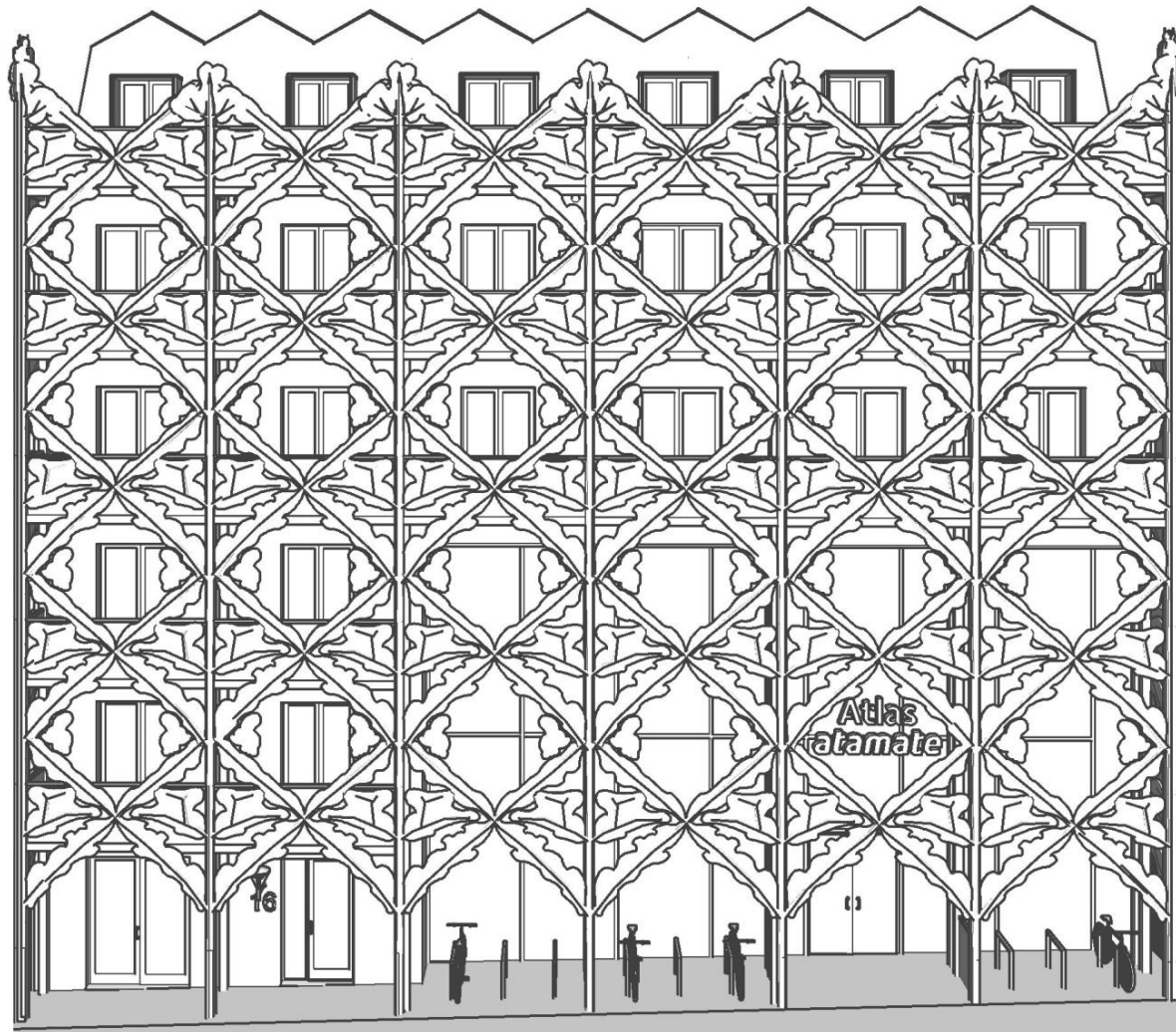
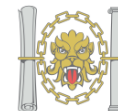


Unit 16 North Street, Reading
Design and Access Statement
Revision: 7.2
July 2019



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Chartered Institute of
Architectural Technologists
Registered Practice

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Chartered Architectural Technologist
Certified Passivhaus Designer
Shared Vision Limited



Cutting-edge UK technology companies Atlas Controls and Atamate present a proposal to locate their growing enterprises in a new office and apartment building in Central Reading

Manufacturers, researchers, and developers in building monitoring, control, and environmental optimisation, Atamate Ltd. and Atlas Controls Ltd. are currently operating in a small office on the outskirts of Oxford. The core development team are geographically distributed and use video conferencing for their meetings. With products now on the market, and partnerships forming with some of the largest companies in the world, the businesses are expanding rapidly and will require new staff and more centralised management

Oxford is extremely limited as a proposition for business expansion - local property is very costly and limited in availability, making recruitment a significant challenge. A simple commute by train from Oxford and London, Reading is a thriving town with opportunity for investment and growth. CEO Joe Miles has acquired Unit 16 North Street, an end-of-life building in a central location, for a new headquarters development



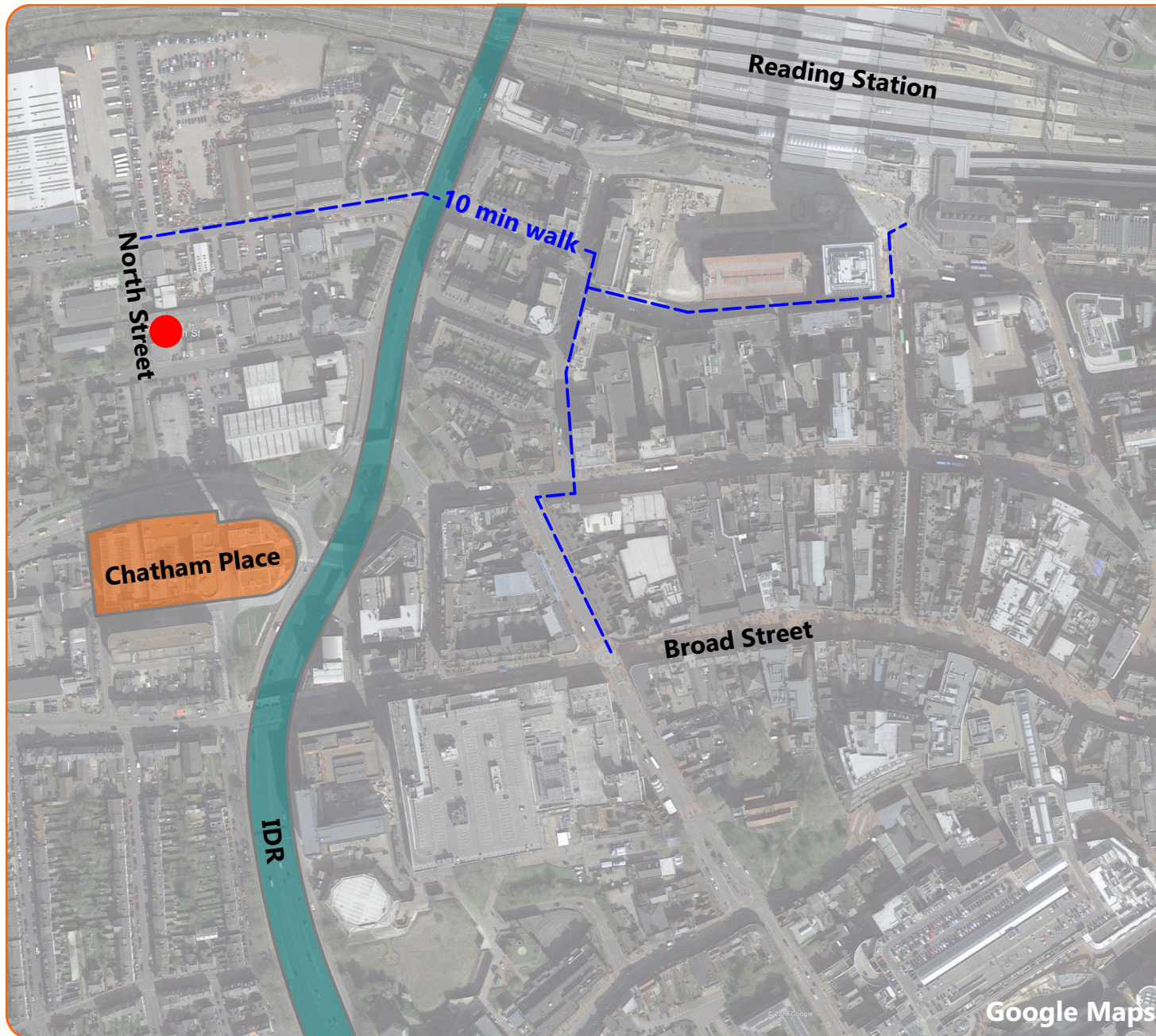
This proposal is the culmination of years of individual study and research by the Atamate and Atlas Controls founder Joe Miles, and the environmental building designer Mark 'Markitect' Wright

This project builds on knowledge built during their recent collaborative project to replace a pair of dilapidated mid-terrace houses with 6 very low-energy healthy apartments for students, which have been the subject of several recent international academic papers including a 1 year study by Oxford Brookes University, presented at the Chartered Institute of Building Services Engineers' conference 2018



Joe Miles BEng CEng: Founder and CEO of Atamate Ltd, a specialist building services control and automation business, and Atlas Controls Ltd, a sustainable building consultancy. Joe is a Chartered Engineer (environmental engineering) with 25 years' experience in the build-to-rent market. He owns several development, investment, and construction companies, and specialises in low-energy buildings, as these offer tenants increased comfort and certainty on utility bills, make good business sense with low running and construction costs, and are less harmful to the environment in construction and use

Mark Wright BSc MCIAT: *Markitect* is a graduate of Construction Management (Building Science) having served time in the construction trades as a ceiling fixer. He founded an environmentally aware solo architectural practice in 2010 and is now professionally qualified as a Chartered Architectural Technologist (2015), and Certified Passivhaus Designer (2016) Mark has focussed on environment conscious building and 3D collaborative design throughout his training and practice



A short walk or cycle to central Reading, with its national and international connecting train station and fully featured 'city' centre, Unit 16 North Street is a highly sustainable location for living and working. With lush local countryside and a lively cultural scene, Reading is a desirable location for attracting employees

Reading has become characterised by new high-rise development around the historic central area. Buildings are contemporary in style, often with quirky profiles



Unit 16 North Street is a 2-storey office built of brick, concrete, and asbestos, in 1980. It is in poor condition, is highly customised, and insufficiently energy efficient to meet current regulations



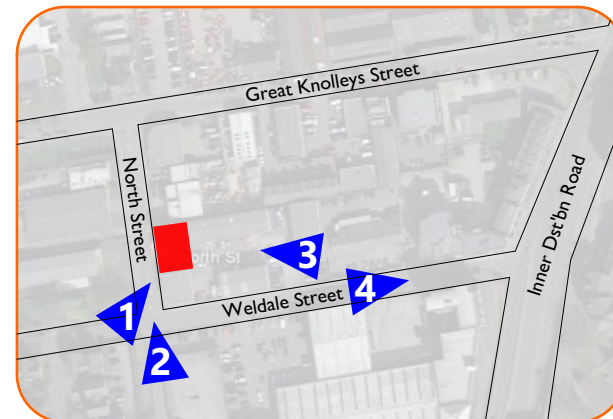
North Street is generally of 2-storey buildings, and is the site of an ambulance station. The road is sloping, with Great Knollys Street somewhat lower than Weldale Street



Unit 16 North Street is adjacent to other buildings in brick and metal sheeting. Occupiers are mostly small businesses engaged in trade sales and vehicle repair



Developments at the junction of Weldale Street and the IDR are of 4 to 6 storeys

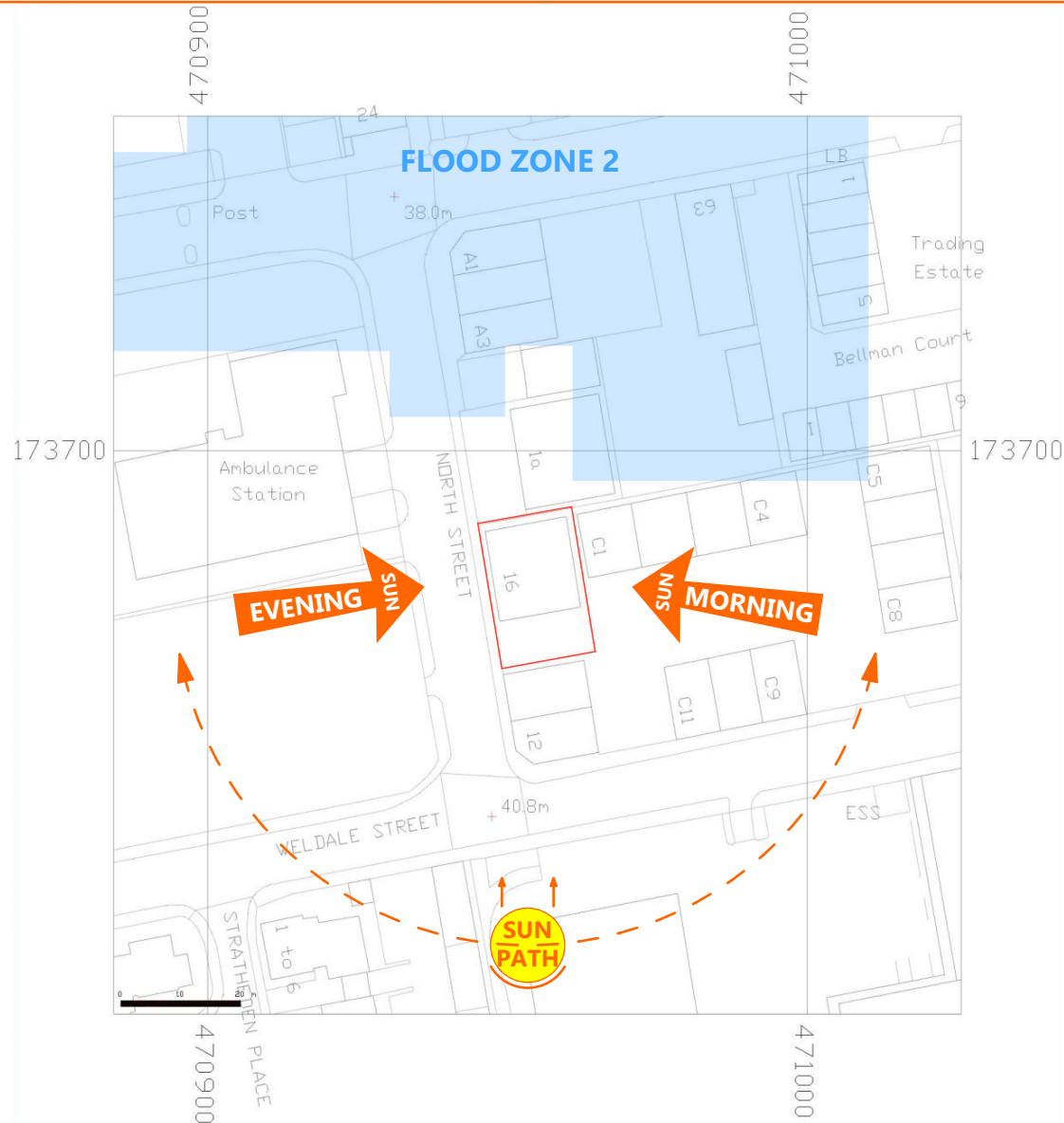


Site Description (from RBC):

The site is located along North Street, west of Reading town centre a short distance from the Inner Distribution Road (IDR). Whilst the area is composed of mixed uses, the immediate vicinity of the site light consists of light industrial and commercial uses. Recent permissions to the south of the site have seen residential led mixed use schemes permitted and high-rise blocks associated with Chatham Place. The existing building is a rather uninspiring two storey industrial building which has been converted and occupied as office accommodation (BI use). The building is currently occupied by Reading Youth Offending Service and it has been confirmed that is within office use as per the lawful use of the site.

The development site is located within an Air Quality Management Area. Independent modelling and sampling found pollution levels to be within safe limits without the inclusion of mitigation methods to protect future users from poor air quality

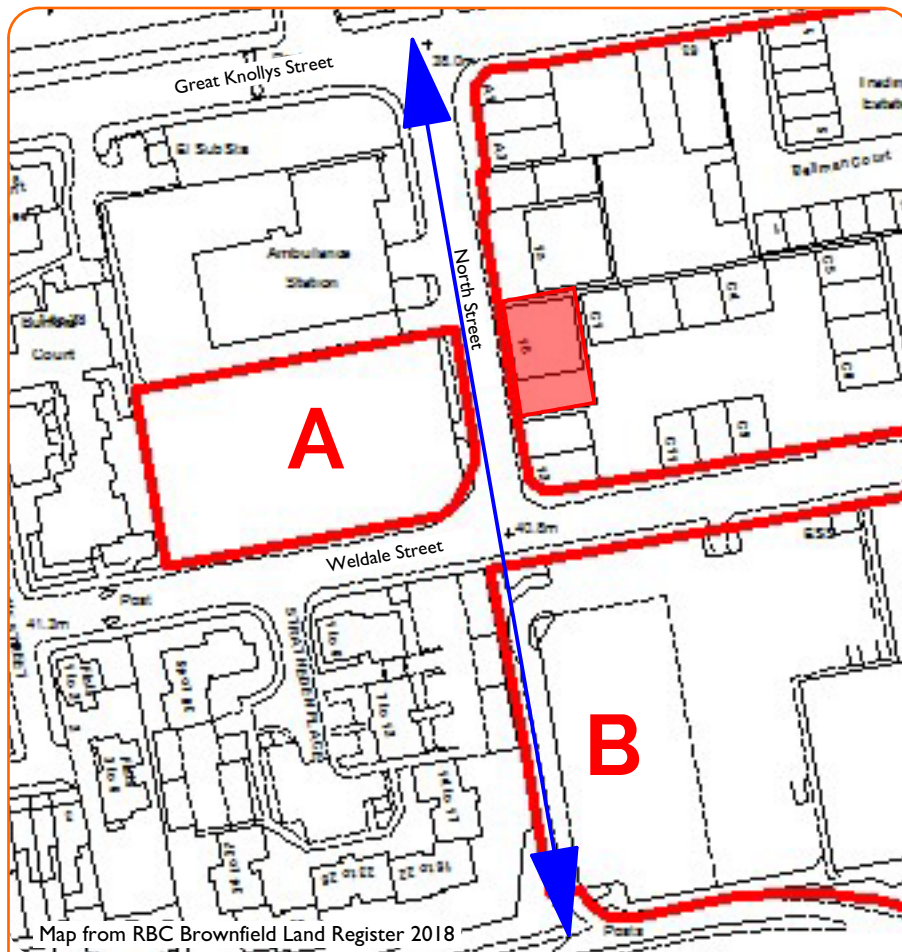
The site is also within a light industrial area, and close to an ambulance station and the IDR. Independent noise-level monitoring shows that although the location is not quiet, residents would be comfortable with windows closed. The proposed building has therefore been designed for its ventilation and cooling needs to be met with closed windows



It is noted that ambulances would logically use the 3-way junction with the IDR at the end of Great Knollys Street, rather than the slip-road onto the north-bound IDR via North Street, and would do so without using their sirens

The site is within Environment Agency Flood Risk Zone 1 and therefore does not have to pass a 'sequential test'

Sun-path analysis shows the building will be susceptible to overheating due to low afternoon sun in the summer, as it shines directly onto the west-southwest facing front of the building



Recently approved development schemes define a virtual extension to North Street, creating a crossroads with Weldale Street. This proposal sits together with them. The emerging materiality is of brick with grey roof parts



- Unit 16 North Street
- Land in private hands / under-utilised: potential for future development*
- Land with extant planning permission
- Reading Borough Council land with intractable leasehold
- Commercial development in active use unlikely to come forward for development
- Residential development in active use unlikely to come forward for development



*the owners of the adjacent plot on North Street do not want to develop at this time

West Side Major Opportunity Area Sub Area B, Reading Central Area Action Plan. Policy RC2b states: "This area will be developed primarily for residential, although development resulting in the loss of small business units should seek to replace some of those units, preferably on site. Residential development should be located on the parts of the site at lower flood risk"

- Limit overlooking of future development
- Respect privacy of future development
- Consider daylight of neighbouring plot
- Active frontage to North Street
- 6 Height in storeys



The true context of this proposal is the group of recently consented buildings that are of an entirely different scale to those of the existing light-industrial and retail area

A transition from 19-storeys (Chatham Place), to 11, 8, and 5-storeys (Foundry Quarter) is established

There is clearly an opportunity for the building replacing Unit 16 North Street to be of a much larger scale

Re-development at scale is supported in policy and established by precedent

" Contain Atlas / Atamate over two floors for sales & demonstrations,
and support & development, in a building that can sustain itself
financially through rental income

Express the company ethos of sustainability, health, and energy saving

Produce an exemplar low-energy building to demonstrate and develop
the Atamate building services control technologies in use "

A highly terraced and planted building with shutters was initially proposed, including parking in accordance with council policy. A second building with a metal solar shade and no parking, which has been evolved into the current proposal, was then presented

Reading Borough Council:

- Habitable windows compromising neighbouring developments
- No comprehensive redevelopment
- "Alien" window shutters
- Building height (7-storeys)
- Building too close to boundaries



Design Review Panel:

- Over-fussy design
- Inactive street frontage
- Design narrative missing
- No reference to site context
- Endorsement of building height
- Poor quality office accommodation

- Welcome proposed use
- Approve of building density
- Positive of building height
- Questions of balcony construction
- Concerns over noise
- Insufficient cycle parking
- Support for design concept



- Welcome calmer design
- Good relationship with street
- Concerns over daylight
- Supportive of solar roof
- Solar shading needs justification
- Questions of building colour
- Good office accommodation

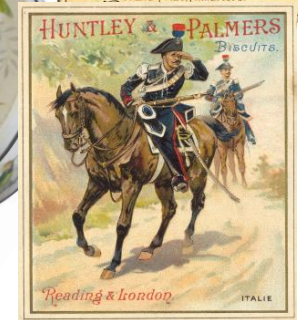
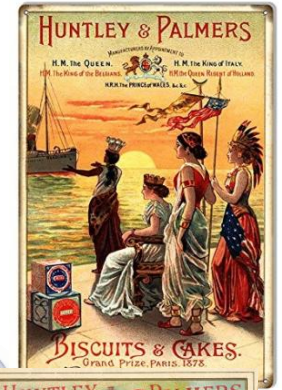
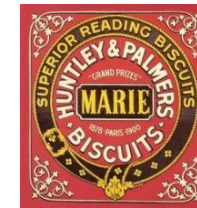


To design a building, it is not sufficient to simply consider its specification, which in this case is *an environmental building*: ideas need a nucleus; a design needs a concept

To establish a relationship with Reading, a great historical icon was chosen as a design concept for this project: the Huntley and Palmer's Biscuit Tin. Herald of Britain, the fancy biscuit tin, made in Reading, promulgated stirring images and evocative design from the mother country across her empire. As durable items, the tins have lasted through generations as homes for cake, stamps, haberdashery and knick-knacks



BISCUIT TIN



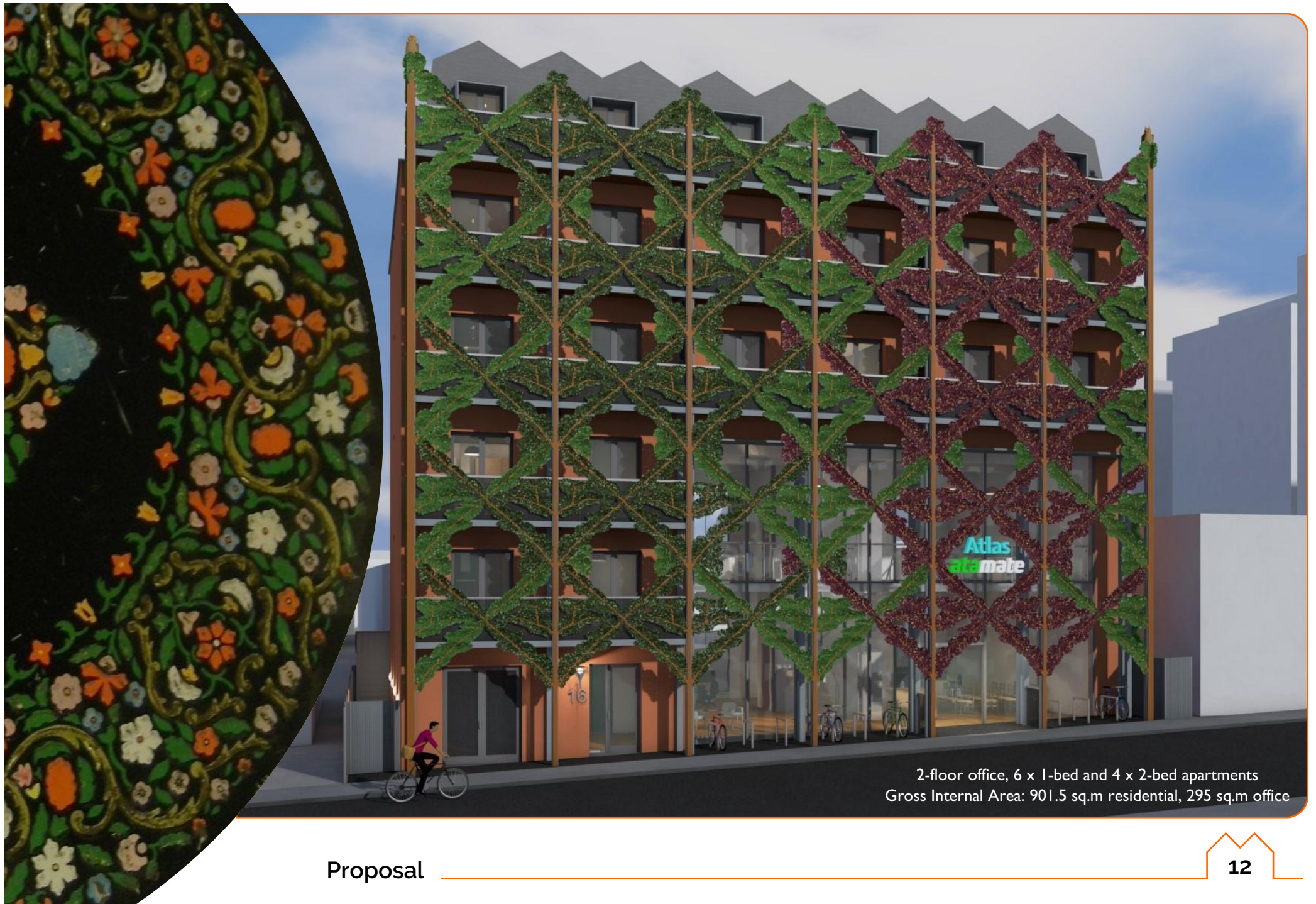
An initial sketch was made, envisioning a rectangular building with a steel exo-skeleton. Cut with different sized holes like the dots in a newsprint image, the façade would both shade the building and display some rousing British image sourced from a biscuit tin

From this idea, a design for a simple building with apartments and a glass fronted two storey office was developed, with a repeating geometric cut metal solar shading façade

Further reflection on the matter at hand, which is to design an environmental building, led to a different thought; to abandon ideas of the metal base material of the tins, and embrace more of their real character. One tin in particular, printed and embossed with a tactile geometry of flowers with acanthus, stood out. There would be a shading façade, not of metal, but of the very flora itself, grown and trained to the geometry of the tin!



Design Concept



2-floor office, 6 x 1-bed and 4 x 2-bed apartments
Gross Internal Area: 901.5 sq.m residential, 295 sq.m office

Proposal



Proposed, is an innovative and highly individual building delivering best-in-class energy performance and climate-change readiness

A car-free development with excellent secure cycle parking and local car club

The future development of adjoining sites is protected

The size of the building is entirely appropriate to its surroundings

A fast-growing UK technology company is ready to invest for the future of Reading and wants to start building!



A conventional rectangular building with low surface-area-to-volume ratio for best thermal performance, presents itself as part of a revived North Street frontage

Responding to adjacent development schemes with grey slate-hung mansard roof and natural lime render coloured with natural pigments similar to brick

Sawtooth roof profile for optimum orientation of 100 sq.m of solar panels

Entrances directly addressing street with level thresholds and wheelchair access throughout building

18 cycle-spaces for the office, 12 more in a secure shed for the apartments

Full-height office windows set back away from the pavement, for shading, and to allow light to the adjacent corner plot

Secure bin storage with direct access



Balconies to each apartment are contained in a structurally separate frame at the front of the building

If the balconies were designed to project directly from the building structure, they would allow heat to escape through a process called thermal bridging

Bracing wires prevent the balcony frame from 'racking', the tendency of a frame to fail sideways like a house-of-cards

Hot-dipped galvanised steel is proposed to be used for its low maintenance, recyclability, and fire resistance. The balcony decks will be similarly inert to fire, and will drain rainfall away from the building to dedicated downpipes

Balcony edge-guarding is proposed to be perforated steel with handrails fixed directly to avoid gaps that might become entwined with climbing plants



Climbing plants to be grown on balcony frame and trained along bracing wires

Deciduous plants providing shade in the summer months, but also allowing useful solar gains in the winter: Hops can be grown while Virginia and Boston Creepers become established

Vegetation provides a rich habitat for small birds, and insects including bees

Planting provides a sense of privacy and enclosure, and obscures hanging laundry from the street in the summer months

Separate use-areas of the building façade are highlighted by the planting scheme

Pigeon deterrence by decoy owls

Watering by harvested rainwater

Maintenance by third-party arboricultural contractor



Habitable rooms are placed at the front of the building as far as possible, in order to prevent the overlooking of future neighbouring developments

Those rooms which are to the rear of the building are concentrated at its southernmost end to prevent intrusion into the privacy of the neighbouring land parcel to the north and are shown:



External wall mounted lighting to rear yard and cycle alley, decorative porch light to flats, overhead illumination to office entrance. No flood lighting

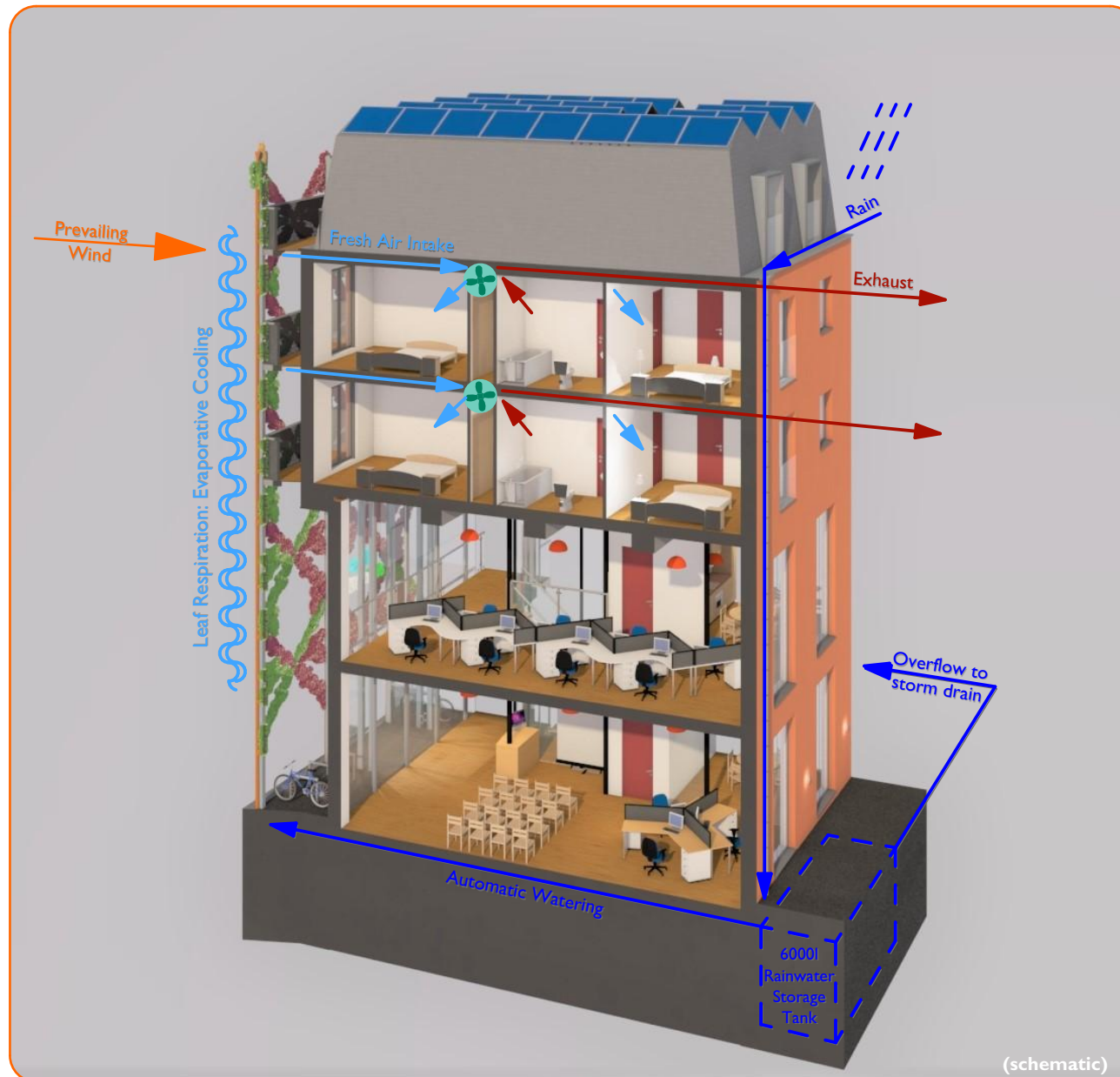
Roof access via hatch. Harness fall-arrest system to walkway giving maintenance access to the solar array and bat roost (in the southernmost roof segment)

The prevailing westerly wind, arriving at the site, has passed over the urban area for only a short distance; it is therefore relatively clean and fresh

The 'green wall' of climbing plants provides cooling by evaporation from its leaves, releases oxygen at night, intercepts particulate pollution, and deflects noise

Ventilation air is drawn from the sheltered balcony enclosures on the fresher west-facing side of the building

Natural west-east wind pressure assists the ventilation system



Rainfall is to be collected in a large storage tank at the rear of the building. The water is to be used for automatically watering the green wall at the front of the building. Distribution and watering will be managed by the Atamate system

The storage tank will attenuate rainfall, particularly during drier periods in the summer, as the tank is likely to be only partly full during the watering season. Overflow, in periods of prolonged rainfall, will flow into the local storm drain

Shaded private balcony

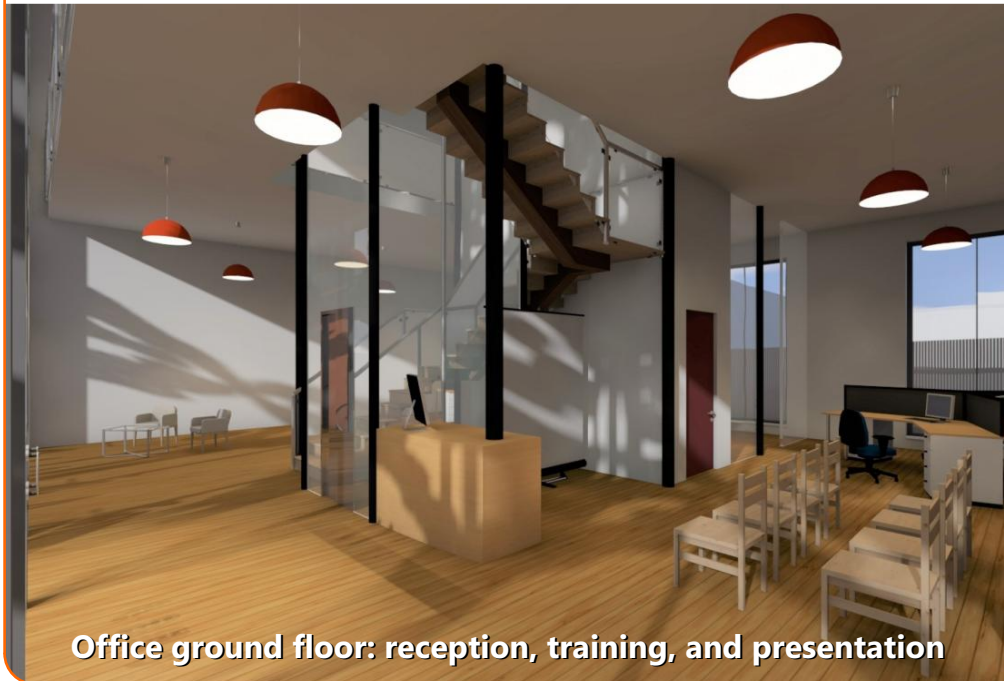


This building has been designed with consideration for the enjoyment of those using and living in it, and also those passing by it on North Street

Each flat meets or exceeds space standards, each one has a private balcony, some with fine views, and others comfortably enclosed and shaded in the summer months

The office space is designed for the specific needs of Atlas and Atamate

Upper private balcony

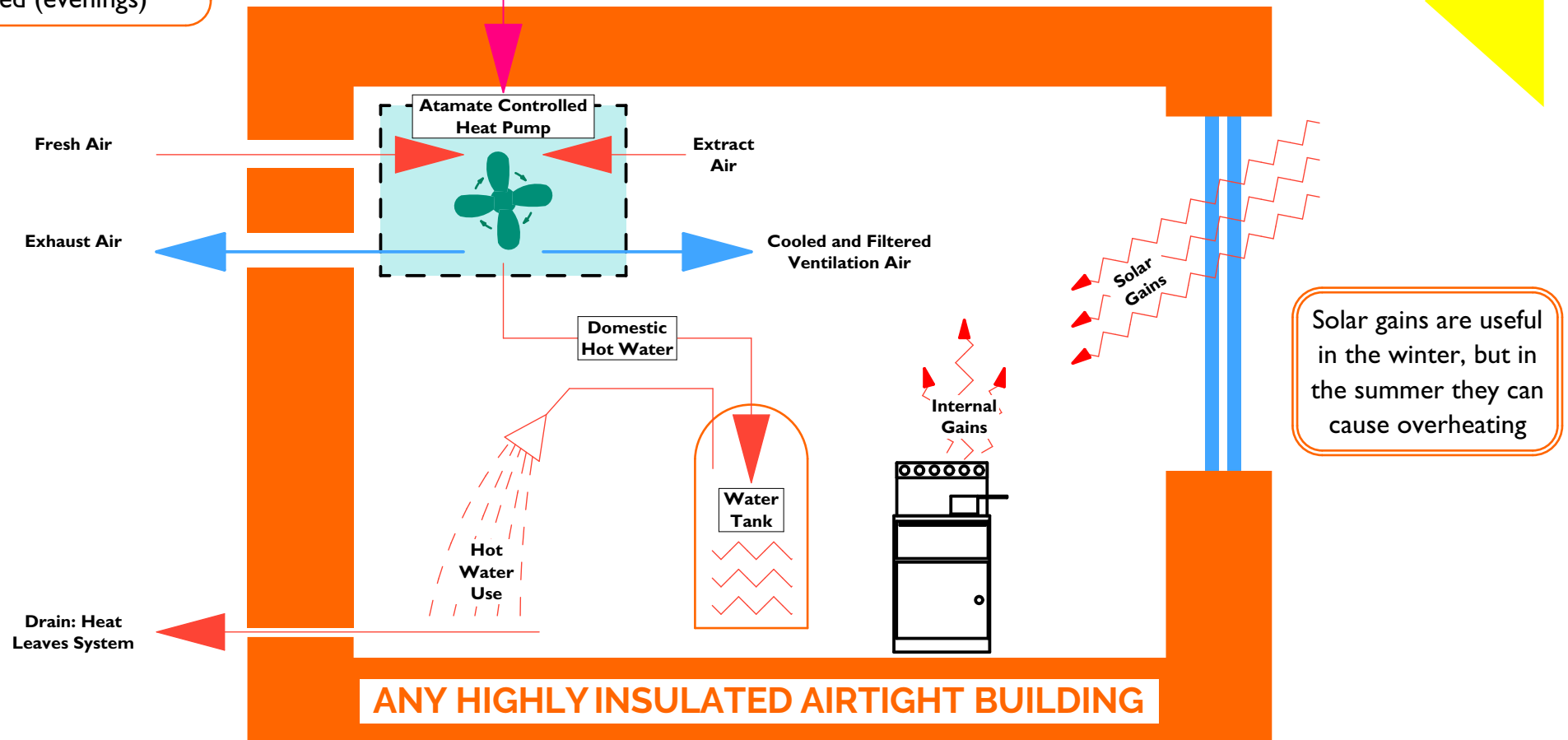


Office ground floor: reception, training, and presentation



Office first floor: technical support and product development

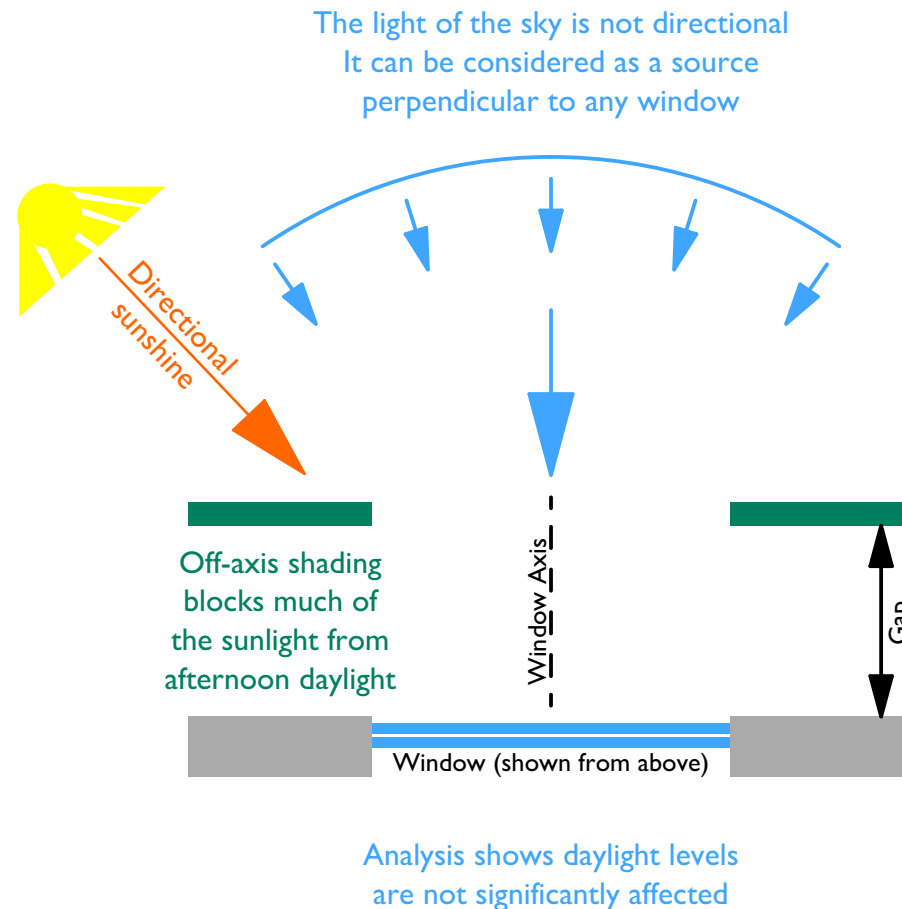
The Atamate system cools air using solar energy, storing excess heat in hot water. This process uses solar electricity when production is high but demand is low (daytime), for use when demand for energy is higher but production is diminished (evenings)



Thermal modelling shows that to control overheating in the summer, solar-control glass, which is sufficient for the east-facing rear elevation, must be supplemented with shading on the west-facing front elevation

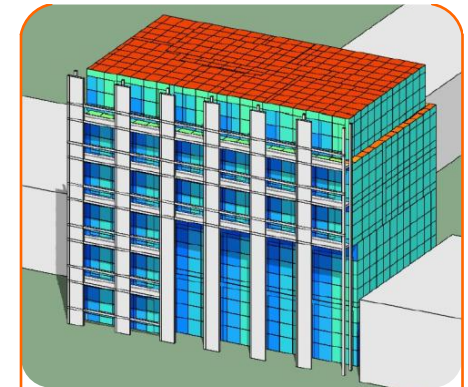


Shading structures above windows are useful when the sun is high in the sky, but cannot shade low afternoon sun



Off-Axis Shading

Shading that is some distance in front of a window, while not in front of it, can shade almost direct sun



Atlas Controls' energy performance expert Kat Kelly PhD used the state-of-the-art dynamic simulation package IES to model the effect of off-axis shading on temperatures and daylighting in the building. An overheating assessment was also carried out according to the methodology set down in CIBSE's TM59

Modelling shows off-axis shading is sufficient to control temperatures, and does not significantly affect light levels

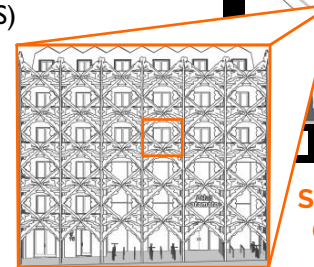
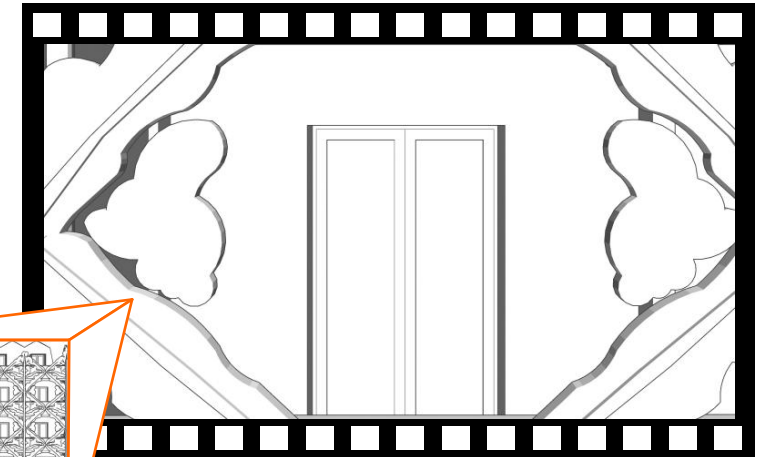
2 sequences are presented here showing the transit of shadows across a pair of doors at the front of the building during 2 afternoons, at each end of the summer

The shadow cast by the balcony above is shown in red dashes

Shadows below the line are created by the off-axis shading

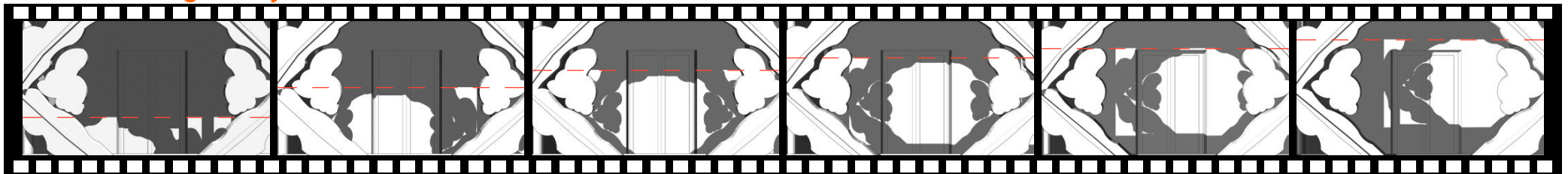
The shading can be seen to be effective in both cases

(graphically simulated using Graphisoft ArchiCAD, and analysed by Atlas Controls using IES)

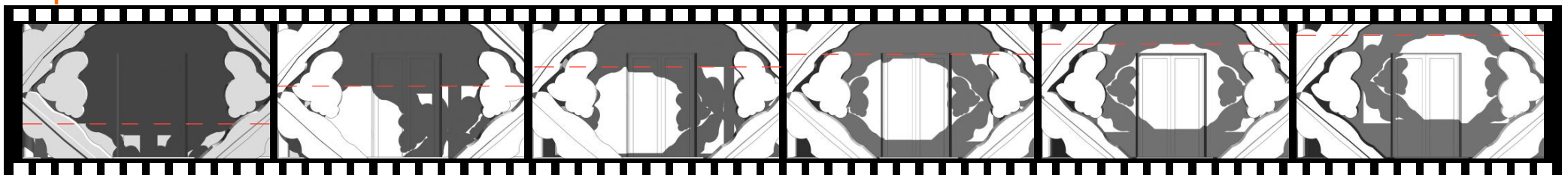


Shading analysis area: doors in middle of building
(no shadows shown for comparison with below)

June 21st (longest day)



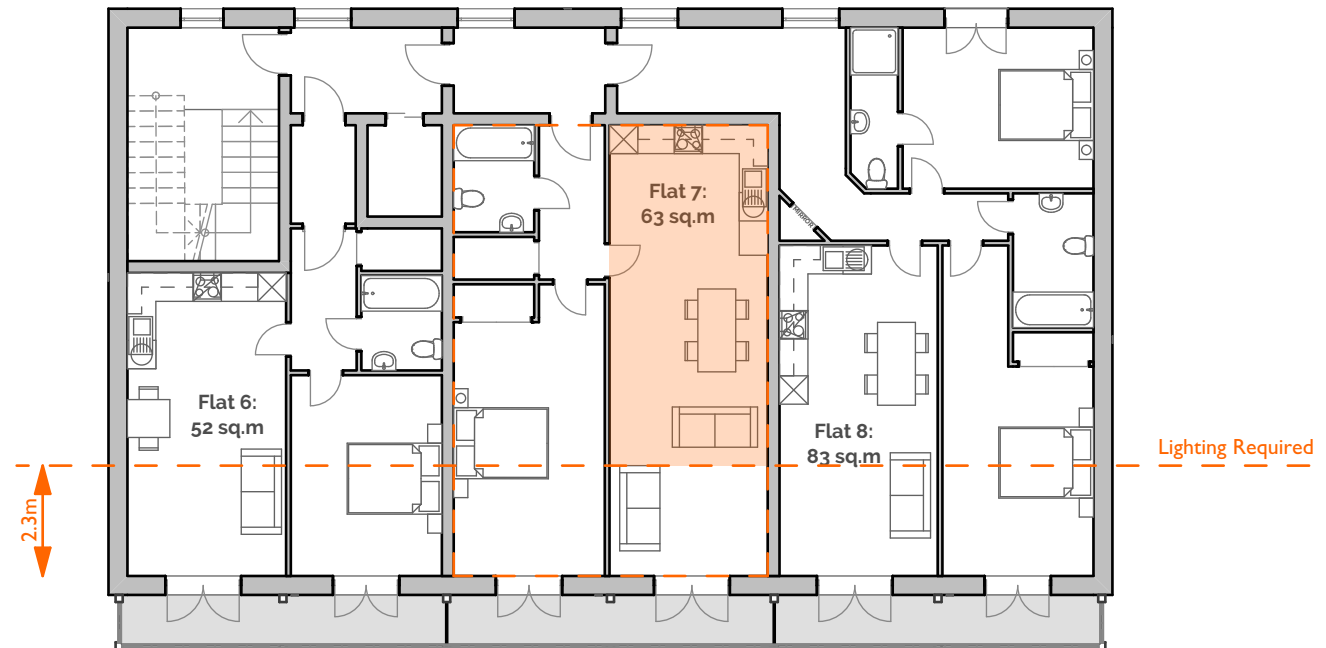
September 1st



5 hours

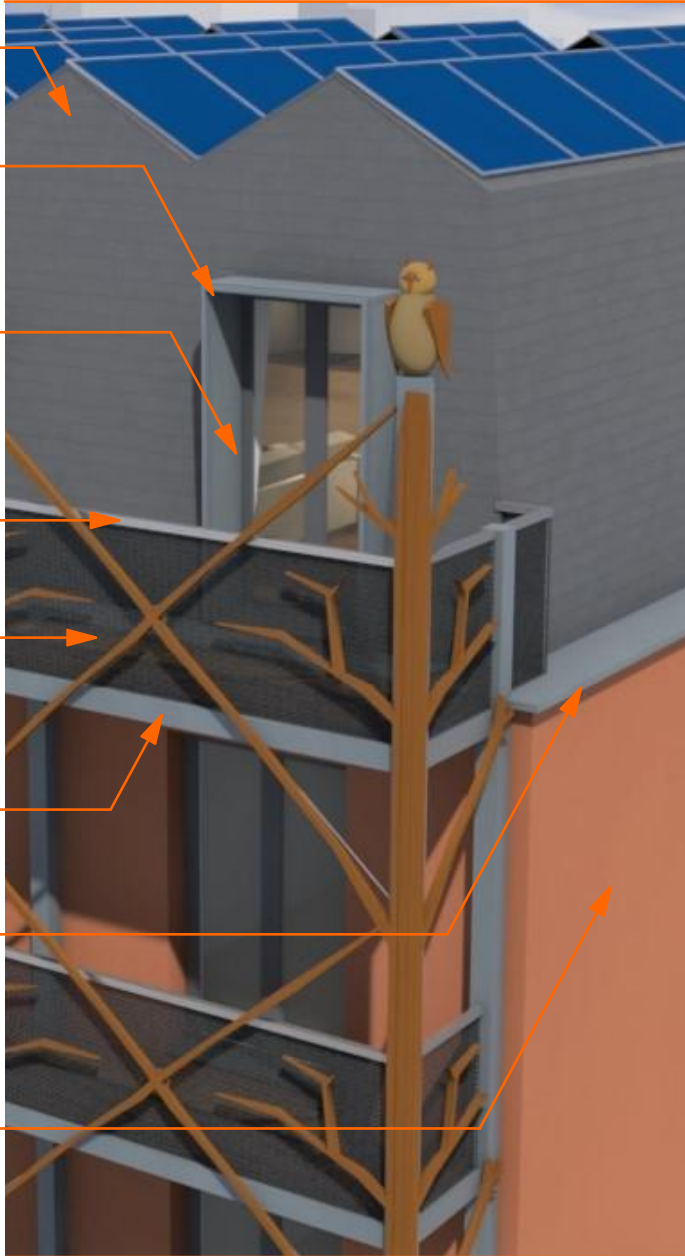


The reasons for the single-aspect arrangement of the building have been discussed
The result of this arrangement is that 2 of the flats in the upper levels are fairly long
Daylighting analysis shows the rear 75% of their living rooms requires artificial lighting
Modelling also shows the external shading does not significantly affect daylighting levels



Each of the apartment living rooms is arranged with its seating area in the zone of natural daylight
The mid-portions of the rooms are lit from above for a table and are the means of access to the sofas
The rear parts are used for kitchens, which would require under-cupboard lighting when in use in any case
To not include the centre of the building within a habitable room would mean wasting it in circulation space
The energy consumption of modern LED fixtures is very small, and Atamate can intelligently manage lighting

Grey recycled
plastic slates
 Zinc window
surrounds
 RAL 7037 Dusty
Grey powder-coat
to all windows,
doors and façade
window framing
 Stainless steel
handrail
 RAL 7039 Quartz
Grey powder-
coated perforated
steel panels
 Hot-dipped
galvanised steel
 Grey anodised
aluminium capping
 Ty-Mawr Glaster:
Brick Pink natural
lime render with
multi-coloured
recycled glass
aggregate



The ultimate specification of materials weighs factors such as health to occupants, health of tradespeople, source of origin, transport, embodied energy, durability, and recyclability, comparing products in a marketplace (sustainable materials) that has new entrants all the time

The fundamental fabric of the building will be very highly insulated, and able to be constructed off-site as there is virtually no space on the site

Windows and doors will be high-specification double-glazed airtight units

Walls are proposed to be rendered in a natural lime product applied to a recycled wood-cement board. These products are naturally sourced, are healthier than others to handle on site, and are not flammable

The project team very much likes the deep colour of the Brick Pink render used on their last project in Cardiff. It is jolly, doesn't jar in a brick environment, and doesn't show dirt like a light-coloured render

All paving is to be of a permeable SuDS-type interlocking paviour

Ventilation terminals shown on drawings are 150mm diameter