20 Sir Tim
Wallis Drive

Project Number
10022

Wānaka

Lot 48

WARREN AND MAHONEY®

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Disclaimer

While Warren and Mahoney has endeavored to summarise the concept design process in this document and appendices, the report format cannot represent the broad range and depth of information captured on the preliminary design Drawings, Specifications and Schedules. Approval of the specific issues contained in this report does not discharge the obligation of the client team to review the drawings and specifications in their entirety.

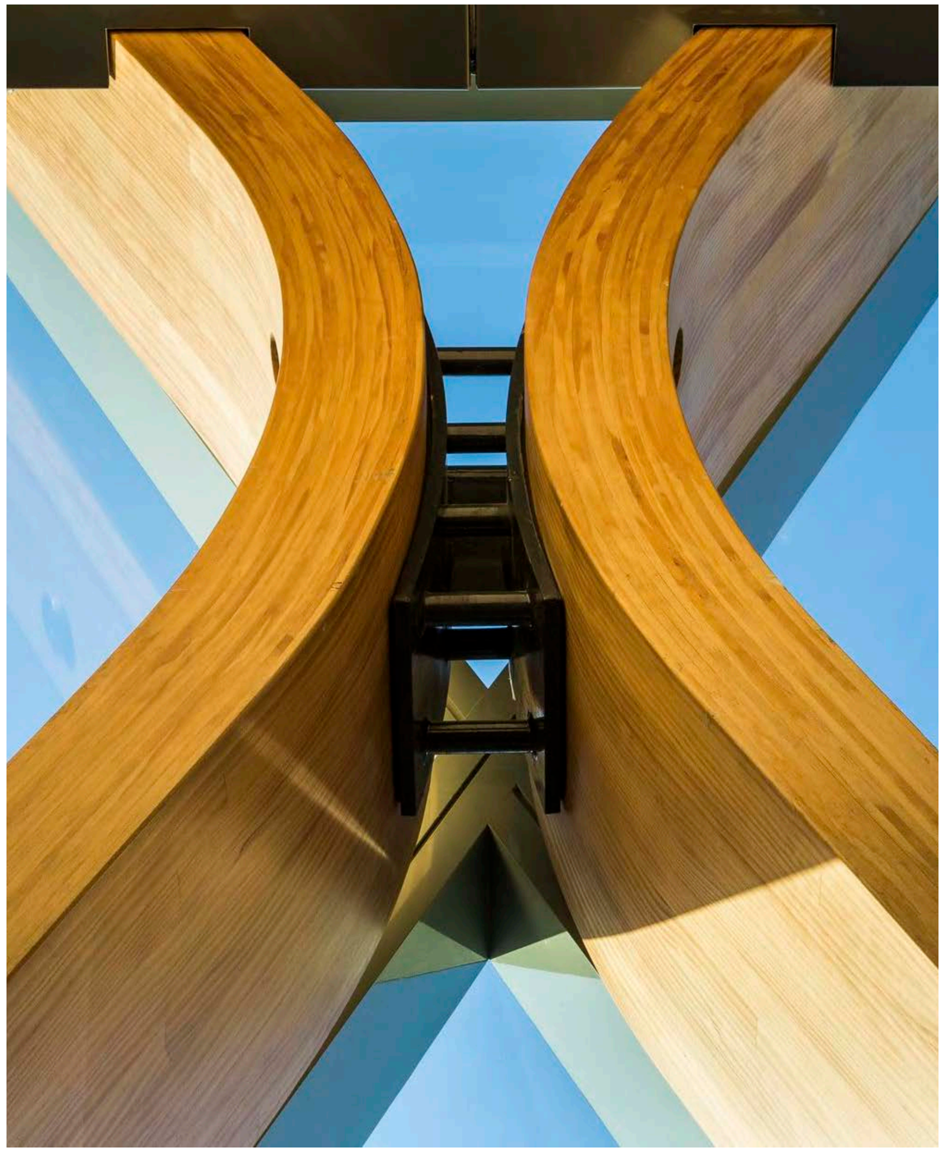
Contents

Key Design Drivers

A New Typology

Three Parks development represents a new type of large scale development for Wanaka. It will be vital in meeting current demand for retail, commercial, and residential space and will be key in defining the future of the Wanaka township.

The design of the mixed use buildings, in particular, offers a unique opportunity to create a new building typology that celebrates Wanaka's unique landscape, community, and history, and sets a sustainable benchmark for future development.



Low Carbon Future

Reducing the carbon intensity of our buildings is vital if New Zealand is to meet our carbon reduction commitments to ensure the prosperity of future generations. To create a meaningful positive impact our environment, is becoming increasingly vital to align sustainable design with tenant expectations and commitments.

We have utilised the latest technology to test different design strategies and their impacts on embodied carbon and building energy use. This process has driven choice of timber primary structure, window sizing and orientation, along with selected building materials to ensure the carbon footprint is minimised.

Unique to Wānaka

Wānaka has a unique, spectacular natural setting with distinctly beautiful seasons that make it a highly desirable location to visit and live. This dramatic alpine landscape and surrounding wilderness have created a unique community that is defined by love of the nature and sense of adventure. This is reflected in the built environment which is vibrant and contemporary, but also steeped in its rural past and respectful to its natural beauty.

The design for Aspiring House needs to sit comfortably within this context and not only maintain but enhance the unique character of Wānaka.

Wellbeing

Designing a building with a focus on well-being involves creating spaces that promote physical and mental health, enhance productivity, and foster a sense of comfort and connection.

This is achieved by maximising access to daylight and views, providing good indoor air quality, and reducing materials that contain harmful chemicals such and VOCs. The use of natural materials, along with spaciousness and generous ceiling heights, helps to create spaces that are uplifting and desirable work in.

Community

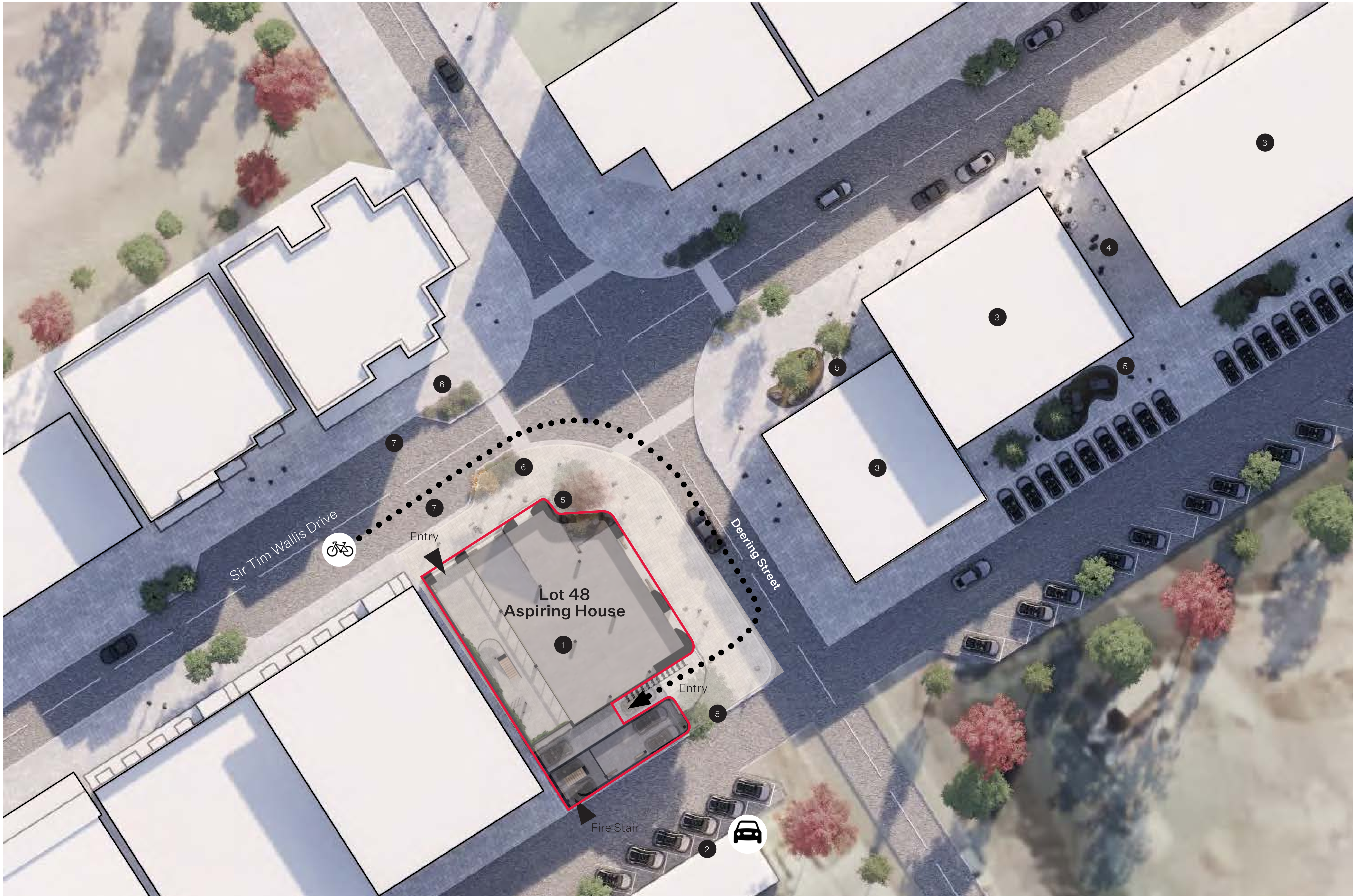
The proximity to outdoor and retail amenities is key in creating a desirable workplace. Being able to develop the design of Aspiring House 'hand-in-hand' with the adjacent Laneways allows for the creation of the right mix of commercial and retail tenants while also enabling the inclusion of meaningful urban spaces such as laneways and outdoor breakout spaces.

Creating pedestrian and cycle friendly urban spaces amongst the new buildings maximises the foot traffic potential and creates a vibrant, people-friendly environment.

Enduring

Designing a building within new large scale development can be challenging. When multiple buildings are being designed concurrently it an be difficult to maintain consistency in architectural style.

Focusing on timeless design moves such as quality natural finishes, timeless proportions, and a balance of glazing and solid facade can help to create a calmer and more enduring urban environment.


3
4
3
5
5
6
7
6
3
7
5
Entry
Sir Tim Wallis Drive
Deering Street
Lot 48
Aspiring House
1
Entry
5
Fire Stair
2

Site Plan

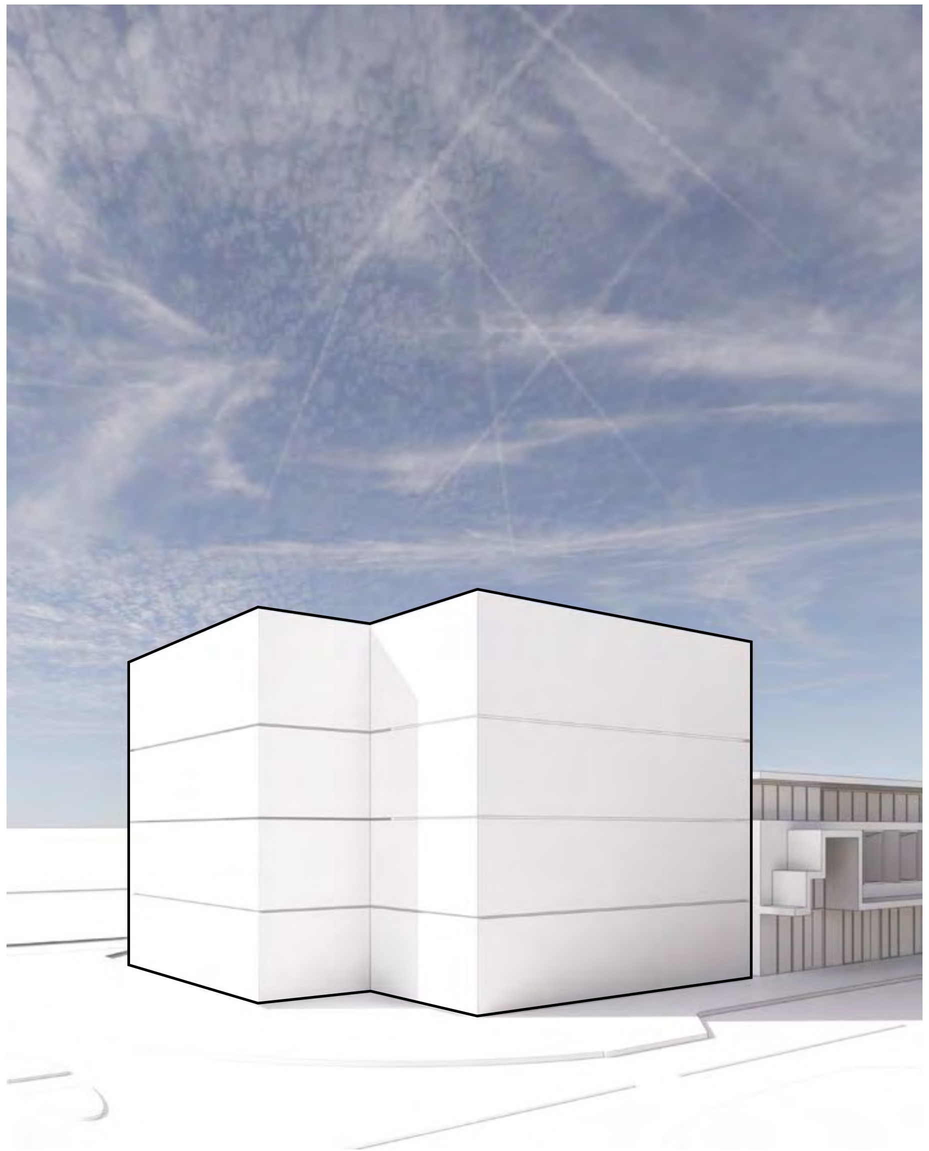
KEY	
Aspiring House	1
Parking Off Rear Laneway	2
Future Development	3
Future Access	4
Proposed New Planting	5
Existing Planting	6
Existing On Street Parking	7

Building Form
Concept

FORM.

The proposed four storey height of the building gives prominence and pressence to the corner site. The increase in occupancy can enhance the surrounding precinct and help to activate and support local retail businesses.

When designing a building concurrently with the neighboring sites it is key to ensure the building form is articulated to generate a scale that is appropriate to the envisioned urban grain as defined in the Lakes District Council's design guidelines.



TACTILE BASE.

The love of the great outdoors is a defining character of the Wānaka community. The introduction of terraces, balconies, and opening windows create links between the internal workplaces and the external realm. They add a layer of vibrancy and connectivity to both the workplaces and surrounding urban spaces.

Including brick and natural materials at ground level, and planting in the landscape and in the architecture, further enhances links to nature and increases the sense of wellbeing of building users and the public.

ARTICULATION.

Human-scale buildings foster a sense of connection between individuals and their environment. When buildings are proportionate to human scale , they create a more intimate and relatable setting and will feel more appropriate within the Wānaka setting. Creating variety in the height and form of the facade enhances this sense of human scale and provides a richer urban environment.

DEMONSTRABLY SUSTAINABLE.

Introducing solar panels to the facade helps to achieve Zero Carbon target for operation use. Used as cladding, the solar panel are also a visual expression of the buildings sustainable credentials and create a strong brand for the building and its occupants.

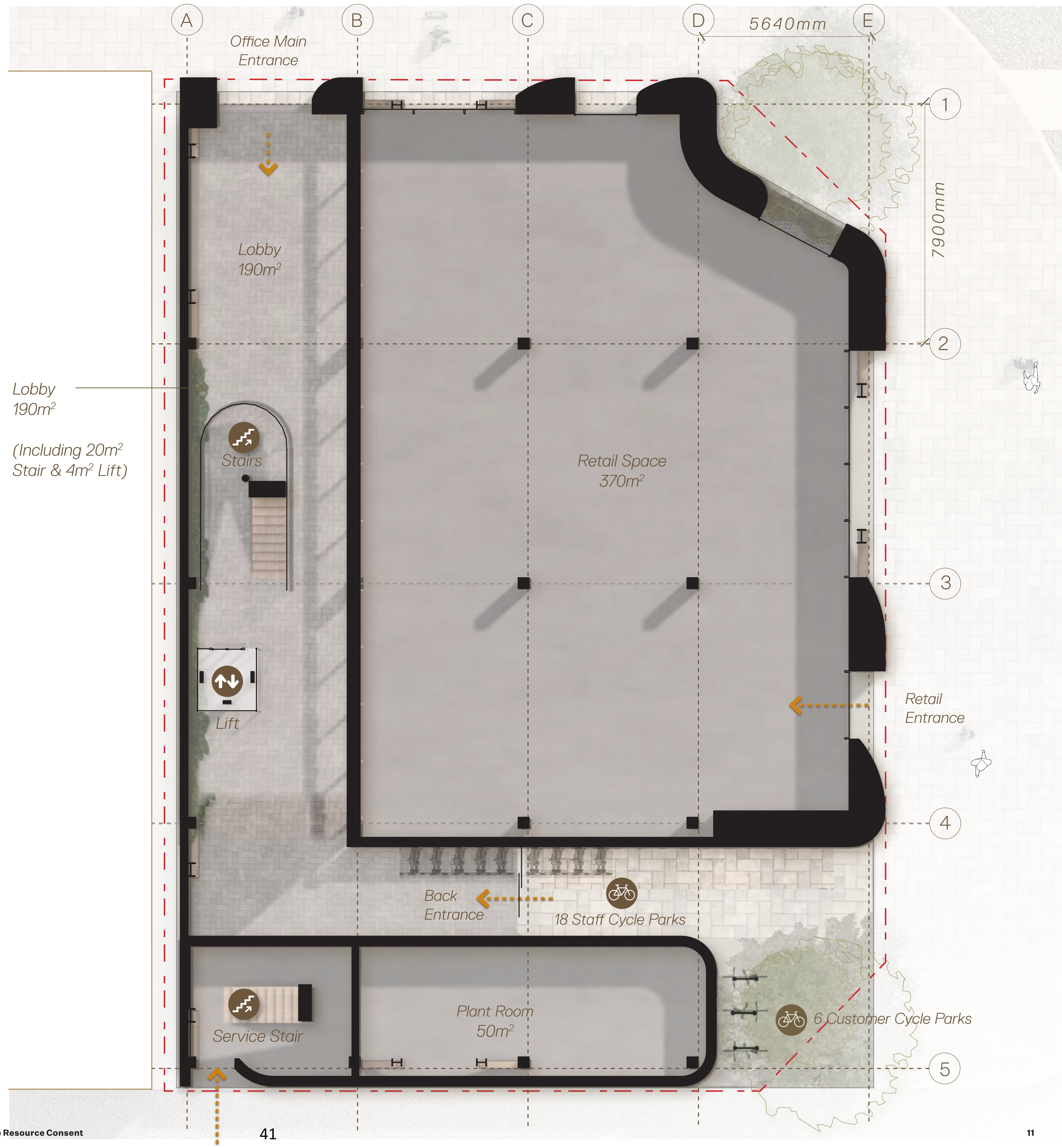
Reflections of the sky in the cladding celebrates the sweeping vistas and 'big sky' of the Central Otago landscape. The thin edge of the panels and light weight cladding to the upper levels creates a contrast to the brick base and aligns with the aspirations set out in the Lakes District design guidance.

General Arrangement Plans

Level 0 | Ground Floor
General Arrangement Plan

	(M²)
LEVEL 0 - NLA (Excluding wall thickness, fire stair, riser plant & lift)	535m²
LEVEL 0 - GFA (Outside face of building envelope)	680m²

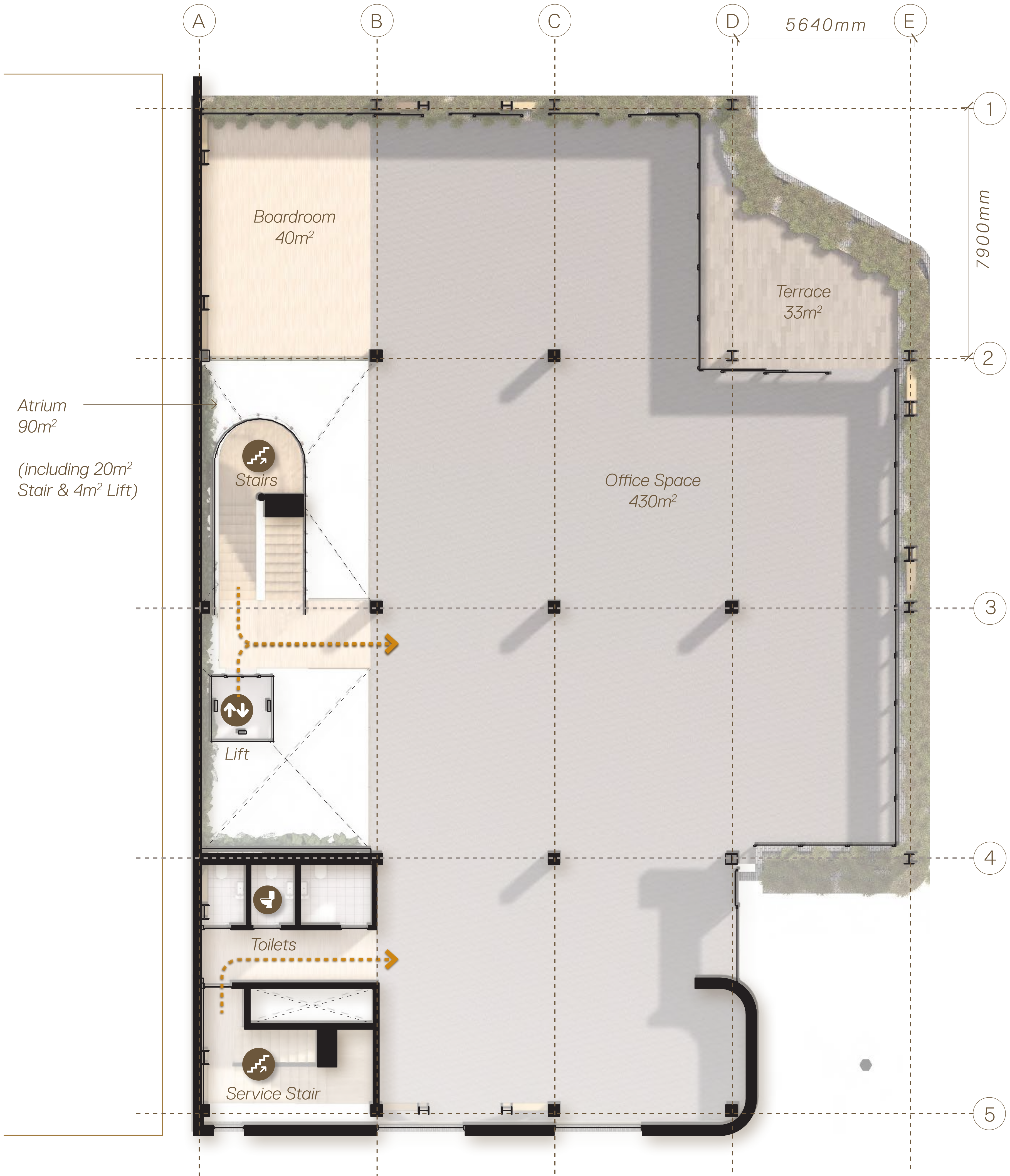
Note area totals are approximate. Further refinement of areas will occur during Preliminary Design phase



Level 1 | Office
General Arrangement Plan

	(M²)
LEVEL 1 - NLA (Excluding wall thickness, fire stair, riser & lift) (including Atrium stair, toilets & terrace)	610m²
LEVEL 1 - GFA (Outside face of building envelope)	645m²

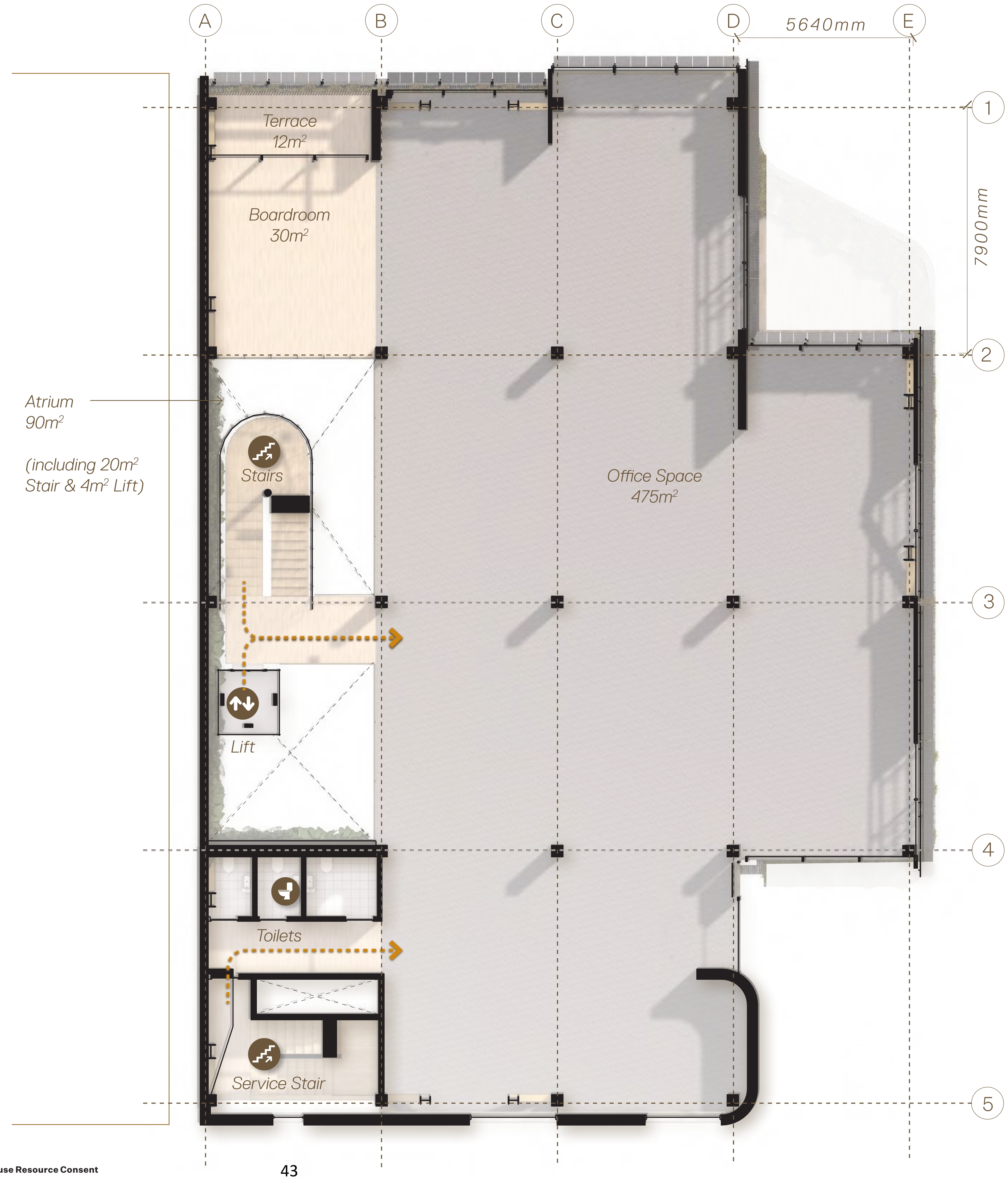
Note area totals are approximate. Further refinement of areas will occur during Preliminary Design phase



Level 2 | Office
General Arrangement Plan

	(M²)
LEVEL 2 - NLA (Excluding wall thickness, fire stair, riser & lift) (including Atrium stair, toilets & terrace)	650m²
LEVEL 2 - GFA (Outside face of building envelope)	665m²

Note area totals are approximate. Further refinement of areas will occur during Preliminary Design phase

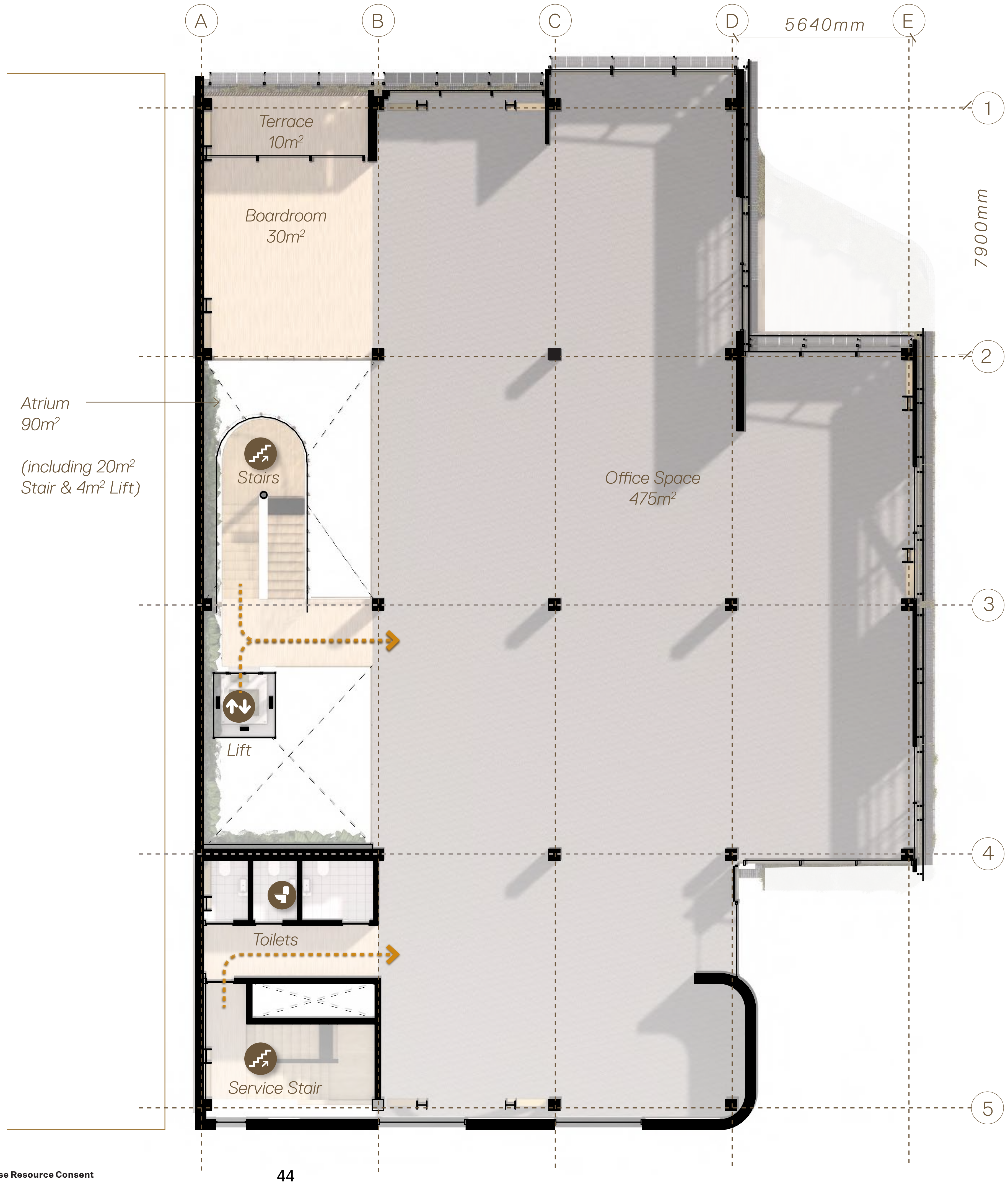


Level 3 | Office

General Arrangement Plan

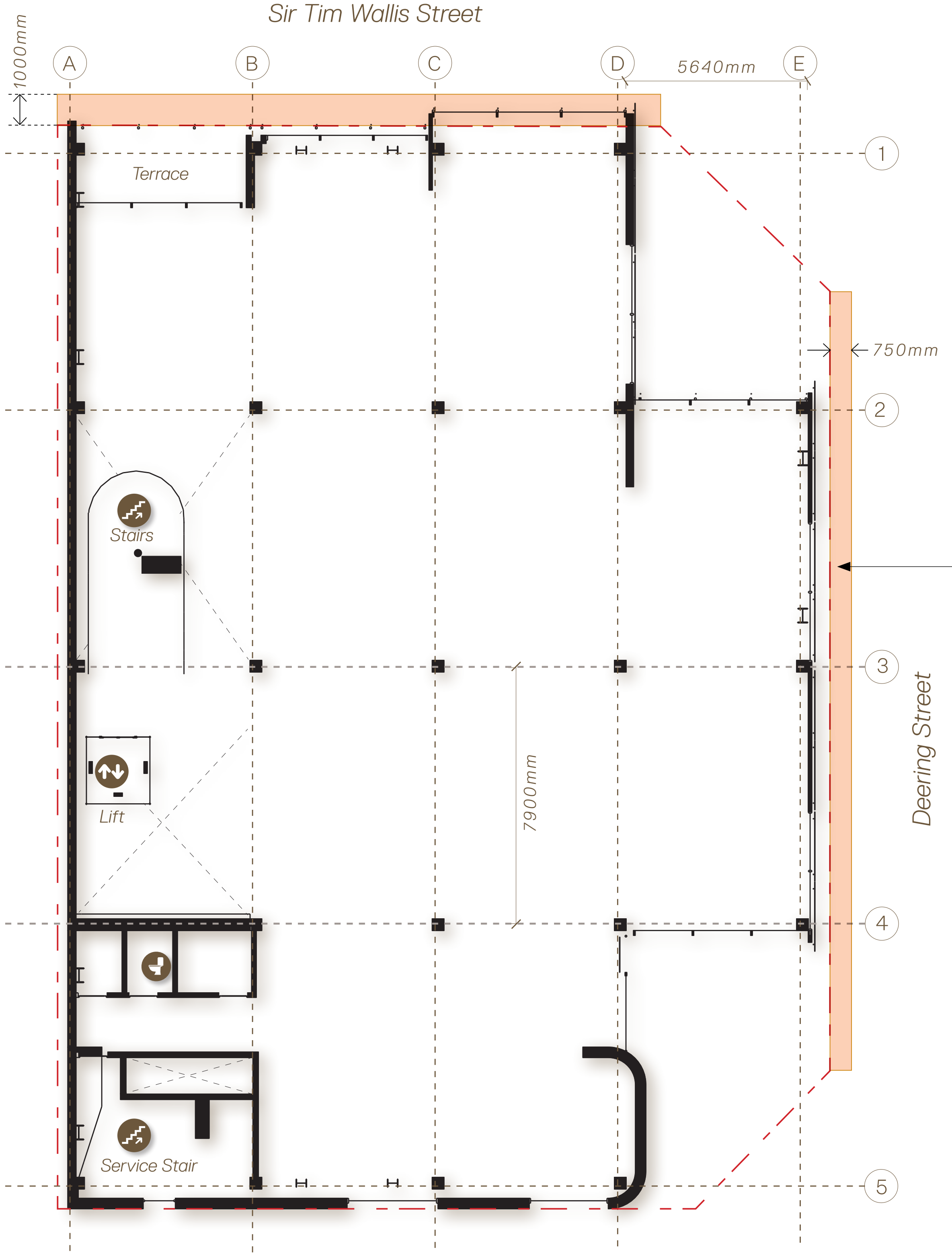
	(M²)
LEVEL 3 - NLA (Excluding wall thickness, fire stair, riser & lift)	650m²
LEVEL 3 - GFA (Outside face of building envelope)	665m²

Note area totals are approximate. Further refinement of areas will occur during Preliminary Design phase



Interior

Solar Panels
Overhang to Boundaries



TYPICAL PLAN (NTS)

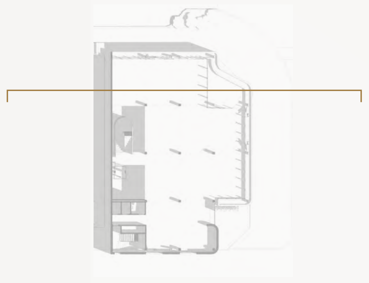
Currently indicated solar panels sit within the site boundary. However, a more detailed study of the optimal solar panel angle and the required support frame may push this over the boundary. An allowance should be made for the future design development.

Zone where solar panels may overhang over boundary. 750mm overhang on Deering Street and 1000mm on Sir Tim Wallis Drive.

SECTION THROUGH DEERING STREET FACADE (NTS)

Site Plan
Laneway Parking

Building Section
E-W



Building Section
N-S

This design approach focuses on integrating nature into the building's environment, known as biophilic design. The lower part of the building's exterior, which is at pedestrian level, aims to replicate natural and organic shapes to enhance the interaction with pedestrians. To bring nature indoors, a green wall is planned for the atrium, and there's a proposal for an integrated planter within the facade of the first level.

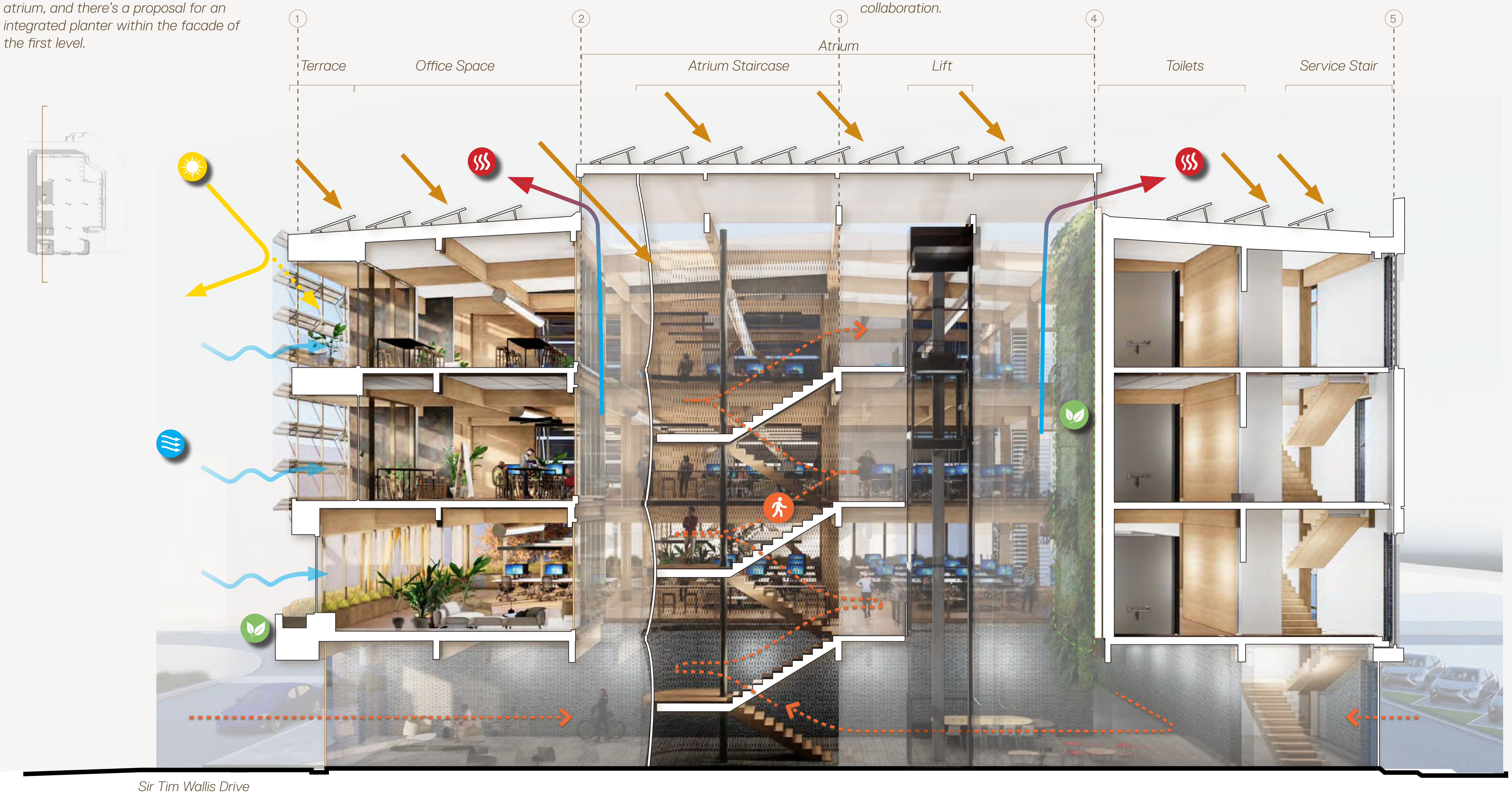
Solar photovoltaic (PV) panels will be installed on the roof, as well as on the north and east sides of the building to generate renewable energy on-site. The energy consumption will be measured through metering.

Efforts will be made to control solar exposure and allow filtered light into the building. The PV panel arrangement serves a dual purpose: it acts as a shading mechanism and generates energy.

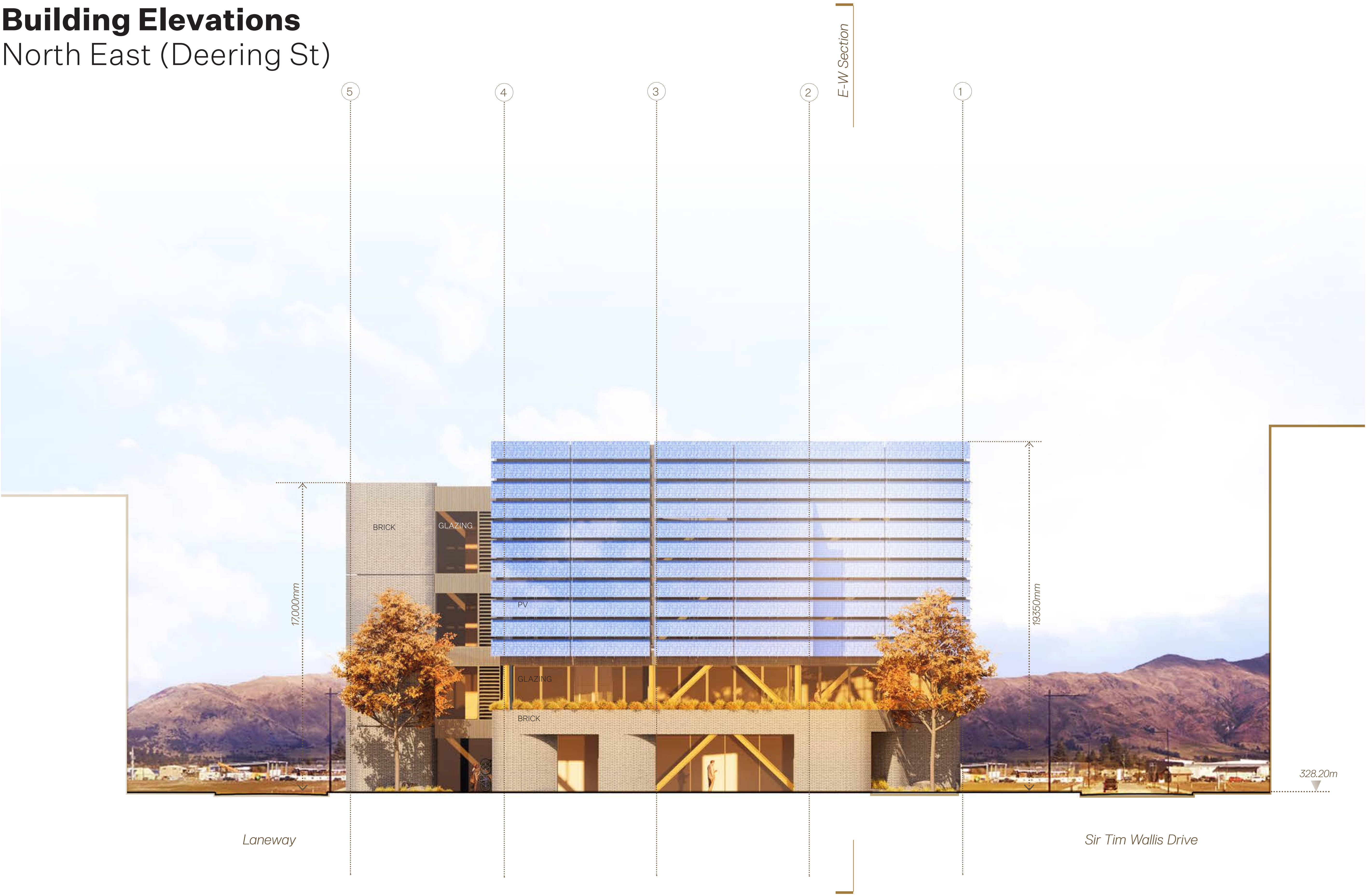
The building design focuses on **human scale** and encourages **walking** by featuring a centrally located staircase. To ensure accessibility for everyone, a prominent lift will be positioned alongside the staircase. The central atrium is designed to serve as a gathering space for occupants, fostering knowledge sharing and collaboration.

The atrium will utilise the stack effect to enhance natural ventilation. Additionally, a pop-up roof structure will help disperse exhaust efficiently.

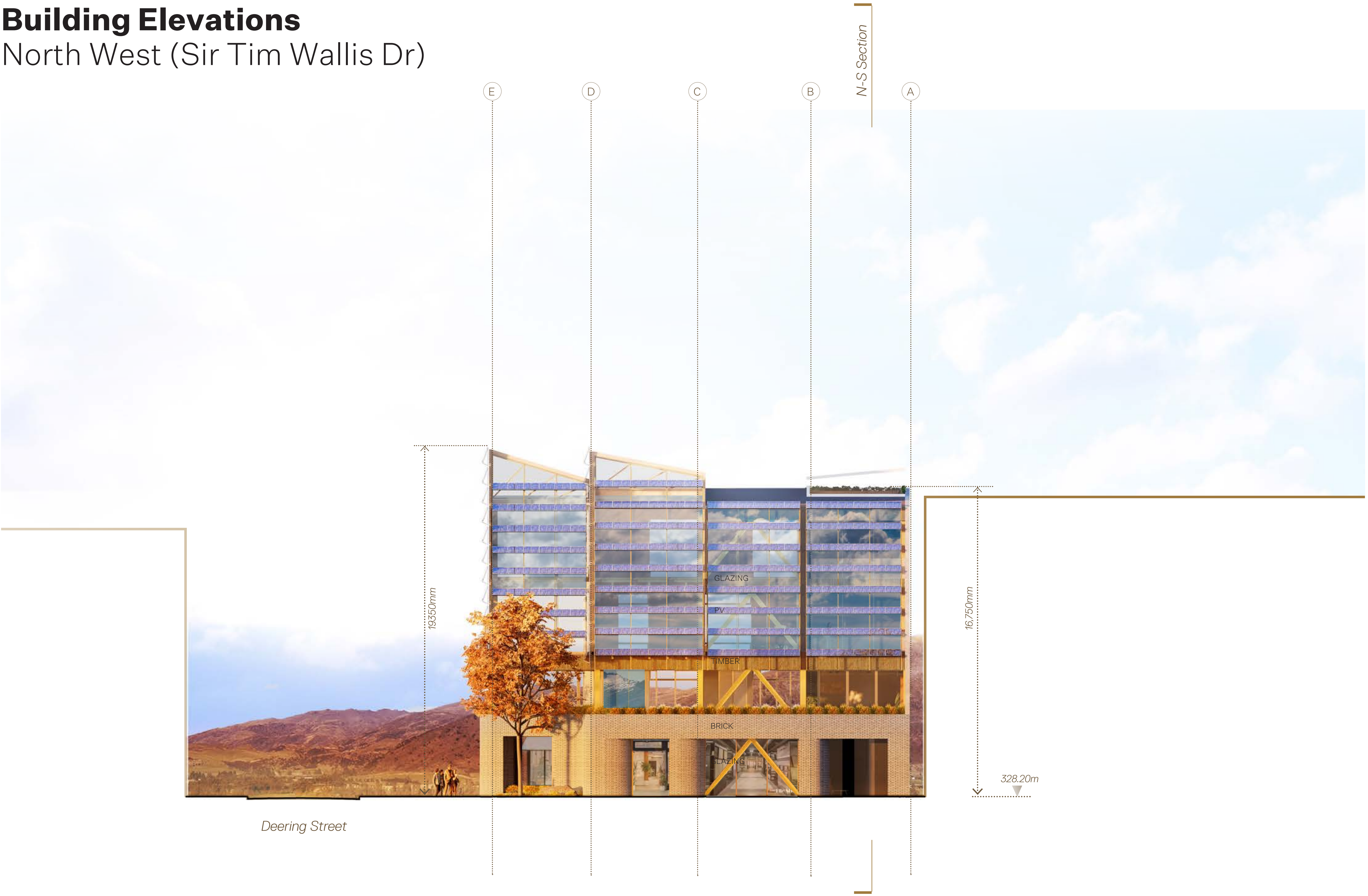
Natural cross ventilation strategies will be employed to promote fresh air circulation throughout the building and work to compliment the stack effect created in the Atrium.



Building Elevations
North East (Deering St)

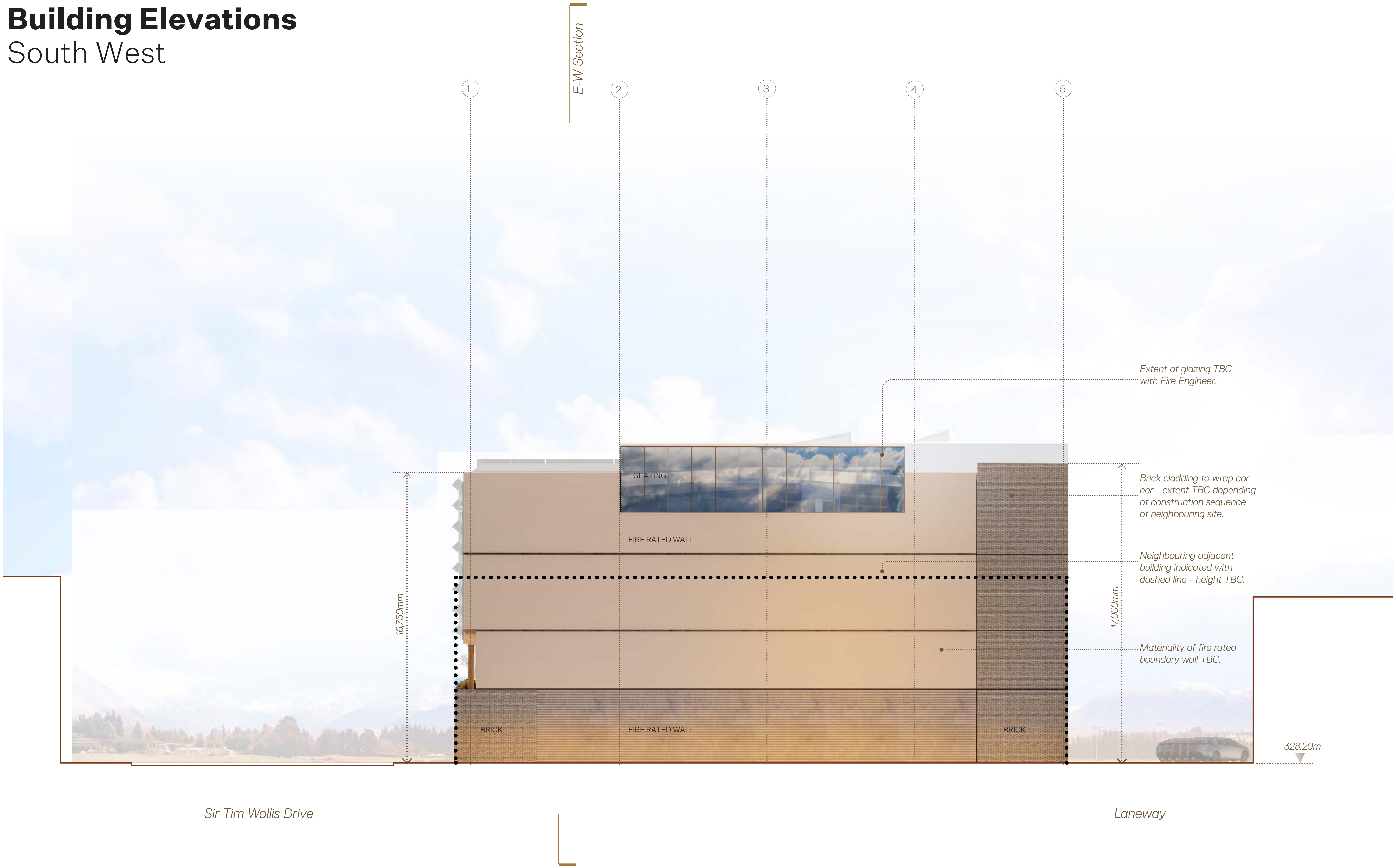


Building Elevations
North West (Sir Tim Wallis Dr)



Building Elevations
South East (Liberty Ln)

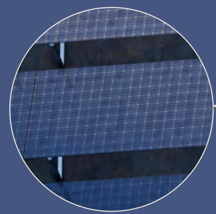
Building Elevations
South West



Materials

TC-01 Laminam Cladding
Vertical large format porcelain panels.

PV Panels
On Custom Aluminium Bracket system



Timber Cladding
Vertical boards - timber finsh TBC

TS-01 Timber Structure
CLT columns. CLT & Potius

Steel Structure
Exposed Perimeter Columns at Level 1

BC-01 Brick
Grey brick from local supplier. Roman brick module.

Polished Concrete floor
Retail Space

Indictative Interior View

Indicative Interior

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Our offices span across New Zealand and Australia, yet we operate as one.

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WELLINGTON
CHRISTCHURCH
QUEENSTOWN
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Appendices

0.3 Services Report

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Aspiring House

ESD, Mechanical, Electrical & Hydraulic Services

Concept Design Report

31st August 2023

Document Control:

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1.0 INTRODUCTION

This report was compiled for the proposed building services at the concept design stage of the proposed office building, Aspiring House, at Lot 48 Sir Tim Wallis Drive, Wanaka, for Southern Lakes Property Trust.

It describes the Environmentally Sustainable Design (ESD) considerations for this project, as well as the Mechanical, Electrical and Hydraulic Services.

2.0 ENVIRONMENTALLY SUSTAINABLE DESIGN (ESD)

2.1 THE NEED FOR A MORE SUSTAINABLE LOW CARBON FUTURE – A NEW BUSINESS AS USUAL.

What does 'leadership' in 'environmental sustainability' really mean in the era of accelerated climate change? It is said that we only have 10 years left to make a meaningful change in carbon emissions to avoid catastrophic climate change and associated economic effects.

Buildings in New Zealand contribute 20% of our Greenhouse gas emissions with approximately half due the materials manufacture, construction, replacement, and disposal (embodied carbon) and the other half from emissions due to energy and water use (operational carbon).

Building Owners need to respond to this imperative quickly and effectively as part of their commitment to our collective future.

The first official report from the Climate Change Commission released on 31 January 2021 has found the government needs to further reduce emissions to meet its obligations under the Paris Agreement.
ESD is becoming very much Business as Usual (BAU) and needs to be factored into any costings accordingly.

The bar has already been raised by the Government with updated and significantly higher H1 Energy Efficiency Building Code requirements.

The Ministry of Business Innovation & Employment has also engaged in a consultation process in July 2020 on its Building for Climate Change (BfCC) programme intending to transform the building and construction sector.

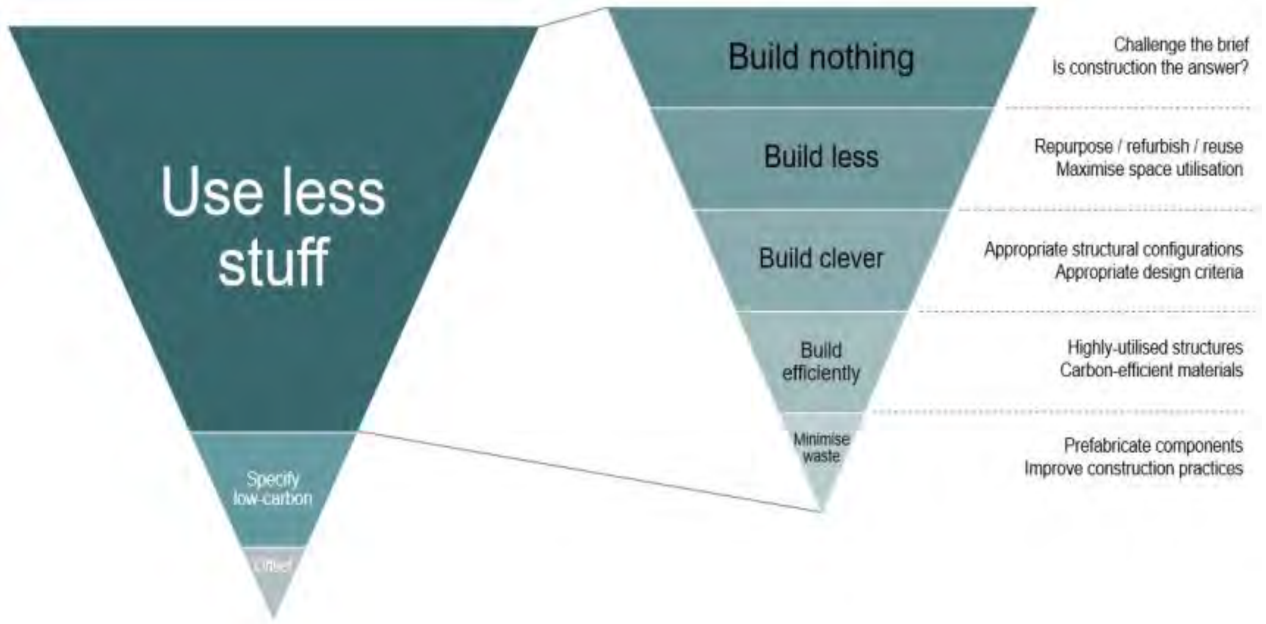
The Building for Climate Change Program will deliver settings to drive transformation, provide the tools the Sector needs to meet the new challenges, and establish a system that will deliver lasting change. This will not be a few quick fixes but a 'once in a generation' system change to help deliver the climate change outcomes New Zealand is asking for. To make this change the environment the Sector operates in needs to shift.

We need to change the attitudes and beliefs of those who are making the day- to- day decisions as well as those of the consumers who drive the Sector's responses.'

It was announced on the 10th of February 2021 that the Resource Management Act is to be repealed and replaced by three new acts: Natural and Built Environment Act, Strategic Planning Act and Climate Change Adaptation Act. Whilst it will not be applicable to this development, this illustrates another regulation shift.

ESD and Low Carbon Design are therefore very much Business as Usual in the new environment we find ourselves in, with the confluence of both top- down regulation by the Government and bottom-up aspirations of Industry bodies, clients and consumers driving much needed change.

2.2 BUILD NOTHING, BUILD LESS, BUILD CLEVER, BUILD EFFICIENTLY AND MINIMISE WASTE



2.3 PROPOSED STRATEGY FOR A LOW/ZERO CARBON BUILDING

As part of the Concept Design proposals, we are proposing the following main initiatives for reducing energy use and associate carbon emissions.

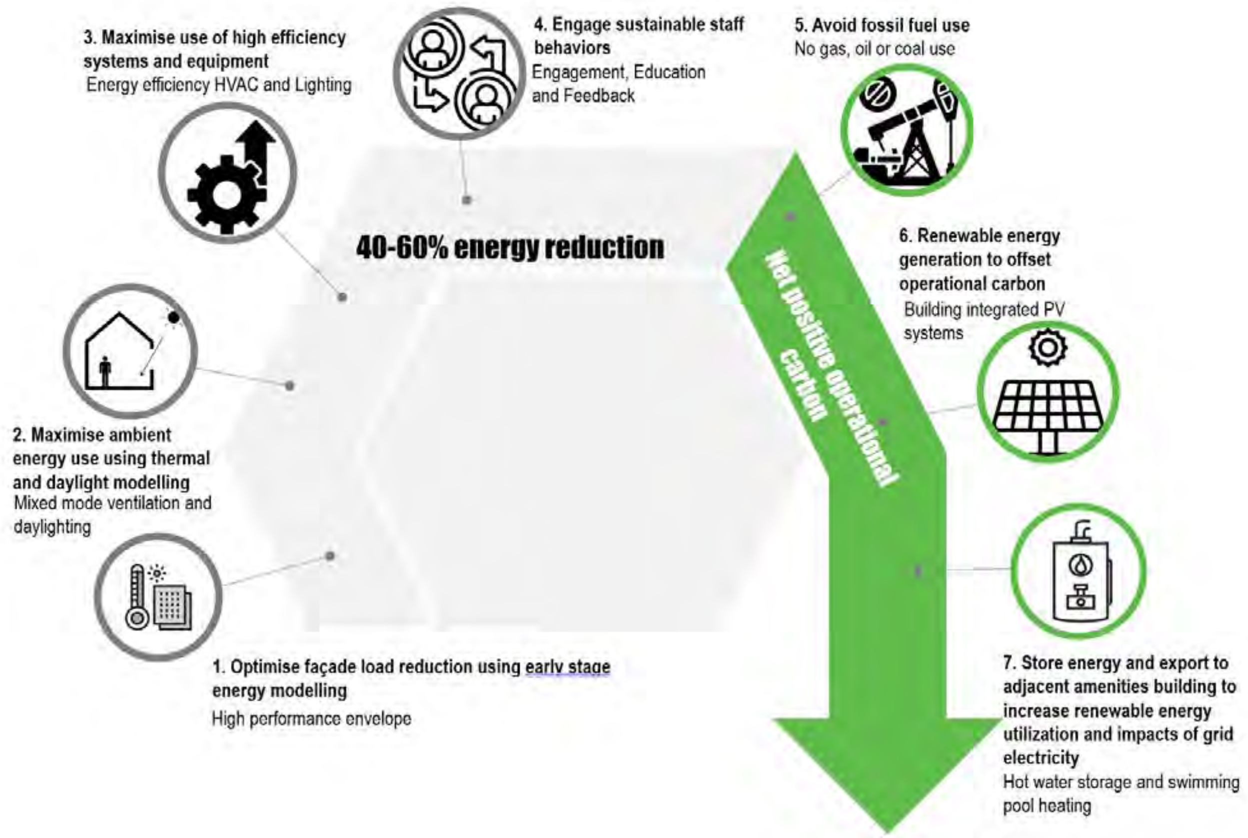
- maximising the energy efficiency of the building and its systems/equipment,
- maximising the contribution of passive renewable energy resources and
- providing an optimally sized PV array for building which will avoid excessive export to the grid.
- A high level of engagement with facilities management staff, and general staff using metering and dashboards as smart infographics.
- The use of fossil fuels will be avoided.

The primary response in terms of an energy and carbon strategy for the building will be to develop a 10-Point Plan for the project to reduce both operational and embodied carbon. 7 points relate to operational carbon reduction and 3 points to embodied carbon reduction.

2.4 7-POINT PLAN REDUCING OPERATIONAL CARBON

The architect has indicated a desire to develop a zero-carbon building solution in terms of both operational and embodied carbon (potential for one-off carbon offset)

The seven-point operational carbon reduction strategy for the building, noting the inherent limitations in terms of available roof area for energy generation. Our aim being to get to low/zero carbon use.



1 OPTIMISING THE FACADE

In terms of load reduction and developing a high-performance façade. Window to wall ratio, glass type and thermal insulation levels.

2 MAXIMISING AMBIENT ENERGY USE

By using mixed mode natural and heat recovery mechanical ventilation and daylighting. Window openings and dispositions. These first two elements of the strategy would be optimised and maximised using a combination of thermal, daylight and energy modelling with early prototyping in an 'Engineering without Engines' approach.

3 MAXIMISE HIGH EFFICIENCY EQUIPMENT AND SYSTEMS

This element of the strategy will be achieved by using best in class systems and equipment including.

- An energy efficient façade is proposed. Use of efficient glazing with double glazed low e IGUs with selective coatings for control of heat loss and heat gain together with highly insulated curtain wall panels roof and suspended floor. The building fabric will provide a high standard of airtightness and avoid thermal bridging wherever possible.
- Use of energy efficient 4-pipe fan coil units with heating, cooling and ventilation including a heat recovery tempered air system.
- High efficiency Heat Pump Chiller
- Electric domestic hot water supply offset by solar PV panels or Central CO_2 Hot water heat pump.
- High efficiency variable speed fans and
- All spaces predominantly daylit during daytime hours.

- Low energy lighting will include 100% use of LED lighting and a semi- automated/manual lighting control system.
- A building management system will be provided with main and sub-electrical metering for energy management and provided with an energy and water overlay such as Quasar, Coppertree or Optergy.

4 ENGAGE SUSTAINABLE USER BEHAVIOURS IN CONJUNCTION WITH FACILITIES MANAGEMENT AND OPERATIONAL STAFF

This element of the strategy will be achieved by a strong level of engagement including.

- First year fine tuning and energy targeting/monitoring
- Use of energy metering, infographics and building dashboards to communicate building performance and achievement of targets to staff.

5 AVOID FOSSIL FUEL USE

The use of gas will be avoided entirely.

6 REDUCING PEAK DEMAND AND OVERNIGHT ENERGY USE

Noting that the NZ grid electricity is currently around 80% and that the 2025 target is to increase to 90%. The remaining use of fossil fuels(gas) is largely related to periods of peak demand primarily in winter. We will therefore also look at ways to reduce the peak winter demand and the evening and overnight parasitic losses. Measures to do this include:

- Minimising the peak heating demand by using low e double glazing, high levels of thermal insulation, reducing air leakage and using heat recovery mechanical ventilation.
- Using hot water storage heating systems for energy storage.
- Load shedding via the BMS (Building Management System)

7 ON SITE RENEWABLE ENERGY USE

The building will be designed with a photovoltaic solar electric panel (PV) to reduce operational energy use as much as possible over the course of the year.

2.5 3-POINT PLAN FOR REDUCING EMBODIED CARBON.

The 3- point plan for reducing operation carbon will be to:

1 LOCALLY SOURCED TIMBER

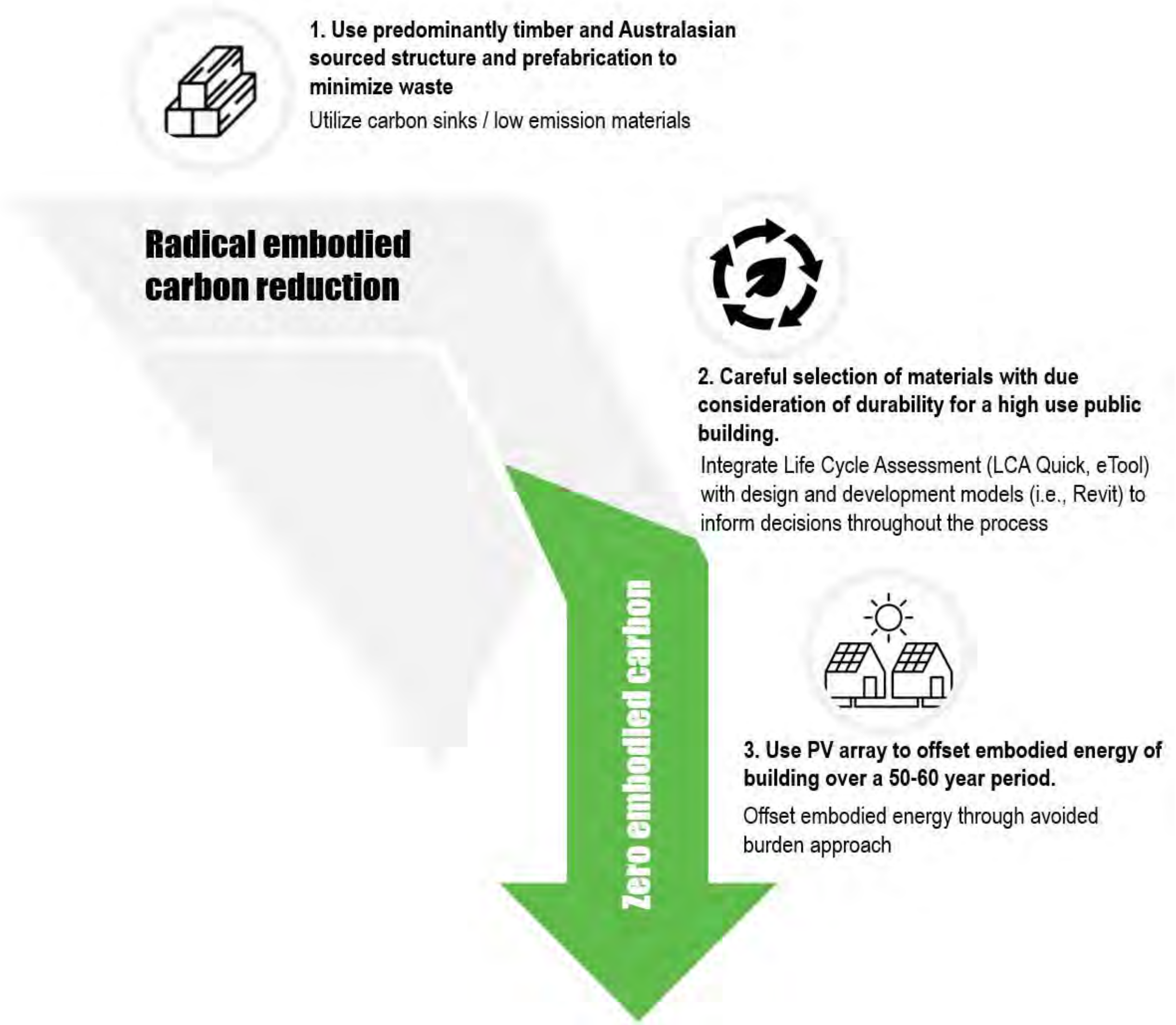
- Use an Australasian sourced predominantly timber structure and prefabrication to minimise waste as a carbon sink.

2 MATERIAL SELECTION

- Careful selection of materials with due consideration to durability and life cycle analysis.

3 ENERGY GENERATION

- Use any excess energy generated by the PV arrays to offset embodied carbon of the building over its life - 50-year period.



2.6 BUILDING ENVELOPE ASSESSMENT AND RECOMMENDATIONS

2.6.1 Engineering Without Engines – Passive First

'Engineering without engines' or 'Passive-First' describes an alternative starting point for building design. Rather than just blindly providing mechanical and electrical services it considers the urban design, building forms and building fabric first. It is essentially a passive design approach to building design that uses the capabilities of thermal, daylight and energy modelling to make buildings naturally comfortable and as independent as possible of artificial heating, cooling, and lighting over the course of a typical weather year.

Adopting a passive first design approach can be incorporated as a key part of the building's sustainability agenda and forms the first step of our 7-Point Plan for Reducing Operational Carbon. By carrying out this analysis at an early stage we maximise the influence a façade analysis can have in reducing loads and increasing energy efficiency with a passive first approach.

This is an iterative process in which we can look at tracking performance against H1 and against an optimised solution. The report is not intended to recommend a particular design solution at this stage but rather it acts as reference to what how high a level of performance could theoretically be achieved.

2.6.2 Initial Modelling

The energy and daylight modelling has been completed based on early sketches and layouts as shown in Figure 3.

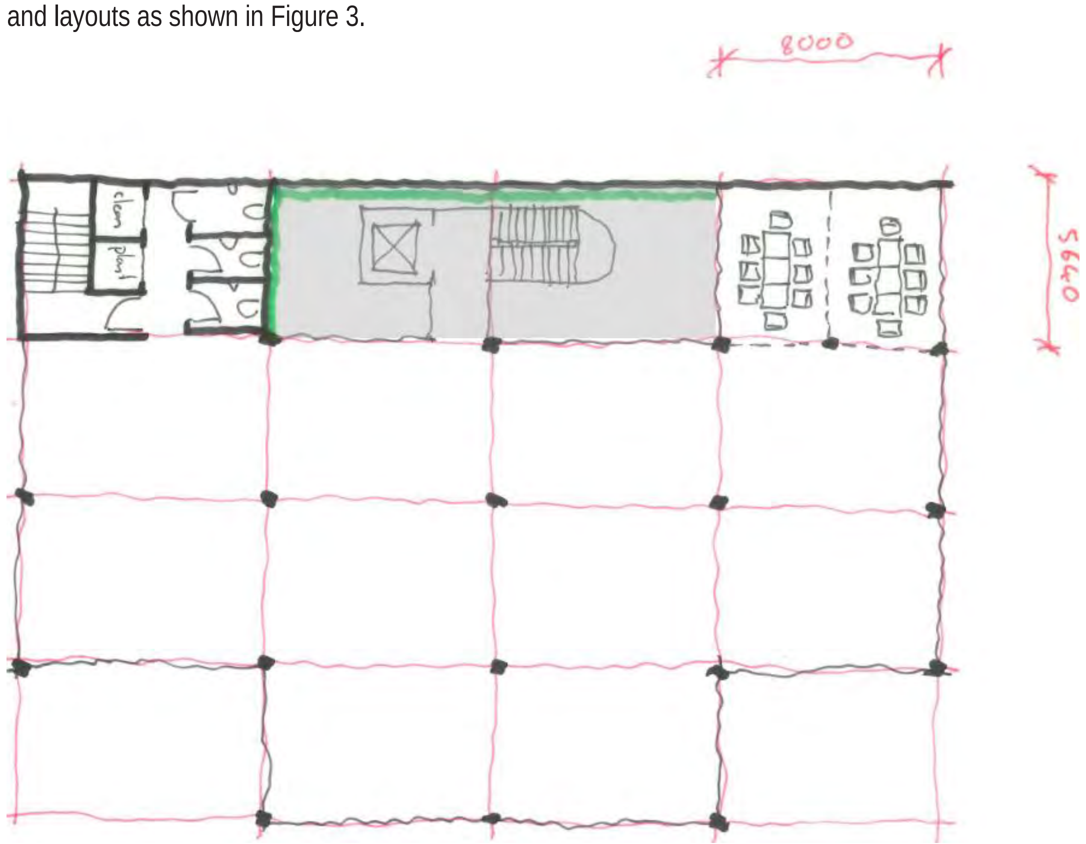


Figure 3 Early concept floor plan (upper floors)

From the initial modelling we can conclude the following for the current building form:

- The heating load is the dominant load on the building.
- Skylight increases natural light and daylight harvesting and has a negligible impact on thermal comfort.
- Ground floor insulation found to significantly impact thermal load requirements for ground floor.[1]
- A targeted approach to reducing solar transmittance through the façade can be effective without compromising natural daylight access.

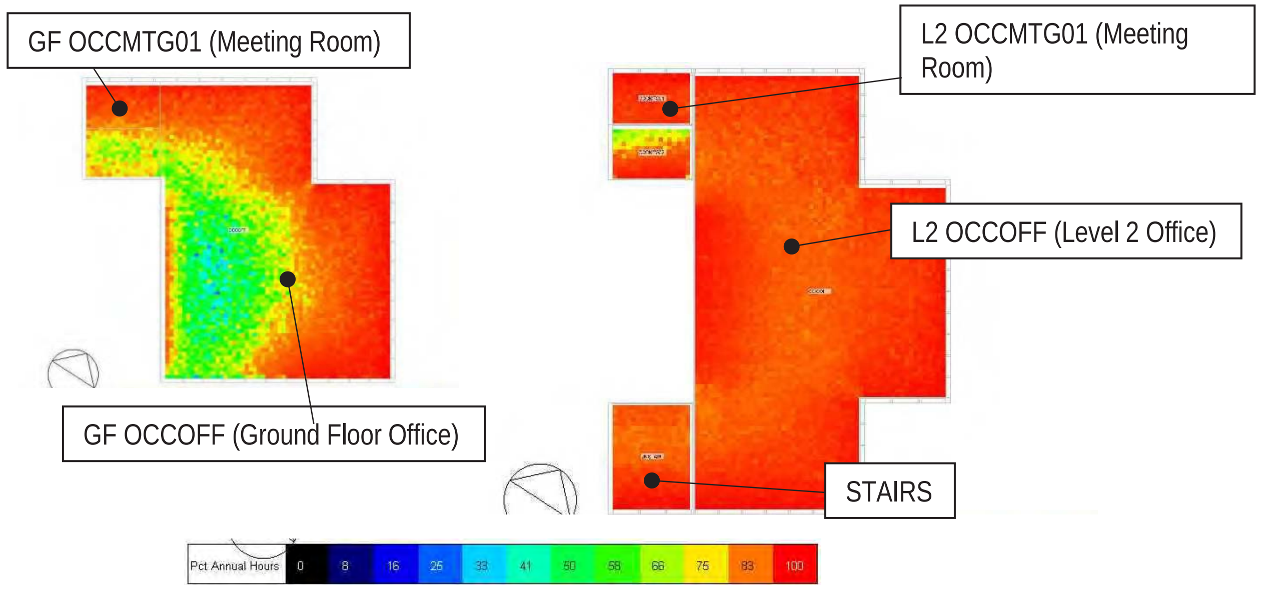


Figure 1 Daylight performance (atrium not illustrated)

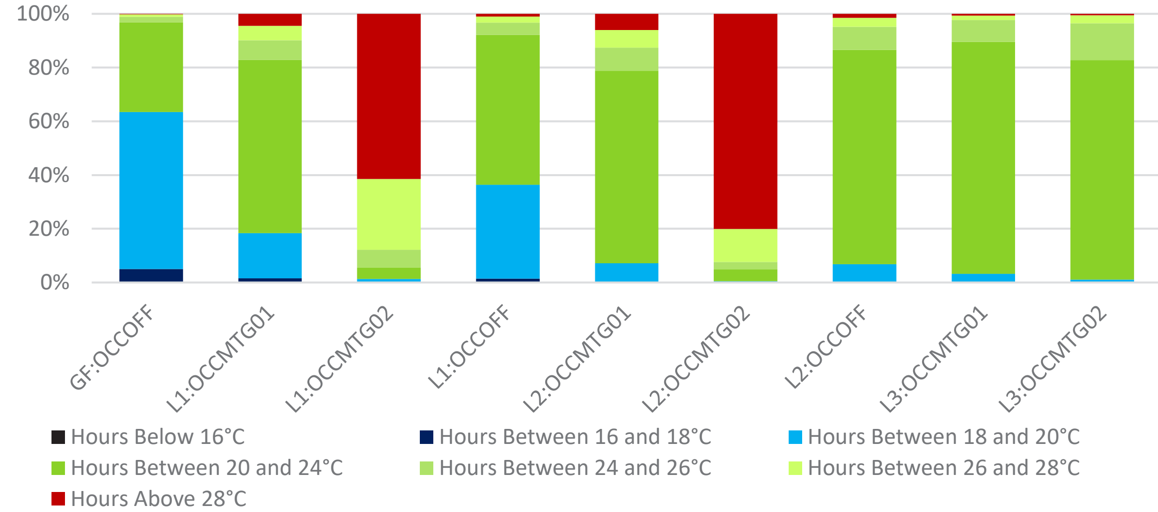


Figure 2 Thermal comfort with skylight

[1] Assumed 140mm slab with 1.2 wide strip of R2.4 underslab insulation along the slab perimeter, where the external walls have masonry veneer cladding

2.6.3 Recommendations

Based on the initial thermal and daylighting simulation results, we make the following recommendations for the building.

- Design for a 40 – 50% window to wall ratio
- Skylight should ideally allow for natural ventilation and night purging.
- Skylight design should include south facing glass that would allow an option for north facing PV.
- Higher than code level R-values (particularly for the ground floor slab.)
- Design open plan spaces along the perimeter to minimize solar heat concentration.
- Place cellular offices and meeting rooms towards the interior
- Local shading to windows where possible.
- Avoid shading on south facing glazing.
- Constant discussion between the architect and ESD engineer as the façade is developed throughout the different design stages.
- Investigate the potential effects of buildings in the nearby area.

2.6.4 Potential Operational Carbon Benefits

- Sensible use of passive renewables before active renewables by a 'Passive- First' approach
- Reduction in heating and cooling demand energy use and carbon emissions
- A less extensive and complex HVAC system.

2.6.5 Potential Embodied Carbon Benefits

- Reduction in high embodied carbon glass/ glazing areas
- Potential reduction in initial and recurrent high embodied carbon mechanical systems
- Target glasses with EPDs

3.0 PHOTOVOLTAIC (PV) RENEWABLE ENERGY GENERATION POTENTIAL

The area of roof available for PV provides an opportunity to generate 100% renewable electricity.

This scenario would produce a peak output kWp: 627 x 200W = 125kW (*30° inclination, 340° north).*

This array would be capable of generating around 150,000 kWh annually.

Based on early energy demand modelling for the site, a roof only array would likely not achieve a net zero operational carbon, and would likely require substitution from the gird throughout summer and winter.

To improve in this situation, additional panels could be added to the façade or shading systems.

Figure 5 and Figure 4 illustrate the differences in solar incident between seasons for the façade. This modelling can be used applied in the design process to optimise placement of additional PV systems.

PV specification for the site should optimised using a Life Cycle Assessment (LCA) (considering the embodied impacts, avoided burden, exported energy benefits).

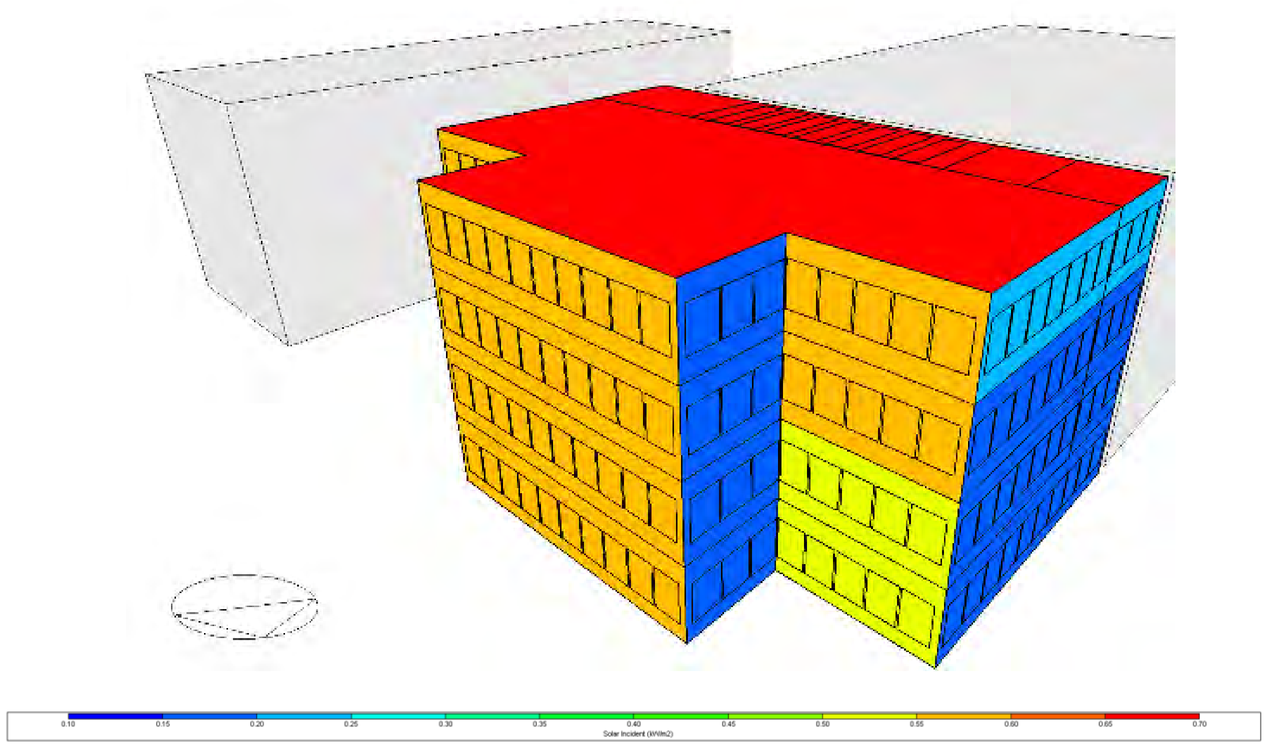


Figure 4 Jul 15th 11pm Solar Incident

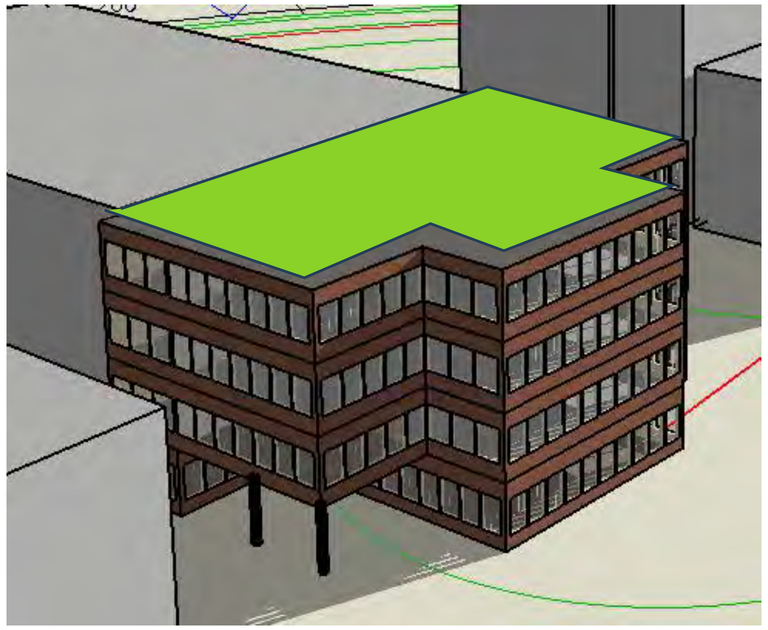


Figure 6 PV solar scenario illustration (roof area modelled)

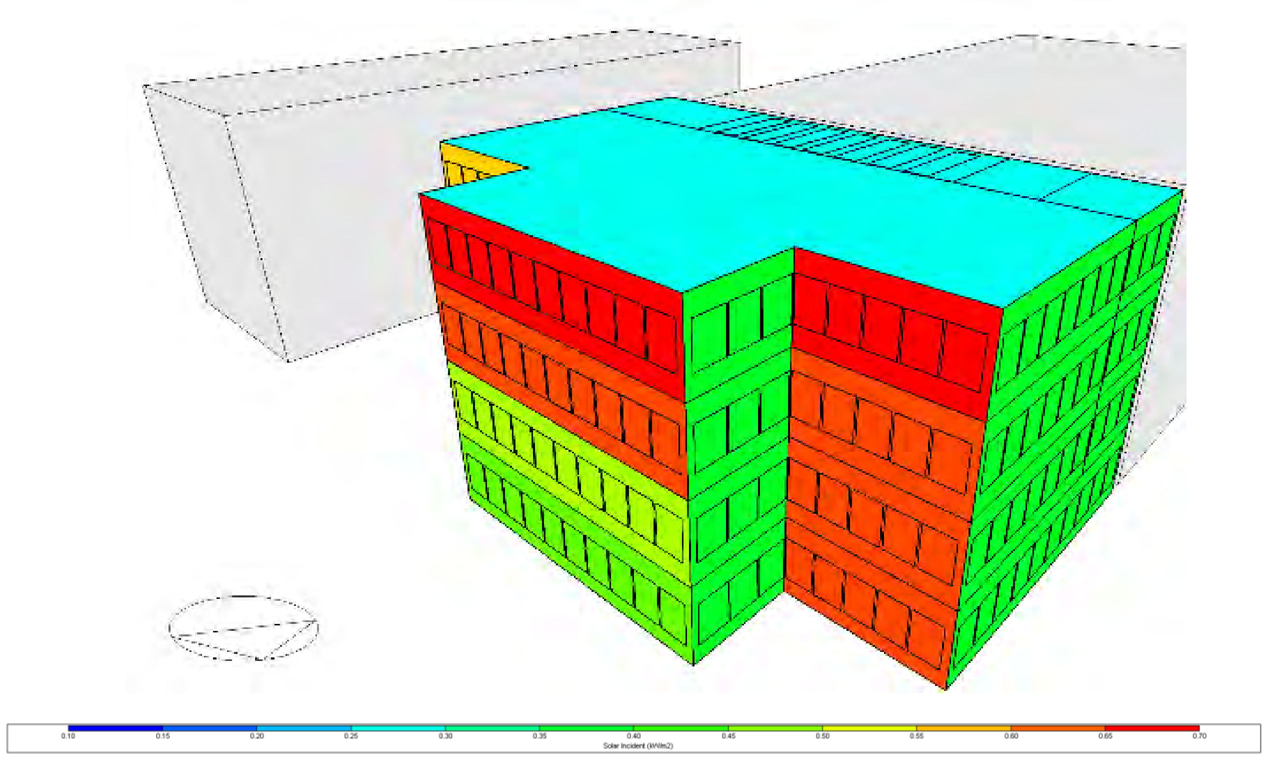


Figure 5 Dec 15th 11pm Solar Incident