LANCASTER WEST

LOT 4 - TREADGOLD HOUSE

LONDON, W11 4HD

ROYAL BOROUGH OF KENSINGTON AND CHELSEA

0003-ECD-XX-XX-RP-A-03003-P05

EMERGING PREFERENCES & CHOICES REPORT

OCTOBER 2021

ECD Architects
ENERGY CONSCIOUS DESIGN

keegans

Wilde

LANCASTER WEST NEIGHBOURHOOD TEAM W11

TACE

deriskuk.com

This RIBA Stage 2/3 Report has been prepared by ECD Architects on behalf of LWNT

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P03 updates

Text adjacent to damp to wall at SW of staircore

Asbestos text amended to cover need for ongoing surveying prior to works

Amended text around ground floor insulation

Added deck access enclosure flow chart & related explanatory text

Added in CGIs shown at pop-up event, added window alternative opening options

Lift text amended to put this outside main contract & secondary power supply still TBC

Updated BIM text & monitoring text

Executive summary moved to appendix

Energiesprong requirements table enlarged

Existing GIA and GEA information added

Updated balcony imagery added

Colours of PVs & ASHPs updated

Reworded explanation of refuse stores & added alternative option including explanatory text about replacing storage sheds

Note added re. potential to move date palm tree at east end of garden

Several appendix items removed

Predicted heat demand & carbon use for heat updated to revised PHPP calculations. PHPP explanation added to, including reference to upcoming TACE overheating report

P04 updates

Energisprong requirements table text orientation changed (p.11)

References to fire safety added on pages 45, 48, 52, 66, 67, 75 & 85

Images of metal panels & composite panels removed, render image made whiter, images of CGIs used to demonstrate possible finishes (p.52 & 53)

Added images of existing rooftop railings and precedents of alternatives (p.68)

Added pros & cons for open & enclosed decks (p.60)

Altered CGI of north entrance to say 'Treadgold House' (p.76)

Altered CGI & plan of new south entrance to include railings & planting to side of path to provide defensible space (p.77)

RIBA Stage 2/3 Report

Client: Lancaster West Neighbourhood Team

Signed by: Lizzy Westmacott

Date: 28th June 2021

Comments:

Author	Reviewer	Date	Rev.	Notes
LB	LW	28/06/2021	-	First Issue
LW	MFF	05/07/21	P01	Minor corrections. Waste storage calc updated
LW	LW	11/07/21	P02	Internal flat layout alterations. Airlock lobby version of new entrance shown
LB/LW	LW	29/07/21	P03	see adjacent notes
LB	LW	26/08/21	P04	See adjacent notes
JS	LW	02/11/21	P05	Minor corrections
JS	LW	19/11/21	P06	Minor corrections

1.0 ACRONYM GUIDE AND DEFINITIONS

There is heat energy in cold, outdoor air. An **Air Source Heat Pump (ASHP)** takes this small amount of heat energy from lots of air and concentrates it, and transfers the energy to water, heating it up. This hot water is then used to heat your home and provide you with hot water from the taps.

A **Mechanical Ventilation with Heat Recovery (MVHR)** unit brings in fresh air and pre-warms this with the heat from outgoing air. This fresh, warmed air is then distributed to living areas, while stale air is extracted from kitchen and bathrooms. Windows can still be opened, but the building will still work even if windows are kept shut.

Photovoltaic panels, also known as solar panels and PV panels, collect energy from the sun and turn it into electrical energy to power your home.

A **U value** tells us how quickly heat energy is lost through a part of a building. The lower the number, the less heat is lost.

A **Thermal Bridge** in a building is part of the construction that bridges the insulation layer, allowing heat to escape more easily across this bridge.

Form Factor describes the relationship between the external surface area and the internal floor area. Buildings lose heat through their external surface area, so the smaller the external area the less heat is lost through this.

Energiesprong is an approach to delivering net zero energy retrofit of homes, financed by savings and with performance guaranteed

The Energiesprong model requires a **Solution Provider** to guarantee the performance of the building after the works. For this reason they need to also be both the designer and contractor, otherwise they would be being asked to guarantee work by others.

Passivhaus buildings are designed to use very little energy for heating, while being comfortable and draught free. They need to be designed and built with great attention to detail to allow them to use around 75% less heating than a standard UK new building.

The **Passivhaus Planning Package (PHPP)** is software that helps us build a detailed model of a building's heat loss and energy use. It requires information about the building's size, shape and orientation. as well as how insulating the walls, floors and roof are, and detailed information about the windows

An **Energy Performance Certificate (EPC)** give and approximate indication of a home's energy efficiency. The most efficient homes have A ratings and least efficient have a rating of G. The average in the UK is a D rating

CDM is short hand for **The Construction (Design and Management) Regulations.** CDM aims to improve health and safety in the industry by ensuring that all bodies involved in construction coordinate their works effectively, manage risk appropriately, and communicate risks to one another.

2.0 INTRODUCTION

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The Lancaster West Estate is situated in Notting Dale in north Kensington, London. There are 795 homes across the estate, the majority of which are flats. The tragedy of the fire at Grenfell Tower in June 2017 highlighted the need for the estate to be maintained and refurbished and for its residents to be part of this process. LWNT have committed to ten core principles for the refurbishment and these have been agreed with residents:

- The refurbishment will be resident led.
- All refurbishment work will be done sensitively and in co-operation with residents.
- There will be no demolishing of people's homes on the Lancaster West Estate.
- We will create a model estate where the community can be proud to live and that the council can be proud to own.
- We will make sure residents can make real choices on the refurbishment.
- We will listen to all age groups and communities on what improvements they want to see.
- The refurbishment will aim to provide local jobs and skills training for local people
- The refurbishment will improve local services, so they are of a high quality.
- The refurbishment will create a sustainable estate that can be maintained to a high standard.
- There will be transparent decision-making and feedback provided by the council at each step.

The Royal Borough of Kensington and Chelsea (RBKC) have appointed ECD Architects to provide multi-disciplinary design services from RIBA Stages 1-3, to design a retrofit solution for the 38 flats that form Treadgold House, as part of this extensive programme of works within the Lancaster West Estate. This appointment will then continue through to the completion of the works with ECD providing client support and advice post-contract.

ECD Architects appointment includes the following disciplines:

- Architecture – ECD Architects
- Structural Engineering – Wilde Engineering
- Cost Consultancy & Procurement advice – Keegans
- Planning Consultancy - Jennifer Ross

ECD Architects are also working collaboratively with other consultants as required by the client and the brief, such as:

- Mechanical, Electrical and Plumbing – TACE
- Fire Safety Engineering - IFC
- Energiesprong UK
- Monitoring and Post Occupancy Evaluation – BuildTest
- Principal Designers – Derisk
- CCTV, door entry, digital TV – TGA Consultancy
- Lift Consultant - Chapmanbdsp

2.1 BRIEF

The Lancaster West Estate is to become a 21st Century Model social housing estate. As part of the estate Treadgold House is to be refurbished to dramatically improve its energy efficiency, as well as addressing other issues raised by residents. The top priority in this work is the residents of Treadgold House and their lives and needs. LWNT have already done a lot of work to understand the residents' needs as well as the buildings' energy use and problems. Prior to ECD's appointment Treadgold House was the subject of the Mustbe0 Energiesprong competition, resulting in an outline design for how the building could be retrofitted to make it net zero carbon. Having gained resident approval for this outline strategy, LWNT intend to take up Mustbe0 funding to support these elements of the work.

ECD's task is to work with LWNT, the residents and other consultants to develop an outline design that builds on this previous work. This is leading to a tender process that will chose a Solution Provider to complete the design and refurbish the building in a way that meets the residents' aspirations as well as the Mustbe0 funding criteria.

OUTCOMES OF CONSULTATION & CO-DESIGN

Co-design events were run across the estate in 2018, recorded in the 'Books of Ideas'. At Treadgold House this revealed problems with the overall site layout, landscaping and security, maintenance issues, particularly around services including the lift, condensation and mould in flats, and frustrations around layouts and balcony spaces.

The more recent prioritisation workshop for Treadgold House picked up similar issues. While kitchens and bathrooms were the top priorities, issues around security and the route to front doors dominated the rest of the list.

ECD's scope mean that they will address some of these priorities, with others addressed by members of the wider consultant team. Some elements may form part of later works, supported by future funding.

Priority	Initial design ideas by
Kitchens	LWNT / ECD
Bathrooms	LWNT / ECD
Block Entry System	TGA Consultancy
CCTV	TGA Consultancy
Communal Entrance	ECD
Replace Lift	Chapmans
Maximise Hidden Storage	ECD
Redesign Car Park etc	Later works
Communal Decor	ECD
Pest Control (assumed to be pigeons)	ECD

Much of the work to the building will be necessary to meet the MustbeZero requirements, and an outline design is provided for these elements, to prove the building's potential to do so. This outline design will also give LWNT and residents a chance to preclude or encourage any specific design elements which are of importance to them.

Other, non-Energesprong-related works are also needed to solve challenges raised by residents and these are designed in a greater level of detail to give LWNT and the residents assurance that their aims will be met.

ENERGIESPRONG & MUSTBE0

LWNT have secured EU funding via the Mustbe0 project for Treadgold House. This project is European-wide scheme supporting deep retrofit of residential apartments using the Energiesprong model. This project is designed to kick-start the market for affordable deep retrofit and improve the quality and performance of existing dwellings.

Post-retrofit, a net zero apartment generates enough energy for its heating, hot water and power appliances. Money that would have been spent on energy bills and maintenance funds the improvement. The aim is that the cost of living doesn't increase because real-life performance for energy use and indoor comfort is guaranteed for an agreed period (currently 10 years). In the Mustbe0 project, 9 housing providers in the UK, France, Germany and the Netherlands have already committed to collaborating on the retrofit of at least 9 demonstrator buildings (415 apartments) which includes 38 at Treadgold House.

This model requires the Solution Provider (typically a design and build contractor) to both design and deliver the proposal and guarantee performance for at least 10 years. In order to improve efficiency whilst delivering performance the contractor will focus on developing and improving retrofit packages (mass customised facades and roofs with fully integrated energy and climate systems). This enables the driving down of costs and installation times to reduce from several months to a few weeks. Aggregating additional demand, improving regulation, and financing structurally creates more market volume and drives the supply chain to industrially produce cheaper and better retrofits which kick-starts a self-sustaining market for affordable deep-retrofit.

The key criteria for this funding is that the works are completed before the end of 2022 to enable monitoring during a full winter season with the final report due in early 2023. Given the nature of the procurement route and in order to deliver this within the required timescales we have provided an extended tender period and allowed a 3-month design period prior to start on site in January 2022.

EXTERNAL WALL INSULATION

At the end of the Mustbe0 competition a meeting was held with residents of Treadgold House to explain the proposals. This and other forms of engagement culminated in a vote in which the majority of residents supported the concept of having external wall insulation on the building. This has allowed LWNT to go ahead with seeking the full Mustbe0 funding to carry out works. It is therefore essential that the refurbishment design meets the requirements of the funding.

PROCUREMENT

The Energiesprong model requires a Solution Provider to guarantee the performance of the building after the works. For this reason they need to also be both the designer and contractor, otherwise they would be being asked to guarantee work by others. Therefore the Energiesprong elements of the works will be procured under a design and build contract, tendered on the basis of a performance specification and some limiting parameters that have been established with residents and LWNT. Those elements of work that are outside the Energiesprong requirements are designed in more detail, ensuring that LWNT and residents get the specific outcomes they are expecting.

DELIVERY

The works are to be carried out largely with residents in-situ. It is therefore be necessary to consider carefully how invasive and noisy works will be, and to make decisions with this in mind. Understanding each resident's specific needs around disruption, noise and how they use their homes will feed into finding the best way to offer respite as works progress in line with LWNT's respite facilities strategy. Derisk are appointed across the estate to ensure health and safety throughout the desing and build process as well as compliance with the Construction (Design & Management) regulations.

NON-COMBUSTIBLE MATERIALS & FIRE STRATEGIES

Given the tragedy at Grenfell Tower proposals are to go beyond the requirements of Part B of the Building Regulations. All insulation will be class A1 or A2, s1-d0 (effectively non combustible) rated for reaction to fire. Existing Fire Risk Assessments are being examined, so that necessary improvements are incorporated in the works. An independent fire consultant forms part of the design team to provide an additional check on compliance with all regulations, including the production of a fire strategy to reflect the proposed design.

ENERGIESPRONG

Energiesprong is an approach to delivering net zero energy retrofit of homes, financed by savings and with performance guaranteed.

Dutch for 'Energy Leap', it was developed by the Dutch Government with their housing and construction industries between 2010 and 2017. The Netherlands has the same carbon reduction targets as those set by the UK Climate Change Act, requiring a zero-emission building stock by 2050. They realised that a radically different approach to the measure by measure, grant funded norm was needed. Delivery rates had to go up, and costs had to come down to enable financing without public subsidy.

Over 4,000 net zero energy homes have been delivered in the Netherlands so far, with 8,000 planned for 2019. A further 100,000 homes are part of a long-term contract between housing owners and construction companies. All financed from energy and maintenance savings alone, without subsidy.

Energiesprong UK is a not for profit organisation, 100% publicly funded, supported by the housing and construction industries and the Dutch Energiesprong team. Their mission is to adapt the Dutch approach for the UK and develop a volume market that can deliver net zero energy retrofit and new build, without public subsidy. They have completed the UK's first 10 homes in Nottingham and have a pipeline of over 300 homes in procurement or contracting phases across the country.

Figure 1 - Energiesprong Approach to Retrofit Homes

HOW IT WORKS

The Energiesprong approach is technology and company agnostic. A high-level Performance Specification requires >80% improvement to fabric thermal performance, plus renewable energy generation and heating equipment required to achieve annual net zero energy consumption. Indoor temperature, air quality and noise levels are specified, and disconnection from the gas network.

Contractors are procured to deliver a 'design, build and guarantee' contract against the Energiesprong Performance Specification. EnergieSprong suggests that contractors should have 15 working days per home (meaning 38x15) on site, which drives the offsite approaches required to reduce costs and improve performance through industrialisation of retrofit. Comfort, energy and maintenance performance and costs are guaranteed by the contractor long term, which enables building owners to finance capital investment from future energy and maintenance savings.

Typically, wall and roof panel cassettes are manufactured off-site and transported to site for quick, 'wrap-around' installation. Heating, hot water, ventilation, and monitoring equipment is integrated into a single easy to install and maintain module. PV generation is integrated into the roof system.

The structure of the contract incentivises inclusion of further energy reduction technologies, such as ventilation & heat recovery, smart controls, low energy appliances, thermal and electrical storage etc. The end result exceeds EPC A, covering all energy use including plug power and renewable on-site generation. Many Energiesprong homes will be capable of disconnecting from the grid at peak times, when grid balancing is required in our all electric, low carbon future.

MARKET DEVELOPMENT

Social housing is the launching market through which increasing volume is being brought to market, enabling companies to invest in industrialisation of their approaches and reduce costs.

Front runner social landlords are preparing to sign a Collective Commitment to bring the next volume to the market, ~1,000 homes initially with more to follow. A positive dialogue with Government is seeking tapered subsidy to match landlord investment and enable contractors to invest and reduce costs as volume increases.

Performance Criteria	Requirement
Energy	
Space heating energy	<40kWh/m2/yr (21°C in living room when living room when outside temperature is -5°C.)
KWh per annum allowance for lighting, cooking and sockets	2,300 kWh/yr. Lighting and standard appliances to be updated at installation. Gas appliances will need to be replaced where they are fitted.
Hot water	System has the capacity to deliver 200 litres at greater than 45°C (or equivalent at higher temperatures) in one hour. Hot water consumption to be scaled by typical number of occupants (N) 64+26N, in litres.
Net energy consumption	Net zero over the year should be achievable on certain well orientated house types. There is an allowance of <1,500 kWh/yr for other housing typologies. Net consumption in import (kWh) minus export (kWh) over the year.
Feedback	Provide feedback to tenants against each of the allowances for heart, hot water and appliances energy use. Provide real-time and historical feedback to make comparisons.
Payments from housing provider	State upfront payment, and ongoing (maintenance/other) payments, and how much the property stands to earn from generating energy.
Tenant payments	Outline the energy service plan, cost, provisions and additional charges. Illustrate impact against pre-retrofit spending for the low, central and high-use case.
Comfort & Health	
Temperature in living room	21°C achievable when outside temperature is -5°C.
Temperature elsewhere	18°C.
Control	Provide options around heating pattern and whether zoning would be appropriate. Provide an override of ‘boost’ function.
Summer overheating	Designed so that less than 11 days a year are over a comfort temperature of 26°C in all rooms, and minimum windows openting of 1/20th the floor area or equivalent mechanical ventilation. Assume median climate conditions for 2050.
Max air velocity (drafts)	<0.2m/s in heating season where people can be reasonable be expected to sit or sleep.

Performance Criteria	Requirement
Indoor air quality	Retrodit solution to comply with Part F of the Building Regulations as if the retrofitted home was a new dwelling.
Daylighting	Daylight is not reduced by more than 10% without agreement.
Noise from ES services inside	30 dBA (equivalent to someone whispering a few feet away) absolute limit in living rooms/bedrooms or where background noise is higher use relative limit of <2 dB.
Noise attenuation from outside and neighbours	Noise attenuation from outside and between dwellings in the same or greater than existing.
Noise from ES services outside	Noise from Energiesprong equipment will not exceed 42 d BA (like bird-song outside) at 1m from window of habitable room.
Installation	
Installation time	Installation time with occupants in-situ <15 active working days per home. Maximum active time onsite two calendar months.
Occupant satisfaction	As part of the overall engagement and feedback strategy obtain feedback before, during and after the installation.
Warranty, Maintenance & Monitoring	
Performance Warranty	Aim is to provide guarantee of energy, comfort and health factors so long as maintenance and occupant protocol has been met.
Design life	Optimise design to satisfy performance warranty period but state which components are likely to last significantly longer and the advantages this may bring.
Maintenance	Provide a fully costed planned and preventative maintenance protocol for the lifecycle plan. Identify cost and resource requirements for each activity so that they can be costed by a third party.
Monitoring	Provide sufficient monitoring and logging to be able to exercise performance warranty. Make suitable data privacy and security arrangements.
Design	
Kerb appeal, highly attractive design uplift, customer satisfaction	Demonstrate how the solutions meets the design brief.

Figure 2 - Summary Energiesprong Performance Specifications – see Appendix 6.4 for full specification

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3.0 EXISTING BUILDINGS & CONTEXT

LANCASTER WEST ESTATE

The Lancaster West Estate is in north west Kensington, just south of the A40 (Westway). It is owned by the Royal Borough of Kensington and Chelsea and consists of 795 homes, most of which are flats. The majority of the homes are occupied by tenants, but some are leasehold, and 16 are freehold houses. The buildings that form the estate have been built at different times over the last century and have very different appearance, construction types and layouts.

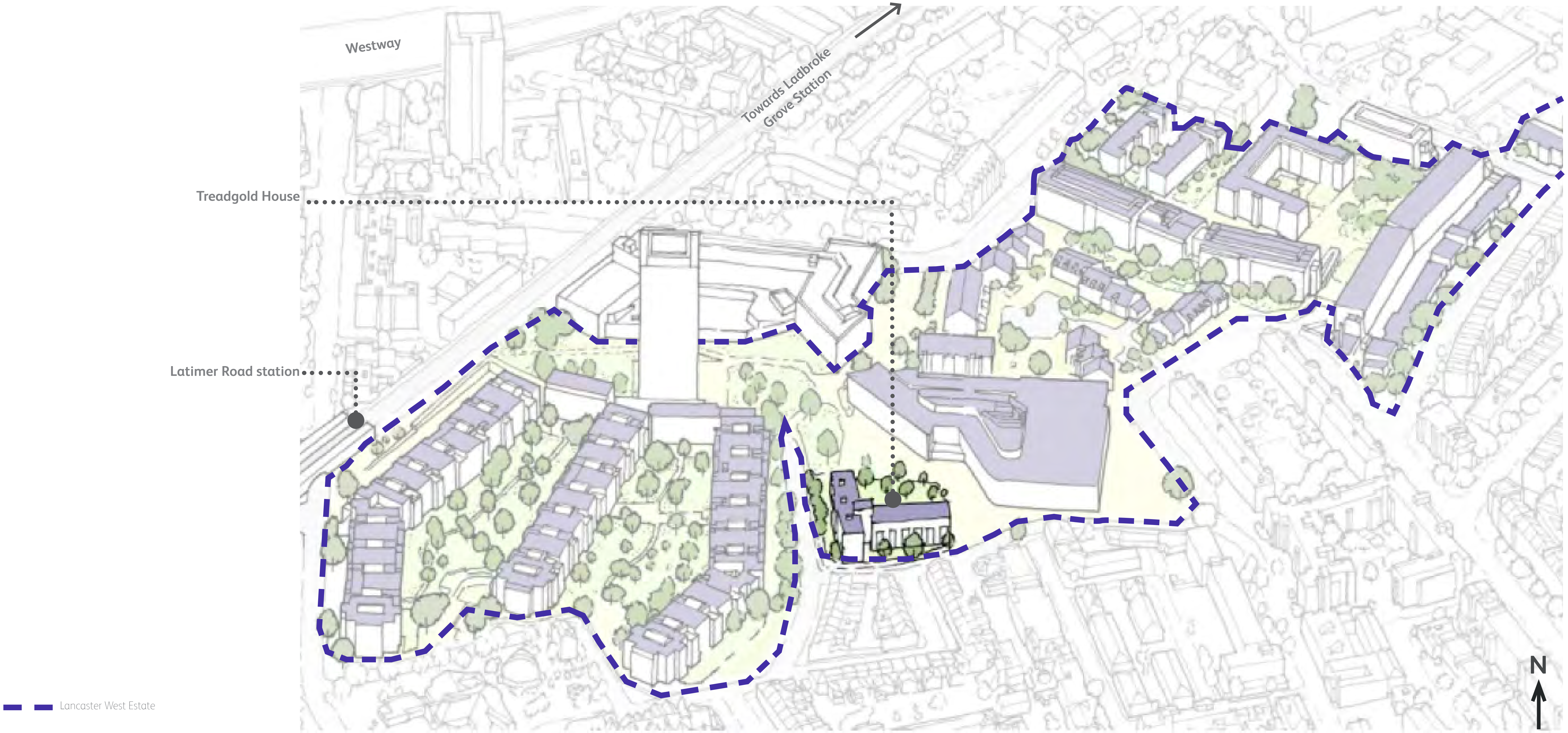


Figure 3 - Aerial view of Lancaster West Estate

TREADGOLD HOUSE - IMMEDIATE SURROUNDINGS

Treadgold House is located in the corner between Bomore Road and Grenfell Road. To the north of the site, where the once listed Silchester Road Baths used to be, is Kensington Leisure Centre, which opened in 2015. The modern centre is of similar height of Treadgold House and its main entrance is located to the north-east of the site with a network of good quality pedestrianised accesses connecting Silchester Road to Bomore Road through the estate.

The south side of Bomore Road is characterised by low rise terraced houses which sit outside the Estate boundary.

To the west of Treadgold House is what was originally phase 1 of Lancaster West Estate which comprises of 3 finger blocks: Barandon Walk, Testerton Walk and Hurstway Walk. These blocks were originally built above garages on a deck with a covered walkway along the centre of the deck (internal street) but the blocks were refurbished in 1992 and the walkway segmented, not keeping with the original concept of the architects which provided a 'street in the sky'. The 3 and four storey linear residential blocks enclose two large green spaces. Lancaster Green, just north of the site, complements this open green space provision.

Most surrounding roads have on-street car parks and street trees, with a Santander bike docking station located south of Treadgold House on Bomore Road.

The area is mostly residential except for the leisure centre and the Academy. Treadgold house is located a short walk away from Latimer Road underground Station.

Figure 4 - Title Plan

3.1 SITE

The building is set back from the surrounding streets leaving a strip of grass along the south and west boundaries. A line of mature trees provide shading on the west and north side of the property where the community garden space is located with tables and benches.

The perimeter is secured with a metal fence hidden by evergreen hedging on the south side and a combination of metal fence and brick wall all around the rest of the site. The only access to the site is through the main gate on the south-east corner. The vehicular gate opens to an internal courtyard which includes 13 car parking spaces. A line of bollards separates the vehicular route from the pedestrian route which runs along the east wing to access the stair core in the middle.

A storage shed is located on the eastern side of the site, just beyond the main gate, and a number of bins are scattered around the storage shed as there is no formal recycling bin store.

The building comprises of two blocks of 5 storeys (13.6 m high) forming a T-shape in plan. The distribution core (stair case and lift) connects the two blocks in the centre of the development giving access to the units via open decks facing the car park.

- Brick wall
- Metal fence
- Gate
- Bollards & railings
- Pedestrian route through site
- Communal garden
- Green area
- Residents' parking
- Communal entrance
- Private entrance

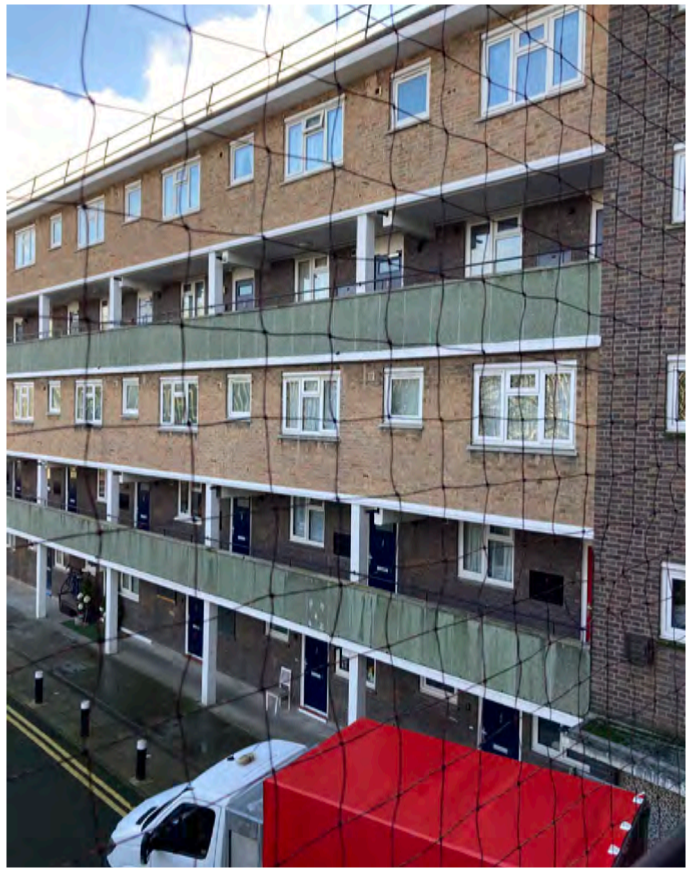

1 *Treadgold House south facade from Bomore Road*


2 *Treadgold House staircore from Bomore Road*


3 *Treadgold House car parking*


4 *Storage spaces adjacent to the main gate*


5 *Estate boundary to the north*


6 *Treadgold House north facade*

BUILDING TYPOLOGY

Treadgold house comprises of 38 units of which 4 are leasehold properties. The wing parallel to Grenfell Road consists of 20 deck access flats spread across 5 identical floor plans of two 1-bedroom flats and two 3-bedroom flats. The second wing running east-west includes 18 units: 6 studio flats on the ground floor with the entrances facing onto the car park; and two storeys of 6 three-bedroom maisonettes above accessible from the first and third floor decks.

In the west wing, a storage cupboard is located outside the front doors of each unit. At the end of both access decks, two rubbish chutes service the east and west wings connected to two bins that can be collected on the ground floor. These bins stores can be accessed through a door near the pedestrian gate and on the north-west corner of the car park.

Internally, the flats have a ceiling height of 2.5 m and a redundant fire place in the living room and some bedrooms. All the units have a separate kitchen and one bathroom – except for the 3 bed flats which have a separate WC. A balcony provides an external private space in each unit which is too small in the majority of the cases.

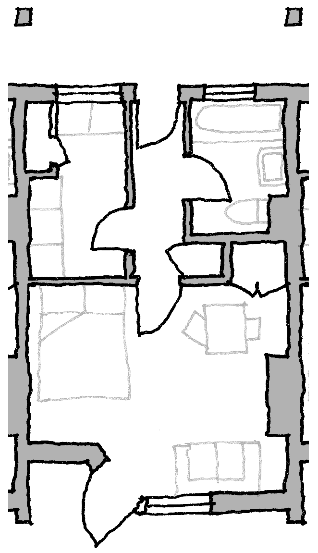
Four of the properties are leasehold, flats 17, 18, 35 and 36. All others are socially rented.

The sizes of units and of bedrooms do not align with current space standards, so it is not possible to exactly classify the unit types and how many residents might be expected to occupy them. The table on the opposite page records the actual current number of residents and compares this with the theoretical occupancy based on the unit size and the Nationally Described Space Standard (NDDS) and against the maximum occupancy if the number of bedrooms were the factor determining occupancy. As can be seen the actual occupancy is lower than either of the other metrics suggest. This is pertinent to design of heating, hot water and to working out overheating risk.

Floor	Total	Studio	1 bed	3 bed (flat)	3 bed (maisonette)
Ground	10	6	2	2	
First	10		2	2	6
Second	4		2	2	
Third	10		2	2	6
Fourth	4		2	2	
Total	38	6	10	10	12

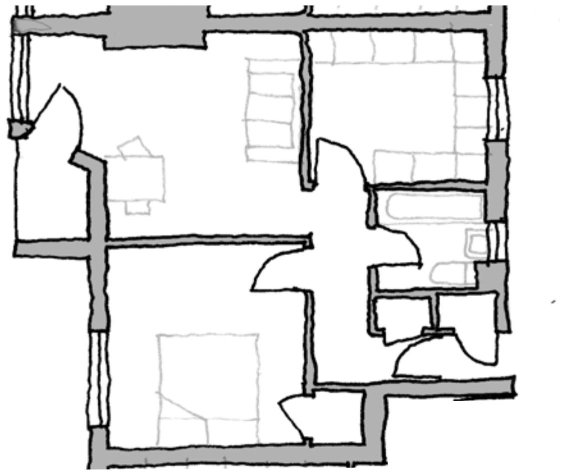
Figure 5 - Schedule of accommodation

Unit number	Size (m^2)	No. bedrooms	Theoretical occupancy under NDDS based on overall size	Assumed max occupancy based on bedrooms
1	31	1	1 *	1
2	31	1	1*	1
3	31	1	1*	1
4	31	1	1*	1
5	31	1	1*	1
6	31	1	1*	1
7	67	3	3	5
8	42	1	1	2
9	42	1	1	2
10	67	3	3	5
11	74	3	3	5
12	74	3	3	5
13	74	3	3	5
14	74	3	3	5
15	74	3	3	5
16	74	3	3	5
17	67	3	3	5
18	42	1	1	2
19	42	1	1	2
20	67	3	3	5
21	67	3	3	5
22	42	1	1	2
23	42	1	1	2
24	67	3	3	5
25	74	3	3	5
26	74	3	3	5
27	74	3	3	5
28	74	3	3	5
29	74	3	3	5
30	74	3	3	5
31	67	3	3	5
32	42	1	1	2
33	42	1	1	2
34	67	3	3	5
35	67	3	3	5
36	42	1	1	2
37	42	1	1	2
38	67	3	3	5
Totals			**82**	**136**



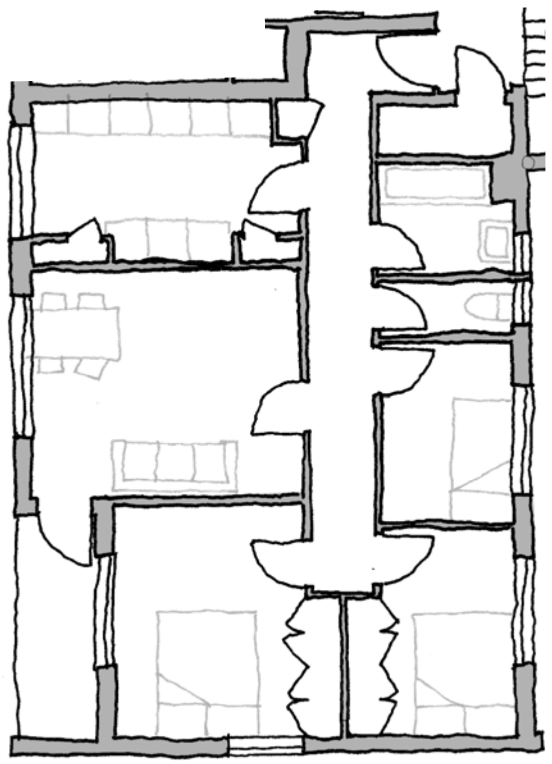
STUDIO FLAT

Internal floor area: 31m²



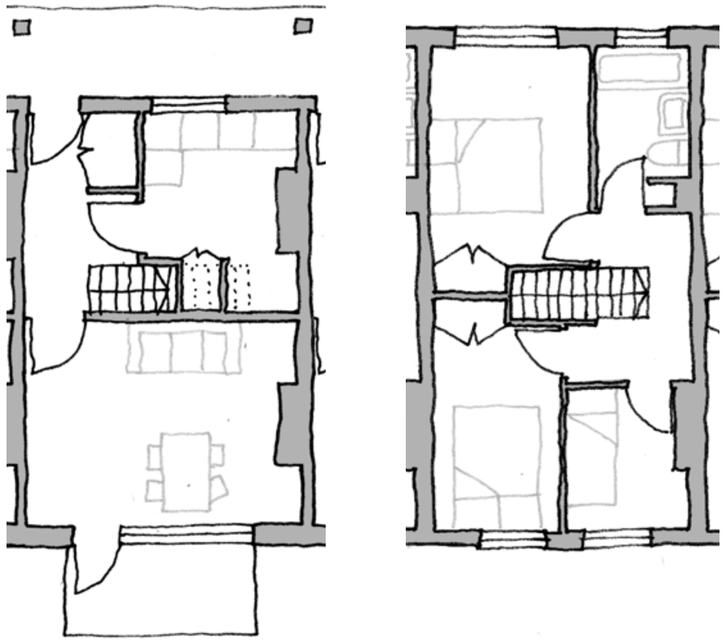
1 BED FLAT

Internal floor area: 42m²



3 BED FLAT

Internal floor area: 67m²



3 BED MAISONETTE

Internal floor area: 74m²

GROSS EXTERNAL AREA

Gross External Area is the area of a building measured externally at each floor level.

The calculation of the Gross External Area, based on the code of measuring practice, includes the perimer wall thicknesses, areas occupied by internal walls and partitions, internal balconies, atria and entrance halls columns and deck area, stairwells, liftwells, plant rooms and storage rooms.

Existing GEA Schedule	
Level	**Area**
0.Ground Floor	*632.25 m²*
1.First Floor	626.50 m²
2.Second Floor	609.68 m²
3.Third Floor	626.50 m²
4.Fourth Floor	609.68 m²
TOTAL	***3104.60 m²***

Figure 6 - Schedule of Gross External Area

GROSS INTERNAL AREA

Gross Internal Area is the area of a building measured to the internal face of the perimeter walls at each floor level.

The calculation of the GIA, based on the code of measuring practice, includes areas occupied by internal walls and partitions, vertical ducts, internal open-sided balconies and walkways, plant rooms and storage room.
In our case, it excludes open balconies as well as the stairwell and the deck area as these are all open.

Existing GIA Schedule	
Level	**Area**
0.Ground Floor	*490.24 m²*
1.First Floor	*469.73 m²*
2.Second Floor	*504.84 m²*
3.Third Floor	*469.73 m²*
4.Fourth Floor	506 m²
TOTAL	***2440.54 m²***

Figure 7 - Schedule of Gross Internal Area

GROUND FLOOR PLAN - EXISTING

- Studio flat
- 1 bed flat
- 3 bed flat
- 3 bed maisonette

FIRST AND THIRD FLOOR PLAN - EXISTING

3.2 EXISTING FLATS & TENURE

SECOND AND FOURTH FLOOR PLAN - EXISTING

EXTERNAL APPEARANCE

Treadgold House presents a regular façade rhythm reflecting the repetition of the internal layouts. The external fabric is mainly constituted of buff bricks with the flank walls of the two wings built with brown brick.

The elevation along Bomore Road is divided horizontally by white slab edges, highlighting the maisonette typology, and supporting the white U shape concrete balconies with green concrete panel parapets.

The West elevation, along Barandon Walk, presents inset balconies for the one and three bedroom flats located on both ends of the building and in the centre of the elevation. The central part of this elevation is set forward from the building line.

The façades facing the car park and the communal garden are characterised by the open deck access at the first and third floor and the white concrete columns forming the structure of the building.

Figure 8 - East wing - South facade

Figure 10 - East wing - North facade

Figure 9 - West wing - West facade

STRUCTURE

The construction is generally load bearing masonry supporting 225mm deep concrete floors and a flat roof.

The east wing, which incorporates duplex units at the upper levels, has external access walkways at second and fourth floor levels. In this wing there are brick cross walls between the units supporting the concrete floors over.

Over the walkways there are upstand concrete beams which are supported on the brick cross walls at the internal end and 225x 225xnm square concrete columns at the external end on the outside line of the workways.

The load bearing cross walls are solid brickwork but the front and rear walls of these units are cavity wall construction with brick outer skin and block inner skin.

Also at the second and fourth floor levels, there are projecting reinforced concrete balconies.

The west wing comprises apartments at each level. The internal layouts are unknown so it's not clear where the load bearing walls are. The external walkway only extends for part of the length of this wing from the stair core where concrete columns can be seen. There is then a solid brick external wall. It is not known if this wall is loadbearing.

In the west wing there are recessed balconies in the outer corners on the west face. There are also projecting balconies on this elevation towards the centre of this wing at the upper levels. These balconies look to span across onto supporting flank walls.

The central stair and lift core look to have been formed with solid load bearing brickwork. The lift core has an overrun an additional storey above the main building.

The communal staircase is reinforced concrete with 225mm deep concrete landings.

Clearly there has previously been some extensive refurbishment of the building since it was originally constructed. The lift shaft and cavity wall construction are not original.

CONSTRUCTION

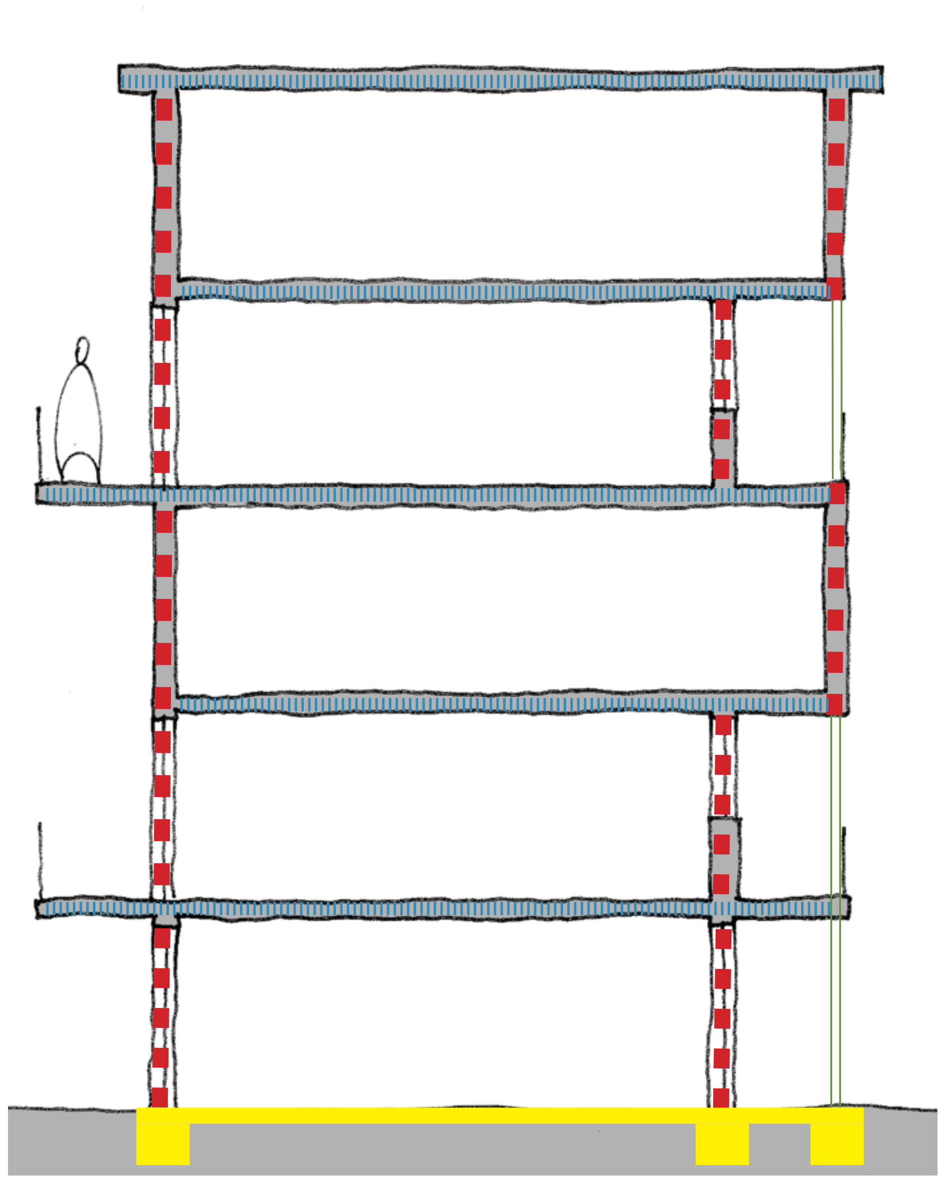
The building appears to have a ground bearing concrete slab, which extends to the outer limits of the building's footprint, even where the building steps in at ground floor. It is assumed that columns and solid brick party walls, which are loadbearing, have larger foundations below ground.

Upper floors are constructed of concrete, which extends beyond the external walls to form the deck access to the maisonettes and flats. Concrete columns span between the floors of this deck access providing support for the decks and the projecting upper floors of maisonettes. Balconies are also formed as an extension of the concrete floor slabs, with thinner concrete walls forming the balustrades to balconies and decks.

External walls are a mixture of cavity infill walling and solid brick walls. The cavity brick walls appear to have been insulated at some point in the building's life, as plugs are visible in the external brickwork where insulation would have been pumped in. Thermographic surveys and in-situ U value measurements will help to establish how continuous and effective this is. Original coal hatches penetrate deck-side wall to each home.

End walls, and the staircore area appear to be of solid brick construction, 215mm thick, as can be seen from the bricklaying pattern. Separating walls between homes appear to be solid brickwork, with blockwork used where maisonettes project. Internal partitions appear to be of blockwork.

The roof is formed of a concrete slab which overhangs the walls. It has 90mm PIR insulation across it at present under a bituminous felt waterproofing layer. Falls to the roof drain to sumped outlets into internal rainwater pipes. The roof is accessed via a ceiling hatch outside the lift at the 4th floor. This is understood to lead into a room above which leads out via doors onto each of the two main roof areas. Fixed railings allow safe access once on the roof. 9 chimney stacks protrude through the roof, originally serving fireplaces in each flat. These are constructed of brick, and several now have satellite dishes attached. Other services and fixtures are also visible on the roof at present.



Brick wall

Concrete Slab

Concrete column

Foundations below ground

Figure 11 - cracking to floor screed, overhang maisonette floor

Figure 12 - Assumed Concrete foundation edge line (view from the car park)

Figure 13 - Assumed Concrete foundation edge line (view from the main gate)

Figure 14 - Brick separating walls

Figure 15 - Block work internal partitions

ROOF ACCESS AND CONDITIONS

The only access to the roof is from a ladder on the 4th floor. The ladder is kept within the adjacent cupboard but it is very old and requires replacement. The two access hatch doors are heavy and narrow and they require fixing into place. Once through the hatch there are handholds to facilitate the access. The landing itself is hazardous until the hatch doors are closed as you need to walk across the opening to access the roofs. Moving to the roof, the narrow access doors require a large step over the threshold.

The Eastern side of the roof presents six chimney breasts and is easier to access. The roof covering appears to be in poor condition, with significant ponding and soft areas. There are several TV aerials installed and animal cages which will require removal. The roof doesn't have an appropriate parapet but a free-standing guard rail which has been installed around the perimeter.

The Western side of the roof includes three chimney breasts and it is more difficult to access than the Eastern side. The access is through the water tank room which is flooded and requires large steps over existing pipework. There is at present a large water leak in the room, which probably comes from the pipework rather than from one of the two tanks. There is significant ponding on the roof, particularly around the north end. The guard rails enclose the perimeter but they stop 4-5m short of the northern edge. There are also several aerials that will require removal. New fibre optic cabling runs on the external wall of the water tank room.

A report on the existing roof condition has been produced by Langley Roofing Systems.

The existing roof construction is as follow:

- Deck - Screeded Concrete
- Vapour Control Layer - Bituminous Vapour Check - Thickness: 3 mm
- Insulation - Rigid PUR - Thickness: 90 mm - State: Dry
- Waterproofing - Built Up Felt - Thickness: 8 mm

Figure 16 - Access to the roof from the third floor

Figure 18 - Water tanks

Figure 17 - Access to the roof from above

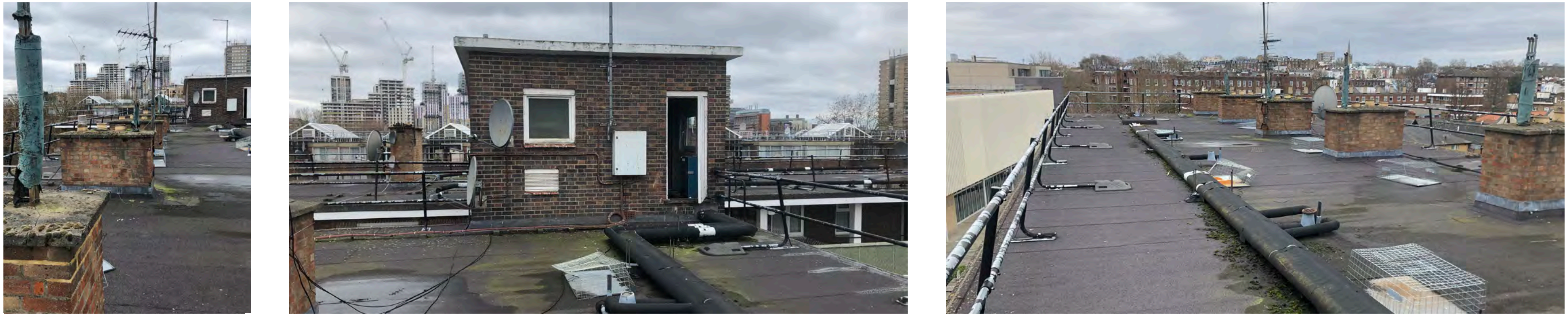


Figure 19 - East wing roof conditions

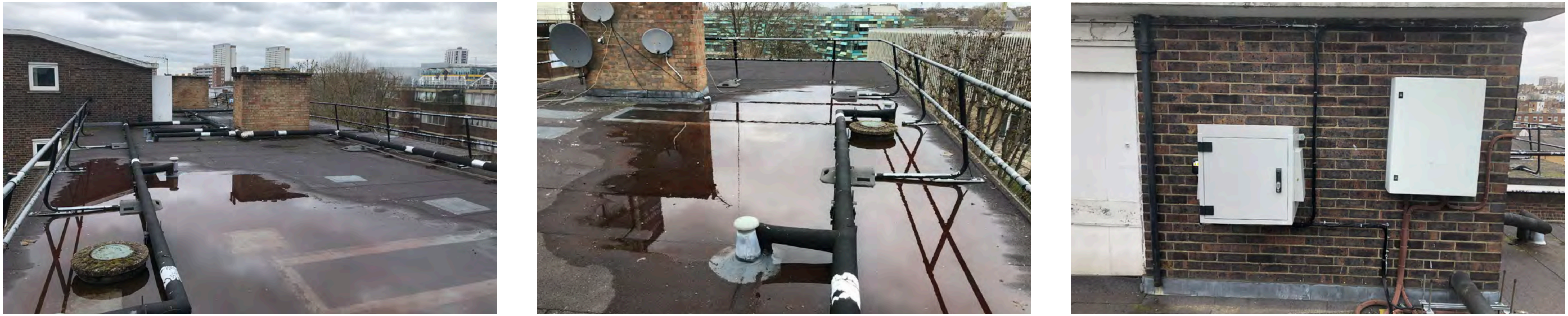
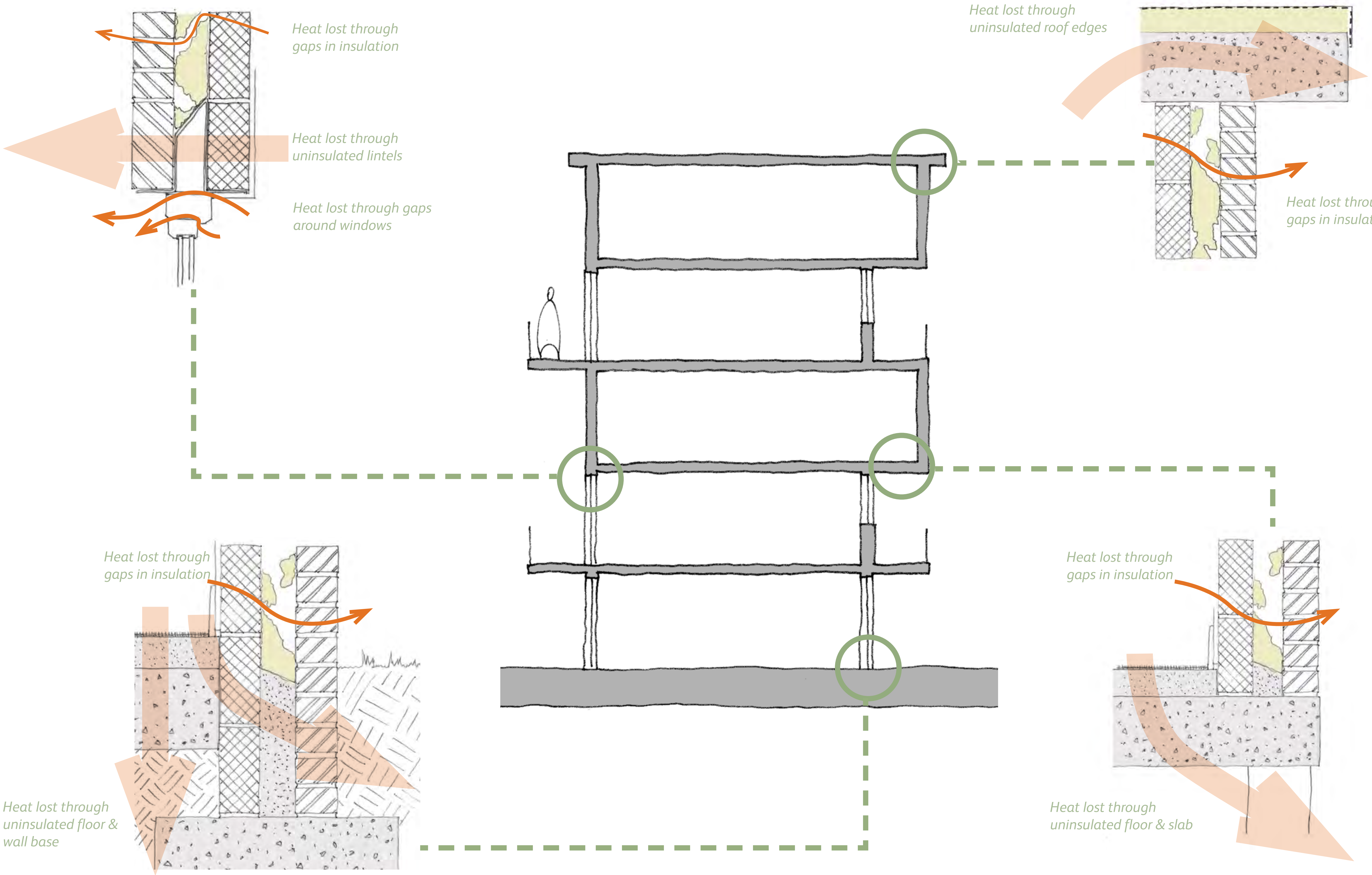


Figure 20 - West wing roof conditions

3.4 EXISTING ENERGY USE & SERVICES



While there is insulation in the cavities of some of the external walls of the block, and insulation to the roof, there are still significant areas where heat is lost from the building. Of particular note are:

- Thermal bridges where concrete floor slabs run from inside to outside. The wall above & below may be insulated, but the concrete passing through provides a 'bridge' for the heat to escape across.
- Not all external walls appear to be cavity walls. It is assumed that the solid walls are uninsulated, and therefore heat loss through these is likely to be greater
- There is assumed to be no insulation to the ground floor, so heat is lost through the screed and concrete floor into the earth below
- The roof insulation is less than 100mm thick, so could definitely be improved
- The building is currently ventilated by trickle vents in windows allowing cold air in and via mechanical fans from kitchens and bathrooms extracting warm air. This solution may provide sufficient ventilation, but wastes much of the heat that is supplied to air inside the home.
- Residents noted draughts around windows (Ideas Day, 2018) and additional warm air will escape here, where windows do not close well or are not sealed into the walls
- Existing windows are double glazed, but the uPVC frames are unlikely to be insulated, so heat will be lost through these. Additionally lintels over windows are probably metal, crossing the insulation line, creating a further 'thermal bridge' for heat to escape.

At the 2018 Ideas Day a number of residents noted mould and condensation in their homes. This is caused by a many of the items above, as specific areas of heat loss will cause cold spots on the inside of walls where moisture in the air can condense. Poor ventilation adds to this problem as moist air is not cleared away.

THERMOGRAPHIC SURVEY

A thermographic survey of the building was carried out by ired remote sensing on 16th March 2021. The full results of this are recorded in their report '*Thermal Imaging Report – Heat Loss & Insulation Survey – Kensington & Chelsea – Treadgold House*' Several of the images are presented here with an explanation, which generally support other construction information.

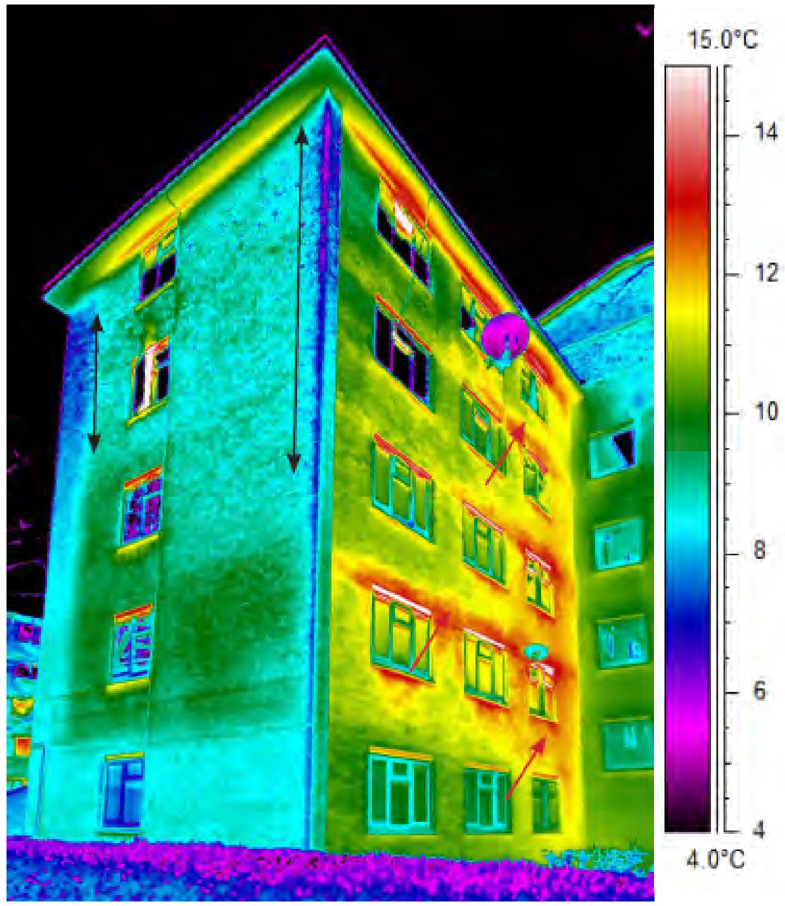
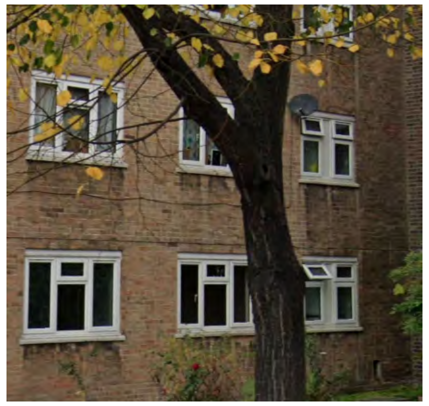


Figure 21 - Wall to the south of the staircore. Red areas above windows show heat is being lost here, presumably through metal lintels that bridge the wall. Larger patches of red above and below windows suggest that the wall is wet here. Cavity insulation may be damp. Drip marks below some of these windows suggest that there may be a problem with drainage from above here. The contractor will need to carry out further investigations to establish the cause of this water marking, and allow to make it good.



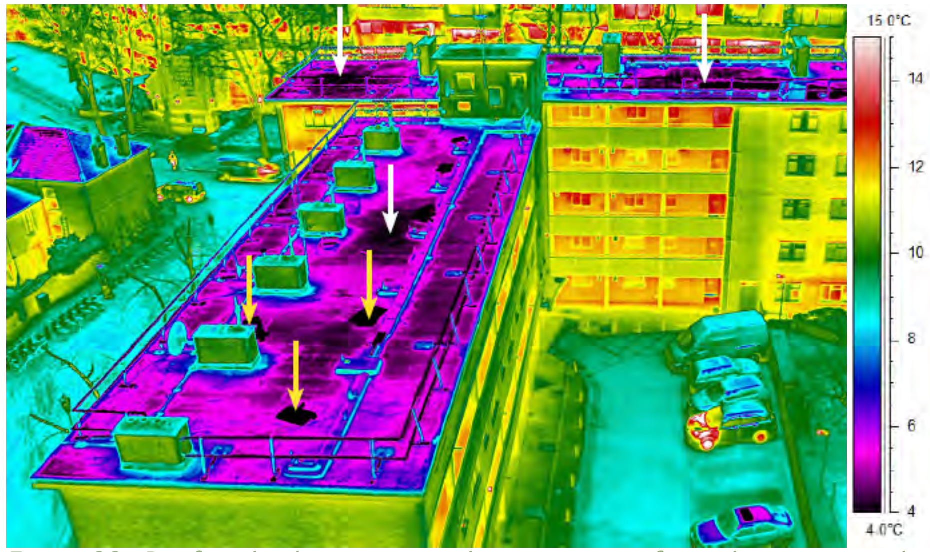


Figure 22 - Roof, with white arrows indicating areas of standing water and yellow arrows indicated discarded items on roof. The roof appears to have a relatively even heat loss, suggesting consistent performance across it. The low temperature recorded on the roof means that little heat was being lost through it. This is consistent with the roof condition report that showed that the insulation was generally dry and consistently applied.

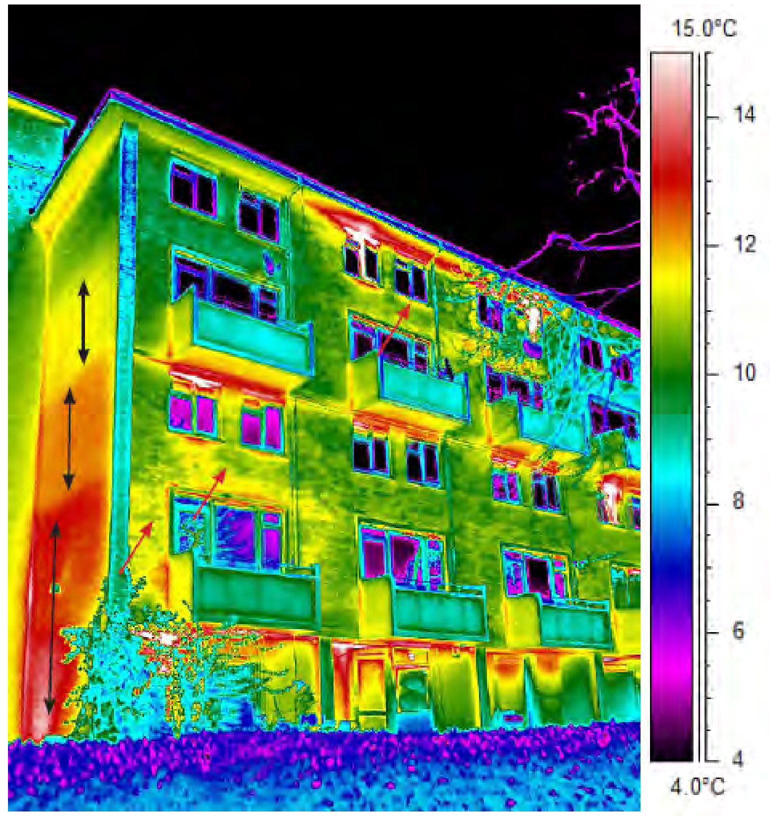


Figure 23 - South facade of the east wing. It is clear that heat is being lost where the balcony floors meet the building as these areas appear red. There is also a lot of heat loss from the ground floor studio screens, suggesting that there is little or no insulation here.

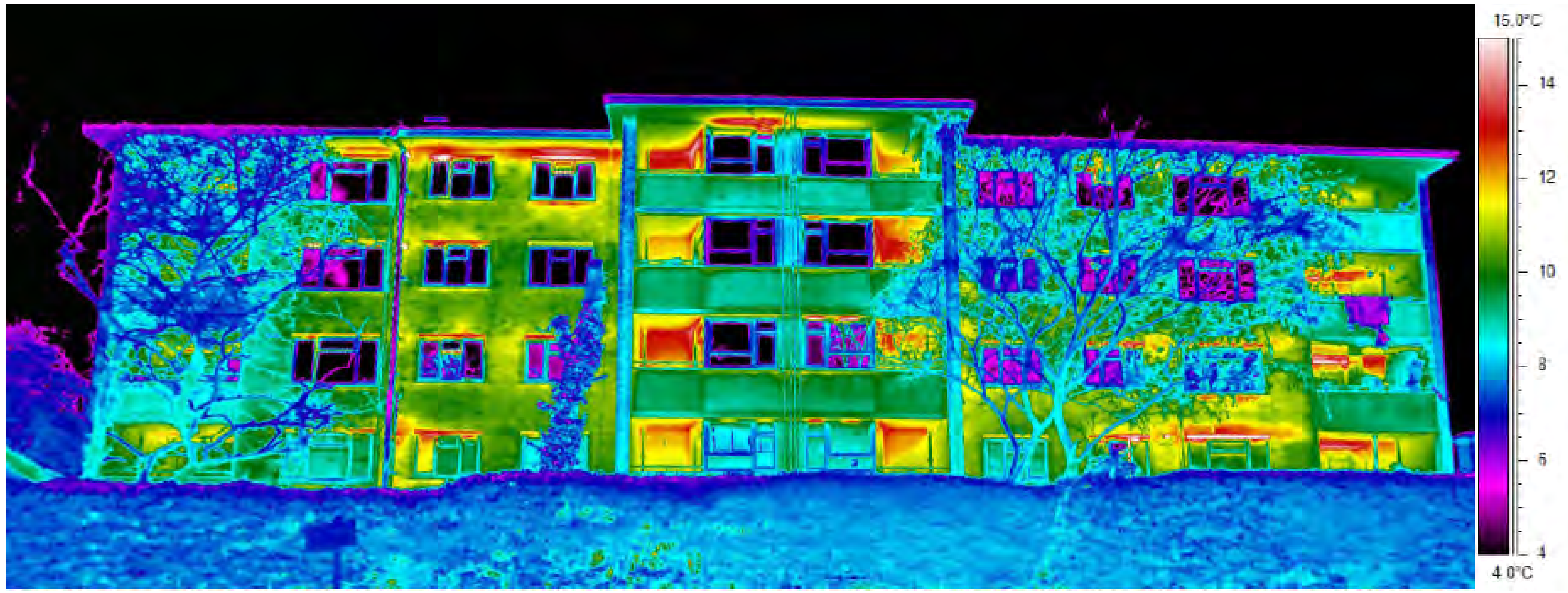


Figure 24 - West facade of the west wing. Red lines above windows suggest heat loss through lintels. Red areas at the back of the balconies to the one bedroom flats show that theses walls are not very insulating

BUILD TEST SOLUTIONS MEASUREMENTS

LWNT commissioned Build Test Solutions to carry out a number of measurements at Treadgold House.

AIRTIGHTNESS MEASUREMENTS

A pulse machine was used to measure the airtightness of one unit, number 2 Treadgold house. This is a ground floor studio flat. The machine emits a pulse of air at high pressure, providing readings for a pressure difference of 4 Pascals. This can then be extrapolated to provide a figure for airtightness at 50 Pascals, which is what is required to feed into the Passivhaus Planning Package (PHPP) model.

	4 Pascals	50 Pascals
Air Permeability (m^3/m^2h)	0.65	3.55
Air Change rate (1/h)	1.03	5.57

Airtightness is expressed in m^3 of air lost per m^2 of building envelope per hour for building regulations measurements. This is the air permeability. The PHPP model however uses the air change rate figure, which is the number of total changes of the internal air per hour.

HEAT TEMPERATURE COEFFICIENT MEASUREMENTS

Additionally Build Test were able to install temperature monitoring devices in 24 of the properties at Treadgold House. These were left in situ for around 3 weeks each during early 2021. By also monitoring the external temperature and taking gas and electricity readings at the start and end of the period Build Test can estimate the energy going into and out of the home. Combining this with information about the geometry of the home they can estimate the Heat Loss Parameter of the Homes and the Heat Transfer Coefficient.

This demonstrates that homes that have more exposed wall, roof or ground area typically lose more heat than mid terrace homes and those on middle floors. It also demonstrated a performance gap between the predicted heat transfer coefficient, calculated on paper, and those measured in reality.

The primary purpose of these measurements is to allow comparison with similar measurements to be taken after the work is carried out. However they can also be used to support the PHPP modelling of the existing building, and to identify any particular anomalies that may warrant further investigation.

Property Type	Sample size	Mean HTC	Mean HLP	Estimated HTC
Studio, ground floor Mid-Terrace	2	60	1.8	67
Studio, ground floor End-Terrace	1	105	3.1	75
Maisonette Mid Floor, Mid-Terrace	3	164	2.4	83
Maisonette Top Floor, Mid-Terrace	1	135	2.0	136
Maisonette Mid Floor, End-Terrace	2	127	1.9	101
Maisonette Top Floor, End-Terrace	2	187	2.7	155
Three Bed Flat, Ground Floor	1	234	2.9	163
Three Bed Flat, Mid Floor	5	166	2.0	119
Three Bed Flat, Top Floor	1	220	2.7	245
One Bed Flat, Ground Floor	2	104	2.7	85
One Bed Flat, Mid Floor	2	100	2.6	64
One Bed Flat, Top Floor	0			124
Average		**146**	**2**	**118**

The recordings also demonstrate the range of temperatures at which residents are keeping their homes at present. These range from mean temperatures of 16.8 degrees up to 25.2 degrees. This will also be important when setting up the Comfort Plan, as residents who prefer a warmer home will end up paying more than the set amount. However they may also find that once draughts have been eliminated they feel comfortable at lower temperatures

Figure 25 - Airtightness testing using a pulse machine

Figure 26 - Monitoring device used to calculate Heat Transfer Coefficient

RETROFIT ACCELERATOR/CARBON TRUST SUMMARY

Prior to the appointment of ECD and other MDC teams LWNT obtained input from Retrofit Accelerator on an estate-wide basis. This high-level study (see report dated 21st May 2020) is based on EPC data and other energy data as well as a site walkaround. It sets out the existing energy use of the homes at Lancaster West and identifies a series of retrofit packages that could be applied to each of the building typologies as part of the route to net zero Carbon.

RESULTS

For Treadgold House the existing heat demand was calculated to vary between 92 and 177 kWh/m²/year, varying slightly between the east and west wings and varying more widely depending on whether the property is ground floor, mid-level or top floor. This suggest Treadgold has a lower heat demand than Lancaster West as a whole, but a higher heat demand than an average UK flat.

Based upon the limited information available at that time this high-level report made several important assumptions about the build-up and condition of the buildings and therefore the authors advise that the results should be treated with caution. Nevertheless, this study highlights the way heat loss and hence energy demand and bills, is likely to vary significantly within Treadgold House, given the variation in size, orientation and location of properties.

Proposals are made for different levels of intervention to reduce heat demand, suggesting this could be brought as low as 22kWh/m²/year in some cases using external wall insulation, triple glazing, roof and floor insulation and improvements to airtightness along with a mechanical ventilation with heat recovery system.

The report then goes on to raise some key questions to be addressed as more detailed investigations and design work are carried out:

- Need to fully understand and address thermal bridges, particularly at balconies and around windows.
- Need to improve ventilation

EVALUATION

While this study is based on relatively limited information, it offers a really useful baseline to test ideas and outcomes against. In the event the Energisprong requirements set out a clear target that needs to be achieved, which is similar to the best case scenario set out by this report.

EPC RATINGS

These EPC ratings have been acquired in the past 12 years but they don't include all the 38 units of Treadgold House. As shown in the table below, all the units surveyed have a "C" EPC rate which is a better performance than the national average. The EPC gives an approximate indication of a home's energy efficiency but as it does not include any accurate monitoring of the heat demand, it is difficult to be sure of the reliability of the results.

ENERGY PERFORMANCE CERTIFICATES

An Energy Performance Certificate (EPC) give and approximate indication of a home's energy efficiency. The most efficient homes have A ratings and least efficient have a rating of G. The average in the UK is a D rating

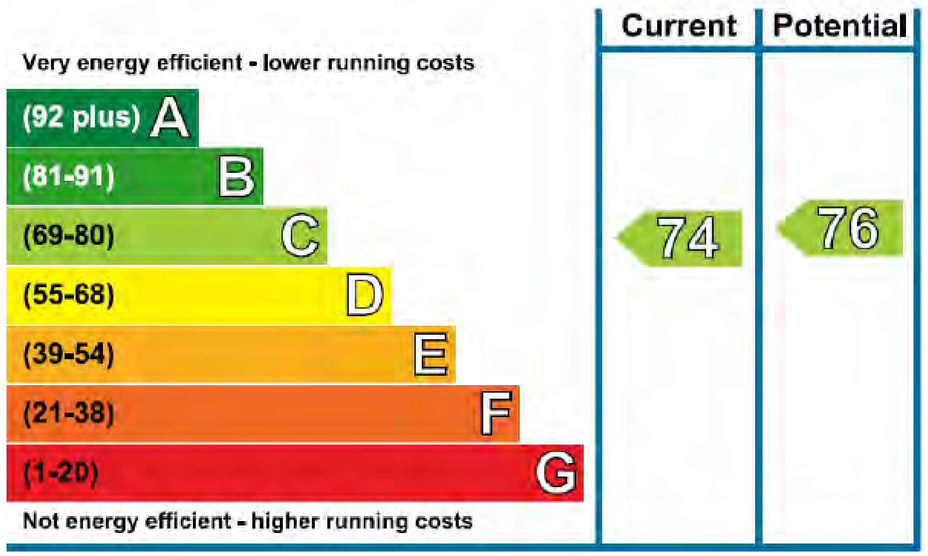


Figure 28 - Energy Efficiency Rating - Example of flat 2

Property number	Type	Floor	EPC band	year	Floor area (m²)	Primary energy use (kWh/m²/yr)	CO_2 emissions (tonnes)	Space heating demand (kWh/yr)	Specific space heating demand (kWh/m²/yr)
2	Flat	ground	C	2015	32	200	1.1	2353	74
5	Flat	ground	C	2020	25	227	1	2156	86
6	Flat	ground	C	2020	25	262	1.2	2807	112
9	Flat	ground	C	2009	43	302	2.2		
14	Flat	mid	C	2011	76	142	2.1	4775	63
17	Flat	mid	C	2017	72	132	1.7	3811	53
19	Flat	mid	C	2020	49	129	1.1	2146	44
20	Flat	mid	C	2009	66	188	2.1		
28	Flat	top	C	2020	74	153	2	5435	73
34	Flat	mid	C	2009	65	231	2.5		
	Flat	**Average**				**197**	**1.7**	**3355**	**72**

Figure 27 - Available EPC information

BOWTIESPRONG MODELLING SUMMARY

As part of the Mustbe0 competition Bowtiesprong produced an energy model of the east wing of Treadgold House using the Passivhaus Planning Package (PHPP). The model assumes the following existing constructions

- External walls - plaster, brick, 50mm cavity, brick. No insulation
- Roof - 150mm rigid mineral wool insulation
- Ground floor - concrete slab with 50mm screed. No insulation
- Air change rate of 35 air changes per hour

RESULTS

This model suggests that the existing building has a heat demand of 289.3kWh/m²/year, far more than the EPCs suggest.

EVALUATION

Far more detailed information is used in a PHPP model than that which goes into EPC models. However Bowtiesprong did not have access to all constructional information, so inevitably assumptions have had to be made. Further time constraints led to modelling half of the building. While it is likely that the two wings of the building are relatively similar constructionally, the differing orientation and inset balconies to the west wing will mean this does perform a little differently.

Investigations since the Bowtiesprong model was made suggest the building may perform better than this suggests. Alteration to wall and roof insulation and to the airtightness suggest a lower heat demand of 158kWh/m²/year.

ECD MODELLING SUMMARY

ECD created their own PHPP model of the existing building, modelling each wing separately. This model assumes the following constructions:

- External walls - plaster, brick, 50mm cavity with blown mineral wool insulation, brick.
- Roof - concrete slab with 90mm PUR insulation
- Ground floor - concrete slab with 50mm screed. No insulation
- Air change rate of 5.6 air changes per hour

RESULTS

This model suggests that the existing building has a heat demand of 123 kWh/m²/year for the south wing and 95 kWh/m²/year for the west wing. While still more than the EPCs for the building suggest, this is somewhat closer to that number.

EVALUATION

This model was able to take into account a measured airtightness value and additional information about the building's construction, as well as modelling both parts of the building, all leading to greater accuracy.

It is interesting to note that solar gains appear to be higher in the west wing, where windows are mostly east or west facing.

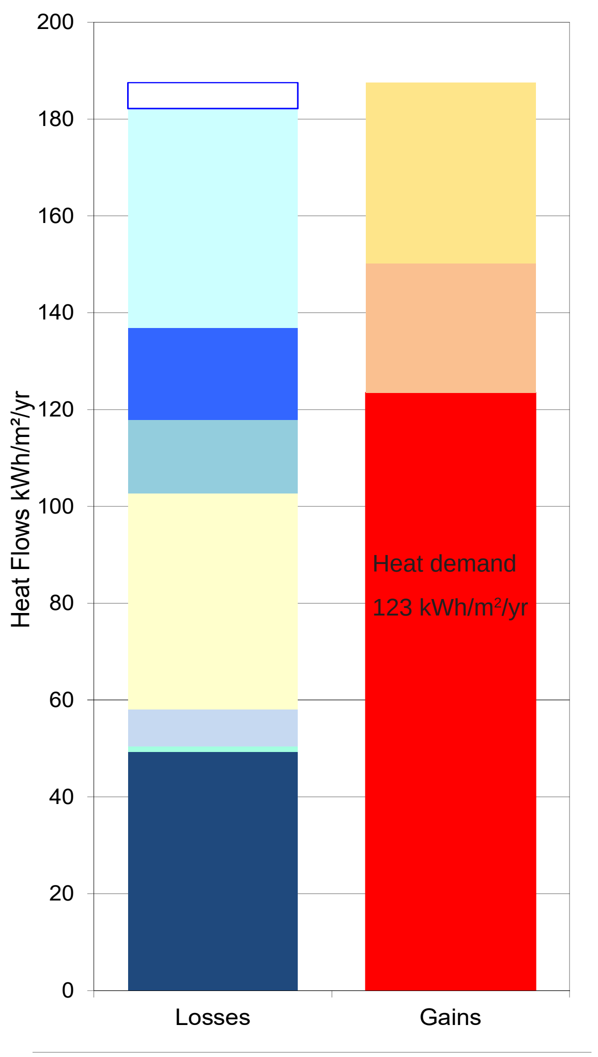


Figure 29 - Energy balance for the south wing

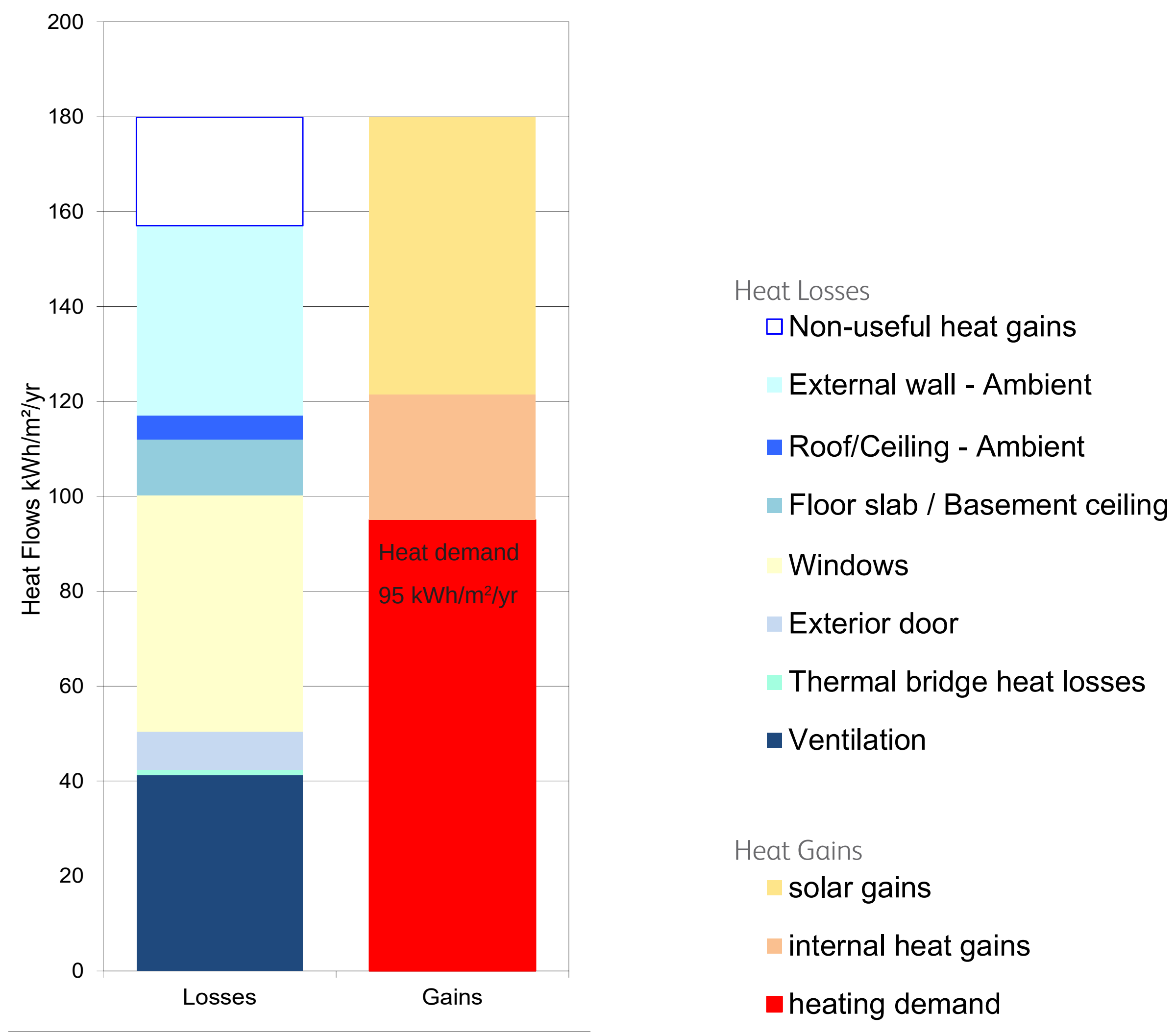


Figure 30 - Energy balance for the west wing

3.4 EXISTING ENERGY USE & SERVICES

SUMMARY

The homes were originally heated by fireplaces, and chimney breast, chimney stacks and original coal hatches remain. It is assumed that chimneys have largely been closed up, though this may not be the case in all leasehold flats. The homes are now heated by gas boilers. These burn gas to heat hot water, which is then provided to taps and to radiators which heat the homes. Boiler flues run across the soffit of the access decks.

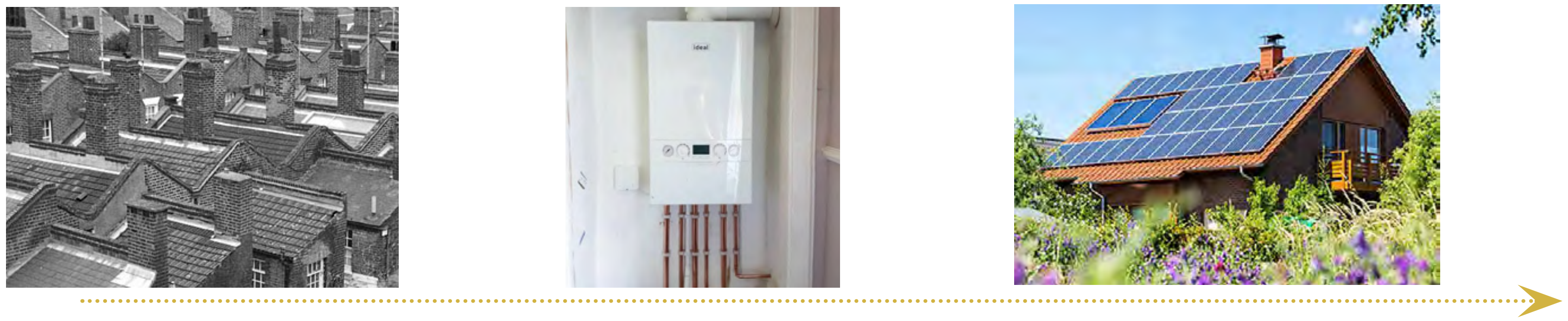
Gas appears to be supplied via an external pipe running up the building's west facade. This appears to be distributed around the building via pipes running across the roof. Internal routes are still to be confirmed.

There are water tanks in the plant room above the stairwell. These are assumed to serve all the flats. However at the Ideas Day it was noted that most residents find their water pressure to be inadequate.

There are no external rainwater downpipes on the building, and it appears that rainwater runs to sumped outlets on the roof. At the west wing of the building rainwater downpipes run at the rear of the inset balconies. It is assumed that in the east wing these run internally, though routes at to be confirmed.

A room below the main communal stairs appears to house the electrical intake for the building.

An intercom system by the car and pedestrian gate to the east of the building is linked to each flat to allow residents to let visitors in. This is audio only.



1960s
Coal

1970s
Gas

2022
Renewables

Figure 31 - Boiler flues to soffit of deck access

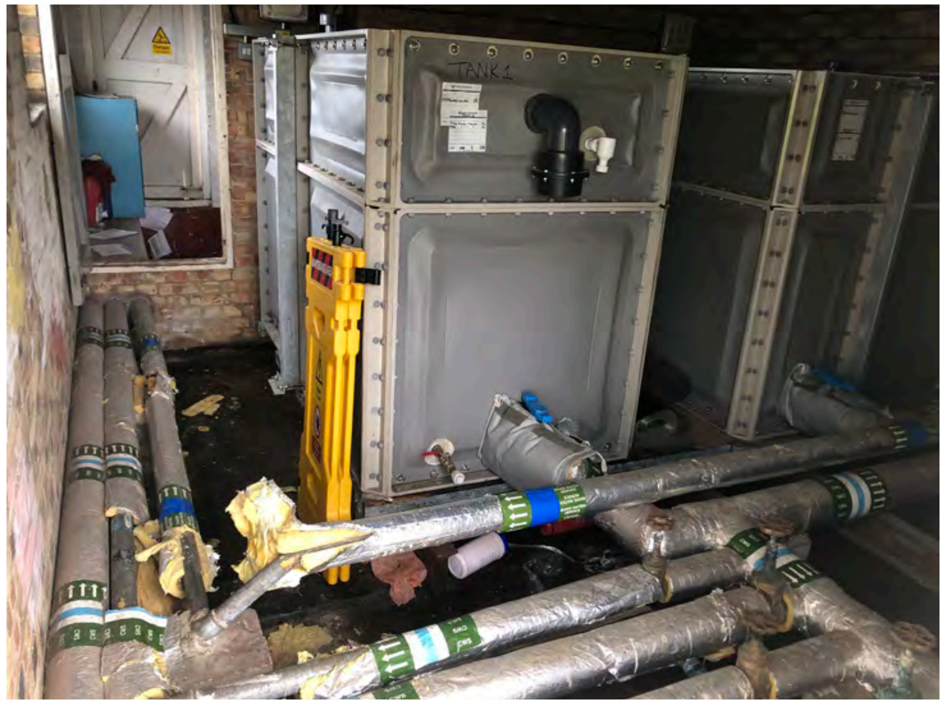


Figure 33 - Water tanks & pipes in rooftop plant room

Figure 35 - Coal chute door

Figure 32 - Rainwater pipes run down rear corner of inset balconies

Figure 34 - Gas pipes running across rooftop

PROCESS

In the light of the Grenfell tragedy and the ongoing inquiry plus the findings of the Building Safer Future report and draft Building Safety Bill; any proposals for changes to the existing buildings will, quite rightly, be required to demonstrate the most rigorous approach to maximising the Fire Safety of residents and the wider community. ECD company policy is to recommend A1 materials on external walls wherever possible and not less than A2 (effectively non combustible) in accordance with Building Regulations Part B. A bespoke non-combustibility tracker will be prepared as the design develops to record all external wall materials and their combustibility. The detailed design information will be reviewed by our independent Fire Consultant and submitted to Building Control for approval prior to the commencement of the works. During construction the contractor will be required to demonstrate to the Clerk of Works (with photographic evidence) the installation of all materials. This evidence will be tagged to the BIM (Building information Modeling) model and will be handed over to RBKC on completion of the works thereby ensuring a 'Golden Thread' of information is maintained from design to completion.

OVERVIEW OF EXISTING

A Type 4 fire risk assessment of the existing building has been carried out for LWNT by Frankhams in April 2020 and this should be referred to for a detailed assessment of the building. This looked at communal areas as well as a sample of flats.

The buildings' overall provision for means of escape in the case of a fire is simple and robust with open deck access allowing smoke to be ventilated easily. A 'stay put' evacuation policy is in place and solid concrete floors and masonry party walls mean that compartments are typically compliant. However a few instances were noted where fire stopping needs to be improved where services pass into risers or through floors.

ASBESTOS REMOVAL

Frankhams carried out refurbishment asbestos surveys in July 2020, prior to fire risk assessment surveys being carried out. This covered the communal areas as well as internal areas of 5no. flats. Asbestos containing material was confirmed in the roof of external stores (away from the main building) and is also presumed to be present in soffits above the ground floor walkway areas. Some areas, such as private stores and the rooftop plant room were not able to be accessed so presence or absence of asbestos could not be established. The report assumes that asbestos will be removed during the refurbishment works, noting that safe working procedures will be required to be put into place in-line with the Control of Asbestos Regulations 2012.

Within the flats asbestos was confirmed to be present in two of the five flats inspected in the bitumen adhesive below carpets and below laminate flooring and in floor tiles. As further site investigations have been carried out, RBKC's asbestos contractor, Manestream, have provided consultancy on locations that need to be checked for the presence of asbestos prior to opening up works.

The Solution Provider will still need to carry out asbestos surveys prior to specific works, as not all flats have been accessed at present and some works will inevitable require interaction with asbestos containing materials, which need to be handled appropriately and removed.

3.6 CO-DESIGN & DECISIONS THUS FAR

Lancaster West Resident Associacion held a a series of co-design events for Treadgold House between January and March 2018.

An extensive engagement programme was carried out during this period, including ideas day events, leafleting and door-knoocking across the estate, block and cluster meetings, attendance at Residents' Association General Meetings, home visits where requested, and telephone and email correspondence.

After various discussions with residents, the following concerns were made about Treadgold House:

- Poor security and access including broken gates, inadequate lighting and limited overlooking.
- Regularly broken and noisy lift causing access issues for residents and general inconvenience.
- Condensation and mould in homes.
- Underused external space. Parking issues, storage is oversubscribed, the garden is not used and there is no play equipment.
- The building and its entrances are hard to find.
- Home layouts do not reflect current patterns of living.
- Balconies are small and of limited use.
- Roosting pigeons are limiting the use of balconies and causing mess on the building.
- Concerns about the general lack of maintenance.

DISCUSSED IDEAS

In response to the issues raised by the residents during the consultation events the consultant team proposed a series of ideas.

All these ideas require further investigation to examine feasibility and costs. They will be discussed with and reviewed by residents.

- Re-plan access and entrances for better safety.
- Install new lift and secure doors to improve circulation.
- New insulation and ventilation plan to improve the temperature and air quality in homes.
- A more usable external space with new entrances, easier to use parking areas, improved storage lockers, bin storage and an improved
- garden and playspace.
- New building boundary with recognisable gates and signage.
- A lighting strategy for the building and outside space.
- Options for homes that maximise available space with a focus on kitchens and bathrooms.

WORKS ACROSS THE ESTATE

These are possible projects that apply to most homes, blocks and external spaces across the estate, and could start before the main refurbishment begins.

- Improve community safety through; additional and better street lighting, providing video door entry systems, and increased CCTV.
- Improve signage across the estate.
- Improvements to refuse areas, including providing space for recycling and disposal of larger items.
- Investigate interim home improvements in advance of full refurbishment, e.g. mechanical ventilation systems, heating, plumbing and water pressure.
- Introduce a local lettings policy to meet local needs.
- Provide secure bike storage, and improve play spaces.
- Make improvements to nursery facilities, and identify options for future location.
- Investigate and resolve pest control issues.
- Usable balcony or garden space.
- Ensuring that designs will stand the test of time, age well and consider future maintenance.

WIDER NEIGHBOURHOOD IDEAS

Key ideas, developed together with local residents, consider safety and security, the quality of open spaces and local streets, architectural identity and the provision of community spaces. As part of the refurbishment of the wider estate, the design and location(s) of nursery and other childcare provision for the estate would be reviewed with residents and service providers with a view to enhancing the current provision.

For more details please refer to the 'Wider Neighbourhood' book which details key concerns, key ideas and possible early projects.

TREADGOLD HOUSE

Safety and security as well as quality of garden space have been identified as priorities for residents of Treadgold House. Lighting and landscape strategies have been proposed that will benefit both local residents and the wider neighbourhood in helping to reinforce safer streets and open spaces.

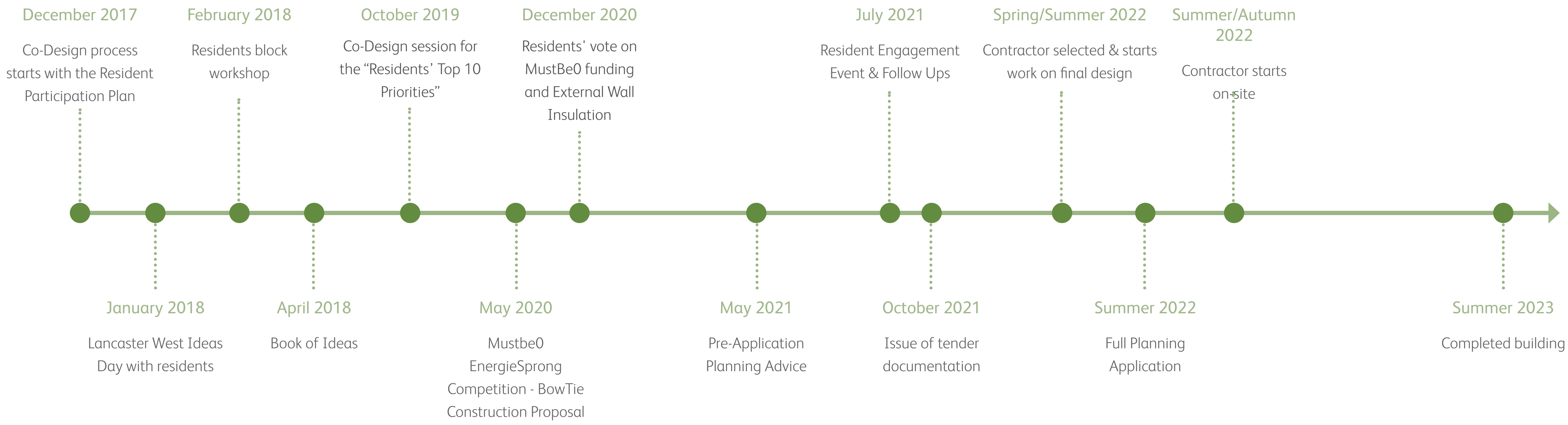


Figure 36 - Indicative timeline

RESIDENTS' TOP 10 PRIORITIES

On the 9th October 2019 the Resident Engagement Team organised a Co-Design session with Treadgold House. This was to establish each residents' priorities for the refurbishment programme from the items available. The residents were contacted via paper invitation, digital invitation and Whatsapp. At that time there were 6 empty properties in Treadgold House and 21 households took part of the Co-design session.

The data collected were ultimately used to write out the "Residents' Top 10 Priorities".

Figure 37 - LWNT online event presenting the Mustbe0 funding opportunity

LATEST ENGAGEMENT

An online event was held in November 2020 to inform the residents about the Mustbe0 funding opportunity. On the 9th December 2020, 87% of the residents voted for the Mustbe0 funding which include the adoption of External Wall Insulation. The result was that 96% of the residents who voted are in favor of EWI. This vote, which is part of the ongoing consultation with the Lancaster Estate residents, was an important step forward for the completion of the design stage for Treadgold House.

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4.0 PROPOSALS

THERMAL IMPROVEMENTS

The most significant works to be carried out at Treadgold House are those to reduce heat demand and carbon emissions to meet the Energiesprong criteria.

On the following pages proposals are made for the various elements that make up the buildings' fabric, setting out why decisions have been taken as they have. The stage 1 report set out a wider range of options for many elements, with pros and cons. These have now been narrowed down to provide preferred solutions in more detail.

Separate reports and drawings presenting the structural, mechanical & electrical, lift and access control proposals are referred to within this report, but should be read alongside it.

Meeting the Energiesprong criteria will be possible but will involve significant disruption and changes to the way residents use their homes, so discussion with residents of the relative benefits is crucial to establish the best way forwards.

OTHER WORKS

Other issues raised by residents are to be addressed alongside these works.

- Communal area redecoration
- Refuse storage improvements
- Internal & external doors
- Door entry systems
- Lighting
- CCTV
- Landscaping works
- Plumbing
- Below ground drainage
- New kitchens & bathrooms
- Fire stopping improvements

OTHER PROPOSALS

This section of the report also addresses proposals for the way the design and construction work will be carried out to ensure safety, good record keeping and an engaging co-design process throughout.

PASSIVHAUS

Passivhaus buildings are designed to use very little energy for heating, while being comfortable and draught free. They need to be designed and built with great attention to detail to allow them to use around 75% less heating than a standard UK new building.

ENERPHIT

This is like the Passivhaus standard, but for existing buildings. It is a little less stringent, but still requires excellent detailing and creates more energy efficient, comfortable homes

PASSIVHAUS PLANNING PACKAGE

The Passivhaus Planning Package (PHPP) is software that helps us build a accurate model of a building's heat loss and energy use. It requires information about the building's size, shape and orientation. as well as how insulating the walls, floors and roof are, and detailed information about the windows

U VALUES

U value tells us how quickly heat energy is lost through a part of a building. The lower the number, the less heat is lost.

ENERGY MODELLING & COMFORT

A Passivhaus Planning Package (PHPP) model of the retrofitted building has been made. The outcomes of this modelling are shown on the opposite page, as a table and graphs.

These demonstrate the dramatic reduction in heat demand that is possible through this deep retrofit of the homes. The work to the homes will not only mean that residents are warmer in their homes, but also more comfortable, with better air quality and no risk of mould. The ability for the Solution Provider to guarantee the building's performance allows an appropriate Comfort Plan to be set up, reducing residents' bills while guaranteeing this comfort.

MODELLING ASSUMPTIONS & GRAPHS

It is assumed that the existing cavity wall insulation is mineral wool and that this is reasonably consistent through out the walls, and remains in place in all scenarios.

CO_2 figures assume carbon emission factor for electricity of 0.351 kg/kWh. *Carbon emission factor for gas = 0.184 kg/kWh

The graphs here each show heat losses on the left hand column of each- heat losses through walls for example are shown in turquoise and are much reduced in both proposed options, but more so in the enclosed decks option. The right hand column of each graph shows heat gains in the building - yellow is gains from the sun through windows, orange is gains from people and equipment in the building and red is the heat needed to make up for all the losses and keep the building warm. The specifics of the PHPP models are expanded on in section 4.23

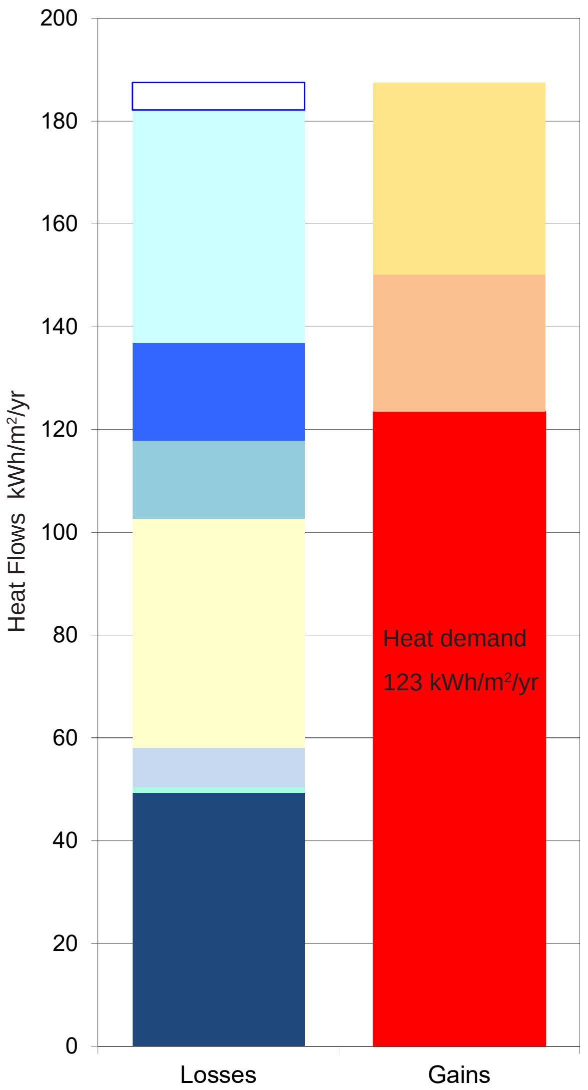


Figure 42 - Existing Building Energy Balance - south wing

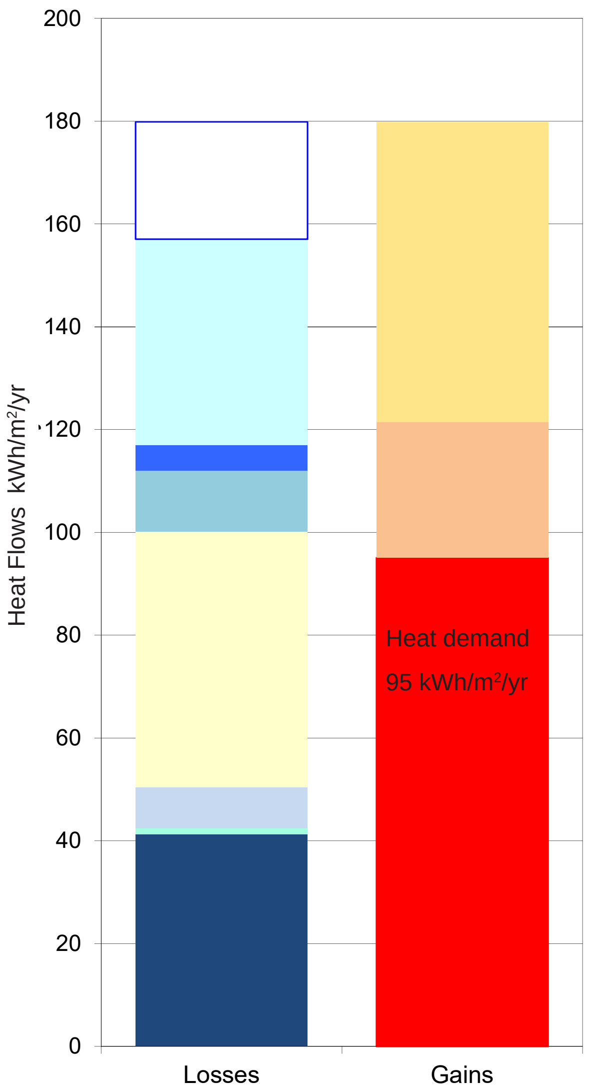


Figure 38 - Existing Building Energy Balance - west wing

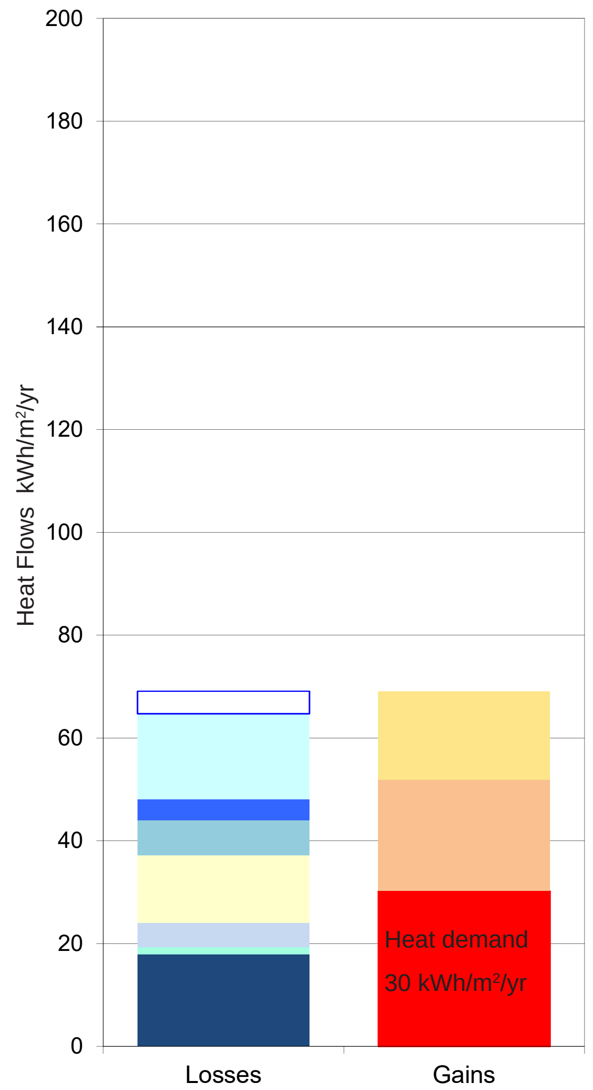


Figure 39 - Retrofitted Building Energy Balance - south wing

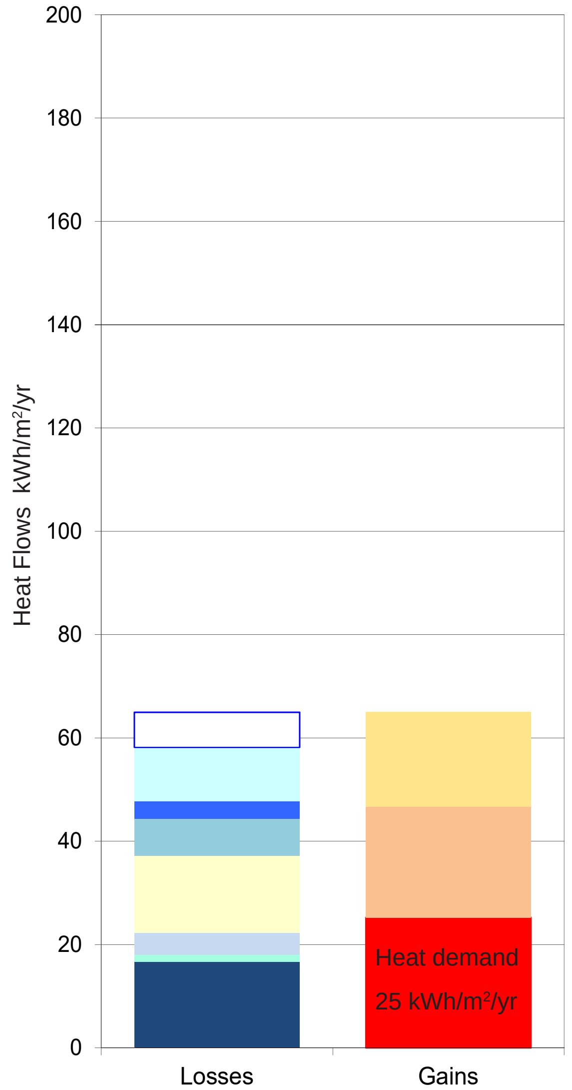


Figure 40 - Retrofitted Building Energy Balance - west wing

LOSSES

- Non-useful heat gains
- External wall - Ambient
- Roof/Ceiling - Ambient
- Floor slab / Basement ceiling
- Windows
- Exterior door
- Thermal bridge heat loss
- Ventilation

GAINS

- solar heat gains
- internal heat gains
- heating demand

Standard	Specific heat demand kWh/m²/yr	Total heat demand (av. flat = 57m²) kWh/yr	Electricity needed to supply this via ASHP (COP3) kWh/yr	CO_2 emitted to do so kgCO2/yr
Existing south wing	123	7011	n/a	1290*
Existing west wing	95	5415	n/a	996
Retrofitted south wing	30	1710	570	200
Retrofitted west wing	25	1425	475	166

Figure 41 - Heat demand & CO_2 figures for the two parts of the building before and after retrofit.
Note that figures do not cover all operational energy use. An assessment of this can be found in TACE's Stage 3 report

EXISTING WALLS

The existing walls are a mixture of solid, loadbearing brickwork, and of masonry cavity walls with some insulation in the cavity. Typically these are wet plastered internally. Lintels, concrete balconies and other items span walls in some areas, creating thermal bridges. Overall there is limited insulation, so walls lose heat faster than they should, and the thermal bridges make this worse. While the wet plastering helps with airtightness, there are gaps in this, so that warm air still escapes from the building.

PROPOSED INSULATION & AIRTIGHTNESS

A new layer of insulation is proposed over the outside of the existing walls, to dramatically reduce heat loss through them. Putting this layer on the outside covers the existing thermal bridges, so that heat is no longer lost via these either. This will most likely be a layer of mineral wool insulation, around 200mm thick to most areas. A new airtightness layer will be added between the existing walls and the new insulation, ensuring continuity of airtightness around the whole building.

The new insulation layer will need an external finish to protect it, and to give the building an appearance that residents are happy with. A variety of options are available for this and will be discussed and agreed with residents. All insulation and external finishes will be non-combustible or of limited combustibility.

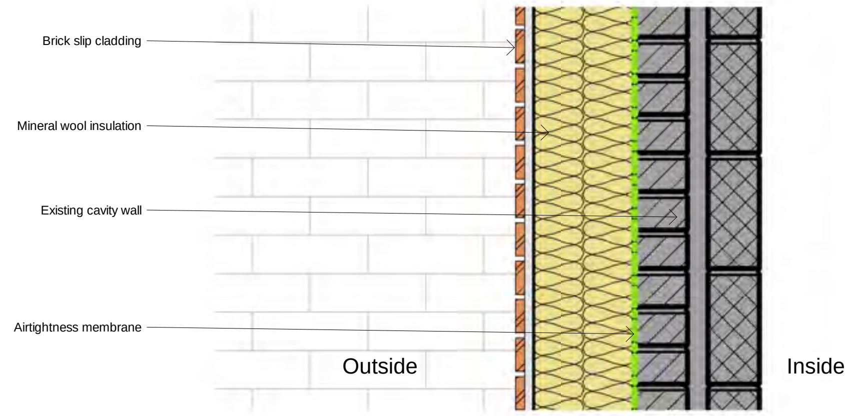


Figure 45 - External wall detail

Figure 44 - Open Deck access areas - Option 1

Figure 43 - Enclosed deck access area - Option 2 and 3

DECK ACCESS AREAS

The existing decks that provide access to individual front doors present a complicated line for this new layer of insulation to follow. One option for the new insulation is to simplify this line, enclosing the existing decks and turning them into corridors. This would offer benefits in terms of installation simplicity and speed, by enclosing the thermal bridges created by the decks and columns and by reducing the building's form factor. However the creation of internal corridors to access the flats also creates challenges in terms of fire escape distances and smoke clearance. Both options have been investigated, and are set out here, but ECD have taken forwards a solution in which the decks remain open and insulation is taken around the line of the existing decks. (option 1).

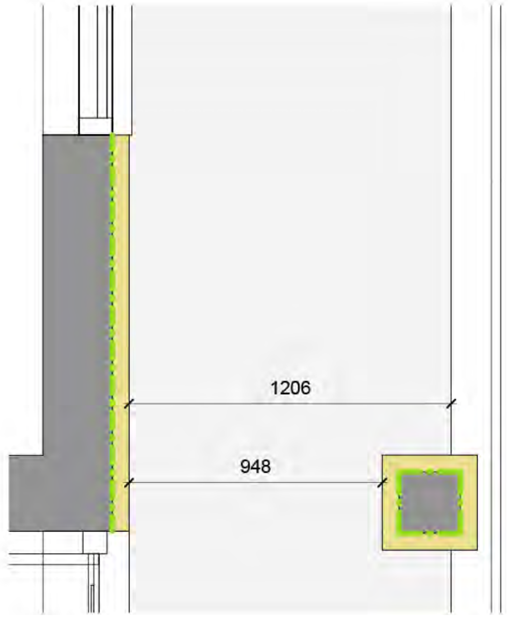
ENCLOSED DECKS

If corridors are created either new fire suppression and smoke extract systems are needed (option 2) or new fire escape stairs are needed, to keep escape distances short (option 3). These options are set out in more detail on pages 61 & 62, along with a flowchart on page 60 that sets out the decision making process that led to the open deck option being prioritised.

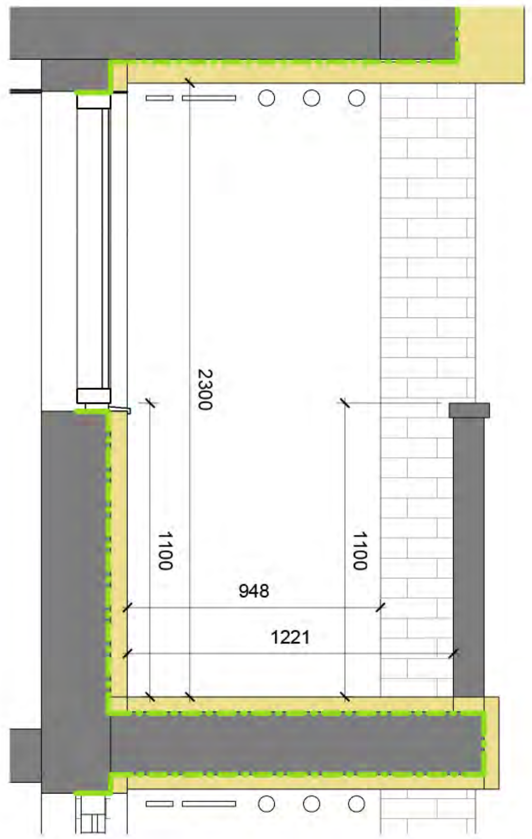
OPEN DECKS - OPTION 1

Due to the difficulties of enclosing the decks, an open deck access option has been taken forwards. This still presents a number of challenges, though a significant benefit is that the way residents access their homes remains relatively unchanged with a simple fire escape strategy, maximising fire safety.

At present the deck access areas are typically around 1.2m wide between wall and balustrade. This narrows down to around 1.05m at each structural column. These areas currently have a head height of around 2440mm from deck floor to the soffit of the deck above. Therefore it will not be possible to insulated these areas with a thick layer of mineral wool insulation, as the decks would become too narrow with low ceilings. Instead it is proposed that these areas are insulated with a higher performance insulation, so that even with a thin layer a similar reduction in heat loss can be achieved.



Plan



Section

Figure 46 - Deck Access Walkway - showing widths & heights required

INSULATION MATERIALS

Two high performance insulation materials have been considered. Slentex is a silica aerogel insulation with a fire rating of A2-s1, d0 (effectively non combustible) and a thermal conductivity of 0.019W/mK. This would be bonded to the existing brick walls, concrete soffit and deck using a mineral adhesive, and mechanically fixed back to ensure the adhesion. This could then be finished with render or a brick slip system.

Calostat insulation has the same fire rating and similar thermal conductivity, but is a more solid board product, intended for use in areas such as balconies over internal spaces, making it appropriate for use to the existing deck areas.

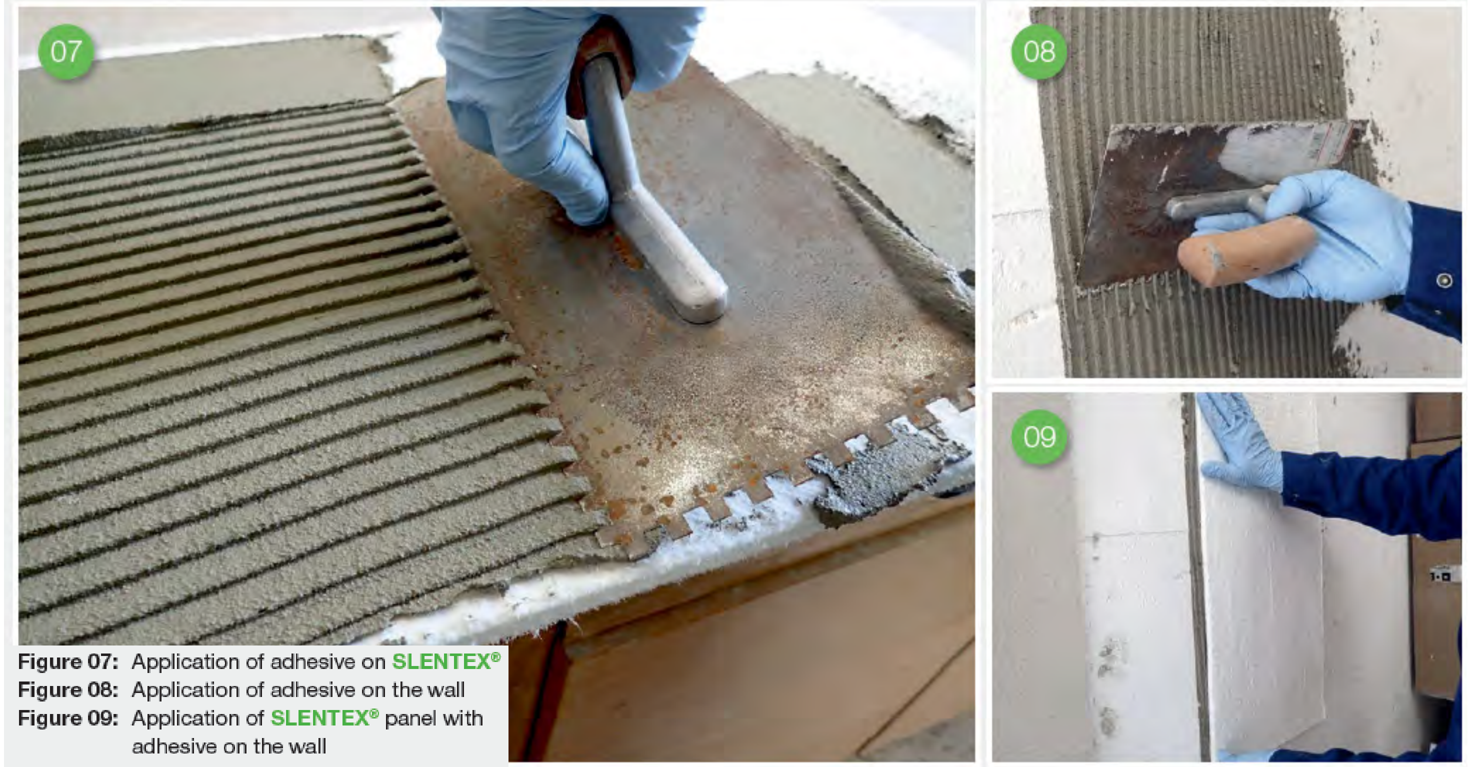


Figure 47 - Slentex panels application procedure

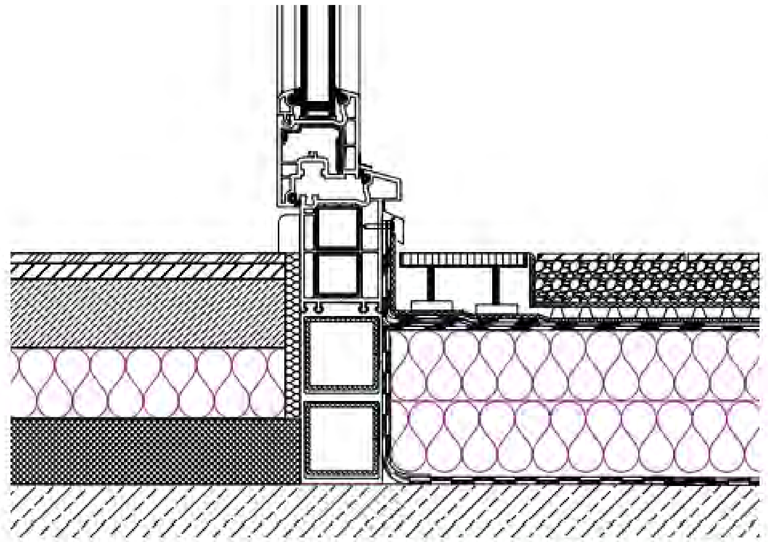


Figure 48 - Calostat typical balcony build up detail

Figure 49 - Calostat boards being intstalled

WATERPROOFING

The existing deck waterproofing layer will be removed and replaced with this new insulation layer and waterproofing with falls created away from the homes, so that water will run off into new rainwater pipes outside the deck areas. At present there is a step up into each home and these will be retained, so that inspite of the thicker deck floor build up, the external floor level will still be lower than the thresholds.

The new waterproofing membrane will be at least class A2-s1, d0 (effectively non combustible). The decks are considered to be specified attachments to the external wall, and the building is to be treated as a 'relevant building'.

Newton 103-S liquid waterproofing membrane is class A2-s1, d0 (effectively non combustible) and is a liquid applied membrane that could be used. Coloured sand or grit cast over the surface provides a slip resistant finish.

Figure 50 - Installation of Newton 103-S waterproofing membrane

BALUSTRADE

The existing balustrades to the deck areas are concrete with a panelised pebbledash finish externally. The concrete appears to be contiguous with the concrete floors to the decks and has a capping at the top with a metal handrail above. The balustrade runs outside the columns. Even if the deck floor is insulated this balustrade creates a thermal bridge if left in-situ and uninsulated. If the balustrade is replaced or is insulated the columns will still create thermal bridges.

Under current building regulations the balustrade ought to be impervious to smoke up to 1100mm above finished floor level, to avoid any smoke from the floor below being able to rise to the deck area on the floor above in the event of a fire.

Therefore the proposal is that the existing balustrade be removed and a new, solid balustrade be constructed, with its top 1100mm above the deck level. This would be fixed to the existing concrete floor slab with thermally broken fixings, so that the new balustrade does not need to be insulated. It is proposed that the existing columns are insulated to minimise the thermal bridges here.

Building Regulations Part M4(1) requires a minimum width of 900mm for access to homes. This will be maintained by using thinner insulated to columns if necessary, and a render finished is proposed here to minimise the overall build up thickness.

Alternative solutions are certainly possible here, as shown on the sketches. The final designer will need to carry out more detailed thermal modeling to establish how bad a thermal bridge there might be for their chosen solution and also confirm that there is no risk of this creating cold spots internally which could lead to mould.

WINDOW SILLS

Windows facing the deck areas should have sill heights of at least 1100mm above finished floor level, so that it would be possible to crawl along the deck below any smoke from a fire inside a flat. Some deck-facing windows currently have sills lower than this, and it is proposed that these sills be raised as windows are replaced.

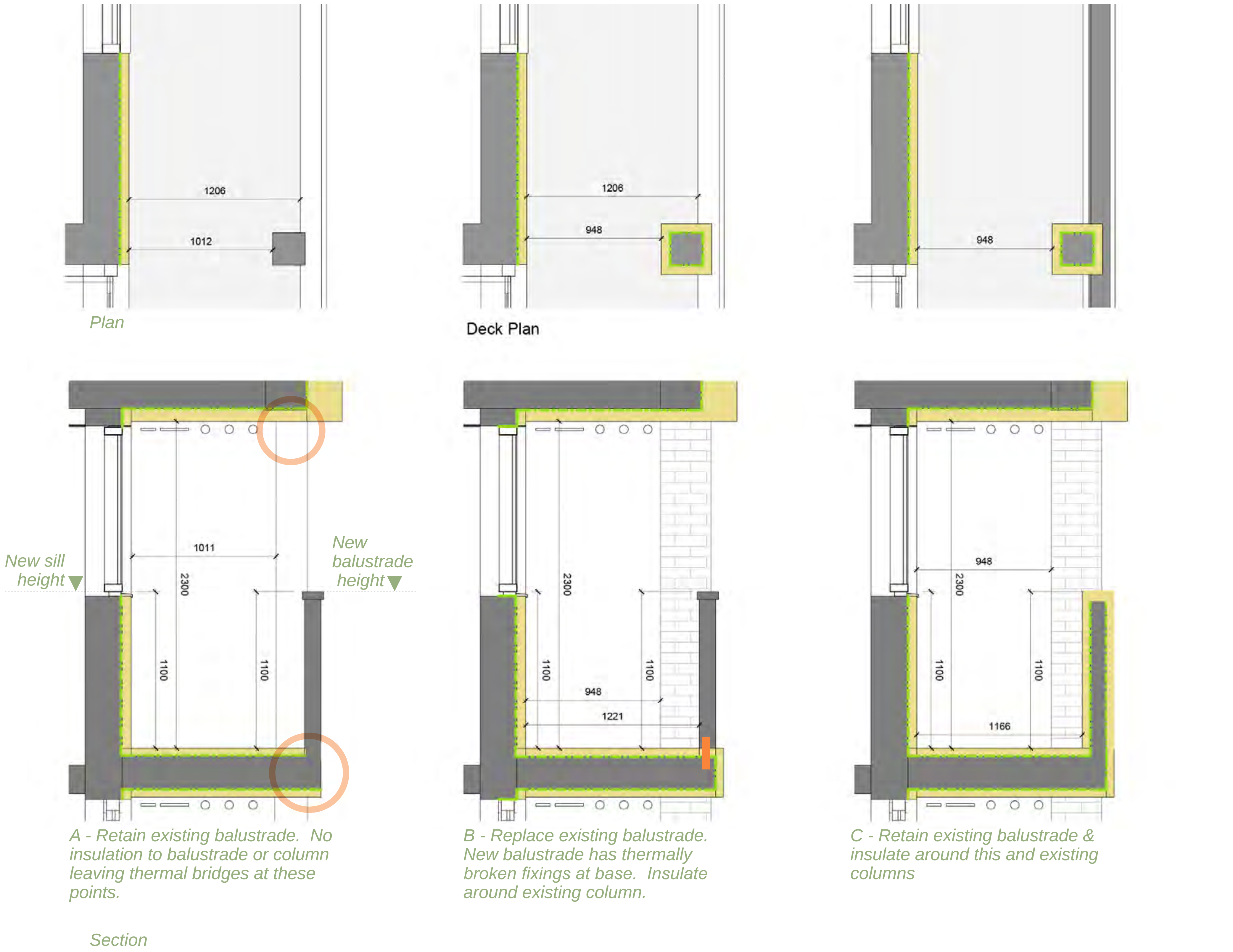


Figure 51 - Insulation options for the Deck area and balustrade

INSULATION TO MAIN AREAS OF WALL

The Energiesprong approach seeks innovative methods for the installation of new insulation and a range of approaches are available. The final Solution Provider will need to determine the specific approach and verify this in terms of technical and fire safety performance.

THICKNESS

The energy modeling carried out for this advisory design proposes a 200mm layer of mineral wool insulation to the outside face of the main areas of Treadgold House's walls (other than those facing deck access areas). This will give U values of around 0.142 W/m^2K. It is important that insulation be as continuous as possible around the building's whole envelope, covering areas where brickwork steps out. However in the open deck option the two wings of the building are treated as separate thermal areas, each independently insulated. While insulation is shown around the stairwell area, this will be an unheated space. Insulation here is to minimise the thermal bridge effect, as these existing walls abut those that form part of the insulated areas of the building.

AIRTIGHTNESS

The pulse airtest carried out in one property so far gave an air change rate of 5.57 per hour at 50Pa. In order to meet Energiesprong requirements this must be reduced to 3 air changes per hour or fewer. It is proposed that a new airtightness layer is included outside the existing building's walls and roof, under the new insulation. Again continuousness is very important, and the specific system and detailing will be critical. Particular challenges are noted are at

- the ground floor, where the slab itself is airtight but connecting to this will be hard to ensure
- the staircore, where the airtightness line needs to run around the flats, but this line is penetrated by the existing brick walls of the staircore.

A further challenge is the availability of suitable products on the market: the majority of existing airtightness products are not A1 or (effectively non combustible) rated for non-combustibility. One solution may be the use of a parge coat to provide airtightness, which typically would be non-combustible. However where systems have been tested as a whole and have an appropriate fire test certification, in spite of including a very thin layer of more combustible airtightness membrane this may be acceptable, subject to client approval.

WALL BASE

As residents will remain in situ during the works it will likely be too disruptive to insulate the ground floor itself. Additionally insulating this internally would leave thermal bridges where internal structural walls rise through the existing slab. Therefore it is proposed instead that new insulation is added below ground level. Creating a 'skirt' of insulation around the base of the building helps to keep the earth below the ground floor slab warm, so that less heat is lost through the floor. This will ensure that there are no cold spots internally, while also reducing heat loss overall.
This will require digging a trench around the outside edge of the existing foundations and installing insulation up against these. This is proposed to be Foamglas insulation, as this is waterproof and non-combustible to maximise fire safety. Precise details will need to be developed, but including this insulation reduces heat loss by 3 kWh/m^2/year.

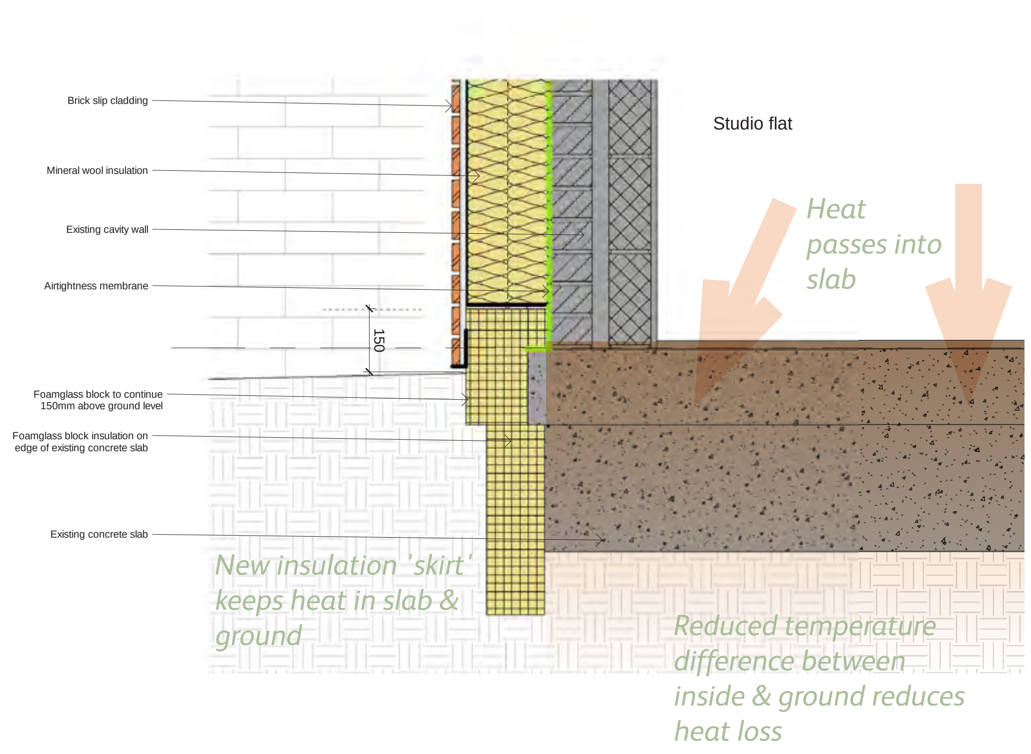


Figure 52 - Insulation of Ground Floor Slab - South & West Facades

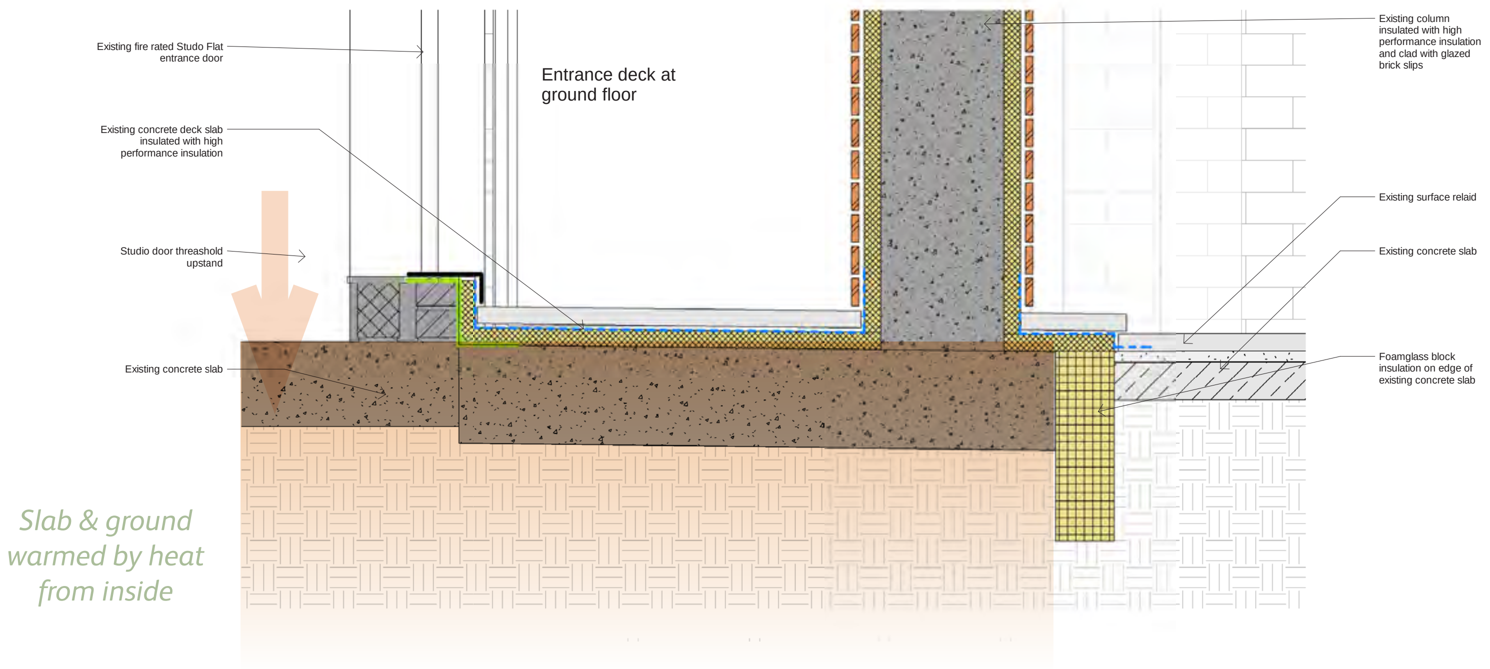


Figure 53 - Insulation of Ground Floor Slab - Deck Side

INSTALLATION

As noted a range of systems have been developed by different suppliers and designers, and the specific solution used will be down to the Solution Provider. It is also noted that if a open deck solution is taken forwards it is likely that this will need to be separately installed on site, as following the more complex lines of the deck areas is not likely to be possible with off-site production.

The following pages present an appraisal and images of possible insulation installation methods, and presented here is a diagram of potential panelised modular installation. In such a scenario the existing walls would first be made airtight and then facade panels, including insulation, new windows and external finishes would be brought to site and fixed back to the existing structure.

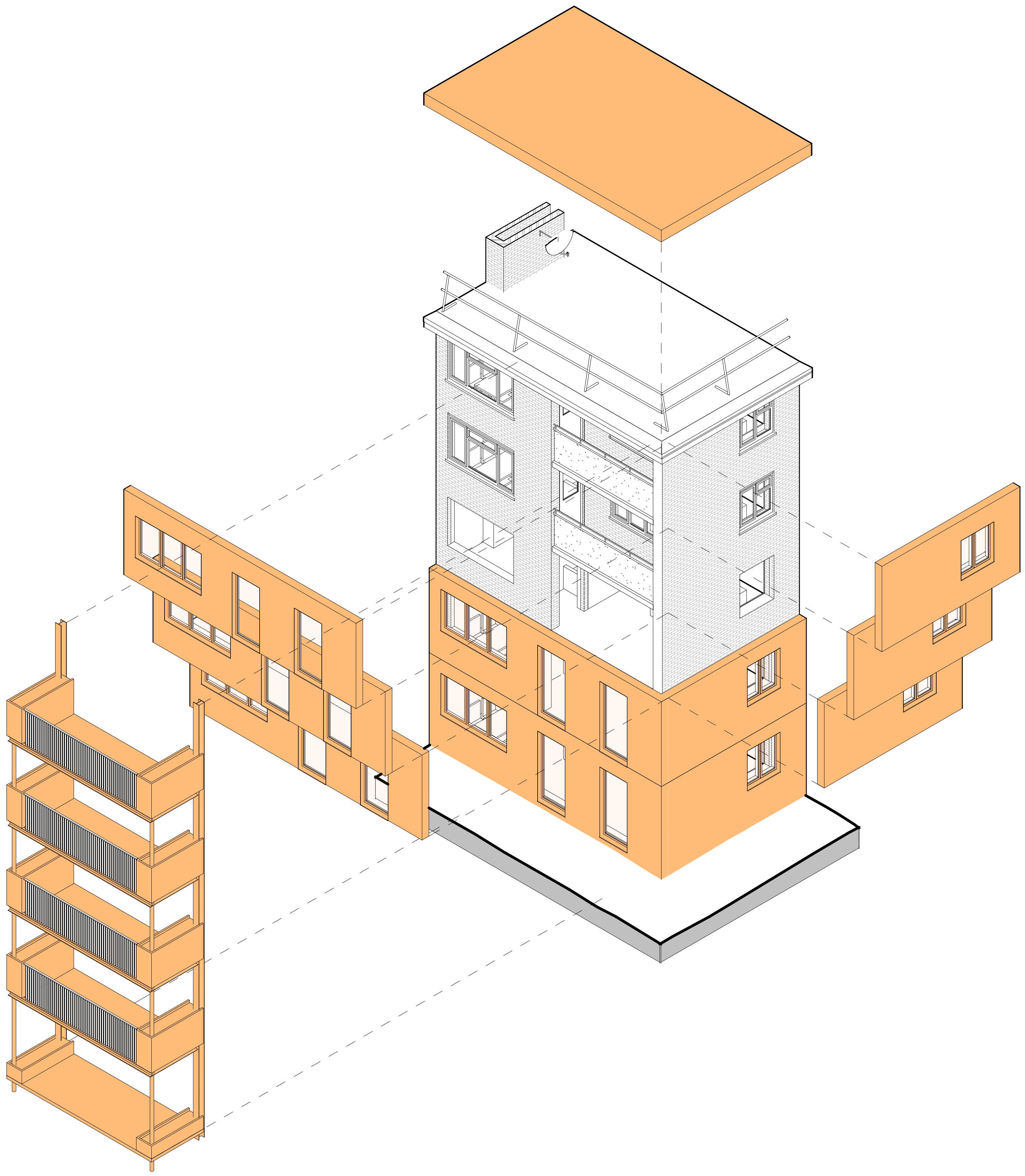


Figure 54 - Diagram external wall insulation installation process

4.2 INSTALLATION OF NEW INSULATION

SCENARIO A - TRADITIONAL ON-SITE INSTALLATION

- install parge coat
- site apply external wall insulation
- site apply external finishes (render/brick slip)

BENEFITS

- Better suited to irregular shapes
- Less large equipment on site
- More traditional construction techniques

MAXIMISING FIRE SAFETY

Non-combustible facade materials and junctions with existing building sealed with intumescent materials.

Quality of workmanship on site must be overseen to ensure no voids created behind insulation etc.

SCENARIO B - 'KIT OF PARTS' INSTALLATION

- install parge coat
- install brackets on existing fabric
- install the steel frame and the substrate board
- infill cavity created with mineral insulation
- apply facade finish

BENEFITS

- Shorter construction period
- Better control over junction details
- Less material stored on site
- Fewer people working on site
- Quality control in the factory

FIRE RISK MITIGATION

The main products within the system are all class A non-combustible

(Bracket, Knauf Insulation, Magply, Brickslips)

SCENARIO C - MODULAR INSTALLATION

- install parge coat
- build the facades in the factory

bring the modular pieces to site

- fix the module into place

BENEFITS

- Fastest construction system
- Better control over components assembly (walls/windows/doors)
- Less material stored on site
- Less people working on site
- Quality control in the factory

FIRE RISK MITIGATION

The system can be designed and tested in detail in the factory.

Better control over the assembly of the parts.

More guaranteed systems are usually available if the product is built off-site.

Figure 56 - EWI construction process

Figure 55 - Brick slips being installed over EWI

Figure 57 - Airtight window installation

Figure 60 - Beattie Passive system construction process

Figure 59 - Beattie Passive system completed / in-progress retrofit schemes

Figure 58 - Melius Homes Modular construction process

Figure 61 - Melius Homes Modular completed retrofit schemes

EXTERNAL APPEARANCE

The new insulation layer will need to be finished with a durable, waterproof covering. This offers an opportunity for residents to be involved in determining the appearance of the finished building. While all proposed materials must be non-combustible to maximise fire safety , a range of options exists. A number of options will be presented to residents at the engagement event on 15th July, with feedback from this forming part of the tender package. Input is also to be gathered at the pre-application planning meeting.

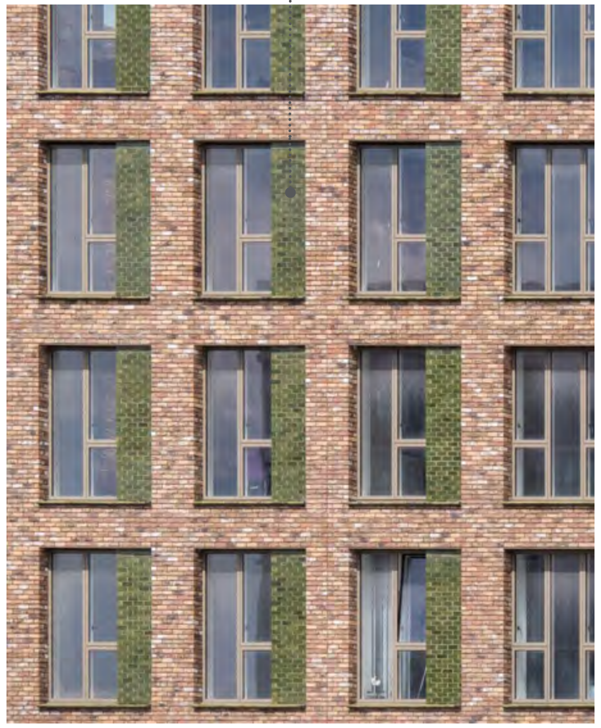
Brick slips could allow the retrofitted building to retain a relatively similar appearance to the existing, but use of varied colours and brick laying patterns could also be used to introduce focal points to the building's facades. Render could also be used over the insulation, and through coloured renders allow the use of a range of colours without the need for frequent repainting. Typically render will require a thinner overall build up than brick slips, so this may be particularly appropriate to the deck access areas, where wall thickness is critical.






Recessed brick detail

Glazed brick details



Projecting brick detail

Brick patterns

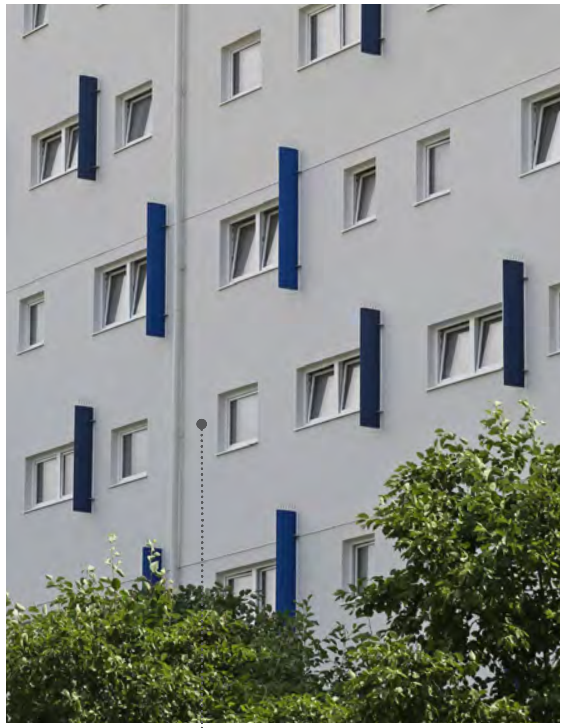
Multi coloured brick pattern

Louvre to mitigate overheating

Figure 62 - External wall finishes solutions - precedents

Highlight the facade module

Coloured render



Render

Render composition

Figure 63 - External wall finishes solutions - precedents

Render composition with graffiti feature

Projecting brick composition

Figure 64 - External wall finishes solutions - Treadgold House visuals

EXTERNAL APPEARANCE

In order to present residents with a range of finish materials, as well as balcony options, ECD have created a range of visuals. The intent was to offer a broad range of options to elicit discussion and ensure residents understood that this critical decision has not yet been taken and their input is vital.

It is not suggested that any one option is the 'right' one, but that they cover a range of features and finishes that could be used, so as to gather opinions on what is desirable. These are presented on the following pages, and resident feedback on these materials is set out in the accompanying Initial Ideas Feedback Report.

Figure 65 - View of retrofitted Treadgold House from the south east with white render finish and pastel render details featuring graffiti artwork on the east wall

Figure 66 - View of retrofitted Treadgold House from the car park with white render finish and pastel render details to pick out the deck areas

Figure 67 - View of retrofitted Treadgold House from the south west with white render finish and pastel render details around the window openings. The ground floor is a pale grey brick, to add durability where the building meets the ground.

4.3 EXTERNAL WALL FINISHES

Figure 70 - View of retrofitted Treadgold House from the south west

Figure 69 - View of retrofitted Treadgold House from the south east, with perforated balcony balustrade and protruding brick detailing between windows and to the east wall

Figure 71 - View of retrofitted Treadgold House from the car park with details of protruding brick composition around the window openings and white render finish in the deck area

Figure 72 - Detail showing protruding brick detail to pick out ground floor and around windows, as well as vertical shading to west facing balconies

Figure 74 - View of retrofitted Treadgold House from the south west with soldier course brick detailing and darker brick colour highlighting the ground floor

Figure 73 - View of retrofitted Treadgold House from the south east with soldier course brick detailing and darker brick to ground floor

Figure 75 - View of retrofitted Treadgold House from the car park with details of different brick composition along the stairwell to highlight the building's volumes

Figure 76 - Detail showing green glazed bricks to walls & columns to deck areas

4.3 EXTERNAL WALL FINISHES

Figure 78 - View of retrofitted Treadgold House from the south west with details of yellow powder coated aluminium frame around the window openings

Figure 77 - View of retrofitted Treadgold House from the south east, showing balcony structure partially supported from abomve

Figure 79 - View of retrofitted Treadgold House from the car park with details of yellow powder coated aluminium frame around the window openings and white glazed bricks to deck areas.

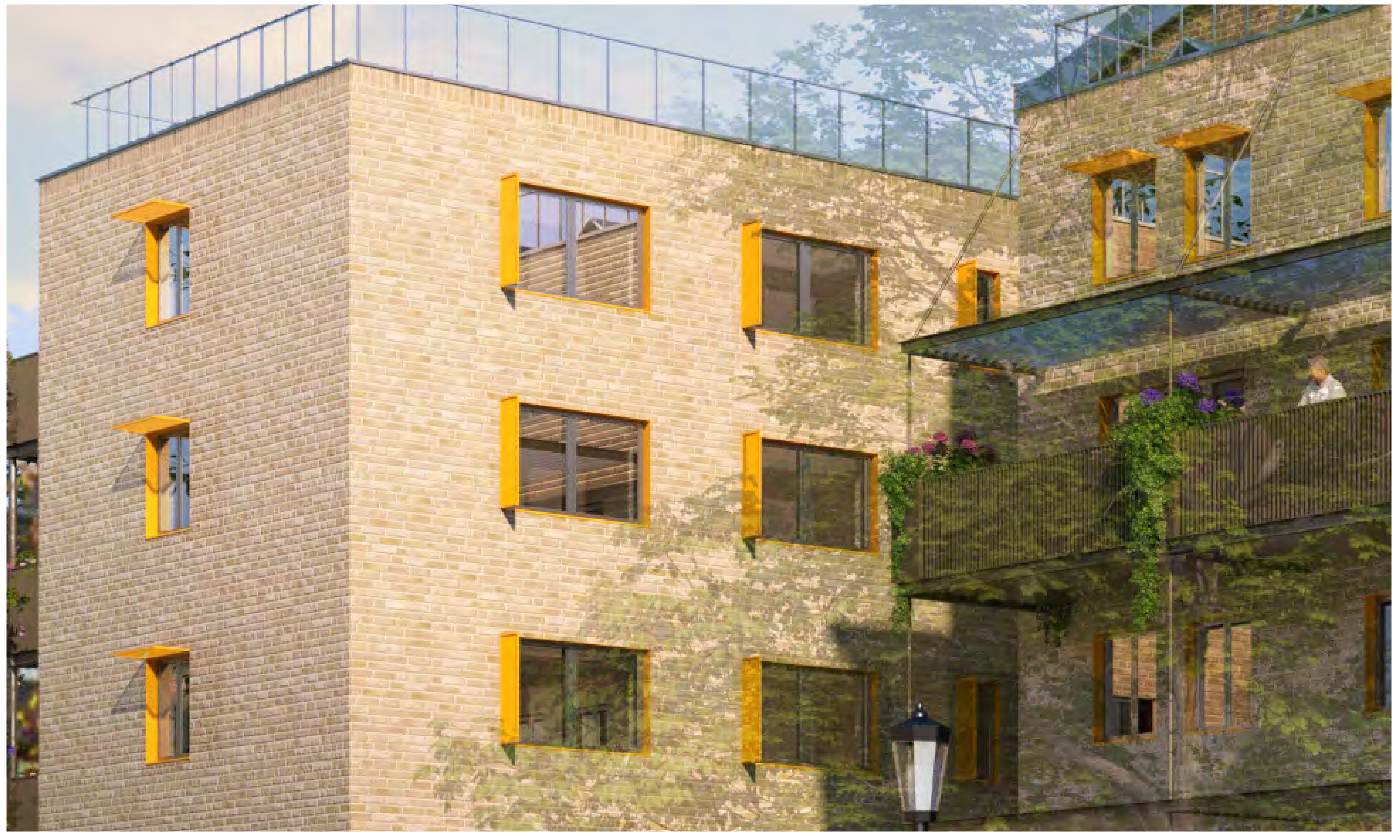


Figure 80 - detail showing coloured powder coated metal window reveals & shading to windows

CONSIDERATION OF DECK ENCLOSURE

At stage 1 the design team looked at options for enclosing the access decks areas, creating corridors here, as well as the option developed here with open decks. While the open deck access option has some technical challenges, these appear to be surmountable, so that the building can meet the Energiesprong criteria with open decks. It is noted however that some further testing and design is needed as the proposal is designed in more detail.

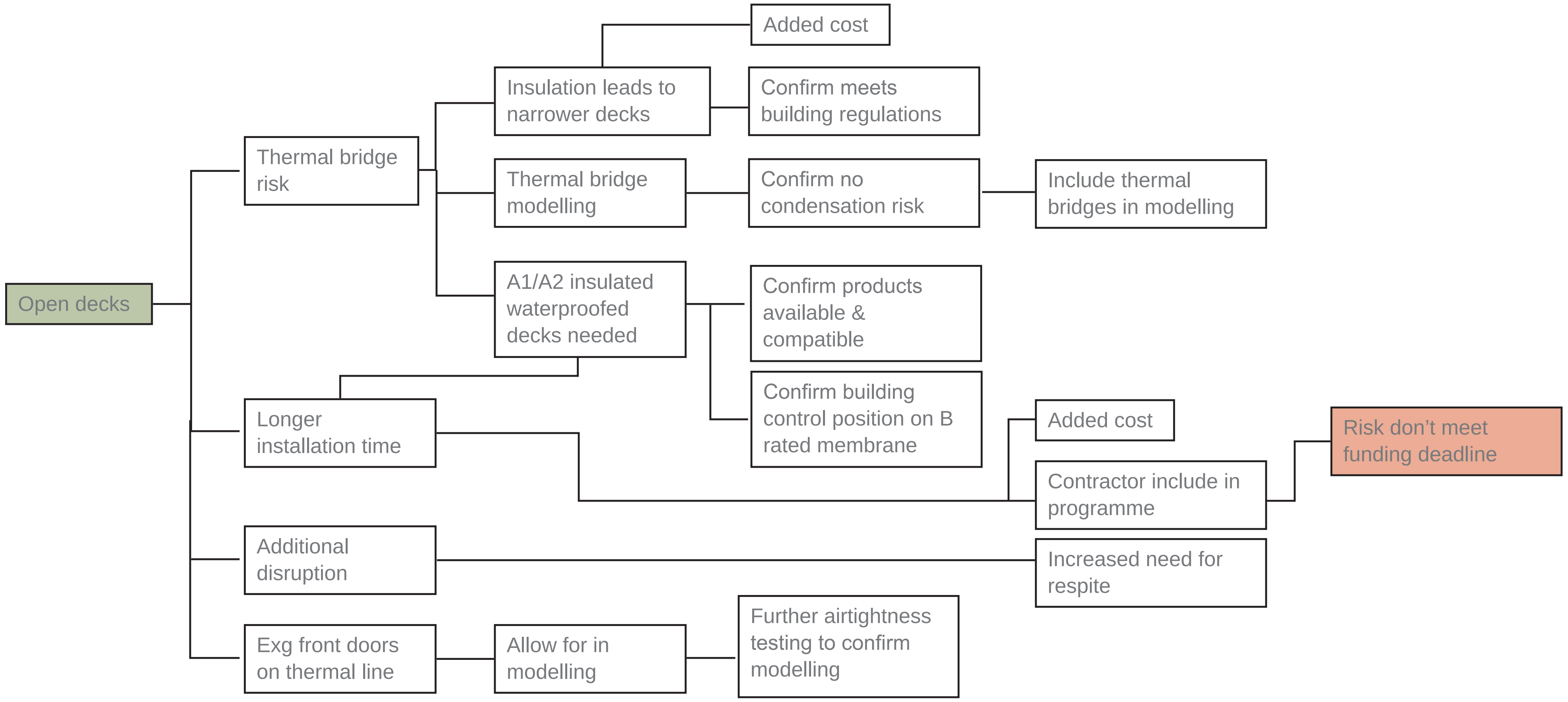
The enclosed deck options, while the 'simpler' solutions in terms of thermal envelope, have a number of knock-on implications that create risks that are less easily controlled by the design team. While the Energiesprong model seeks to leave as much design control as possible with the contractor, some of these risks may be too great for LWNT.

The flowchart on the following page sets out these technical and other risks, highlighting areas that are likely to need resident assent, client acceptance and other outside confirmation.

Figure 81 - View down current open access deck

Figure 82 - View of access decks to west wing flats

4.4 ENCLOSED DECK OPTIONS



OPEN DECKS

Pros

- Less change to way building works
- Kitchen & bathroom windows function as at present
- Building looks more similar to existing - more acceptable to some residents
- Less risk of overheating
- Fire escape strategy remains similar with no complex measures

Cons

- Access deck narrowed
- Harder to install so more risk of poor workmanship
- Insulation to access decks has to be thin to avoid level changes, so will be less effective
- Challenge to design appropriate insulating, waterproof floor detail for these deck areas
- Existing flat front doors remain regardless of airtightness

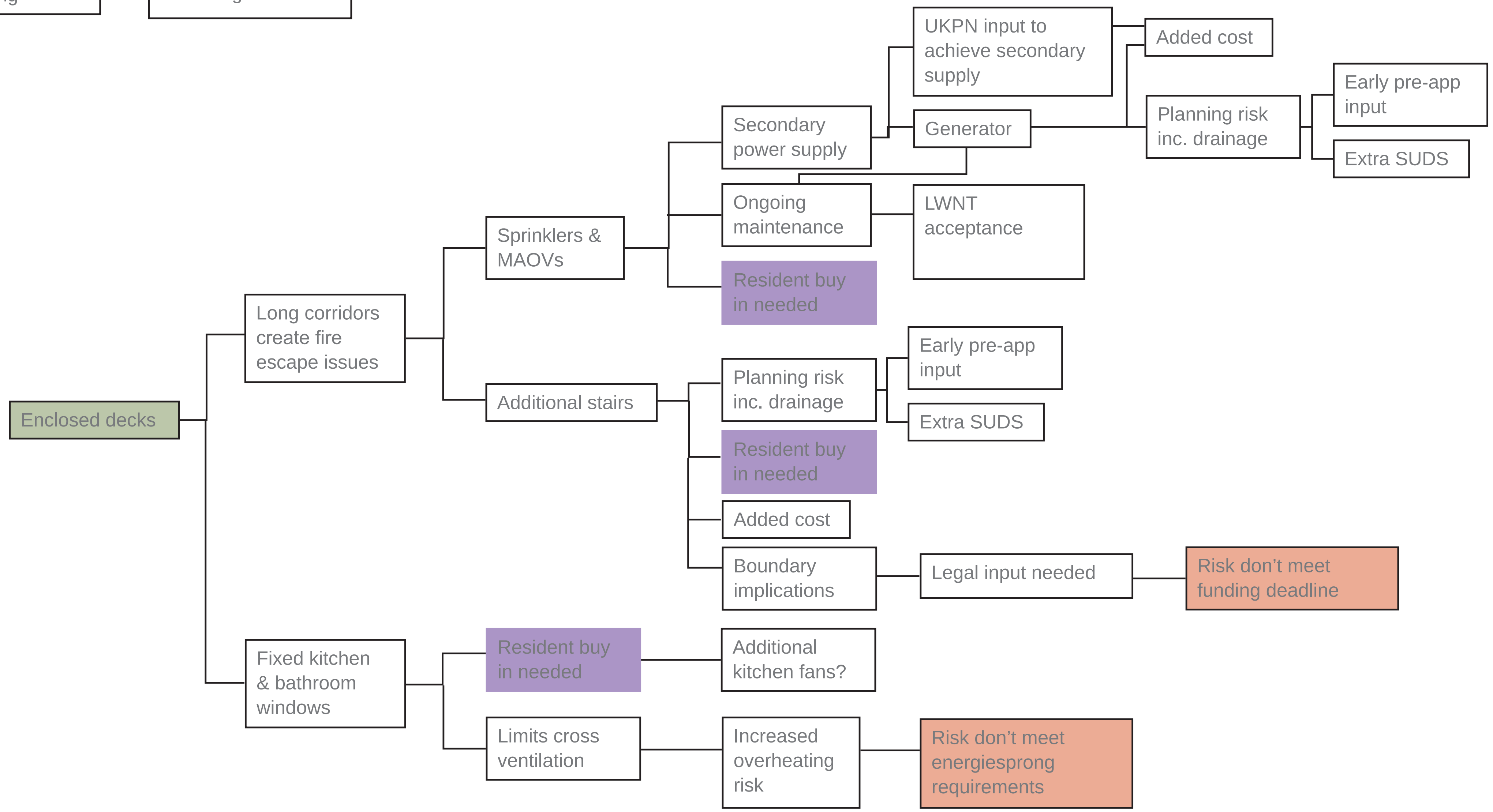
ENCLOSED DECKS

Pros

- Simple continuous line of insulation & airtightness is easier & quicker to install
- Building's 'form factor' is reduced
- Ground floor studio flats enlarged
- Thermal bridging of floor slabs removed as enclosed

Cons

- More complex fire mitigation & escape
- Maintenance requirements for active smoke ventilation
- Some kitchen & bathroom windows fixed shut & less light gets in (though always properly ventilated)
- Fewer opportunities for cross ventilation
- Risk of overheating in the enclosed access corridors
- Additional measures required for fire mitigation are likely to cause further disruption to the residents



ENCLOSED DECKS - OPTION 2

Dead end corridors longer than 7.5m are not allowed under part B without additional measures to suppress fire and to clear smoke.

In the east wing the travel distance from the furthest flat door to the stairs is 28m, and that in the west wing is 12m. Therefore further measures are needed to supress fires and clear smoke. Mechanical smoke ventilation would be needed to the corridors and sprinklers would be needed in each home. Two smoke shafts would serve the long corridor in the east wing while the west wing corridor could either be naturally or mechanically ventilated.

Due to the ongoing maintenance requirements and the need for sprinkler installation this has not been developed in more detail.

IMPLICATIONS

- Sprinklers required, including water tank etc
- New external smoke shaft & conversion of 1 bin chute to smoke shaft
- Secondary power supply needed for ventilation of smoke shafts. If this is a generator it requires monthly maintenance checks
- Deck-facing windows to be fixed and fire rated.

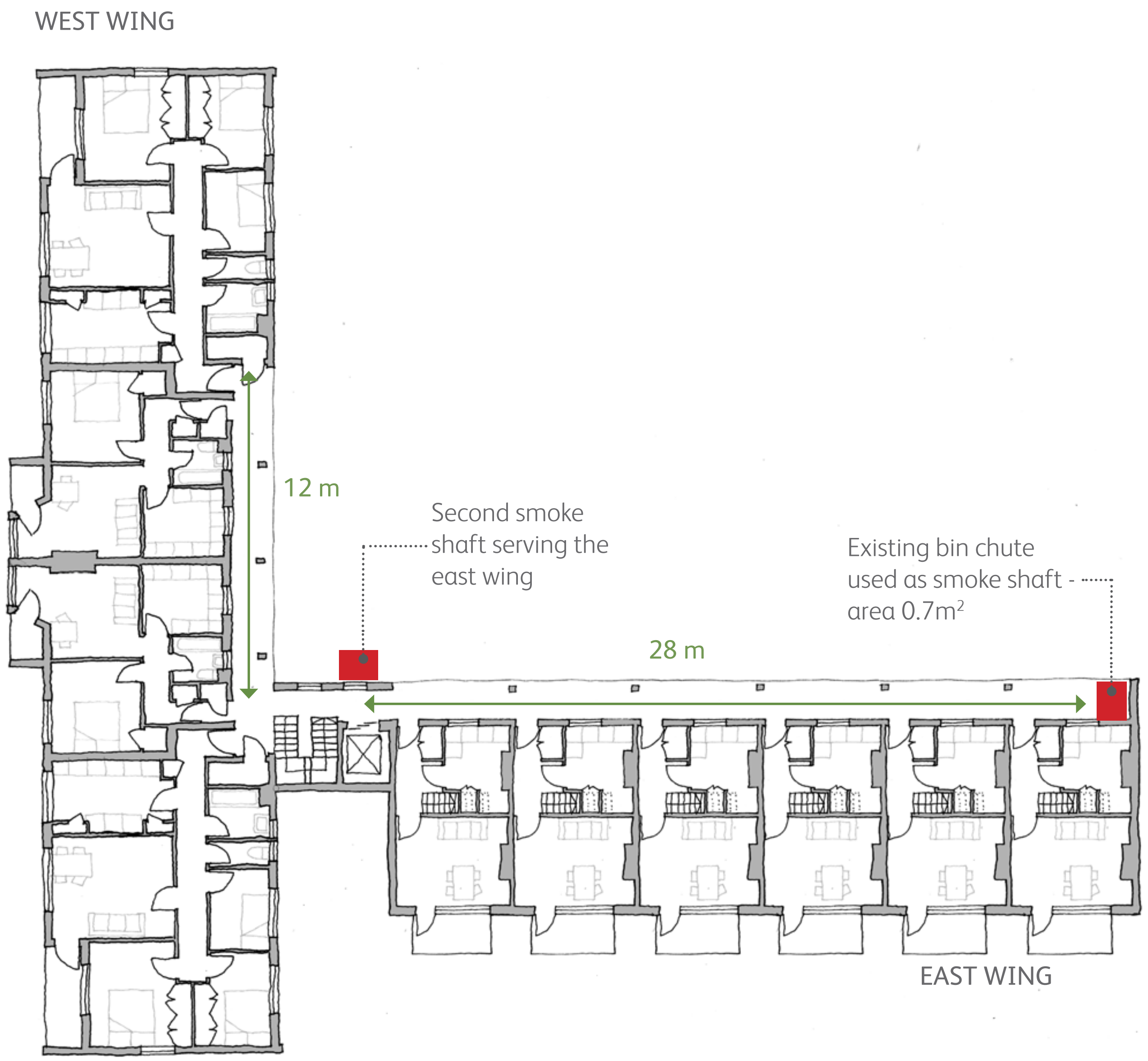


Figure 84 - Existing first floor plan with possible smoke shafts

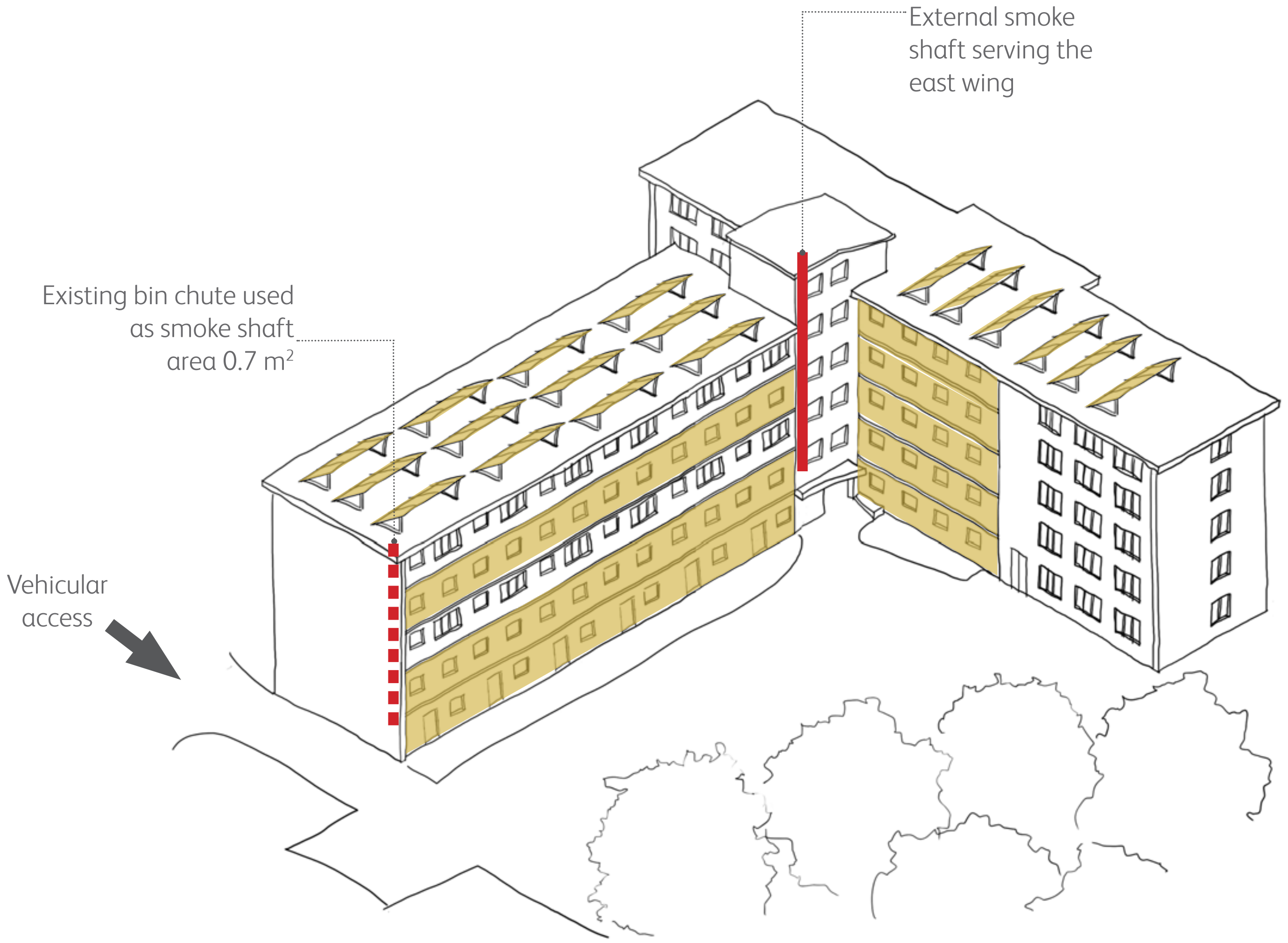


Figure 83 - 3D view showing implications of smoke shafts

ENCLOSED DECKS - OPTION 3

An alternative method is to avoid having long dead-end corridors by adding new stairs to each wing. This would give residents two directions of escape in the event of a fire. While these are not required to be fully internal spaces, they must be covered enough to ensure safe access in the event of a fire.

These new staircores would have a significant impact on the building's appearance, but that on the east wing would also impinge on the existing access gates. Moving this gate over would in turn require the site boundary line to be extended and the existing storage sheds to be relocated. Both changes would require some legal changes to the site and storage sheds are understood to be in demand. Therefore this has not been viewed as a promising option

IMPLICATIONS

- Two new staircores required
- Staircore to east wing would lead to changes to access gates, site boundary and storage sheds
- New stairs could provide new convenient access to roof

Figure 86 - Existing vehicular access from Bomore Road

Figure 85 - Existing first floor plan with possible new stairs indicated

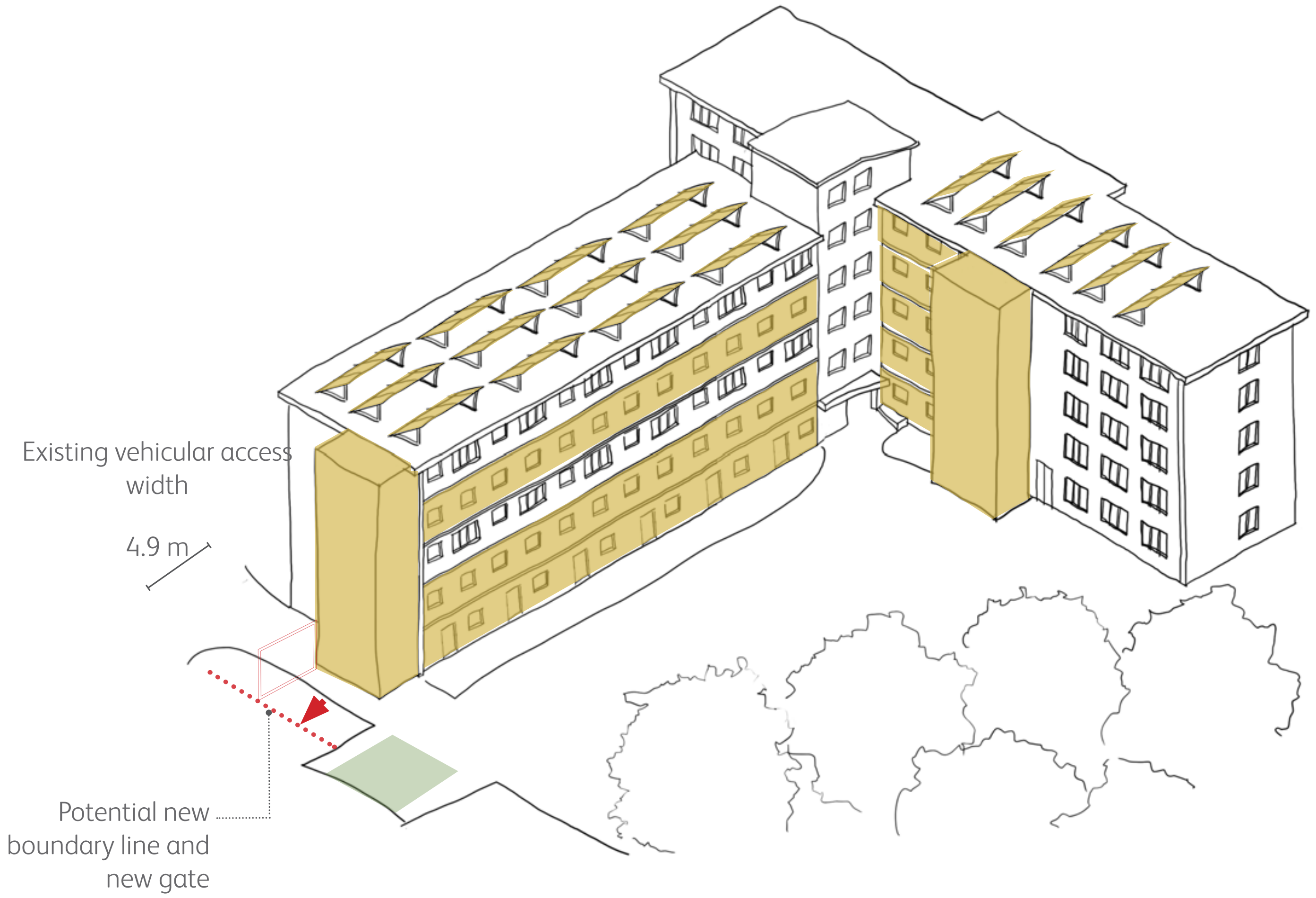


Figure 87 - 3D view showing implications of new staircores

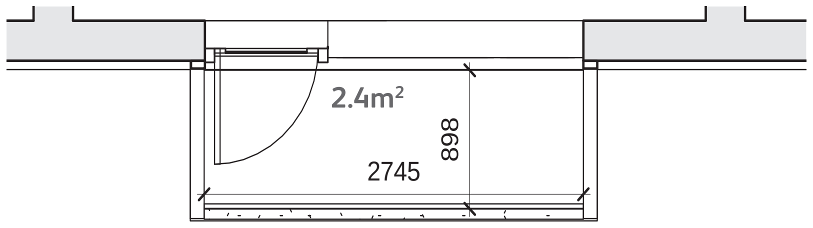
EXISTING BALCONIES

The existing balconies are all smaller than current guidance would suggest for new build properties. Additionally as their floors are formed by concrete slabs that are contiguous with the main internal floor slabs, they create thermal bridges. Therefore it is proposed that the south facing balconies be cut back and replaced and the west facing balconies be enclosed with new balconies added externally.

THERMAL BREAKS

In order to reduce thermal bridging new balconies would be supported by a new steel structure that would be tied back to the existing concrete floor slabs with thermally broken fixings. This would reduce the overall length of fixing back to the structure, and mean that even where there are fixings less heat is lost. Additionally balconies will likely be supported from ground level, so that the load is shared. New foundations will be needed in the ground to support these new posts.

The steel structure will support new steel balconies, but the exact appearance of these will be discussed with residents, looking at balustrade appearance and how balconies are broken up across the facade. However balconies, balustrades, decking and shading are all intended to be metal and consequently non-combustible.



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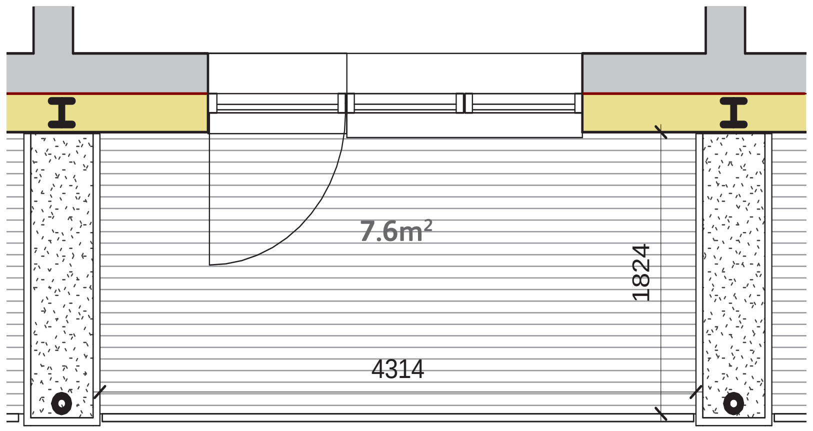
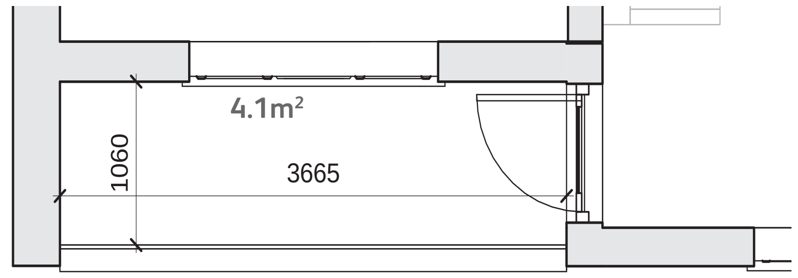
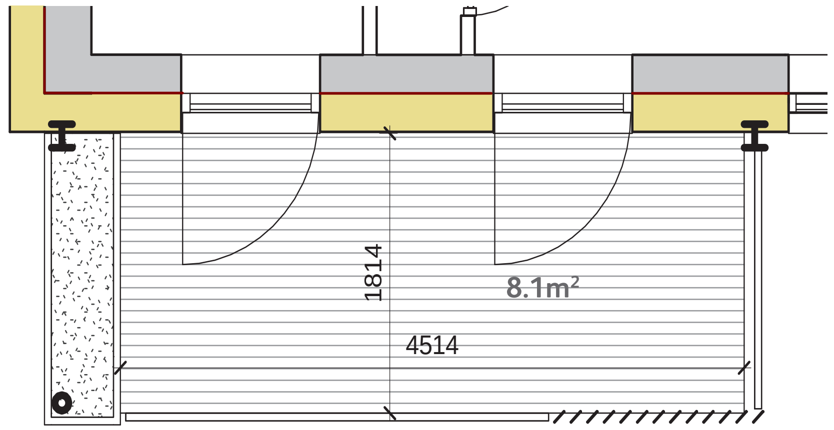


Proposed (adds 5.2m² to exsiting)

South elevation,
3 bedroom maisonette

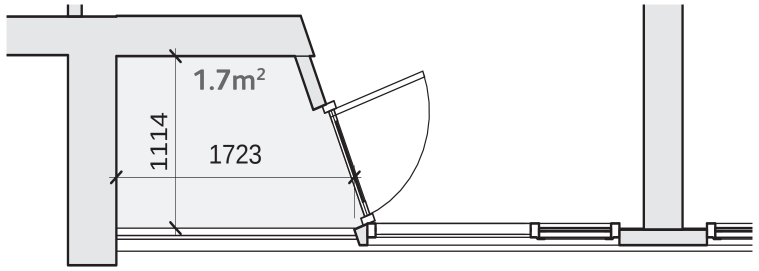


Existing

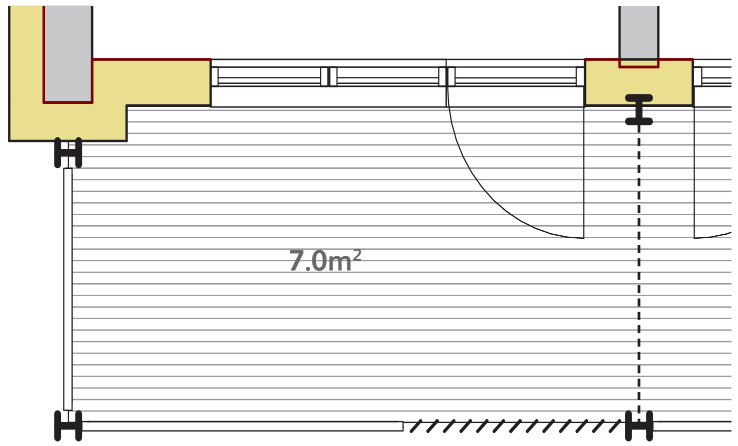


Proposed (adds 4m² to exsiting)

West elevation,
3 bedroom flat



Existing



Proposed (adds 5.3m² to exsiting)
West elevation
1 bedroom flat

Figure 88 - Comparison between existing & proposed balcony sizes

4.5 BALCONIES

SOUTH FACING BALCONIES

These balconies serve the 3 bedroom maisonettes, and are proposed to be 7.6 sqm. The overall balcony structure will be continuous across the face of the building, allowing for these larger balconies, while also minimising the amount of structure needed to support them. Planters separate the individual balconies providing privacy while allowing neighbourly interaction.

The balconies themselves will serve to shade the windows below from high summer sun, mitigating overheating risk in the flats. Lower winter sun will still get to the windows, allowing homes to benefit from solar gain at this time of year. Additional shading is proposed over the large balcony door and window openings, again mitigating overheating.

At ground level planting is again proposed to provide some semi-private space for residents of the studio flats. It has also been suggested that railings / balustrades should be added at all ground floor terraces to increase the delineation of public and private spaces.

PROPOSED BALCONY - OPTION 1

PROPOSED BALCONY - OPTION 2

PROPOSED BALCONY - OPTION 3

PROPOSED BALCONY - OPTION 4

Figure 89 - Structural & Finish possibilities for south facing balconies

WEST FACING BALCONIES

New areas of external wall will be built to turn existing balcony areas into useable internal space, slightly enlarging the flats and simplifying the insulation line. New balcony doors will be provided within these new walls. A continuous structure will provide balconies to the one bedroom flats, again with a planter between to give more privacy.

One option for these balconies includes some vertical rails running between each balcony and the one above. These are intended to provide some shade from lower evening summer sun, as this can significantly contribute to overheating.

PROPOSED BALCONY - OPTION 1 | PROPOSED BALCONY - OPTION 2 | PROPOSED BALCONY - OPTION 3 | **PROPOSED BALCONY - OPTION 4**

Figure 90 - Structural & Finish possibilities for west facing balconies

BALCONY DRAINAGE & DECKING

The existing balconies do not have rainwater downpipes to drain them, but appear to have a single overflow pipe each. There is some evidence of damp and moss growth on some balconies. It is proposed that new balconies will have non-combustible metal decking laid over metal support beams. This improves fire safety compared to other decking materials. These will sit above a series of 'trays' that sub-divide the balcony into smaller sections for water collection. While the balconies themselves are in some cases larger than the 6m^2 area that would normally require positive drainage by a rainwater downpipe, these trays are each smaller than this, and so are allowed to drain without a downpipe. Water is collected by the trays, avoiding drips onto residents below, and the trays slope away from the building so that water drips from the outside edge of the balcony. As balconies will be aligned they will not drip onto a balcony below. This also avoids the need for new drainage along the south side of the east wing. (see detail on following page)

Figure 93 - Neaco balcony decking

Figure 92 - Decking allows water through

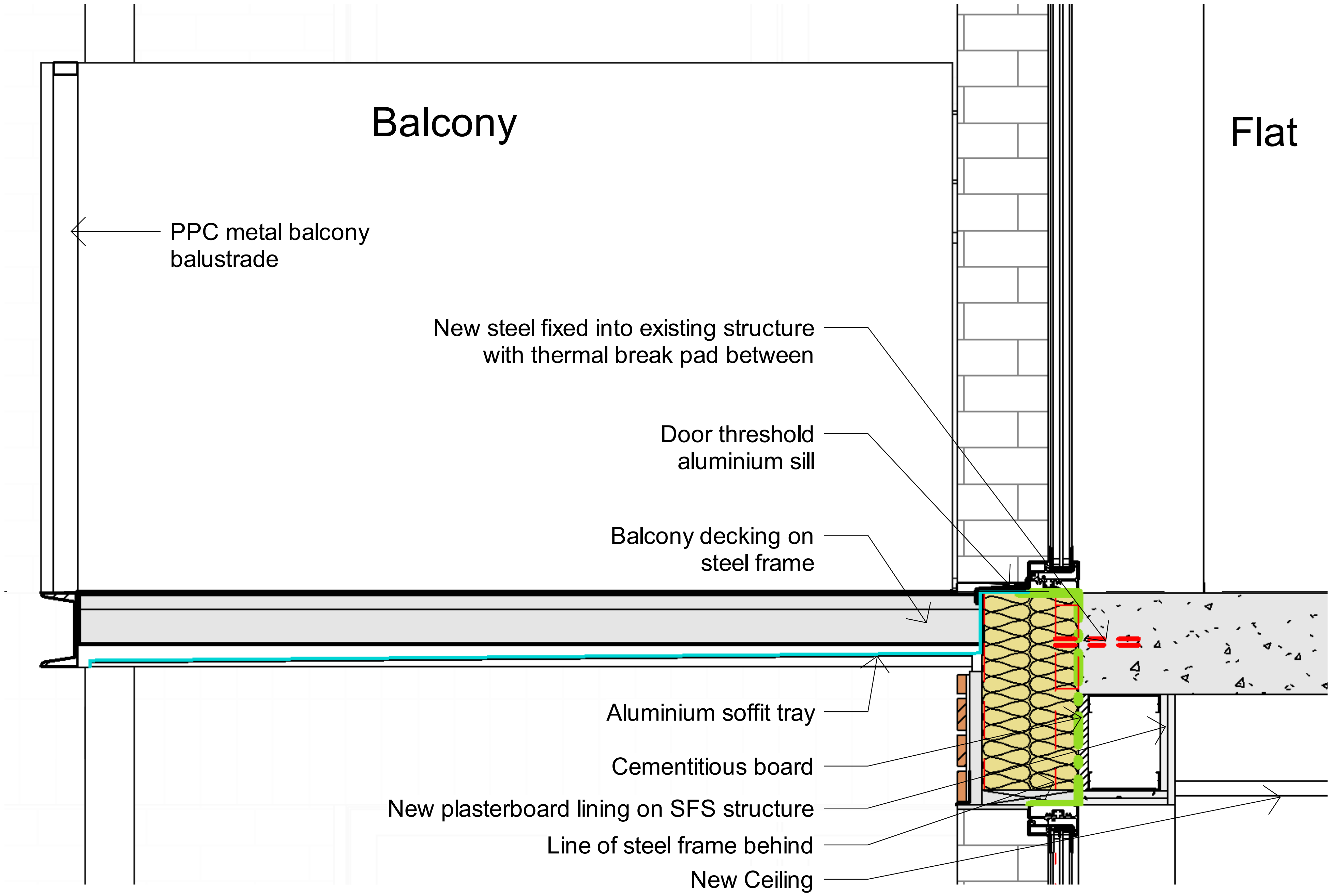


Figure 91 - Balcony section - Drip tray below structure is highlighted in blue. Water drips through decking & structure, down onto tray which directs water away from building to front edge of balcony, where it drips off.

EXISTING ROOF

The roof is formed of a concrete slab which slightly overhangs the walls. This has a screed over creating slight falls. There is a layer of insulation over this, with waterproofing over. The roof is flat, with rainwater outlets that run into pipes running through the flats below. Chimneys penetrate the roof, as well as some other services, and there are a lot of services running across the roof. The staircore extends to create a plant room at roof level. This is accessed via a ladder and through a hatch and contains the lift motor room and water tanks. It has doors which open onto the roof areas over each wing of the building. the roofs have railings around the perimeter to allow safe access on the roof.

INSULATION

The existing insulation and waterproofing layer will be replaced with mineral wool insulation and new waterproofing. A new airtightness membrane may be installed below the new insulation, or the airtightness layer in the wall could be sealed to the existing concrete slab, as this itself may be assumed to be airtight. The finished roof must achieve a fire rating of BRoof(t4) overall, to maximise excellent fire safety.

It was initially proposed to insulate around the roof's overhang. However this created constructional challenges and a very bulky appearance to the roof. Therefore it is proposed that the roof's overhang be cut back in line with the existing walls below and the new insulation and facade finish to the walls runs up creating a low parapet above.

Existing soil and vent pipes may need to be extended to allow for the new deeper insulation layer, but other services (gas and water supply pipes) are to be removed.

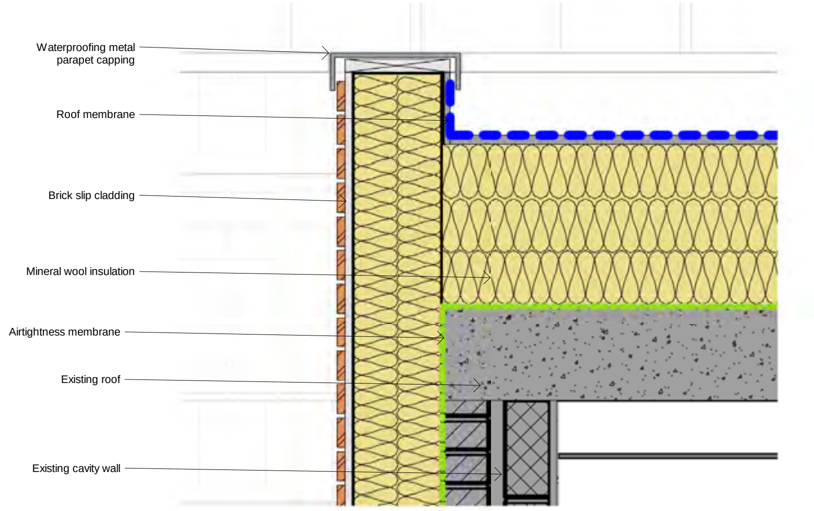


Figure 94 - Roof insulation detail

WATERPROOFING & RAINWATER

Any falls in the existing screed should be evened out prior to adding new insulation. The new roof finish is intended to be flat, with waterproofing turning up the new low parapet wall. Rainwater will be picked up in new outlets through the parapet wall, and into new rainwater downpipes running down the outside of the building on the north and west facades. New gulleys and inlets into the rainwater drain will need to be created, but in both cases the downpipes will fall close to existing below ground drainage. A CCTV survey of the below ground drainage is being commissioned and will confirm exact existing routes to allow for detailed design of these alterations. The existing internal rainwater pipes should ideally be removed and penetrations through floors sealed up. This will avoid heat loss and condensation risk caused by having a pipe of cold air within the homes, and improve compartmentation between homes.

CHIMNEYS

The chimneys are redundant and create a thermal bridge and gap in the airtightness line. Therefore these will be taken down and the opening infilled at slab level. The internal chimney breasts are expected to be retained, but it should be checked that these are all blocked up.

4.6 ROOF

AIR SOURCE HEAT PUMPS

These will extract heat energy from the air and provide heating and hot water for the homes via a communal system. The part of the system that collects this heat energy requires relatively large units with fans running to draw air through them. Again the function of these is expanded upon in the services report. The units are proposed to sit on the roof of the north end of the west wing of the building. Locating them here means that they are less visible from the conservation area to the south. While air needs to be able to pass around these units, a permeable fence is proposed around them to minimise their visual impact. Siting them on the roof means that the noise they make will not be audible to residents in their homes or in the garden area. Additionally anti-vibration feet will ensure that residents in the flat below are not aware of fans running. Access will only be needed occasionally, but again these add to the case for ensuring safe access onto the roof.

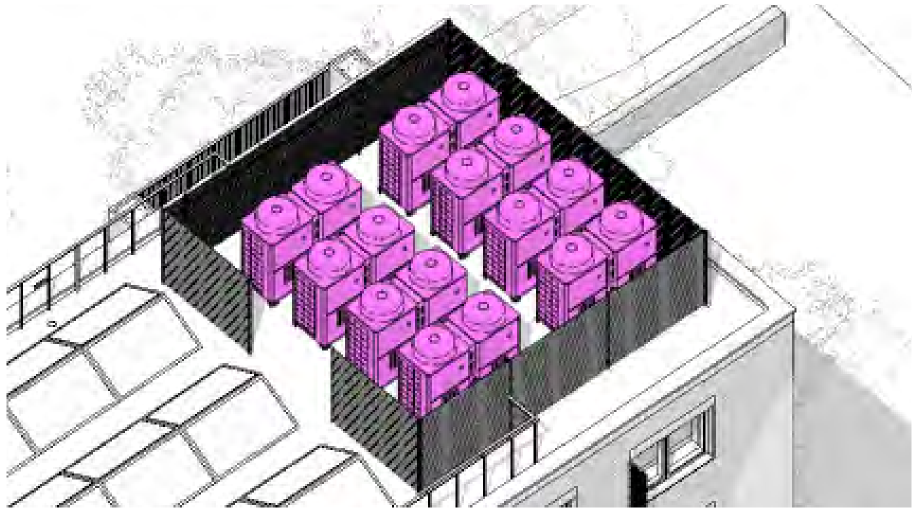


Figure 95 - Air Source Heat Pump Condenser Unit

PHOTOVOLTAIC PANELS (PVs)

As many PV panels as possible are to be installed on the roof to supply the homes with renewable electricity. This will help to reduce the building's carbon emissions, a requirement of Energiesprong. This is expanded upon more in the services report. While these panels do not require frequent maintenance, their addition means that safe roof access will continue to be important, as replacement or repairs may occasionally be needed.

A bio-solar roof was considered, in which PV panels sit above a green roof. However the most efficient arrangement of panels means that most of the roof will not receive any sunlight, as east and west facing panels immediately abutting one another mean that the roof area below will not receive sunlight

ACCESS ONTO ROOF

Consideration was given to extending the existing staircase up into the roof at the head of the staircore. However while water tanks will be removed from this room, space will subsequently be needed for inverters for photovoltaic panels and for equipment relating to new access control and CCTV systems. Therefore the loss of floor area that this would lead to cannot be accommodated. Instead the existing opening is to be enlarged and a more manageable hatch installed with a new ladder.

Figure 96 - Existing Roof Railing

RAILINGS

The existing railings around the roof perimeter will be removed. These are proposed to be replaced with similar but less utilitarian railings, to a height of 1100mm above the new finished roof level. This will mean that anyone on the roof can work safely there.

Planning feedback received has noted that "*From a review of the site's history, it appears that the Council granted consent for the addition of the existing safety barriers to the perimeter of the roof, and therefore, the alteration of these would be likely to be supported.*"

This feedback goes on to note that the design team could consider safety barrier design that would minimise visual impact. Consideration was given to fold down railings, but these would occupy a significant amount of roof space in their folded down position, taking space otherwise available for PVs. Railings that slope inwards were also considered to slightly lessen the visual impact from below. However the access one around the PVs would then need to be measured from the innermost point of the railings, again reducing the area available for PVs.

The current design has access routes of 500mm between panels and around at least one end of each run of panels.

Figure 97 - Roof Railing Precedents

Figure 98 - Railing Precedents

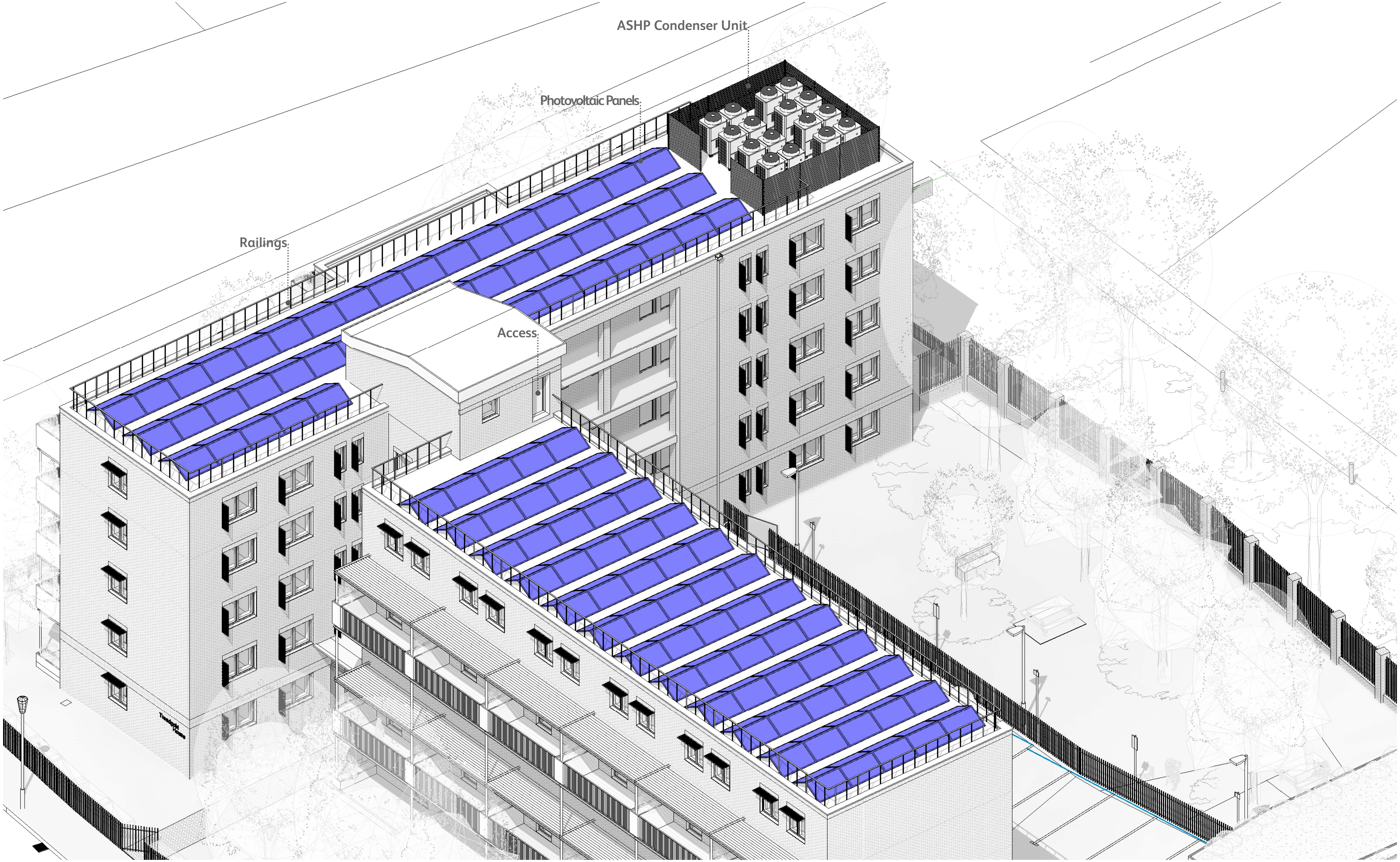


Figure 99 - Roof view with services

4.7 WINDOWS

REPLACING EXISTING WINDOWS

At present there are PVC double glazed windows installed in Treadgold House with an estimated U value of 2.5 W/m²K. The majority of them are divided in 4 parts, 3 parts openable (2 on the side and one on the top) and one fixed in the center.

All existing windows are to be replaced with new triple glazed windows, ideally Passivhaus certified. If they are not certified, the airtightness of the proposed windows seals will need to be assessed when closed (for example Rationel AURA and AURAplus with a U value < 0.80 W/m2K). Triple glazing will lose far less heat than double glazing, reducing heating bills. This improvement is even greater when the windows seal closed properly and are well sealed to the walls, as warm air cannot escape around them. In general these new windows will be the same size overall as existing windows, in the same sized openings.

CHANGES TO EXISTING OPENING SIZES

Windows facing the deck access areas must be fire rated if their sills are below 1100mm above the deck floor. This is not the case for all deck-facing windows at present. Kitchen and bathroom windows here will have their sills raised slightly so that the whole window will be above the 1100mm line and can therefore be openable and non-fire rated. Where these are kitchen windows this will also avoid awkward junctions of kitchen units abutting windows.

All opening window, other than those onto balconies, should have sills at least 800mm above floor level, to mitigate the risk of people falling out of them. There are a few west-facing windows that will have sills raised to achieve this.

At present the south facing maisonette living rooms have full-height glazed screens incorporating the balcony door. It is proposed that these are replaced with a new door and 2 new openable windows, with a solid, insulated area of wall below these windows. This will reduce the potential for overheating in summer, as the area of glazing is slightly smaller. Daylighting will not be significantly affected as the lower parts of the windows contribute little to daylighting the room.

The studio flats currently have a part glazed / part solid screen along their south side. These will be replaced with new insulated walls as part of the main wall insulation system. New windows and door are proposed similar to those to the maisonettes above. This will provide access to the garden area as at present, while providing window sills internally.

Where west-facing balconies become internal spaces new windows and doors will be provided.

FINISHES

It is suggested that the new windows be painted timber internally, providing a softer feel. Externally they would be polyester powder coated aluminium. This is more durable and available in a range of colours. The choice of colour was discussed with residents at the pop-up event along with preferred finish material.

OPENING VENT

The staircore must have smoke ventilation so that if there were a fire and smoke should get into the staircore this would be ventilated away, allowing safe escape down the stairs. This means that the two top level windows in the staircore need to be able to open in case of fire, and it must be ensured that the combined free area of these opened windows is at least 1m². The openings are sufficiently large to enable this, as long as the replacement windows are of a type that can be fully opened (eg. centre pivot, side hung casement etc)

OPENING FUNCTION

Generally the new windows have fewer separate opening panes, allowing larger areas of unobstructed glazing. As well as appearing more modern and providing better views and daylighting, this means the windows will lose less heat, as the glass is more insulating than the frames.

Windows are proposed to be inward opening tilt and turn windows. This means they are hinged at both the bottom and the side. They can tilt open hinging at the bottom, allowing constant ventilation, while still being secure. Or they can be hinged at the side and opened more widely, allowing more air in and enabling cleaning safely from inside.   This proposal is to be discussed with residents, and in particular it is noted that LWNT have already held discussions with residents across the estate about window opening options. Alternative options were also presented to residents at the pop-up event - top hung windows and top hung reversible. The latter offers the capacity to clean it from the inside, but this operation may be challenging for some residents. These windows are outward opening, allowing for internal blinds or curtains more easily.

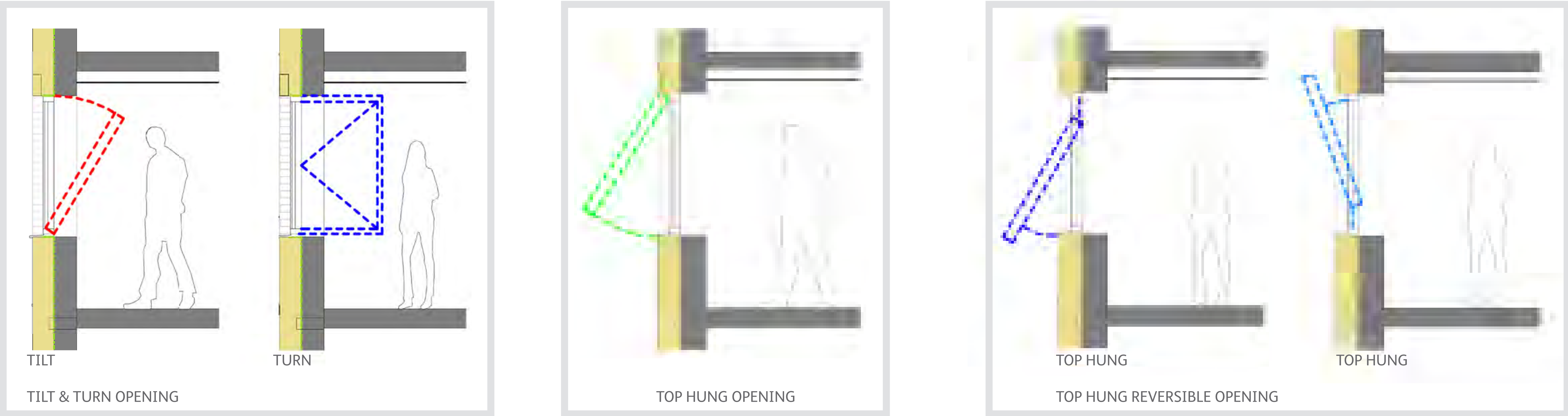


Figure 100 - Diagram of window opening possibilities

4.7 WINDOWS

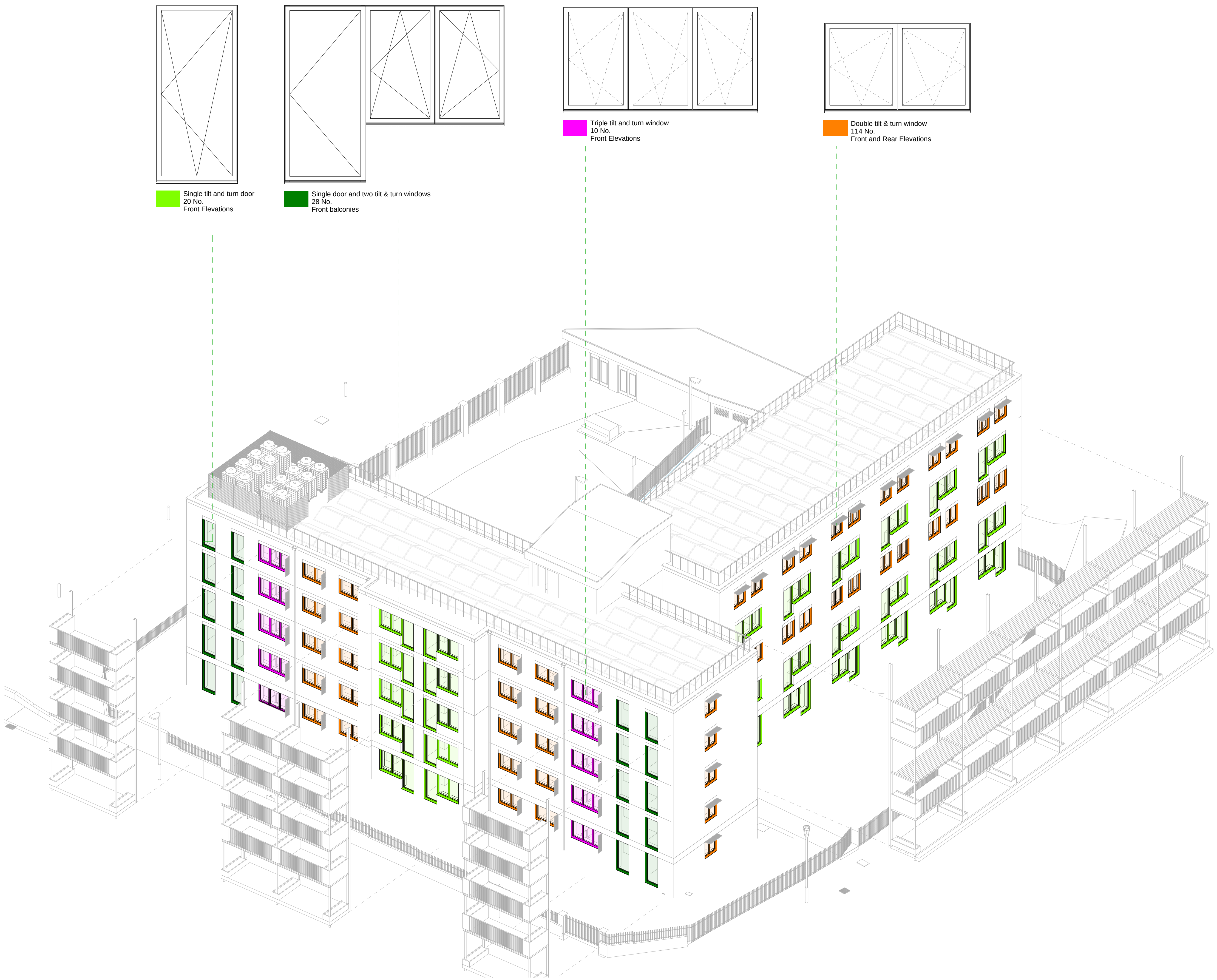


Figure 101 - Window types diagram - South/West side

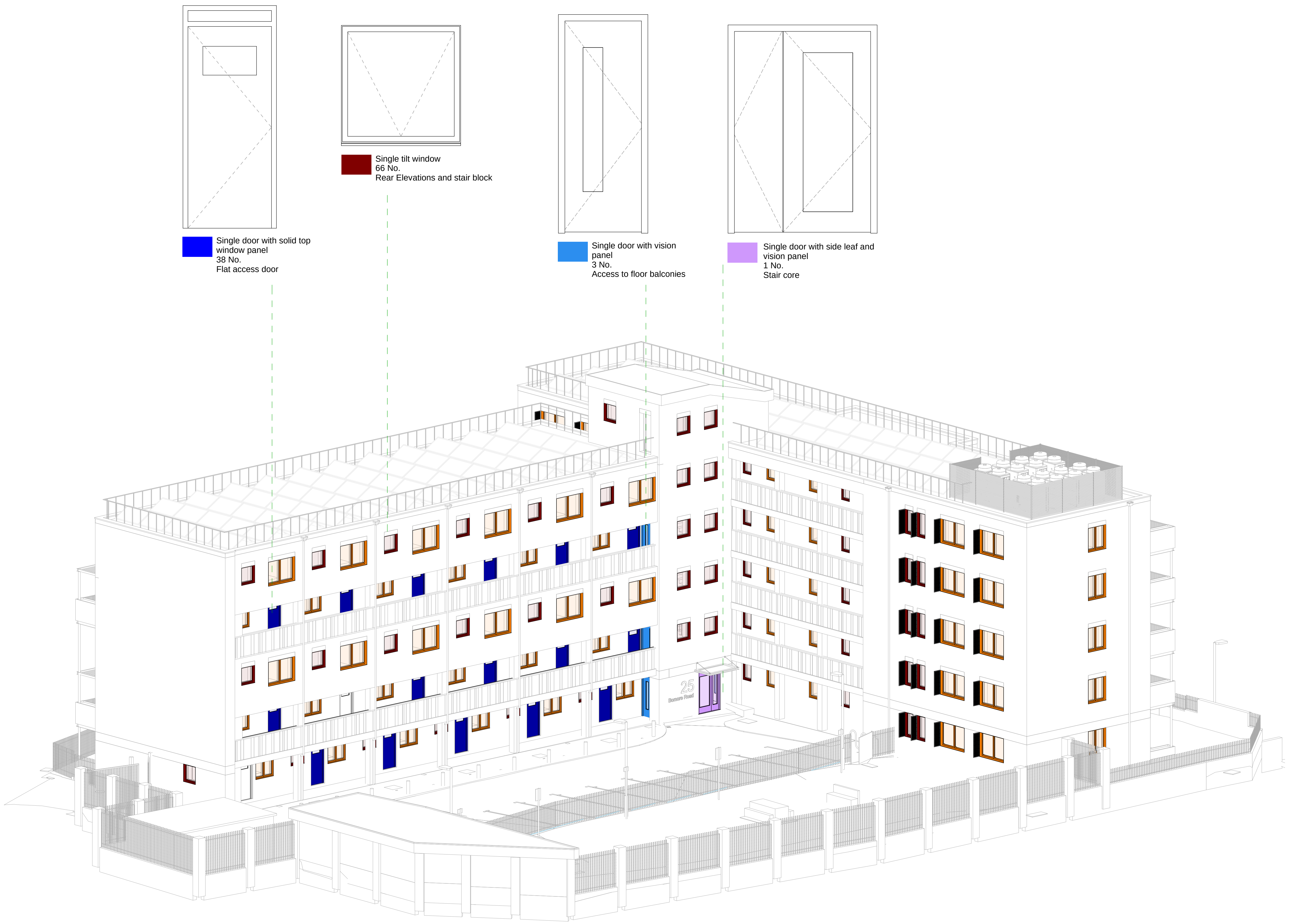


Figure 102 - Window types diagram - North/East side

4.7 WINDOWS

SHADING

All windows will be lined up with the new external insulation layer, to provide continuity of the thermal line. However they will be set back as far as possible within the insulation layer so that the window reveals themselves provide some shading.

Many windows will have balconies above, providing shading from hot summer sun. Where they do not, additional shading is proposed to the head of south facing windows, so that high summer sun reaches less of the window's area, reducing the risk of overheating. East and west facing windows have a similar shading device, slightly reducing the impact of lower morning or afternoon sun. These shading devices are proposed to be of the same colour as is chosen for window frames.

Figure 103 - Window shading in Goldsmith Street project by Mikhail Riches

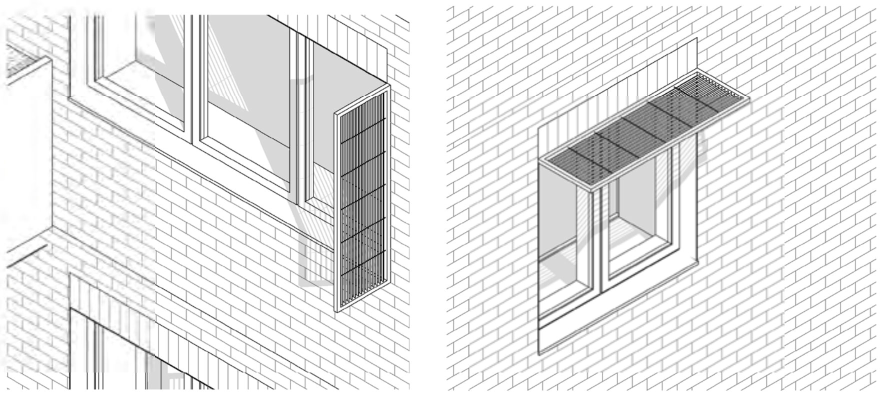


Figure 104 - Window shading detail

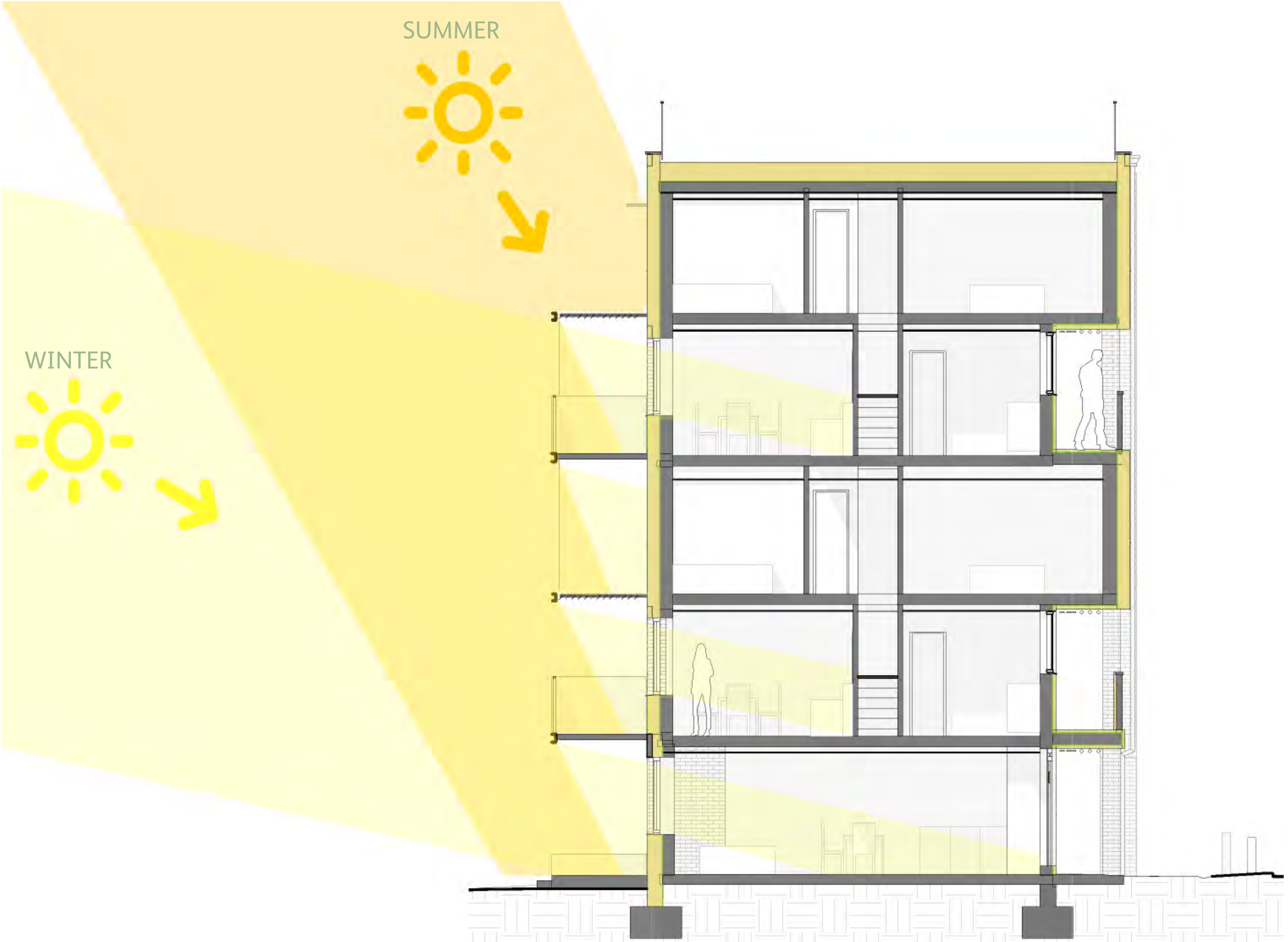


Figure 105 - Shading stops high summer sun from overheating the building but allows low winter sun.

FLAT FRONT DOORS

The majority of front doors to the homes have recently been replaced as part of RBKC's fire door replacement programme and are understood to be FD30s doors, maximising fire safety for residents. In this proposal where the decks remain open, these doors form part of the thermal line and are understood to have a maximum U value of 1.8 Wm^2K. LWNT would like these doors to remain, and it is assumed that they are relatively airtight given the fire rating. However it is noted that they may not perform as well as Passivhaus Certified doors which might otherwise be installed. In particular these doors have letter boxes through them, inevitably limiting their airtightness.

INTERNAL DOORS IN FLATS

All the existing homes except the studio flats are designed with protected corridors, the walls and doors to which ought to provide 30 minutes fire protection. From the few flats where investigations have been possible it appears that these walls and doors do offer this level of protection, but access has not been possible to all flats. Therefore walls and doors ought to be reviewed as each flat is accessed to ensure the retrofitted homes are as fire safe as possible.

Figure 106 - Existing doors to flats

4.9 ENTRANCES TO THE BUILDING

NEW DOORS ONTO STAIRCORES

In order to provide a fire protected staircore new doors are proposed from the staircore to each deck access area. These will need to be 30 minute fire rated doors with smoke seals and be self-closing and should include vision panels. This also presents an opportunity to improve security in the block, by adding fob access to these doors so that only residents of the relevant deck area have access. As these doors are between the open decks and the unheated staircore they do not need to be airtight or require specific thermal performance. They will however need to be suitable for an external environment.

IFC's fire report, while recommending the inclusion of these doors, does state that such retrofitting is not statutorily required. Limited space in this area means a balance must be struck between obstructive door swings and the potential to maximise and improve fire safety. Detailed plans showing these doors are still to be reviewed by building control.

As part of the works to the building there is an opportunity to improve the access to the building. This will make the entrance easier to find and more secure. At present all residents, visitors and deliveries to the building have to access the site via the gate at the east end, which has access control. It is proposed that this is retained, but also that the existing entrance is enclosed, allowing for access control here too. Further, a new street-facing pedestrian entrance is added to the south side of the existing staircore, making it easier to find and access from Bomore Road.

WORKS TO THE EXISTING ENTRANCE

The existing entrance is open with no door or access control, so that once someone is within the site as a whole they have access to all flats at all floors. Enclosing this area will allow for a further layer of access control into the building. The new entrance lobby will be warmer and dry and new finishes will give this the feel of a cared-for internal space. Glazed screens in the existing openings and new glazed doors will maintain good visibility into this space and onto the surrounding access passages. New doors will have the highest security certification of LPS 1175 and have video access control. As they will not be on the building's thermal line, they do not need to be insulating or airtight. A canopy above the doors will provide protection from rain for anyone waiting to be let in, replacing the existing canopy.

Figure 107 - Proposed entrance from the parking area

NEW ENTRANCE TO THE SOUTH

A new gate will be created in the existing fencing on Bomore Road. This will lead onto a new path towards the staircore. A single storey entrance lobby will be built with a new entrance door and glazed screen. The new entrance will be clearly visible from the street and will allow more light into the stairwell. New lighting and bold signage will ensure that the entrance is visible at all times of day and that residents feel safe using it, while avoiding light pollution to adjacent windows.

The existing stairs from ground to first floor will need to be altered to allow a route through next to the stairs so that they can be access from both south and north entrances. Upper storeys of the staircase will be unaffected. While this will necessitate a temporary staircase during the works, the creation of a second entrance, possibly in advance of some of the works may make it easier to maintain safe access to the building.

Again doors will be LPS 1175 certified and will have video access control and a canopy above provides shelter while waiting or finding keys. It is suggested that the detailed design of this element might be developed with the residents.

In order to achieve this the bathroom and toilet windows of the ground floor 3 bedroom flat will need to be closed up. The new MHVR system will ensure good ventilation in these spaces in spite of the lack of windows, while improved lighting will ensure they do not feel dingy. A hedge is proposed between the new path and the existing bedroom windows so that other residents keep away from these windows.

Figure 108 - Existing Front Entrance

Figure 109 - Proposed Front Entrance

AIRLOCK LOBBY

The Designing Out Crime Officers consulted with prefer that this lobby incorporates an 'airlock' area, to reduce risk of people 'tailgating' residents into the building. A layout for this has been experimented with, but the space available is limited. Without the new entrance requiring the closing up of a bedroom window the space would be so tight as to cause collisions. Therefore given that the bedroom window needs to remain, and that additional access control is included at the access point to each deck area, the airlock lobby is not currently proposed to be included.

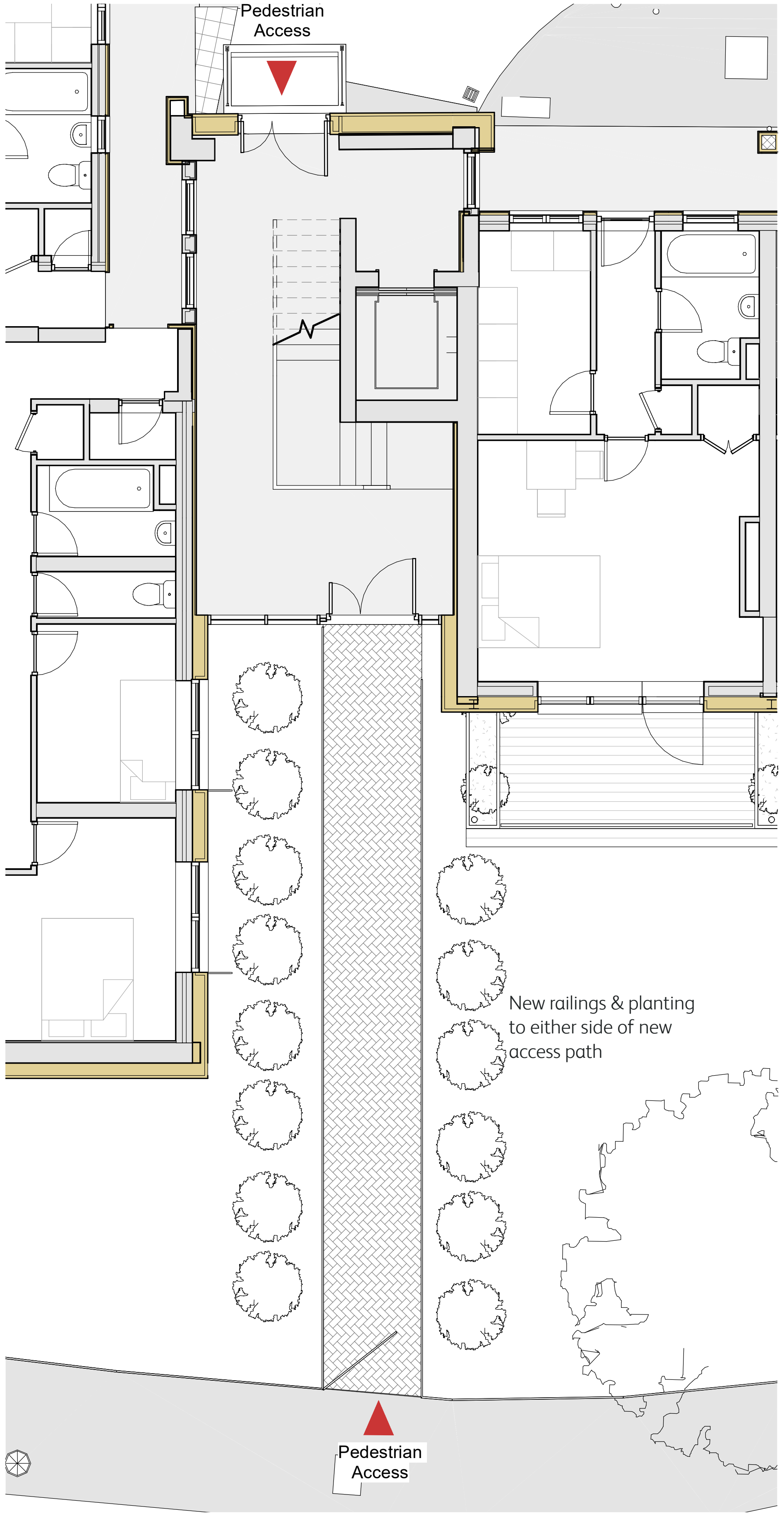


Figure 111 - Proposed new entrance

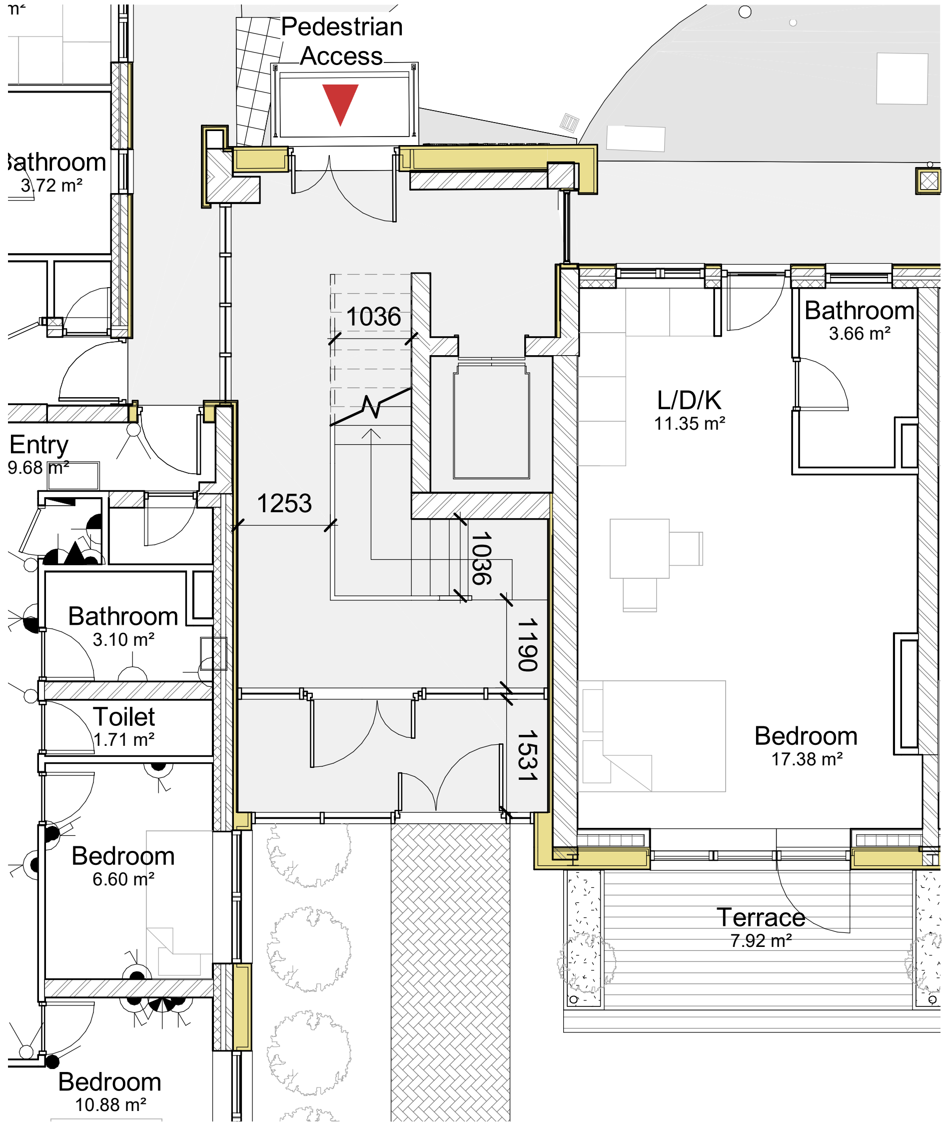


Figure 110 - Entrance area with Airlock lobby demonstrating that this makes the space overly-constrained

NEW LIFT

The existing lift is to be replaced. However this work will form a separate contract, to be carried out after the main project.

Chapmansbdsp have provided a full specification for the replacement of the lift within the existing lift shaft. The key points about the new lift are set out here:

- The existing lift machinery sits above this lift and will be replaced in the same location
- By moving the lift's counterweight from the rear to the side of the lift the new lift car will be able to be enlarged to be 11100mm x 1400mm internally, in compliance with Part M of the building regulations. A mirror on the rear wall of the lift will make it easier for unassisted wheelchair users to enter and leave the lift car.
- New controls will also be compliant with Part M of the building regulations.
- A fire fighting lift is not required at Treadgold House, given its height. However the new lift will incorporate a fire recall facility.
- CCTV will be included within the new lift car.
- As the lift will be beyond access controlled doors it is proposed that the lift be to vandal resistance level 0. However this should be confirmed with the client.
- The new lift provides an opportunity for new decor in the lift and it is intended that this is selected by residents from the options available from the chosen supplier

EVACUATION LIFT

LWNT would like the new lift to function as an evacuation lift, in line with evolving London Plan policy for new buildings. The lift will therefore be designed to allow communication between the lift car and the ground floor, and it will continue to function in the event of a fire. This is detailed in the lift specification. The fire safety consultants and RBKC's head of fire safety have been consulted about how this lift should function in the event of a fire. The fire safety consultants have confirmed the following:

The guidance on evacuation lifts and refuges was developed for office buildings, hotels, public assembly premises and similar, not for unmanaged blocks of flats. Refuges are intended to provide a waiting space while staff fetch the keys to operate the lift and bring it to the floor in question; this concept is based on the premise that there is a management presence in the building. We have discussed the subject of the evacuation of mobility-impaired people with [RBKC's head of fire safety], and have agreed that the lift should continue to operate as normal in the event of a fire so allow mobility-impaired residents to self-evacuate. There is therefore no need for a refuge

An evacuation lift would also require a dual or secondary power supply, so that it could be guaranteed to continue to function even if the primary supply were affected by a fire. TACE and Chapmans are agreeing with LWNT what the best way is to achieve this requirement.

4.11 ACCESS CONTROL, SECURITY & MAINTENANCE

SECURED BY DESIGN

An online meeting was held with Designing Out Crime Officers (DOCO) from the Metropolitan Police on 2/6/21 at which general proposals for all areas of the estate were presented. Subsequent to this the Stage 1 report was sent to the DOCOs for information, and this was followed up by some questions presented by email. A site walkaround was then held on 24/6/21. The emailed questions and answers, the notes from the walkaround and a Secured by Design 'Crib sheet' supplied by the DOCOs are appended to this document.

As this is an existing building, with existing site constraints it will not be possible to achieve a specific level of Secured by Design approval. However the client and the DOCOs would still like the scheme to be designed with the Secured by Design methodology in mind.

Key points arising include:

- Need to have LPS 1175 certified main communal doors at ground floor
- Need for PAS 24 certified doors & windows to all ground floor locations and all balconies, as well as any other 'easily accessible' locations.
- Confirmed that increased compartmentalisation by adding access controlled doors to each deck was viewed positively.
- Wary of ground supported balconies as these will make it easier to climb up the face of the building
- Full-height screening needed between balconies where these are continuous.

ACCESS CONTROL

TGA are appointed by LWNT to address access control and CCTV across the estate. Their proposals are set out on their drawings. The overall strategy can be summarised as follows:

- New video entry & fob control at existing pedestrian & vehicle gates
- New video entry & fob control at new front door at existing entrance on north side of block
- New video entry & fob control at new entrance on south side of block
- Fob entry to each corridor, so that while residents and visitors to all homes may be in the stairwell, access to each deck is only for residents and their visitors.
- Each home will have a video entry phone by the front door to allow them to see potential visitors and admit them

CCTV

New CCTV cameras will be mounted around the building to view entrances, the lobby and lift area and the areas immediately around the building. While some of these cameras replicate existing locations the system will be extended to ensure better coverage than at present.

MAINTENANCE

A full maintenance strategy has not been prepared at this stage, but key points of the design are noted here:

- Inward opening tilt & turn windows allow windows to be cleaned from the inside.
- An enlarged access hatch to the rooftop plant room will allow large pieces of equipment and tools to be carried up to the roof. The opening for this will include hydraulic arms to make it lighter to open and close and will include a catch to hold it open. An integral ladder will make access safer.
- Complete refitting of this rooftop plant area will remove the current trip hazards, making moving around it easier and safer.
- Existing rooftop railings will be replaced with new railings, 1100mm high, ensuring that operatives can move around the roof safely
- 450mm wide pathways are provided between photovoltaic panels ensuring that each panel can be accessed.
- New services will run on the underside of deck access soffits, allowing for relatively easy access should these require maintenance.
- Much of the plant will be at ground level in the new plant room, allowing easier access.

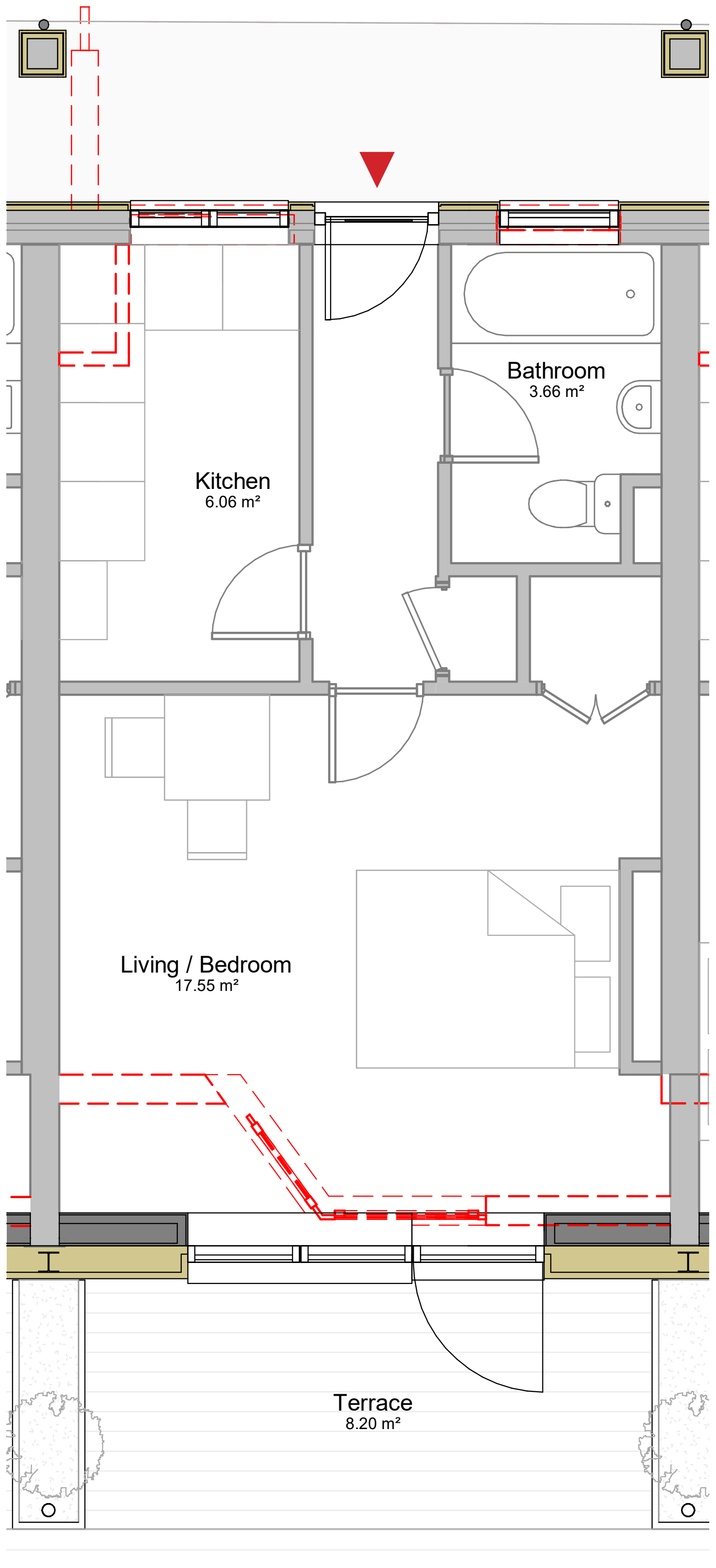
The proposal includes the modernisation of the internal layout of the units, taking into account the residents' top 10 priorities. Additional works aim to increase the storage space inside the units, when it is possible, and update the internal layout to an open plan living space in the studio and one bed flats, if desired by residents. Bathrooms and kitchens will be replaced in all tennanted units in line with LWNT's Internal Refurbishment Specification.

ENERGIESPRONG REQUIREMENTS

- External Wall Insulation, including replacing the wall along the south
- External windows replacement
- Creation of

ADDITIONAL WORKS

- New kitchen
- New bathroom



STUDIO FLAT Internal floor area	
Existing	**Proposed**
31 sqm	33 sqm

- Entrance
- External Wall Insulation
- Existing
- Demolitions
- Proposed works

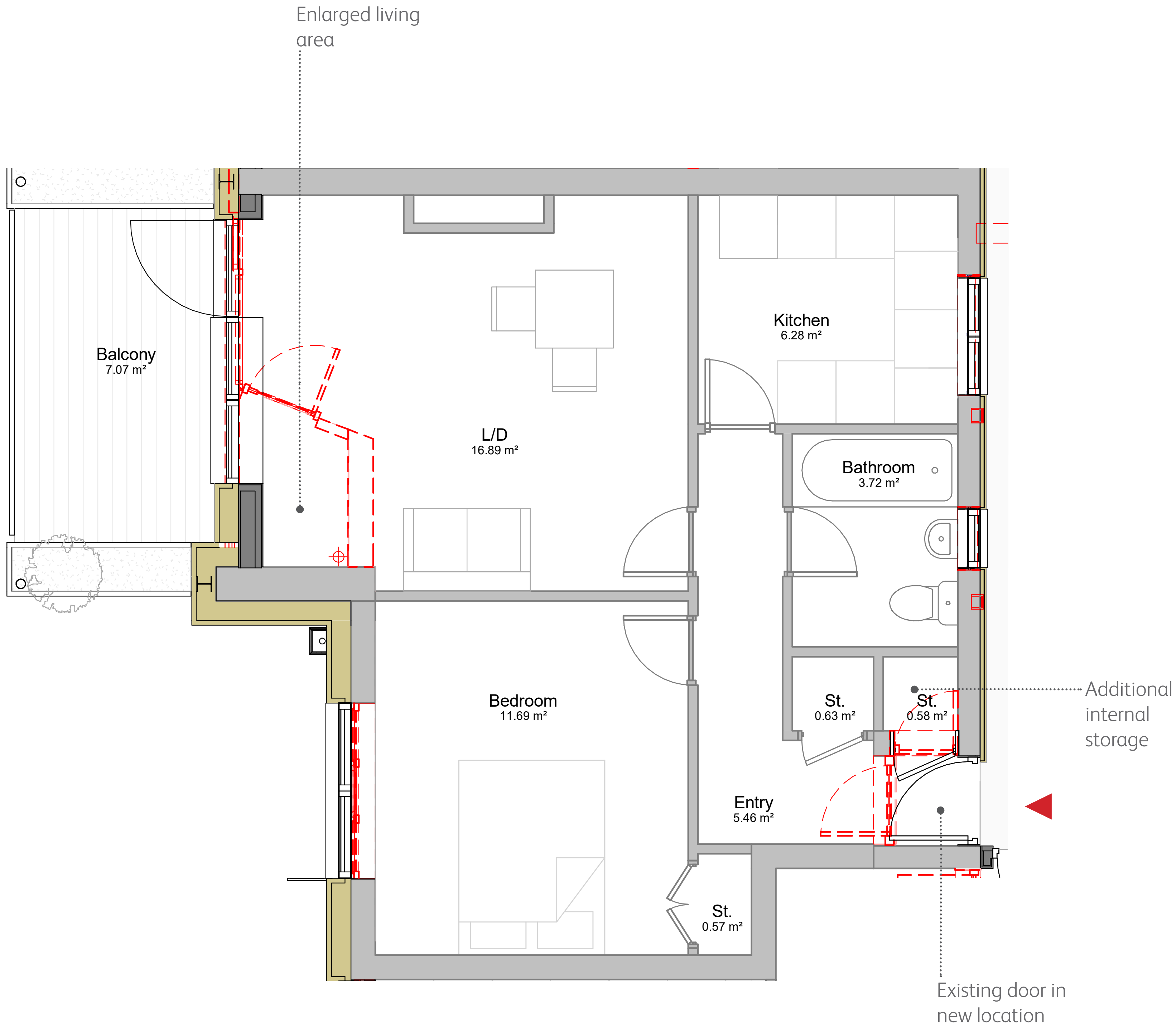
4.12 INTERNAL REARRANGEMENTS - FLAT TYPES

ENERGIESPRONG REQUIREMENTS

- External Wall Insulation
- External windows and front door replacement

ADDITIONAL WORKS

- New kitchen
- New bathroom
- Entrance door moved creates additional storage space
- Existing balcony area added to the living area
- Increased outdoor space with new balcony



1 BED FLAT Internal floor area	
Existing	**Proposed**
42 sqm	45 sqm

- ▶ Entrance
- External Wall Insulation
- Existing
- Demolitions
- Proposed works

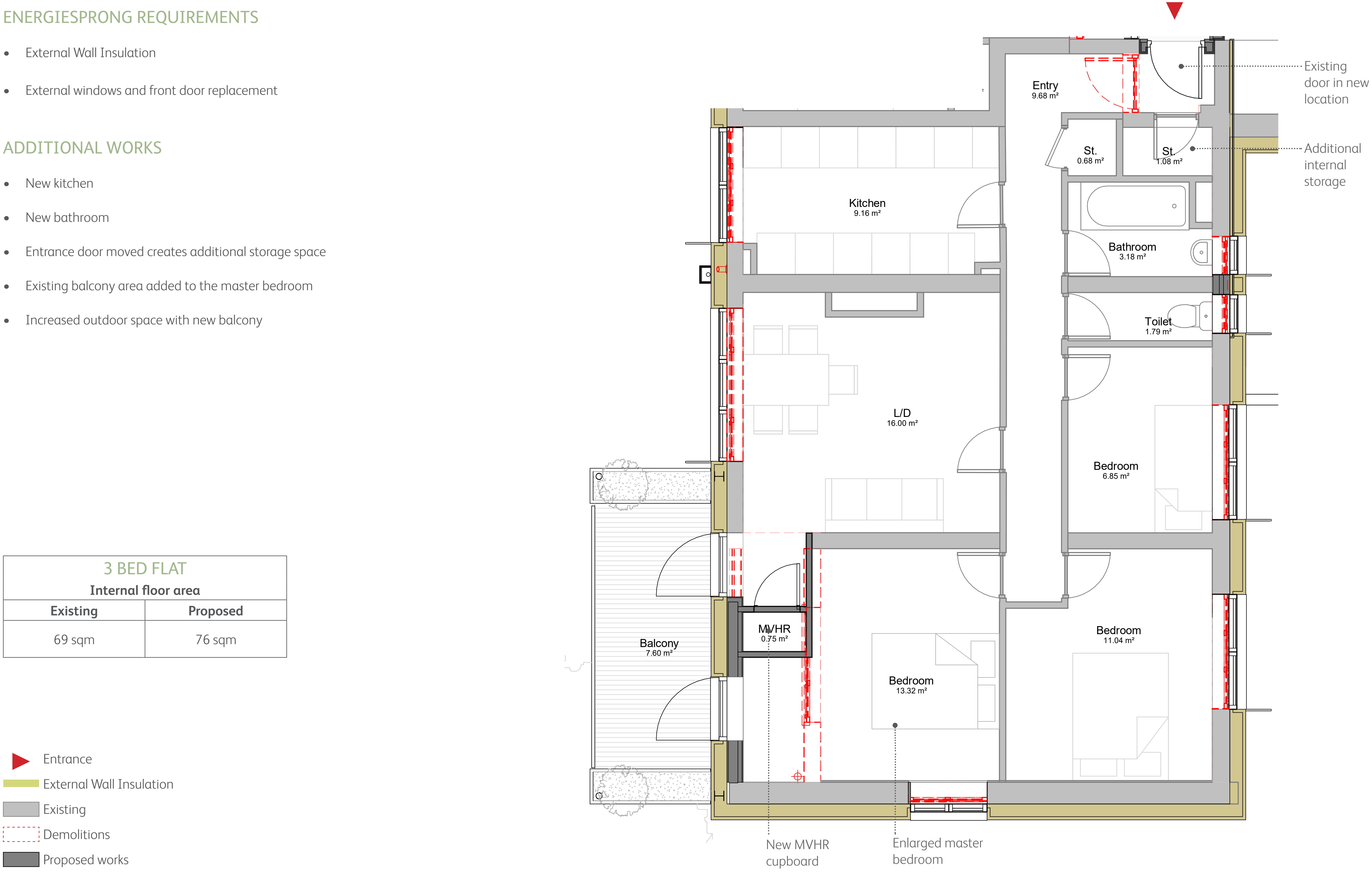
ENERGIESPRONG REQUIREMENTS

- External Wall Insulation
- External windows and front door replacement

ADDITIONAL WORKS

- New kitchen
- New bathroom
- Entrance door moved creates additional storage space
- Existing balcony area added to the master bedroom
- Increased outdoor space with new balcony

3 BED FLAT	
Internal floor area	
Existing	Proposed
69 sqm	76 sqm



ENERGIESPRONG REQUIREMENTS

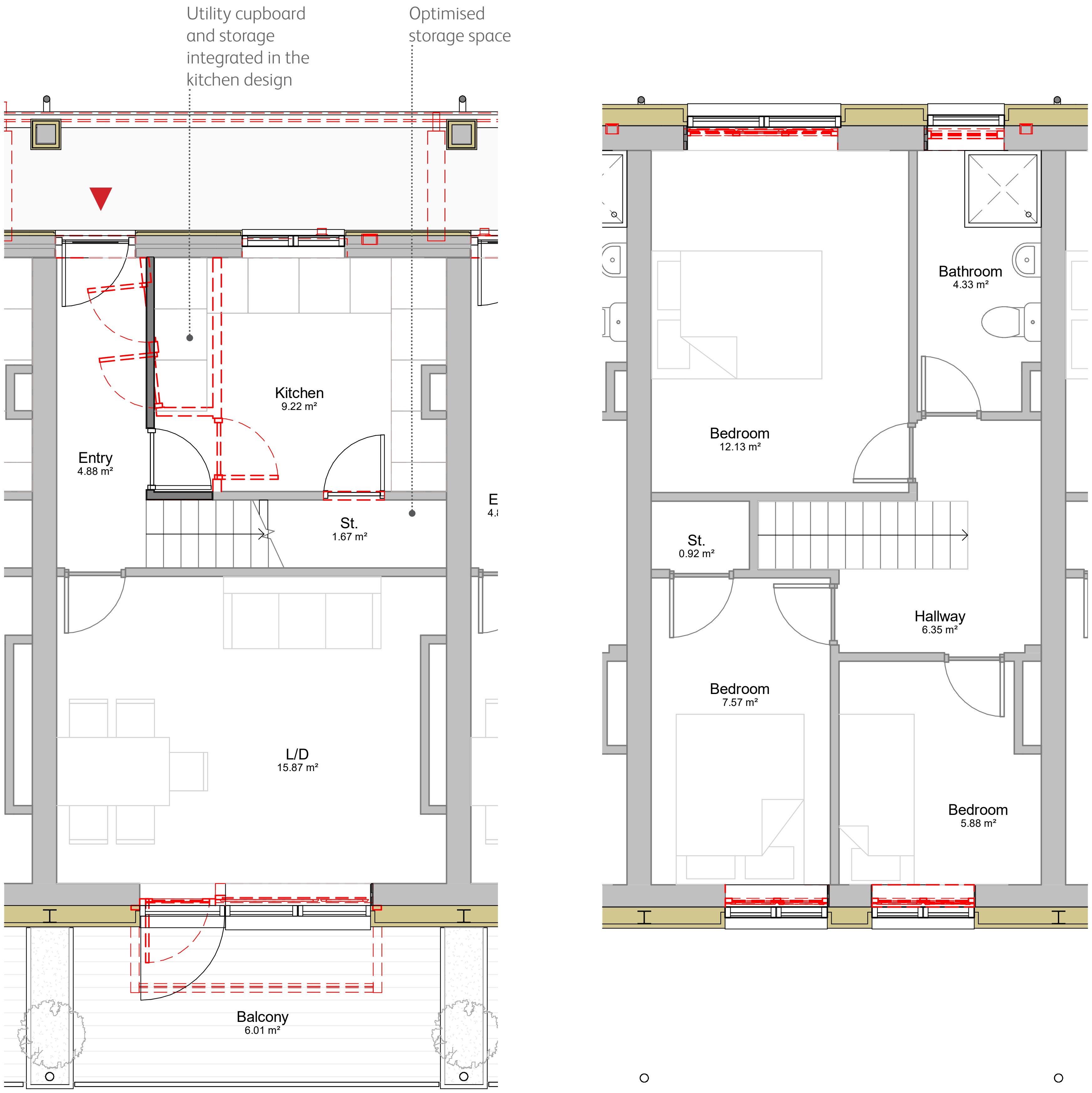
- External Wall Insulation
- External windows and front door replacement

ADDITIONAL WORKS

- New kitchen
- New bathroom
- New storage space under the stairs
- Increased outdoor space with new balcony

The internal layout will be discussed with the tenants to agree whether to integrate the existing storage within the kitchen area or not.

3 BED MAISONETTE
Internal floor area
74 sqm



Entrance
External Wall Insulation
Existing
Demolitions
Proposed works

EXISTING ARRANGEMENTS

At present residents can put refuse into chutes at the end of each deck access walkway. Additionally refuse bins left around the site at ground level allow ground floor residents to dispose of their refuse. Recycling bins are also left around the site, usually near the existing storage sheds. While these are available to residents, recycling currently requires more effort for residents of upper floors than putting all rubbish into the refuse chutes.

LANCASTER WEST REFUSE STRATEGY

LWNT are developing an estate-wide waste management strategy as part of their overall goal to become a model 21st Century Estate. Thus far the team have focussed on understanding the existing situation and what changes residents are most enthusiastic about changing. They have also looked at precedents on other estates to see how changes has been implemented elsewhere and are running a very successful trial of food waste composting on one part of the estate..

A clear set of objectives has been set out and those that are most relevant to the organisation of residents' waste at Treadgold house are marked in bold.

- **Aim to collect 100% of recyclable waste**
- **Make the sorting of waste much easier with appropriate bins**
- **Promote circular practices, where waste is minimised and resources are re-circulated within the community**
- **Accelerate food waste management**
- Run workshops on reusing materials, no waste cooking and other low waste practices
- Ensure that construction contractors working on the estate meet obligations in sorting the five most easily recyclable types of waste: metal, paper, wood, plastic and glass
- For construction waste: set sorting and recycling targets during demolitions but also during the construction phase
- Support the council's action in consolidating collection of waste by shared, low carbon vehicles

What activities and actions can the Lancaster West Neighbourhood Team help you to do more of?

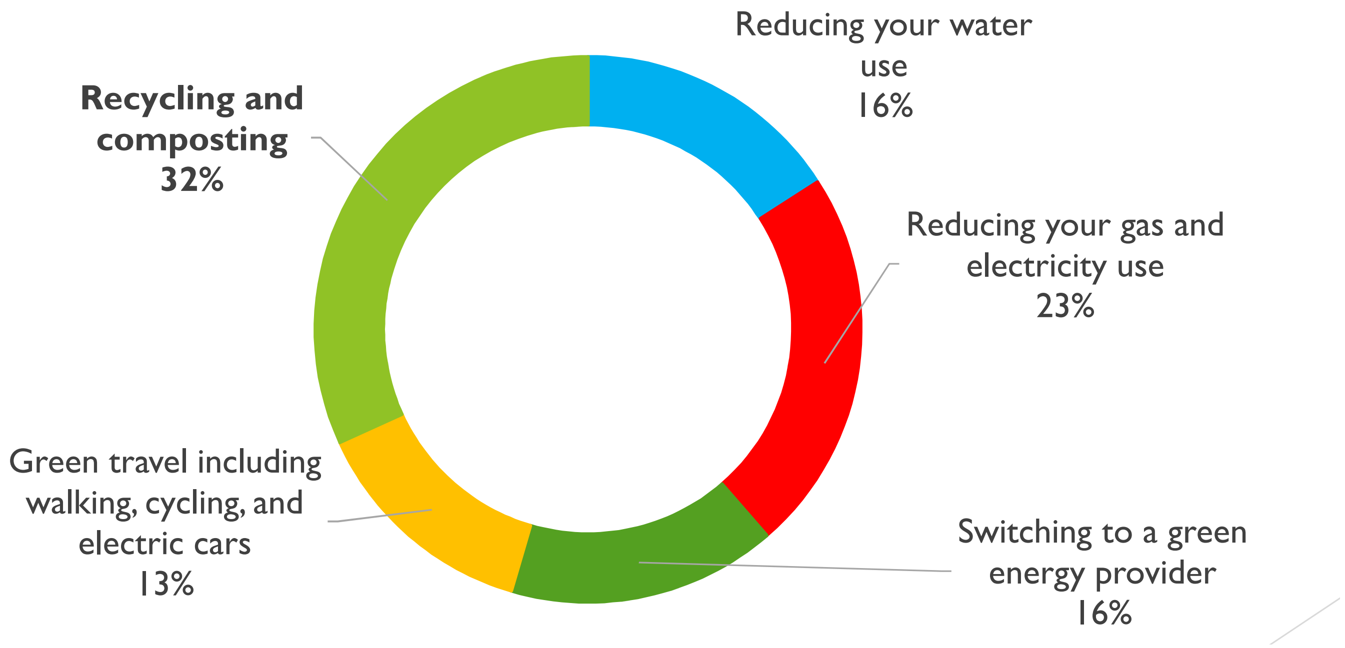


Figure 112 - Support with recycling and composting is a top priority for residents on the estate

TREADGOLD HOUSE PROPOSALS

Existing kitchens are to be refurbished in line with LWNT's internal refurbishment specification which will include an integral split refuse & recycling bin, to encourage residents to separate their waste.

It is proposed that the existing refuse chutes be closed up, with that to the west wing being repurposed as a services riser. In place of the existing chutes a new waste storage area is proposed to provide enclosed storage for refuse, recycling and food composting. This will mean that residents have to walk further to take out their refuse, but will require the same walk to dispose of recycling as at present. By removing the 'easy' option of putting all waste into the refuse chute it is hoped that LWNT's recycling target can be met. This will also remove the risk of bin chute fires. All residents will be provided with food waste caddies, with a new food waste bin provided along with other bins, allowing residents to compost their food waste.

Figure 113 - Refurbished kitchens will include split refuse & recycling bins

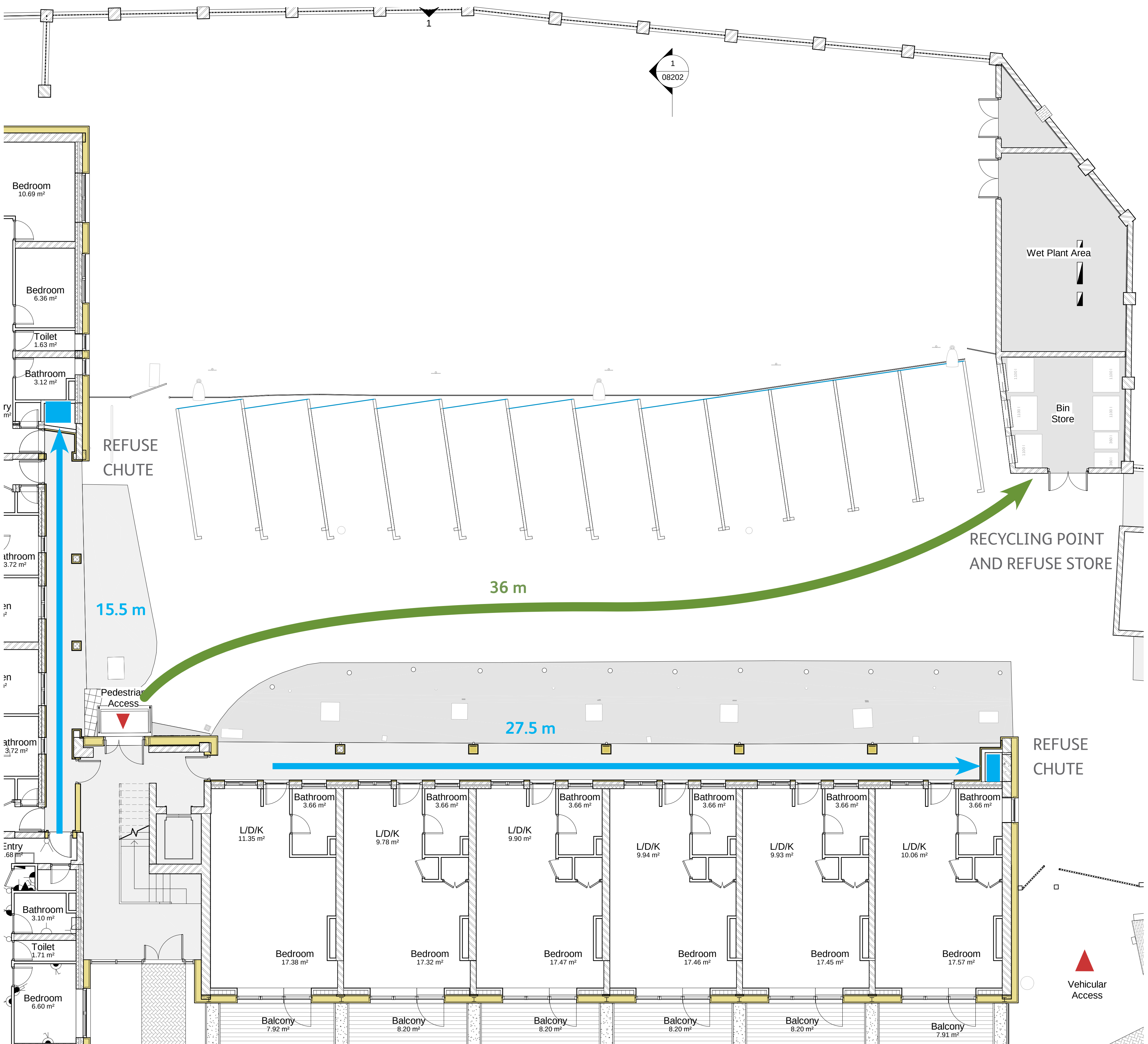


Figure 114 - Distances to existing refuse chutes and new recycling and refuse store

ACCESS & DISTANCE

The furthest that any resident currently has to travel to the refuse chute is 27.5m, though to recycling bins they will typically have to go down to the ground floor and walk a further 38m or so to reach the recycling bins.

A new recycling & refuse store is proposed towards the east end of the site, with residents deciding the exact location. This will place it away from the building, so that noise, smells and arson risk are not adjacent to anyone's home. It is also near to a typical pedestrian route out of the site, so that people can drop waste off as they go out. The store is suggested to be around 36m from the front door, slightly further than the 30m recommended by Part H of the building regulations. It is suggested that this location on the edge of the site is preferable to locating it nearer to the building where it would become a very prominent feature.

While the store needs to be accessible for refuse & recycling collection vehicles, it is also important that it is not too prominently located, as this could attract fly tipping. Therefore the south and west of the site, facing the street, are not appropriate locations for this store.

LWNT are aware that there are some residents for whom the removal of refuse chutes will be challenging, particularly those who are less able. They are therefore considering trialling time-controlled dedicated waste collection from residents front doors for those for whom this is necessary. This will of course need careful management to avoid creating a fire or trip hazard, but could help to ease the transition to a system that is more focused on recycling.

The arboricultural report suggests that the Canary Island Date Palm that sits at the east end of the communal garden could likely be moved elsewhere within the site, though specialist equipment and aftercare would be needed to enable this.

VOLUME

RBKC's '*Planning For Waste Management Waste Design Guidelines for Architects*' from 2017 allows for 60 litres of waste generation per bedroom per week for this type of building. It also stipulates that waste is collected twice weekly. The calculation of refuse & recyling storage required can be seen in the table to the right.

Bin numbers were originally calculated based on Westminster's guidance for this, which called for a slightly more generous provision, with recycling broken down into more different streams. This in total led to the proposal for 3no 1100 litre recycling bins and 2no. 1100 litre refuse bins, along with 2no. 360 litre food composting bins.

While currently RBKC collect mixed recycling, and may not require provision of so many recycling bins, it is proposed that the new bin storage area be sized to ensure that there is always sufficient recycling bin capacity, and so that if recycling is collected in more different streams in the future this can be accommodated.

Number of beds	Number of dwellings	Litres required	Waste	Recycling
Studio	6	360	180	180
1	10	600	300	300
2		0	0	0
3	22	3960	1980	1980
Total	38	4560	2280	2280
Bins required			2no. 1100 litre	2no. 1100 litre

Figure 115 - Waste storage calculations based on RBKC guidelines

ENCLOSURE

In order to minimise new structures on site one proposal is that the store is part of the same structure that will house new plant. (see section 4.14)

It is suggested that the new bin store be built at least partially from the bricks from the chimneys that are to be removed. This would present a really positive story of reuse. It is proposed that the building have a sedum roof, reducing rainwater run off from it and minimising the visual impact when looking down from the homes above. As there will still inevitably be some rainwater run-off this would be an excellent location for a water butt to collect water for use in the garden area.

The store will require a tap internally to allow for cleaning, and a gulley in the floor, so new drainage will be required to this area of the site. Good lighting and clear signage, consistent with other waste stores across the estate will help to make clear to residents where to put what and remind them of the positive impact of their actions.

BULKY WASTE

There is currently no dedicated bulky waste storage at Treadgold House, and there are instances of fly tipping by the storage sheds. Given the limited site area it is proposed that bulky waste be managed by collection rather than building a dedicated store. Residents are able to arrange for bulky items to be collected at a specified time, with the cost of this depending on income. Clearer signage about this service may help to ensure residents make use of it. RBKC are also keen to improve the way the track down and fine residents who fly tip. Renewed efforts to police this, combined with CCTV covering the storage sheds should help to mitigate this problem.

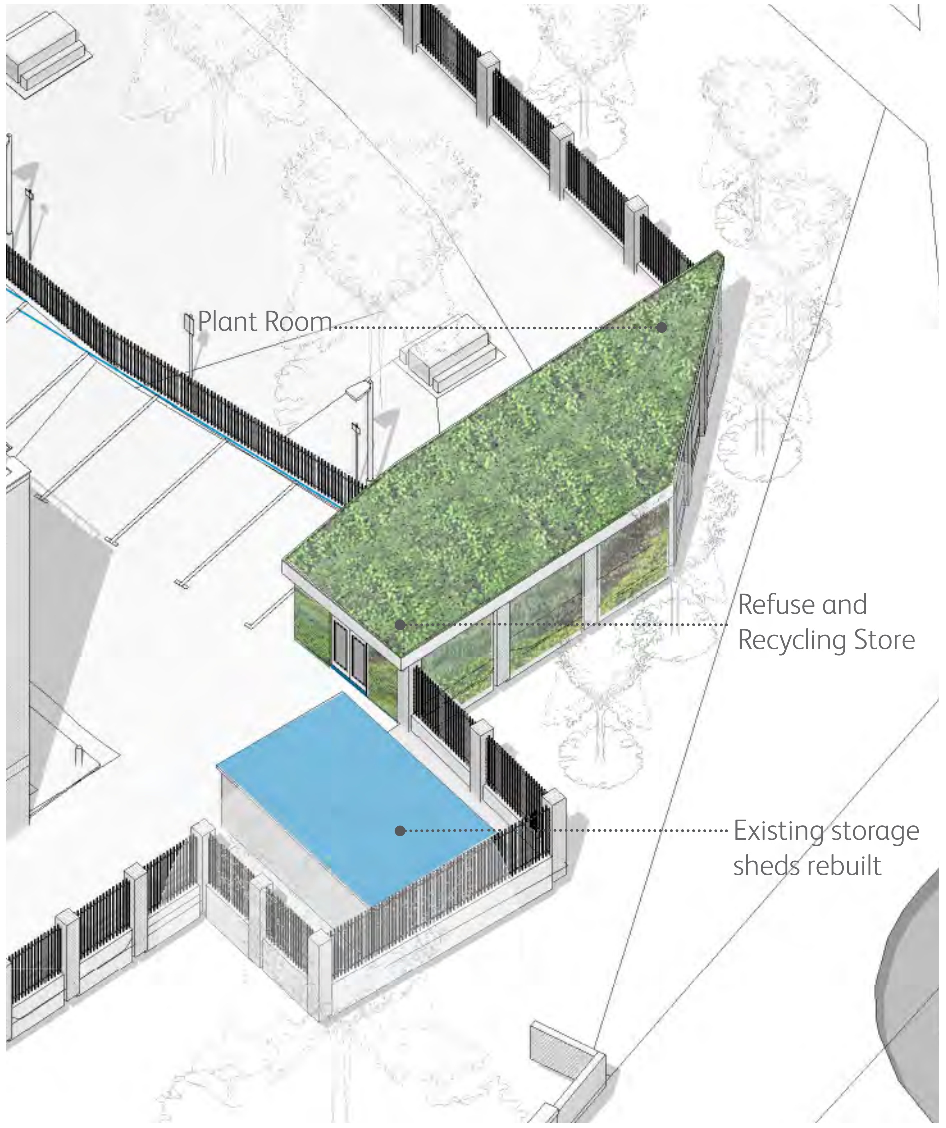


Figure 117 - 3D View of the Plant Room and Refuse & recycling store - Option 1

Figure 116 - Plant Room and Refuse & Recycling Store - Option 1
New plant room and refuse & recycling store at the east end of the existing communal garden & car park
Storage shed rebuilt in the same position.

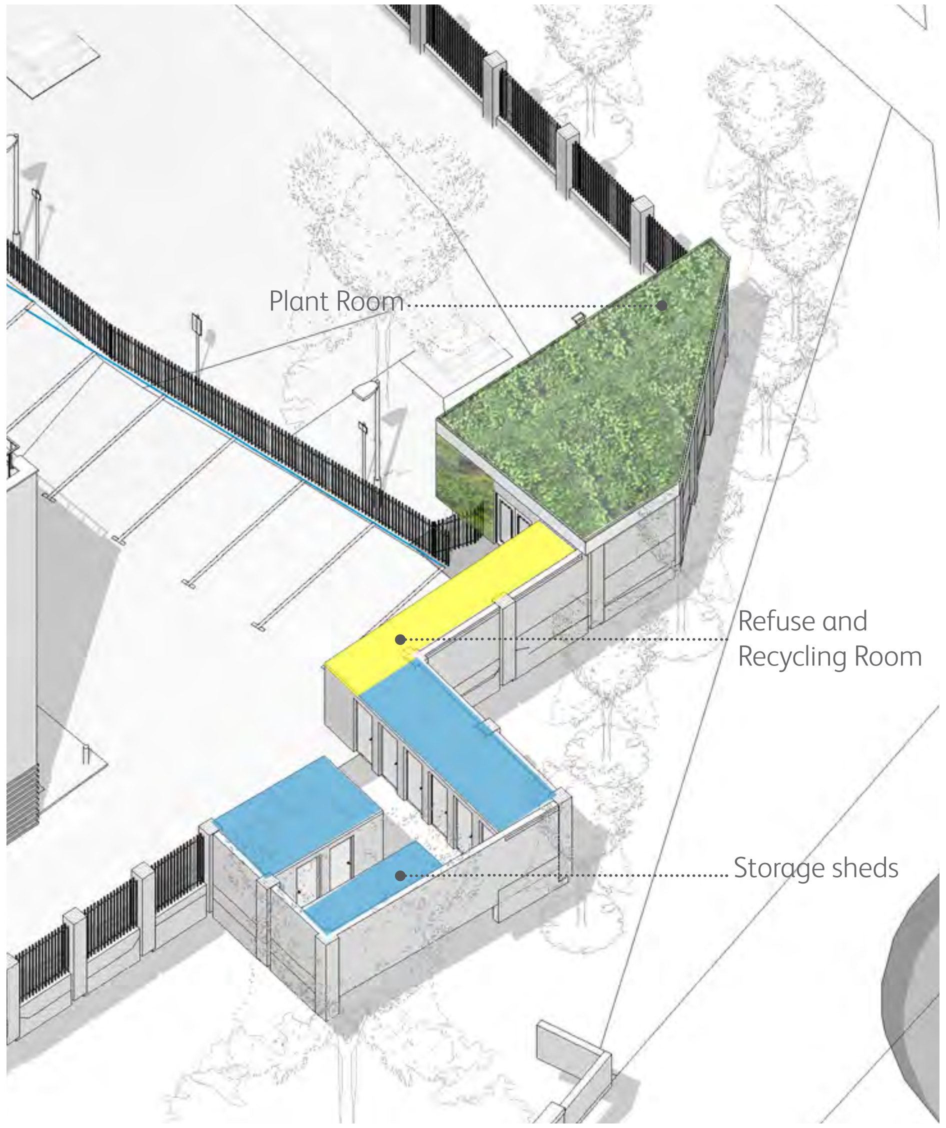


Figure 119 - 3D Visual of the Plant Room and Refuse & Recycling Store - Option 2

Figure 118 - Visual of the Plant Room and Refuse & Recycling Store - Option 2
Storage sheds rebuilt with a more efficient layout, Refuse & Recycling stores face car park, retaining all parking spaces. Plant room at end of communal garden

4.14 PLANT ROOM & OTHER SERVICES IMPLICATIONS

The mechanical and Electrical Stage 3 report by TACE sets out their design strategy and proposals in detail. There are a number of elements that impact the building and site's overall architecture and these are examined in more detail here.

NEW PLANT ROOM

A new plant room is needed at ground level to house new electrical distribution boards, a new cold water tank and booster set and a thermal buffer tank for the communal heating system. The proposed location is at the east end of the existing communal garden area, up against the boundary. This location avoids prominence within the site, and while it will reduce the garden area, it will not impact on the overall useability of the space. New tree and shrub planting infront of this plant room, as well as planting up its walls will offset the shrubs that have to be lost to make way for it, as well as softening the overall appearance.

Rooftop air source heat pumps and photovoltaic panels are proposed on the roof and are explained in more detail in section 4.06

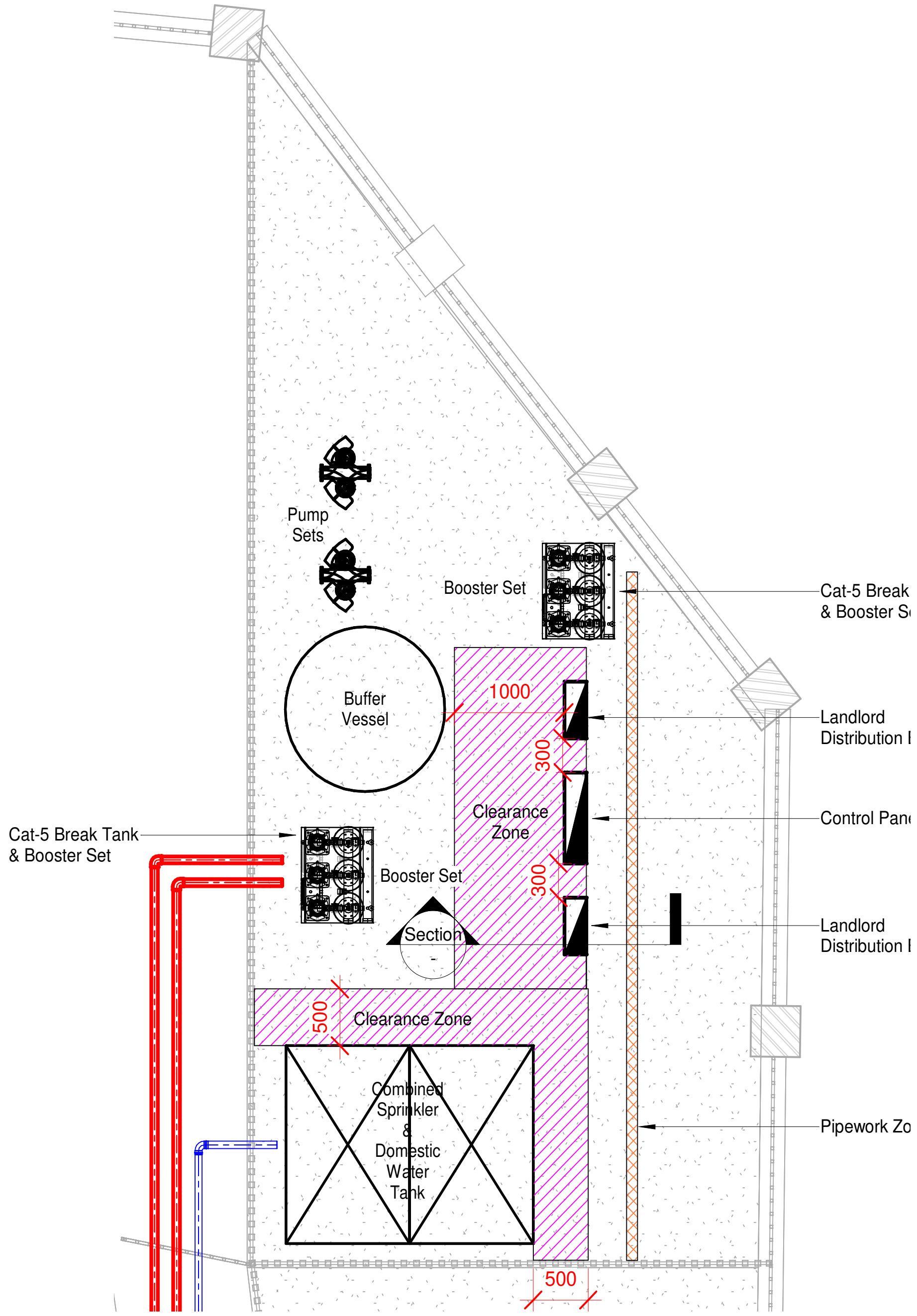


Figure 120 - Plant Room Plan

SERVICES ROUTES AROUND BUILDING

The new cold water and low temperature hot water pipes will run from the plant room below ground, to the existing refuse chute in the west wing, which will be repurposed as a riser. From here they will run along the soffit of each deck access area and into each home via a fire-stopped opening in the existing wall. These penetrations will also need to be made airtight.

Electrical cabling will follow a similar route, so that the soffits to the deck access areas will have a number of insulated pipes and cable trays exposed. Combined with new insulation on these soffits the services will reduce the head height to around 2210mm above the deck level, with possible localised lowering where services need to cross below one another. While the current soffit height is at around 2400mm, this also has some exposed services on it, with boiler flues creating localised downstands as low as 2100mm.

SERVICES WITHIN FLATS

New mechanical ventilation (MVHR) ductwork and new heating pipework will be installed in each flat. At present ceilings are around 90-125mm below the soffit level. MVHR ductwork as been kept as shallow as possible, at 60mm deep x 200mm wide. However this will still require ceilings to be lowered in at least some rooms to conceal these new services. It is hoped that ceiling heights can be kept above 2300mm throughout, which would allow at least 150mm for services and ceiling boards. The top floor flats will have slightly lower ceilings, as they do at present, where the soffit is only 2310mm above floor level. In these areas it may be appropriate to create downstand areas where ductwork is present, to avoid lowering ceilings throughout. Additionally particular attention will be needed to ductwork routes and how these relate to how rooms are used.

While the existing gas boilers will be removed from each home, there will need to be a new heat interface unit and a new mechanical ventilation with heat recovery unit. Services layout proposals have been prepared for the 3 bedroom flats. Here the heat interface unit sits within an existing cupboard, though some storage space will still be available in here. The MVHR unit is proposed to sit in a new cupboard created from what is currently the balcony, therefore it does not lead to any loss of storage. It is intended that similar rearrangements to other flat types can ensure that overall the changes do not lead to significant loss of storage capacity.

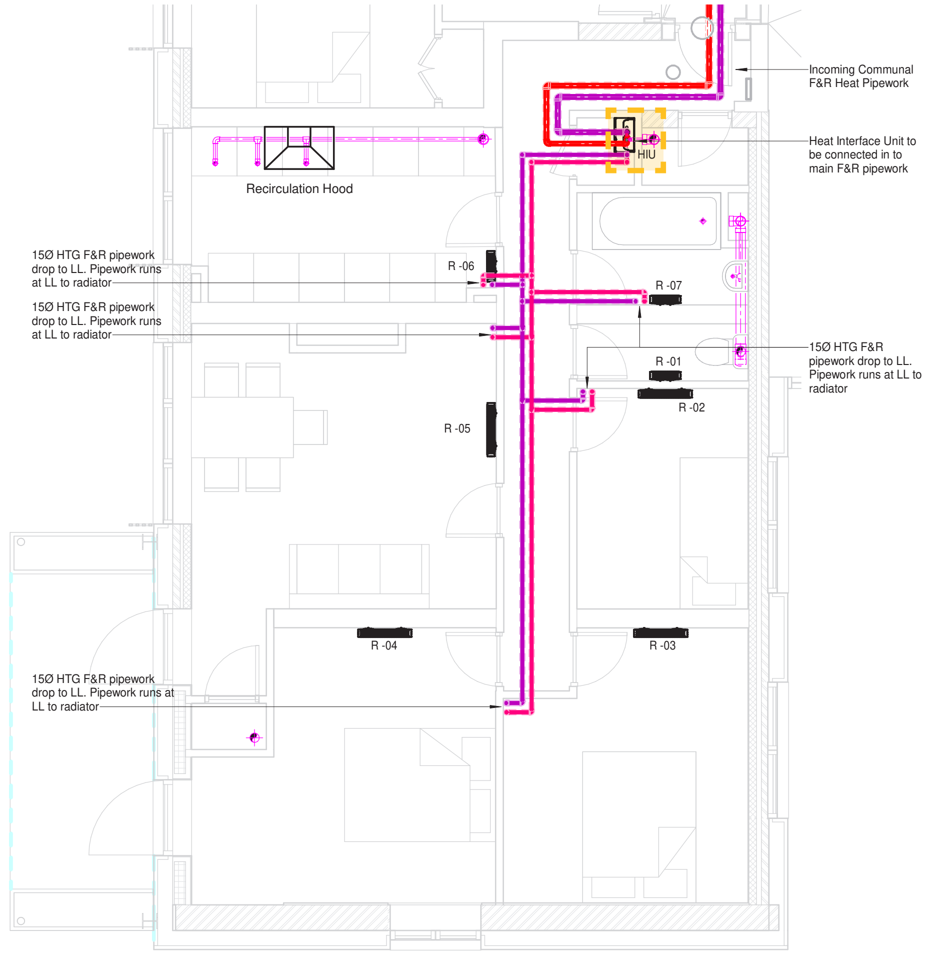


Figure 121 - Heating layout to typical 3 bedroom flat, with heat interface unit location highlighted in yellow

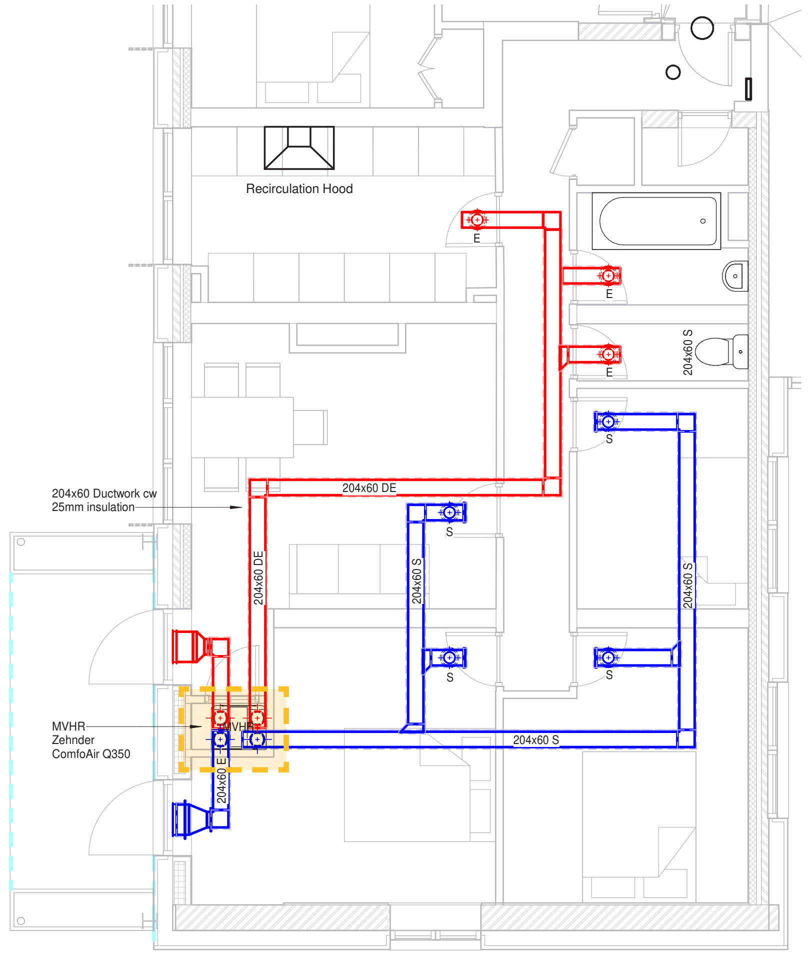


Figure 122 - MVHR layout to typical 3 bedroom flat, with MVHR unit location highlighted in yellow

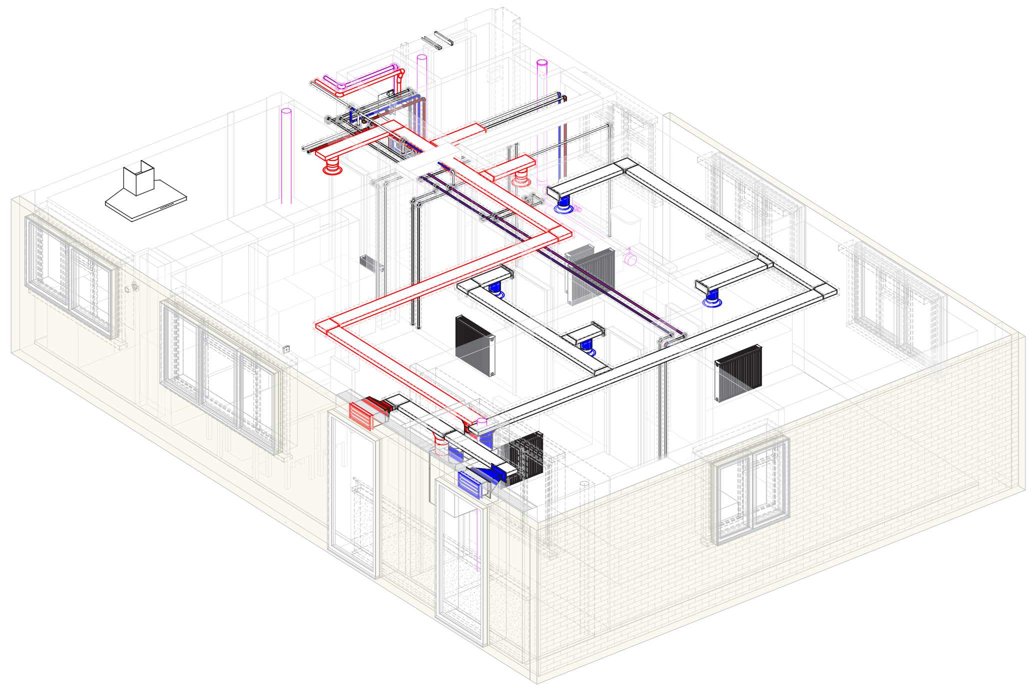


Figure 123 - 3D visual of the MVHR layout in the 3bedrooms flat

IFC FIRE STRATEGY REPORT

As has been noted in section 3.5 of the report, type 4 Fire Risk Assessments were carried out by Frankham prior to ECD starting work on the project (*Frankham RMS Fire Risk Assessment, 9th April 2020*). This led to the drawing up of a priority list by RBKC (*FRA - Priority - Lot 4*) which highlights some omissions to the report, but also confirms remediation works required as part of the building's retrofit. Further surveying has been proposed by IFC, the outcomes of which will be shared once available.

IFC have reviewed the proposed options presented in the initial feasibility study for the building, (*IFC Report FSA/22135/02, June 2021*) setting out the implications of options to enclose the deck access areas or leave them open. This review has been pivotal in taking forwards the open deck access. As explained in section 4.04 enclosing the decks led to more complex fire suppression and escape strategies.

A meeting was held with RBKC's Head of Fire Safety, Keith Todd, on 4/6/2021 and minutes of this are appended to this report. The aim of this meeting was to confirm LWNT's and RBKC's Employer's Requirements around maximising fire safety, as in some areas these go beyond statutory requirements.

Subsequently IFC have been asked to provide a more detailed Fire Strategy for the proposed design, and this should be referred to. This will be submitted to Keith Todd along with proposed plans to allow a review of proposals to be carried out and the design to be signed off.

EMPLOYER'S REQUIREMENTS

Given the context of the building and its proximity to Grenfell Tower, LWNT require the design to go beyond statutory requirements for fire safety in some areas, though the fact that this is an existing building also imposes some limitations. Specific items to note are as follows:

- All buildings on the estate to be treated as ‘relevant buildings’ under Regulation 7(2), regardless of height.
- Roof build up to achieve Broof(t4), with insulation achieving at least A2 rating (effectively non combustible).
- Each unit to have Grade D1 category LD1 fire alarm system
- PV panels: Isolation switch to be installed and location of the inverter to be chosen carefully in order to mitigate fire risk. A2-s1, d0 (effectively non combustible) PV panels noted to be available and to be used.
- Design team to provide fire risk mitigation strategy for PVs.
- Lift must include a communication system in case of emergency
- MVHR ductwork to be in fire resistant boxing in, appropriate to the level of compartmentation required by the dwelling layout. Dampers not typically required where MVHR system is entirely within 1 dwelling

IMPACT ON DESIGN

The most significant impact on the building's design has been the decision to leave the existing deck access areas open. While this creates some challenges in itself, it avoids the need for either sprinklers or new staircores.

New doors have been added between the staircores and the deck access areas. These will reduce smoke getting into the stair area in the case of fire. They do however present challenges as there is limited space in this area, and detailed drawings are still to be reviewed with building control to confirm that door swings are acceptable. IFC's report that there is not explicit requirement to retrospectively enclose the stair.

New balustrades to the deck access areas are proposed to be of solid construction up to 1100mm above finished floor level. In addition to stopping people from falling, these create a 'crawl zone' along the deck that should not fill with smoke in case of fire below. Additionally sills of windows facing onto the deck areas will be raised where these are below 1100mm above floor level.

RBKC are in the process of replacing all flat front doors across the borough with new FD30s front doors. This work appears to have already been carried out across Treadgold House, and LWNT would like these new doors to remain. Confirmation that all doors have been replaced and the specification of these should be confirmed with LWNT.

Within the three bedroom flats the relocation of the front doors to bring existing storage cupboards into the flats slightly extends the corridor lengths, from 8.9m to 9.6m. While this is longer than the required 9m distance it has been discussed that this should be acceptable given the level of fire alarm system proposed in the flats.

New Mechanical Ventilation with Heat Recovery systems are proposed to each home. Each system will be entirely within each home, so that no ductwork runs through party walls or floors. It will however pass between rooms and the protected corridor or stair. Consequently this ductwork is to be boxed out so that it effectively forms its own 30 minute fire compartment. It is still to be confirmed whether this ductwork is required by the client to be non-combustible.

MATERIALS

The need to treat the building as a 'relevant building' creates some challenges with new materials. In particular airtightness membranes and waterproofing membranes to deck access areas should be a minimum of class B-s3, d0. A number of A2 rated (effectively non combustible) airtightness membranes are now available. Some external wall insulation systems use spray-applied airtightness membranes, applied to the outside of the existing wall before the insulation is applied. Typically such membranes are more combustible than class B. An opinion of such systems is being sought from IFC, as they constitute a very think layer, sandwiched between non-combustible brickwork and non-combustible insulation. However it will be up to the Solution Provider to seek confirmation that their proposed system, including the airtightness layer, meets LWNT's requirements.

The new insulation layer to the deck areas must be waterproofed, and waterproofing membranes for such areas were not historically tested for non-combustibility in the same way as wall materials are. Consequently there are not many products available that are appropriately tested. Newton System 100 liquid waterproofing membrane is a class A2-s1, d0 (effectively non combustible) product that may be suitable here, though exact details of build up are still to be confirmed.

REMEDIATION WORKS

Not all flats have been accessed for surveying at this point, therefore while the Frankhams FRAs and subsequent investigations have revealed some areas where fire stopping needs remediation work, this must be assumed to be representative rather than comprehensive. As works progress to each unit all possible areas where compartmentation breaches may occur must be opened up and checked and made good where necessary. Photographs confirming this must be appended to the BIM model.

As noted previously it appears from those flats inspected that internal doors onto protected corridors are typically FD30 doors with intumescent strips and smoke seals. However this should be confirmed in each unit.

New wayfinding signage for the fire service will be installed in line with the 2020 amendment to Approved Document B. Emergency lighting is also to be replaced to ensure it is compliant with current guidance.

RESIDENTS IN SITU

It is intended that the works will be carried out with residents in situ, which makes construction planning more challenging but also more critical. While LWNT are developing a respite plan for particularly disruptive periods of work and for those who are particularly vulnerable, in general residents will need to be able to keep on living in their homes during the works.

RISK REGISTER

A risk register has been prepared highlighting specific challenges of the project. The majority of the risks relate to interaction with residents, and in some cases surveys or steps in the design process have already been taken to mitigate these risks. Much risk reduction will involve clear communication with residents, and setting up and maintaining communication channels with specific individuals within the contractor team will be very important.

The risk register sets out risks related to the design as it stands. The Solution Provider will need to develop this to ensure it picks up risks that are specific to their final design. The register is appended to this document.

The adjacent plan marks ground finishes, trees, and other items on the site and beyond it that may affect construction planning.

4.17 RESIDENT CO-DESIGN

LWNT's Core Principles for Refurbishment make clear that refurbishment is to be resident led, that all age groups and communities must be listened to, and that residents must be given real choices to make at each stage of the refurbishment. In addition, Energiespong funding requirements stipulate the need for a resident engagement plan. They recommend that a script is agreed to ensure all residents receive the same information; that questions are formulated which ask about residents' current experience of living in their home, as well as 'likes' and 'don't likes' to inform designs; and that project outcomes are communicated internally and externally.

In line with LWNT's core principles and Energiesprong's funding guidelines, co-design will continue to be integral to the next phase of the refurbishment. The ideas and proposals of this report will be communicated to residents. Residents' feedback will be listened to and their preferences will be recorded. What they express will shape and inform which ideas and proposals are taken forward.

It is anticipated that this process will have several stages, informed by the recommendations of Energiesprong funding guidelines:

1. PREPARATION

Every resident will receive a letter invitation to a pop-up event where they will have the opportunity to give feedback on the ideas presented. Posters will be put up in communal areas advertising the time and location of the event. A short Instagram video will likewise be used to raise awareness of the event and encourage attendance.

A script is being developed with LWNT which formulates the proposals for refurbishment in clear and accessible terms and includes several key questions which residents will be asked to answer.

2. POP UP

A pop-up event, to be held at Treadgold Gardens, will enable socially distanced face-to-face discussion of the refurbishment. A2 soft boards will display the key proposals for residents to consider. Samples of brick slip, Rockpanel, and window frame materials will allow residents to play with different combinations and develop their preferences for an aesthetic to take forward. Questionnaires will be available to record preferences and monitor which proposals residents would like to pursue.

3. REACHING FURTHER

It is proposed that door knocking and phone calls to residents at Treadgold House follow the pop up in order to ensure as wide participation as possible. At these 1-1 meetings, the same script and images used at the pop-up will be used to explain the retrofit.

INVOLVEMENT IN TENDER PROCESS

The feedback collected through this process will be communicated to residents and summarized as a set of preferences included in tender documents. The contractor will be required to respond to these preferences, and indeed to continue the process of community engagement so central to the refurbishment thus far.

LWNT would like residents to be involved in the selection of the contractor, as they have been with consultant appointment so far. The design team are happy to help facilitate this involvement, including meeting with selected residents to explain the tender process in more detail and work with them to review submissions.

ENGAGEMENT WITH SOLUTION PROVIDER

Once a Solution Provider is appointed they will need to create their own engagement plan as they pick up the design and then move into building it. It is suggested that they work with LWNT to create this, which may include:

- Solution Provider must have specific named resident liaison person, who residents can have ongoing contact with.
- Initial introductory meeting, with specific staff involved. Set out programme for design & works and future meetings.
- '*You said, we did*' meeting to show how pre-contract pop-up event is feeding into design work. Consider vote / how to confirm acceptance of specific decisions.
- Construction logistics meeting to set out initial ideas of carrying out works with residents in-situ. Pick up specific concerns so that these can be fed into the construction programming.
- Proposals for ongoing resident liaison throughout works, including when works will take place to specific units, identifying vulnerable individuals who may need extra support, explaining temporary access & escape procedures
- Ways of continuing to maintain discussions around the benefits of the works as they are ongoing
- 'Soft Landings' approach to help residents make the most of the changes to their homes and ensure all understand the Comfort Plan.
- Ensure ongoing liaison after completion of the works so that any challenges can be solved

Figure 124 - Co-Design Board about new entrance

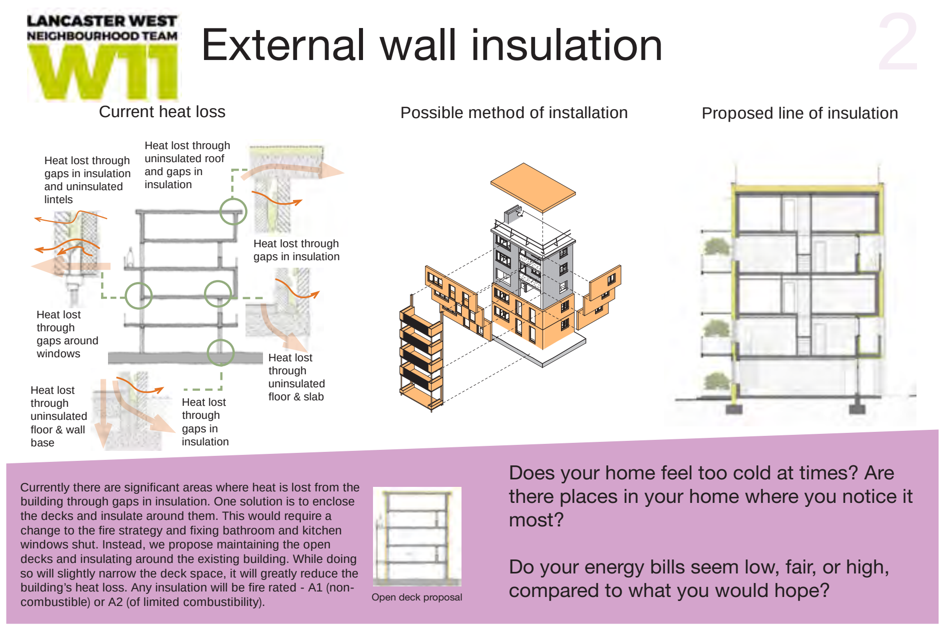


Figure 125 - Co-Design Board about external wall insulation

A meeting was held with Jose Anon of RBKC Building Control on 12/5/2021. It should be noted that the building's design has progressed since this meeting some that some items discussed are no longer relevant.

The most critical discussions relate to fire and to structure and these are expanded on in the relevant sections of this report. In general as a retrofit, the building will not largely need to be changed to comply with current regulations. However where work is being carried out, if there is an opportunity to improve compliance this should be taken up.

It is acknowledged that the building does not currently meet Part M requirements, having steps at each unit's front door, lacking nibs to door openings and not having a WC at the entrance storey etc. Proposals should avoid making this any worse, but it was acknowledged that the homes will not be able to be brought up to full compliance.

Figure 126 - Each home has a step up into it

PLANNING PROCESS

A preliminary meeting was held with Martin Lomas and Laura Fogarty of RBKC planning department on 9th December 2020. While the proposals for Treadgold were not presented at this meeting it was suggested that generally across the estate if residents want refurbishment to happen, it will hold great sway and the planning department will not be minded to refuse.

A pre-application planning report has been sent to RBKC's planning department and a meeting is being arranged. Minutes of this meeting will be included in the tender package once they become available. The aim of this meeting is to explain the Energiesprong process and establish design principles that allow the Solution Provider sufficient freedom to design, but also ensure that the local planning context is fully understood and taken into account.

It is intended that the Solution Provider will submit the planning application for the works, but they will need to be able to start their design with a reasonable level of confidence that they will be able to get approval for intended works.

PLANNING CONTEXT

The pre-application planning document sets out the site's context in more detail and should be referred to. The site is immediately to the north of the Avondale Conservation Area, and this may be pertinent to design work, particularly to the building's south façade.

Additionally the design must be shown to respond to the policy context. The most pertinent of these are the New London Plan and the Council's draft Greening SPD which relates to the energy hierarchy, whole life carbon and circular economy and retrofit risks.

The latter of these two documents has been prepared in the context of the London Plan, RBKC's Local Plan and the Council's commitment to meet its target to be neutral by 2040.

Treadgold House was built around 1960 and is not listed nor in a conservation area. The Avondale Conservation Area begins immediately to the south of the site across Bomore Road. This is characterised by modest, largely brick-built terraces of houses from the late 1800s. The site of Treadgold House was once occupied by similar terraced housing. The road layout was altered when Treadgold House was constructed. Subsequently more of the current Lancaster West Estate was constructed to the north and west of the site, further changing the context.

Figure 127 - 1896 map of the area with Treadgold House site outlined in green & current conservation areas marked in red

Figure 130 - Treadgold House seen from Treadgold Street

At 5 storeys Treadgold House is taller than the 2 storey terraces to the south. However being faced in brick and with a flat roof it's impact is more limited than it might otherwise be. To the west is Barandon Walk, also brick faced but in a more modernist style. The two colours of brick used at Treadgold house are sympathetic to both contexts.

It is noted that mature trees immediately adjacent to the Avondale conservation area are seen as softening the impact of the surrounding architecture, and hence are seen as a positive feature of the conservation area's setting.

Figure 129 - Treadgold House seen beyond terraced houses on Grenfell Road

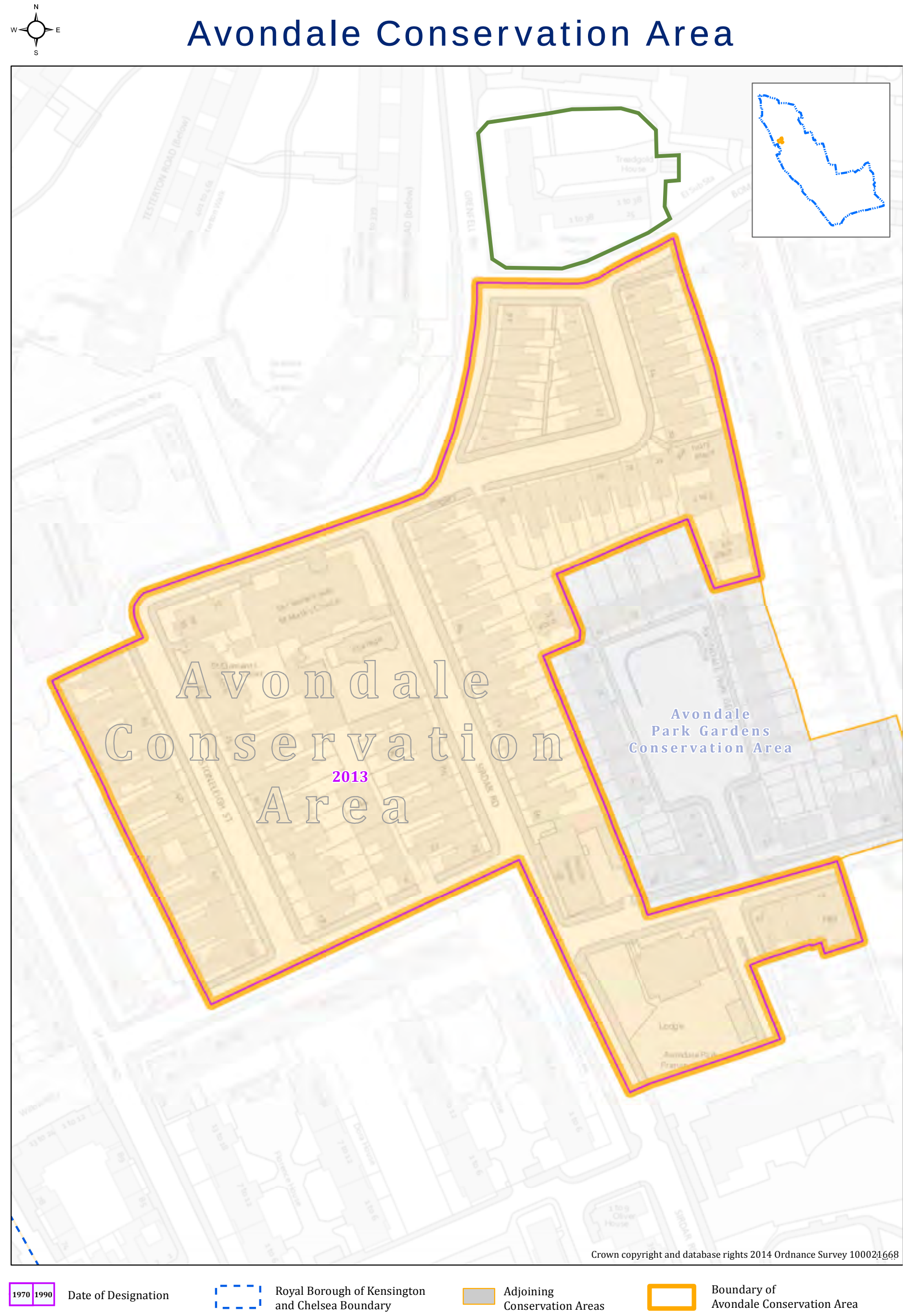


Figure 128 - Avondale Conservation Area with Treadgold House site outlined in green

4.20 BIM & MONITORING

BUILDING INFORMATION MODELLING (BIM)

Integrating BIM provides assurance that asset and facilities managers that they have the most accurate and up to date information. BIM provides a solid foundation for greater certainty regarding capital and operational expenditure as well as continually measuring the performance of their assets, giving them an efficient evaluation tool to make decisions from to enhance their cost savings and quality improvements. On the Lancaster West projects, the common data environment (bim360) being utilised, allows all users to store data and gives accessibility to the information ensuring full transparency.

To meet requirements of the client, BIM360 gives the ability to tag models with pictures, during snagging stages or for the simple purpose to inform facility managers of the condition of the element on the date of upload.

The 3D model can serve as a digital twin to provide a visual representation of that which is to be built. This can be used to allow and encourage resident engagement and welcome comments to be taken on board.

Lancaster West Neighbourhood Team are developing their estate-wide BIM strategy, and the contractor will need to design and build in line with the Employer's Information Requirements.

MONITORING & ENERGY USE FEEDBACK

The contractor will be required to test the building's performance at completion to prove that it meets the Energiesprong requirements.

Smart metering will also be needed to ensure that residents have real-time feedback on energy used and generated by the photovoltaic panels. This will need to be visible in homes, via an app and to feed back to LWNT. In this way residents will know whether they are likely to exceed the Comfort Plan energy usage and LWNT will be able to bill appropriately.

LWNT are still considering their preference of Smart metering device for homes across the estate and will publish a matrix of the devices that they have looked at.

Given the nature of this project we anticipate that PAS 2035 (effective from 1st July 2021) will be required and that as a result the project team will need to demonstrate compliance with this methodology. Due to the Design & Build nature of this project we propose that the Solution Provider (and their appointed design team) are required to undertake the following roles as defined under PAS 2035: Retrofit Assessor, Retrofit Coordinator and Retrofit Designer.

As ECD will be retained by LWNT to provide contract administration and technical scrutiny we propose the ECD should also provide Retrofit Evaluator consultancy at the end of the project. This will ensure independent scrutiny of the performance and support ongoing consultation with residents post-handover.

4.22 PHPP EXPLANATION

The PassivHaus Planning Package (PHPP) has been used to model the existing building and the proposed retrofit. In each case the building has been modelled as two separate thermal envelopes, so two PHPPs have been produced. As the design has been evolving quickly the PHPP file will be further updated to pick up final amendments. The following notes explain the modelling in more detail, highlighting specific areas that have been modelled in particular ways

OCCUPANCY

In all PHPPs this has been set to reflect actual current occupancy plus 20%, with 41 inhabitants in each wing. This would not of course be appropriate for Passivhaus certification, but is a more realistic representation of the actual situation on site. It is suggested that this be stress-tested by assuming all void flats are filled and a slightly higher occupation rate overall.

AIRTIGHTNESS

The existing PHPP uses the airtightness figure measured on site by Build Test Solutions, of 5.57 air changes. As more testing is carried out and more information becomes available this could be revised to reflect these numbers.

The retrofitted building models assume an airtightness of 3 air changes. While it is hoped that a better airtightness can be achieve it is noted that there are uncertainties around what will be possible, particularly where the buildings' wings meet the existing staircore. Therefore a relatively 'safe' number has been used for this modelling.

THERMAL BRIDGING

As has been noted in the report there are a number of areas where thermal bridge analysis will be needed once details are developed, particularly around the deck balustrades and columns. Once these figures are known they can be added into the PHPP models.

OVERHEATING

A separate overheating report is being prepared by TACE, but below are the measures included in the PHPP modelling that relate to how overheating risk has been mitigated.

THRESHOLD

The overheating threshold has been varied to 26°C, to demonstrate the building's ability to comply with Energiesprong requirements.

SHADING

The proposed building PHPP files include the shading shown above and to the sides of windows. This has largely been included by modelling the building in DesignPH, such that this shading appears in the 'shading' sheet. However some of the upper shading to the south wing was added later and has been manually inputted into the 'Additional Shading' sheet. Internal blinds have not been included at present.

WINDOW VENTILATION

No daytime ventilation has been included to the south wing as this was not needed to avoid overheating. In the west wing it has been assumed that 2no. tilt & turn windows are opening 100mm each for 4 hours a day, providing cross ventilation. No night time ventilation has been included, and it is noted that risk is significantly reduced if this is added.

MVHR VENTILATION RATES

Ductwork has been deliberately oversized to allow increased ventilation rates, and the PHPP model includes relatively high rates. See also the TACE Overheating report

GLASS G VALUES

Currently set at 0.51 in the PHPP model. But also see TACE Overheating report

CLIMATE DATA

At present the London climate data has been used. However Energiesprong requirements call for the model to be tested against Met Office weather data for the last 5 years with 3°C added to the summer monthly mean maximum or for the model to be tested against predicted climate data for 2050.

Figure 131 - DesignPH view of existing west wing

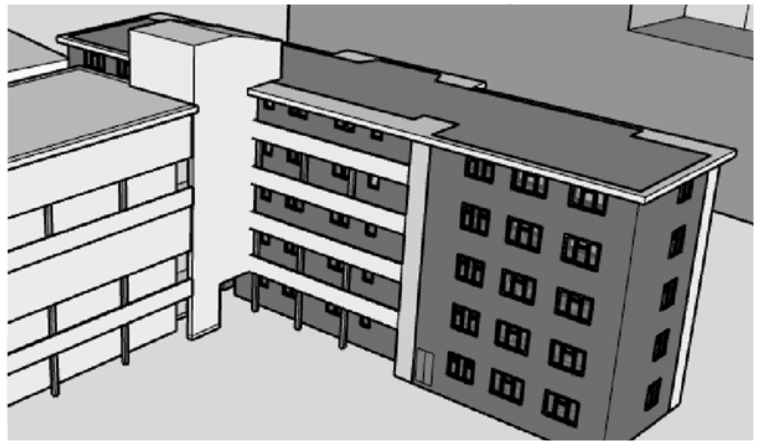


Figure 132 - DesignPH view of existing east wing


GRENFELL
NO DOGS

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5.0 CONCLUSIONS

5.1 Conclusions

5.1 CONCLUSIONS

The competition-winning design for Treadgold House by Bowtiesprong demonstrated that the building could be retrofitted to the Energiesprong standard. This was critical for enabling residents to understand what might happen to their homes and gathering their support for external wall insulation and other measures.

The work since carried out by ECD and design team provides a better understanding of the existing building and its context. Through creating this advisory design the implications of a number of big decisions has been worked through and recorded, allowing the future Solution Provider to progress the final design more quickly and successfully.

Some surveying and engagement with residents and planners is still to be carried out, and it is hoped that the outcomes of these can be included in the tender documentation, to give as full a picture as possible of the parameters within which the Solution Provider will be working.

While the interventions discussed in this report have largely been described in terms of technical detail, their potential impact on the lives of residents is far from abstract. Going forwards with this project has the potential to shape their quality of life in profound and lasting ways.

Improvements to ventilation promise to refresh and cleanse indoor spaces, contributing to the physical health of residents and mitigating against the stress caused by living in environments marred by damp and mould. The addition of external insulation will play a part in creating spaces that feel cosy and comfortable. As well as bringing about immediate comfort benefits, the Energisprong Comfort Plan will ensure residents can afford to have warm homes and lead to predictable billing, alleviatng the pressures that cause fuel poverty. The installation of brand new windows along with a new external finish to the building will refresh the building, marking places and those who dwell in them as cared for and valued. The aesthetic changes that some interventions entail – whether the addition of external wall insulation or the re-design of the entrance – are opportunities to enhance the appearance of the site, adding beauty and uplifting those who live at Treadgold House or pass by it. Ultimately, by taking seriously the energy efficiency of each home we work towards a future in which the welfare and livelihood of future generations is protected.

In these ways and more, the technical interventions discussed in this report have the potential to enrich the lives and well-being of those who live on the Lancaster West Estate for a long time to come.


25 BOMORE
ROAD

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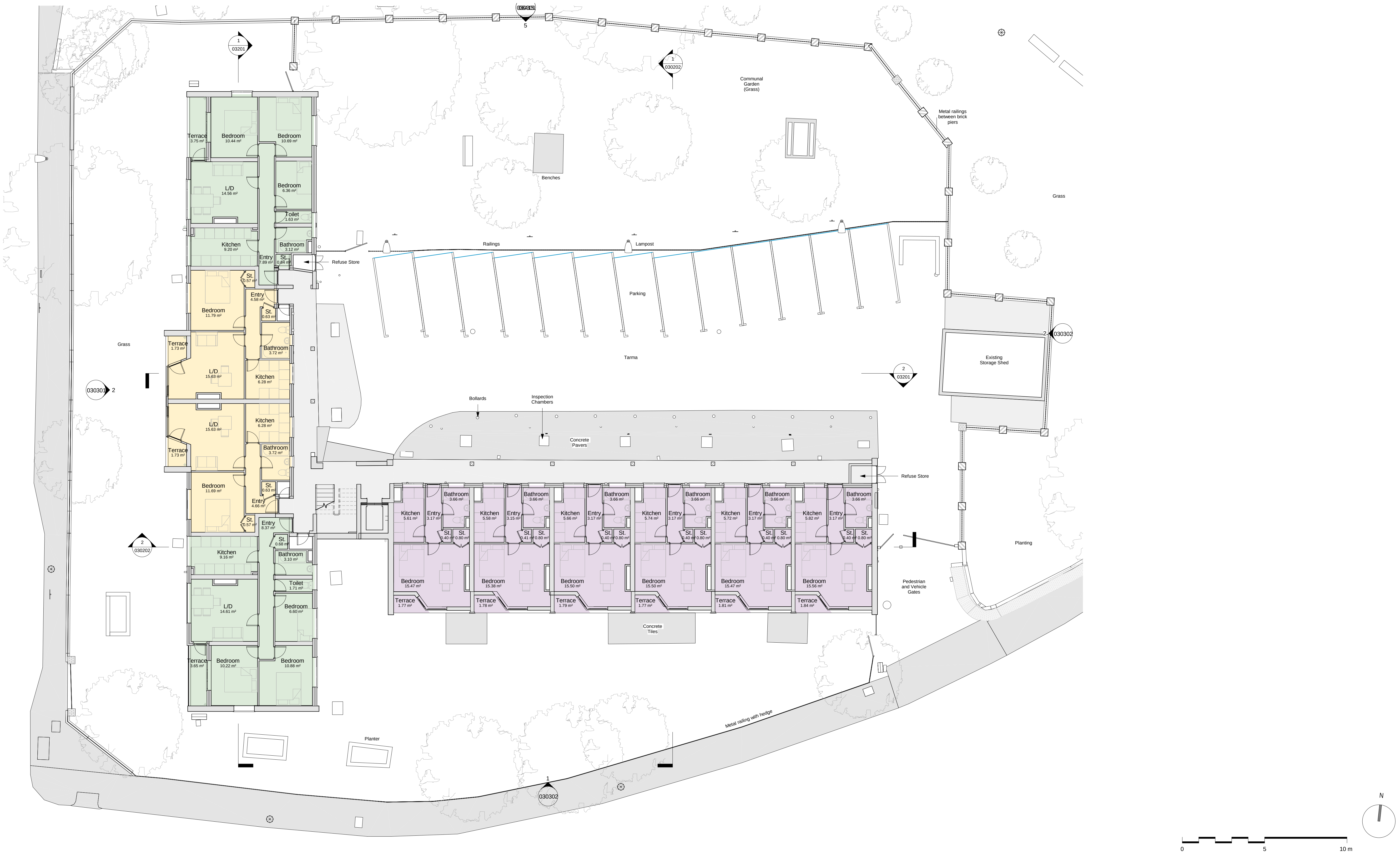
6.0 APPENDICES

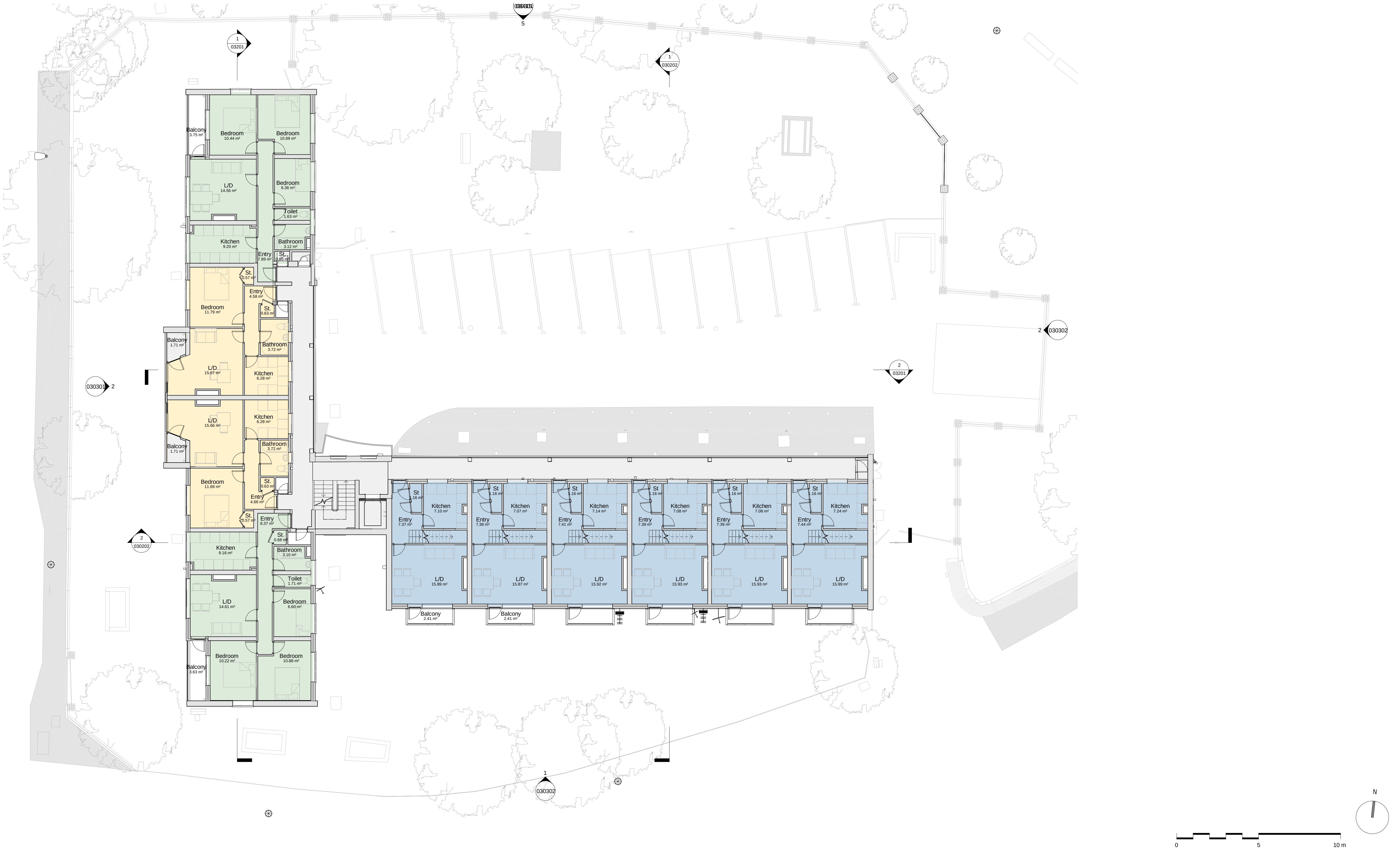
6.1 Appendix 1 - Drawings

6.2 Appendix 2 - Executive Summary

GROUND FLOOR PLAN

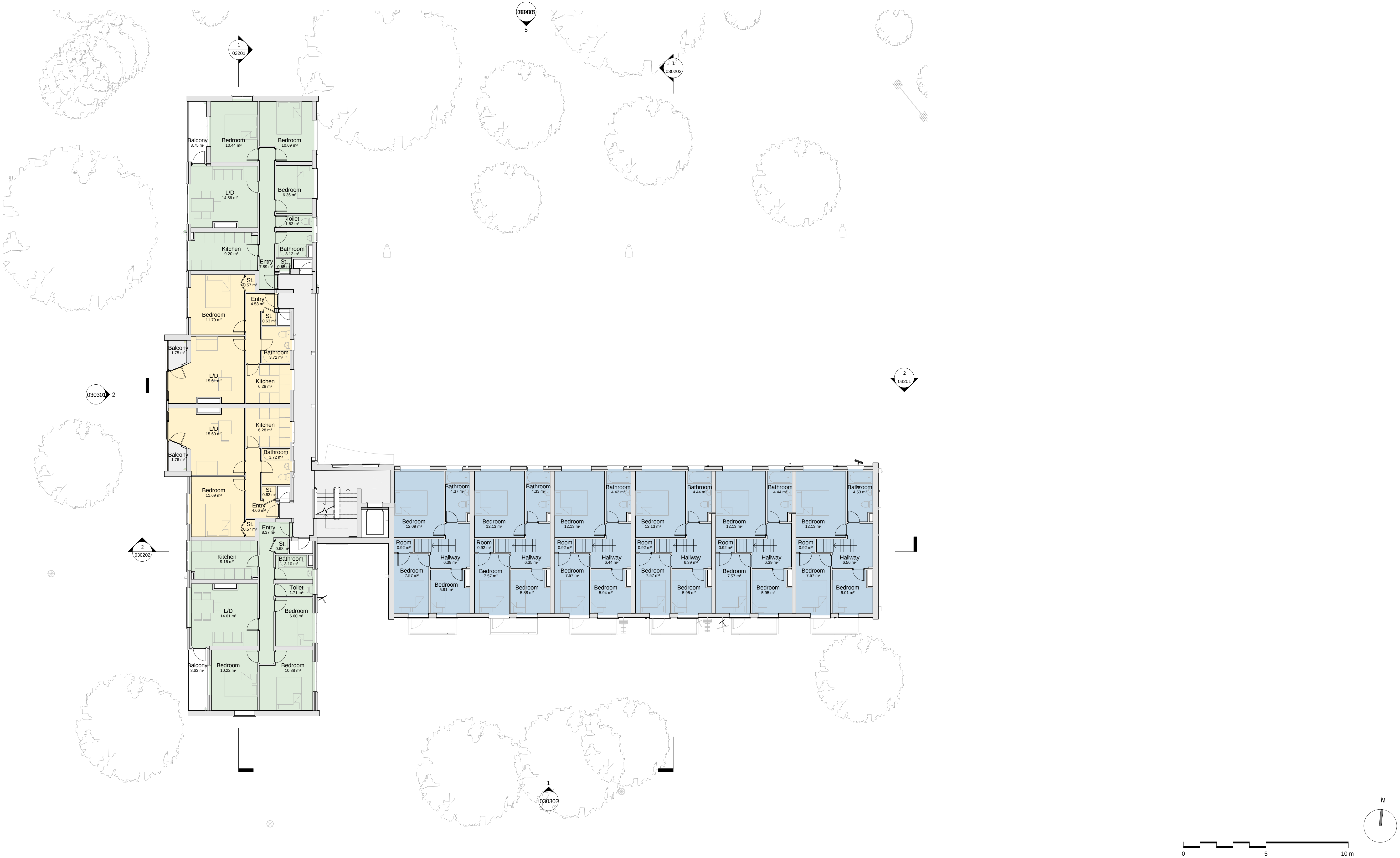


FIRST FLOOR PLAN

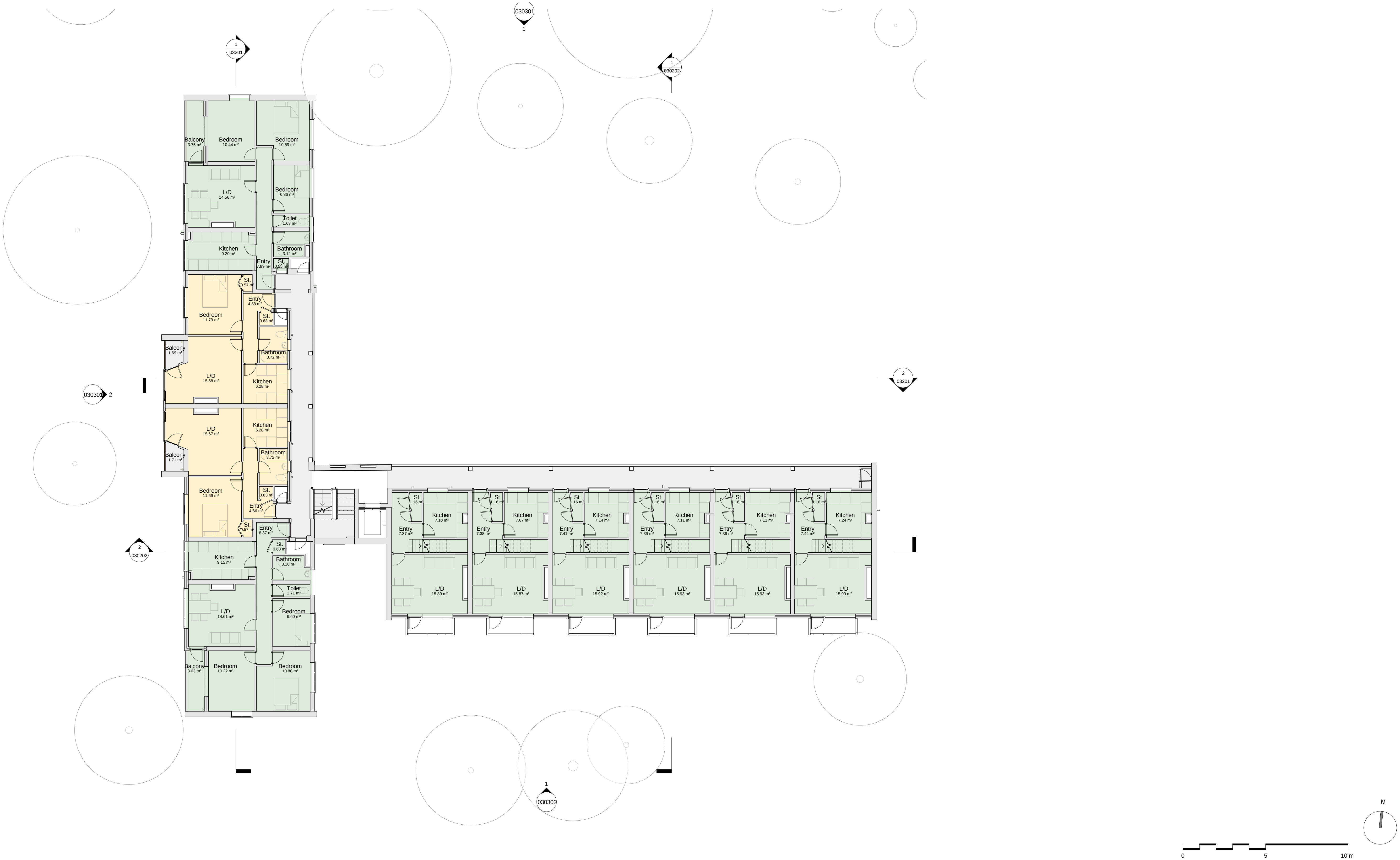


6.1 EXISTING

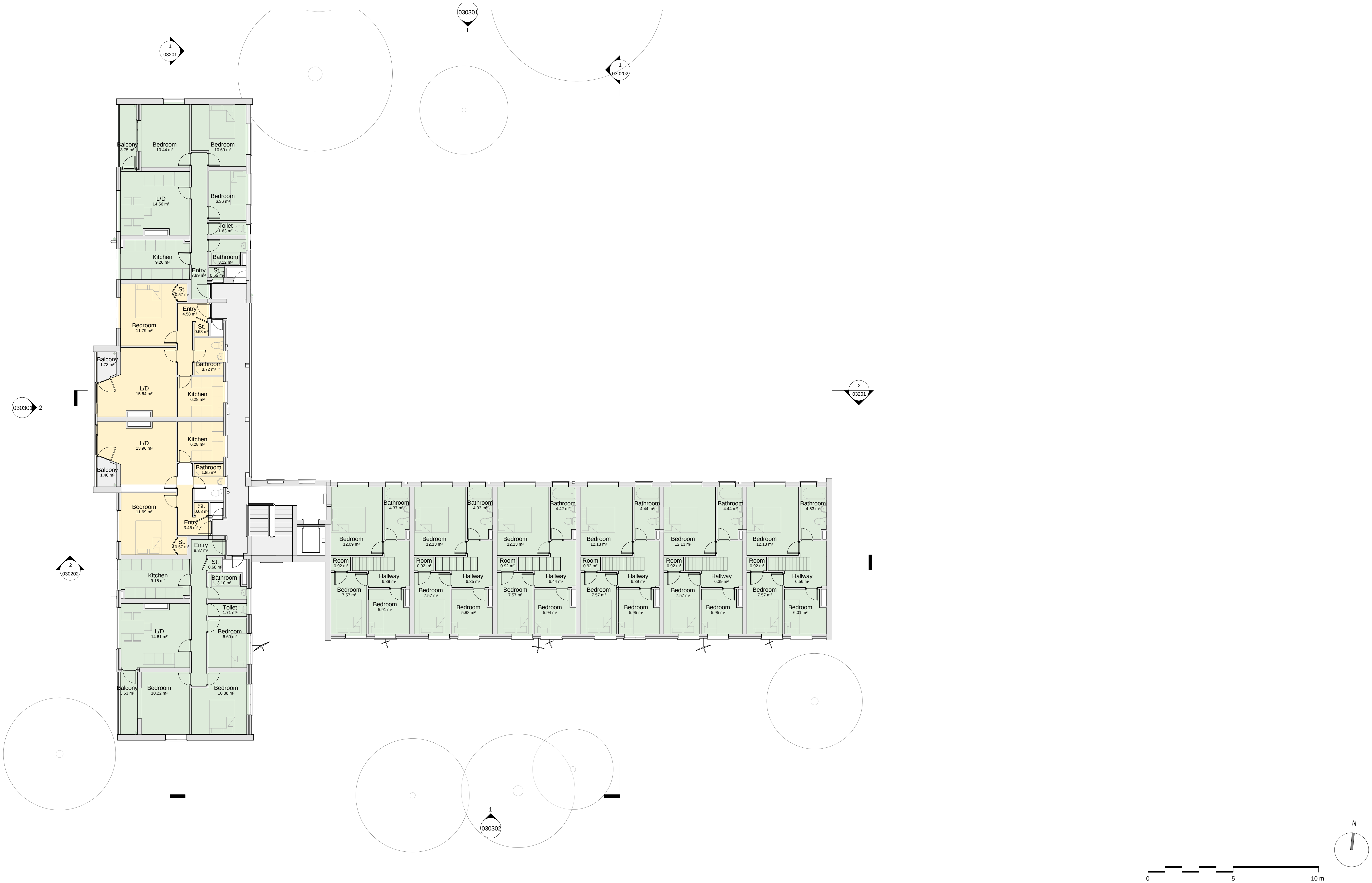
SECOND FLOOR PLAN



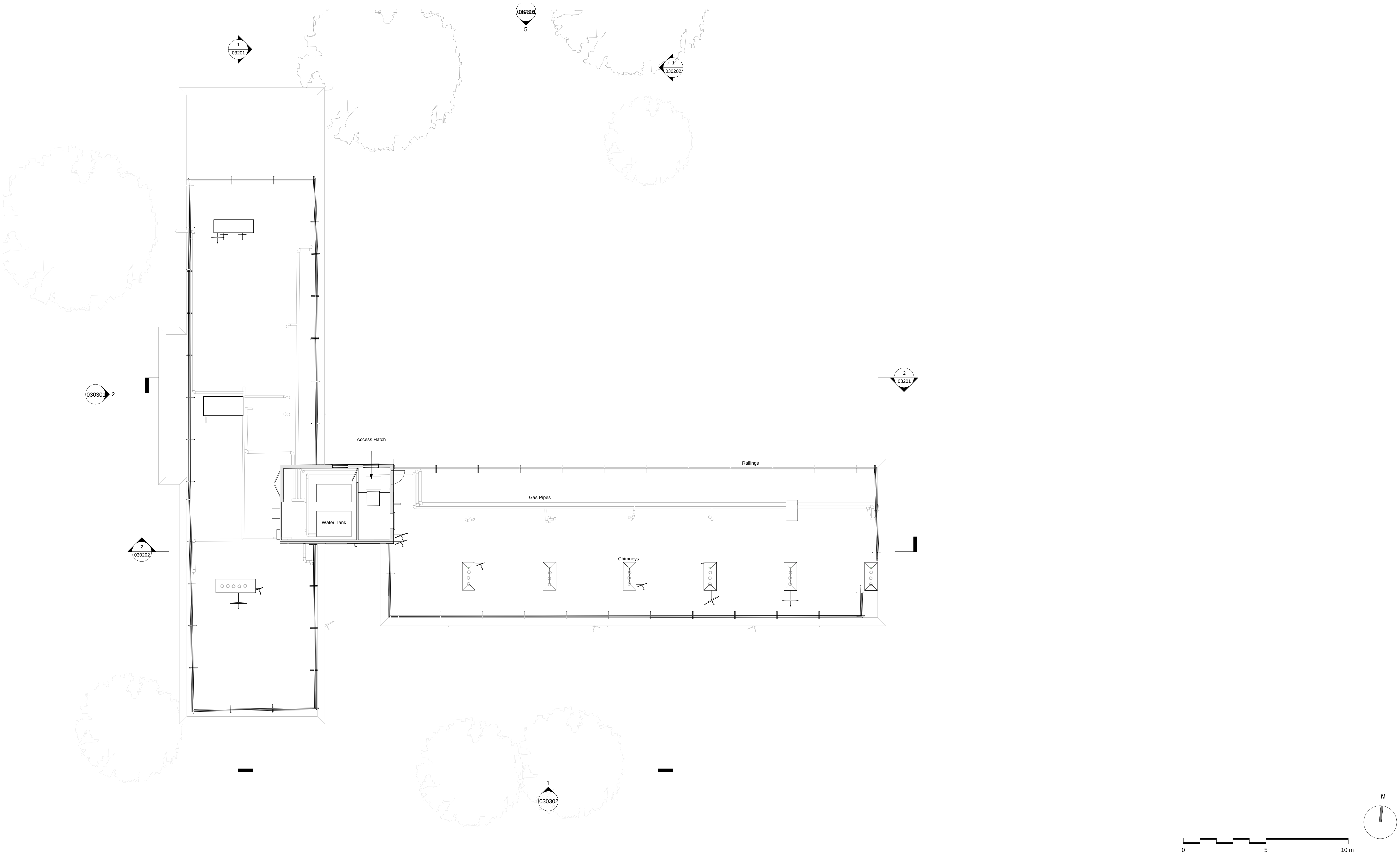
THIRD FLOOR PLAN



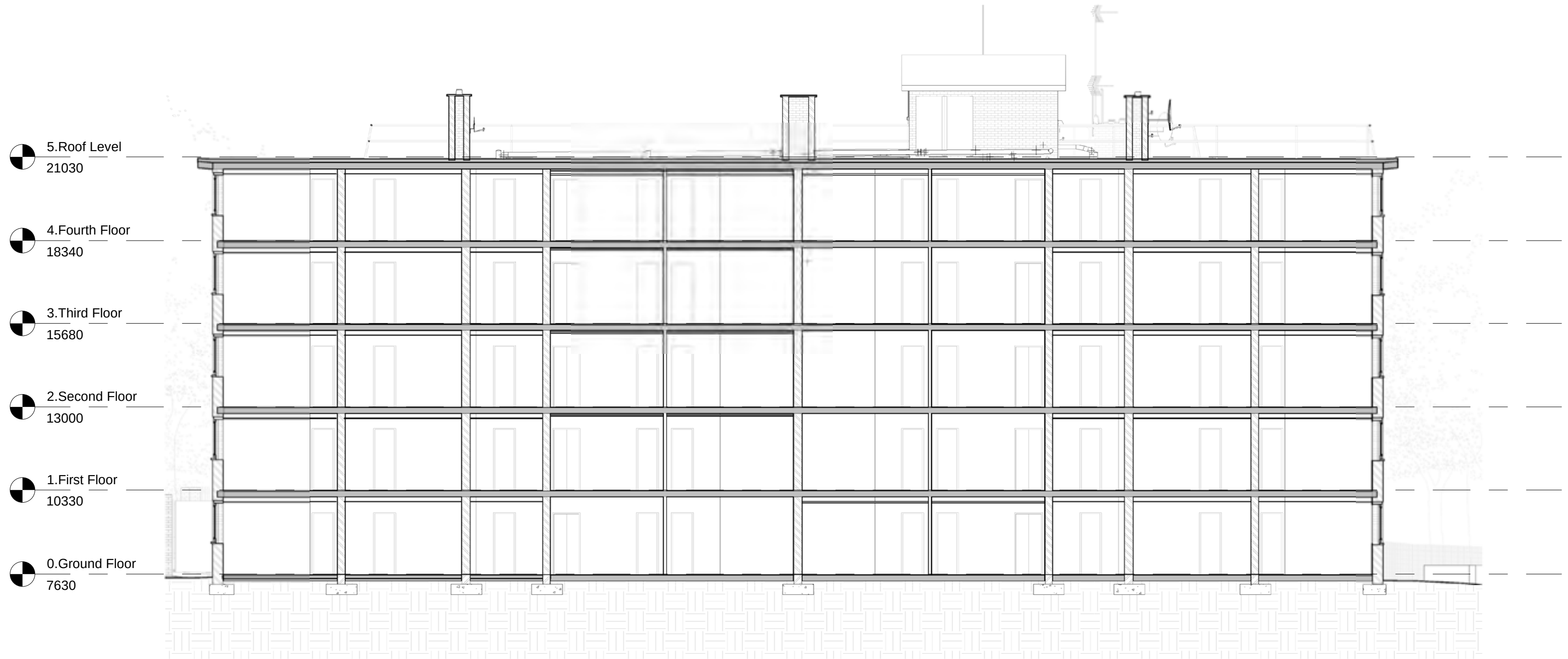
FOURTH FLOOR PLAN



FIFTH FLOOR PLAN



EXISTING SECTIONS



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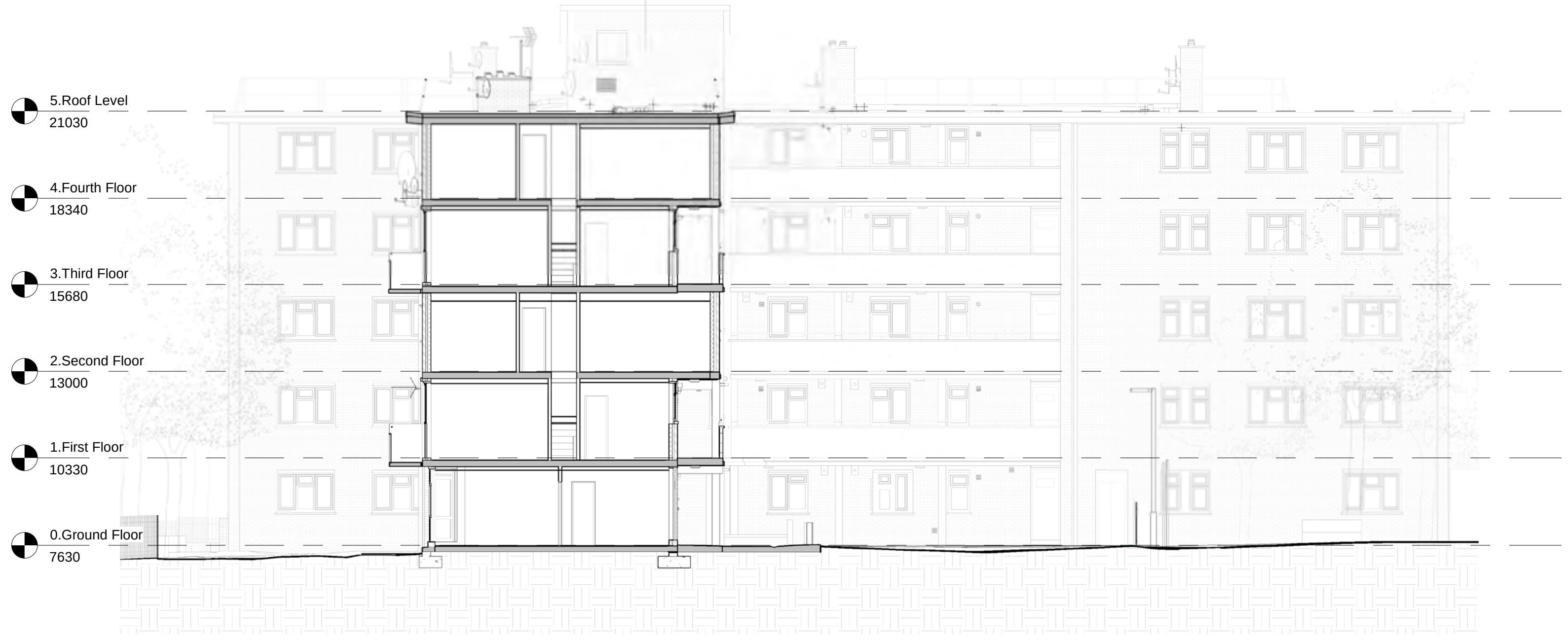
2 **Existing Section BB**
1 : 100

EXISTING SECTIONS



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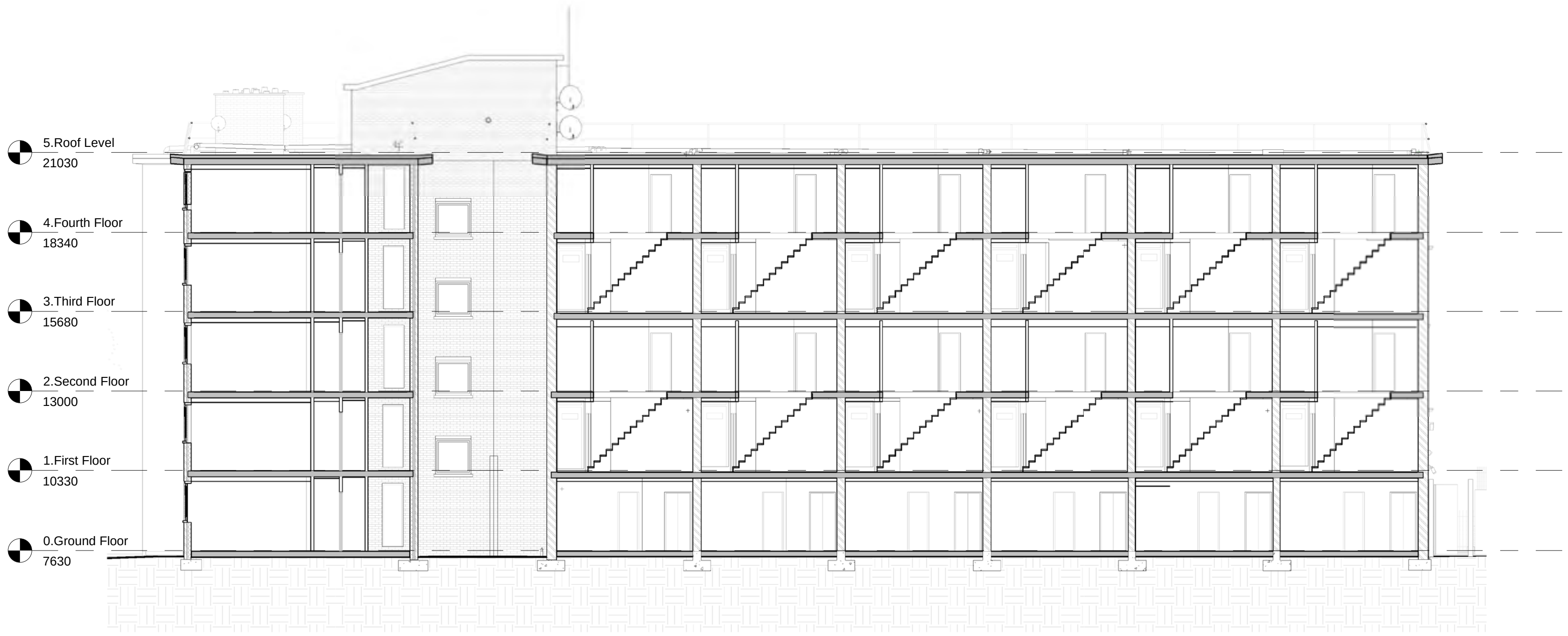

2 **Existing Section DD**
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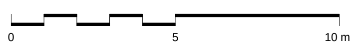
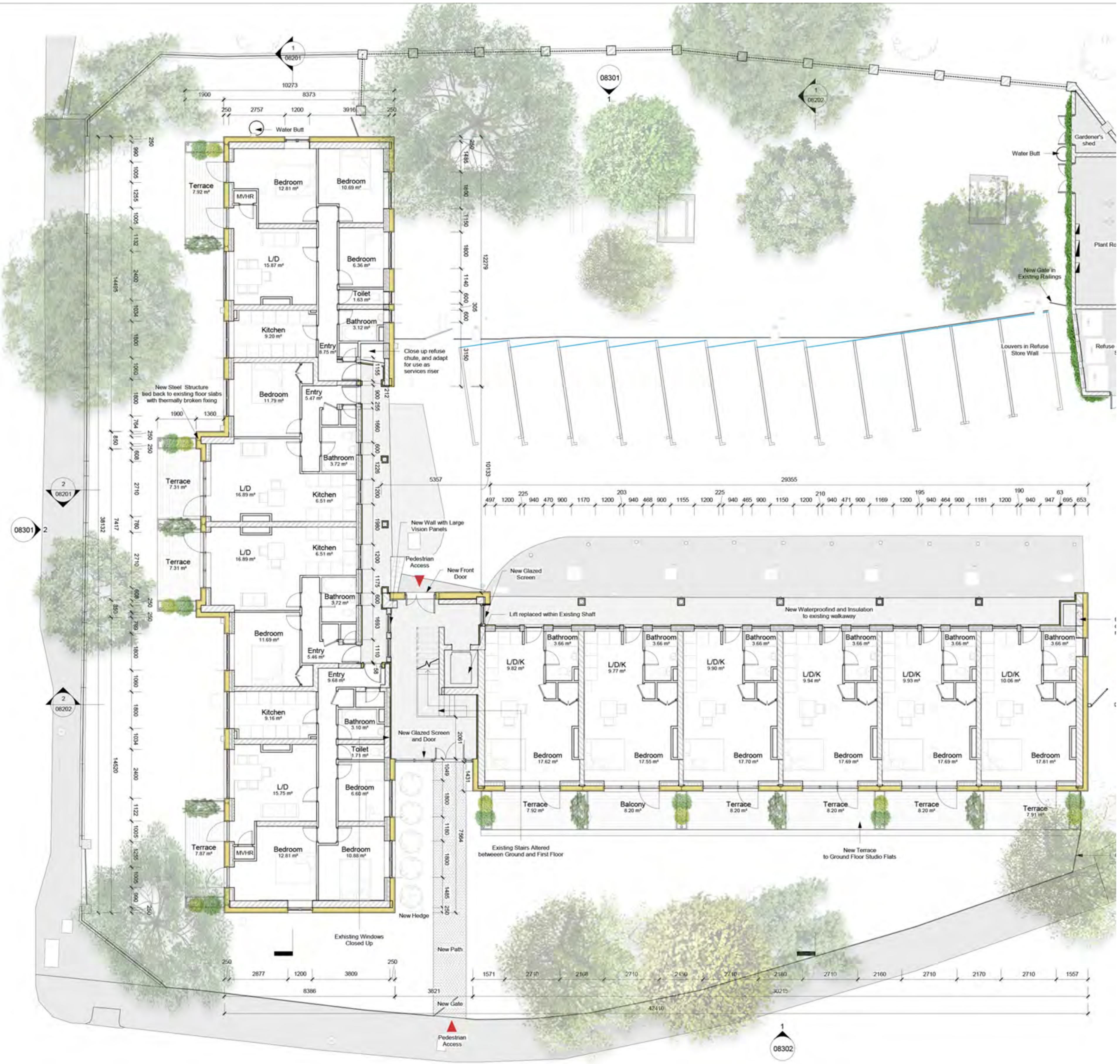
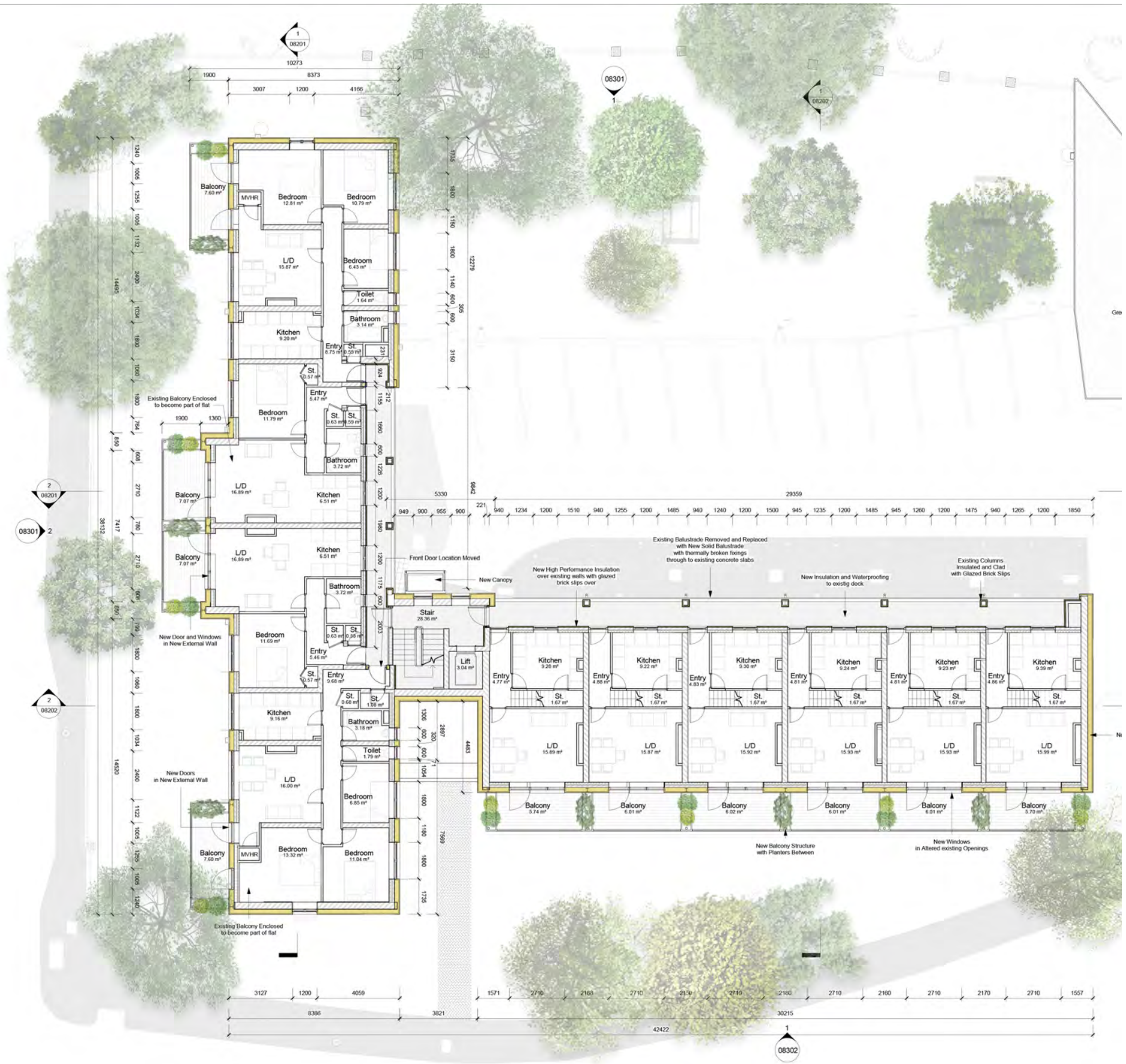


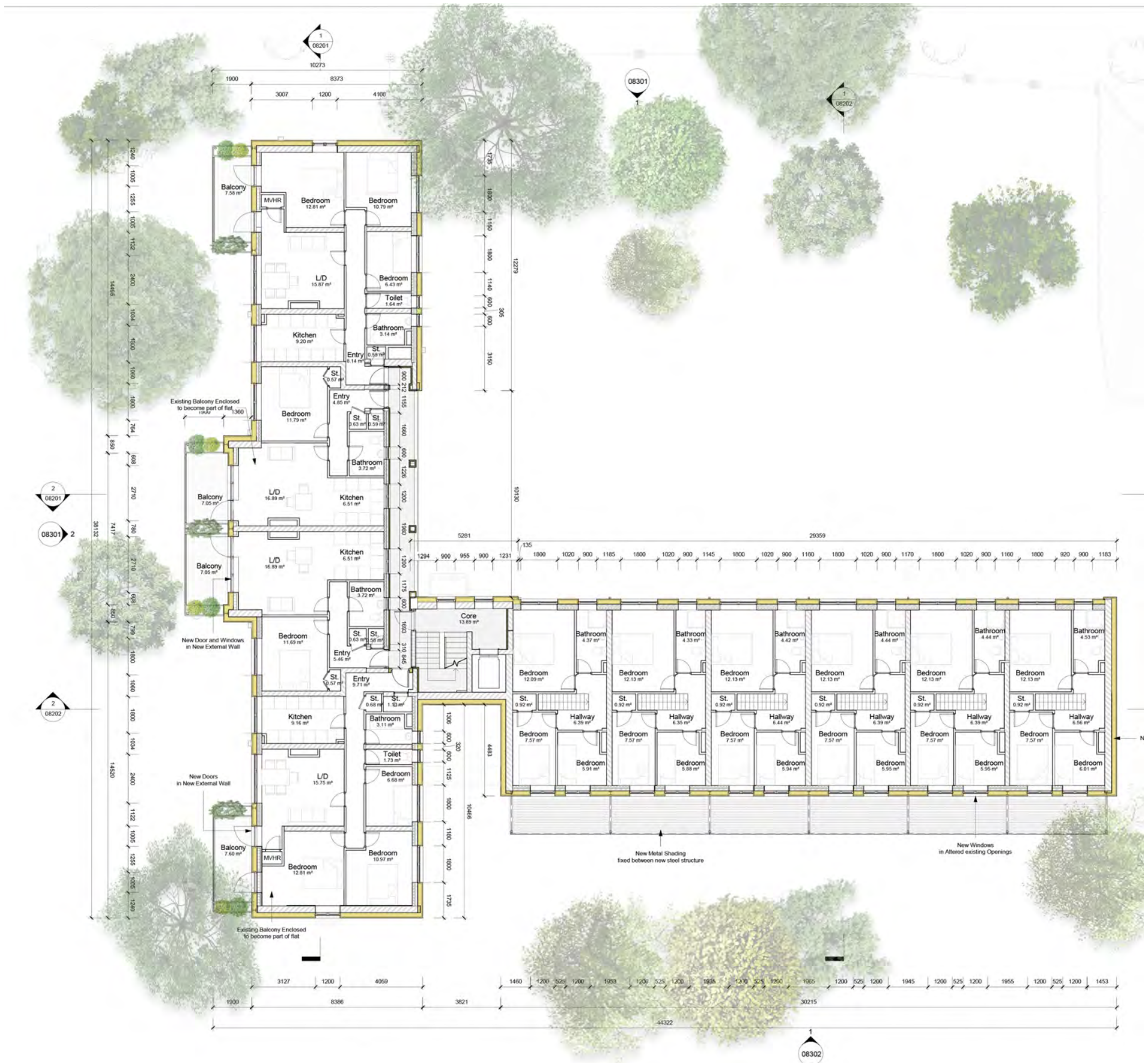
GROUND FLOOR PLAN



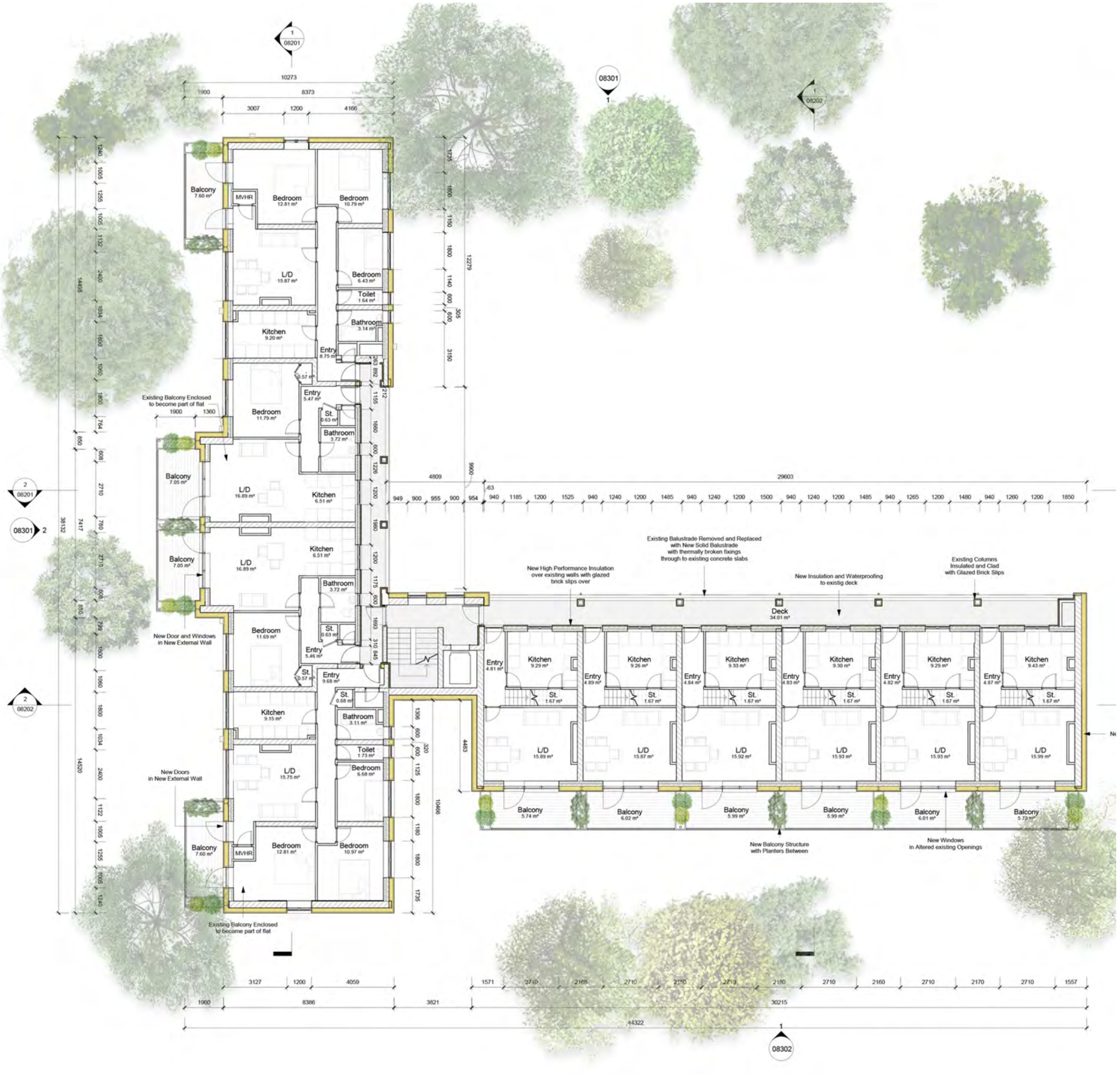
FIRST FLOOR PLAN



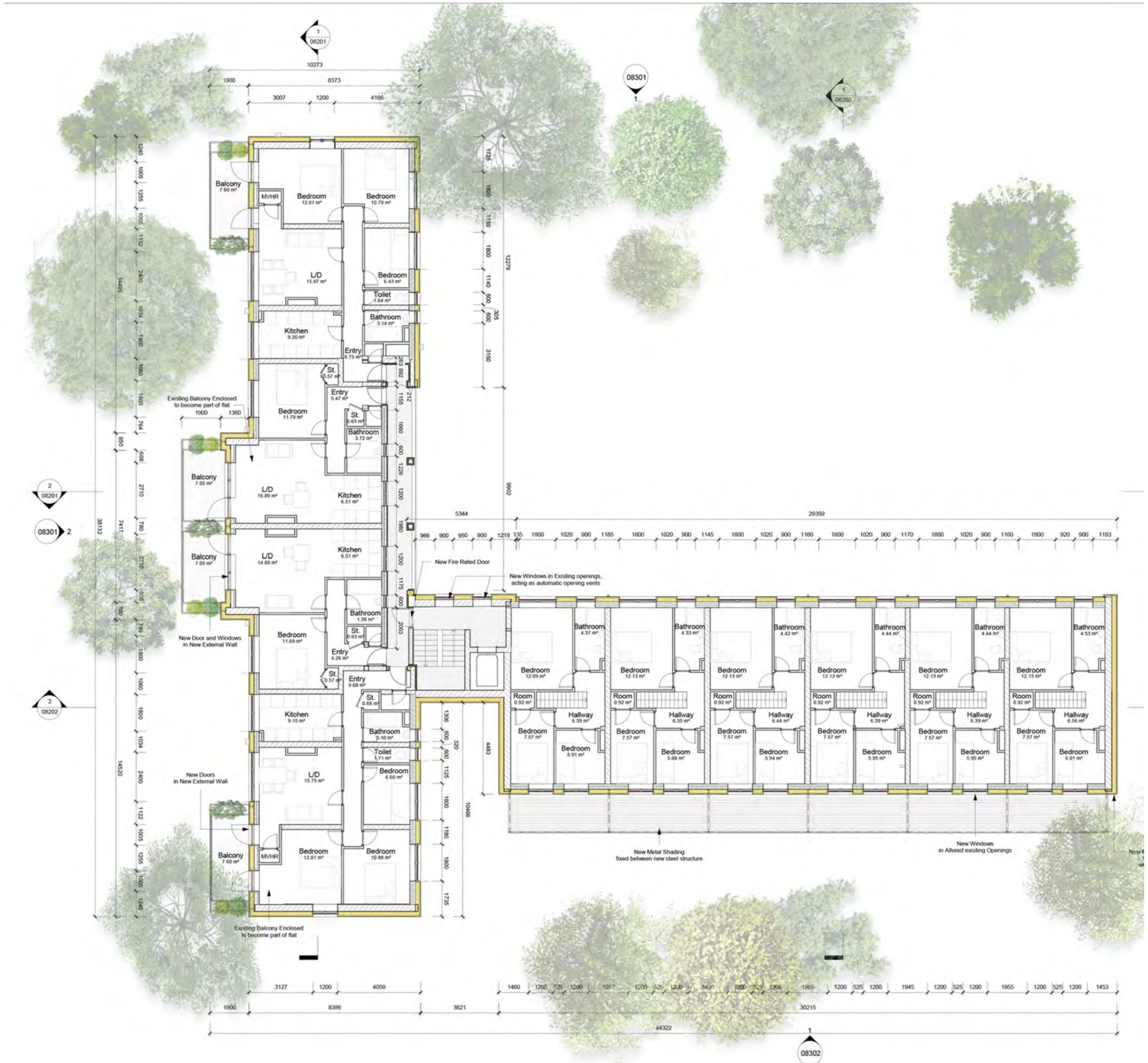
SECOND FLOOR PLAN



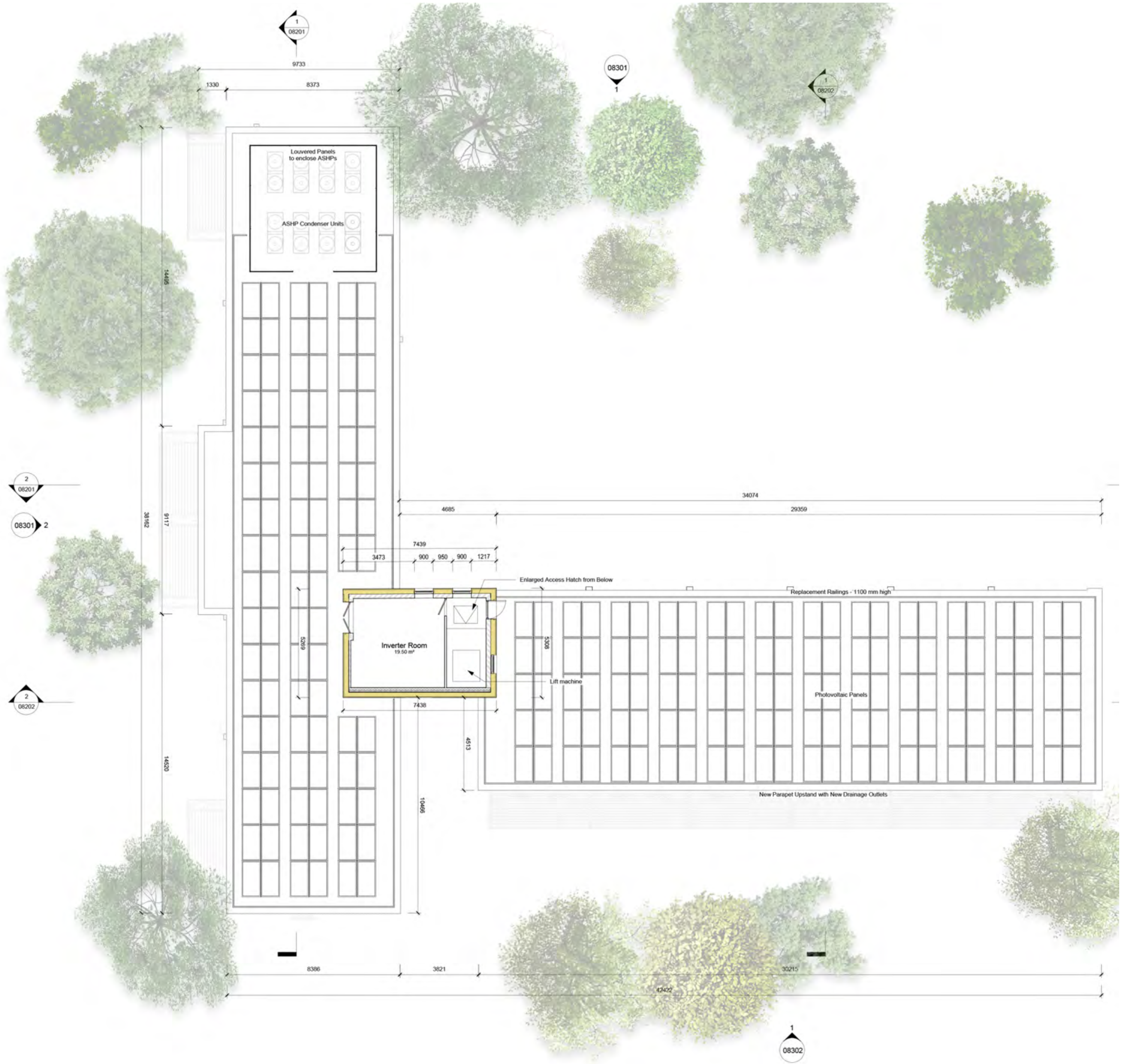
THIRD FLOOR PLAN



FOURTH FLOOR PLAN



ROOF PLAN



Louvered Panels to enclose ASHPs
ASHP Condenser Units
Inverter Room
Enlarged Access Hatch from Below
Replacement Railings - 1100 mm high
Lift machine
Photovoltaic Panels
New Parapet Upstand with New Drainage Outlets

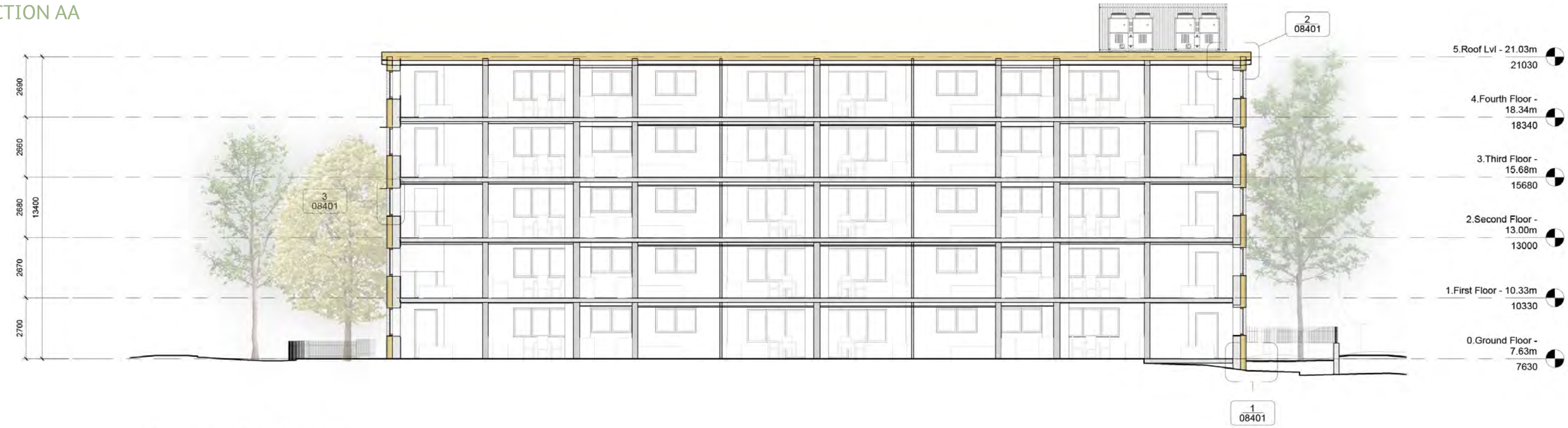
NORTH ELEVATION

WEST ELEVATION

SOUTH ELEVATION

EAST ELEVATION

SECTION AA



1 **Proposed Section AA**
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SECTION BB

SECTION CC

1 **Proposed Section CC**
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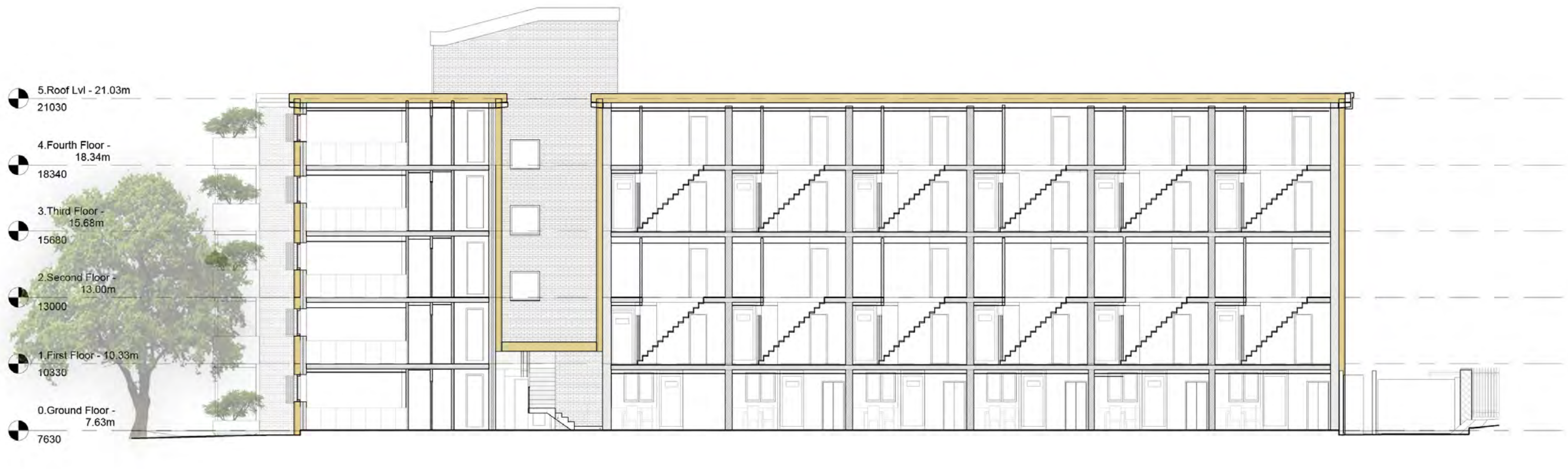
SECTION DD



When Treadgold House was originally built in the early 1960s each home had a fireplace to heat it, with coal hatches by each front door to receive coal to burn. This would have provided uneven heating across the homes, making them relatively uncomfortable, as well as being polluting. Later central heating with gas fired boilers was added to provide the heating and hot water, and this is the system that exists today. While being somewhat more comfortable, burning gas emits carbon dioxide and other pollutants and is a significant contributor to residents' bills. The proposed Energiesprong retrofit of the building will create homes that are comfortable, affordable to heat and have net zero operational carbon emissions.

Treadgold House was previously the subject of a design competition using the Energiesprong model. This proved the potential of the building to meet the Energiesprong standard. A vote by residents in favour of carrying out such a deep retrofit has allowed LWNT to access European funding to carry out works to the building to meet this standard. The funding is conditional on works being completed by the end of 2022.

ECD and their design team have worked to understand the existing building and the residents' needs, and provide an advisory design. This forms the basis of the tender documentation for a design and build contract that will be let by LWNT for a Solution Provider to complete a final design, in discussion with residents. They will then carry out the retrofit that they have designed and guarantee the building's performance, ensuring resident comfort with fixed energy bills.

This report sets out the process that ECD have gone through, so that tendering contractors can pick up what has been learnt and use it to inform their own proposals, and so that the winning contractor can accelerate their design process and complete the project in .

The report summarises information about the existing building and its site, construction, services and occupation. Surveys, modelling and a better understanding of the building's existing use have been required to design up to Stage 3, and this knowledge will be needed by the Solution Provider.

The need for retrofit at Treadgold House is explained and the measures needed to carry this out are introduced. Each measure is expanded on, presenting proposals that have not been taken forwards and the reasons why, while focussing on the intended solutions.

Upgrades to the building's fabric are detailed first, followed by changes to services and the structural implications of the works. Changes to access, security and limited external works are then explained. Maximising fire safety is critical to every aspect of the retrofit and a separate maximising fire strategy report reviews the proposals in detail. This is summarised, along with the Employer's Requirements around fire safety where these go beyond statutory requirements.

1960s
Coal

1970s
Gas

2022
Renewables

The brief for the design was set by both the Energiesprong requirements and previous resident engagement. The outcomes of this earlier engagement are summarised, along with ECD's proposals for engagement in July 2021. This will present the thinking behind the current design, explaining why proposals have developed as they have. A number of options will be set out, encouraging residents to offer preferences and feedback on the design. Outcomes from this will be included in the tender package, ensuring it informs the final design.

Input has also been sought from building control and from the RBKC's planning department, and feedback from these meetings is included. While none of this is final, it aims to provide a framework for the Solution Provider to work with.

Appendices to the report include the current risk register, the outline programme and an explanation of the Passivhaus Planning Package model that has been developed.

In conjunction with survey reports, drawings and other tender documents the report provides a clear explanation of the work so far and the decisions that have informed it. This will allow the Solution Provider to move forwards with a design that suits the residents and the building, enabling them to create safe, comfortable homes that meet the Energiesprong requirements and Lancaster West's zero carbon goal.

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