

ONE
HORTON
HEATH



Upper Acre

Energy and Sustainability Strategy Technical Addendum

December 2025

Energy and Sustainability Strategy Technical Addendum – Upper Acre



Prepared for:
Eastleigh Borough Council (One Horton Heath
Team)

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Introduction

Site Description

This technical addendum has been written to provide additional information from the Overarching Energy and Sustainability Strategy for the Upper Acre Reserved Matters (RM) application at One Horton Heath (OHH).

Upper Acre is 10.34ha, situated towards the eastern boundary of the OPP site, forming a key transition between the proposed Local Centre and the southern residential neighbourhoods of the site at Lower Acre. The RM submissions is for the erection of 424 dwellings with associated public open space, landscaping, and cycle and vehicular parking. The dwellings will consist of:

- 147 apartments (mix of 1- and 2-bed flats)
- 277 houses (mix of 2-, 3-, 4- and 5-bed houses)

This report will contain further information regarding parcel-wide **carbon reduction** and mitigation to **overheating** for the proposed developments.

Topics Covered

Carbon Reduction

For demonstrating carbon reduction, the Eastleigh Borough Local Plan 2016-2036 has Policy DM2 (Environmentally Sustainable Development), which states that all new build residential development (C3 Use Class only) must achieve at the time a Reserved Matters or Full Planning Application is submitted:

- a) **19% improvement in predicted carbon emissions**, compared with the building regulations standard current at the time, through increased energy efficiency of the building fabric, unless this is superseded by an updated building regulations requirement equivalent to 'zero carbon homes'.

This report will provide high level calculations to show that the RM development is achieving a 19% reduction in carbon emissions from a Part L 2021 baseline.

Overheating

Policy DM3 of the Eastleigh Borough Local Plan (2016-2036) focuses on adaptation to climate change. It encourages that developments are designed to reduce the risks of overheating, through building design and orientation. The Environmentally Sustainable Development SPD also contains a policy regarding the minimisation of overheating risks in new developments in ESD5.

A high-level overheating assessment was requested to demonstrate a balance between daylighting levels, overheating protection, purge ventilation requirements, cost and aesthetics alongside security and safety considerations. Assessment have been undertaken in line with Part O compliance, for a sample of dwelling typologies.



1 Energy and Carbon Reduction

High-level energy calculations have been undertaken against Part L 2021 Building Regulations to demonstrate a 19% reduction is seen within the development.

A representative sample of dwelling types from across the OHH development have been used and scaled up to the proportion of houses and apartments within the Upper Acre accommodation schedule. The assumed building fabric u-values and systems are defined within the table below:

Table 1 Assumed building components for proposed dwellings

Component	Houses	Apartments
External Wall	0.17 W/m ² K	
Exposed Floor	0.13 W/m ² K	
Roof	0.13 W/m ² K	
Glazing	1.10 W/m ² K	
External Door	1.00 W/m ² K	
Air Permeability	4 m ³ /h/m ² @ 50Pa	
Ventilation	Natural Ventilation	Mechanical Ventilation (SFP 0.13)
Heating and Hot Water	Air Source Heat Pump (COP 1.7), with hot water storage cylinder (150L apartments/250L houses)	
Lighting	Efficient LED lighting	

*For thermal bridging, a good performance has been assumed which will require bespoke calculations or adherence to a certified scheme

The Standard Assessment Procedure (SAP) was completed with the above information, and the results have been summarised below:

Table 2 Estimated site-wide reduction against a Part L 2021 Baseline

Annual Performance Measure		Target	Actual	% Reduction
Part L 2021	CO ₂ emissions (kg CO ₂ /m ²)	12.4	5.7	54%
	Primary Energy (kWh/m ²)	64.9	60.0	8%
	Fabric Energy Efficiency (kWh/m ²)	37.1	32.7	12%

If a ground source heat technology was chosen over an air source heat pump, this is likely to have a minimal effect on the carbon performance. Further energy reductions could be achieved with the addition of PV to the roof of the dwellings or apartment blocks.



2 Overheating

The simplified Part O overheating methodology is the primary assessment which has been undertaken to determine risk of overheating within the proposed design. The design needs to balance daylighting levels, overheating protection, purge ventilation requirements, cost and aesthetics alongside security and safety considerations (such as Building Regulations Part K and B1).

Simplified Overheating Methodology

For the simplified methodology, the building's overheating risk category is based on location and whether it is cross-ventilated. This is used to select the relevant guidance for both of the following purposes:

- To **limit unwanted solar gains** in summer
- To provide an **appropriate means of removing excess heat** from the indoor environment

The proposed development is in a 'moderate risk' location, and a mix of house and apartment typologies have been assessed, both with and without cross-ventilation. The dwellings selected are expected to be a worst-case scenario, where the largest glazed façade is south facing. The criteria for meeting overheating requirements are stated in the below tables:

Table 3 Limiting solar gains

Largest glazed façade orientation	Buildings or parts of buildings should not exceed the maximum glazing areas			
	Limiting solar gains for buildings or parts of buildings with cross-ventilation		Limiting solar gains for buildings or parts of buildings without cross-ventilation	
	A = Maximum area of glazing (% floor area)	B = Maximum area of glazing in the most glazed room (% room floor area)	A = Maximum area of glazing (% floor area)	B = Maximum area of glazing in the most glazed room (% room floor area)
North	18	37	18	26
East	18	37	18	26
South	15	30	15	15
West	11	22	11	11

Table 4 Removing excess heat

	Buildings or parts of buildings should equal or exceed the minimum free areas			
	Minimum free areas for buildings or parts of buildings with cross-ventilation		Minimum free areas for buildings or parts of buildings without cross-ventilation	
	C = Total minimum free area (the greater of the following):	D = Bedroom minimum free area (the greater of the following):	C = Total minimum free area (the greater of the following):	D = Bedroom minimum free area (the greater of the following):
Floor area (+ room area)	9%	4%	12%	4%
Glazing area	55%	-	80%	-



For the assessment, the following assumptions have been used:

- Windows are assumed to be openable to 90°, with the following exceptions:
 - » Rooflights which were assumed to be openable to 10°.
 - » Full-height windows at ground floor level were assumed to be openable to 20°, which is a conservative assumption.
 - » Windows where the sill is under 1.10m above finished floor level – these windows are restricted to a 100mm opening width.
 - » Windows above ground floor in apartment blocks - these windows are restricted to a 100mm opening width.
- Front doors were not considered ‘free areas’, due to security risks, but garden patio doors are.
- Equivalent areas were utilised for the free area criterion because this better accounts for how different opening types will reduce the amount of air flow by both affecting the way air flows and reducing the physical area. Equivalent areas were calculated using the guidance in Part O Appendix D.

Finalised drawings (dated 02-12-2025) were utilised for the assessment, to obtain dimensions and layouts for window locations. There is a possibility that these designs will change, but these were accurate at the time of assessment.

Simplified Overheating Results

Typology	Cross Ventilation	Maximum Glazed Area		Minimum Free Area	
		Total Dwelling	Most Glazed Room	Total	Bedroom
House Type BB (S)	Yes	Pass	Pass	Fail	Pass
House Type WW (S)	Yes	Pass	Pass	Fail	Fail
Block 1 1B2P (W)	No	Pass	Fail	Fail	Fail
Block 5 2B4P (S)	No	Pass	Fail	Fail	Fail

Table 5 Simplified overheating results

The assessed typologies have the largest glazed façade orientated south, therefore represent some of the dwellings most at risk to overheating within the Upper Acre parcel. The houses both feature cross-ventilation and pass the maximum glazed area criteria. However, both houses fail with regards to the minimum free areas in the house, often passing some elements but failing others which result in an overall failure. The minimum free area criteria are assessed against an expected value determined by the floor area of the dwelling or bedroom. To pass this criterion, there would need to be an increase to the openable area of windows across the dwelling, which would in turn increase the free area. A standard OHH house type has been modelled utilising dynamic thermal modelling and CIBSE TM59, to provide a more detailed insight into the risk and design solutions for overheating in houses.

The apartments are not cross ventilated, therefore have stricter requirements to pass simplified overheating criteria. Whilst both flats pass the total dwelling glazed area criterion, they fail the three remaining criteria. Due to the tighter thresholds instructed for a non-cross ventilated dwelling and the restrictions on openable area, the flat does not perform well under a simplified overheating assessment. The apartments will have mechanical ventilation incorporated into the design; therefore, a standard

OHH flat typology has been assessed utilising dynamic thermal modelling and CIBSE TM59, to provide a more detailed insight into the overheating risk and required flow rates for mechanical ventilation.

The simplified assessment provides advice for the maximum glazed areas and minimum free areas, which could be utilised within the design, where feasible. This includes reviewing fixed windows to design for more openable windows, or increasing the angle at which restricted windows can open to. A detailed dynamic model has been developed for one standardised flat and house type, to more accurately assess the risk of overheating.

Dynamic Thermal Modelling Overheating Methodology

A dynamic thermal model has been produced, using IES Virtual Environment, to more accurately reflect the conditions of the spaces for a typical flat and house within the wider One Horton Heath development. This detailed analysis helps to identify how vulnerable the assets are for both 2020 and 2050 weather files and suggests some high-level design advice for the dwellings. The TM59 methodology introduces two criteria designed to test the dwellings for overheating risk:

- **Criterion (a)** - For living rooms, kitchens and bedrooms: sets a limit for the number of hours that the operative temperature can exceed the threshold comfort temperature (upper limit of the range of comfort temperature) by 1°K or more during the occupied hours of a typical non-heating season (1st May to 30th September). This criterion dictates 3% of occupied hours as a threshold.
- **Criterion (b)** - For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of annual hours. (1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours).
- For **when homes are predominantly mechanically ventilated**, the criteria changes: For homes with restricted window openings, the CIBSE fixed temperature test must be followed, i.e., all occupied rooms should not exceed an operative temperature of 26°C for more than 3% of the annual occupied annual hours (CIBSE Guide A (2015a)).

Key assumptions which are made during the modelling process include all internal gains defined by the TM59 profiles, and that the u-values are the same as those used for the energy calculations (Table 1). Solar gains are calculated automatically by the modelling software based on the orientation of the building, transmission coefficients of the glazing and solar angles. The weather file for Southampton has been used for the simulations.

A strategy of openable windows will be initially utilised to reduce the overheating risk in the bedrooms and living rooms via natural ventilation. All windows are assumed to be openable to 90°, with the following exceptions:

- Balcony doors will open to 90°.
- Windows (above ground floor) where the sill is under 1.10m above finished floor level – these windows are restricted to a 100mm opening width, in line with Part O guidance.
- Windows (above first floor, especially relevant for apartment buildings) - these windows are restricted to a 100mm opening width, in line with Part O guidance (unless otherwise stated).

There are no known acoustic or air quality constraints to the site, therefore windows can be opened at all times of the day, in line with Part O opening profile criteria. All internal doors are modelled as open



but follow the opening profiles within the Part O guidance (which requires bedroom door to be closed during the night). The g-value for windows has been assumed at 0.5, unless otherwise stated.

Individual assessments for Part O will form part of the technical design scope and indicate if any specific dwellings will require additional cooling measures.

Dynamic Modelling Overheating Results

Apartment

Two approaches have been presented to demonstrate a route to compliance with Part O requirements for a standardised south-facing 2-bed flat (shown in Figure 1):

- **Scenario 1:** An alteration to the window opening width; or
- **Scenario 2:** An alteration to the mechanical ventilation flow rate if window opening widths cannot be increased.

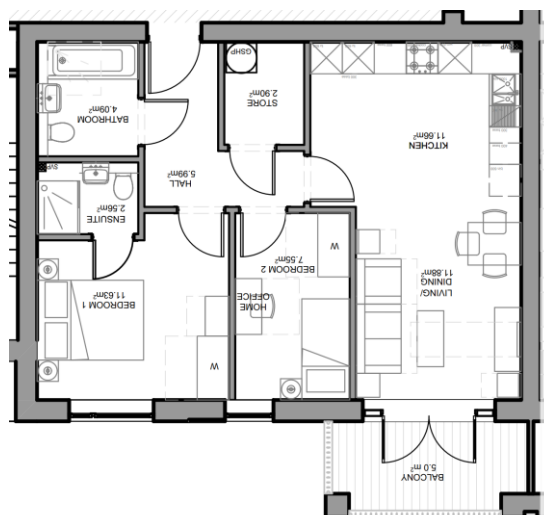


Figure 1 Standardised 2-bed flat

The results for the two weather files, 2020 and 2050, are presented below.

2020 weather file	Scenario 1			Scenario 2		
	L/K/D (4/5)	Single Bedroom (3)	Double Bedroom (2/1)	L/K/D (4/5)	Single Bedroom (3)	Double Bedroom (2/1)
Window restriction (mm or degree °)	90°	200mm	200mm/100mm	90°	100mm	100mm
MVHR background ventilation (l/s)	-	-	-	10 l/s	10 l/s	10 l/s

2050 weather file	Scenario 1			Scenario 2		
	L/K/D (4/5)	Single Bedroom (3)	Double Bedroom (2/1)	L/K/D (4/5)	Single Bedroom (3)	Double Bedroom (2/1)
Window restriction (mm or degree °)	90°	600mm	600mm/100mm	90°	100mm	100mm
MVHR background ventilation (l/s)	10 l/s	10 l/s	10 l/s	10 l/s	35 l/s	30 l/s

Table 6 Dynamic modelling overheating results showing different design requirements for a 2-bed flat.

The modelling shows that for 2020, if windows are restricted to a 100mm opening width which is the most likely scenario, then a background mechanical ventilation of 10l/s would be required in all living spaces to satisfy the overheating criteria. Alternatively, if the opening width could be increased by an additional 100mm to Window 2 in the Double Bedroom, this would remove the need for mechanical ventilation. A guard or other safety measure would be required for Scenario 1 to be a viable option.

For the future weather file 2050, under Scenario 2, flow rates of between 10-35l/s would be required across the flat to ensure all spaces can achieve the required internal temperatures. However, if window opening widths can be altered, then this significantly reduces the reliance on mechanical ventilation. It has been demonstrated that Window 2 and Window 3 (Figure 2, below) would require an opening of 600mm to bring flow rates down to 10l/s across all spaces. This would only be possible if a guard was installed to ensure the safety of users.

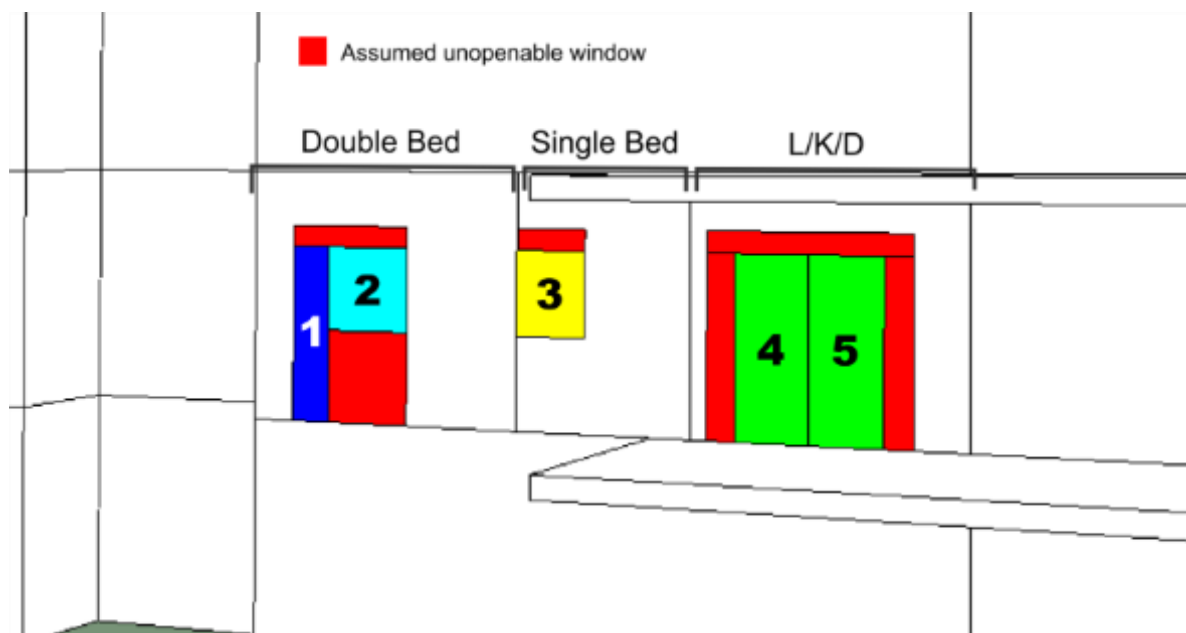


Figure 2 Flat window labelling for dynamic modelling

Within the Upper Acre proposed site layout, the apartments are orientated in a variety of directions, with few apartments with their main glazed façade facing directly south. The window format for the kitchen/dining/living areas is very similar to that modelled within this standard design, and whilst the bedroom glazing area do differ (with no floor to ceiling height windows), there is likely not significantly more glazing than the standardised design has. All windows and doors are expected to operate on the same opening profile as the standardised design. It is therefore appropriate for use at Upper Acre, for the purpose of the RMA.

This dynamic assessment provides an indication to the expected overheating risk to flats based on a standardised design, for a worst-case scenario where the glazing is south facing. It indicates the expected mechanical ventilation flow rates that would required under different conditions. Individual assessments for Part O will form part of the technical design scope and indicate if any specific dwellings will require additional cooling measures.

House

Two dynamic modelling scenarios have been presented to demonstrate a route to compliance with Part O requirements for a standardised 2-bed house, where the main glazed façade is south-facing (shown in Figure 3):

- **Scenario 1:** One openable pane per window set which is opened to its maximum angle (side-hung: 90°, top-hung: 45°) and a g-value set at 0.5.
- **Scenario 2:** All double windows are made openable to their maximum opening angle (side-hung: 90°, top-hung: 45°), a decreased g-value of 0.2 is used for south-facing and the kitchen/dining glazed doors, the removal of a windowpane (within Bedroom 2) and ensuring that the first-floor landing window and bathroom window remain open overnight.

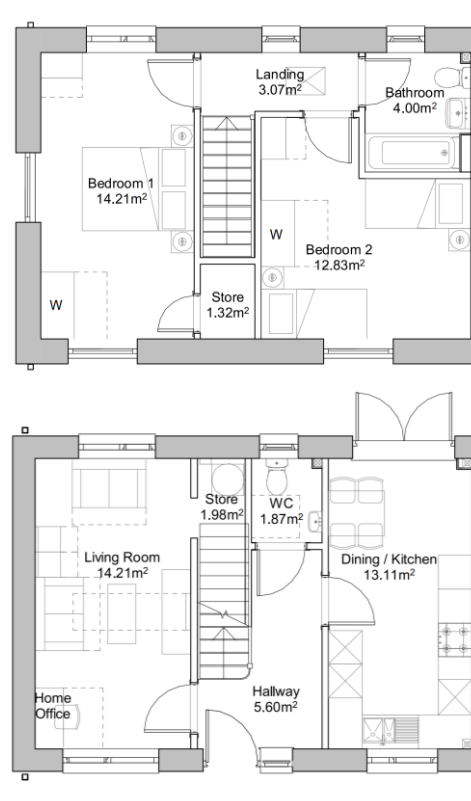


Figure 3 Standardised 2-bed house

After Scenario 1, multiple iterations of the model were produced, to explore ways to reduce the risk of overheating. Through this process, Scenario 2 was formulated, focused upon parameters throughout assessed spaces that are less likely to result in significant alterations to the visual appearance of the design. The opening profile for the windows can be seen in Appendix B. The results for the two weather files, 2020 and 2050, are presented below (where the room fails, the result for that criterion has been provided – this figure is in line with the metric specified in the methodology on pg. 6):

	Scenario 1				Scenario 2			
	2020		2050		2020		2050	
	Criterion (a)	Criterion (b)	Criterion (a)	Criterion (b)	Criterion (a)	Criterion (b)	Criterion (a)	Criterion (b)
GF - Living room	Pass	-	Fail (3.5%)	-	Pass	-	Pass (2.1%)	-
GF - Dining/Kitchen	Pass	-	Fail (5.2%)	-	Pass	-	Pass (2.6%)	-
1F - Bedroom 1	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
1F - Bedroom 2	Pass	Pass	Pass	Fail (109h)	Pass	Pass	Pass	Pass (30h)

Table 7 Dynamic modelling overheating results showing different design requirements for 2-bed house

Under both Scenario 1 and Scenario 2 for 2020, all overheating requirements are met. However, for the 2050 future weather file, only 1 of the 4 assessed spaces passes. In order to increase natural ventilation, additional windows were set as openable (as shown in Figure 4, original openable windows can be found in Appendix B). To reduce solar gains within the dwelling, a g-value of 0.2 was applied to all-south facing windows as well as the double-glazed doors within the kitchen/dining. Combined, these measures safeguard the ground floor living spaces from overheating in a future weather file scenario.

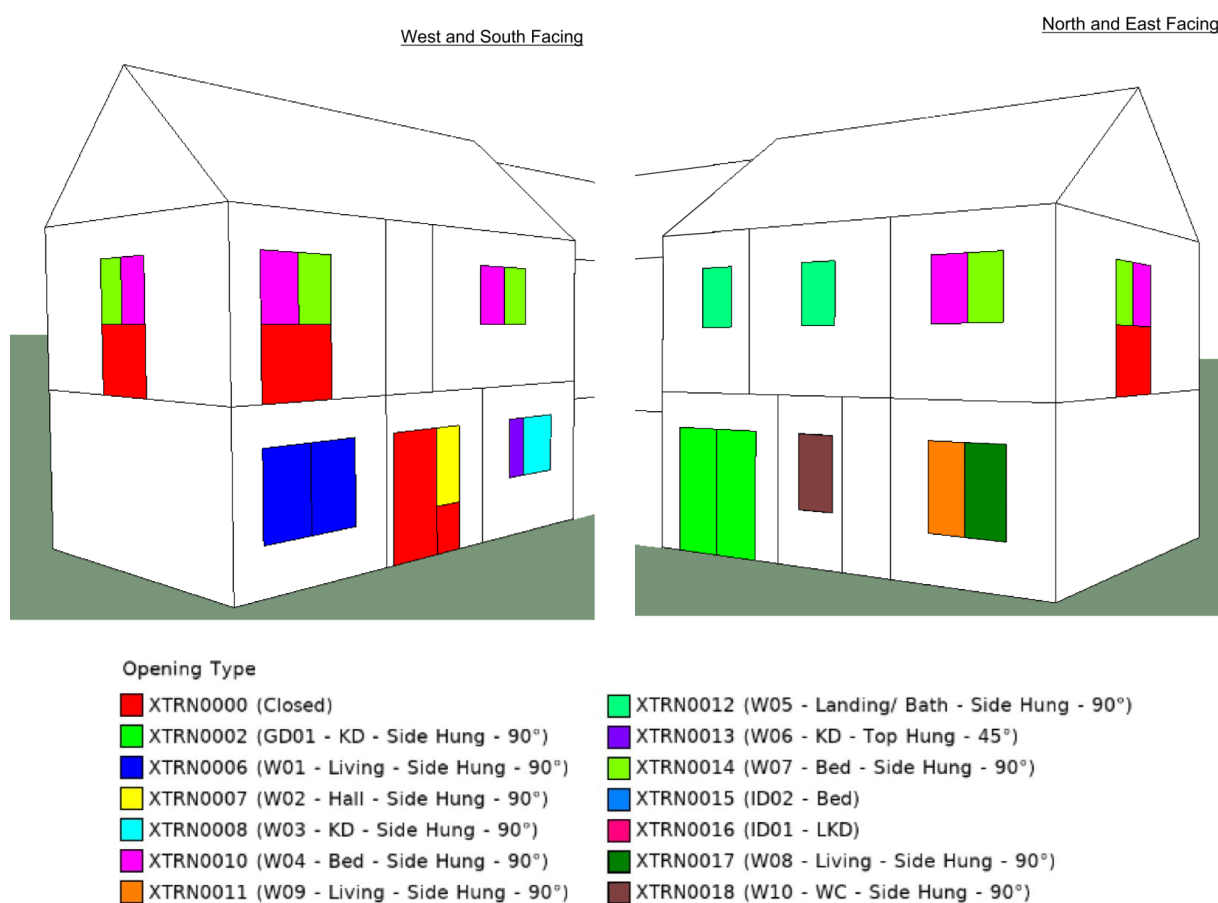


Figure 4 House window labelling for dynamic modelling in Scenario 2

Bedroom 1 does not struggle with overheating, as although it has more windows, it benefits from a greater night purge ventilation effect through the cross ventilation of windows on opposite sides of the room.

The internal layout means that the above strategy is not possible for Bedroom 2. Consequently, initial results showed a significantly increased number of overnight hours above the 26°C threshold. In addition to opening both upper windowpanes and applying a g-value of 0.2, the lower unopenable (as marked up in Figure 4) was removed from the design to further reduce heat gain. Whilst internal doors were modelled as closed overnight, the cooling which is seen by having the first-floor landing window and first-floor bathroom window open help the dwelling to cool at night. Combined, these additional measures help to ensure that Bedroom 2 poses a low overheating risk a future weather file scenario.

Within the Upper Acre proposed site layout, the houses are orientated in a variety of directions, with a significant portion the homes with the front or rear of the property facing south. The window format for the downstairs of the property is very similar to that modelled within this standard design. A small selection of house types within Upper Acre have bedrooms which feature cross ventilation, such as Type OO. Throughout the design, no bedrooms have full-height glazing, with most spaces having the option for two openable windows of equivalent area to the standardised model. All windows and doors are expected to operate on the same opening profile as the standardised design. It is therefore appropriate for use at Upper Acre, for the purpose of the RMA.

This dynamic assessment provides an indication to the expected overheating risk to houses based on the example design, for a dwelling which has its most glazed façade south-facing. By

increasing the number of openable windows, decreasing the g-values of the glass, and removing large unopenable panes of glazing, this can mitigate the risk of overheating in habitable spaces.

This knowledge can be used by the design team to be confident that the majority of dwellings will likely be able to meet the overheating criteria, with a worst-case scenario focused on here. Individual assessments for Part O will form part of the technical design scope and indicate if any specific dwellings will require additional cooling measures.



Appendices



Appendix A Simplified Overheating Results

 Approved Document O - Simplified Method Report Created in the Elmhurst Overheating tool - For use in England only			
Building and Site Details			
Residential building name/number	House Type WW (3B6P)		
Street	-		
Town	-		
County	-		
Postcode	-		
Proposed building use/type of building	Residential		
Are there any security, noise or pollution issues?	None known		
Site Details	Moderate risk location with cross ventilation		
Results			
	Target	Result	Pass/Fail?
Maximum area of glazing (%)	15	9.50	Pass
Maximum area of glazing in the most glazed room (%)	30	13.46	Pass
Total minimum free area as % floor area (m²)	9.99	6.69	Fail
Total minimum free area % glazing area (m²)	5.80	6.69	Pass
<i>The greater of the minimum free area/floor area or glazing area should pass - Highlighted yellow</i>			
Bedroom 1 minimum free area (m²)	0.46	0.32	Fail
Bedroom 2 minimum free area (m²)	0.48	0.52	Pass
Bedroom 3 minimum free area (m²)	0.46	0.92	Pass
Bedroom 4 minimum free area (m²)	0.00	0.00	Pass
Bedroom 5 minimum free area (m²)	0.00	0.00	Pass
Dwelling overall result	Fail		

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Appendix A Simplified Overheating Results


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Building and Site Details

Residential building name/number	House Type BB (2B4P)
Street	-
Town	-
County	-
Postcode	-
Proposed building use/type of building	Residential
Are there any security, noise or pollution issues?	None known
Site Details	Moderate risk location with cross ventilation

Results

	Target	Result	Pass/Fail?
Maximum area of glazing (%)	15	11.91	Pass
Maximum area of glazing in the most glazed room (%)	30	26.89	Pass
Total minimum free area as % floor area (m²)	7.11	6.60	Fail
Total minimum free area % glazing area (m²)	5.18	6.60	Pass
<i>The greater of the minimum free area floor area or glazing area should pass - Highlighted yellow</i>			
Bedroom 1 minimum free area (m²)	0.52	0.92	Pass
Bedroom 2 minimum free area (m²)	0.46	0.92	Pass
Bedroom 3 minimum free area (m²)	0.00	0.00	Pass
Bedroom 4 minimum free area (m²)	0.00	0.00	Pass
Bedroom 5 minimum free area (m²)	0.00	0.00	Pass
Dwelling overall result	Fail		


elmhurst
energy

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Building and Site Details

Residential building name/number	Upper Acre Apartment Block 1 Apartment 23 (1B2P)
Street	
Town	
County	
Postcode	
Proposed building use/type of building	Residential
Are there any security, noise or pollution issues?	None known
Site Details	Moderate risk location with no cross ventilation

Results

	Target	Result	Pass/Fail?
Maximum area of glazing (%)	11	10.28	Pass
Maximum area of glazing in the most glazed room (%)	11	15.54	Fail
Total minimum free area as % floor area (m²)	6.07	1.84	Fail
Total minimum free area % glazing area (m²)	4.16	1.84	Fail
<i>The greater of the minimum free area floor area or glazing area should pass - Highlighted yellow</i>			
Bedroom 1 minimum free area (m²)	0.47	0.30	Fail
Bedroom 2 minimum free area (m²)	0.00	0.00	Pass
Bedroom 3 minimum free area (m²)	0.00	0.00	Pass
Bedroom 4 minimum free area (m²)	0.00	0.00	Pass
Bedroom 5 minimum free area (m²)	0.00	0.00	Pass

Dwelling overall result

Fail

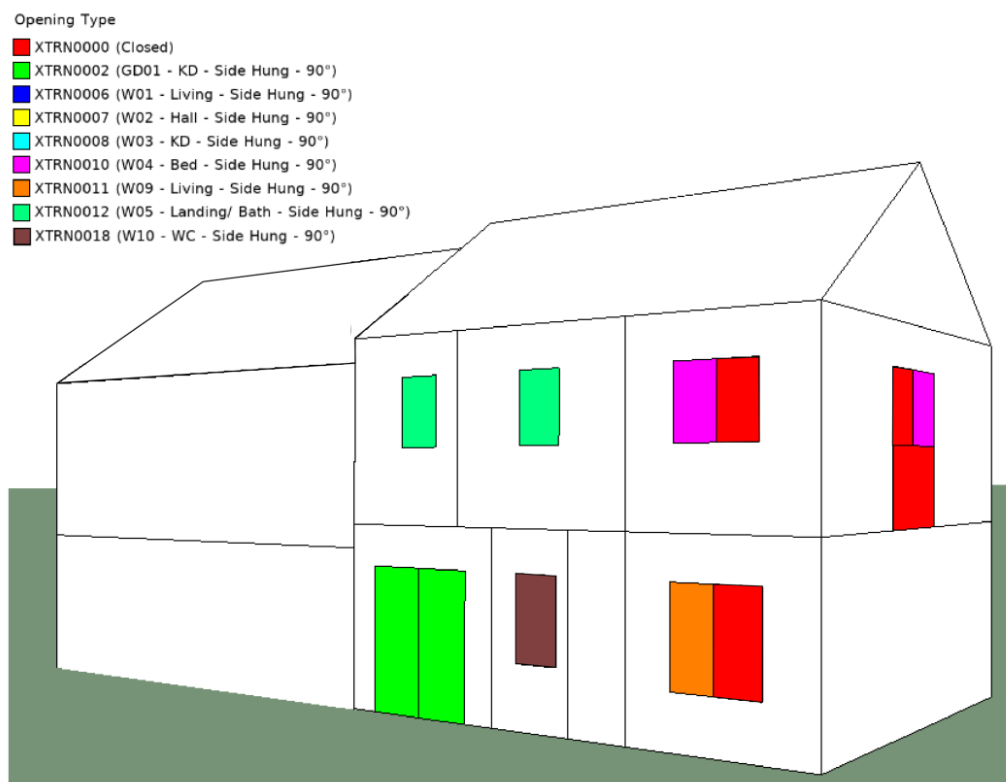
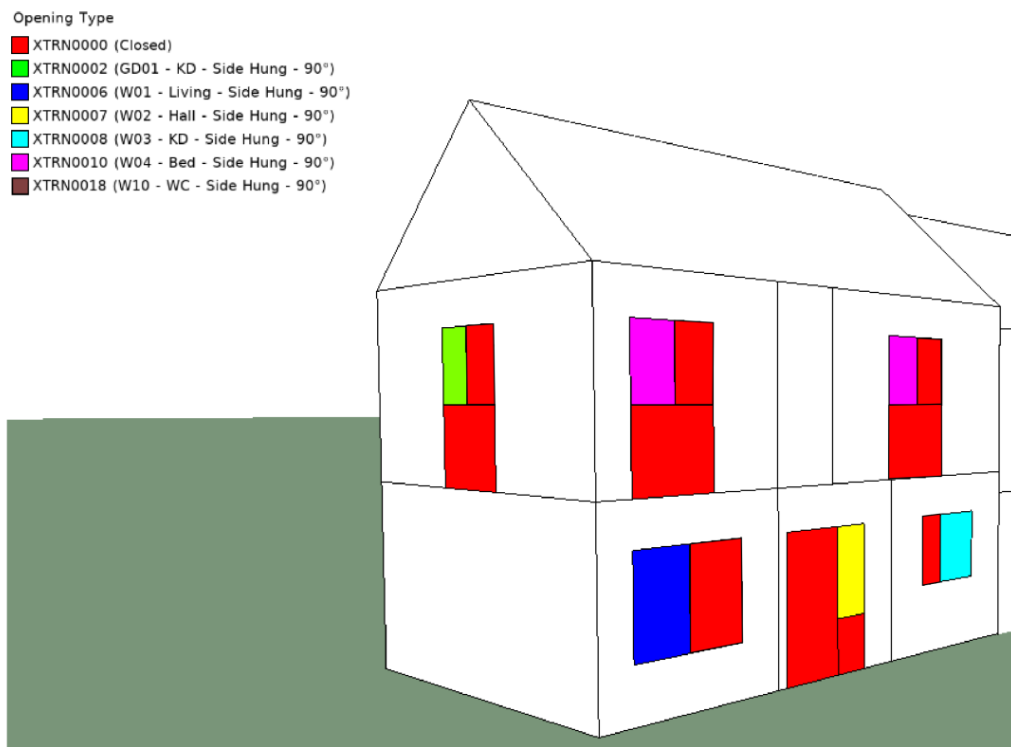


Energy and Sustainability Strategy Technical Addendum – Upper Acre
Appendix A Simplified Overheating Results

 Approved Document O - Simplified Method Report Created in the Elmhurst Overheating tool - For use in England only			
Building and Site Details			
Residential building name/number	Upper Acre Apartment Block 5 Apartment 16 (2B4P)		
Street			
Town			
County			
Postcode			
Proposed building use/type of building	Residential		
Are there any security, noise or pollution issues?	None known		
Site Details	Moderate risk location with no cross ventilation		
Results			
	Target	Result	Pass/Fail?
Maximum area of glazing (%)	15	12.51	Pass
Maximum area of glazing in the most glazed room (%)	15	17.08	Fail
Total minimum free area as % floor area (m²)	9.18	2.78	Fail
Total minimum free area % glazing area (m²)	7.66	2.78	Fail
<i>The greater of the minimum free area/floor area or glazing area should pass - Highlighted yellow</i>			
Bedroom 1 minimum free area (m²)	0.52	0.30	Fail
Bedroom 2 minimum free area (m²)	0.46	0.30	Fail
Bedroom 3 minimum free area (m²)	0.00	0.00	Pass
Bedroom 4 minimum free area (m²)	0.00	0.00	Pass
Bedroom 5 minimum free area (m²)	0.00	0.00	Pass
Dwelling overall result	Fail		

Appendix B House Window Openings

Scenario 1 Openable Windows with Angle of Opening



Scenario 2 Full list of Window Opening Profiles

Opening Type Ref	Max. Opening Angle (°)	Openable Area %	Opening Profile
GD01 - KD - Side Hung - 90°	90	80.0%	ADO section 2.6a (day)
W01 - Living - Side Hung - 90°	90	57.5%	ADO section 2.6a (day)
W02 - Hall - Side Hung - 90°	90	46.1%	ADO section 2.6a (day)
W03 - KD - Side Hung - 90°	90	54.7%	ADO section 2.6a (day)
W04 - Bed - Side Hung - 90°	90	47.6%	ADO section 2.6a+b (day & night)
W05 - Landing/ Bath - Side Hung - 90°	90	49.1%	ADO section 2.6a+b (day & night)
W06 - KD - Top Hung - 45°	45	37.3%	ADO section 2.6a (day)
W07 - Bed - Side Hung - 90°	90	45.8%	ADO section 2.6a+b (day & night)
W08 - Living - Side Hung - 90°	90	52.1%	ADO section 2.6a (day)
W09 - Living - Side Hung - 90°	90	50.5%	ADO section 2.6a (day)
W10 - WC - Side Hung - 90°	90	50.9%	ADO section 2.6a (day)
ID01 - LKD	-	80.0%	On continuously during 0900 to 2200
ID02 - Bed	-	80.0%	On continuously during 0700 to 2200



With every community, we redefine what's possible.



Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

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