

6.2 Building Fabric Performance

Be Lean, Be Clean, Be Green

Be Lean

The first step addresses reduction in energy use, through the adoption of fabric, servicing improvements and the incorporation of flexibility measures.

The proposed development will incorporate a range of energy efficiency measures including levels of insulation exceeding current Building Regulation requirements, the installation of high performance glazing, energy efficient lighting and efficient MVHR system for general ventilation purposes in all habitable spaces.

Be Clean

The possibility of employing a decentralised energy network was investigated but no current or future decentralized energy schemes were identified within the vicinity of the site.

Be Green

All homes are proposed to use Air Source Heat Pumps (ASHPs) to provide both hot water heating and heating for an indoor space. The use of ASHP would allow the development to reduce its carbon emissions and contribute to reducing poor air quality. The units will be located as either fully internal units, or with external units located in rear gardens.

Photovoltaic panels (PVs) will be installed on the roof. The full electric HVAC design solutions will be benefited from the future de-carbonisation of the grid. PVs provision has been maximised.

Proposed Specification

Element	Value	Additional information
External walls	0.13 W/m2K	
Sheltered walls	0.18 W/m2K	
Party walls	0.00 W/m2K	Filled cavity with Edge Sealing
Roof	0.11 W/m2K	
Exposed floors	0.10 W/m2K	
Windows	0.8 (g-value 0.5) W/m2K	Triple Glazing low-E hard 0.15
Entrance door	1.00 W/m2K	Solid door
Thermal bridging	Calculated values	
Air permeability	1 m3/hm2 @ 50 Pa	
Heating and Hot Water	Efficiency: 350 Individual ASHP to houses and flats	ASHPs located in rear gardens or integral within the interior of each home.
Water use	< 95 litres/person/day	
Renewable energy	PV panels (1kW per dwelling)	Orientation: varies according to building Elevation: 30 degrees Overshading: modest
MVHR	Heat Recovery 90% SFP	
Lighting	Low Energy LED	

Thermal Bridging - Assumed Values

House

	Junction details	Source Type	Psi (W/mK)
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.003
External wall	E3 Sill	Independently assessed	0.020
External wall	E4 Jamb	Independently assessed	0.020
External wall	E5 Ground floor (normal)	Independently assessed	0.268
External wall	E6 Intermediate floor within a dwelling	Table K1 - Default	0.140
External wall	E12 Gable (insulation at ceiling level)	Independently assessed	0.080
External wall	E18 Party wall between dwellings	Table K1 - Default	0.240
Party wall	P2 Party wall - Intermediate floor within a dwelling	Table K1 - Default	0.000
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Table K1 - Default	0.480

Flat (TF)

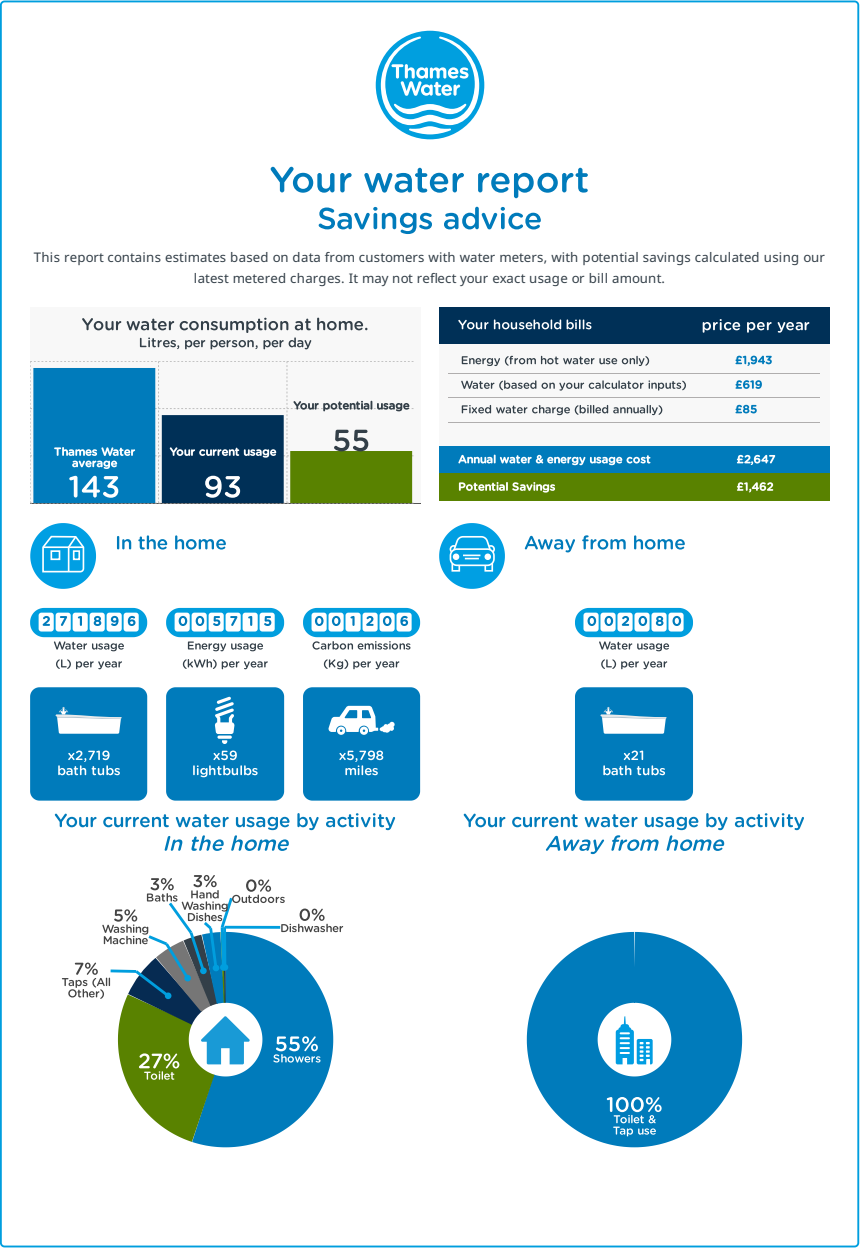
	Junction details	Source Type	Psi (W/mK)
External wall	E2 Other lintels (including other steel lintels)	Independently assessed	0.003
External wall	E3 Sill	Independently assessed	0.020
External wall	E4 Jamb	Independently assessed	0.020
External wall	E7 Party floor between dwellings (in blocks of flats)	Independently assessed	0.140
External wall	E23 Balcony within or between dwellings, balcony support penetrates wall insulation	Independently assessed	0.083
External wall	E15 Flat roof with parapet	Independently assessed	0.560
External wall	E16 Corner (normal)	Independently assessed	0.180
External wall	E18 Party wall between dwellings	Independently assessed	0.120
Party wall	P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	Independently assessed	0.000
Party wall	P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	0.240

6.3 Water Use Estimation

The standard water use is usually estimated at <= 125 litres/person/day. The RIBA 2030 climate challenge suggests that the water use should be reduced to <95 litres/person/day for 2025 targets.

The new dwellings will reduce the use of potable water to below 95 litres/person/day using water efficient fitments. A down pipe is proposed to the rear of every house to provide the opportunity for rainwater collection for gardening purposes.

The adjacent Thames Water report contains estimates based on the estimated inputs into the calculator and suggest a target of <95l per home will be achievable. The inputs are dependent to the occupant's behaviour. It may not reflect the exact usage or bill amount



Water Use Estimation Tool

Your top tips	You selected:	Savings
☒ Use your dishwasher's ECO setting.		Using the eco setting on your dishwasher could save you up to 10 kWh and £4 a year
☒ Wash your car with a bucket & sponge		Washing your car with a bucket & sponge could save you up to 912 litres and £2 a year
☒ Use a watering can in your garden		Using a watering can in your garden could save you up to 270 litres and £1 a year
☒ Reduce the time spent in the shower Your current time in the shower: 15 minutes	4 minutes	Reducing to 4 minutes in the shower could save you 109,824 litres, 3,514 kWh, and £1,445 a year
☒ Cooler wash temperature Your current temperature: 40 degrees	30 degrees	Reducing your wash temperature to 30 degrees could save you 33 kWh and £11 a year
Total estimated savings:		111,006 litres of water, 3,558 kWh of energy, £1,462 per year

6.4 Photovoltaics

The adjacent roof plan demonstrates the implications of the current energy strategy, aligning with Passivhaus principles to provide PV panels equitably across roofs to all homes

Where a roof is flat, and in order to achieve +10% Biodiversity net gain to meet emerging RBC policy, it is proposed that it can be an extensive green roof with PV panels.

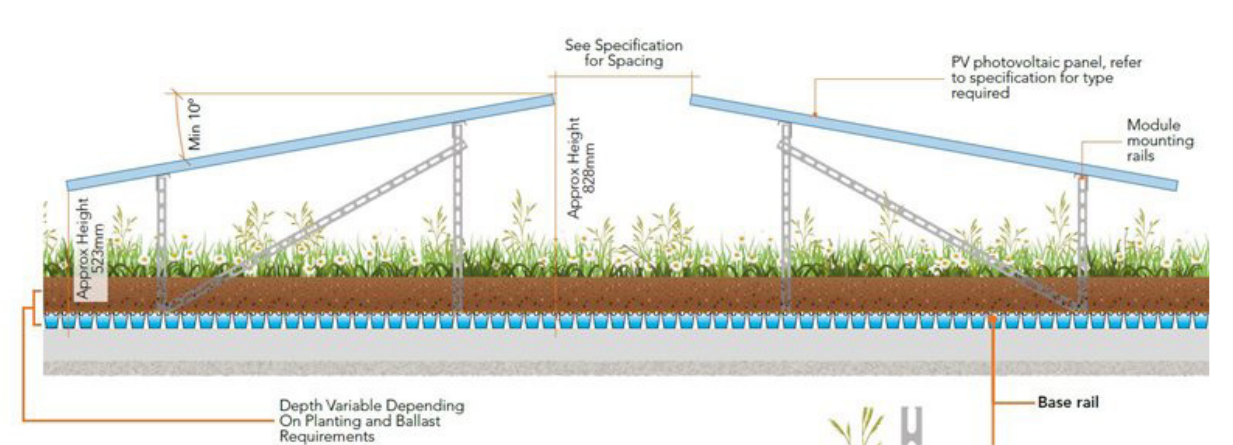
Example system - Bauder BioSOLAR, with "Flora 3 Seed Mix"

Roof Key:

-  Extensive flat Green roof with PV panels
-  Pitched roof with PV panels to one side

- Total Gross PV Area (m²): 793
- Total Net PV Area (m²): 475.8
- Total Peak power generated across the whole site: 9
- Efficiency per PV: 0.2
- Peak power per PV: 0.34 kWp
- PV size=1.6*1.1

Cross-Section through Green Roof with Solar, with extensive substrate buildup acting as ballast to PV's with no roof penetrations





SITE STRATEGIES

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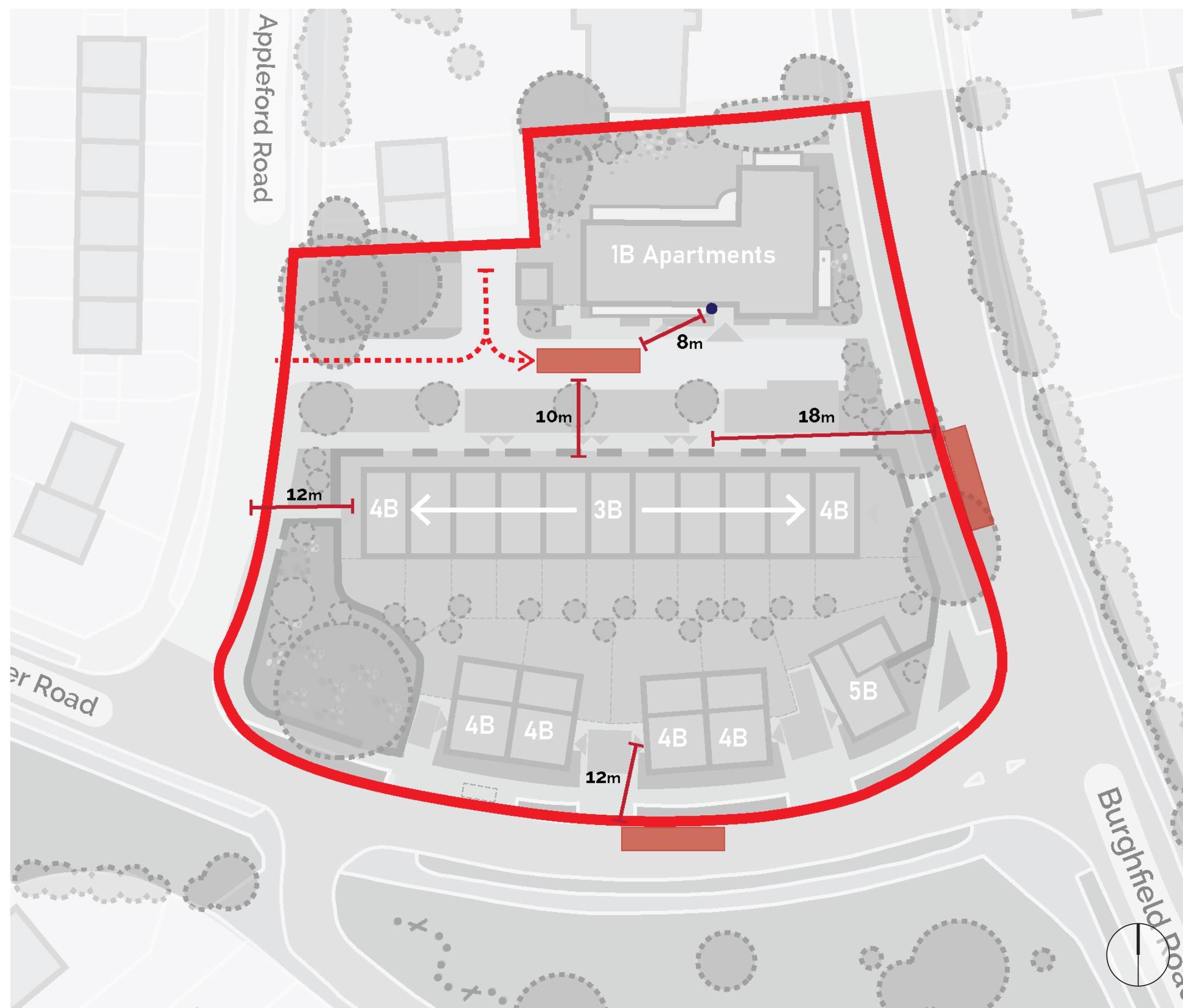
7.1 Site Strategies

Emergency Access

- The apartment block will be designed to accommodate a dry riser, with fire service vehicle access and turning head on new street
- The eastern portion of the terraced homes can be accessed via Burghfield Road (internal hose distance 15m, complies overall with Building Regulation max. 45m hose length) or the new street
- The western terraced homes can be accessed via the mews street, with fire vehicles reversing a max. of 20m from a turning position on site
- Semi detached homes along Dwyer Road can be accessed directly from the street

Key:

- Dry Riser Inlet
- Emergency Vehicle
- XXm Fire Hose Distances
- Site Boundary



Fire Strategy Diagram

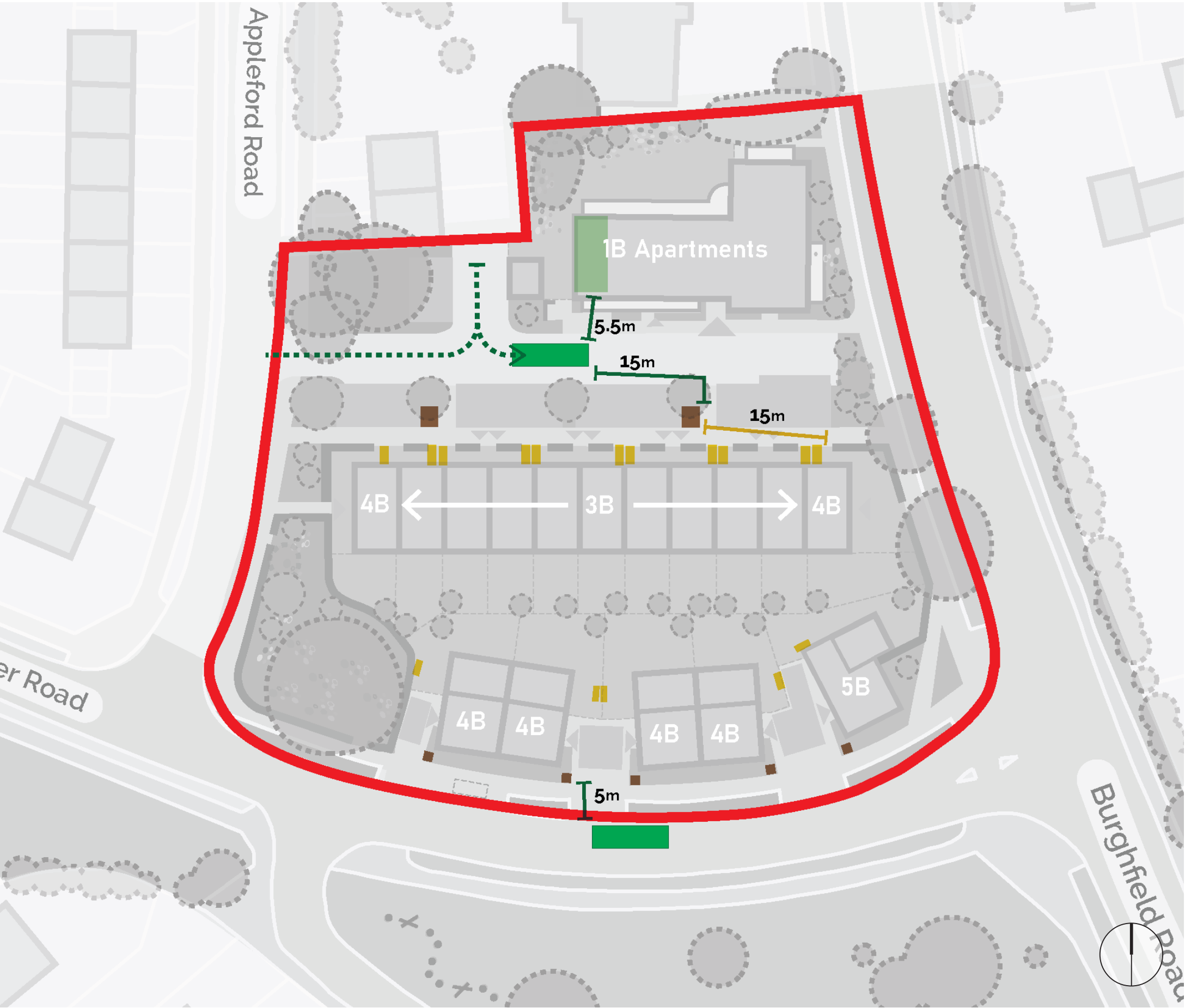
7.2 Site Strategies

Refuse & Recycling Access

- The apartment block will be designed to accommodate an integral communal bin store, housing 1100l eurobins for refuse and recycling on a weekly collection
- A refuse vehicle is proposed to reverse into the site via Appleford Road, to within 15m of communal storage points for 6 no. terraced homes to the east, and the apartment bin store.
- The terraced homes will house their bins in their front gardens
- The semi-detached homes along Dwyer will bring bins from their rear garden to their front driveway on collection day

Key:

-  Refuse Vehicle
-  Operative Carry Distance
-  Resident Carry Distance
-  Daily Refuse Store
-  Collection Point
-  Communal Bin Store
-  Site Boundary



Refuse Strategy Diagram

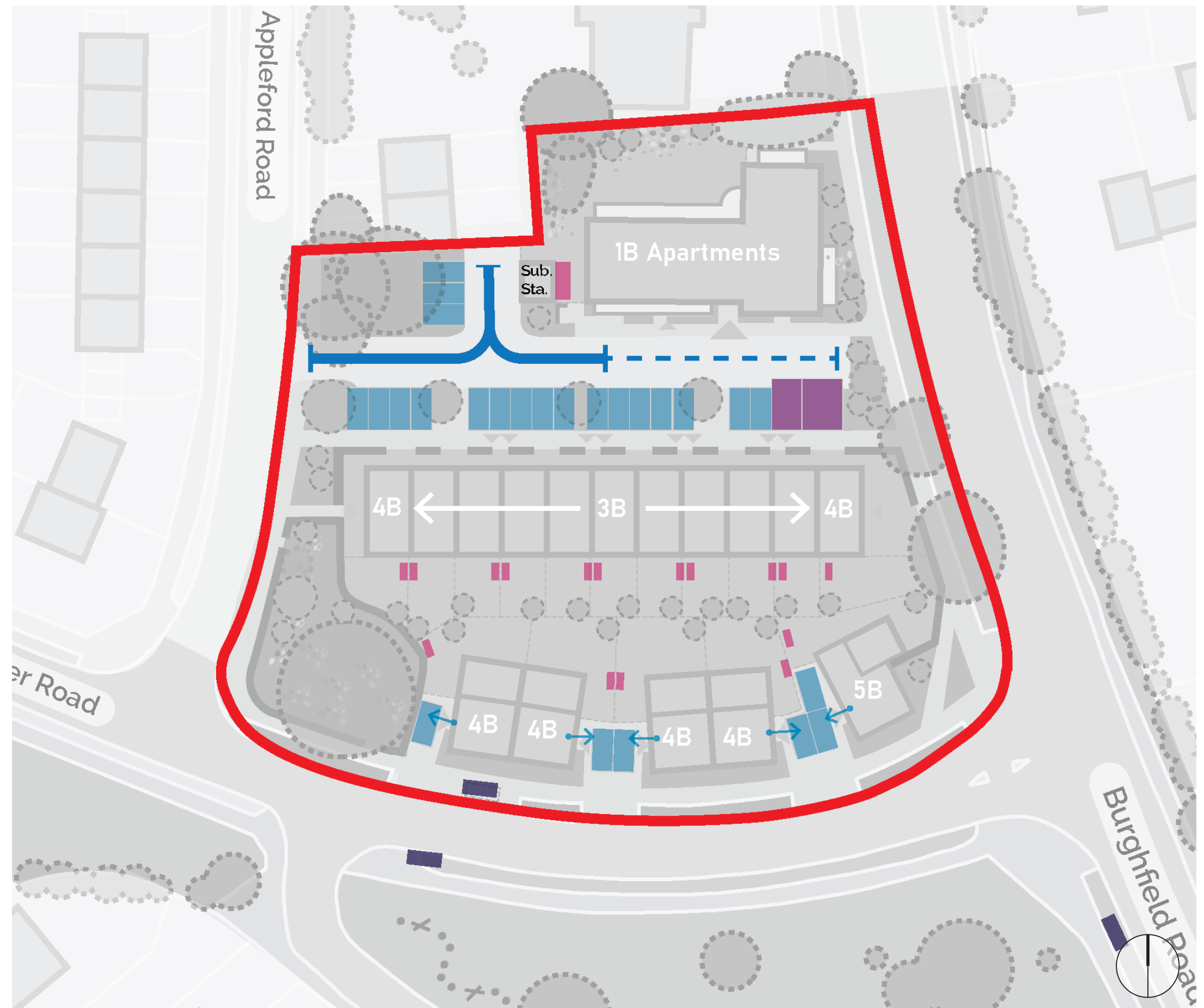
7.3 Site Strategies

Car & Cycle Parking

- The mews street provides 21 perpendicular car parking bays for the houses and apartments
- 2 no. wheelchair accessible bays are provided for M43 homes within the apartment building
- Homes along Dwyer Road have single on-plot parking bays, creating equal access to a single parking bay per home.
- 27 spaces are provided in total (parking ratio is 0.87). This is below SPD requirements, but comparable census data of car ownership in similar areas (see separate Hydrock transport note)
- The single detached home to the south east has been redesigned (formerly a pair of semi detached homes) in order to provide on plot parking, in response to RBC Highways concerns.
- A turning head has been provided within the new street, allowing adequate servicing access to homes by delivery and refuse vehicles, as well as access to the substation.
- All houses will have a secure bike store in their gardens. The apartments will have a sheltered bike store accessed upon entering the communal garden from the mews street.
- 36 cycle storage spaces are provided in total.

Key:

-  Car Access only
-  Delivery Vehicle Access
-  Bike Storage
-  Parking Bay
-  Wheelchair Accessible Parking Bay
-  Existing Bus Stop
-  Site Boundary



Car and Cycle Parking Diagram

7.4 Daylight / Sunlight Impact Studies

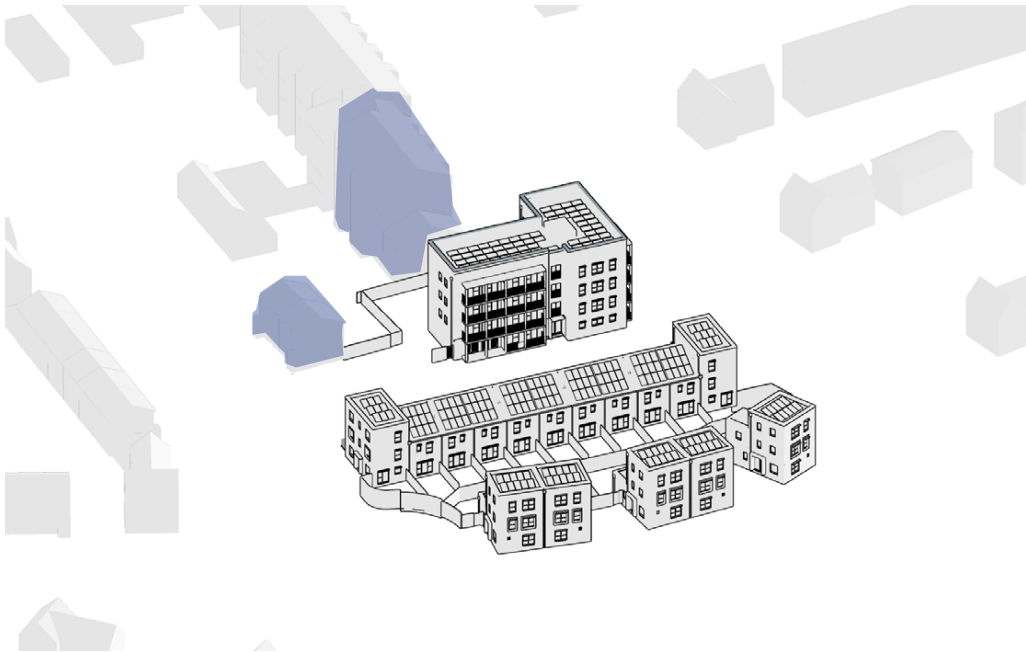
Daylight / Sunlight Assessment

A detailed study of the daylight and sunlight availability has been undertaken to assess the impact of the proposed buildings on the existing properties. Overall the proposed development has some impacts on immediate neighbours but they are considered acceptable for the size and nature of the development.

The sunlight availability in the external spaces were also assessed. While some private gardens have reduced sunlight availability in the March results, the summer availability is adequate.

Overall the designs maximise sunlight within communal and private gardens to ensure occupants have sufficient access to sunlight throughout the year.

Further information can be found in the seperately submitted HTA report on Daylight, Sunlight and Overshadowing.



3D Testing Model, with adjacent neighbours highlighted

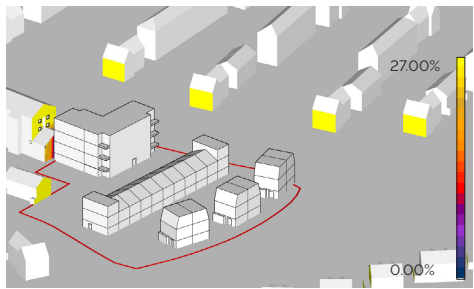


Figure 9 - Vertical Sky Component analysis - Proposed Configuration

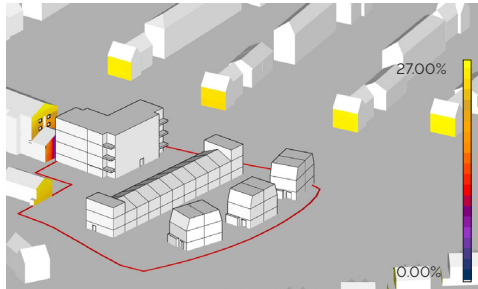


Figure 10 - Vertical Sky Component analysis - Ratio Configuration

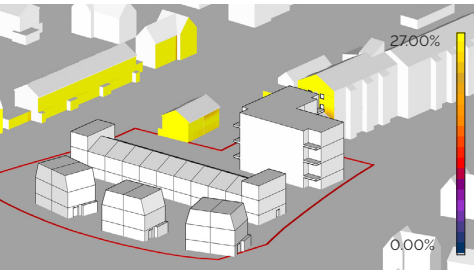


Figure 11 - Vertical Sky Component analysis - Proposed Configuration

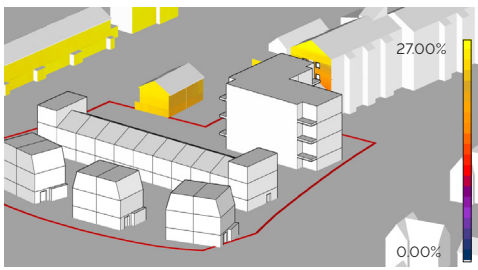
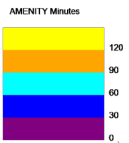
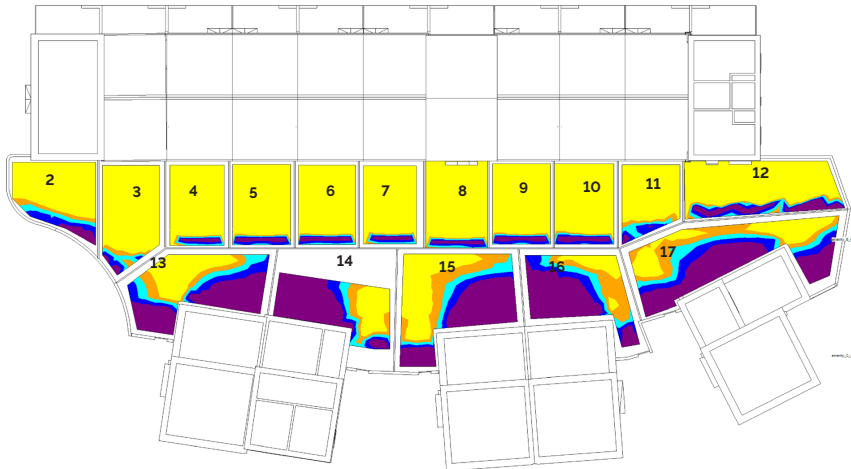


Figure 12 - Vertical Sky Component analysis - Ratio Configuration

3D Testing Model, VSC results



3D Testing Model, Sun on the Ground, 21 March

7.5 Accessibility

Category M4(2)

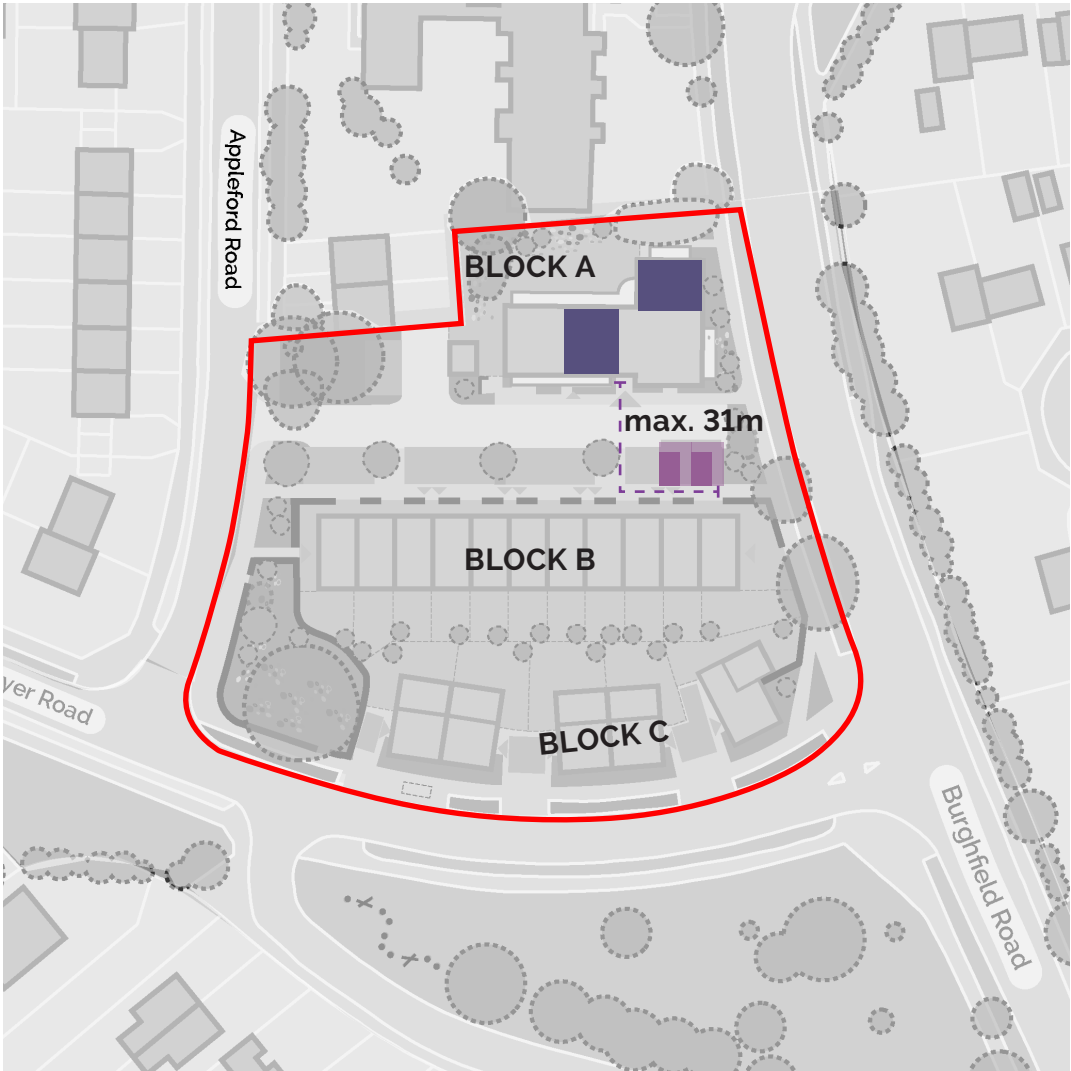
- The houses and majority of the apartments are designed as M42 compliant homes
- Building A is designed specifically for council tenants wishing to downsize. While not necessarily older residents or those with specific physical adaption requirements, the homes are designed to be oversized to accommodate future potential access needs.
- All homes have level access to the front door
- Upper floor apartments are accessed via communal stair and a single lift

Category M4(3)

- 2 no. homes at ground floor in Building A are designed to be M4(3) adaptable
- 2 no. blue badge parking bays have been accommodated on site, in closest proximity to the communal flat entrance.
- In total, 5% of the 31 homes proposed are designed to be wheelchair adaptable per RBC policy.
- Access to the shared garden is level

External Access

- Footway levels will tie into the existing street network.
- Drop kerbs will be provided at key pedestrian crossing points for ease of access
- The new street provides level access from east/west
- All footpaths achieve a minimum of 1500mm clear pavement, behind street furniture.
- Seating is integrated in the public realm at the entrance gate of the flat block, creating an accessible rest point along the new street, or at arrival home.



Key:

- Wheelchair Accessible Parking Bay
- Wheelchair Accessible Apartments
- Site Boundary

Access Diagram

1 Bedroom 2 Person Flat - Type B Total GIA - 61.7m² (NDSS 50m²)

APD Part M43 Wheelchair Adaptable Home



Room	Min. Required*	Area/Quantity
Living / Kitchen / Dining	25 sqm***	32.1 sqm
Bedroom	13.5 sqm	14.0 sqm
Bath/Shower room	n/a	1
Storage	2.0 sqm	2.4 sqm
Total Area	50 sqm**	61.7 sqm

* Minimum required refers to Nationally Described Space Standards where applicable
** Additional internal area is required to meet the needs of wheelchair accessible households
*** Minimum required refer to Building Regulations AM Volume 1 - Part M34

Typical M43 Apartment Layout

7.6 Designing Out Crime

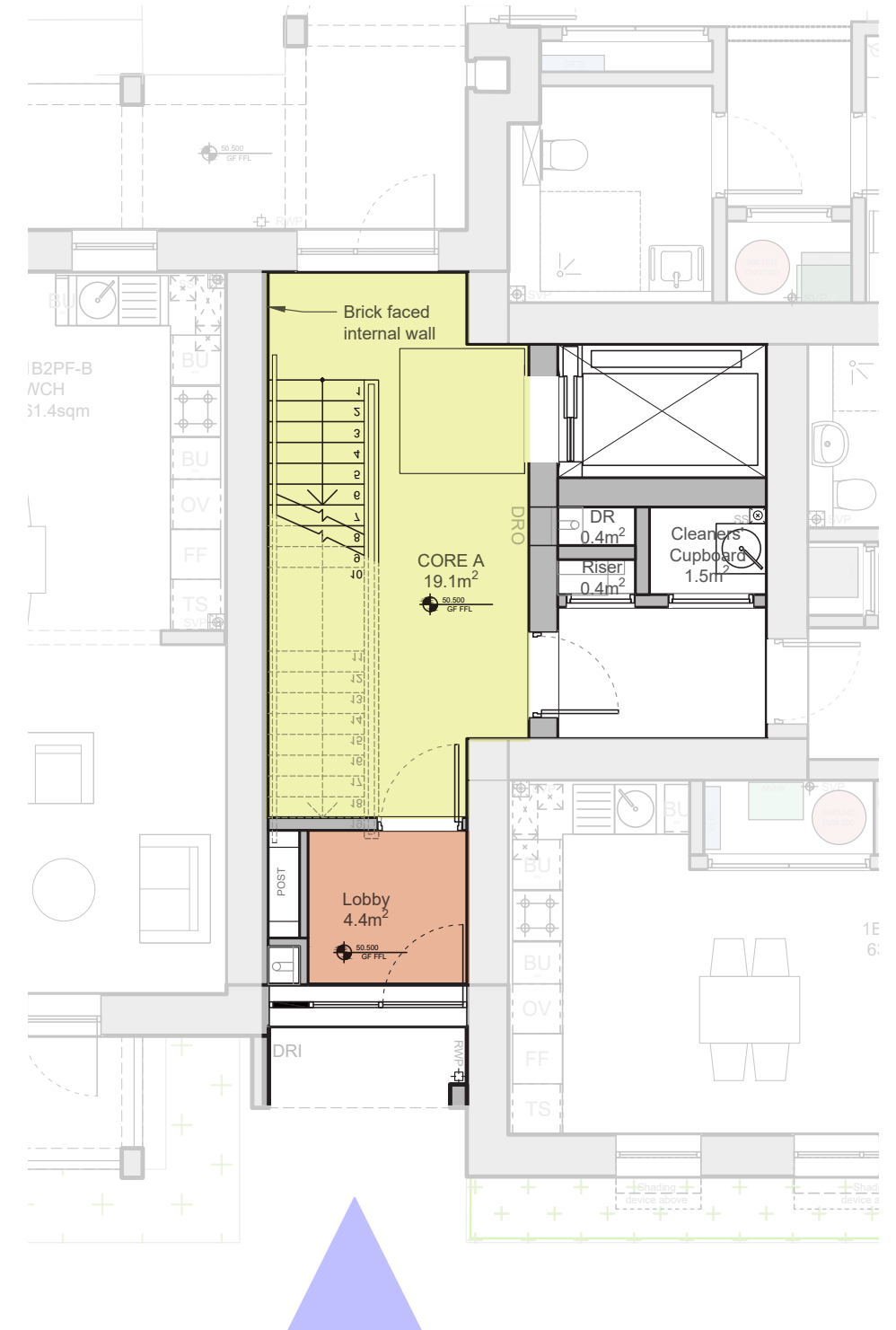
- The proposals have been developed with advice and engagement from the Thames Valley Designing Out Crime Officer.
- The proposals have been amended to ensure the development is safe for residents and the public, with Secured by Design gold standard as a guide.
- Building arrangement and aspect of homes ensures front doors, balconies and habitable rooms face the public realm and all corners of the site; this creates passive security through overlooking.
- Rear gardens are secured by a min. 2.1m high fence/railing to the public realm, and 1.8m between private demises. The gardens will be accessible by gates with controlled fob access for residents or maintenance staff only.
- Gated entrances to the rear gardens are designed to align with building facades to avoid creation of recesses in the public realm.
- Entrance doors are located facing the street, within no setbacks and projecting canopies to avoid large recessed spaces in the public realm.
- The ground floor entrance lobby to the apartments is 'airlocked' at ground floor and above, ensuring no tailgating at communal entrances.
- Post delivery is within this airlocked lobby, or via individual letterboxes.
- Ground floor planting to the building edge discourages access to ground floor windows and terraces.
- New street trees will have a min. 2m clearance under canopies to ensure unobscured sightlines.



Well lit, legible communal entrance



Facades provide activity and overlooking to all streets and spaces



Airlocked communal lobby