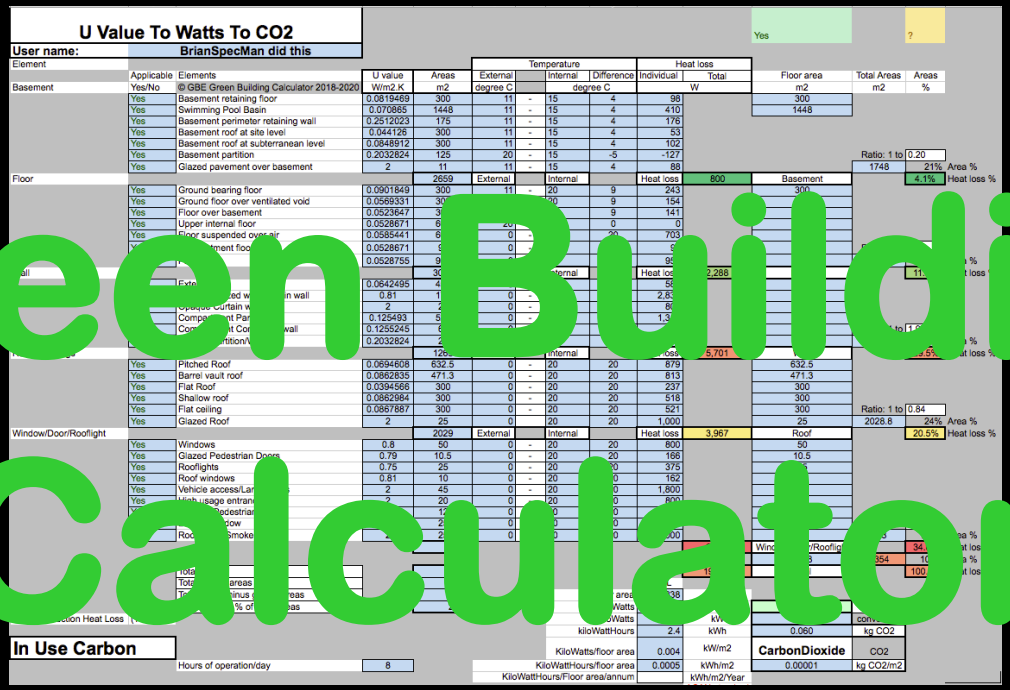
GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk



U Value To Watts To CO2

User name: BrianSpecMan did this

Element	Applicable	Elements	U value	Areas	External		Internal	Difference	Heat loss Individual	Heat loss Total	Floor area	Total Areas	Areas
	Yes/No	© GBE Green Building Calculator 2018-2020	W/m2 K	m2	degree C		degree C		W		m2	m2	%
Basement	Yes	Basement retaining floor	0.0819469	300	11	-	15	4	98		300		
	Yes	Swimming Pool Basin	0.070865	1448	11	-	15	4	410		1448		
	Yes	Basement perimeter retaining wall	0.2512023	175	11	-	15	4	176				
	Yes	Basement roof at site level	0.044126	300	11	-	15	4	53				
	Yes	Basement roof at subterranean level	0.0848912	300	11	-	15	4	102				
	Yes	Basement partition	0.2032824	125	20	-	15	-5	-127			Ratio: 1 to	0.20
	Yes	Glazed pavement over basement	2	11	11	-	15	4	88			1748	21% Area %
Floor				2659	External		Internal		Heat loss	800	Basement		4.1% Heat loss %
	Yes	Ground bearing floor	0.0901849	300	11	-	20	9	243		300		
	Yes	Ground floor over ventilated void	0.0569331	30			20	9	154				
	Yes	Floor over basement	0.0523647	3				9	141				
	Yes	Upper internal floor	0.0528671	8				0	0				
	Yes	Floor suspended over air	0.0585441	8	0	-			703				
		tment floo	0.0528671	9	0	-			9				
			0.0528755	9					95				%
all				30			Internal		Heat loss	2,288			11 t loss
		Extr	0.0642495	4					5				
		ed w in wall	0.81	1	0	-			2,8				
		Opaque Curtain w	2	2	0	-			8				
		Compa nt Par	0.125493	5	0	-			1,3				
		Con t Co wall	0.1255245	6								1 to 1.8	
		tition/	0.2032824	2									%
				126			Internal			5,701			9.5% t loss %
	Yes	Pitched Roof	0.0694608	632.5	0	-	20	20	879		632.5		
	Yes	Barrel vault roof	0.0862835	471.3	0	-	20	20	813		471.3		
	Yes	Flat Roof	0.0394566	300	0	-	20	20	237		300		
	Yes	Shallow roof	0.0862984	300	0	-	20	20	518		300		
	Yes	Flat ceiling	0.0867887	300	0	-	20	20	521		300	Ratio: 1 to	0.84
	Yes	Glazed Roof	2	25	0		20	20	1,000		25	2028.8	24% Area %
Window/Door/Rooflight				2029	External		Internal		Heat loss	3,967	Roof		20.5% Heat loss %
	Yes	Windows	0.8	50	0	-	20	20	800		50		
	Yes	Glazed Pedestrian Doors	0.79	10.5	0	-	20	20	166		10.5		
	Yes	Rooflights	0.75	25	0	-	20	20	375				
	Yes	Roof windows	0.81	10	0	-	20	0	162				
	Yes	Vehicle access/Lar	2	45	0	-	20	0	1,800				
	Yes	Mish usage entran	2	20	0	-	20	0	800				
		Pedestrian		1	0		0	0					
		dow		2	0		0	0					
		Roo Smoke	2	2	0		0	0	00			5	a %
											Win y/Roofligh		34 t los
												354	10 a %
										15			100 t los
		Total											
		Tota areas											
		Tra inus eas						area	38				
		% of as						Watts					
tion Heat Loss								Watts		kWh		conv	
							kiloWattHours		2.4	kWh	0.060	kg CO2	
In Use Carbon							KiloWatts/floor area		0.004	kW/m2	CarbonDioxide	CO2	
		Hours of operation/day	8				KiloWattHours/floor area		0.0005	kWh/m2	0.00001	kg CO2/m2	
							KiloWattHours/Floor area/annum			kWh/m2/Year			

Green Building Calculator

© NGS GBE GBC 2011-2020 BrianSpecMan

Today

- STBA & SPAB Online Conference 2020
- Day 1 of 3 Embodied Carbon
- BrianSpecMan Murphy ONC HNC Construction BSc pgDip Architecture
- Title: ‘TargetUValues + Overheating +GreenCostPlan +VE-CC +BIMBoM +BIMBoQ +EE +EC +SC +LCA = GBC’
- GBC = Green Building Calculator
- Not UK GBC

Calculator on GBC:

- Find GBC V1.0.0. file on GBC website at:
- https://GreenBuildingCalculator.uk
  - V0.0.0. Video
  - V1.0.0. Video Soon
  - Shop: XLSX file
    - Different prices for different users
  - GBC and GBE Newsletter: 1st last week
  - Video show: PPTS file
  - Zoom Recording on YouTube

This Presentation on GBE:

- Find this file on GBE website at:
- https://GreenBuildingEncyclopaedia.uk/?p=38491
  - PDF Show: from V0, V1 & V1+ PowerPoint
  - Full version of this presentation (84/227 slides)
  - To be updated after this event
  - Handout/print/read: PDF file to print
  - Shop: PPTX file
  - GBE & GBC Newsletter: 1st last week
  - Video show: PPTS file
  - Zoom Recording on YouTube

Why did I start making GBC?

- I want I want I want….. us all to do better, first time
  - Clients: to get what they asked for not what we gave them
  - Quality Surveyors: to do VE not Cost cutting, WLC not cheap
  - Manufacturers: to provide all important data, multi-functional products
  - Environmental Assessors: to guide designers with facts
  - Building Designers: to do more analysis themselves
  - Tenderers: to price a proper job and aim to claim no extras
  - BIM: Do what it claims to be possible in the advertising
  - Advisory Bodies: To be able to give more robust guidance
- To have better information at hand when they make all specification decisions
  - Evidence Based Design
  - Competent as was intended

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

Datasets>Equations>Calculators>Apps

- Data is okay, not much use on its own
  - Up to date and reliable data is essential
  - Consistently ordered data is good
  - Datasets can be orderly, in one place, are better
  - Open datasets are best
  - Datasets do not tell the whole story
- Equations are essential
  - Equations can interrogate the datasets
- Calculators save time
  - Consistently competently join up equations and datasets together
  - Can be readymade and waiting to be used speed the process
  - Accommodate many choices and changes and bring instantaneous results
  - Interrogate many issues at the same time
  - Allow comparison of scenarios
  - Allow value engineering (in its original meaning) not just cost cutting
  - Could be educational, guiding, problem avoiding,
  - Could enable and empower individuals
- CAD BIM App Calculators
  - Save time populating the input cells of the calculator
  - Allow two way flow of information

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

I am reminded to

Be the change you want to see in the world

Mahatma Gandhi

20 years collection of idle information

- 1000s Product Information
  - Product properties from many databases
  - Spreadsheets
  - Specifications
- 892 Elemental Assemblies from GreenSpecStudio
  - Elemental Assemblies to Passivhaus
  - Competent Construction assemblies
  - Specification Generator
- Calculators, Equations

GBE Whole Building Calculators

- Previous GBE Green Building Encyclopaedia
  - Elemental calculator: for a student's office task
  - ICE datasets into Excel for practical comparison
  - Whole Building Calculators:
    - Embodied energy, Embodied Carbon, Sequestered Carbon
    - Energy and CO2 in use
    - Created for Post graduate Architectural students 2015-18
  - Waste Cost® lite: created from SWMP workshops
  - Psi values: created for a manufacturer
- GBE Green Building Calculator
  - https://GreenBuildingCalculator.uk
  - Bring them all together in one place, one file
  - 10th June 2020 Version 1.0.0. Launched
    - 440 hours to assemble V1.0.0.
  - 4-5 months to V2.0.0. (end of October 2020?)
    - 395 hours so far V2.0.0. (835 total so far V1 and V2)
    - Excluding marketing, website and CPD
  - 21 versions planned: >24 months of development?

Desire to drive environmental

- Bio-based Construction
  - Low to negative carbon products and materials
  - CAPEM Partner's know-how
  - LCA know-how and LCA datasets
- Plastics Avoidance
  - Changing Streams plastics avoidance campaign
  - Charm & Accord HA Interreg Project
- Circular economy
  - Recycled content
  - Reclaim and Reuse
  - Reclaimed materials with product passports: BAMB

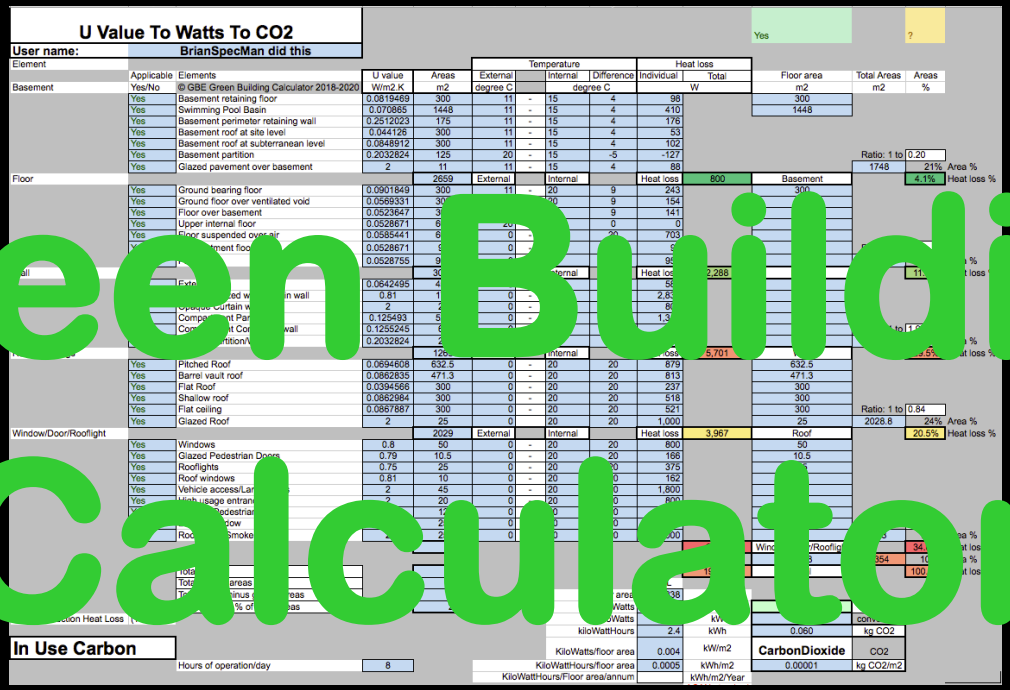
GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk



U Value To Watts To CO2

User name: BrianSpecMan did this

Element	Applicable	Elements	U value	Areas	External		Internal	Difference	Heat loss Individual	Heat loss Total	Floor area	Total Areas	Areas
Basement	Yes/No	© GBE Green Building Calculator 2018-2020	W/m2 K	m2	degree C		degree C		W		m2	m2	%
	Yes	Basement retaining floor	0.0819469	300	11	-	15	4	98		300		
	Yes	Swimming Pool Basin	0.070865	1448	11	-	15	4	410		1448		
	Yes	Basement perimeter retaining wall	0.2512023	175	11	-	15	4	176				
	Yes	Basement roof at site level	0.044126	300	11	-	15	4	53				
	Yes	Basement roof at subterranean level	0.0848912	300	11	-	15	4	102				
	Yes	Basement partition	0.2032824	125	20	-	15	-5	-127			Ratio: 1 to	0.20
	Yes	Glazed pavement over basement	2	11	11	-	15	4	88			1748	21% Area %
Floor				2659	External		Internal		Heat loss	800	Basement		4.1% Heat loss %
	Yes	Ground bearing floor	0.0901849	300	11	-	20	9	243		300		
	Yes	Ground floor over ventilated void	0.0569331	30			20	9	154				
	Yes	Floor over basement	0.0523647	3				9	141				
	Yes	Upper internal floor	0.0528671	8				0	0				
	Yes	Floor suspended over air	0.0585441	8	0	-			703				
	Y	tment floo	0.0528671	9	0	-			9				
			0.0528755	9					95				%
all				30			Internal		Heat los	2,288			11 t loss
		Exte	0.0642495	4					5				
		ed w n wall	0.81	1	0	-			2,8				
		Opaque Curtain w	2	2	0	-			8				
		Compa nt Par	0.125493	5	0	-			1,3				
		Con t Co wall	0.1255245	6								1 to 1.8	
		tition/	0.2032824	2									%
				126			Internal			5,701			9.5% t loss %
	Yes	Pitched Roof	0.0694608	632.5	0	-	20	20	879		632.5		
	Yes	Barrel vault roof	0.0862835	471.3	0	-	20	20	813		471.3		
	Yes	Flat Roof	0.0394566	300	0	-	20	20	237		300		
	Yes	Shallow roof	0.0862984	300	0	-	20	20	518		300		
	Yes	Flat ceiling	0.0867887	300	0	-	20	20	521		300	Ratio: 1 to	0.84
	Yes	Glazed Roof	2	25	0	-	20	20	1,000		25	2028.8	24% Area %
Window/Door/Rooflight				2029	External		Internal		Heat loss	3,967	Roof		20.5% Heat loss %
	Yes	Windows	0.8	50	0	-	20	20	800		50		
	Yes	Glazed Pedestrian Doors	0.79	10.5	0	-	20	20	166		10.5		
	Yes	Rooflights	0.75	25	0	-	20	20	375				
	Yes	Roof windows	0.81	10	0	-	20	0	162				
	Yes	Vehicle access/Lar	2	45	0	-	20	0	1,800				
	Yes	Mish usage entran	2	20	0	-	20	0	800				
	Y	edestrian		1	0		0	0					
		dow		2	0		0	0					
		Roo Smoke	2	2	0		0	0	00			5	a %
											Win y/Roofligh		34 t los
												354	10 a %
										15			100 t los
		Tota areas											
		Tot inus eas						area	38				
		% of as						Watts					
tion Heat Loss								oWatts		kWh		conv	
								kiloWattHours	2.4	kWh	0.060	kg CO2	
In Use Carbon							KiloWatts/floor area		0.004	kW/m2	CarbonDioxide	CO2	
		Hours of operation/day	8				KiloWattHours/floor area		0.0005	kWh/m2	0.00001	kg CO2/m2	
							KiloWattHours/Floor area/annum			kWh/m2/Year			

Green Building Calculator

Executive Summary

V1.0.0. launched June 2020

Quantities:

- No. Buildings
- No. Floors
- Dimensions V1 (Metric)
- Areas & Multiple sizes
- Scope & Volumes
- Hours/Day Room By Room
- Temperatures Inside Outside Ground Room By Room

Set Targets: U values:

- Form Factor
- Regulations UK & Int New / Exiting
- Design Standards: New: PH, CL, Existing: CLR, EnerPHit
- Insulation Material k value U value Thicknesses
- Room By Room Calculator
- Size UFH or Rads or Source

V1 Elemental Assemblies: 36

- Functional Components
- Materials
- Products
- Conductivity
- Resistivity
- Thicknesses
- R values
- U values
- Targets Differences
- Pass/Fail Adjust

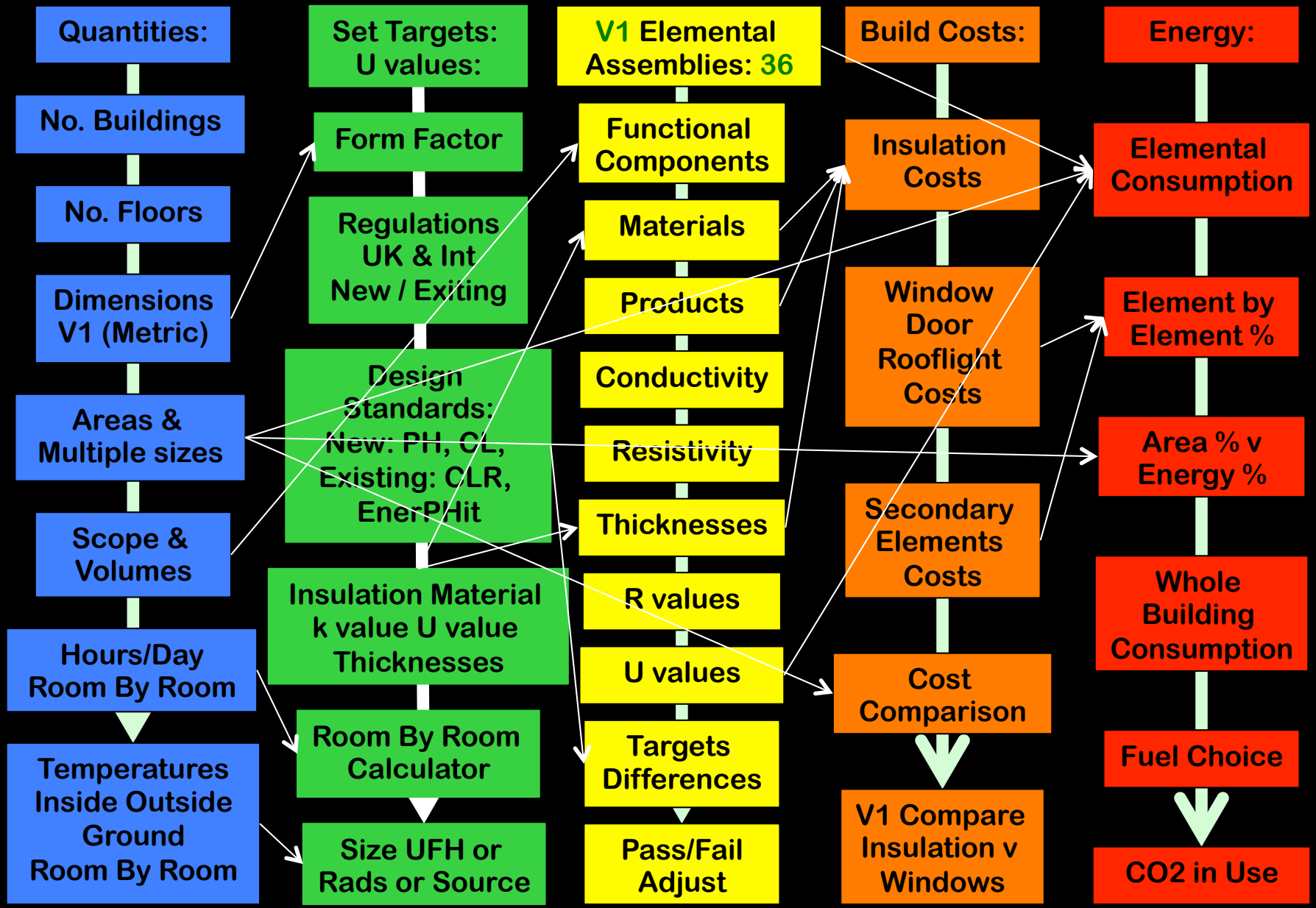
Build Costs:

- Insulation Costs
- Window Door Rooflight Costs
- Secondary Elements Costs
- Cost Comparison
- V1 Compare Insulation v Windows

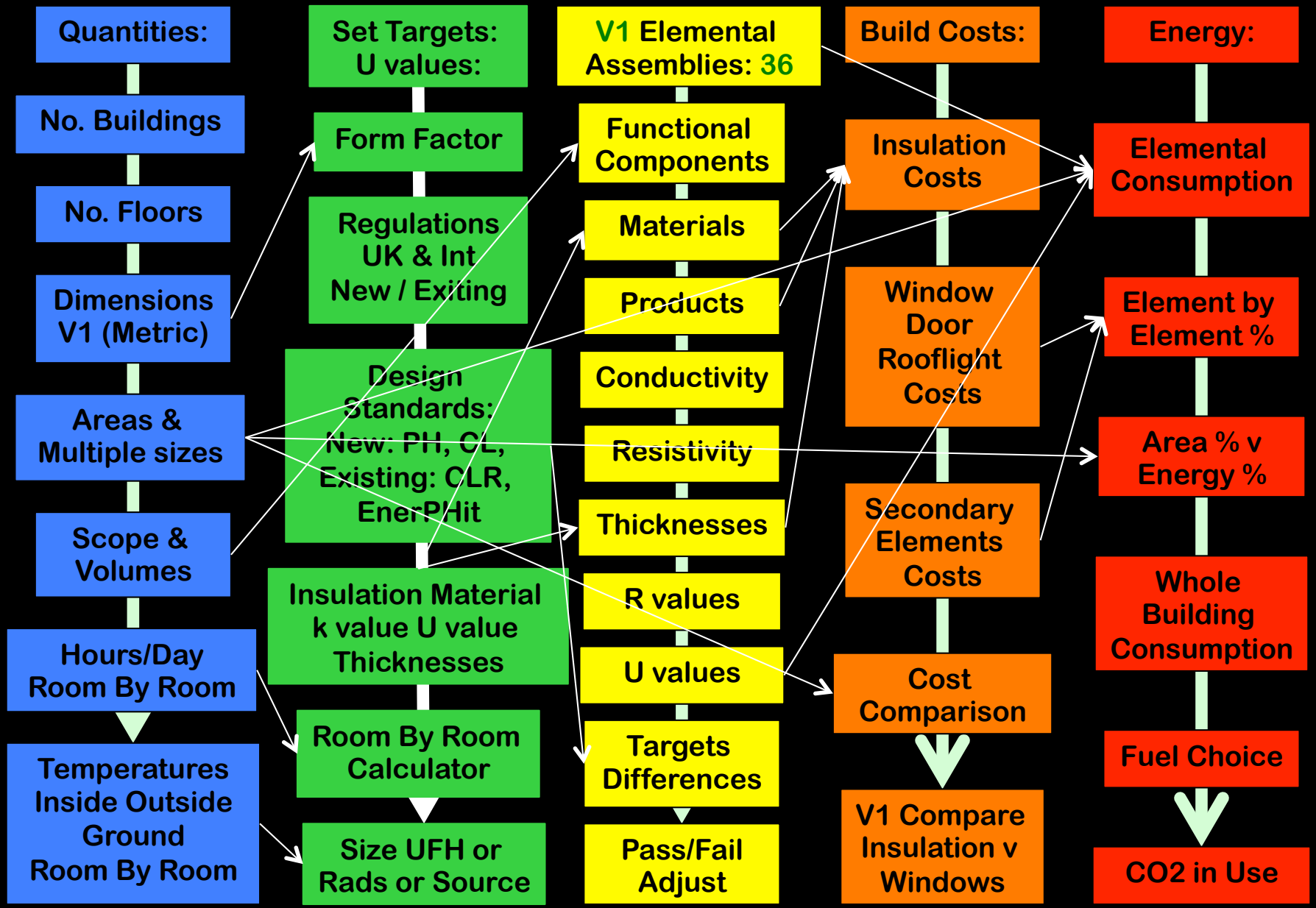
Energy:

- Elemental Consumption
- Element by Element %
- Area % v Energy %
- Whole Building Consumption
- Fuel Choice
- CO2 in Use

V1.0.0. launched June 2020



V1.0.0. launched June 2020



GBE

https://GreenBuildingEncyclopaedia.uk

GBC

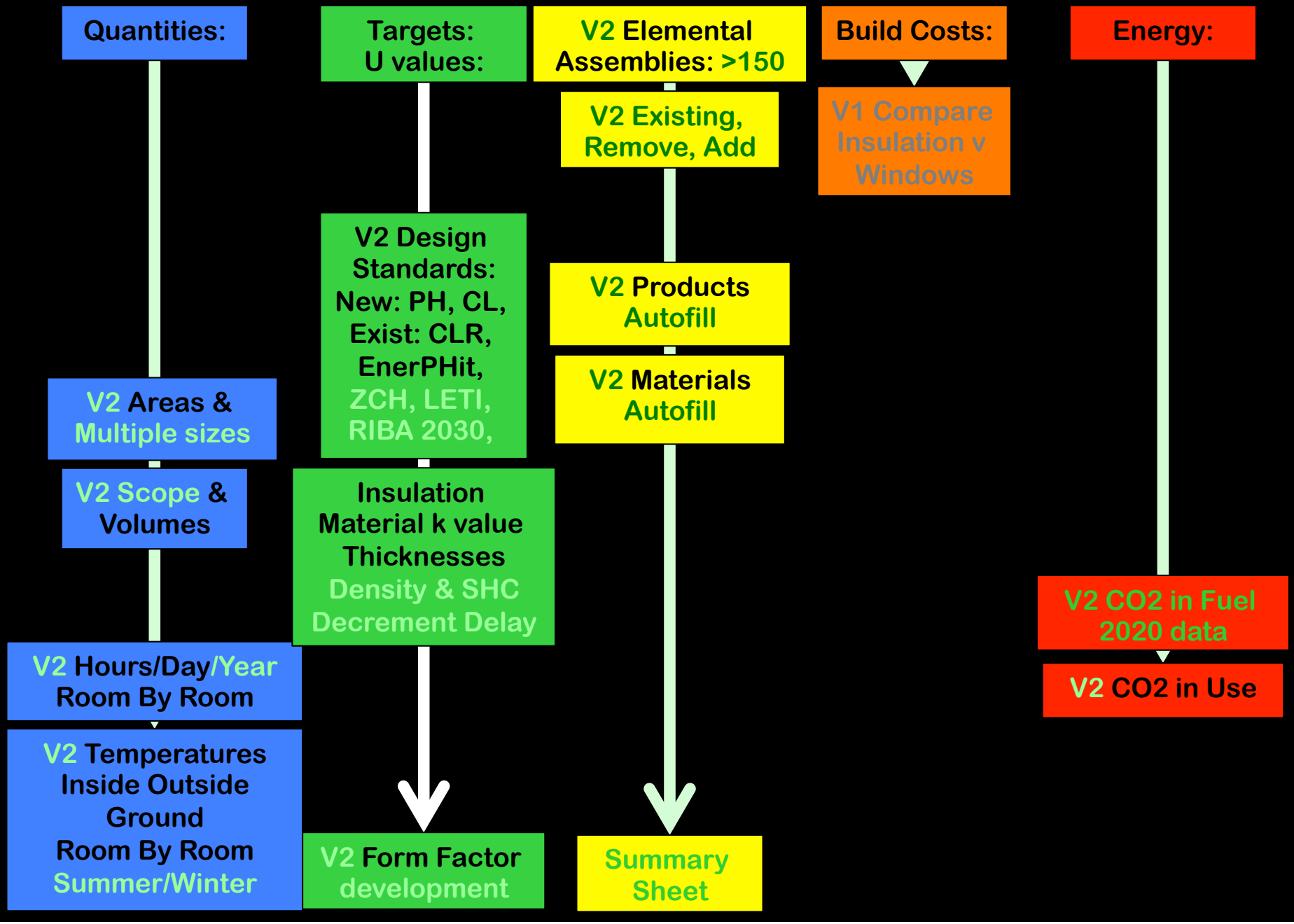
Green Building Calculator

https://GreenBuildingCalculator.uk

GBC Green Building Calculator

- Scope: V1.0.0. Completion:
- New Build, Domestic, Multi-storey, Multi-occupancy, Non-domestic (partial)
- Building Size:
  - Number of buildings and floors, heights, lengths, areas, volumes
- Temperatures: inside, outside, below ground and swimming pool
- Hours in use: per day (period temperatures maintained)
- Room by Room heat loss calculator: size radiators UFH or Boiler
- Form Factor: to set higher targets where necessary
- Regulations v Design standards:
  - U value target Selection:
  - Part L, Passivhaus, EnerPHit, AECB: CL or CLR or others
- Winter Thermal Insulation Material Choices
  - K values v U values = Thicknesses of different materials (50 mm is not enough)
- Assemble elements and all their components,
  - replace components with generic materials or products
  - Get U values, R values, meet targets or not, review thicknesses or materials
  - Energy Consumption, element by element %, add fuel choice > CO_2 in use
  - Bill of Materials, Quantities, Labour, Products, Costs
  - Cost planning by the designer for the client investment not cost cutting

V2.0.0. updates



V2.0.0. additions

Quantities:

- V2 Terraces Community scale
- V2 Shapes & Protrusions
- V2 Trades
- V2 Interiors & Furniture
- V2 MEP Services
- V2 Landscape

V2 Elemental Assemblies: >150

- V2 Overheating Decrement Delay Calculation
- V2 Condensation check BS 5250

- Targets Years
- Embodied Energy
- Embodied Carbon
- Timber: Yes/No
- Sequestered Carbon
- LCA Autofill
- EPD Autofill Component Element Whole Building
- Compare Targets
- Pass/Fail Adjust

Build Costs:

- V2 Bill of Materials
- V2 Bill of Products
- V2 Bill of Quantities
- V2 Bill of Labour
- V2 Bill of Costs
- V2 Cost Plan
- V2 Tender Schedule
- V2 Value Engineer not cost cut

Energy:

- V2 Fuel Costs
- V2 Fuel Cost in use

V2.0.0. update additions combined

Quantities:
- Buildings
- Towers
- V2 Terraces Community
- Dimensions V1 (Metric)
- V2 Areas & Multiples
- V2 Scope & Volumes
- V2 Shapes & Protrusions
- V2 Hours/Day/Year Room By Room
- V2 Temperatures Inside Outside Ground Room By Room Summer/Winter

Targets: U values:
- Regulations UK & Int New & Exist
- V2 Design Standards: New: PH, CL, Exist: CLR, EnerPHit, ZCH, LETI, RIBA 2030,
- Insulation Material k value Thicknesses Density & SHC Decrement
- Room By Room Calculator
- Size UFH or Rads or Source
- V2 Form Factor

V2 Elemental Assemblies: >150
- V2 Existing Remove Add
- Functional Components
- V2 Products Autofill
- V2 Materials Autofill
- Conductivity
- Resistivity
- Thicknesses
- R values
- U values
- EE EC SC LCA
- Targets
- Pass/Fail Adjust Summary

Build Costs:
- V1 Compare Insulation v Windows
- V2 Bill of Materials
- V2 Bill of Products
- V2 Bill of Quantities
- V2 Bill of Labour
- V2 Bill of Costs
- V2 Cost Plan
- V2 Tender Schedule
- V2 Value Engineer not cost cut

Energy:
- Elemental Consumption
- Element by Element %
- Area % v Energy %
- Whole Building Consumption
- Fuel Choice
- V2 CO2 in Fuel 2020 data
- V2 CO2 in Use
- V2 Fuel Choice Costs
- V2 Fuel Cost in use

V2 Current Development

- Progress:
- Non-Domestic, Retrofit and Newbuild more elements;
- Terraces, Community level,
- Decrement Delay, Form Factor refinements: dormers, bays, porches; Condensation Check,
- Embodied Energy, Carbon and Sequestered carbon; LCA Calculator & Materials Miles
- External Envelope elements: 24 > 41
- Envelop Secondary Elements: 12
- Non-external envelope elements:
  - MEP Services: 20 Domestic,
  - Landscape: 20 elements
  - Interiors, Furniture: 25 elements
- Secondary Element Calculator:
  - U Glass, U Frame, Psi glazing bar, U Window, Psi Perimeter

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

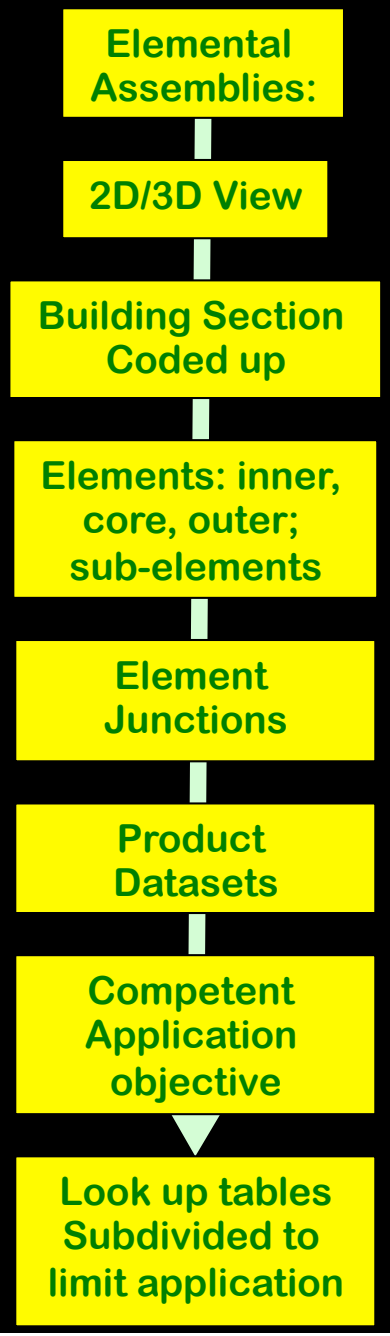
Green Building Calculator

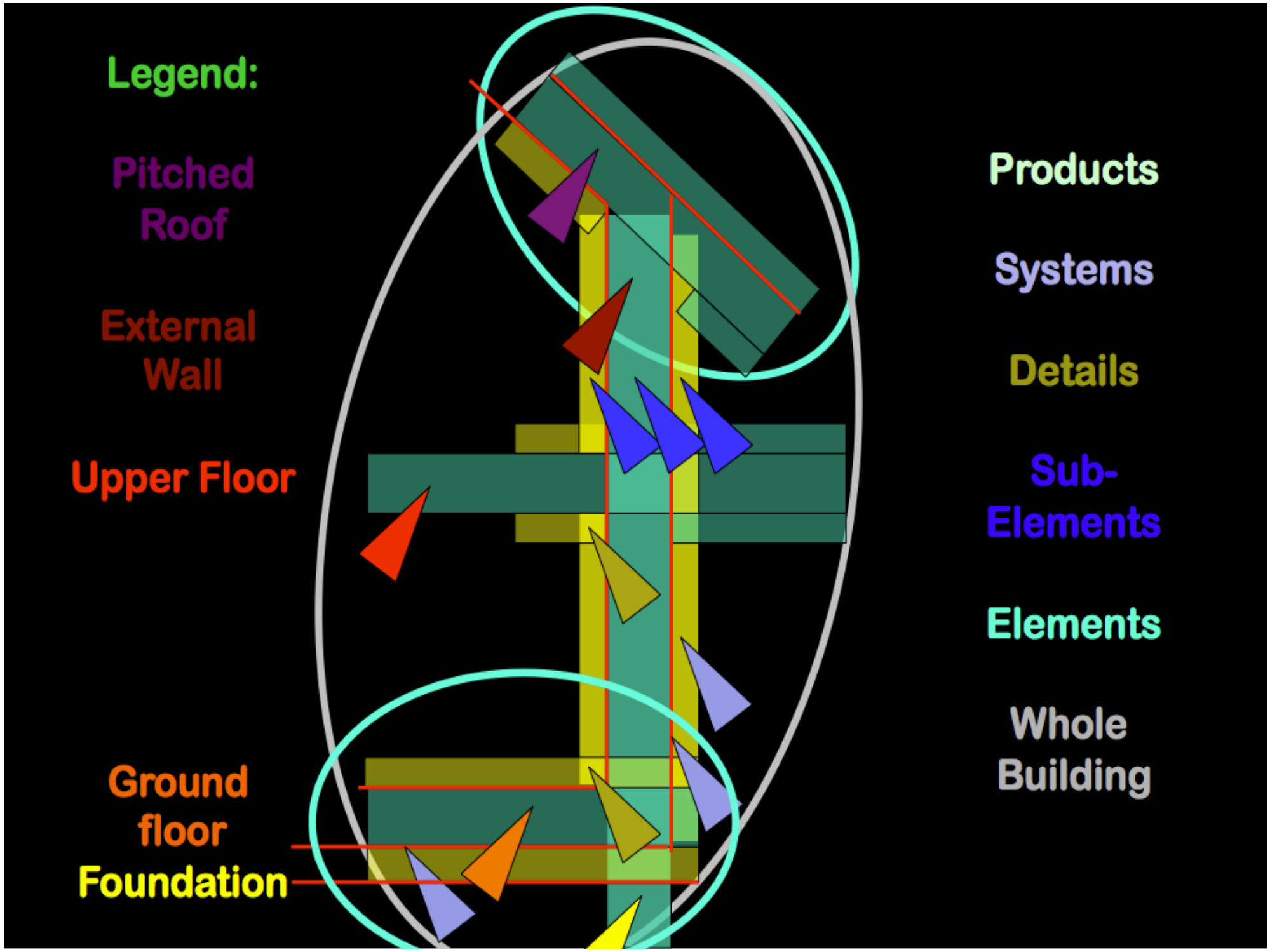
https://GreenBuildingCalculator.uk

V2-V15 Planned Development

- Priorities to bring forward:
- V2 Retrofit, Terraces, Community level, MEP Services,
- V3 Decrement Delay, Form Factor refinements: dormers, bays, porches
- V4 Building Section Coding, Competent Application, 892 ready made elements, Bespoke Assemblies, Accessories, Specification Generator
- V5 Non-Domestic, Retrofit and Newbuild more refinement
- V6 Embodied Energy, Carbon and Sequestered carbon; Non-external envelope elements
- V7 Condensation Check, Thermal Bridge, Secondary Element Calculator, Thermal mass calculator
- V8 LCA Calculator
- V9 Civils and Infrastructure: scope Increased
- V10 Waste Calculator Using WasteCost®Lite
- V11 Plastic free v Recycled Plastic
- V12 Interiors: Scope increased, Ska fit-out. refit
- V14 Circular economy: Reclaim Reuse
- V15 Self-build Interface

V3.0.0. additions no date yet




Legend:
Pitched Roof
External Wall
Upper Floor
Ground floor
Foundation
Products
Systems
Details
Sub-Elements
Elements
Whole Building

Insulation material competency in different elemental locations

Legend	
Y	Yes
N	No
U	Unsure

NEEDS MORE INFORMATION e.g. Does the roof Construction Is the concrete construction weight heavy timber of metal frame or masonry

| | | |

V4.0.0. additions no date yet

Elemental Assemblies:

V4 892+ readymade elemental assemblies

V4 User's Bespoke Assemblies

V4 Manufacturer's Competent System Assemblies

V4 Manufacturers & Suppliers Product datasets

V4 Look up table refinements only competent applications

V4 Specification Generator

V4.0.0. 892 Elemental Assemblies in hierarchy

	J	K	L		P	W	AE
1							0
3	New build						
4		Foundations 1				11_lnn_d11_lnn_nn	
5			Soil improvement D11			11_lnn_d11_lnn_nn	
6							
7							
8							
9							
10							
11							
12			Foundations			16_lnn_e10_lnn_nn	
13							
14							
15							
16							
17							
18							
19							
20			Piling & pile caps			17_lnn_***_lnn_nn	
21							
22							
23							
24							
25							
26							
27			Ground beams				
28				in-situ concrete E10			
29				Precast concrete E10			
30				Metal G10			
31			Bearing Pads			19_lnn_***_lnn_nn	
32				Static load			
33					Recycled plastic Z50		
34					Metal Z11		
35					Composite		
36				Anti-vibration mounting			
37					Recycled plastic Z50		
38					Metal Z11		
39					Composite		
40					Rubber		
41		Basements 9				13_lnn_e10_lnn_nn	
42			Basment Floors			13_lnn_e10_lnn_nn	
43				in-situ concrete E10			
44			Basement retaining walls				
45				in-situ concrete E10			
46				Precast concrete basement panels			
47				Tyre bales			
48				Earthship: Tyres & rammed earth			
49				Cellular concrete (reinforced core) F10			
50				Cellular fired clay F15			
51		Ground floors 12				13_lnn_enn_lnn_nn	
52			Ground bearing			13_lnn_enn_lnn_nn	
53				in-situ Concrete E10			
54					Floated/Power-floated E41		
55					Timber deck K11		
56					Screeded M10		
57				in-situ Limecrete E80			
58				in-situ hempcrete E82			
59			Suspended over site			13_lnn_***_lnn_nn	
60				Sleeper walls			
61				Timber			
62					Timber joists + I composits G20		
63					cross laminated G22		
64					SIPs G26		
65					ISPs G27		
66					stacked wood G28 G28 dowelled/nailed		
67				Clay			

V4.0.0. 892 Elemental Assemblies & Specifications

5.60	7.00	9.00	31.00	32.00
	A-D	A-D	GBE	
	Element ID (Unique long id)	Element Name (If elements have names)		
	Element Component Belongs to	Component Name	Full Specification	Performance Spec (for Design & Build)
	element20080819172457	Name?		
	element20080819172457	Reclaimed/new local fired clay facing brick outer leaf	Reclaimed/new local fired clay facing brick inner leaf, Thickness: 102 mm.	
Sheet Name	Element ID Long Code	Element Name, (If elements have names) Element Name (performance characteristics) Source	Full Specification Prescriptive or Descriptive Proprietry if choosing from product page Material and Workmanship Standards	Performance Specification Custom or Reference (to perforamcne and test standards) for Contractor Design Portion for Design & Build (if not Employer's Requirements)
Keep	Keep	Keep	Omit	
External Cavity wall: Brick/Stone outer leaf	21_f10_f10_f10_01	Brick / cellulose partial cavity insulation / brick		
External Cavity wall: Brick/Stone outer leaf	21_f10_f10_f10_01	+high thermal mass, Potentially: -air-leaky, -high embodied energy		
	21_f10_f10_f10_01	Reclaimed/new local fired clay facing brick outer leaf, 102 mm.	Reclaimed/new local fired clay facing brick inner leaf, Thickness: 102 mm.	Reclaimed/new local fired clay facing brick outer leaf, 102 mm.
	21_f10_f10_f10_01	Lime mortar	Cement:Lime mortar, Mix: _:_:_, Profile: ____, Colour: ___	Cement:Lime mortar, Mix: _:_:_, Profile: ____, Colour: ___
	21_f10_f10_f10_01	Cavity air space, 50 mm.	Residual cavity air space, Width: 50 mm.	Cavity air space, 50 mm.
	21_f10_f10_f10_01	Dense cellulose fibre batts partial fill cavity insulation	Dense cellulose fibre batts partial fill cavity insulation, Size: __ mm.	Dense cellulose fibre batts partial fill cavity insulation, ___ mm.
	21_f10_f10_f10_01	Insulating cavity closer/tie/DPC (if partial cavity fill thermal insulation)	Insulating cavity closer/tie/dpc (if partial fill), Size: __ x __ mm.	Insulating cavity closer/tie/dpc (if partial fill), __ x __ mm.
	21_f10_f10_f10_01	Wall ties: retaining partial fill insulation	Wall ties: retaining partial fill insulation, BBA Certified, Material: Austenitic stainless steel, Grade: 304 equivalent, size: ___ x __ mm.	Wall ties: retaining partial fill insulation, BBA Certified, 304 equivalent stainless steel, ___ x __ mm.
	21_f10_f10_f10_01	Horizontal DPCs damp proof courses	Horizontal DPCs	Horizontal DPCs
	21_f10_f10_f10_01	Cavity tray DPCs damp proof course	Cavity tray DPCs	Cavity tray DPCs
	21_f10_f10_f10_01	Lintel(s) avoiding thermal bridge		Lintels avoiding -thermal bridge
	21_f10_f10_f10_01	Reclaimed/new local fired clay facing brick inner leaf, 102 mm.	Reclaimed/new local fired clay facing brick inner leaf, Thickness: 102 mm.	Reclaimed/new local fired clay facing brick outer leaf, 102 mm.
	21_f10_f10_f10_01	Lime mortar	Cement:Lime mortar, Mix: _:_:_, Profile: ____, Colour: ___	Cement:Lime mortar, Mix: _:_:_, Profile: ____, Colour: ___
External Cavity wall: Brick/Stone outer leaf	21_f10_f10_f10_02	Brick / cavity insulation / brick		
External Cavity wall: Brick/Stone outer leaf	21_f10_f10_f10_02	+high thermal mass, Potentially: -air-leaky, -high embodied energy, -irreclaimable, -unreusable		
	21_f10_f10_f10_02	Reclaimed/new local fired clay facing brick outer leaf, 102 mm.	Reclaimed/new local fired clay facing brick inner leaf, Thickness: 102 mm.	Reclaimed/new local fired clay facing brick outer leaf, 102 mm.
	21_f10_f10_f10_02	Any mortar	Any mortar	Any mortar, mix: _:_:_, Profile: ___, Colour: ___
	21_f10_f10_f10_02	Any cavity wall partial/full fill thermal insulation	Any cavity wall partial/full fill thermal insulation, Size: __ mm.	Any cavity wall partial/full fill thermal insulation, ___ mm.
	21_f10_f10_f10_02	Insulating cavity closer/tie/DPC (if partial cavity fill thermal insulation)	Insulating cavity closer/tie/dpc (if partial fill), Size: __ x __ mm.	Insulating cavity closer/tie/dpc (if partial fill), __ x __ mm.
	21_f10_f10_f10_02	Wall ties to suit insulation	Wall ties to suit insulation, Material: Austenitic stainless steel, Grade: 304 equivalent, size: ___ x __ mm.	Wall ties to suit insulation, 304 equivalent stainless steel, ___ x __ mm.
	21_f10_f10_f10_02	Horizontal DPCs damp proof courses	Horizontal DPCs	Horizontal DPCs
	21_f10_f10_f10_02	Cavity tray DPCs damp proof course	Cavity tray DPCs	Cavity tray DPCs
	21_f10_f10_f10_02	Lintel(s) avoiding thermal bridge		Lintels avoiding -thermal bridge
	21_f10_f10_f10_02	Reclaimed/new local fired clay facing brick inner leaf, 102 mm.	Reclaimed/new local fired clay facing brick inner leaf, Thickness: 102 mm.	Reclaimed/new local fired clay facing brick outer leaf, 102 mm.
	21_f10_f10_f10_02	Any mortar	Any mortar	Any mortar, mix: _:_:_, Profile: ___, Colour: ___

© GBE 2020 GBC Green Building Calculator

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

Future Development Versions

- V5 Thermal Bridge, Thermal mass calculator
- V6 Civils and Infrastructure
- V7 Waste Calculator Using WasteCost®Lite
- V8 Plastic free v Recycled Plastic
- V9 Interiors: Scope increase, Ska fit-out. refit
- V10 Circular Economy Reclaim Reuse
- V11 Self-build Interface links back to GBE Encyclopaedia
- V12 BIM App (conversations started)
- V13 Whole Project Budget calculations: Prelims and fees
- V14 EU, International & Regional versions (USA: Feet inches)
- V15 Services Design Module: Occupancy level, Energy Sources and uses,
- V16 Lighting Design Module: Health & Wellbeing
- V17 Biodiversity Inclusion
- V18 Local Climate Appropriate construction and materials
- V19 Vernacular, local: materials, trades, economy
- V20 GBPB Green Building Price Book
- V21 Value Engineering Opportunities
- V22 Design Life and Durability

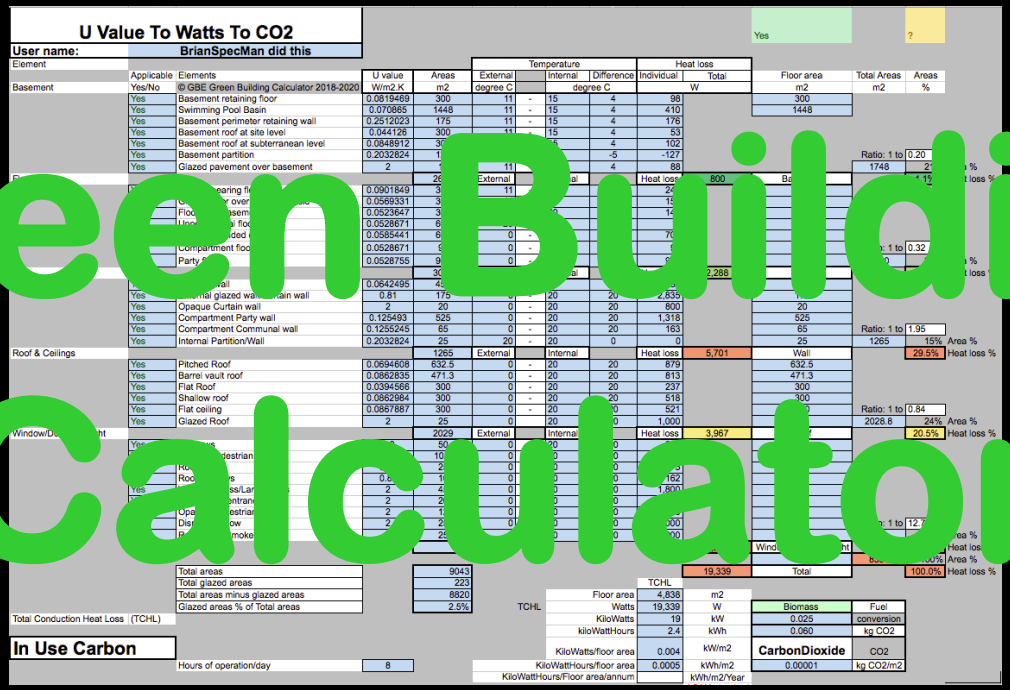
GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk



Green Building Calculator

Bespoke Development Opportunities

Historic Fabric Upgrades

- Compare upgrade measures: what do we really want to know?
  - e.g. single > double or triple glazed windows
  - Glass, spacers, gasses, LowE/SC coatings, frame profile, frame materials, weight, trickle vents
  - Embodied
    - Embodied Energy
    - Embodied Carbon
    - Sequestered Carbon
  - In-use
    - Energy savings: before and after
    - Carbon savings: before and after
  - Costs
    - Of upgrade measure
    - In-use energy cost saving: before and after
    - Financial comparison period? = life expectancy of measures
      - Temporary, Short, Normal and Long term
  - Value for money
    - Cost pay-back periods, profiteering at expense of performance or comfort
  - Value Engineering not just cost cutting
    - Carbon-back periods
  - But don't forget the other properties features, benefits, considerations
    - Thermal comfort (PH & EnerPHit), less condensation, vapour open/closed
    - Plastic content, plastic avoidance, recycled content, fire life risk
    - High recycled content may lead to bad choice of materials and properties

Window frame, Glass, Coating, Perimeter, Spacer, Gas, Finishes, Specifications Guesswork gut instinct Turn +, - & ? to numbers Evidence based design & specification	U value	Energy in use	Carbon In use	B1 Carbon saved in use	V2 Cost in use	Materials	Finishes	V1>V2 Profiles	Initial Cost	B1 Pay back period	Embodied Energy	Embodied Carbon	V11 B1 Carbon in waste	Sequestered carbon	B1 Carbon back period
Existing Single glazing	-	+++++++++	+++++++++ +/-	0	+++++++++	0	+	0	0	?	+/-	+/-	0	0	?
Existing to Double glazing	- -	+++++++	+++++++ +/-	+	+++++++	+	+	++	++	?	+/-	+/-	+	0	?
+Secondary Glazing	- - -	+++++++	+++++++ +/-	++	+++++++	++	+++++++	+++	+++	?	+/-	+/-	+	++	?
+Secondary Double Glazing	- - - -	+++++	+++++ +/-	+++++	+++++	+++++	+++++++	+++++	+++++	?	+/-	+/-	+	++	?
Replace with double glazing	- - - - -	++	++ +/-	+++++	++	+++++++	+++++	+++++	+++++++	?	+/-	+/-	+++++	+++++	?
Replace with triple glazing	- - - - - -	+	+ +/-	+++++++	+	+++++++++	+++++	+++++	+++++++	?	+/-	+/-	+++++++	+++++++	?

Evidence-based Guidance

GBE

Exiting Single glazed Windows

U values > Energy Saving > Cost saving > Carbon saving > Embodied Energy to Sequestered Carbon

Repair & Upgrade Exiting to Double Glazed Window

Secondary glazing with double glazed units

New Double or Triple Glazed windows

V1 V2 & V11 Compare Element Upgrade measures

Quantities:

- Dimensions V1 (Metric)
- V2 Areas & Multiples
- V2 Scope & Volumes
- V2 Temperatures Inside Outside Ground Room By Room Summer/Winter

Targets: U values:

- Regulations UK & Int New & Exist
- V2 Design Standards: New: PH, CL, Exist: CLR, EnerPHit, ZCH, LETI, RIBA 2030,

V2 Elemental Assemblies: >150

- V2 Existing Remove Add
- Functional Components
- V2 Products Autofill
- 1>2 Secondary Element Calculator & Autofill
- Conductivity
- Resistivity
- Thicknesses
- R values
- U values
- Embodied Energy > Sequestered Carbon

Build Costs:

- V1 Compare Insulation v Windows
- V2 Bill of Products
- V2 Bill of Labour
- V2 Bill of Costs
- V2 Value Engineer not cost cut

Energy:

- Elemental Consumption
- Element by Element %
- Area % v Energy %
- Fuel Choice
- V2 CO2 in Fuel 2020 data
- V2 CO2 in Use
- V2 Fuel Choice Costs
- V2 Fuel Cost in use
- Payback period
- Carbon back period

V11 Waste:

- Material in Waste
- Carbon in Waste
- Energy in Waste
- Labour in Waste
- Savings in Waste Min/ Man
- Cost in Waste

V11 NGS WasteCost® *Lite* 2005 + new datasets

© 2005-6 NGS GreenSpec WasteCost® *lite*

Mouse over & Read

INPUTS

1

Number of buildings	1	No.
Building Footprint	0	m2
Number of floors	1	No.

2

Choose a construction type closest to your project		
Average (All building types)	Yes	Type Yes in only one cell Make sure No appears in the remainder
Average (Offices)	No	
Average (Residential)	No	
Innovative MMC Prefab Housing	No	
Steel and Glass Office	No	

OUTPUTS

7

Cost of one skip system of mixed waste removal	£0.00	
"Waste segragation will cost more money"	£0.00	
Revised cost of reduced one skip mixed waste system	£0.00	
"But look how much it can save!"	£0.00	
Predictable Volume of waste generated on Project	0	m3
Volume potentially diverted from landfill	0	m3
Volume diverted with chosen waste streams	0	m3
Predictable weight of waste generated on project	0.00	tonnes
Weight of waste potentially diverted from landfill	0.00	tonnes
Weight diverted with chosen waste streams	0.00	tonnes
Potental % diverted from landfill (by tonnage)	100%	

	3	4		5		6	
Potential Waste Segregation/Reclaim & Reuse/Recycling Streams WAS+ICE Colour system	Add Yes or No in each cell to indicate which	Add or replace rates with local collection rates £/tonne		Number of 8 CuYd skips for each waste stream		Potentially Reusable or recyclable m3	
No Segregation (Mixed incl. Hazardous)	Yes						
Inert	No	£15.00	£/tonne	0	No.	0	m3
Mixed metal	No	-£25.00	£/tonne	0	No.	0	m3
Mixed (non Hazardous)	No	£75.00	£/tonne	0	No.	0	m3
Timber	No	£25.00	£/tonne	0	No.	0	m3
Packaging	No	£15.00	£/tonne	0	No.	0	m3
Compactable	No	£15.00	£/tonne	0	No.	0	m3
Plasterboard	No	£25.00	£/tonne	0	No.	0	m3
Hazardous	No	£800.00	£/tonne	0	No.	0.0000	m3
	1			0	Total	0	Total
	Total number of waste streams proposed for contract	Local waste collection rates £/tonne		Total number of 8 Cu Yd skips		Potentially Reusable or recyclable m3	Mouse over & read

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

2020-2022 Future Development:

- 21+ Versions >24 months development
- Early sales: = development time +grow team
- Users to guide GBC on priorities & scope
  - Order of development: survey/steering group
- Commissioned work may allow parts to be developed or finished sooner
- Consultancy:
  - House Types analysis
  - Competition Entries
- Bespoke:
  - Compare Element Upgrade Measures

GBE

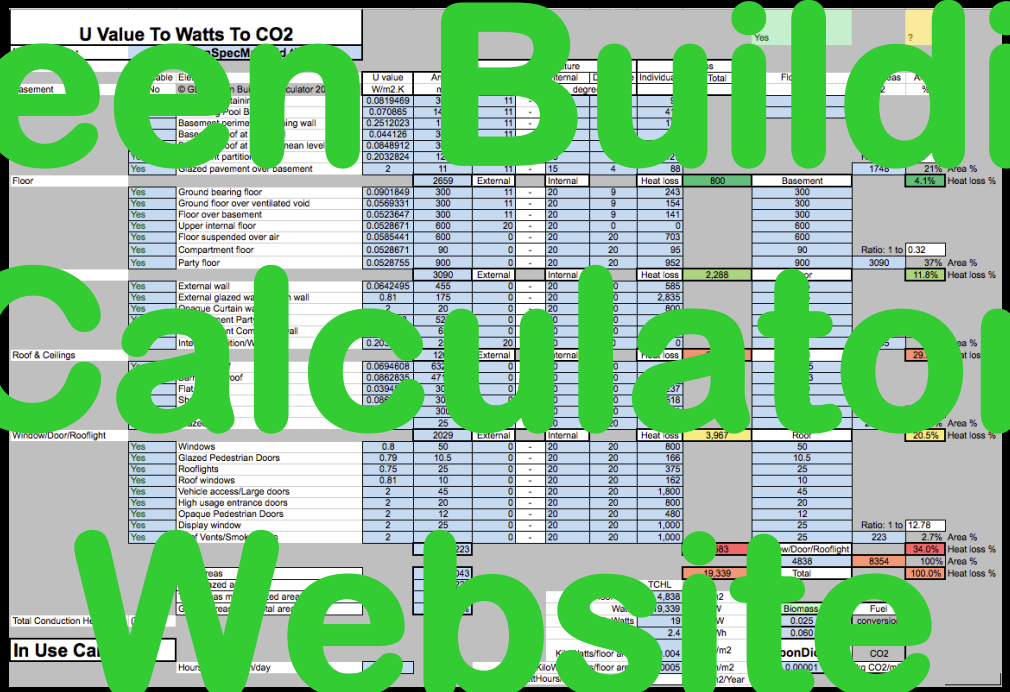
https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

Green Building Calculator Website



https://GreenBuildingCalculator.uk

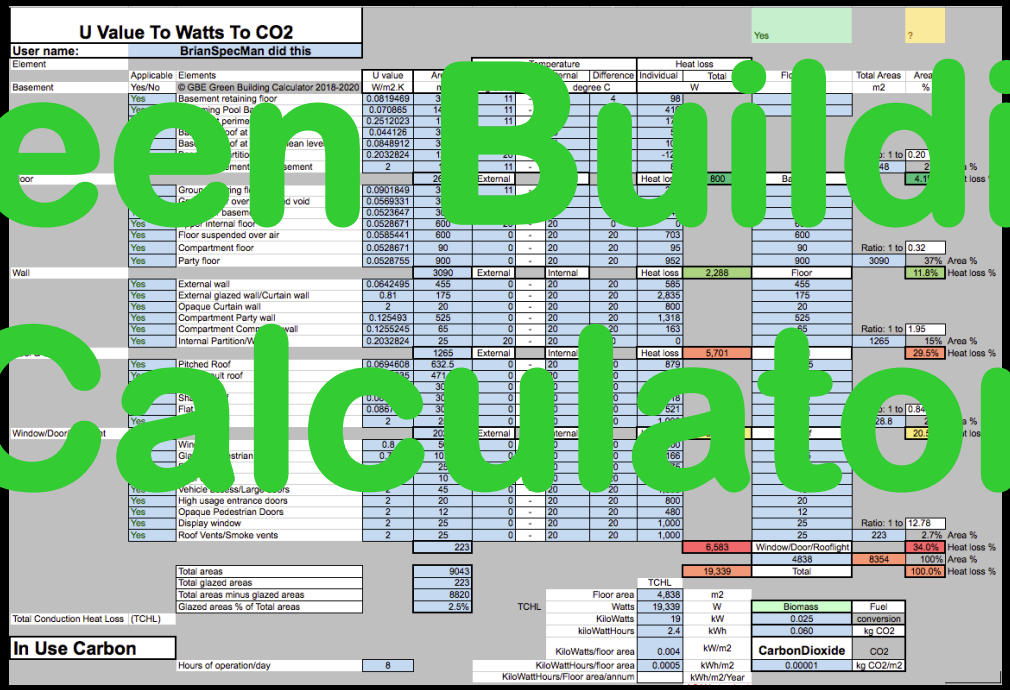
GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk



Green Building Calculator

V1.0.0. In Detail

GBE

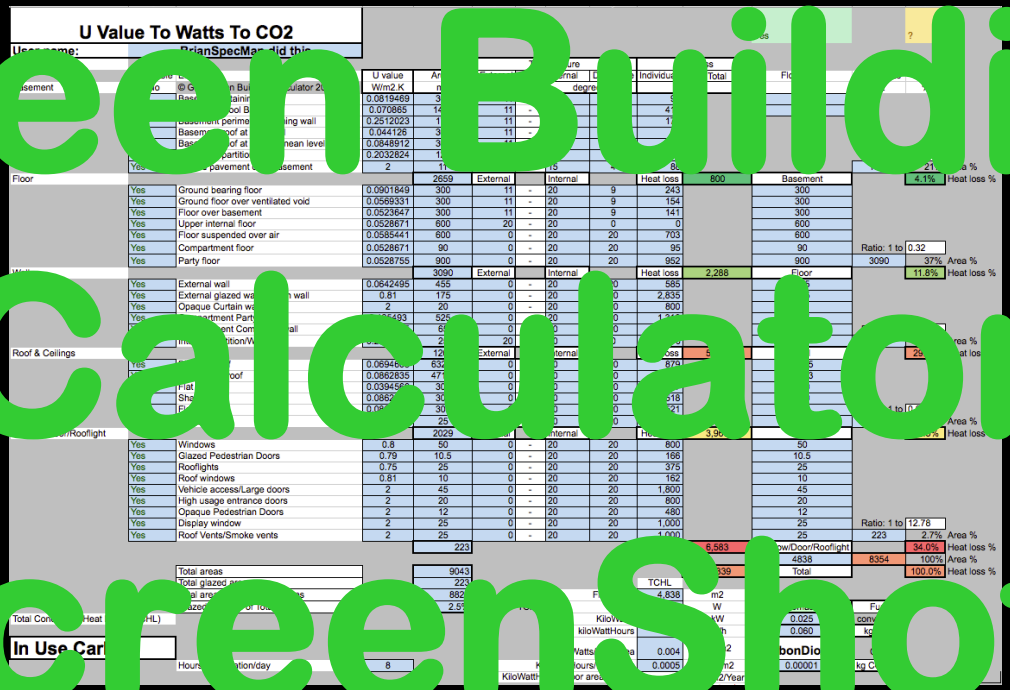
https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

Green Building Calculator ScreenShots



Preview V2 relevant to retrofit

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V2 Instructions

- Plan to add instructions
- for each cell/range
- into pop-up comments
- in relevant cells
- And add videos

Instructions

Legend

Green cells need the user to add, project specific information or replace default information with specific information

Red text in Turquois cells is reproducing building-wide information but the user can over write it with room or element specific values

Blue cells provide results based on a calculation using data from other cells DO NOT OVERWRITE THE CELL CONTENT

File: Spreadsheet

- Using your dimensioned drawings
- Using the latest edition of file GBE Green Building Calculator (BRIDGE 00 xlsx if you have it else use the one I know I will provide)
- Found in GBE Shop https://greenbuildingencyclopaedia.uk/
- Found in Green Building Calculator website https://greenbuildingcalculator.uk/
- Download the file to your C Drive (or other)
- Save the file as a template and make a working copy (File > Save as) and add your project reference or name to the file name
- Edit your working file in your C drive (or other)

Worksheet Instructions: Whole Building

Worksheet	Column(s)	Row(s)	Cells	
Schedule Accommodation		Custom View:	Whole Building	• Work sheet (tab) ScheduleAccommodation
	C	3	C3	• Add your name (this feeds through to numerous worksheets)
	C	4	C4	• Add your project name or reference
	C	5	C5	• Add your project address
	M to O	3 to 5	M3:O5	Observe the diagram used to complete Room by Room schedule, below right
	D, E, F, G, I	10	D10, E10, F10, G10, I10	• Add your project details: Quantities, dimensions
	L	10	L10	• Confirm these match your plans
	N	10	N10	• Confirm or change the number of hours of operation of the whole building (during which internal temperatures are to be maintained, this can be made room by room later)
	O	10	O10	• Confirm or change the internal temperature to be maintained in the whole building (this can be changed to room by room later)
	O	12, 14 to 16	012, O13, O14, O15, O16, O17	• Confirm or change the other temperatures [illegible]
	O	13	O13	• Confirm subsoil temperature (below 1 [illegible] in the UK [illegible] average for other parts of globe
	O	17	O17	• Confirm or change externall temperature Metrological Office data for location (winter average) change for other parts of globe

Save your work

Worksheet Instructions: Schedule of Accommodation

Worksheet	Column(s)	Row(s)	Cells	
Schedule Accommodation		Custom View:	Schedule Accommodation	• Work sheet (tab) Schedule Accommodation
	C	23-31, 33-41, 43-51, 53-61		• Rename the green cells to correspond to the rooms, areas and circulation spaces in your client brief or design aspiration for your building and any others that are different in your building
	C	23-31, 33-41, 43-51, 53-61		• Add more rows as necessary for your building, add new blank rows mid way in each of the floor groups and copy the content of an existing row into your new rows
	D & E	23-31, 33-41, 43-51, 53-61		• Pre-populated from Whole Building figure but can be changed here for each room
	D	23-31, 33-41, 43-51, 53-61		• NB: if you have similar rooms in a row that are not square nor parallel sided use the average of the largest and smallest sides and add the quantity or rooms to column D
	F & G	23-31, 33-41, 43-51, 53-61		• Add the dimensions for each of your rooms
	F & G	23-31, 33-41, 43-51, 53-61		• NB: if you have one room that is not square nor parallel sided use the average of the two lengths and the average of the two widths to get an accurate size
	I	23-31, 33-41, 43-51, 53-61		• Pre-populated from Whole Building figure but can be changed here for each room
	L	23-31, 33-41, 43-51, 53-61		• Leave it as 'Yes' if you included the room, change to 'No' if you failed to include any room in your project
	N	23-31, 33-41, 43-51, 53-61		• Leave as your building default figure, unless some rooms are used and conditioned for different numbers of hours
	O	23-31, 33-41, 43-51, 53-61	O8	• Change the temperature to the designed room temperature if different to the building temperature in cell O8
	H	10, 22, 23, 32, 42, 52, 62		• Rough checks can be carried out to spot any glaring errors by comparing the following cells: (sometimes really rough checks)
	H	10, 63		• Differences will occur if your floor areas and floor plates vary from floor to floor or there are balcony cutouts, Bay windows, Oriel windows, etc.

V2 Future Developments

- Cells will have their instructions added as popup text comments
- PPTX > PDF Show > PDF handout
- PPTX Videos
- Zoom Videos
- Zoom Training

© GBE 2020 GBC Green Building Calculator

V2 V12 Cell colour Legend

Legend	In Excel	In BIM
Cell colour code/content	Explanation	
	User Input cell, feeds into calculations througout GBC	From Bill of Materials
	GBC calculated results, that the user can overwrite. e.g. for variables	From Model?
	GBC calculated results, applying user inputs in other cells or sheets	From Bill of Materials
	User to select option from drop down list GBC will apply choice to calculations	From Bill of Materials?
	Row or Column titles	n/a
Yes/No	User input cell requiring user choice from drop down list	n/a
No	Not complete by GBC OR Users to ignore this row's cells. 'No' will turn red automatically	n/a
?	GBC awaiting information OR User to interrogate this row's cells and review decisions so far	n/a
Yes	Started by GBC OR To be completed by Users. 'Yes' will turn Green Automatically	n/a

© GBE 2020 GBC Green Building Calculator

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V2.0.0. Whole Building/Terraces

User name:	BrianSpecMan did this
Project name:	Over type with Project name
Project address:	Over type with Project address
Building Facility:	Over type with Building User Activity or Purpose

Project Brief Employer Requirements or Architect's Proposal

Whole Building												
		No.	No.	m	m	m2	m	m3		Yes/No	Hours	Degrees C
Building(s)	One or many	Number of buildings	Number of floors	Length(s)	Width(s)	Floor Area Ceiling Area Roof Area	Room heights	Volumes		Confirm achieved in Design	Operation	Internal Temperature
© GBE Green Building Calculator 2017-2020		1 to 1000	1 to 50	1 to 1000	1 to 1000	1 to 1 million	2.4 to 10	1 to 10 million			1 to 24	-20 to +30'
Whole Building	All rooms	1	4	10	6	240	2.5	600	m3	Yes	8	20
Terrace(s)	One or many	Number of terraces	Number of units in terrace	Depth front to back in terrace	Party wall to party wall	Position of single unit in terrace	Number of party walls	Number of end walls		Confirm achieved in Design	Season (summer/winter)	Winter
© GBE Green Building Calculator 2017-2020		1 to 1000	1 to 100	1 to 25	1 to 10	N/A, End or Mid						
		3	51	10	6	Not Applicable	150	6	No.	Yes		

1

4 Nominal Room 2

3

Year	Swimming pool water 16
Winter	Subsoil 11
Winter	Unheated Communal Space
Winter	Basement
Winter	Other Unheated Spaces 15
Winter	Winter outdoors
Summer	Attic Loft 50

© GBE 2020 GBC Green Building Calculator

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V1 Schedule of Accommodation

Winter outdoors	0

Schedule of Accommodation

		NB: 'Room by Room Losses' table is right of this schedule	No.	No.	m	m	m2	m	m3	Yes/No	Hours	Degrees C
		Room Functions	Number of rooms	Number of floors	length(s) (or depth front to back in terrace)	width(s) (or party wall to party wall)	Floor Area Ceiling Area Roof Area	Room heights	Volumes	Achieved in Design	Room in use and temperature controlled hours per day	Design Desired Temperature
	Floor(s)	© GBE Green Building Calculator 2017-2020	1 to 1000	1 to 50	1 to 1000	1 to 1000	1 to 1 million	2.4 to 10	1 to 10 million		1 to 24	-20 to +30°
	Total of 4 subtotals below					Total	3,445	Total	16,613			
Yes	Basement floor(s)	Whole Basement	1	1	20	15	300	2.5	750	Yes	8	15
		Bedroom	1	1	5	5	25	2.5	63	Yes	8	15
		Play room					25		63			
		Operating theatre	1				100		250			
		WC	1	1	3	3	9	2.5	23	Yes	8	15
		Shower	1	1	1	3	3	2.5	8	Yes	8	15
		Garage	1	1	3	6	18	2.5	45	Yes	8	15
		Storeroom	1	1	10	5	50	2.5	125	Yes	8	15
		Kitchen	1	1	3	5	15	2.5	38	Yes	8	15
	Basement floor(s)	Room Subtotal					245		613			
Yes	Ground floor(s)	Whole Ground floor	2	1	20	15	600	2.5	3,000	Yes	8	20
		Bedroom	2	1	10	5	100	2.5	500	Yes	8	20
		Play room	2	1	10	5	100	2.5	500	Yes	8	20
		Operating theatre	2	1	10	5	100	2.5	500	Yes	8	20
		WC	2	1	10	5	100	2.5	500	Yes	8	20
		Shower	2	1	10	5	100	2.5	500	Yes	8	20
		Garage	2	1	10	5	100	2.5	500	Yes	8	20
		Storeroom	2	1	10	5	100	2.5	500	Yes	8	20
		Kitchen	2	1	10	5	100	2.5	500	Yes	8	20
	Ground floor(s)	Room Subtotal					800		4,000			
Yes	Upper floor(s)	Whole upper floors	2	2	20	15	1,200	2.5	6,000	Yes	8	20
		Bedroom	2	2	5	10	200	2.5	1,000	Yes	8	20
		Play room	2	2	5	10	200	2.5	1,000	Yes	8	20
		Operating theatre	2	2	5	10	200	2.5	1,000	Yes	8	20
		WC	2	2	5	10	200	2.5	1,000	Yes	8	20
		Shower	2	2	5	10	200	2.5	1,000	Yes	8	20
		Garage	2	2	5	10	200	2.5	1,000	Yes	8	20
		Storeroom	2	2	5	10	200	2.5	1,000	Yes	8	20
		Kitchen	2	2	5	10	200	2.5	1,000	Yes	8	20
	Upper floor(s)	Room Subtotal					1,600		8,000			
Yes	Top Floor(s) under Roof(s)	Whole top floor	2	1	20	15	600	2.5	3,000	Yes	8	20
		Bedroom	2	1	5	10	100	2.5	500	Yes	8	20
		Play room	2	1	5	10	100	2.5	500	Yes	8	20
		Operating theatre	2	1	5	10	100	2.5	500	Yes	8	20
		WC	2	1	5	10	100	2.5	500	Yes	8	20
		Shower	2	1	5	10	100	2.5	500	Yes	8	20
		Garage	2	1	5	10	100	2.5	500	Yes	8	20
		Storeroom	2	1	5	10	100	2.5	500	Yes	8	20
		Kitchen	2	1	5	10	100	2.5	500	Yes	8	20

V2.0.0. Roofs Parts

Roofs	Shapes	Which roof shape?	Roof Pitch	Ridge/Apex Height above eaves	Quantity	Width party wall to party wall	Length of roof surface front to back in terrace	Area	Total	Volume	Solar heat gain duration to be overcome by decrement delay	Solar heat gain maximum temperature
		Yes/No	Degrees	m	No.	m	m	m2	m2	m3	11	50
	22 Flat Roof (FR)	Yes	8	0.25	1	6	10.00	60.02		7.50	11	[illegible]
	23 Shallow Roof (SR)					6	10.01	60.07		15.02	11	
	24 Pitched Roof (PR)					6	10.44	62.64		93.96	11	
	25 Barrel Vault Roof (BVR)	[illegible]		[illegible]	[illegible]	6	9.43	56.56		133.32	11	50
	26 Domed Roof (DR)	Yes		3	1	6	9.43	84.83		56.56	11	50
	27 Hipped/Pyramid Roof (HPR)	Yes	35	3	1	6	10.44	62.64		93.96	11	50
	28 Mono-Pitched Roof (MPR)	Yes	30	3	1	6	10.44	62.64		93.96	11	50
	29.1 Mansards Roof Flat (MR:F))	Yes	8	0.25	1	6	9.75	58.52	74	147.19	11	50
	29.2 Mansard Roof Vertical (MR:V)	Yes	80	2.5	1	6	2.51	15.07				
	33 Other Geometry Roof (OGR)	Yes	?	3	1	6	13	80.50		120.75	11	50
Dormers	Parts	Dormers or not?	Roof Pitch	Ridge/Apex Height above eaves	Quantity	Width party wall to party wall	Depth	Area				
		Yes/No	Degrees	m	No.	m	m	m2				
	30 Dormer Flat Roofs (DFR)	Yes	8		1	6	3.5	21			11	50
	31 Dormer Side Wall (DSW)	Yes		[illegible]	2		3.5	18			11	50
	32 Dormer Window Wall (DWW)	[illegible]			1	6		15			11	50
Parapets	Positions	Parapets	Roof Pitch	Parapet height above roof	Quantity		Length of roof surface front to back in terrace	Area				
		Yes/No	Degrees	m	No.		m	m2				
	66 Eaves Parapet Walls (EPW)	Yes	35	0.6	[illegible]		12	2203.2				50
	67 Party Wall Parapet (PWP)	Yes	35	0.6			20	1800				50
	68 End of terrace Gable Wall Parapet (GWP)	Yes	35				20	72				50
Overhangs	Positions	Overhangs	Roof Pitch	Distance of overhang	Quantity	Width party wall to party wall		Area				
		Yes/No	Degrees	m	No.	m		m2				
	Eaves overhang	Yes	30	0.3	6	7.8		14.04				
	Verge overhang	Yes	35	0.3	6		11.8	21.24				
Gable Walls	Positions	Gable wall	Roof Pitch	Ridge/Apex Height above eaves	Quantity		Length of roof surface front to back in terrace	Area				
		Yes/No	Degrees	m	No.		m	m2				
	Gable wall upper triangle (Roof)	Yes	35	3	6		20	180				
Party Walls	Positions	Party Wall	Roof Pitch	Ridge/Apex Height above eaves	Quantity		Length front to back of terrace	Area				
		Yes/No	Degrees	m	No.		m	m2				
	Party wall roof triangles	Yes	35	3	150		10	2250				
			Not used in calcs so far									

Legend	
	User Input cell feeds into calculations
	Calculator results that the user can overwrite
	Calculator Results using user inputs
	Select from drop down list
	Row or Column titles
No	Not complete by BRM: Users ignore this row
?	Awaiting information or User to interrogate
Yes	Completed by BRM, to be completed by Users

Future: Other Roof Geometry

User name:	BrianSpecMan did this
Project name:	Over type with Project name
Project address:	Over type with Project address

Other Geomerty Roofs	Which roof?	Roof Pitch	Ridge/Apex Height above eaves	Quantity	Width	Length	Area	Volume
	Yes/No	Degrees	m	No.	m	m	m2	m3
22 Flat Roof (FR)	Yes	8	0.25	1	6	10.00	60.02	7.50
23 Shallow Roof (SR)			5		6	10.01	60.07	15.02
24 Pitched Roof (PR)	Yes	35	3	1	6	10.44	62.64	93.96
25 Barrel Vault Roof (BVR)	Yes		7.5	1	6	9.43	56.56	133.32
26 Domed Roof (DR)	Yes		7.5	1	6	9.43	84.83	56.56
27 Hipped/Pyramid Roof (HPR)	Yes	35	3	1	6	10.44	62.64	93.96
28 Mono-Pitched Roof (MPR)	Yes	30	3	1	6	10.44	62.64	93.96
29.1 Mansards Roof Flat (MR:F))	Yes	8	0.25	1	6	9.75	58.52	147.19
29.2 Mansard Roof Vertical (MR:V)	Yes	80	2.5	1	6	2.51	15.07	0.00
41 Other Geometry Ceiling (OGC)		?	3	1	6	13.42	80.50	121
41.1 Conical		30	5		6	15.62	93.72	?
41.2 Hyperbolic Parabaloid		30	1	1	6	16.97	101.82	?
41.3 Diagonal Butterfly		30	3	1	6	13.42	80.50	?
41.4 Truncated Conical		30	3	1	6	13.42	80.50	?
41.5 Inverted Truncated Conical		30	3	1	6	13.42	80.50	?
41.6 Secant Plan		30	3	1	6	13.42	80.50	?
41.7 Circular/Oval Plan		30	3	1	6	13.42	80.50	?
41.8		30	3	1	6	13.42	80.50	?
		Not used in calculations so far				Not used in calculations so far	Not used in calculations so far	Not used in calculations so far

Legend	
	User Input cell feeds into calculations
	Calculator results that the user can overwrite
	Calculator Results using user inputs
	Select from drop down list
	Row or Column titles
No	Not complete by BRM: Users ignore this row
?	Awaiting information or User to interrogate
Yes	Completed by BRM, to be completed by Users

GBE

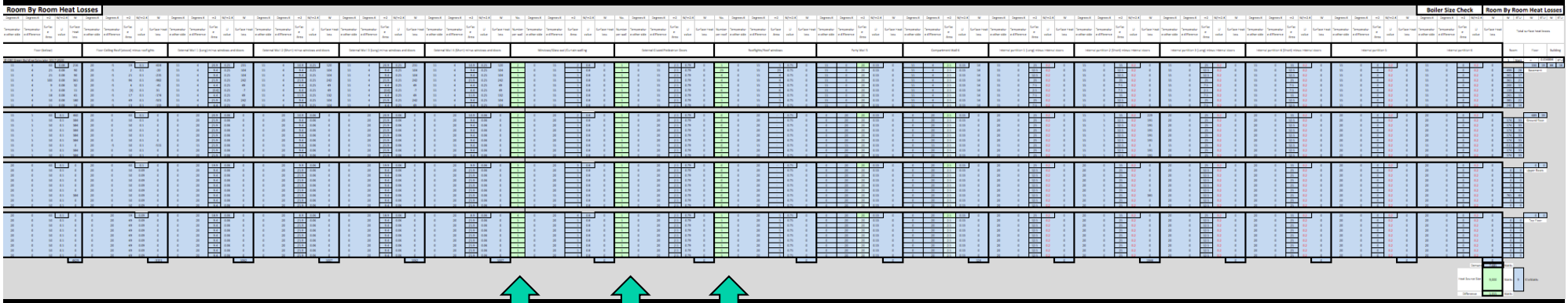
https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V2 Room By Room Heat Losses



© GBE 2020 GBC Green Building Calculator

GBE

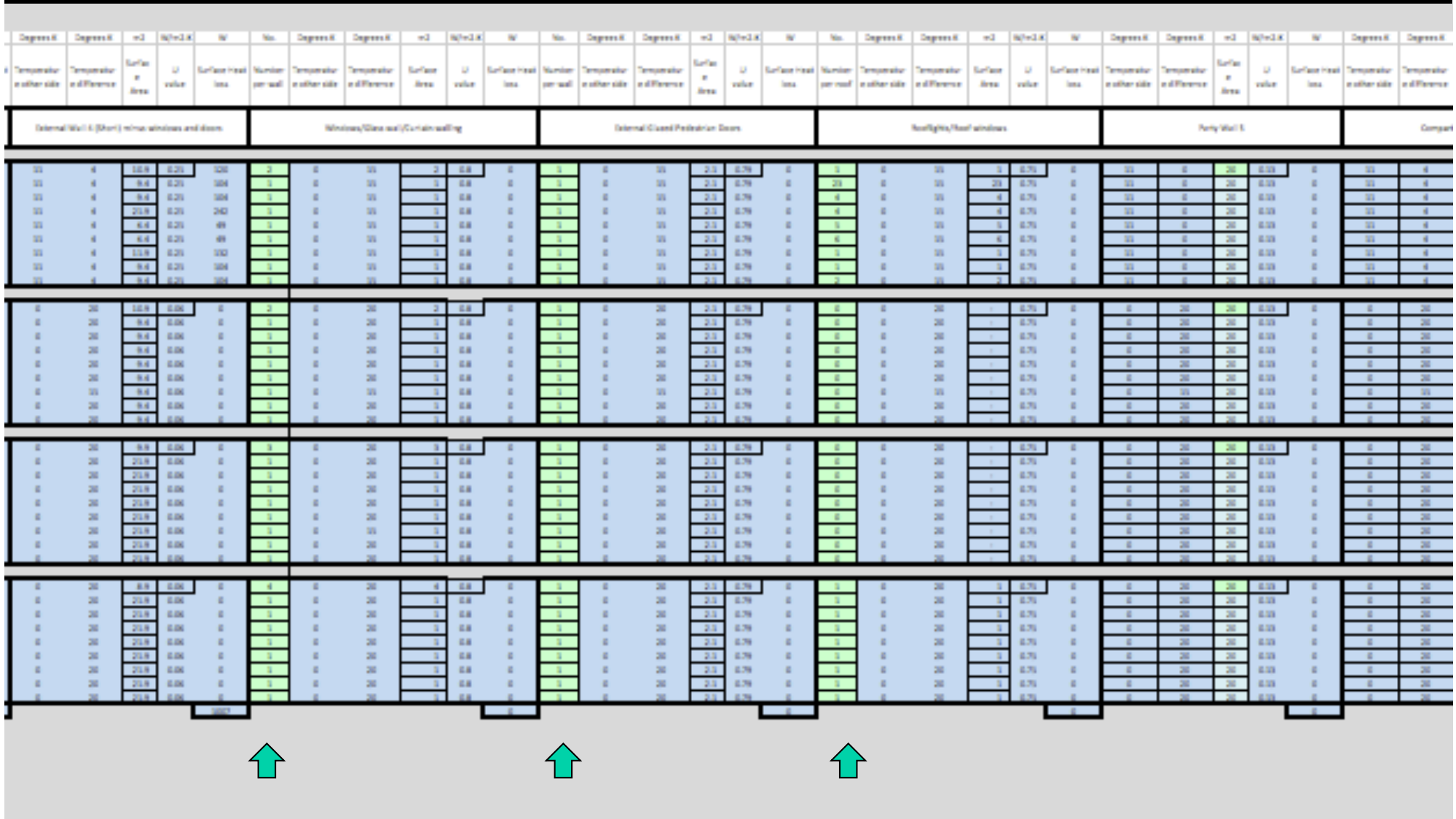
https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V2 Room by room Heat losses



Boiler Size Check

Room By Room Heat Losses

Degrees K	Degrees K	m2	W/m2.K	W	Degrees K	Degrees K	m2	W/m2.K	W	W	BTU	W	BTU	W	BTU
Temperature other side	Temperature difference	Surface Area	U value	Surface Heat loss	Temperature other side	Temperature difference	Surface Area	U value	Surface Heat loss	Total surface heat losses					
Internal partition 5					Internal partition 6					Room		Floor		Building	
										1	Watt	=	0.056884		BTU
15	0	0	0.2033	0	15	0	0	0.2033	0			330	19	1019	58
15	0	0	0.2033	0	15	0	0	0.2033	0	499	28	Basement			
15	0	0	0.2033	0	15	0	0	0.2033	0	305	17				
15	0	0	0.2033	0	15	0	0	0.2033	0	361	21				
15	0	0	0.2033	0	15	0	0	0.2033	0	200	11				
15	0	0	0.2033	0	15	0	0	0.2033	0	139	8				
15	0	0	0.2033	0	15	0	0	0.2033	0	265	15				
15	0	0	0.2033	0	15	0	0	0.2033	0	385	22				
15	0	0	0.2033	0	15	0	0	0.2033	0	240	14				
20	0	0	0.2033	0	20	0	0	0.2033	0			689	39		
20	0	0	0.2033	0	20	0	0	0.2033	0	574	33	Ground floor			
20	0	0	0.2033	0	20	0	0	0.2033	0	574	33				
20	0	0	0.2033	0	20	0	0	0.2033	0	574	33				
20	0	0	0.2033	0	20	0	0	0.2033	0	574	33				
20	0	0	0.2033	0	20	0	0	0.2033	0	574	33				
15	0	0	0.2033	0	15	0	0	0.2033	0	-511	-29				
20	0	0	0.2033	0	20	0	0	0.2033	0	574	33				
20	0	0	0.2033	0	20	0	0	0.2033	0	574	33				
20	0	0	0.2033	0	20	0	0	0.2033	0			0	0		
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0	Upper floors			
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
20	0	0	0.2033	0	20	0	0	0.2033	0	765	44				
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
20	0	0	0.2033	0	20	0	0	0.2033	0			0	0		
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0	Top Floor			
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
20	0	0	0.2033	0	20	0	0	0.2033	0	0	0				
				0					0						

Demand	7,685	Watts		
Heat Source Size	9,000	Watts	9	KiloWatts
Difference	1,315	Watts		

V2.0.0. Form Factor

User name:	BrianSpecMan did this
Project name:	Over type with Project name
Project address:	Over type with Project address
Building Facility:	Over type with Building User Activity or Purpose
Project Brief Employer Requirements or Architect's Proposal	

Form Factor		No.	No.	m	m	m2	m	m3		
Building(s)	Room Functions	Number of buildings	Number of floors	Length(s)	Width(s)	Floor Area Ceiling Area Roof Area	Room heights	Volumes		
© GBE Green Building Calculator 2017-2020		1 to 1000	1 to 50	1 to 1000	1 to 1000	1 to 1 million	2.4 to 10	1 to 10 million		
Whole Building	All rooms	1	4	10	6	240	2.5	600	m3	Volume
Terrace(s)	One or many	Number of terraces	Number of units in terrace	Depth front to back in terrace	Party wall to party wall	Position of single unit in terrace	Number of party walls	Number of end walls		
© GBE Green Building Calculator 2017-2020		1 to 1000	1 to 100	1 to 25	1 to 10	N/A, End or Mid				
		3	51	10	6	Not Applicable	150	6	No.	

	Number of buildings	Number of floors	Length(s)	Width(s)	Floor Area Ceiling Area Roof Area	Room heights
External wall	1	4	80	48	1280	2.5
Ground floor footprint	1		10	6	60	
Ground or upper Floor suspended over external air	1	1	10	6	60	

			Number of buildings	Number of floors	Length(s)	Width(s)	Roof Area	Roof height	Roof Volume	
Yes	Roof area, Roof shape and Attic volume	22 Flat Roof (FR)	[illegible]	[illegible]	[illegible]	6	60	0.25	0	m3
Yes		23 Shallow Roof (SR)	[illegible]	[illegible]	[illegible]	6	60	0.5	15	m3
Yes		24 Pitched Roof (PR)	1	1	10	6	60	3	90	m3
Yes		25 Barrel Vault Roof (BVR)	1	1	10	6	60	3	283	m3
Yes		26 Domed Roof (DR)	[illegible]	1	10	6	60	3	113	m3
Yes		27 Hipped/Pyramid Roof (HPR)	[illegible]	1	10	6	60	3	45	m3
Yes		28 Mono-Pitched Roof (MPR)	[illegible]	1	10	6	60	3	90	m3
Yes		29 Mansard Roof (MR)	1	1	10	6	60	0.25	14	m3
Yes		33 Other Geometry Roof (OGR)	1	1	10	6	60	3	121	m3

	No.	Number of floors	Depth	Width	Floor/Roof Area	Height	Volume		Heat Loss Surface Area	
Terraced House Rear Extension	1	1	5	3.5	17.5	2.5	43.75	m3	51	m2
Weather Porch	[illegible]	1	2	2	4	3	12	m3	25	m2
Conservatory/Sun Space	[illegible]	1	3	5.5	16.5	5	82.5	m3	73.5	m2
Bay window	1	1	1	3	3	2.5	7.5	m3	16.5	m2
Oriel Window (upper floor bay window)	1	1	1	3	3	2.5	7.5	m3	16.5	m2
28-30 Dormer roof/window	1	1	4	5.5	22	2	44	m3	37.5	m2

Heat Loss Surface Area	SA	1				1766	m2		797.25	m3	220	m2
Treated Floor Area	TFA	1	4	10	6	240	m2					

Form Factor (FF) range	0	1	2	3	4	5	6	7	8	9	10	
Form Factor (FF) =	SA/TFA					8.28	Used by Zero Carbon Hub's Designer's Manual					
	Typology/Shape ology					FF		Target U values	Y/N	Unit		
Target Form Factor FF	Apartment Block or uniform terrace					<2	1	0.2 to 0.15	N	W/m2.K	4	
	Semi-detached or compact detached houses					2 to 3	2	0.15 to 0.12	N	W/m2.K	3	
	Less compact detached houses or compact detached bungalows					3 to 4	3	0.12 to 0.10	N	W/m2.K	2	
	Complex shaped detached bungalows					>4	4	<0.1	Y	W/m2.K	1	

	Passivhaus Heat Loss Factor (HLF)	0.7	1.1	1.5	2	2.4	2.8	3	3.3	3.7	4	4.5	No.
0.038	Stone wool insulation (mm)	70	110	150	200	240	280	300	330	370	400	450	mm
K	Equals U values of:	0.5429	0.3455	0.2533	0.1900	0.1583	0.1357	0.1267	0.1152	0.1027	0.0950	0.0844	U
0.022	Polyurethane	64	87	116	139	162	174	191	191	214	232	261	mm

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V1.0.0. Scope: Building Elements

Building Elements

© GBE Calculator 2018-2020

	User name:		over type with User's name		
Buildings	1	Foot print:	1500	Floors	5
Use/Function	Overwrite with building type not Fire station Opera house Fatility Clinic				
External Winter low temperature	4	degrees C	Get local Met Office data for you site		
Subsoil temperature	11	degrees C	Below 1 meter constant 10 to 12 (UK)		
Internal Winter Temperature	20	degrees C	Replace with bespoke temperature 0 to 30		
Communal Area Winter Temperature	15	degrees C	Replace with bespoke temperature 0 to 30		
Basement Winter Temperature	15	degrees C	Replace with bespoke temperature 0 to 30		
Other Internal Temperatures	15	degrees C	Other parts of building at diff temp 0 to 30		
Hours of operation	8	Hrs	1 to 24?		
Storey height (default if consistent)	2.5	m	2.5 to 10 You can add different heights later		
Basement	Yes	Yes/No	External Walls	Yes	Yes/No
Basement Floor	Yes	Yes/No	Wall between integral unheated and heated room	Yes	Yes/No
Basement Perimeter Walls	Yes	Yes/No	Internal partitions/walls	Yes	Yes/No
Basement Roof at site level	Yes	Yes/No	Compartment walls	Yes	Yes/No
Basemment Roof at subterranean level	Yes	Yes/No	Party Wall	Yes	Yes/No
Basement overhead Glazed pavement	Yes	Yes/No	Windows	Yes	Yes/No
Basement partition walls	Yes	Yes/No	Glazed Pedestrian Doors	Yes	Yes/No
Swimming pool basin	Yes	Yes/No	Opaque Pedestrian Doors	Yes	Yes/No
Ground floor over basement	Yes	Yes/No	Rooflights	Yes	Yes/No
Ground floor over void	Yes	Yes/No	Roof windows	Yes	Yes/No
Ground floor ground bearing	Yes	Yes/No	Glazed External Walls	Yes	Yes/No
Upper floor	Yes	Yes/No	Opaque Curtain wall	Yes	Yes/No
Compartment floors	Yes	Yes/No	Display Window	Yes	Yes/No
Party Floor	Yes	Yes/No	Large wall opening/Vehicle Door	Yes	Yes/No
External floor (over air)	Yes	Yes/No	High Usage Entrace Door	Yes	Yes/No
Flat roof	Yes	Yes/No	Glazed roof	Yes	Yes/No
Shallow roof	Yes	Yes/No	Roof vents	Yes	Yes/No
Pitched roof	Yes	Yes/No	Dormer Roofs	Yes	Yes/No
Dome Roof	Yes	Yes/No	Dormer Walls	Yes	Yes/No
Barrel vault roof	Yes	Yes/No	Dormer Windows	Yes	Yes/No
Flat ceiling (below pitched, barrel or domed roof)	Yes	Yes/No	Parapets	No	Yes/No
Vaulted ceiling	Yes	Yes/No	Chimneys	No	Yes/No
Barrel vault ceiling	Yes	Yes/No	Pending	No	Yes/No
Dome ceiling	Yes	Yes/No	Pending	No	Yes/No

V2.0.0. Scope: Building Elements

Building Uv Envelop Elements

Uv = U value	User name:	BrianSpecMan did this
Buildings	1	Foot print
Use/Function	Over type with Building User Activity or Purpose	
External Winter low temperature	0	degrees C
Subsoil temperature	11	degrees C
Internal Winter Temperature	20	degrees C
Communal Area Winter Temperature	10	degrees C
Basement Winter Temperature	15	degrees C
Other Internal Temperature	15	degrees C
Hours of operation	8	Hrs.
Storey height (default / consistent)	2.5	m
Basement (B)		
1 Basement Floor (BF)	Yes	Yes/No
2 Basement Perimeter Retaining Walls (BPRW)	Yes	Yes/No
3 Basement External Wall (BEW)	Yes	Yes/No
4 Basement Roof / Ground Level (BRGL)	Yes	Yes/No
5 Basement Roof / Sub Mansard level (BRSL)	Yes	Yes/No
6 Basement Overhead Covered Pavement (BOCP)	Yes	Yes/No
7 Swimming Pool with (B)	Yes	Yes/No
8 Pile (P)	Yes	Yes/No
9 Ground Floor Slab Basement (GFDB)	Yes	Yes/No
10 Ground Floor Ground Bearing (GFGB)	Yes	Yes/No
11 Ground Floor Over Ventilated Void (GFOV)	Yes	Yes/No
11 Upper Floor (UF)	Yes	Yes/No
12 Services Riser Upper Floor (SRUF)	Yes	Yes/No
13 External Floor & Soffit (EFS) (over air)	Yes	Yes/No
14 Top Floor (TF)	Yes	Yes/No
Compartmentation (C)		
15 Party Floor (PF)	Yes	Yes/No
16 Party Wall (PW)	Yes	Yes/No
17 Communal Compartment Floors (CCF)	Yes	Yes/No
18 Communal Compartment Wall (CCW)	Yes	Yes/No
19 Riser Compartment Upper Floor (RCUF)	Yes	Yes/No
Walls (W)		
20 External Walls (EW)	Yes	Yes/No
21 Internal Unheated Space Wall (IUSW)	Yes	Yes/No
Roofs (R)		
22 Flat Roof (FR)	Yes	Yes/No
23 Shallow Roof (SR)	Yes	Yes/No
24 Pitched Roof (PR)	Yes	Yes/No
25 Barrel Vault Roof (BVR)	Yes	Yes/No
26 Domed Roof (DR)	Yes	Yes/No
27 Hipped/Pyramid Roof (HPR)	Yes	Yes/No
28 Mono-Pitched Roof (MPR)	Yes	Yes/No
29 Mansard Roof (MR)	Yes	Yes/No
30 Dormer Flat Roofs (DFR)	Yes	Yes/No
31 Dormer Side Wall (DSW)	Yes	Yes/No
32 Dormer Window Wall (DWW)	Yes	Yes/No
33 Other Geometry Roof (OGR)	Yes	Yes/No
Internal Ceilings (IC)		
34 Flat Ceiling (FC)	Yes	Yes/No
35 Pitched Vault Ceiling (PVC)	Yes	Yes/No
36 Barrel Vault Ceiling (BVC)	Yes	Yes/No
37 Domed Vault Ceiling (DVC)	Yes	Yes/No
38 Hipped/Pyramid Vault Ceiling (HPVC)	Yes	Yes/No
39 Mono-Pitch Vault Ceiling (MPVC)	Yes	Yes/No
40 Mansard Vault Ceiling (MVC)	Yes	Yes/No
41 Other Geometry Ceiling (OGC)	Yes	Yes/No
Glazing Windows Rooflights/vents and Doors (G)		
42 Windows (W)	Yes	Yes/No
43 Glazed Pedestrian Doors (GPD)	Yes	Yes/No
44 Opaque Pedestrian Doors (OPD)	Yes	Yes/No
45 Large Wall Opening (LWO)	Yes	Yes/No
46 High Usage Entrance Door (HUED)	Yes	Yes/No
47 Display Window (DW)	Yes	Yes/No
48 Glazed External Walls (GEW)	Yes	Yes/No
49 Opaque External Walls (OEW)	Yes	Yes/No
50 Glazed Roof (GR)	Yes	Yes/No
51 Rooflights (RL)	Yes	Yes/No
52 Roof Windows (RW)	Yes	Yes/No
53 Roof Air & Smoke Vents (RASV)	Yes	Yes/No
Foundations (F)		
72 Brickwork Footings (BF)	Yes	Yes/No
73 Strip Foundation (SF)	Yes	Yes/No
74 Foundation Wall (FW) (over strip foundation or trench foundation)	Yes	Yes/No
75 Trenchfill Foundation (TF)	Yes	Yes/No
76 Sleeper Wall (SW) (below suspended ground floor)	Yes	Yes/No
77 Raft Foundation Reinforced Concrete Slab, Edge & Internal Beams (RFRC)	Yes	Yes/No
78 Insulating Permanent Formwork Raft Foundation (IPFRF)	Yes	Yes/No
79 Pad foundation & columns (PFC)	Yes	Yes/No
80 Pile foundation & Grounds beams (PFGB)	Yes	Yes/No
81 Sheet Pile and Top Stiffener (SPTS)	Yes	Yes/No
82 Vibrated Aggregate Pile (VAP)	Yes	Yes/No
83 Steel Corkscrew/Auger Pile (SCAP)	Yes	Yes/No
84 Diaphragm wall (DW)	Yes	Yes/No
85 Secant Pile Wall (SPW)	Yes	Yes/No
86 Underpinning: Trench (UT)	Yes	Yes/No
87 Underpinning: Pile (UP)	Yes	Yes/No
Structural Frame (SF)		
88 Frames: Columns	Yes	Yes/No
89 Frames: Beams (supporting floors and flat roofs)	Yes	Yes/No
90 Frames: Flat roofs/Floors: Trough Decks	Yes	Yes/No
91 Frames: Pitched Roofs: Portal, Ridges, Eaves, Rafters, Purlins	Yes	Yes/No
92 Frames: Diaphragm walls/Diagonal Bracing	Yes	Yes/No
Bespoke Project Specific Items (BPSI)		
160 Basement Retaining Floor (BRF)	Yes	Yes/No
161 Basement Perimeter Retaining Walls (BPRW)	Yes	Yes/No
162 Ground Floor Over Basement (GFDB)	Yes	Yes/No
163 Ground Floor Ground Bearing (GFGB)	Yes	Yes/No
164 Ground Floor Over Void (GFOV)	Yes	Yes/No
165	Yes	Yes/No
166	Yes	Yes/No
167	Yes	Yes/No
168	Yes	Yes/No
169	Yes	Yes/No
170	Yes	Yes/No
171	Yes	Yes/No
172	Yes	Yes/No
173	Yes	Yes/No

Non-Uv Envelop Elements

(24)	Floors	4
Get local Met Office data for your site		
1 m below ground constant 10 to 12 (UK)		
Replace with bespoke temperature 0 to 30		
Replace with bespoke temperature 0 to 30		
Replace with bespoke temperature 0 to 30		
Other parts of building at diff temp 0 to 30		
0 to 24?		
2.5 to 10 You can add different heights later		
Basement External Entrance Well (BEEW)		
54 Basement External Entrance Well Retaining Pavement (BEEWRP)	Yes	Yes/No
55 Basement External Entrance Well Retaining Wall (BEEWRW)	Yes	Yes/No
56 Basement External Entrance Well Staircase (BEEWS)	Yes	Yes/No
57 Basement External Entrance Well Partial Wall (BEEWPW)	Yes	Yes/No
Internal walls partitions Lifters (IW)		
58 Basement Internal Walls (BIW)	Yes	Yes/No
59 Basement Internal Partitions (BIP)	Yes	Yes/No
60 Internal Walls (IW)	Yes	Yes/No
61 Internal Partitions (IP)	Yes	Yes/No
62 Kitchen Units/Cupboards (KU) & Basic Fixtures (BOFF) & Internal Wall Lifters (IWL)	Yes	Yes/No
63 Internal MEP Service Riser Walls (MSRW)	Yes	Yes/No
64 Internal Lift Shaft Walls (LSW)	Yes	Yes/No
65 Internal Stair Riser Walls (ISRW)	Yes	Yes/No
Outside Uv Envelop Building Elements (OUE)		
66 Eaves Parapet Walls (EPW)	Yes	Yes/No
67 Party Wall Parapet (PWP)	Yes	Yes/No
68 End of terrace Gable Wall Parapet (GWP)	Yes	Yes/No
69 Chimneys/Chimney Breast (C/CB)	Yes	Yes/No
70 Attached Party Site Boundary Wall (APWBW)	Yes	Yes/No
71 Party Wall Roof Triangle (PWRT)	Yes	Yes/No
Secondary Elements (SE)		
93 L30 Staircase/Landing/Walkways	Yes	Yes/No
N Furniture Fixtures Equipment (FFE)		
94 N10 Attic Eaves Furniture (AEF)	Yes	Yes/No
95 N10 Other Furniture (OF)	Yes	Yes/No
96 N11 Domestic Kitchen Furniture (DKF)	Yes	Yes/No
97 N12 Catering Equipment (CE) (Non-Domestic)	Yes	Yes/No
98 N13 Bathroom Furniture (BF)	Yes	Yes/No
P Building Fabric Sundries		
99 P10 Sundry Insulation/Proofing work	Yes	Yes/No
100 P11 Foamed/Fibres/Bead cavity wall insulation	Yes	Yes/No
101 P12 Fire Stopping Systems	Yes	Yes/No
102 P14 Air/Wind Tightness Systems	Yes	Yes/No
103 P20 Unframed isolated Trims/Skirtings/Sundry items	Yes	Yes/No
104 P21 Ironmongery	Yes	Yes/No
105 P22 Sealant Joints	Yes	Yes/No
106 P23 Movement Joints (Non-domestic)	Yes	Yes/No
107 P30 Trenches/Pipeways/Pits for buried engineering services	Yes	Yes/No
108 P31 Holes/Chases/Covers/Supports for Services	Yes	Yes/No
109 P32 Services Painting (And identification?)	Yes	Yes/No
110 P33 Plinths and Bund Systems	Yes	Yes/No
111 P39 Cable Pass Throughs (Non-Domestic)	Yes	Yes/No
Landscape (L)		
112 Q10 Raised Beds	Yes	Yes/No
113 Q10 Stairs	Yes	Yes/No
114 Q10 Steps	Yes	Yes/No
115 Q20 Drive	Yes	Yes/No
116 Q20 Paths	Yes	Yes/No
117 Q20 Ramps	Yes	Yes/No
118 Q30 Lawn	Yes	Yes/No
119 Q31 Boarders	Yes	Yes/No
120 Q40 Fence and Gates	Yes	Yes/No
121 Q41 Railings and Gates	Yes	Yes/No
122 Q51 Sports Equipment	Yes	Yes/No
123 Q53 Bat or Bird Accommodation	Yes	Yes/No
124 Q55 Decking	Yes	Yes/No
125 Q55 Balcony & Independent Supports	Yes	Yes/No
126 Q60 Pond/Water Feature/Swimming Pond	Yes	Yes/No
127 Q70 Composter and Wormeries	Yes	Yes/No
128 Q70 Front/Rear Garden Bin/Bike/Delivery Store	Yes	Yes/No
129 Q70 Pergolas/Solar Shading & Independent Supports	Yes	Yes/No
130 Q70 Rear Garden Shed	Yes	Yes/No
131 Q75 Retaining walls	Yes	Yes/No
Domestic MEP Services (DMEPS)		
132 J00 Basement Internal Drainage	Yes	Yes/No
133 R10 Rainwater Gutters Pipework	Yes	Yes/No
134 R11 Above ground drainage	Yes	Yes/No
135 R12 Below ground drainage	Yes	Yes/No
136 R14 Land Drainage	Yes	Yes/No
137 R15 Sustainable Urban Drainage System (SuDS)	Yes	Yes/No
138 R91 Refuse Disposal System Domestic	Yes	Yes/No
139 S14 Irrigation Systems	Yes	Yes/No
139 S17 Rainwater Harvesting Systems	Yes	Yes/No
140 S90 Hot and Cold Water Domestic	Yes	Yes/No
141 S91 Gas Supply Domestic	Yes	Yes/No
142 S92 Sprinkler System Domestic	Yes	Yes/No
143 T14 Air Water Ground Source Heat Pumps	Yes	Yes/No
144 T16 Solar Collectors	Yes	Yes/No
145 T90 Heating Domestic	Yes	Yes/No
146 U90 Ventilation Domestic	Yes	Yes/No
147 V90 Electrical Installation Domestic	Yes	Yes/No
148 V91 Electrical Systems Landscape	Yes	Yes/No
149 W90 Communications & Security Domestic	Yes	Yes/No
150 X90 Transport Systems Domestic	Yes	Yes/No
Non-Domestic MEP Services (N-DMEPS)		
200	Yes	Yes/No
201	Yes	Yes/No
202	Yes	Yes/No
203	Yes	Yes/No
204	Yes	Yes/No
205	Yes	Yes/No
206	Yes	Yes/No
207	Yes	Yes/No
208	Yes	Yes/No
209	Yes	Yes/No
210	Yes	Yes/No
211	Yes	Yes/No
212	Yes	Yes/No
213	Yes	Yes/No

Building Uv Envelop Elements

Uv = U value	User name:	BrianSpecM
Basement (B)		
1 Basement Floor (BF)	Yes	Yes/No
2 Basement Perimeter Retaining Walls (BPRW)	Yes	Yes/No
3 Basement External Wall (BEW)	Yes	Yes/No
4 Basement Roof at Site Level (BRSL)	Yes	Yes/No
5 Basement Roof at SubTerranean level (BRSTL)	Yes	Yes/No
6 Basement Overhead Glazed Pavement (BOGP)	Yes	Yes/No
7 Swimming Pool Basin (SPB)	Yes	Yes/No
Floors (F)		
8 Ground Floor Over Basement (GFOB)	Yes	Yes/No
9 Ground Floor Ground Bearing (GFGB)	Yes	Yes/No
10 Ground Floor Over Ventilated Void (GFOV)	Yes	Yes/No
11 Upper Floor (UF)	Yes	Yes/No
12 Services Riser Upper Floor (SRUF)	Yes	Yes/No
13 External Floor & Soffit (EFS) (over air)	Yes	Yes/No
14 Top Floor (TF)	Yes	Yes/No
Compartmentation (C)		
15 Party Floor (PF)	Yes	Yes/No
16 Party Wall (PW)	Yes	Yes/No
17 Communal Compartment Floors (CCF)	Yes	Yes/No
18 Communal Compartment Wall (CCW)	Yes	Yes/No
19 Riser Compartment Upper Floor (RCUF)	Yes	Yes/No
Walls (W)		
20 External Walls (EW)	Yes	Yes/No
21 Integral Unheated Space Wall (IUSW)	Yes	Yes/No
Roofs (R)		
22 Flat Roof (FR)	Yes	Yes/No
23 Shallow Roof (SR)	Yes	Yes/No
24 Pitched Roof (PR)	Yes	Yes/No
25 Barrel Vault Roof (BVR)	Yes	Yes/No
26 Domed Roof (DR)	Yes	Yes/No
27 Hipped/Pyramid Roof (HPR)	Yes	Yes/No
28 Mono-Pitched Roof (MPR)	Yes	Yes/No
29 Mansard Roof (MR)	Yes	Yes/No
30 Dormer Flat Roofs (DFR)	Yes	Yes/No
31 Dormer Side Wall (DSW)	Yes	Yes/No
32 Dormer Window Wall (DWW)	Yes	Yes/No
33 Other Geometry Roof (OGR)	Yes	Yes/No
Internal Ceilings (IC)		
34 Flat Ceiling (FC)	Yes	Yes/No
35 Pitched Vault Ceiling (PVC)	Yes	Yes/No
36 Barrel Vault Ceiling (BVC)	Yes	Yes/No

Glazing Windows Rooflights/vents and Doors (G)		
42 Windows (W)	Yes	Yes/No
43 Glazed Pedestrian Doors (GPD)	Yes	Yes/No
44 Opaque Pedestrian Doors (OPD)	Yes	Yes/No
45 Large Wall Opening (LWO)	Yes	Yes/No
46 High Usage Entrance Door (HUED)	Yes	Yes/No
47 Display Window (DW)	Yes	Yes/No
48 Glazed External Walls (GEW)	Yes	Yes/No
49 Opaque External Walls (OEW)	Yes	Yes/No
50 Glazed Roof (GR)	Yes	Yes/No
51 Rooflights (RL)	Yes	Yes/No
52 Roof Windows (RW)	Yes	Yes/No
53 Roof Air & Smoke Vents (RASV)	Yes	Yes/No
Foundations (F)		
72 Brickwork Footings (BF)	Yes	Yes/No
73 Strip Foundation (SF)	Yes	Yes/No
74 Foundation Wall (FW) (over strip foundation or trench foundation)	Yes	Yes/No
75 Trenchfill Foundation (TF)	Yes	Yes/No
76 Sleeper Wall (SW) (below suspended ground floor)	Yes	Yes/No
77 Raft Foundation Reinforced Concrete Slab, Edge & Internal Beams (RFRC)	Yes	Yes/No
78 Insulating Permanent Formwork Raft Foundation (IPFRF)	Yes	Yes/No
79 Pad foundation & columns (PF+C)	Yes	Yes/No
80 Pile foundation & Grounds beams (PFGB)	Yes	Yes/No
81 Sheet Pile and Top Stiffener (SPTS)	Yes	Yes/No
82 Vibrated Aggregate PIle (VAP)	Yes	Yes/No
83 Steel Corkscrew/Auger Pile (SCAP)	Yes	Yes/No
84 Diaphragm wall (DW)	Yes	Yes/No
85 Secant Pile Wall (SPW)	Yes	Yes/No
86 Underpinning: Trench (UT)	Yes	Yes/No
87 Underpinning: Pile (UP)	Yes	Yes/No
Structural Frame (SF)		
88 Frames: Columns	Yes	Yes/No
89 Frames: Beams (supporting floors and flat roofs)	Yes	Yes/No
90 Frames: Flat roofs/Floors: Trough Decks	Yes	Yes/No
91 Frames: Pitched Roofs: Portal, Ridges, Eaves, Rafters, Purlins	Yes	Yes/No
92 Frames: Diaphragm walls/Diagonal Bracing	Yes	Yes/No
Bespoke Project Specific Items (BPSI)		
160 Basement Retaining Floor (BRF)	Yes	Yes/No
161 Basement Perimeter Retaining Walls (BPRW)	Yes	Yes/No
162 Ground Floor Over Basement (GFOB)	Yes	Yes/No
163 Ground Floor Ground Bearing (GFGB)	Yes	Yes/No
164 Ground Floor Over Void (GFOV)	Yes	Yes/No
165 _	Yes	Yes/No
166 _	Yes	Yes/No
167 _	Yes	Yes/No
168 _	Yes	Yes/No
169 _	Yes	Yes/No

Non-Uv Envelop Elements

Basement External Entrance Well (BEEW)		
54 Basement External Entrance Well Retaining Pavement (BEEWRP)	Yes	Yes/No
55 Basement External Entrance Well Retaining Wall (BEEWRW)	Yes	Yes/No
56 Basement External Entrance Well Staircase (BEEWS)	Yes	Yes/No
57 Basement External Entrance Well Party wall (BEEWPW)	Yes	Yes/No
Internal walls partitions dividers (IW)		
58 Basement Internal Walls (BIW)	Yes	Yes/No
59 Basement Internal Partitions (BIP)	Yes	Yes/No
60 Internal Walls (IW)	Yes	Yes/No
61 Internal Partitions (IP)	Yes	Yes/No
62 K32 Internal Cubicles (IC) & Back Panels (ICBP) & Inernal Wall Linings (IWL)	Yes	Yes/No
63 Internal MEP Service Riser Walls (MSRW)	Yes	Yes/No
64 Internal Lift Shaft Walls (LSW)	Yes	Yes/No
65 Internal Stair Riser Walls (SRW	Yes	Yes/No
Outside Uv Envelop Building Elements (OUE)		
66 Eaves Parapet Walls (EPW)	Yes	Yes/No
67 Party Wall Parapet (PWP)	Yes	Yes/No
68 End of terrace Gable Wall Parapet (GWP)	Yes	Yes/No
69 Chimneys/Chimney Breast (C/CB)	Yes	Yes/No
70 Attached Party Site Boundary Wall (APWBW)	Yes	Yes/No
71 Party Wall Roof Triangle (PWRT)	Yes	Yes/No
Secondary Elements (SE)		
93 L30 Staircase/Landing/Walkways	Yes	Yes/No
N Furniture Fixtures Equipment (FFE)		
94 N10 Attic Eaves Furniture (AEF)	Yes	Yes/No
95 N10 Other Furniture (OF)	Yes	Yes/No
96 N11 Domestic Kitchen Furniture (DKF)	Yes	Yes/No
97 N12 Catering Equipment (CE) (Non-Domestic)	Yes	Yes/No
98 N13 Bathroom Furniture (BF)	Yes	Yes/No
P Building Fabric Sundries		
99 P10 Sundry Insulation/Proofing work	Yes	Yes/No
100 P11 Foamed/Fibres/Bead cavity wall insulation	Yes	Yes/No
101 P12 Fire Stopping Systems	Yes	Yes/No
102 P14 Air/Wind Tightness Systems	Yes	Yes/No
103 P20 Unframed isolated Trims/Skirtings/Sundry items	Yes	Yes/No
104 P21 Ironmongery	Yes	Yes/No
105 P22 Sealant Joints	Yes	Yes/No
106 P23 Movement Joints (Non-domestic)	Yes	Yes/No
107 P30 Trenches/Pipeways/Pits for buried engineering services	Yes	Yes/No
108 P31 Holes/Chases/Covers/Supports for Services	Yes	Yes/No
109 P32 Services Painting (And Identification?)	Yes	Yes/No
110 P33 Plinths and Bund Systems	Yes	Yes/No

Landscape (L)		
112 Q10 Raised Beds	Yes	Yes/No
113 Q10 Stairs	Yes	Yes/No
114 Q10 Steps	Yes	Yes/No
115 Q20 Drive	Yes	Yes/No
116 Q20 Paths	Yes	Yes/No
117 Q20 Ramps	Yes	Yes/No
118 Q30 Lawn	Yes	Yes/No
119 Q31 Boarders	Yes	Yes/No
120 Q40 Fence and Gates	Yes	Yes/No
121 Q41 Railings and Gates	Yes	Yes/No
122 Q51 Sports Equipment	Yes	Yes/No
123 Q53 Bat or Bird Accommodation	Yes	Yes/No
124 Q55 Decking	Yes	Yes/No
125 Q55 Balcony & independent Supports	Yes	Yes/No
126 Q60 Pond/Water Feature/Swimming Pond	Yes	Yes/No
127 Q70 Composter and Wormeries	Yes	Yes/No
128 Q70 Front/Rear Garden Bin/Bike/Delivery Store	Yes	Yes/No
129 Q70 Pergolas/Solar Shading & Independent Supports	Yes	Yes/No
130 Q70 Rear Garden Shed	Yes	Yes/No
131 Q75 Retaining walls	Yes	Yes/No
Domestic MEP Services (DMEPS)		
132 J00 Basement Internal Drainage	Yes	Yes/No
133 R10 Rainwater Gutters Pipework	Yes	Yes/No
134 R11 Above ground drainage	Yes	Yes/No
135 R12 Below ground drainage	Yes	Yes/No
136 R14 Land Drainage	Yes	Yes/No
137 R15 Sustainable Urban Drainage System (SuDS)	Yes	Yes/No
138 R91 Refuse Disposal System Domestic	Yes	Yes/No
139 S14 Irrigation Systems	Yes	Yes/No
139 S17 Rainwater Harvesting Systems	Yes	Yes/No
140 S90 Hot and Cold Water Domestic	Yes	Yes/No
141 S91 Gas Supply Domestic	Yes	Yes/No
142 S92 Sprinkler System Domestic	Yes	Yes/No
143 T14 Air Water Ground Source Heat Pumps	Yes	Yes/No
144 T16 Solar Collectors	Yes	Yes/No
145 T90 Heating Domestic	Yes	Yes/No
146 U90 Ventilation Domestic	Yes	Yes/No
147 V90 Electrical Installation Domestic	Yes	Yes/No
148 V91 Electrical Systems Landscape	Yes	Yes/No
149 W90 Communications & Security Domestic	Yes	Yes/No
150 X90 Transport Systems Domestic	Yes	Yes/No
Non-Domestic MEP Services (N-DMEPS)		
200 _	Yes	Yes/No
201 _	Yes	Yes/No
202 _	Yes	Yes/No
203 _	Yes	Yes/No

V1.0.0. Building Element Areas

Yes/No	Building Element Areas			Yes/No	© GBE Calculator 2018-2020		
Yes	Basement Floor (BF)						
	Number of basements	1	No.		Basement Footprint	300	m2
	Width of basement	15	m		Total basement floor area(s)	300	m2
	Length of basement	20	m				
	Height of basement walls	2.5	m				
Yes	Basement Perimeter Walls (BPW)						
	Number of basements	1	No.		Length of Basement walls	70	m
	Width of basement	15	m		Basment wall areas	175	m2
	Length of basement	20	m		Total Basement Walls Area(s)	437.5	m2
	Height of basement walls	2.5	m				
Yes	Basement Partitions (BP)						
	Number of basements	1	No.		Basement Internal partitions areas	125	m2
	Width of Basement partitions	0.1	m		Total Basement Internal partitions areas	125	m2
	Length of Basement partitions	50	m				
	Height of Basement partitions	2.5	m				
Yes	Basement Roof at Site Level (BRSL)						
	Number of basement roof at site level	1	No.		Area of basement roof at site level	300	m2
	Width of Basement roof at site level	15	m		Total area of basement roof at site level	300	m2
	Length of Basement roof at site level	20	m				
Yes	Glazed Pavement over Basement (GPOB)						
	Number of Glazed Pavement over Basement	1	No.		Area of Glazed Pavement over Basement	11	m2
	Width of Glazed Pavement over Basement	1	m		Total Area of Glazed Pavement over Basement	11	m2
	Length of Glazed Pavement over Basement	11	m				
	Depth of Glazed Pavement over Basement	0.3	m				
Yes	Basement Roof at Subterranian Level (BRSL)						
	Number of basement roof at subterranian level	1	No.		Area of basement roof at subterranian level	300	m3
	Width of Basement roof at subterranian level	15	m		Total area of basement roof at subterranian level	300	m3
	Length Basement roof at subterranian level	20	m				
Yes	Swimming Pool Basin (SPB)						
	Number of Swimming pool basin	1	No.		Surface Area of Swimming pool basin	1448	m2
	Width of Swimming pool basin	8	m		Total Surface Area of Swimming pool basin	1448	m2
	Length of Swimming pool basin	100	m				
	Height of Swimming pool basin	3	m				
Yes	Ground floor (over basement) (GFOB)						
	Number of ground floors (over basement) (GFOB)	1	No.		Ground floor footprint	300	m2
	Width of ground floor (over basement) (GFOB)	15	m		Total Ground floor area(s) (over basement)	300	m2
	Length of Ground floor (over basement)	20	m		Length of GF External walls	70	m
	Height of GF External walls	2.5	m		Total GF External wall areas	175	m2
Yes	Ground floor (ground bearing) (GFGB)						
	Number of ground floors (ground bearing)	1	No.		Ground floor footprint (ground bearing)	300	m2
	Width of ground floor (ground bearing)	15	m		Total Ground floor area(s)	300	m2
	Length of ground floor (ground bearing)	20	m		Length of GF External walls	70	m
	Height of GF External walls	2.5	m		Total GF External wall areas	175	m2
Yes	Ground floor (over void) (GFOV)						
	Number of ground floors (over void)	1	No.		Ground floor (over void) area(s)	300	m3
	Width of ground floor (over void)	15	m		Total Ground floor area(s)	300	m2
	Length of ground floor (over void)	20	m		Length of GF External walls	70	m
	Height of GF External walls	2.5	m		Total GF External wall areas	175	m2

V2.0.0. Building Element Areas

Outside Uv Envelop Building Elements (OUE)

Yes	66 Eaves Parapet Walls (EPW)					Multiple	DropDownList
	Number of Eaves Parapet Walls	306	No.		Area of Eaves Parapet Wall	3.600	m2
	Thickness of Eaves Parapet Walls	0.215	m		Total Area of Eaves Parapet Walls	1,101.600	m2
	Length of Eaves Parapet Walls	6	m		Volume of Eaves Parapet Wall	0.774	m3
	Height of Eaves Parapet Walls	0.6	m		Total Volume of Eaves Parapet Walls	236.844	m3
Yes	67 Party Wall Parapet (PWP)					Multiple	DropDownList
	Number of Party Wall Parapets	153	No.		Area of Party Wall Parapet	6.000	m2
	Thickness of Party Wall Parapets	0.215	m		Total Area of Party Wall Parapet	918.000	m2
	Length of Party Wall Parapets	10	m		Volume of Party Wall Parapet	1.290	m3
	Height of Party Wall Parapets	0.6	m		Total Volume of Party Wall Parapet	197.370	m3
Yes	69 Chimneys/Chimney Breast (C/CB)					Multiple	DropDownList
	Number of Chimney/Chimney Brest (C/CB)	306	No.		Area of Chimney/Chimney Brest (C/CB)	16.875	m2
	Thickness of Chimney/Chimney Brest (C/CB)	0.215	m		Total Area of Chimney/Chimney Brest (C/CB)	5,163.750	m2
	Length of Chimney/Chimney Brest (C/CB)	5	m		Volume of Chimney/Chimney Brest (C/CB)	3.628	m3
	Height of Chimney/Chimney Brest (C/CB)	1.25	m		Total Volume of Chimney/Chimney Brest (C/CB)	1,110.206	m3
Yes	70 Attached Party Site Boundary Wall (APWBW)					Multiple	DropDownList
	Number of Attached Party Site Boundary Wall (APWBW)	2	No.		Area of Attached Party Site Boundary Wall (APWBW)	5.000	m2
	Thickness of Attached Party Site Boundary Wall (APWBW)	0.215	m		Total Attached Party Site Boundary Wall (APWBW)	10.000	m2
	Length of Attached Party Site Boundary Wall (APWBW)	5	m		Volume of Attached Party Site Boundary Wall (APWBW)	1.075	m3
	Height of Attached Party Site Boundary Wall (APWBW)	1	m		Total Volume of Attached Party Site Boundary Wall (APWBW)	2.150	m3
Yes	71 Party Wall Roof Triangle (PWRT)					Multiple	DropDownList
	Number of Party Wall Roof Triangle (PWRT)	2	No.		Area of Eaves Parapet Wall	10.000	m2
	Thickness of Party Wall Roof Triangle (PWRT)	1.215	m		Total Area of Eaves Parapet Walls	20.000	m2
	Length of Party Wall Roof Triangle (PWRT)	5	m		Volume of Eaves Parapet Wall	12.150	m3
	Height of Party Wall Roof Triangle (PWRT)	2	m		Total Volume of Eaves Parapet Walls	24.300	m3

Foundations (F)

Yes	72 Brickwork Footings (BF)					Multiple	DropDownList
	Number of buildings with brick footings	153	No.		Cross Section Area of wall above brick footings (BF)	0.022	m2
	Width of wall at top	0.215	m		Cross Section Area of wall brick footings	0.065	m2
	Width of brick foorings at base	0.44	m		Volume of wall above brick footings	0.921	m3
	Length of brick footing (perimeter and internal loadbearing walls)	42	m		Volume of wall brick footings	2.724	m3
	Number of courses of brick footings	2	No.		Total Volume of wall above brick footings (BF)	140.890	m3
	Depth of brick footing	0.3	m		Total Volume of wall brick footings (BF)	416.743	m3
Yes	73 Strip Foundation (SF)					Multiple	DropDownList
	Number of buildings with strip foundations	1	No.		Cross Section Area of Strip Foundation (SF)	0.135	m2
	Thickness of strip foundation	0.225	m		Volume of Strip foundation (SF)	17.550	m3
	Length of strip foundation	130	m		Total Volume of Strip Foundation (SF)	17.550	m3
	Width of strip foundation	0.6	m				
Yes	74 Foundation Wall (FW) (over strip foundation or trench foundation)					Singular	DropDownList
	Number of buildings with Foundationl Walls (FW)	1	No.		Cross Section Area of Foundation Wall (FW)	0.045	m2
	Type of foundation	Trenchfill			Volume of Foundation Wall (FW)	5.850	m3
	Thickness of Foundation Wall (FW)	0.3	m		Total Volume of Foundation Wall (FW)	5.850	m3
	Length of Foundation Wall (FW)	130	m		Total Volume multiple size of Foundation Wall (FW)	3,160.000	m3

© GBE 2020 GBC Green Building Calculator

V2.0.0. Building Element Areas

Structural Frames (SF)

Yes	88 Frames: Columns						
	Number of Buildings	1	No.		Number of floors	4	No.
	Spacing of Columns (Square grid)	5	m		Area of Circular Solid Columns	0.283	m2
	Spacing of Columns (Rectangular grid, widthg)	6	m		Area of Square Solid Columns	0.360	m2
	Height of Columns	2.5	m		Area of Rectangular Solid Columns	0.450	m2
	Profile of Columns	Rectangular Solid	List		Area of H Columns	0.009	m2
	External Diameter of Circular Columns	0	m		Area of Circular Hollow Columns	0.009	m2
	Width of Square of Rectangular Column	0.3	m		Area of Square Hollow Columns	0.012	m2
	Depth of Rectangular Columns	0.75	m		Area of Rectangular Hollow Columns	0.013	m2
	Width of H Columns	0.3	m		Volume of Circular Solid Columns	0.707	m3
	Depth of H Columns	0.3	m		Volume of Square Solid Columns	0.900	m3
	Thickness of Flanges and Webs of H Columns	0.01	m		Volume of Rectangular Solid Columns	1.125	m3
	Thickness of wall of Suare Rectangular or Circular Columns	0.01	m		Volume of H Columns	0.023	m3
	Number of columns along length	3	No.		Volume of Circular Hollow Columns	0.023	m3
	Number of columns across width	2	No.		Volume of Square Hollow Columns	0.030	m3
	Total Number of columns	6	No.		Volume of Rectangular Hollow Columns	0.033	m3
	Number of Circular Solid Columns	0	No.		**Total Volume of Circular Solid Columns**	0.000	m3
	Number of Square Solid Columns	0	No.		**Total Volume of Square Solid Columns**	0.000	m3
	Number of Rectangular Solid Columns	6	No.		**Total Volume of Rectangular Solid Columns**	27.000	m3
	Number of H Columns	0	No.		**Total Volume of H Columns**	0.000	m3
	Number of Circular Hollow Columns	0	No.		**Total Volume of Circular Hollow Columns**	0.000	m3
	Number of Square Hollow Columns	0	No.		**Total Volume of Square Hollow Columns**	0.000	m3
	Number of Rectangular Hollow Columns	0	No.		**Total Volume of Rectangular Hollow Columns**	0.000	m3
	Total Column check (if cell is red check number of Columns)	6	No.				
Yes	89 Frames: Beams (supporting floors and flat roofs)						
	Number of Buildings	1	m		Number of upper floors and roofs	4	No.
	Spacing of Beams (Square grid)	5	m		Area of Circular Solid Beams	0.071	m2
	Spacing of Beams (Rectangular grid, short spacing)	6	m		Area of Square Solid Beams	0.090	m2
	Lengths of Beams (average)	5.5	m		Area of Rectangular Solid Beams	0.120	m2
	Profile of Beams	Circular Solid	List		Area of H Beams	0.009	m2
	External Diameter of Circular Beams	0.3	m		Area of Circular Hollow Beams	0.005	m2
	Width of Square of Rectangular Beams	0.3	m		Area of Square Hollow Beams	0.006	m2
	Depth of Rectangular Beams	0.4	m		Area of Rectangular Hollow Beams	0.007	m2
	Width of H Beams	0.3	m		Volume of Circular Solid Beams	0.177	m3
	Depth of H Beams	0.3	m		Volume of Square Solid Beams	0.225	m3
	Thickness of Flanges and Webs of H Beams	0.01	m		Volume of Rectangular Solid Beams	0.300	m3
	Thickness of wall of Square Rectangular or Circular Beams	0.01	m		Volume of H Beams	0.023	m3
	Number of Beams along length of building	3	No.		Volume of Circular Hollow Beams	0.012	m3
	Number of Beams across width of building	2	No.		Volume of Square Hollow Beams	0.015	m3
	Total Number of Beams	6	No.		Volume of Rectangular Hollow Beams	0.017	m3
	Number of Circular Solid Beams	6	No.		**Total Volume of Circular Solid Beams**	4.242	m3
	Number of Square Solid Beams	0	No.		**Total Volume of Square Solid Beams**	0.000	m3
	Number of Rectangular Solid Beams	0	No.		**Total Volume of Rectangular Solid Beams**	0.000	m3
	Number of H Beams	0	No.		**Total Volume of H Beams**	0.000	m3
	Number of Circular Hollow Beams	0	No.		**Total Volume of Circular Hollow Beams**	0.000	m3
	Number of Square Hollow Beams	0	No.		**Total Volume of Square Hollow Beams**	0.000	m3
	Number of Rectangular Hollow Beams	0	No.		**Total Volume of Rectangular Hollow Beams**	0.000	m3
	Total Beam check (if cell is red check number of Beams)	6	No.				

© GBE 2020 GBC Green Building Calculator

V2.0.0. Building Element Areas

Secondary Elements (SE)

Yes	93 L30 Staircase/Landing/Walkways						
	No. of Flights (storeys - 1)	3	No.		Landing Balustrade Height	1.100	m
	Floor to Floor Flight Rise	2.8	m		Landing Balustrade Length	0.900	m
	Flight Going	3.5	m		Area of Stair and Landing Balustrade	29.582	m2
	Flight Length	4.48	m		Area of Flight String, Treads and Risers surface	25.078	m2
	Width of Flight	0.9	m		Landing Length	0.900	m
	Stringer height	0.3	m		Landing Width	0.900	m
	Enclosure area	51.32	m2		Landing Area	4.860	m2

N Furniture Fixtures Equipment (FFE)

Yes	**94 N10 Attic Eaves Furniture (AEF)**						
	Number of eaves (2 eaves per attic floor)	306	No.		Total Length of Furniture runs	1836	m
	Length of Attic Eaves furniture run	6	m		Total number of furniture internal division and end walls (1 eaves)	9	No.
	Height of Attic Eaves furniture (Minimum)	1.5	m		Area of furniture internal division and end walls (1 eaves)	8.91	m2
	Height of Attic Eaves furniture (Maximum)	1.8	m		Area of furniture backs (1 eaves)	9	m2
	Depth of Attic Eaves furniture	0.6	m		Area of furniture fronts including drawers (1 eaves)	10.8	m2
	Number of Attic Eaves furniture items per eaves	3	No.		Thickness Furniture front panel (including drawers)	0.025	m2
	Spacing of internal divisions	1	m		Thickness Furniture carcass panel (including drawers)	0.015	m
	Width of Attic Eaves Furniture Chest of Drawers	1	m		Area of drawer components (excluding Furniture front) (1 eaves)	36	m2
	Number of Attic Eaves Furniture Chest of Drawer Units	2	No.		Area of carcass including drawers	53.91	m2
	Height of each Drawer	0.25	m		Total Area of carcass including drawers	16496.46	m2
	Number of Drawers (1 eaves)	12	No.		Total areas of Furniture Front panels including drawers	3304.80	m2
Yes	**95 N10 Other Furniture (OF)**						
	Number of Other Furniture (OF) rooms	1	No.		Total Length of Other Furniture (OF) runs	6	m
	Length of Other Furniture (OF) run	6	m		Total number of Other Furniture (OF) internal division and end walls	9	No.
	Height of Other Furniture (OF) (Minimum)	1.5	m		Area of Other Furniture (OF) internal division and end walls	8.91	m2
	Height of Other Furniture (OF) (Maximum)	1.8	m		Area of Other Furniture (OF) backs	9	m2
	Depth of Other Furniture (OF)	0.6	m		Area of Other Furniture (OF) fronts including drawers	10.8	m2
	Number of Other Furniture (OF) items per run	3	No.		Thickness Other Furniture (OF) front panel (including drawers)	0.025	m2
	Spacing of internal divisions	1	m		Thickness Other Furniture (OF) carcass panel (including drawers)	0.015	m
	Width of Other Furniture (OF) Chest of Drawers	1	m		Area of Other Furniture (OF) drawer components (excluding Front)	36	m2
	Number of Other Furniture (OF) Chest of Drawer Units	2	No.		Area of Other Furniture (OF) carcass including drawers	53.91	m2
	Height of each Drawer	0.25	m		**Total Area of Other Furniture (OF) carcass including drawers**	53.91	m2
	Number of Drawers	12	No.		**Total areas of Other Furniture (OF) Front panels including drawers**	10.80	m2
Yes	**96 N11 Domestic Kitchen Furniture (DKF)**						
	Number of Kitchen Furniture (KF)	2	No.		Total Length of Kitchen Furniture (KF) runs	10	m
	Length of Kitchen Furniture (KF) run	5	m		Total number of Kitchen Furniture (KF) internal division and end walls	8	No.
	Height of Kitchen Furniture (KF) (Minimum)	1.5	m		Area of Kitchen Furniture (KF) internal division and end walls	7.92	m2
	Height of Kitchen Furniture (KF) (Maximum)	1.8	m		Area of Kitchen Furniture (KF) backs (1 eaves)	7.5	m2
	Depth of Kitchen Furniture (KF)	0.6	m		Area of Kitchen Furniture (KF) fronts including drawers	9	m2
	Number of Kitchen Furniture (KF) items per run	3	No.		Thickness Kitchen Furniture (KF) front panel (including drawers)	0.025	m2
	Spacing of internal divisions	1	m		Thickness Kitchen Furniture (KF) carcass panel (including drawers)	0.015	m
	Width of Kitchen Furniture (KF) Chest of Drawers	1	m		Area of drawer components (excluding Kitchen Furniture (KF) front)	36	m2
	Number of Kitchen Furniture (KF) Chest of Drawer Units	2	No.		Area of carcass including drawers	51.42	m2
	Height of each Drawer	0.25	m		Total Area of carcass including drawers	102.84	m2
	Number of Drawers	12	No.		Total areas of Furniture Front panels including drawers	18.00	m2

© GBE 2020 GBC Green Building Calculator

V2.0.0. Building Element Areas (V9.0.0. Landscape Pending) MEP in development

	Landscape (L)						
Yes	112 Q10 Raised Beds		m	9			
Yes	113 Q10 Stairs		m	9			
Yes	114 Q10 Steps		m	9			
Yes	115 Q20 Drive		m	9			
Yes	116 Q20 Paths		m	9			
Yes	117 Q20 Ramps		m	9			
Yes	118 Q30 Lawn		m	9			
Yes	119 Q31 Boarders		m	9			
Yes	120 Q40 Fence and Gates		m	9			
Yes	121 Q41 Railings and Gates		m	9			
Yes	122 Q51 Sports Equipment		m	9			
Yes	124 Q55 Decking		m	9			
Yes	125 Q55 Balcony & independent Supports		m	9			
Yes	126 Q60 Pond/Water Feature/Swimming Pond		m	9			
Yes	127 Q70 Composter and Wormeries		m	9			
Yes	128 Q70 Front/Rear Garden Bin/Bike/Delivery Store		m	9			
Yes	129 Q70 Pergolas/Solar Shading & Independent Supports		m	9			
Yes	130 Q70 Rear Garden Shed		m	9			
Yes	131 Q75 Retaining walls		m	9			
	Domestic MEP Services (DMEPS)						
Yes	133 R10 Rainwater Gutters Pipework		m	2			
Yes	134 R11 Above ground drainage		m	2			
Yes	135 R12 Below ground drainage		m	2			
Yes	138 R91 Refuse Disposal System Domestic		m	2			
Yes	139 S17 Rainwater Harvesting Systems		m	2			
Yes	140 S90 Hot and Cold Water Domestic		m	2			
Yes	141 S91 Gas Supply Domestic		m	2			
Yes	142 S92 Sprinkler System Domestic		m	2			
Yes	143 T14 Air Water Ground Source Heat Pumps		m	2			
Yes	144 T16 Solar Collectors		m	2			
Yes	145 T90 Heating Domestic		m	2			
Yes	146 U90 Ventilation Domestic		m	2			
Yes	147 V90 Electrical Installation Domestic		m	2			
Yes	148 V91 Electrical Systems Landscape		m	2			
Yes	149 W90 Communications & Security Domestic		m	2			
Yes	150 X90 Transport Systems Domestic		m	2			

© GBE 2020 GBC Green Building Calculator

V5.0.0. Services Systems
V4.0.0. Building Element Areas

	Non-Domestic MEP Services (N-DMEPS)				
Yes	200 _		m	5	
Yes	201 _		m	5	
Yes	202 _		m	5	
Yes	203 _		m	5	
Yes	204 _		m	5	
Yes	205 _		m	5	
Yes	206 _		m	5	
Yes	207 _		m	5	
Yes	208 _		m	5	
Yes	209 _		m	5	
Yes	210 _		m	5	
Yes	211 _		m	5	
Yes	212 _		m	5	
Yes	213 _		m	5	
			m	5	
			m	5	
			m	5	
			m	5	
			m	5	
			m	5	
			m	5	
			m	5	
	Bespoke Project Specific Items (BPSI)				From Readymade Elements Library
Yes	161 Basement Perimeter Retaining Walls (BPRW)		m	4	
Yes	162 Ground Floor Over Basement (GFOB)		m	4	
Yes	163 Ground Floor Ground Bearing (GFGB)		m	4	
Yes	164 Ground Floor Over Void (GFOV)		m	4	
Yes	165 _		m	4	
Yes	166 _		m	4	
Yes	167 _		m	4	
Yes	168 _		m	4	
Yes	169 _		m	4	
Yes	170 _		m	4	
Yes	171 _		m	4	
Yes	172 _		m	4	
Yes	173 _		m	4	
Yes	174 _		m	4	
			m	4	
			m	4	

V1.0.0. Building Elements Multiple sizes

Multiple Size Building Elements

© GBE Calculator 2018-2020

BF			BF A	BF B	BF C	BF D	BF E	BF F	BF G	BF H	BF I	BF J	BF K	BF L
BF Width	m		0	0	0	0	0	0	0	0	0	0	0	0
BF Height	m		0	0	0	0	0	0	0	0	0	0	0	0
BF Quantity	No.		0	0	0	0	0	0	0	0	0	0	0	0
BF Area Total	0	m2	0	0	0	0	0	0	0	0	0	0	0	0
BPW			BPW A	BPW B	BPW C	BPW D	BPW E	BPW F	BPW G	BPW H	BPW I	BPW J	BPW K	BPW L
BPW Width	m		0	0	0	0	0	0	0	0	0	0	0	0
BPW Height	m		0	0	0	0	0	0	0	0	0	0	0	0
BPW Quantity	No.		0	0	0	0	0	0	0	0	0	0	0	0
BPW Area Total	0	m2	0	0	0	0	0	0	0	0	0	0	0	0
BP			BP A	BP B	BP C	BP D	BP E	BP F	BP G	BP H	BP I	BP J	BP K	BP L
BP Width	m		0	0	0	0	0	0	0	0	0	0	0	0
BP Height	m		0	0	0	0	0	0	0	0	0	0	0	0
BP Quantity	No.		0	0	0	0	0	0	0	0	0	0	0	0
BP Area Total	0	m2	0	0	0	0	0	0	0	0	0	0	0	0
BRSL			BRSL A	BRSL B	BRSL C	BRSL D	BRSL E	BRSL F	BRSL G	BRSL H	BRSL I	BRSL J	BRSL K	BRSL L
BRSL Width	m		0	0	0	0	0	0	0	0	0	0	0	0
BRSL Height	m		0	0	0	0	0	0	0	0	0	0	0	0
BRSL Quantity	No.		0	0	0	0	0	0	0	0	0	0	0	0
BRSL Area Total	0	m2	0	0	0	0	0	0	0	0	0	0	0	0
GPOB			GPOB A	GPOB B	GPOB C	GPOB D	GPOB E	GPOB F	GPOB G	GPOB H	GPOB I	GPOB J	GPOB K	GPOB L
GPOB Width	m		0	0	0	0	0	0	0	0	0	0	0	0
GPOB Height	m		0	0	0	0	0	0	0	0	0	0	0	0
GPOB Quantity	No.		0	0	0	0	0	0	0	0	0	0	0	0
GPOB Area Total	0	m2	0	0	0	0	0	0	0	0	0	0	0	0
BRSL			BRSL A	BRSL B	BRSL C	BRSL D	BRSL E	BRSL F	BRSL G	BRSL H	BRSL I	BRSL J	BRSL K	BRSL L
BRSL Width	m		0	0	0	0	0	0	0	0	0	0	0	0
BRSL Height	m		0	0	0	0	0	0	0	0	0	0	0	0
BRSL Quantity	No.		0	0	0	0	0	0	0	0	0	0	0	0
BRSL Area Total	0	m2	0	0	0	0	0	0	0	0	0	0	0	0
SPB			SPB A	SPB B	SPB C	SPB D	SPB E	SPB F	SPB G	SPB H	SPB I	SPB J	SPB K	SPB L
SPB Width	m		0	0	0	0	0	0	0	0	0	0	0	0
SPB Length	m		0	0	0	0	0	0	0	0	0	0	0	0
SPB Quantity	No.		0	0	0	0	0	0	0	0	0	0	0	0
SPB Area Total	0	m2	0	0	0	0	0	0	0	0	0	0	0	0
GFOB			GFOB A	GFOB B	GFOB C	GFOB D	GFOB E	GFOB F	GFOB G	GFOB H	GFOB I	GFOB J	GFOB K	GFOB L
GFOB Width	m		0	0	0	0	0	0	0	0	0	0	0	0
GFOB Height	m		0	0	0	0	0	0	0	0	0	0	0	0
GFOB Quantity	No.		0	0	0	0	0	0	0	0	0	0	0	0
GFOB Area Total	0	m2	0	0	0	0	0	0	0	0	0	0	0	0
GFGB			GFGB A	GFGB B	GFGB C	GFGB D	GFGB E	GFGB F	GFGB G	GFGB H	GFGB I	GFGB J	GFGB K	GFGB L
GFGB Width	m		0	0	0	0	0	0	0	0	0	0	0	0
GFGB Height	m		0	0	0	0	0	0	0	0	0	0	0	0
GFGB Quantity	No.		0	0	0	0	0	0	0	0	0	0	0	0
GFGB Area Total	0	m2	0	0	0	0	0	0	0	0	0	0	0	0
GFOV			GFOV A	GFOV B	GFOV C	GFOV D	GFOV E	GFOV F	GFOV G	GFOV H	GFOV I	GFOV J	GFOV K	GFOV L
GFOV Width	m		0	0	0	0	0	0	0	0	0	0	0	0
GFOV Height	m		0	0	0	0	0	0	0	0	0	0	0	0
GFOV Quantity	No.		0	0	0	0	0	0	0	0	0	0	0	0
GFOV Area Total	0	m2	0	0	0	0	0	0	0	0	0	0	0	0

V2.0.0. Engage Singular/Multiple

Non-U-value Elements

© GBE Green Building Calculator 2017-2020

Basement External Entrance Well (BEEW)

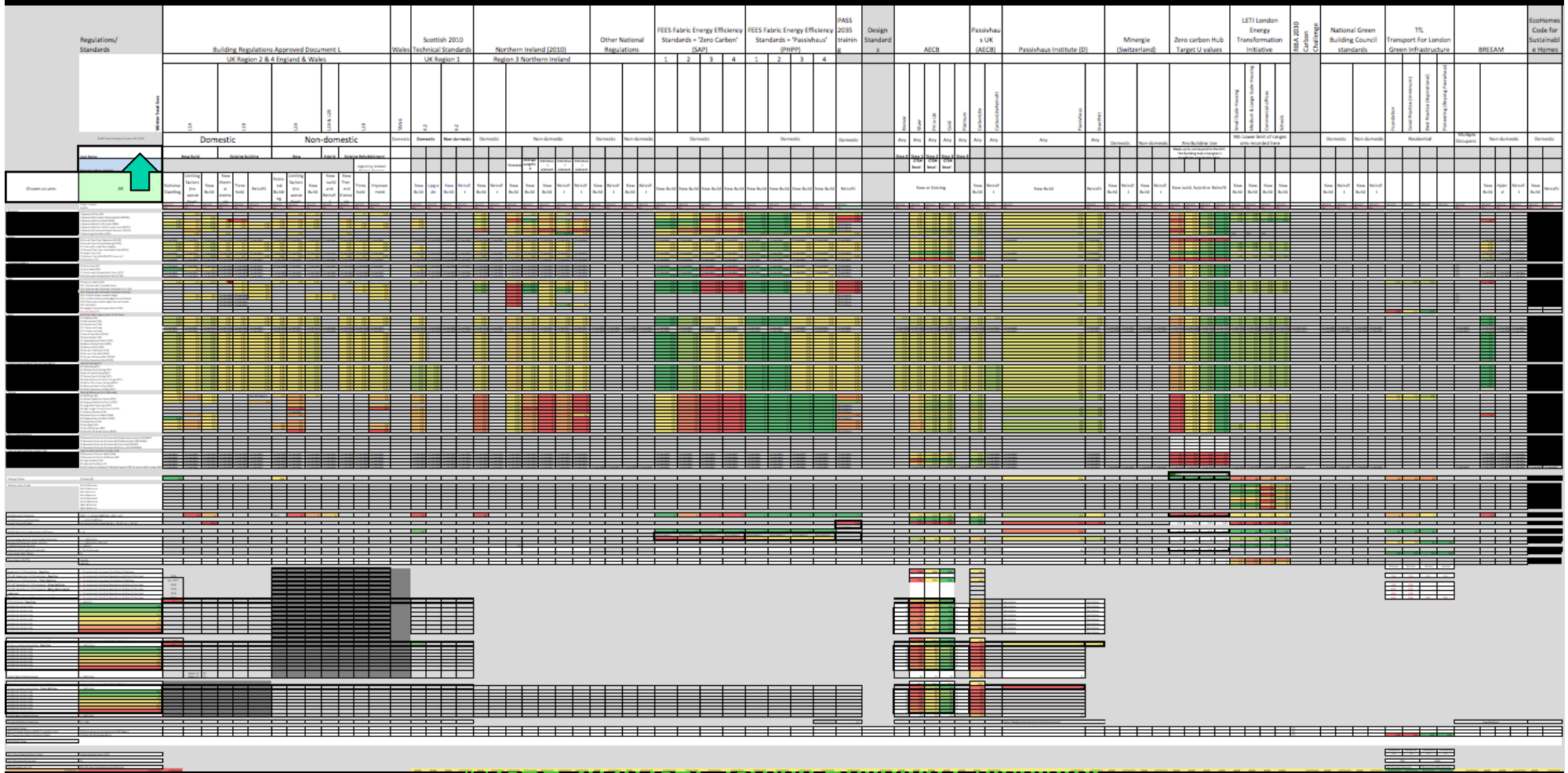
Yes	54 Basement External Entrance Well Retaining Pavement (BEEWRP)					Singular	DropDownList
	Number of Buildings with Basement External Entrance Wells	1	No.		Area Basement External Entrance Wells	6.000	m2
	Number of Basement External Entrace Well Retaining walls	1	No.		Total Area Basement External Entrance Wells	18.000	m2
	Width of Basement External Entrance Wells (Across frontage)	6	m		Total Area multiple sizes of Basement External Entrance Wells	126.000	m2
	Depth of Basement External Entrance Wells (Footpath to Building)	3	m		**Total Area Basement External Entrance Wells (chosen single or multiple)**	18.000	m2
Yes	55 Basement External Entrance Well Retaining Wall (BEEWRW)					Singular	DropDownList
	No. of Buildings with Basement External Entrace Well Retaining walls	1	No.		Area of Basement External Entrace Well Retaining walls	17.100	m2
	Number of Basement External Entrace Well Retaining walls	1	No.		Total Areas Basement External Entrace Well Retaining walls	17.100	m2
	Width of Basement External Entrace Well Retaining walls	6	m		Total Areas multiple sizes of Basement External Entrace Well Retaining walls	132.000	m2
	Height of Basement External Entrace Well Retaining walls	2.85	m		**Total Areas Basement External Entrace Well Retaining walls (chosen single or multiple)**	17.100	m2
Yes	56 Basement External Entrance Well Staircase (BEEWS)					Singular	DropDownList
	No. of Buildings with Basements External Entrance Well Staircase	1	No.		Area Basements External Entrance Well Staircase	3.150	m2
	Number of Basement External Entrance Well Staircases	1	No.		Total Area Basement External Entrance Staircase	3.150	m2
	Rise of Basements External Entrance Well Staircase	2.85	m		Total Area multiple sizes of Basement External Entrance Staircase	252.000	m2
	Going of Basements External Entrance Well Staircase	3.5	m		**Total Area Basement External Entrance Staircase (chosen single or multiple)**	3.150	m2
	Lenght of Basements External Entrance Well Staircase	4.5	m		Thickness of Basements External Entrance Well Staircase	0.300	m
	Width of Basements External Entrance Well Staircase	0.9	m		Volume of Basements External Entrance Well Staircase	0.945	m3
Yes	57 Basement External Entrance Well Party wall (BEEWPW)					Singular	DropDownList
	No. of Buildings with Basement External Entrance Well Party Walls	1	No.		Area of Basement External Entrance Well Party Wall	8.550	m2
	Number of Basement External Entrance Well Party Walls	1	No.		Total Area of Basement External Entrance Well Party Walls	8.550	m2
	Width of Basement External Entrance Well Party Walls	0.315	m		Total Area multiple sizes of of Basement External Entrance Well Party Walls	504.000	m2
	Length of Basement External Entrance Well Party Walls	3	m		**Total Area of Basement External Entrance Well Party Walls (chosen single or multiple)**	8.550	m2
	Height of Basement External Entrance Well Party Walls	2.85	m		Total Volume of Basement External Entrance Well Party Walls	2.693	m3

Internal Walls Partitions Cubicles

Yes	58 Basement Internal Walls (BIW)	(Probably loadbearing)				Singular	DropDownList
	Number of Buildings with Basements	1	No.		Area of Basement Internal Walls (BIW)	25.000	m2
	Thickness of Basement Internal walls (BIW)	0.215	m		Total Area Basement Internal Walls (BIW)	25.000	m2
	Length of Basement Internal Walls (BIW)	10	m		Total Area Basement Internal Walls (BIW)	504.000	m2
	Height of Basement Internal Walls (BIW)	2.5	m		**Total Area Basement Internal Walls (BIW) (chosen single or multiple)**	25.000	m2
					Volume of Basement Internal Walls (BIW)	5.375	m3
					Total Volume of Basement Internal Walls (BIW)	5.375	m3
Yes	59 Basement Internal Partitions (BIP)	(Probably non-loadbearing)				Singular	DropDownList
	Number of Buildings with Basements	1	No.		Area of Basement Internal Partition (BIP)	25.000	m2
	Thickness of Basement Internal Partitions (BIP)	0.1	m		Total Area of Basment Internal Partitions (BIP)	25.000	m2
	Length of Baement Internal Partitions (BIP)	10	m		Total Area of Basment Internal Partitions (BIP)	384.000	m2
	Height of Basement Internal Partitions (BIP)	2.5	m		**Total Area of Basment Internal Partitions (BIP) (chosen single or multiple)**	25.000	m2
					Total Volume of Basement Internal Partitions (BIP)	2.500	m3
					Total Volume of Basement Internal Partitions (BIP)	0.000	m3
Yes	60 Internal Walls (IW)	(Probably loadbearing, not in basement)				Multiple	DropDownList
	Number of Buildings with Internal Walls (IW)	1	No.		Area of Internal Wall (IW)	25.000	m2
	Thickness of Internal Walls (IW)	0.2	m		Total Area of Internal Wall (IW)	25.000	m2

© GBE 2020 GBC Green Building Calculator

V2 U values Etc. Energy Targets Regulations & Design Standards



© GBE 2020 GBC Green Building Calculator

GBE

https://GreenBuildingEncyclopaedia.uk

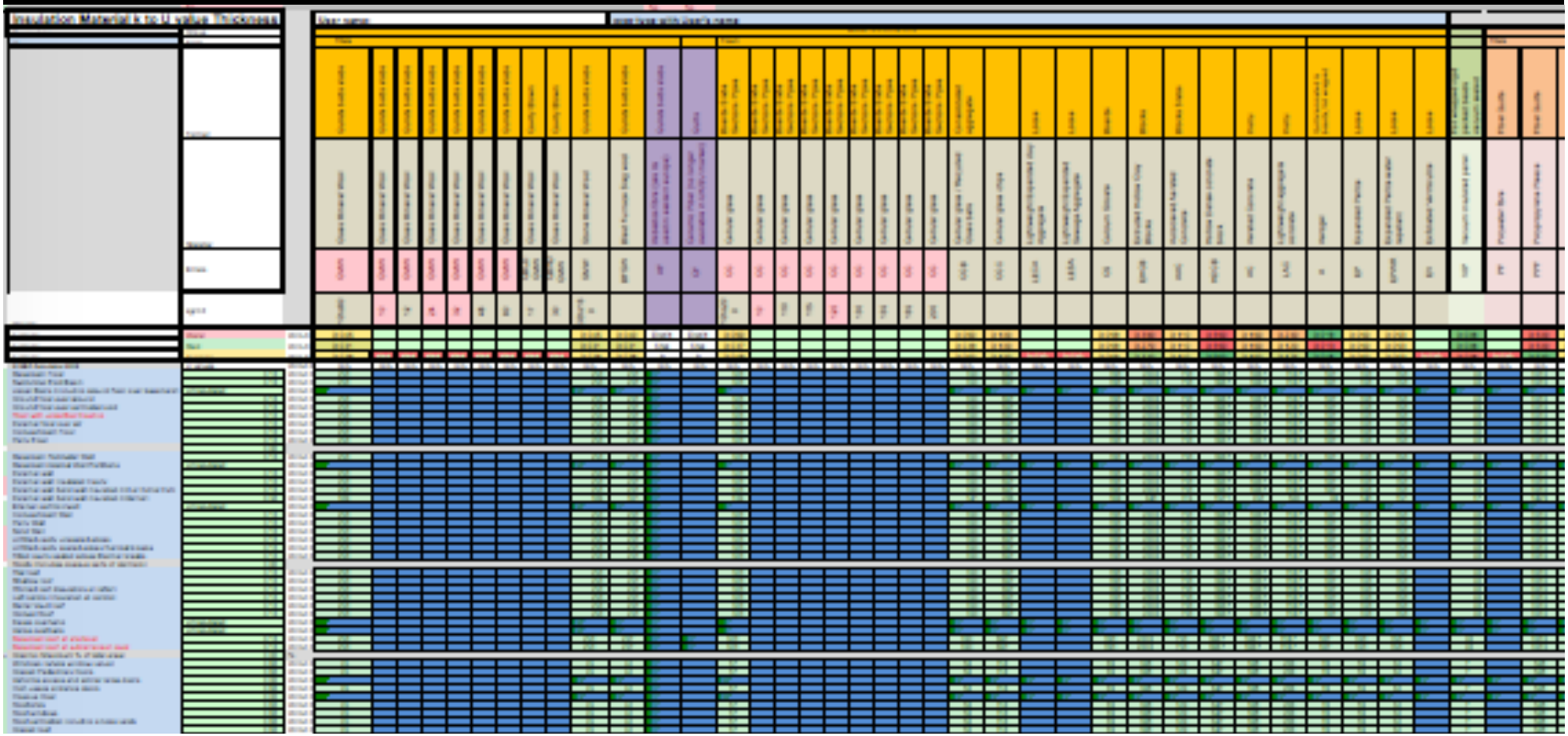
GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V1.0.0. Insulation Thicknesses

k values



Materials > k values > U values > Thicknesses

	Chosen column:	Group		Mainly mineral based															
	AB	Form		Fibre					Foam										
		Form		Quilts batts slabs	Quilts batts slabs	Quilts batts slabs	Quilts batts slabs		Slabs Sections Pipes	Unsolidated aggregate		Loose	Loose	Boards	Blocks	Blocks Slabs		Insitu	Insitu
		Material		Glass Mineral Wool	Stone Mineral Wool	Blast Furnace Slag wool	Asbestos fibre (yes its used in eastern europe)	Ceramic Fiber (no longer available in UK/EU market)	Cellular glass	Cellular glass / Recycled Glass balls	Cellulat glass chips	Lightweight Expanded clay Aggregate	Lightweight Expanded Sewage Aggregate	Calcium Silicate	Extruded Hollow Clay Blocks	Autoclaved Aerated Concrete	Hollow Dense concrete block	Aerated Concrete	Lightweight aggregate concrete
		Initials		GMW	SMW	BFSW	AF	CF	CG	CGB	CGC	LECA	LESA	CS	EHCB	AAC	HDCB	AC	LAC
	k values	Worst	W/m.K	0.045	0.045	0.040	Don't	Don't	0.060	0.060	0.100			0.059	0.390	0.110	0.550	0.160	0.230
	k values	Best	W/m.K	0.031	0.031	0.031	Use	Use	0.037	0.039	0.100			0.059	0.270	0.110	0.550	0.160	0.120
	k values	Average	W/m.K	0.038	0.038	0.036	It	It	0.049	0.050	0.100	0.000	0.000	0.059	0.330	0.110	0.550	0.160	0.175
Floor	© GBE Calculator 2018	U values	W/m2.K	mm	mm	mm	mm		mm	mm		mm	mm	mm		mm		mm	mm
Yes	Basement Floor	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Swimming Pool Basin	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Upper floors (including ground floor over basement)	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Ground floor over ground	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Ground floor over ventilated void	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Floor with underfloor heating	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	External floor over air	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Compartment Floor	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Party Floor	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Walls		0.00																	
Yes	Basement Perimeter Wall	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Basement internal Wall/Partitions	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	External wall	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
No	External wall Insulated Cavity	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
No	External wall Solid wall insulated (Int or Ext)	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Internal partition/wall	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Compartment Wall	0.30	W/m2.K	127	127	118			162	165	333			197	1100	367	1833	533	583
Yes	Party Wall	0.30	W/m2.K	127	127	118			162	165	333			197	1100	367	1833	533	583
No	Solid Wall	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
No	Unfilled cavity unsealed edges	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
No	Unfilled cavity sealed edges thermal breaks	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
No	Filled cavity sealed edges thermal breaks	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Roof	Roofs (includes opaque parts of dormers)	0.00																	
Yes	Flat roof	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Shallow roof	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Pitched roof (insulation at rafter)	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Loft ceiling (insulation at ceiling)	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Barrel Vault roof	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Domed Roof	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Eaves overhang	Unregulated	W/m2.K																
Yes	Verge overhang	Unregulated	W/m2.K																
Yes	Basement roof at site level	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Basement roof at subterranean level	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Glazing	Glazing (Maximum % of total area)	0.00	%																
Yes	Windows (whole window value)	0.95	W/m2.K	40	40	37			51	52	105			62	347	116	579	168	184
Yes	Glazed Pedestrian Doors	0.95	W/m2.K	40	40	37			51	52	105			62	347	116	579	168	184
Yes	Vehichle access and similar large doors	0.75	W/m2.K	51	51	47			65	66	133			79	440	147	733	213	233
Yes	High usage entrance doors	0.75	W/m2.K	51	51	47			65	66	133			79	440	147	733	213	233
Yes	Opaque Door	0.75	W/m2.K	51	51	47			65	66	133			79	440	147	733	213	233
Yes	Rooflights	0.95	W/m2.K	40	40	37			51	52	105			62	347	116	579	168	184
Yes	Roof windows	0.95	W/m2.K	40	40	37			51	52	105			62	347	116	579	168	184
Yes	Roof ventilation including smoke vents	0.75	W/m2.K	51	51	47			65	66	133			79	440	147	733	213	233
Yes	Glazed roof	0.95	W/m2.K	40	40	37			51	52	105			62	347	116	579	168	184

Instructions | ScheduleAccommodation | BuildingAreas | U values Etc | Insulation | Legend | Elements | UToWattsToCO2 | CostsPerm2 | MaterialCostThickness | Revisions | Resistances

Materials > k values > U values > Thicknesses

	Mainly mineral based													Mainly Fossil Oil-based											
														Fibre				Foam							
	Loose	Loose	Boards		Blocks Slabs		Insitu		Loose	Loose	Loose		Fiber Quilts	Fiber Quilts		Fiber Quilts	Boards	Boards	Boards	Boards	Boards	Boards	Boards, Foam	Boards, Foam
Cellulat glass chips	Lightweight Expanded clay Aggregate	Lightweight Expanded Sewage Aggregate	Calcium Silicate	Extruded Hollow Clay Blocks	Autoclaved Aerated Concrete	Hollow Dense concrete block	Aerated Concrete	Lightweight aggregate concrete	Aerogel	Expanded Perlite	Expanded Perlite water repellant	Exfoliated Vermiculite	Vacuum insulated panel	Polyester fibre	Polypropylene Fleece	Soft Foam Polyethylene	Other plastic fibre	Expanded polystyrene	Recycled Expanded polystyrene	Expanded polystyrene Cement Bound	Extruded polystyrene	Extruded polystyrene (HCFC Blown)	Extruded polystyrene (CO2 blown)	Polyurethane	Polyisocyanurate
CGC	LECA	LESA	CS	EHCB	AAC	HDCB	AC	LAC	A	EP	EPWR	EV	VIP	PF	PPF	SFP	OPF	EPS	REPS	EPSCB	XPS	XPSH	XPSC	PUR	PIR
.100			0.059	0.390	0.110	0.550	0.160	0.230	0.013	0.050	0.053		0.006		0.500	0.040		0.044	0.040	0.060	0.040	0.032	0.040	0.040	0.035
.100			0.059	0.270	0.110	0.550	0.160	0.120	0.013	0.050	0.053		0.006		0.500	0.040		0.032	0.032	0.060	0.027	0.032	0.040	0.022	0.025
.100	0.000	0.000	0.059	0.330	0.110	0.550	0.160	0.175	0.013	0.050	0.053	0.000	0.006	0.000	0.500	0.040	0.000	0.038	0.036	0.060	0.034	0.032	0.040	0.031	0.030
	mm	mm	mm		mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
333			197	1100	367	1833	533	583	43	167	177		20		1667	133		127	120	200	112	107	133	103	100
333			197	1100	367	1833	533	583	43	167	177		20		1667	133		127	120	200	112	107	133	103	100
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
105			62	347	116	579	168	184	14	53	56		6		526	42		40	38	63	35	34	42	33	32
105			62	347	116	579	168	184	14	53	56		6		526	42		40	38	63	35	34	42	33	32
133			79	440	147	733	213	233	17	67	71		8		667	53		51	48	80	45	43	53	41	40
133			79	440	147	733	213	233	17	67	71		8		667	53		51	48	80	45	43	53	41	40
133			79	440	147	733	213	233	17	67	71		8		667	53		51	48	80	45	43	53	41	40
105			62	347	116	579	168	184	14	53	56		6		526	42		40	38	63	35	34	42	33	32
105			62	347	116	579	168	184	14	53	56		6		526	42		40	38	63	35	34	42	33	32
133			79	440	147	733	213	233	17	67	71		8		667	53		51	48	80	45	43	53	41	40
105			62	347	116	579	168	184	14	53	56		6		526	42		40	38	63	35	34	42	33	32

sToCO2 / CostsPerm2 / MaterialCostThickness / Revisions / Resistances / Conductivities / FuelCarbonFactor / DropDownLists / PopulatingSequence / SupplierRequest / +

	Foam		Mainly Plant based																					Animal				Mixed			
			Fibre																					Fibre							
Multifoil	Foam Profile	Injected foam	Ridid Board	Board	Board	Batt	Quilt	Flake	Board	Board	Quilt	Quilt	Quilt	Quilt	Quilt	Quilt	Granuals	Ridig Board	Panel	Panel	Quilt	Thatch	Rigid Board	Bale	Quilt		Loose		Insitu	Spray	Block	
Multi-foil Aluminised Polyethylene/ Multi-material Quilts	Rubber Foam	Biobased plastic foam	Wood fibre board rigid (wet formed)	Wood fiber board	Porous Wood Fibre Board	Wood fibre Batt	Wood fibre wool	Cellulose Fiber Flake (recycled newspaper)	Cellulose	Cellulose fibre board (Softboard)	Textile /Textile mix	Flax	Flax with Polyester suporting fibre	Hemp	Hemp	Cork	Expanded Cork Board	Medium Desity Fibreboard	Orientated Strand Board	Grass	Straw	Straw Board	Straw bale	Lamb's/Sheep's wool	Goat hair	Bird Feather	?	Hemp-lime (Hempcrete)	Hemp-lime	Hemp-lime	Hemp & wood fibre
MFQ	RF	BBPF	WFRB	WFBo	PWFB	WFBa	WFW	CFF	CB	CFB	T	FF	FP	HF	HFP	C	ECB	MDF	OSB	GF	S	SBo	SBa	LSW	GH	BF	SCC	HLI	HLS	HLB	HWF
																						420		25							
		0.039	0.055	0.045	0.050	0.036	0.036	0.039	0.040	0.120		0.040	0.040	0.040	0.040	0.050	0.045	0.070	0.130					0.040	0.039			0.070			0.038
		0.038	0.038	0.039	0.050	0.036	0.036	0.030	0.038	0.080		0.038	0.040	0.038	0.040	0.038	0.040	0.180	0.130					0.039	0.039			0.070			0.038
0.000	0.000	0.039	0.047	0.042	0.050	0.036	0.036	0.035	0.039	0.100	0.000	0.039	0.040	0.039	0.040	0.044	0.043	0.125	0.130	0.000	0.000	0.000	0.000	0.040	0.039	0.000	0.000	0.070	0.000	0.000	0.038
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		110	133	120	143	103	103	99	111	286		111	114	111	114	126	121	357	371					113	111			200			10
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			25
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			253
		257	310	280	333	240	240	230	260	667		260	267	260	267	293	283	833	867					263	260			467			253
		45	55	49	59	42	42	41	46	118		46	47	46	47	52	50	147	153					46	46			82			45
		45	55	49	59	42	42	41	46	118		46	47	46	47	52	50	147	153					46	46			82			45
		45	55	49	59	42	42	41	46	118		46	47	46	47	52	50	147	153					46	46			82			45
		45	55	49	59	42	42	41	46	118		46	47	46	47	52	50	147	153					46	46			82			45
		45	55	49	59	42	42	41	46	118		46	47	46	47	52	50	147	153					46	46			82			45
		45	55	49	59	42	42	41	46	118		46	47	46	47	52	50	147	153					46	46			82			45
		45	55	49	59	42	42	41	46	118		46	47	46	47	52	50	147	153					46	46			82			45
		45	55	49	59	42	42	41	46	118		46	47	46	47	52	50	147	153					46	46			82			45
		45	55	49	59	42	42	41	46	118		46	47	46	47	52	50	147	153					46	46			82			45

V2.0.0. Decrement Delay Insulation Thickness (Dev)

Decrement Delay Insulation Thickness

			Fibre										
Format			Quilsts batts slabs	Quilsts batts slabs	Quilsts batts slabs	Quilsts batts slabs	Quilsts batts slabs	Quilsts batts slabs	Quilsts batts slabs	Cavity Blown	Cavity Blown	Quilsts batts slabs	Quilsts batts slabs
Materials			Glass Mineral Wool	Glass Mineral Wool	Glass Mineral Wool	Glass Mineral Wool	Glass Mineral Wool	Glass Mineral Wool	Glass Mineral Wool	Glass Mineral Wool	Glass Mineral Wool	Stone Mineral Wool	Blast Furnace Slag wool
Initials			GMW	GMW	GMW	GMW	GMW	GMW	GMW	CBLD GMW	CBHD GMW	SMW	BFSW
Used in project?			Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Density			10to80	10	12	24	32	48	80	17	30	33to160	0
k Value (average)			0.031	0	0	0	0	0	0	0	0	0.031	0.031
Specific Heat Capacity			Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
Hours of delay (Target)	11	Hours	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
Thickness		mm	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending

Calculation
Q= e*1m²*density
Q=d/1.38*√(λ/p*C)*1m²*density

Formulas
d=1.38*e*√1/a
(diffusivity) a=λ/p*C
e=d*/1.38*√(λ/p*C)

thickness of material layer	0.3	m					
Rhô (volumic mass) [density]	700	kg/m3					
surface area of wall considered	1	m²					
thermal conductivity	1	W/m.K					
Specific heat value	0.58	Wh/kg.K					
Decrement delay (Hours)	12	hours					
Decrement delay (Hours)	0.020546475						
Formulas	d=1,38*e*√1/a	d	Decrement dk	#DIV/0!			
Formulas	a=λ/p*C	a	diffusivity				
Formulas	e=d/1.38*√(p*C/λ)	e	thickness of material layer				
Formulas	Q=e*S*p	Q	Quantity				
Calculation	Q=(d/1.38*√(p*C/λ))*S*p*(DL/CLE)	Q	Quantity	#DIV/0!	kg	Calculated	Checked

V1>V2 24 of 39 Elements

U or R value

12 secondary element U/R values

Refurb Actions

© GBE Green Building Calculator 2017-2020

Elemental U values Component k values & thicknesses | User name: **BrianSpecMan did this**

Yes/Yes	RefurbActions	Component Function	Manufacturer	Product Reference	Material	Density	Thermal Conductivity	Thickness	Thickness	Thermal Resistance	size (solid)	Spacing or cavity (void)	Fraction of area or section	Thermal Resistances	Calculated Total U value	Target Elemental U value	Difference	Pass, PassU or Fail
Yes		**1 Basement Floor (BF)**	text	text	text	kg/m3	W/m.K	mm	m	m2.K/W	mm	mm	%	m2.K/W	W/m2.K	W/m2.K	W/m2.K	Auto
Yes		Resistance of Inside Surface (Rsi)								0.13				0.130				
Yes	Existing Prepared Overcoated	Inner decoration			lacquer	1000	1	1	0.001	0.001	1	1	100%	0.001				
Yes	Existing Unchanged	Floor finish			Hardwood flooring	[illegible]	[illegible]	[illegible]	0.025	0.139	[illegible]	[illegible]	100%	0.139				
Yes	Existing Unchanged	Inner floor lining underlayment			Gypsum fibreboard	[illegible]	[illegible]	[illegible]	0.048	0.133	[illegible]	[illegible]	100%	0.133				
Yes	Existing Unchanged	Inner levelling/wearing			Cement Screed	[illegible]	[illegible]	[illegible]	0.045	0.032	[illegible]	[illegible]	100%	0.032				
Yes	Existing Unchanged	Internal insulation			PIR Insulation	32	0.025	235	0.235	9.400	1	1	100%	9.400				
Yes	Existing Unchanged	Drainage filtration layer			HDPE		1	50	0.05	0.050	2	48	4%	0.002				
Yes	Existing Unchanged	Inner tanking			Polyethylene (PE)	0.4	0.230	1	0.001	0.004	1	1	100%	0.004				
Yes	Existing Unchanged	Retaining floor			Concrete	2300	2.300	150	0.15	0.065	1	1	100%	0.065				
Yes	Existing Removed Reapplied	Damp/Gas proof membrane			Polyethylene (PE)	0.4	0.230	1	0.001	0.004	1	1	100%	0.004				
Yes	Existing Removed Reapplied	Ground gas ventilation labyrinth			Expanded polystyrene EPS	15	0.040	100	0.1	2.500	50	100	50%	1.250				
Yes	New Added	Blinding layer			Sand		2.000	50	0.05	0.025	1	1	100%	0.025				
Yes	New Added	Insulating backfill			LECA		1	150	0.15	0.150	1	1	100%	0.150				
Yes	Existing Removed Reworked	Consolidated hardcore			Recycled masonry		1	150	0.15	0.150	1	1	100%	0.150				
Yes	Existing Removed Reapplied	Drainage layer			Sea shells		1	50	0.05	0.050	1	1	100%	0.050				
Yes	Existing Unchanged	Undisturbed subsoil			Clay		1.500	1000	1	0.667	1	1	100%	0.667				
Yes		Resistance of Outside Surface (Rso)					Potential	2056		0				0.000				Check
							Actual	2056	2.056					12.203	0.082	0.15	-0.068	Pass
								overall thickness mm	overall thickness m					Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, PassU or Fail

© GBE 2020 GBC Green Building Calculator

V1>V2 24 of 39 Elements

12 secondary element U/R values

Insulation v Window Costs

© GBE Green Building Calculator 2017-2020

Elemental U values Component k values & thicknesses	User name:	BrianSpecMan did this		Cost of Insulation v Glazing			
Component Function	Manufacturer	Product Reference	Material	Thickness	£/m2	m2	£
1 Basement Floor (BF)	text	text	text	mm	£	60	£
Resistance of Inside Surface (Rsi)							
Inner decoration			lacquer				
Floor finish			Hardwood flooring				
Inner floor lining underlayment			Gypsum fibreboard				
Inner levelling/wearing			Cement Lime Screed				
Internal insulation			PIR Insulation	235	£1.00	60	£60
Drainage filtration layer			HDPE				
Inner tanking			Polyethylene (PE)				
Retaining floor			Concrete				
Damp/Gas proof membrane			Polyethylene (PE)				
Ground gas ventilation labyrinth			Expanded polystyrene EPS	100	£1.00	60	£60
Blinding layer			Sand				
Insulating backfill			LECA	150	£1.00	60	£60
Consolidated hardcore			Recycled masonry				
Drainage layer			Sea shells				
Undisturbed subsoil			Clay				
Resistance of Outside Surface (Rso)							
				Check			Observe
				485			£180
				Elemental Insulation (mm)	Material rate	Area	Elemental Insulation Cost

Obseve: 0.35%

% of whole insulation cost

V2 Condensation Check (Dev)

Condensation Check BS EN ISO 13788

1 Basement Floor (BF)	Material	Material Thickness	Thermal Conductivity	iv	Thermal Resistance R layer	Vapour Resistance Rv layer
Yes		mm	W/m.K	MN s/g.m	m2K/W	MN s/g
					0.130	
Yes	lacquer	1	1.00	?	0.001	?
Yes	Hardwood flooring	25	0.18	?	0.139	?
Yes	Gypsum fibreboard	48	0.36	?	0.133	?
Yes	Cement Lime Screed	45	1.40	?	0.032	?
Yes	PIR Insulation	235	0.03	?	9.400	?
Yes	HDPE	50	1.00	?	0.050	?
Yes	Polyethylene (PE)	1	0.23	?	0.004	?
Yes	Concrete	150	2.30	?	0.065	?
Yes	Polyethylene (PE)	1	0.23	?	0.004	?
Yes	Expanded polystyrene EPS	100	0.04	?	2.500	?
Yes	Sand	50	2.00	?	0.025	?
Yes	LECA	150	1.00	?	0.150	?
Yes	Recycled masonry	150	1.00	?	0.150	?
Yes	Sea shells	50	1.00	?	0.050	?
Yes	Clay	1000	1.50	?	0.667	?
	Potential	2056			0.000	
	Actual	2056				
		overall thickness mm				

V2 Decrement Delay Overheating Avoidance

Overheating Check: Decrement Factor/Delay

1 Basement Floor (BF)	Material	Material Thickness	Thermal Conductivity	Density	Specific Heat Capacity	Decerement factor	Decerement delay
Yes		mm	W/m.K	kg/m3	?	?	Hours
Yes	lacquer	1	1.00	1000	0.000	?	?
Yes	Hardwood flooring	25	0.18	700	0.000	?	?
Yes	Gypsum fibreboard	48	0.36	0	0.000	?	?
Yes	Cement Lime Screed	45	1.40	1200	0.000	?	?
Yes	PIR Insulation	235	0.03	32	0.000	?	?
Yes	HDPE	50	1.00	0	0.000	?	?
Yes	Polyethylene (PE)	1	0.23	0	0.000	?	?
Yes	Concrete	150	2.30	2300	0.000	?	?
Yes	Polyethylene (PE)	1	0.23	0	0.000	?	?
Yes	Expanded polystyrene EPS	100	0.04	15	0.000	?	?
Yes	Sand	50	2.00	0	0.000	?	?
Yes	LECA	150	1.00	0	0.000	?	?
Yes	Recycled masonry	150	1.00	0	0.000	?	?
Yes	Sea shells	50	1.00	0	0.000	?	?
Yes	Clay	1000	1.50	0	0.000	?	?
	Potential	2056					
	Actual	2056					
		overall thickness mm					

V2 Bill of Materials Quantities Labour Products Costs Refurb actions

Bill of Materials Quantities Costs

	Component Function	Refurb Actions	Material	Area GIFA	Labour rate	Labour Cost	Materials rate	Materials Cost	Total Cost
Yes	1 Basement Floor (BF)			m2	£/m2	£	£/m2	£	£
				60	1 Basement Floor (BF)				
Yes	Inner decoration	Existing Prepared Overcoated	lacquer	60	£0.00	£0	£0.00	£0	£0
Yes	Floor finish	Existing Unchanged	Hardwood flooring	60	£[illegible]	£0	£[illegible]	£0	£0
Yes	Inner floor lining underlayment	Existing Unchanged	Gypsum fibreboard	60	£[illegible]	£0	£[illegible]	£0	£0
Yes	Inner levelling/wearing	Existing Unchanged	Cement Lime Screed	60	£0.00	£0	£0.00	£0	£0
Yes	Internal insulation	Existing Unchanged	PIR Insulation	60	£0.00	£0	£1.00	£60	£60
Yes	Drainage filtration layer	Existing Unchanged	HDPE	60	£0.00	£0	£0.00	£0	£0
Yes	Inner tanking	Existing Unchanged	Polyethylene (PE)	60	£0.00	£0	£0.00	£0	£0
Yes	Retaining floor	Existing Unchanged	Concrete	60	£1.00	£60	£0.00	£0	£60
Yes	Damp/Gas proof membrane	Existing Removed Reapplied	Polyethylene (PE)	60	£0.00	£0	£0.00	£0	£0
Yes	Ground gas ventilation labyrinth	Existing Removed Reapplied	Expanded polystyrene EPS	60	£0.00	£0	£1.00	£60	£60
Yes	Blinding layer	New Added	Sand	60	£0.00	£0	£0.00	£0	£0
Yes	Insulating backfill	New Added	LECA	60	£0.00	£0	£1.00	£60	£60
Yes	Consolidated hardcore	Existing Removed Reworked	Recycled masonry	60	£0.00	£0	£0.00	£0	£0
Yes	Drainage layer	Existing Removed Reapplied	Sea shells	60	£0.00	£0	£0.00	£0	£0
Yes	Undisturbed subsoil	Existing Unchanged	Clay	60	£0.00	£0	£0.00	£0	£0
£1.00				£3.00	£4.00	£60		£180	£240
Elemental				Elemental Materials	Elemental	Elemental		Elemental	Elemental Cost

SFCA 4th Edition

Detailed (Elemental) Cost Analysis (+ optional Components)

Elements (and otional Components)	Total Cost	Cost per m2 GIFA (Gross Internal Floor Area)	Unit Quantity		Unit rate (Cost per No.)
	£	£/m2	m2 or No.	m2 or No.	£/No.
1 Substructure	£480.00	£8[illegible]	[illegible]	m2	£7[illegible]

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V2 EE EC SC

																										Grand totals	#N/A	#N/A	0	0	#N/A
	Embodied Energy To Sequestered Carbon	m	m	m	m	No.	m2	m3					MJ/m3	MJ/m2	MJ/Item	m2	m2	kg C/kg	kg CO2/kg	kg CO2/m2	kg CO2/Item	kg/m3	kg/m2	MJ/m3	kg CO2/m3	Yes/No	MJ	kg CO2	Yes/No	kg CO2	Kg CO2
	Component Function	Length	Width	Height	Element Thickness	Quantity	Areas	Volume	Primary or all Functions	Primary or all Components	Primary or all Materials	Information Source	Embodied Energy	Embodied Energy	Embodied Energy	Area or section	m2	Embodied Carbon	Embodied Carbon Dioxide	Embodied Carbon Dioxide	Embodied Carbon Dioxide	Density	Weight	Embodied Energy	Embodied Carbon Dioxide	Required in building?	Embodied Energy Building	Embodied Carbon Building	Does Column BE include timber?	Sequestered carbon	Total Carbon
Yes	1 Basement Floor (BF)						60																								
Yes	Inner decoration				0.001	1	60	0.06	Decoration	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Floor finish				0.025	1	60	1.5	Finish	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Inner floor lining underlayment				0.048	1	60	2.88	Lining/Sheathing/Sarking	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Inner levelling/wearing				0.045	1	60	2.7	Gap filler / Formation	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Internal insulation				0.235	1	60	14.1	Thermal Insulation	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Drainage filtration layer				0.05	1	60	3	Loadbearing capacity: Foundation	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Inner tanking				0.001	1	60	0.06	Ground water exclusion	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Retaining floor				0.15	1	60	9	Loadbearing capacity: Basement	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Damp/Gas proof membrane				0.001	1	60	0.06	Ground gas exclusion	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Ground gas ventilation labyrinth				0.1	1	60	6	Cross ventilation (below floor)	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Blinding layer				0.05	1	60	3	Gap filler / Formation	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Insulating backfill				0.15	1	60	9	Thermal Insulation	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Consolidated hardcore				0.15	1	60	9	Gap filler / Formation	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Drainage layer				0.05	1	60	3	Loadbearing capacity: Foundation	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A
Yes	Undisturbed subsoil				1	1	60	60	Loadbearing capacity: Foundation	Ground beams/ties/spacers	Paint (2 coats)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A	#N/A	Yes	#N/A	#N/A	No	0	#N/A

© GBE 2020 GBC Green Building Calculator

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V2 LCA EPD (Dev)

Whole Building Life Cycle Analysis

	Component Function	Length (m)	Width (m)	Height (m)	Element Thickness (m)	Quantity (No.)	Areas (m2)	Volume (m3)
Yes	**1 Basement Floor (BF)**						0	
Yes	Inner decoration				1	1	0	0
Yes	Floor finish				0.18	1	0	0
Yes	Inner floor lining underlayment				0.36	1	0	0
Yes	Inner levelling/wearing				1.4	1	0	0
Yes	Internal insulation				0.03	1	0	0
Yes	Drainage filtration layer				1	1	0	0
Yes	Inner tanking				0.23	1	0	0
Yes	Retaining floor				2.3	1	0	0
Yes	Damp/Gas proof membrane				0.23	1	0	0
Yes	Ground gas ventilation labyrinth				0.04	1	0	0
Yes	Blinding layer				2	1	0	0
Yes	Insulating backfill				1	1	0	0
Yes	Consolidated hardcore				1	1	0	0
Yes	Drainage layer				1	1	0	0
Yes	Undisturbed subsoil				1.5	1	0	0

BS EN 15804:2012 — A1 A2

	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Product: Raw Materials Supply	Product: Transport	Product: Manufacturing	Construction: Transport	Construction: Installation	Use: Use	Use: Maintenance	Use: Repair	Use: Replacement	Use: Refurbishment	Use: Energy	Use: Water	EndOfLife: Deconstruction Demolition	EndOfLife: Transport	EndOfLife: Waste Processing	EndOfLife: Disposal	Beyong Building Life Potential: Reuse Recovery Recycling
Yes	Yes	Yes	Yes	Yes										Yes		?	?

	GWP (kg CO2 equiv)	ODP (kg CFC 11 equiv)	AP (kg SO2 equiv)	EP (kg (PO4)3- equiv)	POCP (kg Ethene equiv)	ADP Elements (kg Sb equiv)	ADP Fossil Fuels (MJ, net calorific value)
	Global warming potential (GWP)	Ozone Depletion Potential (ODP) of the stratospheric ozone layer	Acidification potential (AP) of soil & water	Eutrophication Potential (EP)	Photochemical Tropospheric Ozone creation: (POCP)	Abiotic Depletion Potential for non-fossil fule resources	Abiotic Depletion Potential of resources-fossil fuels

© GBE 2020 GBC Green Building Calculator

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V1 Resistances

	Direction of heat flow			
	Upwards	Horizontal	Downwards	
inside resistance	0.10	0.13	0.17	
outside resistance	0.04	0.04	0.04	
underfloor space*	-	0.13	0.17	*These values should be used for the upper and lower surfaces of the underfloor space according to BS EN ISO 13370:1998
Below Ground Exterior Surface		0		

	BS EN ISO 6946		
	Roofs, walls and exposed floors		
	Air space resistanes (m2.K/W)		
	Direction of heat flow		
thichness of air spae	Upwards	Horizontal	Downwards
0	0	0	0
5	0.11	0.11	0.11
7	0.13	0.13	0.13
10	0.15	0.15	0.15
15	0.16	0.17	0.17
25	0.16	0.18	0.19
50	0.16	0.18	0.21
100	0.16	0.18	0.22
300	0.16	0.18	0.23

	BS EN ISO 6946
	Scaling factors for ceiling fixings and wall ties

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V1 Conductivities of Materials

Note: If available, certified test values should be used in preference to those in this table

Format	Common Building Materials	Density ρ	Thermal Conductivity λ	Thickness	Thickness	Resistivity	U value
		kg/m³	W/m.K	mm	m	m2.K/W	W/m2.K
Insitu	Aerated Concrete block, 140 mm	400	0.160	140	0.14	0.875	1.143
Insitu	Aerated Concrete, slab, 250 mm	500	0.160	250	0.25	1.563	0.640
Consolidated layer	Aggregate, gravel or crushed rock, 100 mm	2240	1.300	100	0.1	0.077	13.000
Rigid sheet	Aluminium, 1 mm	2700	230.000	1	0.001	0.000	230000.000
Coating	Asphalt, 8% binder, 10 mm	1550	1.200	10	0.01	0.008	120.000
Layer	Bitumen, 10 mm	1700	0.200	10	0.01	0.050	20.000
Masonry wall/leaf	brick, general clay, 102 mm, inner leaf, 1:1:6 C:L:S	1873	0.620	102	0.102	0.165	6.078
Masonry wall/leaf	brick, general clay, 102 mm, inner leaf, 1:3 L:S	1870	0.620	102	0.102	0.165	6.078
Masonry wall/leaf	brick, general clay, 102 mm, outer leaf, 1:1:6 C:L:S	1873	0.840	102	0.102	0.121	8.235
Masonry wall/leaf	brick, general clay, 102 mm, outer leaf, 1:3 L:S	1870	0.840	102	0.102	0.121	8.235
Multi-layer membrane	Built-up roofing felt, 10 mm	960	0.160	10	0.01	0.063	16.000
Masonry wall/leaf	Calcium Silicate block (Silica) 100 mm	1850	0.910	100	0.1	0.110	9.100
Insitu	Cast concrete, 28/35 Mpa, 250 mm	2000	1.300	250	0.25	0.192	5.200
Boards	Cellular glass, 282 mm	135	0.048	282	0.282	5.875	0.170
	Cellulose, 230 mm	42	0.039	230	0.23	5.897	0.170
Tiles	Ceramic tiles, 8 mm	1900	1.200	8	0.008	0.007	150.000
Boards, Foam	Chipboard	800	0.120		0	0.000	#DIV/0!
Tiles	clay tiles, 10 mm	1900	0.850	10	0.01	0.012	85.000
Block/Wall	Concrete block, high density, 13 N/mm2, 140 mm	2240	1.630	140	0.14	0.086	11.643
Block/Wall	Concrete block, light density, 8 N/mm2, 140 mm	600	0.190	140	0.14	0.737	1.357
Block/Wall	Concrete block, medium density, 10 N/mm2, 140 mm	1400	0.510	140	0.14	0.275	3.643
Panel	Cork, 235 mm	160	0.040	235	0.235	5.875	0.170
	Expanded Polystyrene (EPS), 206 mm	25	0.035	206	0.206	5.886	0.170
	External rendering, C:S, 1:3, 12 mm	1300	0.500	12	0.012	0.024	41.667
Lining	Fermacell, 12.5 mm	1200	0.320	12.5	0.0125	0.039	25.600
Slates	Fibre cement slates, uncoated, 10 mm	350	0.082	10	0.01	0.122	8.200
Boards	Fibreboard, high density, 10 mm	880	0.120	10	0.01	0.083	12.000
	Flax insulation, 224 mm	30	0.038	224	0.224	5.895	0.170

GBE

https://GreenBuildingEncyclopaedia.uk

GBC Green Building Calculator

https://GreenBuildingCalculator.uk

V1 Properties of Products

Products

© GBE Calculator 2018-2020

CAWS+	Elements	Component/Function	Format	Supplier	Manufacturer	Product Reference	Material	Density	Thermal Conductivity	Thickness	Thickness	Thermal resistance	Width or thickness (solid)	Spacing or cavity (Void)	Fraction of area or section	Thermal resistance	U value on own	Source	Source	Year	Updated
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre	180	0.042	50	0.05	1.190	1	1	100%	1.190	0.840	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre	180	0.042	60	0.06	1.429	1	1	100%	1.429	0.700	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre	180	0.042	80	0.08	1.905	1	1	100%	1.905	0.525	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre	180	0.042	100	0.1	2.381	1	1	100%	2.381	0.420	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Multitherm	Wood Fibre	140	0.040	40	0.04	1.000	1	1	100%	1.000	1.000	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Multitherm	Wood Fibre	140	0.040	60	0.06	1.500	1	1	100%	1.500	0.667	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Multitherm	Wood Fibre	[illegible]	0.040	80	0.08	2.000	1	1	100%	2.000	0.500	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	[illegible]	0.039	20	0.02	0.513	1	1	100%	0.513	1.950	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	[illegible]	[illegible]	40	0.04	1.026	1	1	100%	1.026	0.975	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	130	[illegible]	60	0.06	1.538	1	1	100%	1.538	0.650	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	130	[illegible]	80	0.08	2.051	1	1	100%	2.051	0.488	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	130	[illegible]	[illegible]	0.1	2.564	1	1	100%	2.564	0.390	EBS 2018	Supplier	2018	24/05/2020
P10	Flat roof	Insulation	Board and bonded insulation	Direct from Manufacturer	Kingspan	Thermaroof TR31	6 mm ply and 120 Insulation		[illegible]	[illegible]	0.12	#DIV/0!	1	1	100%	#DIV/0!	#DIV/0!	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10	Flat roof	Insulation	Rigid Board insulation	Direct from Manufacturer	Kingspan	Thermapitch TP10			0.022	[illegible]	0.06	2.727272727	1	1	100%	2.727272727	0.367	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10			Rigid Board insulation	Direct from Manufacturer	Kingspan	Thermapitch TP10			0.042	40.0	0.04	0.952380952		1	100%	0.952380952	1.050	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10	External wall	Thermal insulation		Direct from Manufacturer	Kooltherm	Rigid Insulation			0.018	100.0	0.1	5.555555556		1	100%	5.555555556	0.180	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	220	0.22	5.789473684		1	100%	5.789473684	0.173	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	200	0.2	5.263157895		1	100%	5.263157895	0.190	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	30	0.03	0.789473684	2	1	100%	0.789473684	1.267	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	100	0.1	2.631578947	2	1	100%	2.631578947	0.380	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool	18	0.039	100	0.1	2.564	1	1	100%	2.564	0.390	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool	18	0.039	75	0.075	1.923	1	1	100%	1.923	0.520	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool	18	0.039	50	0.05	1.282	1	1	100%	1.282	0.780	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool	18	0.039	140	0.14	3.590	1	1	100%	3.590	0.279	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38	0.040	40	0.04	1.000	1	1	100%	1.000	1.000	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38	0.040	60	0.06	1.500	1	1	100%	1.500	0.667	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38	0.040	80	0.08	2.000	1	1	100%	2.000	0.500	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38	0.040	100	0.1	2.500	1	1	100%	2.500	0.400	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38	0.040	140	0.14	3.500	1	1	100%	3.500	0.286	EBS 2018	Supplier	2018	24/05/2020
P10	Floor	Impact Sound Isolation	Sheet	Direct from Manufacturer		ISO Rubber			0.075	6	0.006	0.08	1	1	100%	0.08	12.500	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10				Direct from Manufacturer		Lambatherm	Sheep's wool		0.03	172.0	0.172	5.733333333	1	1	100%	5.733333333	0.174	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10	Flooring	Thermal Insulation		Direct from Manufacturer		Earthwool Building Slab RS140	Mineral wool		0.034	150.0	0.15	4.411764706	1	1	100%	4.411764706	0.227	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10			Board	NBT		Pavatex			0.04	300.0	0.3	7.5	1	1	100%	7.5	0.133	LSBU EREID 2017	manufacturer	2017	24/05/2020
P11	External Wall	Thermal Insulation	Foam	Direct from Manufacturer	Icynene	Spray foam Insulation	Polyurethane	8	0.04	40	0.04	1.000	550	600	92%	0.917	1.000	ND LSBU EREID 2018	manufacturer	2018	24/05/2020
P14	External Wall	Air tightness layer	Membrane	Ecological Building Systems	Proclima	Intello Plus	Polyolephene	-	0.17	0.5	0.0005	0.003	1	1	100%	0.003	340.000	ND LSBU EREID 2018	manufacturer	2018	24/05/2020
P14	External Wall	Wind tightness layer	Membrane	Ecological Building Systems	Proclima	Solitex Fronta	Polyolephene	-	0.2	0.1	0.0001	0.001	1	1	100%	0.001	2000.000	ND LSBU EREID 2018	manufacturer	2018	24/05/2020

© GBE 2020 GBC Green Building Calculator

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V1 Secondary Elements Data Collection and Calculator

Secondary Elements Materials Performance Costs

© GBE Calculator 2018-2020

PrimaryElements	Manufacturer	ProductReference	Secondary Element	Fenestration	Material	Finish	Glazing	Coating	Gas	Performance			U values			Psi values @		Ironmongery	Opening		Secondary Element Size			Frame			sealed unit spacer			Glazing		
										Solar Heat Gain	Visible Light Transmittance	R value	U value Glass Ug	U value Frame Uf	U value Window Uw	Sealed unit spacer	Perimeter	Materials	width	height	width	height	area	sightline width	Elements	Frame %	width	spacer length	Spacer area	width	height	area
											%		W/m2.K	W/m2.K	W/m2.K			Finishes	mm	mm	mm	mm	m2	mm	No.	%	mm	mm	m2	mm	mm	m2
External Wall	NicaDesign	Engineered Pine Sash	Windows	Sash	Engineered Pine										0				910	910	900	900	0.8	50	2	11.19%	10	3280	0.033	820	820	0.672
External Wall	NicaDesign	Hardwood Sash	Windows	Sash	Hardwood										0				910	910	900	900	0.8	50	2	11.19%		3280	0.033	820	820	0.672
External Wall	NicaDesign	Engineered Pine Casement	Windows	Casement	Engineered Pine										0				910	910	900	900	0.8		1	16.74%		3080	0.031	770	770	0.593
External Wall	NicaDesign	Hardwood Casement	Windows	Casement	Hardwood										0				910	910	900	900	0.8			16.74%		3080	0.031	770	770	0.593
External Wall	NicaDesign	French Doors	French Doors	Side hung pair	Hardwood										0					2110	900	2100	1.9			16.70%		5480	0.055	770	1970	1.517
External Wall	NicaDesign	Front Door	Entrance Doors	?	?										0					2110	900	2100	1.9			16.70%	10	5480	0.055	770	1970	1.517
External Wall	NicaDesign	Bi-fold Door	Doors	Bi-fold	?										0				2110		2100	2100	4.4	75		14.37%	10	7880	0.079	1970	1970	3.881
External Wall	NicaDesign	Sliding Door	Doors	Sliding	Aluminium										0				2110		2100	2100	4.4	75	2	14.37%	10	7880	0.079	1970	1970	3.881
External Wall	NicaDesign	Aluminium Bi-fold Door	Doors	Bi-fold	Aluminium										0				2110		2100	2100	4.4	55	2	10.56%	10	8040	0.080	2010	2010	4.040
External Wall	NicaDesign	Steel-look door	Doors	?	Aluminium										#VALUE!				910	2110	900	2100	1.9	50	1	?	10	5680	0.057	820	2020	1.656
External Wall	NicaDesign	Steel-look window	Windows	?	Aluminium										#VALUE!				910	910	900	900	0.8	50	1	?	10	3280	0.033	820	820	0.672
External Wall	NicaDesign	Aluminium Tilt & Turn Window	Windows	Tilt & Turn	Aluminium										0				910	910	900	900	0.8	75	1	16.74%	10	3080	0.031	770	770	0.593
External Wall	NicaDesign	Aluminium Tilt & Turn Door	Doors	Tilt & Turn	Aluminium										0				910	910	900	900	0.8	75	1	16.74%	10	3080	0.031	770	770	0.593
External Wall		Clear	For windows & doors	Any	Any		2 x Clear	None	1 x Dry air	0.75	81%	2.084	0.48	N/A	N/A	N/A	N/A	N/A						50	1		10		0	900	900	0.81
External Wall		Clear	For windows & doors	Any	Any		3 x Clear	None	2 x Dry air	0.685	74%	3.226	0.31	N/A	N/A	N/A	N/A	N/A						50	1					900	900	0.81
External Wall		Low-e	For windows & doors	Any	Any		2 x Clear	1 x LowE	1 x Argon	0.685	79%	3.846	0.26	N/A	N/A	N/A	N/A	N/A						50	1					900	900	0.81
External Wall		Low-e	For windows & doors	Any	Any		3 x Clear	1 x LowE	2 x Argon	0.615	73%	5.433	0.184	N/A	N/A	N/A	N/A	N/A						50	1					900	900	0.81
External Wall		Low-e	For windows & doors	Any	Any		3 x Clear	2 x LowE	2 x Argon	0.56	70%	7.521	0.133	N/A	N/A	N/A	N/A	N/A						50	1					900	900	0.81
External Wall		SunStop	For windows & doors	Any	Any		2 x Clear	1 x Solar	1 x Argon	0.367	70%	4.044	0.248	N/A	N/A	N/A	N/A	N/A							1					900	900	0.81
External Wall		SunStop	For windows & doors	Any	Any		3 x Clear	1 x Solar	2 x Argon	0.338	63%	5.377	0.186	N/A	N/A	N/A	N/A	N/A												900	900	0.81
External Wall		SunStop	For windows & doors	Any	Any		3 x Clear	2 x Solar	2 x Argon	0.31	54%	8.056	0.124	N/A	N/A	N/A	N/A	N/A												900	900	0.81
External Wall		System V	For windows & doors	Any	Any		2 x clear	2 x LowE	1 x Argon	0.623	77%	4.783	0.209	N/A	N/A	N/A	N/A	N/A												900	900	0.81
External Wall		System V	For windows & doors	Any	Any		2 x clear	1 x LowE 1 x Solar	1 x Argon	0.361	69%	4.998	0.2	N/A	N/A	N/A	N/A	N/A						50						900	900	0.81

© GBE 2020 GBC Green Building Calculator

V2 Element Summary Ext Env For U Value Calculations

	Element Summary: External Envelope	Calculated Total U value	Target Elemental U value	Difference	Pass, PassU or Fail	Form Factor target U value	Difference	Pass, PassU or Fail	Embodied Energy	Traget Embodied Energy	Difference	Pass, PassU or Fail	Embodied Carbon	Sequestered carbon	Total Carbon	Target Carbon	Difference	Pass, PassU or Fail	Element	Secondary Element
	© GBE Green Building Calculator 2017-2020	W/m2.K	W/m2.K	W/m2.K	%%%	W/m2.K	W/m2.K												Y	Y
Yes	1 Basement Floor (BF)	0.082	0.15	-0.07	Pass	0.110	-0.028	Pass	0.00	0.00	0.000	Fail	1.00	-1.00	0.00	0.00	0.000	Fail	Y	
Yes	2 Basement Perimeter Retaining Walls (BPRW)	0.251	0.15	0.10	Fail	0.110	0.141	Fail	0.00	0.00	0.000	Fail	2.00	1.00	1.00	0.00	1.000	Fail	Y	
Yes	3 Basement External Wall (BEW)	0.064	0.15	-0.09	Pass	0.110	-0.046	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	4 Basement Roof at Site Level (BRSL)	0.044	0.15	-0.11	Pass	0.110	-0.066	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	5 Basement Roof at SubTerranean level (BRSTL)	0.085	0.15	-0.07	Pass	0.110	-0.025	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	6 Basement Overhead Glazed Pavement (BOGP)	2.000	0.750	1.250	Fail	0.110	1.890	Fail	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	7 Swimming Pool Basin (SPB)	0.071	0.15	-0.08	Pass	0.110	-0.039	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	8 Ground Floor Over Basement (GFOB)	0.052	0.15	0.15	Fail	0.110	-0.058	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	9 Ground Floor Ground Bearing (GFGB)	0.090	0.15	-0.06	Pass	0.110	-0.020	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	10 Ground Floor Over Ventilated Void (GFOV)	0.057	0.150	-0.093	Pass	0.110	-0.053	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	11 Upper Floor (UF)	0.102	0.15	0.15	Fail	0.110	-0.008	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	13 External Floor & Soffit (EFS) (over air)	0.059	0.150	-0.091	Pass	0.110	-0.051	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	14 Top Floor (TF)	0.118	0.75	-0.63	Pass	0.110	0.008	Fail	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	15 Party Floor (PF)	0.053	0.150	-0.097	Pass	0.110	-0.057	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	16 Party Wall (PW)	0.125	0.300	-0.175	Pass	0.110	0.015	Fail	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	17 Communal Compartment Floors (CCF)	0.053	0.15	-0.10	Pass	0.110	-0.057	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	18 Communal Compartment Wall (CCW)	0.126	0.300	-0.174	Pass	0.110	0.016	Fail	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	20 External Walls (EW)	0.064	0.15	-0.09	Pass	0.110	-0.046	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	21 Integral Unheated Space Wall (IUSW)	0.064	0.75	-0.69	Pass	0.110	-0.046	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	22 Flat Roof (FR)	0.039	0.150	-0.111	Pass	0.110	-0.071	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	23 Shallow Roof (SR)	0.086	0.150	-0.064	Pass	0.110	-0.024	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	24 Pitched Roof (PR)	0.069	0.150	-0.081	Pass	0.110	-0.041	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	25 Barrel Vault Roof (BVR)	0.086	0.150	-0.064	Pass	0.110	-0.024	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	26 Domed Roof (DR)	0.049	0.150	-0.101	Pass	0.110	-0.061	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	25 Hipped/Pyramid Roof (HPR)	0.070	0.00	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	26 Mono-Pitched Roof (MPR)	0.070	0.00	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	27 Mansard Roof (MR)	0.070	0.000	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	28 Dormer Flat Roofs (DFR)	0.070	0.00	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	29 Dormer Side Wall (DSW)	0.070	0.00	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	30 Dormer Window Wall (DWW)	0.070	0.00	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	31 Other Geometry Roof (OGR)	0.070	0.00	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	34 Flat Ceiling (FC)	0.087	0.150	-0.063	Pass	0.110	-0.023	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	33 Pitched Vault Ceiling (PVC)	0.089	0.000	0.000	Pass	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	34 Barrel Vault Ceiling (BVC)	0.089	Unregulated	N/A	PassU	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	35 Domed Vault Ceiling (DVC)	0.089	0.000	0.000	Pass	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	36 Hipped/Pyramid Vault Ceiling (HPVC)	0.089	0.000	0.000	Pass	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	37 Mono-Pitch Vault Ceiling (MPVC)	0.089	0.000	0.000	Pass	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	38 Mansard Vault Ceiling (MVC)	0.089	0.000	0.000	Pass	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	39 Other Geometry Ceiling (OGC)	0.089	0.000	0.000	Pass	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
Yes	42 Windows (W)	0.800	0.950	-0.150	Pass		0.800		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
Yes	43 Glazed Pedestrian Doors (GPD)	0.790	0.950	-0.160	Pass		0.790		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
Yes	44 Opaque Pedestrian Doors (OPD)	2.000	0.750	1.250	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
Yes	45 Large Wall Opening (LWO)	2.000	0.750	1.250	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
Yes	46 High Usage Entrance Door (HUED)	2.000	0.750	1.250	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
Yes	47 Display Window (DW)	2.000	0.950	1.050	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
Yes	48 Glazed External Walls (GEW)	0.810	0.950	-0.140	Pass		0.810		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
Yes	49 Opaque External Walls (OEW)	2.000	0.750	1.250	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
Yes	50 Glazed Roof (GR)	2.000	0.950	1.050	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
Yes	51 Rooflights (RL)	0.750	0.950	-0.200	Pass		0.750		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
Yes	52 Roof Windows (RW)	0.810	0.950	-0.140	Pass		0.810		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
Yes	53 Roof Air & Smoke Vents (RASV)	2.000	0.750	1.250	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		Y
			16.25			4.29			0.00	0.00	0.00		3.00	0.00	1.00	0.00	1.00		24	12
				51	18	of 51		5				51						51		
					Fail			Fail				Fail						Fail		
					32	of 51		34	of 51			0	of 51					0	of 51	
					Pass			Pass				Pass						Pass		
					1	of 51		0	of 51			0	of 51					0	of 51	
					PassU			PassU				PassU						PassU		
					0	of 51		0	of 51			0	of 51					0	of 51	
					N/A			N/A				N/A						N/A		

V2 Element Summary:

Non-Ext Env for EE EC SC LCA

Element Summary: Non-External Envelope	Calculated Total U value	Target Elemental U value	Difference	Pass, Pass U or Fail	Form Factor target U value	Difference	Pass, Pass U or Fail	Embodied Energy	Traget Embodied Energy	Difference	Pass, Pass U or Fail	Embodied Carbon	Sequestered carbon	Total Carbon	Target Carbon	Difference	Pass, Pass U or Fail	Element	Secondary Element
© GBE Green Building Calculator 2017-2020																			
52 Basement External Entrance Well Retaining Pavement (BEEWRP)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
53 Basement External Entrance Well Retaining Wall (BEEWRW)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
54 Basement External Entrance Well Staircase (BEEWS)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
55 Basement External Entrance Well Party wall (BEEWPW)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Basement Walls, Partitions and Cubicles	to be developed																		
58 Basement Internal Walls (BIW)	0.000	0.00	0.00	0.00	0.110	-0.110	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Yes 59 Basement Internal Partitions (BIP)	0.269	0.00	0.00	0.00	0.110	0.093	Fail	0.00	0.00	0.000	Fail	0.00	3.00	-1.00	0.00	-1.000	Pass	Y	
Yes 60 Internal Walls (IW)	tal elemental U vals.	0.00	0.00	0.00	0.110	#VALUE!	#VALUE!	0.00	0.00	0.000	Fail	0.00	3.00	-1.00	0.00	-1.000	Pass	Y	
Yes 61 Internal Partitions (IP)	0.203	0.00	0.00	0.00	0.110	0.093	Fail	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
62 K02 Internal Cubicles (IC) & Back Panels (ICBP) & Internal Wall Linings (IWL)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
	to be developed																		
61 Eaves Parapet Walls (EPW)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
62 Party Wall Parapet (PWP)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
63 Chimneys/Chimney Breast (CC/CB)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
64 Attached Party Flank wall/Site Boundary Wall (APFWS/BW)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Foundations	to be developed																		
65 Foundation (F) (Strip or trench)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
66 Foundation Wall (FW) (over strip)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
67 Sleeper Wall (SW)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
68 Raft Foundation Slab & Strips	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
69 Pad foundation & column	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
70 Pile foundation & Grounds beams	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
71 Diaphragm wall	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
72 Secant Pile Wall	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Secondary Elements (SE)	to be developed																		
L30 Staircase/Landing/Walkways	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Furniture Fixtures Equipment (FFE)	to be developed																		
N10 Attic Eaves Furniture (AEF)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
N10 Other Furniture (OF)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
N11 Kitchen Furniture (KF)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
N12 Catering Equipment (CE) (Non-Domestic)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
N13 Sanitaryware Bathroom Furniture (SBF)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P Building Fabric Sundries	to be developed																		
P10 Sundry Insulation/Proofing work	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P11 Trapped/Tores/Dead cavity wall insulation	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P12 Fire Stopping Systems	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P14 Air/Wind Tightness Systems	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P20 Unframed Isolated Trims/Skirtings/Sundry Items	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P21 Ironmongery	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P22 Sealant Joints	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P23 Movement Joints (Non-domestic)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P32 Trenches/Pipeways/Pits for buried engineering services	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P31 Holes/Chases/Covers/Supports for Services	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P32 Services Painting (And identification?)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P33 Plinths and Band Systems	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P39 Cable Pass Throughs (Non-Domestic)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Landscape (L)	to be developed																		
Q10 Raised Beds	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q10 Stairs	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q10 Steps	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q20 Drive	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q20 Paths	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q20 Ramps	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q30 Lawn	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q31 Boarders	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q40 Fence and Gates	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q41 Railings and Gates	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q51 Sports Equipment	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q53 Bat or Bird Accommodation	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q55 Decking	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q60 Pond/Water Feature/Swimming Pond	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q70 Composter and Wormeries	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q70 Front/Rear Garden Bin/Bike/Delivery Store	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q70 Pergolas	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q70 Rear Garden Shed	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q75 Retaining walls	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Domestic MEP Services (DMEPS)	to be developed																		
J00 Basement Internal Drainage	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
R10 Rainwater Gutters Pipework	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
R11 Above ground drainage	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
R12 Below ground drainage	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
R91 Refuse Disposal System Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S17 Rainwater Harvesting	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S92 Hot and Cold Water Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S91 Gas Supply Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S92 Sprinkler System Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
T14 Air Water Ground Source Heat Pumps	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
T16 Solar Collectors	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
T90 Heating Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
L90 Ventilation Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
V92 Electrical Installation Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
V91 Electrical Systems Landscape	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
W90 Communications & Security Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
X92 Transport Systems Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
	to be developed							0.00	0.00	0.00	63	0.00	0.00	0.00	0.00	0.00	63		

V2 U value to Watts to CO2 In Use

U Values To Watts To CO2

User name: BrianSpecMan did this

© GBE Green Building Calculator 2017-2020

Yes ? ?

Basement	Applicable Elements	U value	Areas	External		Internal	Difference	Individual	Total	Floor area	Total Areas	Areas	Heat loss	Ratio:
	Yes/No	W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x
Yes	1 Basement Floor (BF)	0.082	60	11	-	15	4	[illegible]		[illegible]				
Yes	2 Basement Internal Retaining Wall (BIRW)	0.351	200	11	-	15	4	27		[illegible]				
Yes	3 Basement External Wall (BEW)	[illegible]	125	11	-	15	4	2		125				
Yes	4 Basement Roof at Site Level (BRSL)	0.044	60	11	-	15	4	11		60				
Yes	5 Basement Roof at SubTerranean level (BRSTL)	0.085	60	11	-	15	4	20		60				
Yes	6 Basement Overhead Glazed Pavement (BOGP)	2.000	11	11	-	15	4	88		11				
Yes	7 Swimming Pool Basin (SPB)	0.071	2296	11	-	15	4	651		2296				
			2812						1,023	Basement	2812	22%	#VALUE!	#VALUE!

Floor	Applicable Elements	U value	Areas	External		Internal	Difference	Individual	Total	Floor area	Total Areas	Areas	Heat loss	Ratio:
	Yes/No	W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x
Yes	8 Ground Floor Over Basement (GFOB)	0.052	60	11	-	20	9	28		60				
Yes	9 Ground Floor Ground Bearing (GFGB)	0.090	60	11	-	20	9	49		60				
Yes	10 Ground Floor Over Ventilated Void (GFOV)	0.057	60	11	-	20	9	31		60				
Yes	11 Upper Floor (UF)	0.102	60	20	-	20	0	0		60				
Yes	13 External Floor & Soffit (EFS) (over air)	0.059	120	0	-	20	20	141		120				
Yes	14 Top Floor (TF)	0.118	60	20	-	20	0	0		60				
			420						248	Floor	420	3%	#VALUE!	#VALUE!

Compartmentation	Applicable Elements	U value	Areas	External		Internal	Difference	Individual	Total	Floor area	Total Areas	Areas	Heat loss	Ratio:
	Yes/No	W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x
Yes	15 Party Floor (PF)	0.053	180	0	-	20	20	190		180				
Yes	16 Party Wall (PW)	0.125	7500	0	-	20	20	18,824		7500				
Yes	17 Communal Compartment Floors (CCF)	0.053	180	0	-	20	20	190		180				
Yes	18 Communal Compartment Wall (CCW)	0.126	37.5	0	-	20	20	94		37.5				
			7898						19,299	Compartmentation	7897.5	61%	#VALUE!	#VALUE!

Wall	Applicable Elements	U value	Areas	External	0	Internal	Difference	Individual	Total	Floor area	Total Areas	Areas	Heat loss	Ratio:
	Yes/No 0	W/m2.K	m2	degree C	0	degree C	degree C	W	W	m2	m2	%	%	1 in x
Yes	20 External Walls (EW)	0.064	80	0	-	20	20	103		80				
Yes	21 Integral Unheated Space Wall (IUSW)		0	0	-	15	15	0		0				
Yes	59 Basement Internal Partitions (BIP)	0.203	125	20	-	20	0	0		125				
Yes	60 Internal Walls (IW)	0.203	17.5	20	-	20	0	0		17.5				
			223						103	Wall	222.5	2%	#VALUE!	#VALUE!

Roof	Applicable Elements	U value	Areas	External		Internal	Difference	Individual	Total	Floor area	Total Areas	Areas	Heat loss	Ratio:
	Yes/No	W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x
Yes	22 Flat Roof (FR)	0.039	60	0	-	20	20	47		60				
Yes	23 Shallow Roof (SR)	0.086	60	0	-	20	20	104		60				
Yes	24 Pitched Roof (PR)	0.069	59	0	-	20	20	82		59				
Yes	25 Barrel Vault Roof (BVR)	0.086	68	0	-	20	20	118		68				
Yes	26 Domed Roof (DR)	0.049	31	0	-	20	20	30		31				
Yes	27 Hipped/Pyramid Roof (HPR)	Calculated Total U value	59	0	-	20	20	#VALUE!		59				
Yes	28 Mono-Pitched Roof (MPR)	W/m2.K	59	0	-	20	20	#VALUE!		59				
Yes	29 Mansard Roof (MR)	0.000	48	0	-	20	20	0		48				
Yes	30 Dormer Flat Roofs (DFR)	0.000	41	0	-	20	20	0		41				
Yes	31 Dormer Side Wall (DSW)	0.000	9	0	-	20	20	0		9				
Yes	32 Dormer Window Wall (DWW)	0.000	15	0	-	20	20	0		15				
Yes	33 Other Geometry Roof (OGR)	0.000	121	0	-	20	20	0		121				
			630						#VALUE!	Roof	630	5%	#VALUE!	#VALUE!

Ceilings	Applicable Elements	U value	Areas	External		Internal	Difference	Individual	Total	Floor area	Total Areas	Areas	Heat loss	Ratio:
	Yes/No	W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x
Yes	34 Flat Ceiling (FC)	0.087	60	0	-	50	50	260		60				
Yes	35 Pitched Vault Ceiling (PVC)		41	0		50	50	0		41				
Yes	36 Barrel Vault Ceiling (BVC)		131	0		50	50	0		131				
Yes	37 Domed Vault Ceiling (DVC)		31	0		50	50	0		31				
Yes	38 Hipped/Pyramid Vault Ceiling (HPVC)		59	0		50	50	0		59				
Yes	39 Mono-Pitch Vault Ceiling (MPVC)		41	0		50	50	0		41				
Yes	40 Mansard Vault Ceiling (MVC)		97	0		50	50	0		97				
Yes	41 Other Geometry Ceiling (OGC)		101	0		50	50	0		101				
			561						260	Ceilings	561	4%	#VALUE!	#VALUE!

Window/Door/Rooflight	Applicable Elements	U value	Areas	External		Internal	Difference	Individual	Total	Floor area	Total Areas	Areas	Heat loss	Ratio:
	Yes/No	W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x
Yes	42 Windows (W)	0.8	50	0	-	20	20	800		50				
Yes	43 Glazed Pedestrian Doors (GPD)	0.79	10.5	0	-	20	20	166		10.5				
Yes	44 Opaque Pedestrian Doors (OPD)	2	12	0	-	20	20	480		12				
Yes	45 Large Wall Opening (LWO)	2	45	0	-	20	20	1,800		45				
Yes	46 High Usage Entrance Door (HUED)	2	20	0	-	20	20	800		20				
Yes	47 Display Window (DW)	2	25	0	-	20	20	1,000		25				
Yes	48 Glazed External Walls (GEW)	0.81	80	0	-	20	20	1,296		80				
Yes	49 Opaque External Walls (OEW)	2	20	0	-	20	20	800		20				
Yes	50 Glazed Roof (GR)	2	25	0		20	20	1,000		25				
Yes	51 Rooflights (RL)	0.75	25	0	-	20	20	375		25				
Yes	52 Roof Windows (RW)	0.81	10	0	-	20	20	162		10				
Yes	53 Roof Air & Smoke Vents (RASV)	2	25	0	-	20	20	1,000		25				
			348						9,679	Window/Door/Rooflight	348	3%	#VALUE!	#VALUE!
									#VALUE!		12891	100%	#VALUE!	#VALUE!
									#VALUE!		12543	97%	#VALUE!	#VALUE!

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V1 > V2 Fuel Carbon Factor

FuelOptions	kgCO2/kWh	
Biomass	0.025	0.025
Coal	0.33	0.33
Grid Electricity	0.537	0.186
LPG	0.214	0.214
Natural Gas	0.185	0.185
Oil (Gas oil)	0.252	0.252
Renewable		
	2009	2020

V2 Drop Down Lists: MSR

Drop Down List Manufacturer Supplier Request (MSR)

Element	Component	PrimaryFunction	Format	MSR Materials
U value Envelope Elements		**Alphabetic order**		
Basement (B)		Access		
1 Basement Floor (BF)		Air tightness		
2 Basement Perimeter Retaining Walls (BPRW)		Anchor		
3 Basement External Wall (BEW)		Cladding		
4 Basement Roof at Site Level (BRSL)		Conditioning		
5 Basement Roof at SubTerranean level (BRSTL)		Containment		
6 Basement Overhead Glazed Pavement (BOGP)		Cross ventilation		
7 Swimming Pool Basin (SPB)		Daylight entry		
Floors (F)		Decoration		
8 Ground Floor Over Basement (GFOB)		Disposal		
9 Ground Floor Ground Bearing (GFGB)		Fastening		
10 Ground Floor Over Ventilated Void (GFOV)		Finish		
11 Upper Floor (UF)		Fire resistance		
12 Services Riser Upper Floor (SRUF)		Fixing		
13 External Floor & Soffit (EFS) (over air)		Fixing/Support/Restraint/Anchor/Fastening		
14 Top Floor (TF)		Frost heave accommodation		
Compartmentation (C)		Furniture		
15 Party Floor (PF)		Gap Filler		
16 Party Wall (PW)		Gap filler / Formation		
17 Communal Compartment Floors (CCF)		Gap Formation		
18 Communal Compartment Wall (CCW)		Ground exclusion		
19 Riser Compartment Upper Floor (RCUF)		Ground gas exclusion		
Walls (W)		Ground water exclusion		
20 External Walls (EW)		Heat emissions loss resistance		
21 Integral Unheated Space Wall (IUSW)		Impact sound isolation		
Roofs (R)		Lateral stability		
22 Flat Roof (FR)		Lateral stability/Sheer Resistance		
23 Shallow Roof (SR)		Lining		
24 Pitched Roof (PR)		Lining/Sheathing/Sarking		

V2 Manufacturer Supplier Request Product Data Sheet

Manufacturer Supplier Request

Add as many rows as you have products/sizes/applications

NB This Schedule can be downloaded directy from the Green Building Calculator website

© GBE Green Building Calculator 2017-2020

NB as more functionality is added this table will develop to capture more information

	Element	Component	Primary Function	Manufacturer	Product Reference	Product Code	Format	MSR Materials	Density	k value	SpecificHeatCapatity	Thickness		R value	U value	DecrementValue	DecrementDelay	Size	Size	
									kg/m³	W/m.K		mm	m	m2.K/W	W/m2.K			Length	Width	Comments
	Wall/Floor/Roof/Etc.	Position/Application	Insulation/Structure/VCL/BM/ATL/WTL/etc.	Company name	Product Name	Individual product codes	Quilt Batt Foam Board Block etc.	Wood fibre Sheep's wool Fired clay Straw board, etc.	20	0.160		150	0.15	0.938	1.067			mm	mm	anything else to be taken into account
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					
Drop down lists													0	#DIV/0!	#DIV/0!					

Legend

Cell colour code/content	Explanation
	User Input cell, feeds into calculations througout GBC
	GBC calculated results, that the user can overwrite. e.g. for variables
	GBC calculated results, applying user inputs in other cells or sheets
	User to select option from drop down list GBC will apply choice to calculations
	Row or Column titles

Yes/No	User input cell requiring user choice from drop down list
No	Not complete by GBC OR Users to ignore this row's cells. 'No' will turn red automatically
?	GBC awaiting information OR User to interrogate this row's cells and review decisions so far
Yes	Started by GBC OR To be completed by Users. 'Yes' will turn Green Automatically

© GBE 2020 GBC Green Building Calculator

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V1 Awards/Shortlists

- 3 months after V1.0.0. launch
  - Green Apple 2020 Award Winner
    - Category and metal to be announced
  - Central England Prestige 2020-21 Winner
    - November announcement
  - Construction Computing 2020 Awards Shortlisted: (Announcement Nov/Dec 2020)
    - Innovation of the year 2020
    - One to watch Company 2020
- Submitted Applications:
  - CIBSE Building Performance Award 2021
  - PEA Awards 2020

GREEN APPLE ENVIRONMENT AWARDS

CorporateLiveWire CENTRAL ENGLAND PRESTIGE AWARDS 2020/21 WINNER

Construction Computing AWARDS THE HAMMERS 2020 FINALIST

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

© GBE GBC 2020

- Brian Murphy BSc Dip Arch (Hons+Dist)
  - Architect by Training
  - Specification Writer by Choice
  - Environmentalist by Actions
  - Writer and Editor by necessity (Websites)
  - Educator by calling
  - Number Cruncher by necessity (Calculators)
- Greening up my act since 1999
- Founded National Green Specification 2001
- Funded and Launched www.greenspec.co.uk 2003
- Created: GBE at https://greenbuildingencyclopaedia.uk 2015
- Launched: GBE Learning https://GBELearning.com 2020
- Green Building Calculator https://GreenBuildingCalculator.uk 2020
- E BrianSpecMan@icloud.com
- Twitter: http://twitter.com/brianspecman
- LinkedIn: BrianSpecMan
- Facebook: BrianSpecMan
- Facebook: http://www.facebook.com/brianspecman
- Pinterest: Brian Murphy • GBE Green Building Encyclopaedia