



elmhurst
energy



SAP Report Submission for Building Regulations Compliance

Client: Henry Ruffle
C/O Ian Smillie Architects

Project: Proposed and existing u-values
Tye Barn Cottage/ Micklemas Barking Tye

Contact: Neil Stallard, c/o Stonham Consultants,
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Report Issue Date:

EXCELLENCE
IN ENERGY
ASSESSMENT

U-VALUE CALCULATOR REPORT

Property Reference	2023/129 barking Tye	Issued on Date	19/12/2023
Assessment Reference		Prop Type Ref	
Project			
Calculation Type	New Build (As Built)		

SAP Rating		DER		TER	
Environmental		% DER<TER			
CO ₂ Emissions (t/year)		DFEE		TFEE	
General Requirements Compliance		% DFEE<TFEE			

Assessor Details	Mr. Neil Stallard, Neil Stallard, Tel: , neilstallard2@hotmail.co.uk	Assessor ID	F053-0001
Client			

Building Elements

Wall existing walls - solid walls

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Render - Cement and Sand				
	Main construction	12	1.0000	0.0120	100.00
Layer 2	Blockwork, medium				
	Main construction	150	0.5700	0.2632	93.43
	Main construction	150	0.8803	0.1704	6.57
Layer 3	Render - Cement and Sand				
	Main construction	15	1.0000	0.0150	100.00
Layer 4	Plaster, standard				
	Main construction	4	0.4000	0.0100	100.00
Int surface				0.1300	

Total resistance: Upper limit = 0.463 m² K/W Lower limit = 0.461 m² K/W Average = 0.462 m² K/W
 Total correction = 0.0000 m² K/W U-value (unrounded) = 2.17 W/m² K

Unheated space: None

Total thickness: 181 mm

U-value: 2.17 W/m² K

Kappa: n/a

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Building Elements

Floor existing floor - floor - slab-on-ground floor

Floor Type: Slab On Ground Floor

Area = 68.00 m², Perimeter = 33.60 m, Wall thickness = 200.00 mm, Soil: Clay

Horizontal edge insulation: none

Vertical edge insulation: none

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Screed				
	Main construction	50	1.1500	0.0435	100.00
Layer 2	Concrete, medium density				
	Main construction	100	1.3500	0.0741	100.00
Int surface				0.1700	

Total resistance: Upper limit = 0.118 m² K/W Lower limit = 0.118 m² K/W Average = 0.118 m² K/W
 Total correction = 0.0000 m² K/W U-value (unrounded) = 0.66 W/m² K

Unheated space: None

Total thickness: 150 mm

U-value: 0.66 W/m² K

Kappa: n/a

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Building Elements

Roof existing loft - Pitched roof - insulated at ceiling

Roof Type: Pitched Roof, insulated flat ceiling

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Roof space				
	Main construction	0	0.0000	0.0000	100.00
Layer 2	Mineral wool quilt				
	Main construction	50	0.0440	1.1364	92.17
	Main construction	50	0.1300	0.3846	7.83
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Layer 4	Plaster, standard				
	Main construction	4	0.4000	0.0100	100.00
Int surface				0.1000	

Total resistance: Upper limit = 1.225 m² K/W Lower limit = 1.195 m² K/W Average = 1.210 m² K/W
 Total correction = 0.0066 m² K/W U-value (unrounded) = 0.83 W/m² K

Unheated space: None

Total thickness: 67 mm

U-value: 0.83 W/m² K

Kappa: n/a

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Building Elements

Wall proposed main walls - Masonry wall full cavity fill-slabs

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Render - Cement and Sand				
	Main construction	15	1.0000	0.0150	100.00
Layer 2	FIBO 800 External				
	Main construction	100	0.3800	0.2632	93.43
	Main construction	100	0.8803	0.1136	6.57
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	Earthwool Dritherm 34 Super				
	Main construction	150	0.0340	4.4118	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 4	Thermalite Shield				
	Main construction	100	0.1500	0.6667	93.43
	Main construction	100	0.8803	0.1136	6.57
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 5	airspace/plaster dabs				
	Main construction	15	0.0882	0.1700	80.00
	Main construction	15	0.0882	0.1700	20.00
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 6	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Layer 7	Plaster, standard				
	Main construction	5	0.4000	0.0125	100.00
Int surface				0.1300	

Total resistance: Upper limit = 5.719 m² K/W Lower limit = 5.586 m² K/W Average = 5.652 m² K/W
 Total correction = 0.0062 m² K/W U-value (unrounded) = 0.18 W/m² K

Unheated space: None

Total thickness: 398 mm

U-value: 0.18 W/m² K

Kappa: n/a

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Building Elements

Wall dormers - Timber framed insulation between studs

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Render - Cement and Sand				
	Main construction	15	1.0000	0.0150	100.00
Layer 2	airspace/timber battens				
	Main construction	22	0.1222	0.1800	89.63
	Main construction	22	0.1243	0.1770	10.37
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 3	Breather membrane				
	Main construction	1	0.0000	0.0000	100.00
Layer 4	Orientated Strand Board				
	Main construction	12.5	0.1300	0.0962	100.00
Layer 5	insulation/timber frame				
	Main construction	100	0.0220	4.5455	88.25
	Main construction	100	0.1200	0.8333	11.75
	Corrections - Air Gap: Level 0, Fasteners: None or plastic				
Layer 6	Celotex TB3000				
	Main construction	25	0.0230	1.0870	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 7	Vapour control layer				
	Main construction	1	0.0000	0.0000	100.00
Layer 8	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Int surface				0.1300	

Total resistance: Upper limit = 5.220 m² K/W Lower limit = 4.591 m² K/W Average = 4.905 m² K/W
 Total correction = 0.0005 m² K/W U-value (unrounded) = 0.2 W/m² K

Unheated space: None

Total thickness: 189 mm

U-value: 0.20 W/m² K

Kappa: n/a

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Building Elements

Floor new floor - Floor - suspended beam-and-block floor

Floor Type: Suspended Floor

Area = 81.90 m², Perimeter = 43.40 m, Wall thickness = 350.00 mm, Soil: Clay

Depth of underfloor space below ground:0.200 m Floor wind shielding: Average (suburban)

Floor height above ground:h = 0.000 m

U-value of walls above ground:U_w = 1.500 m

Ventilation openings per perimeter length:e = 0.0015 %

Mean wind speed:v = 5.000 m/s

Resistance on solum:R_g = 0.000 m²K/W

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.1700	
Layer 1	AAC (600 kg/m3)/ concrete				
	Main construction	150	0.1800	0.8333	86.30
	Main construction	150	1.3500	0.1111	13.70
Layer 2	Celotex XR4000				
	Main construction	150	0.0220	6.8182	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	Screed				
	Main construction	75	1.1500	0.0652	100.00
Int surface				0.1700	

Total resistance: Upper limit = 7.949 m² K/W Lower limit = 7.664 m² K/W Average = 7.807 m² K/W

Total correction = 0.0076 m² K/W

U-value (unrounded) = 0.11 W/m² K

Unheated space: None

Total thickness: 375 mm

U-value: 0.11 W/m² K

Kappa: n/a

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Building Elements

Roof new roof loftspace - Pitched roof - insulated at ceiling

Roof Type: Pitched Roof, insulated flat ceiling

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Roof space				
	Main construction	0	0.0000	0.0000	100.00
Layer 2	Earthwool Loft Roll 44				
	Main construction	200	0.0440	4.5455	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 3	Earthwool Loft Roll 44				
	Main construction	200	0.0440	4.5455	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 4	Plasterboard, standard				
	Main construction	12.5	0.2100	0.0595	100.00
Layer 5	Plaster, standard				
	Main construction	4	0.4000	0.0100	100.00
Int surface				0.1000	

Total resistance: Upper limit = 9.300 m² K/W Lower limit = 9.300 m² K/W Average = 9.300 m² K/W
 Total correction = 0.0048 m² K/W U-value (unrounded) = 0.11 W/m² K

Unheated space: None

Total thickness: 417 mm

U-value: 0.11 W/m² K

Kappa: n/a

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Environmental		% DER<TER		
CO ₂ Emissions (t/year)		DFEE		TFEE
General Requirements Compliance		% DFEE<TFEE		
Assessor Details	Mr. Neil Stallard, Neil Stallard, Tel: , neilstallard2@hotmail.co.uk		Assessor ID	F053-0001
Client				

Building Elements

Roof new vaulted areas - pitched roof - insulated slope, sloping

Roof Type: Pitched Roof, insulated sloping ceiling

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)
Ext surface				0.0400	
Layer 1	Tiles, clay				
	Main construction	15	1.0000	0.0150	100.00
Layer 2	Air layer ventilated				
	Main construction	25	0.2500	0.1000	100.00
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 3	Sarking Felt				
	Main construction	1	0.2300	0.0043	100.00
Layer 4	Air layer ventilated				
	Main construction	50	0.5000	0.1000	100.00
	Corrections - Cavity Unventilated, Emissivity: Normal				
Layer 5	Xtratherm Safe R SR/PR (>100mm)				
	Main construction	150	0.0200	7.5000	88.25
	Main construction	150	0.1300	1.1538	11.75
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 6	Xtratherm Thin-R XT/PR				
	Main construction	30	0.0220	1.3636	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 7	Gyproc Wallboard (12.5mm)				
	Main construction	12.5	0.1900	0.0658	100.00
	Corrections - Air Gap: Level 1, Fasteners: None or plastic				
Layer 8	Plaster, standard				
	Main construction	4	0.4000	0.0100	100.00
Int surface				0.1000	

Total resistance: Upper limit = 7.424 m² K/W Lower limit = 6.355 m² K/W Average = 6.889 m² K/W
 Total correction = 0.0048 m² K/W U-value (unrounded) = 0.15 W/m² K

Unheated space: None

Total thickness: 288 mm

U-value: 0.15 W/m² K

Kappa: n/a