MONASH University

GROUP OF EIGHT AUSTRALIA

Scaling up for large commercial

Rob Brimblecombe with special guest Johanna Trickett

Scaling up for large commercial

Series of interim steps and proof of concepts

1. B56 – Proof of concept
2. Financial models
3. Building capacity
4. Interim targets
5. Putting it all together

MONASH University

B56: Proof of concept

MONASH University

AX SAFE WORKING LOAD 2040 Kg. (2 TON)

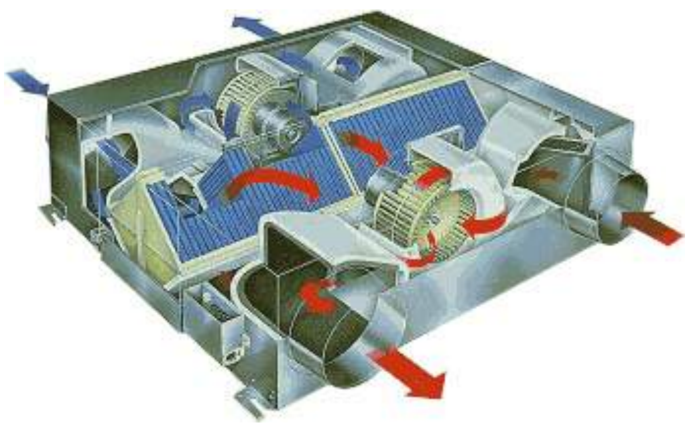
MONASH University

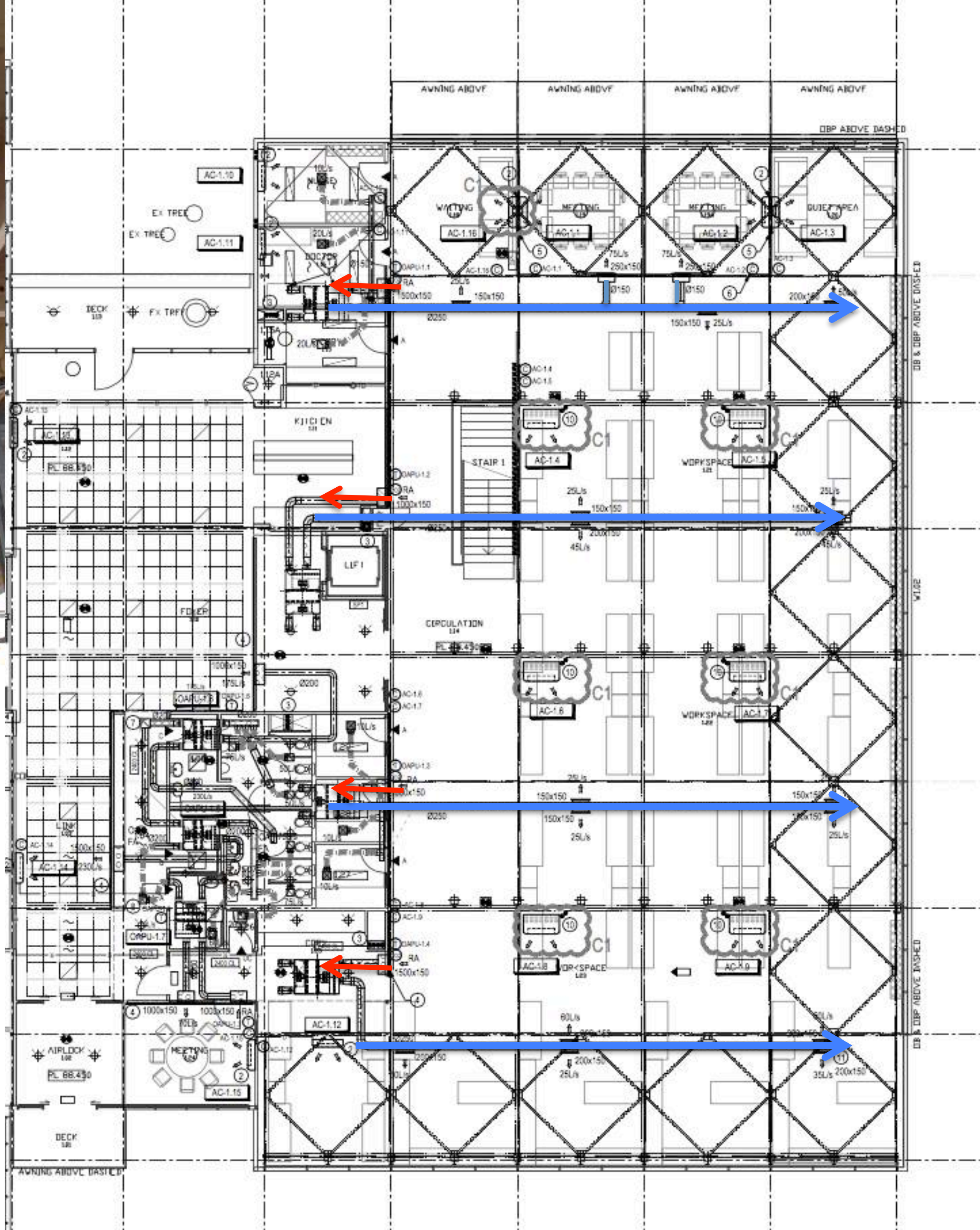

MAX. SAFE WORKING LOAD 2040 Kg

Integrated Design Team

- At the table: Architect, Engineer, PM, Passive House Advisor, Client, QS and Builder
- Key design debates
    - The thermal and air tight layers
    - Thermal bridges
    - Windows
    - Heat recovery mechanical system
    - Solar control and daylight
    - Cost and Program

MONASH University





MONASH University

MONASH University

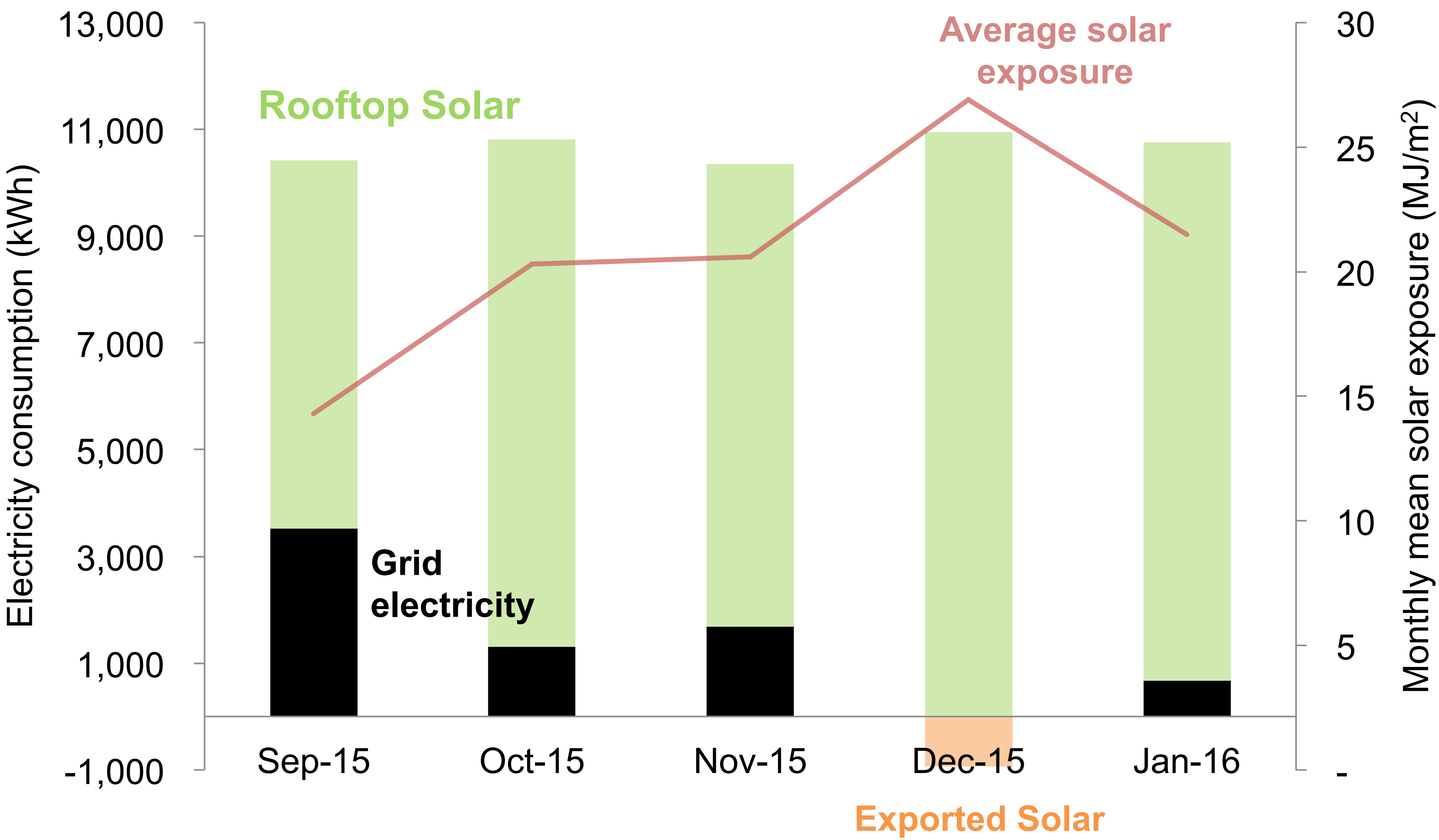
SOLITEX EXTASANA
pro clima

MONASH University

Dry as a bone!
Dry as a bone!

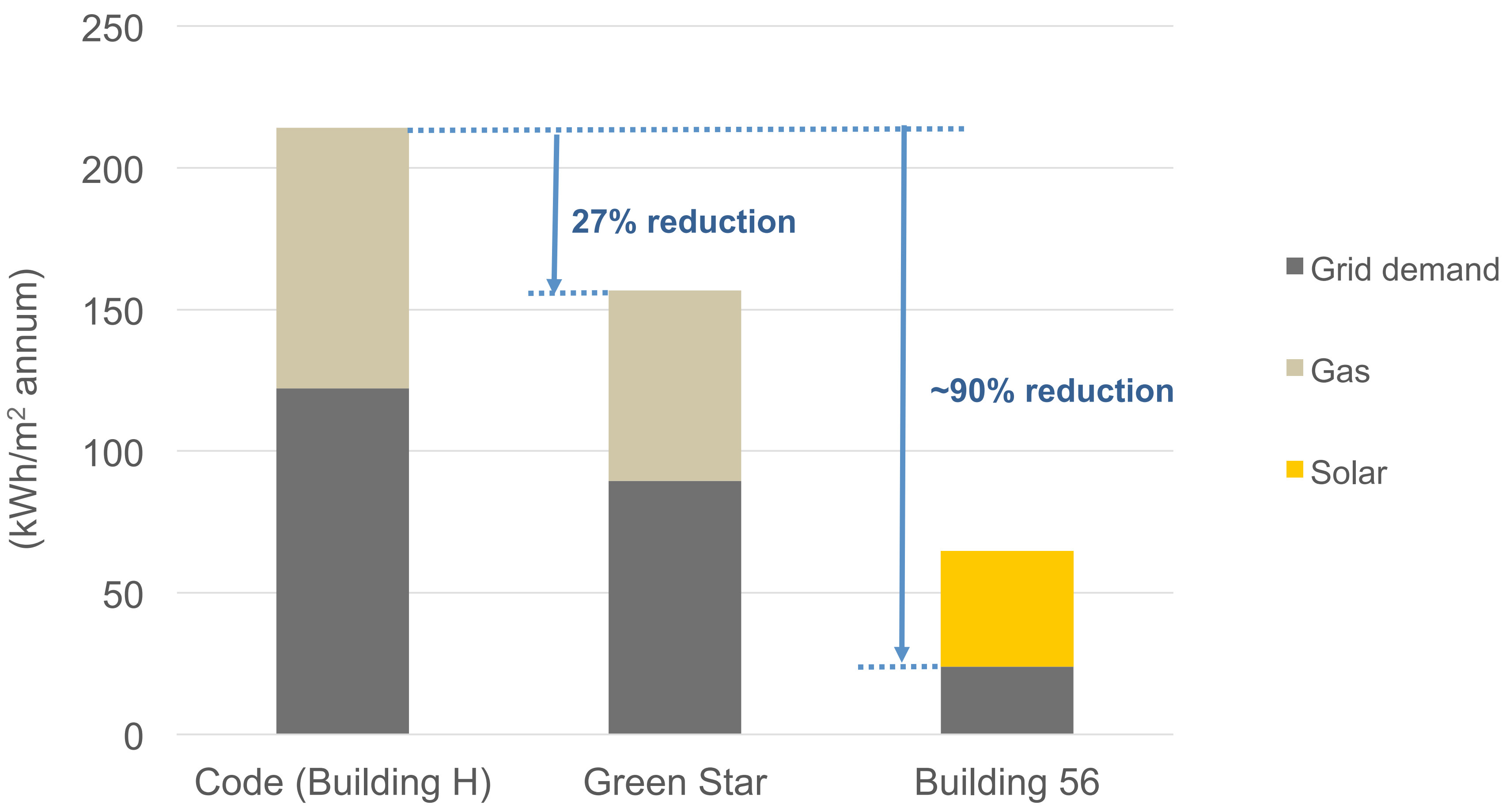

N

Building 56 – Consumption vs Solar



MONASH University

Office Energy Benchmarking



MONASH University

Lessons Learned

1. Set a clear target and expectations from the start
2. Need buy in from **<u>every</u>** part of the team
3. Integrated design with early contractor engagement
4. Design has to accommodate local market and industry capability
5. Need to educate **<u>all</u>** of the sub-contractors
6. Some parts of the build will cost more than code

Moving from concept to certification

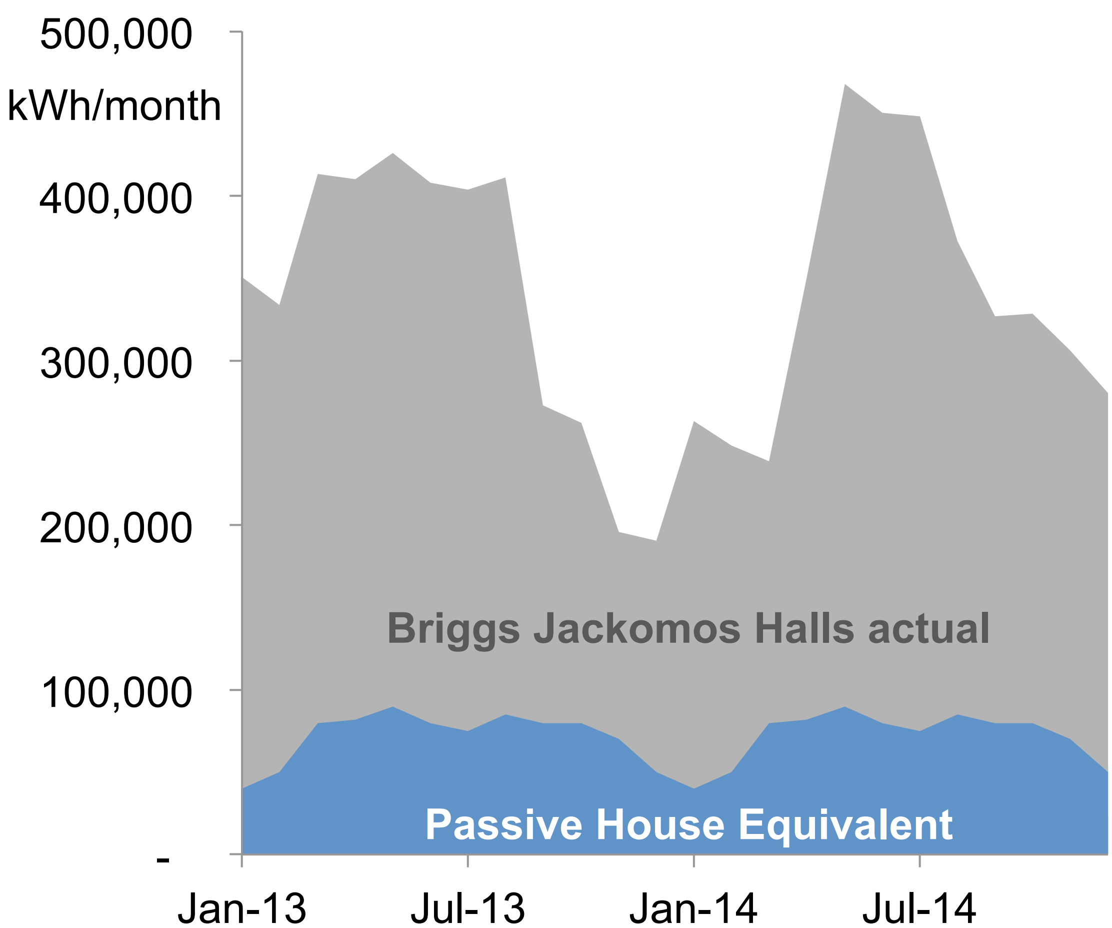
1. Building the value of Passive House
2. Addressing perceived cost premium
3. Building/finding design expertise in big firms
4. Setting documentation expectations
5. Building air tight construction experience
6. Sourcing suitable products e.g. HRV
7. Managing contractor risk premium

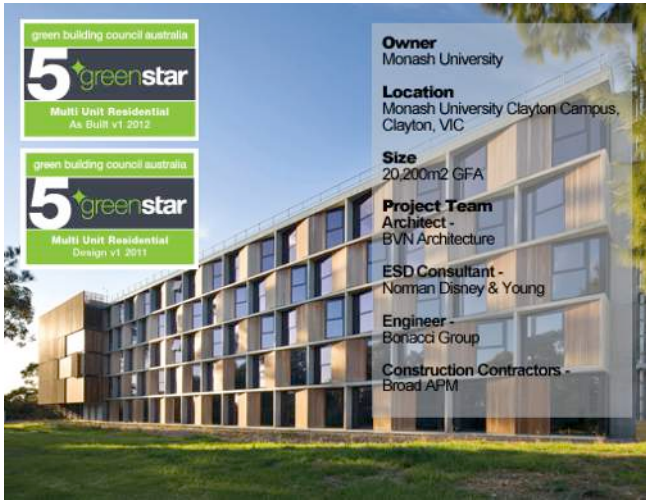
Building Exposure for Passive House

- 2016 Architecture and Design Sustainability Award in the large commercial category.
- Green Gown Award: Built Environment - 16th International ACTS Conference
- 2016 Premiers (Victorian) Sustainability Awards - Finalist


5 Star Green Star
cost premium vs
performance

Passive House – Perceived cost premium





Actual Green Star
Capital Cost = $4,640 /m^2 p.a.
Energy cost = $14.60 /m^2 p.a.

Predicted Passive House
Capital Cost = $4,570 /m^2 p.a
Energy cost = $5.30 /m^2 p.a.

MONASH University

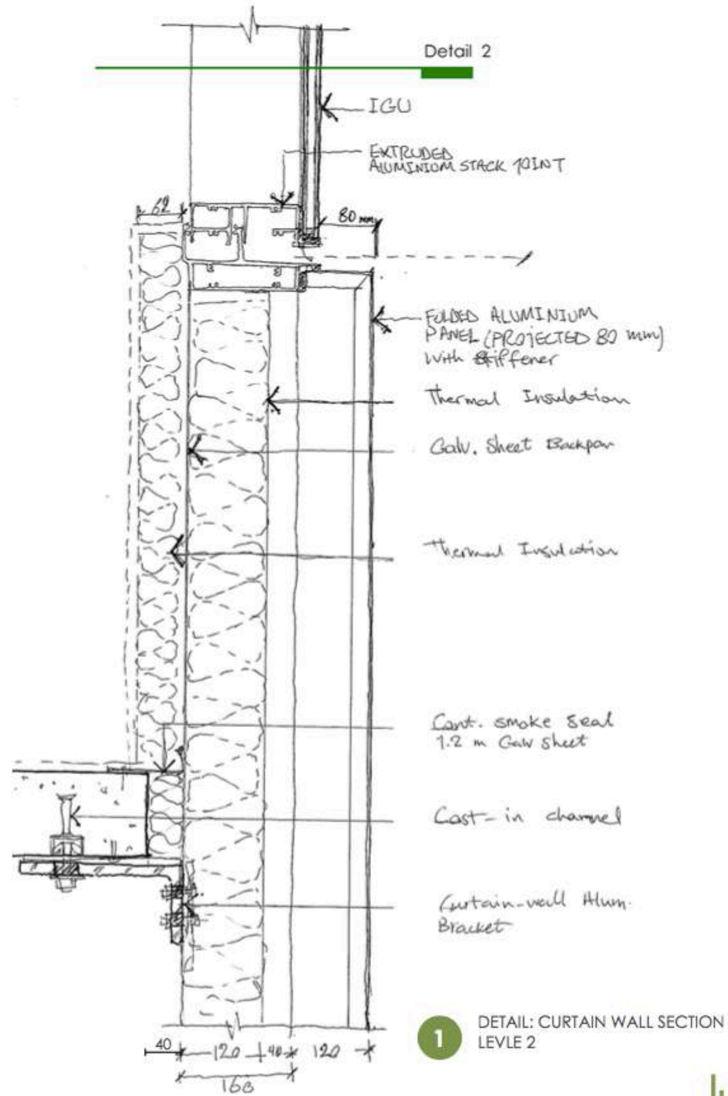
Building Capability – Air Tightness

- Detailing and testing on all fabric projects
  - Tested a range of small projects
  - Aiming to test 20,000m^2 building later this year

Building Capacity – Documentation

Biomedical Teaching Building

- Modeling in PHPP
- Targeting 3 ACH50
- Targeting Ψ< 0.04W/mK
- Briefed for 5 Star Green Star*

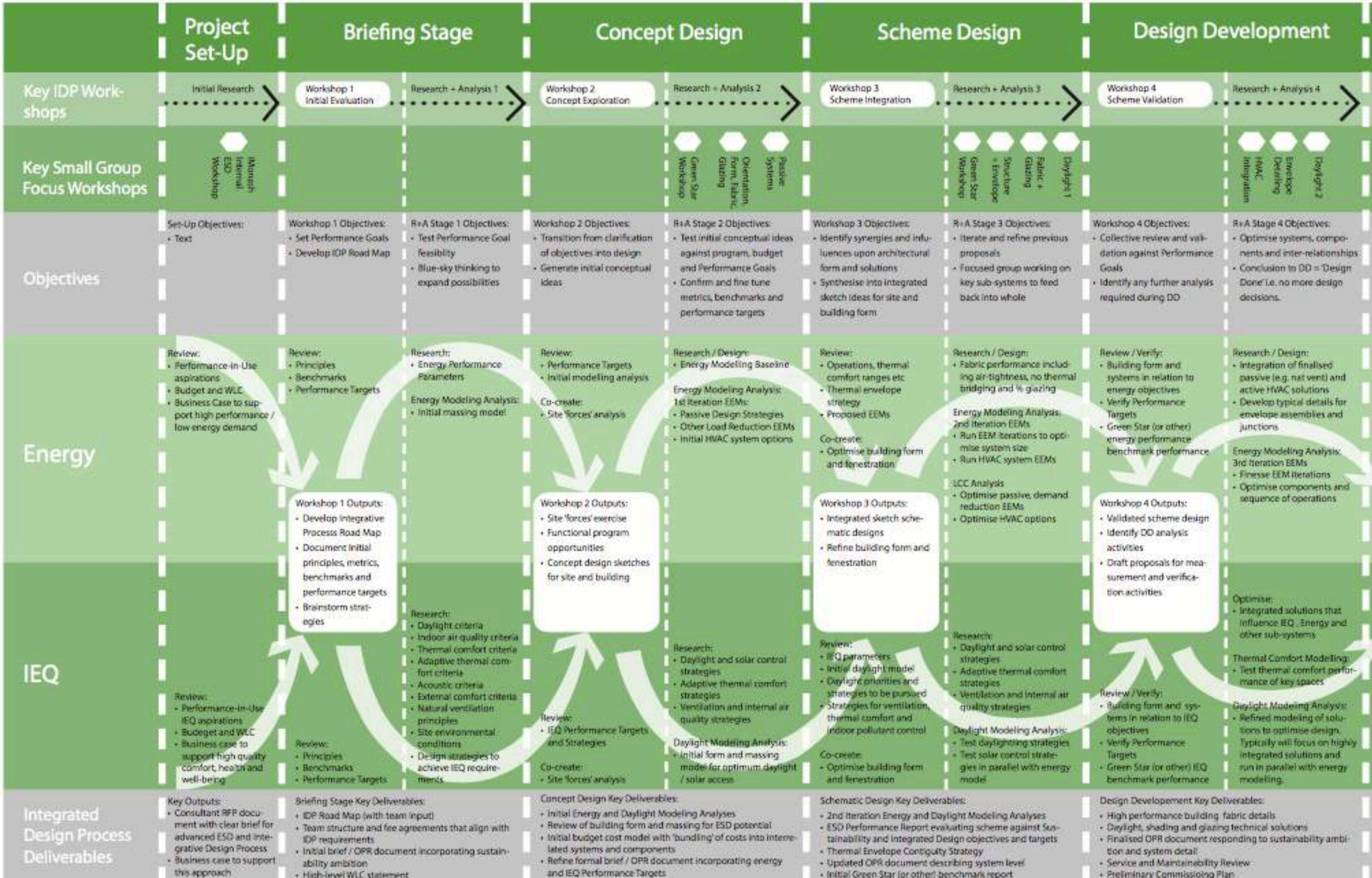


Setting Documentation Expectations

Principle Project Requirements (PPRs)

Performance Criteria:	**Requirement:**	**Allocation of Responsibility:**
Building Air-Tightness References: •Passive House •AS/NZS ISO9972	Project team to design and deliver a building that achieves <0.6ach at 50Pa (under +ve and -ve pressure) (ACH50), as verified with an on-site pressure test (in both pressurized and depressurized states). Concept Design Stage: • Architect to articulate how the concept form of the building will facilitate cost effective airtight construction. Scheme Design Stage: • Architect and façade engineer to produce drawings to identify how the air layer (roof, walls, glazing installation details and floor) will provide a continuous airtight seal around the building, identifying the main airtight elements/materials, any potentially challenging details and appropriate mitigation strategies.	Architect + Façade Engineer+ Contractor

Facilitate Integrated Design



Putting it all together

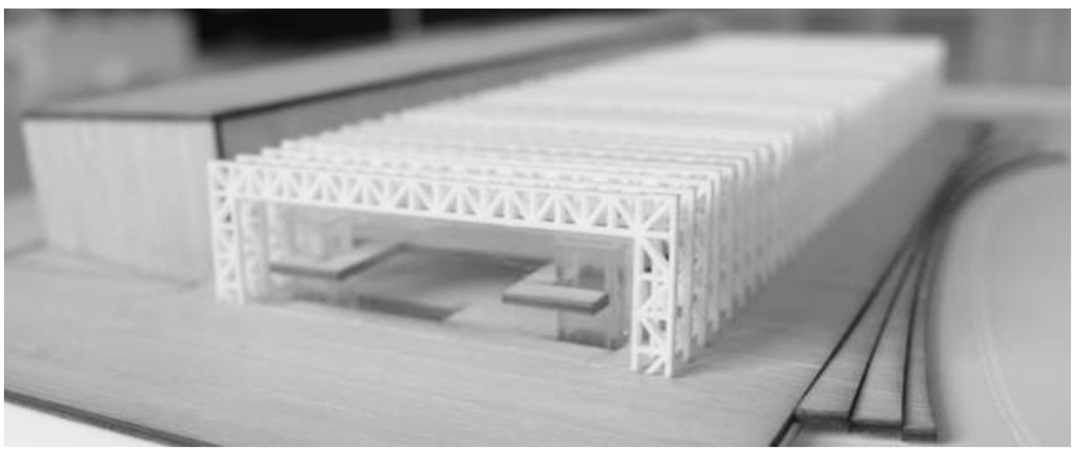
Technology Education (TEd) Building

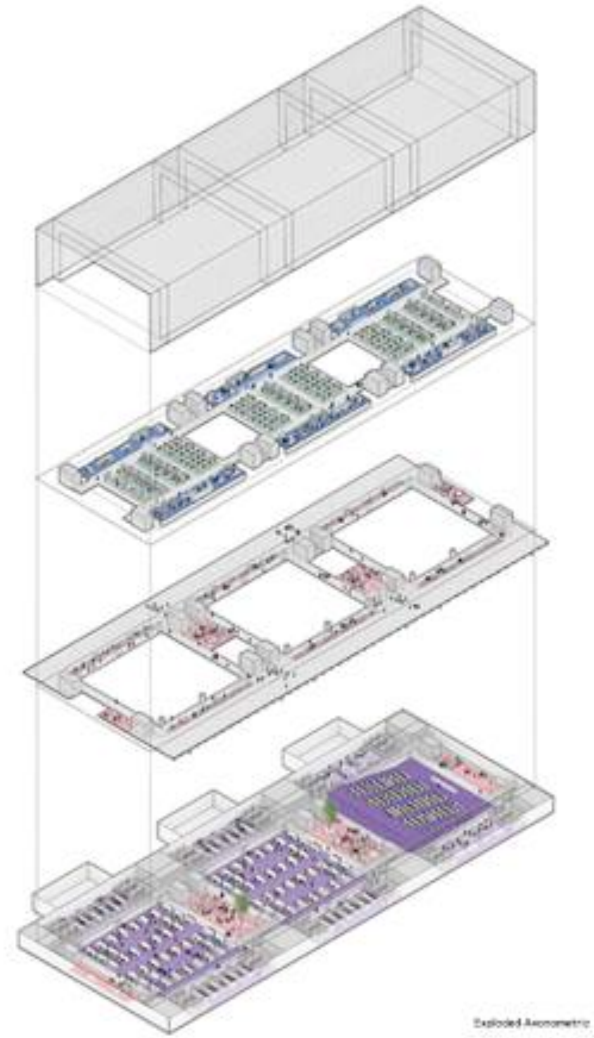
- 10,000m^2 Engineering teaching & office
- Passive House Certification and IEQ PPRs included in tender
- Certified Passive House Designers on team
- Integrated design approach to Concept Design

TEd Concept Design

Workshops discussed:

- Benefits for the project
- Design for construction
- Daylight and solar control

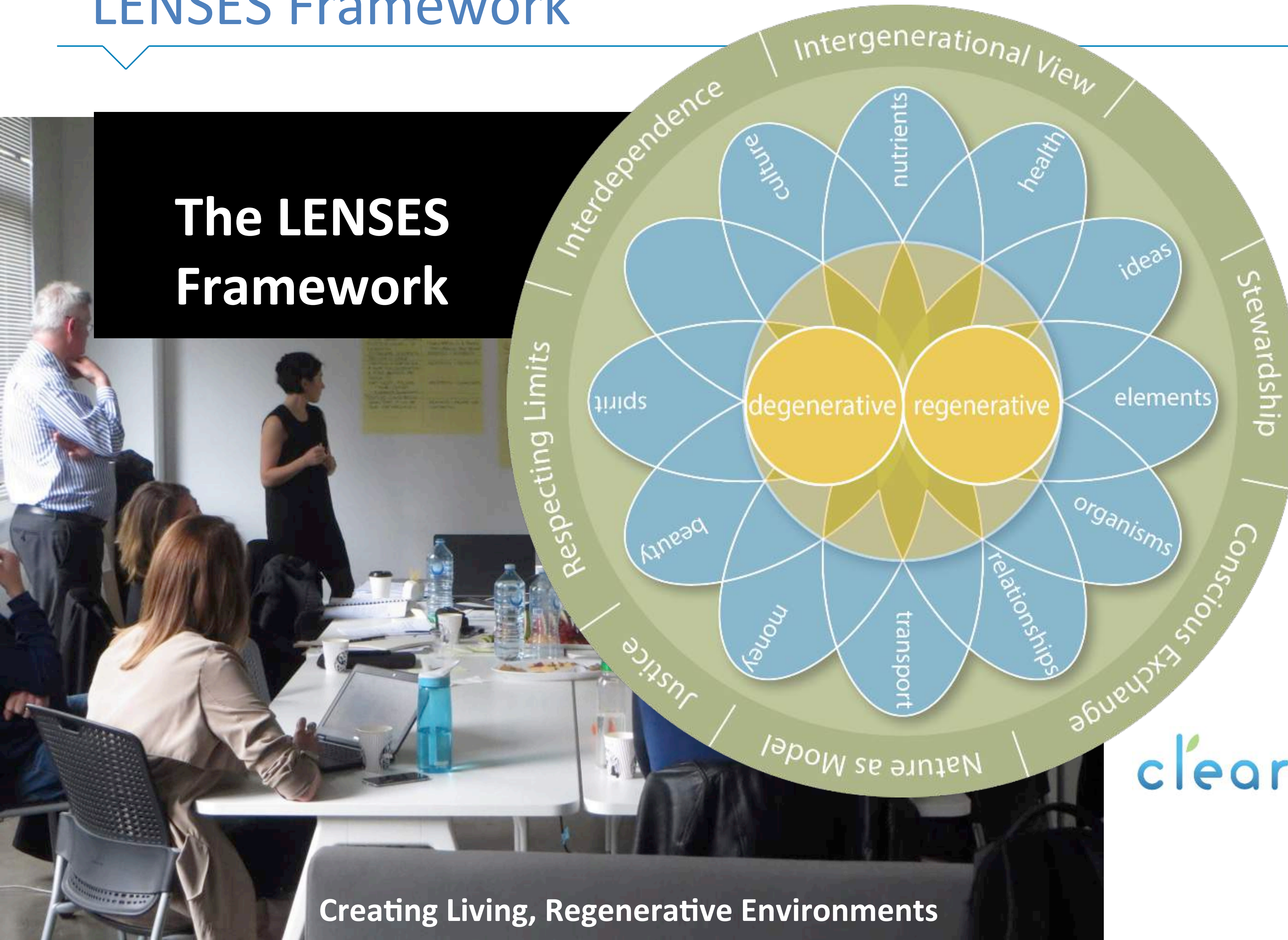




johanna.trickett@aurecongroup.com

Bringing ideas to life

LENSES Framework



clear

Future ready and adaptable

Advances our understanding of sustainability and pathways to a regenerative future

Thriving community

Nurture and build community relationships within and beyond the campus

Living within limits

Contribute positively to living systems through greater alignment between human engineering and nature

Continuous learning

Promote a passion for learning and new horizons of discovery

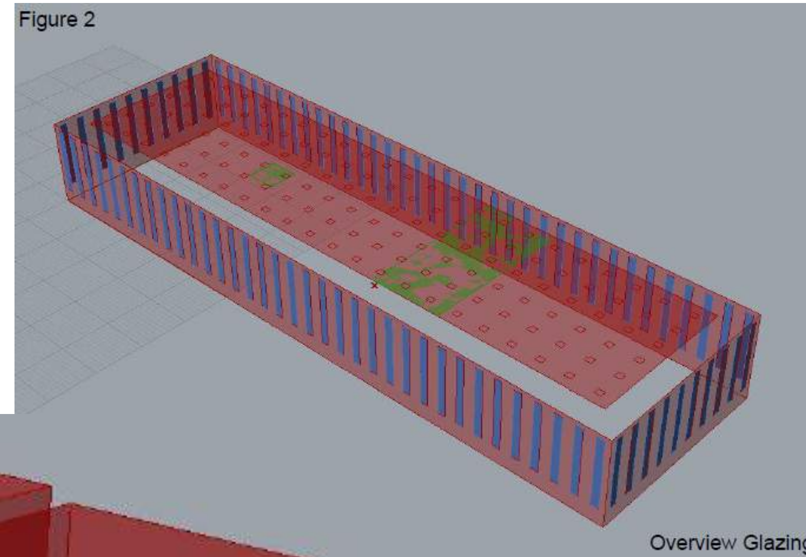
Well loved

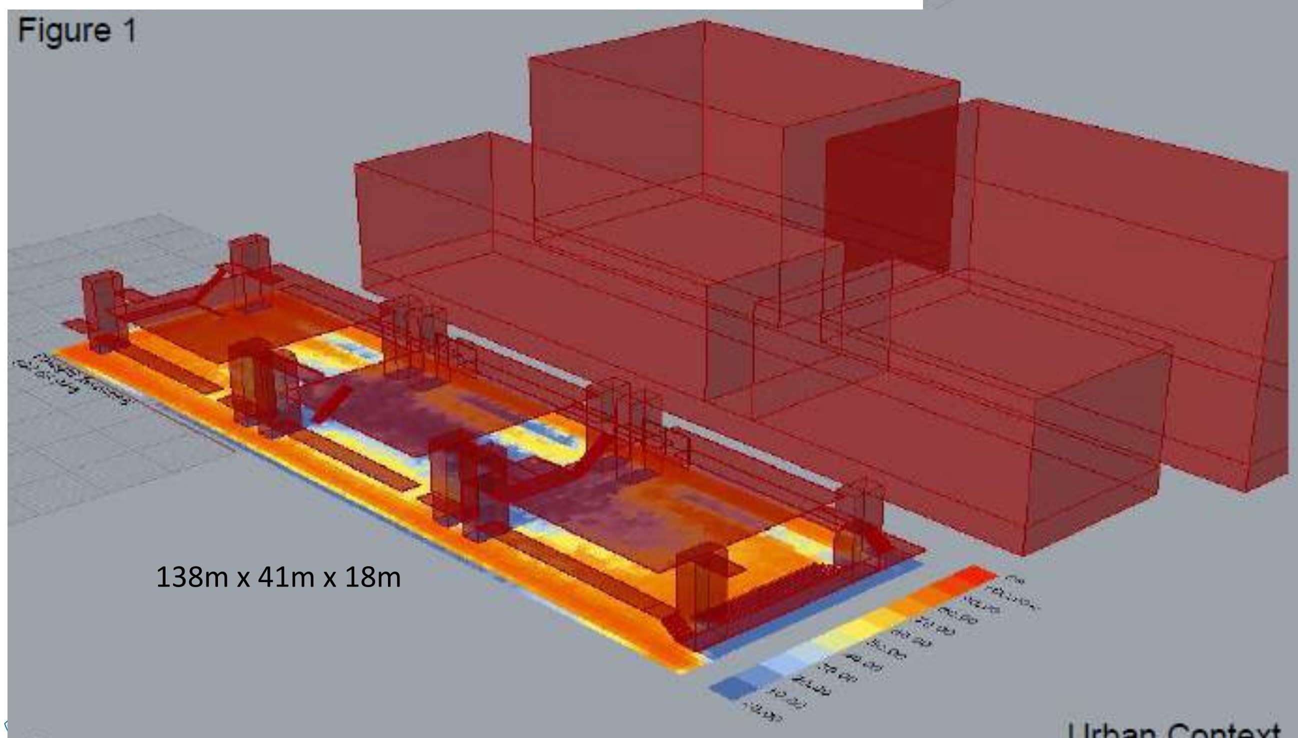
Create an open and inviting building that draws in the campus community

Biophilic and healthy environment

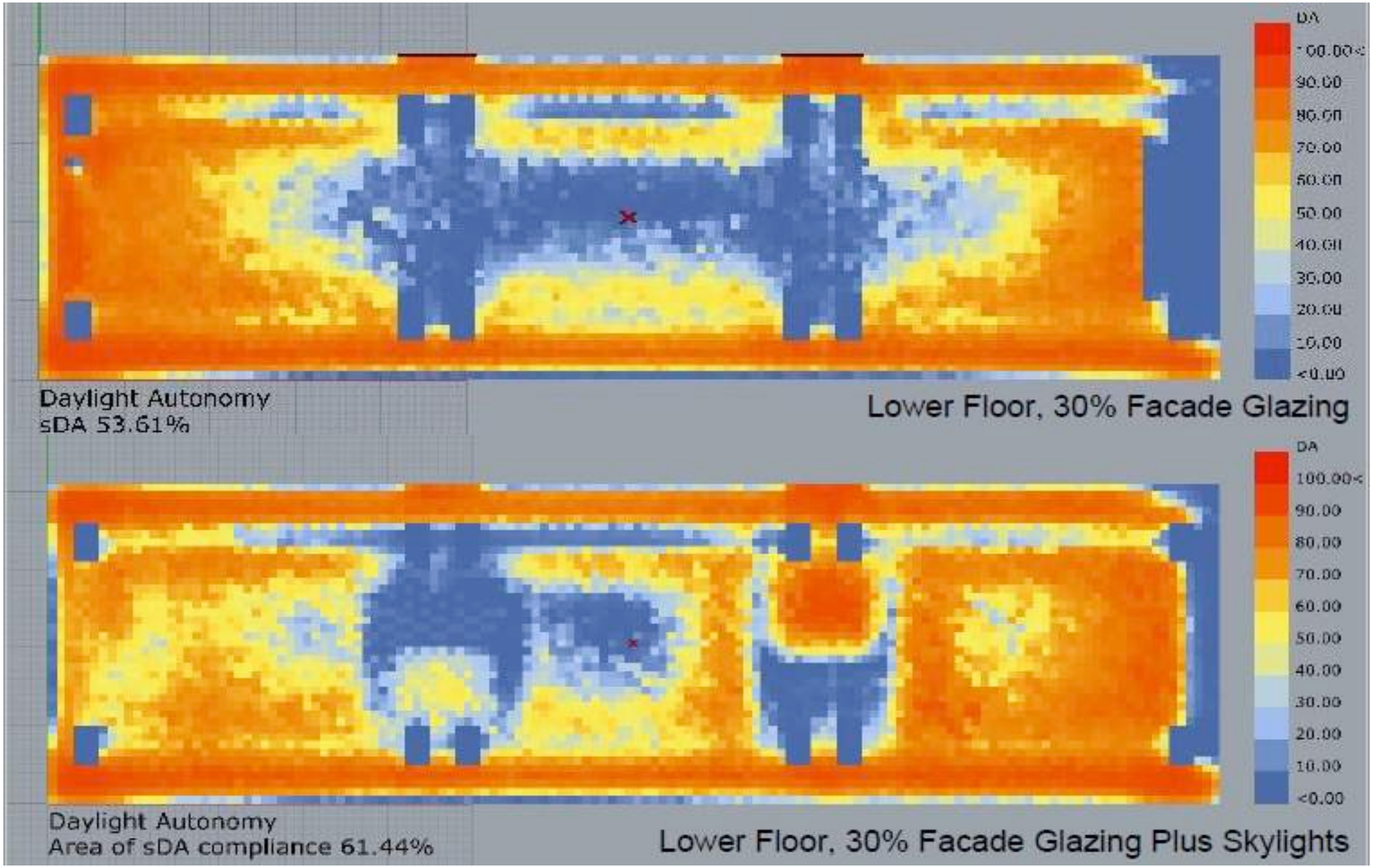
Increase health, well-being and a renewed connection to nature

Daylight Model Setup



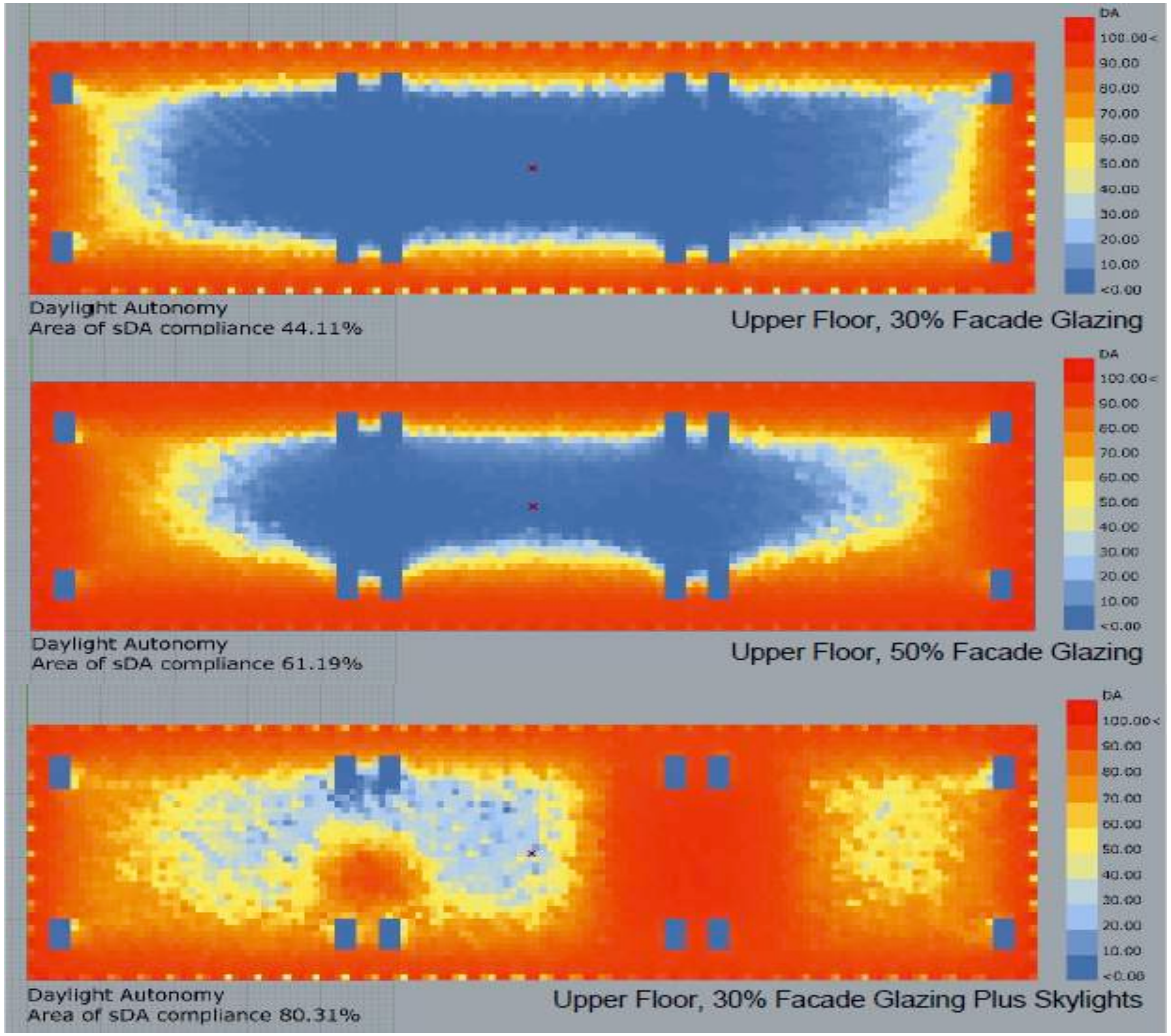


Daylight Modeling – Lower Gournd

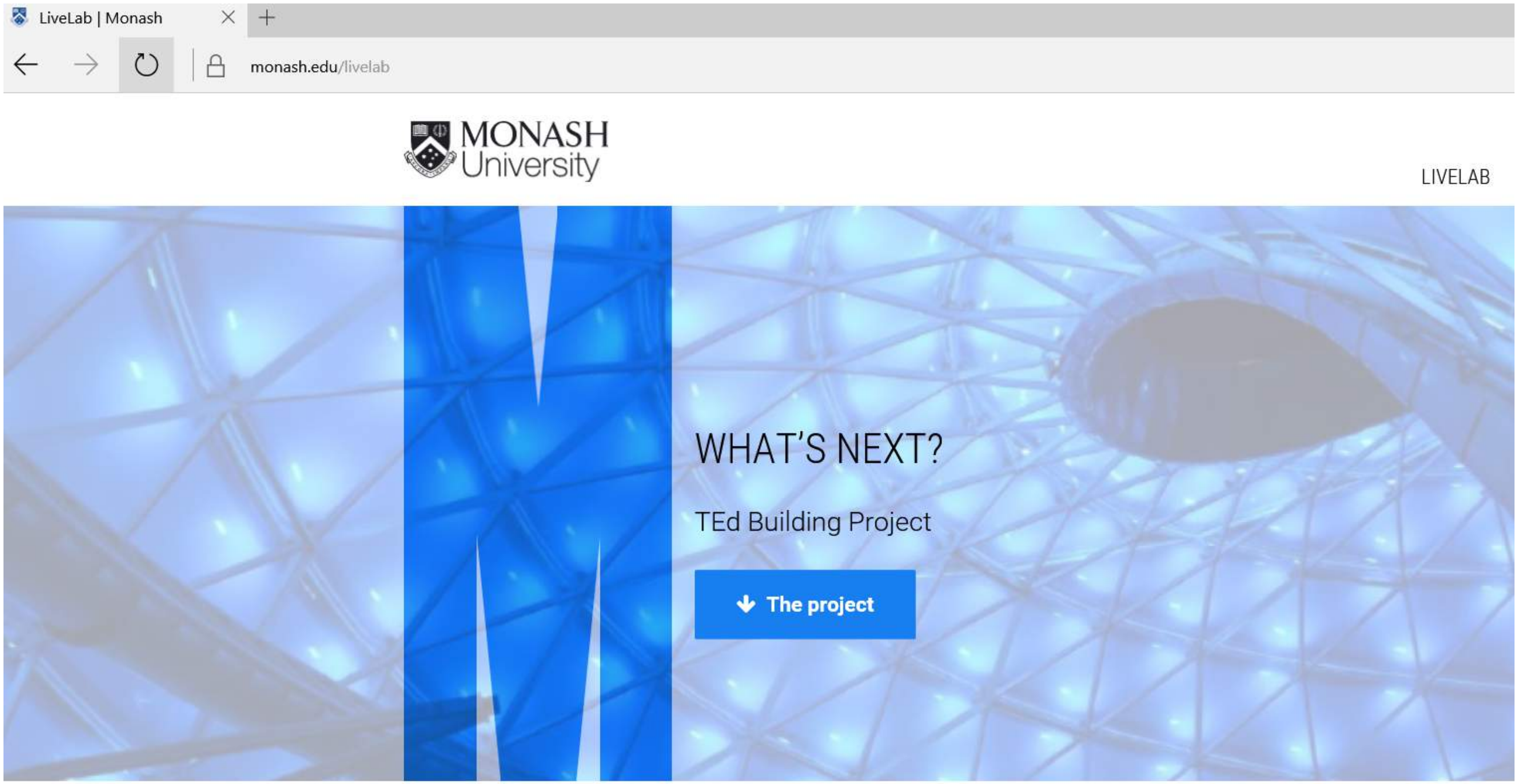


MONASH University

Daylight Modeling – Upper Floor



TEd Passive House Blog



First architectural render….

MONASH University