

U Value Calculations for 49 Corporation Street

1. External walls

Build – up:

- 15mm plaster
- 250mm brickwork
- 100mm EPS 200
- 6mm Render

U Value = 0.28w/m2K

Construction - U value
Upper limit
Lower limit

Select element External wall ▼

External surface resistance 0.04 m2K/W

Internal surface resistance 0.13 m2K/W

Number of layers 4 ▼

Material selector General Materials - Surf ▼ Add to layer

Bridged material

Bridging material

4 ▼

Add

U value

0.28 W/m2K

Upper limit resistance 3.5193 m2K/W

Lower limit resistance 3.5193 m2K/W

Corrections 0.0000 W/m2K

Layers	Material	Thermal conductivity (W/mK)	Thickness (mm)	Thermal resistance (m2K/W)	Bridged layer	Corrections
Layer 1	Standard Gyps	0.21	15	0.0714	<input type="checkbox"/>	<input type="checkbox"/>
Layer 2	Brickwork	0.77	250	0.3247	<input type="checkbox"/>	<input type="checkbox"/>
Layer 3	EPS 200 (30 kg	0.034	100	2.9412	<input type="checkbox"/>	<input type="checkbox"/>
Layer 4	Plaster (dense)	0.5	6	0.0120	<input type="checkbox"/>	<input type="checkbox"/>

2. Partitions

Build-up:

- 12.5mm plaster board
- Nominal 75mm metal stud @600c/c
- 12.5mm plaster board

U Value=1.77w/m2K

Select element **External wall** ▼

External surface resistance **0.04** m2K/W

Internal surface resistance **0.13** m2K/W

Number of layers **3** ▼

Material selector **General Materials - Met** ▼ Add to layer

Bridged material Bridging material **2** ▼ Add

U value

1.77 W/m2K

Upper limit resistance 0.7189 m2K/W

Lower limit resistance 0.4120 m2K/W

Corrections 0.0000 W/m2K

Layers	Material	Thermal conductivity (W/mK)	Thickness (mm)	Thermal resistance (m2K/W)	Bridged layer	Corrections
Layer 1	Standard Gypsi	0.21	12.5	0.0595	<input type="checkbox"/>	<input type="checkbox"/>
Layer 2	100 mm Cavity	0.54625	250	0.1230	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Bridged by 2.5 % of	Steel	60				
Layer 3	Standard Gypsi	0.21	12.5	0.0595	<input type="checkbox"/>	<input type="checkbox"/>

3. Roof

Build-up:

- Felt/membrane
- 120mm Phenolic insulation
- VCL
- 18mm ply deck
- Nominal 175mm joists @600c/c
- 15mm plasterboard & skim

U Value = 0.16w/m2K

Select element **External roof** ▼

External surface resistance **0.04** m2K/W

Internal surface resistance **0.1** m2K/W

Number of layers **6** ▼

Material selector **General Materials - Gyp** ▼ Add to layer

Bridged material
 Bridging material
 6 ▼
Add

U value

0.16 W/m2K

Upper limit resistance 6.3307 m2K/W




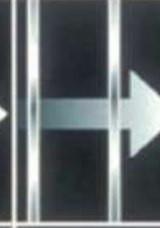


Lower limit resistance 6.1859 m2K/W

Corrections 0.0000 W/m2K

Layers	Material	Thermal conductivity (W/mK)	Thickness (mm)	Thermal resistance (m2K/W)	Bridged layer	Corrections
Layer 1	Felt/sheet	0.23	2	0.0087	<input type="checkbox"/>	<input type="checkbox"/>
Layer 2	Phenolic foam	0.021	120	5.7143	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Layer 3	Polyethylene, l	0.33	1	0.0030	<input type="checkbox"/>	<input type="checkbox"/>
Layer 4	Plywood (500 k	0.13	18	0.1385	<input type="checkbox"/>	<input type="checkbox"/>
Layer 5	300 mm Cavity	1.84876	175	0.1100	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Bridged by 15 % of	Timber (500 kg	0.13				
Layer 6	Standard Gypsi	0.21	15	0.0714	<input type="checkbox"/>	<input type="checkbox"/>

4. Existing windows

Impossible to tell without thorough examination/testing. Likely U value for old double glazed units in excess of 2.8w/m²K

Single-glazed	Double-glazed 12 mm gap	Double-glazed Low E	Secondary glazing 100 mm gap	Single-glazed + curtains	Single-glazed + night shutters
					
U ~ 4.8	U ~ 2.8	U ~ 2.0	U ~ 3.8	U ~ 3.7 *	U ~ 3.0 *

This table from *Building Regulations and Historic Buildings (2)* shows that significant improvements to thermal performance can be gained from benign improvements such as using blinds, heavy lined curtains and shutters. Draughtproofing and secondary-glazing can now give U-values which meet the target in the Approved Documents.

5. Floor

Assumed upgrade of existing concrete floor slab perimeter/area ratio 0.5:

Build up:

- 65mm sand & cement screed
- 50mm phenolic insulation
- 150mm concrete slab (assumed)

U Value = 0.23w/m2K

The screenshot displays a web-based calculation tool for U-values. The interface is split into two main sections: a control panel on the left and a results panel on the right.

Control Panel (Left):

- Calculations** (Section Header)
- Construction type:** Buttons for Floors, Walls, Pitched Roof, and Flat Roof. 'Floors' is selected.
- Floor Type:** Dropdown menu set to 'Ground floor'.
- Floor Sub-Type:** Dropdown menu set to 'Solid concrete - Insulation below screed'.
- PA Ratio:** Dropdown menu set to '0.5'.
- Insulation Thickness:** A slider control with markers for 45mm, 50mm, and 60mm. The value is currently set to 50mm.
- Footer:** A checkbox labeled 'Tick here if you would like to receive the BIM Object for this construction build-up.' and an 'EMAIL ME THIS' button.

Results Panel (Right):

- U-value:** Large display showing '0.23' with the unit 'W/m²·K' below it.
- Range:** A horizontal slider showing a range from 0.09 to 0.25, with the current value at 0.23.
- Product:** 'Kingspan Kooltherm K103 Floorboard' is listed.
- Build-up Details:** A list titled 'Construction build-up includes:' containing:
 - 65mm screed
 - separation layer
 - Kingspan Kooltherm K103 Floor Board
 - 150mm concrete slab
 - damp proof membrane
 - hardcore.
- Link:** 'Click here to view construction build-up' with an external link icon.
- Footer:** 'See website for more details' with an external link icon.