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WEST SOMPTING PHASE 2 – SOMPTING, WEST SUSSEX



AD O Overheating Assessment

December 2024

SEC/lj/ss/OH-3719/-



Southern Energy
Consultants
Energy & Sustainability Solutions

Building Regulations: Part O Compliance Report

WEST SOMPTING PHASE 2

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Executive Summary

This Overheating Report has been provided by Southern Energy Consultants Ltd (SEC) for Persimmon Homes Thames Valley (the Client) to present the results from the Dynamic Simulation Model (DSM) assessment conducted for various unit types at West Sompting Phase 2 (the Development). This assessment determines if the Development is at risk of overheating and if any mitigation measures are required to manage internal temperatures.

The DSM assessed all house types identified as exceeding the internal nighttime noise levels for AD O 2021 compliance within the Sound Advice Environmental Noise Impact Assessment (the Noise Report) reference SA-7134/Rev5 dated July 2024 provided by the Client. along with bespoke maisonettes, bespoke house types and Regional variations of standard house types to verify internal conditions, all other dwelling types are addressed via standard house type models to be provided by the Client under separate cover . Each room was assigned specific design parameters that account for expected heat gains from occupants and equipment, represented through a variation profile.

In accordance with Part O, security and safety considerations have been addressed as follows:

- Ground floor bedroom windows are kept closed at night to prevent intrusion; assessed bedrooms comply with ADO, minimizing the need for additional security measures (e.g., fixed or lockable grilles).
- Window sills must have a clearance of 1100mm from the floor to eliminate the need for guardrails and prevent falls.
- Handles of outward-opening windows must not extend beyond 650mm from the interior wall when fully opened to reduce fall risk.
- SEC have applied outward-opening side-hung casement windows on all floors in accordance with the Client provided drawings; The opening angle is restricted dependent on the casement width.

The simulation results show that all occupied rooms meet the relevant criteria set out in Part O of the Building Regulations and CIBSE TM59 guidance under the Southampton current (2020) weather file.

Upon incorporating the above parameters, the units pass the criteria of TM59 and achieve Part O compliance.

Introduction

This Overheating Report has been provided by SEC on behalf of the Client to determine the risk of overheating, if any, within the standard House Types as identified within the Noise Report & bespoke House & Maisonette Types located within the Development. Also, this report outlines compliance with Building Regulations Part O, relating to overheating risk for each assessed dwelling type under Southampton current (2020) weather file.

CIBSE Technical Memorandum TM59 (Design Methodology for the Assessment of Overheating Risk in Homes) has been applied to model the dwellings in accordance with the requirements set out in Section 2 of Approved Document O – Dynamic Thermal Modelling. This DSM approach adopts a design-led strategy for ensuring compliance with Part O, allowing specific design features of the assessed dwelling type to be factored into the calculation process.

The DSM has been undertaken using the IES VE 2024 software, utilising Persimmon Homes Group AD L 2021 Construction Specifications provided by the Client. The DSM models are fully compliant with CIBSE Applications Manual AM11 and are considered an accurate representation of the current design intentions of the unit types modelled.

Where any assumptions or approximations have been made when compiling this report, for example where details or specifications are unknown, or unclear, these will be clearly identified within the report.

Description of Development

The Development, West Sompting Phase 2, is located in Sompting, West Sussex, and comprises the construction of 91 no. new residential dwellings. Figure 1 opposite shows the layout of the Development.

FIGURE 1: THE DEVELOPMENT



Assessment Methodology

The DSM is used to identify the risk of overheating and has been undertaken in accordance with the guidance and design parameters specified within CIBSE TM59.

CIBSE Technical Memorandum TM59 – 'Design Methodology for the Assessment of Overheating Risk in Homes' has been applied to assess the risk of overheating in habitable rooms. The results are based on the output from the IES software and are to be taken as an indication of the expected internal conditions.

CIBSE TM59 is based on guidance from CIBSE TM52 (2013) and CIBSE Guide A (2015a) to provide a standardised approach to predicting overheating risk in both naturally and mechanically ventilated residential buildings. The development also needs to comply with Building Regulations Part O, which sets out standards for overheating in new residential buildings.

Methodology advice within CIBSE Guide A and CIBSE TM59 has been used for assumed internal heat gains and user profiles.

WEATHER FILES

CIBSE provide weather files based on the sites location which should be used for all relevant modelling. Files are available for a number of varying future scenarios based on estimated climate change predictions, and the temperature increases predicted as a result.

Simulations have been tested using CIBSE DSY (Design Summer Year) weather files. There are three types of DSY files, DSY1, DSY2 and DSY3, representing summers with various types of heat events as outlined below:

- DSY1: moderately warm summer
- DSY2: short, intense warm spell
- DSY3: long, intense warm spell

These types of weather files are available in three different time periods, which cover a

range of years and also represent different emissions scenarios:

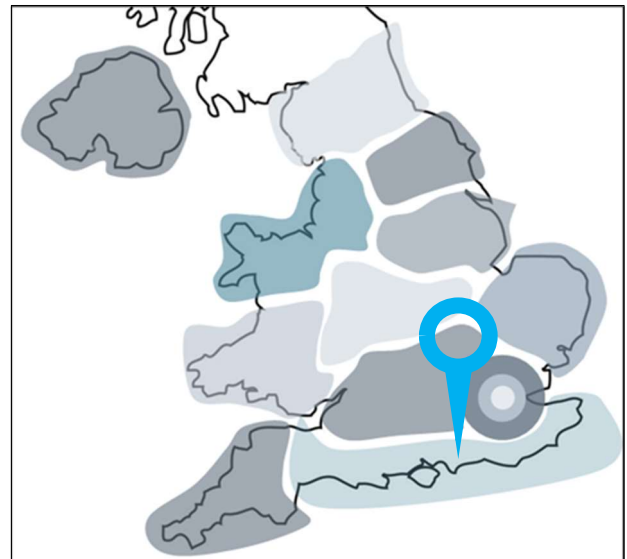
- 2020s: covers years 2011 – 2040 and represents high emissions
- 2050s: covers years 2041 – 2070 and represents medium and high emissions
- 2080s: covers years 2071 – 2100 and represents low, medium and high emissions

Different percentiles are also available for each weather file:

- 10th percentile: represents a mild or cooler summer
- 50th percentile: represents a medium or average summer
- 90th percentile: represents a hot or extreme summer

As outlined by CIBSE TM59, a DSY1 weather file best suited to the site location must be used and the Development is required to pass on this weather file. For this study, CIBSE DSY1 2020 weather data for **Southampton** has been used due to the locational climate of the Development.

FIGURE 2: INDICATIVE WEATHER FILE ZONES



No modelling for further future, more extreme weather files has been undertaken on the modelled dwellings at this time as this is not required as part of the assessment process to comply with Part O requirements.

OVERHEATING CRITERIA

This section outlines the assessment criteria used to determine the risk of overheating in the spaces modelled.

Given that comfort and overheating are highly subjective issues influenced by a multitude of factors—many of which can vary from individual to individual—guidelines must be utilized to assess the suitability of the predicted internal temperatures.

CIBSE provide 2 no. guides that serve as benchmarks for identifying internal temperature thresholds deemed uncomfortable. These guides underpin the framework of this report and the associated DSM efforts.

FIGURE 3: APPROVED DOCUMENT O



Building Regulations Part O addresses overheating from a regulatory standpoint, permitting calculations to be conducted in accordance with CIBSE TM59, albeit with minor adjustments to specific profiles within the dynamic model.

The specifics of each criterion are outlined opposite.

CIBSE TM59 (2017) – Design Methodology for the Assessment of Overheating Risk in Homes

CIBSE TM59 is based on guidance from CIBSE TM52 (2013) and CIBSE Guide A (2015a) to provide a standardised approach to predicting overheating risk in both naturally and mechanically ventilated residential buildings.

TM59 introduces two sets of compliance criteria for assessing overheating based upon the ventilation type of the dwelling.

Criteria for homes predominantly naturally ventilated:

- a. *For Living rooms, kitchens and bedrooms:* The number of hours during which ΔT (difference between actual operative temperature and limiting maximum acceptable temperature) is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3% of occupied hours (TM52 criterion 1).
- b. *For bedrooms only:* To guarantee comfort during the sleeping hours, the operative temperature in the bedroom from 10pm to 7am shall not exceed 26°C for more than 1% of annual hours. (Note: 1% of occupied hours between 22:00 and 07:00 for bedrooms is 32 hours.

The above two criteria must be met for all relevant rooms to comply with CIBSE TM59.

Criteria for homes predominantly mechanically ventilated:

- a. The CIBSE Guide A 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 hours.

The dwellings at the Development are naturally ventilated and therefore have been assessed against the relevant CIBSE TM59 criteria.

Building Regulations – Approved Document O

Approved Document O utilises "CIBSE TM59 – Design Methodology of Overheating Risk in Homes" as the basis for calculations to confirm compliance. However, additional criteria are applied to limit the choices available to the modeller when assessing the results and running the simulations. These are as follows:

- a. When a room is occupied during the day (8am-11pm), openings should be modelled to do 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, Approved Document O.
 - 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.

There are also limitations on the strategies which can be employed to limit overheating, which go beyond those that could potentially be used within a standard TM59 Assessment.

Solar gains in summer should be limited by any of the following means:

- a. Fixed shading devices, comprising any of the following:
 - i. Shutters.
 - ii. External blinds.
 - iii. Overhangs.
 - iv. Awnings.

b. Glazing design, involving any of the following solutions:

- i. Size.
- ii. Orientation.
- iii. g-value.
- iv. Depth of the window reveal.

c. Building design – for example, the placement of balconies.

d. Shading provided by adjacent permanent buildings, structures or landscaping.

Although internal blinds and curtains provide some reduction in solar gains, they should **not** be taken into account when considering whether requirement O1 has been met. Likewise, foliage, such as tree cover, can provide some reduction in solar gains. However, it should not be taken into account when considering whether requirement O1 has been met.

NOISE, SECURITY AND SAFETY CONSIDERATIONS

Noise

External noise issues can impact the overheating strategy of a dwelling, with the potential for disruption to sleep through excessive external noise when windows are open. Therefore, Building Regulations Part O provides guidance on the levels of noise deemed acceptable within bedrooms during the sleeping period. Should these be exceeded, bedrooms windows are required to be modelled with the windows closed at night, with other forms of ventilation being provided, where required.

With regards to noise issues relating to the opening of windows, Approved Document O (ADO) states the following:

In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- 40dB LAeq,T, averaged over 8 hours (between 11pm and 7am).
- 55dB LAFmax, more than 10 times a night (between 11pm and 7am).

Where in-situ noise measurements are used as evidence that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' Measurement of Sound Levels in Buildings with the overheating mitigation strategy in use.

The Client provided Noise Report was consulted to ensure that the identified noise affected plots were modelled in the ADO assessment. For facades where noise levels exceeded the limits outlined in Part O, windows were modelled as closed during the night (11pm-7am).

Security

Building Regulations Part O stipulates the following criteria for security:

When determining the free area available for ventilation during sleeping hours, only the proportion of openings that can be opened securely should be considered to provide useful ventilation. This particularly applies in the following locations, where openings may be vulnerable to intrusion by a casual or opportunistic burglar.

- Ground floor bedrooms
- Easily accessible bedrooms

- Open windows or doors can be made secure by using any of the following:

- Fixed or lockable louvred shutters
- Fixed or lockable window grilles or railings

As part of the DSM, security measures have been considered. For the maisonettes, ground floor bedroom windows have been modelled closed during the night time period to prevent intrusion. The results indicate that ground floor bedrooms do not overheat with this restriction in place, and therefore solutions such as shutters, grilles and railings will not be required for security purposes.

Safety

Concerns around safety are also required to be considered as part of the overheating strategy, with windows that pose a risk to safety not permitted to be used as part of the overheating mitigation strategy.

Building Regulations Part O also stipulates the following criteria for safety:

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.

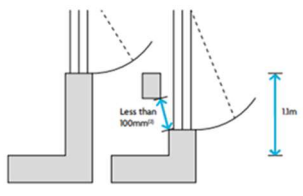
Openings that can be opened wider than 100mm may form part of the overheating mitigation strategy where they meet all of the following conditions.

- 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.
- Guarding meets the minimum standards in Table 3.1.
- Guarding does not allow children to easily climb it. For example, horizontal bars should generally be avoided.

Required guarding is outlined below:

FIGURE 4: PART O GUARDING REQUIREMENTS

Change in floor level between inside and outside	Guarding Height ⁽¹⁾
Less than 600mm	See Approved Document K
More than 600mm	1.1m



NOTES:

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

No guarding has been implemented within the Client drawings provided for the Development and it is the Client's responsibility to liaise with the appointed Building Control Body for advice on protection from falling at the Development.

To meet the security criteria of Building Regulations Part O, windows will be required to have guarding to reduce falling risk. Part O stipulates a minimum guarding height of 1100mm. Additionally, outward opening window handles must not exceed 650mm, from the inside face of the wall and once the window has reached the maximum opening angle, to reduce the risk of falling.

As part of the DSM, the window opening were modelled accordingly to comply with Part O regulations on outward opening windows where relevant.

Protection from entrapment

Regarding entrapment, Part O stipulates the following criteria for protection from entrapment:

Louvred shutters, window railings and ventilation grilles should not allow body parts to become trapped. They should comply with all of the following.

- a. Not allow the passage of a 100mm diameter sphere
- b. Any hole which allows the passage of an 8mm diameter rod should also allow the passage of a 23mm diameter rod. Such holes should not taper in a way that allows finger entrapment
- c. Any looped cords must be fitted with child safety devices

It should be noted that the above criteria must be met if louvred shutters, window railings and ventilation grilles are to be implemented for the Development. There has been no requirement to model any of the above items to return AD O compliance at the Development.

Dynamic Simulation Modelling

The DSM was conducted using IES-VE 2024, a fully dynamic analysis tool that complies with CIBSE Applications Manual AM11. A detailed 3D thermal model of the Development was generated, based on the architectural drawings and specifications provided by the Client, to accurately reflect the layout, orientation, window openings, and overall aspect of the dwellings.

The models have been divided into distinct zones according to their specific use, with relevant profiles and internal gains assigned to each area in line with the CIBSE criteria outlined in this report. This study focuses solely on the main occupied spaces, leaving out secondary areas like toilets, bathrooms, and cupboards, as they are typically occupied for less than 30 minutes and fall outside the scope of the assessment.

UNIT SAMPLING

Not all dwellings are required to be modelled under the requirements of TM59, and therefore Part O.

CIBSE TM59 provides guidance on how to select sample units as stated below.

The assessment should try to identify all the dwellings that are at risk of overheating. These are likely to be those:

- with large glazing areas
- on the topmost floor
- having less shading
- having large, sun-facing windows
- having a single aspect
- having limited opening windows

Using the above guidance, and with reference to the Noise Report, samples have been selected and highlighted within Figure 5.

On this basis, the following units have been selected as a fair representation of each across the Development.

TABLE 1: SCHEDULE OF MODELLED UNITS

Type	Plot Modelled	Other Applicable Plots
Maisonette 12-13	12-13	n/a
Maisonette 25-26	25-26	n/a
Maisonette 27-28	27-28	n/a
Maisonette 54-55	54-55	n/a
House A Mid-Terrace	68	31, 88
House A End-Terrace	48	1, 29, 30, 32, 34, 35, 42, 43, 44, 45, 46, 47, 49, 67, 69, 70, 71, 74, 75, 76, 77, 87
House C End-Terrace	7	5, 6, 8
Heartwood	11	n/a
Brampton	58	56, 57
Barndale	72	91
Sherwood	59	n/a
Wareham Mid-Terrace	22	n/a
Wareham End-Terrace	61	17, 18, 19, 20, 21, 23, 62, 65, 66
Dallington Mid-Terrace	15	n/a
Dallington End-Terrace	53	14, 16, 24, 50, 51, 52, 63, 64

Figure 5 identifies the plot selections made for the Development. The plots which suffer most from noise issues were prioritised for DSM, followed by the plots with the orientation most at risk of overheating.

FIGURE 5: MODELLED UNITS ON SITE PLAN



GENERIC INPUT CRITERIA AND PARAMETERS

This section outlines the design criteria applied within the DSM for bedrooms and kitchen/living areas. The load profiles and occupancy patterns draw from both the CIBSE TM59 methodology and CIBSE Guide A, ensuring a comprehensive approach. These criteria consider a range of variables, from heat gains to activity levels, creating a nuanced framework for assessing each room type under diverse conditions.

Occupancy Hours and Levels

People occupying a space generate heat which, in extreme cases, can contribute to

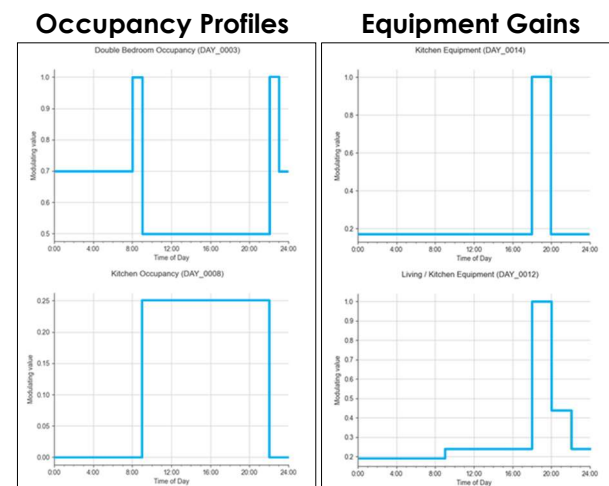
overheating. Therefore, the presence of people has to be accounted for within the DSM in accordance with TM59 Guidance. The level of occupancy is applied to the spaces via occupancy profiles, which determine the number of people assumed to be in any given space at any time, and their activity level are illustrated below.

The occupancy levels shown are as stipulated within CIBSE TM59 and for the purposes of this assessment, the occupancy heat gain profile per person is set to 75W sensible and 55W latent.

Additional Heat Gains

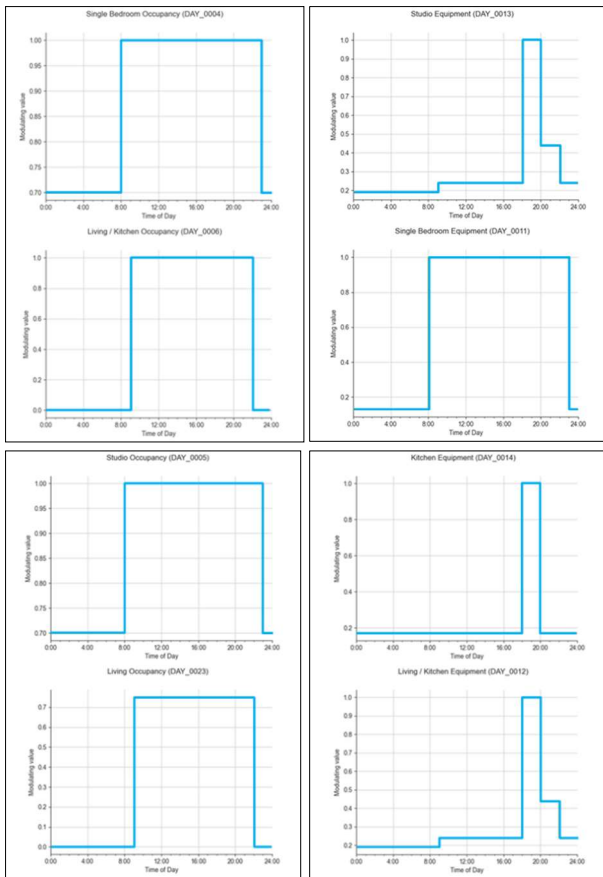
Additional heat gains from equipment used in any given space are also factored in, as they can contribute to overheating. Cooking, along with the use of electrical devices and lighting, generates heat gains that must be incorporated into the DSM process. These gains are specified by CIBSE TM59 guidance and are applied according to the intended use of each space, as detailed below.

FIGURE 6: ADDITIONAL HEAT GAIN PROFILES



Occupancy Profiles

Equipment Gains



SITE SPECIFIC INPUT CRITERIA

Mechanical Ventilation Proposals

The presence of mechanical extract ventilation in 'wet rooms' (such as bathrooms) can influence the rate at which heat is removed from adjacent habitable rooms (such as bedrooms). As a result, mechanical ventilation profiles have been assumed in the wet rooms within the IES model in line with Approved Document F requirements.

The flow rates detailed in the Table 2 are to act as allowances for ventilation to ensure proper air quality in line with Building Regulations Part F.

Opposite are the specific air flow rates that have been used in the TM59 profiles, which are part of the building model, for each type of room.

Room	Flow Rate (l/s)	System
All Rooms	0.25 ACH	Infiltration
Bathroom	8l/s	Decentralised, continuous mechanical extract
Kitchen	13l/s	
Utility	8l/s	

Building Fabric

Thermal mass is a material's ability to absorb, store and release thermal energy. This ability can assist in regulating internal conditions by absorbing heat when external temperatures rise and releasing heat when external temperatures fall. Thermal mass is incorporated into the building details such as walls, roofs and floors. The thermal mass of a detail is impacted by the following parameters:

- Thermal capacity
- Thermal conductivity
- Density
- Surface resistance
- Thickness

These parameters determine the detail's ability to absorb and release thermal energy.

Higher thermal mass results in more stable internal temperatures, which ultimately reduces the risk of overheating. Therefore, building fabric constructions must be modelled correctly to provide the most accurate simulation results.

Thermal build ups for the Development have been provided by the Client as part drawings and specifications issued to SEC, which details a specification of proposed build ups. Following dwelling type modelling, the thermal mass of the dwellings within the Development proved to be medium. The thermal properties of the building fabric have been summarised in Table 3 overleaf.

TABLE 2: AIR FLOW AND VENTILATION PROFILES

TABLE 3: BUILDING FABRIC THERMAL PROPERTIES

Detail	U-Value	G-Value
External Walls – Ground Floor 3 Storey Houses and Apartments	0.26 W/m ² K	-
External Walls – Ground Floor 2 Storey Houses and Bungalow	0.24 W/m ² K	-
External Walls – Upper Floor Walls Houses	0.23 W/m ² K	-
External Walls – Upper Floor Walls Apartments	0.24 W/m ² K	-
External Walls – Dormer Walls	0.26 W/m ² K	-
Ground Floor	0.12 W/m ² K	-
Slope Roof	0.16 W/m ² K	-
Plane Roof	0.09 W/m ² K	-
Solid Door	1.10 W/m ² K	-
Window and Glazed Door	1.30 W/m ² K	0.46
Rooflights	1.3 W/m ² K	0.63

All modelled houses were assumed to be cladding faced as this was the worst case facing for overheating.

Summary of window opening types

The type of window opening can drastically affect the overheating. Since no window opening details were provided for the dwellings at the Development, windows are assumed to be side hung with the exception of rooflights which were assigned as top hung. All window opening angles were designed in accordance with Part O safety restrictions. Most windows were modelled as openable. Full details about window opening types used for this site can be found in Appendix A.

OVERHEATING ANALYSIS CURRENT WEATHER FILE

In accordance with CIBSE TM59, the overheating assessment has been undertaken for the summer period only - 1st May to 30th September. The air speed is set at 0.1 m/s to generate operative temperature, and the thermal comfort category has been set to 'Category II' (new building) in the assessment.

Using the CIBSE 2020 Southampton DSY 1 weather data file to assess the parameters outlined in this report, all occupied rooms have been assessed for compliance with CIBSE TM59 criteria. The results from the DSM conclude that all rooms pass the CIBSE TM59 assessment. These results are summarised in Table 4 below:

TABLE 4: DSM ASSESSMENT RESULTS

Unit Type	Criteria A	Criteria B
Maisonette 12-13	Pass	Pass
Maisonette 25-26	Pass	Pass
Maisonette 27-28	Pass	Pass
Maisonette 54-55	Pass	Pass
House A Mid-Terrace	Pass	Pass
House A End-Terrace	Pass	Pass
House C End-Terrace	Pass	Pass
Heartwood	Pass	Pass
Brampton	Pass	Pass
Barndale	Pass	Pass
Sherwood	Pass	Pass
Wareham (End)	Pass	Pass
Wareham (Mid)	Pass	Pass
Dallington (End)	Pass	Pass
Dallington (Mid)	Pass	Pass

Conclusion

The DSM assessed 11 Nr. sample house type plots and 4 Nr. blocks of Maisonettes to validate internal conditions based on the current **Southampton Design Summer Year** weather file. Each room was assigned a specific set of design parameters that account for anticipated heat gains from occupants and equipment, represented through a variation profile.

It has been confirmed that design measures have been incorporated to minimise the risk of overheating within the overall building design. These measures are through a combination of mechanical extract ventilation in kitchens, bathrooms and utility rooms and openable windows where possible to facilitate optimal natural airflow.

To comply with Part O, security and safety considerations have been mentioned. Ground floor bedroom external doors and windows have been closed at night, due to how easily accessible they are and the risk of intrusion. In addition, window sills must have a clearance of 1100mm from floor level to mitigate guarding measures and prevent from falling. Additionally, the handles of outward-opening windows must not extend beyond 650mm from the interior face of the wall when the window is fully opened, in order to minimize the risk of falling. All windows are assumed to be outward opening and the opening angles appropriately restricted in accordance with modelling requirements of AD O 2021.

Simulation results demonstrate that all occupied rooms meet the relevant criteria established in Part O and CIBSE TM59 guidance under current weather conditions, categorizing the risk of overheating as generally low. As a result, summertime overheating in all modelled dwellings is expected to be minimal, ensuring that occupants feel comfortable during the summer months.

Appendix A: Summary of DSM Models

MAISONETTE PLOTS 12-13

FIGURE 7: THERMAL TEMPLATE MAISONETTE 12-13

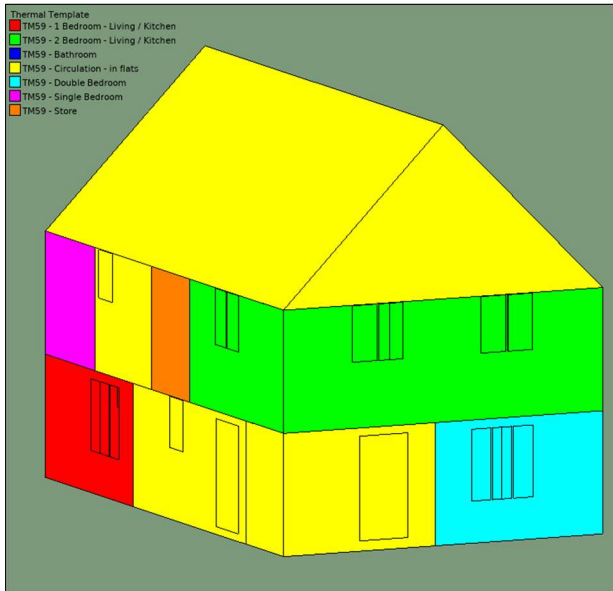


FIGURE 8: OPENING TYPES MAISONETTE 12-13

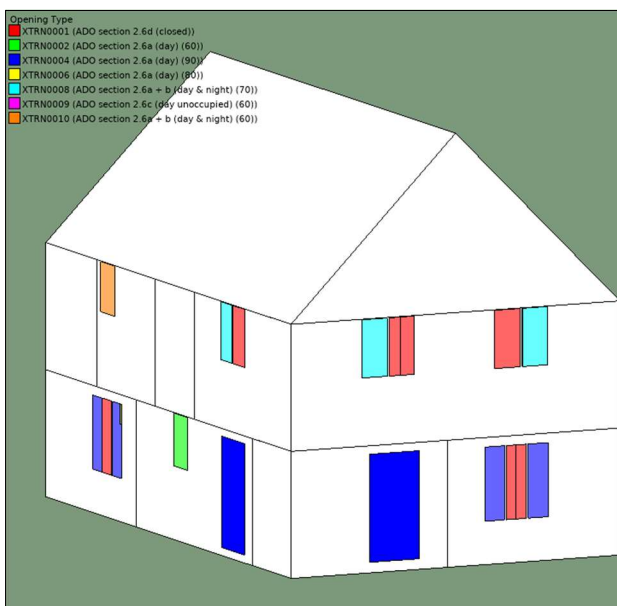


TABLE 5: ADO ASSESSMENT RESULTS MAISONETTE 12-13

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Ground Floor Flat Kitchen/Living/Dining	0.0	n/a	Pass
Ground Floor Flat Bedroom 1	0.0	5	Pass
First Floor Flat Kitchen/Living/Dining	0.0	n/a	Pass
First Floor Flat Bedroom 1	0.0	0	Pass
First Floor Flat Bedroom 2	0.0	0	Pass

MAISONETTE PLOTS 25-26

FIGURE 9: THERMAL TEMPLATE MAISONETTE 25-26

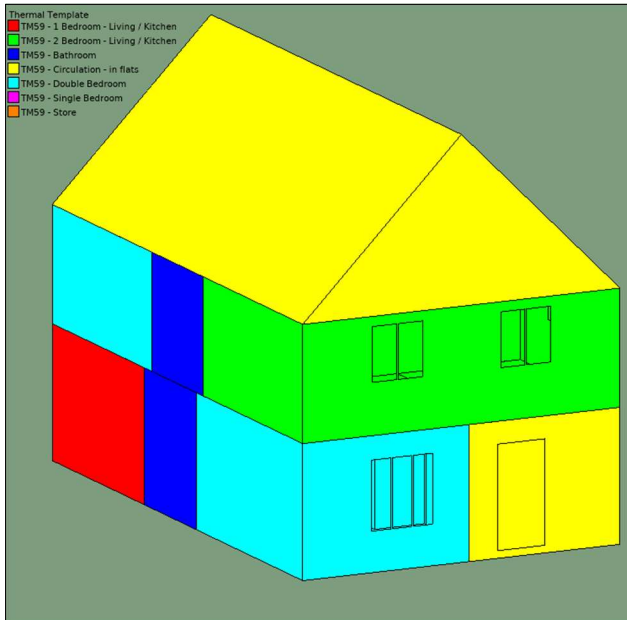


FIGURE 10: OPENING TYPES MAISONETTE 25-26

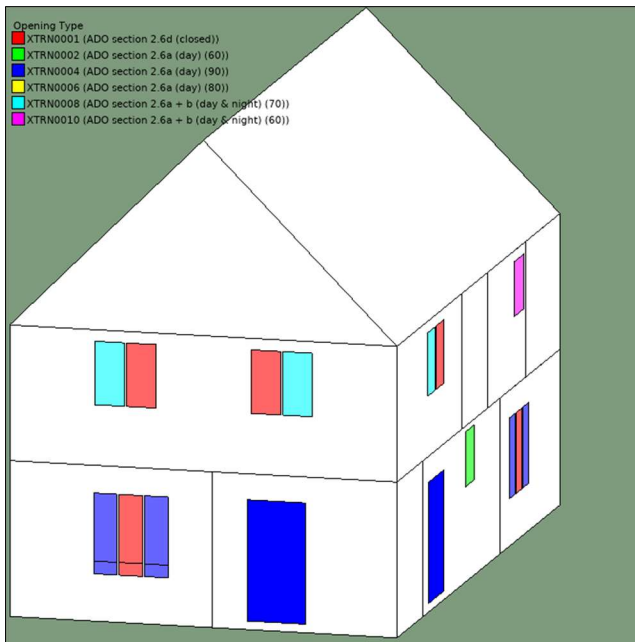


TABLE 6: ADO ASSESSMENT RESULTS MAISONETTE 25-26

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Ground Floor Flat Kitchen/Living/Dining	0.0	n/a	Pass
Ground Floor Flat Bedroom 1	0.0	0	Pass
First Floor Flat Kitchen/Living/Dining	0.0	n/a	Pass
First Floor Flat Bedroom 1	0.0	0	Pass
First Floor Flat Bedroom 2	0.0	0	Pass

MAISONETTE PLOTS 27-28

FIGURE 11: THERMAL TEMPLATE MAISONETTE 27-28

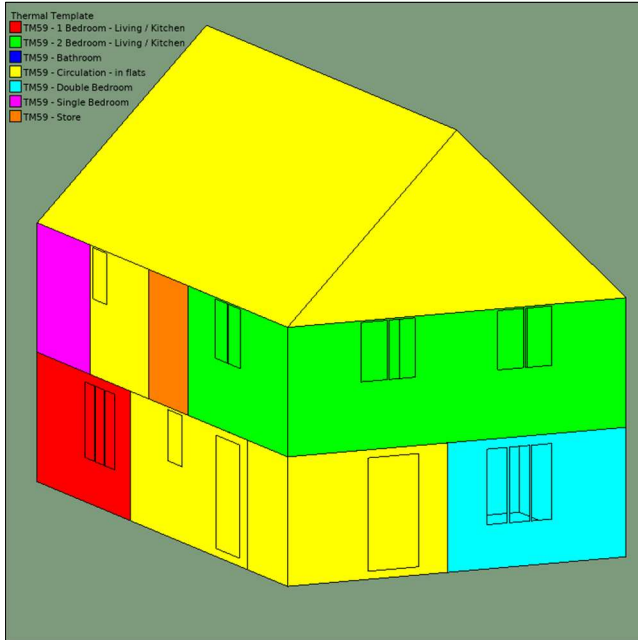


FIGURE 12: OPENING TYPES MAISONETTE 27-28

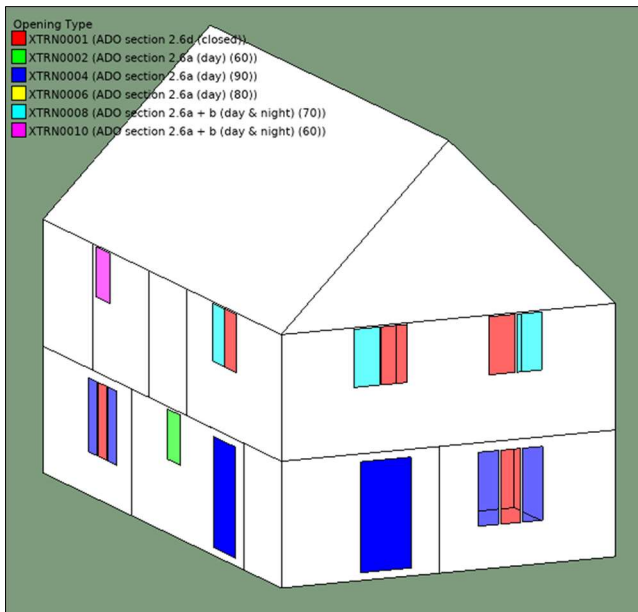


TABLE 7: ADO ASSESSMENT RESULTS MAISONETTE 27-28

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Ground Floor Flat Kitchen/Living/Dining	0.0	n/a	Pass
Ground Floor Flat Bedroom 1	0.0	6	Pass
First Floor Flat Kitchen/Living/Dining	0.0	n/a	Pass
First Floor Flat Bedroom 1	0.0	0	Pass
First Floor Flat Bedroom 2	0.0	0	Pass

MAISONETTE PLOTS 54-55

FIGURE 13: THERMAL TEMPLATE MAISONETTE 54-55

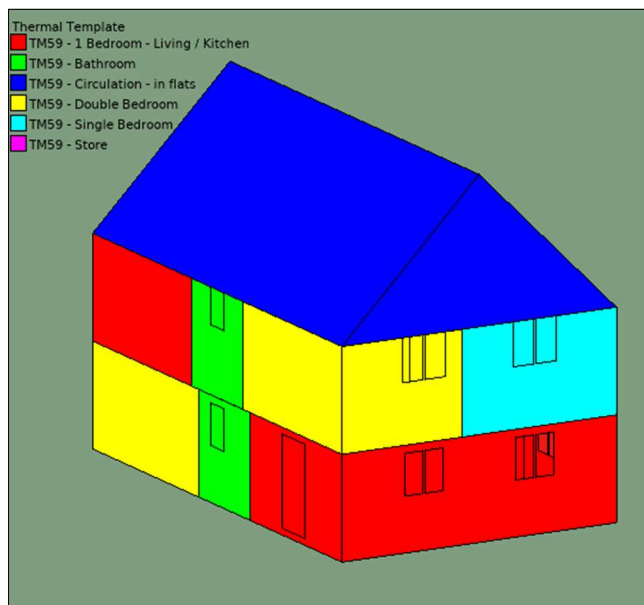


FIGURE 14: OPENING TYPES MAISONETTE 54-55

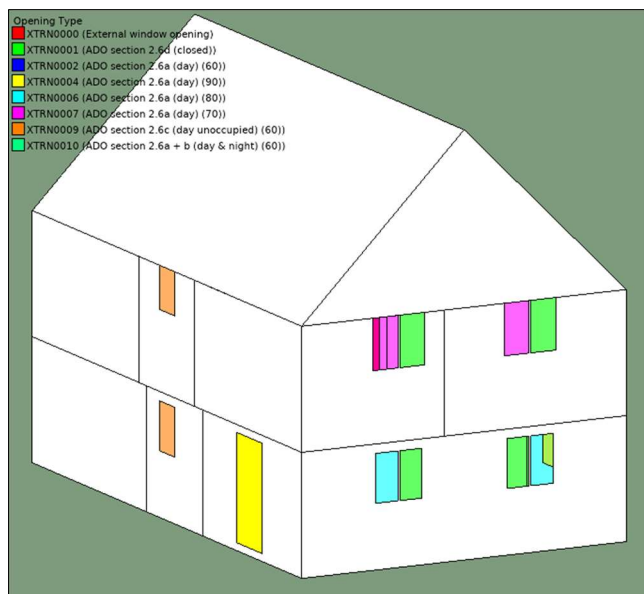


TABLE 8: ADO ASSESSMENT RESULTS MAISONETTE 54-55

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Ground Floor Flat Kitchen/Living/Dining	0.0	n/a	Pass
Ground Floor Flat Bedroom 1	0.0	16	Pass
First Floor Flat Kitchen/Living/Dining	0.0	n/a	Pass
First Floor Flat Bedroom 1	0.0	32	Pass
First Floor Flat Bedroom 2	0.0	17	Pass

HOUSE A END-TERRACE PLOT 48

FIGURE 15: THERMAL TEMPLATES HOUSE A END-TERRACE

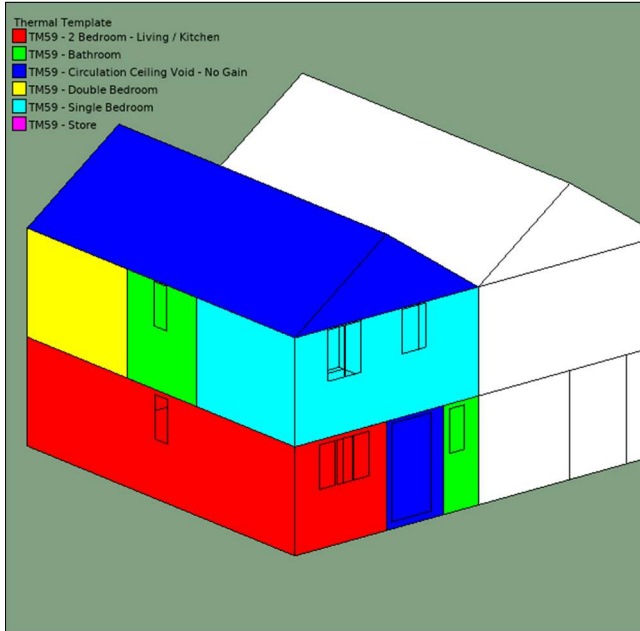


FIGURE 16: OPENING TYPES HOUSE A END-TERRACE

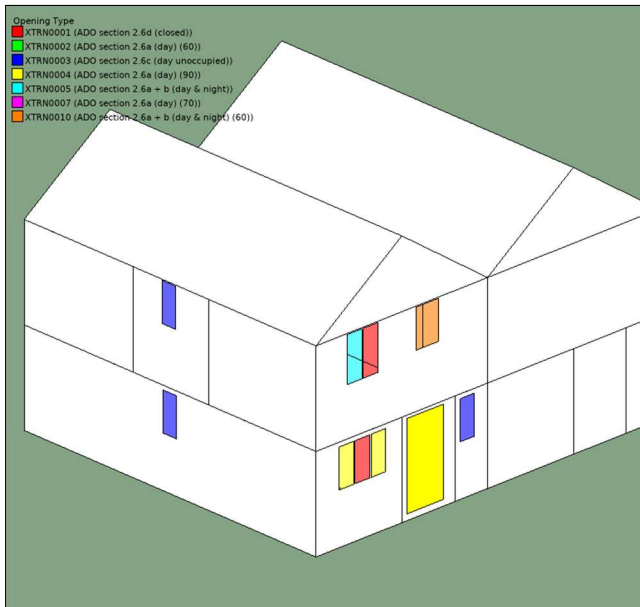


TABLE 9: ADO ASSESSMENT RESULTS HOUSE A END-TERRACE

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Kitchen/Living/Dining	0.0	n/a	Pass
Bedroom 1	0.0	29	Pass
Bedroom 2	0.0	0	Pass

HOUSE A MID-TERRACE PLOT 68

FIGURE 17: THERMAL TEMPLATES HOUSE A MID-TERRACE

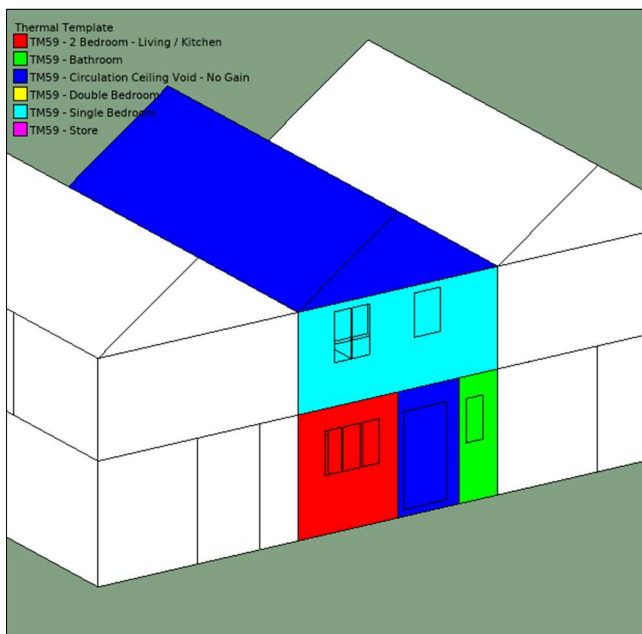


FIGURE 18: OPENING TYPES HOUSE A MID-TERRACE

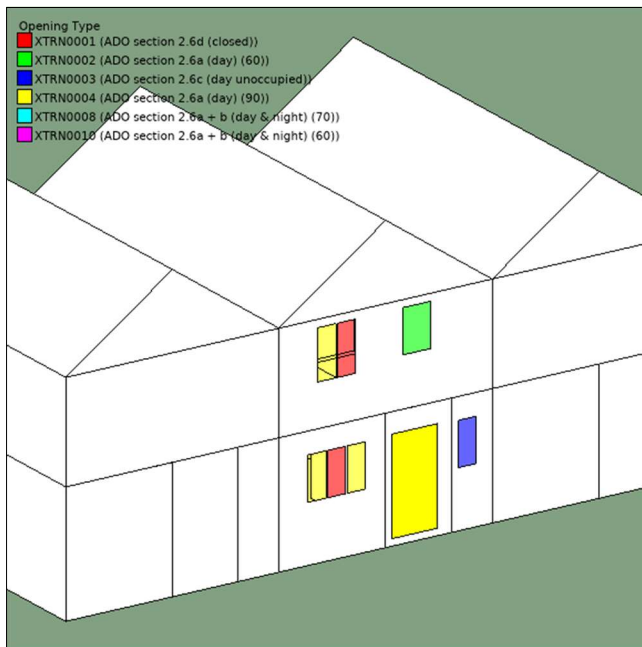


TABLE 10: ADO ASSESSMENT RESULTS HOUSE A MID-TERRACE

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Kitchen/Living/Dining	0.0	n/a	Pass
Bedroom 1	0.0	0	Pass
Bedroom 2	0.0	8	Pass

HOUSE C END-TERRACE PLOT 7

FIGURE 19: THERMAL TEMPLATES HOUSE C END-TERRACE

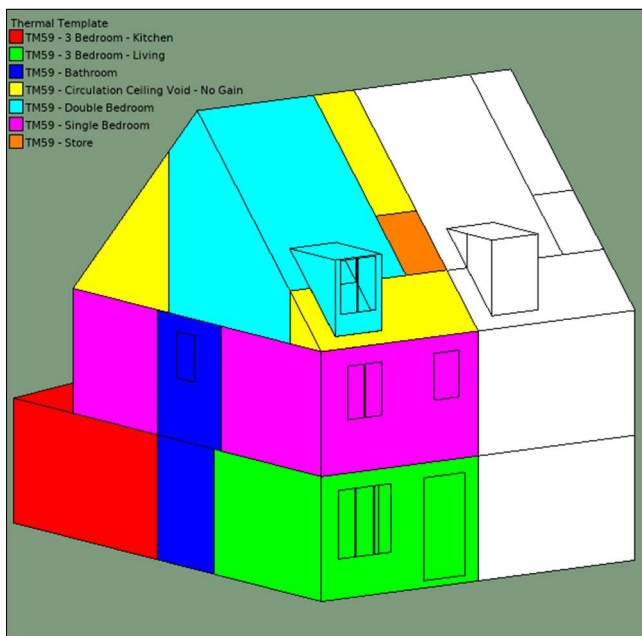


FIGURE 20: OPENING TYPES HOUSE C END-TERRACE

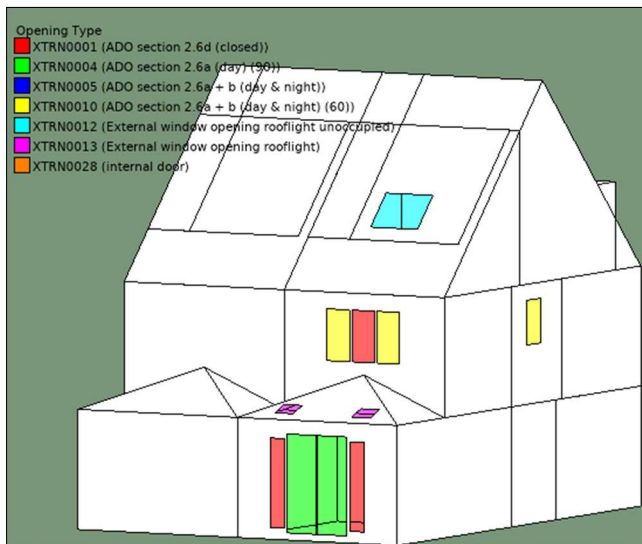


TABLE 11: ADO ASSESSMENT RESULTS HOUSE C END-TERRACE

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Kitchen/Dining	0.0	n/a	Pass
Living Room	0.0	n/a	Pass
Bedroom 1	0.0	0	Pass
Bedroom 2	0.0	0	Pass
Bedroom 3	0.0	0	Pass

HEARTWOOD PLOT 11

TABLE 12: ADO ASSESSMENT RESULTS HEARTWOOD

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Kitchen/Living/Dining	0.0	n/a	Pass
Bedroom 1	0.0	29	Pass

FIGURE 21: THERMAL TEMPLATES HEARTWOOD

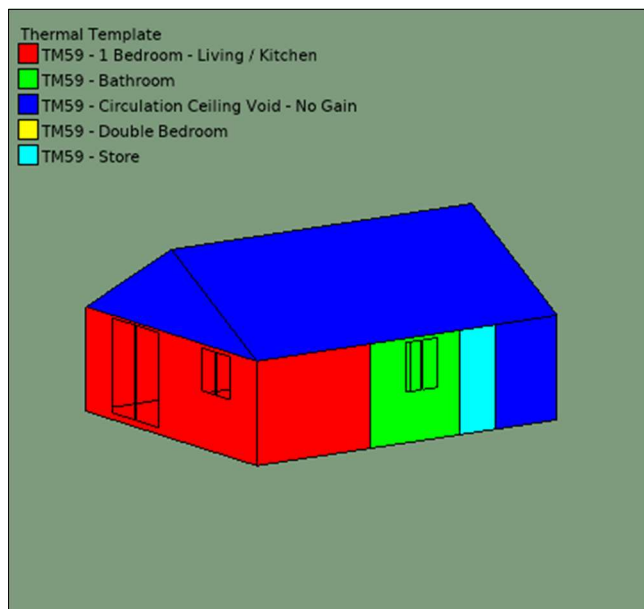
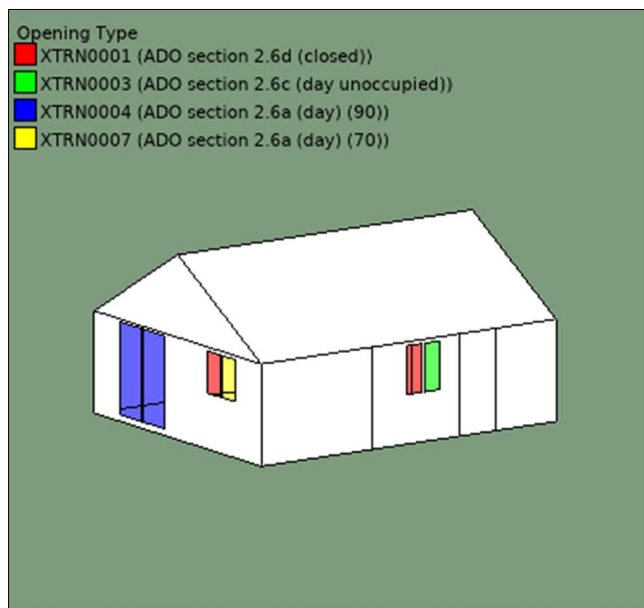


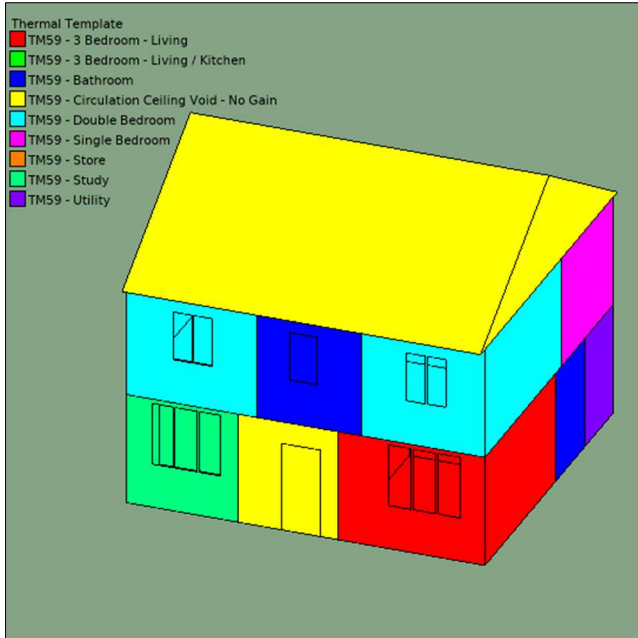
FIGURE 22: OPENING TYPES HEARTWOOD



BRAMPTON PLOT 58

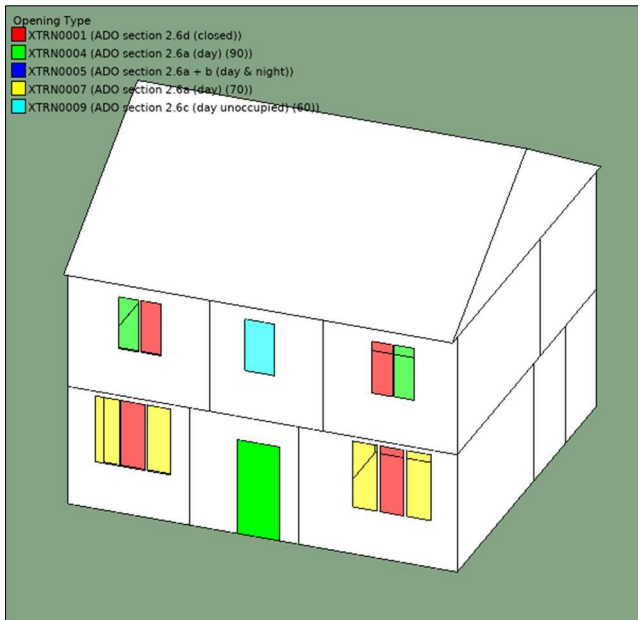
TABLE 13: ADO ASSESSMENT RESULTS BRAMPTON

FIGURE 23: THERMAL TEMPLATES BRAMPTON



Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Kitchen/Living/Dining	0.0	n/a	Pass
Living Room	0.0	n/a	Pass
Bedroom 1	0.0	0	Pass
Bedroom 2	0.0	0	Pass
Bedroom 3	0.0	0	Pass
Bedroom 4	0.0	0	Pass

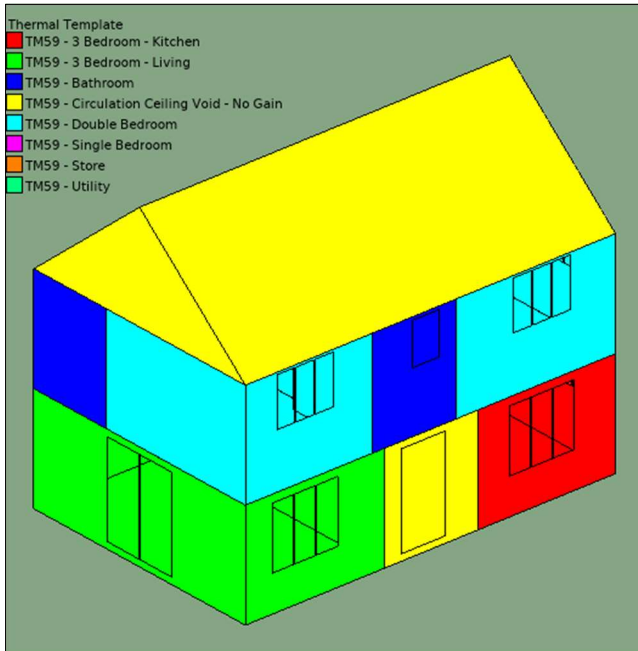
FIGURE 24: OPENING TYPES BRAMPTON



BARNDALE PLOT 72

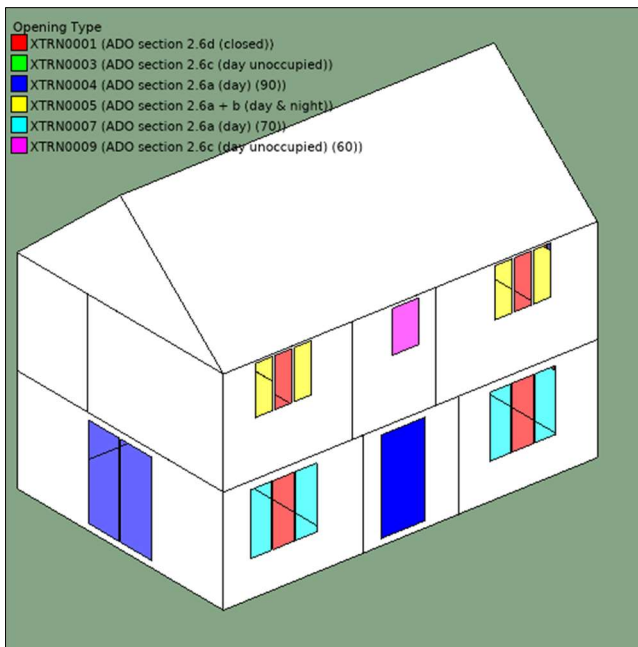
TABLE 14: ADO ASSESSMENT RESULTS BARNDALE

FIGURE 25: THERMAL TEMPLATES BARNDALE



Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Kitchen/Dining	0.0	n/a	Pass
Living Room	0.0	n/a	Pass
Bedroom 1	0.0	0	Pass
Bedroom 2	0.0	0	Pass
Bedroom 3	0.0	0	Pass

FIGURE 26: OPENING TYPES BARNDALE



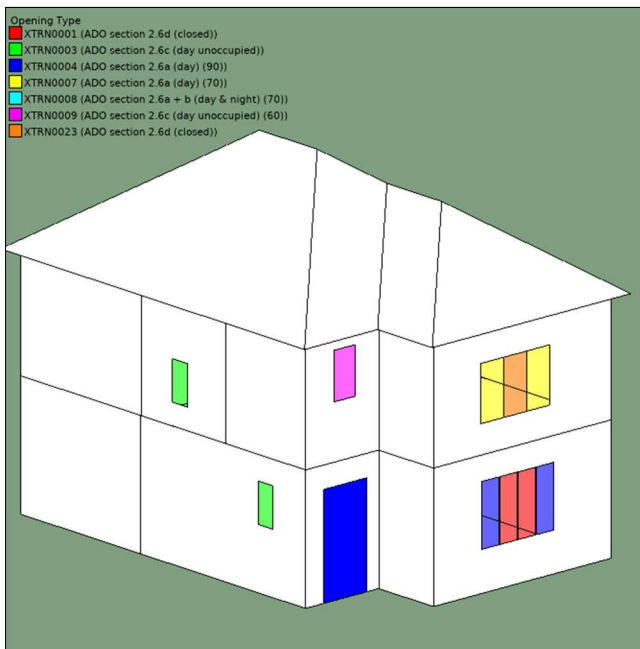
SHERWOOD PLOT 59

TABLE 15: ADO ASSESSMENT RESULTS SHERWOOD

FIGURE 27: THERMAL TEMPLATES SHERWOOD



FIGURE 28: OPENING TYPES SHERWOOD



Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Kitchen/Dining	0.0	n/a	Pass
Living Room	0.0	n/a	Pass
Bedroom 1	0.0	0	Pass
Bedroom 2	0.0	0	Pass
Bedroom 3	0.0	0	Pass

WAREHAM END-TERRACE PLOT 61

FIGURE 29: THERMAL TEMPLATES WAREHAM END-TERRACE

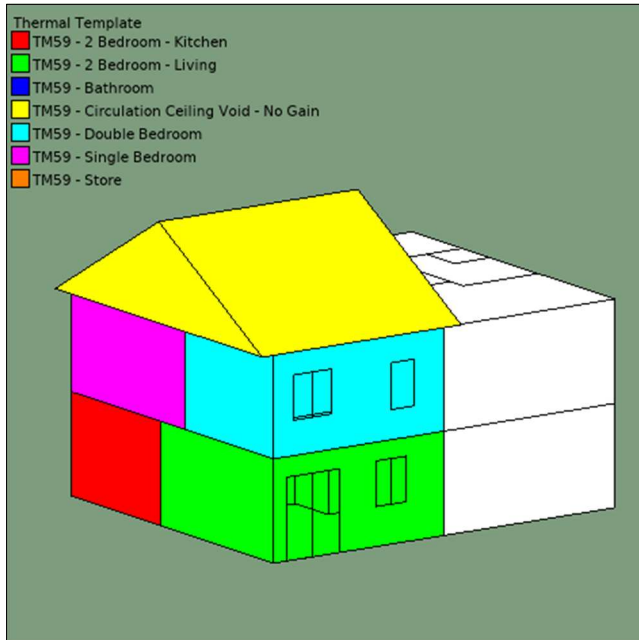


FIGURE 30: OPENING TYPES WAREHAM END-TERRACE

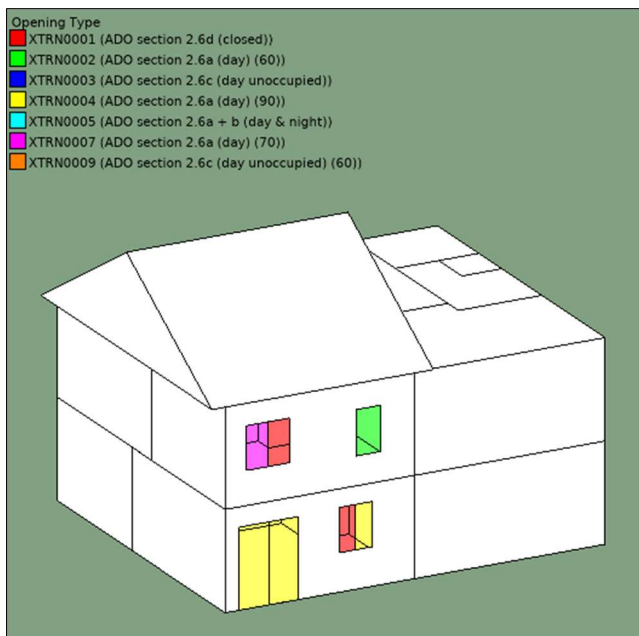


TABLE 16: ADO ASSESSMENT RESULTS WAREHAM END-TERRACE

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Kitchen	0.0	n/a	Pass
Living Room	0.0	n/a	Pass
Bedroom 1	0.0	0	Pass
Bedroom 2	0.0	0	Pass

WAREHAM MID-TERRACE PLOT 22

FIGURE 31: THERMAL TEMPLATES WAREHAM MID-TERRACE

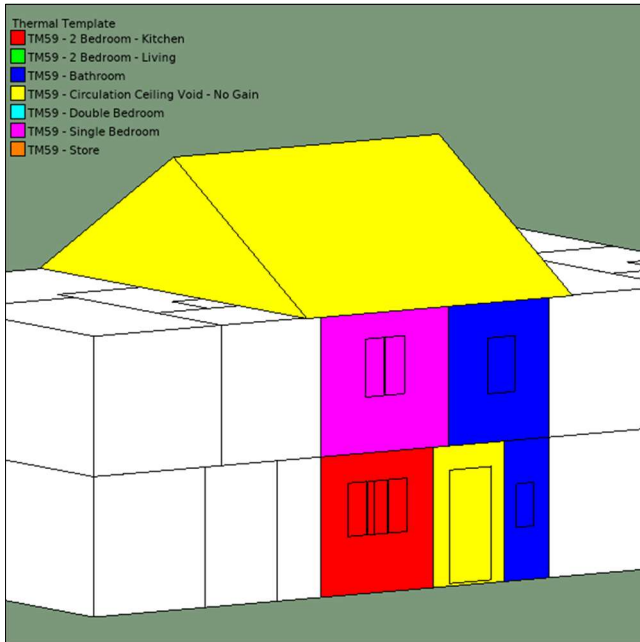


FIGURE 32: OPENING TYPES WAREHAM MID-TERRACE

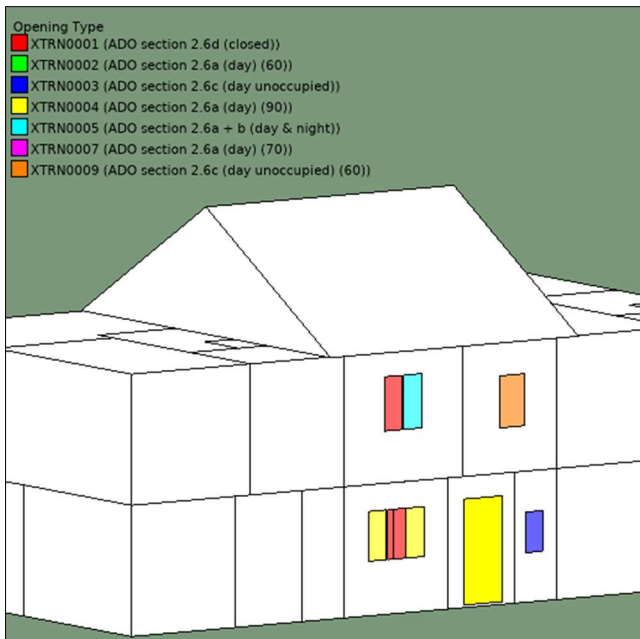


TABLE 17: ADO ASSESSMENT RESULTS WAREHAM MID-TERRACE

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Kitchen	0.0	n/a	Pass
Living Room	0.0	n/a	Pass
Bedroom 1	0.0	0	Pass
Bedroom 2	0.0	0	Pass

DALLINGTON END-TERRACE PLOT 53

FIGURE 33: THERMAL TEMPLATES DALLINGTON END-TERRACE

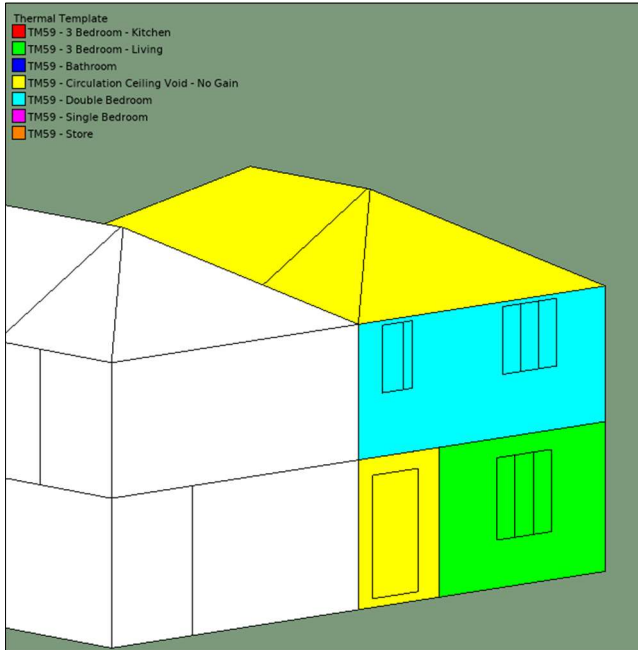


FIGURE 34: OPENING TYPES DALLINGTON END-TERRACE

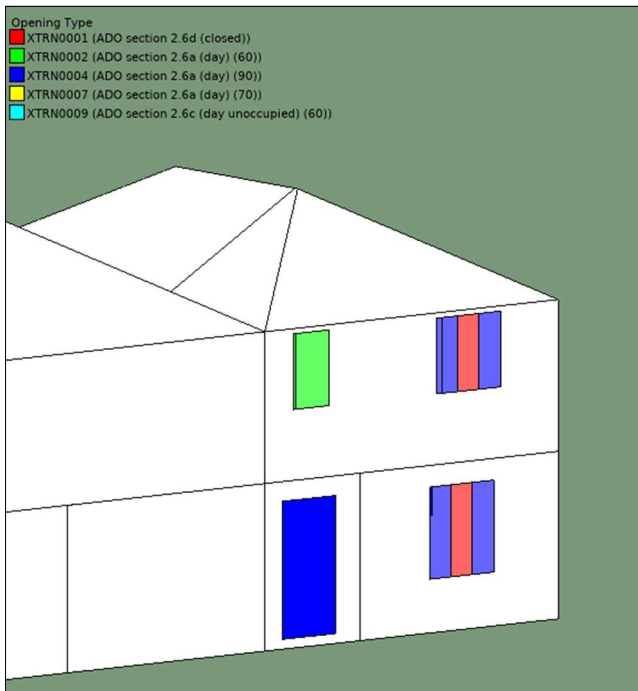


TABLE 18: ADO ASSESSMENT RESULTS DALLINGTON END-TERRACE

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Kitchen/Dining	0.0	n/a	Pass
Living Room	0.0	n/a	Pass
Bedroom 1	0.0	0	Pass
Bedroom 2	0.0	0	Pass
Bedroom 3	0.0	0	Pass

DALLINGTON MID-TERRACE PLOT 15

FIGURE 35: THERMAL TEMPLATES DALLINGTON MID-TERRACE

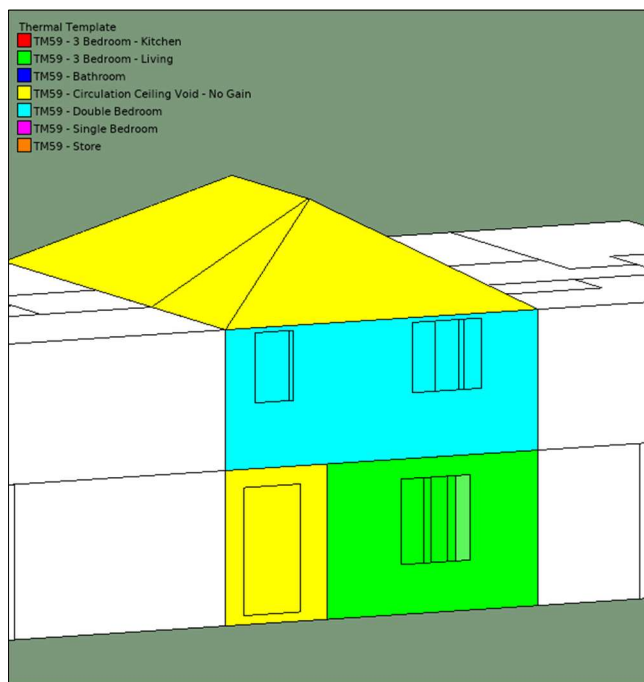


FIGURE 36: OPENING TYPES DALLINGTON MID-TERRACE

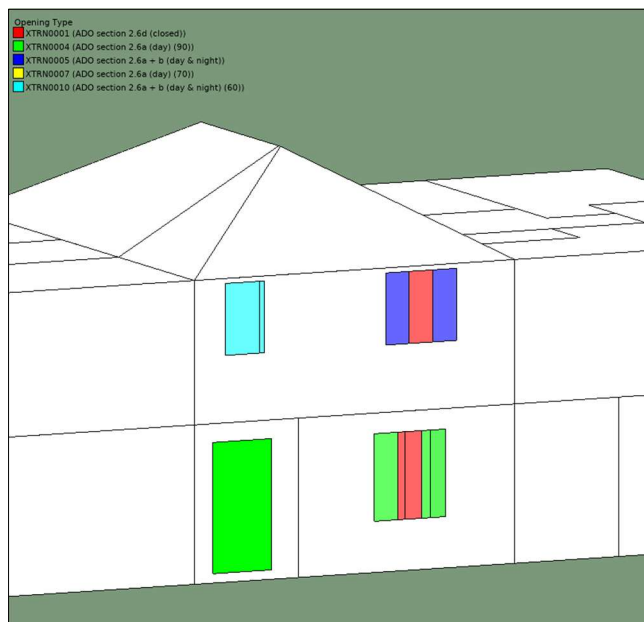


TABLE 19: ADO ASSESSMENT RESULTS DALLINGTON MID-TERRACE

Room	Crit A Limit 3%	Crit B Limit 33	Pass or Fail
Kitchen/Dining	0.0	n/a	Pass
Living Room	0.0	n/a	Pass
Bedroom 1	0.0	0	Pass
Bedroom 2	0.0	0	Pass
Bedroom 3	0.0	0	Pass

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