PHPP Addendum

Essex Net Zero Specifications

September 2025

Introba Levitt Bernstein People.Design Etude Currie & Bro

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1.0 Executive Summary

The Essex Climate Action Commission have commissioned Introba, Levitt Bernstein, Etude and Currie & Brown to develop the Essex Net Zero Specifications Guide (ENZS Guide) for six different residential typologies. For each typology fabric specifications and heating system options have been presented.

This report demonstrates that the specifications presented in ENZS Guide meet the '*Operational Energy & Carbon (Net Zero) – Planning Policy Statement (2025)*' requirements for space heating demand and energy use intensity. Predictive energy modelling using PHPP software was undertaken for the six domestic typologies, with the fabric and systems specifications listed on Page 5, and space heating demand and energy use intensity results have been presented on pages 6 and 7 respectively.

It must be noted that not all the specifications presented in the ENZS Guide have been tested, only sample specifications have been selected for the purpose of this exercise. Furthermore, the specifications on Page 5 and the ENZS Guide do not guarantee that the space heating demand and energy use intensity limits are met for any typology, as there are other factors that influence these, such as form factor, orientation and glazing ratios.

2.0 PHPP Energy modelling specifications

The following table summarises the different fabric and systems specifications modelled.

Domestic Developments		Unit	Block of Flats Low Rise	Block of Flats Mid Rise	Block of Flats High Rise	Terrace Block	Semi-Detached House	Bungalow
Space Heating Demand		kWh/m²/year	15.0	10.9	7.4	14.9	15.0	20.0
Energy Use Intensity		kWh/m²/year	28.4	30.6	26.3	25.5	31.1	31.3
Form Factor		-	2.43	1.33	0.84	2.58	2.76	4.33
Window Proportions		N E S W	6% 13% 18% 11%	22% 18% 20% 12%	18% 18% 27% 19%	20% 6% 18% 6%	0% 18% 0% 15%	11% 7% 28% 14%
PHPP Climate Data Set		-	GB0002b-Bedford					
Fabric	Floor U-value (SAP)	W/m²K	0.08	0.10	0.10	0.08	0.08	0.08
	Floor U-value (PHPP)	W/m²K	0.09	0.13	0.12	0.09	0.09	0.09
	External Wall U-value	W/m²K	0.12	0.15	0.15	0.12	0.12	0.12
	Roof U-value	W/m²K	0.10	0.10	0.10	0.10	0.10	0.10
	Windows average U-value	W/m²K	0.80	0.80	0.80	0.80	0.80	0.80
	Windows G-value	W/m²K	0.50	0.50	0.50	0.50	0.50	0.50
	External doors U-value	W/m²K	1.10	1.10	1.10	1.10	1.10	1.10
	Thermal bridging (PHPP)	kWh/m²/yr	3	4	4	3	2	2
	Airtightness	ACH	0.60	0.48	0.28	0.60	0.60	0.60
	Air permeability	m³/m²h	0.747	1	1	0.67	0.59	0.42
Systems	MVHR heat recovery efficiency	%	90%	90%	90%	90%	90%	90%
	MVHR specific fan power (SAP)	W/l/s	0.85	0.85	0.85	0.85	0.85	0.85
	MVHR specific fan power (PHPP)	Wh/m³	0.3	0.3	0.3	0.3	0.3	0.3
	Average duct length	m	2	2	2	2	2	2
	External duct insulation	mm	30	25	25	25	25	25
	Duct insulation conductivity	W/mK	0.04	0.04	0.04	0.04	0.04	0.04
	Space heating system	-	Individual ASHP	Communal ASHP	Communal ASHP	Individual ASHP	Individual ASHP	Individual ASHP
	Space heating efficiency	%	190%	190%	190%	270%	270%	270%
	DHW system	-	Individual ASHP	Instantaneous through HIU	Instantaneous through HIU	Individual ASHP	Individual ASHP	Individual ASHP
	DHW efficiency	%	210%	210%	210%	210%	210%	210%

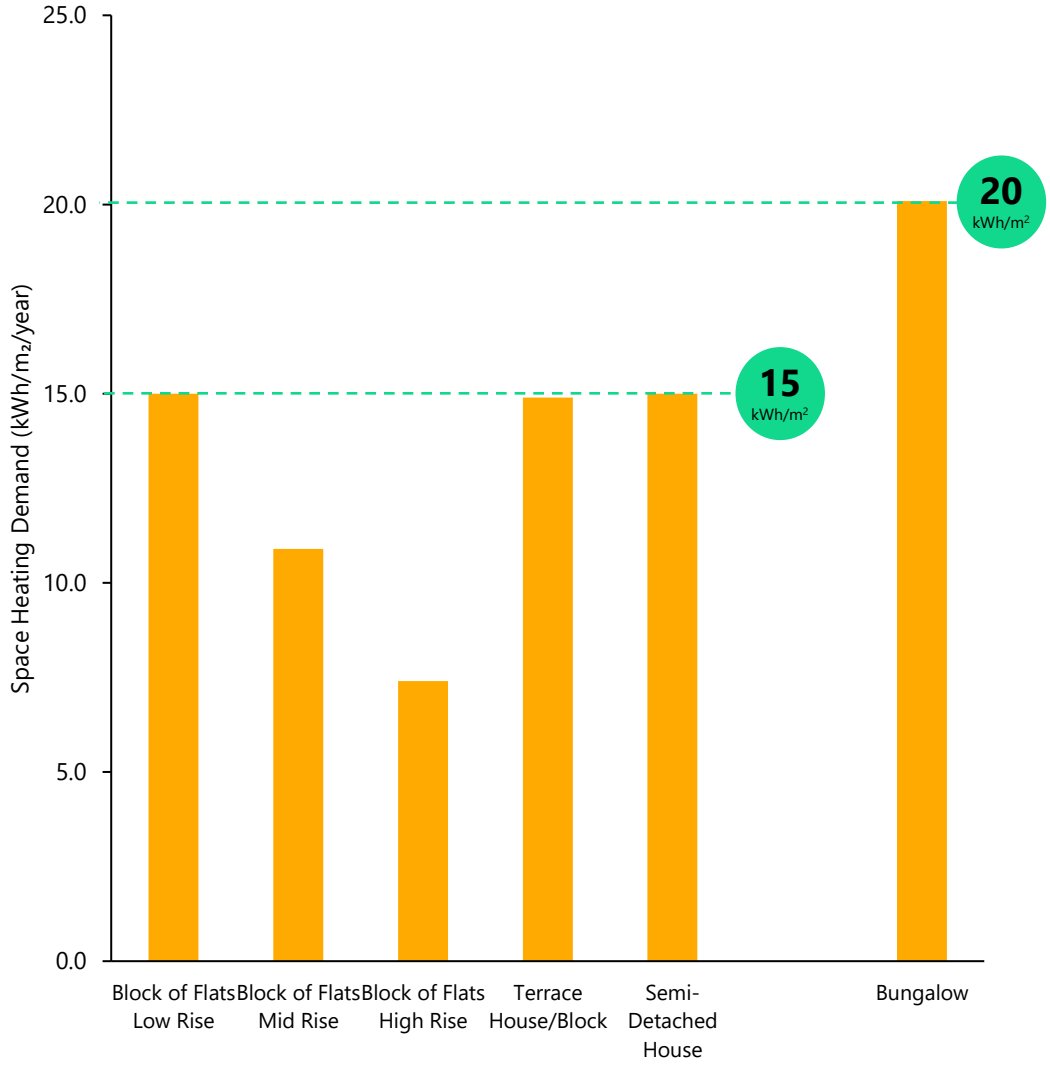
3.0 PHPP Energy Modelling Results | Space Heating Demand (kWh/m²/year)

Requirement 1 of the Net Zero policy requires:

- all dwellings, apart from bungalows, to achieve a space heating demand of less than **15 kWh/m²/year**.
- all bungalows, to achieve a space heating demand of less than **20 kWh/m²/year**.

Predictive energy modelling using PHPP software was undertaken for the six domestic typologies with the fabric and systems specifications listed on Page 5.

The graph shows the space heating demand results for the different typologies, demonstrating that all the dwellings meet the proposed space heating demand limit.



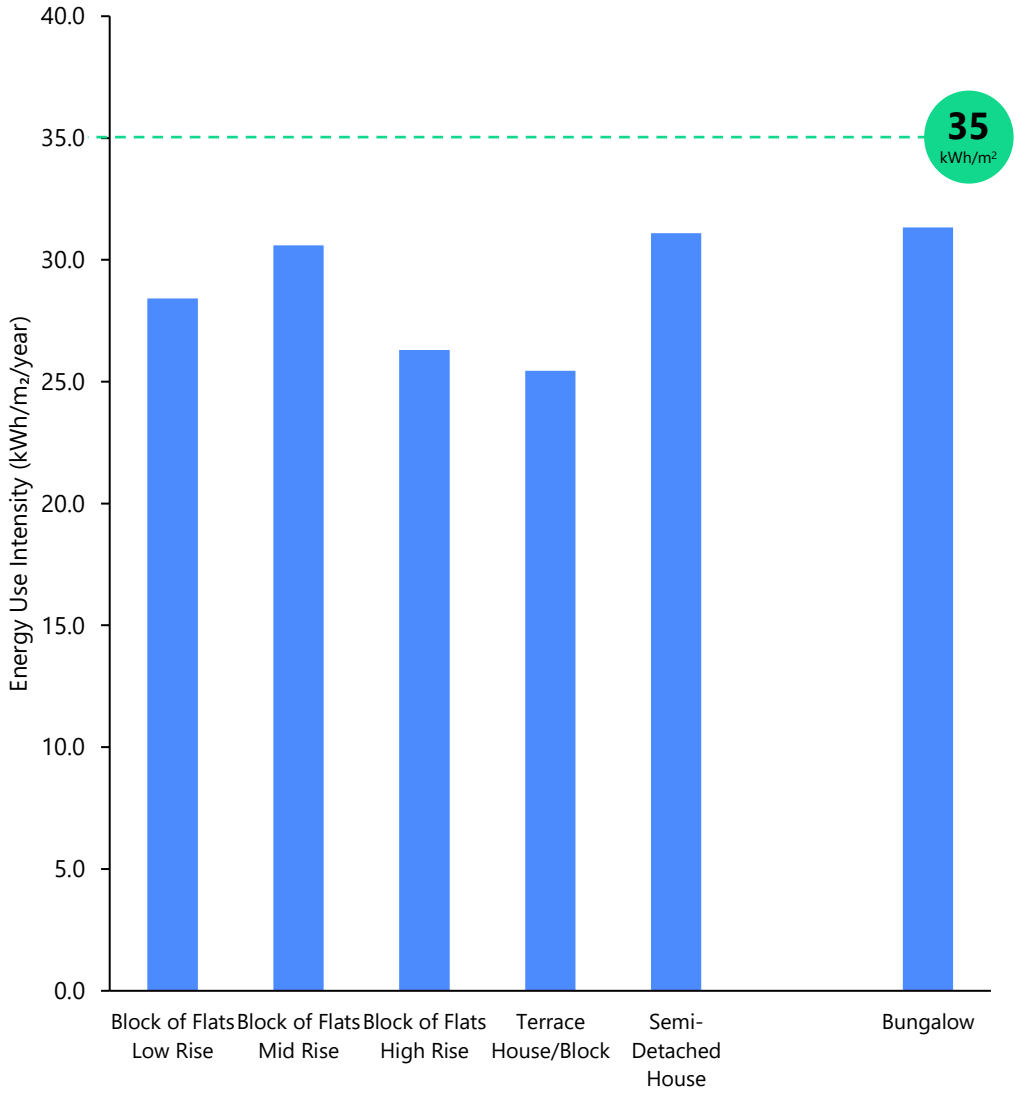
Graph 1: Space heating demand results from PHPP modelling of all the domestic typologies following specifications presented on page 5

4.0 PHPP Energy Modelling Results | Energy Use Intensity (kWh/m²/year)

Requirement 3 of the Net Zero policy requires all dwellings, to achieve an energy use intensity of no more than **35 kWh/m²/year**.

Predictive energy modelling using PHPP software was undertaken for the six domestic typologies with the fabric and systems specifications listed on Page 5.

The graph shows the energy use intensity results for the different typologies, demonstrating that all the dwellings meet the proposed energy use intensity limit.



Graph 2: Energy use intensity results from PHPP modelling of all the domestic typologies following specifications presented on page 5