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GBC

Green Building Calculator

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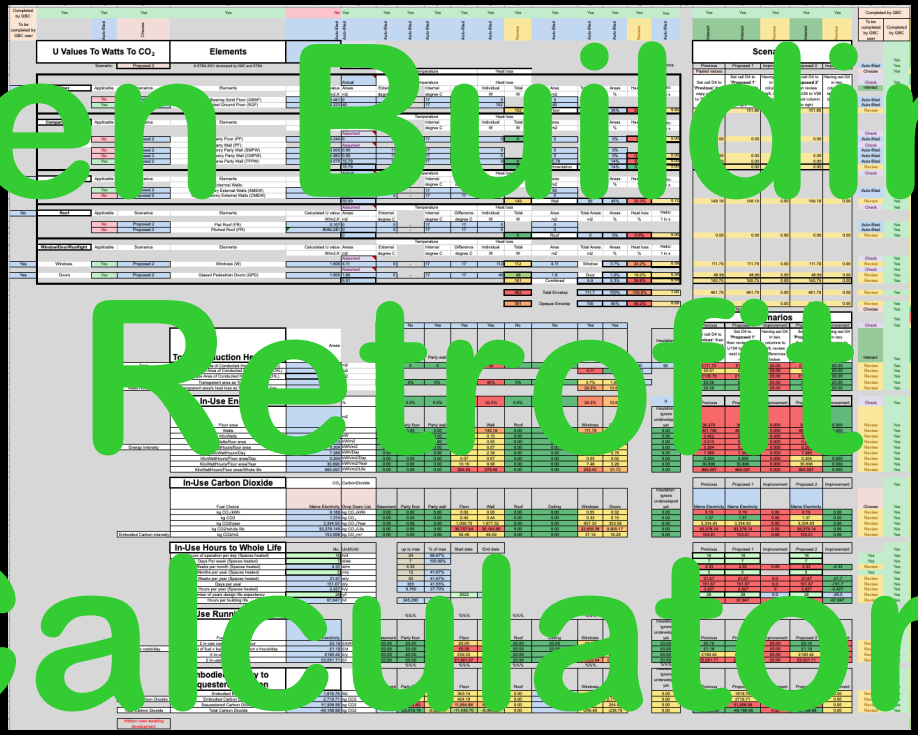
Green Building & Retrofit Calculators



BrianSpecMan Murphy GBC Number-Cruncher

GBC V2 GRC V1 Grand Designs Live 2023

Representing HiiGuru Ask an Expert

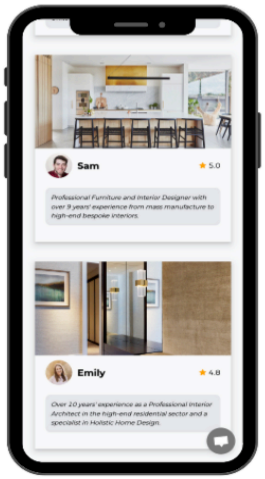
Need some expert advice?

Chat with top home design & build experts
at a fraction of the cost

1

Select a Category

2



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Book a Slot

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Get Live 1:1 Advice

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Avoid expensive mistakes

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Brian

New!

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Award-winning Professional Eco-Home Advisor with over 45 years' experience in Architecture & Construction and over 23 years' experience in Sustainable & Environmental design.

Areas of expertise

- Green construction choices
- Environmental specifications
- Sustainable materials
- Energy, carbon & cost efficiency calculations

Qualifications

- BSc Degree (Hons) & PG Diploma (Distinction) in Architecture from London Metropolitan University — ONC & HNC Construction from Peterborough Regional College

30-Minute Video Chat- Environmental Design & Construction Advisor

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£35 | $45

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Brian Murphy

- Technician and Architect by training
- Specification Writer by choice (e.g. British Library)
- Environmentalist by action
- Educator by calling
- Carbon Counter by necessity
- Building Tour Guide for Fun (E.g. British Library)

British Library £511m

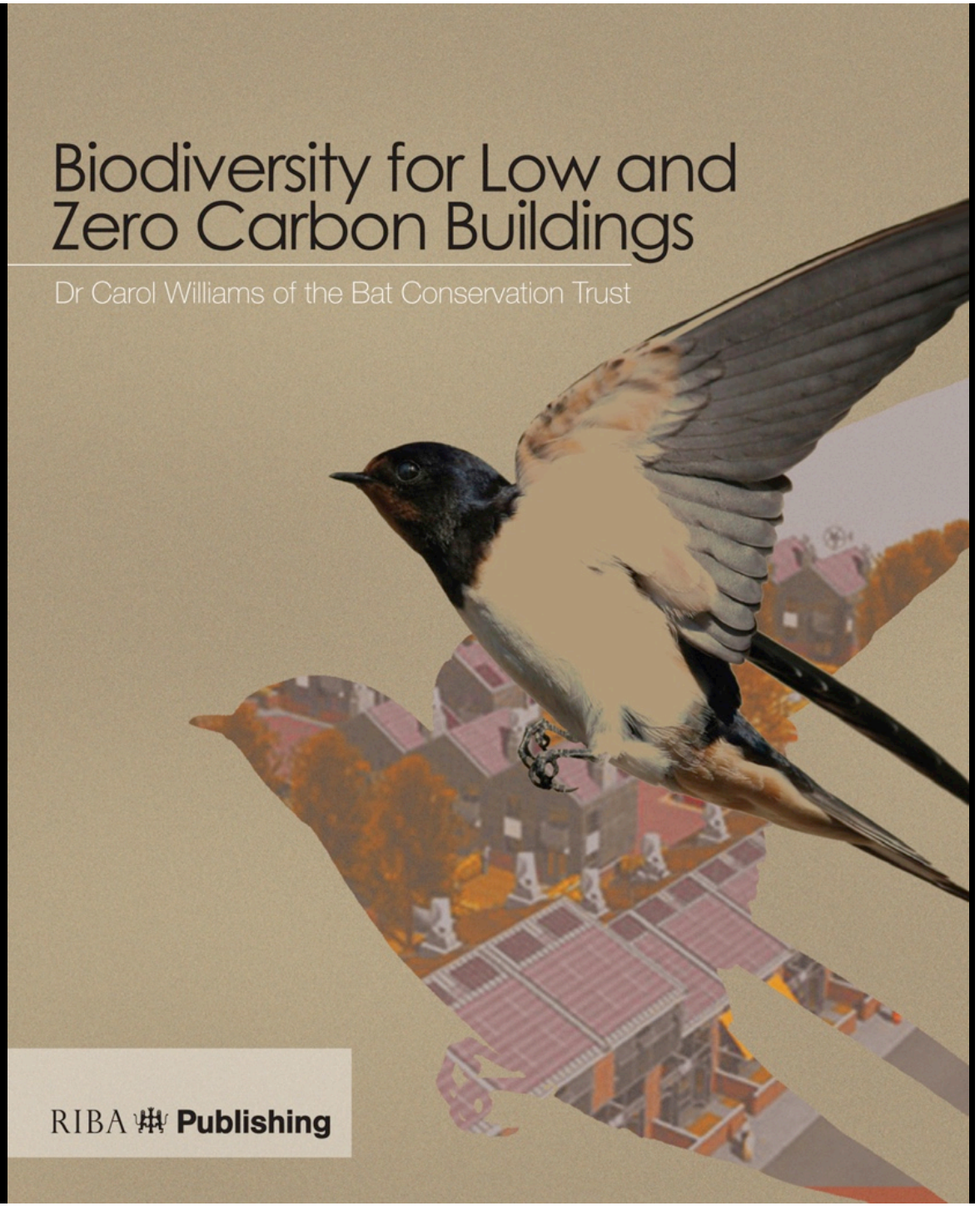
1st Freelance commission

Contract Specification writing

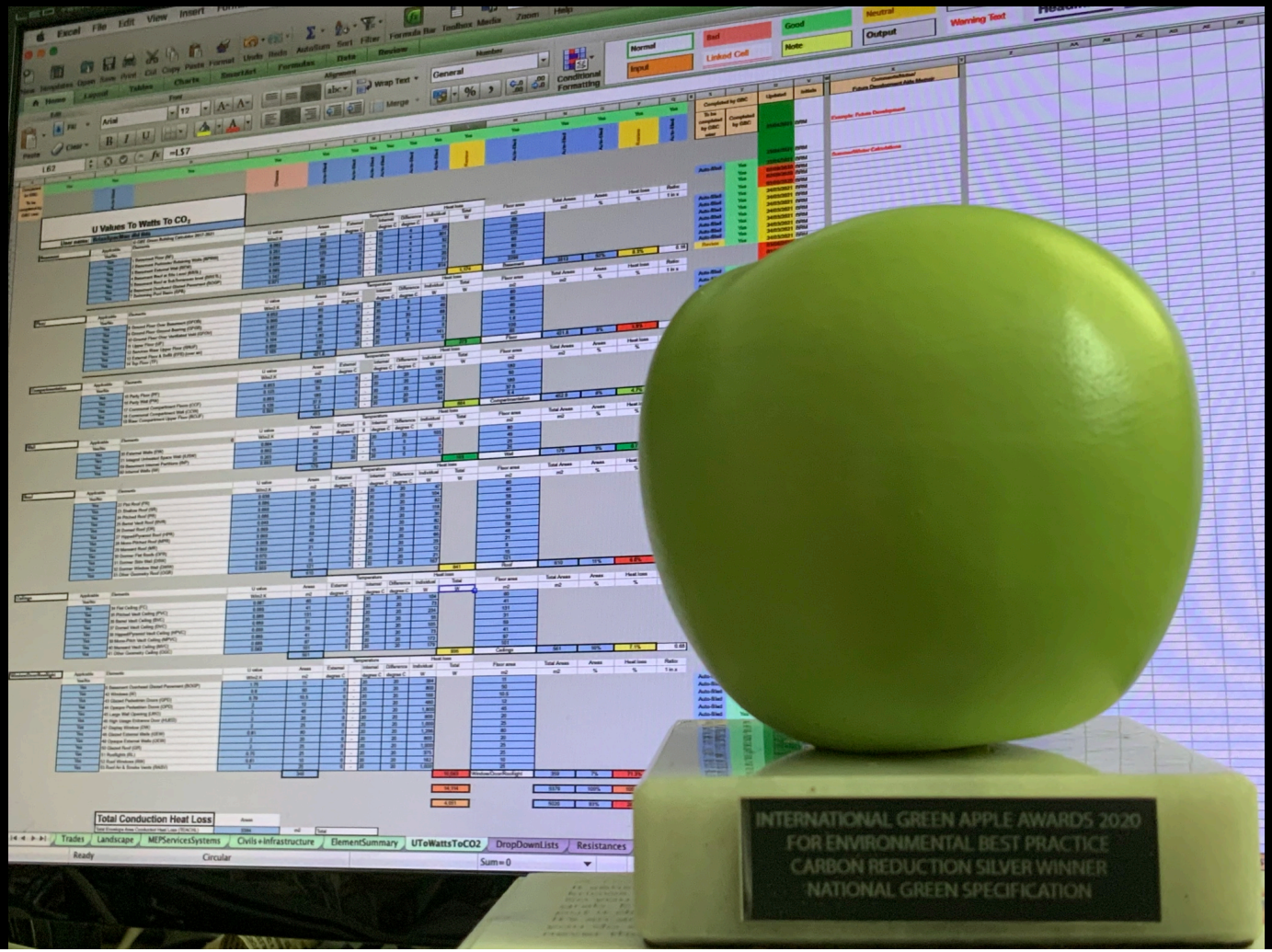
8 years

Aberystwyth University Arts centre & Dance School extensions: Specifications

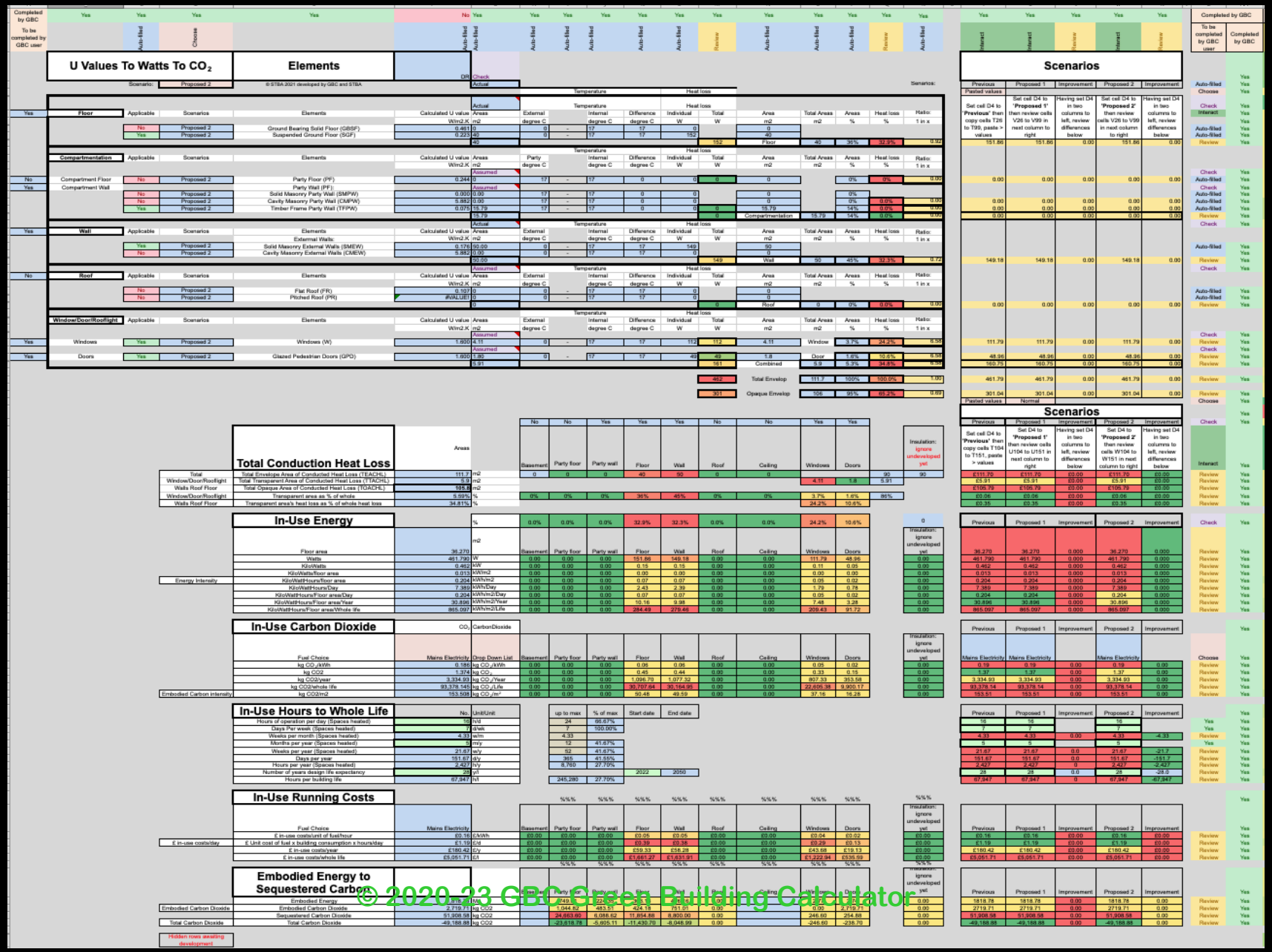
BCT & RSPB
RIBA Publishing
1st & 2nd editions
BRM Wrote 50% of book
10 Future proof construction methods
3D cutaways
2D Sections
Details and Specifications
Product Critique



Green Apple Award 2020
International Silver for Carbon Reduction



Green Retrofit Calculator



U Values To Watts To CO_2

Elements

Scenarios

Total Conduction Heat Loss

In-Use Energy

In-Use Carbon Dioxide

In-Use Hours to Whole Life

In-Use Running Costs

Embodied Energy to Sequestered Carbon

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What did you do during COVID?

- I combined two whole building calculators
  - –
  - –
  - –
- I made Green Building Calculator
  - –
- Working on Green Retrofit Calculator
  - – Regen ‘22 Liverpool)
- Built in Bill of Quantities to carryout:
  - – Green cost planning
  - – Collecting sub-contract pricing
  - – Tenders
  - – Intelligent value engineering

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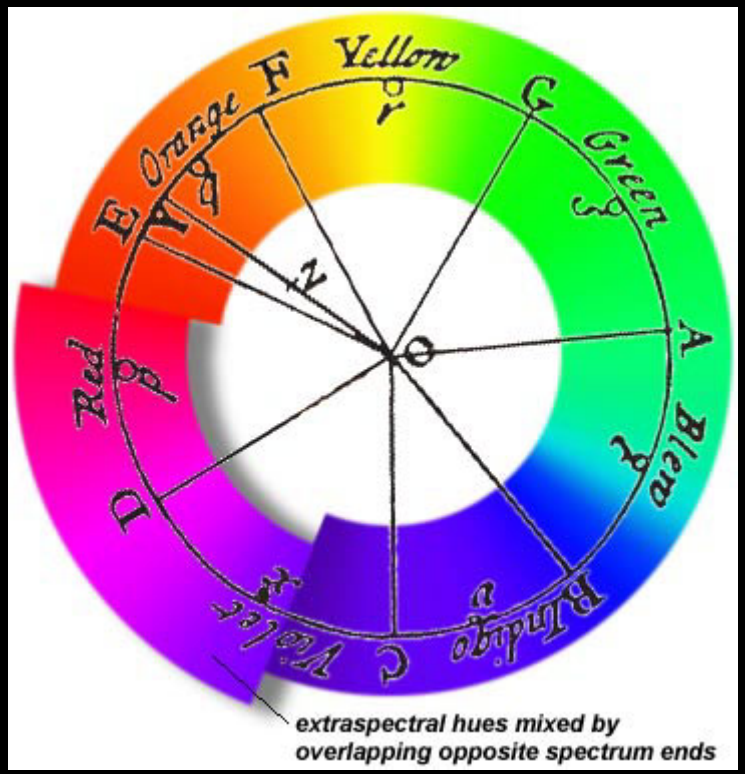
Sustainable
Environmental
Eco
Green



Violet
Violent
Violate

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‘ ’ Materials

- ‘ ’ meaning:
- ‘any material, construction product, construction method or building
- or adjacent materials
- whose performance diminishes in use or over time
- might sum them up but many ‘normal’ materials are violet

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‘ ’ Industry

- designers, Quantity Surveyors, contractors, manufacturers, applicators/installers, advisory organisations, manufacturer associations
- anyone that does not care about the environment
- or anyone that does not act on its behalf
- Virtually the whole industry
- It has been changing, slowly driven by legislation
- But far too slowly, until XR, Greta, David A,
- Watch out post-Brexit diminishing legislation
- And a Government that has not got a clue how

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Violet Materials

- Non-renewable, finite
  -
  -
    - Paints
    - Plastics (from hydrocarbons)
- Unsustainable
  -
  -
- High embodied energy: e.g. energy intensive manufacture
  -
  -
  -
- Hazardous materials and hazardous waste:
  -
    - resins, paints, sealants, chemicals,
  -
  -
- Ozone depleting & Global Warming
  -

    Aluminium production PFCs

Green: Environmentally Sustainable Materials

- Renewable: timber,
- Rapidly renewable: Plant based materials
- Abundant: Site subsoil, rocks, sand, gravel, stone
- Recycled & Recyclable:
  - post consumer content,
- Reclaimed & Reused:
  - on site materials, timber as timber not chipboard
- Carbon already out there:
  - reclaimed bricks, slates, stone
- Carbon sequestration: low, neutral or Carbon negative:
  - Plant and timber based
  - Grown aggregate by carbonation C8Systems
- Low embodied energy: Plant based, minerals
- Local: low transport miles, fuel, emissions and congestion

Deleterious Materials

- materials to builders and occupants and demolition
- materials
- Materials that are incompatible or incompetent within an application
- Materials that are not effective in their role

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Healthy Materials

- Low VOC Volatile Organic Compounds:
  - –
- No hazardous materials in application and use
- No hazardous waste
- (ignored by BRE GG)
- Low to Zero toxicity
- Good IAQ Indoor air quality
  - – (ignored by BRE GG)

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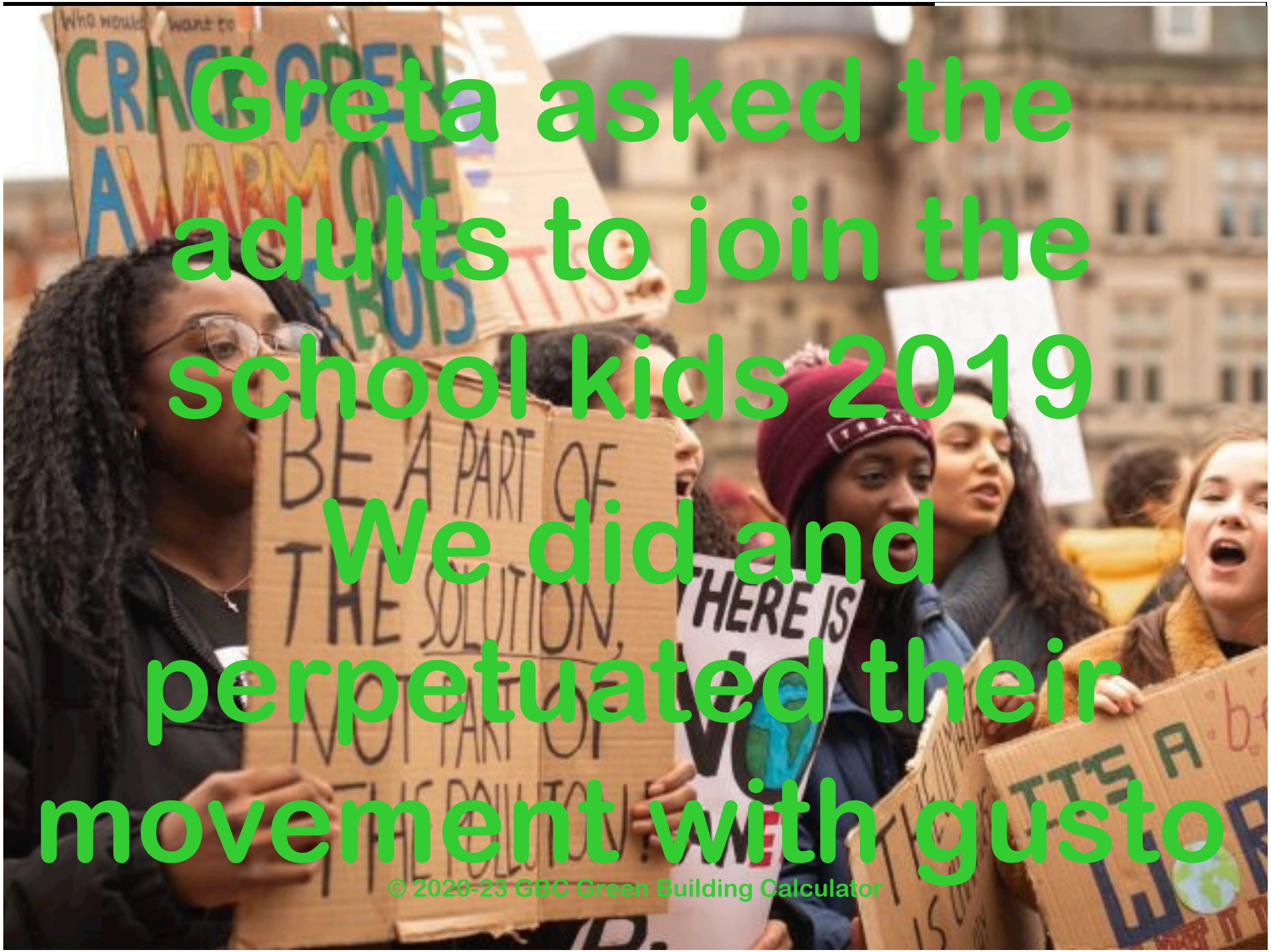
Self-build
Self-manage
Custom-build



Greta asked the adults to join the school kids 2019

We did and perpetuated their movement with gusto

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ACAN launch Householdsdeclare.org

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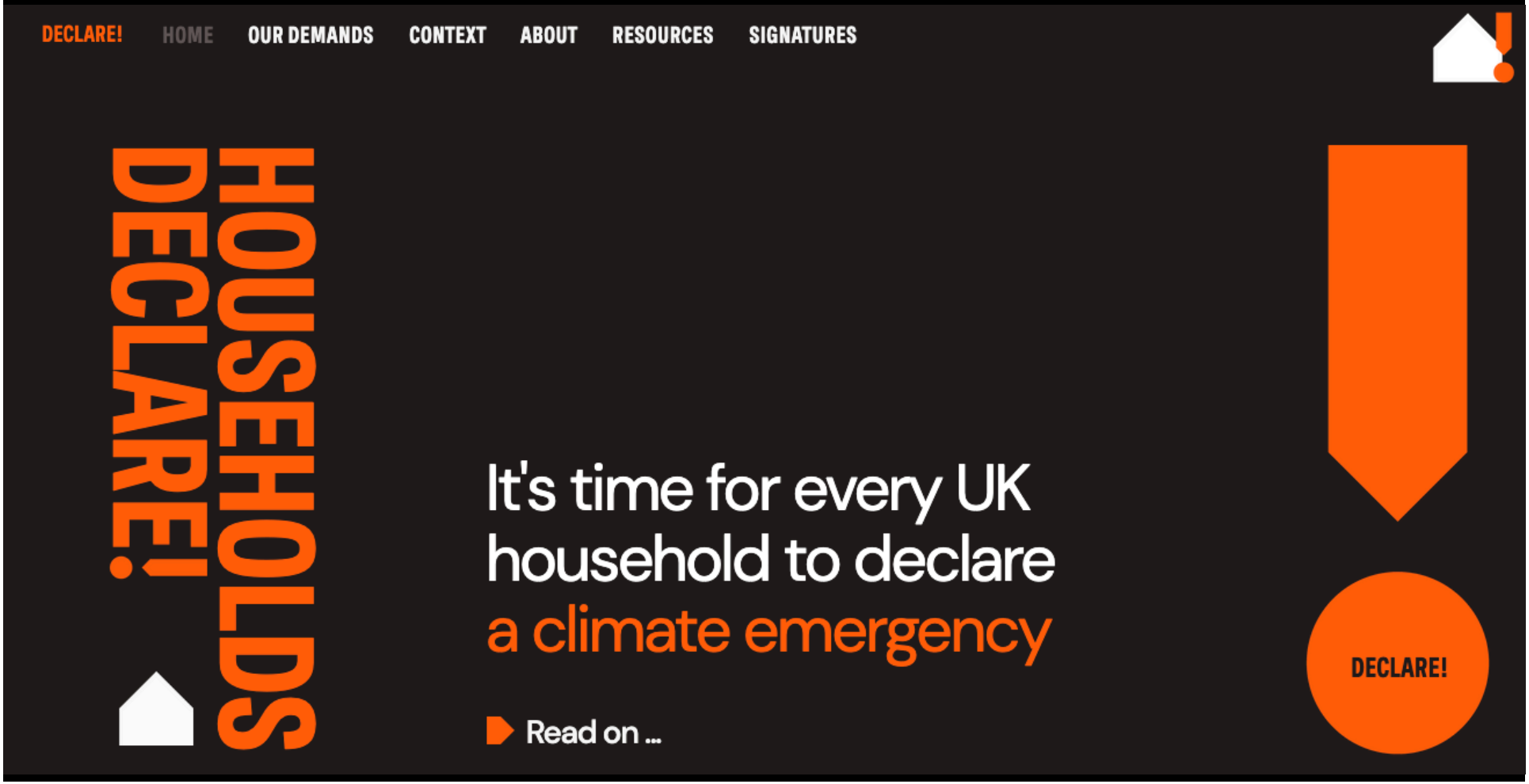

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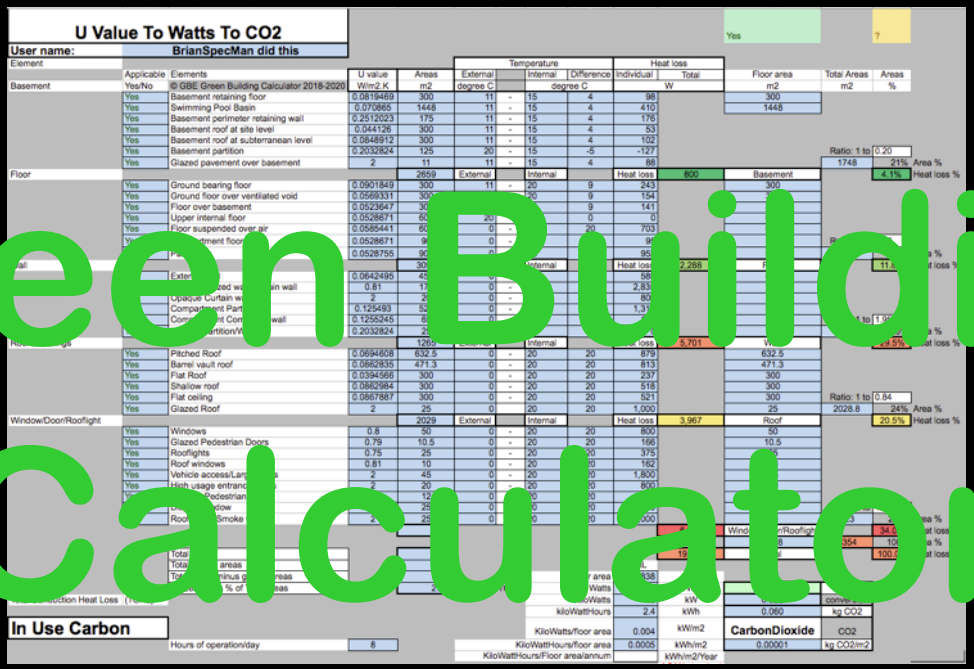

Green Building Calculator

I want.. I want.. I want..

Why did I start making GBC?

- .....
  -
  - lity Surveyors: to do VE not Cost cutting, WLC not cheap; carbon & costs
  - Procurement: to focus on management of competency of end result
  - Manufacturers: to provide all important data, multi-functional products
  - Environmental Assessors: to guide designers with facts and figures
  - Building Designers: to do their own cost planning & technical analysis
  - Enable non-BIMers to do BIM app type analysis outside of BIM
  - Tenderers: to price a proper job and aim to claim no extras
  - Advisory Bodies: To be able to give more robust guidance
- decisions
  - Evidence Based Design
  - Competent as was intended

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I want I want I want
I am reminded to

Be the change you want to see in the world

Mahatma Gandhi

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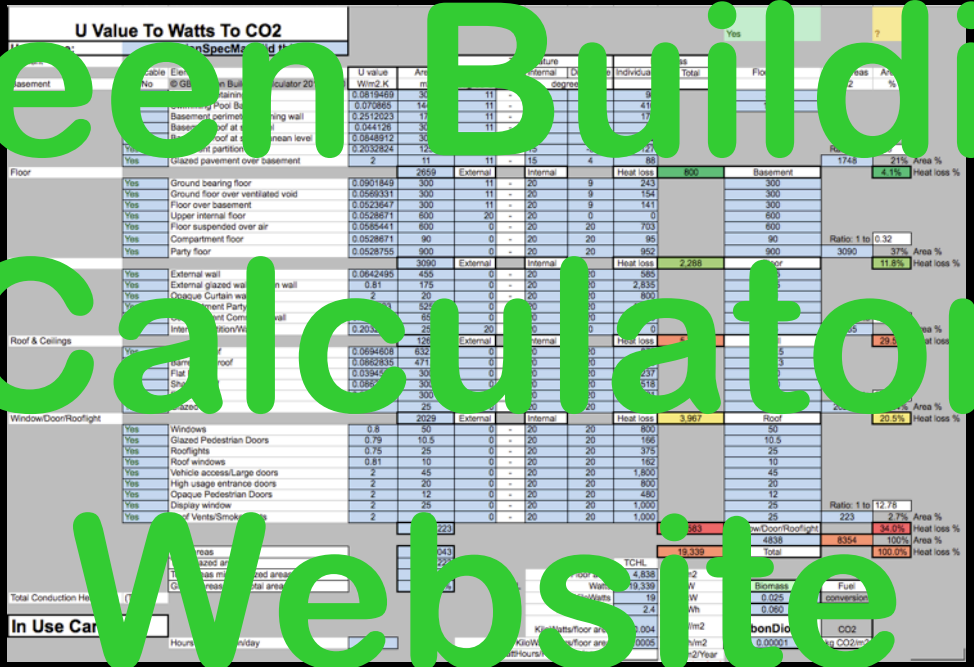
Green Building Calculator Website



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GBC V2+GBC V12 Cell colour codes & symbols Excel and BIM

- Was on every page
- Now on it own page
- Updated by GBC B2 Bespoke developments
- Brown not yet deployed

Legend	In Excel	GBC V2	In BIM
Cell colour code/content	Explanation	Examples	
Orange	Row or Column titles	Complete	n/a
Pale Green	Multiple cells require different responses by user	Multiple	
Green	User Input cell, feeds into calculations throughout GBC	Yes	From Bill of Materials
Green with Red text	User input cells with sample entries to populate calculations (replace as required)	0,00	By User if required
Red	User to select option from drop down list GBC will apply choice to calculations	Choose	From Bill of Materials?
Blue	GBC calculated results, applying user inputs in other cells or sheets	0	From Bill of Materials
Brown	GBC delivers results from Look Up Tables triggered by choice from Drop Down Lists		
Turquoise	GBC calculated results, that the user can overwrite. e.g. for variables	0	From Model?
Turquoise with red text	GBC example calculated results, that the user can overwrite. e.g. for variables, can be ov	0	By User if required
Violet	GBC totals up, User to check if correct OR use the information elsewhere in the calculato	Check	By User if required
Yellow	Information to be collected if readily available quickly		n/a
Yes/No	User input cell requiring user choice from drop down list		By User from list
No	Not complete by GBC OR Users to ignore this row's cells. 'No' will turn red automatically		n/a
Review	GBC awaiting information OR User to interrogate this row's cells and review decisions so far		User to interrogate result
Yes	Started by GBC OR To be completed by Users. 'Yes' will turn Green Automatically		By User if required
%%%	In development incomplete		GBC Aide memoir
///	Pending development		GBC Aide memoir
>>>	Date related update		GBC Aide memoir
***	Seperator in Drop Down Lists		GBC Aide memoir
Grey cell no text	Cells not containing calculations nor containing text or other information		

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GBC V2.3 Buildings

Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Auto filled	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple		
User name:	Over-type with User name									
Practice Name:	Over-type with Practice name									
Client Name:	Over-type with Client name									
Project Reference:	Over-type with Project reference									
Project name:	Over-type with Project name									
Project address:	Over-type with Project address									
Building Facility Function/Use:	Over-type with Building User Activity or Purpose									
GBC V2.3 %%%	**Schedule of Accommodation**									
Whole Building		No.	No.	m	m	m2	m	m3		
Building(s)	**One or many Tall or short**	Number of buildings	Number of floors	Internal Length(s)	Internal Width(s)	Floor Area Ceiling Area Roof Area	Internal Room height (average)	Volumes		
© GBE Green Building Calculator 2011-2023		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	1	7.2	4	29	2.7	78	m3	
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 2011-2023		1 to 1000	1 to 100	1 to 25	1 to 10	N/A, End or Mid				
		1	1	10	6	End	0	0	No.	
Gridded Building		Number of X Spans	Spacing of X spans	X overall Length	Number of Y Spans	Spacing of Y spans	Y overall length	X x Y area		
Red text in Turquois cells is reproducing building-wide information but the user can over write it with room or element specific values		1 to 1000	1 to 20	1 to 20,000	1 to 1000	1 to 20	1 to 20,000	1 to 40,000,000		
		4	8	32	3	8	24	768		

Other Geometry Roofs	Other Geometry Roofs		
Building Plan Shapes	Building Plan Shapes		
Circular Geometry	To be developed (prompted by the Video V0)		
Form Factor	Form Factor:		
Option Switches	OptionSwitches:		
Hours & Temperatures	TemperatureHours	Hours	Temperatures

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GBC V2.3 Option Switched

Option Switches	Option switches from simple to more detailed buildings To be developed in later stages	Drop Down List	
Rooms v Multiple Rooms	Schedule of Accommodation: Room Functions v Room by Room Heat losses	Pending	Schedule of Accommodation: Room Functions v Room by Room Heat losses
Singular v Multiple sizes	When for example there are windows of a 'Singular' size or 'Multiple' sizes choose the appropriate item in the lists against each work section. They can be edited individually later.	Pending	Building Areas: Singular v Multiple Size Building Elements
Sub-Element v Components	Prices and performance may be available as whole sub-elements (windows or doors) or can be worked out to a chosen specification	Pending	Windows, doors, rooflights, glazing as sub-elements v components
Components costs v Elemental Cost Analysis	Prices and performance may be available as whole sub-elements (windows or doors) or can be worked out to a chosen specification	Pending	Elemental/Component Bill of Materials v Elemental Cost Analysis
Seasons: Summer v Winter	Need to investigate the building performance in winter with heating and summer overheating potential with/out cooling	Pending	Summer v Winter analysis
New Build v Retrofit	To account for some components are existing, some are removed, replaced and others are new. Affects pricing and impacts	Pending	Elemental/Components: New Build, Refurbishment, Reclaimed, Reused
Generic Materials v Products	When assembling elements made of components choose between Generic materials, Products or Both	Pending	Elemental Components: Materials v Products
Elements, Bespoke, Readymade	Engages Summary sheets with correct elements	Pending	
Domestic v Non-Domestic	Choose Structures MEP Services	Pending	
Terrace with steps	Lateral or vertical steps	Pending	
Demolition v Retrofit v New		Pending	

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GBC V2.3 Hours Temperatures

GBC V2.3 %%%	In-Use Hours to Whole Life	No.	Unit	up to max	% h/y	
	(Spaces heated or cooled)					
	Hours of operation/day	8	h/d	24	33.33%	Type or paste
	Days per week	7	d/wk	7	100.00%	Type or paste
	Weeks per month	4.33	w/m	4.33	100.00%	Auto-filled
	Months per year	5	m/y	12	41.67%	Type or paste
	Weeks per year	21.67	w/y	52	41.67%	Auto-filled
	Days per year	151.67	d/y	365	41.55%	Auto-filled
	Hours per year	1213.36	h/y	8760	13.85%	Auto-filled
	NEW BUILD	NEW BUILD	NEW BUILD	NEW BUILD	NEW BUILD	
	Design Life: Standards	Normal (UK BS 7543)				Choose
	Design Life: Number of years	60	y/l			Looked Up
	Hours per building life	72,802	h/l	525,600	13.85%	Auto-filled
	Start Year	2023	y			Type or paste
	End Year	2083	y			Auto-filled
	RETROFIT	RETROFIT	RETROFIT	RETROFIT	RETROFIT	
	Start year	2023	y			accept or change
	Target year	2050	y			Type or paste
	Number of years of target design life remaining	27	y	60	45.00%	Auto-filled
	Hours of target building life remaining	32,761	h/tl	236,520	13.85%	Auto-filled

GBC V2.3 %%%	Temperatures & Lifestyle				
	Internal External and below ground Temperature	Degrees C			
	Range: -20 to +29	-20 to +30'			
	Season (summer/winter)	Summer			Choose
	Subsoil	11			accept or change
	Swimming pool water	16			accept or change
	Unheated Communal Space	10			accept or change
	Basement	15			accept or change
	Other Unheated Spaces (Integral garage, etc.)	20			accept or change
	Outdoors	20			accept or change
	Ventilated void below suspended ground floor	N/A			Auto-filled
	Attic Loft	50			Auto-filled
	Occuapnts and lifestyles determine temperatures				
	Lifestyle temperature Choice:	Underwear only	< Drop Down List		Choose
	Temperature Choice:	25	VLOOKUP	2	Looked Up
	Assumed lifestyle choice for parties beyond party walls/floors	Toasty	< Drop Down List		Choose
	Other parties temperature choice:	23	VLOOKUP	2	Looked Up

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GBC V2 Schedule of Accommodation

Schedule of Accommodation

NB: 'Room by Room Losses' table is right of this schedule

	Floor(s)	Room Functions	No. Number of rooms	No. Number of floors	m Length(s)	m Width(s)	m2 Floor Area Ceiling Area Roof Area	m Room heights	m3 Volumes	Yes/No Achieved in Design	Hours Room in use and temperature controlled hours per day	Degrees C Design Desired Temperature
	© GBE Green Building Calculator 2017-2021		1 to 1000	1 to 50	1 to 1000	1 to 1000	1 to 1 million	2.4 to 10	1 to 10 million	Engage in Calculation	1 to 24	-20 to +30'
	Total of 4 subtotals below					Total	1,445	Total	125			
Yes	Basement floor(s)	Whole Basement	1	1	10	6	60	2.5	150	Yes	8	15
		Bedroom	1	1	5	5	25	2.5	63	Yes	8	15
		Play room	1	1	5	5	25	2.5	63	Yes	8	15
		Operating theatre	1	1	10	10	100	2.5	-		8	15
		WC	1	1	3	3	9	2.5	-		8	15
		Shower	1	1	1	3	3	2.5	-		8	15
		Garage	1	1	3	6	18	2.5	-		8	15
		Storeroom	1	1	10	5	50	2.5	-		8	15
		Kitchen	1	1	3	5	15	2.5	-		8	15
	Basement floor(s)	Room Subtotal					245		125			
Yes	Ground floor(s)	Whole Ground floor	1	1	10	6	60	2.5	150		8	20
		Bedroom	1	1	10	5	50	2.5	-		8	20
		Play room	1	1	10	5	50	2.5	-		8	20
		Operating theatre	1	1	10	5	50	2.5	-		8	20
		WC	1	1	10	5	50	2.5	-		8	20
		Shower	1	1	10	5	50	2.5	-		8	20
		Garage	1	1	10	5	50	2.5	-		8	15
		Storeroom	1	1	10	5	50	2.5	-		8	20
		Kitchen	1	1	10	5	50	2.5	-		8	20
	Ground floor(s)	Room Subtotal					400		-			
Yes	Upper floor(s)	Whole upper floors	1	1	10	6	60	2.5	150		8	20
		Bedroom	1	1	5	10	50	2.5	-		8	20
		Play room	1	1	5	10	50	2.5	-		8	20
		Operating theatre	1	1	5	10	50	2.5	-		8	20
		WC	1	1	5	10	50	2.5	-		8	20
		Shower	1	1	5	10	50	2.5	-		8	20
		Garage	1	1	5	10	50	2.5	-		8	20
		Storeroom	1	1	5	10	50	2.5	-		8	20
		Kitchen	1	1	5	10	50	2.5	-		8	20
	Upper floor(s)	Room Subtotal					400		-			
Yes	Top Floor(s) under Roof(s)	Whole top floor	1	1	10	6	60	2.5	150		8	20
		Bedroom	1	1	5	10	50	2.5	-		8	20
		Play room	1	1	5	10	50	2.5	-		8	20
		Operating theatre	1	1	5	10	50	2.5	-		8	20
		WC	1	1	5	10	50	2.5	-		8	20
		Shower	1	1	5	10	50	2.5	-		8	20
		Garage	1	1	5	10	50	2.5	-		8	20
		Storeroom	1	1	5	10	50	2.5	-		8	20
		Kitchen	1	1	5	10	50	2.5	-		8	20
	Top Floor(s)	Room Subtotal					400		-			

GBC V2 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	50
	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)					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			2		3.5	18				11	50
	32 Dormer Window Wall (DWW)				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	30		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

GBC V2: 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)		30	3	1	6	10.44	62.64	93.96
29.1 Mansards Roof Flat (MR:F))		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	5	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

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GBC V2 Room By Room Heat Losses

GBC 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	
[illegible]	[illegible]	[illegible]	0.2033	[illegible]	15	0		0.2033	0			330	19	1019	58
[illegible]	0	0	0.2033	[illegible]	[illegible]	[illegible]		[illegible]	0	[illegible]	28	[illegible]			
[illegible]	0	[illegible]	0.2033	[illegible]	15	[illegible]		[illegible]	[illegible]	[illegible]	17				
15	0	[illegible]	0.2033	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]				
15	0	0	0.2033	0	15	0	0	[illegible]	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	[illegible]	[illegible]	0	[illegible]	0	385	22				
15	0	0	0.2033	0	[illegible]	[illegible]	[illegible]	[illegible]	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				
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		

GBC V2 Form Factor

To be completed by GBC user													To be completed by GBC user
	Yes	Yes	Auto-filled	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Auto-filled	Auto-filled	Auto-filled	
		User name:	**Over type with user name**										Auto-filled
		Project name:	**Over type with Project name**										Auto-filled
		Project address:	**Over type with Project address**										Auto-filled
		Building Facility Function/Use:	**Over type with Building User Activity or Purpose**										Auto-filled
		Project Brief Employer Requirements or Architect's Proposal											
	GBC V2	**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 2011-2022		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	Auto-filled
		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 2011-2022		1 to 1000	1 to 100	1 to 25	1 to 10	N/A, End or Mid					
				3	51	10	6	End	1	1	No.		Auto-filled
				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				Auto-filled
		Ground floor footprint		1		10	6	60					Auto-filled
		Ground or upper Floor suspended over external air		1	1	10	6	60					Multiple
				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)	1	1	10	6	60	0.25	0	m3		Multiple
	Yes		23 Shallow Roof (SR)	1	1	10	6	60	0.5	15	m3		Multiple
	Yes		24 Pitched Roof (PR)	1	1	10	6	60	3	90	m3		Multiple
	Yes		25 Barrel Vault Roof (BVR)	1	1	10	6	60	3	283	m3		Multiple
	Yes		26 Domed Roof (DR)	1	1	10	6	60	3	113	m3		Multiple
	Yes		27 Hipped/Pyramid Roof (HPR)	1	1	10	6	60	3	45	m3		Multiple
	Yes		28 Mono-Pitched Roof (MPR)	1	1	10	6	60	3	90	m3		Multiple
	Yes		29 Mansard Roof (MR)	1	1	10	6	60	0.25	14	m3		Multiple
	Yes		33 Other Geometry Roof (OGR)	1	1	10	6	60	3	121	m3		Multiple
				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	Multiple
		Weather Porch		1	1	2	2	4	3	12	m3	25 m2	Multiple
		Conservatory/Sun Space		1	1	3	5.5	16.5	5	82.5	m3	73.5 m2	Multiple
		Bay window		1	1	1	3	3	2.5	7.5	m3	16.5 m2	Multiple
		Oriel Window (upper floor bay window)		1	1	1	3	3	2.5	7.5	m3	16.5 m2	Multiple
		28-30 Dormer roof/window		1	1	4	5.5	22	2	44	m3	37.5 m2	Multiple
		Heat Loss Surface Area	SA	1				1766	m2	797.25	m3	220 m2	Auto-filled
		Treated Floor Area	TFA	1	4	10	6	240	m2				Auto-filled

	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						Auto-filled
		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		Auto-filled
		Semi-detached or compact detached houses					2 to 3	2	0.15 to 0.12	N	W/m2.K	3		Auto-filled
		Less compact detached houses or compact detached bungalows					3 to 4	3	0.12 to 0.10	N	W/m2.K	2		Auto-filled
		Complex shaped detached bungalows					>4	4	<0.1	Y	W/m2.K	1		Auto-filled
	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	Auto-filled
alue	Equals U values of:	0.54	0.35	0.25	0.19	0.16	0.14	0.13	0.12	0.10	0.10	0.08	U	Auto-filled
0.16	Calcium Silicate	463	632	842	1011	1179	1263	1389	1389	1558	1684	1895	mm	Choose
		Rule of thumb: Halve the heat loss area, halve the insulation thickness												

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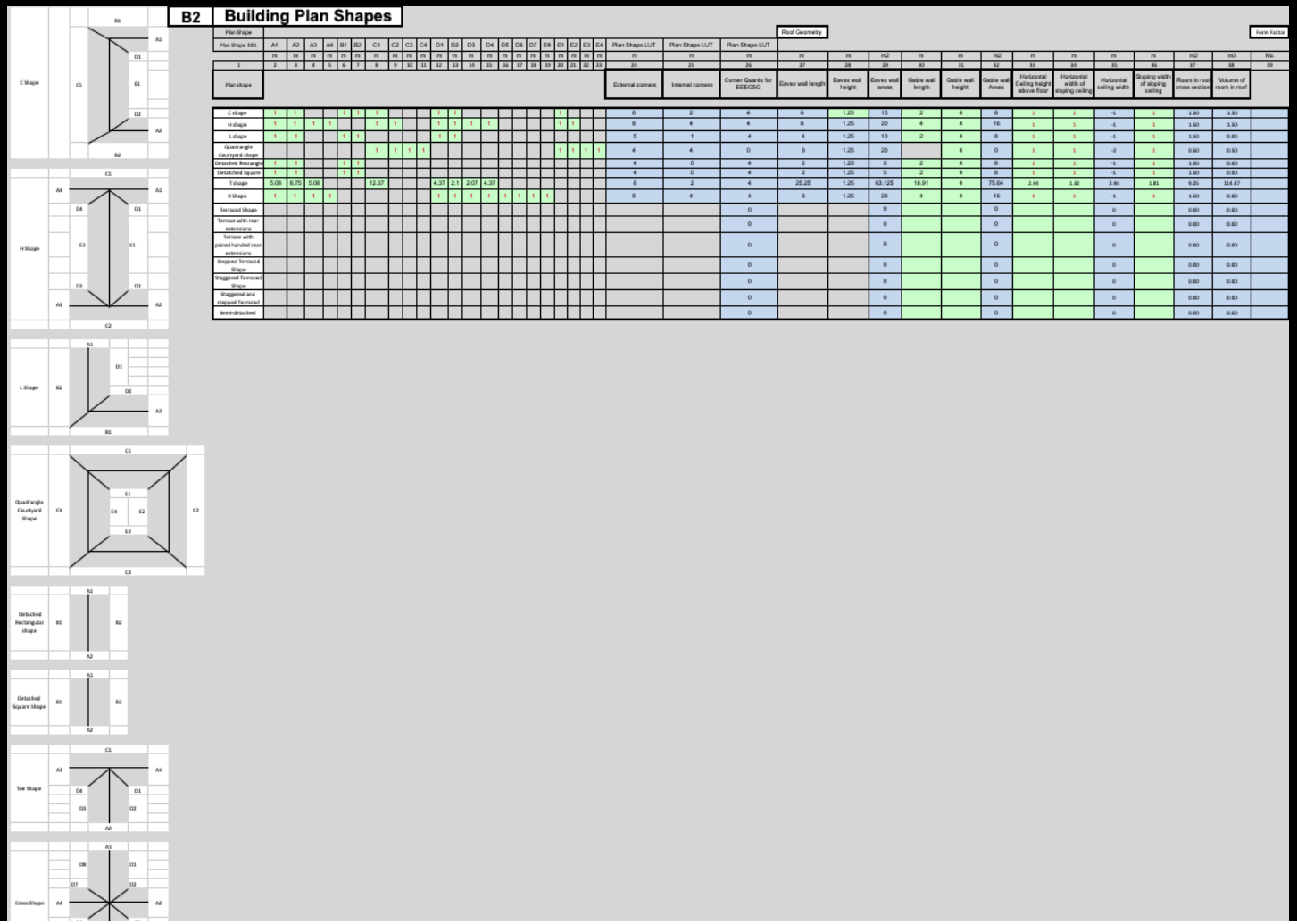
GBC V3 Building Plan Shapes



B2 Building Plan Shapes

Plan Shape	Plan Shape DDL	External corners	Internal corners	Corner Quants for EEECSC	Eaves wall length	Eaves wall height	Eaves wall areas	Gable wall length	Gable wall height	Gable wall Areas	Horizontal Ceiling height above floor	Horizontal width of sloping ceiling	Horizontal ceiling width	Sloping width of sloping ceiling	Room in roof cross section	Volume of room in roof
C shape		6	2	4	6	1.25	15	2	4	8	1	1	-1	1	1.50	1.50
H shape		8	4	4	8	1.25	20	4	4	16	1	1	-1	1	1.50	1.50
L shape		5	1	4	4	1.25	10	2	4	8	1	1	-1	1	1.50	0.80
Quadrangle Courtyard shape		4	4	0	8	1.25	20		4	0	1	1	-2	1	0.50	0.50
Detached Rectangle		4	0	4	2	1.25	5	2	4	8	1	1	-1	1	1.50	0.80
Detached Square		4	0	4	2	1.25	5	2	4	8	1	1	-1	1	1.50	0.80
T shape	5.08 8.75 5.08 12.37 4.37 2.1 2.07 4.37	6	2	4	25.25	1.25	63.125	18.91	4	75.64	2.46	1.32	2.46	1.81	9.25	114.47
X shape		8	4	4	8	1.25	20	4	4	16	1	1	-1	1	1.50	0.80
Terraced Shape				0			0			0			0		0.80	0.80
Terrace with rear extensions				0			0			0			0		0.80	0.80
Terrace with paired handed rear extensions				0			0			0			0		0.80	0.80
Stepped Terraced Shape				0			0			0			0		0.80	0.80
Staggered Terraced Shape				0			0			0			0		0.80	0.80
Staggered and stepped Terraced				0			0			0			0		0.80	0.80
Semi-detached				0			0			0			0		0.80	0.80

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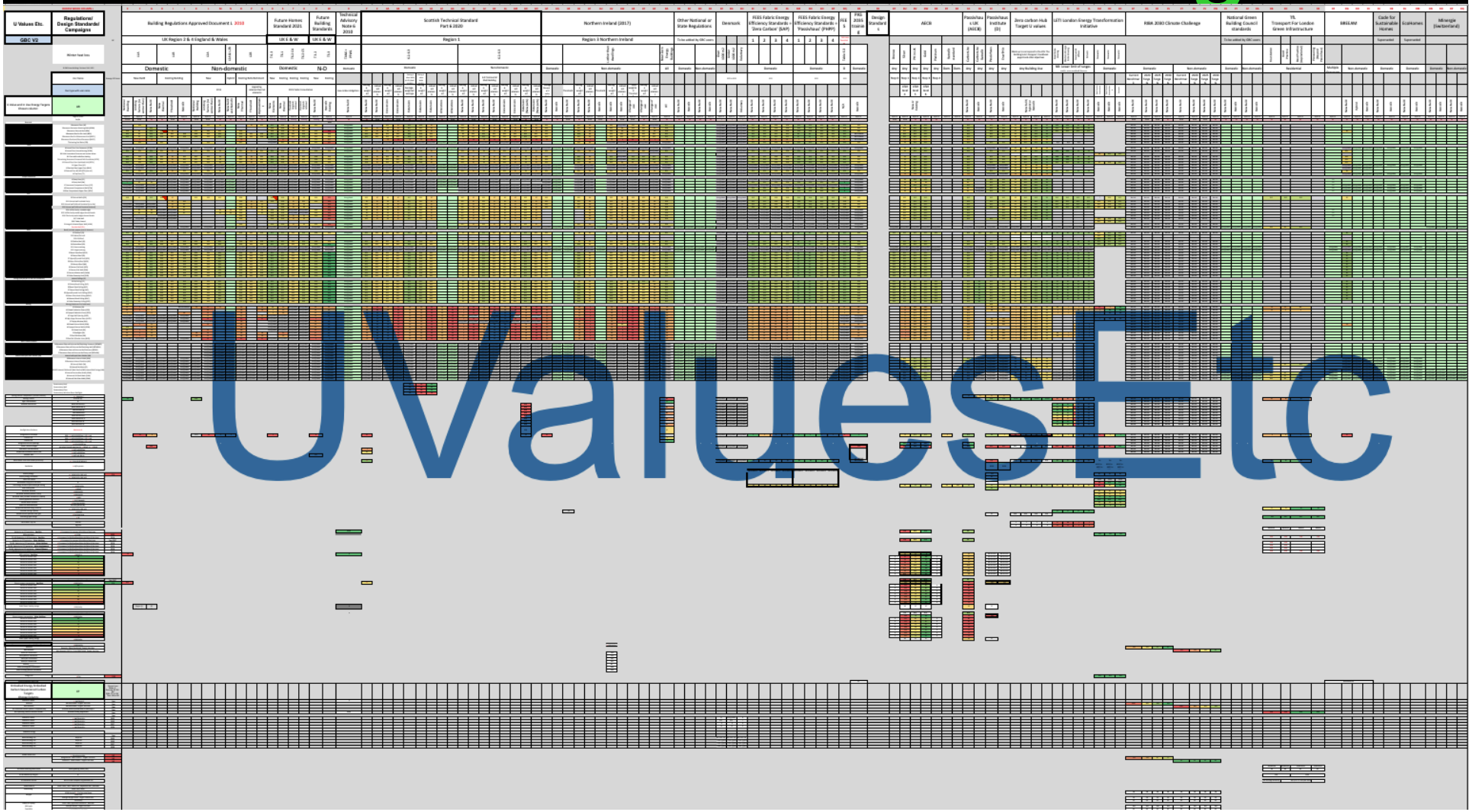
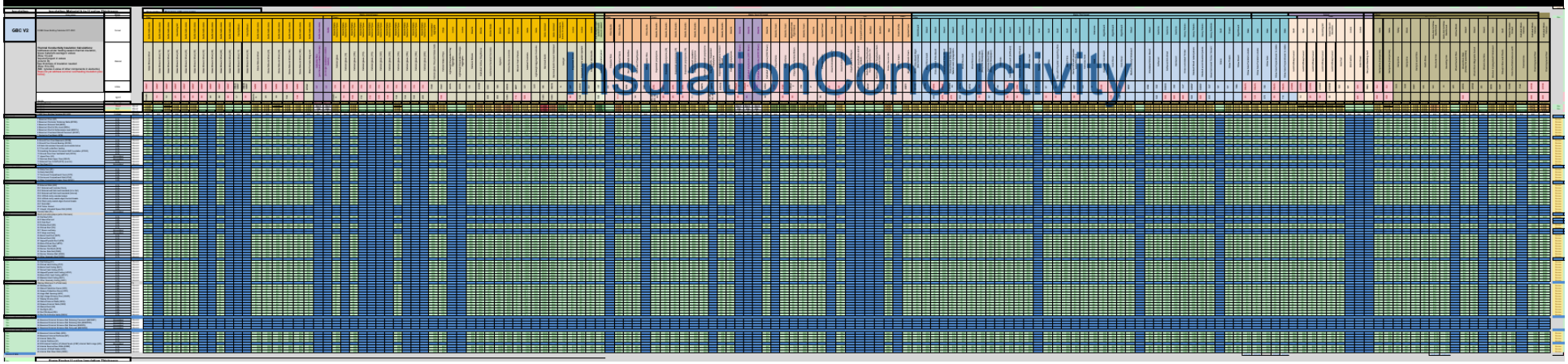
GBC V2 U values Etc. Targets



GBC V2 Thermal Insulation Conductivities

- Violet columns: Violet materials: do not use:
  - (asbestos, ceramic fibre, CFC, HCFC plastics)
- Dark blue columns: need more properties



>150 Materials/formats > k values > U values > Thickness

Chosen column:	Group		Mainly mineral based																
AB	Form		Fibre					Foam											
	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	

>150 Materials/formats >
k values > U values > Thickness

Mainly mineral based														Fibre				Foam						Mainly Fossil Oil-based	
	Loose	Loose	Boards	Blocks	Blocks Slabs		Insitu	Insitu	Quilts laminated ...s, foil wrapped	Loose	Loose	Loose	Foil wrapped ... packed beads vacuum sealed	Fiber Quilts	Fiber Quilts		Fiber Quilts	Beads, Boards	Boards	Beads, 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
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
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667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
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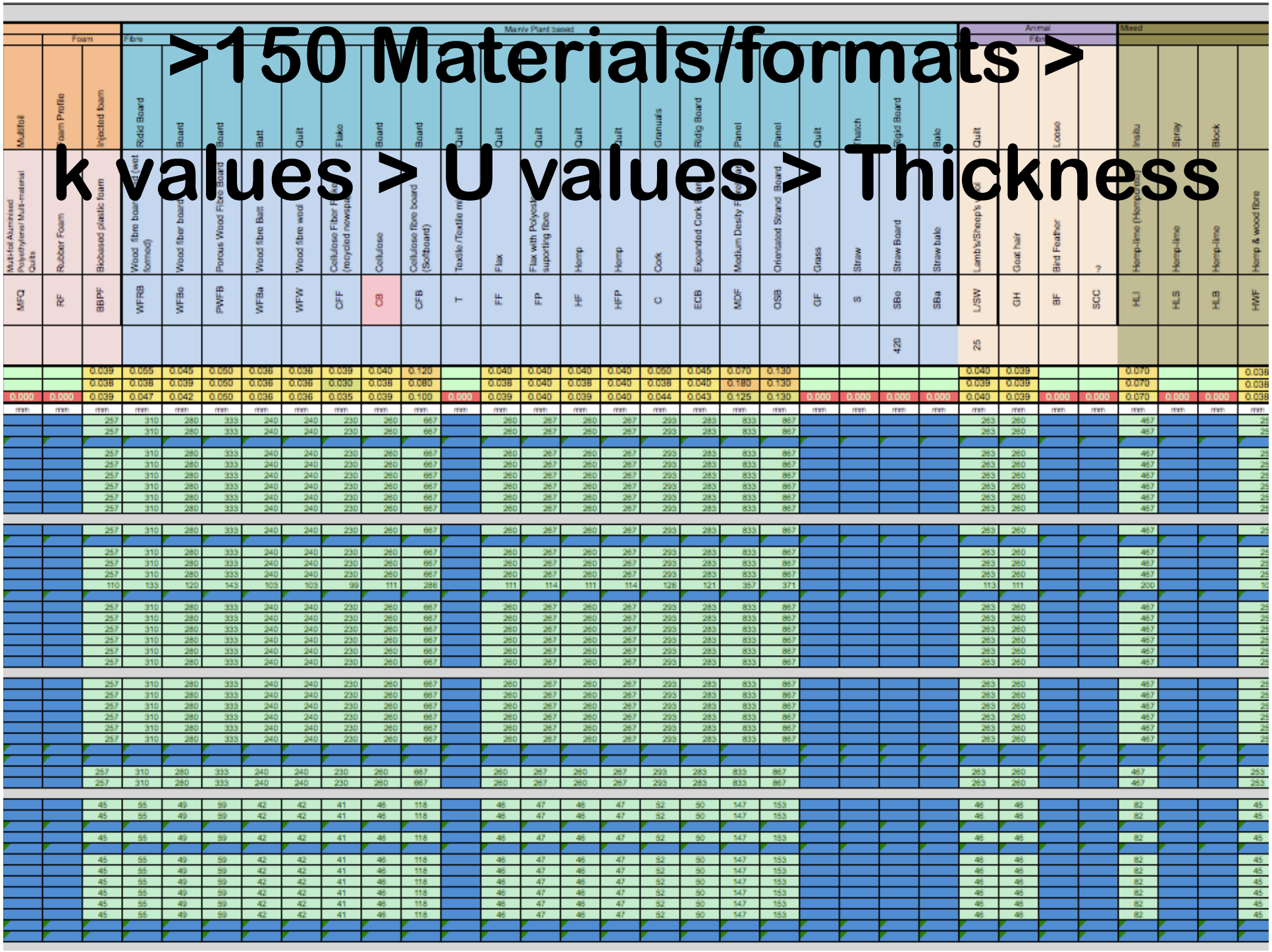
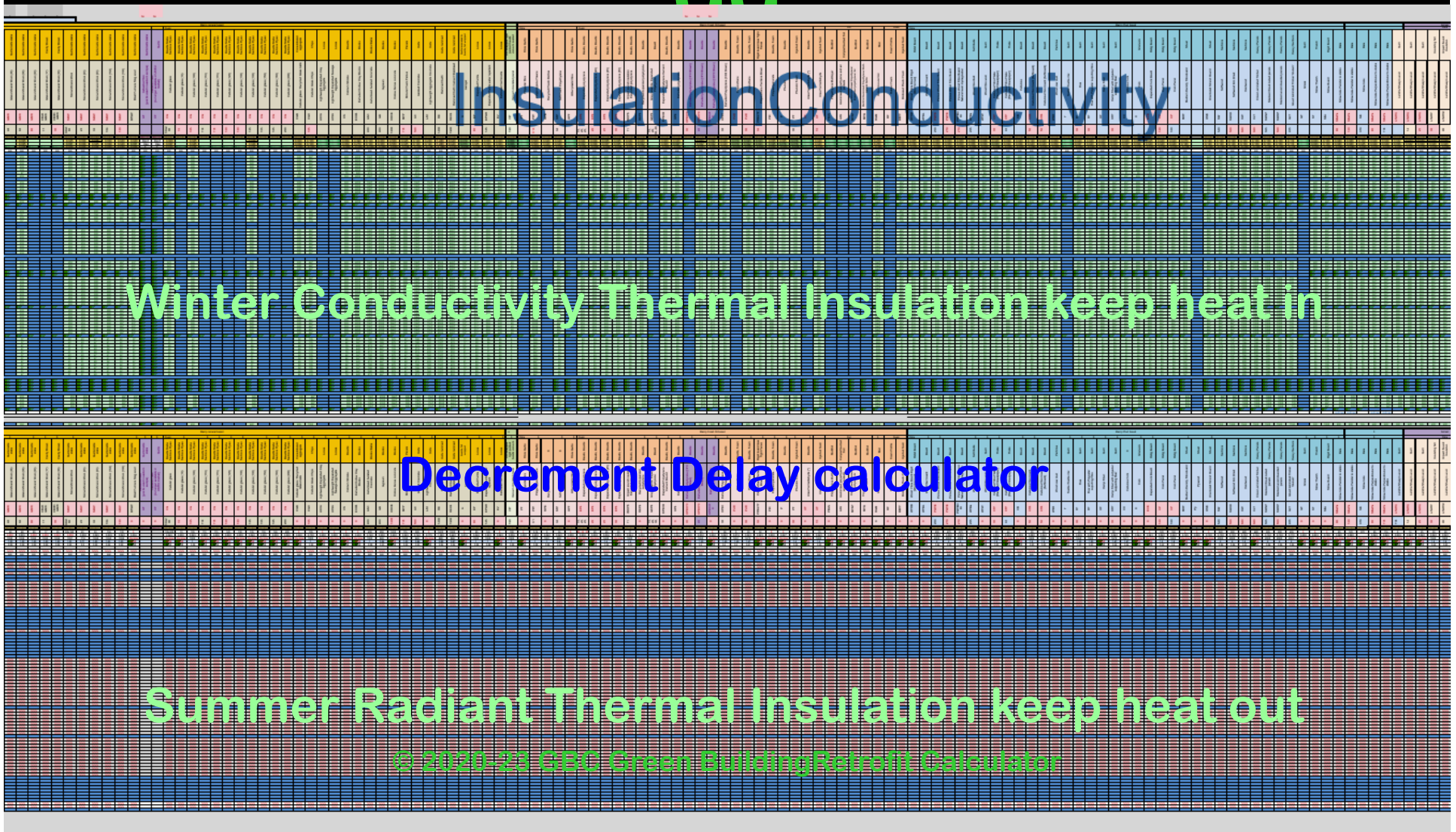
667			393	2200	733	3667	1067	1167	87	333	353		40		3333	267		253	240	400	223	213	267	207	200
105			62	347	116	579	168	184	14	53	56		6		526	42		40	38	63	35	34	42	33	32
105			62	347	116	579	168	184	14	53	56		6		526	42		40	38	63	35	34	42	33	32
133			79	440	147	733	213	233	17	67	71		8		667	53		51	48	80	45	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

tsToCO2 | CostsPerm2 | MaterialCostThickness | Revisions | Resistances | Conductivities | FuelCarbonFactor | DropDownLists | PopulatingSequence | SupplierRequest | +


>150 Materials/formats >
k values > U values > Thickness

GBC V3 Insulation k density she dd



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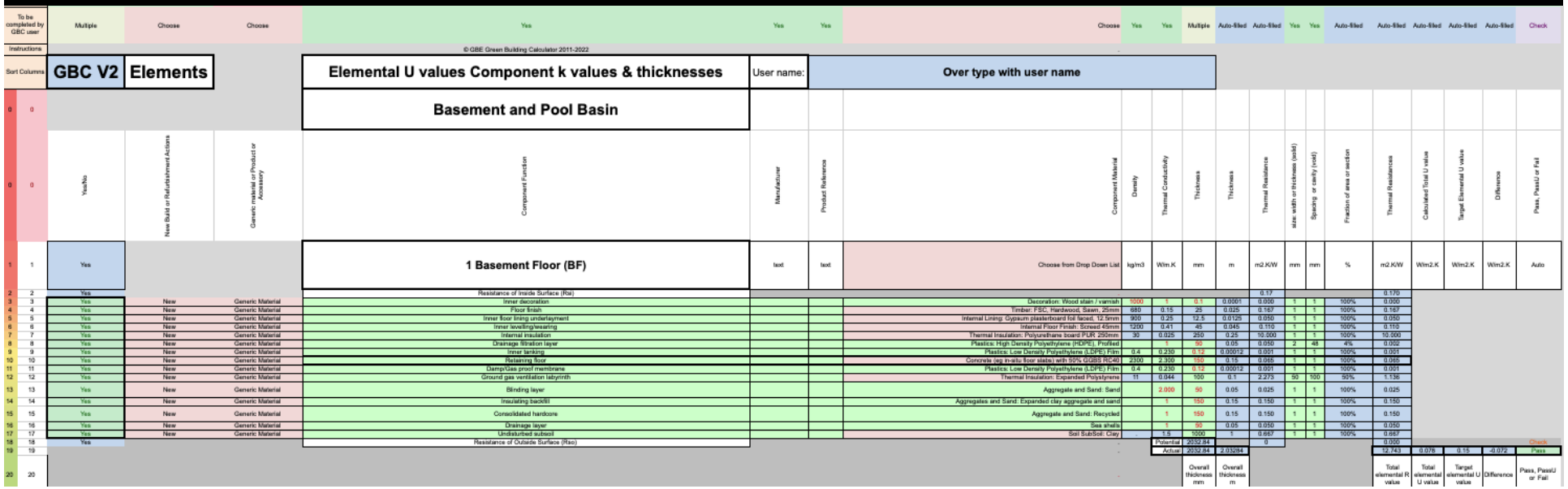
GBC V2 Elements

- Component rows: Yes, No
- Choose: New, Retrofit, Demolition
- Choose: Generic materials, Products
- Components: Choose materials
- Check: U value Pass or fail



To be completed by GBC user		Multiple	Choose	Choose	Yes	Yes	Yes	Choose	Yes	Yes	Multiple	Auto-filled	Auto-filled	Yes	Yes	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Check
Instructions					© GBE Green Building Calculator 2011-2022																
Sort Columns		GBC V2	Elements		Elemental U values Component k values & thicknesses		User name:	Over type with user name													
0	0				Basement and Pool Basin																
0	0	Yes/No	New Build or Refurbishment Actions	Generic material or Product or Accessory	Component Function		Manufacturer	Product Reference	Component Material	Density	Thermal Conductivity	Thickness	Thickness	Thermal Resistance	size: width or thickness (solid)	Spacing or cavity (void)	Fraction of area or section	Thermal Resistances	Calculated Total U value	Target Elemental U value	Difference	Pass, Pass/U or Fail
1	1	Yes			1 Basement Floor (BF)		text	text	Choose from Drop Down List	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
2	2	Yes			Resistance of Inside Surface (Rsi)									0.17				0.170				
3	3	Yes	New	Generic Material	Inner decoration				Decoration: Wood stain / varnish	500	1	0.1	0.0001	0.000	1	1	100%	0.000				
4	4	Yes	New	Generic Material	Floor finish				Timber: FSC, Hardwood, Sawn, 25mm	680	0.15	25	0.025	0.167	1	1	100%	0.167				
5	5	Yes	New	Generic Material	Inner floor lining underlayment				Internal Lining: Gypsum plasterboard foil faced, 12.5mm	900	0.25	12.5	0.0125	0.050	1	1	100%	0.050				
6	6	Yes	New	Generic Material	Inner levelling/wearing				Internal Floor Finish: Screed 45mm	1200	0.41	45	0.045	0.110	1	1	100%	0.110				
7	7	Yes	New	Generic Material	Internal insulation				Thermal Insulation: Polyurethane board PUR, 250mm	30	0.025	250	0.25	10.000	1	1	100%	10.000				
8	8	Yes	New	Generic Material	Drainage filtration layer				Plastics: High Density Polyethylene (HDPE), Profiled		1	50	0.05	0.050	2	48	4%	0.002				
9	9	Yes	New	Generic Material	Inner tanking				Plastics: Low Density Polyethylene (LDPE) Film	0.4	0.230	0.12	0.00012	0.001	1	1	100%	0.001				
10	10	Yes	New	Generic Material	Retaining floor				Concrete (eg in-situ floor slabs) with 50% GGBS RC40	2300	2.300	150	0.15	0.065	1	1	100%	0.065				
11	11	Yes	New	Generic Material	Damp/Gas proof membrane				Plastics: Low Density Polyethylene (LDPE) Film	0.4	0.230	0.12	0.00012	0.001	1	1	100%	0.001				
12	12	Yes	New	Generic Material	Ground gas ventilation labyrinth				Thermal Insulation: Expanded Polystyrene	11	0.044	100	0.1	2.273	50	100	50%	1.136				
13	13	Yes	New	Generic Material	Blinding layer				Aggregate and Sand: Sand		2.000	50	0.05	0.025	1	1	100%	0.025				
14	14	Yes	New	Generic Material	Insulating backfill				Aggregates and Sand: Expanded clay aggregate and sand		1	150	0.15	0.150	1	1	100%	0.150				
15	15	Yes	New	Generic Material	Consolidated hardcore				Aggregate and Sand: Recycled		1	150	0.15	0.150	1	1	100%	0.150				
16	16	Yes	New	Generic Material	Drainage layer				Sea shells		1	50	0.05	0.050	1	1	100%	0.050				
17	17	Yes	New	Generic Material	Undisturbed subsoil				Soil SubSoil: Clay	-	1.5	1000	1	0.667	1	1	100%	0.667				
18	18	Yes			Resistance of Outside Surface (Rso)						Potential	2032.84		0				0.000				Check
19	19										Actual	2032.84	2.03284					12.743	0.078	0.15	-0.072	Pass
20	20											Overall thickness mm	Overall thickness m					Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, Pass/U or Fail

GBC GBC B2 Elemental Assembly > 4 Bill of Materials Quantities Costs

Yes/No	Exiting Previous Proposed	Component Function	Manufacturer	Product Reference	Material	Area GIFA	Labour Rate	Labour Cost	Accessories Rate	Accessories Cost	Products or Materials Rate	Products or Materials Cost	Preliminaries, Overheads, Profits Rate	Preliminaries, Overheads, Profits Cost	Total Rate	Total Cost
No		**Ground Bearing Solid Floor (GBSF) Bill of MQLAPMOC**				m2	£/m2	£	£/m2	£	£/m2	£	£/m2	£	£/m2	£
Yes						0.00										
No	Proposed	Internal Floor Decoration	0	0	Lacquer	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Proposed	Internal Floor Finish	0	0	Hardwood flooring	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Proposed	Internal Decking	0	0	Gypsum fibreboard	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Proposed	Internal Thermal Insulation	0	0	Wood fibre	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Previous	Internal Floor Decoration	0	0	Lacquer	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Previous	Internal Floor Finish	0	0	Softwood	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Previous	Internal Decking	0	0	Chipboard	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Previous	Internal Thermal insulation	0	0	Mineral wool, rock	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Previous	Internal Vapour control layer	0	0	PE foil Polyethylene	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Existing	Floor wearing surface	0	0	Ceramic Tile	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Existing	Levelling/Bedding	0	0	Screed	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Existing	Solid Ground Floor	0	0	Softwood	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Existing	Undisturbed Subsoil	0	0	Undisturbed Soil	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
Yes																
						£0.00	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
						Elemental Cost/m2	Elemental Labour Rate/m2	Elemental Labour Cost	Elemental Accessories rate/m2	Elemental Accessories Cost	Elemental Material Rate/m2	Elemental Material Costs	Elemental Preliminaries , Overheads, Profits Rate	Elemental Preliminaries , Overheads, Profits Cost/m2	Total Elemental Intervention: Materials Accessories & Labour Rate	Elemental Intervention Cost: Materials Accessories & Labour

- Retrofit bespoke development
- Existing, previous & proposed interventions
- Individual rates or overall rates

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GBC V2 Elemental Cost Planning

SFCA 4th Edition

Detailed (Elemental) Cost Analysis

Elements (and otional Components)	Area or Quantity?	Cost per m2 GIFA (Gross Internal Floor Area)	Total Area	Unit Quantity	Unit rate (Cost per No.)	Total Cost
	Drop Down List	£/m2	m2	No.	£/No.	£
1 Substructure	m2	£45.00	60	1	£1.00	£2,700.00

Here be dragons

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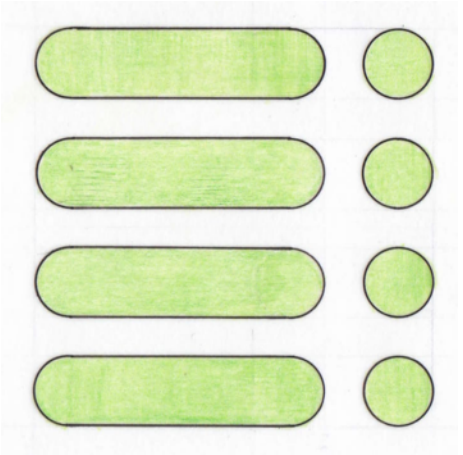

Green Building Price Book

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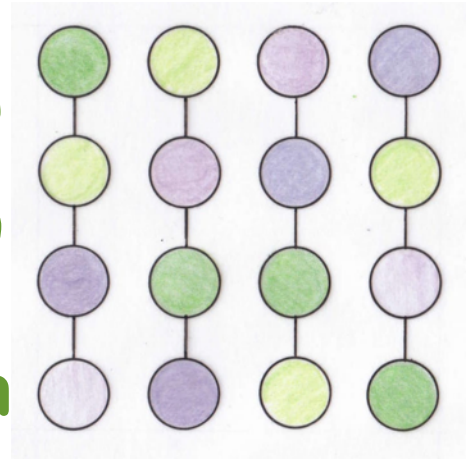
GBPDC

Green Building Product Data Collection



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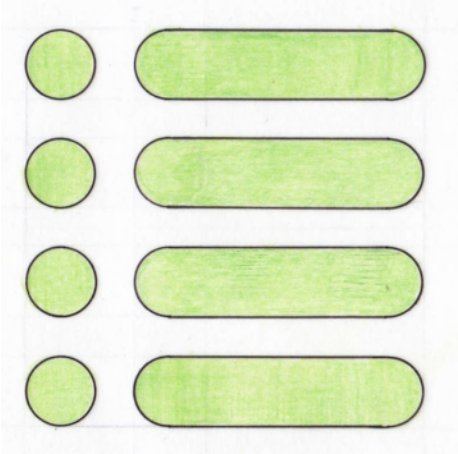
Green Building Specification



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Green Building Readymade Elemental Assemblies

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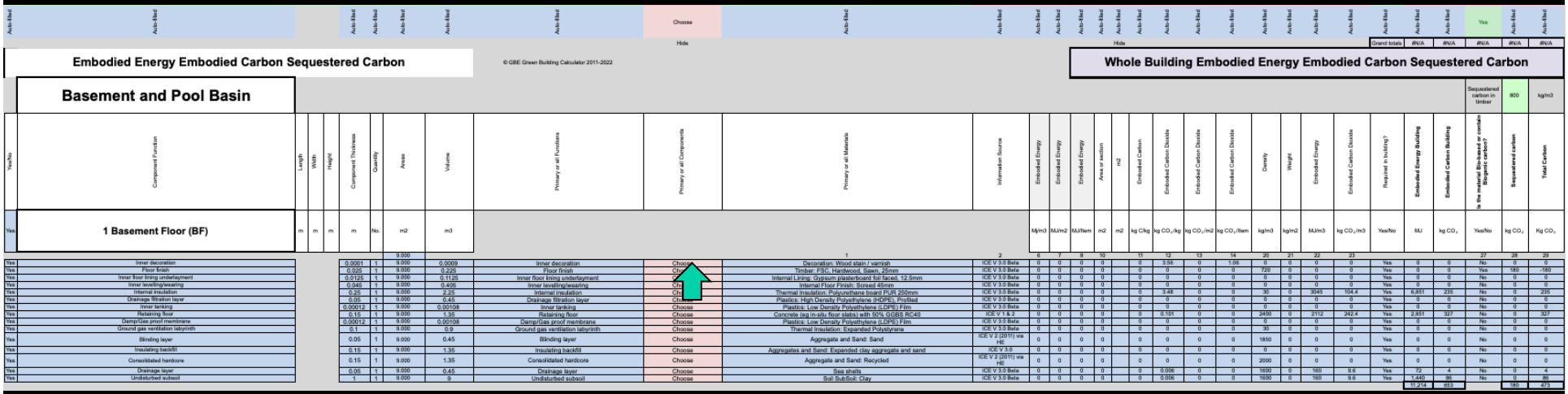
GBC V2
Element EE EC & SC



Auto-filled	Auto-filled			Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Choose	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Yes	Auto-filled	Auto-filled
									Hide						Hide										Grand totals	#N/A	#N/A	#N/A	#N/A	#N/A
Embodied Energy Embodied Carbon Sequestered Carbon								© GBE Green Building Calculator 2011-2022																Whole Building Embodied Energy Embodied Carbon Sequestered Carbon					
Basement and Pool Basin																										Sequestered carbon in timber	800	kg/m3
Yes/No	Component Function	Length	Width	Height	Component 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	Is the material Bio-based or contain Biogenic carbon?	Sequestered carbon	Total Carbon
Yes	1 Basement Floor (BF)	m	m	m	m	No.	m2	m3					MJ/m3	MJ/m2	MJ/Item	m2	m2	kg C/kg	kg CO_2/kg	kg CO_2/m2	kg CO_2/Item	kg/m3	kg/m2	MJ/m3	kg CO_2/m3	Yes/No	MJ	kg CO_2	Yes/No	kg CO_2	Kg CO_2
							9.000				1	2	6	7	8	10		11	12	13	14	20	21	22	23				27	28	29
Yes	Inner decoration				0.0001	1	9.000	0.0009	Inner decoration	Choose	Decoration: Wood stain / varnish	ICE V 3.0 Beta	0	0	0	0		0	3.96	0	1.08	0	0	0	0	Yes	0	0	No	0	0
Yes	Floor finish				0.025	1	9.000	0.225	Floor finish	Choose	Timber: FSC, Hardwood, Sawn, 25mm	ICE V 3.0 Beta	0	0	0	0		0	0	0	0	720	0	0	0	Yes	0	0	Yes	180	-180
Yes	Inner floor lining underlayment				0.0125	1	9.000	0.1125	Inner floor lining underlayment	Choose	Internal Lining: Gypsum plasterboard foil faced, 12.5mm	ICE V 3.0 Beta	0	0	0	0		0	0	0	0	0	0	0	0	Yes	0	0	No	0	0
Yes	Inner levelling/wearing				0.045	1	9.000	0.405	Inner levelling/wearing	Choose	Internal Floor Finish: Screed 45mm	ICE V 3.0 Beta	0	0	0	0		0	0	0	0	0	0	0	0	Yes	0	0	No	0	0
Yes	Internal insulation				0.25	1	9.000	2.25	Internal insulation	Choose	Thermal Insulation: Polyurethane board PUR 250mm	ICE V 3.0 Beta	0	0	0	0		0	3.48	0	0	30	0	3045	104.4	Yes	6,851	235	No	0	235
Yes	Drainage filtration layer				0.05	1	9.000	0.45	Drainage filtration layer	Choose	Plastics: High Density Polyethylene (HDPE), Profiled	ICE V 3.0 Beta	0	0	0	0		0	0	0	0	0	0	0	0	Yes	0	0	No	0	0
Yes	Inner tanking				0.00012	1	9.000	0.00108	Inner tanking	Choose	Plastics: Low Density Polyethylene (LDPE) Film	ICE V 3.0 Beta	0	0	0	0		0	0	0	0	0	0	0	0	Yes	0	0	No	0	0
Yes	Retaining floor				0.15	1	9.000	1.35	Retaining floor	Choose	Concrete (eg in-situ floor slabs) with 50% GGBS RC40	ICE V 1 & 2	0	0	0	0		0	0.101	0	0	2400	0	2112	242.4	Yes	2,851	327	No	0	327
Yes	Damp/Gas proof membrane				0.00012	1	9.000	0.00108	Damp/Gas proof membrane	Choose	Plastics: Low Density Polyethylene (LDPE) Film	ICE V 3.0 Beta	0	0	0	0		0	0	0	0	0	0	0	0	Yes	0	0	No	0	0
Yes	Ground gas ventilation labyrinth				0.1	1	9.000	0.9	Ground gas ventilation labyrinth	Choose	Thermal Insulation: Expanded Polystyrene	ICE V 3.0 Beta	0	0	0	0		0	0	0	0	30	0	0	0	Yes	0	0	No	0	0
Yes	Blinding layer				0.05	1	9.000	0.45	Blinding layer	Choose	Aggregate and Sand: Sand	ICE V 2 (2011) via HE	0	0	0	0		0	0	0	0	1850	0	0	0	Yes	0	0	No	0	0
Yes	Insulating backfill				0.15	1	9.000	1.35	Insulating backfill	Choose	Aggregates and Sand: Expanded clay aggregate and sand	ICE V 3.0	0	0	0	0		0	0	0	0	0	0	0	0	Yes	0	0	No	0	0
Yes	Consolidated hardcore				0.15	1	9.000	1.35	Consolidated hardcore	Choose	Aggregate and Sand: Recycled	ICE V 2 (2011) via HE	0	0	0	0		0	0	0	0	2000	0	0	0	Yes	0	0	No	0	0
Yes	Drainage layer				0.05	1	9.000	0.45	Drainage layer	Choose	Sea shells	ICE V 3.0 Beta	0	0	0	0		0	0.006	0	0	1600	0	160	9.6	Yes	72	4	No	0	4
Yes	Undisturbed subsoil				1	1	9.000	9	Undisturbed subsoil	Choose	Soil SubSoil: Clay	ICE V 3.0 Beta	0	0	0	0		0	0.006	0	0	1600	0	160	9.6	Yes	1,440	86	No	0	86
																											11,214	653		180	473

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GBC V2

GBC Green Building Calculator

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EE EC SC Look Up Table

More datasets needed

GBC V2	EE EC ES Datasets Embodied Energy & Embodied & Sequestered CO3	© GBE Green Building Calculator 2015-2022																												
Materials or component	Specification CWVS-	CWVS- Title	Material	Information Source	Sample Size	Declared Unit	Mass per declared unit	Embodied Energy	Embodied Energy	Embodied Energy	Area or volume	Embodied Carbon	Embodied Carbon$_0$	Embodied Carbon$_0$	Embodied Carbon$_0$	Embodied Carbon$_0$ equivalent	Embodied Carbon$_0$ equivalent	Embodied Carbon$_0$ equivalent	Embodied Carbon$_0$ equivalent	Embodied Carbon$_0$ equivalent	Density	Weight	Embodied Energy	Embodied Carbon$_0$	Volume Required in Building	Embodied Energy in Building	Embodied Carbon in Building	Will biobased/ Durevil contain Biogenic Carbon?	Sequestered carbon in Building	Total Embodied minus Sequestered Carbon in Building	Energy Command	Pack prot Enha Ener
					No.	DDL-3	kg/declared unit	MJ/m³	MJ/m³	MJ/litre	MJ/kg	m³	kg C/kg	kg CO$_2$/kg	kg CO$_2$/m³	CO$_2$/litre	kgCO$_2$e/kg	kgCO$_2$e/ linear	kgCO$_2$e/ m2 per 1 mm	kgCO$_2$e/ m2 per 100 mm	kgCO$_2$e/ unit	kg/m³	kg/m³	MJ/m³	kg CO$_2$/m³	m³	MJ	kg CO$_2$	Yes/No	kg CO$_2$	kg CO$_2$		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Materials	G22	Created macadam/Asphalt roads/pavings	Adhesion: Bitumen	ICE V 2 (2011) xls: ME																		1000		0.00	0.00				No				
Materials	J41	Built up felt roof coverings	Adhesion: Bitumen (general) mem.	ICE V 2		kg					55		0.43									1000		55,000.00	430.00				No				
Materials	J41	Built up felt roof coverings	Adhesion: Bitumen (general) min.	ICE V 2		kg					55		0.38									1000		55,000.00	380.00				No				
Materials	J48	Flexible sheet lashing/damp proof membranes	Adhesion: Bitumen emulsion	ICE V 3.0 Db1c		.	.				1					0.231655	.	.			1000		1	1	1	1	1	No	1	1	Pending	Pen
Materials	J48	Flexible sheet lashing/damp proof membranes	Adhesion: Bitumen: Polymer modified bitumen (PMB)	ICE V 3.0 Db1c		.	.				1					0.32623	.	.			1000		1	1	1	1	1	No	1	1	Pending	Pen
Materials	J48	Flexible sheet lashing/damp proof membranes	Adhesion: Bitumen: Straight-run bitumen	ICE V 3.0 Db1c		.	.				1					0.15895	.	.			1000		1	1	1	1	1	No	1	1	Pending	Pen
Materials	E10	In situ concrete mixes, casting and curing	Aggregates and Sand:	ICE V 2		kg					0.005		0.0048									2240		185.92	10.75				No				
Materials	E10	In situ concrete mixes, casting and curing	Aggregate and Sand:	ICE V 2		kg					0.005		0.0048									2240		185.92	10.75				No				
Materials	E10	In situ concrete mixes, casting and curing	Aggregate and Sand:	E-CT		kg					0.1		0.005									2240		224.00	11.20				No				
Materials	D28	Excavating & Filling Resources Processing/Waste Minimisation	Aggregate and Sand: Quarried	ICE V 2 (2011) xls: ME																		2000							No				
Materials	D28	Excavating & Filling Resources Processing/Waste Minimisation	Aggregate and Sand: Recycled	ICE V 2 (2011) xls: ME																		2000							No				
Materials	D28	Excavating & Filling Resources Processing/Waste Minimisation	Aggregate and Sand: Sand	ICE V 2 (2011) xls: ME																		1858							No				
Materials	E10	In situ concrete mixes, casting and curing	Aggregates and Sand: Expanded clay agg and sand	ICE V 3.0	2						1											0		0	0	1	0	0	No	0	0	Pending	Pen
Materials	E10	In situ concrete mixes, casting and curing	Aggregates and Sand: Expanded foamed glass	ICE V 3.0	1						1											0		0	0	1	0	0	No	0	0	Pending	Pen
Materials	E10	In situ concrete mixes, casting and curing	Aggregates and Sand: From recycled resources, as bulk fine aggregate, bulk, loose	ICE V 3.0 Db1c: V2 ME		kg	.				1					0.0069555					2000		1	1	1	1	1	No	1	1	Pending	Pen
Materials	E10	In situ concrete mixes, casting and curing	Aggregates and Sand: From recycled resources, as bulk fine aggregate, bulk, loose	ICE V 3.0 Db1c: V2 ME		kg	.				1					0.1107747					2000		1	1	1	1	1	No	1	1	Pending	Pen
Materials	E10	In situ concrete mixes, casting and curing	Aggregates and Sand: From secondary resources, bulk, loose	ICE V 3.0 Db1c: V2 ME		kg	.				1					0.003328					2000		1	1	1	1	1	No	1	1	Pending	Pen
Materials	E10	In situ concrete mixes, casting and curing	Aggregates and Sand: From virgin land use resources, bulk, loose	ICE V 3.0 Db1c: V2 ME		kg	.				1					0.0043844					2000		1	1	1	1	1	No	1	1	Pending	Pen
Materials	E10	In situ concrete mixes, casting and curing	Aggregates and Sand: From virgin marine resources, bulk, loose	ICE V 3.0 Db1c: V2 ME		kg	.				1					0.0038975					2000		1	1	1	1	1	No	1	1	Pending	Pen
Materials	E10	In situ concrete mixes, casting and curing	Aggregates and Sand: General aggregate	ICE V 3.0 V2 ME	1						1											2000		1	1	1	1	1	No	1	1	Pending	Pen
Materials	E10	In situ concrete mixes, casting and curing	Aggregates and Sand: general UK, mixture of land use, marine, secondary and recycled, bulk, loose	ICE V 3.0 Db1c: V2 ME		kg	.				1					0.0074636					2000		1	1	1	1	1	No	1	1	Pending	Pen
Materials	E10	In situ concrete mixes, casting and curing	Aggregates and Sand: general, virgin mixture of land use and marine, bulk, loose	ICE V 3.0 Db1c: V2 ME		kg	.				1					0.0045078					2000		1	1	1	1	1	No	1	1	Pending	Pen

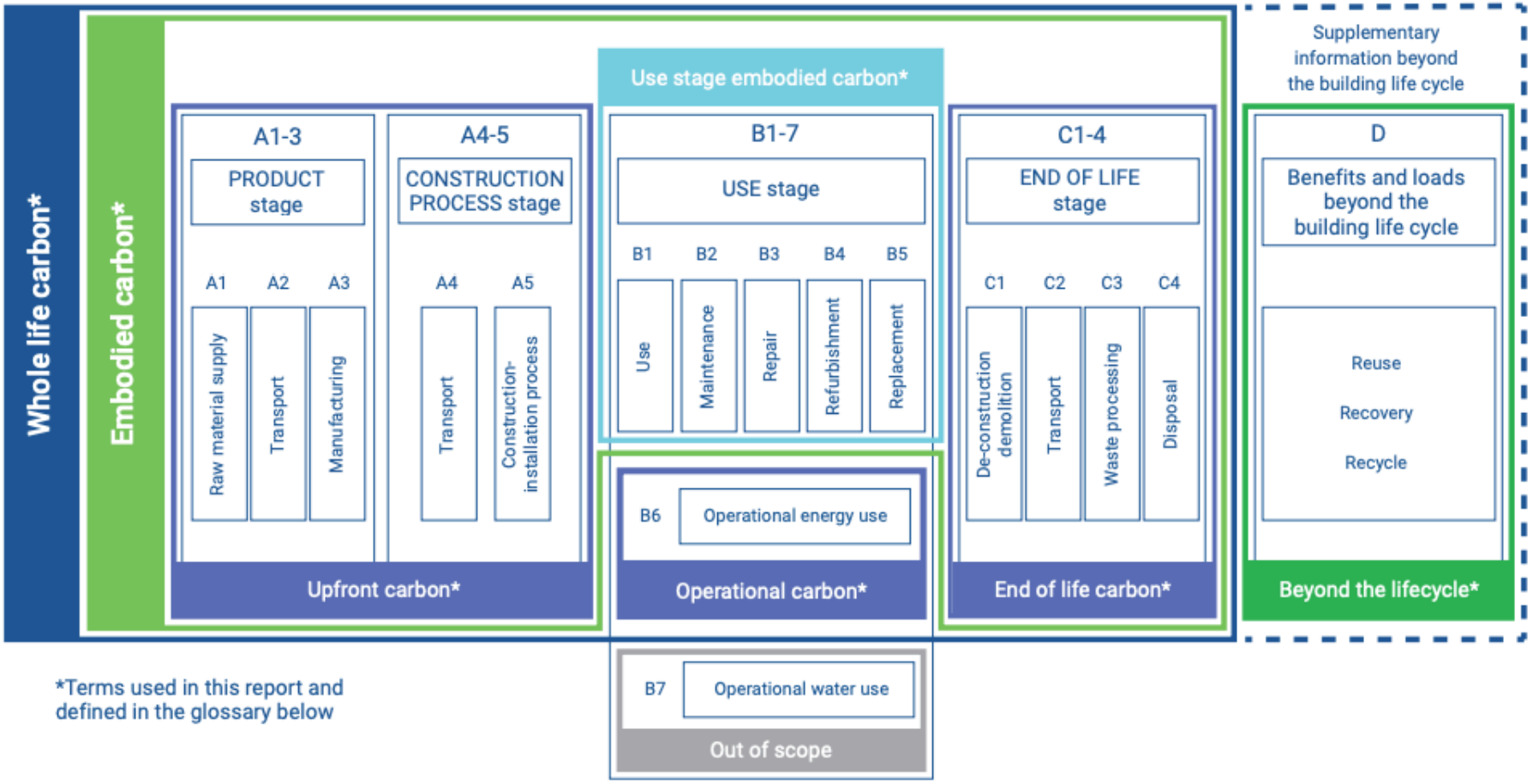
ICE 3.0 database carbon reporting options

Mass/Declared Unit	kg/Declared Unit
Embodied Energy only	
Embodied CarbonO2 (only)	kgCO2/kg
Embodied CarbonO2 (only)	kgCO2/m2
Embodied CarbonO2 equivalent	kgCO2e/kg
Embodied CarbonO2 equivalent	kgCO2e/tonne
Embodied CarbonO2 equivalent	kgCO2e/m2 per 1 mm
Embodied CarbonO2 equivalent	kgCO2e/m2 per 100 mm
Embodied CarbonO2 equivalent	kgCO2e/unit
Module A1-3, Embodied Carbon	kg CO2e/kg
Module D, Carbon	kg CO2e/kg
Module A-D, Embodied Carbon	kg CO2e/kg

GBC B2 ICE Database EC datasets: more calculations to enable comparison

EE EC SC Datasets Embodied Energy & Embodied & Sequestered CO2			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Materials or component	Specification CAWS	CAWS Title	Material	Information Source	Embodied Energy	Embodied Energy	Embodied Energy	Area x section	m2	Embodied Carbon	Embodied Carbon Dioxide	Embodied Carbon Dioxide	Embodied Carbon Dioxide	Density	Weight	Embodied Energy	Embodied Carbon Dioxide	Volume Reqired in Building	Embodied Energy in Building	Embodied Carbon in Building	Is it biobased? Does it contain Biogenic Carbon?	Sequestered carbon in Building	Total Carbon in Building
					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	m3	MJ	kg CO2	Yes/No	kg CO2	Kg CO2
Materials	F10	Brick/block walling	Aerated block	ICE 1 & 2	3.5						0.3			750		2,625.00	225.00	1.00	2625	225.00	No	0.00	225.00
Materials	F10	Brick/block walling	Aerated block	ICE 1 & 2	3.5						0.3			750		2,625.00	225.00	1.00	2625	225.00	No	0.00	225.00
Materials	E10	Concrete	Aggregate	ICE 2	0.083						0.0048			2240		185.92	10.75	1.00	185.92	10.75	No	0.00	10.75
Materials	E10	Concrete	Aggregate	ICE 2	0.083						0.0048			2240		185.92	10.75	1.00	185.92	10.75	No	0.00	10.75
Materials	E10	Concrete	Aggregate	ICE 1	0.1						0.005			2240		224.00	11.20	1.00	224	11.20	No	0.00	11.20
Materials	D20	Excavation & Filling	Aggregate Quarried	ICE 2 (2011) via HE										2000				1.00	0	0.00	No	0.00	0.00
Materials	D20	Excavation & Filling	Aggregate Recycled	ICE 2 (2011) via HE										2000				1.00	0	0.00	No	0.00	0.00
Materials	E10	Concrete	Aggregates	E-CT	0.1					0.005				2240		224.00	0.00	1.00	224	0.00	No	0.00	0.00
Materials	Z11	Metals	Aluminium (general & incl 33% recycled)	ICE 1 & 2	155						8.24			2700		418,500.00	22,248.00	1.00	418500	22,248.00	No	0.00	22248.00
Materials	Z11	Metals	Aluminium (general & incl 33% recycled)	ICE 1 & 2	155						8.24			2700		418,500.00	22,248.00	1.00	418500	22,248.00	No	0.00	22248.00
Materials	H11	Metals	Aluminium (recycled)	E-CT	27					1.69				2700		72,900.00	0.00	1.00	72900	0.00	No	0.00	0.00
Materials	H11	Metals	Aluminium (virgin)	E-CT	154.3					11.46				2700		416,610.00	0.00	1.00	416610	0.00	No	0.00	0.00
Component	L10	Windows	Aluminium / timber frame double casement 1200 x 1200 2x glazed, air or argon filled	ICE 2			1460	1.44	m2				75			2,102.40	108.00	1.00	2102.4	108.00	%	0.00	108.00
Components	L10	Windows	Aluminium / timber frame double casement 1200 x 1200 2x glazed, krypton filled	ICE 2			1970	1.44	m2				101			2,836.80	145.44	1.00	2836.8	145.44	%	0.00	145.44
Components	L10	Windows	Aluminium / timber frame double casement 1200 x 1200 2x glazed, xeon filled	ICE 2			5960	1.44	m2				304			8,582.40	437.76	1.00	8582.4	437.76	%	0.00	437.76
Components	L10	Windows	Aluminium clad timber frame 1200 x 1200 2x glazed, air or argon filled	ICE 2			950	1.44	m2				48			1,368.00	69.12	1.00	1368	69.12	%	0.00	69.12
Components	L10	Windows	Aluminium clad timber frame 1200 x 1200 2x glazed, krypton filled	ICE 2			1460	1.44	m2				74			2,102.40	106.56	1.00	2102.4	106.56	%	0.00	106.56
Components	L10	Windows	Aluminium clad timber frame 1200 x 1200 2x glazed, xeon filled	ICE 2			5450	1.44	m2				277			7,848.00	398.88	1.00	7848	398.88	%	0.00	398.88
Components	L10	Windows	Aluminium clad timber, 2x glazed, argon filled, window	ICE 1			1200	1	m2				61			1,200.00	61.00	1.00	1200	61.00	%	0.00	61.00
Components	L10		Aluminium clad timber, 2x glazed, argon filled, window	ICE 1			1200	1					61			1,200.00	61.00	1.00	1200	61.00	%	0.00	61.00
Components	L10	Windows	Aluminium frame 1200 x 1200 2x glazed, air or argon filled	ICE 1 & 2			5470	1.44	m2				279			7,876.80	401.76	1.00	7876.8	401.76	No	0.00	401.76
Components	L10	Windows	Aluminium frame 1200 x 1200 2x glazed, krypton filled	ICE 2			5980	1.44	m2				305			8,611.20	439.20	1.00	8611.2	439.20	No	0.00	439.20
Components	L10	Windows	Aluminium frame 1200 x 1200 2x glazed, xeon filled	ICE 2			9970	1.44	m2				508			14,356.80	731.52	1.00	14356.8	731.52	No	0.00	731.52
Materials	Z11	Metals	Aluminium: general	ICE 2 (2011) via HE										2700		0.00	0.00	1.00	0	0.00	No	0.00	0.00
Materials	Q22	Asphalt Paving	Asphalt	ICE 2 (2011) via HE										1700		0.00	0.00	1.00	0	0.00	No	0.00	0.00
Materials	Q22	Asphalt Paving	Asphalt paving	ICE 1	2.41						0.14			2100		5,061.00	294.00	1.00	5061	294.00	No	0.00	294.00
Materials	Q22	Asphalt Paving	Asphalt paving	ICE 1	2.41						0.14			2100		5,061.00	294.00	1.00	5061	294.00	No	0.00	294.00
Materials	Q22	Asphalt Paving	Bitumen	ICE 2 (2011) via HE										1000		0.00	0.00	1.00	0	0.00	No	0.00	0.00
Materials	Q20		Bitumen (general)	ICE 1	47						0.48					0.00	0.00	1.00	0	0.00	No	0.00	0.00
Materials	J41	Built up felt roofing	Bitumen (general) max.	ICE 2	51						0.43					0.00	0.00	1.00	0	0.00	No	0.00	0.00
Materials	J41	Built up felt roofing	Bitumen (general) min.	ICE 2	51						0.38					0.00	0.00	1.00	0	0.00	No	0.00	0.00
Materials	F30	Brick/block walling	Bituminous Damp Proof Course	E-CT	134					4.2				1850		247,900.00	0.00	1.00	247900	0.00	No	0.00	0.00
Materials	F10	Brick/block walling	Brick Standard	ICE 2 (2011) via HE										2.30	tonnes / 1000 bricks			1.00	0	0.00	No	0.00	0.00
Materials	F10	Brick/block walling	Bricks	E-CT	3					0.22				1700		5,100.00	0.00	1.00	5100	0.00	No	0.00	0.00
Materials	F10	Brick/block walling	Bricks (common)	ICE 2	3						0.24			1700		5,100.00	408.00	1.00	5100	408.00	No	0.00	408.00
Materials	F10	Brick/block walling	Bricks (common)	ICE 2	3						0.24			1700		5,100.00	408.00	1.00	5100	408.00	No	0.00	408.00
Materials	F10	Brick/block walling	Bricks (common)	ICE 1	3						0.22			1700		5,100.00	374.00	1.00	5100	374.00	No	0.00	374.00
Materials	F10	Brick/block walling	Bricks (facing)	ICE 1	8.2						1.46			1700		13,940.00	2,482.00	1.00	13940	2,482.00	No	0.00	2482.00
Materials	F10		Bricks (facing)	ICE 1	8.2						1.46			1700		13,940.00	2,482.00	1.00	13940	2,482.00	No	0.00	2482.00
Materials	M50	Flexible floor coverings	Carpet Nylon	ICE 1	67.90 - 149						3.55 – 7.31					#VALUE!	#VALUE!	1.00	#VALUE!	#VALUE!	No	0.00	#VALUE!
Materials	M50	Flexible floor coverings	Carpet tiles, nylon (Polyamide), pile weight 770g/m2	ICE 2		279						13.7			4.6	1,283.40	63.02	1.00	1283.4	63.02	No	0.00	63.02
Materials	P10	Proofing: Insulation	Cellular Glass Insulation	ICE 1 & 2	27											0.00	0.00	1.00	0	0.00	No	0.00	0.00
Materials	P10	Proofing: Insulation	Cellulose insulation (loose fill)	ICE 1 & 2	0.94									43		40.42	0.00	1.00	40.42	0.00	Yes	0.00	0.00
Materials	P10	Proofing: Insulation	Cellulose insulation (loose fill)	ICE 2	3.3									43		141.90	0.00	1.00	141.9	0.00	Yes	0.00	0.00
Materials	Z21	Mortar	Cement mortar (1:3)	ICE 2	1.33						0.208					0.00	0.00	1.00	0	0.00	No	0.00	0.00

EN 15978



*Terms used in this report and defined in the glossary below

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GBC

Green Building Calculator

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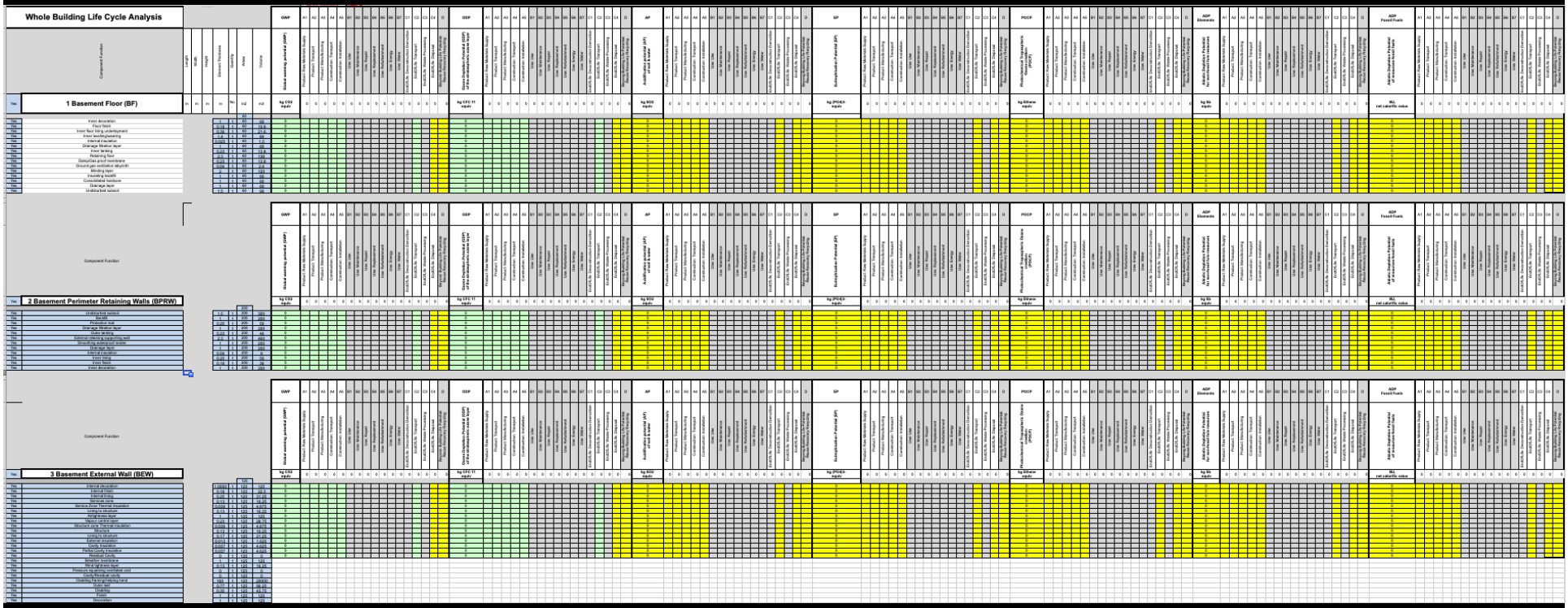
GBC GBC V3 LCA EPD



- Each row is a component of an element (3 to 20 components make up an element)
  - (framing insulation lining)
- Each group of components makes an element (up to 39 make up a building)
  - (partition, wall, floor, roof)
- Each column is an EN 15804 stage A-D or subdivision column
- Each group of columns is an environmental impact (7 groups 7 impacts 1 is carbon=)

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GBC Green Building Calculator

https://GreenBuildingCalculator.uk

GBC V2 Conductivities right columns inconsistent format Reformatted

	Choose	Choose	Choose	Choose	Multiple	Multiple	Multiple			Note: If available, certified test values should be used in preference to those in this table						
0	**Conductivities**	© GBE Green Building Calculator 2011-2021														
CAWS	Element	Component	Primary Function	Generic Material/Product	Manufacturer	Product Reference	Product Code	Initials	Format	Common Building Materials	Density ρ	Thermal Conductivity λ	Thickness	Thickness	Resistivity	U value
0	Wall/Floor/Roof/Etc.	Position/Application	Insulation/Structure/VCL/BM		Company name	Product Name	Model No.	Individual codes	Quilt/Batt/Foam/Board/Block/etc.	Wood fibre/Sheep's wool/Fired clay/straw board/etc.	kg/m³	W/m.K	mm	m	m2.K/W	W/m2.K
	Choose from Drop Down List	Choose from Drop Down List	Choose from Drop Down List	Choose from Drop Down List	Type information below	Type information below	Type information below									
K10	20 External Walls (EW)	Choose	Choose	Sector Generic material	Not applicable	Not applicable	Not applicable		Boards	Gypsum plasterboard	900	0.250	12.5	0.0125	#REF!	#REF!
K10	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Boards/Linings	Gypsum plasterboard	900	0.160	12.5	0.0125	#REF!	#REF!
K13	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Boards/Linings/Patrass	Gypsum fibre reinforced board		0.360	12.5	0.0125	#REF!	#REF!
F10	20 External Walls (EW)	Outer leaf	Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Brick/Wall	Brickwork (outer leaf)	1700	0.770	102	0.102	#REF!	#REF!
F10	20 External Walls (EW)	Outer leaf	Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Brick/Wall	Brickwork (inner leaf)	1700	0.560	102	0.102	#REF!	#REF!
F10	20 External Walls (EW)		Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Block/Wall	Concrete block (medium density)	1400	0.570	100	0.1	#REF!	#REF!
F10	20 External Walls (EW)		Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Block/Wall	Concrete block (low density)	600	0.180	100	0.1	#REF!	#REF!
F10	20 External Walls (EW)	Inner leaf	Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Block/Wall	Concrete (medium density) (inner leaf)	1800	1.130	100	0.1	#REF!	#REF!
F10	20 External Walls (EW)	Inner leaf	Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Block/Wall	Concrete (medium density) (inner leaf)	2000	1.330	100	0.1	#REF!	#REF!
F10	20 External Walls (EW)	Inner leaf	Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Block/Wall	Concrete (medium density) (inner leaf)	2200	1.590	100	0.1	#REF!	#REF!
E10	20 External Walls (EW)		Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Insitu cast	Concrete (high density)	2400	1.930	600	0.6	#REF!	#REF!
E10	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Insitu cast	Reinforced concrete (1% steel)	2300	2.300	300	0.3	#REF!	#REF!
E10	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Insitu cast	Reinforced concrete (2% steel)	2400	2.500	300	0.3	#REF!	#REF!
Z21	20 External Walls (EW)	inner leaf mortar bedding		Sector Generic material	Not applicable	Not applicable	Not applicable		Joints	Mortar (protected) (inner leaf)	1750	0.880	100	0.1	#REF!	#REF!
Z21	20 External Walls (EW)	inner leaf mortar bedding		Sector Generic material	Not applicable	Not applicable	Not applicable		Joints	Mortar (exposed) (outer leaf)	1750	0.940	100	0.1	#REF!	#REF!
M20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Plaster coat	Gypsum lightweight	600	0.180	13	0.013	#REF!	#REF!
M20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Plaster coat	Gypsum (medium density)	900	0.300	13	0.013	#REF!	#REF!
M20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Plaster coat	Gypsum (dense)	1200	0.430	13	0.013	#REF!	#REF!
F20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Blocks/Stones/Slabs/Tiles/	Sandstone	2600	2.300	100	0.1	#REF!	#REF!
F20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Blocks/Stones/Slabs/Tiles/	Limestone, soft	1800	1.100	100	0.1	#REF!	#REF!
F20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Blocks/Stones/Slabs/Tiles/	Limestone, hard	2200	1.700	100	0.1	#REF!	#REF!
P10	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Boards/Insulation	Fibreboard	400	0.100	10	0.01	#REF!	#REF!
K10	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Boards/Linings	Plasterboard	900	0.250	12.5	0.0125	#REF!	#REF!
K10	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Boards/Linings	Plasterboard foil faced	900	0.250	12.5	0.0125	#REF!	#REF!
M40	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Tiles	Tiles ceramic	2300	1.300	5	0.005	#REF!	#REF!
G20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Timber sections	Timber (softwood)	500	0.130	150	0.15	#REF!	#REF!
G20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Timber sections	Timber (softwood)	700	0.180	150	0.15	#REF!	#REF!
G20	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Timber sections	Hardwood timber	700	0.180	25	0.025	#REF!	#REF!
G20	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Timber sections	softwood timber	500	0.130	18	0.018	#REF!	#REF!
G20	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Timber sections	softwood timber	1000	0.240	18	0.018	#REF!	#REF!
K11	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Panels	Softwood plywood	500	0.130	18	0.018	#REF!	#REF!
K11	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Panels	Softwood plywood	1000	0.240	18	0.018	#REF!	#REF!
K11	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Panels	softwood chipboard	500	0.130	18	0.018	#REF!	#REF!
K11	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Panels	softwood chipboard	1000	0.240	18	0.018	#REF!	#REF!
G10	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable			Steel	7800	50.000	5	0.005	#REF!	#REF!
Z113	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid sheet	Stainless steel	7900	17.000	1	0.001	#REF!	#REF!
M20	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		External render	External rendering	1300	0.570	19	0.019	#REF!	#REF!
M20	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Internal plaster	Plaster (dense)	1300	0.570	19	0.019	#REF!	#REF!
M20	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Internal plaster	Plaster (lightweight)	600	0.180	12	0.012	#REF!	#REF!
E10	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable	RC	Insitu	Reinforced concrete (1% steel)	2300	2.300	300	0.3	#REF!	#REF!
E10	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable	RC	Insitu	Reinforced concrete (2% steel)	2400	2.500	300	0.3	#REF!	#REF!
E10	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable	ACS	Slab	Aerated concrete slab	500	0.160	150	0.15	#REF!	#REF!
J21	Roofs/Floor/Tanking			Sector Generic material	Not applicable	Not applicable	Not applicable	A	Coating	Asphalt	2100	0.700	20	0.02	#REF!	#REF!
J	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable		Flexible membrane	Felt/bitumen layers	1100	0.230	7	0.007	#REF!	#REF!
M10	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable		Levelling Screed/Wearing surface/Structural Topping	Screed	1200	0.410	25	0.025	#REF!	#REF!
Q23	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable		Loose gravel	Stone chippings	2000	2.000	10	0.01	#REF!	#REF!
H6	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid overlap tiles	Tiles (clay)	2000	1.000	6	0.006	#REF!	#REF!
0	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid overlap tiles	Tiles (concrete)	2100	1.500	10	0.01	#REF!	#REF!
	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid slab	Wood wool slab	500	0.100	50	0.05	#REF!	#REF!
E10	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Cast insitu	Cast concrete	2000	1.350	300	0.3	#REF!	#REF!
E10	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Cast insitu	Reinforced concrete (1% steel)	2300	2.300	300	0.3	#REF!	#REF!
E10	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Cast insitu	Reinforced concrete (2% steel)	2400	2.500	300	0.3	#REF!	#REF!
0	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid sheet	Metal tray (steel)	7800	50.000	2	0.002	#REF!	#REF!
M10	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Levelling Screed/Wearing surface/Structural Topping	Screed	1200	0.410	45	0.045	#REF!	#REF!
G20	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid sections	Hardwood timber	700	0.180	25	0.025	#REF!	#REF!
G20	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid sections	softwood timber	500	0.130	18	0.018	#REF!	#REF!
G20	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid sections	softwood timber	1000	0.240	18	0.018	#REF!	#REF!
K11	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Sheet	softwood plywood	500	0.130	18	0.018	#REF!	#REF!
K11	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Sheet	softwood plywood	1000	0.240	18	0.018	#REF!	#REF!
K11	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Sheet	softwood chipboard	500	0.130	18	0.018	#REF!	#REF!
K11	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Sheet	softwood chipboard	1000	0.240	18	0.018	#REF!	#REF!
P10	Thermal or acoustic Insulation		Insulating	Sector Generic material	Not applicable	Not applicable	Not applicable		Board	Expanded polystyrene (EPS) board	15	0.040	400	0.4	#REF!	#REF!
P10	Thermal or acoustic Insulation		Insulating	Sector Generic material	Not applicable	Not applicable	Not applicable		Quilt	Mineral wool quilt	12	0.042	420	0.42	#REF!	#REF!
P10	Thermal or acoustic Insulation		Insulating	Sector Generic material	Not applicable	Not applicable	Not applicable		Batt	Mineral wool batt	25	0.038	380	0.38	#REF!	#REF!
P10	Thermal or acoustic Insulation		Insulating	Sector Generic material	Not applicable	Not applicable	Not applicable		Boards, Foam	Phenolic foam board	30	0.025	250	0.25	#REF!	#REF!
P10			Insulating	Sector Generic material	Not applicable	Not applicable	Not applicable		Boards, Foam	Phenolic foam board	35	0.025	250	0.25	#REF!	#REF!
P10	Thermal or acoustic Insulation		Insulating	Sector Generic material	Not applicable	Not applicable	Not applicable		Boards, Foam	Polyurethane board PUR	30	0.025	250	0.25	#REF!	#REF!

GBE

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GBC V2

GBC Green Building Calculator

https://GreenBuildingCalculator.uk

Conductivities updated

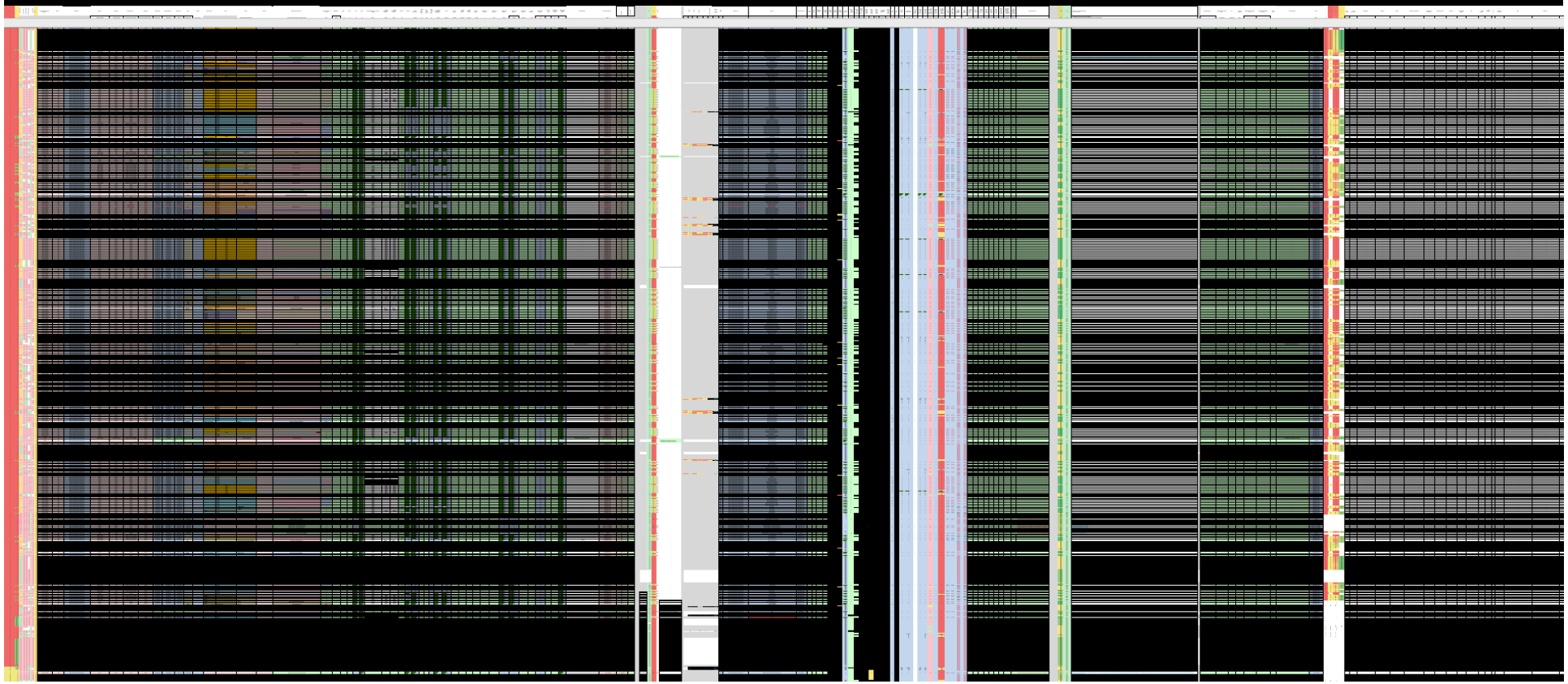
More data needed

Format	Common Building Materials	Density	Weight/Area	Thermal Conductivity k value	Thickness	Thickness	Resistivity	U value
.	.	p	.	λ	.	.	R	U
Quilt/Batt/Foam/Board/Block/etc.	Wood fibre/Sheep's wool/Fired clay/straw board/etc.	kg/m³	kg/m2	W/m.K	mm	m	m2.K/W	W/m2.K
.	1	2	3	4	5	6	7	8
Floor spacers	.	.	#VALUE!	.	.	#VALUE!	#VALUE!	#VALUE!
Floor spacers	.	.	#VALUE!	.	.	#VALUE!	#VALUE!	#VALUE!
Floor spacers	.	.	#VALUE!	.	.	#VALUE!	#VALUE!	#VALUE!
.	Accessory: Floor spacers, 200mm	.	#VALUE!	.	200	0.2	#VALUE!	#VALUE!
.	Accessory: Floor spacers, 60mm	.	#VALUE!	.	60	0.06	#VALUE!	#VALUE!
.	Accessory: Floor spacers, 80mm	.	#VALUE!	.	80	0.08	#VALUE!	#VALUE!
Liquid applied coating	Adhesive: Bitumen	1050	#VALUE!	0.230	.	#VALUE!	#VALUE!	#VALUE!
Liquid applied coating	Adhesive: Bitumen	1700	#VALUE!	0.200	.	#VALUE!	#VALUE!	#VALUE!
Liquid applied coating	Adhesive: Bitumen Coating	1050	#VALUE!	0.250	.	#VALUE!	#VALUE!	#VALUE!
Liquid applied coating	Adhesive: Bitumen, 10mm	1700	17	0.200	10	0.01	0.050	20.000
Adhesive	Adhesive: Synthetic resin-based	1200	#VALUE!	0.900	.	#VALUE!	#VALUE!	#VALUE!
Undisturbed Subsoil	Aggregate & Sand: Dry Gravel	.	#VALUE!	1.500	1000	1	0.667	1.500
Undisturbed Subsoil	Aggregate & Sand: Dry Sand	.	#VALUE!	1.500	1000	1	0.667	1.500
Loose Aggregate	Aggregate & sand: Gravel	1800	#VALUE!	0.700	.	#VALUE!	#VALUE!	#VALUE!
Consolidated layer	Aggregate & Sand: gravel or crushed rock	2240	#VALUE!	1.300	.	#VALUE!	#VALUE!	#VALUE!
Consolidated layer	Aggregate & Sand: gravel or crushed rock, 100mm	2240	224	1.300	100	0.1	0.077	13.000
Loose Aggregate	Aggregate & sand: Gravel, 50mm	1800	90	0.700	50	0.05	0.071	14.000
Loose gravel	Aggregate & Sand: Stone: chippings	1600	#VALUE!	0.700	.	#VALUE!	#VALUE!	#VALUE!
Loose gravel	Aggregate & Sand: Stone: chippings	1600	#VALUE!	0.700	.	#VALUE!	#VALUE!	#VALUE!
Loose gravel	Aggregate & Sand: Stone: chippings, 10mm	2000	20	2.000	10	0.01	0.005	200.000
Undisturbed Subsoil	Aggregate & Sand: Wet Gravel	.	#VALUE!	2.000	1000	1	0.500	2.000
Undisturbed Subsoil	Aggregate & Sand: Wet Gravel	.	#VALUE!	2.000	1000	1	0.500	2.000
Air space	Air space: heat flow downwards, 100mm				100	0.1	0.22	.
Air space	Air space: heat flow downwards, 10mm				10	0.01	0.15	.
Air space	Air space: heat flow downwards, 15mm				15	0.015	0.17	.
Air space	Air space: heat flow downwards, 25mm				25	0.025	0.19	.
Air space	Air space: heat flow downwards, 300mm				300	0.3	0.23	.
Air space	Air space: heat flow downwards, 50mm				50	0.05	0.21	.
Air space	Air space: heat flow downwards, 5mm				5	0.005	0.11	.
Air space	Air space: heat flow downwards, 7mm				7	0.007	0.13	.
Air space	Air space: heat flow horizontal, 100mm				100	0.1	0.18	.
Air space	Air space: heat flow horizontal, 10mm				10	0.01	0.15	.

GBC V2 & GBC V3
Intelligent DDL & LUT

alue Total DDL (23/03/2022)	Elemental U value Blocks	EUVDDL Name	EUVDDL shorter	M
Alphabetic order	Alphabetic order	Alphabetic order	Alphabetic order	
Choose	Choose	Choose	Choose	
ACCESSORY:	ACCESSORY:	AccessoryEUVDDL	AccessoryEUVDDL	Ger
ccessory: Floor spacers, 200mm	Accessory: Floor spacers, 200mm		AdhesiveEUVDDL	Pro
ccessory: Floor spacers, 60mm	Accessory: Floor spacers, 60mm		Aggregates&SandEUVDDL	Acc
ccessory: Floor spacers, 80mm	Accessory: Floor spacers, 80mm		AirSpaceEUVDDL	Sub
***	ADHESIVE:	AdhesiveEUVDDL	CladdingEUVDDL	Sys
ADHESIVE:	Choose		ConcreteInsituEUVDDL	Ele
Adhesive: Bitumen	Adhesive: Bitumen		ConcretePrecastReinforcedEUVDDL	
Adhesive: Bitumen Coating	Adhesive: Bitumen Coating		ExternalWallFinishshEUVDDL	Oth
Adhesive: Bitumen, 10mm	Adhesive: Bitumen, 10mm		GlazingEUVDDL	
dhesive: Synthetic resin-based	Adhesive: Synthetic resin-based		ImpactSoundInsulationEUVDDL	

GBC V2 Material Product Data EECSC EPD Data Collected becomes Look Up Table



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Green Building Calculator

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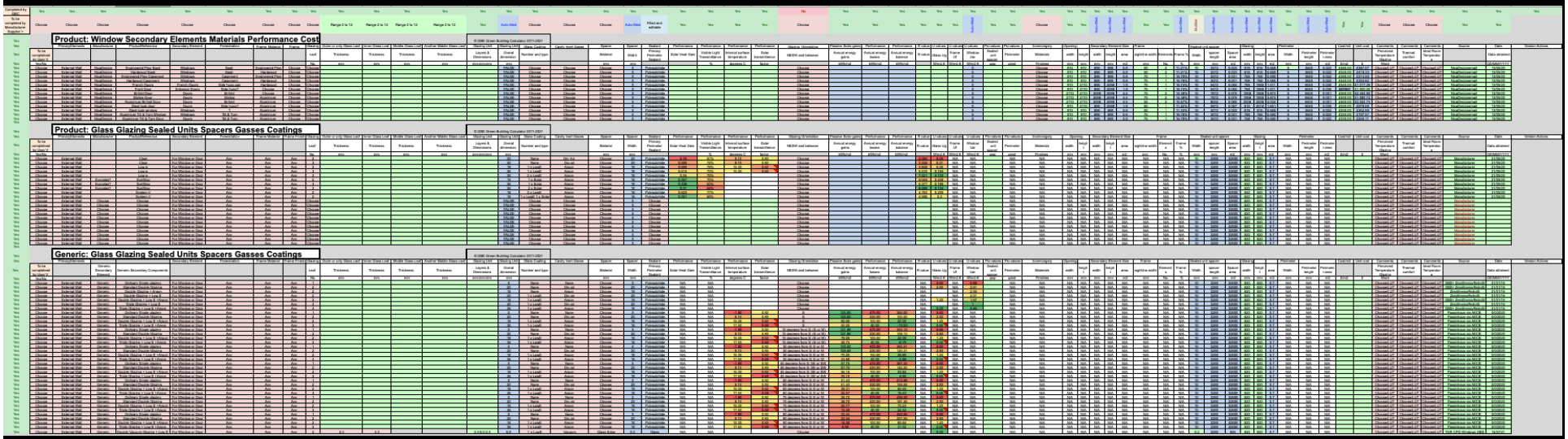
GBC V2 Secondary Elements
Windows & Glazing options



GBC V2 U value > Watts > CO2 In Use

U Values To Watts To CO_2

User name: BrianSpecMan did this

	Auto-filled		Choose	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Review	Auto-filled	Auto-filled	Auto-filled	Review	Auto-filled	To be completed by GBC user
					Temperature				Heat loss							
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	20		60					Auto-filled
	Yes	2 Basement Perimeter Retaining Walls (BPRW)	0.251	200	11	-	15	4	201		200					Auto-filled
	Yes	3 Basement External Wall (BEW)	0.064	125	11	-	15	4	32		125					Auto-filled
	Yes	4 Basement Roof at Site Level (BRSL)	0.044	60	11	-	15	4	11		60					Auto-filled
	Yes	5 Basement Roof at SubTerranean level (BRSTL)	0.085	60	11	-	15	4	20		60					Auto-filled
	Yes	6 Basement Overhead Glazed Pavement (BOGP)	1.747	11	11	-	15	4	77		11					Auto-filled
	Yes	7 Swimming Pool Basin (SPB)	0.071	2296	11	-	16	5	814		2296					Auto-filled
				2812						1,174	Basement	2812	52%	8.3%	0.16	Review
					Temperature				Heat loss							
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	15	-	20	5	16		60					Auto-filled
	Yes	9 Ground Floor Ground Bearing (GFGB)	0.090	60	11	-	20	9	49		60					Auto-filled
	Yes	10 Ground Floor Over Ventilated Void (GFOV)	0.057	60	0	-	20	20	68		60					Auto-filled
	Yes	11 Upper Floor (UF)	0.102	60	20	-	20	0	0		60					Auto-filled
	Yes	12 Services Riser Upper Floor (SRUF)	0.104	1.80	20	-	20	0	0		1.8					Auto-filled
	Yes	13 External Floor & Soffit (EFS) (over air)	0.059	120	0	-	20	20	141		120					Auto-filled
	Yes	14 Top Floor (TF)	0.105	60	20	-	20	0	0		60					Auto-filled
				421.8						273	Floor	421.8	8%	1.9%	0.25	Review
					Temperature				Heat loss							
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					Auto-filled
	Yes	16 Party Wall (PW)	0.125	50	0	-	20	20	125		50					Auto-filled
	Yes	17 Communal Compartment Floors (CCF)	0.053	180	0	-	20	20	190		180					Auto-filled
	Yes	18 Communal Compartment Wall (CCW)	0.126	37.5	0	-	20	20	94		37.5					Auto-filled
	Yes	19 Riser Compartment Upper Floor (RCUF)	0.593	5.4	0	-	20	20	64		5.4					Auto-filled
				452.9						664	Compartmentation	452.9	8%	4.7%	0.56	Review
					Temperature				Heat loss							
Wall	Applicable	Elements	U value	Areas	External		Internal	Difference	Individual	Total	Floor area	Total Areas	Areas	Heat loss	Ratio:	
	Yes/No	0	W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x	
	Yes	20 External Walls (EW)	0.064	80	0	-	20	20	103		80					Auto-filled
	Yes	21 Integral Unheated Space Wall (IUSW)	0.062	49	5	-	5	0	0		49					Auto-filled
	Yes	59 Basement Internal Partitions (BIP)	0.203	25	15	-	15	0	0		25					Auto-filled
	Yes	60 Internal Walls (IW)	0.093	25	20	-	20	0	0		25					Auto-filled
				179						103	Wall	179	3%	0.7%	0.22	Review
					Temperature				Heat loss							
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					Auto-filled
	Yes	23 Shallow Roof (SR)	0.086	60	0	-	20	20	104		60					Auto-filled
	Yes	24 Pitched Roof (PR)	0.069	59	0	-	20	20	82		59					Auto-filled
	Yes	25 Barrel Vault Roof (BVR)	0.086	68	0	-	20	20	118		68					Auto-filled
	Yes	26 Domed Roof (DR)	0.049	31	0	-	20	20	30		31					Auto-filled
	Yes	27 Hipped/Pyramid Roof (HPR)	0.069	59	0	-	20	20	82		59					Auto-filled
	Yes	28 Mono-Pitched Roof (MPR)	0.069	59	0	-	20	20	82		59					Auto-filled
	Yes	29 Mansard Roof (MR)	0.069	48	0	-	20	20	66		48					Auto-filled
	Yes	30 Dormer Flat Roofs (DFR)	0.069	21	0	-	20	20	29		21					Auto-filled
	Yes	31 Dormer Side Wall (DSW)	0.070	9	0	-	20	20	12		9					Auto-filled
	Yes	32 Dormer Window Wall (DWW)	0.069	15	0	-	20	20	21		15					Auto-filled
	Yes	33 Other Geometry Roof (OGR)	0.069	121	0	-	20	20	167		121					Auto-filled
				610						841	Roof	610	11%	6.0%	0.53	Review
					Temperature				Heat loss							
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	-	20	20	104		60					Auto-filled
	Yes	35 Pitched Vault Ceiling (PVC)	0.089	41	0		20	20	73		41					Auto-filled
	Yes	36 Barrel Vault Ceiling (BVC)	0.089	131	0		20	20	234		131					Auto-filled
	Yes	37 Domed Vault Ceiling (DVC)	0.089	31	0		20	20	55		31					Auto-filled
	Yes	38 Hipped/Pyramid Vault Ceiling (HPVC)	0.089	59	0		20	20	105		59					Auto-filled
	Yes	39 Mono-Pitch Vault Ceiling (MPVC)	0.089	41	0		20	20	73		41					Auto-filled
	Yes	40 Mansard Vault Ceiling (MVC)	0.089	97	0		20	20	172		97					Auto-filled
	Yes	41 Other Geometry Ceiling (OGC)	0.089	101	0		20	20	179		101					Auto-filled
				561						996	Ceilings	561	10%	7.1%	0.68	Review
					Temperature				Heat loss							
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	6 Basement Overhead Glazed Pavement (BOGP)	1.75	11	0	-	20	20	384		11					Auto-filled
	Yes	42 Windows (W)	0.8	50	0	-	20	20	800		50					Auto-filled
	Yes	43 Glazed Pedestrian Doors (GPD)	0.79	10.5	0	-	20	20	166		10.5					Auto-filled
	Yes	44 Opaque Pedestrian Doors (OPD)	2	12	0	-	20	20	480		12					Auto-filled
	Yes	45 Large Wall Opening (LWO)	2	45	0	-	20	20	1,800		45					Auto-filled
	Yes	46 High Usage Entrance Door (HUED)	2	20	0	-	20	20	800		20					Auto-filled
	Yes	47 Display Window (DW)	2	25	0	-	20	20	1,000		25					Auto-filled
	Yes	48 Glazed External Walls (GEW)	0.81	80	0	-	20	20	1,296		80					Auto-filled
	Yes	49 Opaque External Walls (OEW)	2	20	0	-	20	20	800		20					Auto-filled
	Yes	50 Glazed Roof (GR)	2	25	0		20	20	1,000		25					Auto-filled
	Yes	51 Rooflights (RL)	0.75	25	0	-	20	20	375		25					Auto-filled
	Yes	52 Roof Windows (RW)	0.81	10	0	-	20	20	162		10					Auto-filled
	Yes	53 Roof Air & Smoke Vents (RASV)	2	25	0	-	20	20	1,000		25					Auto-filled
				359						10,063	Window/Door/Rooflight	359	7%	71.3%	10.73	Review
										14,114		5396	100%	100.0%	1.00	Review
										4,051		5036	93%	28.7%	0.31	Review

GBC V2
In-use Energy Carbon Costs

				Yes	Yes	Yes	Yes	Yes	Yes	Yes			Auto-filled
GBC V2	**Total Conduction Heat Loss**	Areas		Basement	Compartmentation	Floor	Wall	Roof	Ceiling	Windows, Glazing & Doors			
Total	Total Envelope Area Conducted Heat Loss (TEACHL)	3204	m^2	621	453	421.8	179	610	561			2845	Auto-filled
Window/Door/Rooflight	Total Transparent Area Conducted Heat Loss (TTACHL)	359	m^2	Areas						359		358.5	Auto-filled
Walls Roof Floor	Total Opaque Area Conducted Heat Loss (TOACHL)	**2845**	m^2										Auto-filled
	Envelope element areas as % of whole envelope		%	19%	14%	13%	6%	19%	18%	11%		100%	
Window/Door/Rooflight	Transparent area as % of whole	12.60%	%										Auto-filled
	In-Use Energy	Total heat loss via elements:	%	2.0%	5.1%	2.1%	0.7%	7.1%	8.3%	74.7%			
	Floor area	3,204	m^2	Basement	Compartmentation	Floor	Wall	Roof	Ceiling	Windows, Glazing & Doors			Auto-filled
	Watts	13,476	W	271	681	285	100	957	1,116	10,066		13475.8812	Auto-filled
	KiloWatts	13.476	kW	0.27	0.68	0.28	0.10	0.96	1.12	10.07		13.4759	Auto-filled
	kiloWattHours	107.8	kWh	2.17	5.44	2.28	0.80	7.66	8.93	80.53		107.8070	Auto-filled
	KiloWatts/floor area	0.004	kW/m^2	0.0001	0.0002	0.0001	0.0000	0.0003	0.0003	0.0031		0.0042	Auto-filled
	KiloWattHours/floor area	0.0336	kWh/m^2	0.0007	0.0017	0.0007	0.0002	0.0024	0.0028	0.0251		0.0336	Auto-filled
	KiloWattHours/Floor area/annum	40.8262	kWh/m^2/Year	0.82	2.06	0.86	0.30	2.90	3.38	30.50		40.8262	Auto-filled
	In-Use Carbon Dioxide	CO_2	Carbon Dioxide										
	Fuel Choice	Grid Electricity Mix: UK 2020	Drop Down List	Basement	Compartmentation	Floor	Wall	Roof	Ceiling	Windows, Glazing & Doors			Choose
	CO_2 equivalent		kg CO_2eq/kWh										
	CO_2	0.186	kg CO_2/kWh										Auto-filled
	conversion												
	kg CO_2	20.052	kg CO2										Auto-filled
	kg CO_2/m^2	8,458	kg CO2/m2	170	427	179	63	601	700	6,318			Auto-filled
	In-Use Hours	h/d	Unit			% h/y							
odation N14 or edit here	Hours of operation/day (spaces heated or cooled)	8	h/d	up to max	24								Review
	Days per week (spaces heated or cooled)	7	d/wk	up to max	7								Yes
	Weeks per month (spaces heated or cooled)	4.33	w/m	up to max	4.33								Auto-filled
	Months per year (spaces heated or cooled)	5	m/y	up to max	12								Yes
	Weeks per year (spaces heated or cooled)	21.67	w/y	up to max	52								Auto-filled
	Days per year (spaces heated or cooled)	151.67	d/y	up to max	365								Auto-filled
	Hours per year (spaces heated or cooled)	1213.33	h/y	up to max	8760	13.85%							Auto-filled
	In-Use Costs	Total		Basement	Compartmentation	Floor	Wall	Roof	Ceiling	Windows, Glazing & Doors			
	Fuel Choice	Oil to DHW	Drop Down List										Choose
	£ costs/unit of fuel:	0.468	£/kWh	0.009	0.024	0.010	0.003	0.033	0.039	0.349	£/kWh		Auto-filled
	Embodied Energy	Total		Basement	Compartmentation	Floor	Wall	Roof	Ceiling	Windows, Glazing & Doors			
		#N/A	MJ	1,071,033	81,256	#N/A	39,427	465,092	#N/A	223,560	MJ		Auto-filled
	Embodied Carbon	Total		Basement	Compartmentation	Floor	Wall	Roof	Ceiling	Windows, Glazing & Doors			
		#N/A	kg CO_2	39,301	3,819	#N/A	2,517	20,690	#N/A	12,730	kg CO2		Auto-filled
	Sequestered Carbon	Total		Basement	Compartmentation	Floor	Wall	Roof	Ceiling	Windows, Glazing & Doors			
		#N/A	kg CO_2	39,880	35,840	#N/A	35,088	147,134	#N/A	19,420	kg CO2		Auto-filled
	Total Carbon	Total		Basement	Compartmentation	Floor	Wall	Roof	Ceiling	Windows, Glazing & Doors			
		#N/A	kg CO_2	-579	-32,021	#N/A	-32,571	-126,445	#N/A	-6,690	kg CO2		Auto-filled
	Total Build Cost	Total		Basement	Compartmentation	Floor	Wall	Roof	Ceiling	Windows, Glazing & Doors			
		£305,115.77	£	£45,996.00	£27,940.00	£0.00	£12,384.00	£59,872.57	£37,353.21	£96,850.00	£		Auto-filled

GBC V2 Then add: Carbon targets Pass or Fail
GBC V2 Then add: Cost Pay Back Carbon Pay Back Value Engineering

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GBC V2 Costs to users

Completed by GBC	GBC V2	Yes	Yes	Yes
	V2 Prices	V1 One off payment (no longer available when V2 is launched)	V2 One off (with corrections but no future developments)	V2 Annual renewal subscription (with future developments)
	Larger practice	£98.88	£98.88	£98.88
	Six to ten person practice		£78.88	£78.88
	One to five person practice	£48.88	£48.88	£48.88
	Graduate, employee (Own use)		£8.88	£8.88
	University Professor, Tutor, Lecturer (to show/demo)		£8.88	£8.88
	University Professor, Tutor, Lecturer (to hangout to one student cohort)		£98.88	£98.88
	Student (own use only)	£4.88	£4.88	£4.88
	Self Builders, TAN6 OPD Wales	£4.88	£4.88	£4.88
	Other Self Builders, BIY, DIY, Self-Managers	£48.88	£48.88	£48.88
	GBC V1.1 (Lite demo)		£1.88	
	GBC V2 (view only non-functioning) explore before you buy		£1.88	

GBC V2-GBC V36 Planned Development

Priorities to bring forward:

- Retrofit, Terraces, Community level, MEP Services,
- GBC V3 Decrement Delay, Form Factor refinements: dormers, bays, porches
- GBC V4 Building Section Coding, Competent Application,
- 892 ready made elements, Bespoke Assemblies, Accessories, Specification Generator
- GBC V5 Non-Domestic, Retrofit and Newbuild more refinement
- GBC V6 Embodied Energy, Carbon and Sequestered carbon; Non-external envelope elements
- GBC V7 Condensation Check, Thermal Bridge, Secondary Element Calculator, Thermal mass calculator
- GBC V8 LCA Calculator
- GBC V9 Landscape
- GBC V10 Civils and Infrastructure: scope Increased
- GBC V11 Waste Calculator using WasteCost®Lite
- GBC V12 Plastic free v Recycled Plastic
- GBC V13 Interiors: Scope increased, Ska fit-out. refit
- GBC V14 Circular economy: Reclaim Reuse
- GBC V15 Self-build Interface
- GBC V16 CAD BIM App
- GBC V17 Whole Project Budget Calculations, full Fee bid calculation based on cost plan
- GBC V18 EU and International versions
- GBC V19 Services Design Module: Occupancy level, Energy Sources and uses,
- GBC V20 Lighting Design Module: Health & Wellbeing, Light Nutrition
- GBC V21 Biodiversity Inclusion, Biodiversity Net Gain
- GBC V22 Local Climate Appropriate construction and materials
- GBC V23 Vernacular, local: materials, trades, economy
- GBC V24 GBPB Green Building Price Book
- GBC V25 O&MM Operation & Maintenance Manuals
- GBC V26 FM Specification
- GBC V27 Local Procurement, Transport to site, distance search facility
- GBC V28 On Site Construction Emissions
- GBC V29 Design Life, Durability and Competent Products
- GBC V30 Air tightness & Energy Loss
- GBC V31 Value Engineering Opportunities: in not out
- GBC V32 Healthy Building
- GBC V33 Screening Priorities
- GBC V34 Indoor Air Quality
- GBC V35 Natural Lighting Levels
- GBC V36 Demolition Embodied carbon in waste

B Bespoke

- GBC B1 Retrofit Window & Insulation Calculator
- GBC B2 Responsible retrofit Carbon Calculator
- GBC B3 Window Calculator
- GBC B4 Screeds Calculator
- GBC B5 NRM4 QS interface

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GBC V1 Awards/Shortlists

- 3 months after GBC V1 launch
  - Green Apple 2020-21 Award Winner
    - Category and metal to be announced
  - Central England Prestige 2020-21 Winner
    - November announcement
  - Construction Computing 2020 Awards
    Shortlisted but no award
    - Innovation of the year 2020
    - One to watch Company 2020
    -
      reapply
  - LSI RISE Awards 2021:
    - Highly Commended
    - Category: Education & Training


U Values To Watts To CO_2
Total Conduction Heat Loss
Trades
Landscape
MEPServicesSystems
Civils+Infrastructure
ElementSummary
UToWattsToCO2
DropDownLists
Resistances
Ready
Circular
Sum=0
INTERNATIONAL GREEN APPLE AWARDS 2020
FOR ENVIRONMENTAL BEST PRACTICE
CARBON REDUCTION SILVER WINNER
NATIONAL GREEN SPECIFICATION

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GBRC B6 Retrofit

STBA & HES Responsible Retrofit Options Appraisal & Carbon Calculator

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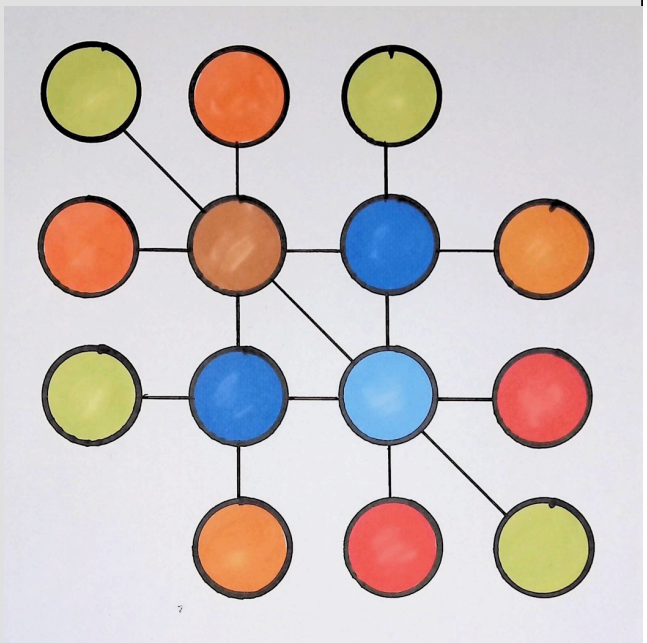
Green Retrofit Calculator



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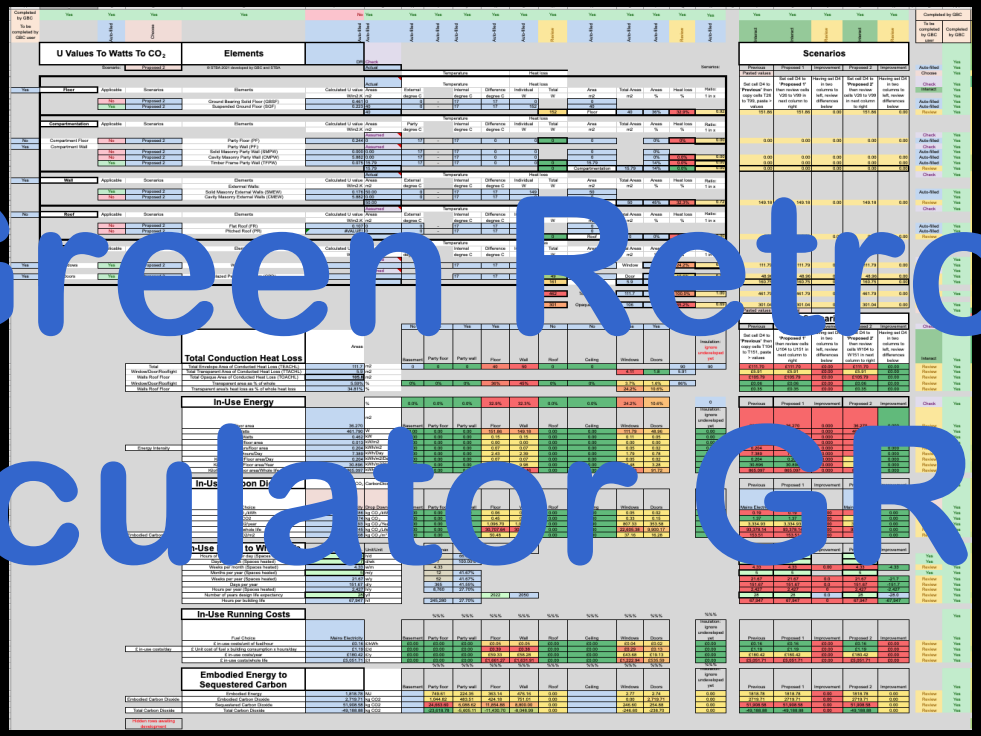

Green Retrofit Calculator GRC V1

Developed by BrianSpecMan of GBC and Peter Draper of STBA

Presented by BrianSpecMan

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English Housing Survey:

8 Eras

7 House formats,

Floor areas, Plot areas

numbers of rooms,

number of bedrooms

Ranges and averages

Demolitions

Alterations Conversions

International comparison

https://www.gov.uk/government/collections/english-housing-survey

Up to 2021

Scottish equivalent data

Ministry of Housing, Communities & Local Government

English Housing Survey

Floor Space in English Homes – main report

50th Anniversary

ENGLISH HOUSING SURVEY

1967 - 2017

GBC B2 House Type Data Sets > 1 England and Scotland

B2 Standard House Types Building Data table BDT1 & BDT0	Choose	Choose	Yes	Yes	Yes	Yes	Yes	Yes	Choose	No
House Type Look Up Reference (Concatenated)	DDL7	Construction Era	Site Location Postcode	Site Location City	Existing Wall Material	Existing Wall Format	Existing Wall Thickness (mm)	Internal finish	Previous External Wall Insulation Position	Previous External Wall Ins Material
Alphabetic order (in use)	Drop Down List	Drop Down List							Drop Down List	
EnglandWalesNIreland:1919 to 1944:Detached House	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	330	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:1919 to 1944:End Terrace	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:1919 to 1944:Flat/Apartment	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:1919 to 1944:Mid Terrace	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:1919 to 1944:Semi-Detached	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	330	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Post 1944:Bungalow	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Post 1944:Detached House	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Post 1944:End Terrace	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Post 1944:Flat/Apartment	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Post 1944:Mid Terrace	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Post 1944:Semi-Detached	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Pre 1919:Bungalow	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Pre 1919:Detached House	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Pre 1919:End Terrace	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Pre 1919:Flat/Apartment	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Pre 1919:Mid Terrace	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Pre 1919:Semi-Detached	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
EnglishWalesNIreland:1919 to 1944:Bungalow	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Detached Cottage	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render/Brick/Air/Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Detached Villa	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render/Brick/Air/Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Flat/Apartment	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Semi-Detached	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render/Brick/Air/Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Tenement	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Terraced House	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render/Brick/Air/Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyre
Scotland:Pre 1919:Detached Cottage	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre
Scotland:Pre 1919:Detached Villa	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre
Scotland:Pre 1919:Flat/Apartment	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre
Scotland:Pre 1919:Semi-Detached	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre
Scotland:Pre 1919:Tenement	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre
Scotland:Pre 1919:Terraced House	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre

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GRC V1 B6 Paper Based Site Survey

B2	B2 Paper based site survey	© STBA 2021-2022 developed by GBC and STBA

Survey Plot, House or Flat No.		
Core Data Source	Site survey	Site survey
Construction Era		
Site Location Postcode		
Site Location City		
Existing Wall Material		
Existing Wall Format		
Existing Wall Thickness (mm)		
Existing Internal finish		
Previous External Wall Insulation Position		
Previous External Wall Insulation Material		
Previous External Wall Insulation Thickness		
Habitable rooms		
Bathrooms		
BuildingFormat		
Total Floor Area		
Number of Stories in house		
Area of ground floor		
Ground floor construction		
Ground floor insulation position		
Ground Floor Insulation material		
Ground Floor Insulation thickness		
Area of Roof		
Existing Roof Pitch		
Previous Roof Insulation Position		
Previous Roof Insulation material		
Previous Roof Insulation thickness		
House width		
House Depth		
HLP Heat Loss Perimeter per floor		
Floor to ceiling height		
Storey (Floor to Floor) Height		

- Can be developed as iPad survey sheet
- To auto-feed bespoke building types into house types table
- Choose the one new bespoke building type to populate calculation cells

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GRC V1 Tablet Survey Feed

D	E	F	G	H	I
B2 Tablet site survey	© STBA 2021-2023 developed by GBC and STBA				
	Site survey	Site survey	Site survey	Site survey	Site survey
Concatenated Look Up Table Reference	Scottish Islands:Pre 1919:TerracedCafe	Scottish Islands:Pre 1919:TerracedCottage	Scottish Islands:Pre 1919:TerracedWorkshop	Scottish Islands:Pre 1919:VillaBottomFlat	Scottish Islands:Pre 1919:VillaMidFlat
Survey Plot, House or Flat No.					
Core Data Source	Choose	Interreg Energy Pathfinder Survey	Interreg Energy Pathfinder Survey	Interreg Energy Pathfinder Survey	Interreg Energy Pathfinder Survey
Construction Era	Choose	Pre 1919	Pre 1919	Pre 1919	Pre 1919
Site Location Postcode	KW17 2BG	KW17 2BG	KW17 2BG	KW17 2DL	KW17 2DL
Site Location City	Café, North-West block, Dennis Ness, Orkney, North Ronaldsay	Cottage 1, South-East block, Dennis Ness, Orkney, North Ronaldsay	Workshop, North-West block, Dennis Ness, Orkney, North Ronaldsay	Flat 1, Bayview, Pierowall, Westray, Orkney	Flat 3, Bayview, Pierowall, Westray, Orkney
Existing Wall Material	Choose	Brick	Insitu Concrete	Sandstone	Sandstone
Existing Wall Format		Solid Masonry	Solid Masonry	Solid Masonry	Solid Masonry
Existing Wall Thickness (mm)		600	600	800	800
Existing Internal finish		Lime Plaster on the hard	Chipboard drylining	Insulated plasterboard drylining	Gypsum plasterboard
Previous External Wall Insulation Position		None	None	Internal	Internal
Previous External Wall Insulation Material		None	None	Phenolic foam, foil-backed	Phenolic foam, foil-backed
Previous External Wall Insulation Thickness		0	0	120	120
Habitable rooms		4	6	2	2
Bathrooms	Choose	1	0	1	1
BuildingFormat	Choose	Semi-Detached	Semi-Detached	Flat/Apartment (Converted)	Flat/Apartment (Converted)
Total Floor Area	100.72	78.98	134.17	35.27	36.27
Number of Stories in house	Choose	1	1	1	1
Area of ground floor	#VALUE!	78.98	134.17	35.27	36.27
Ground floor construction	Choose	Suspended Timber	Solid	Solid	Suspended Timber
Ground floor insulation position	Choose	None	None	Below slab	Between Joists
Ground Floor Insulation material	None	None	None	Phenolic Foam	Unknown
Ground Floor Insulation thickness	0	0	0	100	0
Area of Roof	#VALUE!	78.98	134.17	35.27	N/A
Existing Roof Pitch	Choose	Flat Roof	Flat Roof	Party Floor Above	Party Floor Above
Previous Roof Insulation Position	Choose	Ceiling Joist level	None	None	None
Previous Roof Insulation material	None	Mineral wool	None	None	None
Previous Roof Insulation thickness	0	200	0	0	0
House width	13.7	10.79	16.73	8.4	8.51
House Depth	#VALUE!	7.55	8.02	5.07	5.07
HLP Heat Loss Perimeter per floor	#VALUE!	28.5	45.76	20.49	20.51
Floor to ceiling height	2.74	2.81	3.26	2.39	2.4
Storey (Floor to Floor) Height	2.74	3.41	3.26	2.83	2.83
Architypes	Choose	Semi-Detached	Semi-Detached	Bottom floor Flat/Apartment/ Tenament	Mid floor Flat/Apartment/ Tenament
Area of external walls minus openings	-14.17	71.16	100.16	42.62	43.32
Party wall thickness	Choose	150	200	300	300
Party Wall Format	Choose	Solid Masonry	Solid Masonry	Timber framed	Timber framed
Party wall length	0	8.18	3.74	6.34	6.58
Area of Party Walls	0	22.99	12.19	15.15	15.79
Previous Party Wall Insulation Position	None	None	None	within timber frame	within timber frame
Previous Party Wall Insulation material	None	None	None	Phenolic foam	Phenolic foam

Choose
Brick
Brick Air Brick
Lime Render Brick Air Brick
Stone
Insitu Concrete

GRC V1 GBC B2 Survey Data Sets

Add any building to house types

Completed by GBC		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Completed by GBC	© STBA 2021-22 developed by GBC for STBA	DDL7	**B2 Standard House Types** Building Data table BDT1 & BDT0	Choose	Choose	Type or paste	Type or paste	Choose	Choose	Choose	Choose	Choose	Type or paste	Type or paste	Choose	Choose	Choose	Type or paste	Choose	Auto-filled	Choose	Choose	Type or Paste
Instructions																							
SlidePages	PD populate order	Application Page	House Type Look Up Reference (Concatenated)	Core Data Source	Construction Era	Site Location Postcode	Site Location City	Existing Wall Material	Existing Wall Format	Existing Wall Thickness (mm)	Existing Internal finish	Previous External Wall Insulation Position	Previous External Wall Insulation Material	Previous External Wall Insulation Thickness	Habitable rooms	Bathrooms	BuildingFormat	Total Floor Area	Number of Stories in house	Area of ground floor	Ground floor construction	Ground floor insulation position	Ground Floor Insulation materia
			Alphabetic order (in use)	Drop Down List DD7	Drop Down List			Drop Down List	Drop Down List	Drop Down List	Drop Down List	Drop Down List			Drop Down List	Drop Down List	Drop Down List	m2	No.	m2	Drop Down List	Drop Down List	
2	2	Page 1	EnglandWalesNIreland:1919 to 1944:Detached House	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	330	Lime Plaster	External	Expanded Polystyrene	100	6	2	Detached House	153	2	76.5	Suspended	Between Joists	Mineral wool, roc
2	14	Page 1	EnglandWalesNIreland:1919 to 1944:End Terrace	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyrene	100	5	1	End Terrace	83	2	41.5	Suspended	Between Joists	Mineral wool, roc
2	11	Page 1	EnglandWalesNIreland:1919 to 1944:Flat/Apartment	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyrene	100	4	1	Flat/Apartment	55	1	55	Over heated space	Between Joists	Mineral wool, roc
2	17	Page 1	EnglandWalesNIreland:1919 to 1944:Mid Terrace	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyrene	100	4	1	Mid Terrace	78	2	39	Suspended	Between Joists	Mineral wool, roc
2	5	Page 1	EnglandWalesNIreland:1919 to 1944:Semi-Detached	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	330	Lime Plaster	External	Expanded Polystyrene	100	5	2	Semi-Detached	94	2	47	Suspended	Between Joists	Mineral wool, roc
2	9	Page 1	EnglandWalesNIreland:Post 1944:Bungalow	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene	100	4	1	Bungalow	75	1	75	Solid	Above Screed	Aerogel
2	3	Page 1	EnglandWalesNIreland:Post 1944:Detached House	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene	100	6	2	Detached House	147	2	73.5	Suspended	Between Joists	Mineral wool, roc
2	15	Page 1	EnglandWalesNIreland:Post 1944:End Terrace	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene	100	5	1	End Terrace	79	2	39.5	Suspended	Between Joists	Mineral wool, roc
2	12	Page 1	EnglandWalesNIreland:Post 1944:Flat/Apartment	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene	100	4	1	Flat/Apartment	54	1	54	Over heated space	Between Joists	Mineral wool, roc
2	18	Page 1	EnglandWalesNIreland:Post 1944:Mid Terrace	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene	100	4	1	Mid Terrace	76	2	38	Suspended	Between Joists	Mineral wool, roc
2	6	Page 1	EnglandWalesNIreland:Post 1944:Semi-Detached	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene	100	5	2	Semi-Detached	82	2	41	Suspended	Between Joists	Mineral wool, roc
2	7	Page 1	EnglandWalesNIreland:Pre 1919:Bungalow	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	4	1	Bungalow	105	1	105	Solid	Above Screed	Aerogel
2	1	Page 1	EnglandWalesNIreland:Pre 1919:Detached House	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	6	2	Detached House	197	2	98.5	Suspended	Between Joists	Mineral wool, roc
2	13	Page 1	EnglandWalesNIreland:Pre 1919:End Terrace	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	5	1	End Terrace	104	2	52	Suspended	Between Joists	Mineral wool, roc
2	10	Page 1	EnglandWalesNIreland:Pre 1919:Flat/Apartment	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyrene	100	4	1	Flat/Apartment	69	1	69	Over heated space	Between Joists	Mineral wool, roc
2	16	Page 1	EnglandWalesNIreland:Pre 1919:Mid Terrace	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	4	1	Mid Terrace	87	2	43.5	Suspended	Between Joists	Mineral wool, roc
2	4	Page 1	EnglandWalesNIreland:Pre 1919:Semi-Detached	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	5	2	Semi-Detached	126	2	63	Suspended	Between Joists	Mineral wool, roc
2	8	Page 1	EnglishWalesNIreland:1919 to 1944:Bungalow	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyrene	100	4	1	Bungalow	74	1	74	Solid	Above Screed	Aerogel
2	22	Page 1	Scotland:Post 1919:Detached Cottage	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render Brick Air Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyrene	100			Small Detached Cottage					Between Joists	Mineral wool, roc
2	20	Page 1	Scotland:Post 1919:Detached Villa	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render Brick Air Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	6	2	Large Detached Villa	133	2	66.5	Suspended	Between Joists	Mineral wool, roc
2	30	Page 1	Scotland:Post 1919:Flat/Apartment	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	4	1	Flat/Apartment	64	1	64	Over heated space	Between Joists	Mineral wool, roc
2	24	Page 1	Scotland:Post 1919:Semi-Detached	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render Brick Air Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	6	2	Semi-Detached	88	2	44	Suspended	Between Joists	Mineral wool, roc
2	28	Page 1	Scotland:Post 1919:Tenement	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lime Plaster	External	Expanded Polystyrene	100	4	1	Tenement	65	1	65	Over heated space	Between Joists	Mineral wool, roc
2	26	Page 1	Scotland:Post 1919:Terraced House	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render Brick Air Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	5	1	Terraced House	87	2	43.5	Suspended	Between Joists	Mineral wool, roc
2	21	Page 1	Scotland:Pre 1919:Detached Cottage	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyrene	100			Small Detached Cottage					Between Joists	Mineral wool, roc
2	19	Page 1	Scotland:Pre 1919:Detached Villa	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyrene	100	6	2	Large Detached Villa	172	2	86	Suspended	Between Joists	Mineral wool, roc
2	29	Page 1	Scotland:Pre 1919:Flat/Apartment	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyrene	100	4	1	Flat/Apartment	95	1	95	Over heated space	Between Joists	Mineral wool, roc
2	23	Page 1	Scotland:Pre 1919:Semi-Detached	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyrene	100	6	2	Semi-Detached	127	2	63.5	Suspended	Between Joists	Mineral wool, roc
2	27	Page 1	Scotland:Pre 1919:Tenement	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyrene	100	4	1	Tenement	72	1	72	Over heated space	Between Joists	Mineral wool, roc
2	25	Page 1	Scotland:Pre 1919:Terraced House	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyrene	100	5	1	Terraced House	109	2	54.5	Suspended	Between Joists	Mineral wool, roc
2		Page 1	Scottish Islands:Pre 1919:Flat/Apartment (Converted)	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2DL	Bayview, Pierowall, Westray, Orkney	Sandstone	Solid Masonry	800	Insulated plasterboard drylining	Internal	Phenolic foam, foil-backed	120	2	1	Flat/Apartment (Converted)	35.27	1	35.27	Solid	Below slab	Phenolic Foam
2		Page 1	Scottish Islands:Pre 1919:TerracedCafe	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2BG	Café, North-West block, Dennis Ness, Orkney, North Ronaldsay	Insitu Concrete	Solid Masonry	600	Lath and plaster inner lining	None	None	0	5	2 WCs Potential Shower Bath	Small Detached Cottage	100.72	1	100.72	Suspended Timber	None	None
2		Page 1	Scottish Islands:Pre 1919:TerracedCottage	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2BG	Cottage 1, South-East block, Dennis Ness, Orkney, North Ronaldsay	Brick	Solid Masonry	600	Lime Plaster on the hard	None	None	0	4	1	Semi-Detached	78.98	1	78.98	Suspended Timber	None	None
2		Page 1	Scottish Islands:Pre 1919:TerracedWorkshop	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2BG	Workshop, North-West block, Dennis Ness, Orkney, North Ronaldsay	Insitu Concrete	Solid Masonry	600	Chipboard drylining	None	None	0	6	0	Semi-Detached	134.17	1	134.17	Solid	None	None
3		Page 1	Scottish Islands:Pre 1919:VillaBottomFlat	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2DL	Flat 1, Bayview, Pierowall, Westray, Orkney	Sandstone	Solid Masonry	800	Insulated plasterboard drylining	Internal	Phenolic foam, foil-backed	120	2	1	Flat/Apartment (Converted)	35.27	1	35.27	Solid	Below slab	Phenolic Foam
3		Page 1	Scottish Islands:Pre 1919:VillaMidFlat	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2DL	Flat 3, Bayview, Pierowall, Westray, Orkney	Sandstone	Solid Masonry	800	Gypsum plasterboard	Internal	Phenolic foam, foil-backed	120	2	1	Flat/Apartment (Converted)	36.27	1	36.27	Suspended Timber	Between Joists	Unknown
3		Page 1	Scottish Islands:Pre 1919:VillaTopFlat	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2DL	Flat 4, Bayview, Pierowall, Westray, Orkney	Sandstone	Solid Masonry	800	Gypsum plasterboard	Wall Stud Zone	Phenolic foam	120	3	1	Flat/Apartment (Converted)	72.13	1	72.13	Over heated space	None	None
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
								Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes		Yes			Yes

GBC B2 Survey Sheet v 1

B2 STBA Retrofit Survey Form	© STBA 2021 developed by GBC and STBA		
Options Appraisal Data Imput	populated		
Context			
Input into decision making choices/data will include:			
Appraisal Options			
Cost saving:	Yes	< Drop Down List	Choose
Carbon Saving:	Yes	< Drop Down List	Choose
~~Good~~ Indoor Air Quality:	Choose	< Drop Down List	Choose
~~No~~ Surface or Interstitial Condensation and Mould:	Yes	< Drop Down List	Choose
Overheating:	No	< Drop Down List	Choose
Health & Wellbeing:	Yes	IF	Auto-filled
Electrical efficieny	No	< Drop Down List	Choose
Client/Designer Aspiration			
Experimental or Innovative	No	< Drop Down List	Choose
Sourcing:	Made in Scotland	< Drop Down List	Choose
Normal or Research Evidence	Research	< Drop Down List	Choose
Scope	Choose one at a time or many together		
Basement:	No	< Drop Down List	Choose
Ground floor:	Yes	< Drop Down List	Choose
External Wall:	Yes	< Drop Down List	Choose
Party Floor:	No	< Drop Down List	Choose
Party Wall:	No	< Drop Down List	Choose
Roof:	Yes	< Drop Down List	Choose
Windows:	Yes	< Drop Down List	Choose
Doors:	Yes	< Drop Down List	Choose
Services:	No	< Drop Down List	Choose
Heating:	No	< Drop Down List	Choose
Ventilation	No	< Drop Down List	Choose
Lighting:	No	< Drop Down List	Choose
Hot water:	No	< Drop Down List	Choose
Electiric vehicle:	No	< Drop Down List	Choose
Risk factors	See below for each element's own risk analysis		

GBC B2 Survey Sheet v 2 Populated Scotland

Context:	Step 1	
Project Address:	Type or paste text	
* Project Address Country:	Scotland	< Drop Down List
Wind Driven Rain Index:	3 Severe 56.5 to 100	3
Construction: Moisture open or closed:	Open	IF
Construction Era:	Pre 1919	< Drop Down List
Heritage status:	Unprotected Building	< Drop Down List
Risk Status:	Minor Concern	< Drop Down List
* Building Format:	Terraced House	< Drop Down List
Building Type Look Up Code:	Scotland:Pre 1919:Terraced House	CONCATENATE
Building Fabric Condition:	Poor	< Drop Down List
Choose between EnerPHit Retrofit, Conservation Retrofit:	Technical Standards 6.2-6.3 Domestic: Individual Elements Conversion	< Drop Down List
B2 Uvalue Etc column:	DO	VLOOKUP
Standardised dwelling database Assumed Areas or actual:	Actual	< Drop Down List
Outside winter average temperature:	4	Degrees C
Below Ground floor temperature:	4	IF
Lifestyle temperature Choice:	Underwear only	< Drop Down List
Temperature Choice:	25	VLOOKUP
Assumed lifestyle choice for parties beyond party walls/floors	Jumper wearers	< Drop Down List
Parties temperature choice:	17	VLOOKUP

GBC B2 Moisture Risk Factors & Feedback

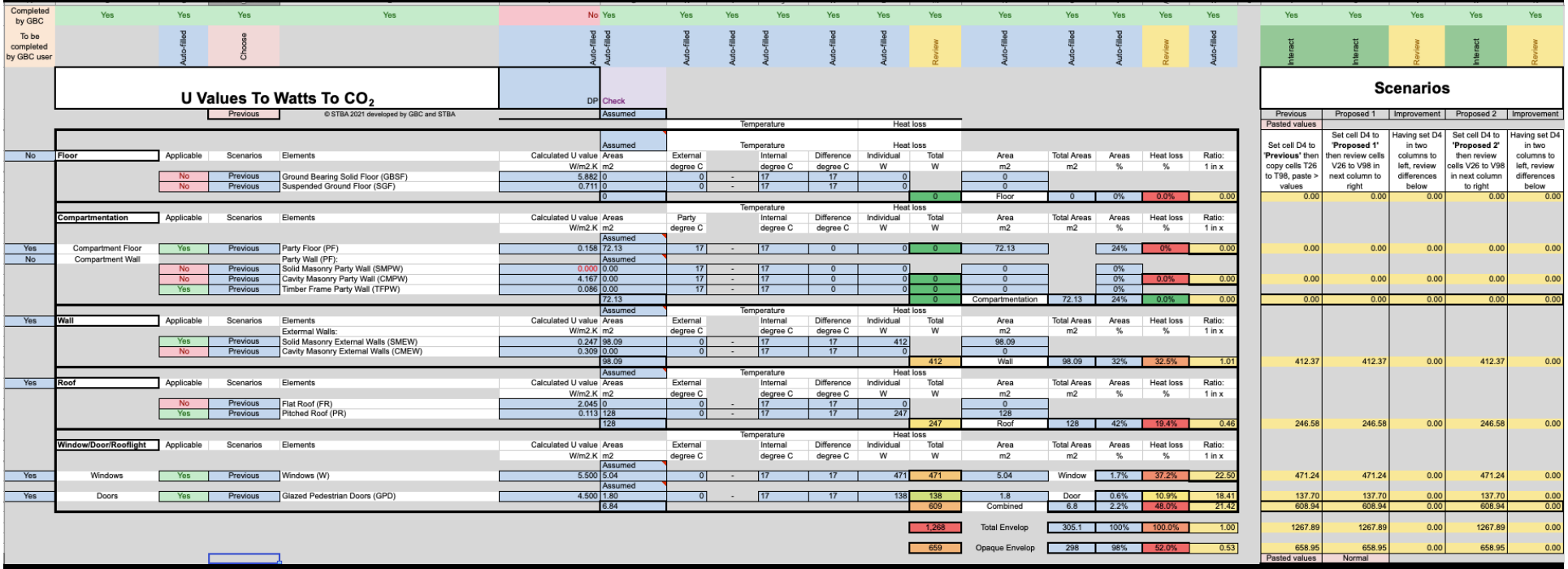
B2 Risk factors

	Build	Build Abbreviation	Element	Element Abbreviation	Element Format	Element Format	Insulation Position	Building Fabric Moisture Type	Insulation Material Moisture Type	Building Fabric Condition	Wind Driven Rain Index	RISK	Comments
Concatenate	**Traditional/Conventional**						IWI CWI EWI	Moisture Open	Moisture Open	Excellent, Good, Fair Poor, V Poor	1 2 3 4	13	14
CB:CW:EWI:SMC:IMC:F:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	F	1	Medium	Moisture closed materials over moisture closed structure in a sheltered location but building in poor condition appropriate repairs / enabling works required prior to application
CB:CW:EWI:SMC:IMC:F:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	F	2	Medium	Moisture closed materials over moisture closed structure in a sheltered location but building in poor condition appropriate repairs / enabling works required prior to application
CB:CW:EWI:SMC:IMC:F:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	F	3	High	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMC:F:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	F	4	High	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMC:G:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	G	1	Low	Moisture closed materials over moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:EWI:SMC:IMC:G:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	G	2	Low	Moisture closed materials over moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:EWI:SMC:IMC:G:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	G	3	Medium	Moisture closed materials over moisture closed structure in a good condition but the high exposure site requires that special care is taken to ensure detailing is correct to stop rain penetration.
CB:CW:EWI:SMC:IMC:G:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	G	4	Medium	Moisture closed materials over moisture closed structure in a good condition but the high exposure site requires that special care is taken to ensure detailing is correct to stop rain penetration.
CB:CW:EWI:SMC:IMC:P:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	P	1	Medium	Moisture closed materials over moisture closed structure in a sheltered location but building in poor condition appropriate repairs / enabling works required prior to application
CB:CW:EWI:SMC:IMC:P:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	P	2	Medium	Moisture closed materials over moisture closed structure in a sheltered location but building in poor condition appropriate repairs / enabling works required prior to application
CB:CW:EWI:SMC:IMC:P:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	P	3	High	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMC:P:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	P	4	High	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMC:V:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	V	1	Medium	Moisture closed materials over moisture closed structure in a sheltered location but building in poor condition appropriate repairs / enabling works required prior to application
CB:CW:EWI:SMC:IMC:V:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	V	2	Medium	Moisture closed materials over moisture closed structure in a sheltered location but building in poor condition appropriate repairs / enabling works required prior to application
CB:CW:EWI:SMC:IMC:V:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	V	3	High	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMC:V:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	V	4	High	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMO:F:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	F	1	Medium	Moisture open materials can be used as a sheltered location, however appropriate repairs and enabling works are required prior to application.
CB:CW:EWI:SMC:IMO:F:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	F	2	Medium	Moisture open materials can be used as a sheltered location, however appropriate repairs and enabling works are required prior to application.
CB:CW:EWI:SMC:IMO:F:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	F	3	High	Moisture open materials are higher risk due to exposed location and the condition of the structure. Care is required to ensure appropriate repairs and enabling works are undertaken prior to application. A long term maintenance plan is required as the site has high exposure.
CB:CW:EWI:SMC:IMO:F:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	F	4	High	Moisture open materials are higher risk due to exposed location and the condition of the structure. Care is required to ensure appropriate repairs and enabling works are undertaken prior to application. A long term maintenance plan is required as the site has high exposure.
CB:CW:EWI:SMC:IMO:G:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	G	1	Low	Moisture open materials can be used safely as condition is good and sheltered location
CB:CW:EWI:SMC:IMO:G:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	G	2	Low	Moisture open materials can be used safely as condition is good and sheltered location
CB:CW:EWI:SMC:IMO:G:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	G	3	Medium	Moisture open materials can be used as condition is good and cavity nature of wall will remove moisture risk for internal environment however a long term maintenance plan is required as the site has high exposure.
CB:CW:EWI:SMC:IMO:G:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	G	4	Medium	Moisture open materials can be used as condition is good and cavity nature of wall will remove moisture risk for internal environment however a long term maintenance plan is required as the site has high exposure.
CB:CW:EWI:SMC:IMO:P:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	P	1	Medium	Moisture open materials can be used as a sheltered location, however appropriate repairs and enabling works are required prior to application.
CB:CW:EWI:SMC:IMO:P:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	P	2	Medium	Moisture open materials can be used as a sheltered location, however appropriate repairs and enabling works are required prior to application.
CB:CW:EWI:SMC:IMO:P:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	P	3	High	Moisture open materials are higher risk due to exposed location and the condition of the structure. Care is required to ensure appropriate repairs and enabling works are undertaken prior to application. A long term maintenance plan is required as the site has high exposure.
CB:CW:EWI:SMC:IMO:P:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	P	4	High	Moisture open materials are higher risk due to exposed location and the condition of the structure. Care is required to ensure appropriate repairs and enabling works are undertaken prior to application. A long term maintenance plan is required as the site has high exposure.
CB:CW:EWI:SMC:IMO:V:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	V	1	Medium	Moisture open materials can be used as a sheltered location, however appropriate repairs and enabling works are required prior to application.
CB:CW:EWI:SMC:IMO:V:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	V	2	Medium	Moisture open materials can be used as a sheltered location, however appropriate repairs and enabling works are required prior to application.
CB:CW:EWI:SMC:IMO:V:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	V	3	High	Moisture open materials are higher risk due to exposed location and the condition of the structure. Care is required to ensure appropriate repairs and enabling works are undertaken prior to application. A long term maintenance plan is required as the site has high exposure.
CB:CW:EWI:SMC:IMO:V:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	V	4	High	Moisture open materials are higher risk due to exposed location and the condition of the structure. Care is required to ensure appropriate repairs and enabling works are undertaken prior to application. A long term maintenance plan is required as the site has high exposure.
CB:CW:IWI:SMC:IMC:E:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	E	1	Low	Moisture closed materials inside moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:IWI:SMC:IMC:E:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	E	2	Low	Moisture closed materials inside moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:IWI:SMC:IMC:E:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	E	3	Medium	Moisture closed materials inside moisture closed structure in a good condition but the high exposure site requires that special care is taken to ensure detailing is correct to stop rain penetration.
CB:CW:IWI:SMC:IMC:E:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	E	4	Medium	Moisture closed materials inside moisture closed structure in a good condition but the high exposure site requires that special care is taken to ensure detailing is correct to stop rain penetration.
CB:CW:IWI:SMC:IMC:F:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	F	1	Low	Moisture closed materials inside moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:IWI:SMC:IMC:F:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	F	2	Low	Moisture closed materials inside moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:IWI:SMC:IMC:F:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	F	3	Medium	Moisture closed materials inside moisture closed structure in a good condition but the high exposure site requires that special care is taken to ensure detailing is correct to stop rain penetration.
CB:CW:IWI:SMC:IMC:F:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	F	4	Medium	Moisture closed materials inside moisture closed structure in a good condition but the high exposure site requires that special care is taken to ensure detailing is correct to stop rain penetration.
CB:CW:IWI:SMC:IMC:G:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	G	1	Low	Moisture open materials can be used safely as condition is good and sheltered location
CB:CW:IWI:SMC:IMC:G:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	G	2	Low	Moisture open materials can be used safely as condition is good and sheltered location
CB:CW:IWI:SMC:IMC:G:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	G	3	Medium	Moisture open materials can be used as condition is good however a long term maintenance plan for external condition is recommended as the site has high exposure.
CB:CW:IWI:SMC:IMC:G:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	G	4	Medium	Moisture open materials can be used as condition is good however a long term maintenance plan for external condition is recommended as the site has high exposure.
CB:CW:IWI:SMC:IMC:P:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	P	1	Medium	Moisture closed materials inside moisture closed structure in a sheltered location but building in poor condition appropriate external repairs required prior to application

GBC B2 Elemental Assembly > 1 v GF
Existing & Previous Interventions

Yes/No	New Build or Refurbishment Actions	Component Function	Component Material	Density	Thermal Conductivity	Thickness	Thickness	Thermal Resistance	size: width or thickness (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		**Suspended Ground Floor (SGF) Existing with previous intervention**	Choose from Drop Down List	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)	.					0.17				0.170				
No	Proposed	Internal decoration	Lacquer	1000	1	0.25	0.00025	0.000	1	1	100%	0.000				
No	Proposed	Internal finish	Hardwood flooring	700	0.180	25	0.025	0.139	1	1	100%	0.000				
No	Proposed	Internal lining/levelling	Gypsum fibreboard	1000	0.360	48	0.048	0.133	1	1	100%	0.000				
No	Proposed	Thermal Insulation	Mineral Wool, rock	24	0.038	100	0.1	2.632	1	1	100%	0.000				
Yes	Previous	Structure zone Thermal insulation	Mineral wool, rock	24	0.038	100	0.1	2.632	550	600	92%	2.412				
Yes	Existing	Floor boarding	Softwood	500	1	25	0.025	0.025	1	1	100%	0.025				
Yes	Existing	Structure Floor joists	Softwood	500	1	100	0.1	0.100	50	600	8%	0.008				
Yes	Existing	Resistance of Outside Surface (Rso)	Surface Resistivity					0.170	1	1	100%	0.170				
Yes	Existing	Ventilated air space	Air					0.230	1	1	100%	0.230				
Yes	Existing	Resistance of Outside Surface (Rso)	Surface Resistivity					0.170	1	1	100%	0.170				
Yes	Existing	Oversite	sand		2.000	50	0.05	0.025	1	1	100%	0.025				
Yes	Existing	Undisturbed sub soil	Clay		1.500	1000	1	0.667	1	1	100%	0.667				
Yes		Resistance of Outside Surface (Rso)	.		Proposed	1448.25		0.17				0.170				
			.		Previous	1448.25	1.45					4.047	0.247	0.25	-0.003	Pass
			.			Overall thickness mm	Overall thickness m					Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, PassU or Fail

GBC B2 Energy > Fuel Choice > In Use CO2 > In Use £ & By Element And Retrofit Scenarios



U Values To Watts To CO_2

Previous | © STBA 2021 developed by GBC and STBA | DP | Check | Assumed

							Temperature				Heat loss						
						Assumed											
No	Floor	Applicable	Scenarios	Elements	Calculated U value	Areas	External		Internal	Difference	Individual	Total	Area	Total Areas	Areas	Heat loss	Ratio:
					W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x
		No	Previous	Ground Bearing Solid Floor (GBSF)	5.882	0	0	-	17	17	0		0				
		No	Previous	Suspended Ground Floor (SGF)	0.711	0	0	-	17	17	0		0				
						0						0	Floor	0	0%	0.0%	0.00
							Temperature				Heat loss						
	Compartmentation	Applicable	Scenarios	Elements	Calculated U value	Areas	Party		Internal	Difference	Individual	Total	Area	Total Areas	Areas	Heat loss	Ratio:
					W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x
						Assumed											
Yes	Compartment Floor	Yes	Previous	Party Floor (PF)	0.158	72.13	17	-	17	0	0	0	72.13		24%	0%	0.00
No	Compartment Wall			Party Wall (PF):		Assumed											
		No	Previous	Solid Masonry Party Wall (SMPW)	0.000	0.00	17	-	17	0	0		0		0%		
		No	Previous	Cavity Masonry Party Wall (CMPW)	4.167	0.00	17	-	17	0	0	0	0		0%	0.0%	0.00
		Yes	Previous	Timber Frame Party Wall (TFPW)	0.086	0.00	17	-	17	0	0	0	0		0%		
						72.13						0	Compartmentation	72.13	24%	0.0%	0.00
						Assumed			Temperature			Heat loss					
Yes	Wall	Applicable	Scenarios	Elements	Calculated U value	Areas	External		Internal	Difference	Individual	Total	Area	Total Areas	Areas	Heat loss	Ratio:
				External Walls:	W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x
		Yes	Previous	Solid Masonry External Walls (SMEW)	0.247	98.09	0	-	17	17	412		98.09				
		No	Previous	Cavity Masonry External Walls (CMEW)	0.309	0.00	0	-	17	17	0		0				
						98.09						412	Wall	98.09	32%	32.5%	1.01
						Assumed			Temperature			Heat loss					
Yes	Roof	Applicable	Scenarios	Elements	Calculated U value	Areas	External		Internal	Difference	Individual	Total	Area	Total Areas	Areas	Heat loss	Ratio:
					W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x
		No	Previous	Flat Roof (FR)	2.045	0	0	-	17	17	0		0				
		Yes	Previous	Pitched Roof (PR)	0.113	128	0	-	17	17	247		128				
						128						247	Roof	128	42%	19.4%	0.46
							Temperature				Heat loss						
	Window/Door/Rooflight	Applicable	Scenarios	Elements	Calculated U value	Areas	External		Internal	Difference	Individual	Total	Area	Total Areas	Areas	Heat loss	Ratio:
					W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x
						Assumed											
Yes	Windows	Yes	Previous	Windows (W)	5.500	5.04	0	-	17	17	471	471	5.04	Window	1.7%	37.2%	22.50
						Assumed											
Yes	Doors	Yes	Previous	Glazed Pedestrian Doors (GPD)	4.500	1.80	0	-	17	17	138	138	1.8	Door	0.6%	10.9%	18.41
						6.84						609	Combined	6.8	2.2%	48.0%	21.42
												1,268	Total Envelop	305.1	100%	100.0%	1.00
												659	Opaque Envelop	298	98%	52.0%	0.53

Scenarios

Previous	Proposed 1	Improvement	Proposed 2	Improvement
Pasted values				
Set cell D4 to **'Previous'** then copy cells T26 to T98, paste > values	Set cell D4 to **'Proposed 1'** then review cells V26 to V98 in next column to right	Having set D4 in two columns to left, review differences below	Set cell D4 to **'Proposed 2'** then review cells V26 to V98 in next column to right	Having set D4 in two columns to left, review differences below
0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00
412.37	412.37	0.00	412.37	0.00
246.58	246.58	0.00	246.58	0.00
471.24	471.24	0.00	471.24	0.00
137.70	137.70	0.00	137.70	0.00
608.94	608.94	0.00	608.94	0.00
1267.89	1267.89	0.00	1267.89	0.00
658.95	658.95	0.00	658.95	0.00
Pasted values	Normal			

GBC B2 In Use Energy > CO2 > £ EE EC SC and Retrofit Scenarios Build Costs and Pay back Periods

Total Conduction Heat Loss

		Areas		Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors		Insulation
				N	Y	N	No		Yes	N				
Total	Total Envelope Area of Conducted Heat Loss (TEACHL)	305.1	m2	0	72	0	0	98	128	0			298	298
Window/Door/Rooflight	Total Transparent Area of Conducted Heat Loss (TTACHL)	6.8	m2								5.04	1.8	6.84	
Walls Roof Floor	Total Opaque Area of Conducted Heat Loss (TOACHL)	298.2	m2											
Window/Door/Rooflight	Transparent area as % of whole	2.29%	%	0%	24%	0%	0%	32%	42%	0%	1.7%	0.6%	100%	
Walls Roof Floor	Transparent area's heat loss as % of whole	48.03%	%								37.2%	10.9%		

Scenarios

Previous	Proposed 1	Improvement	Proposed 2	Improvement
Having set D4 to Previous, then copy cells T102 to T141, paste > values	Having set D4 to "Proposed 1", then review differences U102 to U141 in next column to right	Having set D4 to Previous, then review differences below	Having set D4 to "Proposed 2", then review differences W102 to W141 in next column to right	Having set D4 in two columns to left, review differences below
305.1	305.1	0.0	305.1	0.0
6.8	6.8	0.0	6.8	0.0
298.2	298.2	0.0	298.2	0.0
2.29%	2.29%	0%	2.29%	0.0
48.03%	48.03%	0%	48.03%	0.0

In-Use Energy

		%	0.0%	0.0%	0.0%	0.0%	32.5%	19.4%	0.0%	37.2%	10.9%	0	Previous	Proposed 1	Improvement	Proposed 2	Improvement
Floor area	305	m2	Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors	Insulation	305.1	305.1	0.0	305.1	0.0
Watts	1,268	W	0.00	0.00	0.00	0.00	412.37	246.58	0.00	471.24	137.70	0.00	1,267.9	1,267.9	0.0	1,267.9	0.0
KiloWatts	1.268	kW	0.00	0.00	0.00	0.00	0.41	0.25	0.00	0.47	0.14	0.00	1.3	1.3	0.0	1.3	0.0
kiloWattHours/day	20	kWh	0.00	0.00	0.00	0.00	6.60	3.95	0.00	7.54	2.20	0.00	20.3	20.3	0.0	20.3	0.0
KiloWatts/floor area	0.004	kW/m2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0
KiloWattHours/floor area	0.0665	kWh/m2	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.02	0.01	0.00	0.1	0.1	0.0	0.1	0.0
KiloWattHours/Floor area/year	161	kWh/m2/Year	0.00	0.00	0.00	0.00	52.48	31.38	0.00	59.98	17.53	0.00	161.4	161.4	0.0	161.4	0.0
KiloWattHours/Floor area/60 years	9,682	kWh/m2/Life	0.00	0.00	0.00	0.00	3,149.06	1,883.04	0.00	3,598.64	1,051.55	0.00	9,682.3	9,682.3	0.0	9,682.3	0.0

In-Use Carbon Dioxide

	CO_2	CarbonDioxide											Proposed 1	Proposed 1	Improvement	Proposed 2	Improvement
Fuel Choice	Mains Electricity	Drop Down List	Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors	Insulation	Mains Electricity	Mains Electricity		Mains Electricity	
CO_2	0.186	kg CO_2/kWh	0.00	0.00	0.00	0.00	0.06	0.04	0.00	0.07	0.02	0.00	0.186	0.186	0.0	0.186	0.0
kg CO2	3.773	kg CO_2	0.00	0.00	0.00	0.00	1.23	0.73	0.00	1.40	0.41	0.00	3.773	3.773	0.0	3.773	0.0
kg CO2/year	451.360	kg CO_2	0.00	0.00	0.00	0.00	146.80	87.78	0.00	167.76	49.02	0.00	451.360	451.360	0.0	451.360	0.0
kg CO2/whole life	27,081.60	kg CO_2	0.00	0.00	0.00	0.00	8,807.99	5,266.91	0.00	10,065.48	2,941.21	0.00	27,081.6	27,081.6	0.0	27,081.6	0.0
kg CO2/m2	1,151	kg CO_2/m^2	0.00	0.00	0.00	0.00	374.37	223.86	0.00	427.82	125.01	0.00	1,151.1	1,151.1	0.0	1,151.1	0.0

In-Use Hours to Whole Life

	h/d	h/d			% h/y	Proposed 1	Proposed 1	Improvement	Proposed 2	Improvement
Hours of operation per day (Spaces heated)	16	h/d	up to max	24	66.67%	16	16		16	
Days Per week (Spaces heated)	7	d/wk	up to max	7	100.00%	7	7		7	
Weeks per month (Spaces heated)	4.33	w/m	up to max	4.33		4.33	4.33	0.00	4.33	-4.33
Months per year (Spaces heated)	5	m/y	up to max	12	41.67%	5	5		5	
Weeks per year (Spaces heated)	21.67	w/y	up to max	52	41.67%	21.67	21.67	0.0	21.67	-21.7
Days per year	151.67	d/y	up to max	365	41.55%	151.67	151.67	0.0	151.67	-151.7
Hours per year (Spaces heated)	2,427	h/y	up to max	8,760	27.70%	2,426.67	2,426.67	0.00	2,426.67	-2,426.67
Number of years design life expectancy	60	y/l				60	60	0.0	60	-60.0
Hours per life	145,600	h/l	up to max	525,600	27.70%	145,600.00	145,600.00	0.00	145,600.00	-145,600.00

In-Use Costs

			%%%	%%%	%%%	%%%	%%%	%%%	%%%	%%%	%%%	Proposed 1	Proposed 1	Improvement	Proposed 2	Improvement
Fuel Choice	Mains Electricity		Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors	Insulation					
£ in-use costs/unit of fuel/hour	£0.16	£/kWh	£0.00	£0.00	£0.00	£0.00	£0.05	£0.03	£0.00	£0.06	£0.02	£0.00	£0.16	£0.16	£0.00	£0.16	£0.00
£ Unit cost of fuel x building consumption x hours/day	£3.27	£/d	£0.00	£0.00	£0.00	£0.00	£1.06	£0.64	£0.00	£1.21	£0.35	£0.00	£3.27	£3.27	£0.00	£3.27	£0.00
£ in-use costs/year	£495.36	£/y	£0.00	£0.00	£0.00	£0.00	£161.11	£96.34	£0.00	£184.11	£53.80	£0.00	£495.36	£495.36	£0.00	£495.36	£0.00
£ in-use costs/whole life	£29,721.39	£/l	£0.00	£0.00	£0.00	£0.00	£9,666.56	£5,780.31	£0.00	£11,046.62	£3,227.91	£0.00	£29,721.39	£29,721.39	£0.00	£29,721.39	£0.00

Embodied Energy to Sequestered Carbon

			%%%	%%%	%%%	%%%	%%%	%%%	%%%	%%%	%%%	Proposed 1	Proposed 1	Improvement	Proposed 2	Improvement
			Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors	Insulation					
Embodied Energy	1035.76	MJ	0.00	0.00	0.00	0.00	336.87	201.44	0.00	384.96	112.49	0.00	1035.76	1035.76	0.00	1035.76	0.00
Embodied Carbon	19663.56	kg CO2	0.00	0.00	0.00	0.00	6395.36	3824.23	0.00	7308.40	2135.57	0.00	19663.56	19663.56	0.00	19663.56	0.00
Sequestered Carbon	50340.20	kg CO2	0.00	0.00	0.00	0.00	16372.60	9790.32	0.00	18710.06	5467.23	0.00	50,340.20	50,340.20	0.00	50,340.20	0.00
Total Carbon	-30676.64	kg CO2	0.00	0.00	0.00	0.00	-9977.24	-5966.09	0.00	-11401.66	-3331.65	0.00	-30,676.64	-30,676.64	0.00	-30,676.64	0.00

Building Costs

			Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors	Insulation		Previous	Proposed 1	Improvement	Proposed 2	Improvement
£ costs of Building and elements	£16.00	£	£0.00	£0.00	£0.00	£0.00	£5.20	£3.11	£0.00	£5.95	£1.74	£0.00	%%%	£24.00	£24.00	£0.00	£16.00	£8.00
£ costs of building/m2	£0.05	£/m2	£0.00	£0.00	£0.00	£0.00	£0.02	£0.01	£0.00	£0.02	£0.01	£0.00	%%%	£0.09	£0.09	£0.00	£0.05	£0.04
£ costs of Building/year of life	£0.27	£/y	£0.00	£0.00	£0.00	£0.00	£0.09	£0.05	£0.00	£0.10	£0.03	£0.00	%%%	£0.40	£0.40	£0.00	£0.27	£0.13

Pay-back periods

	Secondary-element V Components																	
Windows	Components										Windows			Previous	Proposed 1	Improvement	Proposed 2	Improvement
Cost of Windows	£0.00	£/y									£0.00		%%%	£8.00	£25.68	-17.7	£0.00	8.0
Cost pay-back period	0.00	Years									£0.00		%%%	£0.00	£1.12	-1.1	£0.00	0.0
Energy pay-back period	#VALUE!	Years									#VALUE!		%%%	£0.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Carbon pay-back period	#VALUE!	Years									#VALUE!		%%%	£0.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Thermal Insulation			Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors	Insulation						
Cost of Thermal Insulation	£0.00	£/y	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	%%%	£0.00	£0.00	0.0	£0.00	0.0
Cost pay-back period	0.00	Years	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	%%%	£0.00	£0.43	-0.4	£0.00	0.0
Energy pay-back period	#VALUE!	Years	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	%%%	£0.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Carbon pay-back period	#VALUE!	Years	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	%%%	£0.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Whole Building			Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors	Insulation						
Cost of Building	£16.00	£/y	£0.00	£0.00	£0.00	£0.00	£5.20	£3.11	£0.00	£5.95	£1.74	£0.00	%%%	£24.00	£24.00	0.0	£16.00	8.0
Cost pay-back period		Years	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	%%%	£0.00	£0.00	0.0	£0.00	0.0
Energy pay-back period		Years	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	%%%	£0.00	£0.00	0.0	£0.00	0.0
Carbon pay-back period		Years	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	%%%	£0.00	£0.00	0.0	£0.00	0.0

Completed by GBC	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
To be completed by GBC user		Auto-filled	Choose		Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Review	Auto-filled	Auto-filled	Auto-filled	Review	Auto-filled

U Values To Watts To CO_2

Elements

Scenario: Proposed 2

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OR Check Actual

Scenarios:

	Element group	Applicable	Scenarios	Elements	Calculated U value W/m2.K	Areas m2	External / Party degree C		Internal degree C	Difference degree C	Individual heat loss W	Total heat loss W	Area m2	Total Areas m2	Areas %	Heat loss %	Ratio: 1 in x
Yes	**Floor**					Actual											
		No	Proposed 2	Ground Bearing Solid Floor (GBSF)	0.461	0	0	-	17	17	0		0				
		Yes	Proposed 2	Suspended Ground Floor (SGF)	0.223	40	0	-	17	17	152		40				
						40						152	Floor	40	36%	32.9%	0.92
	Compartmentation																
No	Compartment Floor	No	Proposed 2	Party Floor (PF)	0.244	Assumed 0	17	-	17	0	0	0	0		0%	0%	0.00
Yes	Compartment Wall			Party Wall (PF):		Assumed											
		No	Proposed 2	Solid Masonry Party Wall (SMPW)	0.000	0.00	17	-	17	0	0		0		0%		
		No	Proposed 2	Cavity Masonry Party Wall (CMPW)	5.882	0.00	17	-	17	0	0		0		0%	0.0%	0.00
		Yes	Proposed 2	Timber Frame Party Wall (TFPW)	0.075	15.79	17	-	17	0	0	0	15.79		14%	0.0%	0.00
						15.79						0	Compartmentation	15.79	14%	0.0%	0.00
Yes	**Wall**			External Walls:		Actual											
		Yes	Proposed 2	Solid Masonry External Walls (SMEW)	0.176	50.00	0	-	17	17	149		50				
		No	Proposed 2	Cavity Masonry External Walls (CMEW)	5.882	0.00	0	-	17	17	0		0				
						50.00						149	Wall	50	45%	32.3%	0.72
No	**Roof**					Assumed											
		No	Proposed 2	Flat Roof (FR)	0.107	0	0	-	17	17	0		0				
		No	Proposed 2	Pitched Roof (PR)	#VALUE!	0	0	-	17	17	0		0				
						0						0	Roof	0	0%	0.0%	0.00
	Window/Door/Rooflight																
Yes	Windows	Yes	Proposed 2	Windows (W)	1.600	Assumed 4.11	0	-	17	17	112	112	4.11	Window	3.7%	24.2%	6.58
Yes	Doors	Yes	Proposed 2	Glazed Pedestrian Doors (GPD)	1.600	Assumed 1.80	0	-	17	17	49	49	1.8	Door	1.6%	10.6%	6.58
						5.91						161	Combined	5.9	5.3%	34.8%	6.58
												462	Total Envelop	111.7	100%	100.0%	1.00
												301	Opaque Envelop	106	95%	65.2%	0.69

Scenarios

	Previous	Proposed 1	Improvement	Proposed 2	Improvement	To be completed by GBC user	Completed by GBC
	Pasted values					Auto-filled / Choose	Yes
	Set cell D4 to **'Previous'** then copy cells T26 to T99, paste > values	Set cell D4 to **'Proposed 1'** then review cells V26 to V99 in next column to right	Having set D4 in two columns to left, review differences below	Set cell D4 to **'Proposed 2'** then review cells V26 to V99 in next column to right	Having set D4 in two columns to left, review differences below	Check / Interact	Yes
Floor	151.86	151.86	0.00	151.86	0.00	Review	Yes
Party Floor	0.00	0.00	0.00	0.00	0.00	Auto-filled	Yes
Cavity Masonry Party Wall	0.00	0.00	0.00	0.00	0.00	Auto-filled	Yes
Timber Frame Party Wall	0.00	0.00	0.00	0.00	0.00	Auto-filled	Yes
Compartmentation	0.00	0.00	0.00	0.00	0.00	Review	Yes
Wall	149.18	149.18	0.00	149.18	0.00	Review	Yes
Roof	0.00	0.00	0.00	0.00	0.00	Review	Yes
Windows	111.79	111.79	0.00	111.79	0.00	Review	Yes
Doors	48.96	48.96	0.00	48.96	0.00	Review	Yes
Combined	160.75	160.75	0.00	160.75	0.00	Review	Yes
Total Envelop	461.79	461.79	0.00	461.79	0.00	Review	Yes
Opaque Envelop	301.04	301.04	0.00	301.04	0.00	Review	Yes
	Pasted values	Normal				Choose	Yes

Total Conduction Heat Loss

		Areas		Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors		Insulation: ignore undeveloped yet
				No	No	Yes	Yes	Yes	No	No	Yes	Yes		
Total	Total Envelope Area of Conducted Heat Loss (TEACHL)	111.7	m2	0	0	0	40	50	0	0			90	90
Window/Door/Rooflight	Total Transparent Area of Conducted Heat Loss (TTACHL)	5.9	m2								4.11	1.8	5.91	
Walls Roof Floor	Total Opaque Area of Conducted Heat Loss (TOACHL)	105.8	m2											
Window/Door/Rooflight	Transparent area as % of whole	5.59%	%	0%	0%	0%	36%	45%	0%	0%	3.7%	1.6%	86%	
Walls Roof Floor	Transparent area's heat loss as % of whole heat loss	34.81%	%								24.2%	10.6%		

Scenarios	Previous	Proposed 1	Improvement	Proposed 2	Improvement		
	Set cell D4 to **'Previous'** then copy cells T104 to T151, paste > values	Set D4 to **'Proposed 1'** then review cells U104 to U151 in next column to right	Having set D4 in two columns to left, review differences below	Set D4 to **'Proposed 2'** then review cells W104 to W151 in next column to right	Having set D4 in two columns to left, review differences below	Interact	Yes
TEACHL	£111.70	£111.70	£0.00	£111.70	£0.00	Review	Yes
TTACHL	£5.91	£5.91	£0.00	£5.91	£0.00	Review	Yes
TOACHL	£105.79	£105.79	£0.00	£105.79	£0.00	Review	Yes
Transparent area as % of whole	£0.06	£0.06	£0.00	£0.06	£0.00	Review	Yes
Transparent area's heat loss as %	£0.35	£0.35	£0.00	£0.35	£0.00	Review	Yes

In-Use Energy

				Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors	Insulation: ignore undeveloped yet
			%	0.0%	0.0%	0.0%	32.9%	32.3%	0.0%	0.0%	24.2%	10.6%	0
	Floor area	36.270	m2										
	Watts	461.790	W	0.00	0.00	0.00	151.86	149.18	0.00	0.00	111.79	48.96	0.00
	KiloWatts	0.462	kW	0.00	0.00	0.00	0.15	0.15	0.00	0.00	0.11	0.05	0.00
	KiloWatts/floor area	0.013	kW/m2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy Intensity	KiloWattHours/floor area	0.204	kWh/m2	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.05	0.02	0.00
	KiloWattHours/Day	7.389	kWh/Day	0.00	0.00	0.00	2.43	2.39	0.00	0.00	1.79	0.78	0.00
	KiloWattHours/Floor area/Day	0.204	kWh/m2/Day	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.05	0.02	0.00
	KiloWattHours/Floor area/Year	30.896	kWh/m2/Year	0.00	0.00	0.00	10.16	9.98	0.00	0.00	7.48	3.28	0.00
	KiloWattHours/Floor area/Whole life	865.097	kWh/m2/Life	0.00	0.00	0.00	284.49	279.46	0.00	0.00	209.43	91.72	0.00

	Previous	Proposed 1	Improvement	Proposed 2	Improvement		
						Check	Yes
Floor area	36.270	36.270	0.000	36.270	0.000	Review	Yes
Watts	461.790	461.790	0.000	461.790	0.000	Review	Yes
KiloWatts	0.462	0.462	0.000	0.462	0.000	Review	Yes
KiloWatts/floor area	0.013	0.013	0.000	0.013	0.000	Review	Yes
KiloWattHours/floor area	0.204	0.204	0.000	0.204	0.000	Review	Yes
KiloWattHours/Day	7.389	7.389	0.000	7.389	0.000	Review	Yes
KiloWattHours/Floor area/Day	0.204	0.204	0.000	0.204	0.000	Review	Yes
KiloWattHours/Floor area/Year	30.896	30.896	0.000	30.896	0.000	Review	Yes
KiloWattHours/Floor area/Whole life	865.097	865.097	0.000	865.097	0.000	Review	Yes

In-Use Carbon Dioxide

		CO_2	CarbonDioxide	Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors	Insulation: ignore undeveloped yet
	Fuel Choice	Mains Electricity	Drop Down List										
	kg CO_2/kWh	0.186	kg CO_2/kWh	0.00	0.00	0.00	0.06	0.06	0.00	0.00	0.05	0.02	0.00
	kg CO2	1.374	kg CO_2	0.00	0.00	0.00	0.45	0.44	0.00	0.00	0.33	0.15	0.00
	kg CO2/year	3,334.93	kg CO_2/Year	0.00	0.00	0.00	1,096.70	1,077.32	0.00	0.00	807.33	353.58	0.00
	kg CO2/whole life	93,378.145	kg CO_2/Life	0.00	0.00	0.00	30,707.64	30,164.95	0.00	0.00	22,605.38	9,900.17	0.00
Embodied Carbon intensity	kg CO2/m2	153.508	kg CO_2/m²	0.00	0.00	0.00	50.48	49.59	0.00	0.00	37.16	16.28	0.00

	Previous	Proposed 1	Improvement	Proposed 2	Improvement		
Fuel Choice	Mains Electricity	Mains Electricity		Mains Electricity		Choose	Yes
kg CO_2/kWh	0.19	0.19	0.00	0.19	0.00	Review	Yes
kg CO2	1.37	1.37	0.00	1.37	0.00	Review	Yes
kg CO2/year	3,334.93	3,334.93	0.00	3,334.93	0.00	Review	Yes
kg CO2/whole life	93,378.14	93,378.14	0.00	93,378.14	0.00	Review	Yes
kg CO2/m2	153.51	153.51	0.00	153.51	0.00	Review	Yes

In-Use Hours to Whole Life

	No.	Unit/Unit	up to max	% of max	Start date	End date
Hours of operation per day (Spaces heated)	16	h/d	24	66.67%		
Days Per week (Spaces heated)	7	d/wk	7	100.00%		
Weeks per month (Spaces heated)	4.33	w/m	4.33			
Months per year (Spaces heated)	5	m/y	12	41.67%		
Weeks per year (Spaces heated)	21.67	w/y	52	41.67%		
Days per year	151.67	d/y	365	41.55%		
Hours per year (Spaces heated)	2,427	h/y	8,760	27.70%		
Number of years design life expectancy	28	y/l			2022	2050
Hours per building life	67,947	h/l	245,280	27.70%		

	Previous	Proposed 1	Improvement	Proposed 2	Improvement		
Hours of operation per day	16	16		16		Yes	Yes
Days Per week	7	7		7		Yes	Yes
Weeks per month	4.33	4.33	0.00	4.33	-4.33	Review	Yes
Months per year	5	5		5		Yes	Yes
Weeks per year	21.67	21.67	0.0	21.67	-21.7	Review	Yes
Days per year	151.67	151.67	0.0	151.67	-151.7	Review	Yes
Hours per year	2,427	2,427	0	2,427	-2,427	Review	Yes
Number of years design life expectancy	28	28	0.0	28	-28.0	Review	Yes
Hours per building life	67,947	67,947	0	67,947	-67,947	Review	Yes

In-Use Running Costs

				Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors	Insulation: ignore undeveloped yet
					%%%	%%%	%%%	%%%	%%%	%%%	%%%	%%%	%%%
	Fuel Choice	Mains Electricity											
	£ in-use costs/unit of fuel/hour	£0.16	£/kWh	£0.00	£0.00	£0.00	£0.05	£0.05	£0.00	£0.00	£0.04	£0.02	£0.00
£ in-use costs/day	£ Unit cost of fuel x building consumption x hours/day	£1.19	£/d	£0.00	£0.00	£0.00	£0.39	£0.38	£0.00	£0.00	£0.29	£0.13	£0.00
	£ in-use costs/year	£180.42	£/y	£0.00	£0.00	£0.00	£59.33	£58.28	£0.00	£0.00	£43.68	£19.13	£0.00
	£ in-use costs/whole life	£5,051.71	£/l	£0.00	£0.00	£0.00	£1,661.27	£1,631.91	£0.00	£0.00	£1,222.94	£535.59	£0.00
					%%%	%%%	%%%	%%%	%%%	%%%	%%%	%%%	%%%

	Previous	Proposed 1	Improvement	Proposed 2	Improvement		
£ in-use costs/unit of fuel/hour	£0.16	£0.16	£0.00	£0.16	£0.00	Review	Yes
£ in-use costs/day	£1.19	£1.19	£0.00	£1.19	£0.00	Review	Yes
£ in-use costs/year	£180.42	£180.42	£0.00	£180.42	£0.00	Review	Yes
£ in-use costs/whole life	£5,051.71	£5,051.71	£0.00	£5,051.71	£0.00	Review	Yes

Embodied Energy to Sequestered Carbon

				Basement	Party floor	Party wall	Floor	Wall	Roof	Ceiling	Windows	Doors	Insulation: ignore undeveloped yet
	Embodied Energy	1,818.78	MJ		749.61	224.35	363.14	476.16	0.00		2.77	2.74	0.00
Embodied Carbon Dioxide	Embodied Carbon Dioxide	2,719.71	kg CO2		1,044.82	483.51	424.18	751.01	0.00		0.00	2,719.71	0.00
	Sequestered Carbon Dioxide	51,908.58	kg CO2		24,663.60	6,088.62	11,854.88	8,800.00	0.00		246.60	254.88	0.00
Total Carbon Dioxide	Total Carbon Dioxide	-49,188.88	kg CO2		-23,618.78	-5,605.11	-11,430.70	-8,048.99	0.00		-246.60	-238.70	0.00

	Previous	Proposed 1	Improvement	Proposed 2	Improvement		
Embodied Energy	1818.78	1818.78	0.00	1818.78	0.00	Review	Yes
Embodied Carbon Dioxide	2719.71	2719.71	0.00	2719.71	0.00	Review	Yes
Sequestered Carbon Dioxide	51,908.58	51,908.58	0.00	51,908.58	0.00	Review	Yes
Total Carbon Dioxide	-49,188.88	-49,188.88	0.00	-49,188.88	0.00	Review	Yes

Hidden rows awaiting development

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Green Building Calculator

https://GreenBuildingCalculator.uk

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