

Overheating Study

CIBSE TM59:2017

Block E1, Land at The Chocolate Factory, 5 Clarendon Road, Wood Green, Greater London, N22

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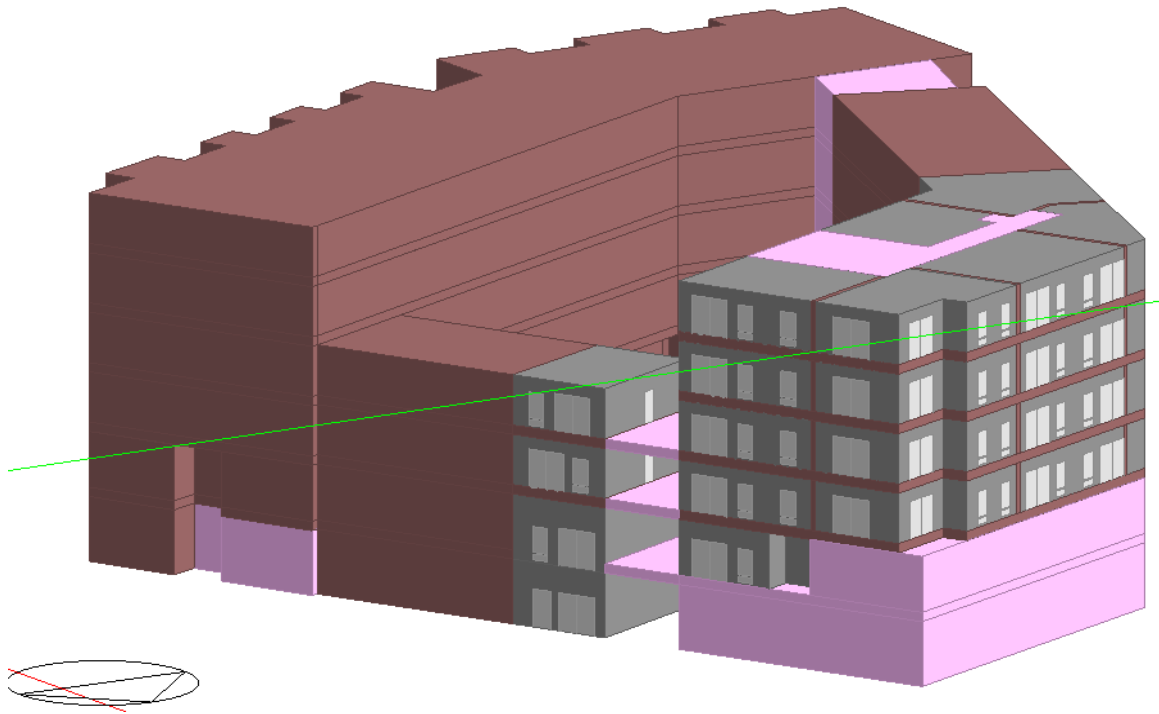
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1.0 DSM Model



The building has been modelled using Design Builder Dynamic Simulation Modelling Software, using the Energy Plus Simulation Engine.

The DSM model can be used to provide:

- Overheating analysis (this report)
- Energy consumption prediction
- Heating and Cooling Load prediction
- Thermal Fluid Dynamics Assessment
- Building Compliance Assessment (Building Regulations Part-L and EPC)

Classification of Overheating

TM59 provides two criteria for assessing comfort and overheating in predominantly naturally ventilated buildings:

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

- (a) For living rooms, kitchens and bedrooms: the number of hours during which ΔT is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent 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).

2.0 Specification for Model

The following information has been used to produce the building model:

Drawing Pack	25021_PL-BE1-### - WD Pack
Weather Data	CIBSE DSY1 - London Gatwick
HVAC	ASHP
Lighting	TM59 default lighting
Infiltration Rate	0.7 ACH
Window Properties	U= 1.2, G= 0.63
Wall U-value	0.12 W/m ² .K
Floor U-value	0.15 W/m ² .K
Roof U-value	0.12 W/m ² .K

Ventilation Strategy

Natural (purge) ventilation is provided by opening windows. The windows are simulated to be opened when a room is occupied and the operative temperature in the room is above 22°C.

Air infiltration through other openings, vents and cracks in the building structure is simulated and included in the natural ventilation rate.

Internal Conditions

Defined by dynamic simulation model as per TM59:2017, Section 6, Table 2:

Adjacent Buildings

Adjacent buildings have not been used in the model.

3.0 Current Building Design

Table of TM59 results by zone

Floor	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
E1X2X1SF	BEDROOM1	1.86	17.5	Pass
E1X2X1SF	BEDROOM2	0.57	14	Pass
E1X2X1SF	BEDROOM3	0.57	12.83	Pass
E1X2X1SF	KITXDINXLIV	1.97	N/A	Pass
E1X3X13F	BEDROOM1	1.85	17.33	Pass
E1X3X13F	BEDROOM2	0.56	13.83	Pass
E1X3X13F	BEDROOM3	0.57	12.83	Pass
E1X3X13F	KITXDINXLIV	2.11	N/A	Pass
E1X4X14F1	BEDROOM1	2.09	16.17	Pass
E1X4X14F1	BEDROOM2	0.62	13.33	Pass
E1X4X14F1	BEDROOM3	0.6	12.33	Pass
E1X4X14F1	KITXDINXLIV	2.33	N/A	Pass
E1X4X14F	BEDROOM1	1.85	17.33	Pass
E1X4X14F	BEDROOM2	0.54	13.67	Pass
E1X4X14F	BEDROOM3	0.53	12.67	Pass
E1X4X14F	KITXDINXLIV	2.13	N/A	Pass
E4X1X18BFF	BEDROOM1	0.18	4.17	Pass
E4X1X18BFF	BEDROOM2	0.51	4.67	Pass
E4X1X18BGF	KITXDIN	1.65	N/A	Pass
E4X1X18BGF	LIVING	1.12	N/A	Pass
E4X1X19FF	BEDROOM1	0.21	8.33	Pass
E4X1X19FF	BEDROOM2	0.24	8.67	Pass
E4X1X19FF	KITXDINXLIV	1.12	N/A	Pass
E4X1X20FF	BEDROOM1	0.23	9.67	Pass
E4X1X20FF	BEDROOM2	0.2	7.33	Pass
E4X1X20FF	KITXDINXLIV	1.23	N/A	Pass
E4X2X18SF	BEDROOM1	0.89	5.67	Pass
E4X2X18SF	BEDROOM2	0.23	7.67	Pass
E4X2X18SF	KITXDINXLIV	2.4	N/A	Pass
E4X2X19SF	BEDROOM1	0.2	10	Pass
E4X2X19SF	BEDROOM2	0.18	8.67	Pass
E4X2X19SF	KITXDINXLIV	1.83	N/A	Pass
E4X2X20SF	BEDROOM1	0.22	10.33	Pass
E4X2X20SF	BEDROOM2	0.18	7.5	Pass
E4X2X20SF	KITXDINXLIV	1.48	N/A	Pass
E4X2X21SF	BEDROOM1	0.37	9.67	Pass
E4X2X21SF	BEDROOM2	0.31	9.5	Pass
E4X2X21SF	KITXDINXLIV	2.59	N/A	Pass
E4X2X22SF	BEDROOM1	0.27	4.33	Pass
E4X2X22SF	BEDROOM2	0.17	9.33	Pass
E4X2X22SF	BEDROOM3	0.18	8.33	Pass

E4X2X22SF	KITXDINXLIV	0.96	N/A	Pass
E4X2X23SF	BEDROOM1	0.38	12.17	Pass
E4X2X23SF	KITXDINXLIV	2.31	N/A	Pass
E4X3X183F	BEDROOM1	1.36	5.83	Pass
E4X3X183F	BEDROOM2	0.36	8.33	Pass
E4X3X183F	KITXDINXLIV	2.31	N/A	Pass
E4X3X193F	BEDROOM1	0.2	9.83	Pass
E4X3X193F	BEDROOM2	0.18	8.67	Pass
E4X3X193F	KITXDINXLIV	1.74	N/A	Pass
E4X3X203F	BEDROOM1	0.21	10.5	Pass
E4X3X203F	BEDROOM2	0.19	8.83	Pass
E4X3X203F	KITXDINXLIV	1.37	N/A	Pass
E4X3X213F	BEDROOM1	2.21	21.56	Pass
E4X3X213F	BEDROOM2	0.29	11.33	Pass
E4X3X213F	KITXDINXLIV	2.62	N/A	Pass
E4X3X223F	BEDROOM1	0.27	4.17	Pass
E4X3X223F	BEDROOM2	0.17	9.33	Pass
E4X3X223F	BEDROOM3	0.18	8.5	Pass
E4X3X223F	KITXDINXLIV	0.96	N/A	Pass
E4X3X233F	BEDROOM1	0.38	12.17	Pass
E4X3X233F	KITXDINXLIV	2.62	N/A	Pass
E4X4X194F1	BEDROOM1	0.2	9.33	Pass
E4X4X194F1	BEDROOM2	0.18	8.17	Pass
E4X4X194F1	KITXDINXLIV	1.63	N/A	Pass
E4X4X194F	BEDROOM1	0.2	9.67	Pass
E4X4X194F	BEDROOM2	0.18	8.5	Pass
E4X4X194F	KITXDINXLIV	1.76	N/A	Pass
E4X4X204F1	BEDROOM1	0.37	10.67	Pass
E4X4X204F1	BEDROOM2	0.2	9.17	Pass
E4X4X204F1	KITXDINXLIV	1.56	N/A	Pass
E4X4X204F	BEDROOM1	0.21	10.67	Pass
E4X4X204F	BEDROOM2	0.19	9	Pass
E4X4X204F	KITXDINXLIV	1.42	N/A	Pass
E4X4X214F1	BEDROOM1	0.28	9	Pass
E4X4X214F1	BEDROOM2	0.25	8.17	Pass
E4X4X214F1	KITXDINXLIV	2.22	N/A	Pass
E4X4X214F	BEDROOM1	0.2	9.33	Pass
E4X4X214F	BEDROOM2	0.18	8.67	Pass
E4X4X214F	KITXDINXLIV	2.21	N/A	Pass
E4X4X224F1	BEDROOM1	0.44	4.5	Pass
E4X4X224F1	BEDROOM2	0.19	10	Pass
E4X4X224F1	BEDROOM3	0.26	9.17	Pass
E4X4X224F1	KITXDINXLIV	1.19	N/A	Pass
E4X4X224F	BEDROOM1	0.27	4	Pass
E4X4X224F	BEDROOM2	0.17	9.33	Pass

E4X4X224F	BEDROOM3	0.18	8.33	Pass
E4X4X224F	KITXDINXLIV	0.96	N/A	Pass
E4X4X234F1	BEDROOM1	0.43	11.83	Pass
E4X4X234F1	KITXDINXLIV	1.19	N/A	Pass
E4X4X234F	BEDROOM1	0.37	12	Pass
E4X4X234F	KITXDINXLIV	2.22	N/A	Pass

Table 1: Simulation results of model measured against TM59 criteria in applicable areas.

4.0 Conclusion

The development has been assessed using the TM59 methodology outlined by CIBSE. The results indicated no significant risk of overheating in any of the applicable areas based on the current design specification, indicating compliance with part O. Table 1 above gives details on compliance in individual zones.