Part O Dynamic Thermal Modelling Report

Assessment on: Penland Farm, Penlands Green, Haywards Heath, West Sussex

Client: Brixter Developments Ltd.

Assessed by: Adam Hicks

Date: 26-Nov-25

EES number: EES/027504

elmhurstenergy APPROVED OVERHEATING COMPETENCY SCHEME MEMBER

Executive Results Summary

The development has achieved compliance by utilizing the original glazing dimensions but by incorporating low g glazing on some rooms. Ventilation requirements are achieved by window openings to achieve the required air changes.

Disclaimer

The methodology (TM59) includes clear reporting requirements to enable all stakeholders to review the outcome and understand its basis and implications for the design. It is vital that the mitigation options selected as a result of the assessment are fully incorporated into the design or the assessment would not be an accurate representation of the completed building. In addition, this report has been prepared to cover overheating risk – it should be checked that the mitigations in this report do not implicate other building regulations.

You should check that the assessor producing this report is an Elmhurst Energy Overheating Scheme member to ensure that they are competent to complete this work. You can verify a member with their EES number on our website; https://www.elmhurstenergy.co.uk/find-an-assessor/

Introduction

Plot or Building information

Were there any noise issues?	*N/A*
Were there any pollution issues?	*N/A*
Were there any security issues during the 'sleeping hours'?	*N/A*
Is the property naturally or mechanically ventilated?	Naturally
Were there any communal areas assessed as part of this project?	*None*

About the project and property	The development is 4 detached houses based on the development site Penland Farm Development site, Penlands Green, Haywards Heath, West Sussex. This report covers the two polts as outlined in the image below. The heating provision is via an ASHP and has been designed as per the attached plans.

Plans (Full plans can be found in Appendix A)

Dynamic Thermal Modelling

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.

d. The overheating mitigation strategy is usable, as per the guidance in Section 3 of ADO.

Compliance Criteria for CIBSE TM59

A home can still be considered predominantly naturally ventilated where mechanical ventilation is provided for cooling at night.

4.2 Criteria for homes predominantly naturally ventilated

Compliance is based on passing *both* of the following two criteria:

(*a*) *For living rooms, kitchens and bedrooms*: the number of hours during which DT is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 percent of occupied hours. (CIBSE TM52 Criterion 1: *Hours of exceedance*).

(*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. (*Note*: 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26 °C will be recorded as a fail).

Criteria 2 and 3 of CIBSE TM52 may fail to be met, but both (*a*) and (*b*) above *must* be passed for all relevant rooms.

4.3 Criteria for homes predominantly mechanically ventilated

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)).

Approved Document O - Limits on CIBSE's TM59 modelling

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.

Mitigation measures utlised in the overheating strategy should be discussed and agreed with builder, building control and/or home warranty provider.

Modelling input

Model used (see appendix B)	
Modelled as predominately naturally or mechanically ventilated?	Naturally ventilated
Mechanical Ventilation?	*No*
Additional information	Limited application of Low g glass (top floor)
Full property specification can be found in Appendix C.	

2b.1 Modelling details	
Dynamic software name and version	Design Builder v2025.1.089
Weather file location used, including any additional, more extreme weather files	TM59 LONDON GATWICK DSY1 2020 High50 EPW

Number of sample units modelled, including an explanation of why the size/selection has been chosen	*All units modelled*	
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**	~~No~~
Details of the occupancy profiles used	TM59 LIVING/KITCHEN TM59 COMMON CIRCULATION AREAS TM59 SINGLE BEDROOM TM59 DOUBLE BEDROOM	
Details of the equipment profiles used	TM59 EQUIPMENT PROFILES	
Details of the opening profiles used	*ADO Paragraph* 2.6.	
2b.3 Modelled overheating mitigation strategy		
Free Areas		
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. If window limiters have been used to restrict openings to less than 100mm these would need to be agreed with the builder, building control and/or home warranty provider.		
Do all the rooms meet the above requirements? Full free area specification can be found in appendix C	Yes	
Window g-value	0.7/0.4	
Shading strategy (agreed with builder, building control and/or home warranty provider)	As per drawings	
Mechanical cooling	N/A	

Results

Plot 1

CIBSE TM59

Export CSV

Naturally ventilated | Mechanically ventilated | Corridors

Criteria for predominantly naturally ventilated homes

Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
P11STFLOOR	BED1	0.46	20.33	Pass
P11STFLOOR	BED2	0.64	24.00	Pass
P11STFLOOR	BED3	0.80	27.67	Pass
P12NDFLOOR	BED4	0.50	28.17	Pass
P12NDFLOOR	BED5	0.57	24.83	Pass
P1GROUNDFLOOR	KITCHEN	2.89	N/A	Pass
P1GROUNDFLOOR	LIVING	0.85	N/A	Pass

CIBSE TM59

Export CSV

Naturally ventilated | Mechanically ventilated | Corridors

Criteria for corridors

Block	Zone	% Hours Exceeded	Pass/Fail
P11STFLOOR	LANDING	0.47	Pass
P11STFLOOR	STORE	0.43	Pass
P12NDFLOOR	LANDING2	0.43	Pass
P12NDFLOOR	ROOFSTORAGE	0.65	Pass
P12NDFLOOR	ROOFSTORAGE1	0.54	Pass
P1GROUNDFLOOR	HALL	0.30	Pass
P1GROUNDFLOOR	STORE	0.14	Pass
P1GROUNDFLOOR	UTILITY	0.46	Pass

Plot 2

CIBSE TM59

Export CSV

Naturally ventilated | Mechanically ventilated | Corridors

Criteria for predominantly naturally ventilated homes

Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
P21STFLOOR	BED1	0.34	19.00	Pass
P21STFLOOR	BED2	0.47	20.33	Pass
P21STFLOOR	BED3	0.60	25.83	Pass
P22NDFLOOR	BED4	0.55	22.67	Pass
P22NDFLOOR	BED5	0.53	23.17	Pass
P2GROUNDFLOOR	KITCHEN	1.42	N/A	Pass
P2GROUNDFLOOR	LIVING	0.84	N/A	Pass

CIBSE TM59

Export CSV

Naturally ventilated | Mechanically ventilated | Corridors

Criteria for predominantly naturally ventilated homes

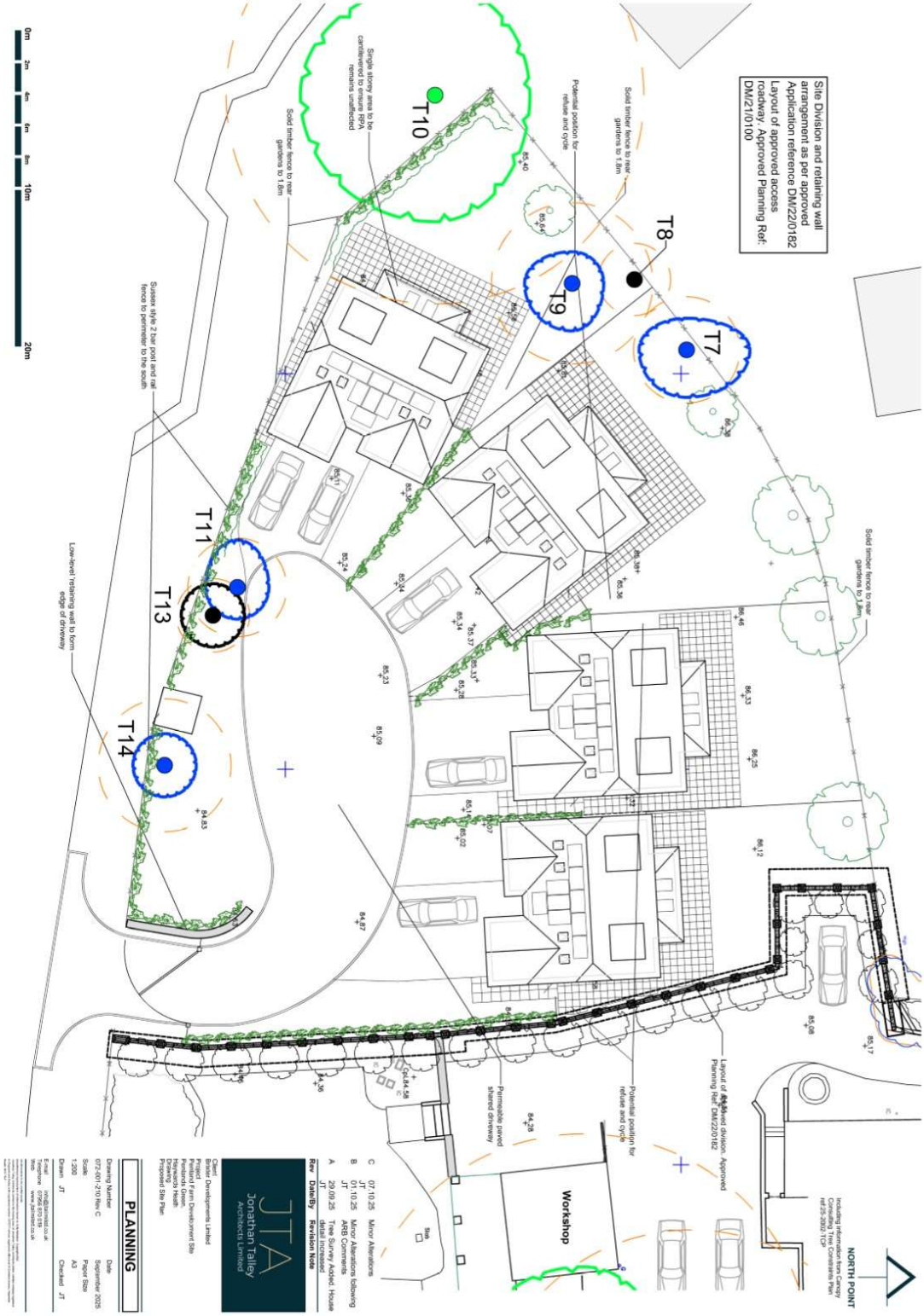
Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
P21STFLOOR	BED1	0.34	19.00	Pass
P21STFLOOR	BED2	0.47	20.33	Pass
P21STFLOOR	BED3	0.60	25.83	Pass
P22NDFLOOR	BED4	0.55	22.67	Pass
P22NDFLOOR	BED5	0.53	23.17	Pass
P2GROUNDFLOOR	KITCHEN	1.42	N/A	Pass
P2GROUNDFLOOR	LIVING	0.84	N/A	Pass

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 of ADO?	**Yes**	~~No~~
What is the overall overheating strategy (i.e. what design features are key to the project passing)?	As per drawings with limited low g to second floor only.	

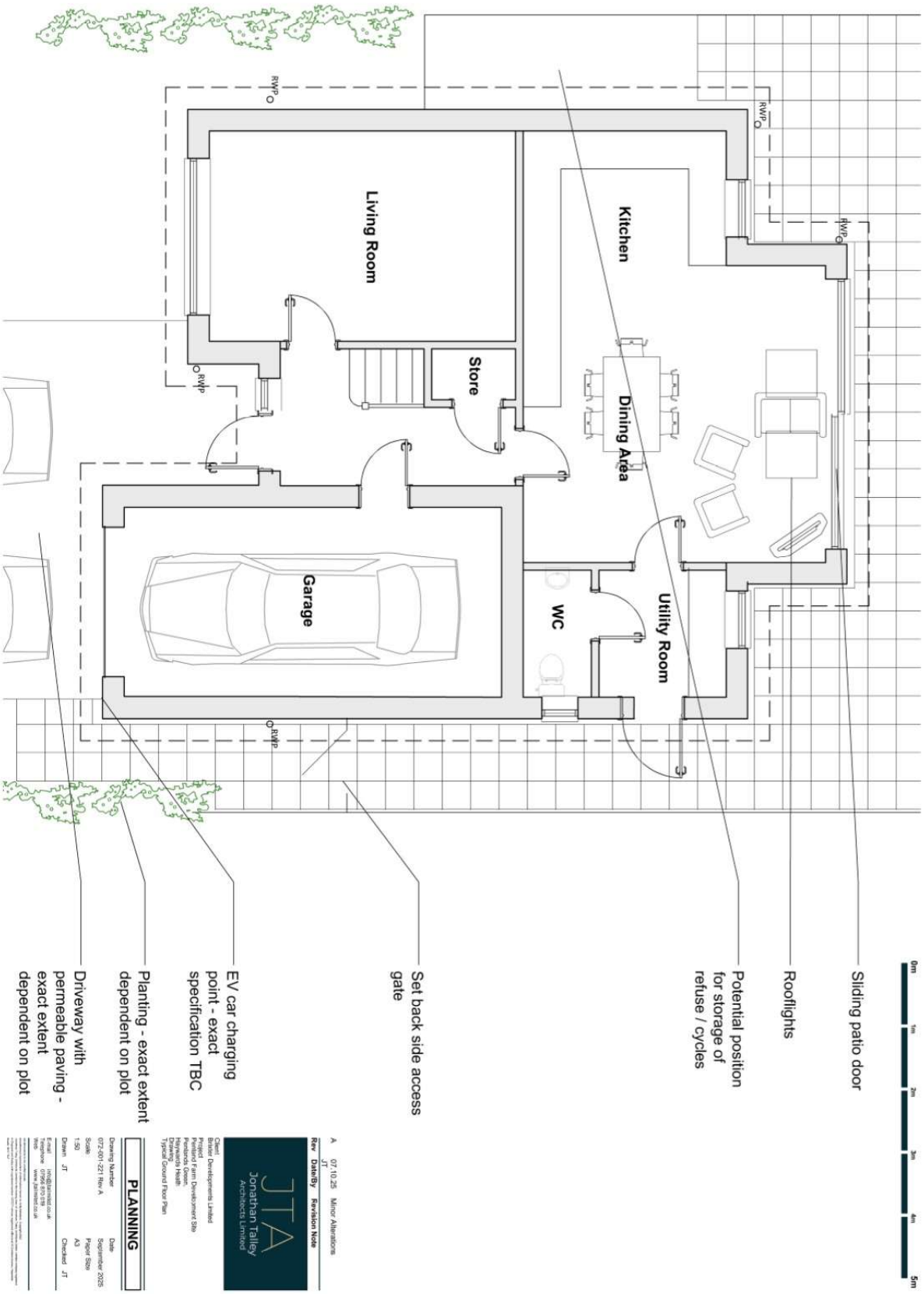
Overheating Assessor details and declaration

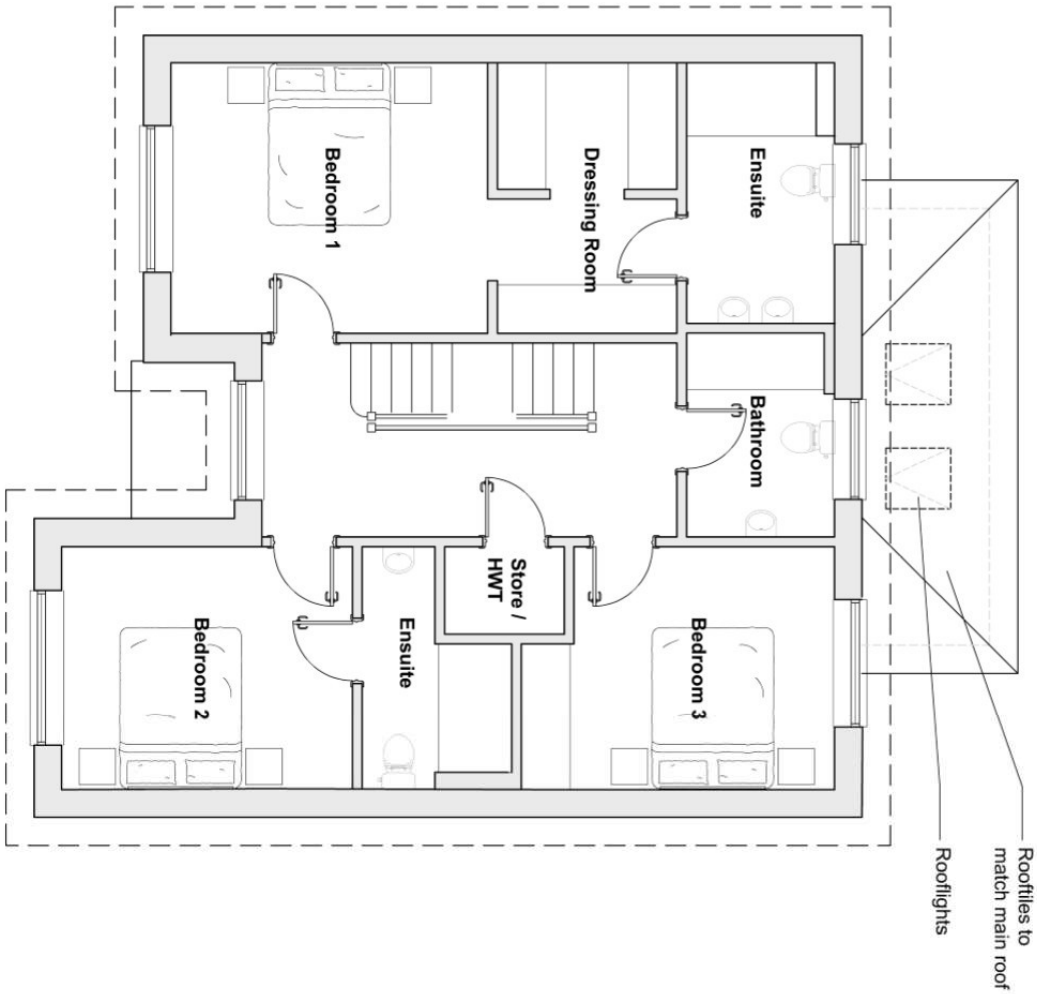
2b.5 Designer's declaration		
Has the building construction proposal been modelled accurately?	**Yes**	~~No~~
Name	Adam Hicks	
Organisation	Falcon Energy Ltd	
Signature		
Registration number (if applicable)	EES/027504	
Date of design	26-Nov-25	

Conclusions Appendix A – Full site plans and notes




JTA
Jonathan Talley
Architects Limited
Client
Builder
Project
Pentlands Green,
Hyssop Lane,
Pentlands Heath
Drawing
Typical Floor Plans
Drawing Number
072-001-220 Rev A
Scale
1:100
Drawn
JT
Date
Sept 2025
Paper Size
A2
Checked
JT
Email
Telephone
Web
PLANNING
Rev
Date
By
Revision Note
A
07.10.25
JT
Minor Alterations
Living Room
Kitchen
Dining Area
Store
Garage
WC
Utility Room
Front lawn area
Rooflights
Rear lawn area
Bedroom 1
Dressing Room
Ensuite
Bathroom
Bedroom 2
Ensuite
Bedroom 3
Roof Storage
Bedroom 4
Bathroom
Bedroom 5
Roof Storage
Rear hung dormer


Living Room
Kitchen
Store
Dining Area
Garage
WC
Utility Room
RWP
Sliding patio door
Rooflights
Potential position for storage of refuse / cycles
Set back side access gate
EV car charging point - exact specification TBC
Planting - exact extent dependent on plot
Driveway with permeable paving - exact extent dependent on plot
0m
1m
2m
3m
4m
5m
JTA
Jonathan Talley
Architects Limited
Rev Date/By Revision Note
A JT 07.10.25 Minor Alterations
Client
Bolster Developments Limited
Project
Proposed Farm Development Site
Pondlands Green,
Haywards Heath
Drawing
Typical Ground Floor Plan
PLANNING
Drawing Number
072-001-221 Rev A
Date
September 2025
Scale
1:50
Paper Size
A3
Drawn JT
Checked JT



A 07.10.25 Minor Alterations
Rev Date/By Revision Note

JTA
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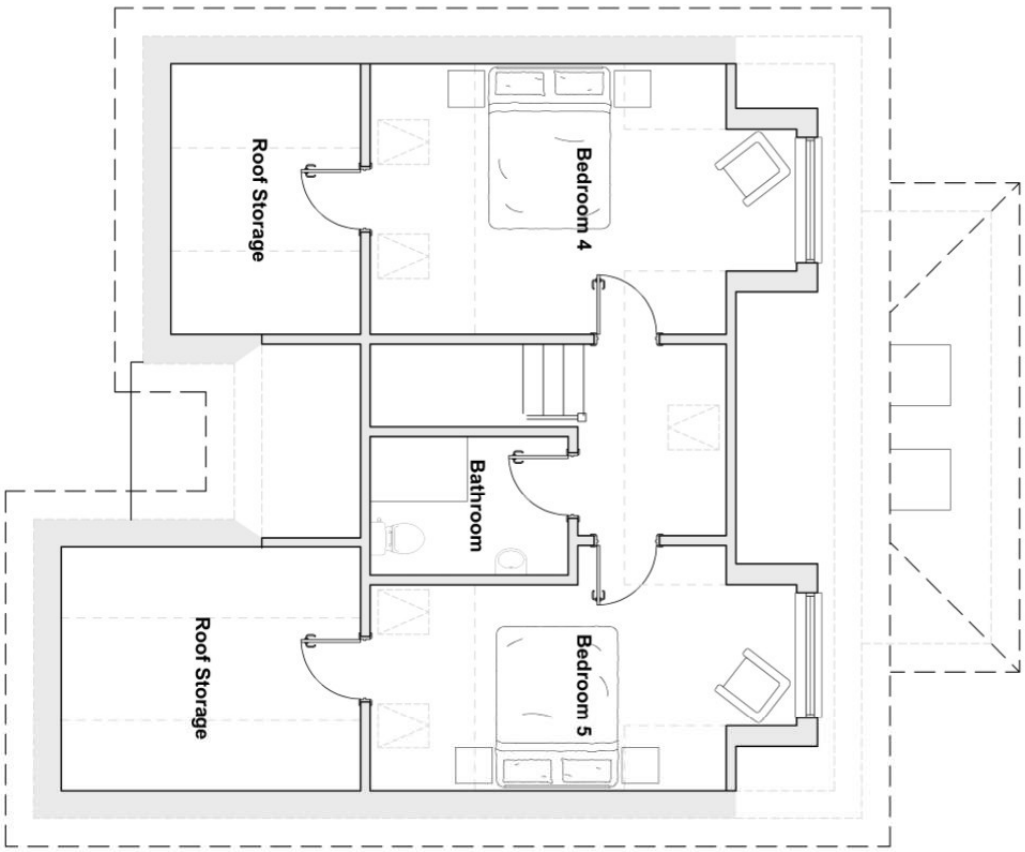
Client
Bolster Developments Limited
Project
Part of Farm Development Site
Portlands Green,
Haywards Heath
Drawing
Typical First Floor Plan

PLANNING

Drawing Number
072-401-222 Rev A
Scale
1:50
Drawn JT
Date
September 2025
Paper Size
A3
Checked JT

Email info@jtarchitects.co.uk
Telephone 07956 670 019
Web www.jtarchitects.co.uk



A 07.10.25 Minor Alterations
Rev Date/By Revision Note

JTA
Jonathan Talley
Architects Limited

Client
Brinster Developments Limited
Project
Land at Farm Development Site
Portlands Green,
Haywards Heath
Drawing
Typical Second Floor Plan

PLANNING

Drawing Number: 072-001-223 Rev A
Date: September 2025
Scale: 1:50
Paper Size: A3
Drawn: JT
Checked: JT

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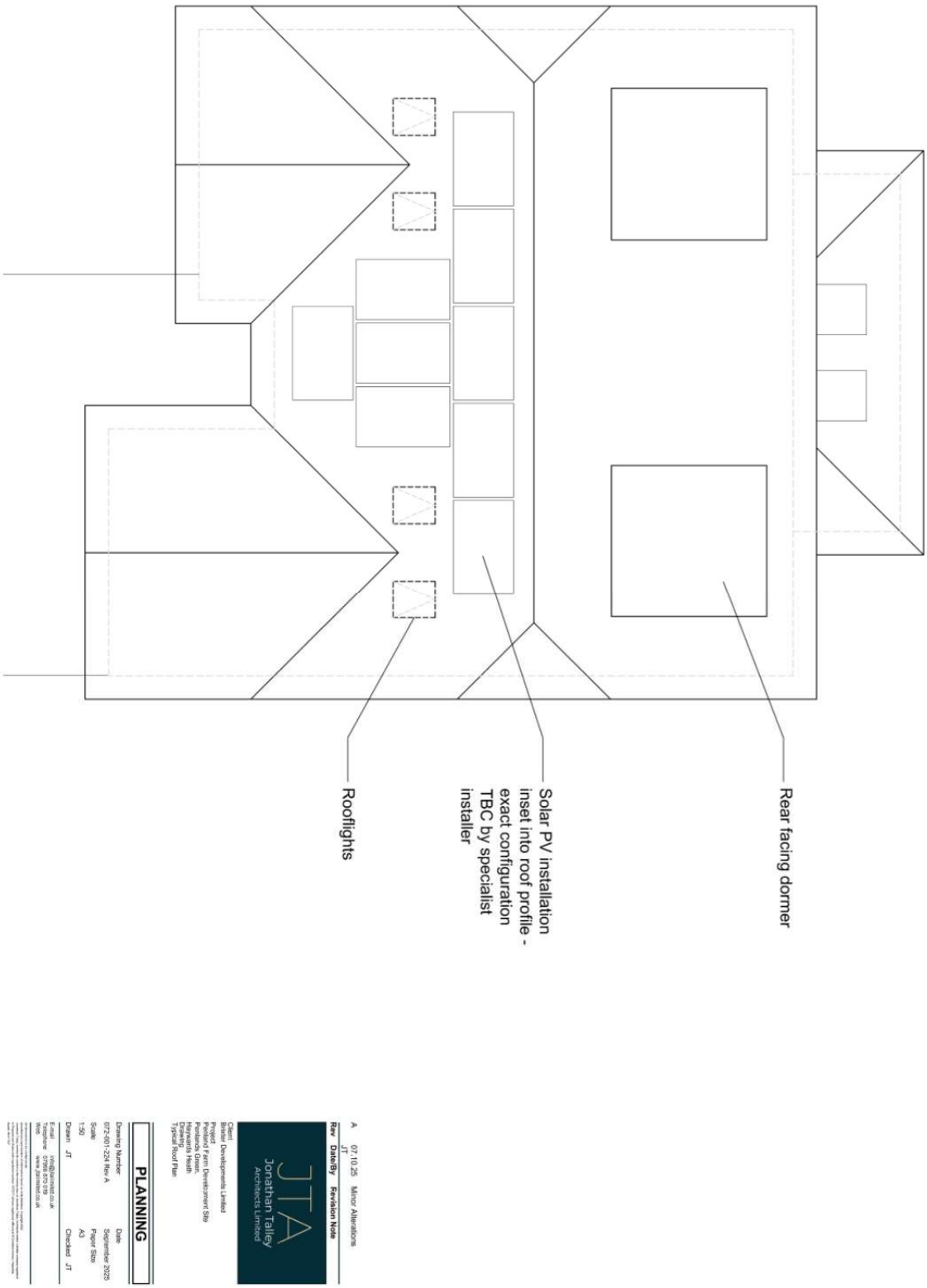
Telephone: 07986 870 019
Web: www.jtarchitects.co.uk


Rooflights
Solar PV installation inset into roof profile - exact configuration TBC by specialist installer
Rear facing dormer
0m
1m
2m
3m
4m
5m
JTA
Jonathan Talley
Architects Limited
Rev Date/By Revision Note
A JT 07.10.25 Minor Alterations
Client
Bolster Developments Limited
Project
Proposed Farm Development Site
Portlands Green,
Haywards Heath
Drawing
Typical Roof Plan
PLANNING
Drawing Number
07.Z-401-224 Rev A
Date
September 2025
Scale
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Paper Size
A3
Drawn JT
Checked JT
Email
Telephone 07966 670 019
Web www.jtarchitect.co.uk


0m
1m
2m
3m
4m
5m
10m
Side Elevation
Front Elevation
Side Elevation
Rear Elevation
Rev Date/By Revision Note
JTA
Jonathan Talley
Architects Limited
Client
Bristol Developments Limited
Project
Proposed Farm Development Site
Parklands Green,
Haywards Heath
Drawing
Proposed House Elevations
Option 1
PLANNING
Drawing Number
072-001-310
Date
September 2025
Scale
1:100
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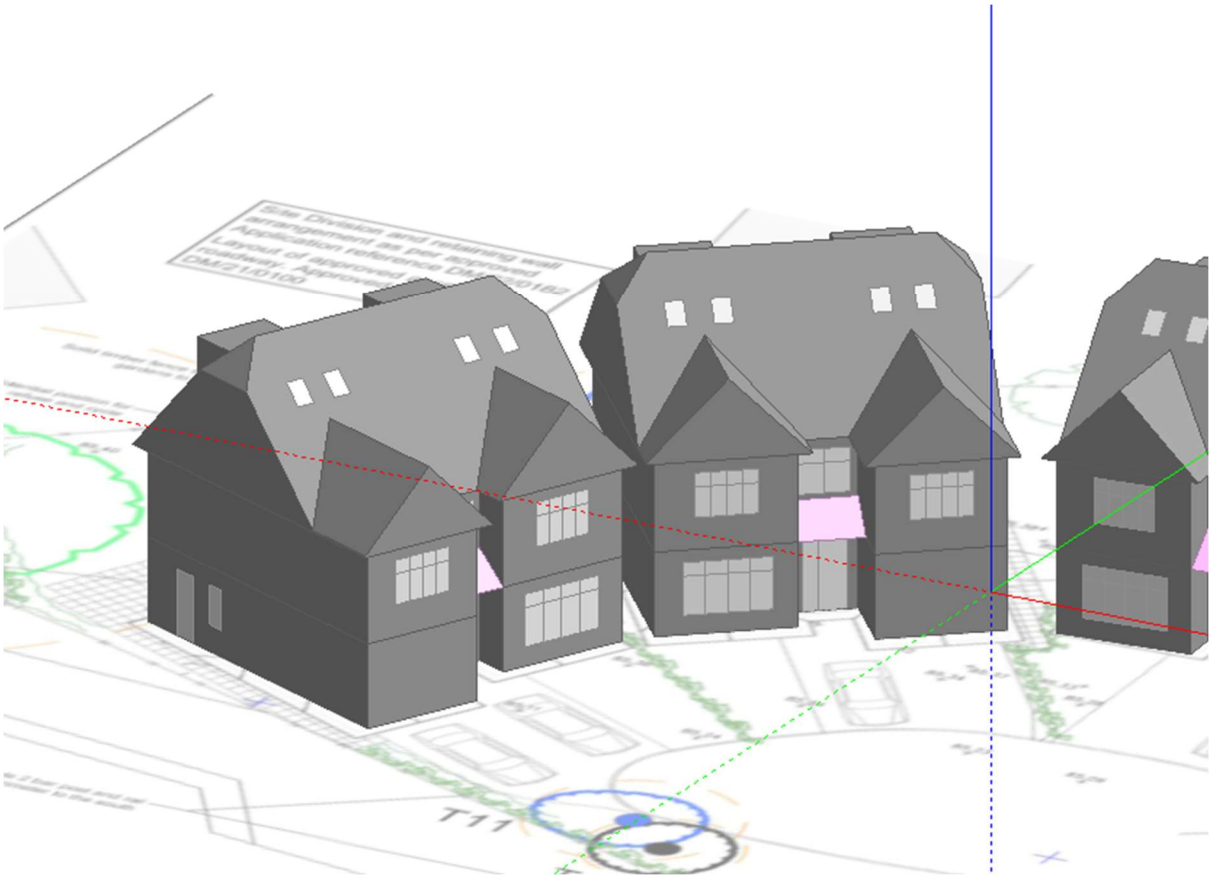
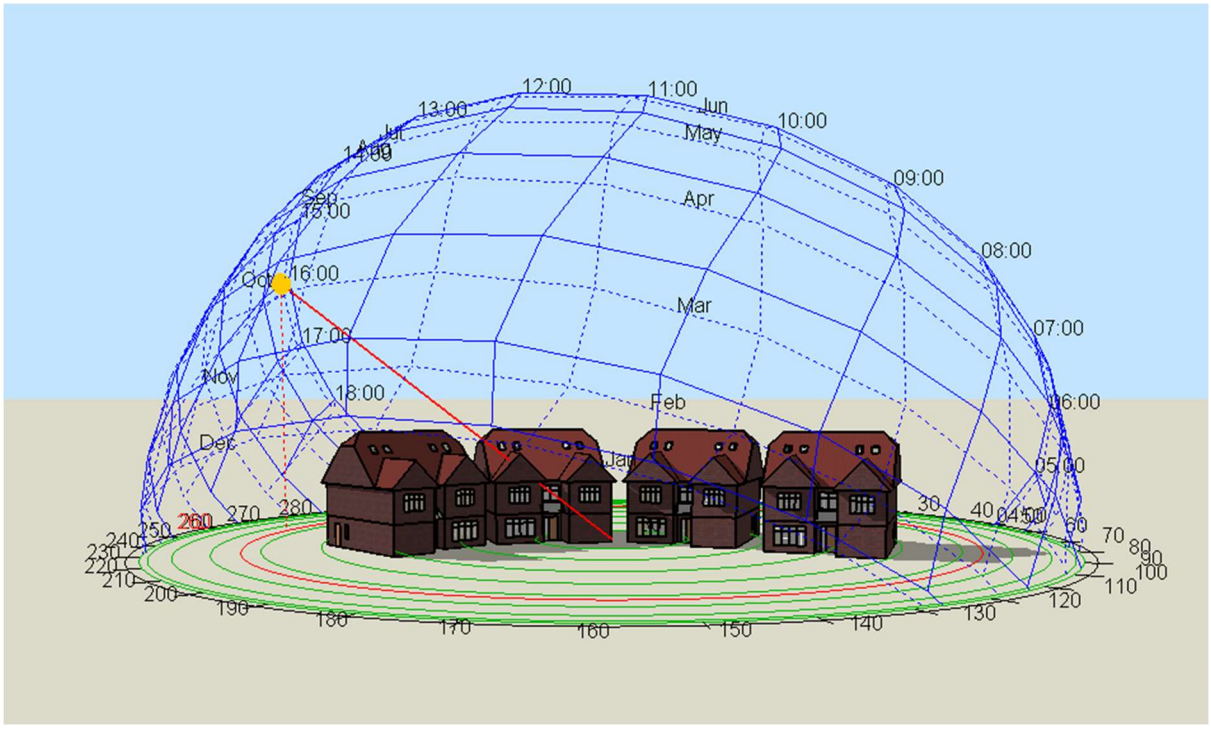
A3
Drawn JT
Checked JT
Email
Telephone 07956 870 019
Web
www.jtarchitect.co.uk

Appendix B – Modelling images

Plot 1 & 2





Appendix C – Full dwelling specification

Thermal build ups for the proposed development have been selected from building regulations Part L, Volume 1 Dwellings, notional values, which provides a specification of proposed build ups.

The thermal properties of the building fabric, as confirmed in the building regulations Part L, have been summarised in the table below:

Element	U-value	G-value
External walls	0.18	
Ground floor	0.13	
Roofs	0.11	
Doors	1.0	
Windows and Glazed doors	1.2	0.7/0.4

This development will use mostly traditional methods providing a medium/low thermal mass giving a more stable temperature environment and to enable the use of natural nighttime cooling to reduce energy consumption.

Window alterations

Low g glass (0.4) to all glazing in top floor velux windows and dormer windows as per image below in blue. All other glazing to remain as standard.