Plasmor
CONCRETE PRODUCTS

PART O - OVERHEATING (2021) Building Regulation
Dynamic Thermal Modelling Method Report

Assessment date: 05.03.2024
Assessor: Luke Butler
Project: Hill House, Colden Lane, Old Alresford, SO24 9DY

The above project complies with Part O Dynamic Thermal Modelling Method based on the information provided on drawings*

- 22388 100 G Existing and proposed site plan and setting out
- 22388 101 G Proposed house ground floor plan
- 22388 102 G Proposed house first floor plan
- 22388 103 G Proposed house second floor plan
- 22388 104 G Proposed house roof plan
- 22388 105 G Proposed house North and South elevations
- 22388 106 G Proposed house East and West elevations
- 22388 106a G Proposed house sections AA and BB

and the proposed fabric and heating specification for the development

**Any changes to the design of the dwelling will requirement a re-assessment for compliance to Part O – please contact the Technical Office on 01977 673221*

Summary of Overheating Mitigation Strategy

- Free areas – Sash windows with bottom section openable
- Window g-value of 0.63
- Bedroom windows open during the day and night as they are not easily accessible.
- Easily accessible windows to be closed at night.

East elevation

West elevation

North elevation

South elevation

Protection from falling

Approved Document O gives additional guidance on increased levels of protection from falling (when compared to Part K) for any opening that is included in the overheating strategy. Where the difference between the internal floor level and the outside floor level exceeds 600mm, guarding should be provided at a height of 1100mm (+/-100mm) and could include, but is not limited to, the following:-

- Shutters with a child proof lock
- Fixed internal guarding (minimum of 600mm above inside floor level if horizontal bars)
- Fixed external guarding

Internal guarding is the most suitable way to comply with Part O where window heights dictate that they are required.

Interaction with other Approved Documents

This document only demonstrates compliance with Part O Overheating (2021 edition). The following Approved Documents still need to be complied with; Part B, Part F, Part J, Part K, Part L, Part M and Part Q. Any overlap with these documents need to be addressed by the Principle Designer for the scheme

Key terms

Cross-ventilation The ability to ventilate using openings on opposite facades of a dwelling. Openings that are not opposite does not allow for cross-ventilation e.g. corner flat

Effective area The area through which air flows after the resistance of airflow has been taken into account

Equivalent area A measure of aerodynamic performance of an opening. It is the area of a sharp-edged circular orifice through which air would pass at the same volume flow rate, under an identical applied pressure difference, as through the opening under consideration

Floor area The area of the residential unit, measured to the internal face of the perimeter walls at each floor level

Floor area of the room The area of the room measured to the internal face of the perimeter walls. Where a room serves more than one activity e.g. open plan kitchen and living room, the area with the largest glazing area should be assessed and the room area calculated based on a room depth no greater than 4.5m from the glazed façade

Free area The geometric open area of ventilation opening. This area assumes a clear sharp-edged orifice that would have a coefficient of discharge of 0.62

Glazing area The area of transparent material, not including the window frame

Approved Document O report
Overheating risk in residential buildings
for
Hill House

Hill House

Building details

Project name: Hill House	Date: 05-03-2024 12:02:27
Location: New Alresford; ENG, GB	
Address: Hill House Colden Lane Old Alresford SO24 9DY	
Building use: Residential	
Are there any security, noise, or pollution issues: N/A	

Designer's details

Designer's name: Luke Butler
Designer's organisation: Plasmor Ltd
Designer's address: Plasmor Ltd | PO Box 44 | Womersley Road | Knottingley | West Yorkshire | WF11 0DN

Dynamic thermal model

Software: IESVE version 2023.1.0.0	
Weather file: Southampton_DSY1_2020High50_.epw	
Results file: Hill House1.aps	
Number of rooms analysed: 8	
TM59: summer elevated air speed: 0.1	
TM59: occupant category: Category II (normal)	
Overheating mitigation strategy: See Cover Sheet	
Has the building construction proposal been modelled accurately?	YES
Have the analysed rooms passed the assessment for Approved Doc O Dynamic Thermal Modelling Method (CIBSE TM 59)?	YES
Designer's signature:	

Summary

CIBSE TM59 overheating methodology for predominantly naturally ventilated rooms assesses against two criteria, (a) and (b) (for Category I occupancy criterion A, Tmax is reduced by 1K):

- Criterion (a) states that for living rooms, kitchens and bedrooms, the number of hours during which ΔT is greater than or equal to 1K from May to September (or November to March for southern hemisphere locations) shall not exceed 3% of occupied hours
- Criterion (b) states that the operative temperature of the bedrooms from 22:00-07:00 shall not exceed 26°C for more than 1% of annual hours (33 hours is therefore recorded as a fail). Approved document O applies limits to CIBSE TM59 section 3.3 (openings); these requirements are applied by appropriate assignment of MacroFlo types / scripted profiles in the model (see Modelled Openings Section).

CIBSE TM59 overheating methodology for predominantly mechanically ventilated rooms states the operative temperature of all rooms shall not exceed 26°C for more than 3% of annual occupied hours.

CIBSE TM59 also states that the inclusion of corridors in the overheating analysis is mandatory where community heating pipework runs through them. While there is no mandatory target for communal corridors, if an operative temperature of 28°C is exceeded for more than 3% of the total annual hours this should be identified as a significant risk.

Room name	Naturally ventilated Criterion a check	Naturally ventilated Criterion b check	Mechanically ventilated check	Corridor overheating risk check
Kitchen	Pass	N/A	-	-
Drawing Room	Pass	N/A	-	-
Bed 3	Pass	Pass	-	-
Bed 4	Pass	Pass	-	-
Bed 2	Pass	Pass	-	-
Bed 1	Pass	Pass	-	-
Guest Bedroom 2	Pass	Pass	-	-
Guest Bedroom	Pass	Pass	-	-

Naturally ventilated rooms – criterion (a)

Criterion (a) states that for living rooms, kitchens and bedrooms, the number of hours during which ΔT is greater than or equal to 1K from May to September (or November to March for southern hemisphere locations) shall not exceed 3% of occupied hours.

Room name	Occupied hours	No. hours ΔT ≥ 1°K	% Occupied hours ΔT ≥ 1°K	Criterion a check
Kitchen	1989	1	0.1	Pass
Drawing Room	1989	2	0.1	Pass
Bed 3	3672	0	0.0	Pass
Bed 4	3672	0	0.0	Pass
Bed 2	3672	0	0.0	Pass
Bed 1	3672	0	0.0	Pass
Guest Bedroom 2	3672	0	0.0	Pass
Guest Bedroom	3672	0	0.0	Pass

Naturally ventilated rooms – criterion (b)

Criterion (b) states that the operative temperature of the bedrooms from 22:00-07:00 shall not exceed 26°C for more than 1% of annual hours (33 hours is therefore recorded as a fail). Any rooms that are not bedrooms are therefore not assessed, hence the corresponding N/A values.

Room name	No. hours > 26°C 22:00-24:00	No. hours > 26°C 00:00-07:00	Total hours > 26°C	Criterion b check
Kitchen	N/A	N/A	N/A	N/A
Drawing Room	N/A	N/A	N/A	N/A
Bed 3	0	0	0	Pass
Bed 4	0	0	0	Pass
Bed 2	0	0	0	Pass
Bed 1	0	0	0	Pass
Guest Bedroom 2	0	0	0	Pass
Guest Bedroom	0	0	0	Pass

Mechanically ventilated rooms

CIBSE TM59 overheating methodology for predominantly mech. vent. rooms states the operative temperature of all rooms shall not exceed 26°C for more than 3% of annual occupied hours.

Room name	No. hours > 26°C	% Annual hours > 26°C	Mechanically ventilated check
No mech vent rooms	N/A	N/A	N/A

Communal corridors

CIBSE TM59 states that whilst there is no mandatory target for communal corridors, if an operative temperature of 28°C is exceeded for more than 3% of annual hours, then this should be identified as a significant risk within the TM59 overheating report.

Room name	No. hours > 28°C	% Annual hours > 28°C	Corridor overheating risk check
No corridors	N/A	N/A	N/A

Modelled details & overheating mitigation strategy

Approved document O: Providing Information & Appendix B requires information about the model and the overheating mitigation strategy. The following tables detail the modelling method and mitigation strategies applied to each analysed room. Where multiple active openings per space (windows & louvres) exist they are all listed. Occupancy, equipment and lighting profiles for occupied rooms comply with TM59 section 5.

Modelled occupancy

Room name	Floor area m²	Thermal template	Occupancy profile	Equipment profile	Lighting profile
Kitchen	81.48	TM59 - 3 Bedroom - Kitchen	Kitchen Occupancy	Kitchen Equipment	18-23h
Drawing Room	56.71	TM59 - 3 Bedroom - Living	Living Occupancy	Living Equipment	18-23h
Bed 3	12.16	TM59 - Double Bedroom	Double Bedroom Occupancy	Double Bedroom Equipment	18-23h
Bed 4	17.58	TM59 - Single Bedroom	Single Bedroom Occupancy	Single Bedroom Equipment	18-23h
Bed 2	17.98	TM59 - Double Bedroom	Double Bedroom Occupancy	Double Bedroom Equipment	18-23h
Bed 1	21.01	TM59 - Double Bedroom	Double Bedroom Occupancy	Double Bedroom Equipment	18-23h
Guest Bedroom 2	20.51	TM59 - Double Bedroom	Double Bedroom Occupancy	Double Bedroom Equipment	18-23h
Guest Bedroom	20.87	TM59 - Double Bedroom	Double Bedroom Occupancy	Double Bedroom Equipment	18-23h

Modelled openings

Room name	Window to wall ratio %	Window g-value (EN 410)	Opening gross area m²	Opening free area (avg) %	Opening free area / floor area ratio %	Opening profile(s)
Kitchen	33.23	0.6338, 0.6372, 0.6338, 0.6338	2.52, 2.52, 2.52, 2.52, 4.58, 9.2, 1.89, 1.89, 1.89, 1.89, 1.89, 1.89, 1.89, 1.89, 0.91, 0.99	0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 80.0, 80.0, 80.0, 80.0, 80.0, 80.0, 80.0, 80.0, 0.0, 80.0	15.82	ADO.Section_26a, ADO.AlwaysOff
Drawing Room	37.34	0.6338, 0.6338, 0.6338, 0.6338, 0.6338, 0.6338, 0.6338, 0.6338, 0.6338, 0.6338	2.23, 1.87, 3.1, 3.1, 1.87, 2.23, 1.18, 1.2, 0.88, 0.89, 1.18, 1.2, 0.87, 0.89	80.0, 80.0, 80.0, 0.0, 80.0, 80.0, 0.0, 80.0, 0.0, 80.0, 0.0, 0.0, 80.0, 80.0	21.84	ADO.AlwaysOff, ADO.Section_26a
Bed 3	15.29	0.6338, 0.6338	0.6, 0.62, 0.94, 0.94	0.0, 80.0, 0.0, 80.0	10.26	ADO.AlwaysOff, ADO.Section_26ab
Bed 4	20.94	0.6338, 0.6338	0.94, 0.94, 0.94, 0.94, 0.95, 0.95	0.0, 80.0, 80.0, 0.0, 0.0, 80.0	12.88	ADO.AlwaysOff, ADO.Section_26ab
Bed 2	27.52	0.6338	1.87, 1.87	80.0, 80.0	16.64	ADO.Section_26ab
Bed 1	17.5	0.6338, 0.6338	0.6, 0.62, 0.93, 0.94, 0.94, 0.93	0.0, 80.0, 0.0, 80.0, 80.0, 0.0	9.52	ADO.AlwaysOff, ADO.Section_26ab
Guest Bedroom 2	19.3	0.6338, 0.639, 0.6338	0.62, 1.04, 1.66	80.0, 80.0, 80.0	12.95	ADO.Section_26ab
Guest Bedroom	43.16	0.6338, 0.6338, 0.639	1.65, 0.62, 1.04	80.0, 80.0, 80.0	12.69	ADO.Section_26ab

Hill House

Modelled ventilation

Room name	Infiltration rate ACH	Mech vent flow rate ACH
Kitchen	0.15	0
Drawing Room	0.15	0
Bed 3	0.15	0
Bed 4	0.15	0
Bed 2	0.15	0
Bed 1	0.15	0
Guest Bedroom 2	0.15	0
Guest Bedroom	0.15	0