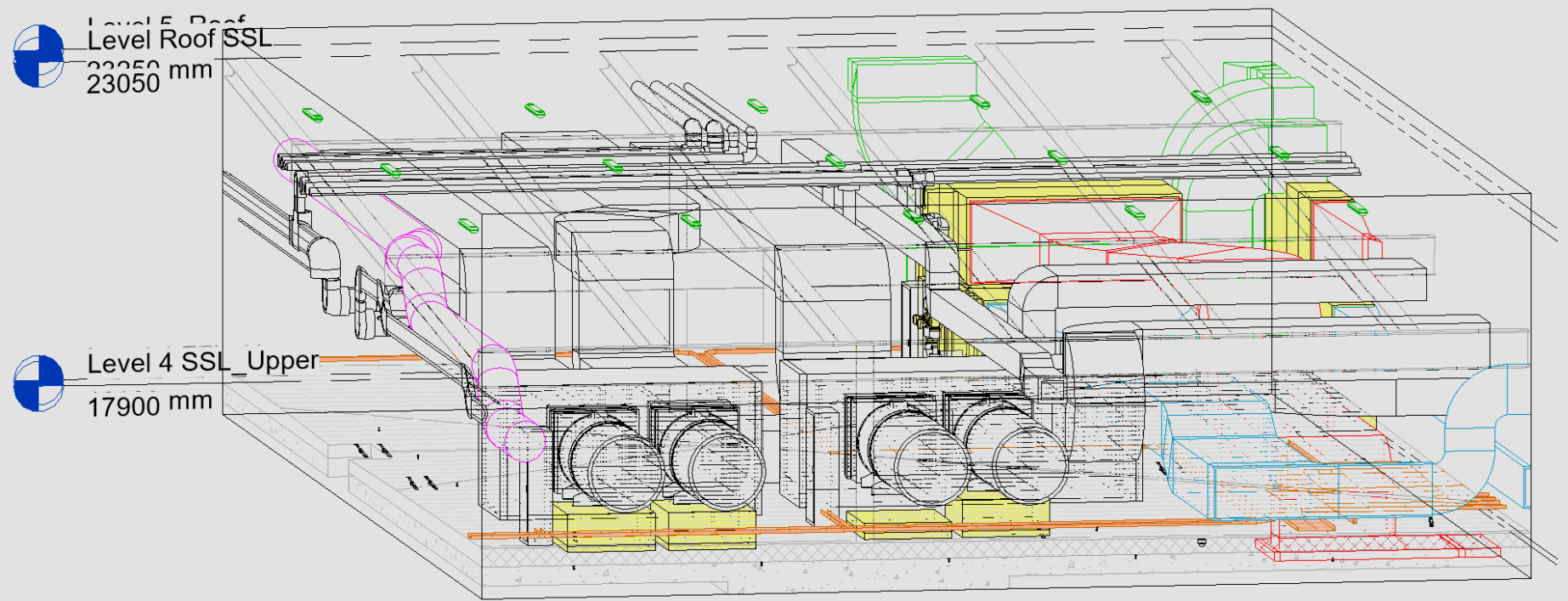
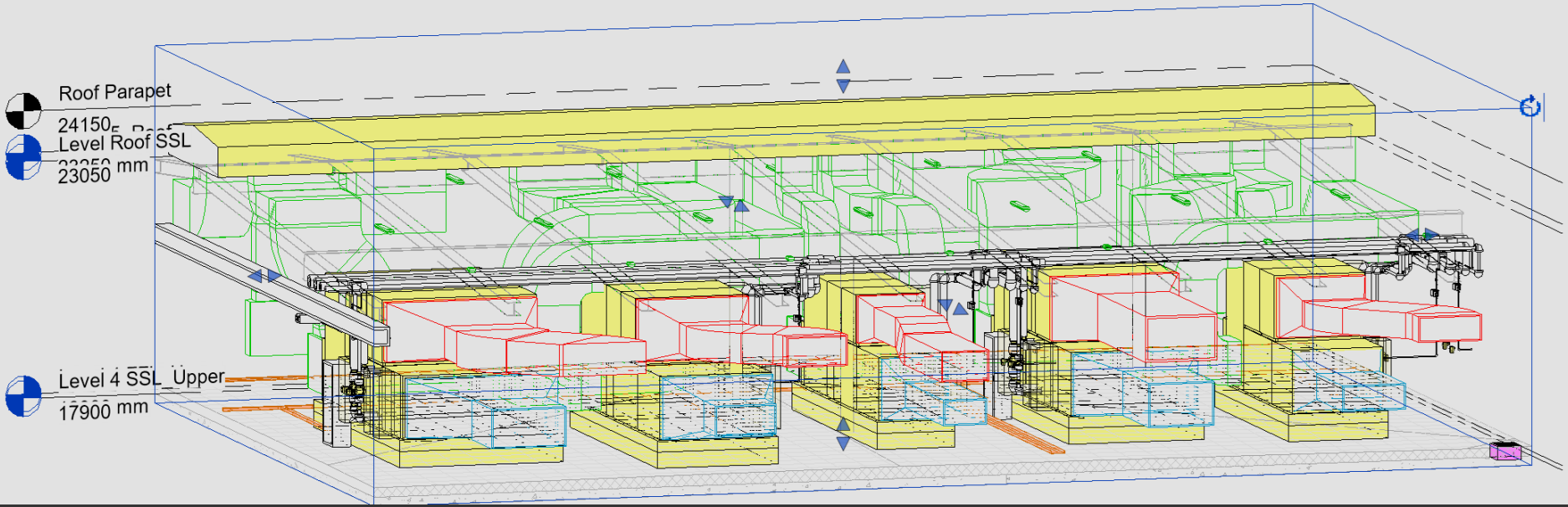
Potential for  
reuse, recovery  
and recycling

## DIMENSIONS OF BIM













FINEGREEN 19x64

Home Edit Draw Draw 3D Insert Annotate View Output Tools Express Tools Plus Definitions Building Entities Drawings-Calculations Help

Plan View 3D Drawing Screen Drawing Axonometric Drawing Zone parameters Space height Energy surface model Building Plot Definition Neighbor Building Definition PV panels Horizontal cantilever Slab Solar collectors First Lighting Reference Point Second Lighting Reference Point Calculation Heating parameters Cooling design Simulation design Heating design export to IDF Cooling design export to IDF Simulation export to IDF

Project Drawings Plan View Data Calculations

Property

No selection

General

Color  ByLayer  
 Layer 0  
 Linetype  ByLayer  
 Linetype scale 1.00  
 Lineweight  ByLayer  
 Thickness 0  
 Transparency  ByLayer

3D Visualisation

Plan Views

- \* Level:1 -3.85
- Level:2 0.00
- Level:3 3.00
- Level:4 7.55
- Level:5 11.30

Cooling Results

Type

Chart  
 Grid  
 Detailed Grid

Temperature

15  
10  
5  
0

Relative humidity

55  
50  
45  
40

Time 0 2 4 6 8 10 12 14

Simulation Results

Relative humidity

60  
40

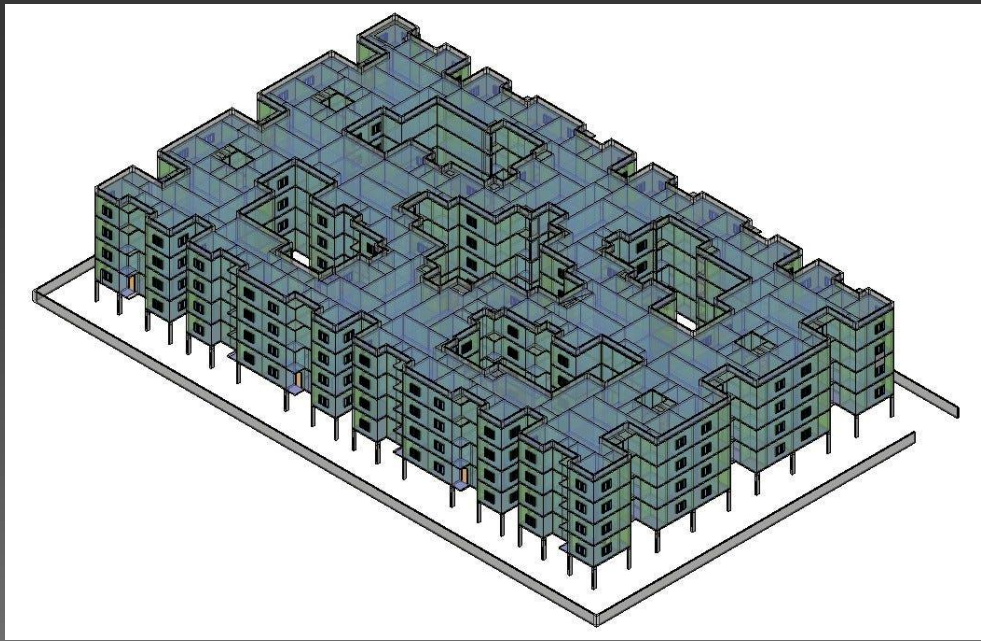
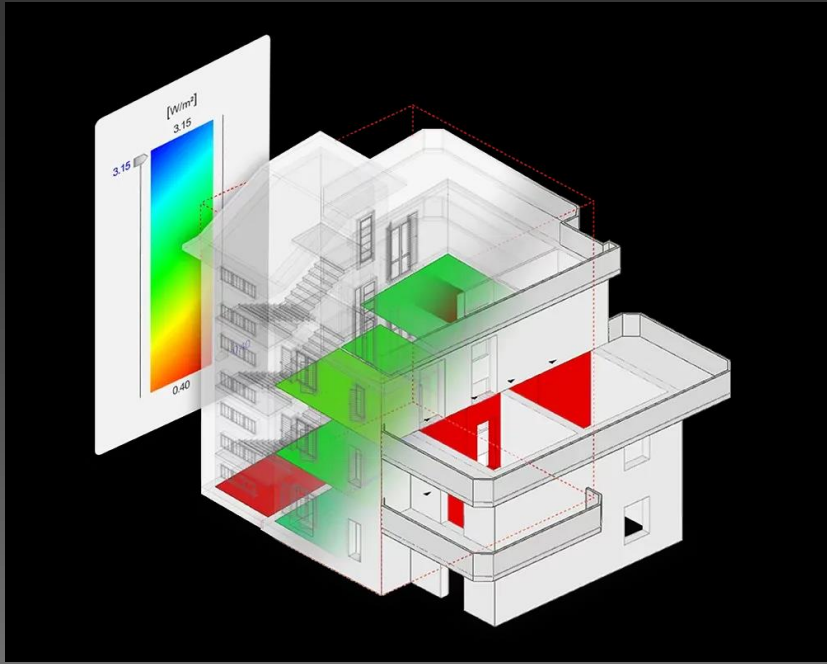
HVAC System

Simulation Results

Relative humidity

60  
40

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 Enter an option [2Dwireframe/3Dwireframe/3D Hidden/Realistic/Conceptual/Other] <2Dwireframes> \_R  
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Skidmore, Owings & Merrill's (SOM)  
Urban Sequoia





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**Thank you for your attention!**

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