

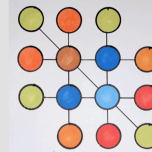


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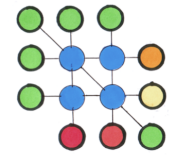
Green Retrofit Calculator

<https://GreenBuildingCalculator.uk>



Green Building Calculator

<https://GreenBuildingCalculator.uk>



Green Retrofit Calculator

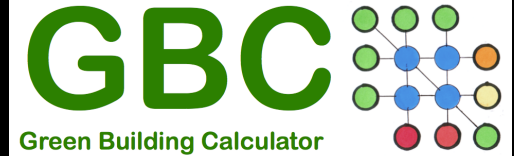
The screenshot displays a complex software interface with multiple data tables and charts. Key sections include:

- U Values To Watts To CO₂**: A table listing building elements like walls, roofs, and floors with their U-values and associated energy and CO₂ metrics.
- Scenarios**: A table comparing different retrofit scenarios (e.g., Scenario 1, Scenario 2) across various metrics.
- Total Conduction Heat Loss**: A summary table of heat loss for different building components.
- In-Use Energy**: A table showing energy consumption for different building systems.
- Carbon Emissions**: A table detailing CO₂ emissions from different sources.
- In-Use Hours to Whole Life**: A table showing the relationship between in-use energy and whole-life energy.
- In-Use Running Costs**: A table showing the operational costs of different building systems.
- Embodied Energy to Sequestered Carbon**: A table showing the carbon footprint of building materials and the potential for carbon sequestration.

© NGS GBE GBC GRC 2011-2023
 BrianSpecMan Murphy GBC Number-Cruncher
 Caroe CPD 13th April 2023
 with added text slides after the event



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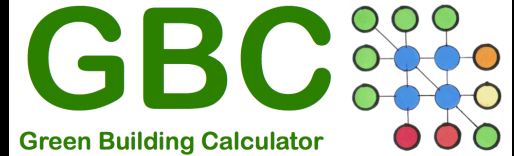
<https://GreenBuildingCalculator.uk>

This Presentation on GBE/GBC:

- Find this file on GBE or GBC websites at:
- https://GreenBuildingEncyclopaedia.uk/?p=____
- <https://GreenBuildingCalculator.uk/?p=2030>
- Go there for:
 - the latest update
 - versions presented to different audiences
 - the whole presentation, all of the hidden slides
 - other file formats:
 - Handout, Show, PDF, PPTX
 - Links to related: GBE & GBC CPD & other content



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<https://GreenBuildingCalculator.uk>

BrianSpecMan Murphy

- **ONC & HNC Construction**
- **BSc Degree Architecture (Honours)**
- **PG Diploma Architecture (Distinction)**
- **Technician and Architect by training**
- **Specification Writer by choice**
- **Environmentalist by action**
- **Educator by calling**
- **Carbon Counter by necessity**
- **Building Tour Guide for Fun**
- **46 Years of experience in construction**
- **40 years in specification**
- **24 years in environmental**
- **16 years in Education**
- **12 years building carbon calculators**

What did you do during COVID?

- I combined 2 whole-building calculators
 - In-use energy and carbon
 - Embodied energy and carbon
 - Originally created for 5th year Architecture module
 - Built in Bill of Quantities to carryout:
 - Green cost planning
 - Collecting sub-contract pricing
 - Tenders
 - Intelligent value engineering not just dumb cost cutting
- Added much more to make a design and decision tool
- I made Green Building Calculator
 - (GBC V2 April 2022 preview at Futurebuild '22 London)
- Finalising Green Retrofit Calculator
 - (GRC V1 April 2023 preview at Futurebuild '22 & '23)

Element	Applicable Yes/No	Elements	U value W/m2.K	Element Area			Elements No.	Areas m2	Temperature difference		Individual Heat loss W	Sub total Heat loss W	Total Floor area m2
				Length m	Width m	Height m			External degree C	Internal degree C			
Basement	Yes	Basement retaining floor	0.1	5	6	1	30	11	20	27.00		30	
	Yes	Basement perimeter retaining wall	0.1	22		2.5	55	11	20	0.00			
	Yes	Basement partition	1	3		2.5	7.5	20	20	0.00			
	Yes	Glazed pavement	0.5	5	1	1	5	0	20	0.00			
Floor				Length	Width	Height	No.	Areas	External	Internal	Heat loss	27.00	Basement 1%
	Yes	Ground bearing floor	0.1	4	4		1	16	11	20	14.40		16
	Yes	Upper internal floor	1	4	4		1	16	20	20	0.00		16
	Yes	Floor suspended over air	0.1	4	4		1	16	0	20	32.00		16
	Yes	Compartment party floor	0.1	4	4		1	16	0	20	32.00		16
Wall				Length		Height	No.	Areas	External	Internal	Heat loss	78.40	Floor 3%
	Yes	External wall	0.1	16		3.5	1	56	0	20	112.00		
	Yes	External glazed wall	0.75	16		3.5	1	56	0	20	840.00		
	Yes	External subterranean wall	0.1	16		3.5	1	56	11	20	50.40		
	Yes	Compartment Party wall	0.1	4		3.5	1	14	0	20	28.00		
	Yes	Compartment Communal wall	0.1	4		3.5	1	14	0	20	28.00		
	Yes	Integral unheated space to Internal room	0.1	1		3.5	1	3.5	0	20	7.00		
	Yes	Internal partition	1	3		3.5	1	10.5	20	20	0.00		
Roof				Length	Width	Height	No.	Areas	External	Internal	Heat loss	1065.40	Wall 45%
	Yes	Pitched Roof	0.1	4	4	2	1	24	0	20	32.00		
	Yes	Barrel vault roof	0.1	4	4	2	1	24	0	20	32.00		
	Yes	Flat Roof	0.1	4	4		1	16	0	20	32.00		
	Yes	Shallow roof	0.1	4	4	1	1	12	0	20	32.00		
	Yes	Subterranean flat roof	0.1	4	4		1	16	11	20	14.40		
	Yes	Glazed Roof	0.75	4	4	1	1	12	0	20	240.00		
Window/Door/Rooflight				Width	Height	No.	Areas	External	Internal	Heat loss	382.40	Roof 16%	
	Yes	Windows	0.75	1	1	20	20	0	20	300.00			
	Yes	Doors	0.75	2	2.1	5	21	0	20	315.00			
	Yes	Rooflights	1	1	1	5	5	0	20	100.00			
	Yes	Roof windows	1	1	1	5	5	0	20	100.00			
											815.00	Window/Door/Rooflight 34%	

Total Conduction Heat Loss (TCHL)	2369.200	Watts	94.2	Watts	2369.200	Watts	94.2	Watts	2369.200	Watts	94.2	Watts	2369.200
	368	KiloWatts	0.7	KiloWatts	368	KiloWatts	0.7	KiloWatts	368	KiloWatts	0.7	KiloWatts	368
	946	KiloWatts	10.4	KiloWatts	946	KiloWatts	10.4	KiloWatts	946	KiloWatts	10.4	KiloWatts	946
	0.025	KiloWatts/floor area	CarbonDioxide	0.025	KiloWatts/floor area	CarbonDioxide	0.025	KiloWatts/floor area	0.025	KiloWatts/floor area	CarbonDioxide	0.025	KiloWatts/floor area
	0.202	KWh/m2	Fuel conversion	0.202	KWh/m2	Fuel conversion	0.202	KWh/m2	0.202	KWh/m2	Fuel conversion	0.202	KWh/m2
Hours of operation/day	8												

In Use Energy and Carbon Embodied Energy and Carbon

Building Elements	Area	U Value	Volume	Weight	Embodied Energy	Embodied Carbon	Operational Energy	Operational Carbon	Total Carbon
Basement retaining floor	30	0.1	180	180000	180000	180000	27.00	27.00	180000
Basement perimeter retaining wall	55	0.1	137.5	1375000	1375000	1375000	0.00	0.00	1375000
Basement partition	7.5	1	18.75	187500	187500	187500	0.00	0.00	187500
Glazed pavement	5	0.5	25	250000	250000	250000	0.00	0.00	250000
Ground bearing floor	16	0.1	96	960000	960000	960000	14.40	14.40	960000
Upper internal floor	16	1	144	1440000	1440000	1440000	0.00	0.00	1440000
Floor suspended over air	16	0.1	96	960000	960000	960000	32.00	32.00	960000
Compartment party floor	16	0.1	96	960000	960000	960000	32.00	32.00	960000
External wall	56	0.1	336	3360000	3360000	3360000	112.00	112.00	3360000
External glazed wall	56	0.75	280	2800000	2800000	2800000	840.00	840.00	2800000
External subterranean wall	56	0.1	336	3360000	3360000	3360000	50.40	50.40	3360000
Compartment Party wall	14	0.1	84	840000	840000	840000	28.00	28.00	840000
Compartment Communal wall	14	0.1	84	840000	840000	840000	28.00	28.00	840000
Integral unheated space to Internal room	3.5	0.1	21	210000	210000	210000	7.00	7.00	210000
Internal partition	10.5	1	84	840000	840000	840000	0.00	0.00	840000
Pitched Roof	24	0.1	144	1440000	1440000	1440000	32.00	32.00	1440000
Barrel vault roof	24	0.1	144	1440000	1440000	1440000	32.00	32.00	1440000
Flat Roof	16	0.1	96	960000	960000	960000	32.00	32.00	960000
Shallow roof	12	0.1	72	720000	720000	720000	32.00	32.00	720000
Subterranean flat roof	16	0.1	96	960000	960000	960000	14.40	14.40	960000
Glazed Roof	12	0.75	108	1080000	1080000	1080000	240.00	240.00	1080000
Windows	20	0.75	150	1500000	1500000	1500000	300.00	300.00	1500000
Doors	21	0.75	157.5	1575000	1575000	1575000	315.00	315.00	1575000
Rooflights	5	1	35	350000	350000	350000	100.00	100.00	350000
Roof windows	5	1	35	350000	350000	350000	100.00	100.00	350000

In the context of fiduciary rules

Profits > People > Planet

∨

HERACEY™ =

Healthy Environmental

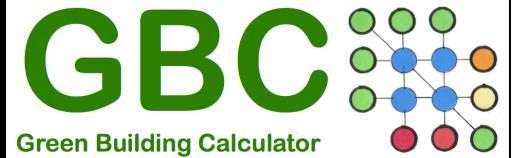
Resourceful Appropriate

Competent Effective Yardstick

=Sustainability



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Green Building Calculator

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Green Building Calculator Version 2

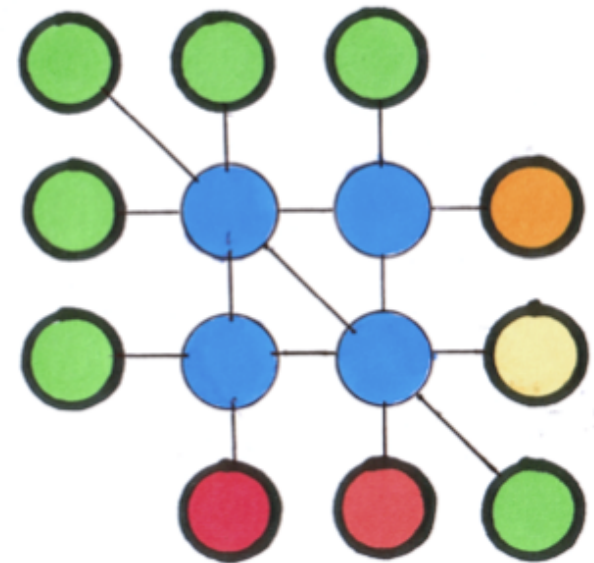
GBC V2

Green Retrofit Calculator Version 1

GRC V1

GBC

Green Building Calculator



<https://GreenBuildingCalculator.uk>

GBC Version 2 went live 20/04/22

GRC Version 1 to go live April '23

U Value To Watts To CO2

Yes

?

User name: **BrianSpecMan did this**

Element	Applicable Yes/No	Elements	U value W/m2.K	Areas m2	Temperature			Heat loss		Floor area m2	Total Areas m2	Areas %
					External degree C	Internal degree C	Difference degree C	Individual W	Total W			
Basement	Yes	Basement retaining floor	0.081947	300	11	- 15	4	98		300		
	Yes	Swimming Pool Basin	0.070865	1448	11	- 15	4	410		1448		
	Yes	Basement perimeter retaining wall	0.251202	175	11	- 15	4	176				
	Yes	Basement roof at site level	0.044126	300	11	- 15	4	53				
	Yes	Basement roof at subterranean level	0.084891	300	11	- 15	4	102				
	Yes	Basement partition	0.203282	125	20	- 15	-5	-127				
	Yes	Glazed pavement over basement	2	11	11	- 15	4	88				
				2859	External	Internal		Heat loss	800	Basement	1748	21% Area %
Floor	Yes	Ground bearing floor	0.090185	300	11	- 20	9	243		300		4.1% Heat loss %
	Yes	Ground floor over ventilated void	0.056933	300	11	- 20	9	154		300		
	Yes	Floor over basement	0.052365	300	11	- 20	9	141		300		
	Yes	Upper internal floor	0.052867	600	20	- 20	0	0		600		
	Yes	Floor suspended ceiling	0.058544	600	0	- 20	20	703		600		
	Yes	Ground floor	0.02217	90	0	- 20	20	95		90		0.32 Ratio: 1 to
	Yes	Party wall	0.02217	90	0	- 20	20	952		900		37% Area %
Wall	Yes	External wall	0.16425	455	0	- 20	20	585		455		11.8% Heat loss %
	Yes	Party wall	0.02217	175	0	- 20	20	2,835		175		
	Yes	Spaced Curtain wall	0.02217	20	0	- 20	20	800		20		
	Yes	Compartment Party wall	0.125493	525	0	- 20	20	1,318		525		
	Yes	Compartment Communal wall	0.125525	65	0	- 20	20	163		65		1.95 Ratio: 1 to
	Yes	Internal Partition/Wall	0.203282	25	20	- 20	0	0		25		15% Area %
Roof & Ceilings				1265	External	Internal		Heat loss	5,701	Wall	1265	29.5% Heat loss %
	Yes	Pitched Roof	0.069461	632.5	0	- 20	20	879		632.5		
	Yes	Barrel vault roof	0.06784	471.3	0	- 20	20	813		471.3		
	Yes	Flat roof	0.0915	300	0	- 20	20	237		300		
	Yes	Flat roof	0.06596	300	0	- 20	20	518		300		
	Yes	Flat ceiling	0.066789	300	0	- 20	20	521		300		0.84 Ratio: 1 to
	Yes	Glazed Roof	2	25	0	- 20	20	1,000		25		24% Area %
Window/Door/Rooflight				2029	External	Internal		Heat loss	3,967	Roof	2028.8	20.5% Heat loss %
	Yes	Windows	0.8	50	0	- 20	20	800		50		
	Yes	Glazed Pedestrian Doors	0.79	10.5	0	- 20	20	166		10.5		
				25	0	- 20	20	375		25		
				10	0	- 20	20	162		10		
				45	0	- 20	20	1,800		45		
				20	0	- 20	20	800		20		
				12	0	- 20	20	480		12		
				25	0	- 20	20	1,000		25		12.78 Ratio: 1 to
				25	0	- 20	20	1,000		25		2.7% Area %
				223				6,583		Window/Door/Rooflight	223	34.0% Heat loss %
				9043				19,339		Total	8354	100% Area %
				223				6,583		Total	8354	100.0% Heat loss %

GBC Green Building Calculator
 GRC Green Retrofit Calculator
 Create Greener Buildings

- GBC Green Building Calculator Buy now
- GRC Green Retrofit Calculator PENDING
- Schedule a CPD Seminar, meeting or call

Total areas	9043
Total glazed areas	223
Total areas minus glazed areas	8820
Glazed areas % of Total areas	2.5%

Total Conduction Heat Loss (TCHL)

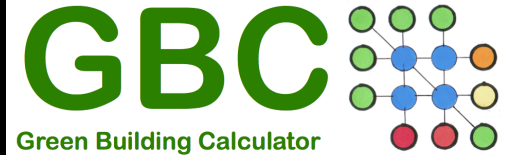
In Use Carbon

Hours of operation/day: **8**

TCHL	Floor area	4,838	m2	Biomass	Fuel
	Watts	19,339	W	0.025	conversion
	KiloWatts	19	kW	0.060	kg CO2
	kiloWattHours	2.4	kWh		
	KiloWatts/floor area	0.004	kW/m2	CarbonDioxide	CO2
	KiloWattHours/floor area	0.0005	kWh/m2	0.00001	kg CO2/m2



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<https://GreenBuildingCalculator.uk>

U Value To Watts To CO2													
User name: BrianSpecMan did this													
Element	Applicable	Elements	U value W/m2 K	Areas m2	Temperature			Heat loss		Floor area m2	Total Areas m2	Areas %	
					External degree C	Internal degree C	Difference degree C	Individual W	Total W				
Basement													
Yes	No	Basement retaining floor	0.0815663	300	11	-15	4	98		300			
Yes	No	Swimming Pool Basin	0.076865	1448	11	-15	4	410		1448			
Yes	No	Basement perimeter retaining wall	0.2512023	175	11	-15	4	176					
Yes	No	Basement roof at site level	0.044126	300	11	-15	4	53					
Yes	No	Basement roof at subterranean level	0.0848912	300	11	-15	4	102					
Yes	No	Basement partition	0.2032824	125	20	-15	-5	-127					
Yes	No	Glazed pavement over basement	2	11	11	-15	4	88					
Floor													
Yes	No	Ground bearing floor	0.0901849	300	11	-20	9	243	800	300	1748	21%	
Yes	No	Ground floor over ventilated void	0.0869331	300	11	-20	9	154					
Yes	No	Floor over basement	0.0528647	30	20	0	0	0					
Yes	No	Upper internal floor	0.0528671	60	20	0	0	0					
Yes	No	Floor suspended over air	0.0585441	60	0	-20	20	703					
Yes	No	Internal floor	0.0528671	9	0	0	0	9					
Yes	No	Internal floor	0.0528755	90	0	0	0	95					
Yes	No	External wall	0.0642495	40	0	-20	20	56	2,288			11%	
Yes	No	External wall	0.81	1	0	-20	20	2,05					
Yes	No	Opaque Curtain wall	2	2	0	-20	20	80					
Yes	No	Compartment Part	0.125493	52	0	-20	20	1,37					
Yes	No	Compartment Part	0.125493	61	0	-20	20	1,57					
Yes	No	Partition Wall	0.2032824	2	0	-20	20	81					
Roofs													
Yes	No	Pitched Roof	0.0934608	632.5	0	-20	20	879	5,701	632.5	2028.8	24%	
Yes	No	Barns vault roof	0.0852835	471.3	0	-20	20	813					
Yes	No	Fiat Roof	0.0394568	300	0	-20	20	237					
Yes	No	Shallow roof	0.0852884	300	0	-20	20	518					
Yes	No	Fiat ceiling	0.0897887	300	0	-20	20	521					
Yes	No	Glazed Roof	2	25	0	-20	20	1,000					
Window/Door/Rooflight													
Yes	No	Windows	0.8	50	0	-20	20	800	3,967			20.5%	
Yes	No	Glazed Pedestrian Doors	0.79	10.5	0	-20	20	166					
Yes	No	Rooflights	0.75	25	0	-20	20	375					
Yes	No	Roof windows	0.81	10	0	-20	20	162					
Yes	No	Vehicle access/Large	2	45	0	-20	20	1,800					
Yes	No	Lift usage entrance	2	20	0	-20	20	800					
Yes	No	Roof Pedestrian	0.8	12	0	-20	20	96					
Yes	No	Roof Pedestrian	0.8	25	0	-20	20	160					
Yes	No	Roof Pedestrian	2	25	0	-20	20	1,000					
Summary													
Total areas									19			100.0%	
Total heat loss									354			100.0%	
Total heat loss									19			100.0%	
In Use Carbon													
Hours of operation/day			8										
KiloWattHours			2.4			kWh			0.060			kg CO2	
KiloWatts/floor area			0.004			kW/m2			CarbonDioxide			CO2	
KiloWattHours/floor area			0.0005			kWh/m2			0.00001			kg CO2/m2	
KiloWattHours/Floor area annum						kWh/m2/Year							

Green Building Calculator

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

I am coming at this problem:

- Technician and Architect by training
- Specification Writer by choice (40 years)
- Side-line frustrated spectator
- Observer of projects going wrong:
 - Briefing batters dropped at each interchange
 - Because of bad cost planning and layers of procurement complications
 - Lack of joined up management of it all
 - Loss of scrutiny of competency of anything

I don't want:

- **A building Performance Gap**
 - Started by philosophical, aesthetics and snappy-graphics education
 - Educational Aspiration: Awareness v Industry needs: Competency
 - Little or no technical, physics, science, numeracy, environmental education
 - Increasingly challenging Legislation Regulation Interpretation and Administration
 - Regulatory Tsunami just appearing over the horizon: Post-Grenfell Competency imperative
 - RIBA-discouraged and shrinking supervision role
 - Insurance encouraged “don't approve anything”
 - Evolves into vulnerable technical design
 - Invited by “Or Similar” annotation of drawings (“Or Equivalent” is safer in the Specification)
 - Undermined by substitution and surreptitious substitution
 - Brought on by inadequate tender leading to bread and butter contracts
 - Manipulated by main contractor Dutch bargaining with sub-contractors
 - Lubricated by power over supply chain
 - Facilitated by out of control & bespoke procurement methods
 - Muddied by ill informed and misaligned perceptions “Contractors specify it now”
 - Encouraged by Constructing Excellence 10% year on year improvement
 - Compounded by 2013 Industrial strategy -33% cost, -50% emissions, -50% time
 - Cost cutting in disguise as “value engineering”
 - Driven by inadequately specific incompetent elemental cost planning
 - All leading to: incapacity of construction sector to deliver:
 - Client's bespoke design, green brief & investment ambitions

Why did I start making GBC?

- I want I want I want..... us all to do better, first time
 - Clients: to get what they asked for not what we gave them
 - Quality Surveyors: to do VE not Cost cutting, WLC not cheap; 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
- To have better information at hand when they make all specification decisions
 - Evidence Based Design
 - Competent as was intended
 - No more engineering the value out of projects, but VE them in

I want clients

- with aspirations and objectives for a Healthy, Environmental, Useful building:
 - To know they can engage a building designer team who have the tools and skills to meet their brief
 - To be able to invest well and get what they want;
 - not be driven down the business as usual cost cutting route initiated by QSs bad cost plans
 - and procurement that adds a fee to reduce quality
 - To know that their aspirations & objectives will survive all the way to completion on site

I want building designers to be able to:

- Do their own Cost Planning on small jobs not needing a QS
 - based on the real cost of doing it greener and better for client
 - not just cheapest-wins every time
 - Don't set yourself up for a fall
- Do it without a QS
 - that steers the project towards financial and performance gaps
 - Avoiding approximate elemental pricing rates
 - Avoiding non-representative labour rates
 - Avoiding incompetent violet price books
- Immediately understand the environmental impact
 - Of construction or refurbishment methods
 - Help make better informed choices of materials or products
 - Become 'carbon literate'



I want building designers to be able to:

- **Compare alternative scenarios easily, quickly**
 - to begin to build an understanding of the consequences of their choices
 - in time be able to intuitively choose lower impact materials and methods
- **Intelligently interrogate the bill of materials**
 - do environmental analysis on the fly.
- **Access comprehensive generic materials and product datasets at their fingertips**
 - adopt, apply and interrogate designs



Counting Carbon

- ACAN, LETI and RIBA campaigns
- Challenging Government to improve Building Regulations
- BRAD Z Counting carbon may arrive sooner than you think
- You may want to start interrogating building impacts, before you have to
- Get up to speed and land running



I want building designers to be able to

- Know where a product was invented to be used
 - not risk its inappropriate application
 - ‘Post-Grenfell golden thread’ GBC V3, started in GBC V1
- Close the performance gap:
 - Energy now,
 - Airtightness, next
 - Fire, acoustics, indoor air quality, etc. later
 - Services design, lighting design, later
- Have access to competent elemental assembly datasets
 - 892 already for GBC V3
 - For use in the absence of know-how to assemble their own.
 - Choose from and adopt or adapt competently



I want building designers to be able to

- Have a low cost tool affordable by small practices
- Have a multi-functional tool that interrogates the same building model/dataset
 - That only has to be built once, to get many results
 - Unlike WRAP and BRE tools
- Submit to architectural competitions and awards
 - that insist on embodied energy, embodied carbon and sequestered carbon and energy and carbon in use,
 - as part of the criteria for success
 - with an appropriate weighting I hope.



I want Non-BIM'ers

- Who have no need for BIM
 - Who cannot afford to implement BIM
 - Not doing Government work, not needing BIM
 - Have not experienced the benefits of BIM
- To be able to do BIM-app-type analysis outside of BIM
 - Interrogate the data and get useful results
- In the future:
 - Enable seamless BIM adoption later
 - Two way flow of information between BIM and GBC and visa versa



I want environmental and energy assessors to

- Be able to model whole buildings
 - With real products and their values
 - Not generic materials & grey values (GGtS)
 - find their weaknesses and communicate
 - in terms that building designers cannot ignore
- Interrogate at component level not just at:
 - elemental (GGtS) or whole building level (LCA)
- Interrogate bespoke assemblies
 - without having to refer back to control bodies
 - that take months to reply (BRE)



I want Quantity Surveyors to:

- **Become a useful part of procurement process again**
 - Cost planning has to do better than it has done over last few decades
 - Pricing books are woefully inadequate
 - do not reflect what is going on out there
 - Tradesmen rates are wrong as far as we can tell
 - Elemental rates are limited in scope
 - Accurate Cost planning appears to be impossible
 - Don't propose D&B etc. if the client wants bespoke, quality and good Investment
- **Be Quality Surveyors not Quantity Surveys**
 - Why give the client a Violet cost plan for a green brief for a green building?
 - Why give them false expectations? And then fail from there onwards?
 - Be more accurate than +/- 10% measuring and worse estimating
- **Create the 'Green Building Price Book'**
 - Alistair McConnochie proposed 20 years ago
 - to become a reality, inside GBC
- **Do Green, competent Cost Planning**
 - not win the 'race to the violet bottom'
- **Do real Value Engineering of green stuff into the project, not out of it**
 - not cost-cutting disguised as Value Engineering;
 - but will they look at the bigger picture?
- **Do Whole Life Value without charging an extra fee**
 - TOTEX = CAPEX + OPEX
- **More on Green and Violet Cost planning later**

I want procurement to:

- Focus on the client expectations
 - No more novated designers without whistleblowing clauses
- Not focused on low cost and fast delivery
- At the expense of performance & quality
 - Craft supervisors not QA box tickers
 - Not sub-contracted snagging
- Not create long supply chain barriers between designers and craftsmen
- Manage interfaces between packages
 - Deliver consistency of end results for whole building
 - Easy to maintain by client's FM
- Go back to General Contracting if that's good enough

I want manufacturers to:

- **Make multi-functional materials, products and systems:**
 - But avoiding composites and mixing natural with technical materials
 - To replace many singular function alternatives
 - That succeed in Value Engineering processes
 - Because they are difficult to substitute
- **Make low impact materials and products**
 - Not hide behind BRE GGtS Generic Materials Assessments
 - at industry sector level: aggregated average grey not green or violet
- **Make their independently verified credible data available**
 - as ‘big open data’ in ‘consistent formats’
 - Readily interrogated by calculators with intelligent search functions
- **Populate GBC Product Data Collection tables to create a single robust source and allow integration into GBC & bespoke Calculators**
 - Share NBS Source datasets and add green data
 - Create Green Building Product Dataset & Green Building Price Book
- **In BIM provide:**
 - High Levels of Information (LOI)
 - Before High Levels of Detail (LOD)
 - Enable High Levels of Accuracy (LOA)



I want tenderers:

- To be able to use the built-in calculator
 - as the Bill of Quantities Tender Document
- To not have to price the job with every intention of making claims
 - Because retention moneys will never be paid without a fight
 - Dutch bargaining discounts will be expected
 - Main-Contractor levy or discounts will be expected
 - Payments will be late: 3 months is normal today
 - Especially on Guaranteed Maximum Price GMP domestic tenders
- To be able to price the job properly:
 - not chasing some false illusion cost plan,
 - to allow trades people to have the time to care
 - and do a competent job using proper materials
 - Accurate and complete tender documents can invite accurate and complete pricing
- I want Specification Substitution to be done:
 - Transparently with all the facts and figures available
 - about the consequence of every change,
 - other than just cost savings for the contractor or shared with the client



I want BIM

- To live up to its expectations and hype
 - To do all the wonderful things it claims possible
 - Interrogate the model and BoM
 - I want to be able to do it myself asap
 - (still waiting for more data)



BIM is not popular yet

- Recent surveys show that BIM penetration into the design sector of the Construction industry is low
- If you do not do Government Work there is no need
- If you do not do big jobs there is no need
- If you have not experienced the benefits of BIM you have no incentive
- If you do not want to or cannot afford to run bigger computer systems to run BIM and open big files
- You may not get the benefit of BIM Apps
- You may need alternative tools to do the same jobs



I want advisory bodies

- To update their out of date generic information
 - E.g. BRE's House's elemental heat loss %
 - Based on historic data?
 - Based on BRAD L or SAP?
 - Replace it with Design Guide specifics?
 - Aspirational/Design Tool: PHPP
 - Evidence Based Guidance





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In use Carbon

I/we want embodied & in-use energy
Up front carbon, embodied, sequestered,
biogenic, total and in-use carbon
Build & running costs, payback & carbon-
back periods, all in one place at one time



<https://GreenBuildingEncyclopaedia.uk>



I want I want I want
I am reminded to

**Be the change
you want to see in
the world**

Mahatma Gandhi



If you want to dig deeper

- We are at Stand M60 Firstplanit
- Come over to explore Firstplanit+GBC+GRC
- Go at your own pace
- Zoom in on the details you want to explore
- Ask your questions get your answers
- Take a souvenir postcard
- Scan your badge get more information
- Reserve an in house Zoom FPI, GBC & GRC CPD
- Get your product data into Firstplanit+GBC+GRC



<https://GreenBuildingEncyclopaedia.uk>



Green Retrofit Calculator
<https://GreenBuidlingCalculator.uk>

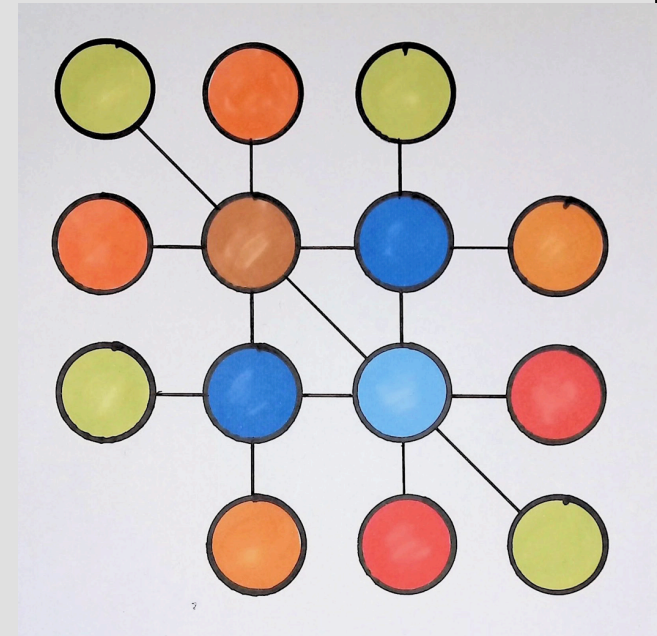


Green Building Calculator
<https://GreenBuildingCalculator.uk>

GRC

Green Retrofit Calculator

<https://GreenBuildingCalculator.uk>



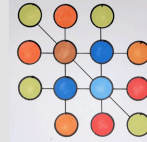


<https://GreenBuildingEncyclopaedia.uk>



Green Retrofit Calculator

<https://GreenBuidlingCalculator.uk>



Green Building Calculator

<https://GreenBuildingCalculator.uk>



The screenshot displays the Green Retrofit Calculator (GRC) interface, which is a complex spreadsheet-based tool. It is divided into several main sections:

- U Values To Watts To CO₂:** A table listing building elements (e.g., External Wall, Roof, Floor) with their U-values and associated energy loss.
- Elements:** A detailed table for each element, including its area, U-value, and energy loss.
- Scenarios:** A table comparing different retrofit scenarios (e.g., Scenario 1, Scenario 2) across various metrics like energy loss and CO₂ emissions.
- Total Conduction Heat Loss:** A summary table showing the total heat loss for different scenarios.
- In-Use Energy:** A table showing energy consumption for different building components.
- In-Use Carbon Dioxide:** A table showing CO₂ emissions from energy use.
- In-Use to Watts:** A table showing the conversion of energy use to power.
- In-Use Running Costs:** A table showing the operational costs of different scenarios.
- Embodied Energy to Sequestered Carbon:** A table showing the carbon footprint of building materials.

Green Retrofit Calculator GRC V1

Developed by BrianSpecMan of GBC
and Peter Draper of STBA
Presented by BrianSpecMan



<https://GreenBuildingEncyclopaedia.uk>



Green Retrofit Calculator
<https://GreenBuidlingCalculator.uk>



Green Building Calculator
<https://GreenBuildingCalculator.uk>

GRC V1 Retrofit

GBC B2: STBA & HES

**Responsible Retrofit Options
Appraisal & Carbon Calculator**

**GBC B6: Interreg NP&AP
Energy Pathfinder Project
Scottish Islands Case Study**

Manufacturer Remanufacturers	Importers Agents Distributors			Suppliers Builders Merchants			Installers Applicators		
Components: Products Data Sheet Products Accessories Windows, Glazing Accredited Elements & Systems	Primary Function	Building Application	Product Performances	Costs: Products	Costs: Accessories	Costs: Labour	Energy EE EC SC BC Carbon	LCA EPD A-D	
Drop Down Lists: Materials Products	Look Up Tables: Product Data Sheet			Schedule of Accommodation: Quantities > Sizes > Areas > Volumes Protrusions Internal, External & Soil Temperature Hours of use			Form factor > Target U values		
Insulation k values Decrement values	Material k values Conductivities			Option Switches ++			Roof Geometry Protrusion Geometry Multiple Room Sizes Room by Room heat losses Multiple Glazing sub-element sizes		
Targets: U values Regulations v Design Standards Target Airtightness Target Glazing % EE EC SC BC Glazing orientation	Surface & Cavity Resistivity						Sub contractor Quotes		Tenderers
Building Elements Yes/No	Building Elements Detail dimensions			BillofMat BofProd BofAcce BofQuan BofLab BofCost			Elemental Cost Plan	Energy EE EC SC BC Carbon	LCA EPD A-D
Element Assembly: Components Exists or New Gen Mat or Product k, U or R value check & warn	Thermal Bridge Break	Condensation	Decrement Factor & Delay	BillofMat BofProd BofAcce BofQuan BofLab BofCost			Elemental Cost Plan	Energy EE EC SC BC Carbon	LCA EPD A-D
Non Envelope EA Furniture Interiors Trades, MEP Landscape User Bespoke EA Ready-made EA Infrastructure MEP	GBC Users: Designer Engineer Specifiers FM PM CAD operators CP, QS & VE CDP & EPC Contractors			BillofMat BofProd BofAcce BofQuan BofLab BofCost			Elemental Cost Plan	Energy EE EC SC BC Carbon	LCA EPD A-D
Summary Sheet: Elements & Building U values In use Energy & %s Fuel Choice + Fuel Carbon factors = In-use Carbon	Summary Sheet: Elements & Building Embodied Energy Embodied Carbon Sequestered & Biogenic Carbon Life Cycle Assessm't			Summary Sheet: Elements & Building Cost £/m2 PaybackCarbonback In-use Energy + Fuel Costs = In-use Costs			With instantaneous results for any change in spec. Potential to do well-informed Value Engineering not dumb Cost Cutting		

Product Information Providers

Product Data Collection

Excel mechanisms

Data Sources

Data inputs

Generic Materials Datasets

Choosing targets & Data sources

Option Switches for more detail

Choosing

Price Information

Chosen Elements

Choosing Components

Choosing Materials or Products

Automatic Number Crunching

Checking Targets Met or warnings

GBC Users

Dashboard

Summary Sheets

Purpose of Green Building Calculator

Green Building Calculator V 2

<https://GreenBuildingCalculator.uk> V1 so far



Manufacturer Remanufacturers	Importers Agents Distributors			Suppliers Builders Merchants			Installers Applicators	
Components: Products Data Sheet Products Accessories Windows, Glazing Accredited Elements & Systems	Primary Function	Building Application	Product Performances	Costs: Products	Costs: Accessories	Costs: Labour	Energy EE EC SC BC Carbon	LCA EPD A-D
Drop Down Lists: Materials Products	Look Up Tables: Product Data Sheet			Schedule of Accommodation: Quantities > Sizes > Areas > Volumes Protrusions Internal, External & Soil Temperature Hours of use			Form factor > Target U values	
Insulation k values Decrement values	Material k values Conductivities			Option Switches ++			Roof Geometry Protrusion Geometry Multiple Room Sizes Room by Room heat losses Multiple Glazing sub-element sizes	
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Building Elements Yes/No			Building Elements Detail dimensions					
Element Assembly: Components Exists or New Gen Mat or Product k, U or R value check & warn	Thermal Bridge Break	Condensation	Decrement Factor & Delay	Bill of Mat BofProd BofAcce BofQuan BofLab BofCost	Elemental Cost Plan		Energy EE EC SC BC Carbon	LCA EPD A-D
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Summary Sheet: Elements & Building U values In use Energy & %s Fuel Choice + Fuel Carbon factors = In-use Carbon	Summary Sheet: Elements & Building Embodied Energy Embodied Carbon Sequestered & Biogenic Carbon Life Cycle Assessm't			Summary Sheet: Elements & Building Cost £/m2 PaybackCarbonback In-use Energy + Fuel Costs = In-use Costs			With instantaneous results for any change in spec. Potential to do well-informed Value Engineering not dumb Cost Cutting	

Green Building Calculator V 2

<https://GreenBuildingCalculator.uk> V1 so far



Manufacturers Remanufacturers	Importers Agents Distributors			Suppliers Builders Merchants			Installers Applicators	
Accredited Elemental Assemblies Components & Systems Products Data Sheet Products Accessories Materials Windows, Glazing	Materials Product Function	Intended Application	Properties Performances	Cost Rates: Products	Cost Rates: Accessories	Cost Rates: Labour	Embodied Energy Sequestered Embodied Biogenic & Total Carbon	Life Cycle Assessment Environmental Product Declaration
English & Scottish House Condition Surveys House Types Default data sets	Location Exposure Conditions	Dimensions Sizes Volumes	Existing Materials & Construction	Performance and Emissions	Materials Moisture permeability	Existing Doors Windows	Existing Services Lighting Vent Heating Hot Water	Previous interventions Insulation material thickness position
Project Survey: Accept house types dataset or modify to surveyed data Or add your own Building Types	Risk Assessment	Existing methods and materials	Structure Moisture open or closed	Insulation Moisture open or closed	Moisture permeability	Building condition	Exposure Conditions Wind Driven Rain Index	Risk Factor Risk Statement
Targets: U values Regulations v Design Standards v Campaigns v WUFI limits Retrofit, EnerPHit, CLR & EE EC SC BC TC Targets	Drop Down Lists: Choose Products	Look up tables: Populate cells	Triggers number crunching	Terrace, Roof, Bay, Porch Protrusions	Surface & Cavity Resistivity	Material Conductivity	Users: Designers & Specifiers, CAD + BIM; CP QS VE Contractor	Tenderer Sub-contractors
Elemental Assembly Components K values > U or R values + 2 Option Scenarios	Existing, Previous + 2 Proposed Options Scenarios Insulation materials thickness and positions	Terrace, Roof & Bay Protrusion Geometry		Bill of Materials BoM Bill of Products & Accessories Bill of Quantities Bill of Plant Bill of Preliminaries & Overheads Bill of £ +2 Options scenarios	Embodied Energy Sequestered Embodied Biogenic & Total Carbon		Life Cycle Assessment Environmental Product Declaration Building EBD	
Summary Sheet: Performance Existing + 2 Options Elemental & Building U values In use Energy & % Fuel Choice + Fuel Carbon factors = In-use Carbon	Summary Sheet: Impacts Components, Elements, Building Building Embodied Energy EE Embodied Carbon EC Biogenic Carbon BC Sequestered Carbon SC LCA, EPD Product, EBD Building			Summary Sheet: Costs Existing + 2 Options Component, Element, Building Costs £/m2 In-use Energy + Fuel Costs = In-use Costs Pay back & Carbon back periods			With instantaneous results for any change in specification Potential well informed value engineering not dumb cost cutting	

Green Retrofit Calculator V1

<https://GreenBuildingCalculator.uk>



Product Information Providers

Product Data Collection
Generic Materials Datasets
Readymade Elemental Assemblies
Accredited Elemental Assemblies
House types default data sets
Sizes quantities building fabric & service
Exiting and previous interventions
Project Survey and actual sizes
Site exposure, internal temperatures
Building Condition moisture permeability
Risk assessment Risk Statement
Choosing U value targets & EC targets
Excel mechanisms: control choices
Drop down lists Look up tables
GRC Users Subcontractors Tenderers
Existing Elements and components
Intervention Components
Choosing Materials or Products
Automatic Number Crunching
Checking Targets Met or warning if not
Dashboard:
Summary Sheets
Existing, previous and proposed actions
+2 scenarios
Choose & Instant updates

Manufacturers Remanufacturers	Importers Agents Distributors			Suppliers Builders Merchants			Installers Applicators	
Accredited Elemental Assemblies Components & Systems Products Data Sheet Products Accessories Materials Windows, Glazing	Materials Product Function	Intended Application	Properties Performances	Cost Rates: Products	Cost Rates: Accessories	Cost Rates: Labour	Embodied Energy Sequestered Embodied Biogenic & Total Carbon	Life Cycle Assessment Environmental Product Declaration
English & Scottish House Condition Surveys House Types Default data sets	Location Exposure Conditions	Dimensions Sizes Volumes	Existing Materials & Construction	Performance and Emissions	Materials Moisture permeability	Existing Doors Windows	Existing Services Lighting Vent Heating Hot Water	Previous interventions Insulation material thickness position
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Local Procurement	Products/Materials: Factory gate to site	Products/Materials: Transport miles	Transport Emissions LCA
Products Data Sheet	Building Section Coding	Appropriate and Competent Application	Elemental Assembly Code Numbers
Readymade Competent Elemental Assemblies	Bespoke Elemental Assemblies	Manufacturers Accredited Systems	Secondary Element Calculator
Specification Generator	FM Specification Generator	GBP/B Green Building Price Book	Structures Calculator
Non-Domestic Retrofit	Domestic new Build	Non-Domestic New Build	Landscape Elements
ICE V3 Inventory of Energy & Carbon	LCA Database Datasets	Climate Appropriateness	Civils & Infrastructure
Embodied/Sequestered Energy & Carbon	LCA Calculator	Thermal Mass Calculator	Furniture Impact Calculator
EE EC SC Calculator	Design Life & Durability	Airtightness & Energy Loss	Furniture Dataset
Sequestered Carbon calculator	Waste Cost Calculator	Indoor Air quality Calculator	Interior Finishes Dataset
Carbon consumed or avoided	Plastics Diverted and recycled	Plastic free options database	Interior Finishes Dataset
EE & EC in Waste EE & EC in Reclaim	Reclaim Reuse Resource Audits	Circular Economy Resource Efficiency	Ska Fit-out Refit Interface
Self Build Construction Primer	Links to Green Building Encyclopaedia	Bird Box Bat Roost Integration Check	Biodiversity Net gain
Whole project Budget calculator	Overheads Profits Fees Preliminaries	Construction on-site Emissions	End of Life Solutions
Renewable Energy Calculator	MEP Services Calculator	Lighting Calculator	Light Nutrition Calculator
International Regional versions	Imperial Metric U v R values	Currency	Local Product Datasets
Green Building Calculator V3-29			GBC Green Building Calculator

<https://GreenBuildingCalculator.uk> V1 so far

Manufacturers Remanufacturers	Importers Agents Distributors	Suppliers Builders Merchants	Installers Applicators
Accredited Elemental Assemblies Components & Systems Products Data Sheet Products Accessories Materials Windows, Glazing	Materials Product Function	Intended Application	Properties Performances
English & Scottish House Condition Surveys House Types Default data sets	Location Exposure Conditions	Dimensions Sizes Volumes	Existing Materials & Construction
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Summary Sheet: Performance Existing + 2 Options Elemental & Building U values In use Energy & % Fuel Choice + Fuel Carbon factors = In-use Carbon	Summary Sheet: Impacts Components, Elements, Building Embodied Energy EE Embodied Carbon EC Biogenic Carbon BC Sequestered Carbon SC LCA, EPD Product, EBD Building	Summary Sheet: Costs Existing + 2 Options Component, Element, Building Costs £/m2 In-use Energy + Fuel Costs = In-use Costs Pay back & Carbon back periods	With instantaneous results for any change in specification Potential well informed value engineering not dumb cost cutting
			GRC Green Retrofit Calculator

<https://GreenBuildingCalculator.uk> V1

<https://GreenBuildingCalculator.uk>

Local Procurement	Products/Materials: Factory gate to site	Products/Materials: Transport miles	Transport Emissions LCA
Products Data Sheet	Building Section Coding	Appropriate and Competent Application	Elemental Assembly Code Numbers
Readmade Competent Elemental Assemblies	Bespoke Elemental Assemblies	Manufacturers Accredited Systems	Secondary Element Calculator
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ICE V3 Inventory of Energy & Carbon	LCA Database Datasets	Climate Appropriateness	Civils & Infrastructure
Embodied/Sequestered Energy & Carbon	LCA Calculator	Thermal Mass Calculator	Furniture Impact Calculator
EE EC SC Calculator	Design Life & Durability	Airtightness & Energy Loss	Furniture Dataset
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Carbon consumed or avoided	Plastics Diverted and recycled	Plastic free options database	Interior Finishes Dataset
EE & EC in Waste EE & EC in Reclaim	Reclaim Reuse Resource Audits	Circular Economy Resource Efficiency	Ska Fit-out Refit Interface
Self Build Construction Primer	Links to Green Building Encyclopaedia	Bird Box Bat Roost Integration Check	Biodiversity Net gain
Whole project Budget calculator	Overheads Profits Fees Preliminaries	Construction on-site Emissions	End of Life Solutions
Renewable Energy Calculator	MEP Services Calculator	Lighting Calculator	Light Nutrition Calculator
International Regional versions	Imperial Metric U v R values	Currency	Local Product Datasets

Product Information Providers

Product Data Collection

Elemental & Sub-elemental Assemblies

Specifications

Prices

Scope of Work

Other Disciplines

Choosing targets & Data sources

Impacts

LCA & design Life

Interiors

Waste

Plastics

Circular Economy

Self Build

Biodiversity

Preliminaries

MEP Services

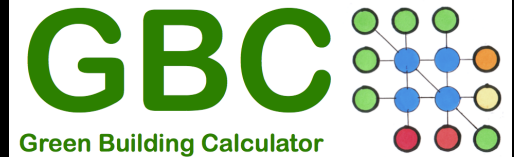
Regional International Variations

Bespoke Modules



<https://GreenBuildingEncyclopaedia.uk>

GRC V2-V36



<https://GreenBuildingCalculator.uk>

Planned Development

Priorities to bring forward:

- GBC V2 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

B Bespoke

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

STBA Sustainable Traditional Building Alliance Carbon Calculator

STBA	http://stba.uk.org/
Responsible Retrofit	https://responsible-retrofit.org/
STBA Guidance Wheel	https://responsible-retrofit.org/wheel
Carbon Calculator	https://responsible-retrofit.org/carboncalc
HES Historic Environment Scotland	
HES	https://www.historicenvironment.scot/
Refurbishment Case Study 37	https://www.historicenvironment.scot/archives-and-research/publications/publication?publicationid=17c8b362-178b-416a-9733-abb6009c521d
Scottish house condition survey 2016: key findings	https://www.gov.scot/publications/scottish-house-condition-survey-2016-key-findings/pages/4/
Baker, P., 2010. Thermal performance of traditional windows. Rev. 2010 (TP1).PDF	http://www.climatechangeandyourhome.org.uk/live/content_pdf/579.pdf
Baker, P., 2011. U-values and traditional buildings (TP10).PDF	https://www.spab.org.uk/sites/default/files/documents/MainSociety/Advice/SPAB%20Building%20Performance%20Survey%202011%20Report%2021.pdf
Historic England	
Understanding carbon in historic environment	https://historicengland.org.uk/content/docs/research/understanding-carbon-in-historic-environment/
hc2019-re-use-recycle-to-reduce-carbon	https://historicengland.org.uk/content/heritage-counts/sub/2019/hc2019-re-use-recycle-to-reduce-carbon/
Planning responsible retrofit of traditional buildings/responsible retrofit trad bldgs	https://historicengland.org.uk/images-books/publications/planning-responsible-retrofit-of-traditional-buildings/responsible-retrofit-trad-bldgs/
Moisture Risk/hygrothermal behaviours from IW1	https://historicengland.org.uk/whats-new/research/back-issues/simulation-models-and-energy-efficiency-in-historic-buildings/
English Housing Survey: Floor Space in English Homes – main report	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/725085/Floor_Space_in_English_Homes_main_report.pdf
Research Papers	
Baker, P., 2010. Thermal performance of traditional windows. Rev. 2010 (TP1).PDF	http://www.climatechangeandyourhome.org.uk/live/content_pdf/579.pdf
Baker, P., 2011. U-values and traditional buildings (TP10).PDF	https://www.spab.org.uk/sites/default/files/documents/MainSociety/Advice/SPAB%20Building%20Performance%20Survey%202011%20Report%2021.pdf
UCL Solid-wall U-values (1) (1).PDF	https://discovery.ucl.ac.uk/id/eprint/1452229/3/Biddulph_3-15-2018_Solid-wall.pdf
Thermal performance of solid brick walls	https://research.historicengland.org.uk/Report.aspx?i=15741
Thermal performance of timber sash windows and their improvements	https://research.historicengland.org.uk/Report.aspx?i=16036
ASPB Website	https://aspb.org
Members including: Suppliers and manufacturers:	https://aspb.org.uk/our-members
Interactive House: Suppliers and manufacturers via elements	https://aspb.org.uk/our/aspb-interactive-house
UK Centre for Moisture in Buildings	
Website	http://www.ukcmb.org/
BRE	
Wind Driven Rain Index	See BS 8104 below, URL to map app, or provide the map with national boundaries
BSI British Standard Institution	
BS 5250:2011+A1:2016 Code of practice for control of condensation in buildings	https://shop.bsigroup.com/ProductDetail?pid=000000000030139579
BS 5250:2021 Moisture in buildings an integrated approach to risk assessment and guidance	https://shop.bsigroup.com/ProductDetail?pid=000000000030148522
BS 7913:2013 Guide to the conservation of historic buildings	https://shop.bsigroup.com/ProductDetail?pid=00000000000273071
BS 8104:1992 Code of practice for assessing exposure of walls to wind-driven rain	Pending
BS EN 12524	Pending
PAS 2035/2030:2019 Retrofitting dwellings for improved energy efficiency. Specification and guidance	https://shop.bsigroup.com/ProductDetail/PAS_2030+2035_2019
PAS 2038 Pending	Pending
Window Energy Rating WER Band C	https://www.bsigroup.com/en-GB/our-services/product-certification/industry-sector-schemes/energy-kitemark-schemes/kitemark-for-window-energy-rating/
CIBSE	
CIBSE Guide A [41] Section 3	Pending
Retrofit	
Each home counts' Bonfield Review	https://www.eachhomecounts.com/
Trustmark	https://www.trustmark.org.uk/
Post Grenfell Hackett Review	
'Building A Safer Future: an Implementation Plan'	https://www.gov.uk/government/publications/building-a-safer-future-an-implementation-plan
ICE Database	
Embodied Carbon Data Sets Bath Uni BSRIA ICE 1.1, 1.5, 3.0	https://circularecology.com/embodied-carbon-footprint-database.html
Artist of images	
© John Gilbert	Pending
GBC GBE GBL Websites	
Green Building Calculator	https://GreenBuildingCalculator.uk
Green Building Encyclopaedia	https://GreenBuildingEncyclopaedia.uk
Green Building Learning	https://GBELearning.com
GBC Website Pages	
Home page	https://GreenBuildingCalculator.uk
Q&A	https://greenbuildingcalculator.uk/green-building-calculator/your-questions-gbc-answers/
Bespoke	https://greenbuildingcalculator.uk/bespoke/
Buy Now Version 1	https://greenbuildingcalculator.uk/buy-now/
Contact Us	https://greenbuildingcalculator.uk/contact-us/
Email Contact: Helpline	info@greenbuildingcalculator.uk
GBC CPD	
PowerPoint files on Green Building Calculator	
Introduction to Version 1	https://greenbuildingencyclopaedia.uk/wp-content/uploads/2020/06/GBC-CPD-Whole-Building-Calculator-A00BRM300612.pdf
SPAB & STAB Conference 2020	SPAB STBA Conference 2020
Event	https://GreenBuildingEncyclopaedia.uk?i=38634
Presentation	https://greenbuildingencyclopaedia.uk/wp-content/uploads/2020/08/GBC-CPD-Green-Building-Calculator-V1-STBA-061020-S87.pdf
GBC Pages on GBE website	https://GreenBuildingEncyclopaedia.uk
SPAB STBA Conference 2020 (Events) G#38634	https://GreenBuildingCalculator.uk?i=38634
GBE Green Building Calculator Big Practice (Shop) G#38525	https://GreenBuildingCalculator.uk?i=38525
GBE Green Building Calculator Small Practice (Shop) G#38524	https://GreenBuildingCalculator.uk?i=38524
GBE Green Building Calculator Student (Shop) G#38520	https://GreenBuildingCalculator.uk?i=38520
GBE Green Building (Calculator) G#38491	https://GreenBuildingCalculator.uk?i=38491
GBC Product Data Collection	https://greenbuildingcalculator.uk/gbc-product-data-collection/

GRC V1

STBA's

Responsible

Retrofit

Guidance

Wheel links

STBA Guidance Wheel URLs

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					https://www.stba.org.uk/retrofit-guidance-wheel-urls/
					https://www.stba.org.uk/retrofit-guidance-wheel-urls/
					https://www.stba.org.uk/retrofit-guidance-wheel-urls/
Measures	Fabric	Wall	Cavity Wall Insulation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/1
Measures	Fabric	Wall	External Wall Insulation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/2
Measures	Fabric	Wall	Internal Wall Insulation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/3
Measures	Fabric	Wall	Frame Infill Insulation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/4
Measures	Fabric	Roof	Loft Hatch Insulation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/5
Measures	Fabric	Roof	Loft Insulation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/6
Measures	Fabric	Roof	Flat roof insulation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/7
Measures	Fabric	Roof	Room in roof insulation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/8
Measures	Fabric	Roof	Loft hatch and ceiling airtightness		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/9
Measures	Fabric	Floor	Floor Insulation between under floor joists		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/10
Measures	Fabric	Floor	Floor Insulation on top of existing floor finish		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/11
Measures	Fabric	Floor	Floor void filled with insulation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/12
Measures	Fabric	Floor	Exposed soffits to upper floors: insulation in between joists or under soffits		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/13
Measures	Fabric	Floor	Replacement of existing ground floor with new concrete insulated solid ground floor		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/14
Measures	Fabric	Floor	Increased Floor airtightness		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/15
Measures	Fabric	Windows	Window draughtproofing		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/16
Measures	Fabric	Windows	Energy efficient glazing		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/17
Measures	Fabric	Windows	Window refurbishment		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/18
Measures	Fabric	Windows	Secondary glazing		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/19
Measures	Fabric	Windows	Window External Shading		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/20
Measures	Fabric	Windows	Window Replacement		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/21
Measures	Fabric	Doors	Door draughtproofing		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/22
Measures	Fabric	Doors	High performance doors		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/23
Measures	Fabric	Doors	Door refurbishment		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/24
Measures	Fabric	Chimney	Chimney removal complete		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/25
Measures	Fabric	Chimney	Chimney removal internal		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/26
Measures	Fabric	Chimney	Chimney blocking		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/27
Measures	Fabric	Chimney	Reduced air flow		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/28
Measures	Services	Heat Generation	Heating system Refurbishment		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/29
Measures	Services	Heat Generation	High efficiency gas-fired condensing boilers		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/30
Measures	Services	Heat Generation	Oil-fired condensing boilers		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/31
Measures	Services	Heat Generation	Air source heat pumps		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/32
Measures	Services	Heat Generation	Ground/Water source heat pumps		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/33
Measures	Services	Heat Generation	Biomass boilers		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/34
Measures	Services	Heat Generation	Biomass stoves with back boiler		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/35
Measures	Services	Heat Generation	Fan-assisted replacement storage heaters		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/36
Measures	Services	Heat Generation	Flue gas heat recovery devices		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/37
Measures	Services	Heat Generation	Solar water heating		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/38
Measures	Services	Heat Generation	Hot water tank recovery devices for showers		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/39
Measures	Services	Heat Generation	Communal heat generating systems		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/40
Measures	Services	Heat Generation	Micro combined heat and power		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/41
Measures	Services	Heat Generation	High efficiency replacement warm-air units		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/42
Measures	Services	Hot Water Storage	Cylinder thermostats		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/43
Measures	Services	Hot Water Storage	Hot water cylinder insulation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/44
Measures	Services	Hot Water Storage	New cylinder		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/45
Measures	Services	Heat Distribution	Heating controls (for wet and warm air systems)		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/46
Measures	Services	Heat Distribution	Heating Distribution Refurbishment		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/47
Measures	Services	Heat Distribution	Pipe insulation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/48
Measures	Services	Heat Distribution	Hot Under-floor heating		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/49
Measures	Services	Heat Distribution	Communal Heat Distribution System and controls		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/50
Measures	Services	Ventilation	Background ventilators and intermittent extract fans		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/51
Measures	Services	Ventilation	Passive stack ventilation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/52
Measures	Services	Ventilation	Continuous mechanical extract ventilation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/53
Measures	Services	Ventilation	Continuous mechanical supply and extract ventilation with heat recovery		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/54
Measures	Services	Ventilation	Passive stack ventilation with heat recovery		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/55
Measures	Services	Ventilation	Passive stack ventilation with demand control ventilation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/56
Measures	Services	Ventilation	Continuous mechanical extract ventilation with demand control ventilation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/57
Measures	Services	Ventilation	Continuous mechanical supply and extract ventilation with heat recovery and with demand control ventilation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/58
Measures	Services	Lighting	Lighting system upgrade		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/59
Measures	Services	Electrical Generation	Small wind generation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/60
Measures	Services	Electrical Generation	Photovoltaics		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/61
Measures	Services	Electrical Generation	Hydrogen generation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/62
Measures	Behaviour	People Interaction	User training for sustainability		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/63
Measures	Behaviour	People Interaction	Provision of simple and clear information		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/64
Measures	Behaviour	People Interaction	Improving User interest and involvement		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/65
Measures	Behaviour	People Interaction	Maintenance		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/66
Concerns	Technical	Moisture	Interstitial Surface Condensation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/67
Concerns	Technical	Moisture	Thermocouple heat nature		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/68
Concerns	Technical	Moisture	Rain and Drains (liquid moisture penetration)		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/69
Concerns	Technical	Detailing care needed	Thermal Bridges		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/70
Concerns	Technical	Detailing care needed	Stair/Door/Skirting Adjustment		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/71
Concerns	Technical	Detailing care needed	Condensing Flume location		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/72
Concerns	Technical	Detailing care needed	Noise		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/73
Concerns	Technical	Detailing care needed	Structural loading changes		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/74
Concerns	Technical	Detailing care needed	Hidden services		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/75
Concerns	Technical	Detailing care needed	Relation of air flow - door underside		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/76
Concerns	Technical	Fabric uncertainty	Relation to Building Thermal Performance		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/77
Concerns	Technical	Sufficient Ventilation?	Sufficient ventilation?		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/78
Concerns	Technical	Sufficient Ventilation?	Overheating		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/79
Concerns	Technical	Affaircare needed	Handover to users		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/80
Concerns	Technical	Affaircare needed	Maintenance interval and complexity		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/81
Concerns	Technical	Affaircare needed	Monitoring and feedback required		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/82
Concerns	Technical	User aspects	Personal preference		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/83
Concerns	Technical	Complexity	Complex installation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/84
Concerns	Technical	Complexity	Complex operation		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/85
Concerns	Technical	Permissions needed	Building Control/Warrant		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/86
Concerns	Technical	Permissions needed	Party Wall		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/87
Concerns	Technical	People	Personal preference		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/88
Concerns	Technical	People	Personal capacity/Right opportunity		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/89
Concerns	Heritage	Detailing care needed	Detail for Access to services		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/90
Concerns	Heritage	Heritage Detail	Original internal detail lost		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/91
Concerns	Heritage	Heritage Detail	Original external detail lost		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/92
Concerns	Heritage	Heritage Detail	Detail retain character?		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/93
Concerns	Heritage	Heritage Detail	Use of sympathetic materials		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/94
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Concerns	Heritage	Permissions needed	Planning consent with conservation area		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/96
Concerns	Heritage	Permissions needed	Planning consent outside conservation area		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/97
Concerns	Energy	Energy implication	Actual U-values?		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/98
Concerns	Energy	Energy implication	Daylight reduction		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/99
Concerns	Energy	Energy implication	Increased infiltration		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/100
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Concerns	Energy	User aspects	Reduced effects		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/102
Concerns	Energy	User aspects	User understanding		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/103
Concerns	Energy	Site Conditions	Appropriate siting		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/104
Concerns	Energy	Quality needed	Product quality		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/105
Concerns	Energy	Quality needed	Installation quality		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/106
Concerns	Energy	Quality needed	Commissioning quality		https://www.stba.org.uk/retrofit-guidance-wheel-urls/retrofit-guidance-wheel-urls/107

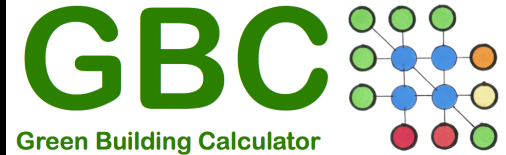
GRC V1 Colour coded Cells

Legend	In Excel	Conditional formatting	In BIM	
Cell colour code/content	Explanation	Examples		to be completed by users
Green	User Input cell, feeds into calculations throughout GBC	Type or paste	From Bill of Materials	Type or Paste
Green with Red text	User input cells with sample entries to populate calculations (replace as required)	Replace	By User if required	Replace
Dark Green	User to follow instructions to get result and secure them to enable comparison	Interact	n/a	Interact
Turquoise	GBC calculated results, that the user can overwrite. e.g. for variables	Accept or Change	From Model?	Accept or Change
Turquoise with red text	GBC example calculated results, that the user can overwrite. e.g. for variables, can be overwritten	Replace	By User if required	Replace
Blue	GBC calculated results, applying user inputs in other cells or sheets	Auto-filled	From Bill of Materials	
Brown	GBC delivers results from Look Up Tables triggered by choice from Drop Down Lists	VLOOKUP	From VLOOKUP or HLOOKUP tables	
Pale Green	Multiple cells require different responses by user	Multiple	n/a	
Violet	GBC totals up, User to check if correct OR use the information elsewhere in the calculator	Check	By User if required	Check
Red	User to select option from drop down list GBC will apply choice to calculations	Choose	From Bill of Materials?	Choose
Orange	Row or Column titles	Complete	n/a	
Yellow	Information to be collected if readily available quickly (LCA EPD)		n/a	
Conditional Formatting	Explanation	Examples		
Amber	User input cell requiring user choice from drop down list	Yes/No	By User from list	
Red	Not complete by GBC OR Users to ignore this row's cells. 'No' will turn red automatically	No	n/a	
Amber	GBC awaiting information OR User to interrogate this row's cells and review decisions so far	Review	User to interrogate result	Review
Green	Started by GBC OR To be completed by Users. 'Yes' will turn Green Automatically	Yes	By User if required	
GBC Aid memoir	Explanation	Symbol		
%%%	In development, incomplete	%%%	n/a	
///	Pending development	///	n/a	
>>>	Date related update	>>>	n/a	
***	Used as a spacer in Drop Down Lists	***	n/a	

- Legend: Colour coded cells indicate actions or reactions in each cell
- Conditional formatting prompts awareness or review
 - On-line GUI may change this, but not a lot
 - GUI Graphic User Interface



https://GreenBuildingEncyclopaedia.uk



https://GreenBuildingCalculator.uk

GRC V1 Instructions

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B2 Instructions

Legend

- Green cells: need the user to add, project specific information or replace default information with specific information
- Red Text in Turquoise cells: is reproducing building-wide information but the user can over write it with room or element specific values
- Blue cells: provide results based on a calculation using data from other cells DO NOT OVERWRITE THE CELL CONTENT
- Red cells indicate a drop down list is available to choose from options
- Brown Cells: GBC delivers results from Look Up Tables triggered by choice from Drop Down Lists
- Pale green cells: Multiple cells require different responses by user
- Violet cells: GBC totals up, User to check if correct OR use the information elsewhere in the calculator

File: Spreadsheet

- Using your dimensioned drawings
- Using the latest edition of file STBA Carbon Calculator
- Found at <https://>
- Download the file to your C Drive (or other, on the server, ask your IT department)
- Save the file as a Microsoft Excel Template file (Save As > *.XLTX) in the Template folder (automatically offered if set up correctly)
- Make a working copy (File > New from Template > Scroll > Choose > File > Save as > name file) add your project reference or name to the file r
- Edit your working file in your C drive (or other on your server, dictated by you're IT department)

Instructions for STBA Review

Scenarios Work process instructions: B2: STBA HES; B6

Find Building Assessment 3 columns, copy 3 found columns

Insert 3 empty columns

Paste 3 found and copied columns into empty columns (do not delete other columns (H to AF))

Now switch to work sheet (tab) B2 UToWattaToCO2 (Custom View) UToWattsToCO2

Scenario: Existing and Previous

- B2 UValuesToWattsToCO2: Cell: D4 Scenarios: Choose 'Previous' (existing + any previous changes)
- B2 Survey: Column F: Check or Complete green and red cells for existing only (ignor proposed interventions)
- B2 Survey: Check or Complete cells F40, F43, F66 many others are automatic (these ensure the B2 HouseTypes dataset are deployed to the calc
- B2 Survey: Check F39, F47 & F49 are as expected (many other cells are completed automatically)
- B2 Survey: Check F51, if F51 is correct make F52 "Assumed"; if F51 is incorrect update F53 and make F52 "Actual"
- B2 Survey: Check F69, if F69 is correct make F71 "Assumed"; if F69 is incorrect update F70 and make F71 "Actual"
- B2 Survey: Check F109, if F109 is correct make F111 "Assumed"; if F109 is incorrect update F110 and make F111 "Actual"
- B2 Survey: Check F189, if F189 is correct make F191 "Assumed"; if F189 is incorrect update F190 and make F191 "Actual"
- B2 Survey: Check F228, if F228 is correct make F230 "Assumed"; if F228 is incorrect update F229 and make F230 "Actual"
- B2 Survey: Check F232, if F232 is correct make F234 "Assumed"; if F232 is incorrect update F233 and make F234 "Actual"
- B2 Survey: Check F236, if F236 is correct make F238 "Assumed"; if F236 is incorrect update F237 and make F238 "Actual"
- B2 Survey: Check F307, if F307 is correct make F309 "Assumed"; if F307 is incorrect update F308 and make F309 "Actual"
- B2 Survey: Check F335, if F335 is correct make F339 "Assumed"; if F335 is incorrect update F337 and make F339 "Actual"
- B2 Survey: Check F399, if F399 is correct make F401 "Assumed"; if F399 is incorrect update F400 and make F401 "Actual"

Worksheet	Column(s)	Row(s)	Cells
B6 ProjectSummarySheet	E to P, R to AC	All	E to P, R to AC All
	E to G	All	E to G Whole columns
	E to G	All	E to G Whole columns

Worksheet	Column(s)	Row(s)	Cells
B2 UValueToWattsToCO2	D	4	D4
B2 Survey	F	11 to 23, 382	F11 to F23, F31 to F382
B2 Survey	F	40, 43, 66	F40, F43, F66
B2 Survey	F	39, 47	F39, F47
B2 Survey	F	51 to 53	F51 to F53
B2 Survey	F	69 to 72	F69 to F72
B2 Survey	F	109 to 112	F109 to F112
B2 Survey	F	189 to 192	F189 to F191
B2 Survey	F	228 to 231	F228 to F231
B2 Survey	F	232 to 235	F228 to F232
B2 Survey	F	236 to 239	F236 to F239
B2 Survey	F	307 to 310	F307 to F310
B2 Survey	F	335 to 3340	F335 to F340
B2 Survey	F	336 to 344	F336 to F344

GBC B2 Survey Sheet v 1

B2 STBA Retrofit Survey Form

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Options Appraisal Data Input
Context

Input into decision making choices/data will include:

Appraisal Options

Cost saving:	Choose	< Drop Down List	Choose
Carbon Saving:	Choose	< Drop Down List	Choose
Good Indoor Air Quality:	Choose	< Drop Down List	Choose
No Surface or Interstitial Condensation and Mould:	Choose	< Drop Down List	Choose
Overheating:	Choose	< Drop Down List	Choose
Health & Wellbeing:	No	IF	Auto-filled
Electrical efficiency	No	< Drop Down List	Choose

Client/Designer Aspiration

Experimental or Innovative	Choose	< Drop Down List	Choose
Sourcing:	Choose	< Drop Down List	Choose
Normal or Research Evidence	Research	< Drop Down List	Choose

Scope

Choose one at a time or many together

Basement:	Yes	< Drop Down List	Choose
Ground floor:	Yes	< Drop Down List	Choose
External Wall:	Yes	< Drop Down List	Choose
Party Floor:	Yes	< Drop Down List	Choose
Party Wall:	Yes	< Drop Down List	Choose
Roof:	Yes	< Drop Down List	Choose
Windows:	Yes	< Drop Down List	Choose
Doors:	Yes	< Drop Down List	Choose
Services:	Yes	< Drop Down List	Choose
Heating:	Yes	< Drop Down List	Choose
Ventilation:	Yes	< Drop Down List	Choose
Lighting:	Yes	< Drop Down List	Choose
Hot water:	Yes	< Drop Down List	Choose
Electric vehicle:	Yes	< Drop Down List	Choose

Risk factors

See below for each element's own risk analysis

GBC B2 Survey Sheet v 1

B2 STBA Retrofit Survey Form

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Options Appraisal Data Input

Context

Input into decision making choices/data will include:

populated

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 efficiency:	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
Electric vehicle:	No	< Drop Down List	Choose

Risk factors

See below for each element's own risk analysis



<https://GreenBuildingEncyclopaedia.uk>

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](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



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 Polystyrene
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
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
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
EnglandWalesNireland:1919 to 1944:Semi-Detached	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyrene
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
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
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
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
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
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
EnglandWalesNireland:Pre 1919:Bungalow	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene
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
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
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
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
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
EnglandWalesNireland: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
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
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
Scotland:Post 1919:Flat/Apartment	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene
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
Scotland:Post 1919:Tenement	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lime Plaster	External	Expanded Polystyrene
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
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
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
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
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
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
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

- 30 ready made house types with all the data needed to do serious number crunching: choose one it populates cells

GBC B2 House Type Data Sets >

2 England and Scotland

No	No	Choose	Choose	Choose	Choose	Choose	Auto-filled	Choose	Choose	Yes	Yes	Auto-filled	No	No
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 construction	Previous Roof Insulation Position
		Drop Down List	Drop Down List	Drop Down List	m2	No.	m2	Drop Down List	Drop Down List	Mineral wool, rock	mm	m2		Drop Down List
Expanded Polystyrene	100	6	2	Detached House	153	2	76.5	Suspended	Between Joists	Mineral wool, rock	100	76.5	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	5	1	End Terrace	83	2	41.5	Suspended	Between Joists	Mineral wool, rock	100	41.5	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	4	1	Flat/Apartment	55	1	55	Over heated space	Between Joists	Mineral wool, rock	100	55	Same building above	None
Expanded Polystyrene	100	4	1	Mid Terrace	78	2	39	Suspended	Between Joists	Mineral wool, rock	100	39	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	5	2	Semi-Detached	94	2	47	Suspended	Between Joists	Mineral wool, rock	100	47	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	4	1	Bungalow	75	1	75	Solid	Above Screed	Aerogel	10	75	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	6	2	Detached House	147	2	73.5	Suspended	Between Joists	Mineral wool, rock	100	73.5	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	5	1	End Terrace	79	2	39.5	Suspended	Between Joists	Mineral wool, rock	100	39.5	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	4	1	Flat/Apartment	54	1	54	Over heated space	Between Joists	Mineral wool, rock	100	54	Same building above	None
Expanded Polystyrene	100	4	1	Mid Terrace	76	2	38	Suspended	Between Joists	Mineral wool, rock	100	38	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	5	2	Semi-Detached	82	2	41	Suspended	Between Joists	Mineral wool, rock	100	41	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	4	1	Bungalow	105	1	105	Solid	Above Screed	Aerogel	10	105	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	6	2	Detached House	197	2	98.5	Suspended	Between Joists	Mineral wool, rock	100	98.5	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	5	1	End Terrace	104	2	52	Suspended	Between Joists	Mineral wool, rock	100	52	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	4	1	Flat/Apartment	69	1	69	Over heated space	Between Joists	Mineral wool, rock	100	69	Same building above	None
Expanded Polystyrene	100	4	1	Mid Terrace	87	2	43.5	Suspended	Between Joists	Mineral wool, rock	100	43.5	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	5	2	Semi-Detached	126	2	63	Suspended	Between Joists	Mineral wool, rock	100	63	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	4	1	Bungalow	74	1	74	Solid	Above Screed	Aerogel	10	74	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100			Small Detached Cottage					Between Joists	Mineral wool, rock	100		Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	6	2	Large Detached Villa	133	2	66.5	Suspended	Between Joists	Mineral wool, rock	100	66.5	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	4	1	Flat/Apartment	64	1	64	Over heated space	Between Joists	Mineral wool, rock	100	64	Same building above	None
Expanded Polystyrene	100	6	2	Semi-Detached	88	2	44	Suspended	Between Joists	Mineral wool, rock	100	44	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	4	1	Tenement	65	1	65	Over heated space	Between Joists	Mineral wool, rock	100	65	Same building above	None
Expanded Polystyrene	100	5	1	Terraced House	87	2	43.5	Suspended	Between Joists	Mineral wool, rock	100	43.5	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100			Small Detached Cottage					Between Joists	Mineral wool, rock	100		Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	6	2	Large Detached Villa	172	2	86	Suspended	Between Joists	Mineral wool, rock	100	86	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	4	1	Flat/Apartment	95	1	95	Over heated space	Between Joists	Mineral wool, rock	100	95	Same building above	None
Expanded Polystyrene	100	6	2	Semi-Detached	127	2	63.5	Suspended	Between Joists	Mineral wool, rock	100	63.5	Pitched Roof	Ceiling Joist level
Expanded Polystyrene	100	4	1	Tenement	72	1	72	Over heated space	Between Joists	Mineral wool, rock	100	72	Same building above	None
Expanded Polystyrene	100	5	1	Terraced House	109	2	54.5	Suspended	Between Joists	Mineral wool, rock	100	54.5	Pitched Roof	Ceiling Joist level

GBC B2 House Type Data Sets >

3 England and Scotland

No	Yes	Yes	Yes	Auto-filled	Auto-filled	Yes	Auto-filled	Choose	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Auto-filled	Yes	Yes
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	Archetypes	Area of external walls minus openings	Party wall thickness (= External wall)	Party Wall Format (= External wall)	Party wall length	Area of Party Walls	Previous Party Wall Insulation Position	Previous Party Wall Insulation material
Drop Down List		mm	m	m	m	m	m	Drop Down List	m2	mm		m	m2		
Ceiling Joist level	Mineral wool, rock	150	8	9.56	35.13	2.6	2.9	Detached	183.1	330	Solid Masonry	0.00	0	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	5	8.30	26.60	2.6	2.9	End of Terrace	90.4	230	Solid Masonry	8.30	48	Room Side	Mineral wool, rock
None	None	0	6	9.17	30.33	2.6	2.9	Mid terrace	25.7	230	Solid Masonry	18.33	53	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	5	7.80	25.60	2.6	2.9	Mid terrace	43.4	230	Solid Masonry	15.60	90	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	7	6.71	27.43	2.6	2.9	Semi-Detached	102.0	330	Solid Masonry	6.71	39	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	7	10.71	35.43	2.4	2.7	Detached	84.7	280	Cavity Masonry	0.00	0	Cavity & Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	8	9.19	34.38	2.4	2.7	Detached	167.4	280	Cavity Masonry	0.00	0	Cavity & Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	5	7.90	25.80	2.4	2.7	End of Terrace	80.9	280	Cavity Masonry	7.90	43	Cavity & Room Side	Mineral wool, rock
None	None	0	6	9.00	30.00	2.4	2.7	Mid terrace	23.3	280	Cavity Masonry	18.00	49	Cavity & Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	5	7.60	25.20	2.4	2.7	Mid terrace	39.4	280	Cavity Masonry	15.20	82	Cavity & Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	7	5.86	25.71	2.4	2.7	Semi-Detached	91.4	280	Cavity Masonry	5.86	32	Cavity & Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	7	15.00	44.00	2.8	3.1	Detached	123.0	450	Solid Masonry	0.00	0	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	8	12.31	40.63	2.8	3.1	Detached	231.3	450	Solid Masonry	0.00	0	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	5	10.40	30.80	2.8	3.1	End of Terrace	110.7	450	Solid Masonry	10.40	64	Room Side	Mineral wool, rock
None	None	0	6	11.50	35.00	2.8	3.1	Mid terrace	28.1	230	Solid Masonry	23.00	71	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	5	8.70	27.40	2.8	3.1	Mid terrace	47.4	450	Solid Masonry	17.40	108	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	7	9.00	32.00	2.8	3.1	Semi-Detached	124.4	450	Solid Masonry	9.00	56	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	7	10.57	35.14	2.6	2.9	Detached	89.7	230	Solid Masonry	0.00	0	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150								450	Cavity Masonry			Cavity & Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	8	8.31	32.63	2.5	2.8	Detached	163.3	450	Cavity Masonry	0.00	0	Cavity & Room Side	Mineral wool, rock
None	None	0	6	10.67	33.33	2.5	2.8	Mid terrace	24.5	450	Solid Masonry	21.33	60	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	7	6.29	26.57	2.5	2.8	Semi-Detached	96.6	450	Cavity Masonry	6.29	35	Cavity & Room Side	Mineral wool, rock
None	None	0	6	10.83	33.67	2.5	2.8	Mid terrace	24.5	600	Solid Masonry	21.67	61	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	5	8.70	27.40	2.5	2.8	Mid terrace	40.2	450	Cavity Masonry	17.40	97	Cavity & Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150								600	Solid Masonry			Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	8	10.75	37.50	2.8	3.1	Detached	211.9	600	Solid Masonry	0.00	0	Room Side	Mineral wool, rock
None	None	0	6	15.83	43.67	2.8	3.1	Mid terrace	28.1	600	Solid Masonry	31.67	98	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	7	9.07	32.14	2.8	3.1	Semi-Detached	124.9	600	Solid Masonry	9.07	56	Room Side	Mineral wool, rock
None	None	0	6	12.00	36.00	2.8	3.1	Mid terrace	28.1	600	Solid Masonry	24.00	74	Room Side	Mineral wool, rock
Ceiling Joist level	Mineral wool, rock	150	5	10.90	31.80	2.8	3.1	Mid terrace	46.2	600	Solid Masonry	21.80	135	Room Side	Mineral wool, rock

GBC B2 House Type Data Sets > 4 England and Scotland

Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Auto-filled	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Previous Party Wall Insulation material	Previous Party Wall Insulation thickness	No. of existing doors	Average size of Existing Doors	Existing Door Insulated or uninsulated	Existing Door U value	No. of existing windows	Average size of existing windows	Area of existing Windows & Doors	Existing Window Glazing	Existing Window U Value	Roof Pitch above horizontal	Volume of house interior	Existing Fuel	Existing Heater	Existing Thermostat	Existing Radiators	Existing Controller
		No.	m2		W/m2.K	No.	m2	m2	Spec	W/m2.K	Degrees	m3					
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	14	1.2	20.58	Double Glazed pre 2002	2.81	40	841.5	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	10	1.2	15.78	Double Glazed pre 2002	2.81	40	456.5	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	1	1.89	Uninsulated	4.5	6	1.2	9.09	Double Glazed pre 2002	2.81	40	302.5	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	9	1.2	14.58	Double Glazed pre 2002	2.81	40	429	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	12	1.2	18.18	Double Glazed pre 2002	2.81	40	517	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	100	2	1.89	Uninsulated	4.5	6	1.2	10.98	Double Glazed pre 2002	2.81	40	382.5	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	100	2	1.89	Uninsulated	4.5	12	1.2	18.18	Double Glazed pre 2002	2.81	40	749.7	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	100	2	1.89	Uninsulated	4.5	10	1.2	15.78	Double Glazed pre 2002	2.81	40	402.9	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	100	1	1.89	Uninsulated	4.5	6	1.2	9.09	Double Glazed pre 2002	2.81	40	275.4	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	100	2	1.89	Uninsulated	4.5	9	1.2	14.58	Double Glazed pre 2002	2.81	40	387.6	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	100	2	1.89	Uninsulated	4.5	10	1.2	15.78	Double Glazed pre 2002	2.81	40	418.2	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	8	1.2	13.38	Double Glazed pre 2002	2.81	40	619.5	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	14	1.2	20.58	Double Glazed pre 2002	2.81	40	1162.3	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	10	1.2	15.78	Double Glazed pre 2002	2.81	40	613.6	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	1	1.89	Uninsulated	4.5	6	1.2	9.09	Double Glazed pre 2002	2.81	40	407.1	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	9	1.2	14.58	Double Glazed pre 2002	2.81	40	513.3	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	12	1.2	18.18	Double Glazed pre 2002	2.81	40	743.4	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	7	1.2	12.18	Double Glazed pre 2002	2.81	40	407	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	100	2	1.89	Uninsulated	4.5	12	1.2	18.18	Double Glazed pre 2002	2.81	40	0	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	100	2	1.89	Uninsulated	4.5	13	1.2	19.38	Double Glazed pre 2002	2.81	40	704.9	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	1	1.89	Uninsulated	4.5	6	1.2	9.09	Double Glazed pre 2002	2.81	40	339.2	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	100	2	1.89	Uninsulated	4.5	11	1.2	16.98	Double Glazed pre 2002	2.81	40	466.4	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	1	1.89	Uninsulated	4.5	6	1.2	9.09	Double Glazed pre 2002	2.81	40	344.5	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	100	2	1.89	Uninsulated	4.5	10	1.2	15.78	Double Glazed pre 2002	2.81	40	461.1	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	12	1.2	18.18	Double Glazed pre 2002	2.81	40	0	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	14	1.2	20.58	Double Glazed pre 2002	2.81	40	1014.8	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	1	1.89	Uninsulated	4.5	6	1.2	9.09	Double Glazed pre 2002	2.81	40	560.5	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	12	1.2	18.18	Double Glazed pre 2002	2.81	40	749.3	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	1	1.89	Uninsulated	4.5	6	1.2	9.09	Double Glazed pre 2002	2.81	40	424.8	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer
Mineral wool, rock	50	2	1.89	Uninsulated	4.5	10	1.2	15.78	Double Glazed pre 2002	2.81	40	643.1	Mains Gas	Combi-boiler	Room Thermostat	TRV Radiators	Programmer

GBC B2 House Type Data Sets > 5 England and Scotland

Yes	Yes	Auto-filled	Yes	Yes	Auto-filled	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exiting Heating Efficiency	Water heating	Lighting Luminaires	Luminaire Watts	Light on hours average	Lighting demand	Party Walls	Party Floors	Previous External Wall Insulation Finish	Previous Ground Floor materials	Previous Ground Floor Finish	Previous Ground Floor Slab or Joist Depth	Party Wall Material (=External Wall)	Roof Rafter/Joist depth	Roof Covering	Roof Structure Material	Proposed Window Improvements
		No.	W	Hrs	W/day	No.	No.					=				
90%	Combi-boiler	11	10	8	880	0	0	Render	Softwood	Softwood	100	Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	9	10	8	720	1	0	Render	Softwood	Softwood	100	Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	2	Render	Softwood	Softwood	100	Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	0	Render	Softwood	Softwood	100	Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	10	10	8	800	1	0	Render	Softwood	Softwood	100	Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	0	0	Render	Concrete	Ceramic Tile	100	Brick/Air/Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	0	0	Render	Softwood	Softwood	100	Brick/Air/Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	9	10	8	720	1	0	Render	Softwood	Softwood	100	Brick/Air/Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	2	Render	Softwood	Softwood	100	Brick/Air/Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	0	Render	Softwood	Softwood	100	Brick/Air/Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	10	10	8	800	1	0	Render	Softwood	Softwood	100	Brick/Air/Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	0	0	Render	Concrete	Ceramic Tile	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	0	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	9	10	8	720	1	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	2	Render	Softwood	Softwood	100	Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	10	10	8	800	1	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	0	0	Render	Concrete	Ceramic Tile	100	Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler		10	8		0	0	Render	Softwood	Softwood	100	Lime Render/Brick/Air/Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	0	0	Render	Softwood	Softwood	100	Lime Render/Brick/Air/Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	2	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	1	0	Render	Softwood	Softwood	100	Lime Render/Brick/Air/Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	9	10	8	720	0	0	Render	Softwood	Softwood	100	Lime Render/Brick/Air/Brick	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler		10	8		0	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	0	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	2	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	1	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed
90%	Combi-boiler	9	10	8	720	2	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Upgrade to Triple Glazed



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GRC V1 B6 Paper Based Site Survey

B2

B2 Paper based site survey

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Survey Plot, House or Flat No.			<ul style="list-style-type: none"> Print for site visit Manual input unrestricted Manual transfer to bespoke building type rows of House Types table Manual check that data is compatible with calculations No 'N/A' > '0'
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			



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GRC V1 B6 Paper Based Site Survey

B2

B2 Paper based site survey

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Survey Plot, House or Flat No.			
Core Data Source	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			

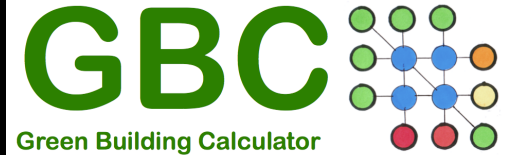
• Can be developed as iPad survey sheet

• 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				
Concatenated Look Up Table Reference	Site survey	Site survey	Site survey	Site survey	Site survey
Survey Plot, House or Flat No.	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
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	In situ Concrete	Sandstone	Sandstone
Existing Wall Format	<ul style="list-style-type: none"> Choose Brick Brick Air Brick Lime Render Brick Air Brick Stone In situ Concrete 	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
Archetypes	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

GRC V1 GBC B2 Survey Sheet v 2 Populated England

Context:	Step 1		
Project Address:	Type or paste text		Type or paste
* Project Address Country:	EnglandWalesNIreland	< Drop Down List	Choose
Wind Driven Rain Index:	1 Sheltered less than 33	1	Multiple
Construction: Moisture open or closed:	Open	IF	Auto-filled
Construction Era:	Pre 1919	< Drop Down List	Choose
Heritage status:	Choose	< Drop Down List	Choose
Risk Status:	Choose	< Drop Down List	Choose
* Building Format:	Mid Terrace	< Drop Down List	Choose
Building Type Look Up Code:	EnglandWalesNIreland:Pre 1919:Mid Terrace	CONCATENATE	Auto-filled
Building Fabric Condition:	Poor	< Drop Down List	Choose
Choose between EnerPHit Retrofit, Conservation Retrofit:	E&W BRAD L1B Domestic Retrofit	< Drop Down List	Choose
B2 Uvalue Etc column:	DN	VLOOKUP	Looked Up
Standardised dwelling database Assumed Areas or actual:	Actual	< Drop Down List	Choose
Outside winter average temperature:	4	Degrees C	Type or paste
Below Ground floor temperature:	4	IF	Auto-filled
Lifestyle temperature Choice:	Underwear only	< Drop Down List	Choose
Temperature Choice:	25	VLOOKUP	Looked Up
Assumed lifestyle choice for parties beyond party walls/floors	Jumper wearers	< Drop Down List	Choose
Parties temperature choice:	17	VLOOKUP	Looked Up

GRC V1 GBC B2 Survey Sheet v 3 populated England

Building Elements	Step 2			
Ground or Lower Floor	Yes	=	0.0	Auto-filled
Ground Floor Construction Format:	Suspended Timber	VLOOKUP	19	1.0 Looked Up
Existing Floor Thickness:	150	mm	69	2.0 Looked Up
Existing Floor Material:	Suspended timber	VLOOKUP	67	3.0 Looked Up
Existing Floor Finish:	Carpet	VLOOKUP	68	4.0 Looked Up
Previous Ground Floor Insulation Material:	Unknown	VLOOKUP	21	6.0 Looked Up
Previous Ground Floor Insulation Position:	Between Joists	VLOOKUP	20	7.0 Looked Up
Previous Ground floor Insulation Thickness:	0	mm	22	8.0 Looked Up
Previous Ground floor Insulation Finish:	Carpet	VLOOKUP	68	9.0 Looked Up
Standardised dwelling database Assumed Ground Floor Area:	36.27	m2	18	10.0 Looked Up
Actual Ground Floor Area:	40	m2	11.0	Type or paste
Assumed or Actual Ground Floor area?:	Actual	< Drop Down List	12.0	Accept or Change
Calculation Ground Floor Area:	40	m2	13.0	Auto-filled
Project Target U value: Floor Refurbishment	0.18	W/m2.K	14.0	Auto-filled
Previous Intervention Calculated U value: Floor Refurbishment	0.711	W/m2.K	15.0	Auto-filled
Proposed New Insulation Position:	Below slab	IF	16.0	Auto-filled
Proposed New Insulation Material:	Foamed glass chippings	IF	17.0	Auto-filled
Proposed New Insulation Thickness:	200	mm	18.0	Auto-filled
Proposed New Insulation Finish:	None	< Drop Down List	19.0	Choose
Proposed intervention Calculated U value:	0.711	W/m2.K	20.0	Auto-filled
Proposed intervention cost:		No Cost datasets	21.0	Auto-filled
Proposed intervention Calculated Embodied Energy:	360	MJ	22.0	Auto-filled
Proposed intervention Calculated Embodied Carbon:	408	kg CO2	23.0	Auto-filled
Proposed intervention Calculated Sequestered Carbon:	11600.00	kg CO2	24.0	Auto-filled
Proposed intervention Calculated Total Carbon:	-11192.00	kg CO2	25.0	Auto-filled
Short fall or exceeded U value:	-0.04	W/m2.K	26.0	Auto-filled
Pass or fail:	Fail	Pass or Fail	27.0	Auto-filled
In Use Heat loss:	151.86	W	28.0	Auto-filled
In use Carbon Dioxide:	0.061	kg CO2/kWh	29.0	Auto-filled
Build:	Traditional Builds	TB	30.0	Auto-filled
Element:	Floor	F	31.0	Auto-filled
Element Format:	Suspended Floor	SuF	32.0	Auto-filled
Insulation Position:	Below Floor Structure	BFS	33.0	Auto-filled
Structure Moisture Permeability:	Structure Moisture Open	SMO	34.0	Auto-filled
Insulation Permeability:	Insulation Moisture Open	IMO	35.0	Auto-filled
Building fabric condition:	Poor	P	36.0	Accept or Change
Wind Driven Rain Index:	4 Very Severe 100 or more	4	37.0	Auto-filled
Risk Level:	?	VLOOKUP	14	38.0 Looked up
Risk factor: Look Up Code:	TB:F:SuF:BFS:SMO:IMO:P:4	Concatenate	Many	39.0 Concatenated
Risk Statement: Ground floor:	No moisture risk assessment currently available	VLOOKUP	15	40.0 Looked up

GRC V1 GBC B2 Survey Sheet v 4 Populated England

External Wall	Yes	=		0.0	Auto-filled
External Wall Materials/Format	Solid Masonry	VLOOKUP	7	1.0	Looked Up
Existing External Wall Thickness:	800	mm	8	2.0	Looked Up
Existing External Wall Material:	Sandstone	VLOOKUP	6	3.0	Looked Up
Existing Internal finish:	Gypsum plasterboard	VLOOKUP	9	4.0	Looked Up
Previous External Wall Insulation Material:	Phenolic foam, foil-backed	VLOOKUP	11	6.0	Looked Up
Previous External Wall Insulation Position:	Internal	VLOOKUP	10	7.0	Looked Up
Previous External Wall Insulation Thickness:	120	mm	12	8.0	Looked Up
Previous External Wall Insulation Finish:	None	VLOOKUP	66	9.0	Looked Up
Standardised dwelling database Assumed Wall Area:	43.32	m2	34	10.0	Looked Up
Actual Wall Area:	50	m2		11.0	Type or paste
Assumed or Actual Wall area?	Actual	< Drop Down List		12.0	Accept or Change
Calculation External Wall Area:	50	m2		13.0	Auto-filled
Project Target U Value External Wall:	0.3	W/m2.K		14.0	Auto-filled
Calculated Previous Intervention U value:	0.25	W/m2.K		15.0	Auto-filled
Proposed New Insulation Position:	Inner face	IF		16.0	Auto-filled
Proposed New Insulation Material:	Wood Fibre	IF		17.0	Auto-filled
Proposed New Insulation Thickness:	100	mm		18.0	Auto-filled
Proposed New Insulation Finish:	Perlite Lime Mix	< Drop Down List		19.0	Choose
Proposed intervention Calculated U value:	0.176	W/m2.K		20.0	Auto-filled
Proposed intervention cost:		No Cost datasets		21.0	
Proposed intervention Calculated Embodied Energy:	139,103	MJ		22.0	Auto-filled
Proposed intervention Calculated Embodied Carbon:	975	kg CO2		23.0	Auto-filled
Proposed intervention Calculated Sequestered Carbon:	0.00	kg CO2		24.0	Auto-filled
Proposed intervention Calculated Total Carbon:	0.00	kg CO2		25.0	Auto-filled
Short fall or exceeded U value:	0.124	W/m2.K		26.0	Auto-filled
Pass or fail:	Pass	Pass or Fail		27.0	Auto-filled
In Use Heat loss:	149.18	W		28.0	Auto-filled
In use Carbon:	0.06	kg CO2/kWh		29.0	Auto-filled
Build:	Traditional Builds	TB		30.0	Auto-filled
Element:	External Wall	EW		31.0	Auto-filled
Element Format:	Solid Wall	SW		32.0	Auto-filled
Insulation Position:	Inner face	IWI		33.0	Auto-filled
Structure Moisture Permeability:	Structure Moisture Open	SMO		34.0	Auto-filled
Insulation Permeability:	Insulation Moisture Open	IMO		35.0	Auto-filled
Building fabric condition:	Poor	P		36.0	Accept or Change
Wind Driven Rain Index:	4 Very Severe 100 or more	4		37.0	Auto-filled
Risk factor: Look Up Code:	High	VLOOKUP	14	38.0	Looked up
Risk Level:	TB:EW:SW:IWI:SMO:IMO:P:4	Concatenate	Many	39.0	Concatenated
Risk Statement: External Wall:	Fully moisture open solution in exposed location. Essential that external detailing is undertaken to minimise water penetration, re-check pointing / render, window seals, sills etc. to ensure moisture open and weather tight.	VLOOKUP	15	40.0	Looked up

GRC V1 GBC B2 Survey Sheet v5 Populated England

Roof	Yes	=	0.0	Auto-filled
Existing Roof Format: Flat or Pitched	Pitched Roof	VLOOKUP	1.0	Looked Up
Existing roof rafter/joist depth:	150	mm	2.0	Looked Up
Existing roof structure material:	Softwood	VLOOKUP	3.0	Looked Up
Existing roof covering material:	Slate	VLOOKUP	4.0	Looked Up
Previous Roof Insulation Material:	Mineral wool, rock	VLOOKUP	6.0	Looked Up
Previous Roof Insulation Position:	Ceiling Joist level	VLOOKUP	7.0	Looked Up
Previous Roof Insulation Thickness:	150	mm	8.0	Looked Up
Actual Roof Insulation Thickness:	100	mm	8.1	Type or Paste
Choose Assumed or Actual Roof Insulation Thickness:	Assumed	< Drop Down List	8.2	Accept or Change
Calculation Roof Insulation Thickness:	150	mm	8.3	Auto-filled
Assumed Roof Pitch:	40	Degrees	8.4	Looked Up
Actual Roof Pitch:	60	Degrees	8.5	Type or Paste
Choose Assumed or Actual Roof Pitch:	Assumed	< Drop Down List	12.0	Accept or Change
Calculation Roof Pitch:	40	Degrees	8.7	Auto-filled
Standardised dwelling database Assumed Roof Area:	43.5	m2	10.0	Looked Up
Actual Roof Area	45	m2	11.0	Type or Paste
Assumed or Actual Roof area?	Assumed	< Drop Down List	12.0	Accept or Change
Calculation Roof Area:	43.5	m2	13.0	Auto-filled
Project Target U value: Roof Refurbishment	0.18	W/m2.K	14.0	Auto-filled
Calculated Previous Intervention U value:	0.11	W/m2.K	15.0	Auto-filled
Proposed New Insulation Position:	Above Ceiling Joists	< Drop Down List	16.0	Choose
Proposed New Insulation Material:	Dense Wood Fibre Insulation	< Drop Down List	17.0	Choose
Proposed New Insulation Thickness:	200	mm	18.0	Choose
Proposed New internal finish:	Perlite Lime Mix	< Drop Down List	19.0	Choose
Proposed intervention calculated U value:	#N/A	W/m2.K	20.0	Auto-filled
Proposed intervention cost:		No Cost datasets	21.0	
Proposed intervention Calculated Embodied Energy:	0	MJ	22.0	Auto-filled
Proposed intervention Calculated Embodied Carbon:	0.00	kg CO2	23.0	Auto-filled
Proposed intervention Calculated Sequestered Carbon:	0.00	kg CO2	24.0	Auto-filled
Proposed intervention Calculated Total Carbon:	0.00	kg CO2	25.0	Auto-filled
Short fall or exceeded U value:	#N/A	W/m2.K	26.0	Auto-filled
Pass or fail:	#N/A	Pass or Fail	27.0	Auto-filled
In Use Heat loss:	0.00	W	28.0	Auto-filled
In use Carbon:	0.00	kg CO2/kWh	29.0	Auto-filled
Build:	Traditional Builds	TB	30.0	Auto-filled
Element:	Roof		31.0	Auto-filled
Element Format:			32.0	Auto-filled
Insulation Position:			33.0	Auto-filled
Structure Moisture Permeability:	Structure Moisture Open	SMO	34.0	Auto-filled
Insulation Permeability:	Insulation Moisture Closed	IMC	35.0	Auto-filled
Building fabric condition:	Poor	P	36.0	Accept or Change
Wind Driven Rain Index:	1	1	37.0	Auto-filled
Risk Level:	TB:::SMO:IMC		38.0	Concatenated
Risk factor: Look Up Code:	High		39.0	Looked up
Risk Statement: Roof:	Moisture risk with roofs is based around two factors: cross ventilation (or equivalent) in the roof structure needs to be good and the condition of the roof needs to be at least good (anything less requires immediate remedial works). Use of moisture closed insulation requires that the VCL is continuous and this requires long lasting tapes, good seals between different materials (walls) as well as between insulation boards / membrane.		40.0	Looked up

GRC V1 GBC B2 Survey Sheet v 6 England

Windows	Yes	=		0.0	Choose
Existing Windows:	Double glazed post 2002	VLOOKUP	49	1.0	Looked Up
Standardised dwelling database Exiting window U value:	1.6	W/m2.K	50	1.1	Looked Up
Proposed Window Energy Improvements:	None	VLOOKUP	74	1.2	Looked Up
Proposed Window Energy Replacements:	N/A	W/m2.K	75	1.3	Looked Up
Standardised dwelling database Assumed Number of windows:	3	No.	46	10.1	Looked Up
Standardised dwelling database Assumed Average Window Area:	1.37	m2	47	10.2	Looked Up
Assumed Total Glazing Area:	4.11	m2		10.0	Auto-filled
Actual Number of windows:	9	No.		11.0	Type or Paste
Actual Average Window Area:	1.4	m2		11.1	Type or Paste
Actual Glazing Area	12.6	m2		11.0	Auto-filled
Assumed or Actual Glazing area?	Assumed	< Drop Down List		12.0	Accept or Change
Calculation Glazing Area:	4.11	m2		13.0	Auto-filled
Proposed intervention cost:		No Cost datasets		21.0	
Proposed intervention Calculated Embodied Energy:	2.77	MJ		22.0	Auto-filled
Proposed intervention Calculated Embodied Carbon:	0.00	kg CO2		23.0	Auto-filled
Proposed intervention Calculated Sequestered Carbon:	246.60	kg CO2		24.0	Auto-filled
Proposed intervention Calculated Total Carbon:	-246.60	kg CO2		25.0	Auto-filled
Short fall or exceeded U value:	0.011	W/m2.K		26.0	Auto-filled
Pass or fail:	Fail	Pass or Fail		27.0	Auto-filled
In Use Heat loss:	111.79	W		28.0	Auto-filled
In use Carbon:	0.045	kg CO2/kWh		29.0	Auto-filled
Doors:	Yes	=		0.0	Auto-filled
Existing Doors:	Uninsulated	VLOOKUP	44	1.0	Looked Up
Standardised dwelling database Exiting door U value:	1.60	W/m2.K	45	1.1	Looked Up
Previous Door Energy Improvements:	None	VLOOKUP	76	1.2	Looked Up
Proposed Door Energy Improvements:	N/A	W/m2.K	77	1.3	Looked Up
Assumed Number of doors	1	No.	42	10.1	Looked Up
Assumed Average Door Area:	1.8	m2	43	10.2	Looked Up
Assumed Total Glazing Area:	1.8	m2		10.0	Auto-filled
Actual Glazing Area	4.5	m2		11.0	Type or Paste
Assumed or Actual Glazing area?	Assumed	< Drop Down List		12.0	Accept or Change
Calculation Glazing Area:	1.8	m2		13.0	Auto-filled
Proposed Intervention calculated U value:	5.88	W/m2.K		20.0	Auto-filled
Proposed intervention cost:		No Cost datasets		21.0	
Proposed intervention Calculated Embodied Energy:	2.7	MJ		22.0	Auto-filled
Proposed intervention Calculated Embodied Carbon:	16.18	kg CO2		23.0	Auto-filled
Proposed intervention Calculated Sequestered Carbon:	254.88	kg CO2		24.0	Auto-filled
Proposed intervention Calculated Total Carbon:	-238.70	kg CO2		25.0	Auto-filled
Short fall or exceeded U value:	4.28	W/m2.K		26.0	Auto-filled
Pass or fail:	Fail	Pass or Fail		27.0	Auto-filled
In Use Heat loss:	48.96	W		28.0	Auto-filled
In use Carbon:	0.02	kg CO2/kWh		29.0	Auto-filled



<https://GreenBuildingEncyclopaedia.uk>



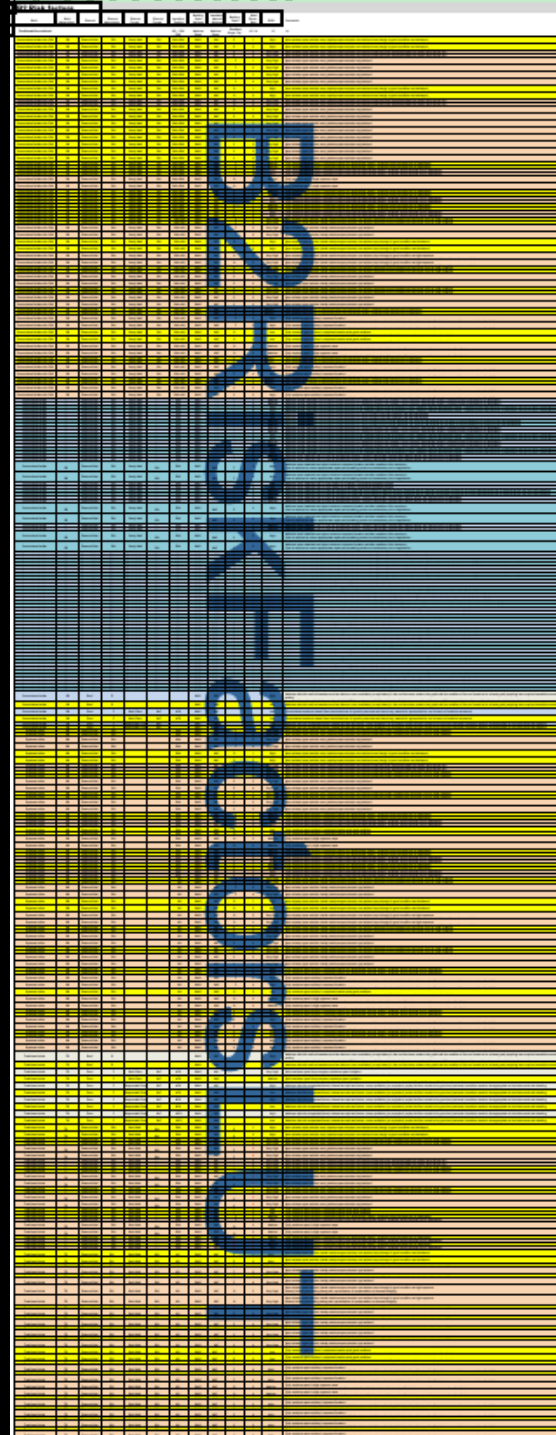
<https://GreenBuildingCalculator.uk>

GBC B2 STBA Risk Analysis

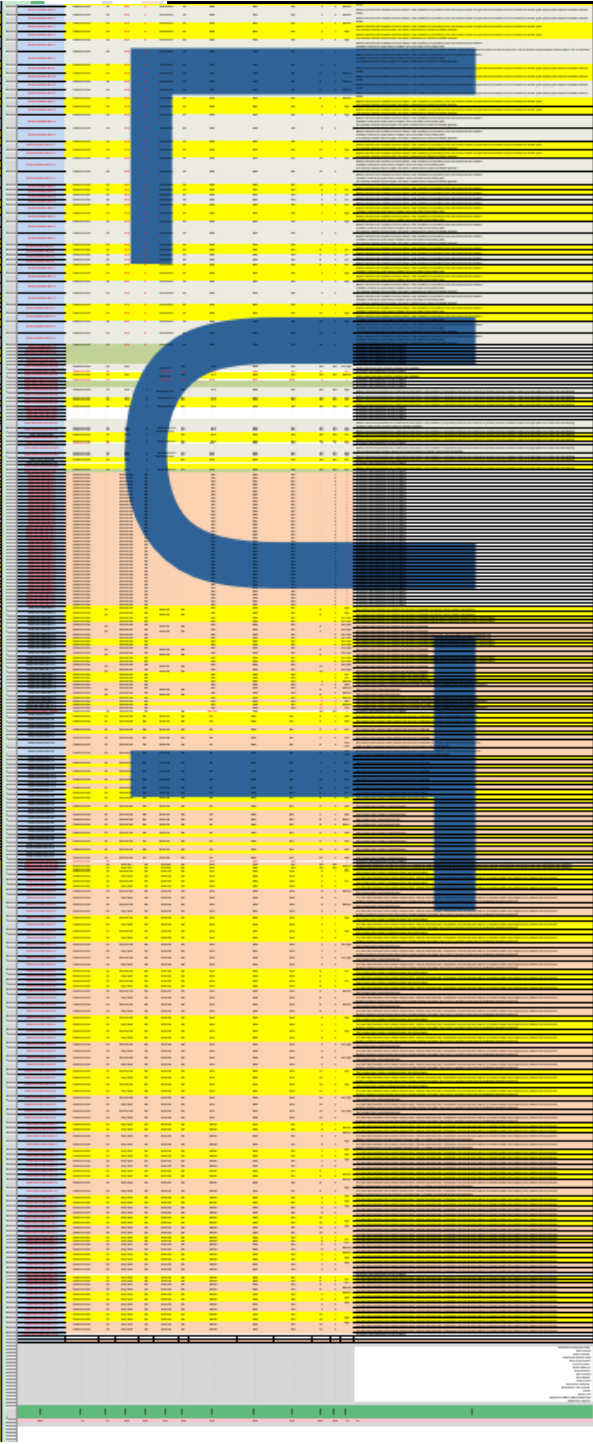
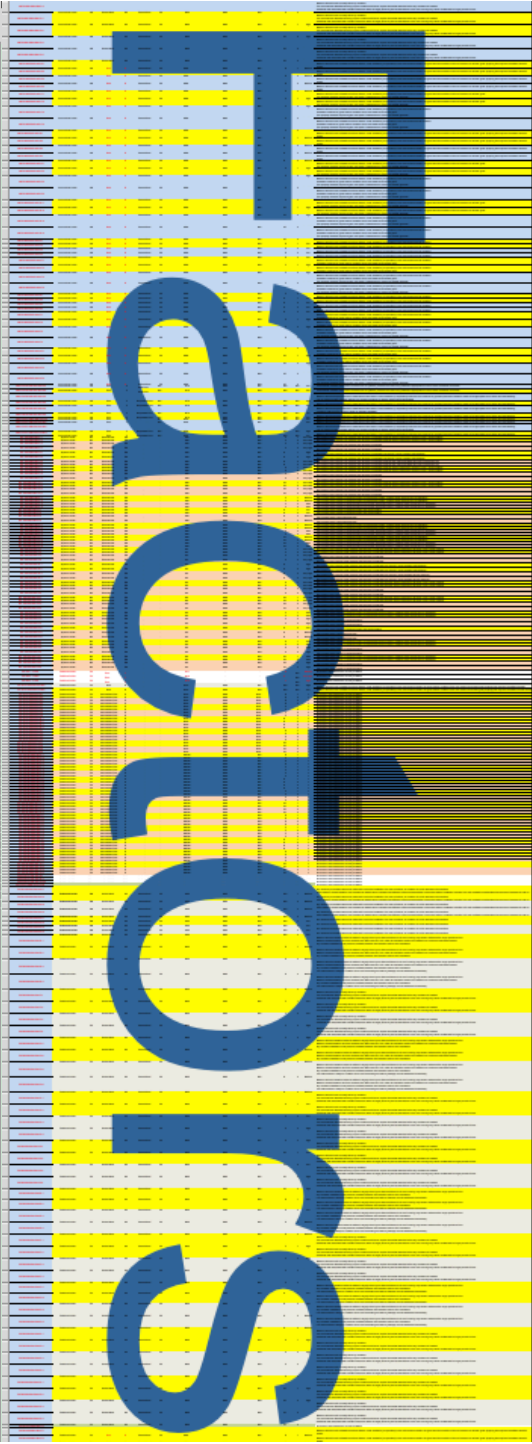
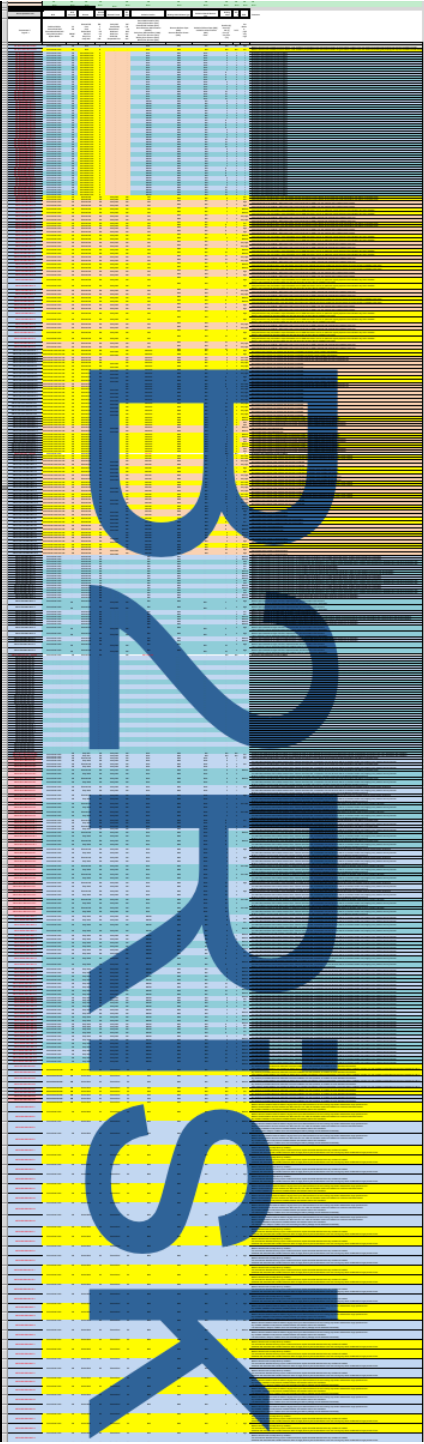
Summary	Structure		Insulation Material		Condition			Wind Driven Rain			RISK	Comments
	Moisture Open	Moisture Closed	Moisture Open	Moisture Closed	Excellent, Good	Fair, Poor, V Poor	1 or 2	3 or 4	1 or 2	3 or 4		
Traditional builds	1		1		1		1		1		Low	Fully moisture open solution in sheltered location and good condition. Recommended that external detailing re-checked (pointing / render, window seals, sills etc) to ensure moisture open and weather tight.
Traditional builds	1		1		1		1		1		Medium	Fully moisture open in high exposure area. External detailing key to minimise water penetration, re-check pointing / render, window seals, sills etc to ensure moisture open and weather tight.
Traditional builds	1		1			1	1		1		High	Fully moisture open solution in sheltered location but appropriate external repairs / enabling works required prior to application.
Traditional builds	1		1			1	1		1		High	Fully moisture open solution in exposed location. Essential that external detailing is undertaken to minimise water penetration, re-check pointing / render, window seals, sills etc to ensure moisture open and weather tight.
Traditional builds	1		1		1		1		1		High	Non moisture open solution inside moisture open structure not advised even though in good condition and sheltered. Risks of hidden moisture and concentration of condensation via thermal bridging.
Traditional builds	1		1		1		1		1		Very High	Non moisture open solution inside moisture open structure not advised even though in good condition as high exposure. Risks of hidden penetrating damp and concentration of condensation via thermal bridging. Long term maintenance plan and inspection regime required.
Traditional builds	1		1			1	1		1		Very High	Non moisture open solution inside moisture open structure not advised especially where underpinning structure is not in good condition.
Traditional builds	1		1			1	1		1		Very High	Non moisture open solution inside moisture open structure not advised. Risks very high due to poor condition and exposed nature of the site.
Conventional builds		1		1		1			1		Low	Moisture open materials can be used safely as condition is good and sheltered location
Conventional builds		1		1		1			1		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.
Conventional builds		1		1		1		1	1		Medium	Moisture open materials can be used as a sheltered location, however appropriate external repairs and enabling works are required prior to application.
Conventional builds		1		1		1		1	1		Medium	Moisture open materials can be used, however appropriate external repairs and enabling works are required prior to application.
Conventional builds		1		1		1		1	1		Low	Moisture closed materials inside moisture closed structure in a good condition and low exposure site are appropriate.
Conventional builds		1		1		1		1	1		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.
Conventional builds		1		1		1		1	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
Conventional builds		1		1		1		1	1		Medium	Moisture closed materials inside moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs works required prior to application.
LATER												
Conventional builds with CWI												Need to be treated as solid wall
Systems builds												Need to be treated as solid wall

- **Build: traditional conventional or system**
- **Structure: Moisture open or closed**
- **Insulation: Moisture open or closed**
- **Condition: Excellent Good Fair Poor or V Poor**
- **Wind driven rain index: 1 2 3 or 4**
- **Many permutations of the above**
- **Risk: Low Medium High or Very High**
- **Risk comments: guidance on areas of focus to reduce risk**

**GBC B2
Moisture Risk
Factors,
Permutations
& Feedback:
Partial
development
more to
follow>**



GRC V1 GBC B6 > More methods of construction permutations



GRC V1

GBC B2 Survey Sheet v

7 England

Services	No	=	0.0	Auto-filled
Occupant numbers:	Choose	< Drop Down List		Choose
Lifestyle choice: Temperature desired (C):	Choose	< Drop Down List		Choose
Assumed Volume of House:	63	m2		Looked Up
Assumed No. of Bathrooms:	1	No.		Looked Up
Actual Volume of House:	700	m2		Type or Paste
Actual No. of Bathrooms:	3	No.		Type or Paste
Assumed or Actual Volumes and numbers?	Assumed	< Drop Down List	12.0	Accept or Change
Calculation Volume of House:	643	m2		Auto-filled
Calculation No. of Bathrooms:	1	No.		Auto-filled
Existing Fuel/Energy Use:	Mains Gas	VLOOKUP		Looked Up
Existing Multiple Fuel/Energy Type:	Mains Gas	VLOOKUP		Looked Up
Existing heater:	Combi-boiler	VLOOKUP		Looked Up
Exiting Monitoring & Controls: Thermostat:	Room Thermostat	VLOOKUP		Looked Up
Exiting Monitoring & Controls: Radiators:	TRV Radiators	VLOOKUP		Looked Up
Exiting Monitoring & Controls: Controller:	Programmer	VLOOKUP		Looked Up
Existing Heating Efficiency:	90%	VLOOKUP		Looked Up
Proposed Monitoring & Controls: Thermostat:	Room Thermostat	VLOOKUP		Looked Up
Proposed Monitoring & Controls: Radiators:	TRV Radiators	VLOOKUP		Looked Up
Proposed Monitoring & Controls: Controller:	Programmer	VLOOKUP		Looked Up
Heating	No	=	0.0	
Calculated Energy Consumption:	50	kWh/annum		Auto-filled
Lifestyle adjustment:	110	%		Auto-filled
Calculated Lifestyle Adjusted Energy Consumption:	55	kWh/annum		Auto-filled
Proposed Fuel/Energy Type:	Mains Gas	VLOOKUP		Looked Up
Proposed Multiple Fuel/Energy types:	Mains Gas	VLOOKUP		Looked Up
Existing Heating Source:	Combi-boiler	VLOOKUP		Looked Up
Heating delivery system:	Radiators	< Drop Down List		Choose
Proposed Heating Source:	Choose	< Drop Down List		Choose
Proposed Monitoring & Controls:	Choose	< Drop Down List		Choose
Proposed Monitoring & Controls: Thermostat:	Room Thermostat	VLOOKUP		Looked Up
Proposed Monitoring & Controls: Radiators:	TRV Radiators	VLOOKUP		Looked Up
Proposed Monitoring & Controls:	Programmer	VLOOKUP		Looked Up
Ventilation	No	=	0.0	Auto-filled
Proposed Fuel/Energy Type:	Mains Gas	VLOOKUP		Looked Up
Proposed Multiple Fuel/Energy types:	Mains Gas	VLOOKUP		Looked Up
Existing Ventilation Type:	Air Leaky House	< Drop Down List		Choose
Proposed Ventilation System:	MVHR Mechanical Ventilation with Heat Recovery	< Drop Down List		Choose
Proposed Monitoring & Controls:	Programmer	VLOOKUP		Looked Up
Calculated Energy Consumption:		kWh/annum		Auto-filled
Lighting	No	=	0.0	Auto-filled
Number of luminaires:	9	No.		Looked Up
Luminaire Watts: (average):	10	W		Looked Up
Light on average Hours:	8	Hrs.		Looked Up
Lighting Demand:	720	W/day		Looked Up
Hot water	No	=	0.0	Auto-filled
Existing Fuel/Energy Use:	Mains Gas	VLOOKUP		Looked Up
Multiple fuel types:	Mains Gas	VLOOKUP		Looked Up
Proposed Fuel:	Mains Gas	VLOOKUP		Looked Up
Existing Water Heating Method:	Combi-boiler	VLOOKUP		Looked Up
Water Storage Method:	Choose	< Drop Down List		Choose
Proposed Monitoring & Controls:	Programmer	VLOOKUP		Looked Up
Electric vehicle:	No	=	0	Auto-filled

GRC V1 B2 4 No. Elements

Uvaules: Ex. Prop. BofQ EEECS

B2 Elements									
Element	Code	Category	Material	Quantity	Unit	Volume	Area	Weight	Value
Ground Beating Solid Floor (GSF) Existing with any previous intervention									
Ground Beating Solid Floor (GSF) Proposed intervention									
Ground Beating Solid Floor (GSF) Bil of BCLAF/ACC									
Ground Beating Solid Floor (GSF) EE EG BC									
Suspended Ground Floor (SGF) Existing with previous intervention									
Suspended Ground Floor (SGF) Proposed intervention									
Suspended Ground Floor (SGF) Bil of BCLAF/ACC									
Suspended Ground Floor (SGF) EE EG BC									
Solid Masonry External Walls (SMEW) Existing with previous intervention									
Solid Masonry External Walls (SMEW) Proposed intervention									
Solid Masonry External Walls (SMEW) Bil of BCLAF/ACC									
Solid Masonry External Walls (SMEW) EE EG BC									
Cavity Masonry External Walls (CMEW) Existing with previous intervention									
Cavity Masonry External Walls (CMEW) Proposed intervention									
Cavity Masonry External Walls (CMEW) Bil of BCLAF/ACC									
Cavity Masonry External Walls (CMEW) EE EG BC									

GRC V1 GBC B2 Elemental Assembly > 1 v GBSF Existing & Previous Interventions

Yes/No	New Build or Refurbishment Actions	Component Function	Component Material	Density	Thermal Conductivity	Thickness	Thickness	Thermal Resistance	width or 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		
No		Ground Bearing Solid Floor (GBSF) 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)	© STBA 2021 developed by GBC and STBA									0.17					0.170	
No	Proposed	Internal Floor Decoration	Lacquer	1000	1	0.25	0.00025	0.000	1	1	100%	0.000						
No	Proposed	Internal Floor Finish	Hardwood flooring	700	0.180	25	0.025	0.139	1	1	100%	0.000						
No	Proposed	Internal Decking	Gypsum fibreboard	1000	0.360	48	0.048	0.133	1	1	100%	0.000						
No	Proposed	Internal Thermal Insulation	Wood fibre	50	0.036	100	0.1	2.778	1	1	100%	0.000						
No	Previous	Internal Floor Decoration	Lacquer	1000	1	0.25	0.00025	0.000	1	1	100%	0.000						
No	Previous	Internal Floor Finish	Softwood	500	1	25	0.025	0.025	1	1	100%	0.000						
Yes	Previous	Internal Decking	Chipboard	1000	0.14	12.5	0.0125	0.089	1	1	100%	0.089						
Yes	Previous	Internal Thermal insulation	Mineral wool, rock	24	0.038	100	0.1	2.632	1	1	100%	2.632						
No	Previous	Internal Vapour control layer	PE foil Polyethylene	0.4	0.23	0.12	0.00012	0.001	1	1	100%	0.001						
Yes	Existing	Floor wearing surface	Ceramic Tile	2000	1	8	0.00	0.000	1	1	100%	0.000						
Yes	Existing	Levelling/Bedding	Screed	1200	0.41	40	0.04	0.098	1	1	100%	0.098						
Yes	Existing	Solid Ground Floor	Softwood	500	2.5	100	0.1	0.040	1	1	100%	0.040						
Yes	Existing	Undisturbed Subsoil	Undisturbed Soil	1700	1.5	300	0.30	0.200	1	1	100%	0.200						
Yes		Resistance of Outside Surface (Rso)					Proposed	759.12					0.000					
							Previous	751.12	0.75					3.229	0.310	0.25	0.060	Fail
							Overall thickness mm	Overall thickness m					Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, PassU or Fail	

GRC V1 GBC B2 Regulations v Retrofit Design Standards v WUFI

Look Up Table LUT1		CHOOSE WHICH COLUMN >																						BU		BV		BW		BX		BY		CA		CC		CD		CE		CF		CG		CU		DN		DO		DP		DQ	
B2 U Values Etc	Regulations/ Design Standards	Building Regulations Approved Document L	Future Homes Standard 2021	Scottish Technical Standard Part 6 2020												Northern Ireland (2017)				Other National or State Regulations	PAS 2035 trainin	Design Standards	AECB				Passivhaus UK (AECB)	Passivhaus Institute (B)	Zero carbon Hub Target U values	LETI London Energy Transformation Initiative	RIBA 2030 Climate Challenge				National Green Building Council standards	STBA Sustainable Traditional Building Alliance																			
		UK Region 2 & 4 England & Wales	UK E & W	Region 1												Region 3 Northern Ireland				To be added by RRG users														To be added by GBC	RRCC Responsible Retrofit Carbon Calculator																				
	Winter heat loss	LIB	T6.1	T6.2.C4	T6.2.C5	6.2.6.3												Near Zero Energy Buildings												Made up to correspond to the ZCH The Building Hub's Designer's Handbook page 8 and other objectives																									
		Domestic	Domestic	Domestic												Domestic				All	Domestic	Domestic							Domestic				Domestic	Domestic				Any																	
		Existing Building	Existing	Existing	Existing																									Current Benchmark				2020 Targets	2025 Targets	2030 Targets		Existing Building																	
		2023 Public Consultation																						Average weight of elements				Individual elements				Average weight of elements				Individual elements				Average weight of elements				Individual elements				Average weight of elements				Individual elements			
See row 3 Red Capital Letters	DN	New thermal elements	Threshold	Retrofit	New thermal elements	Threshold	Retrofit	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements	Thermal elements																
		Target U value	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max																
		0.20	0.22	0.24	0.26	0.28	0.30	0.32	0.34	0.36	0.38	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.74	0.76	0.78	0.80	0.82	0.84	0.86	0.88	0.90	0.92	0.94																

- WUFI limits, E&W:L, STS:6, NI, ZCH, PAS 2035, LETI, RIBA 2030, TfL, STBA, AECB CLR, PH EnerPHit,
- Choose a red column heading reference,
- record in green cell and calculator resets and applies

Completed by GBC	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	No	No	Yes	
To be completed by GBC user		Auto-filled	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	
Show or Hide			Show	Show	Show	Show	Show	Show	Show	Show	Show	Show	Show	Show	Show	Show	Show	Show	Show	Show	Show	
	1	Look Up Table LUT1																				
	2	CHOOSE WHICH COLUMN >																				
	3	G H I R S T Z AA AB AC AD AE AF AO AP AZ BA BB BQ																				
	4	B2 U Values Etc																				
	5	Regulations																				
	6	Building Regulations Approved Document L																				
	7	Future Homes Standard 2021																				
	8	Scottish Technical Standard Part 6 2020																				
	9	Northern Ireland (2017)																				
	10	Other National or State Regulations																				
	11	PAS 2035 training																				
	12	© STBA 2021 developed by GBC and STBA																				
	13	UK Region 2 & 4 England & Wales																				
	14	UK E & W																				
	15	Region 1																				
	16	Region 3 Northern Ireland																				
	17	To be added by RRG users																				
	18	Winter heat loss																				
	19	L1B																				
	20	T6.1																				
	21	T6.2 C4																				
	22	T6.2 C5																				
	23	6.2-6.3																				
	24	Near Zero Energy Buildings																				
	25	Domestic																				
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	120	Domestic																				
8	See row 3 Red Capital Letters	Scenarios set column choice: Regulations, Design Standards or Campaign targets to help set project targets																				
8	DO	New thermal elements	Threshold	Retrofit	New thermal elements	Threshold	Upgrade retained thermal elements	Improved	Upgrade retained thermal elements	Conversion	Conversion	Extension	Extension	Extension	Alterations	Alterations	New Build	Retrofit	All	New Build	Retrofit	Retrofit
9	Target U values	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K	W/m2.K
9	Yes/No	No	Avoid	Yes	Pending	Pending	Pending	No	Yes	No	No	Avoid	No	Avoid	No	Avoid	No	No	No	No	No	?
10	Floors	9 Ground Floor Ground Bearing (GFGB)																				
10	0.22	0.7	0.25	0.18	0.7	0.25	0.25	0.35	0.15	0.18	0.7						0.25		0.15			0.25
11	10 Ground Floor Over Ventilated Void (GFOV)	0.22	0.7	0.25	0.18	0.7	0.25	0.25	0.35	0.15	0.18	0.7					0.25		0.15			0.25
12	Compartmentation	15 Party Floor (PF)																				
12	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated
13	16 Party Wall (PW)	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated	Unregulated
14	Wall	20 External Walls (EW)																				
14	0.28	0.7	0.3	0.18	0.7	0.3	0.3	0.7	0.17	0.22	0.7						0.35		0.18			0.25
15	20.1 External wall Insulated Cavity		0.7	0.55	0.18	0.7	0.55	0.3	0.7	0.17	0.22	0.7					0.35		0.18			0.25
16	20.2 External wall Solid wall insulated (Int or Ext)		0.7	0.3	0.18	0.7	0.3	0.3	0.7	0.17	0.22	0.7					0.35		0.18			0.25
17	20.3 External wall Solid wall insulated (Internal)		0.7	0.2	0.18	0.7	0.3	0.3	0.7	0.17	0.22	0.7					0.35		0.18			0.25
18	20.7 Solid Wall	Unregulated	Unregulated		0.18	0.7	0.3	0.3	0.7	0.17	0.22	0.7							0.18			Unregulated
19	Roof (includes opaque parts of dormers)	22 Flat Roof (FR)																				
19	0.18	0.35	0.18	0.15	0.35	0.16	0.25	0.35	0.13	0.18	0.35						0.25		0.15			0.16
20	24 Pitched Roof (PR)	0.18	0.35	0.18	0.15	0.35	0.16	0.25	0.35	0.13	0.18	0.35					0.25		0.15			0.16
21	Ceilings (may be part of the roof calculation)	Internal Ceilings (IC)																				
21	0.18	0.35	0.16	0.15	0.35	0.16	0.25	0.35	0.11	0.15	0.35						0.25		0.15			0.16
22	34 Flat Ceiling (FC)	0.18	0.35	0.16	0.15	0.35	0.16	0.25	0.35	0.11	0.15	0.35					0.25		0.15			0.16
23	35 Pitched Vault Ceiling (PVC)	0.18	0.35	0.16	0.15	0.35	0.16	0.25	0.35	0.11	0.15	0.35					0.25		0.15			0.16
24	Glazing	42 Windows (W)																				
24				Min WER Band C	1.4	Unregulated	Unregulated	1.6	3.3	1.4	1.6	3.3	1.2	3.5	2.2		1.4		1.4			1.4
25	43 Glazed Pedestrian Doors (GPD)				1.4	Unregulated	Unregulated	1.6	3.3	1.4	1.6	3.3	1.2	3.5	2.2		1.4		1.4			1.4
26	44 Opaque Pedestrian Doors (OPD)			1.8	1.4	Unregulated	Unregulated	1.6	3.3	1.4	1.6	3.3	1.2	3.5	2.2		1.4		1.4			1.1
27	51 Rooflights (RL)				2.2	Unregulated	Unregulated	1.6	3.3	1.4	1.6	3.3	1.2	3.5	2.2		1.6		1.6			1.4
28	52 Roof Windows (RW)				1.4	Unregulated	Unregulated	1.6	3.3	1.4	1.6	3.3	1.2	3.5	2.2		1.6		1.6			1.4
29	Conservatory: Roof								1.8	1.8	3.3											
30	Conservatory: Wall								1.8	1.8	3.3											
31	Conservatory: Floor								1.8	1.8	3.3											
32	Conservatory: Windows Doors Rooflights								1.8	1.8	1.8											
33	Embodied Carbon	* kgCO2e/m2																				
34	Domestic	M4i benchmark. Targets: Less than																				

GRC V1 GBC B2 Insulation:

Materials Formats Densities: 17 of >150

Chosen U value targets = Thicknesses

B2 Insulation		Insulation Material k to U value Thickness			© STBA 2021 developed by GBC and STBA																	Yes								
Chosen column: DN					Mainly mineral based			Mainly Fossil Oil-				Mainly Plant based				Mixed														
Group					Fibre			Foam				Fibre				Mineral-plant														
Format					Quilts batts slabs			Quilts batts slabs				Boards, Foam				Rigid Board														
Material					Glass Mineral Wool (10-60)			Recycled (40-60%) Glass fibre:				Stone Mineral Wool (33-160)				Calcium Silicate														
Initials					GMW			RGF				SMW				CS														
Density					10 to 80			33 to 160				255						35												
Used in Project					Yes or No V			Yes/No >				Yes/No				Yes/No				Yes/No										
k values					Worst			Best				Best				Best				Best										
k values					Average			Average				Average				Average				Average										
Target U values (insulation only)					U values			mm				mm				mm				mm										
Elements					(insulation only)			(including other components)				mm				mm				mm				mm						
Floors																														
Yes 9 Ground Floor Ground Bearing (GFGB)		0.25						W/m2.K				152				156				152				236						
Yes 10 Ground Floor Over Ventilated Void (GFOV)		0.25						W/m2.K				152				156				152				236						
Compartmentation																														
Yes 15 Party Floor (PF)		Unregulated						W/m2.K																						
Yes 16 Party Wall (PW)		Unregulated						W/m2.K																						
Walls																														
Yes 20 External Walls (EW)		0.30						W/m2.K				127				130				127				197						
Roof																														
Yes 22 Flat Roof (FR)		0.18						W/m2.K				211				217				211				328						
Yes 24 Pitched Roof (PR)		0.18						W/m2.K				211				217				211				328						
Internal Ceiling																														
Yes 34 Flat Ceiling (FC)		0.16						W/m2.K				238				244				238				369						
Yes 35 Pitched Vault Ceiling (PVC)		0.16						W/m2.K				238				244				238				369						
Glazing																														
Yes 42 Windows (W)		1.60						W/m2.K				24				24				24				37						
Yes 43 Glazed Pedestrian Doors (GPD)		0.00						W/m2.K				24				24				24				37						
Source of data																														

GRC V1 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	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	0.025	1	1	100%	0.025				
Yes	Existing	Undisturbed sub soil	Clay	1.500	1000	1	0.667	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 V1 GRC V1 GBC B2 Material Conductivities >150 materials GBC V3 >2200 materials

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

Common Building Materials										
Density ρ	Thermal Conductivity λ	Thermal Conductivity λ maximum	Thermal Conductivity λ minimum	Thermal Conductivity λ average	Thickness	Thickness	Resistivity	Resistance of sub assembly $R_{s,u}$	U value	Vapour resistivity
Density ρ (average or actual)	Thermal Conductivity λ k-value	Thermal Conductivity λ					Resistivity		U value	Vapour resistivity
kg/m ³	W/m.K	W/m.K	W/m.K	W/m.K	mm	m	m ² .K/W	m ² .K/W	W/m ² .K	MNs/gm
kg/m ³	W/m.K	W/m.K	W/m.K	W/m.K			m ² .K/W	m ² .K/W	W/m ² .K	MNs/gm
1	2	3	4		4	5	6			
Gypsum plasterboard	900	0.250			12.5	0.0125	0.050		20.000	20
Gypsum plasterboard	900	0.180			12.5	0.0125	0.078		12.800	-
Gypsum fibre reinforced board		0.380			12.5	0.0125	0.035		29.800	130
Brickwork (outer leaf)	1700	0.770			102	0.102	0.132		7.548	50
Brickwork (inner leaf)	1700	0.580			102	0.102	0.182		5.490	50
Concrete block (medium density)	1400	0.870			100	0.1	0.175		5.700	-
Concrete block (low density)	600	0.180			100	0.1	0.556		1.800	-
Concrete (medium density) (inner leaf)	1800	1.130			100	0.1	0.088		11.300	-
Concrete (medium density) (inner leaf)	2000	1.330			100	0.1	0.075		13.300	-
Concrete (medium density) (inner leaf)	2200	1.590			100	0.1	0.063		15.900	-
Concrete (high density)	2400	1.930			600	0.6	0.311		3.217	-
Reinforced concrete (1% steel)	2300	2.300			300	0.3	0.130		7.667	-
Reinforced concrete (2% steel)	2400	2.500			300	0.3	0.120		8.333	-
Mortar (protected) (inner leaf)	1750	0.880			100	0.1	0.114		8.800	-
Mortar (exposed) (outer leaf)	1750	0.940			100	0.1	0.106		9.400	-
Gypsum lightweight	600	0.180			13	0.013	0.072		13.846	-
Gypsum (medium density)	900	0.300			13	0.013	0.043		23.077	-
Gypsum (dense)	1200	0.430			13	0.013	0.030		33.077	-
Sandstone	2600	2.300			100	0.1	0.043		23.000	-
Limestone, soft	1800	1.100			100	0.1	0.091		11.000	-
Limestone, hard	2200	1.700			100	0.1	0.059		17.000	-
Fibreboard	400	0.100			10	0.01	0.100		10.000	-
Plasterboard	900	0.250			12.5	0.0125	0.050		20.000	-
Plasterboard foil faced	900	0.250			12.5	0.0125	0.050		20.000	-
Tiles ceramic	2300	1.300			5	0.005	0.004		260.000	-
Timber (softwood)	500	0.130			150	0.15	1.154		0.867	100
Timber (softwood)	700	0.180			150	0.15	0.833		1.200	100
Hardwood timber	700	0.180			25	0.025	0.139		7.200	250
softwood timber	500	0.130			18	0.018	0.138		7.222	-
softwood timber	1000	0.240			18	0.018	0.075		13.333	-
Softwood plywood	500	0.130			18	0.018	0.138		7.222	450
Softwood plywood	1000	0.240			18	0.018	0.075		13.333	450
softwood chipboard	500	0.130			18	0.018	0.138		7.222	-
softwood chipboard	1000	0.240			18	0.018	0.075		13.333	-
Steel	7800	50.000			5	0.005	0.000		10000.000	-
Stainless steel	7900	17.000			1	0.001	0.000		17000.000	-
External rendering	1300	0.570			19	0.019	0.033		30.000	-
Plaster (dense)	1300	0.570			19	0.019	0.033		30.000	-
Plaster (lightweight)	600	0.180			12	0.012	0.067		15.000	-
Reinforced concrete (1% steel)	2300	2.300			300	0.3	0.130		7.667	-
Reinforced concrete (2% steel)	2400	2.500			300	0.3	0.120		8.333	-
Aerated concrete slab	500	0.160			150	0.15	0.938		1.067	-
Asphalt	2100	0.700			20	0.02	0.029		35.000	-
Fellblumen layers	1100	0.230			7	0.007	0.030		32.857	-
Screed	1200	0.410			25	0.025	0.061		16.400	-
Stone chippings	2000	2.000			10	0.01	0.005		200.000	-
Tiles (clay)	2000	1.000			6	0.006	0.006		166.667	-
Tiles (concrete)	2100	1.500			10	0.01	0.007		150.000	-
Wood wool slab	500	0.100			50	0.05	0.500		2.000	-
Cast concrete	2000	1.300			300	0.3	0.222		4.500	-
Reinforced concrete (1% steel)	2300	2.300			300	0.3	0.130		7.667	-
Reinforced concrete (2% steel)	2400	2.500			300	0.3	0.120		8.333	-
Metal tray (steel)	7800	50.000			2	0.002	0.000		25000.000	-
Screed	1200	0.410			45	0.045	0.110		9.111	-
Hardwood timber	700	0.180			25	0.025	0.139		7.200	-
softwood timber	500	0.130			18	0.018	0.138		7.222	-
softwood timber	1000	0.240			18	0.018	0.075		13.333	-
softwood plywood	500	0.130			18	0.018	0.138		7.222	-

GRC V1 GBC B2 Elemental Assembly

> 4 Bill of Materials Quantities Costs

Yes/No	Existing 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	£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	

GRC V1 GBE B6 Bill of Quantities Elemental Summary

Bill of MQLAPMOC	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	All insulation components per element
Ground Bearing Solid Floor (GBSF) Bill of MQLAPMOC	£8	£2	£4	£2	£4	£2	£2	£2	£4	£8	£14	£0
Suspended Ground Floor (SGF) Bill of MQLAPMOC	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Ground Floor total												
Solid Masonry External Walls (SMEW) Bill of MQLAPMOC	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Cavity Masonry External Walls (CMEW) Bill of MQLAPMOC	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
External wall Total												
Party Floor (PF) Bill of MQLAPMOC	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Solid Masonry Party Walls (SMPW) Bill of MQLAPMOC	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Cavity Masonry Party Walls (CMPW) Bill of MQLAPMOC	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Timber Framed Party Walls (TFPW) Bill of MQLAPMOC	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Party Wall Total												
Pitched Roof (PR) Bill of MQLAPMOC	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Flat Roof (FR) Bill of MQLAPMOC	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Roof total												
Windows (W) Bill of MQLAPMOC	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Glazed Pedestrian Doors (GPD) Bill of MQLAPMOC	£8	£2	£4	£2	£4	£2	£2	£2	£4	£8	£14	£0
Whole Building	£16	£4	£7	£4	£7	£4	£4	£4	£7	£16	£29	£0

GRC V1 GBC B2 Elemental Assembly > 5 Embodied Energy > Sequestered Carbon

Yes/No	Component Function	Length m	Width m	Height m	Component Thickness m	Quantity No.	Area m ²	Volume m ³	Primary or all Functions	Primary or all Components	Primary or all Materials	Information Source	Embodied Energy MJ/m ³	Embodied Energy MJ/m ²	Embodied Energy MJ/Item	Area or section m ²	Embodied Carbon kg C/kg	Embodied Carbon kg CO2/kg	Embodied Carbon kg CO2/m ²	Embodied Carbon kg CO2/Item	Density kg/m ³	Weight kg/m ²	Embodied Energy MJ/m ³	Embodied Carbon kg CO2/m ³	Required in building works Yes/No	Embodied Energy (Intervention) MJ	Embodied Carbon (Intervention) kg CO2	Is the material Bio-based or contain Biogenic carbon? Yes/No	Sequestered Carbon (Intervention) kg CO2	Total Carbon (Intervention) Kg CO2	
No	Ground Bearing Solid Floor (GBSF) EE EC SC						0.00				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
No	Lacquer				0.0003	1	0.00	0	Choose	Choose	Wood stain / varnish	ICE 1	50	0	0	0	m ²	0	0	0	0	0	0	0	0	No	0.000	0.000	No	0	0
No	Hardwood flooring				0.0250	1	0.00	0	Choose	Choose	Hardboard (maximum)	ICE 2	16	0	0	0	m ²	0	1.05	0	0	1000	0	16000	1050	No	0.000	0.000	Yes	0	0
No	Gypsum fibreboard				0.0480	1	0.00	0	Choose	Choose	Plasterboard	ICE 1 & 2	6.75	0	0	0	m ²	0	0.38	0	0	800	0	5400	304	No	0.000	0.000	0.16	0	0
No	Wood fibre				0.1000	1	0.00	0	Choose	Choose	Hardboard (minimum)	ICE 2	16	0	0	0	m ²	0	1.05	0	0	600	0	9600	630	No	0.000	0.000	Yes	0	0
No	Lacquer				0.0003	1	0.00	0	Choose	Choose	Wood stain / varnish	ICE 1	50	0	0	0	m ²	0	0	0	0	0	0	0	0	No	0.000	0.000	No	0	0
No	Softwood				0.0250	1	0.00	0	Choose	Choose	Sawn Softwood	ICE 2 (2011) via HE	0	0	0	0	m ²	0	0	0	0	500	0	0	0	No	0.000	0.000	Yes	0	0
No	Chipboard				0.0125	1	0.00	0	Choose	Choose	Plasterboard	ICE 1 & 2	6.75	0	0	0	m ²	0	0.38	0	0	800	0	5400	304	No	0.000	0.000	0.16	0	0
No	Mineral wool, rock				0.0001	1	0.00	0	Choose	Choose	Rockwool (slab)	ICE 1 & 2	16.8	0	0	0	m ²	0	1.05	0	0	24	0	403.2	25.2	No	0.000	0.000	No	0	0
No	PE foil Polyethylene				0.1000	1	0.00	0	Choose	Choose	HDPE High Density Polyethylene	E-CT	84.4	0	0	0	m ²	2	0	0	0	1400	0	118160	0	No	0.000	0.000	No	0	0
No	Ceramic Tile																														
No	Screed				0.0400	1	0.00	0	Choose	Choose	Mortar (cement:sand mix)	ICE 2 (2011) via HE	0	0	0	0	m ²	0	0	0	0	1900	0	0	0	No	0.000	0.000	No	0	0
No	Softwood				0.1000	1	0.00	0	Choose	Choose	Sawn Softwood	ICE 2 (2011) via HE	0	0	0	0	m ²	0	0	0	0	500	0	0	0	No	0.000	0.000	Yes	0	0
No	Undisturbed Soil				0.3000	1	0.00	0	Choose	Choose	Soil	ICE 2 (2011) via HE	0	0	0	0	m ²	0	0	0	0	1700	0	0	0	No	0.000	0.000	No	0	0
																										0	0		0	0	
																										Embodied Energy (Intervention)	Embodied Carbon (Intervention)	Is the material Bio-based or contain Biogenic carbon?	Sequestered Carbon (Intervention)	Total Carbon (Intervention)	

GRC V1 GBC B2 ICE Database

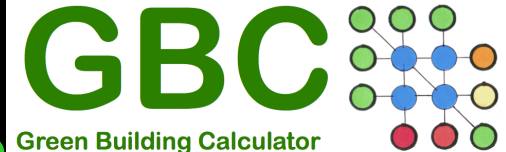
Embodied Carbon datasets V1>V3

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 M/m ³	Embodied Energy M/Item	Area or section m ²	Volume m ³	Embodied Carbon kg CO ₂ /kg	Embodied Carbon kg CO ₂ /m ²	Embodied Carbon kg CO ₂ /Item	Density kg/m ³	Weight kg/m ²	Embodied Energy MJ/m ³	Embodied Carbon kg CO ₂ /m ³	Volume Required in Building m ³	Embodied Energy in Building MJ	Embodied Carbon in Building kg CO ₂	Is it bio-based? Does it contain Biogenic Carbon?	Sequestered carbon in building kg CO ₂	Total Carbon in Building kg CO ₂		
																						Embodied Energy	Embodied Carbon
Materials	F10	Brick/block walling	Aerated block	ICE 1 & 2	3.5				0.3			750		2,625.00	225.00	1.00	2,625.00	225.00	No	0.00	2,625.00		
Materials	F10	Brick/block walling	Aerated block	ICE 1 & 2	3.5				0.3			750		2,625.00	225.00	1.00	2,625.00	225.00	No	0.00	2,625.00		
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	224.00	11.20	No	0.00	11.20		
Materials	D20	Excavation & Filling	Aggregate Quarried	ICE 2 (2011) via HE								2000							No	0.00	0.00		
Materials	D20	Excavation & Filling	Aggregate Recycled	ICE 2 (2011) via HE								2000							No	0.00	0.00		
Materials	E10	Concrete	Aggregates	E-CT	0.1				0.005			2240		224.00	0.00	1.00	224.00	0.00	No	0.00	0.00		
Materials	Z11	Metals	Aluminium (general & ind 33% recycled)	ICE 1 & 2	155				8.24			2700		418,500.00	22,248.00	1.00	418,500.00	22,248.00	No	0.00	22,248.00		
Materials	Z11	Metals	Aluminium (general & ind 33% recycled)	ICE 1 & 2	155				8.24			2700		418,500.00	22,248.00	1.00	418,500.00	22,248.00	No	0.00	22,248.00		
Materials	H11	Metals	Aluminium (recycled)	E-CT	27				1.62			2700		7,290.00	0.00	1.00	7,290.00	0.00	No	0.00	0.00		
Materials	H11	Metals	Aluminium (virgin)	E-CT	154.3				11.48			2700		416,810.00	0.00	1.00	416,810.00	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		1480	1.44	m ²				75		2,102.40	108.00	1.00	2,102.40	108.00	Yes	0.00	108.00		
Components	L10	Windows	Aluminium / timber frame double casement 1200 x 1200 2x glazed, krypton filled	ICE 2		1970	1.44	m ²				101		2,836.80	145.44	1.00	2,836.80	145.44	Yes	0.00	145.44		
Components	L10	Windows	Aluminium / timber frame double casement 1200 x 1200 2x glazed, xenon filled	ICE 2		5990	1.44	m ²				304		8,582.40	437.76	1.00	8,582.40	437.76	Yes	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	m ²				48		1,368.00	69.12	1.00	1,368.00	69.12	Yes	0.00	69.12		
Components	L10	Windows	Aluminium clad timber frame 1200 x 1200 2x glazed, krypton filled	ICE 2		1460	1.44	m ²				74		2,102.40	106.56	1.00	2,102.40	106.56	Yes	0.00	106.56		
Components	L10	Windows	Aluminium clad timber frame 1200 x 1200 2x glazed, xenon filled	ICE 2		5450	1.44	m ²				277		7,848.00	398.88	1.00	7,848.00	398.88	Yes	0.00	398.88		
Components	L10	Windows	Aluminium clad timber, 2x glazed, argon filled, window	ICE 1		1200	1	m ²				61		1,200.00	61.00	1.00	1,200.00	61.00	Yes	0.00	61.00		
Components	L10	Windows	Aluminium clad timber, 2x glazed, argon filled, window	ICE 1		1200	1	m ²				61		1,200.00	61.00	1.00	1,200.00	61.00	Yes	0.00	61.00		
Components	L10	Windows	Aluminium frame 1200 x 1200 2x glazed, air or argon filled	ICE 1 & 2		5470	1.44	m ²				279		7,878.00	401.76	1.00	7,878.00	401.76	No	0.00	401.76		
Components	L10	Windows	Aluminium frame 1200 x 1200 2x glazed, krypton filled	ICE 2		5980	1.44	m ²				305		8,611.20	439.20	1.00	8,611.20	439.20	No	0.00	439.20		
Components	L10	Windows	Aluminium frame 1200 x 1200 2x glazed, xenon filled	ICE 2		9970	1.44	m ²				508		14,356.80	731.52	1.00	14,356.80	731.52	No	0.00	731.52		
Materials	Z11	Metals	Aluminium general	ICE 2 (2011) via HE								2700		0.00	0.00	1.00	0.00	0.00	No	0.00	0.00		
Materials	Q22	Asphalt Paving	Asphalt	ICE 2 (2011) via HE								1700		0.00	0.00	1.00	0.00	0.00	No	0.00	0.00		
Materials	Q22	Asphalt Paving	Asphalt paving	ICE 2	2.31				0.14			2100		5,061.00	294.00	1.00	5,061.00	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	5,061.00	294.00	No	0.00	294.00		
Materials	Q20	Bitumen (general)	Bitumen (general)	ICE 2 (2011) via HE								3000		0.00	0.00	1.00	0.00	0.00	No	0.00	0.00		
Materials	Q20	Bitumen (general)	Bitumen (general)	ICE 1	47				0.48			3000		0.00	0.00	1.00	0.00	0.00	No	0.00	0.00		
Materials	J41	Built up felt roofing	Bitumen (general) max.	ICE 2	51				0.43			270		0.00	0.00	1.00	0.00	0.00	No	0.00	0.00		
Materials	J41	Built up felt roofing	Bitumen (general) min.	ICE 2	51				0.38			270		0.00	0.00	1.00	0.00	0.00	No	0.00	0.00		
Materials	F30	Brick/block walling	Bituminous Damp Proof Course	E-CT	134				4.2			1650		247,900.00	0.00	1.00	247,900.00	0.00	No	0.00	0.00		
Materials	F10	Brick/block walling	Brick Standard	ICE 2 (2011) via HE								230	tonnes / 1000 bricks		1.00	0.00	0.00	No	0.00	0.00			
Materials	F10	Brick/block walling	Bricks (common)	E-CT	3				0.22			1700		5,100.00	0.00	1.00	5,100.00	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	5,100.00	408.00	No	0.00	408.00		
Materials	F10	Brick/block walling	Bricks (common)	ICE 1	3				0.21			1700		5,100.00	408.00	1.00	5,100.00	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	5,100.00	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	13,940.00	2,482.00	No	0.00	2,482.00		
Materials	F10	Brick/block walling	Bricks (facing)	ICE 1	8.2				1.46			1700		13,940.00	2,482.00	1.00	13,940.00	2,482.00	No	0.00	2,482.00		
Materials	M20	Flexible floor coverings	Carpet Nylon	ICE 1	57.90 - 149				3.55 - 7.31			1700		#VALUE!	#VALUE!	1.00	#VALUE!	#VALUE!	No	0.00	#VALUE!		
Materials	M20	Flexible floor coverings	Carpet tiles, nylon (PVC) tile weight 770g/m ²	ICE 2		279						13.7		1,233.60	63.00	1.00	1,233.60	63.00	No	0.00	63.00		
Materials	P10	Proofing, insulation	Cellulose glass insulation	ICE 1 & 2	27							43		0.00	0.00	1.00	0.00	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	141.90	0.00	Yes	0.00	0.00		
Materials	Z21	Mortar	Cement mortar (1:3)	ICE 2	1.33				0.208			1700		0.00	0.00	1.00	0.00	0.00	No	0.00	0.00		



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GRC V1 GBC B6



Green Building Calculator

<https://GreenBuildingCalculator.uk>

Elements EEECS Summary

EE EC SC Embodied Energy Embodied Carbon Sequestered Carbon >>>	Embodied Energy (Intervention)	Embodied Carbon dioxide (Intervention)	Sequestered Carbon dioxide (Intervention)	Total Carbon dioxide (Intervention)
Ground Bearing Solid Floor (GBSF) EE EC SC	2.10	16.18	197.28	-181.10
Suspended Ground Floor (SGF) EE EC SC	0.00	0.00	0.00	0.00
Ground Floor total	2.10	16.18	197.28	-181.10
Solid Masonry External Walls (SMEW) EE EC SC	546.68	973.07	9416.64	-8443.57
Cavity Masonry External Walls (CMEW) EE EC SC	0.00	0.00	0.00	0.00
External wall Total	546.68	973.07	9416.64	-8443.57
Party Floor (PF) EE EC SC	175.55	303.19	12983.40	-12680.21
Solid Masonry Party Walls (SMPW) EE EC SC	0.00	0.00	0.00	0.00
Cavity Masonry Party Walls (CMPW) EE EC SC	0.00	0.00	0.00	0.00
Timber Framed Party Walls (TFPW) EE EC SC	0.00	0.00	0.00	0.00
Party Wall Total	0.00	0.00	0.00	0.00
Pitched Roof (PR) EE EC SC	279.50	3696.85	27545.60	-23848.75
Flat Roof (FR) EE EC SC	0.00	0.00	0.00	0.00
Roof total	279.50	3696.85	27545.60	-23848.75
Windows (W) EE EC SC	29.83	14658.08	0.00	14658.08
Glazed Pedestrian Doors (GPD) EE EC SC	2.10	16.18	197.28	-181.10
Whole Building	1035.76	19663.56	50340.20	-30676.64

GRC V1 GBC B2 Window Door Rooflights

Existing & Previous Interventions

											Overall thickness mm	Overall thickness m					Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, PassU or Fail
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		Windows (W) 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					
No	Existing	Single glazed	Softwood											5.88							
Yes	Previous	Double Glazed pre 2002	PVC											2.81							
No	Proposed	Upgrade to Triple Glazed	Laminated softwood aluminium face composite																		
											Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, PassU or Fail						
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		Glazed Pedestrian Doors (GPD) 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					
No	Existing	Single glazed	Softwood																		
Yes	Previous	Uninsulated	PVC											4.50							
No	Proposed	Upgrade to Insulated	???											1.00							
											Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, PassU or Fail						

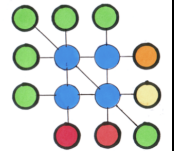
GRC V1 GBC B2 Whole Building U values > Watts > % & Scenarios

U Values To Watts To CO ₂										Scenarios						
DR Check										Previous	Proposed 1	Improvement	Proposed 2	Improvement	Auto-filled	
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										Temperature	Heat loss					
										Assumed	Assumed					
										Temperature	Temperature					
										Internal	Internal					
										Difference	Difference					
										Individual	Individual					
										Total	Total					
										Area	Area					
										Total Areas	Total Areas					
										Areas	Areas					
										Heat loss	Heat loss					
										Ratio:	Ratio:					
										1 in x	1 in x					
No	Floor	Applicable	Scenarios	Elements	Calculated U value Areas W/m ² .K.m ²	External degree C	Internal degree C	Difference degree C	Individual W	Total W	Area m ²	Total Areas m ²	Areas %	Heat loss %	Ratio: 1 in x	
		No	Previous	Ground Bearing Solid Floor (GBSF)	5.882	0	-	17	17	0	0	0	0%	0.0%	1 in x	
		No	Previous	Suspended Ground Floor (SGF)	0.711	0	-	17	17	0	0	0	0%	0.0%	1 in x	
					0					0	0	0%	0.0%	1 in x	0.00	
										Temperature	Temperature					
										Internal	Internal					
										Difference	Difference					
										Individual	Individual					
										Total	Total					
										Area	Area					
										Total Areas	Total Areas					
										Areas	Areas					
										Heat loss	Heat loss					
										Ratio:	Ratio:					
										1 in x	1 in x					
Yes	Compartmentation	Applicable	Scenarios	Elements	Calculated U value Areas W/m ² .K.m ²	Party degree C	Internal degree C	Difference degree C	Individual W	Total W	Area m ²	Total Areas m ²	Areas %	Heat loss %	Ratio: 1 in x	
		Yes	Previous	Party Floor (PF)	0.158	17	-	17	0	0	72.13	72.13	24%	0%	1 in x	0.00
		No	Previous	Party Wall (PW)	0.000	17	-	17	0	0	0	0	0%	0.0%	1 in x	0.00
		No	Previous	Solid Masonry Party Wall (SMPW)	4.167	17	-	17	0	0	0	0	0%	0.0%	1 in x	0.00
		No	Previous	Cavity Masonry Party Wall (CMPW)	0.068	17	-	17	0	0	0	0	0%	0.0%	1 in x	0.00
		Yes	Previous	Timber Frame Party Wall (TFPW)	0.068	17	-	17	0	0	0	0	0%	0.0%	1 in x	0.00
					72.13					0	72.13	72.13	24%	0.0%	1 in x	0.00
										Temperature	Temperature					
										Internal	Internal					
										Difference	Difference					
										Individual	Individual					
										Total	Total					
										Area	Area					
										Total Areas	Total Areas					
										Areas	Areas					
										Heat loss	Heat loss					
										Ratio:	Ratio:					
										1 in x	1 in x					
Yes	Wall	Applicable	Scenarios	Elements	Calculated U value Areas W/m ² .K.m ²	External degree C	Internal degree C	Difference degree C	Individual W	Total W	Area m ²	Total Areas m ²	Areas %	Heat loss %	Ratio: 1 in x	
		Yes	Previous	External Walls (SMEW)	0.247	0	-	17	17	412	98.09	98.09	32%	32.5%	1 in x	0.00
		No	Previous	Cavity Masonry External Walls (CMEW)	0.308	0	-	17	17	0	0	0	0%	0.0%	1 in x	0.00
					98.09					412	98.09	98.09	32%	32.5%	1 in x	0.00
										Temperature	Temperature					
										Internal	Internal					
										Difference	Difference					
										Individual	Individual					
										Total	Total					
										Area	Area					
										Total Areas	Total Areas					
										Areas	Areas					
										Heat loss	Heat loss					
										Ratio:	Ratio:					
										1 in x	1 in x					
Yes	Roof	Applicable	Scenarios	Elements	Calculated U value Areas W/m ² .K.m ²	External degree C	Internal degree C	Difference degree C	Individual W	Total W	Area m ²	Total Areas m ²	Areas %	Heat loss %	Ratio: 1 in x	
		No	Previous	Flat Roof (FR)	2.045	0	-	17	17	0	0	0	42%	19.4%	1 in x	0.46
		Yes	Previous	Pitched Roof (PR)	0.113	0	-	17	17	247	128	128	42%	19.4%	1 in x	0.46
					128					247	128	42%	19.4%	1 in x	0.46	
										Temperature	Temperature					
										Internal	Internal					
										Difference	Difference					
										Individual	Individual					
										Total	Total					
										Area	Area					
										Total Areas	Total Areas					
										Areas	Areas					
										Heat loss	Heat loss					
										Ratio:	Ratio:					
										1 in x	1 in x					
Yes	Window/Door/Rooflight	Applicable	Scenarios	Elements	Calculated U value Areas W/m ² .K.m ²	External degree C	Internal degree C	Difference degree C	Individual W	Total W	Area m ²	Total Areas m ²	Areas %	Heat loss %	Ratio: 1 in x	
		Yes	Previous	Windows (W)	5.500	0	-	17	17	471	5.04	5.04	1.7%	37.2%	1 in x	22.50
		Yes	Previous	Glazed Pedestrian Doors (GPD)	4.500	0	-	17	17	138	1.8	1.8	0.6%	10.9%	1 in x	18.41
					6.84					609	6.84	2.2%	48.0%	1 in x	21.42	
										Temperature	Temperature					
										Internal	Internal					
										Difference	Difference					
										Individual	Individual					
										Total	Total					
										Area	Area					
										Total Areas	Total Areas					
										Areas	Areas					
										Heat loss	Heat loss					
										Ratio:	Ratio:					
										1 in x	1 in x					
										1.268	Total Envelop				1.00	
										659	Opaque Envelop				0.53	
										305.1	Combined				2.2%	
										298	Opaque Envelop				98%	
										1267.89	Total Envelop				100%	
										658.95	Opaque Envelop				52.0%	
										1267.89	Total Envelop				100%	
										658.95	Opaque Envelop				52.0%	
										Pasted values	Normal				Choose	

• Scenarios

• Column 1: Existing and Previous interventions

• Columns 2-3 & 4-5: 2 alternative insulation options



GRC V1 IUE > Total ECO2

			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									
			£111.70	£111.70	£0.00	£111.70	£0.00					
			£5.91	£5.91	£0.00	£5.91	£0.00					
			£105.79	£105.79	£0.00	£105.79	£0.00					
			£0.06	£0.06	£0.00	£0.06	£0.00					
			£0.35	£0.35	£0.00	£0.35	£0.00					
			Insulation: ignore undeveloped yet									
			0									
			Insulation: ignore undeveloped yet									
			36.270	36.270	0.000	36.270	0.000					
			461.790	461.790	0.000	461.790	0.000					
			0.462	0.462	0.000	0.462	0.000					
			0.013	0.013	0.000	0.013	0.000					
			0.204	0.204	0.000	0.204	0.000					
			7.389	7.389	0.000	7.389	0.000					
			0.204	0.204	0.000	0.204	0.000					
			30.896	30.896	0.000	30.896	0.000					
			865.097	865.097	0.000	865.097	0.000					
			Insulation: ignore undeveloped yet									
			Insulation: ignore undeveloped yet									
			0.19	0.19	0.00	0.19	0.00					
			1.37	1.37	0.00	1.37	0.00					
			3.334.93	3.334.93	0.00	3.334.93	0.00					
			93.378.14	93.378.14	0.00	93.378.14	0.00					
			153.51	153.51	0.00	153.51	0.00					
			Insulation: ignore undeveloped yet									
			Insulation: ignore undeveloped yet									
			16	16		16						
			7	7		7						
			4.33	4.33	0.00	4.33	-4.33					
			5	5		5						
			21.67	21.67	0.0	21.67	-21.7					
			151.67	151.67	0.0	151.67	-151.7					
			2.427	2.427	0	2.427	-2.427					
			28	28	0.0	28	-28.0					
			67.947	67.947	0	67.947	-67.947					
			Insulation: ignore undeveloped yet									
			Insulation: ignore undeveloped yet									
			£0.16	£0.16	£0.00	£0.16	£0.00					
			£1.19	£1.19	£0.00	£1.19	£0.00					
			£180.42	£180.42	£0.00	£180.42	£0.00					
			£5,051.71	£5,051.71	£0.00	£5,051.71	£0.00					
			Insulation: ignore undeveloped yet									
			Insulation: ignore undeveloped yet									
			1818.78	1818.78	0.00	1818.78	0.00					
			2719.71	2719.71	0.00	2719.71	0.00					
			51,908.58	51,908.58	0.00	51,908.58	0.00					
			-49,188.88	-49,188.88	0.00	-49,188.88	0.00					

GRC V1 GBC B2 Fuel CO2-Factors

B2 Fuel Factors												Fuel Cost Assumptions		
Year	Country	Data Source	Fuel group/Activity	Energy Source/Fuel Type/Unit	Fuel Format	Domestic use?	Energy/Fuel carbon Intensity	Fuel Carbon Intensity	Fuel factor	Fuel Cost Assumption	Efficiency Assumptions	Carbon Value		
					Abbreviation	Yes/No	gCO2/kWh	kgCO2/kWh		percent/kWh	%	kWh/£		
2013-16	UK	BRAD LSA	Renewables	Any fuel with a CO2 emissions factor		Yes	0	0	5.4					
	UK	TGR GBE CFD	Renewables	AGWP for 24Hr SCOP		Yes	0	0	0		175			
	UK	TGR GBE CFD	Renewables	AGWP to 5 Heating SCOP @ 35 deg C flow temp.		Yes	0	0	0		489			
	UK	TGR GBE CFD	Renewables	AGWP to 5 Heating SCOP @ 40 deg C flow temp.		Yes	0	0	0		453			
2009	UK	Carbon Trust via TGR CFD	Renewables	AGWP to 5 Heating SCOP @ 35 deg C flow temp.		Yes	0	0	0		346			
	UK	Carbon Trust via TGR CFD	Renewables	Biomass within 30 km	100km	Yes	35	0.025	0.125					
2004	UK	PHPP 2004	Fossil Fuels	Coal		Yes	393	0.34	1.782					
	UK	PHPP 2004	Oil	District heating	C CP 20% P&C	Yes	0	0	0					
	UK	PHPP 2004	Oil	District heating	C CP 25% P&C	Yes	0	0	0					
	UK	PHPP 2004	Oil	District heating	C HP Oil P&C	Yes	0	0	0					
	UK	PHPP 2004	CHP Combined heat and Power	Gas Cogeneration Station	GCS 20% P&C		0	0	0					
	UK	PHPP 2004	CHP Combined heat and Power	Gas Cogeneration Station	GCS 25% P&C		0	0	0					
	UK	PHPP 2004	CHP Combined heat and Power	Gas Cogeneration Station	HSG Oil P&C		0	0	0					
	UK	BRAD LSA	Electricity	Grid Electricity Msc. Sweden 2003 UK 2004		Yes	0	0	0	00.55				
	UK	PHPP 2004	Electricity	Grid Electricity Msc. Sweden 2003 UK 2004		Yes	0	0	0	00.55				
	UK	Carbon Trust via TGR CFD	Electricity	Grid Electricity Msc. Sweden 2003 UK 2009		Yes	537	0.537	2.8996	00.55				
20157	UK	TGR GBE CFD	Electricity	Grid Electricity Msc. Sweden 2003 UK 20157		Yes	388	0.388	2.1492	00.55				
	UK	TGR GBE CFD	Electricity	Grid Electricity Msc. Sweden 2003 UK 2020		Yes	386	0.386	2.0944	00.55				
2004	UK	PHPP 2004	Fossil Fuels	Hard Coal		Yes	0	0	0					
	UK	TGR GBE CFD	Fossil Fuels	Liquid Gas for Domestic Hot Water	Liquid Gas for DHW	Yes	242	0.242	1.3522	00.08	75			
2009	UK	Carbon Trust via TGR CFD	Fossil Fuels	Liquid Gas for SH	Liquid Gas for SH	Yes	242	0.242	1.3968	00.08	90			
	UK	PHPP 2004	Fossil Fuels	Liquid Petroleum Gas	LPG	Yes	0	0	0					
2013-16	UK	BRAD LSA	Fossil Fuels	Liquid Petroleum Gas	LPG	Yes	254	0.254	1.1556					
	UK	PHPP 2004	Fossil Fuels	Main Electricity		Yes	0	0.186	0	00.55				
2004	UK	PHPP 2004	Fossil Fuels	Natural Gas		Yes	0	0.258	1.1232	00.55	90			
	UK	Carbon Trust via TGR CFD	Fossil Fuels	Natural Gas		Yes	185	0.185	0.989	00.55				
2009	UK	Carbon Trust via TGR CFD	Fossil Fuels	Natural Gas		Yes	185	0.185	0.989	00.55				
	UK	TGR GBE CFD	Fossil Fuels	Natural Gas to Domestic Hot Water	NG to DHW	Yes	208	0.208	1.1232	00.55	75			
2004	UK	PHPP 2004	Fossil Fuels	Natural Gas to SH	NG to SH	Yes	208	0.208	1.1232	00.55	90			
	UK	PHPP 2004	Fossil Fuels	Oil	Oil	Yes	0	0	0					
2013-16	UK	BRAD LSA	Fossil Fuels	Oil	Oil	Yes	0	0	0					
	UK	Carbon Trust via TGR CFD	Fossil Fuels	Oil (Gas Oil)	Oil (Gas Oil)	Yes	252	0.252	1.3608					
	UK	PHPP 2004	CHP Combined heat and Power	Oil Cogeneration Station	C CP 20% P&C		0	0	0					
	UK	PHPP 2004	CHP Combined heat and Power	Oil Cogeneration Station	C CP 25% P&C		0	0	0					
	UK	PHPP 2004	CHP Combined heat and Power	Oil Cogeneration Station	C HP Oil P&C		0	0	0					
	UK	TGR GBE CFD	Fossil Fuels	Oil to Domestic Hot Water	Oil to DHW	Yes	298	0.298	1.6263	00.06	75	10.85		
	UK	TGR GBE CFD	Fossil Fuels	Oil to SH	Oil to SH	Yes	298	0.298	1.6263	00.06	85	10.85		
	UK	PHPP 2004	Renewable Electricity	PV-Electricity				0	0					
	UK	BRAD LSA	Fossil Fuels	Solid Mineral Fuel				0	0					
	UK	BRAD LSA	Fossil Fuels	Solid Multi-Fuel				0	0					
2004	UK	PHPP 2004	Biomass	Wood		Yes	0	0	0					
Many	Many	Many Sources	Many Sources	Many Sources	PHPP 2004		WELT+Gov+CT 2009	Calculated mixed	Calculated CT 2009	TGR GBE CFD 2015	TGR GBE CFD 2015	TGR GBE CFD 2015		
	2020	Country	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc.		gCO2/kWh	kgCO2/kWh						
2020	Norway	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Norway 2020		30	0.028	0.168						
2020	Sweden	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Sweden 2020		34	0.038	0.216						
2020	France	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. France 2020		36	0.034	0.204						
2020	Austria	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Austria 2020		38	0.036	0.216						
2020	Lithuania	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Lithuania 2020		128	0.128	0.7168						
2020	Spain	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Spain 2020		126	0.126	0.7056						
2020	Portugal	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Portugal 2020		134	0.134	0.7524						
2020	Finland	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Finland 2020		136	0.136	0.7632						
2020	Latvia	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Latvia 2020		138	0.138	0.774						
2020	Bulgaria	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Bulgaria 2020		148	0.148	0.8484						
2020	Denmark	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Denmark 2020		168	0.168	0.9492						
2020	UK	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. UK 2020		186	0.186	1.0494	00.55					
2020	Slovenia	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Slovenia 2020		222	0.222	1.2534						
2020	Slovakia	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Slovakia 2020		224	0.224	1.2648						
2020	Hungary	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Hungary 2020		228	0.228	1.2852						
2020	Romania	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Romania 2020		234	0.234	1.3212						
2020	Ireland	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Ireland 2020		238	0.238	1.3416						
2020	Germany	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Germany 2020		240	0.24	1.3608						
2020	Italy	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Italy 2020		280	0.28	1.5816						
2020	Greece	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Greece 2020		380	0.38	2.1492						
2020	Estonia	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Estonia 2020		385	0.385	2.1756						
2020	Bulgaria	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Bulgaria 2020		395	0.395	2.2284						
2020	Czechia	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Czechia 2020		433	0.433	2.4204						
2020	Netherlands	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Netherlands 2020		530	0.53	2.9244						
2020	Poland	2020 Provisional Data YTD Wamalia Energy Transition lab	Grid Electricity Msc.	Grid Electricity Msc. Poland 2020		790	0.79	4.3812						

GRC V1 GBC B2 Fuel Costs

Fuel Cost Collection			Electricity	Electricity	Electricity	Electricity	Gas	Gas						Notes
pence/kWh			Day	Day	Night	Night	Fixed	Variable						Day or night?
Domestic Supplier	Data source	Date	Fixed	Variable	Fixed	Variable	Fixed	Variable						Fixed or variable tariff?
Ovo energy + E.ON	U Switch.com	19/04/21	£0.1829	£0.1154	£0.2174	£0.1137	£0.0293	£0.0333						/kWh
British Gas Evolve + E.ON	U Switch.com	19/04/21	£0.1906	£0.1109	£0.2174	£0.1137	£0.0319	£0.0333						/kWh
Bulb + E.ON	U Switch.com	19/04/21	£0.1947	£0.1054	£0.2174	£0.1137	£0.0283	£0.0333						/kWh
Pure Planet + E.ON	U Switch.com	19/04/21	£0.1632	£0.1632	£0.2174	£0.1137	£0.0319	£0.0333						100% renewable elec + 100% Carbon offset gas
Octopus Energy + E.ON	U Switch.com	19/04/21	£0.2045	£0.1052	£0.2174	£0.1137	£0.0296	£0.0333						/kWh
SD Energy + E.ON	U Switch.com	19/04/21	£0.1818	£0.1351	£0.2174	£0.1137	£0.0302	£0.0333						/kWh
Avo Energy + E.ON	U Switch.com	19/04/21	£0.1664	£0.1664	£0.2174	£0.1137	£0.0305	£0.0333						/kWh
EDF + E.ON	U Switch.com	19/04/21	£0.2176	£0.0612	£0.2174	£0.1137	£0.0322	£0.0333						/kWh
Scottish Power + E.ON	U Switch.com	19/04/21	£0.2102	£0.1026	£0.2174	£0.1137	£0.0314	£0.0333						/kWh
SSE Souther Electric	U Switch.com	19/04/21	£0.1907	£0.1401	£0.2174	£0.1137	£0.0340	£0.0333						/kWh
Average	Average	Average	Average	Average	Average	Average	Average	Average						/kWh
			£0.1903	£0.1225	£0.2174	£0.1137	£0.0309	£0.0333						/kWh
			Average	£0.1610			£0.0321							/kWh

31/03/21	19/04/21	19/04/21	19/04/21	19/04/21	19/04/21	19/04/21	19/04/21	19/04/21	19/04/21	21/04/21	21/04/21	21/04/21	21/04/21	19/04/21
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Liquid Fuel Cost Collection			Red Diesel (Gas Oil)	Paraffinic Diesel	Diesel	Biodiesel	Furnace Fuel	AdBlue	Lubricants	Industrial heating oil	Crown CHP Biofuel	Home heating Oil	Notes	
Domestic Supplier	Data source	Date	aka 35 Second		aka White Diesel, DERV, Road Diesel	HVO 90% less GHG FAME free		Nox reducing agent for Diesel engines		aka IHO	100% 100% renewable 87% lower	aka HHO, Kerosene, Burning Oil	aka and CO2 or GHG	
Domestic Supplier	Data source	Date	BS 2869 Class A2		EN 15940:2016 Class A	BS 142147	BS EN 2869 Class D	ISO 2241		BS 2869	OFGEM ROC approved	BS 2869 Class C2	Standards	
Domestic Supplier	Data source	Date	EN 590: 2018	BS 25490	ASTM D975:19b					Class A2 10ppm	Exceeds EN 14214			
Domestic Supplier	Data source	Date								Class D 1000ppm				
Crown Oil	crownoil.co.uk	22/04/21	45.4									45.9	MJ/kg Gross Calorific Value	
Crown Oil	crownoil.co.uk	22/04/21				42						43	MJ/kg Net Calorific Value	
Crown Oil	crownoil.co.uk	22/04/21	38.8										MJ/Litre Gross specific energy	
Crown Oil	crownoil.co.uk	22/04/21				782	780					1220	Litres/tonne Specific Volume	
Crown Oil	crownoil.co.uk	22/04/21	860										kg/m3 Density at 15 degrees C	
Crown Oil	crownoil.co.uk	22/04/21				3000	300						kg CO2e/1000litres	
Crown Oil	crownoil.co.uk	22/04/21	0	0	3	0.3	0	0	0	0	0	0	kg CO2e/litres	
Crown Oil	crownoil.co.uk	22/04/21					8.13						g CO2e/MJ	
Crown Oil	crownoil.co.uk	22/04/21					0.00813						kg CO2e/MJ	
Crown Oil	crownoil.co.uk	22/04/21											£/kWh	
Crown Oil	crownoil.co.uk	23/04/21	£0.57		?	?				?	?	£0.39	ppl pence per litre @ 1000 litres delivery	
Watson Oil	watsonfuels.co.uk	26/04/21	£0.57									£0.39	ppl pence per litre @ 1000 litres delivery	
Certes Energy	certesenergy.co.uk	26/04/21								£0.44			ppl pence per litre	
ONS Office of nat stats		01/01/19											£0.53	/kWh
Tank Topper	tanktopper.co.uk	22/04/21											£0.41	ppl pence per litre
Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	£0.4676	/kWh
#DFV/01	#DFV/01	#DFV/01	#DFV/01	#DFV/01	#DFV/01	#DFV/01	#DFV/01	#DFV/01	#DFV/01	#DFV/01	#DFV/01	#DFV/01	£0.4676	/kWh

Solid Fuel Cost Collection			House Coal	House Coal	House Coal	Smokeless Ovals	Superheav Smokeless	Anthracite Small Nuts	Burnright Smokeless	Stovemaster	Homefire Ovals	Smokeless Fuel	Notes
Domestic Supplier	Data source	Date	Scottish coal doubles	Scottish coal trebles	Selected Mixed Dsids	HETAS & DEFRA approved	Smoke control Area approved	Smoke control Area approved	Smoke control Areas & HETAS approved	HETAS approved	HETAS approved		
House Fuel NSO	housefuel.co.uk cmen/mmm23	Dec-2020	£239.99	£319.99	£249.99	£296.99	£294.99	£364.99	£359.99	£354.99	£499.99	£608.75	/tonne
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	/kWh
			£239.99	£319.99	£249.99	£296.99	£294.99	£364.99	£359.99	£354.99	£499.99	£608.75	/kWh
			£359.07	Average									/kWh

Fuel costs became volatile during GRC development.

It now needs other cells for Client's Fuel Costs on fixed term pricing and/or year on year planned increases

Project Summary: 8 Buildings Existing & 2 Proposal Scenarios & Results

	Flat 1				Flat 2				Flat 3				Flat 4				Café				Workshop				Cottage 1				Cottage 2			
	Scenarios				Scenarios				Scenarios				Scenarios				Scenarios				Scenarios				Scenarios				Scenarios			
	Proposed	Proposed 1	Proposed 2	Proposed 3	Proposed	Proposed 1	Proposed 2	Proposed 3	Proposed	Proposed 1	Proposed 2	Proposed 3	Proposed	Proposed 1	Proposed 2	Proposed 3	Proposed	Proposed 1	Proposed 2	Proposed 3	Proposed	Proposed 1	Proposed 2	Proposed 3	Proposed	Proposed 1	Proposed 2	Proposed 3	Proposed	Proposed 1	Proposed 2	Proposed 3
Total Conduction Heat Loss	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00
In-Use Energy	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00
In-Use Carbon Dioxide	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00
In-Use Hours to Whole Life	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00
In-Use Costs	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00
Embodied Energy to Sequestered Carbon	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00
Building Costs	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00
Pay-back periods	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00
EE EC SC Embodied Energy, Embodied Carbon, Sequestered Carbon, Total Carbon	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00	188.00
Ground Bearing Solid Floor (GBSF)	1.94	0.00	180.00	-180.00	2.10	16.19	197.28	-181.10	1.94	0.00	180.00	-180.00	0.00	0.00	0.00	0.00	7.14	0.00	675.00	-675.00	11.00	84.85	1034.62	-949.77	4.70	0.00	450.00	-450.00	2.10	16.19	197.28	-181.10
Suspended Ground Floor (SGF)	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solid Masonry External Walls (SMEW)	405.88	640.16	7501.12	-6660.96	546.68	973.07	8416.64	-8443.57	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	546.68	973.07	8416.64	-8443.57
Cavity Masonry External Walls (CMEW)	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Party Floor (PF)	0.00	0.00	0.00	0.00	175.55	303.19	12983.40	-12980.21	0.00	0.00	0.00	0.00	745.38	1038.92	24624.20	-23485.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	175.55	303.19	12983.40	-12980.21
Solid Masonry Party Walls (SMPW)	11.21	0.00	1212.00	-1212.00	0.00	0.00	0.00	0.00	11.68	0.00	1263.20	-1263.20	0.00	0.00	0.00	0.00	121.39	171.48	715.19	-543.71	5.89	68.66	0.00	68.66	53.83	1583.38	735.68	847.70	0.00	0.00	0.00	0.00
Cavity Masonry Party Walls (CMPW)	11.21	0.00	1212.00	-1212.00	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Timber Framed Party Walls (TFPW)	212.84	463.91	5235.84	-4773.93	0.00	0.00	0.00	0.00	246.77	515.72	5962.30	-5448.58	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
Pitched Roof (PR)	0.00	0.00	0.00	0.00	279.50	3696.86	27545.60	-23448.75	0.00	0.00	0.00	0.00	1283.79	5002.45	48205.60	-43203.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	279.50	3696.86	27545.60	-23448.75
Flat Roof (FR)	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	1001.15	15063.59	33841.92	-18778.33	124.07	25123.50	2146.72	22976.78	152.85	6998.85	13900.48	-6901.63	0.00	0.00	0.00	0.00
Windows (W)	3.06	0.00	271.80	-271.80	29.83	14658.08	0.00	14658.08	2.77	0.00	246.60	-246.60	29.83	14658.08	0.00	14658.08	5.19	0.00	445.20	-445.20	145.07	71283.66	0.00	71283.66	4.33	0.00	385.20	-385.20	29.83	14658.08	0.00	14658.08
External Pedestrian Doors (EPD)	1.94	0.00	180.00	-180.00	0.00	0.00	197.28	-181.10	1.94	0.00	180.00	-180.00	0.00	0.00	0.00	0.00	7.14	0.00	675.00	-675.00	11.00	84.85	1034.62	-949.77	4.70	0.00	450.00	-450.00	2.10	16.19	197.28	-181.10
Whole Building	648.09	1104.08	10792.76	-14688.68	1035.76	19663.56	50340.20	-30676.64	265.12	515.73	7832.10	-7316.38	3033.98	22238.96	90795.64	-8194.45	1142.02	15236.06	36352.31	-21117.24	297.03	6645.52	4215.97	62429.56	220.23	652.03	16921.36	-7339.33	1035.76	19663.56	50340.20	-30676.64

GBC V1 Awards/Shortlist

- 3 months after GBC V1 launch
 - Green Apple 2020-21 Award Winner
 - Silver Environmental Award for Carbon reduction
 - Central England Prestige 2020-21 Winner
 - Winner
 - Construction Computing 2020 Awards
 - Finalist but no award
 - Innovation of the year 2020
 - One to watch Company 2020
 - Too new, no results, collect results & reapply
 - LSI RISE Awards 2021:
 - Highly Commended
 - Category: Education & Training
 - World society of Sustainable Energy technologies
 - Winner Innovation Award 2020/21

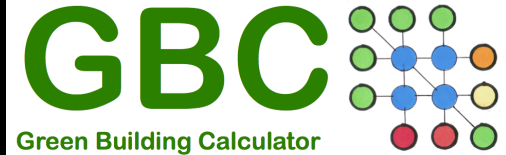


CorporateLiveWire
CENTRAL ENGLAND
PRESTIGE AWARDS
2020/21 WINNER





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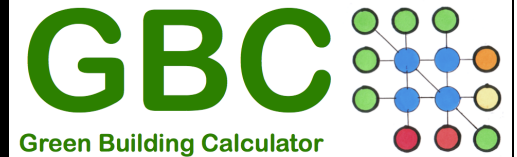


<https://GreenBuildingCalculator.uk>





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<https://GreenBuildingCalculator.uk>

GBC V2 Costs to users

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	

Yes

GRC V1 Green Retrofit Calculator

Same prices as GBC V2

One off or Annual Subscription

Add Charity rate £4.88 to all



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Green Retrofit Calculator
<https://GreenBuildingCalculator.uk>



Green Building Calculator
<https://GreenBuildingCalculator.uk>

GBPFMS

GBMP

GBMS



Green Building Price Book



Green Building Product Data Collection



Green Building Readymade Elemental Assemblies

GBC Look Up Table

GBC Drop Down Lists

Post-Grenfell Golden Thread: Selective filtering for competency

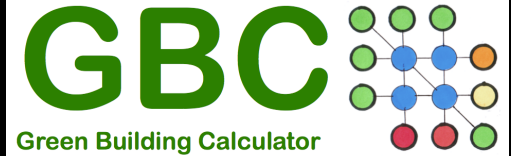
GBC Elemental Assembly Component choices

Outputs:

Embodied & In use Energy & Carbon Data, Build & Running costs
GBRobustSpec GBFMSpec GBMethodsStatement GBMaterialsPassport



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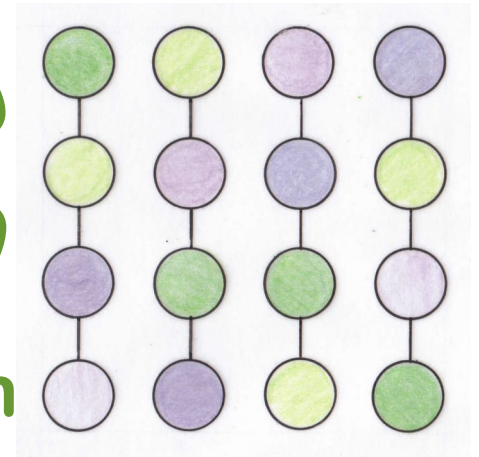


Green Building Calculator

<https://GreenBuildingCalculator.uk>

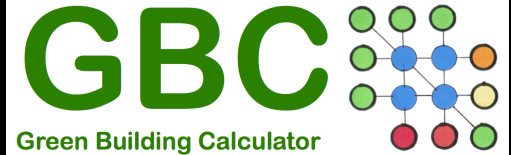
GBPDC

Green Building Product Data Collection





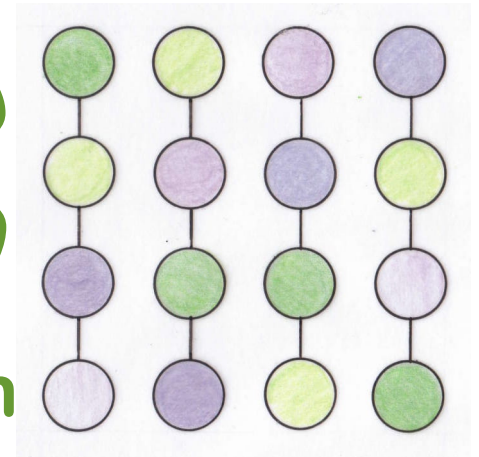
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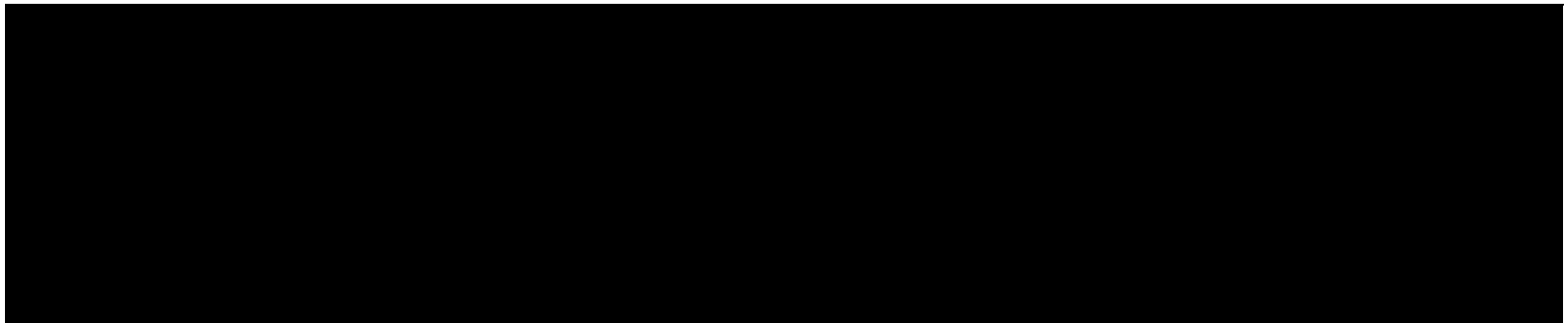
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~~GBPDCC~~



~~Green Building Product Data Collection~~

Retrofit



GRC Green Retrofit Product Data Collection

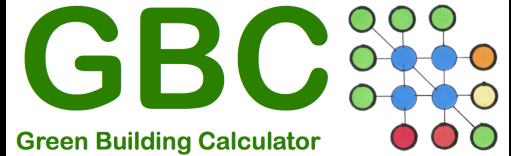
- Import Excel or CSV tables
- Product information and properties
- Post Grenfell: 'Golden thread'
 - GRC needs to be selective
 - Only offer a product in place it was invented for and uses to solve
- Intelligent Excel worksheet
 - Drop down lists to choose from, less errors
- Being tested with some manufacturer
 - before general release

Green Retrofit Product Data Collection (GRPDC)

- **Manufacturer and Supplier populated**
 - Anti-Greenwash campaign
 - CCPI Competent Construction Product Information aligned
- **Intelligent Data collection tables,**
 - Drop down lists, choose to avoid typos
 - Some cells to type or paste into
 - Allocate products to correct locations in elemental look up tables
 - Avoid inappropriate applications
 - Follows manufacturers recommendations
 - Values for calculator
 - Verification data (certificates, dates, evidence confirmed)
- **To integrate with:**
 - Green Retrofit Price Book
 - Green Retrofit Calculator
 - Green Retrofit Specification
 - Green Retrofit FM specification
 - Firstplanit
- **Enable other design & decision tools**



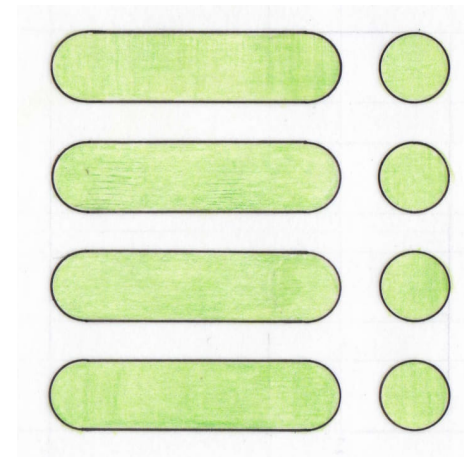
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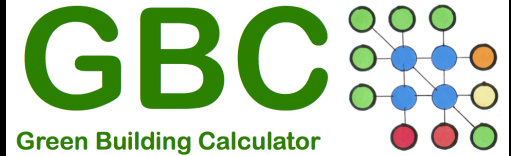
GBP B

Green Building Price Book





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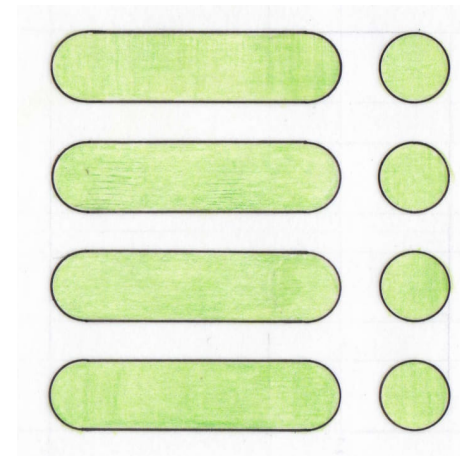


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R

~~GBPB~~

~~Green Building Price Book~~
Retrofit



Green Retrofit Price Book (GRPB)

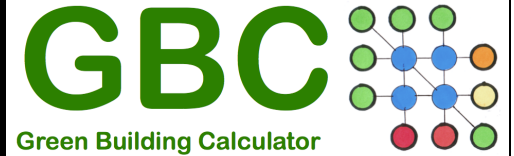
- **After GBC V2 & GRC V1**
- **Initially: Excel worksheet to be sent to manufacturers, suppliers and installers**
- **Long term: stand alone on-line platform available to GBC, GRC other App developers or data users**
- **To obtain robust prices to build robust cost plans**
- **Like MRRP: Manufacturers recommended retail/trade price**
- **Price for Green Retrofit Products by Green Retrofit Installers**
 - (not inflated for unfamiliarity by violet contractor)
- **Materials, Products, Accessories, Whole systems, Elements, Sub-elements, Buildings**
- **Not their best price but their normal price that all can have**
 - Or we end up back in the substitution vortex
- **We will also ask for prices for:**
 - 1m³, 10m³, 100m³, etc. (opportunity for discounts for quantity)
 - Unopened, un-split delivery packs/pallets (> potential wastage rates for later version)
- **Installation rates: m³/day and labour day rates**
 - (feeds into potential Programme, not by GBC or GRC)
- **Plant hire, power, delivery, fuel rates**
- **Overheads prelims profits (unless to be accounted separately)**

Green Retrofit Price Book (GRPB)

- Because Violet Price books and Violet Cost Planning
 - Have bankrupted the industry
- So designers can do their own cost planning without QS
- Manufacturer, Supplier and Retrofit Installer populated
 - The whole supply chain
 - £/m²,
 - £/1m², £/10m², £/100m², £/1000m², etc.
 - £/ unbroken packs
- To Integrate with:
 - Green Building/Retrofit Calculator
 - Green Building/Retrofit Products Data Collection
 - Feeds Firstplanit
- Enable other design & decision tools



<https://GreenBuildingEncyclopaedia.uk>

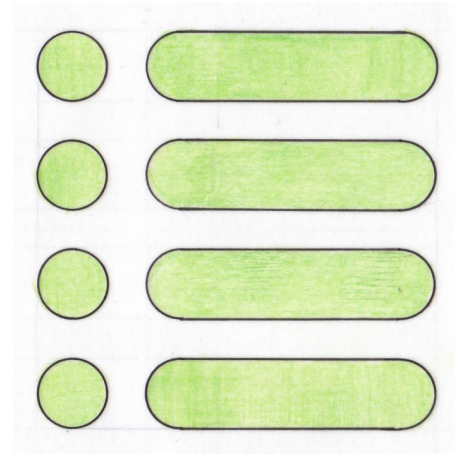


Green Building Calculator

<https://GreenBuildingCalculator.uk>

GBS

Green Building Specification



GRC GRPDC >

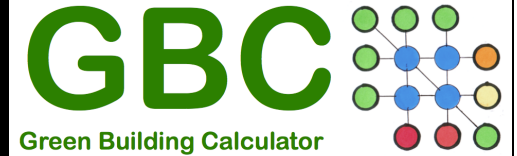
GRS Specification

- Import Excel or CSV tables
 - Product information and properties
- Feeds into GRC Elemental Assemblies:
 - Component Choices
- Generates an outline specification
 - That is a Robust Specification
 - To fend off substitution

- **Manufacturer and Supplier populated GRPDC**
- **Intelligent Data collection tables,**
 - Drop down lists, choose to avoid typos
 - Some cells to type or paste into
 - Allocate products to correct locations in elemental look up tables
 - Avoid inappropriate applications
 - Follows manufacturers recommendations
 - Values for calculator
 - Verification data (certificates, dates, evidence confirmed)
- **To integrate with:**
 - Green Building/Retrofit Price Book
 - Green Building/Retrofit Calculator
 - Green Building/Retrofit FM specification
 - Firstplanit
- **Enable other design & decision tools**



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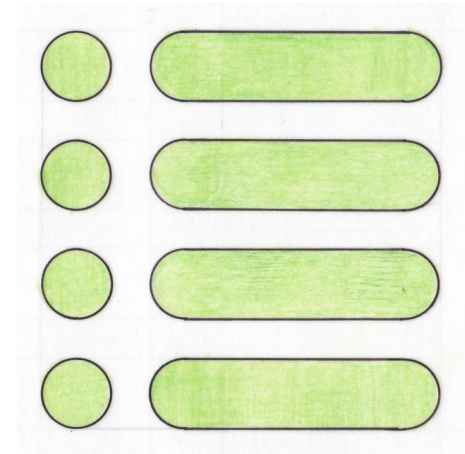


Green Building Calculator

<https://GreenBuildingCalculator.uk>

GBRS

Green Building Robust Specification



GBS Robust Specification

L10 → **WINDOWS/ROOFLIGHTS/SCREENS/LOUVRES** [☒]
 To be read with Preliminaries [A10-A55] General Conditions [☒]

5 → **BSI CEN ISO DOCUMENTS** referred to in, or relevant to, L10 include: [☒]
 BS EN-12150-1:2002: Glass in building. Thermally toughened soda lime silicate safety glass. Definition and description [☒]
 BS EN ISO-12543-2:1998. Glass in building. Laminated glass and laminated safety glass. Laminated safety glass [☒]
 EN-13501-2:2010: Fire classification of construction products and building elements. [☒]
 EN-13501-2:2010+A1: Classification using data from fire resistance tests, excluding ventilation services [☒]
 EN-15254-4:2008+A1:2011: Reduced application of results from fire resistance tests – Non-loadbearing walls [☒]
 EN-15254-4:2008+A1:2011: Glazed constructions [☒]

9A → **LOSS PREVENTION COUNCIL (LPC) DOCUMENTS** referred to in, or relevant to, L10 include: [☒]
 Loss Prevention Standards: [☒]
 LPS-1056:2014: Issue 6.2: Requirements for the LPCB approval and listing of fire doorsets, lift landing doors and shutters [☒]
 LPS-1158:2014: Issue 2.2: Requirements and tests for fire resistant glazing systems [☒]

9B → **LPCB CERTIFICATE OF PRODUCT APPROVAL, CERTIFICATES** referred to in, or relevant to, L10 include: [☒]
 1406a/D1: Issue: 01-Date of issue: -15-March 2017 [☒]
 1406a/D2: Issue: 01-Date of issue: -15-March 2017 [☒]
 1406a/D3: Issue: 01-Date of issue: -15-March 2017 [☒]
 1406a/D4: Issue: 01-Date of issue: -15-March 2017 [☒]
 1406a/D5: Issue: 01-Date of issue: -15-March 2017 [☒]

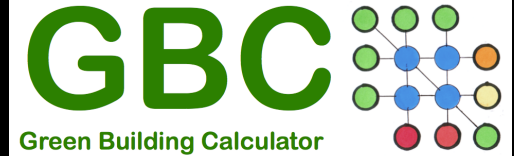
9C → **LPCB CLASSIFICATION REPORTS** referred to in, or relevant to, L10 include: [☒]
 00749.1/15/ZOONP/le Date of issue: 05-June 2015 [☒]
 00749.2/15/ZOONP/le Date of issue: 28-May 2015 [☒]
 00749.3/15/ZOONP/le Date of issue: 24-May 2015 [☒]
 03125/16/R35NP Date of issue: 30-April 2016 [☒]
 03125/16/R35NP → Annex 1 Date of issue: 10-October 2016 [☒]

560A → **METAL FRAMED, [GLAZED], FIRE SCREEN SYSTEM** [CAD/BIM tag-reference] [☒]
 Reference Drawing(s): [☒]
 → Architect's: [] [☒]
 → Manufacturer's: [Doppel-sk EI60 -- projekt001.gazdowscy.dwg] [☒]
 Location: [] [☒]
 Exposure: [External/Internal] [☒]
 Surround: [☒]
 → Standard Rigid Masonry: See-F10/___A [☒]
 → Standard Flexible-Partition: See-K10/115A-K10/125A [☒]
 Surround fire performance: EI30 [☒]
 Surround materials: Gypsum plasterboard/Protective-H-boards/Concrete-boards [☒]
 Surround thickness: 100 mm minimum [☒]
 Testing Standard: LPS-1056 [☒]
 Fire Resistance Classification: to EN-13501-2 (Minutes) [☒]
 → Integrity-E/Insulation-I: 15/15-Minutes [☒]
 → Integrity-E/Insulation-I: 30/30-Minutes [☒]
 → Integrity-E/Insulation-I: 60/60-Minutes [☒]
 → Integrity-E/Insulation-I: 120/120-Minutes [☒]
 → Integrity-E/Insulation-I: 30/30-Minutes [☒]
 → Integrity-E/Insulation-I: 60/60-Minutes [☒]
 NB where a lower performance is required the higher performing system may be substituted: [☒]
 → if EI15SL or EI15DL is required, use of EI30SL or EI30DL is permissible [☒]
 → if EI45SL or EI45DL is required, use of EI60SL or EI60DL is permissible [☒]
 Self-closing/Smoke leakage classification: to EN-13501-2 [☒]
 Manufacturer: Alufire Sp. z o.o. ul. Wesoła 4, 87-148 Lisowice, Torunia, Poland [☒]
 Suppliers/Installers: Checkmate Fire Solutions Limited, The Second Floor, Rosemount House, Rosemount Estate, Huddersfield Road, Elland, West Yorkshire, HX5-0EE [☒]
 T → 01279-860021 [☒]
 E → info@checkmatefire.com → W → www.checkmatefire.com [☒]
 W → www.alufire.co.uk [☒]
 Product Reference: [☒]

- **Product Clauses <1p**
 - [Options to select from]
 - [Blanks for populating by project specifier]
- **Material Clauses**
- **Bespoke Component Clauses**
- **Accessory Clauses**
- **Fixings Fastener Clauses**
- **Proofing Clauses**
- **Elemental Clauses**
- **System Clauses**
- **MEP Services Clauses**
- **Samples Mock-ups Clauses**
- **Reference Clauses**
- **Performance Clauses**
- **Testing Clauses**
- **Workmanship Clauses**
- **Maintenance Clauses**
- **= Work sections >20-50p**
 - **Template for Project editing**



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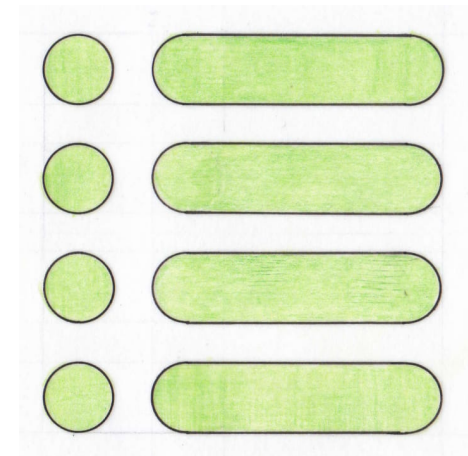


Green Building Calculator

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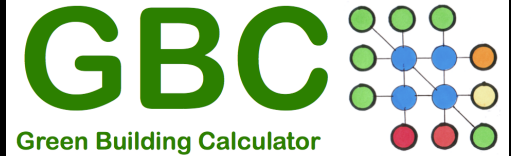
GBMP

Green Building Material Passport





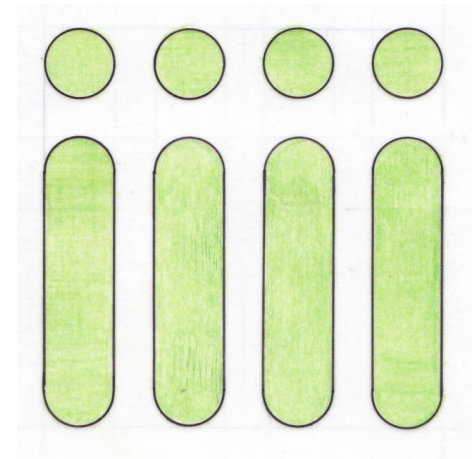
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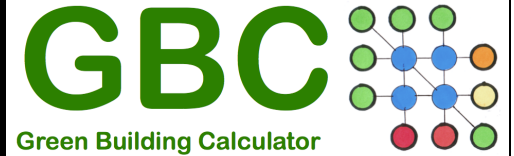
GBFMS

Green Building FM Specification





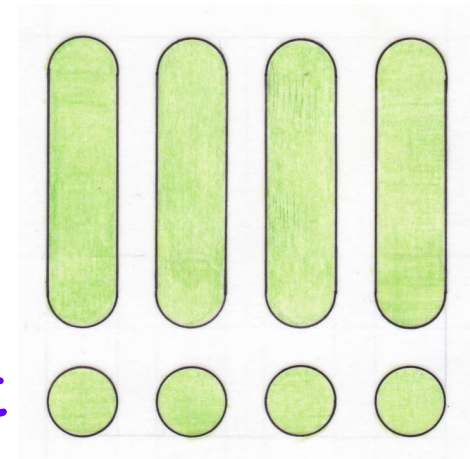
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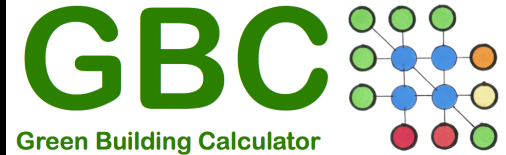
GBMS

Green Building Method Statement





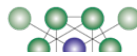
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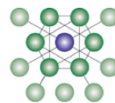
GBE Method Statement

GBE Method Statements



• 75 datapoints

GBE Method Statements



Green Building Encyclopaedia

Company: [LoftZone](#)
 Address: 82 Coast Road, West Mersea, Colchester, Essex, CO5 8LS
 Product: [StoreFloor](#)
 Manufacture: Made in the UK
 Date: 14/10/2016

Offsite activity:
 Delivery: Currently deliver to addresses in mainland UK (England Wales Scotland), to your nominated safe place, local address or your consolidation centre.
 Delivery: By UPS or parcel force courier
 Delivery Charge: [StoreFloor](#) components or kits: Monday to Friday: £12 regardless of quantity.
 Delivery Charge: Decking, Insulation and Ladders: Monday to Friday: £40 regardless of quantity.
 Delivery Charge: [StoreFloor](#) components, Decking and Insulations: Monday to Friday: £40 regardless of quantity.
 Delivery Limitations: Saturdays limited to some products and some postcodes (Enquire by phone 01483 600304)
 Delivery Time: minimum: 2 working days, maximum: 1 working week

Delivery packaging:
 • [StoreFloor](#) components: Cardboard boxes: 1200 x 400 x 300 mm, with enclosed sealed instruction manual
 • Decking in packs of three: 15 kg. (5kg. each) on softwood pallets
 • Insulation: on softwood pallets
 • Ladders: on softwood pallets

Collection: from Leicestershire warehouse: for free (book in advance phone 01483 600304)
 Collection: from Home Improvement Shop UK GMT 8am-5pm (address as above)

Off-site prefabrication:
 • None, to enable handling through ceiling access hatch
 • All parts premade to size but not preassembled
 Transport: by courier or collected
 Delivery logistics: None offered by [LoftZone](#)
 Consolidation centers: None provided by [LoftZone](#); delivery to your consolidation centre optional

Products:
 • Galvanized steel cross beams 1150 l x 80-85 w x 50 d mm.
 • Recycles Nylon or Polypropylene Props: 290 h x 75 w x 42 l mm and 290 h x 75 w x 50-250 t mm
 • Loft ladders: 1 x 1 x 1 w x 1 h mm

Materials:
 • Thermal Insulation: Polyethylene wrapped rolls mineral fibre quilt
 • Flooring grade decking: Chipboard 1220 x 325 x 18 mm. 3 No. per pack

On site activity:
 Handling:
 • On pallets by forklift truck: 1 kg (maximum weight)
 • Deck packs: manual handling: 15 kg
 • [StoreFloor](#) Kits: In cardboard boxes: 1 kg (maximum weight)
 • [StoreFloor](#) components: in cardboard boxes: 1 kg (maximum weight)

• [Loft Ladders](#): 1 kg (each)
 Temporary storage: Under cover, off the ground, in original packaging, do not allow boxes or contents to get wet
 Temporary works:
 • create a temporary landing platform inside the attic to receive boxed components, spanning over ceiling joists
 • consider using first pack(s) of deck boards to create the temporary landing platform
 Hoarding: not normally applicable
 Scaffolding: not normally applicable, access upper floors via permanent stairs
 Timing:
 • no limitations anticipated,
 • 8 minutes to lay 2 m2,
 • portable electric drill/screwdriver battery life

Phasing and zoning:
 • If necessary reposition (some or all) occupant's possessions to allow progress, this can be done in phases
 • Clear space, construct platform, move possessions to completed deck, make room for next area of deck
 • Create platform and complete it before moving possessions onto platform
 • Do not overload ceiling joists or deck with high stacks of materials or possessions

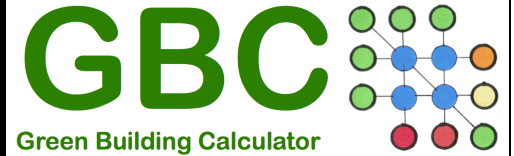
Sequence of work for competency and protection:
 • Work from hatch and temporary landing platform, away from hatch towards extremity, assembling platform as you progress, working from platform already created
 • If you progress from extremely back towards hatch then create temporary access and working platform bearing on ceiling joists repositioning platform as the work progresses
 Modification: Do not modify props, reposition decking or reduce size of deck area
 Preparation:
 • Move aside occupant's belongings/possessions to enable creation of first area of [StoreFloor](#) platform
 • Create temporary landing platform for materials adjacent to hatch, leaving room for access
 • If insulation between ceiling joists is not present this should be completed before installing props
 • If top-up insulation is already in existence, this will need to be rolled back to place and secure props
 Insitu conditioning: None required
 Preparation of substrate bases and backgrounds: None required
 Protection of worker:
 • This is effectively working at height, there is a risk of falling through ceilings
 • Always use temporary access platforms as the work progresses
 • PPE: overalls, gloves, face mask and goggles recommended for work with existing and new insulation
 • Consider safety harnesses,
 Risk Assessment: Co-ordinate with the Contractors CDM Risk Assessments and comply
 Interdependence of trades:
 • Power cables must not be buried in thermal insulation without upgrading the cables
 • Recessed ceiling lighting may need access for fitting and maintaining before and after installation
 Congested sites: no issues anticipated
 Congested working: Only if electricians are not complete before commencing sequencing to minimise height
 Methods of pre-assembly: Not applicable, to enable handling through ceiling attic hatch
 Offering up: Not applicable
 Craning: not anticipated, use hoist and fork lift trolley for pallets
 Sequence of assembly:
 • Follow instruction manual or instruction video;
 • Previous trades: preparation, setting out, props, screws, beams, screws, decks, screws, possessions
 Final piece assembly: cross-beams can slide over props to negotiate adjacent obstructions
 Safe access for maintenance and removal or replacement of damaged pieces:
 • the deck provide access, if required roll back insulation and use temporary platform on ceiling joists
 Staff: [StoreFloor](#) is available via an installer network (Enquire by phone 01483 600304)
 Skills: [StoreFloor](#) is suitable for Do-it-yourself
 Accessories:
 • Screws 'Spax' Wood Screws 4 x 40 mm No. 8 x 1.5" countersunk head, and self-drill into steel
 • Thermal insulation
 • Decking boards
 Equipment for installation:
 • String, chalk line or lazer and pencil
 • Portable battery drill/screwdriver with countersink and drill bits and spare battery on larger jobs
 Protection of installed parts:
 • None needed
 • Immediate use anticipated with transfer of belongings/possession onto deck as work progresses
 Access after protection: use deck, if permitted to use permanent installation during construction
 Modification of protection: Not applicable
 Warranty maintenance: None available
 Final removal of protection: Not applicable

• To help manufacturers to ensure their products are specified properly on site

Logistics: [StoreFloor](#) components, storage and reinstatement upon completion:
 • Decanting necessary, possessions relocated onto deck as the work progresses
 Decanting of occupants, temporary accommodation and returning to homes:
 • Not required but keep rooms below clear of occupants in case of accidents
 • Consider dust sheet on possessions in rooms below in case of accidents
 • If necessary reposition (some or all) occupant's possessions to allow progress, this can be done in phases
 • Clear space, construct platform, move possessions to completed deck, make room for next area of deck
 • Create platform and complete it before moving possessions onto platform
 • Do not overload ceiling joists or deck with high stacks of materials or possessions
 Excess to requirements:
 Return to stock: full refund for returned to warehouse within 28 days (phone in advance 01483 600304)
 Offcut take back: None available
 Waste management and recovery:
 • [StoreFloor](#) components: Cardboard boxes: 1200 x 400 x 300 mm, with enclosed sealed instruction manual
 • Decking in packs of three: 15 kg. (5kg. each) on softwood pallets
 • Insulation: on softwood pallets
 • Ladders: on softwood pallets
 Waste minimization and management: plan ahead, do not over order
 Offcuts: avoid obstructions, keep modular, avoid cutting
 Waste handling on site: segregate Plastics and metal
 Waste removal on site: European Waste Catalogue:
 • 17 01 01 → paper and cardboard packaging
 • 17 01 01 → wood (debris)
 • 17 02 03 → plastic (polypropylene)
 • 17 04 04 → zinc (galvanizing)
 • 17 04 05 → iron and steel (cross-beams)
 • 17 04 07 → mixed metals (galvanized steel cross-beams)
 • 17 06 → INSULATION MATERIALS AND ASBESTOS-CONTAINING CONSTRUCTION MATERIALS
 • 17 06 01 → insulation materials containing asbestos
 • 17 06 03 → insulation materials consisting of or containing DS
 • 17 06 03 → insulation materials other than those mentioned in 17 06 01 and 17 06 03 (thermal insulation)
 • 17 08 → GYPSUM-BASED CONSTRUCTION MATERIALS
 • 17 08 01 → gypsum-based construction materials contaminated with DS
 • 17 08 02 → gypsum-based construction materials other than those mentioned in 17 08 01 (in case of accidents)
 End of Life Opportunities for reclaim and reuse or recycling and recovery:
 • unscrew all components, reclaim and make available for reuse
 • [StoreFloor](#) components: Cardboard boxes: 1200 x 400 x 300 mm, with enclosed sealed instruction manual
 • Decking in packs of three: 15 kg. (5kg. each) on softwood pallets
 • Insulation: on softwood pallets
 • Ladders: on softwood pallets
 • Triangular prop has an additional identifier "A/G"
 • Cross-beams are dot matrix printed with the company name and CE mark
 Value Engineering Opportunities:
 • Multi-functional:
 • Protects installation team and helps to avoid falls from height
 • Protection of thermal insulation from compression and loss of performance
 • Storage deck for belongings/possessions increasing building storage capacity
 • Access walkway for maintenance of MEP service installations
 • Creates its own work platform for extending the platform
 Lean Construction:
 • All parts premade to size but not preassembled
 • Simple, easy to handle, fast to install,
 Specifications:
 • Products: 1 / 1
 • System: 1 / 1
 • Accessories: 1 / 1
 • Installation: 1 / 1
 • Workmanship: 1 / 1
 • Waste: 1 / 1
 • End of Life: 1 / 1
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 14th October 2016



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Green Building Calculator

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GBREAiZi

Green Building Readymade Elemental Assemblies





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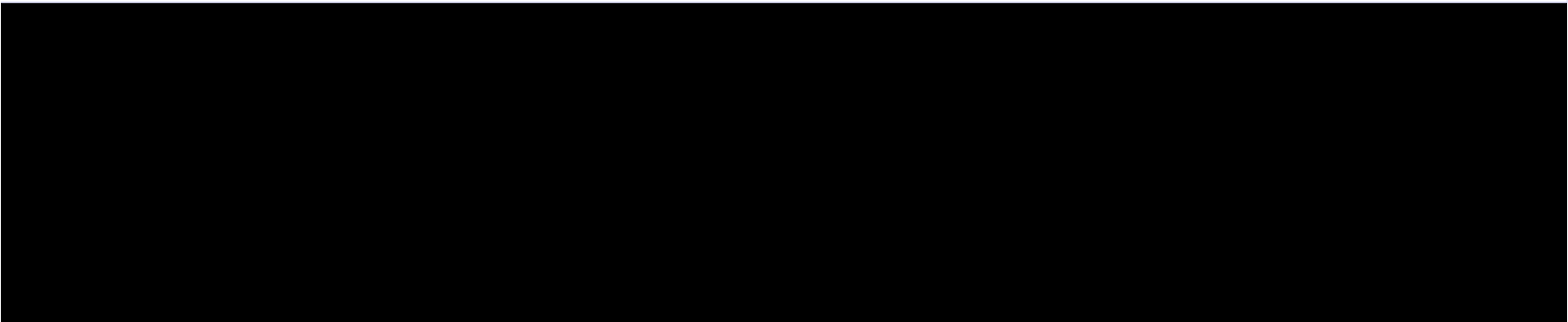


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GRRRPA

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~~Green Building Readymade Elemental Assemblies~~
Green Retrofit Readymade Pallet of Assemblies



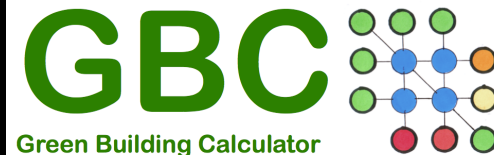
Historic Fabric

- **Brick and/or Stone walls:**
 - Thicknesses already addressed
 - Varying thickness with height can be modelled
 - Buttresses and Flying buttresses
 - Columns and walls with rubble fill
 - Complex profiles
- **Cob (started) and other wall methods**
- **Heavy timber post and beam frame**
 - already modelled
 - needs further development for roofs



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File Updates 4

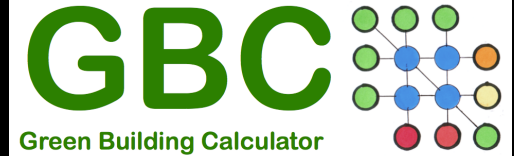


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Rev No.	Comments	Author	Date
A31	Added GRC logos and posters	BRM	28/02/2023
A32	Updated GRC V1 for Futurebuild 23 Edge talk	BRM	09/03/2023
A33	Update for Wilkinson Eyre CPD	BRM	15/03/2023
A34	Added images for Exhibition Sticky labels	BRM	19/03/2023
A35	Update from Interreg Energy Pathfinder and Interreg CobBauge for CAROE. Added more text slides after the event	BRM	14/04/2023
A36		BRM	00/03/2023
A37		BRM	00/03/2023
A38		BRM	00/03/2023
A39		BRM	00/03/2023
A40		BRM	00/03/2023



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 - Number Cruncher by necessity (Calculators)
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- Funded and Launched www.greenspec.co.uk 2003
- Created: GBE at <https://GreenBuildingEncyclopaedia.uk> 2015
- Launched: GBE Learning <https://GBELearning.com> 2020
- Green Building Calculator <https://GreenBuildingCalculator.uk> 2020-2023
- Green Retrofit Calculator <https://GreenBuildingCalculator.uk> 2022-2023
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