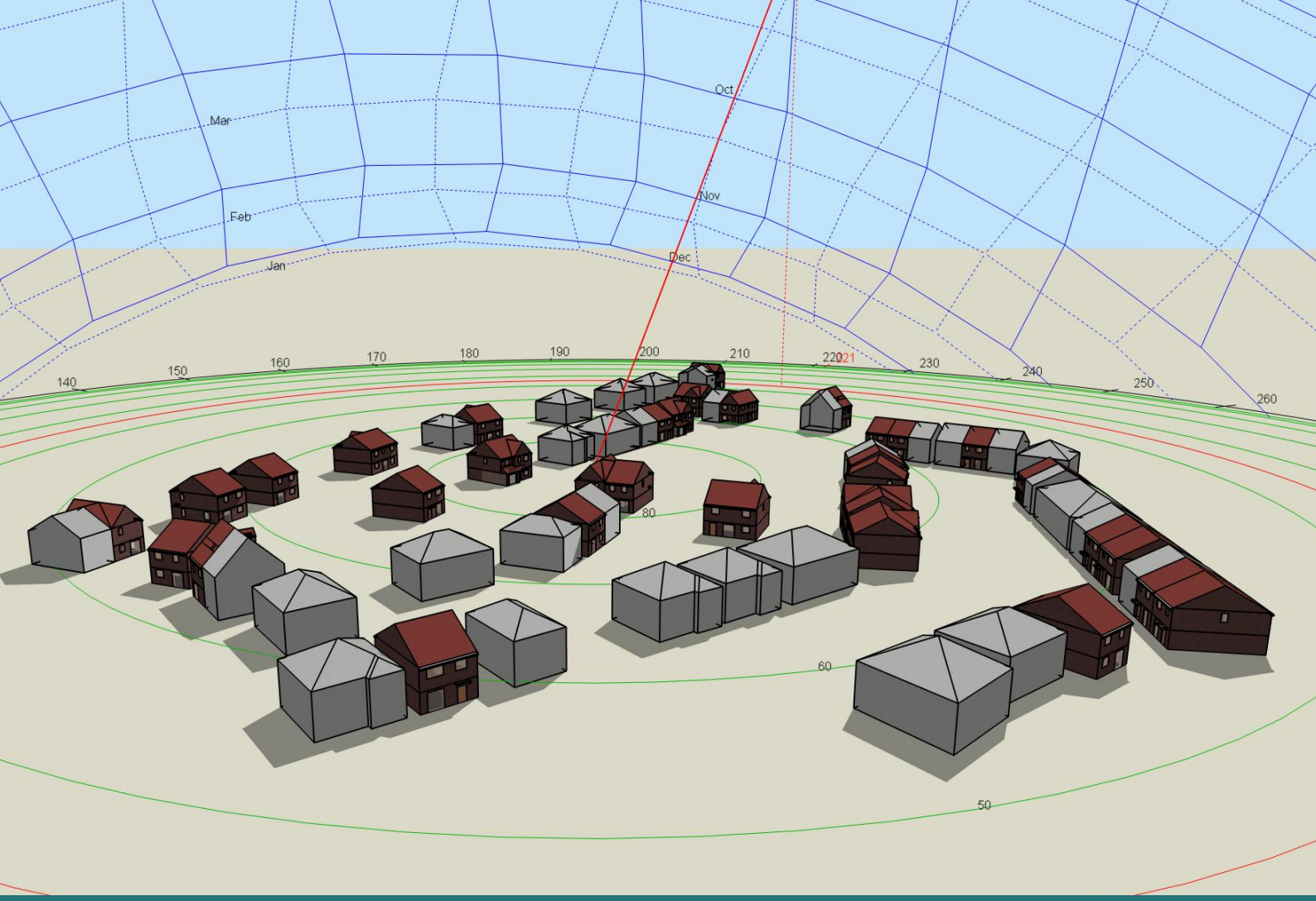


Part O Dynamic Thermal Modelling Report

Assessment on: **Hinchley Road**

Barton, Barton AW, Crawford, Harper, Kimpton, Langton, Latchford, Lever, Worthington, Worthington AW

Client: **Miller Homes**

elmhurstenergy APPROVED
OVERHEATING COMPETENCY SCHEME MEMBER

Energy & Design
requests@energyanddesign.net
01543 547771

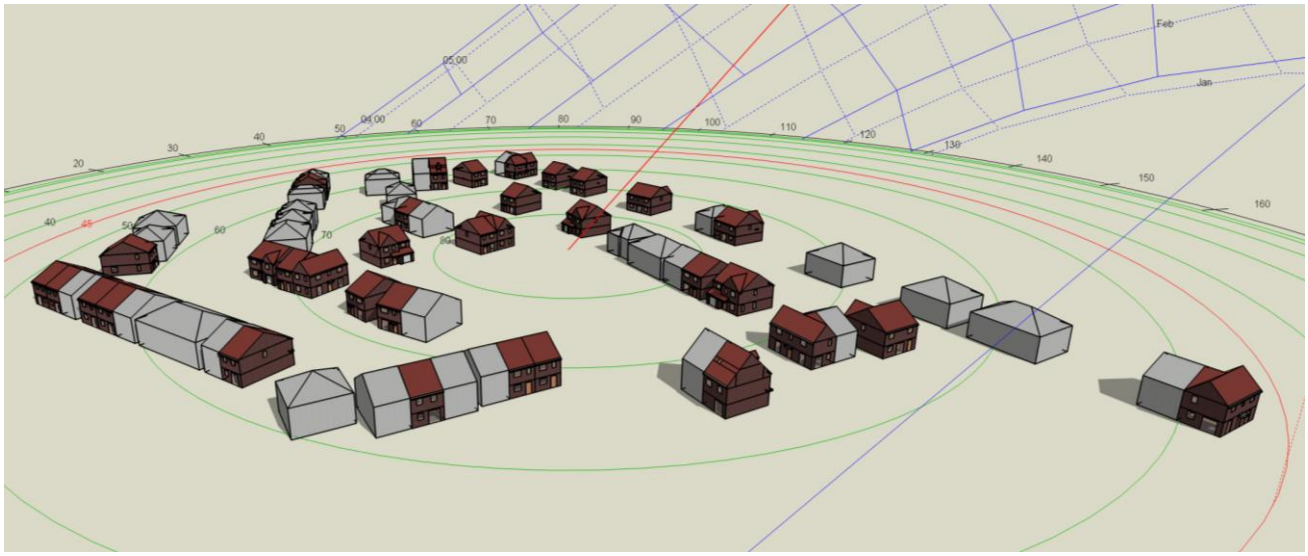
Revisions

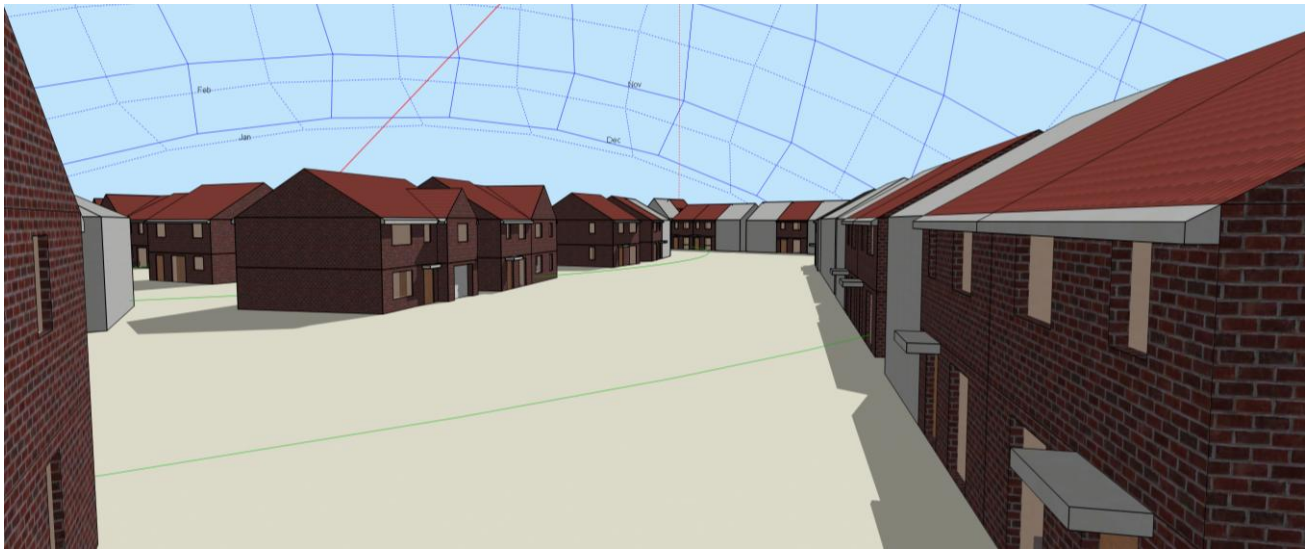
Revision	Revision Details	Report prepared by			Report checked by		
		Name	Signature	Date	Name	Signature	Date
-	-	Will Howarth	[redacted]	03/11/2025	William Harrison-Hurd	[redacted]	03/11/2025

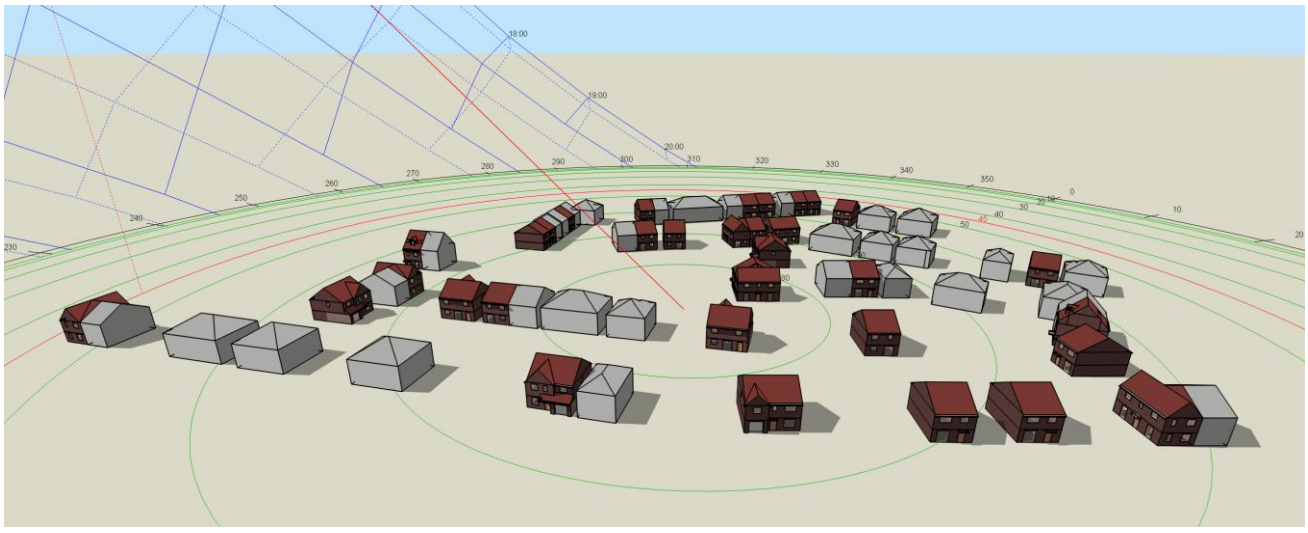
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DSM Model





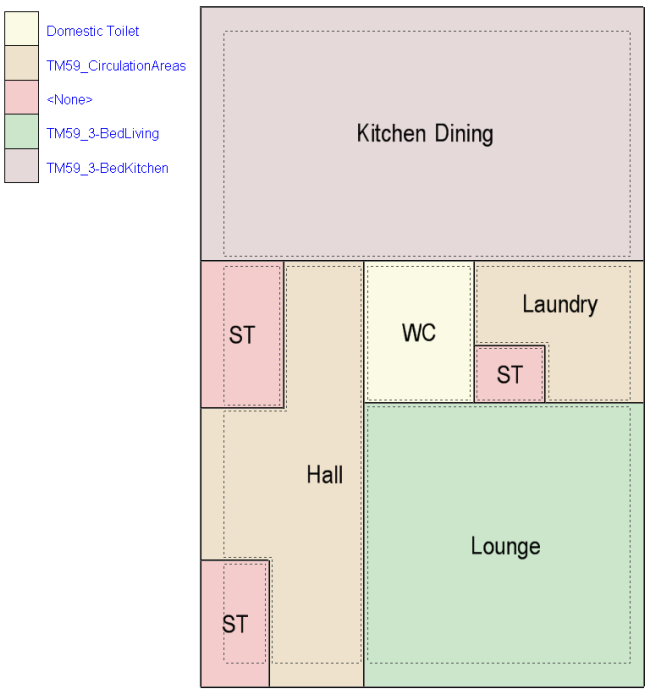


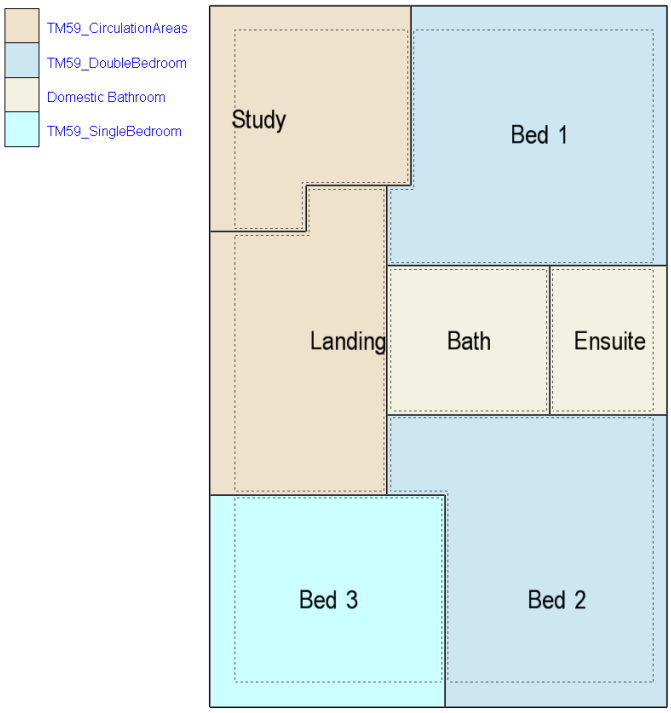
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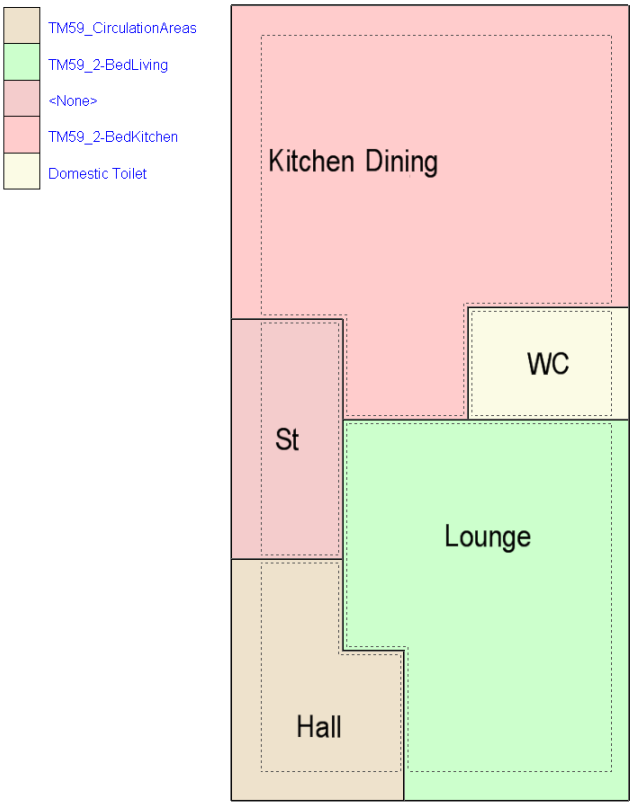
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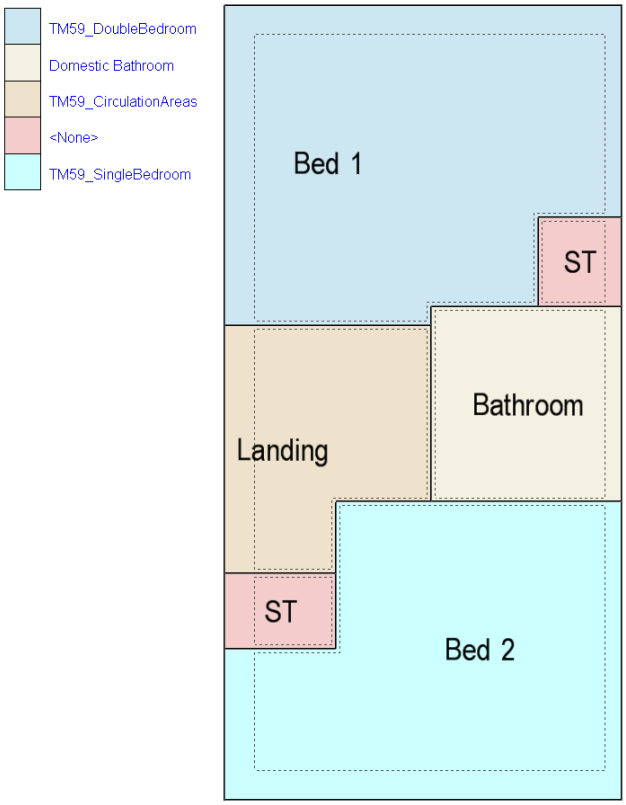
Barton / Barton AW





Crawford

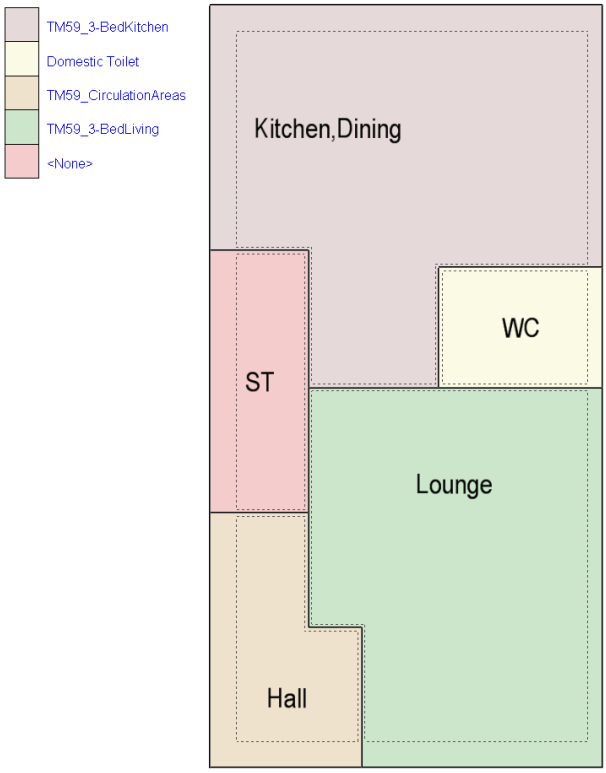


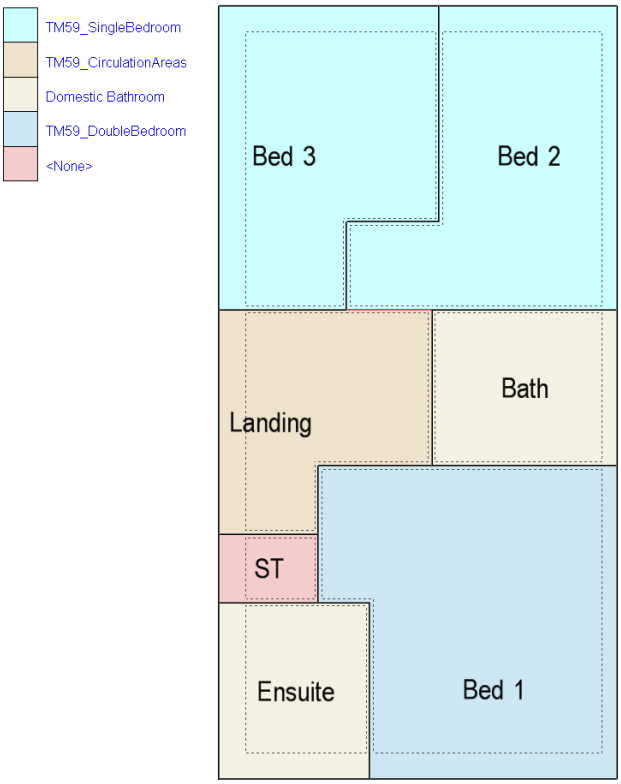


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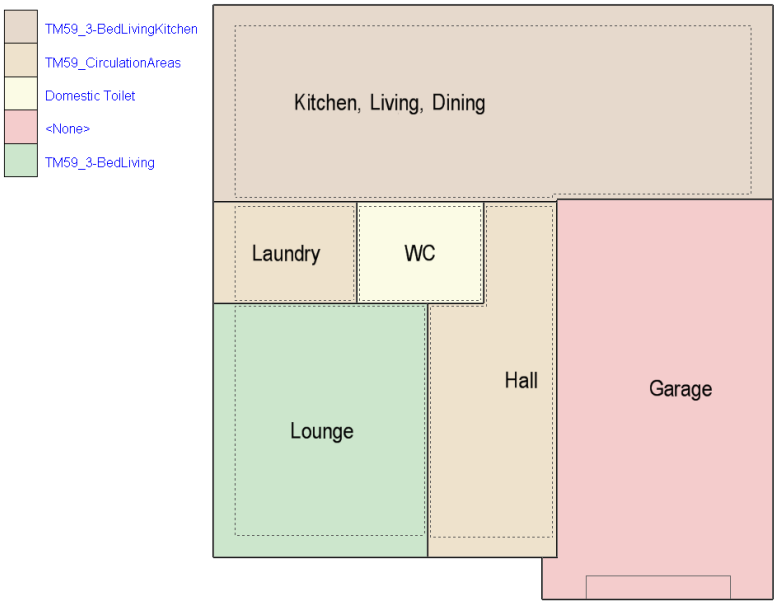
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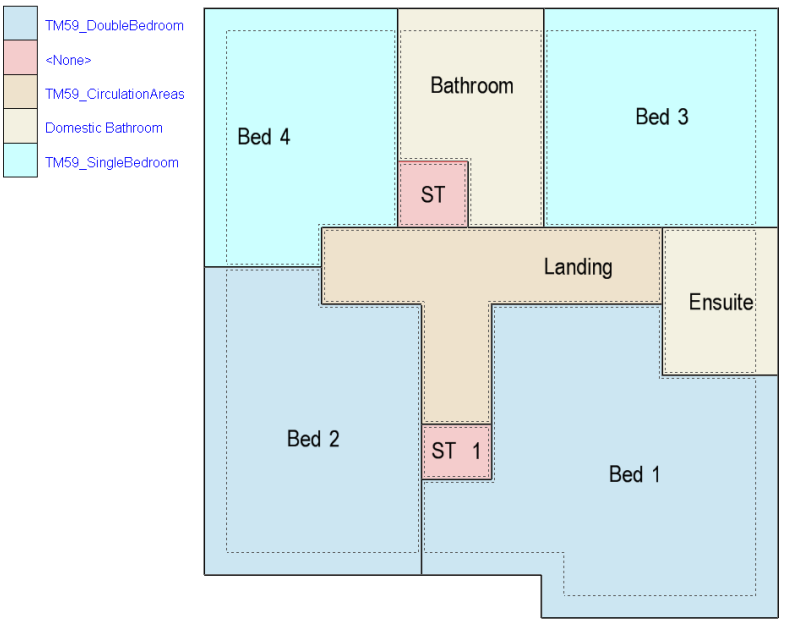
Harper





Kimpton

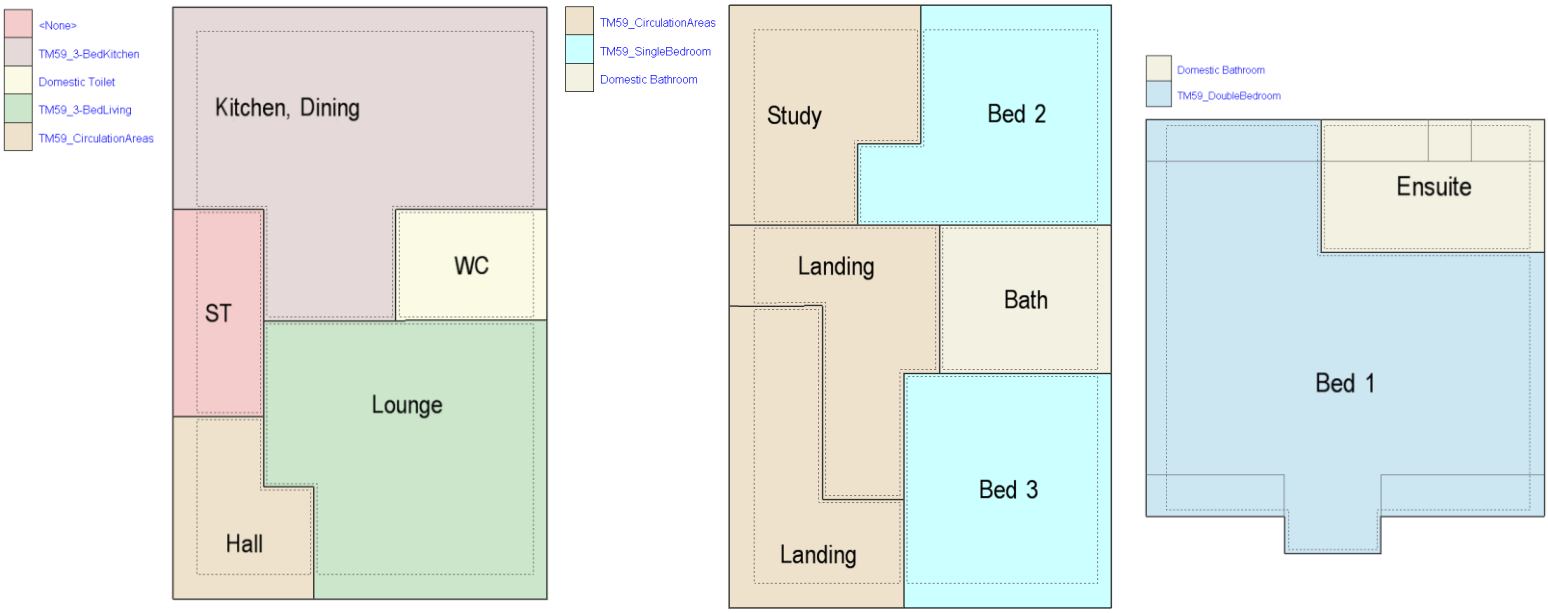




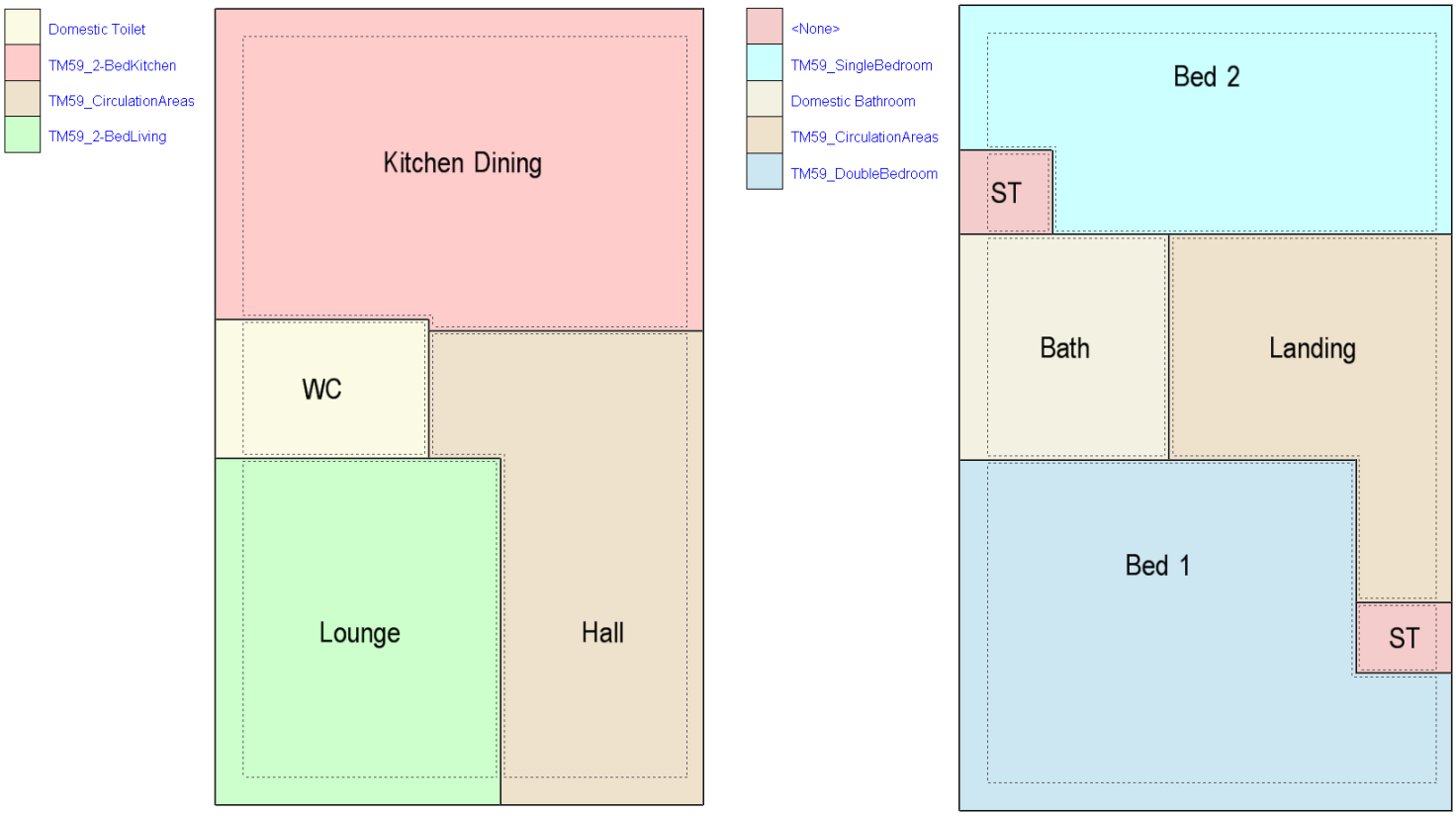
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Langton



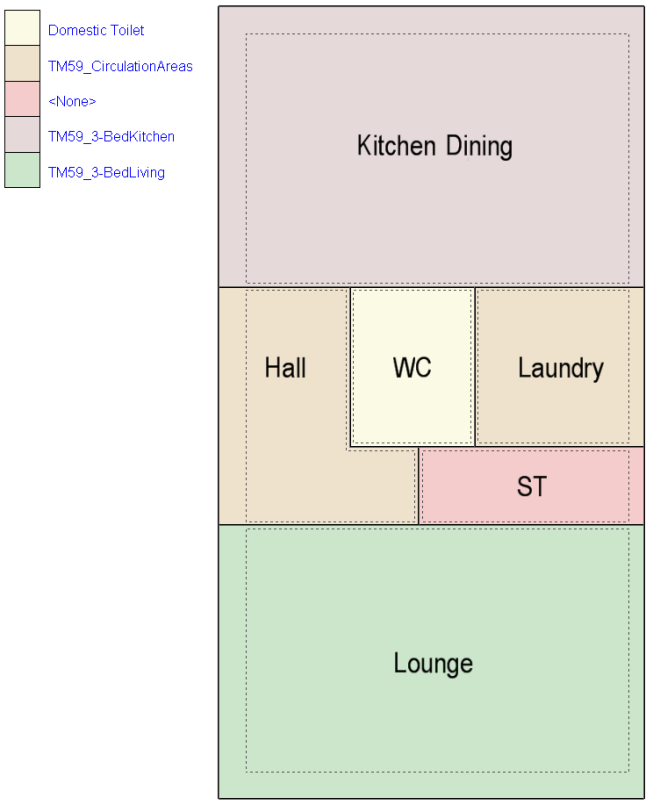
Latchford

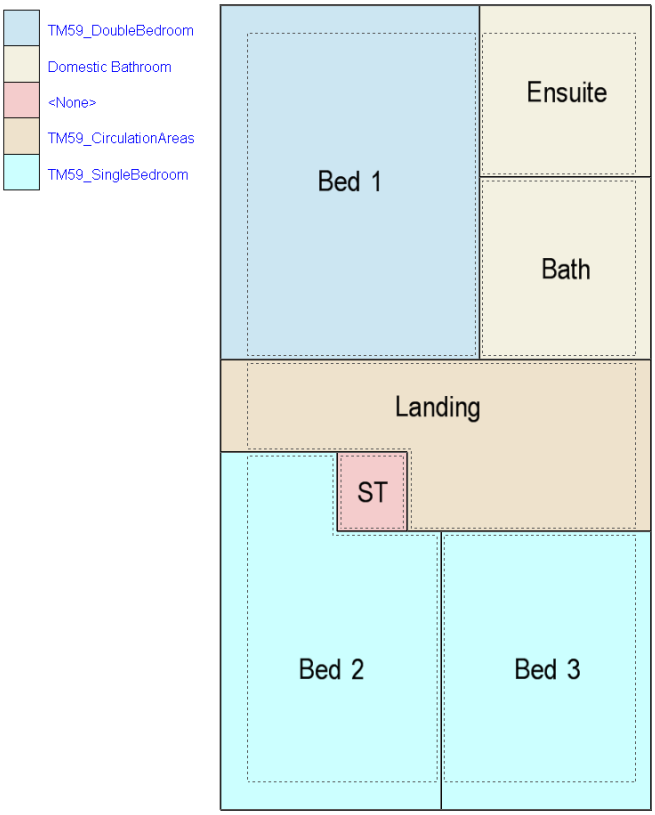


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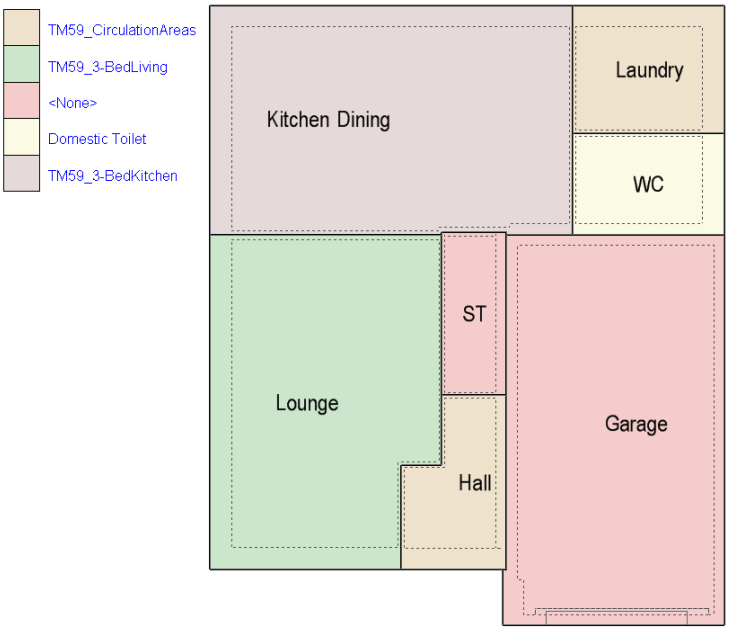
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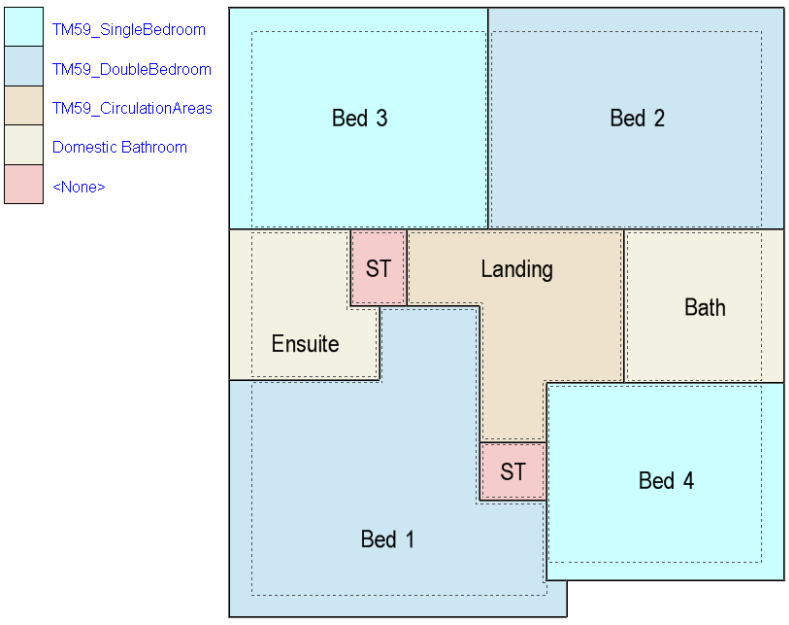
Lever





Worthington / Worthington AW





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Introduction

Software

The building has been modelled using DesignBuilder Dynamic Simulation Modelling Software Version 7.2.0.032, using the EnergyPlus Simulation Engine.

The DSM model can be used to provide:

- Overheating analysis (this report)
- Future weather energy-consumption predictions
- Heating and Cooling Load calculations
- Climate Based Daylight Modelling
- Thermal Fluid Dynamics Assessments
- Building Compliance Assessments (Building Regulations Part-L and EPC)
- Bespoke detailed HVAC analysis
- Digital Twin and Calibrated Modelling
- Uncertainty and Sensitivity Analysis
- Optimisation

In accordance with Approved Document O

2.3 To demonstrate compliance using the dynamic thermal modelling method, all of the following guidance should be followed.

a. CIBSE's TM59 methodology for predicting overheating risk.

b. The limits on the use of CIBSE's TM59 methodology set out in paragraphs 2.5 and 2.6.

c. The acceptable strategies for reducing overheating risk in paragraphs 2.7 to 2.11.

Compliance Criteria for CIBSE TM59

TM59 is the design methodology for the assessment of overheating risk in homes. It is an extension of the BS EN 15251 standard described above. It contains standardised internal gains and occupancy profiles that must be included in all TM59 modelling and stipulates which weather files should be used. In order to pass the standard, both of the following criteria must pass the annual simulation test:

- Criterion A - For Living Rooms, Kitchens and Bedrooms - CIBSE TM52 Criterion 1: Hours of exceedance. < 3% indicates a fail.

- Criterion B - For Bedrooms Only – from 10 pm to 7 am shall not exceed 26 °C for more than 1% of annual hours. This equals 32hrs - so 33hrs indicates a fail.

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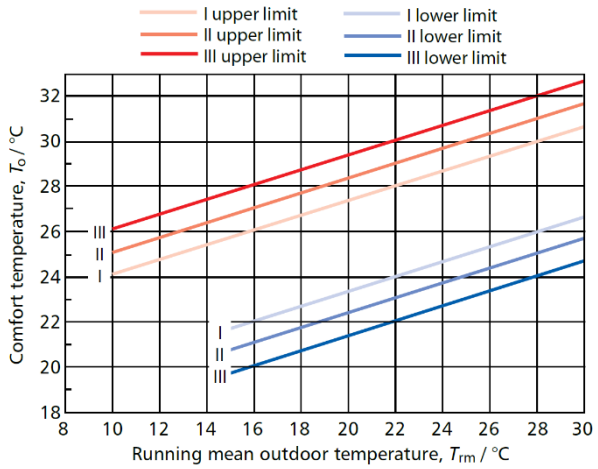
Corridors – Assessment Criteria

N.B. Whilst TM59 does not include a mandatory target for corridors, they suggest that ≯3% of total annual hours at 28°C operative should be the target. See S4.5 from TM59 below. Research has shown that overheating corridors lead to overheating flats.

"4.5 Corridors: assessment criteria

The overheating test for corridors should be based on the number of annual hours for which an operative temperature of 28 °C is exceeded. Whilst there is no mandatory target, if an operative temperature of 28 °C is exceeded for more than 3% of total annual hours, this should be flagged as a significant risk within the report. "

Adaptive Comfort Category



Adaptive Comfort Category Description

Table 2 Suggested applicability of the categories and their associated acceptable temperature range for free-running buildings and of PMV for mechanically ventilated buildings (from BSI, 2007). The CIBSE suggestion is that designers should aim to remain within the Category II limits.

Category	Explanation	Suggested acceptable range (K)	Suggested acceptable limits PMV
I	High level of expectation only used for spaces occupied by very sensitive and fragile persons	± 2	± 0.2
II	Normal expectation (for new buildings and renovations)	± 3	± 0.5
III	A moderate expectation (used for existing buildings)	± 4	± 0.7
IV	Values outside the criteria for the above categories (only acceptable for a limited periods)	>4	> 0.7

This building has been tested under Category II limits, as per the table above.

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Limits on CIBSE's TM59 modelling (Part O)

2.5 CIBSE's TM59 method requires the modeller to make choices. The dynamic thermal modelling method in this section applies limits to these choices, which are detailed in paragraph 2.6. These limits should be applied when following the guidance in CIBSE's TM59.

2.6 All of the following limits on CIBSE's TM59, section 3.3, apply.

a. When a room is occupied during the day (8am to 11pm), openings should be modelled to do all of the following.

   i. Start to open when the internal temperature exceeds 22°C.

   ii. Be fully open when the internal temperature exceeds 26°C.

   iii. Start to close when the internal temperature falls below 26°C.

   iv. Be fully closed when the internal temperature falls below 22°C.

b. At night (11pm to 8am), openings should be modelled as fully open if both of the following apply.

   i. The opening is on the first floor or above and not easily accessible.

   ii. The internal temperature exceeds 23°C at 11pm.

c. When a ground floor or easily accessible room is unoccupied, both of the following apply.

   i. In the day, windows, patio doors and balcony doors should be modelled as open, if this can be done securely, following the guidance in paragraph 3.7 below.

   ii. At night, windows, patio doors and balcony doors should be modelled as closed.

d. An entrance door should be included, which should be shut all the time.

Acceptable mitigation strategies in accordance with Part O

a) Fixed shading devices; Shutters, external blinds, overhangs, awnings.
b) Glazing design involving; size, orientation, g-value, depth of window reveal.
c) Building design
d) Shading by permanent buildings

Blinds, curtains, and foliage such as tree cover should not be taken into account when considering whether the requirements of Part O have been met.

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Location and Orientation

This site was simulated using Manchester DSY1 2020's HIGH 50% CIBSE weather location file, Manchester is the closest of the 16 approved weather stations - Approximately 5.7 miles from the site (M9). The plots have been orientated as per the provided site layout – please see Appendix 1. The appropriate overshading from nearby properties has been modeled.

Specification for the Model

The following information has been used to produce the building model.

Drawing Pack

The Client provided:

- AutoCad Plans
- AutoCad Elevations
- AutoCad Sections
- Site Layout Plan - Rev C

Construction Specification

As per Energy Specification (L1 2021) 25/07/23 – Please see Appendix 2

Thermal Mass – Thermal characteristics of all elements are integral to the Dynamic Model.

HVAC

Heating – Vaillant AroTherm pure, Radiator heating.

Ventilation – DMEV, Vent Axia Lo-Carbon NBR DMEV C (ADF table 1.22)

Ventilation Strategy

Natural (purge) ventilation is provided by opening windows. The windows are simulated to start to open as per opened when a room is occupied and the operative temperature in the room is above 22°C, as stated in Part O, section 2.6, (i).

Hepworth Acoustics "Noise Impact Assessment" (03/09/2025), confirms that windows can be modelled as open to mitigate overheating – please see appendix 3

Air infiltration through other openings, vents and cracks in the building structure is simulated and included in the Crack Template.

EnergyPlus Crack Template of Good = 5.0 $m^3/(h.m^2)$ @ 50 PaA

Internal Conditions

Defined by dynamic simulation model as per TM59:2017, Section 6, Table 2: Please see appendix 4

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Detailed Inputs

Input	Figure	Source
Metabolic Rates	130 w (sensible = 65W, latent = 65w)	TM59
Lighting	2 W/m2	TM59 Default
Main zonal temperature setpoints	Various	TM59 Default
Equipment IHG & Schedules	Various	TM59 Defaults – see Appendix 4
Internal Air Speed	0.1m/s	TM59 Default

Window & Door Schedule

Approved Document O opening protocols have been used to set opening schedules. (See below)

Opening	Schedule
All Openings (Apart from entrance Door)	Included in ventilation strategy
Entrance Door	Always Closed
Easily Accessible Openings (Defined by ADO)	Closed 11pm until 8am, Opening remaining hours
Internal Doors	Closed 11pm until 8am. Opening remaining hours
All Remaining Openings	Open 24/7

The discharge coefficient for each opening has been calculated using the Future Homes Hub Part O Simplified Method Spreadsheet tool (This takes into consideration ADO's 650mm restriction for outward opening windows).

Easily Accessible - Defined as one of the following:

- A window or doorway, any part of which is within 2m vertically of an accessible level surface, such as the ground or basement level, or an access boundary.
- A window within 2m vertically of a flat or sloping roof (with a pitch of less than 30 degrees) that is within 3.5m of ground level.

Windows above porches/canopies, where they have no independent structural contact with the ground, have not been considered accessible; following the removal of NHBC's technical bulletin 6.7/22. If the technical bulletin returned, it would be more than likely that a Certificate, proving the porch/canopy cannot be used to gain accessibility, would be required.

Protection From Falling

As all windows form part of the ventilation strategy, all openings must comply with Approved Document O – Protection from Falling – Section 3.8 – 3.10 (please see appendix 5). Meaning that any openings currently not complying with this; will require guarding meeting the criteria laid out within sections 3.8 – 3.10.

Sample Selection

As a minimum we will always model each type, and each built form of that type. We do this as the characteristics of each individual design behave differently in regard to overheating.

The sample of plots to represent these types is then selected based on the following characteristics; predominantly west-facing glazing, none/little shading from nearby properties. This ensures we produce our mitigation strategy for each type from the plots which are most at risk of overheating.

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Part O Calculation Results

Criteria

- Criterion A - > 3% indicates a fail (Living rooms, Kitchens and Bedrooms).
- Criterion B - > 32hrs indicates a fail (Bedrooms only).

Base Specification Results

Base Results					
Criteria for predominantly naturally ventilated homes					
Plot	Floor	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
Barton - Detached					
51	FF	BED1	0	6.33	Pass
	FF	BED2	0	11.83	Pass
	FF	BED3	0	8.17	Pass
	GF	KITCHENDINING	0.2	N/A	Pass
	GF	LOUNGE	0.03	N/A	Pass
75	FF	BED1	0	11	Pass
	FF	BED2	0.1	18	Pass
	FF	BED3	0.09	13.17	Pass
	GF	KITCHENDINING	0	N/A	Pass
	GF	LOUNGE	1.08	N/A	Pass
79	FF	BED1	0	14.83	Pass
	FF	BED2	0.02	9.5	Pass
	FF	BED3	0	5.83	Pass
	GF	KITCHENDINING	0.16	N/A	Pass
	GF	LOUNGE	0.46	N/A	Pass
104	FF	BED1	0	5.83	Pass
	FF	BED2	0.02	14.33	Pass
	FF	BED3	0	9	Pass
	GF	KITCHENDINING	0.17	N/A	Pass
	GF	LOUNGE	0.45	N/A	Pass
Barton - Semi-detached					
67	FF	BED1	0	8.83	Pass
	FF	BED2	0	5.17	Pass
	FF	BED3	0	4.5	Pass
	GF	KITCHENDINING	0.03	N/A	Pass
	GF	LOUNGE	0.26	N/A	Pass
93	FF	BED1	0	4.33	Pass
	FF	BED2	0	9.83	Pass
	FF	BED3	0	7.67	Pass
	GF	KITCHENDINING	0.1	N/A	Pass
	GF	LOUNGE	0.12	N/A	Pass
Barton AW - Detached					

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23	FF	BED1	0	5	Pass
	FF	BED2	0.02	12	Pass
	FF	BED3	0	3.83	Pass
	GF	KITCHENDINING	0.23	N/A	Pass
	GF	LOUNGE	0.42	N/A	Pass
45	FF	BED1	0	10.67	Pass
	FF	BED2	0.01	10.67	Pass
	FF	BED3	0.01	3.5	Pass
	GF	KITCHENDINING	0	N/A	Pass
	GF	LOUNGE	0.44	N/A	Pass
78	FF	BED1	0	11	Pass
	FF	BED2	0.01	8.67	Pass
	FF	BED3	0.02	3.83	Pass
	GF	KITCHENDINING	0.23	N/A	Pass
	GF	LOUNGE	0.45	N/A	Pass
Crawford - Semi-detached					
26	FF	BED1	0.02	7.67	Pass
	FF	BED2	0	2.5	Pass
	GF	KITCHENDINING	0	N/A	Pass
	GF	LOUNGE	0	N/A	Pass
Crawford - Mid-terrace					
27	FF	BED1	0	5.67	Pass
	FF	BED2	0	1.33	Pass
	GF	KITCHENDINING	0	N/A	Pass
	GF	LOUNGE	0	N/A	Pass
Harper - Semi-detached					
34	FF	BED1	0	2.67	Pass
	FF	BED2	0	8.83	Pass
	FF	BED3	0	11.67	Pass
	GF	KITCHENXDINING	0.4	N/A	Pass
	GF	LOUNGE	0	N/A	Pass
44	FF	BED1	0	1.17	Pass
	FF	BED2	0	4.5	Pass
	FF	BED3	0	6	Pass
	GF	KITCHENXDINING	0.17	N/A	Pass
	GF	LOUNGE	0	N/A	Pass
60	FF	BED1	0	3.83	Pass
	FF	BED2	0	1.17	Pass
	FF	BED3	0	1.5	Pass
	GF	KITCHENXDINING	0	N/A	Pass
	GF	LOUNGE	0	N/A	Pass
64	FF	BED1	0	7.67	Pass

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	FF	BED2	0	5.83	Pass
	FF	BED3	0	7.17	Pass
	GF	KITCHENXDINING	0	N/A	Pass
	GF	LOUNGE	0.27	N/A	Pass
Harper - Mid-terrace					
30	FF	BED1	0	5.33	Pass
	FF	BED2	0	9	Pass
	FF	BED3	0	9	Pass
	GF	KITCHENXDINING	0.58	N/A	Pass
	GF	LOUNGE	0	N/A	Pass
43	FF	BED1	0	2.33	Pass
	FF	BED2	0	7.83	Pass
	FF	BED3	0	8.17	Pass
	GF	KITCHENXDINING	0.32	N/A	Pass
	GF	LOUNGE	0	N/A	Pass
Kimpton - Detached					
59	FF	BED1	0	14.5	Pass
	FF	BED2	0.06	15	Pass
	FF	BED3	0	6.67	Pass
	FF	BED4	0	7	Pass
	GF	KTCHNXLVNGXDNNG	0.31	N/A	Pass
	GF	LOUNGE	0.49	N/A	Pass
82	FF	BED1	0	9.5	Pass
	FF	BED2	0	14.17	Pass
	FF	BED3	0.01	17.83	Pass
	FF	BED4	0	10	Pass
	GF	KTCHNXLVNGXDNNG	0.6	N/A	Pass
	GF	LOUNGE	0.27	N/A	Pass
Langton - Semi-detached					
12	FF	BED2	0	5.17	Pass
	FF	BED3	0	2	Pass
	GF	KITCHENXDINING	0	N/A	Pass
	GF	LOUNGE	0	N/A	Pass
	SF	BED1	0	7.33	Pass
74	FF	BED2	0	2.17	Pass
	FF	BED3	0.05	3.67	Pass
	GF	KITCHENXDINING	0	N/A	Pass
	GF	LOUNGE	0.24	N/A	Pass
	SF	BED1	0	12.17	Pass
Latchford - Semi-detached					
25	FF	BED1	0	2.33	Pass
	FF	BED2	0	6.83	Pass

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	GF	KITCHENDINING	0.13	N/A	Pass
	GF	LOUNGE	0.24	N/A	Pass
41	FF	BED1	0	2.33	Pass
	FF	BED2	0	6.33	Pass
	GF	KITCHENDINING	0.24	N/A	Pass
	GF	LOUNGE	0.19	N/A	Pass
Latchford - Mid-terrace					
40	FF	BED1	0	1.83	Pass
	FF	BED2	0	5.5	Pass
	GF	KITCHENDINING	0.17	N/A	Pass
	GF	LOUNGE	0.16	N/A	Pass
Lever - Semi-detached					
1	FF	BED1	0	10.67	Pass
	FF	BED2	0.12	4.17	Pass
	FF	BED3	0	3.67	Pass
	GF	KITCHENDINING	0.82	N/A	Pass
	GF	LOUNGE	0.9	N/A	Pass
11	FF	BED1	0	7.67	Pass
	FF	BED2	0	3.33	Pass
	FF	BED3	0	3.17	Pass
	GF	KITCHENDINING	1.1	N/A	Pass
	GF	LOUNGE	0.06	N/A	Pass
61	FF	BED1	0	6.83	Pass
	FF	BED2	0.07	5.17	Pass
	FF	BED3	0.01	6.67	Pass
	GF	KITCHENDINING	0.44	N/A	Pass
	GF	LOUNGE	0.51	N/A	Pass
65	FF	BED1	0	4	Pass
	FF	BED2	0.06	3.67	Pass
	FF	BED3	0.05	5.67	Pass
	GF	KITCHENDINING	0.12	N/A	Pass
	GF	LOUNGE	0.58	N/A	Pass
77	FF	BED1	0	9	Pass
	FF	BED2	0.08	3.67	Pass
	FF	BED3	0	3.33	Pass
	GF	KITCHENDINING	0.8	N/A	Pass
	GF	LOUNGE	0.69	N/A	Pass
Worthington - Detached					
9	FF	BED1	0	7.5	Pass
	FF	BED2	0.1	14.5	Pass
	FF	BED3	0.1	11.67	Pass
	FF	BED4	0	7.83	Pass

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	GF	KITCHENDINING	0.91	N/A	Pass
	GF	LOUNGE	0	N/A	Pass
62	FF	BED1	0.09	14	Pass
	FF	BED2	0	12.17	Pass
	FF	BED3	0	9.33	Pass
	FF	BED4	0.09	14	Pass
	GF	KITCHENDINING	0	N/A	Pass
	GF	LOUNGE	0.14	N/A	Pass
86	FF	BED1	0	4.67	Pass
	FF	BED2	0	9	Pass
	FF	BED3	0	7.83	Pass
	FF	BED4	0	4.67	Pass
	GF	KITCHENDINING	0.03	N/A	Pass
	GF	LOUNGE	0	N/A	Pass
100	FF	BED1	0	8.5	Pass
	FF	BED2	0	6.17	Pass
	FF	BED3	0	5.83	Pass
	FF	BED4	0	7.33	Pass
	GF	KITCHENDINING	0.23	N/A	Pass
	GF	LOUNGE	0	N/A	Pass
Worthington AW - Detached					
92	FF	BED1	0	8.33	Pass
	FF	BED2	0	5.67	Pass
	FF	BED3	0	5.67	Pass
	FF	BED4	0	6.83	Pass
	GF	KITCHENDINING	0.24	N/A	Pass
	GF	LOUNGE	0.32	N/A	Pass

Conclusion

From the base specification, all House Types achieved compliance under both criterions; therefore, they require no mitigation.

Throughout this report, the term Semi-detached has also been used to refer to End-terrace plots

Disclaimer

The data used in this report has been provided by the developer, it has been used in good faith and is assumed to be correct at the time of writing. Different weather conditions and altered usage of the building will produce different results. Alterations to the assumptions listed in this report could result in a different set of results, therefore, the conclusion that the building will not overheat may no longer hold true.

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Part O Compliance Check list

2b.1 Modelling details	
Dynamic software name and version	DesignBuilder – Version 7.2.0.032
Weather file location used, including any additional, more extreme weather files	Manchester_DSY1_2020High50_
Number of sample units modelled, including an explanation of why the size/selection has been chosen	30 Units – A sample chosen to reflect the L12021 House Types
2b.2 Modelled occupancy	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?(1)	Yes
Details of the occupancy profiles used	TM59. See Appendix 4 for more details
Details of the equipment profiles used	TM59. See Appendix 4 for more details
Details of the opening profiles used	ADO opening protocols
2b.3 Modelled overheating mitigation strategy	
Free areas	Calculated using the Future Homes Hub Part O Simplified Method Spreadsheet tool
Infiltration and mechanical flow rates	Infiltration rate - 5.0 $m^3/(h.m^2)$ @ 50 Pa DMEV – Vent Axia Lo-Carbon NBR DMEV C
Window g-value	0.41
Shading strategy	Shading from nearby dwellings
Mechanical cooling	N/A
2b.4 Modelling results	
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?	Yes
What is the overall overheating strategy (i.e. what design features are key to the project passing)?	Open windows in warm weather.
2b.5 Designer's declaration	
Has the building construction proposal been modelled accurately?	Yes
Designer's name	Will Howarth
Designer's organisation	Energy & Design Ltd
Designer's signature	[redacted]
Registration number (if applicable)	Elmhurst Energy Approved Overheating Competency Scheme Member Y778-0001
Date of design	03/11/2025

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Appendix 1

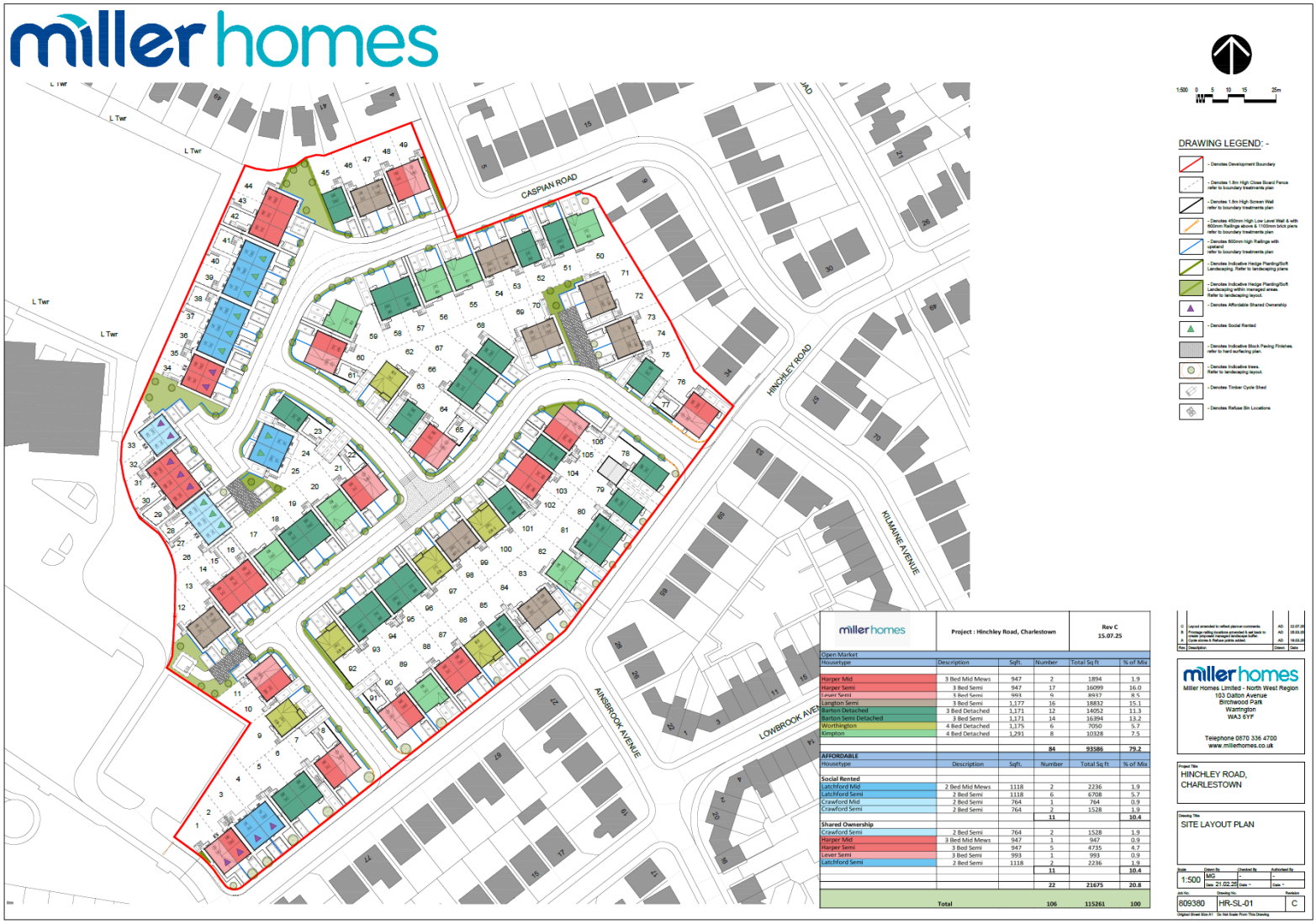


Figure 1: Site Layout Plan - Rev C

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Appendix 2

Thursday, 21 September 2023

Rev A

Energy Specification (L1a 2021)

Miller L12021 only not Scotland

- Ground floor – 125mm 0.022 PIR insulation
- Semi exposed Upper floor – 0.11 U value 200mm loft roll 40 between joists (or similar 0.040w/mk) with 93mm thermaline PIR (or similar) and another layer of 12.5mm gyproc Fireline
- Exposed Concrete Floor – 0.22 U value 100mm Total Kooltherm K7(0.020 w/mk) between timber battens
- External cavity walls - 0.21 u value = 125mm fully filled cavity with Knauf supafill 34 (or similar 0.034 w/mk) with 100mm aircrete block (0.15 w/mk)
- Garage solid wall – 0.28 u value = 100mm aircrete block (0.15 w/mk) with 63mm thermaline PIR
- Garage solid brick wall – 0.30 u value = 215mm brick with 63mm thermaline PIR
- Garage cavity wall - 0.18 U Value = 100mm aircrete block (0.15 w/mk) 125mm fully filled cavity with Knauf supafill 34 (or similar 0.034 w/mk) with 100mm aircrete block (0.15 w/mk)
- Party Walls – 0.0 U Value = fully filled with sealed edges
- Studded Knee Wall – 0.15 U Value – 90mm Knauf Frame therm 32 (or similar 0.032 w/mk) between Joists, underlined with 93mm Thermaline PIR
- Dormer wall and cheeks – 0.19 U value - 90mm Knauf Frame therm 32 (or similar 0.032 w/mk) between timber underlined with 63mm thermaline PIR
- Roof Main - 0.07 U value = Knauf loft roll 44 (or similar 0.044 w/mk) 600mm total - 100mm between joists and 500mm cross laid over
- Roof (Dormers, Bays & RITR eaves area) - 0.16 U value = Knauf loft roll 44 (or similar 0.044 w/mk) 270mm total - 100mm between joists and 170mm cross laid over
- Sloping Roof – 0.13 U Value – 140mm Knauf Frame Therm 32 (or similar 0.032 w/mk) between rafters, underlined with 93mm Thermaline PIR
- Windows / French Doors–1.3 U value, 0.41 G Factor from BFRC Certificate
- Roof Light – 1.3 U value 0.72G, 0.7 frame factor
- Entrance Doors – 1.5 U value
- Rear Doors – 1.5 U value
- Garage Doors – 1.4 U value
- Boilers & heating controls – **as per heating design**
- Bulbs - 9W & 806 Lumens
- Shower - Flow rate 8 from combi
- Design air permeability 4.5 (all plots tested)
- no secondary fire or flue
- DMEV – 500340 Vent axia Flexible duct/500776 in SAP 10
- Thermal Linear bridging details – As Per PSI Details Schedule
- Technologies - PV or WWHRS & FGHRS

Figure 2: Energy Specification

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Appendix 3

6.0 SUMMARY

6.1 A noise impact assessment has been undertaken for the proposed residential development at Hinchley Road, Charlestown.

6.2 The impact of noise from an adjacent sports pitch and from road traffic on the surrounding network has been assessed for the proposed residential development at Hinchley Road, Charlestown.

6.3 The results of the noise surveys have indicated that road traffic noise levels on the site are low and no specific noise mitigation measures are warranted.

6.4 An ADO assessment has indicated that windows can be modelled as open as part of the strategy to mitigate overheating in bedrooms.

6.5 Given the proximity of the sports pitch to the proposed dwellings, an appropriate scheme of noise mitigation measures (i.e. an acoustic fence) has been recommended to adequately protect the amenity of the new residents and also safeguard the use of the sports pitch.

6.6 The implementation of an adequate scheme of noise mitigation measures can be ensured by the use of appropriately worded planning conditions.

Figure 3: Hepworth Acoustics "Noise Impact Assessment" (03/09/2025)

Appendix 4

Table 2 Occupancy and equipment gain descriptions

Unit/ room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double bed)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only; see section 3.1 above

Figure 4: TM59 Occupancy and equipment gain descriptions

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Figure 1 Heat gain profile

Number of people	Description	Peak load (W) Sensible	Peak load (W) Latent	Period 00–01	01–02	02–03	03–04	04–05	05–06	06–07	07–08	08–09	09–10	10–11	11–12	12–13	13–14	14–15	15–16	16–17	17–18	18–19	19–20	20–21	21–22	22–23	23–24
	Hour ending			1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
1	Single bedroom occupancy	75	55	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7
2	Double bedroom occupancy	150	110	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.7
2	Studio occupancy	150	110	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7
1	1-bedroom living/kitchen occupancy	75	55	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
1	1-bedroom living occupancy	75	55	0	0	0	0	0	0	0	0	0	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0	0
1	1-bedroom kitchen occupancy	75	55	0	0	0	0	0	0	0	0	0	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0	0
2	2-bedroom living/kitchen occupancy	150	110	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
2	2-bedroom living occupancy	150	110	0	0	0	0	0	0	0	0	0	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0	0
2	2-bedroom kitchen occupancy	150	110	0	0	0	0	0	0	0	0	0	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0	0
3	3-bedroom living/kitchen occupancy	225	165	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
3	3-bedroom living occupancy	225	165	0	0	0	0	0	0	0	0	0	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0	0
3	3-bedroom kitchen occupancy	225	165	0	0	0	0	0	0	0	0	0	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0	0
	Single bedroom equipment	80		0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.13
	Double bedroom equipment	80		0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.13
	Studio equipment	450		0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	1	1	0.44	0.44	0.24	0.24
	Living/kitchen equipment	450		0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	1	1	0.44	0.44	0.24	0.24
	Living equipment	150		0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1	1	1	1	0.4	0.4
	Kitchen equipment	300		0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	1	1	0.17	0.17	0.17	0.17
	Lighting profile	2 (W/m2)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0

Figure 5: TM59 Schedules and Heat Gain Profiles

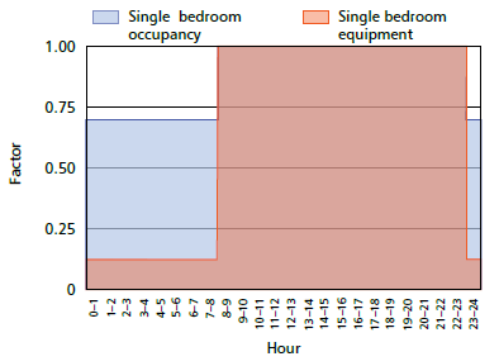


Figure 6: TM59 Single Bedroom

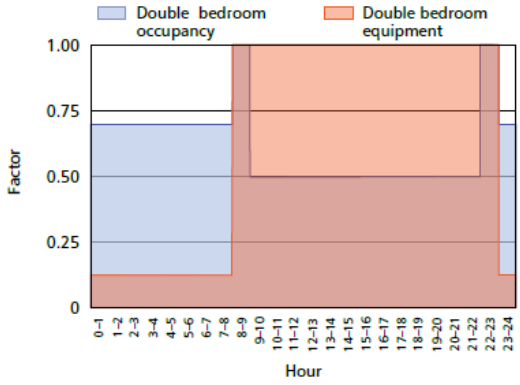


Figure 7: TM59 Bedroom Occupancy

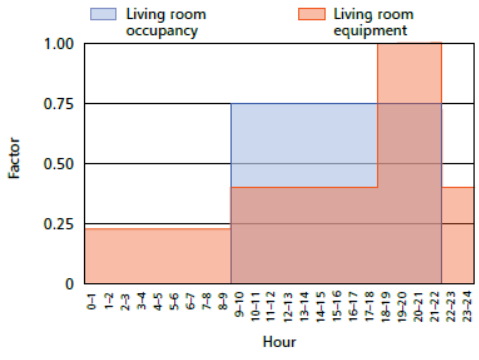


Figure 8: TM59 Living Room Occupancy

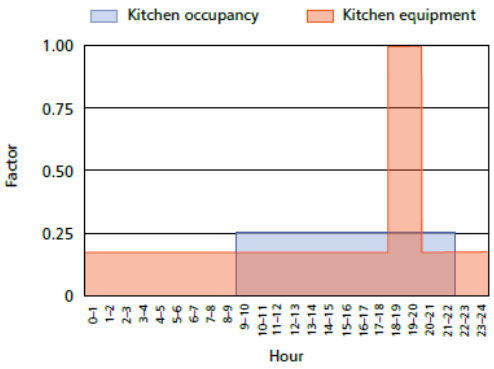


Figure 9: TM59 Kitchen Occupancy

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Figure 10: TM59 Living Room/Kitchen Occupancy

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Appendix 5

ONLINE VERSION O1(2)(a)

Protection from falling

3.8 Openings which are intended to be open for long periods to reduce overheating risk might pose a higher risk of falls from height. Only the proportion of openings which can be opened with a very low risk of occupants falling from height should be considered to form part of the overheating mitigation strategy.

3.9 Openings that can be opened wider than 100mm may form part of the overheating mitigation strategy where they meet all of the following conditions.

a. Window handles on windows that open outwards are not more than 650mm from the inside face of the wall when the window is at its maximum openable angle.

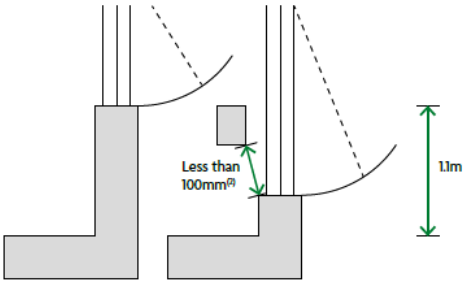
b. Guarding meets the minimum standards in Table 3.1.

c. Guarding does not allow children to easily climb it. For example, horizontal bars should generally be avoided.

NOTE: To ensure safe operation it may be necessary to reduce the size of the outward opening windows and provide more windows to meet the required free area.

Table 3.1 Guarding heights

Change in floor level between inside and outside	Guarding height[1]
Less than 600mm	See Approved Document K
More than 600mm	1.1m



NOTES:

1. This approved document has increased levels of protection from falling compared to Approved Document K. Where applicable, the higher standard applies.
2. Guarding should be sized to prevent the passage of a 100mm sphere.

3.10 Guarding for large openings could include, but is not limited to, either of the following.

a. Shutters with a child-proof lock.

b. Fixed guarding.

ONLINE VERSION

Figure 11: Noise Constraints

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