

East Worlington Parish Hall – Foyer Extension

Date: Dec 2018 – Revision 0

Supporting Notes & Calculations for Building Regulation Application

1 Approved Document Part L2B

Design standards from Tables 3, 4 and 5:-

| | <u>Standard</u> | <u>As Designed</u> |
|------------------------------------|---------------------------|----------------------------------|
| External Walls | = 0.28 W/m ² K | 0.22 W/m ² K |
| Pitched Roof (Rafter level) | = 0.18 W/m ² K | 0.18 W/m ² K |
| Ground floor | = 0.22 W/m ² K | 0.20 W/m ² K |
| Controlled Fitting - Roof window | = 1.8 W/m ² K | 1.3 W/m ² K |
| Controlled Fitting – Entrance Door | = 3.5 W/m ² K | 3.0 W/m ² K (Typical) |

As Designed

Calculation 1 – External Wall

See Ecotherm U-value Calculation

Calculation 2 – Ground Floor

Calculated with BRE U-value Calculator version 2.04a

Element type: Floor - Slab-on-ground floor

Calculation Method: BS EN ISO 6946

Thermal resistance of floor construction:

| <u>Layer</u> | <u>d (mm)</u> | <u>□ layer</u> | <u>□ bridge</u> | <u>Fraction</u> | <u>R layer</u> | <u>R bridge</u> | <u>Description</u> |
|--------------|---------------|----------------|-----------------|-----------------|----------------|-----------------|----------------------|
| | | | | | 0.170 | | Rsi |
| 1 | 75 | 1.150 | | | 0.065 | | Concrete screed |
| 2 | 75 | 0.022 | | | 3.409 | | Insulation |
| 3 | 150 | 1.701 | | | 0.088 | | Concrete Slab |
| 4 | | | | | | | Vapour control layer |
| 5 | 50 | | | | | | Sand blinding |
| 6 | 150 | | | | | | Hardcore |
| 7 | | | | | | | Rse |
| | <u>500 mm</u> | | | | | 3.732 | |

Total resistance: Upper limit: 3.732 Lower limit: 3.732 Ratio: 1.000 Average: 3.732 m²K/W

Ground parameters:

Perimeter P: 16.63 m
Area A: 29.66 m²
P/A: 0.561

Wall thickness: 325 mm
Ground type: Clay/silt (□ = 1.5 W/m·K)
Rse: 0.04 m²K/W

U-value 0.197
U-value (rounded) 0.20 W/m²K

Calculation 3 - Roof

Calculated with BRE U-value Calculator version 2.04a

Element type: Roof - Pitched roof - insulated slope, sloping ceiling

Calculation Method: BS EN ISO 6946

| Layer | d (mm) | Σ layer | Σ bridge | Fraction | R layer | R bridge | Description |
|-------|---------------|------------------------|-----------------|----------|--------------|----------|----------------------------|
| | | | | | 0.100 | | Rsi |
| 1 | 12.5 | 0.210 | | | 0.060 | | Plasterboard |
| 2 | 55 | 0.022 | | | 2.500 | | Insulation below rafters |
| 3 | 100 | 0.022 | 0.130 | 0.190 | 4.545 | 0.769 | Insulation board / rafters |
| 4 | 25 | R-value | | | 0.160 | | Air layer unventilated |
| 5 | 1 | 0.230 | | | 0.004 | | Sarking Felt |
| 6 | 5 | 1.000 | | | 0.005 | | Slates |
| | | | | | <u>0.040</u> | | Rse |
| | <u>199 mm</u> | (total roof thickness) | | | 7.414 | | |

Total resistance: Upper limit: 6.193 Lower limit: 5.221 Ratio: 1.186 Average: 5.707 m²K/W

U-value (uncorrected) 0.175

U-value corrections

Air gaps in layer 3 $\Sigma U = 0.004$ (Level 1)

No fixings in layer 3

Total ΣU 0.004

U-value (corrected) 0.179

U-value (rounded) 0.18 W/m²K