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SUBJECT **THERMAL COMFORT (MARKET AND EVENT HALL)**

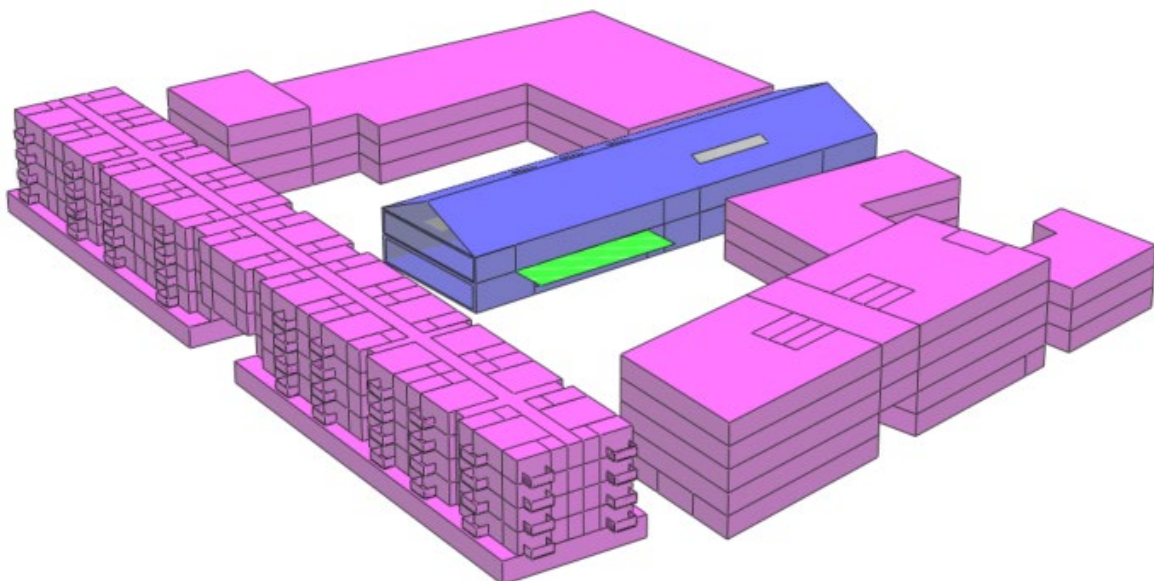
## Summary:

- The thermal comfort assessment has been completed following the layouts received July 2020
- The market and event hall have been checked against TM52 comfort criteria
- Results showed that the spaces analysed will meet the thermal comfort criteria and the operative temperatures in these spaces will remain below 26 deg C for the entire year

## Thermal/Overheating Modelling Assumptions

### 1.0 Geometry

Based on the CAD drawings current at July 2020.



## 2.0 Thermal Performance

### U Values

Roof	0.10 W/m <sup>2</sup> .K
New/ Existing Walls	0.12/1.95 W/m <sup>2</sup> .K
Floors (External)	0.10 W/m <sup>2</sup> .K
New/ Existing Windows	1.0/4.66 W/m <sup>2</sup> .K
Rooflights	2.3 W/m <sup>2</sup> .K
Air permeability	0.25 ach

### Thermal Mass

All rooms are assumed to have the following finishes/build ups;

Soffit	1 layer of plasterboard Lightweight
Internal and external walls	1 layers of plasterboard each side Lightweight
Floors	Concrete slab

## 3.0 Glazing Spec

Windows	
g-value	0.30
LT-value	0.7
FF (%)	0
Rooflights	
g-value	0.55
LT-value	0.6
FF (%)	15

## 4.0 Building Services

### Ventilation Rates

Typical ventilation rate	10l/s/person
Supply air cooling to	18 Deg C

### Cooling Units

FCU/VRF (Event Hall)	25 Deg C
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## 5.0 Occupancy

### Values

Occupancy	GF Market Hall: 175 people; FF Market Hall: 120 people; Event Hall:500 people
Occupants Gains:	Market Hall: 90W sensible, 60W latent; Event Hall: 90W sensible, 120W latent

## Patterns

Occupancy patterns TBC Assumptions: 12h-14h; 17h-24h

### 6.0 Equipment (to be confirmed)

- 5 W/m<sup>2</sup>

### 7.0 Lights (to be confirmed)

- 12 W/m<sup>2</sup>

## 8.0 Assessment Methodology

In accordance with CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings, 26degC summer temperature is used as a threshold to avoid overheating in mechanically cooled public spaces.

**Table 4 Maximum temperatures for different types of indoor space.**  
Clothing is assumed to be 1.0 clo in winter and 0.5 clo in summer  
(after BS EN 15251 (BSI, 2007), Table A2)

Type and use of space	Assumed met	Winter (clo = 1.0) PMV < +0.5	Summer (clo = 0.5) PMV < +0.5
Residential (sedentary)	1.2	25.0	26.0
Residential (active)	1.5	25.0	
Offices	1.2	24.0	26.0
Public spaces (auditoria, cafe etc.)	~1.2	24.0	26.0
Classrooms	1.2	24.0	26.0
Kindergarten	1.4	22.5	25.5
Shops	1.6	22.0	25.0

Figure. Maximum temperatures for different types of indoor space.

## 9.0 Results

In accordance with CIBSE TM 52 methodology for mechanically cooled buildings, the spaces analysed meet the assessment criteria: The operative temperature remains below 26 degrees C for the entire year.

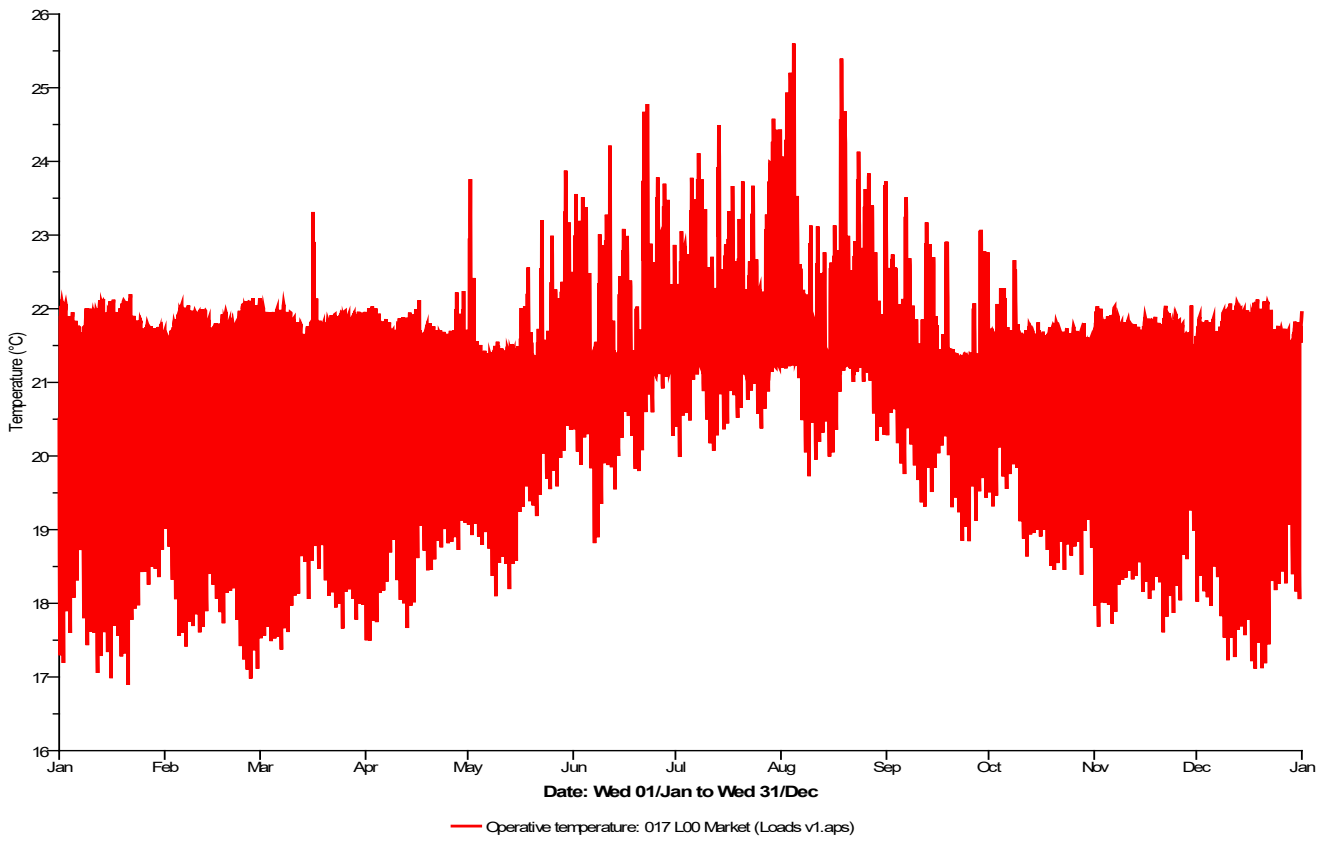


Figure. Market hall maximum operative temperatures

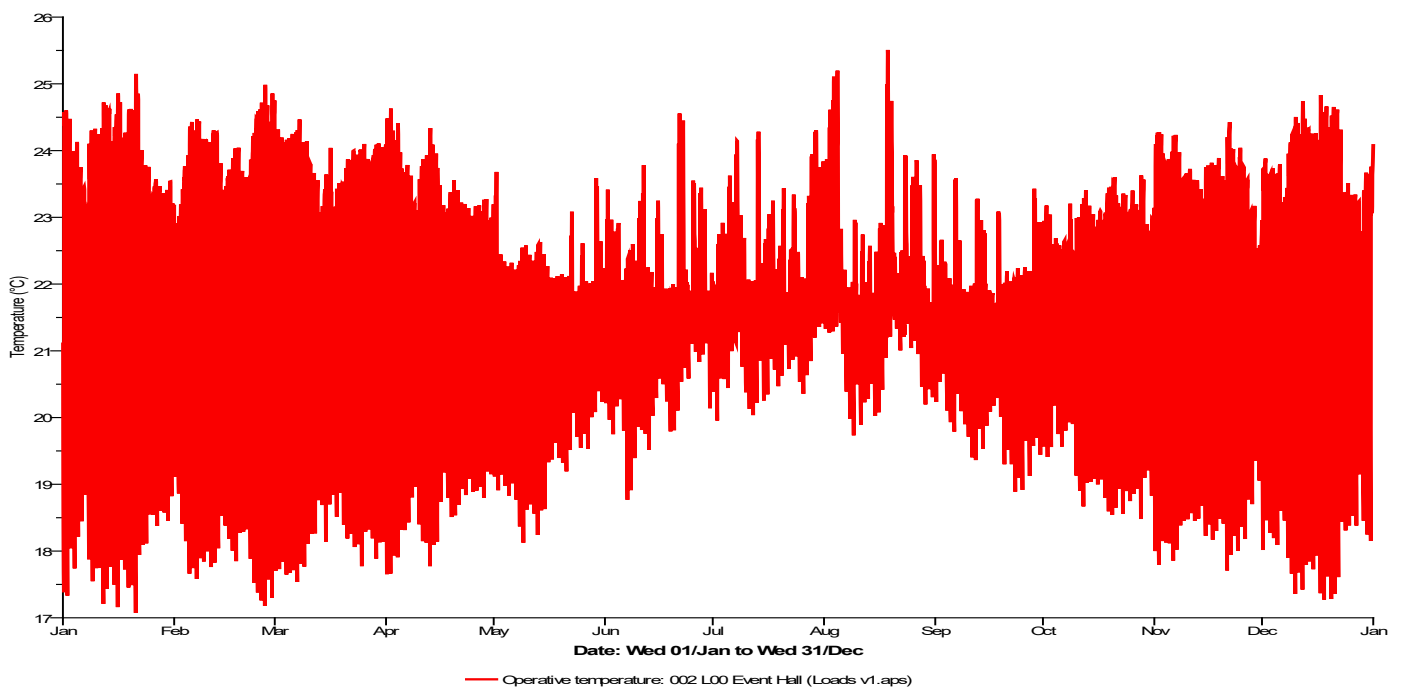


Figure. Event hall maximum operative temperatures