

# Residential Part O/TM59 Assessment. Albert Bridge House.

## Executive Summary.

This thermal comfort report has been prepared on behalf of Oval Real Estate for the proposed residential units at Albert Bridge House.

The study set out within this report was undertaken to determine occupant thermal comfort conditions during the summer months within proposed dwellings, in accordance with Building Regulations Approved Document O 2021 (Part O). This assessment has assessed a representative sample of dwellings across the residential building.

### Part O assessment methodology.

Compliance with the requirements of Part O Requirement O1 can be demonstrated using either the Simplified method or the Dynamic Thermal Modelling method. The Dynamic Thermal Modelling method has been used in this assessment.

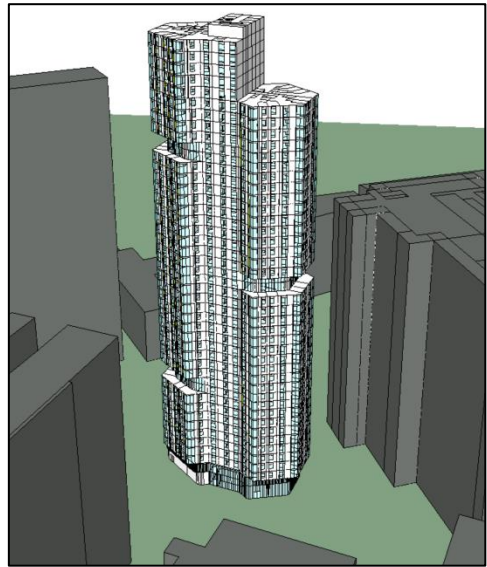


Figure 1 - Image of IES model of the proposed development

The risk of overheating within selected sample apartments has been assessed using the thermal comfort criteria for predominantly mechanically ventilated dwellings within the methodology set out in CIBSE Technical Memorandum 59 (TM59): ‘Design methodology for the assessment of overheating risk in homes’ with the principles and restrictions of Part O applied.

- For living rooms, kitchens and bedrooms: Operative temperature should not exceed 26°C for more than 3% of annual occupied hours (Jan – Dec).

Moreover, while there is no mandatory target for corridors, when the operative temperature in these areas exceeds 28°C for more than 3% of annual occupied hours (Jan – Dec), this should be identified as a significant risk.

### Thermal comfort study.

Determining the risk of overheating within the occupied spaces of the proposed dwellings has considered:

- Fabric performance
- Ventilation strategy

- Internal gains
- External shading
- Occupancy profiles; and
- External weather conditions taken from CIBSE Leeds weather centre future climate data: **DSY1\_Manchester\_2020High50** (Design Summer Year 1: 2020, high emissions scenario (50<sup>th</sup> percentile)).

It is recommended that at the next design stage, the assessment includes further climate scenarios represented by weather sets DSY2 and DSY3, as well as potentially assessing against risks in other future climate scenarios.

### Summary.

After a series of workshops and analysis of different design interventions and glazing specifications, the combination of the following three measures was agreed to be the most appropriate to assess at Stage 2, as no single measure has the potential to result in compliance on its own.

The risk of overheating has been minimised through the use of:

- Reduction of glazing to bedrooms to 20% ratio
- Adding 50% screening to living rooms
- Improving the g-value to 0.3

Supply air will be provided to the dwellings via MVHR units to minimise the risk of excessive internal temperatures during the summer months.

Each of the 18 sample dwellings assessed within this study has been shown to satisfy the CIBSE TM59 thermal comfort criteria using a mechanical ventilation strategy under the DSY1 climate scenario. This suggests that all proposed dwellings within Albert Bridge House appear to experience no risk of overheating under this specific climate scenario in line with the CIBSE TM59 criteria and therefore are compliant with Building Regulations Part O.

### Living rooms/Bedrooms.

Three scenarios were tested for their compliance with the TM59 criteria:

- Scenario 1: MVHR only, supply air temperature: same as external, Part F supply flow rates (Table 4)
- Scenario 2: MVHR only, supply air temperature: same as external, boost supply flow rates (Table 5)
- Scenario 3: MVHR only, supply air temperature: 16°C, boost supply flow rates (Table 5)

The compliance results are captured in the table below. These describe the number of living rooms and bedrooms passing the applicable criteria, out of the total number of tested rooms of each type.

| Area         | Scenario 1 | Scenario 2 | Scenario 3 |
|--------------|------------|------------|------------|
| Living rooms | 0/18       | 0/18       | 18/18      |
| Bedrooms     | 0/39       | 0/39       | 39/39      |

Table 1 TM59 results – Living rooms and Bedrooms

The analysis indicates that, of the tested scenarios, scenario 3 is the preferred one, as it leads to compliance with the TM59 criterion for predominantly mechanically ventilated dwellings, without increasing cost significantly, considering natural ventilation cannot be relied upon due to environmental constraints.

### Corridors.

As Scenario 3 was considered the most favourable, as it achieves compliance for all spaces without maximising supply flow rates, corridors were only assessed for this scenario.

| Area      | Scenario 3 |
|-----------|------------|
| Corridors | 5/5        |

Table 2 TM59 results – Corridors

Next steps.

While achieving compliance with the requirements of Part O of the Building Regulations is a positive outcome, the desired façade design, as described in this summary note, is not currently within the planning application. Studio Egret West should produce a façade that aligns with the proposed parameters and agree upon the planning approach and risk mitigation strategies with Deloitte and Oval Real Estate.

The apartments chosen for this study represent a sample of typical dwellings across the proposed development. It is recommended that at the next stage of design, the assessment is expanded to include all apartment in order to assess and mitigate the risk of overheating within each apartment.

Whilst the sample of apartments identify achievement with the applicable thermal comfort criteria, it is recommended that assessment is made against climate scenarios represented by design summer weather files DSY2 and DSY3, as well as potentially assessing against risks in other future climate scenarios, in line with CIBSE TM59 recommendations. However, no pass is mandatory under these climate scenarios.

Design Parameters.

Geometry Basis.

| Source            | Drawing Type | Description                               | Data Type   | Date Received |
|-------------------|--------------|-------------------------------------------|-------------|---------------|
| Studio Egret West | 3D Model     | ABH Residential Tower                     | Revit model | 12/09/2022    |
|                   | 3D Model     | 0412-SEW-ZZ-ZZ-M3-A-00000_detached_220909 | Revit model | 12/09/2022    |
|                   | Plans        | 0412-SEW-AA-00-DR-A-PL1100                | DWG         | 10/10/2022    |
|                   |              | 0412-SEW-AA-01-DR-A-PL1101                |             |               |
|                   |              | 0412-SEW-AA-05-DR-A-PL1105                |             |               |
|                   |              | 0412-SEW-AA-10-DR-A-PL1110                |             |               |
|                   |              | 0412-SEW-AA-11-DR-A-PL1111                |             |               |
|                   |              | 0412-SEW-AA-22-DR-A-PL1122                |             |               |
|                   |              | 0412-SEW-AA-23-DR-A-PL1123                |             |               |
|                   |              | 0412-SEW-AA-34-DR-A-PL1134                |             |               |
|                   |              | 0412-SEW-AA-35-DR-A-PL1135                |             |               |
|                   |              | 0412-SEW-AA-36-DR-A-PL1136                |             |               |
|                   |              | 0412-SEW-AA-40-DR-A-PL1140                |             |               |
|                   |              | 0412-SEW-AA-45-DR-A-PL1145                |             |               |

Table 3 - Geometry information

Weather File.

CIBSE TM59 states that a DSY 2020 High 50 weather file should be selected in the most appropriate location. Manchester 2020 High 50 has been deemed to be the most appropriate climate file for this development.

Proposed mitigation measures.

After a series of workshops and analysis of different design interventions and glazing specifications, the combination of the following three measures was agreed to be the most appropriate to assess at Stage 2, as no single measure has the potential to result in compliance on its own.

- Reduction of glazing to bedrooms to 20% ratio
- Adding 50% screening to living rooms
- Improving the g-value to 0.3

Sample apartments.

For this final round of analysis, a total of 18 apartments were assessed. These were chosen to represent higher risk dwellings on floors 30, 35, 38, 40 and 44 of the proposed residential unit of Albert Bridge House based on the previous iterations that were run across the whole building.

Natural Ventilation.

An assessment of the external conditions and the residential building envelope acoustic performance indicated that a suitable mechanical ventilation system is required to mitigate summertime overheating without relying on opening windows. Opening windows can only be acceptable for short periods.

Taking into account the effect of environmental constraints, such as noise or air quality, windows were considered to remain closed throughout the day.

Mechanical Ventilation.

Supply air will be provided to the dwellings via MVHR units to minimise the risk of excessive internal temperatures during the summer months.

A total of three scenarios were tested, based on three sets of mechanical ventilation supply flow rates.

Part F whole-dwelling supply flow rates.

The following supply flow rates represent the system in trickle mode. It should be noted that mechanical boost mode, when only included for occasional use with louder fan noise, should not be assumed.

1. **Scenario 1** assumes Part F flowrates without the provision of active cooling.

| Apartment Type     | Supply Flow Rate (l/s) |                    |                |         |
|--------------------|------------------------|--------------------|----------------|---------|
|                    | Single bedroom         | Double bedroom     | Kitchen Living | Overall |
| 1 Bedroom          | -                      | 5                  | 24             | 29      |
| 2 Bedroom (Type 1) | 4                      | 5                  | 20             | 29      |
| 2 Bedroom (Type 3) | 5                      | 7                  | 25             | 37      |
| 3 Bedroom          | 3                      | 5.5 (each bedroom) | 23             | 37      |

Table 4 - Flow rates for each apartment type (Part F)

Boost mode supply flow rates.

The supply flow rates summarised in Table 3 represent elevated mechanical flow rates that can be achieved by MVHRs. Two further scenarios were based on these flow rates:

2. **Scenario 2:** MVHR units supply ‘free cooling’ when conditions allow at a minimum supply air temperature of 16°C.
3. **Scenario 3:** Built-in cooling coils have been fitted to the MVHR units to provide supply air at 16°C. The supply air has been set to run continuously, provided that the indoor air temperature exceeds 20°C.

| Apartment Type  | Supply Flow Rate (l/s) |                   |                |         |
|-----------------|------------------------|-------------------|----------------|---------|
|                 | Single bedroom         | Double bedroom    | Kitchen Living | Overall |
| 1 Bedroom       | -                      | 10                | 50             | 60      |
| 2 Bedroom (all) | 10                     | 15                | 55             | 80      |
| 3 Bedroom       | 8                      | 12 (each bedroom) | 53             | 85      |

Table 5 - Flow rates for each apartment type (Boost)

## Compliance Criteria.

The CIBSE TM59: Thermal Comfort criteria has been used to test the overheating risk in line with the requirements of Approved Document Part O 2021. The applicable criteria for predominantly mechanically ventilated dwellings (i.e. where opportunities to open windows may be limited due to acoustic or air quality constraints) are as follows:

- For living rooms, kitchens and bedrooms: Operative temperature should not exceed 26°C for more than 3% of annual occupied hours (Jan – Dec).

Moreover, while there is no mandatory target to meet for assessing corridors, when operative temperature exceeds 28°C for more than 3% of annual occupied hours (Jan – Dec), this should be identified as a significant risk.

## Results.

### Living rooms/Bedrooms.

Three scenarios were tested for their compliance with the TM59 criteria:

- Scenario 1: MVHR only, supply air temperature: same as external, Part F supply flow rates (Table 2)
- Scenario 2: MVHR only, supply air temperature: same as external, boost supply flow rates (Table 3)
- Scenario 3: MVHR only, supply air temperature: 16°C, boost supply flow rates (Table 3)

The compliance results are captured in the table below. These describe the number of living rooms and bedrooms passing the applicable criteria, out of the total number of tested rooms of each type.

| Area         | Scenario 1 | Scenario 2 | Scenario 3 |
|--------------|------------|------------|------------|
| Living rooms | 0/18       | 0/18       | 18/18      |
| Bedrooms     | 0/39       | 0/39       | 39/39      |

Table 6 TM59 results – Living rooms and Bedrooms

### Corridors.

As Scenario 3 was considered the most favourable, as it achieves compliance for all spaces without maximising supply flow rates, corridors were only assessed for this scenario.

| Area      | Scenario 3 |
|-----------|------------|
| Corridors | 5/5        |

Table 7 TM59 results – Corridors

## Discussion.

### Scenario 1: MVHR only, supply air temperature: same as external, Part F supply flow rates.

No living rooms or bedrooms pass the TM59 26°C criterion. Passing the criterion with fixed windows and Part F supply flow rates would require significant façade optimisation. If all passive measures have been exhausted, mechanical cooling may also be accepted towards compliance.

### Scenario 2: MVHR only, supply air temperature: same as external, boost supply flow rates.

This scenario includes elevated supply flow rates but assumes no built-in cooling coils in the MVHR units. This scenario results in even higher percentages of annual occupied hours when operative temperature exceeds 26°C. These results highlight the need for built-in cooling coils in the MVHR units.

### Scenario 3: MVHR only, supply air temperature: same as external, boost supply flow rates.

All living rooms and bedrooms pass the TM59 criterion. This was deemed the preferred scenario, considering openings cannot be relied on because of external noise levels.

## Conclusion.

The analysis indicates that, of the tested scenarios, Scenario 3 is the preferred one, as it leads to compliance with the TM59 criterion for predominantly mechanically ventilated dwellings, without increasing cost significantly, considering natural ventilation cannot be relied upon due to environmental constraints.

The diagram below intends to set out a simulation and decision-making pathway to compliance with the new Part O Regulations, based on the results of this Albert Bridge House overheating assessment.

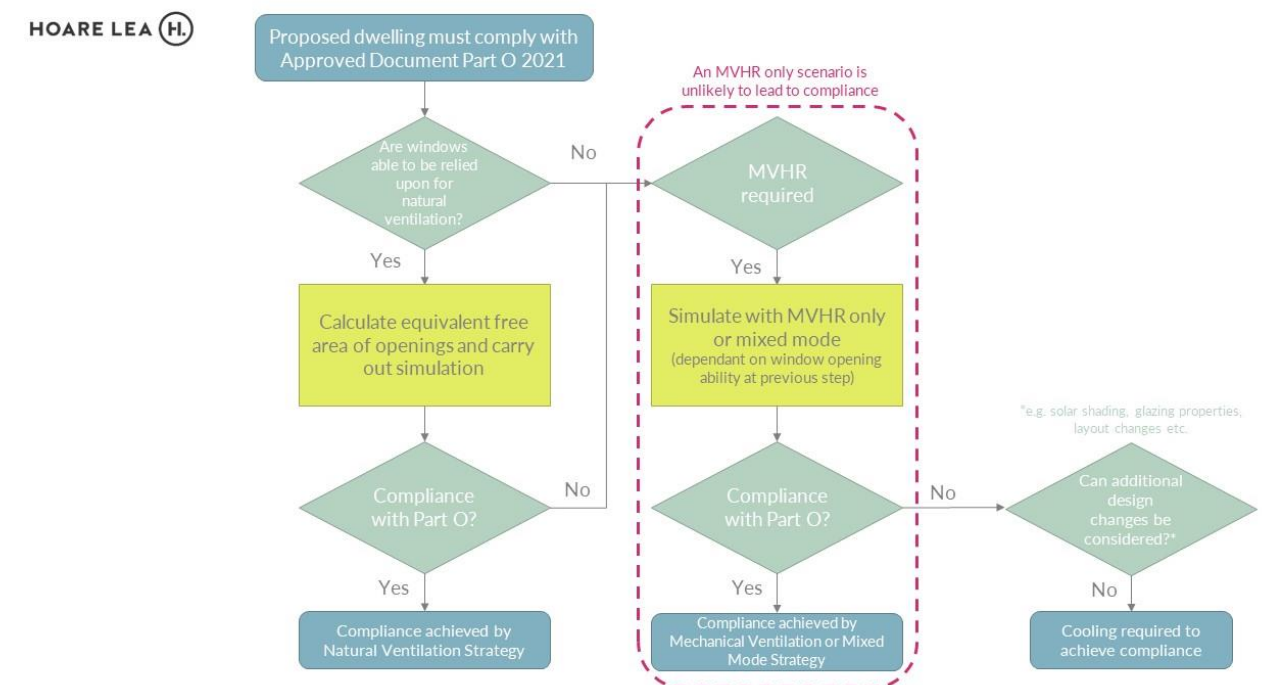


Figure 2 Part O decision making chart

Appendix A: CIBSE TM59 Results.

The results for the CIBSE TM59 assessment are shown below for each occupied space within the sample apartments assessed for Albert Bridge House. CIBSE TM59 is shown to be satisfied when the threshold temperature is not exceeded for more than 3% of the occupied hours.

Scenario 1 – Apartments.

| #  | Room name                          | % Hours >26°C | Result                 |
|----|------------------------------------|---------------|------------------------|
| 1  | 30-2B3P Type 01 Double Bedroom     | 12.5          | Risk criterion not met |
|    | 30-2B3P Type 01 Kitchen Living     | 15.8          | Risk criterion not met |
|    | 30-2B3P Type 01 Single Bedroom     | 13.8          | Risk criterion not met |
| 2  | 30-2B4P Type 03 Double Bedroom 1   | 13.5          | Risk criterion not met |
|    | 30-2B4P Type 03 Double Bedroom 2   | 9.2           | Risk criterion not met |
|    | 30-2B4P Type 03 Kitchen Living     | 14.7          | Risk criterion not met |
| 3  | 30-2B4P Type 30 R Double Bedroom 1 | 12.9          | Risk criterion not met |
|    | 30-2B4P Type 30 R Double Bedroom 2 | 11.4          | Risk criterion not met |
|    | 30-2B4P Type 30 R Kitchen Living   | 14.7          | Risk criterion not met |
| 4  | 30-3B4P Type 01 Double Bedroom     | 8.8           | Risk criterion not met |
|    | 30-3B4P Type 01 Double Bedroom 2   | 6.8           | Risk criterion not met |
|    | 30-3B4P Type 01 Kitchen Living     | 11.1          | Risk criterion not met |
| 5  | 35- 1B2P Type 35 Double Bedroom    | 10.4          | Risk criterion not met |
|    | 35-1B2P Type 35 Kitchen Living     | 6.2           | Risk criterion not met |
| 6  | 35-1B2P Type 01 R Kitchen Living   | 14.5          | Risk criterion not met |
|    | 35-1B2P Type 01 R Double Bedroom   | 12.9          | Risk criterion not met |
| 7  | 35-2B4P Type 01 R Double Bedroom 1 | 13.5          | Risk criterion not met |
|    | 35-2B4P Type 01 R Double Bedroom 2 | 12.5          | Risk criterion not met |
|    | 35-2B4P Type 01 R Kitchen Living   | 13.7          | Risk criterion not met |
| 8  | 35-2B4P Type 35 R Double Bedroom 1 | 14.6          | Risk criterion not met |
|    | 35-2B4P Type 35 R Double Bedroom 2 | 12.7          | Risk criterion not met |
|    | 35-2B4P Type 35 R Kitchen Living   | 16.1          | Risk criterion not met |
| 9  | 38-1B2P Type 01 L Double Bedroom   | 7.4           | Risk criterion not met |
|    | 38-1B2P Type 01 L Kitchen Living   | 8.6           | Risk criterion not met |
| 10 | 38-1B2P Type 01 R Double Bedroom   | 12.0          | Risk criterion not met |

| #  | Room name                          | % Hours >26°C | Result                 |
|----|------------------------------------|---------------|------------------------|
|    | 38-1B2P Type 01 R Kitchen Living   | 14.5          | Risk criterion not met |
| 11 | 38-2B3P Type 01 Double Bedroom     | 13.7          | Risk criterion not met |
|    | 38-2B3P Type 01 Kitchen Living     | 15.1          | Risk criterion not met |
|    | 38-2B3P Type 01 Single Bedroom     | 13.9          | Risk criterion not met |
| 12 | 38-2B4P Type 38 L Double Bedroom 1 | 8.8           | Risk criterion not met |
|    | 38-2B4P Type 38 L Double Bedroom 2 | 11.4          | Risk criterion not met |
|    | 38-2B4P Type 38 L Kitchen Living   | 14.1          | Risk criterion not met |
| 13 | 40-3B6P Type 01 Double Bedroom 1   | 5.1           | Risk criterion not met |
|    | 40-3B6P Type 01 Double Bedroom 2   | 7.9           | Risk criterion not met |
|    | 40-3B6P Type 01 Double Bedroom 3   | 10.8          | Risk criterion not met |
| 14 | 40-3B6P Type 01 Kitchen Living     | 5.8           | Risk criterion not met |
|    | 40-3B6P Type 02 Double Bedroom 1   | 10.5          | Risk criterion not met |
|    | 40-3B6P Type 02 Double Bedroom 2   | 11.6          | Risk criterion not met |
| 15 | 40-3B6P Type 02 Double Bedroom 3   | 8.6           | Risk criterion not met |
|    | 40-3B6P Type 02 Kitchen Living     | 11.7          | Risk criterion not met |
| 16 | 40-3B6P Type 03 Double Bedroom 1   | 5.5           | Risk criterion not met |
|    | 40-3B6P Type 03 Double Bedroom 2   | 12.7          | Risk criterion not met |
|    | 40-3B6P Type 03 Double Bedroom 3   | 11.6          | Risk criterion not met |
| 17 | 40-3B6P Type 03 Kitchen Living     | 10.5          | Risk criterion not met |
|    | 44-3B6P Type 01 Double Bedroom 1   | 3.9           | Risk criterion not met |
|    | 44-3B6P Type 01 Double Bedroom 2   | 7.2           | Risk criterion not met |
| 18 | 44-3B6P Type 01 Double Bedroom 3   | 6.6           | Risk criterion not met |
|    | 44-3B6P Type 01 Kitchen Living     | 3.7           | Risk criterion not met |
| 19 | 44-3B6P Type 02 Double Bedroom 1   | 8.5           | Risk criterion not met |
|    | 44-3B6P Type 02 Double Bedroom 2   | 9.1           | Risk criterion not met |
|    | 44-3B6P Type 02 Double Bedroom 3   | 6.1           | Risk criterion not met |
| 20 | 44-3B6P Type 02 Kitchen Living     | 8.7           | Risk criterion not met |
|    | 44-3B6P Type 03 Double Bedroom 1   | 4.7           | Risk criterion not met |
|    | 44-3B6P Type 03 Double Bedroom 2   | 9.9           | Risk criterion not met |
| 21 | 44-3B6P Type 03 Double Bedroom 3   | 9.2           | Risk criterion not met |
|    | 44-3B6P Type 03 Kitchen Living     | 7.6           | Risk criterion not met |

Scenario 2 – Apartments.

| #  | Room name                          | % Hours >26°C | Result                 |
|----|------------------------------------|---------------|------------------------|
| 1  | 30-2B3P Type 01 Double Bedroom     | 20.1          | Risk criterion not met |
|    | 30-2B3P Type 01 Kitchen Living     | 24.8          | Risk criterion not met |
|    | 30-2B3P Type 01 Single Bedroom     | 23.2          | Risk criterion not met |
| 2  | 30-2B4P Type 03 Double Bedroom 1   | 29.2          | Risk criterion not met |
|    | 30-2B4P Type 03 Double Bedroom 2   | 17.8          | Risk criterion not met |
|    | 30-2B4P Type 03 Kitchen Living     | 30.1          | Risk criterion not met |
| 3  | 30-2B4P Type 30 R Double Bedroom 1 | 24.8          | Risk criterion not met |
|    | 30-2B4P Type 30 R Double Bedroom 2 | 19.4          | Risk criterion not met |
|    | 30-2B4P Type 30 R Kitchen Living   | 27.6          | Risk criterion not met |
| 4  | 30-3B4P Type 01 Double Bedroom     | 12.5          | Risk criterion not met |
|    | 30-3B4P Type 01 Double Bedroom 2   | 8.8           | Risk criterion not met |
|    | 30-3B4P Type 01 Kitchen Living     | 15.3          | Risk criterion not met |
|    | 30-3B4P Type 01 Single Bedroom     | 16.2          | Risk criterion not met |
| 5  | 35- 1B2P Type 35 Double Bedroom    | 20.9          | Risk criterion not met |
|    | 35-1B2P Type 35 Kitchen Living     | 10.5          | Risk criterion not met |
| 6  | 35-1B2P Type 01 R Kitchen Living   | 28.5          | Risk criterion not met |
|    | 35-1B2P Type 01 R Double Bedroom   | 24.9          | Risk criterion not met |
| 7  | 35-2B4P Type 01 R Double Bedroom 1 | 22.7          | Risk criterion not met |
|    | 35-2B4P Type 01 R Double Bedroom 2 | 19.9          | Risk criterion not met |
|    | 35-2B4P Type 01 R Kitchen Living   | 20.4          | Risk criterion not met |
| 8  | 35-2B4P Type 35 R Double Bedroom 1 | 34.4          | Risk criterion not met |
|    | 35-2B4P Type 35 R Double Bedroom 2 | 28.6          | Risk criterion not met |
|    | 35-2B4P Type 35 R Kitchen Living   | 36.9          | Risk criterion not met |
| 9  | 38-1B2P Type 01 L Double Bedroom   | 12.3          | Risk criterion not met |
|    | 38-1B2P Type 01 L Kitchen Living   | 12.2          | Risk criterion not met |
| 10 | 38-1B2P Type 01 R Double Bedroom   | 20.2          | Risk criterion not met |
|    | 38-1B2P Type 01 R Kitchen Living   | 23.6          | Risk criterion not met |
| 11 | 38-2B3P Type 01 Double Bedroom     | 18.5          | Risk criterion not met |
|    | 38-2B3P Type 01 Kitchen Living     | 20            | Risk criterion not met |
|    | 38-2B3P Type 01 Single Bedroom     | 21.1          | Risk criterion not met |

| #  | Room name                          | % Hours >26°C | Result                 |
|----|------------------------------------|---------------|------------------------|
| 12 | 38-2B4P Type 38 L Double Bedroom 1 | 14.6          | Risk criterion not met |
|    | 38-2B4P Type 38 L Double Bedroom 2 | 21.1          | Risk criterion not met |
|    | 38-2B4P Type 38 L Kitchen Living   | 24.3          | Risk criterion not met |
| 13 | 40-3B6P Type 01 Double Bedroom 1   | 6.4           | Risk criterion not met |
|    | 40-3B6P Type 01 Double Bedroom 2   | 11.3          | Risk criterion not met |
|    | 40-3B6P Type 01 Double Bedroom 3   | 13.8          | Risk criterion not met |
|    | 40-3B6P Type 01 Kitchen Living     | 7             | Risk criterion not met |
| 14 | 40-3B6P Type 02 Double Bedroom 1   | 14.7          | Risk criterion not met |
|    | 40-3B6P Type 02 Double Bedroom 2   | 14            | Risk criterion not met |
|    | 40-3B6P Type 02 Double Bedroom 3   | 10.1          | Risk criterion not met |
|    | 40-3B6P Type 02 Kitchen Living     | 13.8          | Risk criterion not met |
| 15 | 40-3B6P Type 03 Double Bedroom 1   | 5.6           | Risk criterion not met |
|    | 40-3B6P Type 03 Double Bedroom 2   | 16.4          | Risk criterion not met |
|    | 40-3B6P Type 03 Double Bedroom 3   | 16.9          | Risk criterion not met |
|    | 40-3B6P Type 03 Kitchen Living     | 11            | Risk criterion not met |
| 16 | 44-3B6P Type 01 Double Bedroom 1   | 4.3           | Risk criterion not met |
|    | 44-3B6P Type 01 Double Bedroom 2   | 8.5           | Risk criterion not met |
|    | 44-3B6P Type 01 Double Bedroom 3   | 8.4           | Risk criterion not met |
|    | 44-3B6P Type 01 Kitchen Living     | 4.5           | Risk criterion not met |
| 17 | 44-3B6P Type 02 Double Bedroom 1   | 10.2          | Risk criterion not met |
|    | 44-3B6P Type 02 Double Bedroom 2   | 9.8           | Risk criterion not met |
|    | 44-3B6P Type 02 Double Bedroom 3   | 6.8           | Risk criterion not met |
|    | 44-3B6P Type 02 Kitchen Living     | 9             | Risk criterion not met |
| 18 | 44-3B6P Type 03 Double Bedroom 1   | 4.8           | Risk criterion not met |
|    | 44-3B6P Type 03 Double Bedroom 2   | 11.4          | Risk criterion not met |
|    | 44-3B6P Type 03 Double Bedroom 3   | 11.4          | Risk criterion not met |
|    | 44-3B6P Type 03 Kitchen Living     | 7.8           | Risk criterion not met |

Scenario 3 – Apartments.

| #  | Room name                          | % Hours >26°C | Result             |
|----|------------------------------------|---------------|--------------------|
| 1  | 30-2B3P Type 01 Double Bedroom     | 0.7           | Risk criterion met |
|    | 30-2B3P Type 01 Kitchen Living     | 1.4           | Risk criterion met |
|    | 30-2B3P Type 01 Single Bedroom     | 1.7           | Risk criterion met |
| 2  | 30-2B4P Type 03 Double Bedroom 1   | 2.5           | Risk criterion met |
|    | 30-2B4P Type 03 Double Bedroom 2   | 0.7           | Risk criterion met |
|    | 30-2B4P Type 03 Kitchen Living     | 2.1           | Risk criterion met |
| 3  | 30-2B4P Type 30 R Double Bedroom 1 | 1.6           | Risk criterion met |
|    | 30-2B4P Type 30 R Double Bedroom 2 | 0.4           | Risk criterion met |
|    | 30-2B4P Type 30 R Kitchen Living   | 1.1           | Risk criterion met |
| 4  | 30-3B4P Type 01 Double Bedroom     | 0.2           | Risk criterion met |
|    | 30-3B4P Type 01 Double Bedroom 2   | 0.3           | Risk criterion met |
|    | 30-3B4P Type 01 Kitchen Living     | 0.1           | Risk criterion met |
|    | 30-3B4P Type 01 Single Bedroom     | 0.3           | Risk criterion met |
| 5  | 35- 1B2P Type 35 Double Bedroom    | 1.7           | Risk criterion met |
|    | 35-1B2P Type 35 Kitchen Living     | 0.2           | Risk criterion met |
| 6  | 35-1B2P Type 01 R Kitchen Living   | 0.5           | Risk criterion met |
|    | 35-1B2P Type 01 R Double Bedroom   | 0.0           | Risk criterion met |
| 7  | 35-2B4P Type 01 R Double Bedroom 1 | 0.0           | Risk criterion met |
|    | 35-2B4P Type 01 R Double Bedroom 2 | 0.0           | Risk criterion met |
|    | 35-2B4P Type 01 R Kitchen Living   | 0.0           | Risk criterion met |
| 8  | 35-2B4P Type 35 R Double Bedroom 1 | 1.6           | Risk criterion met |
|    | 35-2B4P Type 35 R Double Bedroom 2 | 0.5           | Risk criterion met |
|    | 35-2B4P Type 35 R Kitchen Living   | 1.1           | Risk criterion met |
| 9  | 38-1B2P Type 01 L Double Bedroom   | 0.4           | Risk criterion met |
|    | 38-1B2P Type 01 L Kitchen Living   | 0.8           | Risk criterion met |
| 10 | 38-1B2P Type 01 R Double Bedroom   | 1.2           | Risk criterion met |
|    | 38-1B2P Type 01 R Kitchen Living   | 1.5           | Risk criterion met |
| 11 | 38-2B3P Type 01 Double Bedroom     | 0.7           | Risk criterion met |
|    | 38-2B3P Type 01 Kitchen Living     | 1.2           | Risk criterion met |
|    | 38-2B3P Type 01 Single Bedroom     | 1.5           | Risk criterion met |

| #  | Room name                          | % Hours >26°C | Result             |
|----|------------------------------------|---------------|--------------------|
| 12 | 38-2B4P Type 38 L Double Bedroom 1 | 0.9           | Risk criterion met |
|    | 38-2B4P Type 38 L Double Bedroom 2 | 1.9           | Risk criterion met |
|    | 38-2B4P Type 38 L Kitchen Living   | 2.8           | Risk criterion met |
| 13 | 40-3B6P Type 01 Double Bedroom 1   | 0.0           | Risk criterion met |
|    | 40-3B6P Type 01 Double Bedroom 2   | 0.3           | Risk criterion met |
|    | 40-3B6P Type 01 Double Bedroom 3   | 1.3           | Risk criterion met |
|    | 40-3B6P Type 01 Kitchen Living     | 0.0           | Risk criterion met |
| 14 | 40-3B6P Type 02 Double Bedroom 1   | 2.1           | Risk criterion met |
|    | 40-3B6P Type 02 Double Bedroom 2   | 2.7           | Risk criterion met |
|    | 40-3B6P Type 02 Double Bedroom 3   | 1.5           | Risk criterion met |
|    | 40-3B6P Type 02 Kitchen Living     | 1.8           | Risk criterion met |
| 15 | 40-3B6P Type 03 Double Bedroom 1   | 2.8           | Risk criterion met |
|    | 40-3B6P Type 03 Double Bedroom 2   | 2.4           | Risk criterion met |
|    | 40-3B6P Type 03 Double Bedroom 3   | 2.0           | Risk criterion met |
|    | 40-3B6P Type 03 Kitchen Living     | 1.8           | Risk criterion met |
| 16 | 44-3B6P Type 01 Double Bedroom 1   | 0.0           | Risk criterion met |
|    | 44-3B6P Type 01 Double Bedroom 2   | 0.3           | Risk criterion met |
|    | 44-3B6P Type 01 Double Bedroom 3   | 0.5           | Risk criterion met |
|    | 44-3B6P Type 01 Kitchen Living     | 0.0           | Risk criterion met |
| 17 | 44-3B6P Type 02 Double Bedroom 1   | 1.8           | Risk criterion met |
|    | 44-3B6P Type 02 Double Bedroom 2   | 2.3           | Risk criterion met |
|    | 44-3B6P Type 02 Double Bedroom 3   | 1.1           | Risk criterion met |
|    | 44-3B6P Type 02 Kitchen Living     | 1.3           | Risk criterion met |
| 18 | 44-3B6P Type 03 Double Bedroom 1   | 2.3           | Risk criterion met |
|    | 44-3B6P Type 03 Double Bedroom 2   | 2.0           | Risk criterion met |
|    | 44-3B6P Type 03 Double Bedroom 3   | 1.6           | Risk criterion met |
|    | 44-3B6P Type 03 Kitchen Living     | 1.5           | Risk criterion met |

Scenario 3 – Corridors.

| Room name            | % Hours >28°C | Result             |
|----------------------|---------------|--------------------|
| 30-Communal Corridor | 0.0           | Risk criterion met |
| 35-Communal Corridor | 0.0           | Risk criterion met |
| 38-Communal Corridor | 0.0           | Risk criterion met |
| 40-Communal Corridor | 0.0           | Risk criterion met |
| 44-Communal Corridor | 0.0           | Risk criterion met |