

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





# This Presentation on GBE/GBC:

- Find this file on GBE or GBC websites at:
- https://GreenBuildingEcyclopaedia.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





# 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 Applic	cable	Elements	U value	Elem	nent Area	1	Elements		Temperat	ture d	difference	individual	Sub total	Total	
Yes/N				Length	Width		No.	Areas	External		Internal	Heat loss	Heat loss	Floor area	
Basement			W/m2.K	m	m	m		m2	degree C	_	degree C	W	W	m2	
Yes Yes		Basement retaining floor	0.1	5 22	6	2.5	1	30 55	11	_	20	27.00		30	
Yes	-	Basement perimeter retaining wall Basement partition	1	3		2.5	1	7.5	11 20		20	0.00			
Yes		Glazed pavement	0.5	5	1	2.5	1	5	0		20	0.00			
Floor			0.0	Length	Width	Height	No.	Areas	External	_	Internal	Heat loss	27.00	Basement	1%
Yes		Ground bearing floor	0.1	4	4		1	16	11	- 2	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	Halaka	1	16	0	_	20	32.00	70.40	16	201
Wall Yes		External wall	0.1	Length 16		Height 3.5	No.	Areas 56	External	_	Internal 20	Heat loss 112.00	78.40	Floor	5%
Yes		External wall External glazed wall	0.75	16		3.5	1	56	0		20	840.00			
Yes		External subteranean wall	0.1	16		3.5	1	56	11		20	50.40			
Yes		Compartment Party wall	0.1	4		3.5	1	14	0	- 2	20	28.00			
Yes		Compartment Communal wall	0.1	4		3.5	1	14	0	- 2	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			4504
Roof		Dischard Poof	0.1		Width	Height	No.	Areas	External	—	Internal	Heat loss	1065.40	Wall	45%
Yes Yes	_	Pitched Roof Barrel vault roof	0.1	4	4	2	1	24	0	-	20	32.00 32.00			
Yes	_	Flat Roof	0.1	4	4	-	1	16	_	- 2		32.00			
Yes		Shallow roof	0.1	4	4	1	1	12		- 2		32.00			
Yes		Subteranean flat roof	0.1	4	4		1	16	11	- 2	20	14.40			
Yes		Glazed Roof	0.75	4	4	1	1	12	0	2	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	_		300.00			
Yes Yes		Doors Rooflights	1		1	2.1	5	21 5		- 2		315.00 100.00			
Yes		Roof windows	1		1	1	5	5		- 2		100.00			
													815.00	Window/Door/Rooflight	34%
Total Conduction Heat Loss (TC		Use E	n	e	r	9	y	a	TCHL		KiloWatts, Kilowatts, Kilowatts, Kilowatts, Kilowatts, Tiloor area	.946 0.025	th kW/mz	Gold Floctricity  O.: 7  10 /4  Carbon broxide	Fuel conversion kg CO2 CO2
		Hours of operation/day	8								KiloWattHours/floor area	0.202	KWh/m2	0.108	kg CO2/m2
building Exercise  After many congressions by all displayed and all the state of th			don don don Ples/a	Primary Complete Comp		Concepto (see In-	or and a second		5 g 5 g 6	2 m	ing y CF CO2 As 000 And la	200 2,000,00 2,400,00	43), 600 156 3,112,00 3,10	000 000 000 000 000 000 000 000 000 00	97.192 10.570044 0 175,936 0 1356,320 0 3,306,320
No prit/filide		50 10 1 1 1 500 Ground exclusion 50 10 1 0.3 1 150 Loadbearing capacity, Found	tica	Mass fill foundation Consolidated hardcore/pill	n line max	Concrete (eg in-	Astroposis	605.	61 & 2 0.88 GCT 0.1		0.001	2,400.00	2,112.00 3 224.00	- No 0 0 No	0 0
to Ground beams/stro/treschi	Will	50 10 1 0.0 1 150 Thermal tradiction 50 10 1 0.001 1 0.5 Molecure Vacour resistance or see	meability Dam	Conduction Thermal Inc. o/Sas Proof membrane/tan	ulation iking/draining	Expanded P Glass 1	dystyrene insulation (rei bre insulation (plass wo:	nimum) i	CE2 88.6 CE2 28		2.55 1.35	15.00 12.00	1,329.00 336.00	1825 No 0 0 No 1620 No 0 0 No	0 0
No Superment retaining floor	or newall	50 10 1 025 1 125 Ground exclusion 120 1 2.5 0.35 1 105 Ground exclusion		Retaining floor Retaining wall/piles feb	Mets	Concrete (eg in-	its foor slabel with 50% its foor slabel with 50%		11&2 0.88 11&2 0.88		0.201	2,400.00	2,112.00 3 2,112.00 3	12.40 No 0 0 No 10 No	0 0
Frame Specifical Speci		50 1 25 0.1 1 125 Room perimeters/division space definitionally Width Height Thickness No. Areas Volume	ion/actiou/ation	Brick/block/stone			Bricks (common)	-	CE2 1		0.301	1,700.00	5,300.00 6	08.06 No 0 No	0 0
Yes Columns Compression Pos Yes Beams	961	4 06 06 1 33 47.52 Loadhearing capacity: Flor 120 03 0.45 1 30 324 Loadhearing capacity: Flor	56 /S	Columns/Compression s Seams	DOIDS .	Concrete (1.1. Timber (peneral	il er instuffor dabe, excludes requestrationi		(1.6.2 1.31 (C) 30		0.159 0.72	2,400.00 720.00	7,300.00 S	81.60 Yes 126,569 18,134 No 18.40 Yes 2,312,800 167,662 Yes	0 18,134 259,280 95,238
No Chaponal bracine/libeer plan No Roof trusses	ané	1 1 1 5 5 5 Loadbaring capacity Pitches  Innerty Width Height Thickness No. Argan	Roof	Trustes	DOM:	Timber (peneral	see recoded excludes requestration	(maximum)	CE 2 50		0.43	7,800.00 720.00	7,200.00 S	98,00 No 0 0 No No 0 186	0 0
Yes Ground floor Yes Useer floor		50 10 1 0.25 1 125 Loadhearing cloady Riol 50 20 1 0.3 4 600 Loadhearing cloady Riol	is is	Loadbearing structur Loadbearing capacity: R	ne loors	Concrete (eg in- limber frame 1200 v	its floor slabel with 50% 1200 2s placed, knotses	GGSS RC48 ICI	C16-2 0.88 CC2	760	0.301 1.44 m2	2,400.00	2,112.00 2 1,065.60	62.40 Yes 264,000 30,300 No 54.72 Yes 639,360 32,832 Yes	0 30,306 480,000 447,158
Stair/Ramp/Balcony/Bridge/Walkway	W.	50 30 1 0.3 1 150 Loadbearing capacity, Rico Length Wilton Height Wilconess No. Areas Volume	rs.	Loadbearing capacity: R	loors	Timber (general	excludes sequestration	(maximum)	CE 2 10		0.72	720.00	7,300.06 S	18.40 No 0 0 Ves	0 0
Nec Scair flaint No Ranso		5 1 1 0.25 2 2.5 Access Movement Passage Cont 90 1 1 0.25 1 30 Room perimeters/division space definit	inmest on/acticulation	Foundation Salustrades	=	Timber (peneral- fixtanded P	excludes sequestration systyrene insulation (na	(maximum) simum)	CE 2 10 PD 88.6	240	0.72 2.55	720.00 30.00	7,300.00 S 2,659.00	18.40 Yes 18,000 1,2% Yes 25.50 No 0 0 No	2,000 304
Wal/Partition Yes External wall		Length Width Height Thickness No. Areas Volume 220 1 3.5 0.4 1 308 Loadbearing capacity Wi	1	Malleable metal cladd	Sing	Copper	layerage incl. 65% recycl	ed)	CE1 48	760	3.65	8,600,00	412,800.00 25.8	95.00 Ves 127,142,400 7,972,888 No	0 7,972,888
No internal partition No External wall		220 1 3.5 0.4 1 358 Loodbearing capacity: Wi 220 1 3.5 0.4 1 308 Loodbearing capacity: Wi	lk lk fe	Framing/carrier syste rather membrane/wind dat	ens honess layer	HORE	Numinium (recycled) High Density Polyethyles	10 1	FCT 27		1.69	2,700.00 1,400.00 1,700.00	72,900.00 118,160.00	- Yes 22,453,200 0 No	0 0
No (beenal wall no internal partition		20	is on/action/ation players	Brick/block Birn/oanse coat filme/swoo	um/daw/cement/		Bricks (facine) Line Hydrated		GE1 82 FCT 5.3		0.34	1,700.00	13,940.00 2,4	82.00 No 0 0 No No	0 0
Yes Par Roof		50 10 1 0.4 1 300 Loadhearing capacity. Pitched	Roof Raft	tero/isiate/beans/Aurine/to Tension fabric mod	russed rathers		Sawn Softwood PVC (separal)		GCT 7.A GC2 77.2		0.45	\$50.00 1,380.00	4,670.00 106,536.00 38,7	- Yes 854,060 0 Yes 78,00 No 0 0 No	190,000 190,000
tio Barrel sout roof tio Par Roof		50 20 1 0.4 1 300 (codesting coopiny flan 50 20 1 0.4 1 300 (codesting coopiny flan	oof oof	Malleable metal diadd Timber framing	tine	Copper	Sawn Softwood		CE 2 77.2 CE 1 48 I-CT 7.4		28.1 3.85 0.45 0.45		412,980.00 25,8 4,870.00	- No 0 0 No	0 0
No Shallow roof No Addic/Room		50 10 1 0.4 1 300 Loadbearing capacity. Flat: 50 10 3 0.4 1 600 Loadbearing capacity. Artic o	eef Raft Hing	ero/isiato/bearne/Auritre/tr SPS	russed rafters	Palvate	Sawn Softwood thane insulation triald for	976)	E-CT 2.4 CE 2 301.5		0.45 3.48 0.38	\$50.00 \$50.00 30.00 800.00	4,670.00 3,645.00 3	- No 0 0 Vec	0 0
Door/Window/Rooflights Task Windows Windows		20   20   1   20   1   200   100   200	e con	Purperboard/day boo	ard embles	Aluminia m clinia	mber, 2x spreet warm 6		GE1 635	1200	1 02	800.00	1,300.00	1,040,000 0 No	34,000 32,170
Ties Windows Ties Deors Ties Deors		1 2 21 0.1 2 84 0.86 Washer sociation 1 1 1 0.1 5 4 0.5 Washer sociation		Doors/Shutters/Hatch Rooflights/Access hatch	hes thes	Aluminium died t Aluminium fran	mber, 2x placed, argon fi to 1200 x 1200 2x placed	iled window I	CE 1 CE 2	1200 9970	1 m2 1.44 m2	61 - ide -	1,300.00 34,356.80 7	51:00 Yes 35;000 1,830 Yes 61:00 Yes 1,008 51 Yes 91:52 No 0 0 No	
Soof windows Landscape		1 1 1 03 10 1 1 Weather exclusion Length Width Height Thickness No. Areas Volume		Roof windows/balcon	nies	Aluminium fran	e 1200 x 1200 2x placed	xeon filled		9970		ide -	\$4,356.80 7	R1.52 No 0 0 No	0 0
No Hand Payernent Yes Soil/Strate/Planting	NAME OF TAXABLE PARTY.	50 5 1 0.1 1 250 15 Loadbearing cooking Payer 35 25 1 0.05 1 625 31.25 Rainwater Permeability/distinated	tanesting	ument slabs hiles/cobbles/b Grass	ridubiodu		Concrete paying		CE1 134		0.327	2,800.00	2,480.00 2	Yes 0 0 No	0 0
See Fencing Marriers (Radustrade/) No Serves Parkets	en/alls	100   1   18   0.06   1   300   14.4   Room perimeters/devision space defining   6   1   1   0.1   1   6   0.6   Access Movement Passage Cont.	inners	Bridge Framo Structu	100 MIX		Sawn Hardwood		I-CT 7.8 I-CT 7.8		0.47	900.00 900.00	6260.00	- Yes 89,856 0 Yes - No 0 10 Yes	11,538 11,538





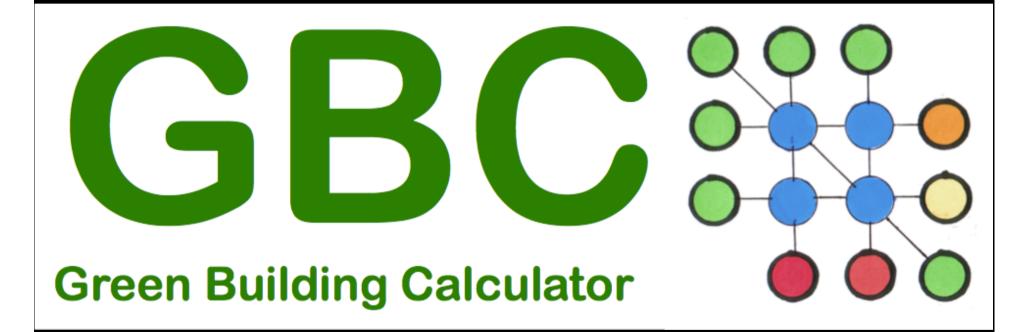
# In the context of fiduciary rules **Profits > People > Planet** HERACEYTM = **Healthy Environmental** Resourceful Appropriate **Competent Effective Yardstick** =Sustainability



**Green Building Calculator** https://GreenBuildingCalculator.ul

https://GreenBuildingEncyclopaedia.uk

# Green Building Calculator Version 2 GBC V2 Green Retrofit Calculator Version 1 GRC V1



https://GreenBuildingCalculator.uk

GBC Version 2 went live 20/04/22

GRC Version 1 to go live April '23



### https://GreenBuildingCalculator.uk

#### U Value To Watts To CO2 Yes User name: BrianSpecMan did this Element Temperature Heat loss Total Applicable Elements U value Areas External Internal Difference Individual Floor area Total Areas Areas © GBE Green Building Calculator 2017-2020 W/m2.K Basement Yes/No m2 degree C degree C 0.081947 300 300 Yes Basement retaining floor 98 11 410 Yes Swimming Pool Basin 0.070865 1448 11 15 1448 Yes Basement perimeter retaining wall 0.251202 175 15 176 53 Basement roof at site level 0.044126 300 15 4 Yes 102 Yes Basement roof at subterranean level 0.084891 300 15 4 Yes Basement partition 0.203282 125 20 15 -5 -127 Ratio: 1 to 0.20 Yes 21% Area % Glazed pavement over basement 11 15 88 1748 2659 External 4.1% Heat loss % Internal Heat loss Basement Floor Ground bearing floor 0.090185 300 243 Yes 0.056933 300 11 20 9 154 300 Yes Ground floor over ventilated void Yes Floor over basement 0.052365 20 141 300 Upper internal floor 0 600 0.058544 703 600 600 Floor suspended co Ratio: 1 to 0.32 ic mua mun floo 20 95 90 952 900 37% Area % Heat loss 2.288 Floor 11.8% Heat loss % 455 585 External wall .81 (A tr ma c az d w .... Curtuin wull 20 2,835 175 800 20 Compartment Party wall 0.125493 1.318 525 Compartment Communal wall 0.125525 163 65 65 Ratio: 1 to 1.95 1265 Internal Partition/Wall 25 15% Area % 25 Roof & Ceilings External Internal Heat loss 5,701 29.5% Heat loss % 879 632.5 Pitched Roof 0.006/84 20 471.3 arrel vault roof 471.3 813 20 237 0 300 nt (or -20 518 300 Flat ceiling 521 300 Ratio: 1 to 0.84 Glazed Roof 25 20 20 1.000 25 2028.8 24% Area % 20.5% Heat loss % 2029 External Heat loss Roof Window/Door/Rooflight Internal 3.967 Yes Windows 0.8 50 20 800 50 Glazed Pedestrian Doors 10.5 0 20 20 166 10.5 25 20 20 375 25 0 **GBC Green Building Calculator Buy now** 10 20 20 162 10 45 20 20 1,800 45 0 20 20 20 800 20 GRC Green Retrofit Calculator PENDING 12 0 20 20 480 12 25 20 1.000 25 Ratio: 1 to 12.78 0 25 1.000 25 2.7% Area % Window/Door/Rooflight Heat loss % 223 6.583 Schedule a CPD Seminar, meeting or call 4838 8354 100% Area % 9043 19.339 Heat loss % Total glazed areas 223 TCHL Total areas minus glazed areas 8820 Floor area 4.838 m2 Glazed areas % of Total areas 2.5% 19,339 TCHL Biomass Watts W Fuel Total Conduction Heat Loss (TCHL) KiloWatts 0.025 19 kW conversion kiloWattHours 2.4 kWh 0.060 kg CO2 In Use Carbon kW/m2 CarbonDioxide KiloWatts/floor area 0.004 CO2 0.00001 0.0005 kg CO2/m2 Hours of operation/day 8 KiloWattHours/floor area

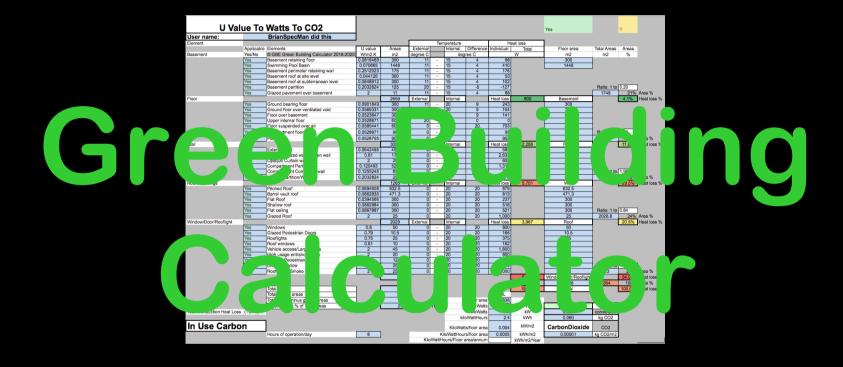
ViloMottHours/Floor oron/opp

MMb/m2/Voc



https://GreenBuildingEncyclopaedia.uk





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 battens 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 bod
  - that take months to reply (BRE)





https://GreenBuildingCalculator.uk

# 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





https://GreenBuildingCalculator.uk

### 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







# 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 & carbonback periods, all in one place at one time





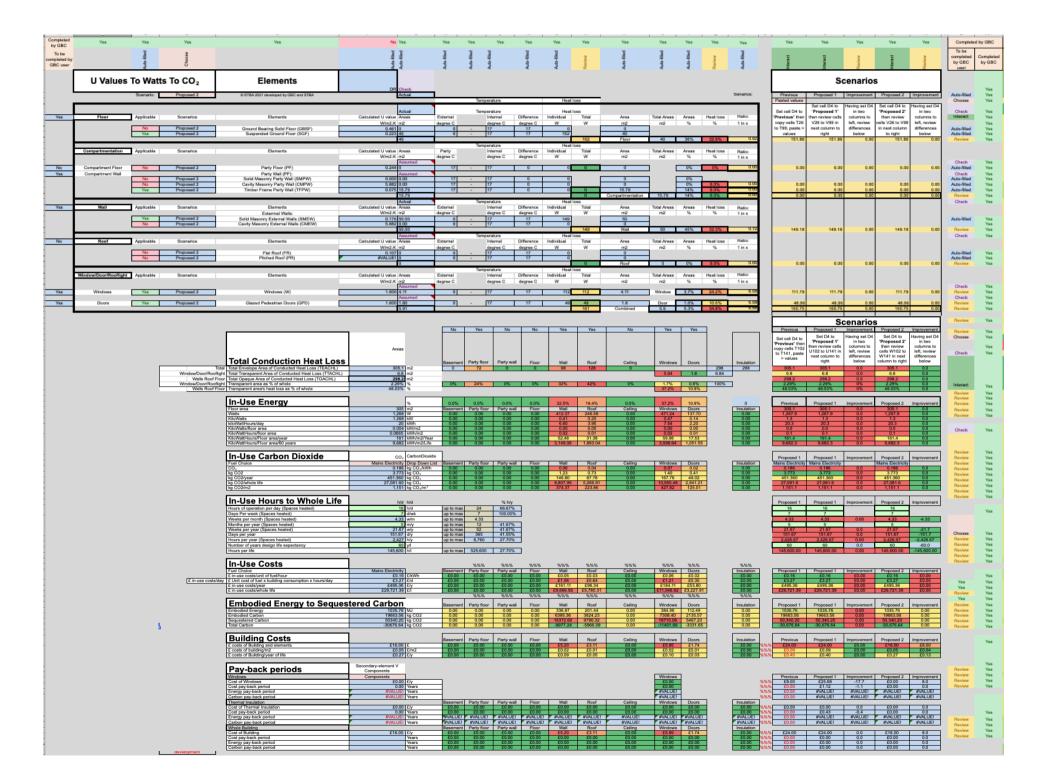


I want I want I want I am reminded to

# 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







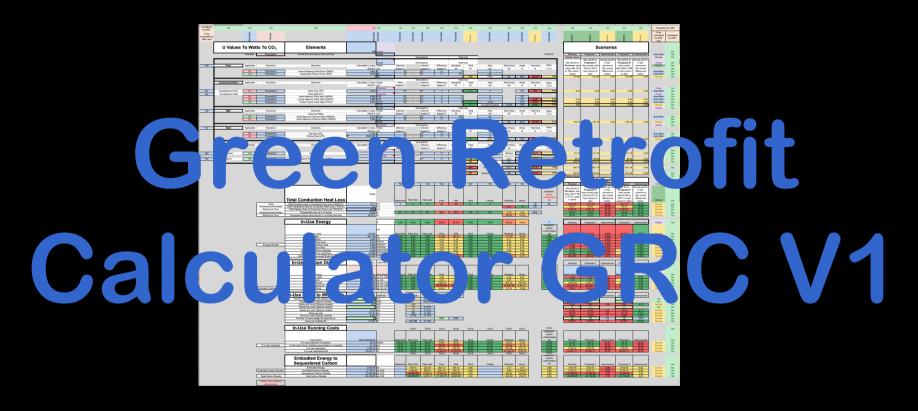
**Green Retrofit Calculator** 

https://GreenBuildingCalculator.uk









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







# 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	Impo	rtore Ac	ionte	S.	upplior		Install	ore				
Manufacturer Importers Agents Remanufacturers Distributors			Suppliers Builders Merchants			Applica		Product Information Providers				
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	Product Data Collection			
Drop Down Lists: Look Up Tables: Materials Products Product Data Sheet				Schedule of Accommodation:			Form fa Target U		Excel mechanisms Data Sources Data inputs Generic Materials Datasets Choosing targets & Data sources			
Insulation k values  Decrement values  Conductivities			Quantities > Sizes > Areas > Volumes Protrusions			Roof Ge Protrusion	Geometry					
Targets: U values Surface & Cavity Regulations v Resistivity				Internal, External & Soil Temperature Hours of use			Multiple Room Sizes Room by Room heat losses					
Design Standards Target Airtightness Target Glazing %	Build	ing Elei Yes/No		Option Switches ++			Multiple ( sub-elem		Option Switches for more detail Choosing Price Information			
EE EC SC BC Glazing orientation	Build Deta	ing Elei il dimer	ments isions	Sub contractor Quotes			Tende	rers				
Element Assembly: Components Exists or New Gen Mat or Product k, U or R value check & warn	Thermal Bridge Break	Condensation	Decrement Factor & Delay	BillofM BofPro BofAco BofQu BofLa BofCo	od ce an ab	Elemental Cost Plan	Energy EE EC SC BC Carbon	LCA EPD A-D	Chosen Elements Choosing Components Choosing Materials or Products			
Non Envelope EA Furniture Interiors Trades, MEP Landscape User Bespoke EA Ready-made EA Infrastructure MEP	Desig Spec CA CF CI	BC Use gner Engifiers Fl D opera P, QS & DP & EF ontracto	gineer M PM ators VE PC	BillofM BofPro BofAc BofQu BofLa BofCo	od ce an ab	Elemental Cost Plan	Energy EE EC SC BC Carbon	LCA EPD A-D	Automatic Number Crunching Checking Targets Met or warnings GBC Users			
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 instar results for change in Potentia well-inform Engineer dumb Cos	or any n spec. I to do led Value ing not	Dashboard Summary Sheets Purpose of Green Building Calculator			
Green Building Calculator V 2  https://GreenBuildingCalculator.uk V1 so far												

Manufacturer Remanufacturers		ters Aç stributo		S Builde	upplie rs Mer		Install Applica		Manufacturers Remanufacturers		orters Ager Distributors			oliers Build Merchants		Inst	tallers A	pplicato	rs
Components: Products Data Sheet Products Accessories Windows, Glazing Accredited Elements & Systems	Primary Function	Building Application	Product Performances	Costs: Products	Costs:	Costs: Labour	Energy EE EC SC BC Carbon	LCA EPD A-D	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
Drop Down Lists: Materials Products  Insulation k values Decrement values  Targets: U values	Mater Cor Surfa	rial k vanductiv	Sheet alues ities	Accor Quanti > Area Pro Interna	s > Vo otrusio	ation: Sizes olumes ons ernal &	Form factor > Target U values  Roof Geometry Protrusion Geometry Multiple Room Sizes Room by Room heat losses		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
Regulations v Design Standards Target Airtightness Target Glazing % EE EC SC BC Glazing orientation	Buildi Buildi	esistiv ng Ele Yes/No ng Ele I dimer	ments ments	Option Sub	urs of	thes ++	Multiple ( sub-eleme	Glazing ent sizes	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	xposure Conditions	Wind Driven Rain Index	Risk Factor	Risk Statement
Element Assembly: Components Exists or New Gen Mat or Product k, U or R value check & warn	Thermal Bridge Break	Condensation	Decrement Factor & Delay	BillofM BofPr BofAc BofQu BofLa BofCc	od ce an ab	Elemental Cost Plan	Energy EE EC SC BC Carbon	LCA EPD A-D	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 scrunching	Ferrace, Roof , Bay, In	Surface & Cavity Resistivity	Material Conductivity	Users: Designers & E		Tenderer	Sub-contractors
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		BillofN BofPr BofAc BofQu BofLa BofCc	od ce an ab	Elemental Cost Plan	Energy EE EC SC BC A-D Carbon		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 Biogenic & Total Carbon	Life Cycle Assessment Environmental Product	Dedaration Building EBD	
U values In use Energy & %s Fuel Choice + Fuel Carbon factors = In-use Carbon  Embodied Energy Embodied Carbon Sequestered & Biogenic Carbon Life Cycle Assessm't		Cost £/m2 chang Cost £/m2 chang PaybackCarbonback In-use Energy + Fuel Costs Engir		With instar results for change in Potentia well-inform Engineer dumb Cos	or any n spec. I to do led Value ing not	Summary Sheet: Performance Existing + 2 Options Elemental & Building U values In use Energy & % Fuel Choice + Fuel Carbon factors = In-use Carbon	Embo Embo Bioge Seques	nmary She Impacts nents, Eler Building died Energ died Carbo nic Carbor tered Carb	nents, by EE on EC on BC oon SC	Existi Compo ( In- + Fuel	ary Sheet: ing + 2 Op onent, Eler Building Costs £/m2 use Energ Costs = Ir Costs oack & Car	tions ment, 2 IV n-use	Poter val	s for an specific ntial we lue eng	ntaneou ly chang cation ell information ost cutt	ned g ting			
Green Bu https://Gree						20	GB(	ator	Green Retrofit C	alcula	Building tor V1			ack period //Gree		Green Ret	Calcu Calc	ulato	r.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		orters Ager Distributors			liers Build Merchants	ers	In	stallers A	Applicat	ors
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	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 arunching	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	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	Embor Embor Bioge Seques	nmary She Impacts nents, Eler Building died Energ died Carbo enic Carbo tered Carb PD Produc Building	ments,  y EE on EC on BC oon SC	Existi Compo C In- + Fuel Pay b	ry Sheet: ng + 2 Opt onent, Eler Building costs £/m2 use Energ Costs = In Costs ack & Car ack periods	ions nent, y i-use bon	Pote vi not	/ith insta Its for ar specifi ential we alue eng dumb o	ny chan cation ell infor gineering cost cu	ge in rmed

**Green Retrofit Calculator V1** 

https://GreenBuildingCalculator.uk

Local Procurement	Products/Materials:	Products/Materials:	Transport Emissions
	Factory gate to site	Transport miles	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	FM Specification	GBPB Green	Structures
Generator	Generator	Building Price Book	Calculator
Non-Domestic	Domestic new	Non-Domestic New	Landscape
Retrofit	Build	Build	Elements
ICE V3 Inventory of	LCA Database	Climate	Civils & Infrastructure
Energy & Carbon	Datasets	Appropriateness	
Embodied/Sequestered	LCA Calculator	Thermal Mass	Furniture Impact
Energy & Carbon		Calculator	Calculator
EE EC SC	Design Life &	Airtightness &	Furniture Dataset
Calculator	Durability	Energy Loss	
Sequestered	Waste Cost	Indoor Air quality	Interior Finishes
Carbon calculator	Calculator	Calculator	Dataset
Carbon consumed or avoided	Plastics Diverted and recycled	Plastic free options database	Interior Finishes Dataset
EE & EC in Waste	Reclaim Reuse	Circular Economy	Ska Fit-out Refit
EE & EC in Reclaim	Resource Audits	Resource Efficiency	Interface
Self Build	Links to Green Building	Bird Box Bat Roost	Biodiversity Net gain
Construction Primer	Encyclopaedia	Integration Check	
Whole project	Overheads Profits	Construction on-site	End of Life
Budget calculator	Fees Preliminaries	Emissions	Solutions
Renewable Energy	MEP Services	Lighting Calculator	Light Nutrition
Calculator	Calculator		Calculator
International	Imperial Metric	Currency	Local Product
Regional versions	U v R values		Datasets
	ding Calcul		GBC

Manufacturers Remanufacturers		orters Ager Distributors			liers Build Merchants	ers	In	stallers A	Applicat	ors
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	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 Materials BoM Bill of Products & Accessories Bill of Quantities Bill of Pelant Bill of Pelant Bill of Pelant Coverheads Bill of E +2 Options scenarios			Embodied Biogenic & Total Carbon	Life Cycle Assessment Environmental Product	Declaration Building EBD
Summary Sheet: Performance Existing + 2 Options Elemental & Building U	Compo	nmary She Impacts nents, Eler Building	ments,	Compo	nry Sheet: ng + 2 Opt onent, Eler Building	tions nent,	Pote	lith insta lits for ar specifi	ny chan cation ell info	ge in

Green Retrofit Calculator V1

values

In use Energy & %

Fuel Choice +

Fuel Carbon factors

= In-use Carbon

Embodied Energy EE

Embodied Carbon EC

Biogenic Carbon BC

Sequestered Carbon SC

LCA, EPD Product, EBD

Pay back & Carbon back periods

https://GreenBuildingCalculator.uk

value engineering

not dumb cost cutting

Costs £/m2

In-use Energy

+ Fuel Costs = In-use

Costs

Local Procurement	Products/Materials:	Products/Materials:	Transport Emissions
	Factory gate to site	Transport miles	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	FM Specification	GBPB Green	Structures
Generator	Generator	Building Price Book	Calculator
Non-Domestic	Domestic new	Non-Domestic New	Landscape
Retrofit	Build	Build	Elements
ICE V3 Inventory of	LCA Database	Climate	Civils & Infrastructure
Energy & Carbon	Datasets	Appropriateness	
Embodied/Sequestered	LCA Calculator	Thermal Mass	Furniture Impact
Energy & Carbon		Calculator	Calculator
EE EC SC	Design Life &	Airtightness &	Furniture Dataset
Calculator	Durability	Energy Loss	
Sequestered	Waste Cost	Indoor Air quality	Interior Finishes
Carbon calculator	Calculator	Calculator	Dataset
Carbon consumed or avoided	Plastics Diverted and recycled	Plastic free options database	Interior Finishes Dataset
EE & EC in Waste	Reclaim Reuse	Circular Economy	Ska Fit-out Refit
EE & EC in Reclaim	Resource Audits	Resource Efficiency	Interface
Self Build	Links to Green Building	Bird Box Bat Roost	Biodiversity Net gain
Construction Primer	Encyclopaedia	Integration Check	
Whole project	Overheads Profits	Construction on-site	End of Life
Budget calculator	Fees Preliminaries	Emissions	Solutions
Renewable Energy	MEP Services	Lighting Calculator	Light Nutrition
Calculator	Calculator		Calculator
International	Imperial Metric	Currency	Local Product
Regional versions	U v R values		Datasets

https://GreenBuildingCalculator.uk V1 so far

#### **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





**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 Build	ling Alliance Carbon Calculator
STBA	http://srbauk.org/
Responsible Retrofit STBA Guidance Wheel	https://responsible-retrofit.org/ https://responsible-retrofit.org/wheel
Carbon Calculator	https://resonsible-retrofit.org/enteet
HES Historic Environment Scotland	report appearance on a great consens.
HES HISTORIC ENVIRONMENT SCOTIANU	https://www.historicenvironment.scot/
Refurbishment Case Study 37	https://www.nsunneurre.com/en.scov/ https://www.nsunneurre.com/en.scov/archives-and-research/publications/publication/publication/d=f7c8b362-f78b-416a-9733-abb5009c521d
Scotlish 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_pdfs/579.pdf
Baker, P., 2011. U-values and traditional buildings [TP10].PDF	https://www.spab.org.uk/sites/default/files/documents/MainSociety/Advico/SPA8%208uilding%20Performace%20Survey%202012%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/pub/2019/hc2019-re-use-recycle-to-reduce-carbon/
Planning-responsible-retrofit-of-traditional-buildings/responsible-retrofit-trad-bidgs	https://historicongland.org.uk/mages-books/publications/planning-responsible-retrofit-of-traditional-buildings/responsible-retrofit-del- https://historicongland.org.uk/whats-new/research/back-issues/simulation-models-and-energy-efficiency-in-historic-buildings/
Moisture Risk/hygrothermal behaviours from IWI 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
	The Clause Page 1 to San and S
Research Papers	
Baker, P., 2010. Thermal performance of traditional windows. Rev. 2010 (TP1).PDF  Baker, P., 2011. U-values and traditional buildings (TP10).PDF	http://www.climatechangeunbyourhome.org.uk/live/content.pdfs/579.pdf https://www.spab.org.uk/sites/default/files/documents/MainSociety/Advice/SPA8K20Building%20Performacr%20Survey%202012%20Report%2021.pdf
UCL Solid-wall U-values (1) (1) PDF	https://discovery.ucl.ac.uk/id/eprint/1452229/3/ididulph 3-15-2008 Soil-e-will.pdf
Thermal performance of solid brick walls	https://research.historicengland.org.uk/Report.augs?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://aubp.org.uk/our-members
Interactive House: Suppliers and manufacturers via elements	https://aibp.org.uk/tool/asbp-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
	One by the beauty, of the to map appy, or provide the map want material business
BSI British Standard Institution  BS 5250:2011+A1:2016 Code of practice for control of condensation in buildings	
BS 5250:2021 Moisture in buildings an integrated approach to risk assessment and guidance	https://shop.bsigroup.com/ProductDetail?pid=0000000003339579
BS 7913:2013 Guide to the conservation of historic buildings	https://shop.bsigroup.com/ProductDetail?pid=00000000030248522
BS 8104:1992 Code of practice for assessing exposure of walls to wind-driven rain	https://shop.bsigroup.com/ProductDetail7pid=00000000000273071
BS EN 12524	Pending
PAS 2035/2030:2019 Retrofitting dwellings for improved energy efficiency. Specification and guidance PAS 2038 Pending	https://shop.bsigroup.com/ProductDetail/PAS 2030+2035:2019 Pending
Window Energy Rating WER Band C	https://www.bsigroup.com/en-08/our-services/product-certification/industry-sector-schemes/energy-kitemark-schemes/otemark-for-window-energy-rating/
CIBSE	
CIBSE Guide A [41] Section 3	Pending
Retrofit	
'Each home counts' Bonfield Review	http://www.eachhomecounts.com/
Trustmark	https://www.trustmark.org.uk/
Post Grenfell Hackett Review	
'Building A Safer Future: an implementation Plan'	New Course of Control
	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, 1.6, 3.0	https://circularecology.com/embodied-carbon-footprint-database.html
Artist of images	
C John Gilbert	Pending
GBC GBE GBL Websites	
Green Building Calculator Green Building Encyclopaedia	https://GreenBuildingCalculator.uk https://GreenBuildingEncyclopeedia.uk
Green Building Learning Green Building Learning	https://GBELeaming.com
GBC Website Pages	https://GreenBuildingCalculator.uk
Home page Q&A	https://greenbuildingcalculator.uk/green-building-calculator/your-questions-gbc-answers/
Bespoke	https://greenbuildingoalculator.uk/bespoke/
Buy Now Version 1	https://greenbuildingoalculator.uk/buy-now/
Contact Us Email Contact: Helpline	https://greenbuildingcalculator.uk/contact-us/
	into@greenbuildingcaloulator.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/7p=38634
Presentation	https://greenbuiklingencyclopaedia.uk/wp-content/up/oads/2020/08/GBC-CPD-Green-Buikling-Calculator-V1-STBA-061020-S87.pdf
GBC Pages on GBE website	https://GreenBuildingEncyclopaedia.uk/
	https://GreenBuildingCalculator.uk/7p=38634
GBE Green Building Calculator Big Practice (Shop) G#38525	https://GreenBuildingCalculator.uk/7p=38525
GBE Green Building Calculator Big Practice (Shop) G#38525 GBE Green Building Calculator Small Practice (Shop) G#38524	https://GreenBuildingCalculator.uk/7p=38525 https://GreenBuildingCalculator.uk/7p=38524
GBE Green Building Calculator Small Practice (Shop) G#38524 GBE Green Building Calculator Student (Shop) G#38520	https://GreenBuiktingCatautator.uk/7p=38525 https://GreenBuiktingCatautator.uk/7p=38524 https://GreenBuiktingCatautator.uk/7p=38520
GBE Green Building Calculator Big Practice (Shop) G#38525 GBE Green Building Calculator Small Practice (Shop) G#38524	https://GreenBuildingCalsulator.uk/7p=38525 https://GreenBuildingCalsulator.uk/7p=38524

### GRC V1 STBA's Responsible Retrofit Guidance Wheel links

STBA	Guida	ance Wheel		© STBA 2001 developed by GBC and STBA
				http://etbauk.org/
				hitos tireconsible retroff, ora/wheel
Measures	Fabric	Well	Cavity Wall Insulation	hace lineaceastie-vetroti contenent-venutu/hose-mensure hace lineaceastie-vetroti contrenent-vetr-veni-insulation/11
Measures			External Wall insulation Internal Wall insulation	Pipe Trappositie-ratroff, og/merasserosteral-vall-trautation(U) https://mpossitie-ratroff, og/merasserinternal-vall-trautation(U)
Measures	Fabric	Wall	Frame infill insulation	https://responsible-retrofit.org/neasune/harne-infli-insulation/47
Measures			Laft Hetch insulation Laft insulation	https://esponsible-estrolli.org/measure/ort-hasth-insulationS/ https://esponsible-estrolli.org/measure/ort-insulation/6/
Measures			Rather insulation Flat roof insulation	https://expossible-retrofit.org/neasure/rater-insulation/7/
Measures				htips: linepossible-ratrofit orginea suneffat-roof-insulation/life htips: linepossible-ratrofit orginea sunefrom-in-roof-insulation/life
Measures			Laft hatch and ceiling sirtightness. Floor insulation betweenlander floor joints	htips://espossible-stroff.org/measure/of-hatch-and-celling-sintightness/HIV htips://espossible-stroff.org/measure/floor-insulation-between-under-floor-joints/HIV
Measures	Fabric	Floor	Floor insulation on top of existing floor finish	https://expossible-retroft.org/resexure/foor-insulation-on-top-of-existing-floor-finish/12
Measures Measures			Floor void filled with insulation Exposed soffits to upper floors: insulation in between joints or under soffit	https://respossible-retroft.org/resesses/floor-void-filted-with-insulation/10 https://respossible-retroft.org/resesses/earfilts-to-upper-floors-insulation-in-between-joints-or-under-soft/14
Measures	Fabric	Floar	Replacement of existing ground floor with new concrete insulated solid ground floor	https://inequasible-retroft.org/neasure/regiscenent-of-colding-ground-floor-with-new-concrete-insulated-cold-ground-floor15
Measures		Floor Windows	Increased Floor sitightness Window draughtproofing	htips://napossibie-ratrofit.org/measure/increased-6cor-air/ightness/16 htips://napossibie-ratrofit.org/measure/window-chaughtproofing/17
Measures			Energy efficient glooing Window refurbishment	https://responsible-ratrofit.org/measure/sharpy-efficient-planing/18 https://responsible-ratrofit.org/measure/shaton-ratrofishment/19
Measures	Fabric	Windows	Secondary glazing	https://expossible-retroft.org/reseaure/secondary-glazing08
Measures	Fabric Fabric	Windows Windows	Wildow Stutten Refurbishment Wildow External Shading	https://respossible-retroff.org/resesses/eindow-etusters-refurblehment01 https://respossible-retroff.org/resesses/eindow-esternal-shading00
Measures	Fabric	Wisdows	Window Regiscement	https://expossible-ratrofit.org/reasure/vindow-replacement/23
Measures			Door draughtproofing High performance doors	https://esponsible-retrollt.org/measune/door-draughtproofing/G4 https://esponsible-retrollt.org/measune/https://esponsible-ret
bleasures		Doors	Door refurbishment	https://eappresible-retrofit.org/resasure/door-refurblishment/26
Measures			Chinney removal complete Chinney removal internal	https://expossible-ratroff.org/measure/chimney-ramonal-complete/07 https://expossible-ratroff.org/measure/chimney-ramonal-internation
Measures	Fabric	Chiraney	Chineney blocking	https://inappessible-estrofit.org/reseause/chimsey-blocking/29
Measures	Services	Heat Generation	Heating system Refurbishment	https://napossibie-retroff.org/measure/heduced-pir-flow/30 https://napossibie-retroff.org/measure/heating-system-refurbishment/94
			High efficiency gas-fined condensing ballers Oil-fixed condensing boilens	https://espossible-retroff.org/neasuse/high-efficiency-gas-freel-condensing-bollers/16 https://espossible-retroff.org/neasuse/oil-freel-condensing-bollers/16
bleasures	Services	Heat Generation	Air equippe heat pumps	https://esponsible-retrofit.org/neasure/sir-source-heat-gumps/37
			Ground/Water source heat pumps. Biomass boilers	htps://espossible-estroft.org/neasure/ground-ester-source-heat-pumps/SB https://espossible-estroft.org/neasure/biomass-boilwn/SP
Measures	Services	Heat Generation	Biomass stove with back boiler	https://expossible-retroft.org/resexurationsse-stove-with-back-bollen90
Measures	Services Services	Heat Generation Heat Generation	Fan-assisted replacement storage heaters Flue-gas heat recovery devices	https://espossible-retroft.org/ressumefan-assisted-replacement-storage-hasters/41 https://espossible-retroft.org/ressumefas-gas-hast-recovery-devices/42
bleasures	Services	Heat Generation	Solar water heating Whate water heat recovery devices for showers	https://expossible-retroft.org/neasure/solar-water-hasting/43
				htjps://napossibie-ratrofit.org/measure/water-heat-recovery-devices-fur-shovers/H4 htjps://napossibie-ratrofit.org/measure/communal-heat-generating-system/H5
		Heat Generation	Micro combined heat and power	https://expossible-retroft.org/neasure/micro-combined-heat-and-power46
bleasures	Services.	Hot Water Storage	High efficiency replacement warm-air units Cylinder thermostats	https://esponsible-retrollt.org/reseaune/righ-efficiency-replacement-warm-air-cirits/47 https://esponsible-retrollt.org/reseaune/cylinder-thermostats/filli
Measures	Services Services		Hot water cylinder insulation New cylinder	https://responsible-retrolit.org/measure/hot-valer-cylinder-insulation/HB https://responsible-retrolit.org/measure/new-cylinder-SB
bleasures	Services.	Heat Distribution	Heating controls (for wet and warm air systems)	https://expossible-estroff.org/neasune/heating-contrals-for-wed-and-warre-air-eyetens/51
			Heating Distribution Returbishment Pipe insulation	htips: linaposable-ratroff: orgineasuselheating-distribution-raturbishment/52 htips: linaposable-ratroff: orgineasuselpipe-insulation/53
Measures	Services.	Heat Distribution	Wet Under-floor heating	https://expossible-retroft.org/neasure/wet-under-floor-heating-54
Measures	Services Services	Heat Distribution Vestilation	Communal Heat Distribution System and controls Background ventilators and intermittent estract fans	https://espossible-retroft.org/reseause/communal-heart-distribution-system-and-controlat55 https://espossible-retroft.org/reseause/background-ventilators-and-internitient-eatract/fams57
Measures	Services	Vertilation	Passive stack ventilation	htps://epposible-estroft.org/neasure/passive-stade-ventilation/58 htps://epposible-estroft.org/neasure/continuou-machanical-extract-ventilation/58
Measures		Ventilation	Continuous mechanical suggly and extract ventilation with heat recovery	https://responsible-retrots.org/reseaune/continuous-mechanical-extract-ventilation-uith-heat-recovery(6) https://responsible-retrots.org/reseaune/continuous-mechanical-eapply-and-extract-ventilation-with-heat-recovery(6)
Measures Measures	Services Services	Ventilation	Passive stack vertilation with heat recovery  Passive stack vertilation with densard control vertilation	htips: linepossible-retrolit orgines sunspassive-stado-ventilator-with-head-recovery/61 htips: linepossible-retrolit orgines sunspassive-stado-ventilator-with-densard-control-ventilator/62
bleasures	Services	Ventilation	Continuous mechanical extract ventilation with demand control ventilation	https://responsible-retroff.org/resexura/continuous-mechanical-oxtract-vertilation-with-demand-control-vertilation/E3
Measures		Ventilation Lighting	Continuous mechanical suggly and extract ventilation with heat recovery and with de Lighting system upgrade	https://expossible-retroff.org/measure/continuous-mechanical-supply-and-extract-entitation-with-heat-recovery-and-with-demand-control-entitation/64 https://expossible-retroff.org/measure/lighting-system-upgrader56
Measures	Services	Electrical Generation	Small wind generation	https://expossible-retrofit.org/reseasure/arrait-wind-generation/S1
		Electrical Generation Electrical Generation	Photovoltaios Hydropower generation	https://responsible-reholb.org/resesure/photovolatios/30 https://responsible-reholb.org/resesure/hydrogover-generation/20
bleasures	Bohavlour	People Interaction	User interfaces for usuability	https://inappesible-estrofit.org/reseaure/user-interfaces-for-usability/65
bleasures	Bohavlour	People Interaction	Provision of simple and clear information Improving User interest and involvement:	https://egpossible-retroft.org/reseause/provision-of-eirople-and-clear-information/66 https://espossible-retroft.org/reseause/ingroving-user-interest-and-involvement/67
bleasures	Bohavlaur	People Interaction	Maintenance Intentitie/leuritoco Condensation	https://expossible-estrofit.org/reasure/maintenance/filli
Concerns Concerns	Technical	Moisture	Trappediaccumulated moisture	https://responsible-retrollt.org/concent/interstital-eurlace-condensation*! https://responsible-retrollt.org/concent/inapped-accumulated-inolature/II
Concerns	Technical Technical	Moisture Detailing care needed	Rain and Drains (liquid recisture penetration) Thermal Bridges	https://responsible-retroff.org/concentrain-and-chaine-liquid-moleture-penetration/S https://responsible-retroff.org/concent/fermal-bridges/4
Conpens	Technical	Detailing care needed	Stain/Dear/Skirting Adjustment	https://responsible-retroffc.org/concern/stain-door-ekinting-edjustment/5
Conpers	Technical	Detailing care needed	Condensing Plume location Noise	https://responsible-ratrofit.org/comoran/condensing-plume-location/7 https://responsible-ratrofit.org/comoran/contensing-plume-location/7
Concerns	Technical	Detailing care needed	Structural loading changes	https://expossible-retrollt.org/cancers/structural-loading-changes/8
Concerns	Technical	Detailing care needed Detailing care needed	Retention of air flow - door undercuts	https://responsible-retrollt.org/cancers/tridden-services/18 https://responsible-retrollt.org/cancers/retendon-of-air-flow-door-undersuts/11
Conpens	Technical	Fabric uncertainty Sufficient Ventilation?	Relation to Building Thermal Performance	htips://expossible-estrolli.org/concern/selston-to-ballding-thermal-performance/13 https://expossible-estrolli.org/concern/sufficient/verifishon/14
Conperse	Technical	Sufficient Ventilation?	Overheating	https://expossible-estrofit.org/concern/overheating/16
Concerns	Technical Technical	Aftercare needed Aftercare needed		https://responsible-retrofit.org/comorns/handover-to-user-s/28 https://responsible-retrofit.org/comorns/haintanance-interval-and-complexity/21
Conperse	Technical	Aftercare needed	Monitoring and feedback required	https://expossible-retrofit.org/cancers/monitoring-and-feedback-required/22
Concerns	Technical	Liser aspects	Space limitations Complex installation	https://responsible-retrofit.org/commens/space-limits/dons/25 https://responsible-retrofit.org/commens/complex-installation/26
Conpens	Technical	Complexity	Complex operation Building Control/Warrant	https://responsible-retroft.org/concern/complex-operation/07
Concerns Concerns			Building Control/Warrant Party Wall	https://responsible-retrollt.org/concern/building-control-warrant/96 https://responsible-retrollt.org/concern/party-wai/177
Concerns	Technical	People	Personal preference	htps://repossible-retroff.org/concern/personal-preference/H
Concerns Concerns	Haritapa	Detailing care needed	Personal capacity/Right opportunity Detail for Access to services	https://responsible-retrollt.org/cancers/personal-capacity-right-opportunity/42 https://responsible-retrollt.org/cancers/detail-for-access-to-serv/cas/life
Concerns	Heritops	Heritage Detail	Original internal detail lost Original external detail lost	htps://responsible-estroft.org/concern.forginal-internal-detail-lost/20 htps://responsible-estroft.org/concern.forginal-esternal-detail-lost/30
Concerns	Heritoge	Heritage Detail	Detail retains character?	https://expossible-retroft.org/concern/detail-retains-character/31
Concerns	Heritope	Heritage Detail	Use of sympathetic materials Listed building consent	https://responsible-retroff.org/concent/use-of-sympathedo-materials/20 https://responsible-retroff.org/concent/lated-building-consent/20
Conperss	Heritage	Permissions seeded	Planning consent within conservation area.	https://expossible-estrofit.org/concers/planning-consent-within-conservation-area/54
Concerns Concerns	Heritage Energy	Permissions needed Fabric uncertainty	Planning consent outside consentation area Actual U-value?	https://responsible-ratrolit.org/concern/planning-consent-outside-conservation-area/25 https://responsible-ratrolit.org/concern/actual-u-value/1/2
Conpens	Energy	Energy implication		https://expossible-retrofit.org/concern/day/ight-reduction/17
Concerns Concerns	Energy	Energy implication	Default settings	https://esponsible-estroff.org/concern/increased-infiltration/16 https://esponsible-estroff.org/concern/default-estrings/19
Concerns Concerns	Energy	User aspects	Rebound effects User understanding	https://expossible-retroft.org/concern/rebound-effects/23
Concerns	Energy	Site Conditions	Appropriate siting	htjps://eppensibie-estrollt.org/concern/user-understanding/S4 https://expensibie-estrollt.org/concern/appropriate-eiliteg/S8
Concerns Concerns			Product quality Installation quality	htps://espossible-estroft.org/concern/product-quality/S8 https://espossible-estroft.org/concern/installation-quality/S9
Concerns				https://expossible-retroff.org/cancers/commissioning-quality/40

#### **GRC V1 Colour coded Cells**

Legend	In Excel	Conditional formatting	In BIM	to be completed by users
Cell colour code/content	Explanation	Examples		
	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://GreenBuildingCalculator.uk

#### **GRC V1 Instructions**

© STBA 2021 developed by GBC and STBA **B2 Instructions** Legend Green cells: need the user to add, project specific information or replace default information with specific information Red Text in Turquois cells: is reproducing building-wide information but the user can over write it with room or element specific values Blue cells: provide results based on a calculation using data from other cells DO NOT OVERWRITE THE CELL CONTENT 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 use 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 is 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 Workshoot Column(s) Row(s) Cells E to P, R to AC E to P. R to AC All All B6 ProjectSummarySheet E to G All E to G Whole columns Insert 3 empty columns E to G Whole columns F to G All Paste 3 found and copied columns into empty columns (do not delete other columns (H to AF)) Custom View B2 UValueToWattsToCO2 Now switch to work sheet (tab) B2 UToWattaToCO2 (Custom View) UToWattsToCO2 Scenario: Existing and Previous B2 UValueToWattsToCO2 D B2 UValuesToWattsToCO2: Cell: D4 Scenarios: Choose 'Previous' (existing + any previous changes) F11 to F23, F31 to F382 11 to 23, 382 B2 Survey: Column F: Check or Complete green and red cells for existing only (ignor proposed interventions) B2 Survey B2 Survey 40, 43, 66 F40, F43, F66 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 39.47 F39, F47 B2 Survey: Check F39, F47 & F49 are as expected (many other cells are completed automatically) 51 to 53 F51 to F53 B2 Survey B2 Survey: Check F51, if F51 is correct make F52 "Assumed"; if F51 is incorrect update F53 and make F52 "Actual" 69 to 72 F69 to F72 B2 Survey B2 Survey: Check F69, if F69 is correct make F71 "Assumed"; if F69 is incorrect update F70 and make F71 "Actual" F109 to F112 B2 Survey 109 to 112 B2 Survey: Check F109, if F109 is correct make F111 "Assumed"; if F109 is incorrect update F110 and make F111 "Actual" 189 to 192 F189 to F191 B2 Survey: Check F189, if F189 is correct make F191 "Assumed"; if F189 is incorrect update F190 and make F191 "Actual" B2 Survey 228 to 231 F228 to F231 B2 Survey: Check F228, if F228 is correct make F230 "Assumed"; if F228 is incorrect update F229 and make F230 "Actual" F228 to F232 B2 Survey 232 to 235 B2 Survey: Check F232, if F232 is correct make F234 "Assumed"; if F232 is incorrect update F233 and make F234 "Actual" 236 to 239 F236 to F239 B2 Survey B2 Survey: Check F236, if F236 is correct make F238 "Assumed": if F236 is incorrect update F237 and make F238 "Actual" 307 to 310 F307 to F310 B2 Survey: Check F307, if F307 is correct make F309 "Assumed"; if F307 is incorrect update F308 and make F309 "Actual" B2 Survey 335 to 3340 F335 to F340 B2 Survey: Check F335, if F335 is correct make F339 "Assumed"; if F335 is incorrect update F337 and make F339 "Actual"

### GBC B2 Survey Sheet v 1

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



**English Housing Survey:** 8 Eras 7 House formats, Floor areas, Plot areas numbers of rooms, number of bedrooms Ranges and averages **Demolitions Alterations Conversions** International comparison https://www.gov.uk/ government/collections/ english-housing-survey **Up to 2021** 

Scottish equivalent data



#### **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 In: Material
Alphabetic order (in use)	Drop Down List	Drop Down List							Drop Down List	
EnglandWalesNireland:1919 to 1944:Detached House	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	330	Lime Plaster	External	Expanded Polystyre
EnglandWalesNireland:1919 to 1944:End Terrace	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyre
EnglandWalesNireland:1919 to 1944:Flat/Apartment	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:1919 to 1944:Mid Terrace	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:1919 to 1944:Semi-Detached	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	330	Lime Plaster	External	Expanded Polystyre
EnglandWalesNireland:Post 1944:Bungalow	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNireland:Post 1944:Detached House	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNireland:Post 1944:End Terrace	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Post 1944:Flat/Apartment	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Post 1944:Mid Terrace	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Post 1944:Semi-Detached	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick/Air/Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Pre 1919:Bungalow	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Pre 1919:Detached House	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
EnglandWalesNireland:Pre 1919:End Terrace	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
EnglandWalesNireland:Pre 1919:Flat/Apartment	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Pre 1919:Mid Terrace	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
EnglandWalesNIreland:Pre 1919:Semi-Detached	English Housing Survey (EW&NI)	Pre 1919	CV13 6AZ	Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
EnglishWalesNIreland:1919 to 1944:Bungalow	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Detached Cottage	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render/Brick/Air/Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Detached Villa	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render/Brick/Air/Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Flat/Apartment	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Semi-Detached	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render/Brick/Air/Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Tenement	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lime Plaster	External	Expanded Polystyre
Scotland:Post 1919:Terraced House	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render/Brick/Air/Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyre
Scotland:Pre 1919:Detached Cottage	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre
Scotland:Pre 1919:Detached Villa	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre
Scotland:Pre 1919:Flat/Apartment	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre
Scotland:Pre 1919:Semi-Detached	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre
Scotland:Pre 1919:Tenement	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre
Scotland:Pre 1919:Terraced House	Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyre

 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		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	Architypes	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	Ineral 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 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 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
Coming Solat level	Miliotal Wool, Tock	100	9	10.00	01.00	2.0	V. I	HILL COLLEGE	-10.2	500	Oona Masonly	21.00	100	100111 0100	minoral Wool, Took

## 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	Exiting Radiators	Exiting 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		1.89	Uninsulated	4.5		1.2		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		1.89	Uninsulated	4.5		1.2		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	Updrade to Triple Glazed
90%	Combi-boiler	9	10	8	720	1	0	Render	Softwood	Softwood	100	Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	2	Render	Softwood	Softwood	100	Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	0	Render	Softwood	Softwood	100	Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	10	10	8	800	1	0	Render	Softwood	Softwood	100	Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	0	0	Render	Concrete	Ceramic Tile	100	Brick/Air/Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	0	0	Render	Softwood	Softwood	100	Brick/Air/Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	9	10	8	720	1	0	Render	Softwood	Softwood	100	Brick/Air/Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	2	Render	Softwood	Softwood	100	Brick/Air/Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	0	Render	Softwood	Softwood	100	Brick/Air/Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	10	10	8	800	1	0	Render	Softwood	Softwood	100	Brick/Air/Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	0	0	Render	Concrete	Ceramic Tile	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	0	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	9	10	8	720	1	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	2	Render	Softwood	Softwood	100	Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	10	10	8	800	1	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	0	0	Render	Concrete	Ceramic Tile	100	Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler		10	8		0	0	Render	Softwood	Softwood	100	Lime Render/Brick/Air/Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	0	0	Render	Softwood	Softwood	100	Lime Render/Brick/Air/Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	2	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	1	0	Render	Softwood	Softwood	100	Lime Render/Brick/Air/Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	9	10	8	720	0	0	Render	Softwood	Softwood	100	Lime Render/Brick/Air/Brick	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler		10	8		0	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	0	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	2	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	11	10	8	880	1	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	8	10	8	640	2	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed
90%	Combi-boiler	9	10	8	720	2	0	Render	Softwood	Softwood	100	Stone	150	Slate	Softwood	Updrade to Triple Glazed

## GBC B2 House Type Data Sets >I 6 England and Scotland

Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proposed Window Improvements	Proposed Windows U value	Proposed Door Energy Replacments	Proposed Door U value	Party Floor thickness	Party Floor Format	Party Floor Material	Party Floor Finish	Area of Party Floors (= Ground floor)	Number of party Floors	Previous Party Floor Insulation Position	Previous Party Wall Insulation material	Previous Party Wall Insulation thickness
	W/m2.K		W/m2.K	mm				m2	No.			mm
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	200	Suspended framed	Softwood	Softwood Boarding	55	1	Joist Zone	Mineral wool, rock	100
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	200	Suspended framed	Softwood	Softwood Boarding	54	1	Joist Zone	Mineral wool, rock	100
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	200	Suspended framed	Softwood	Softwood Boarding	69	1	Joist Zone	Mineral wool, rock	100
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	200	Suspended framed	Softwood	Softwood Boarding	64	1	Joist Zone	Mineral wool, rock	100
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	200	Suspended framed	Softwood	Softwood Boarding	95	1	Joist Zone	Mineral wool, rock	100
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0	0	0	0	0
Updrade to Triple Glazed	0.85	Updrade to Insulated	1.00	0	0	0	0	0		0	0	0





https://GreenBuildingCalculator.uk

#### GRC V1 B6 Paper Based Site Survey

<b>B2</b>	B2 Paper bas	ed site s	surv	ev	© STBA 2021-2022 developed by GBC and STBA
				<u> </u>	
	Survey Plot, House or Flat No.			Drintfo	k oito vioit
	Core Data Source	Site survey		<del>PHIIIL 10</del>	Site Site VISIT
	Construction Era	,			,
	Site Location Postcode				
	Site Location City			<b>Manual</b>	input
	Existing Wall Material			manaa	- Inpac
	Existing Wall Format			unrestr	rictod
	Existing Wall Thickness (mm)			<del>uni cou</del>	<del>1010</del>
	Existing Internal finish				
	Previous External Wall Insulation Position				
	Previous External Wall Insulation Material			Manual	transfer to
	Previous External Wall Insulation Thickness				
	Habitable rooms			hosnok	e building type
	Bathrooms			<del>neabon</del>	ballallig type
	BuildingFormat			rowo	House Types
	Total Floor Area			TOWS OI	House Types
	Number of Stories in house				
	Area of ground floor			table	
	Ground floor construction				
	Ground floor insulation position				
	Ground Floor Insulation material			Manual	check that
	Ground Floor Insulation thickness			Manuai	Check that
	Area of Roof				1:1-1
	Existing Roof Pitch			<u>data is</u>	compatible
	Previous Roof Insulation Position				•
	Previous Roof Insulation material			with ca	<b>Iculations</b>
	Previous Roof Insulation thickness			With Su	Calations
	House width				
	House Depth			NI- GALLA	2 (0)
	HLP Heat Loss Perimeter per floor			NO NE	<b>&gt;</b> U
	Floor to ceiling height				
	Storay (Floor to Floor) Height				





https://GreenBuildingCalculator.uk

#### **GRC V1 B6 Paper Based Site Survey**

<b>B2</b>	B2 Paper base	ed site s	surv	ev	© STBA 2021-2022 developed by GBC and STBA
				<u> </u>	J
	Survey Plot, House or Flat No.				
	Core Data Source	Site survey	•	<del>Can he</del>	sideveloped as
	Core Data Source  Construction Era	Site survey		<u> </u>	Sites restricted and an arrangement of the sites of the s
	Site Location Postcode			:D	
	Site Location City			<del>IPad St</del>	rvey sheet
	Existing Wall Material				
	Existing Wall Format				
	Existing Wall Thickness (mm)				
	Existing Internal finish		•	To auto	<del>o-teed </del>
	Previous External Wall Insulation Position			10 000	1000
	Previous External Wall Insulation Material			la a a la a l	de levilelies
	Previous External Wall Insulation Thickness			<del>-pespoi</del>	<del>ke building</del>
	Habitable rooms			•	
	Bathrooms			typoci	nto house
	BuildingFormat			<del>rypes i</del>	nto house
	Total Floor Area				
	Number of Stories in house			types t	ahle
	Area of ground floor			<del>types t</del>	anic
	Ground floor construction				
	Ground floor insulation position				
	Ground Floor Insulation material			Chans	e the one new
	Ground Floor Insulation thickness			<del>OHOO3</del>	<del>y thic one new</del>
	Area of Roof			•	
	Existing Roof Pitch			bespo	ke building
	Previous Roof Insulation Position			<del>~~~</del>	10 20 11 11 19 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Previous Roof Insulation material			1,100	la caralete
	Previous Roof Insulation thickness			type to	populate
	House width				•
	House Depth			coloula	ation cells
	HLP Heat Loss Perimeter per floor			Calcula	TUOLI CELIS
	Floor to ceiling height				
	Storey (Floor to Floor) Height				





https://GreenBuildingCalculator.uk

#### **GRC V1 Tablet Survey Feed**

	D	E		F	G	Н	I
Tablet	site survey	© STBA 2021-2023 developed by GBC	and STBA				
		Site survey		Site survey	Site survey	Site survey	Site survey
Concatenated Loo	ok Up Table Reference	Scottish Islands:Pre 1919:Terraced	Cafe	Scottish Islands:Pre 1919:TerracedCottage	Scottish Islands:Pre 1919:TerracedWorkshop	Scottish Islands:Pre 1919:VillaBottomFlat	Scottish Islands:Pre 1919:VillaMidF
Survey Plot, i	House or Flat No.						
Core D	Oata Source	Choose	,	Interreg Energy Pathfinder Survey	Interreg Energy Pathfinder Survey	Interreg Energy Pathfinder Survey	Interreg Energy Pathfinder Surve
Constr	ruction Era	Choose		Pre 1919	Pre 1919	Pre 1919	Pre 1919
Site Locat	tion Postcode	KW17 2BG		KW17 2BG	KW17 2BG	KW17 2DL	KW17 2DL
Site Lo	ocation City	Café, North-West block, Dennis Ness, North Ronaldsay	Orkney,	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, Westra Orkney
Existing \	Wall Material	Choose		<b>♦</b> Brick	Insitu Concrete	Sandstone	Sandstone
Existing	Wall Format	✓ Choose		Solid Masonry	Solid Masonry	Solid Masonry	Solid Masonry
Existing Wall	l Thickness (mm)			600	600	800	800
Existing I	Internal finish	Brick	8	Lime Plaster on the hard	Chipboard drylining	Insulated plasterboard drylining	Gypsum plasterboard
Previous External \	Wall Insulation Position	Brick Air Brick		None	None	Internal	Internal
Previous External \	Wall Insulation Material	Lime Render Brick Air Brick		None	None	Phenolic foam, foil-backed	Phenolic foam, foil-backed
Previous External W	Vall Insulation Thickness	Stone		0	0	120	120
	able rooms	Insitu Concrete		4	6	2	2
	throoms	Choose		1	0	1	1
	ingFormat	Choose		Semi-Detached	Semi-Detached	Flat/Apartment (Converted)	Flat/Apartment (Converted)
	Floor Area	100.72		78.98	134.17	35.27	36.27
	Stories in house	Choose		1	134:17	1	30.27
	ground floor	#VALUE!		78.98	134.17	35.27	36.27
		Choose			Solid	Solid	
	or construction			Suspended Timber	None	Below slab	Suspended Timber
	insulation position	Choose		None			Between Joists
	Insulation material	None		None	None	Phenolic Foam	Unknown
	Insulation thickness	0		0	0	100	0
	a of Roof	#VALUE!		78.98	134.17	35.27	N/A
	g Roof Pitch	Choose		Flat Roof	Flat Roof	Party Floor Above	Party Floor Above
	Insulation Position	Choose		Ceiling Joist level	None	None	None
	Insulation material	None		Mineral wool	None	None	None
	Insulation thickness	0		200	0	0	0
	use width	13.7		10.79	16.73	8.4	8.51
	se 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 o	ceiling height	2.74		2.81	3.26	2.39	2.4
Storey (Floor	r to Floor) Height	2.74		3.41	3.26	2.83	2.83
Arc	chitypes	Choose		Semi-Detached	Semi-Detached	Bottom floor Flat/Apartment/ Tenament	Mid floor Flat/Apartment/ Tename
Area of external v	walls minus openings	-14.17		71.16	100.16	42.62	43.32
Party wa	all thickness	Choose		150	200	300	300
Party W	Vall Format	Choose		Solid Masonry	Solid Masonry	Timber framed	Timber framed
Party v	wall length	0		8.18	3.74	6.34	6.58
Area of	Party Walls	0		22.99	12.19	15.15	15.79
	/all Insulation Position	None		None	None	within timber frame	within timber frame
	/all Insulation material	None		None	None	Phenolic foam	Phenolic foam

### GRC V1 GBC B2 Survey Data Sets Add any building to house types

0																							
by GBC	© STBA 2021-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Completed by GBC	22 developed by GBC for STBA		B2 Standard House Types Building Data table BDT1 & BDT0	Choose	Choose	Type or paste	Type or paste	Choose	Choose	Choose	Choose	Choose	Type or paste	Type or paste	Choose	Choose	Choose	Type or paste	Choose	Auto-filled	Choose	Choose	Type or Paste
Instructions																							
SlidePages	PD populate order	Application Page	House Type Look Up Reference (Concatenated)	Core Data Source	Construction Era	Site Location Postcode	Site Location City	Existing Wall Material	Existing Wall Format	Existing Wall Thickness (mm)	Existing Internal finish	Previous External Wall Insulation Position	Previous External Wall Insulation Material	Previous External Wall Insulation Thickness	Habitable rooms	Bathrooms	BuildingFormat	Total Floor Area	Number of Stories in house	Area of ground floor	Ground floor construction	Ground floor insulation position	Ground Floor Insulation materia
			Alphabetic order (in use)	Drop Down List DD7	Drop Down Lis	t		Drop Down List	Drop Down List	Drop Down List	t Drop Down List	Drop Down List		Inickness	Drop Down List	Drop Down List	Drop Down List	m2	No.	m2	Drop Down List	Drop Down List	
2	2	Page 1	EnglandWalesNireland:1919 to 1944:Detached House	English Housing Survey (EW&NI)	1919 to 1944	CV13 6AZ	Fenny Drayton	Brick	Solid Masonry	330	Lime Plaster	External	Expanded Polystyrene	100	6	2	Detached House	153	2	76.5	Suspended	Between Joists	Mineral wool, rock
2	14	Page 1	EnglandWalesNireland:1919 to 1944:End Terrace	English Housing Survey (EW&NI)		CV13 6AZ		Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyrene	100	5	1	End Terrace	83	2	41.5		Between Joists	Mineral wool, rock
2	11	Page 1	EnglandWalesNireland:1919 to 1944:Flat/Apartment	English Housing Survey (EW&NI)	1919 to 1944		Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyrene	100	4	1	Flat/Apartment	55	1	55	Over heated space		Mineral wool, rock
2	17	Page 1	EnglandWalesNireland:1919 to 1944:Mid Terrace	English Housing Survey (EW&NI)	1919 to 1944		Fenny Drayton	Brick Brick	Solid Masonry	230 330	Lime Plaster Lime Plaster	External External	Expanded Polystyrene Expanded Polystyrene	100	5	2	Mid Terrace Semi-Detached	78 94	2	39 47	Suspended	Between Joists Between Joists	Mineral wool, rock
2	5	Page 1	EnglandWalesNireland:1919 to 1944:Semi-Detached EnglandWalesNireland:Post 1944:Bungalow	English Housing Survey (EW&NI)  Fnglish Housing Survey (FW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene Expanded Polystyrene	100	4	1	Semi-Detached Rungalow	75	2	75	Suspended	Above Screed	Agreed .
2	3	Page 1	EnglandWalesNireland:Post 1944:Detached House	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ		Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene	100	6	2	Detached House	147	2	73.5	Suspended	Between Joists	Mineral wool, roc
2	15	Page 1	EnglandWalesNireland:Post 1944:End Terrace	English Housing Survey (EW&NI)	Post 1944		Fenny Drayton	Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene	100	5	1	End Terrace	79	2	39.5	Suspended	Between Joists	Mineral wool, rock
2	12	Page 1	EnglandWalesNireland:Post 1944:Flat/Apartment	English Housing Survey (EW&NI)	Post 1944		Fenny Drayton	Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene	100	4	1	Flat/Apartment	54	1	54	Over heated space	Between Joists	Mineral wool, rock
2	18	Page 1	EnglandWalesNireland:Post 1944:Mid Terrace	English Housing Survey (EW&NI)	Post 1944	CV13 6AZ	Fenny Drayton	Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene	100	4	1	Mid Terrace	76	2	38	Suspended	Between Joists	Mineral wool, rock
2	6	Page 1	EnglandWalesNireland:Post 1944:Semi-Detached	English Housing Survey (EW&NI)			Fenny Drayton	Brick Air Brick	Cavity Masonry	280	Lime Plaster	External	Expanded Polystyrene	100	5	2	Semi-Detached		2	41		Between Joists	Mineral wool, rock
2	7	Page 1	EnglandWalesNireland:Pre 1919:Bungalow	English Housing Survey (EW&NI)	Pre 1919		Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	4	1	Bungalow	105	1	105	Solid	Above Screed	Aerogel
2	1	Page 1	EnglandWalesNireland:Pre 1919:Detached House	English Housing Survey (EW&NI)	Pre 1919		Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	6	2	Detached House	197	2	98.5	Suspended	Between Joists	Mineral wool, rock
2	13	Page 1	EnglandWalesNireland:Pre 1919:End Terrace EnglandWalesNireland:Pre 1919:Fiet/Apartment	English Housing Survey (EW&NI)  Fnglish Housing Survey (FW&NI)	Pre 1919		Fenny Drayton	Stone	Solid Masonry Solid Masonry	450	Lime Plaster	External External	Expanded Polystyrene Expanded Polystyrene	100	5	1	End Terrace Flat/Apartment	104	2	52 69	Suspended Over heated space	Dottrout course	Mineral wool, rock
2	10	Page 1	EnglandWalesNireland:Pre 1919:Hat/Apartment EnglandWalesNireland:Pre 1919:Mid Terrace	English Housing Survey (EW&NI)  English Housing Survey (EW&NI)	Pre 1919 Pre 1919		Fenny Drayton Fenny Drayton	Stone	Solid Masonry Solid Masonry	230 450	Lime Plaster Lime Plaster	External	Expanded Polystyrene Expanded Polystyrene	100	4	1	Mid Terrace	87	1	43.5	Over heated space Suspended	Between Joists Between Joists	Mineral wool, roci
- 2	4	Page 1	EnglandWalesNireland:Pre 1919:Semi-Detached	English Housing Survey (EW&NI)	Pre 1919		Fenny Drayton	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene Expanded Polystyrene	100	5	2	Semi-Detached	126	2	63		Between Joists	Mineral wool, rock
2	8	Page 1	EnglishWalesNireland:1919 to 1944:Bungalow	English Housing Survey (EW&NI)	1919 to 1944		Fenny Drayton	Brick	Solid Masonry	230	Lime Plaster	External	Expanded Polystyrene	100	4	1	Rungalow	74	1	74	Solid	Ahove Screed	Aerocel
2	22	Page 1	Scotland:Post 1919:Detached Cottage	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render Brick Air Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyrene	100			Small Detached Cottage					Between Joists	Mineral wool, rock
2	20	Page 1	Scotland:Post 1919:Detached Villa	Scottish House Condition Survey	Post 1919		Blair Atholl	Lime Render Brick Air Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	6	2	Large Detached Villa	133	2	66.5	Suspended	Between Joists	Mineral wool, rock
2	30	Page 1	Scotland:Post 1919:Flat/Apartment	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	4	1	Flat/Apartment	64	1	64	Over heated space	Between Joists	Mineral wool, rock
2	24	Page 1	Scotland:Post 1919:Semi-Detached	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Lime Render Brick Air Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	6	2	Semi-Detached	88	2	44	Suspended	Between Joists	Mineral wool, rock
2	28	Page 1	Scotland:Post 1919:Tenement	Scottish House Condition Survey	Post 1919	PH18 5SA	Blair Atholl	Stone	Solid Masonry	600	Lime Plaster	External	Expanded Polystyrene	100	4	1	Tenement	65	1	65	Over heated space	Between Joists	Mineral wool, rock
2	26	Page 1	Scotland:Post 1919:Terraced House	Scottish House Condition Survey	Post 1919		Blair Atholl	Lime Render Brick Air Brick	Cavity Masonry	450	Lime Plaster	External	Expanded Polystyrene	100	5	1	Terraced House	87	2	43.5	Suspended		Mineral wool, rock
2	21	Page 1	Scotland:Pre 1919:Detached Cottage	Scottish House Condition Survey	Pre 1919	PH18 5SA		Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyrene	100			Small Detached Cottage					Between Joists	Mineral wool, rock
2	19	Page 1	Scotland:Pre 1919:Detached Villa	Scottish House Condition Survey	Pre 1919		Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyrene	100	6	2	Large Detached Villa	172	2	86	Suspended	Between Joists	Mineral wool, rock
2	29	Page 1	Scotland:Pre 1919:Flat/Apartment	Scottish House Condition Survey	Pre 1919		Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyrene	100	4	1	Flat/Apartment	95 127	1	95	Over heated space		Mineral wool, rock
2	23 27	Page 1 Page 1	Scotland:Pre 1919:Semi-Detached Scotland:Pre 1919:Tenement	Scottish House Condition Survey Scottish House Condition Survey	Pre 1919	PH18 5SA	Blair Atholl Blair Atholl	Stone Stone	Solid Masonry	600	Lath and plaster inner lining Lath and plaster inner lining	External External	Expanded Polystyrene Expanded Polystyrene	100	4	1	Semi-Detached Tenement	72	2	63.5 72	Suspended Over heated space	Between Joists Between Joists	Mineral wool, roci
2	25	Page 1	Scotland: Pre 1919: Terraced House	Scottish House Condition Survey	Pre 1919		Blair Atholl	Stone	Solid Masonry	600	Lath and plaster inner lining	External	Expanded Polystyrene	100	5	1	Terraced House	109		54.5	Suspended Suspended	Between Joists	Mineral wool, rock
2		Page 1	Scottish Islands:Pre 1919:Flat/Apartment (Converted)	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2DL	Bayview, Pierowall, Westray, Orkney	Sandstone	Solid Masonry	800	Insulated plasterboard drylining	Internal	Phenolic foam, foil-backed	120	2	1	Flat/Apartment (Converted)	35.27	1	35.27	Solid	Below slab	Phenolic Foam
2		Page 1	Scottish Islands:Pre 1919:TerracedCafe	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2BG	Café, North- West block, Dennis Ness, Orkney, North Ronaldsay	Insitu Concrete	Solid Masonry	600	Lath and plaster inner lining	None	None	0	5	2 WCs Potential Shower Bath	Small Detached Cottage	100.72	1	100.72	Suspended Timber	None	None
2		Page 1	Scottish Islands:Pre 1919:TerracedCottage	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2BG	Cottage 1, South-East block, Dennis Ness, Orkney, North Ronaldsay	Brick	Solid Masonry	600	Lime Plaster on the hard	None	None	0	4	1	Semi-Detached	78.98	1	78.98	Suspended Timber	None	None
2		Page 1	Scottish Islands:Pre 1919:TerracedWorkshop	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2BG	Workshop, North-West block, Dennis Ness, Orkney, North Ronaldsay	Insitu Concrete	Solid Masonry	600	Chipboard drylining	None	None	0	6	0	Semi-Detached	134.17	1	134.17	Solid	None	None
3		Page 1	Scottish Islands:Pre 1919:VillaBottomFlat	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2DL	Flat 1, Bayview, Pierowall, Westray, Orkney	Sandstone	Solid Masonry	800	Insulated plasterboard drylining	Internal	Phenolic foam, foil-backed	120	2	1	Flat/Apartment (Converted)	35.27	1	35.27	Solid	Below slab	Phenolic Foam
3		Page 1	Scottish Islands:Pre 1919:VillaMidFlat	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2DL	Flat 3, Bayview, Pierowall, Westray, Orkney	Sandstone	Solid Masonry	800	Gypsum plasterboard	Internal	Phenolic foam, foil-backed	120	2	1	Flat/Apartment (Converted)	36.27	1	36.27	Suspended Timber	Between Joists	Unknown
3		Page 1	Scottish Islands:Pre 1919:VillaTopFlat	Interreg Energy Pathfinder Survey	Pre 1919	KW17 2DL	Flat 4, Bayview, Pierowall, Westray, Orkney	Sandstone	Solid Masonry	800	Gypsum plasterboard	Wall Stud Zone	Phenolic foam	120	3	1	Flat/Apartment (Converted)	72.13	1	72.13	Over heated space	None	None
	1		1	2	3	4	5	6		8	0	10	**	12	13	14	15	16	17	18	19	20	21
	5		1	2	3	4		Yes	Yes	Yes	y	Yes	Yes	12 Yes	13 Yes	Yes	10	Yes	17	Yes.	19	20	Yes
						_		.00	.00	.00		.00	.00	. 20	.00	.00		100	_	.00			

### 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 BR AD 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	1	13.0	Auto-filled
Project Target U value: Floor Refurbishment	0.18	W/m2.K	1	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	1	16.0	Auto-filled
Proposed New Insulation Material:	Foamed glass chippings	IF		17.0	Auto-filled
Proposed New Insulation Thickness:	200	mm	l	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	1	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	1	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	Ī	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	1	33.0	Auto-filled
Structure Moisture Permeability:	Structure Moisture Open	SMO		34.0	Auto-filled
Insulation Permeability:	Insulation Moisture Open	IMO	1	35.0	Auto-filled
Building fabric condition:	Poor	P	1	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
Callette and the state of the state o					

## 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:		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:		kg CO2		24.0	Auto-filled
Proposed intervention Calculated Total Carbon:		kg CO2		25.0	Auto-filled
Short fall or exceeeded 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
	Fully moisture open solution in exposed location.  Essential that external detailing is undertaken to minimise water penetration, recheck pointing / render, window seals, sills etc. to ensure moisture open and	VLOOKUP	15	40.0	Looked up
Risk Statement: External Wall:	weather tight.				

Roof	Yes	=	0.0	Auto-filled
Existing Foof Format: Fixe Piterou	Tito ad Roof	VLOOKUP	1.0	Looked Up
E sting pof ra er/joiet de the	Sc , w orl		0	Lo ke Up
disting pof structure ha high	So M or I my A VAVA	VL 0 UP	20	Local d 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 Countien Position: Previous Roof Countien Counties Previous Roof Counties Count	Ceiling Jointel	LOOKUP	7.0	Looked Up
Previor Roof Sulf log at ck	Hatechia enchan	TI TI	8.0	Looked Up
Actual pof Ir ulatio thi kr ss			8.1	Type or Paste
Choose Assumed or Actual Roof Insulation Thickress:	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	
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	
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 exceeeded 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		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  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  Looked up

### **GRC V1 GBC B2 Survey Sheet v**6 Fingland

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
in use Carbon:	0.010	1.9 1111111		20.0	
Doors:	Yes	=		0.0	Auto-filled
			44	0.0	Auto-filled Looked Up
Doors:	Yes	=	44 45	0.0	
Existing Doors:  Standardised dwelling database Exiting door U value:  Previous Door Energy Improvements:	Yes Uninsulated 1.60 None	VLOOKUP W/m2.K VLOOKUP	45 76	0.0 1.0 1.1 1.2	Looked Up Looked Up Looked Up
Existing Doors:  Standardised dwelling database Exiting door U value:  Previous Door Energy Improvements:  Proposed Door Energy Improvements:	Yes Uninsulated 1.60	= VLOOKUP W/m2.K	45 76 77	0.0 1.0 1.1 1.2 1.3	Looked Up Looked Up
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors	Yes Uninsulated 1.60 None N/A 1	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No.	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1	Looked Up Looked Up Looked Up Looked Up Looked Up
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area:	Yes Uninsulated 1.60 None N/A 1	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No. m2	45 76 77	0.0 1.0 1.1 1.2 1.3 10.1 10.2	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area:	Yes Uninsulated 1.60 None N/A 1 1.8	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No. m2 m2	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.2 10.0	Looked Up Looked Up Looked Up Looked Up Looked Up
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area	Yes Uninsulated 1.60 None N/A 1	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No. m2 m2 m2 m2	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.2	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area Assumed or Actual Glazing area?	Yes Uninsulated 1.60 None N/A 1 1.8 1.8 4.5 Assumed	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No. m2 m2 m2 c Drop Down List	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.2 10.0 11.0	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste Accept or Change
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area	Yes Uninsulated 1.60 None N/A 1 1.8 1.8 4.5 Assumed 1.8	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No. m2 m2 cm2 cm2 componentiat m2	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.2 10.0 11.0 12.0 13.0	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste Accept or Change Auto-filled
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area Assumed or Actual Glazing area?	Yes Uninsulated 1.60 None N/A 1 1.8 1.8 4.5 Assumed	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No. m2 m2 m2 c Drop Down List	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.2 10.0 11.0	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste Accept or Change
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area Assumed or Actual Glazing area? Calculation Glazing Area:	Yes Uninsulated 1.60 None N/A 1 1.8 1.8 4.5 Assumed 1.8	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No. m2 m2 cm2 cm2 componentiat m2	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.2 10.0 11.0 12.0 13.0	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste Accept or Change Auto-filled
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area Assumed or Actual Glazing area? Calculation Glazing Area: Proposed Intervention calculated U value:	Yes Uninsulated 1.60 None N/A 1 1.8 1.8 4.5 Assumed 1.8 5.88	W/m2.K No. m2 m2 c Drop Down List m2 W/m2.K No. f Drop Down List m2 W/m2.K	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.2 10.0 11.0 12.0 13.0 20.0	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste Accept or Change Auto-filled
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area Assumed or Actual Glazing area? Calculation Glazing Area: Proposed Intervention calculated U value: Proposed intervention cost:	Yes Uninsulated 1.60 None N/A 1 1.8 1.8 4.5 Assumed 1.8 5.88	W/m2.K VLOOKUP W/m2.K No. m2 m2 compound for the following statement of the	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.2 10.0 11.0 12.0 13.0 20.0 21.0 22.0 23.0	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste Accept or Change Auto-filled Auto-filled Auto-filled Auto-filled
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area: Actual Glazing Area: Assumed or Actual Glazing area? Calculation Glazing Area: Proposed Intervention calculated U value: Proposed intervention Cost: Proposed intervention Calculated Embodied Energy:	Yes Uninsulated 1.60 None N/A 1 1.8 1.8 4.5 Assumed 1.8 5.88	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No. m2 m2 compount List m2 W/m2.K No Cost datasets MJ kg CO2 kg CO2	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.2 10.0 11.0 12.0 13.0 20.0 21.0 22.0 23.0 24.0	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste Accept or Change Auto-filled Auto-filled Auto-filled Auto-filled Auto-filled Auto-filled
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area: Actual Glazing Area: Actual Glazing Area: Actual Glazing Area: Proposed Intervention calculated U value: Proposed Intervention Calculated Embodied Energy: Proposed intervention Calculated Embodied Carbon: Proposed intervention Calculated Sequestered Carbon: Proposed intervention Calculated Total Carbon:	Yes Uninsulated 1.60 None N/A 1 1.8 1.8 4.5 Assumed 1.8 5.88 2.7 16.18 254.88 -238.70	W/m2.K VLOOKUP W/m2.K No. m2 m2 composite to the second se	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.0 11.0 12.0 13.0 20.0 21.0 22.0 23.0 24.0 25.0	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste Accept or Change Auto-filled Auto-filled Auto-filled Auto-filled Auto-filled Auto-filled Auto-filled
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area: Actual Glazing Area: Assumed or Actual Glazing Area: Calculation Glazing Area: Proposed Intervention calculated U value: Proposed intervention Calculated Embodied Energy: Proposed intervention Calculated Embodied Carbon: Proposed intervention Calculated Sequestered Carbon:	Yes Uninsulated 1.60 None N/A 1 1.8 1.8 4.5 Assumed 1.8 5.88 2.7 16.18 254.88 -238.70 4.28	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No. m2 m2 compount List m2 W/m2.K No Cost datasets MJ kg CO2 kg CO2 kg CO2 W/m2.K	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.0 11.0 12.0 13.0 20.0 21.0 22.0 23.0 24.0 25.0 26.0	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste Accept or Change Auto-filled
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area: Actual Glazing Area: Actual Glazing Area: Actual Glazing Area: Proposed Intervention calculated U value: Proposed Intervention Calculated Embodied Energy: Proposed intervention Calculated Embodied Carbon: Proposed intervention Calculated Sequestered Carbon: Proposed intervention Calculated Total Carbon:	Yes Uninsulated 1.60 None N/A 1 1.8 1.8 4.5 Assumed 1.8 5.88 2.7 16.18 254.88 -238.70 4.28 Fail	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No. m2 m2 compount List m2 W/m2.K No Cost datasets MJ kg CO2 kg CO2 kg CO2 W/m2.K Pass or Fail	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.0 11.0 12.0 13.0 20.0 21.0 22.0 23.0 24.0 25.0 27.0	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste Accept or Change Auto-filled
Existing Doors:  Standardised dwelling database Exiting door U value: Previous Door Energy Improvements: Proposed Door Energy Improvements: Assumed Number of doors Assumed Average Door Area: Assumed Total Glazing Area: Actual Glazing Area: Actual Glazing Area: Assumed or Actual Glazing Area: Assumed or Actual Glazing Area: Proposed Intervention calculated U value: Proposed intervention Calculated Embodied Energy: Proposed intervention Calculated Embodied Carbon: Proposed intervention Calculated Sequestered Carbon: Proposed intervention Calculated Total Carbon: Short fall or exceeeded U value:	Yes Uninsulated 1.60 None N/A 1 1.8 1.8 4.5 Assumed 1.8 5.88 2.7 16.18 254.88 -238.70 4.28	W/m2.K VLOOKUP W/m2.K VLOOKUP W/m2.K No. m2 m2 compount List m2 W/m2.K No Cost datasets MJ kg CO2 kg CO2 kg CO2 W/m2.K	45 76 77 42	0.0 1.0 1.1 1.2 1.3 10.1 10.0 11.0 12.0 13.0 20.0 21.0 22.0 23.0 24.0 25.0 26.0	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Type or Paste Accept or Change Auto-filled



GBC

Green Building Calculator

https://GreenBuildingEncyclopaedia.uk

https://GreenBuildingCalculator.uk

#### GBC B2 STBA Risk Analysis

•		to colored	n Material		dition	Wind Drive			Comments
Summary	Structure							tisk	Comments
	Moisture Open Moisture C	osed Moisture Open	Moisture Closed	Excellent, Good	Fair, Poor, V Poor	1 or 2			
Traditional builds	1	1		1		1	L		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 N	∕ledium	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	Н	ligh	Fully moisture open solution in sheltered location but appropriate external repairs / enabling works required prior to application.
Traditional builds	1	1			1		1 H		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			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 V	ery 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 tyerm maintenance plan and inspection regime required.
Traditional builds	1		1		1	1	V	ery 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 V	ery 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	L	ow	Moisture open materials can be used safely as condition is good and sheltered location
Conventional builds	1	1		1			1 N	⁄ledium	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	N.	∕ledium	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 N	⁄ledium	Moisture open materials can be used, however appropriate external repairs and enabling works are required prior to application.
Conventional builds	1		1	1		1	L	ow	Moisture closed materials inside moisture closed structure in a good condition and low exposure site are appropriate.
Conventional builds	1		1	1			1 N	∕ledium	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	N.	⁄ledium	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 N	⁄ledium	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 builts									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 & Feedback

© STBA 2021 developed by GBC and STBA	B2 Risk fa	ctors											
	Build	Build Abbreviation	Element	Element Abbreviation	Element Format	Element Format	Insulation Position	Building Fabric Moisture Type	Insulation Material Moisture Type	Building Fabric Condition	Wind Driven Rain Index	RISK	Comments
Concatenate	Traditional/Conventional						IWI CWI	Moisture Open	Moisture Open	Excellent, Good, Fair Poor, V Poor	1234	13	14
CB-CW-FWI-SMC-IMC-F-1	Conventional builds	CB	External Wall	FW	Cavity Wall	CW	FWI	SMC	IMC	F	1 1	Medium	Moisture closed materials over moisture closed structure in a sheltered location but building in poor condition appropriate repairs / enabling works required prior to application
CB:CW:EWI:SMC:IMC:F:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	F	2	Medium	
CB:CW:EWI:SMC:IMC:F:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	F	3	High	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMC:F:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	F	4	High	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMC:G:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	G	1	Low	Moisture closed materials over moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:EWI:SMC:IMC:G:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	G	2	Low	Moisture closed materials over moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:EWI:SMC:IMC:G:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	G	3	Medium	Moisture closed materials over moisture closed structure in a good condition but the high exposure site requires that special care is taken to ensure detailing is correct to stop rain penetration.
CB:CW:EWI:SMC:IMC:G:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	G	4	Medium	Moisture closed materials over moisture closed structure in a good condition but the high exposure site requires that special care is taken to ensure detailing is correct to stop rain penetration.
CB:CW:EWI:SMC:IMC:P:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	Р	1	Medium	mentative descent activities of the mentative descent and structure resident appropriate repairs of charge and the descent
CB:CW:EWI:SMC:IMC:P:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	P	2	Medium	
CB:CW:EWI:SMC:IMC:P:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	Р	3	High	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMC:P:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	Р	4	High	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMC:V:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	V	1	Medium	modular choice materials over modular choice stratum on a stratum sax ballang in poor condition appropriate repairs in chairing works required prior to approximate
CB:CW:EWI:SMC:IMC:V:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	V	2	Medium	
CB:CW:EWI:SMC:IMC:V:3	Conventional builds	CB CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	V	3	High	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMC:V:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMC	V F	4	High Medium	Moisture closed materials over moisture closed structure in an exposed location with the building in poor condition requires appropriate repairs / enabling works required prior to application and a long term maintenance plan
CB:CW:EWI:SMC:IMO:F:1 CB:CW:EWI:SMC:IMO:F:2	Conventional builds Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	F	1 2	Medium	
CB:CW:EWI:SMC:IMO:F:3	Conventional builds	СВ	External Wall	EW	Cavity Wall	cw	EWI	SMC	IMO	F	3	High	Moisture open materials are higher risk due to exposed location and the condition of the shructure.  Care is required to ensure appropriate repairs and enabling works are undertaken prior to application.
CB:CW:EWI:SMC:IMO:F:4	Conventional builds	СВ	External Wall	EW	Cavity Wall	cw	EWI	SMC	IMO	F	4	High	A long term maintenance plan is required as the sisk has high exposure.  Moisture open materials are higher risk due to exposed location and the codition of the structure.  Care is required to ensure appropriate repairs and enabling works are undertaken prior to application.
OD CHIERTING 140 0.4	Conventional builds	CB	External Wall	EW	On the Mari	CW	EWI	SMC	IMO	G	1	1	A long term maintenance plan is required as the site has high exposure.
CB:CW:EWI:SMC:IMO:G:1 CB:CW:EWI:SMC:IMO:G:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	G	2	Low	Moisture open materials can be used safely as condition is good and sheltered location Moisture open materials can be used safely as condition is good and sheltered location Moisture open materials can be used safely as condition is good and sheltered location
CB:CW:EWI:SMC:IMO:G:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	G	3	Medium	
CB:CW:EWI:SMC:IMO:G:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	G	4	Medium	
CB:CW:EWI:SMC:IMO:P:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	Р	1	Medium	
CB:CW:EWI:SMC:IMO:P:2	Conventional builds	CB	External Wall	FW	Cavity Wall	cw	FWI	SMC	IMO	P	2	Medium	
CB:CW:EWI:SMC:IMO:P:3	Conventional builds	СВ	External Wall	EW	Cavity Wall	cw	EWI	SMC	IMO	Р	3	High	Moisture open materials are higher risk due to exposed location and the condition of the structure.  Care is required to ensure appropriate repairs and enabling words are undertaken prior to application.  A long term materiaence plan is required as the sith each subject exposure.
CB:CW:EWI:SMC:IMO:P:4	Conventional builds	СВ	External Wall	EW	Cavity Wall	cw	EWI	SMC	IMO	Р	4	High	Moisture open materials are higher risk due to exposed location and the condition of the structure.  Care is required to ensure appropriate repairs and enabling words are undertaken prior to application.  A long form maintenance plan is required as the sith sha high exposure.
CB:CW:EWI:SMC:IMO:V:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	V	1	Medium	Moisture open materials can be used as a sheltered location, however appropriate repairs and enabling works are required prior to application.
CB:CW:EWI:SMC:IMO:V:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	EWI	SMC	IMO	V	2	Medium	
CB:CW:EWI:SMC:IMO:V:3	Conventional builds	СВ	External Wall	EW	Cavity Wall	cw	EWI	SMC	IMO	v	3	High	Misisture open materials are higher risk due to exposed location and the condition of the structure.  Care is required to ensure appropriate repairs and enabling works are undertaken prior to application.  A long term maintenance plan is required as the site has high exposure.
CB:CW:EWI:SMC:IMO:V:4	Conventional builds	СВ	External Wall	EW	Cavity Wall	cw	EWI	SMC	IMO	v	4	High	Moisture open materials are higher risk due to exposed location and the condition of the structure.  Care is required to ensure appropriate repairs and enabling words are undertaken prior to application.  A long form materianance plan is required as the site has high exposure.
CB:CW:IWI:SMC:IMC:E:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	E	1	Low	Moisture closed materials inside moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:IWI:SMC:IMC:E:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	E	2	Low	Moisture closed materials inside moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:IWI:SMC:IMC:E:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	Е	3	Medium	
CB:CW:IWI:SMC:IMC:E:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	E	4	Medium	
CB:CW:IWI:SMC:IMC:F:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	F	1	Low	Moisture closed materials inside moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:IWI:SMC:IMC:F:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	F	2	Low	Moisture closed materials inside moisture closed structure in a good condition and low exposure site are appropriate.
CB:CW:IWI:SMC:IMC:F:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	F	3	Medium	
CB:CW:IWI:SMC:IMC:F:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	F	4	Medium	
CB:CW:IWI:SMC:IMC:G:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	G	1	Low	Moisture open materials can be used safely as condition is good and sheltered location
CB:CW:IWI:SMC:IMC:G:2	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	G	2	Low	Moisture open materials can be used safely as condition is good and sheltered location
CB:CW:IWI:SMC:IMC:G:3	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	G	3	Medium	
CB:CW:IWI:SMC:IMC:G:4	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	SMC	IMC	G	4	Medium	
CB:CW:IWI:SMC:IMC:P:1	Conventional builds	CB	External Wall	EW	Cavity Wall	CW	IWI	a MC	IMC	P	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

- Every permutation gets its own row
- Abbreviations for concatenated identifiers

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



### methods of construction B6 > More permutations GRC V1 GBC

Occupant numbers:  Life ity a choice: Timp lature desirer Degree C:  Assured No. to particular desirer Degree C:  Assured Or Actual Volumes and numbers?  Calculation Volume of House:  Calculation No. of Bathrooms  Existing Fuel/Energy Use:  Mains Gas  VLOOKUP  Existing Multiple Fuel/Energy Type:  Existing Multiple Fuel/Energy Type:  Existing Monitoring & Controls: Thermostat:  Existing Monitoring & Controls: Radiators  Exiting Monitoring & Controls: Radiators  Existing Monitoring & Controls: Radiators  Existing Heating Efficiency:  Proposed Monitoring & Controls: Radiators  TRV Radiators  VLOOKUP  Existing Heating Efficiency:  Proposed Monitoring & Controls: Radiators  TRV Radiators  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Intellegation Volume and the programmer  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Intellegation Volume and No.  Existing Meating Efficiency:  Programmer  VLOOKUP  Intellegation Volume and No.  Intellegation Volume and No.	Auto-filled Choose Choose Lo ked Up Looked Up Type or Paste Type or Paste Coept or Change Auto-filled Auto-filled Looked Up
Life by scholace: Temporative desire Degree C: Vissum of Volt new hid ser. Vissum of Volt new hid ser. Assur and No. & Dunfo.  Actual Volume of House: Actual Volume of House: Actual No. of Bathrooms Actual Volumes and numbers? Assumed or Actual Volumes and numbers? Calculation Volume of House: Calculation Volume of House: Assumed or Actual Volume of House: Calculation No. of Bathrooms Existing Fuel/Energy Use: Assumed Or Actual Volume of House: Assumed Or Actual Volume of House: Calculation No. of Bathrooms Assumed Or Actual Volume of House: Assumed Or Assumed Or Assumed Or Actual Volume of House: Calculation No. of Bathrooms Assumed Or Assumed Or Assumed Or Actual Volume of House: Actual No. Existing Fuel/Energy Use: Assumed Or Assumed Or Assumed Or Actual Volume of House: Actual No. Existing Fuel/Energy Type: Mains Gas VLOOKUP Existing Monitoring & Controls: Thermostat: Combi-boiler Exiting Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Controller Existing Monitoring & Controls: Controller Proposed Monitoring & Controls: Radiators Proposed Monitoring & Controls: Radiators Proposed Monitoring & Controls: Radiators Proposed Monitoring & Controls: Controller Programmer VLOOKUP  Heating No Calculated Energy Consumption: Lifestie adjustment: 110  KWh/annum Lifestie adjustment:	Choose Locked Up Lood d Up Type or Paste Type or Paste Coept or Change Auto-filled Auto-filled Looked Up
Assuried No. Benific  Assuried No. Benific  Actual Volume of House:  Actual Volume of House:  Actual No. of Bathrooms  Assumed or Actual Volumes and numbers?  Calculation Volume of House:  Calculation No. of Bathrooms  Existing Fuel/Energy Use:  Existing Fuel/Energy Use:  Existing Multiple Fuel/Energy Type:  Existing Monitoring & Controls: Thermostat:  Exiting Monitoring & Controls: Radiators  Exiting Monitoring & Controls: Controller  Existing Heating Efficiency:  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Contro	Looked Up
Actual Volume of House: Actual No. of Bathrooms Assumed or Actual Volumes and numbers? Calculation Volume of House: Calculation No. of Bathrooms Existing Fuel/Energy Use: Mains Gas Existing Multiple Fuel/Energy Type: Existing Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Radiators Exiting Monitoring & Controls: Controller Existing Heating Efficiency: Proposed Monitoring & Controls: Thermostat: Room Thermostat VLOOKUP  Proposed Monitoring & Controls: Thermostat: Room Thermostat VLOOKUP  Frogrammer VLOOKUP  Proposed Monitoring & Controls: Thermostat: Room Thermostat VLOOKUP  Proposed Monitoring & Controls: Thermostat: Room Thermostat VLOOKUP  Proposed Monitoring & Controls: Thermostat: Room Thermostat VLOOKUP  Proposed Monitoring & Controls: Thermostat: Proposed Monitoring & Controls: Thermostat: Proposed Monitoring & Controls: Controller Programmer VLOOKUP  Proposed Monitoring & Controls: Controller Programmer VLOOKUP  Accutal Mains Gas VLOOKUP  Programmer VLOOKUP  Proposed Monitoring & Controls: Thermostat: Proposed Monitoring & Controls: Thermostat: Proposed Monitoring & Controls: Controller Programmer VLOOKUP  Programmer VLOOKUP  Accutal Mains Gas VLOOKUP  Proposed Monitoring & Controls: Thermostat: Proposed Monitoring & Controls: Thermostat: Proposed Monitoring & Controls: Thermostat: Programmer VLOOKUP  Accutal Mains Gas VLOOKUP  Proposed Monitoring & Controls: Thermostat: Proposed M	Looled Up Type or Paste Type or Paste Cept or Change Auto-filled Auto-filled Looked Up Auto-filled Auto-filled
Actual Volume of House: Actual No. of Bathrooms Assumed or Actual Volumes and numbers? Calculation Volume of House: Calculation No. of Bathrooms Existing Fuel/Energy Use:  Existing Multiple Fuel/Energy Type: Existing Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Radiators Existing Monitoring & Controls: Controller Existing Heating Efficiency: Proposed Monitoring & Controls: Thermostat: Room Thermostat VLOOKUP  Proposed Monitoring & Controls: Thermostat: Room Thermostat VLOOKUP  Frogrammer VLOOKUP  Proposed Monitoring & Controls: Thermostat: Room Thermostat VLOOKUP  Proposed Monitoring & Controls: Radiators TRV Radiators VLOOKUP  Proposed Monitoring & Controls: Controller Programmer VLOOKUP  Proposed Monitoring & Controls: Controller Programmer VLOOKUP  Accumal Mains Gas VLOOKUP  Proposed Monitoring & Controls: Thermostat: Room Thermostat VLOOKUP  Proposed Monitoring & Controls: Thermostat: Room Thermostat VLOOKUP  Proposed Monitoring & Controls: Controller Programmer VLOOKUP  Accumal Mains Gas VLOOKUP  Proposed Monitoring & Controls: Thermostat: Room Thermostat VLOOKUP  Proposed Monitoring & Controls: Controller Programmer VLOOKUP  Accumal Mains Gas VLOOKUP  Proposed Monitoring & Controls: Controller Programmer VLOOKUP  Accumal Mains Gas No.  No.  Existing Meater: Combi-boiler No.  Accumal Mains Gas VLOOKUP  No.  Proposed Monitoring & Controls: Controller Programmer VLOOKUP  No.  Calculated Energy Consumption: Lifestle adjustment: 110	Type or Paste Type or Paste Coept or Change Auto-filled Auto-filled Looked Up Auto-filled Auto-filled
Assumed or Actual Volumes and numbers? Calculation Volume of House: Calculation No. of Bathrooms Existing Fuel/Energy Use: Mains Gas Existing Multiple Fuel/Energy Type: Mains Gas Existing Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Radiators Existing Monitoring & Controls: Controller Exiting Monitoring & Controls: Controller Exiting Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Controller Exiting Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Controller Existing Heating Efficiency: Froposed Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Ther	Auto-filled Looked Up
Calculation Volume of House: Calculation No. of Bathrooms Existing Fuel/Energy Use: Mains Gas VLOOKUP Existing Multiple Fuel/Energy Type: Mains Gas VLOOKUP Existing Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Radiators Exiting Monitoring & Controls: Controller Existing Monitoring & Controls: Controller Existing Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Radiators Exiting Monitoring & Controls: Controller Existing Heating Efficiency: Proposed Monitoring & Controls: Thermostat: Exiting Monitor	Auto-filled Auto-filled Looked Up Auto-filled Auto-filled
Calculation Volume of House: Calculation No. of Bathrooms Existing Fuel/Energy Use: Mains Gas VLOOKUP Existing Multiple Fuel/Energy Type: Mains Gas VLOOKUP Existing Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Radiators Exiting Monitoring & Controls: Controller Existing Monitoring & Controls: Controller Existing Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Radiators Exiting Monitoring & Controls: Controller Existing Heating Efficiency: Proposed Monitoring & Controls: Thermostat: Exiting Monitor	Auto-filled Auto-filled Looked Up Auto-filled Auto-filled
Existing Fuel/Energy Use:  Existing Multiple Fuel/Energy Type:  Existing Multiple Fuel/Energy Type:  Existing Monitoring & Controls: Thermostat:  Exiting Monitoring & Controls: Radiators  Exiting Monitoring & Controls: Controller  Exiting Monitoring & Controls: Controller  Existing Monitoring & Controls: Controller  Existing Heating Efficiency:  Proposed Monitoring & Controls: Thermostat:  Room Thermostat  VLOOKUP  Proposed Monitoring & Controls: Thermostat:  Room Thermostat  VLOOKUP  Proposed Monitoring & Controls: Radiators  TRV Radiators  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Addiators  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Frogrammer  VLOOKUP  Addiators  VLOOKUP  Frogrammer  VLOOKUP  Frogrammer  VLOOKUP  Addiators  VLOOKUP  Frogrammer  Frogrammer  VLOOKUP  Frogrammer  Frogramm	Looked Up
Existing Multiple Fuel/Energy Type: Existing heater: Combi-boiler VLOOKUP Existing Monitoring & Controls: Thermostat: Exiting Monitoring & Controls: Radiators Exiting Monitoring & Controls: Radiators Exiting Monitoring & Controls: Controller Existing Heating Efficiency: Proposed Monitoring & Controls: Thermostat: Proposed Monitoring & Controls: Radiators Proposed Monitoring & Controls: Radiators Proposed Monitoring & Controls: Radiators Proposed Monitoring & Controls: Controller Proposed Monitoring & Controls: Controller Proposed Monitoring & Controls: Controller Programmer VLOOKUP Proposed Monitoring & Controls: Controller Programmer VLOOKUP  Heating No  Calculated Energy Consumption: Lifestle adjustment: 110	Looked Up Auto-filled Auto-filled
Existing heater:  Exiting Monitoring & Controls: Thermostat:  Exiting Monitoring & Controls: Radiators  Exiting Monitoring & Controls: Radiators  Exiting Monitoring & Controls: Controller  Exiting Monitoring & Controls: Controller  Existing Heating Efficiency:  Proposed Monitoring & Controls: Thermostat:  Proposed Monitoring & Controls: Thermostat:  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Controls: Controller  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  TRV Radiators  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Reating  No  Calculated Energy Consumption:  Lifestle adjustment:  110	Looked Up Auto-filled Auto-filled
Exiting Monitoring & Controls: Thermostat:  Exiting Monitoring & Controls: Radiators  Exiting Monitoring & Controls: Radiators  Exiting Monitoring & Controls: Controller  Exiting Monitoring & Controls: Controller  Existing Heating Efficiency:  Proposed Monitoring & Controls: Thermostat:  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Controls: Controller  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  TRV Radiators  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Room Thermostat  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Calculated Energy Consumption:  Lifestle adjustment:  110	Looked Up Auto-filled Auto-filled
Exiting Monitoring & Controls: Radiators  Exiting Monitoring & Controls: Controller  Existing Monitoring & Controls: Controller  Existing Heating Efficiency:  Proposed Monitoring & Controls: Thermostat:  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Controls: Controller  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  TRV Radiators  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Programmer  VLOOKUP  Calculated Energy Consumption:  Lifestle adjustment:  110	Looked Up Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled Auto-filled
Exiting Monitoring & Controller  Existing Heating Efficiency:  Proposed Monitoring & Controls: Thermostat:  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Controls: Controller  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  TRV Radiators  VLOOKUP  Proposed Monitoring & Controls: Controller  Programmer  VLOOKUP  Programmer  VLOOKUP  I Addiators  Calculated Energy Consumption:  Lifestle adjustment:  110	Looked Up Looked Up Looked Up Looked Up Looked Up Auto-filled
Existing Heating Efficiency:  Proposed Monitoring & Controls: Thermostat:  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Controls: Controller  Proposed Monitoring & Controls: Controller  Programmer  No  Calculated Energy Consumption:  Lifestle adjustment:  110  VLOOKUP  VLO	Looked Up Looked Up Looked Up Looked Up Auto-filled
Proposed Monitoring & Controls: Thermostat:  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Controls: Radiators  Proposed Monitoring & Controls: Controller  Programmer  No  Calculated Energy Consumption:  Lifestle adjustment:  Programmer  No  Educating  No  No  No  No  No  No  No  No  No  N	Looked Up Looked Up Auto-filled Auto-filled
Proposed Monitoring & Controller Programmer VLOOKUP  Heating No = 0.0  Calculated Energy Consumption: 50 kWh/annum Lifestle adjustment: 110 %	Auto-filled Auto-filled
Heating         No         =         0.0           Calculated Energy Consumption:         50         kWh/annum           Lifestle adjustment:         110         %	Auto-filled Auto-filled
Calculated Energy Consumption: 50 kWh/annum Lifestle adjustment: 110 %	Auto-filled
Lifestle adjustment: 110 %	Auto-filled
0-11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	Accelor Attitudes
	Auto-filled
	Looked Up
	Looked Up
Existing Heating Source: Combi-boiler VLOOKUP  Heating delivery system: Radiators < Drop Down List	Looked Up Choose
Proposed Heating Source Choose < Drop Down List	Choose
Proposed Monitoring & Controls: Choose < Drop Down List	Choose
	Looked Up
	Looked Up
Proposed Monitoring & Controls: Programmer VLOOKUP	Looked Up
Ventilation No = 0.0	Auto-filled
Proposed Fuel/Energy Type: Mains Gas VLOOKUP	Looked Up
	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
	Looked Up Auto-filled
1.59	Auto-filled
	Looked Up
	Looked Up Looked Up
	Looked Up
	Auto-filled
	Looked Up
	Looked Up
	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 EEECSC



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

Yes/No	New Build or Refurbishment Actions	Component Function	Component	Density	Thermal Conductivity	Thickness	Thickness	Thermal Resistance	size: width or thickness (solid)	Spacing or cavity (vold)	Fraction of area or section	Thermal Resistances	Calculated Total U value	Target Elemental U value	Difference	Pass, PassU or Fall
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				0.000				
					Previous	751.12	0.75					3.229	0.310	0.25	0.060	Fail
					Overall thickness mm m						Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, PassU or Fail	

# GRC V1 GBC B2 U value calculation: Resistances: Normal v Research Evidence

B2 No	rmal Re	sistance	:S		B2 Res	earch R	esistanc	es	Notes
		BS EN ISO 6946					BS EN ISO 6946		
	Roofs	Walls Windows	Floors	BS 5250:2021 Annex B no change		Roofs	Walls Windows	Floors	BS 5250:2021 Annex B no change
	Surf	ace resistances (m	2.K/W)			Surf	ace resistances (m	2.K/W)	
		Direction of heat fl	ow				Direction of heat fl	ow	
	Upwards	Horizontal	Downwards			Upwards	Horizontal	Downwards	
inside resistance	0.10	0.13	0.17		inside resistance	0.10	0.18	0.17	UCL Solid-wall U-values (1) (1).pdf
outside resistance	0.04	0.04	0.04		outside resistance	0.04	0.06	0.04	UCL Solid-wall U-values (1) (1).pdf
				*These values should be used for the upper and					*These values should be used for the upper and
				lower surfaces of the underfloor space					lower surfaces of the underfloor space
underfloor space*	-	0.13	0.17	according to BS EN ISO 13370:1998	underfloor space*	-	0.13	0.17	according to BS EN ISO 13370:1998
Below Ground Exterior Surface		0			Below Ground Exterior Surface		0		
		BS EN ISO 6946					BS EN ISO 6946		
	Roof	s, walls and expose	d floors			Roof	s, walls and expose	d floors	1
	Airs	pace resistances (n	12.K/W)			Airs	pace resistances (n	n2.K/W)	1
		Direction of heat fl	ow				Direction of heat fl	ow	1
thickness of air space	Upwards	Horizontal	Downwards		thickness of air space	Upwards	Horizontal	Downwards	
0	0	0	0		0	0	0	0	UCL Solid-wall U-values (1) (1).pdf
5	0.10	0.10	0.10	BS 5250:2021 Annex B (were 0.11)	5	0.11	0.11	0.11	UCL Solid-wall U-values (1) (1).pdf
7	0.13	0.13	0.13		7	0.13	0.13	0.13	UCL Solid-wall U-values (1) (1).pdf
10	0.15	0.15	0.15		10	0.15	0.15	0.15	UCL Solid-wall U-values (1) (1).pdf
15	0.16	0.17	0.17		15	0.16	0.17	0.17	UCL Solid-wall U-values (1) (1).pdf
25	0.16	0.18	0.19	BS 5250:2021 Annex B confirms	25	0.16	0.18	0.19	UCL Solid-wall U-values (1) (1).pdf & BS 5250
50	0.16	0.18	0.21		50	0.16	0.18	0.21	UCL Solid-wall U-values (1) (1).pdf
100	0.16	0.18	0.22		100	0.16	0.18	0.22	UCL Solid-wall U-values (1) (1).pdf
300	0.16	0.18	0.23		300	0.16	0.18	0.23	UCL Solid-wall U-values (1) (1).pdf
		BS EN ISO 6946					BS EN ISO 6946		
	Scaling fact	ors for ceiling fixing	gs and wall ties			Scaling fact	ors for ceiling fixing	gs and wall ties	1
	scaling factor (a)	type of mech	anical fastenings			scaling factor (a)	type of mech	anical fastenings	1
	5	roof	fixings	1		5	roof	fixings	
	6	wall ties between	en masonry leaves	1		6	wall ties between	en masonry leaves	
				•			UCL		

### **GRC V1 GBC B2 Regulations v Retrofit Design Standards v WUFI**

Look Up Table LUT1	CHOOSE WHICH COLUMN >	G H I	-	S 7	Z AA	AR AC	AD AF	- 44	40 40	47	BA BB	80		BII	RV	RW	RY RY	CA.	cc	CD CE CF CG							CU	DN	00 1	DP DQ
B2 U Values Etc	Regulations/ Design Standards	Building Regulations Approved Document L	Futu St	re Home tandard 2021	dard Scottish Technical Standard Part 6 2020 Ire					Northern Ireland (2017)			Design Standards				Passivhaus UK (AECB)	2 0	Zero carbon Hub Ener		RIBA 2030 Climate formation Challenge				National Green Building Council standards		STBA Sustainable Traditional Buildin Alliance		nable uilding	
0 STBA 2021 developed by DBC and STBA		UK Region 2 & 4 England & Wales	UI	UK E & W Region 1 Reg					Region 3 Northern Ireland by RRGG users																		added GBC		RRCC Responsible Retrofit Carbon Calculator	
	Winter heat loss	118	T6.1	T6.2.C4		6.263				Near Zero Energy Buildings				PH in UK	Pold	Platinum	Retrofit	CarbonLite Retrofit	EnerPHit	Made up to correspond to the ZCH The Building Hub's Designer's handbook page 8 and other objectives	Small Scale Housing Medium & Large	Витон него						BRAD LIB E & W	Scotaland	Conservative EnerPHit
		Domestic	De	omestic		Domest	ic		Domestic	tic All Domestic Domes			:	Any	Any	Any	Dom. Dom	. Any	Апу	Any Building Use	Militarer limit of ser only resorded here		Domestic Domestic			Don	nestic	Don	Domestic	
		Existing Building	Existing	Existing Exist	4	Enting U Taking U refer Walls   1-0.74() Reed   1-0.214()								Step 2	Step 3	Step 4							rrent 202 chmark Targ		25 2030 gets Target			Existing Building		
			2021 Pi	ublic Consultation		Average- weighted zwerage zwerage	Individus Averag weight elements d zeorag	de lorante	Amerage iomental U value (Uwi)					C/SH level 5															Swidual ements	
See row 3 Red Capital Letters Chosen column and type here > Chose Regulations or Design Standards to help set targets	DN	New thermal elements Threshold Retrofit	New thermal elements	Threshold Upgrade retained thermal elements Improved Upgrade retained	Conversion Conversion	Extension Extension	Extension	Alterations	New Build Retrofit	M	New Build Retrofit	Retrofit			New or Existing			Retrofit	Retrofit	New build, Inferio or Retrofit	New Build		New Build		New Build	New Build	Retrofit	Retrofit	Conversion	Retrofit
Flores	Target il salves Target il	North North North	N/H-3 K Pending	Relied K. Relies Pending Pend	x North North	North North	North North	K No-SK Andd	No. 10 Mar.	N/m2 K No	Notes I Marie	K Nord K	3	N/m2.K	N/h=2.K Ma	N/brd.K Ma	Medic Medic	N/b=2.K No	N/h=2.K No	Node No No No	Noted At Notes	1 K	Oral X Notes	1 K 10	ed K North	N/S=2 K Ma	R/Ind.K Decree	Fes.	Ten.	bel X North X
Companinguista	8 Describ Floor Ground Bearing (SPGR) 28 Describ Floor Gron Vertillated Velot (SPGR)	8.23 8.2 8.21 8.23 8.2 8.21	131	87 83 87 83	121 E31	E31 E38	E.7		131	8.35 8.35		8.21 8.21	3		8.38 8.38				E31	13 E31 E33 E3 14 E31 E31 E3	8.00 8.0 8.00 8.0	1 1	ini set blod s ini set blod s	et blo	set like set set like set			121 121	E31 1	121 E31
No.	28 Party Floor (PE) 28 Party Mol (PM)	Unagulated Unagulated Unagulated Unagulated Unagulated Unagulated	Unagulated Unagulated	Unngulated Unngul Unngulated Unngul	ted Unogulated Unogulated ted Unogulated Unogulated	Unngulated Unngulated Unngulated Unngulated	Unregulated Unregula Unregulated Unregula	ated Unoquiated Un ated Unoquiated Un	nongulated Unongulated nongulated Unongulated	Unagulated Unagulated		Unoquiated Unoquiated	3	8.38 8.3	8.38 8.3				E38	E3 E38 E33 E3 E3 E38 E38 E3		h	ini set Nini s ini set Nini s	ei blo	set likeset set likeset			Unequisted Un Unequisted Un		E21 E21
Berl	28 Internal Auth (IVI) 28.1 Internal and Inscissor Carby 28.2 Determal and Inscissor Carby 28.3 Determal and Inscissor Determined 28.1 Internal and India and Inscissor Determined 28.1 Internal and India and Inscissor Determined Enoth (India) Secure parts of decreenly	8.38 8.3 8.9 8.7 8.91 8.7 8.3 Unongulated Unongulated	F28 F28 F28 F28	82 83 82 83	11 D 11 D 11 D	8.37 8.33 8.37 8.33 8.37 8.33 8.37 8.33 8.37 8.33	E2 E2		LH LH LH	E28 E28 E28		8.25 8.25 8.25 8.25 Unoquiated		8.76 8.76	8.31 8.31 8.31				E31 E31 E31	2.7 2.71 2.31 2.3 2.7 2.71 2.32 2.3 2.7 2.71 2.32 2.3 2.7 2.71 2.32 2.3 2.7 2.71 2.32 2.3	833 83 833 83	1 1	ini set Notes ini set Notes	et blo et blo et blo	set likeset set likeset set likeset			8.01 8.3	D I	13 13 13 13 13 13 13 13 13 13 13
Cellings (may be part of the roof classified)	20 Piel Peel (PR) 24 Pielent (PR) 34 Pielent (PR) Internal Callings (IC)	E38 E38 E38	E31	131 13 131 13	121 E31	E21 E28	E31		E21 E21	8.35 8.35	$\pm$	E38	3	8.78	E31	8.38		838	E31	12 E31 E31 E3	83 83 83 83	1	ini set blok s ini set blok s	ei blei ei blei	set bisi set set bisi set			E38	E31 1	DH DH
Garing	36 Flat Galling (FC) 35 Flather/Vault Celling (FIC) Galling Maximum N of India areal	E3 E3 E3 E3							E21	8.35 8.35		E36		8.78 8.78	E31	8.78 8.78				63 E38 E33 E3 63 E38 E33 E3								136		134 E31
	G Windows (W) GI Glased Pedesidan Cours (GPG) GI Clased Pedesidan Cours (GPG) GI Clased Pedesidan (GPG) US Berlügbin (H) US Bard Mindows (UM)	Mr-VIII Sand	24 24 24 23 23	Unagulated Unagu Unagulated Unagu Unagulated Unagu Unagulated Unagu Unagulated Unagu Unagulated Unagu	ted 16 13 fed 16 13 fed 16 13 fed 16 13 fed 16 13	14 18 14 18 14 18 14 18 14 16	13 13 13 13 13 13 14 13 14 13	31 31 31 31	33 33 33 33 33	34 34 34 38 38		14 14 13 14		8.91 8.91 8.91 8.91 8.91	8.81 8.91 8.71 8.91 8.91				LIS LIS LIS	2 871 871 83 2 871 871 83 2 871 871 83 2 871 871 83 2 871 871 83	3 3 3 3 88 3	h h	ini seri - Mini s	et blo et blo et blo	set histori set histori set histori			Min Will flavol E	11 11 11 11 11	14 ER 14 ER 14 E 22 ER 23 ER
	Conservationy Read Conservationy Visit Conservationy Visit Conservationy Visit Conservationy Visites Conservationy Conservationy Visites Conservation					18 18 18 18 18 18 18 18	3.3 3.3 3.3 3.6																							
Embassiles Carleon  Demonitor  Demonitor  Data demonitor  BF1 Embassiles Carleon (SAPACT complicate test)  BF2 Operating Carleon Embassiles Carleon	s IgCCO plo0 Millionachmark. Targeto Lero than Millionachmark. Targeto Lero than Millionachmark. Targeto Lero than N inten kanafun jarakhiluburi at 1888 Bage 2 N inten kulufun Segulationa																						2000 KIN		-					

- 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



**Green Retrofit Calculator** https://GreenBuidlingCalculator.uk



#### https://GreenBuildingEncyclopaedia.uk

															Hech	J.,, C			9 •	al GGI	ator.uk
Completed by GBC	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	No	No	Yes
To be completed by		Auto-filled	Choose	Chnose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose
GBC user 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	CHOOSE WHICH COLUMN >	G	Н	1	R	S	T	Z	AA	AB	AC	AD	AE	AF	AO	AP	AZ	BA	BB	BQ
				Buildi	_														ō	Su	PAS
2	B2 U Values Etc	Dogulations	Re	egulat	ions	Futu	re Ho	mes		Scott	ish Te	chnica	ıl Star	าdard		Nort	hern	Ireland	Other	State gulatio	2035
2	bz o values etc	Regulations	l p	Approv	/ed	Stan	dard :	2021			Par	t 6 20	20				(201	7)	Other National	State Regulations	
				ocume													,	,	ž	Re	training
L				( Region									_						To be	added	
3	© STBA 2021 developed by GBC and STBA			gland &		UI	(E&	W			Re	egion	1			Region	3 North	ern Ireland	by RRG		
																		0 s			
4		Minton hoot look		118		T6.1	T6.2 C4	5				6.2-6.3						Near Zero Energy Buildings			
*		Winter heat loss		Ξ		1 9	T6.2	T6.2				6.2-						ear Ene uilc			
							·											N B			
5			Γ	Domes	stic	Do	mest	tic			Do	omest	ic			Dom	estic	All	Dom	estic	Domestic
											Exising U value:	Exising U									
6			E	xisting Bui	lding	Existing	Existing	Existing			Walls (>0.7U) Roof: (>0.25U)	(<0.7U) Root:									
											110011 (1-0.230)	(<0.25U)									
7		Existing Domestic				2021 P	ublic Consu	ultation	Average- weighted	Individual	Average- weighted	Average- weighted	Individual	Average- weighted	Individual	Average Elemental					
						202211			average	elements	average	average	elements	average	elements	U value (Um)					
	See row 3 Red Capital Letters		ه م	-		le «	ned	ned	ء	Ē	_	_	_	SI	SI	-			-		
8	Scenarios set column	DO	New thermal elements	Threshold	Retrofit	New thermal elements	Threshold Upgrade retained thermal elements	Improved Upgrade retaine thermal elemen	Conversion	Conversion	Extension	Extension	Extension	Alterations	Alterations	Build	Retrofit	F	New Build	Retrofit	Retrofit
	choice: Regulations, Design Standards or Campaign targets to	ВО	w th	hres	Retr	w th	Three rade mal (	Impr rade mal e	onve	) uc	xter	xter	xter	tera	tera	New	Retr	A	ew	Retr	Retr
	help set project targets						Upg	Upg							1						
9		Target U values Yes/No	W/m2.K No	W/m2.K Avoid	W/m2.K Yes	W/m2.K Pending	W/m2.K Pending	W/m2.K Pending	W/m2.K No	W/m2.K Yes	W/m2.K No	W/m2.K No	W/m2.K Avoid	W/m2.K No	W/m2.K Avoid	W/m2.K No	W/m2.K No	W/m2.K No	W/m2.K No	W/m2.K No	W/m2.K
19 21	Floors		0.00	0.7			0.7		0.05		045	0.40	0.7			0.05		0.45			0.05
24		9 Ground Floor Ground Bearing (GFGB) 10 Ground Floor Over Ventilated Void (GFOV)	0.22	0.7	0.25 0.25	0.18 0.18	0.7	0.25 0.25	0.25 0.25	0.35 0.35	0.15 0.15	0.18 0.18	0.7			0.25 0.25		0.15 0.15			0.25 0.25
29 30	Compartmentation	15 Party Floor (PF)		Unregulated	Unregulated						Unregulated			Unregulated	Unregulated	Unregulated	Unregulated	Unregulated			Unregulated
31 35	Wall	16 Party Wall (PW)		Unregulated	Unregulated						Unregulated			Unregulated	Unregulated		Unregulated	Unregulated			Unregulated
36 37		20 External Walls (EW) 20.1 External wall insulated Cavity	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 0.18			0.25 0.25
38		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
39 43		20.3 External wall Solid wall insulated (Internal) 20.7 Solid Wall	Unanadated	0.7 Unregulated	0.3	0.18	0.7	0.3	0.3	0.7	0.17 0.17	0.22	0.7			0.35		0.18 0.18			0.25 Unregulated
46	Roof	Roofs (includes opaque parts of dormers)	Unregulated	Unregulated		0.18	0.7	0.3	0.3	0.7	0.17	0.22	0.7					0.18			Onregulated
47		22 Flat Roof (FR)	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
49 61	Ceilings (may be part of the roof claculation)	24 Pitched Roof (PR) Internal Ceilings (IC)	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
62	and the same same same same same same same sam	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
63		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
70 71	Glazing	Glazing (Maximum % of total area) 42 Windows (W)			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
72		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
73 80		44 Opaque Pedestrian Doors (OPD) 51 Rooflights (RL)			1.8	1.4	Unregulated	Unregulated	1.6	3.3	1.4	1.6	3.3	1.2	3.5	2.2		1.4			1.1
81		51 Rooflights (RL) 52 Roof Windows (RW)				2.2	Unregulated Unregulated	Unregulated	1.6 1.6	3.3	1.4	1.6	3.3	1.2	3.5 3.5	2.2		1.6 1.6			1.4
97																					
98 99		Conservatory: Roof Conservatory: Wall									1.8	1.8	3.3								
100		Conservatory: Floor									1.8	1.8	3.3								
101 188		Conservatory: Windows Doors Rooflights									1.8	1.8	1.8	J							
189 190	Embodied Carbon Domestic	x kgCO2e/m2 M4i benchmark. Targets: Less than	7																		
190	Domestic	M4I Denchmark. Targets: Less than	_																		



https://GreenBuildingEncyclopaedia.uk





https://GreenBuildingCalculator.uk

	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	Choose	?	?	Choose	Choose	Choose	Choose	Choose	Choose	Choose		
Show	Show BU	BV	BW	BX	BY	CA	CC	CD	CE	Show	Show	Show	Show	Show	Show	Show	Show	Hide	Show	Show DN	Show	Show DP	Show DQ	DR	DS	Show	Show DU	Hide DV
Design Standards			AECB			Passivhaus UK (AECB)	Passivhaus Institute (D)			rbon I U valı		En Transfe	London ergy ormation iative		2030 Challe		ate	Gre Buil Cou	ional een Iding uncil dards	WUFI or Delphin Calculated safe values	Interreg Energy Pathfinder			BA Sus litiona Allia	l Build		Archive	
														_				I .	added C users	To be added by GBC users		Options	Appraisa	l Tool				
	PH in UK	Plob	Platinum	Retrofit	standard	CarbonLite Retrofit	EnerPHit	Buildin	ng Hub's De	spond to th esigner's ha other object	andbook	Small Scale Housing	Medium & Large Scale Housing							WUFI or Delphin	Existing Building Assumed U values	Denmark Regulations for Farmes	BR AD L1B E & W	Tech Stds Scotaland	Traditional Conservation	EnerPHit		
	Any	Any	Any	Dom.	Dom.	Any	Any	A	Any Bui	ilding Us	se		limit of ranges orded here		Dome	stic		Dom	nestic		Any		D	omest	ic	Any		
	Step 2	Step 3	Step 4											Current Benchmark	2020 Targets	2025 Targets	2030 Targets			Existing Building		Existing Building	Existing Building					
	CfSH level 5	CfSH level 6																						Individual elements				
		New or Existing				Retrofit	Retrofit		New build,	hybrid or Retrofit		New Build	New Build	New Build	New Build	New Build	New Build	New Build	Retrofit	Retrofit	Existing and Previous interventions	Retrofit	Retrofit	Conversion	Retrofit	Retrofit		
	No	W/m2.K No	W/m2.K No	W/m2.K	W/m2.K	W/m2.K No	W/m2.K No	W/m2.K No	No	W/m2.K No	No	No	No	W/m2.K Avoid	W/m2.K Avoid	W/m2.K Avoid	W/m2.K No	No	W/m2.K Choose	W/m2.K Yes	W/m2.K Yes Assumed	W/m2.K Yes None or DR	W/m2.K Yes	W/m2.K Yes (AA)	W/m2.K Yes	Yes		
	0.15 0.15	0.15					0.15 0.15	0.2	0.15 0.15	0.12	0.1	0.08	0.08	Not set Not set	Not set Not set	Not set Not set	Not set Not set				2.48 2.48		0.25 0.25	0.18 0.18	0.15 0.15	0.15 0.15		
	0.15	0.15					0.15 0.15	0.2	0.15 0.15	0.12 0.12	0.1			Not set Not set	Not set Not set	Not set Not set	Not set Not set				Not defined Not defined		Unregulated Unregulated	Unregulated Unregulated	0.25	0.15 0.15		
	0.15 0.15 0.15 0.15	0.15 0.15 0.15 0.15					0.15 0.15 0.15 0.35 0.15	0.2 0.2 0.2 0.2 0.2	0.15 0.15 0.15 0.15	0.12		0.13 0.13 0.13 0.13	0.13 0.13 0.13 0.13	Not set Not set Not set Not set Not set Not set	Not set Not set Not set Not set	Not set Not set Not set Not set	Not set Not set Not set				1.48 Not defined 1.48 1.48		0.3 0.55 0.3 0.3	0.3 0.7 0.3 0.3	0.45 0.55 0.45 0.45	0.15 0.15 0.15 0.35 0.15		
	0.15 0.15 0.15	0.15 0.15 0.15	0.15			0.15	0.15 0.15	0.2	0.15 0.15 0.15	0.12 0.12 0.12		0.1	0.1	Not set Not set	Not set Not set		Not set				0.21		0.18 0.18	0.18	0.13	0.15 0.15		
	0.15	0.15	0.15			0.1	0.15	0.2	0.15	0.12	0.1	0.1	0.1	Not set	Not set	Not set	Not set				Not defined Not defined		0.16	0.35	0.16	0.15		
	0.15	0.15	0.15		I	0.1	0.15	0.2	0.15	0.12	0.1	0.1	0.1	Not set Not set	Not set Not set	Not set Not set	Not set Not set	<u> </u>	<u> </u>	I	Not defined		0.16 Min WER Band C	1.6	0.16	0.15		
	0.95 0.75 0.95 0.95	0.95 0.75 0.95 0.95					0.85 0.85 0.85	1 1 1	0.75 0.75 0.75 0.75		0.5	1 0.8 0.8	1 1 1	Not set Not set Not set Not set	Not set Not set Not set Not set	Not set	Not set Not set Not set				3 Not defined		1.8	1.6 1.6 3.3 3.3	1.4 1.4 2.2	0.85 0 0.85 0.85		
														1000														

# GRC V1 GBC B2 Insulation: Materials Formats Densities: 17 of >150 Chosen U value targets = Thicknesses

	Insulation Material k to U value			Group	Mainly mir	neral based				Mainly Fos	sil Oil-	Mainly Pla	nt based						Mixed		
	DN			Form								Fibre							Minera	i-plant	
		Addresses winter insulation; summe addressed below Material's average Project target U	Insulation Calculations: neating season thermal overheating insulation (See Row 106 below). Je k values (Row 13) I values (column D) in needed (Rows 15 - 60)	Format	Quilts batts slabs	Quilts batts slabs	Quilts batts slabs	Boards	Quilts laminated to boards, foil wrapped	Sprayed Expanding Foam	Boards, Foam	Ridid Board	Soft Betts	Quilt	Flake	Önil	Ouit	ăn'ă	Insitu	Spray	Plaster Render Screed
		NB: Column E Ignores k value of all other components in the element buildup	NB: Column F Takes account of existing and intervention other components and intervention insulation	Material	Glass Mineral Wool (10- 80)	Recycled (40-60%) Galss fibre:	Stone Mineral Wool (33-	Calcium Silicate	Aerogel	Expanding Spray Polyurethane Foam	Polyisocyanurate	Wood Fibre Board Rigid (Wet Formed)	Wood fibre Batt	Wood fibre wool	Cellulose Fibre Flake (Recycled Newspaper)	Hemp Fiber	Hemp Fiber with polyester supporting fiber	Lamb's/Sheep's wool (14- 90)	Hemp-lime (Hempcrete)	Hemp-lime	Cork-lime-Diathomacous earth
	Choose between: whole target U value being acheved with: insulation only (unrealistic) existing and intervention other conponents and insulation	Yes	No	Initials	MWD	RGF	SMW	SS	¥	ESPURF	PIR	WFRB	WFBa	WFW	CFF	生	HFP	USWQ	HLI	HLS	CLDE
		kg/m3	kg/m3	Density	10to80		33to 160						255		35		30	14-90	350		
	Used in Project	Yes or No V	Yes or No V	Yes/No >	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
	k values	Worst	Worst	W/m.K	0.045	0.046	0.045	0.059	0.019	0.027	0.035	0.055	0.058	0.038	0.040	0.040	0.040	0.042	0.070	0.070	0.045
	k values	Best	Best	W/m.K	0.031	0.032	0.031	0.059	0.013	0.025	0.025	0.038	0.058	0.036	0.030	0.038	0.040	0.039	0.070	0.070	0.045
	k values	Average	Average	W/m.K	0.038	0.039	0.038	0.059	0.016	0.026	0.030	0.047	0.058	0.037	0.035	0.039	0.040	0.041	0.070	0.070	0.045
	°	Target U values	U values	W/m2.K	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
	Elements	(insulation only)	(including other components)																		
Floors	9 Ground Floor Ground Bearing (GFGB)	0.25		W/m2.K	152	156	152	236	64	104	120	186	232	148	140	156	160	162	280	280	180
	10 Ground Floor Over Ventilated Void (GFOV)	0.25		W/m2.K		156	152	236	64	104	120	186	232	148	140	156	160	162	280	280	180
mpatmentation																					
	15 Party Floor (PF)	Unregulated		W/m2.K																	
	16 Party Wall (PW)	Unregulated		W/m2.K																	$\leftarrow$
Walls	20 External Walls (EW)	0.30		W/m2.K	127	130	127	197	53	87	100	155	193	123	117	130	133	135	233	233	150
	Roofs (includes opaque parts of dormers)	0.30		W/mz.K	127	130	127	197	55	01	100	100	193	123	117	130	100	135	233	200	150
	22 Flat Roof (FR)	0.18		W/m2.K	211	217	211	328	89	144	167	258	322	206	194	217	222	225	389	389	250
	24 Pitched Roof (PR)	0.18		W/m2.K	211	217	211	328	89	144	167	258	322	206	194	217	222	225	389	389	250
Internal Ceiling																					
	34 Flat Ceiling (FC)	0.16		W/m2.K	238	244	238	369	100	163	188	291	363	231	219	244	250	253	438	438	281
	35 Pitched Vault Ceiling (PVC)	0.16		W/m2.K	238	244	238	369	100	163	188	291	363	231	219	244	250	253	438	438	281
	Glazing (Maximum % of total area) 42 Windows (W)	1.60		% W/m2.K	24	24	24	27	10	16	10	20	26	22	22	24	26	26	44	44	20
	42 VIIIUWS (IV)	0.00		W/m2.K W/m2.K	24	24	24	37	10	16	19	29	36	23	22	24	25	25	44	44	28

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

Yes/No	New Build or Refurbishment Actions	Component	Component	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 Fall
Yes		Suspended Ground Floor (SGF) Existing with previous intervention	Choose from Drop Down List	kg/m3	W/m.K	mm	m	m2.K/W	mm	mm	%	m2.K/W	W/m2.K	W/m2.K	W/m2.K	Auto
Yes		Resistance of Inside Surface (Rsi)						0.17				0.170				
No	Proposed	Internal decoration	Lacquer	1000	1	0.25	0.00025	0.000	1	1	100%	0.000				
No	Proposed	Internal finish	Hardwood flooring	700	0.180	25	0.025	0.139	1	1	100%	0.000				
No	Proposed	Internal lining/levelling	Gypsum fibreboard	1000	0.360	48	0.048	0.133	1	1	100%	0.000				
No	Proposed	Thermal Insulation	Mineral Wool, rock	24	0.038	100	0.1	2.632	1	1	100%	0.000				
Yes	Previous	Structure zone Thermal insulation	Mineral wool, rock	24	0.038	100	0.1	2.632	550	600	92%	2.412				
Yes	Existing	Floor boarding	Softwood	500	1	25	0.025	0.025	1	1	100%	0.025				
Yes	Existing	Structure Floor joists	Softwood	500	1	100	0.1	0.100	50	600	8%	0.008				
Yes	Existing	Resistance of Outside Surface (Rso)	Surface Resistivity					0.170	1	1	100%	0.170				
Yes	Existing	Ventilated air space	Air					0.230	1	1	100%	0.230				
Yes	Existing	Resistance of Outside Surface (Rso)	Surface Resistivity					0.170	1	1	100%	0.170				
Yes	Existing	Oversite	sand		2.000	50	0.05	0.025	1	1	100%	0.025				
Yes	Existing	Undisturbed sub soil	Clay		1.500	1000	1	0.667	1	1	100%	0.667				
Yes		Resistance of Outside Surface (Rso)			Proposed	1448.25		0.17				0.170				
					Previous	1448.25	1.45					4.047	0.247	0.25	-0.003	Pass
						Overall thickness mm	Overall thickness m					Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, PassU or Fail

# GBC 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.						-	-				
									Resistance		
Common Building Materials	Density p	Thermal Conductivity A	Thermal Conductivity & maximum	Thermal Conductivity & minimum	Thermal Conductivity & average	Thickness	Thickness	Resistivity	of sub assembly Ru	U value	Vapour resistivity
	Density p (average or actual)	Thermal Conductivity A k-value	Thermal Conductivity λ			-	-	Resistivity		U value	Vapour resistivity
Wood fibre/Sheep's wool/Fired clay/straw board/etc.	kg/m³	W/m.K	W/m.K	W/m.K	W/m.K	mm	m	m2.K/W		W/m2.K	MNs/gm
	kg/m³	W/m.K	W/m.K	W/m.K	W/m.K	-	-	m2.K/W	m2.K/W	W/m2.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	0.160				12.5	0.0125	0.078		12.800	-
Gypsum fibre reinforced board  Brickwork (outer leaf)	1700	0.360	-			12.5	0.0125	0.035		28.800 7.549	130
Brickwork (inner leaf)	1700	0.560				102	0.102	0.182		5.490	50
Concrete block (medium density)	1400	0.570				100	0.1	0.175		5,700	-
Concrete block (low density) Concrete (medium density) (inner leaf)	600 1800	0.180 1.130				100	0.1	0.556		1.800	-
Concrete (medium density) (inner lear)  Concrete (medium density) (inner leaf)	2000	1.330				100	0.1	0.088		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 1750	2.500 0.880				300	0.3	0.120		8.333 8.800	
Mortar (protected) (inner leaf) Mortar (exposed) (outer leaf)	1750	0.880				100	0.1	0.114		9,400	
Gypsum lightweight	600	0.940				13	0.013	0.106		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 Plasterboard foil faced	900 900	0.250				12.5 12.5	0.0125	0.050		20.000	-
Tiles ceramic	2300	1.300				5	0.0125	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 1000	0.130				18 18	0.018	0.138		7.222 13.333	450 450
Softwood plywood softwood chipboard	500	0.240				18	0.018	0.075		7.222	450
softwood chipboard	1000	0.130				18	0.018	0.136		13.333	
Steel	7800	50.000				5	0.006	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 2300	0.180				12	0.012	0.067		15.000	
Reinforced concrete (1% steel) Reinforced concrete (2% steel)	2300	2.300 2.500				300 300	0.3	0.130	_	7.667 8.333	
Aerated concrete (2% steet)	500	0.160				150	0.15	0.120		1.067	
Asphalt Concrete State	2100	0.700				20	0.02	0.029		35.000	
Felt/bitumen 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 Cast concrete	500 2000	0.100 1.350				50 300	0.05	0.500		2.000 4.500	-
Reinforced concrete (1% steel)	2300	2.300				300	0.3	0.130		7.667	
Reinforced concrete (1% steel)	2400	2.500				300	0.3	0.130		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 B6 Elemental Assembly > 2** v GF Existing & Proposed Interventions Element: Roof, 2<sup>ndry</sup> Element: Window

Yes/No	New Build or Refur bishment Actions	Component	Component	Density	Conductivity	Thickness	Thermal	size: width or thickness	Spacing or cavity (void) raction of area or section	Thermal Registances	Calculated Total U value	Target Elemental U value	Difference	Pass, PassU or Fail	Yes/No	New Build or Refurbishment Actions	Component	Manufacturer Product Reference	Make of Make o
No		Flat Roof (FR) Existing with previous intervention	Choose from Drop Down Lis			mm m				m2.K/W			Wm2.K	Auto	No		Flat Roof (FR) Proposed interventions	text text	t Choose from Drop Down List kg/m3 W/m.K mm m m2.KW mm mm % m2.KW W/m2.K W/m2.K W/m2.K
Yes		Resistance of Outside Surface (Rso)					0.10			0.100					Yes		Resistance of Inside Surface (Rsi)		0.10 0.100
No	Existing	Solar protection	Aggregate	s 2000	1.3	50 0.000	0.000	1	1 100%	0.000					No	Existing	Solar protection	0 0	Aggregates 2000 1.3 50 0 0.000 1 1 100% 0.000
Yes	Existing	Waterproofing	Loa	d 11340	35	1.8 0.001	18 0.000	1	1 100%	0.000					Yes	Existing	Waterproofing	0 0	Lead 11340 35 1.8 0.0018 0.000 1 1 100% 0.000
No	Existing	Warm Deck Thermal Insulation	Mineral wool, roc	k 24 0.	.037	100 0.000	0.000	1	1 100%	0.000					No	Existing	Warm Deck Thermal Insulation	0 0	Mineral wool, rock 24 0.037 100 0 0.000 1 1 1 100% 0.000
Yes	Existing	Deck	FSC WBP Plywoo	d 500 0.	.130	20 0.020	00 0.154	1	1 100%	0.154					Yes	Existing	Deck	0 0	FSC WBP Plywood 500 0.13 20 0.02 0.154 1 1 100% 0.154
Yes	Existing	Structure	Softwoo	d 500 0.	.130	200 0.200	00 1.538	50	600 8%	0.128					Yes	Existing	Structure	0 0	Softwood 500 0.13 200 0.2 1.538 50 600 8% 0.128
No	Previous	Structure zone Thermal insulation	Phenolic foam, foil face	d 24 0.	.038	200 0.000	0.000	550	600 92%	0.000					No	Proposed	Structure zone Thermal insulation	0 0	Wood fibre 255 0.058 280 0 0.000 550 600 92% 0.000
No	Proposed	Structural zone Ceiling Joist	Softwoo	d 500 0	0.13	280 0.000	0.000	50	600 8%	0.000					No	Proposed	Structural zone Ceiling Joist	0 0	Softwood 500 0.13 280 0 0.000 550 600 8% 0.000
No	Proposed	Celling structure zone insulation	Phenolic Foan	m 30 0.	.018	0 0.000	0.000	550	600 92%	0.000					Yes	Proposed	Ceiling structure zone insulation	0 0	
No	Proposed	Structure soffit lining	FSC WBP Plywoo	d 500 0.	.130	19 0.000	0.000	1	1 100%	0.000					No	Proposed	Structure soffit lining	0 0	FSC WBP Plywood 500 0.13 19 0 0.000 1 1 100% 0.000
Yes	Existing	Internal lining	Plasterboan	rd 900 C	0.25	12.5 0.012	25 0.050	1	1 100%	0.050					Yes	Existing	Internal lining	0 0	Plasterboard 900 0.25 12.5 0.0125 0.050 1 1 1 10016 0.050
Yes	Existing	internal finish	Plaster Skin	m 600 0	0.18	3 0.003	30 0.017	1	1 100%	0.017					Yes	Existing	internal finish	0 0	Plaster Skim 600 0.18 3 0.003 0.017 1 1 100% 0.017
Yes	Existing	Internal decoration	Pain	nt 1400	0.7	0.2 0.000	0.000	1	1 100%	0.000					Yes	Existing	Internal decoration	0 0	Paint 1400 0.7 0.2 0.0002 0.000 1 1 100% 0.000
Yes		Resistance of Inside Surface (Rsi)		. Pro	posed 8	886.5	0.04			0.040					Yes		Resistance of Outside Surface (Rso)		Potential 1246.5 0.04 0.040
				. Pr	evious 2	237.5 0.22				0.489	2.045	#N/A	#N/A	#N/A					Actual 517.5 0.502 4.914 0.203 MN/A MN/A
					thi	Overall Overalickness thickness	ess			Total elemental	Total elemental	Target elemental U	Difference	Pass, PassU or F	all				Overall Overall Total Total Target demental elemental elemental U Difference
						mm m				R value	U value	value							mm m R value U value value
Yea/No	New Build or Refur bishment Actions	Component	Component	Density	Conductivity	Thidmess	Thermal Resistance	size: width or ickness (solid)	Spacing or cavity (void) raction of area or section	Thermal Resistances	alculated Total U value	Target Elemental U value	Difference	ters, Passid or Fail	Yes/No	New Build or Refur bishment Actions	Component	Manufacturer Product Reference	Demonstration of the control of the
Yes		Windows (W) Existing with previous intervention	Choose from Drop Down Lis	st kg/m3 W	Vm.K	mm m	m2.K/W	v mm	mm %	m2.K/W	W/m2.K	W/m2.K	W/m2.K	Auto	Yes		Windows (W) Proposed interventions	text text	t Choose from Drop Down List kg/m3 W/m.K mm m m2.KW mm mm % m2.KW W/m2.K W/m2.K W/m2.K
No	Evisting	Single glazed	Softwoo	-1			_	_				5.50			No	Remove	Single glazed		Softwood 5.5
Yes	Previous	Double Glazed	PVI	_								1.60			No	Previous	Double Glazed	-	PVC 1.6
No	Proposed	Double Glazed	Softwoo	-								1.60			No	Upgarde or New	. Upgrade to double glazing		Softwood 1.60
Yes							0.06	_			1					replacement	·	_	
	01	Resistance of Outside Surface (Rso)  Outer casement/face: Outer finish		1400		0.25 0.0000			4 4000	0.000	-				Yes		Outer casement/face: Outer finish	0 0	0.06 0.060 Lacquer 1400 1 0.25 0.0003 0.0003 1 1 1 100% 0.0003
No Yes	Choose	Outer casement/face: Outer finish  Outer casement material or core framing	Lacque Mild stee		_	0.25 0.0000				0.0000					Yos	Proposed Remove	Outer casement/face: Outer finish  Outer casement material or core framing	0 0	
Yes	Previous	Outer Casement/Sash/Frame	PVC (General		-	75 0.0750	_			_					No.	Premier	Outer Casement/Sash/Frame	0 0	Softwood 500 0.13 75 0.075 0.5769 75 1000 8% 0.0433
No	Choose	Outer Casement/Sastvirrame	PVC (General	1		0.25 0.0000				0.0433					188 V	Proposed	Outer Casement/Sast/Prame	0 0	
No No	Choose	Glazed Unit: Glass/Gas/Spacer	TGSI		_	0.25 0.0000				0.0000	1				No.	Choose	Glazed Unit; Glass/Gas/Spacer	0 0	
Yes	Prenious	Glazing	Glas			4 0.0040	_								Yes	Previous	Glazing	0 0	
Yes	Previous	Cavity	Argon Ga			12 0.0120	_			0.4000					Yes	Previous	Cavity	0 0	
Yes	Previous	Glazing	Glas			4 0.0040				0.0038					Yes	Previous	Glazing	0 0	
No	Choose	Cavity	Argon Ga			12 0.0000				0.0000					No	Choose	Cavity	0 0	
No	Choose	Glazing	Glas		.050	4 0.0000				0.0000					No	Choose	Glazing	0 0	
Yes		Resistance of Inside Surface (Rsi)				147	0.18			0,180				Check	Yes		Resistance of Outside Surface (Rso)		Potential 112 0.18 0.180
	_									0.691	1.448	1.60	-0.152	Pass				_	0.691 1.448 1.60 -0.152
										Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, PassU or F	ail				Overall   Total Target   Total   Total   Target   Total   Target   Total   Target
												.,,,,,							111000 01000

### **GRC V1 GBC B2 Elemental Assembly** > 4 Bill of Materials Quantities Costs

Yes/No	Exiting Previous Proposed	Component	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					id Floor (GBSF) APMOC	m2	£/m2	£	£/m2	£	£/m2	£	£/m2	£	£/m2	£
Yes						0.00										
No	Proposed	Internal Floor Decoration	0	0	Lacquer	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Proposed	Internal Floor Finish	0	0	Hardwood flooring	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Proposed	Internal Decking	0	0	Gypsum fibreboard	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Proposed	Internal Thermal Insulation	0	0	Wood fibre	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Previous	Internal Floor Decoration	0	0	Lacquer	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Previous	Internal Floor Finish	0	0	Softwood	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Previous	Internal Decking	0	0	Chipboard	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Previous	Internal Thermal insulation	0	0	Mineral wool, rock	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Previous	Internal Vapour control layer	0	0	PE foil Polyethylene	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Existing	Floor wearing surface	0	0	Ceramic Tile	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Existing	Levelling/Bedding	0	0	Screed	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Existing	Solid Ground Floor	0	0	Softwood	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
No	Existing	Undisturbed Subsoil	0	0	Undisturbed Soil	0.00	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0	£0.00	£0
Yes																
						£0.00	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
						Elemental Cost/m2	Elemental Labour Rate/m2	Elemental Labour Cost	Elemental Accessories rate/m2	Elemental Accessories Cost	Elemental Material Rate/m2	Elemental Material Costs	Elemental Preliminaries , Overheads, Profits Rate	Elemental Preliminaries Overheads, Profits Cost/m2	Total Elemental Intervention: Materials Acces sories & 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 AccessoriesC ost	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	Length Width Height	Component	Quantity	Areas	Volume	Primary or all Functions	Primary or all Components	Primary or all Materials	Information Source	Embodied	Embodied Energy	Embodied	Area or section m2	Embodied Carbon	Embodied Carbon Dioxide	Embodied Carbon Dioxide	Embodoed Carbon Dioxide	Density	Weight Embodied	Embodied Carbon Dioxide	Required in building works	Embodied Energy (Intervention)	Embodied Carbon (Intervention)	Is the material Bio-based or contain Biogenic carbon?	Sequestered Carbon (Intervention)	Total Carbon (Intervention)
No	Ground Bearing Solid Floor (GBSF) EE EC SC	m m m	m	No.	m2	m3					Mj/m3	MJ/m2	MJ/Item	m2 m2	kg C/kg	kg CO2/kg	kg CO2/m2	kg CO2/Item	kg/m3	kg/m2 MJ/m	3 kg CO2/m	13 Yes/No	MJ	kg CO2	Yes/No	kg CO2	Kg CO2
					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		0.000	03 1	0.00	0	Choose	Choose	Wood stain / varnish	ICE 1	50	0	0	0 m2	0	0	0	0	0	0 0	0	No	0.000	0.000	No	0	0
No	Hardwood flooring		0.025	50 1	0.00	0	Choose	Choose	Hardboard (maximum)	ICE 2	16	0	0	0 m2	0	1.05	0	0	1000	0 1600	0 1050	No	0.000	0.000	Yes	0	0
No	Gypsum fibreboard		0.048	80 1	0.00	0	Choose	Choose	Plasterboard	ICE 1 & 2	6.75	0	0	0 m2	0	0.38	0	0	800	0 5400	304	No	0.000	0.000	0.16	0	0
No	Wood fibre		0.100	00 1	0.00	0	Choose	Choose	Hardboard (minimum)	ICE 2	16	0	0	0 m2	0	1.05	0	0	600	0 9600	630	No	0.000	0.000	Yes	0	0
No	Lacquer		0.000	03 1	0.00	0	Choose	Choose	Wood stain / varnish	ICE 1	50	0	0	0 m2	0	0	0	0	0	0 0	0	No	0.000	0.000	No	0	0
No	Softwood		0.025	50 1	0.00	0	Choose	Choose	Sawn Softwood	ICE 2 (2011) via HE	0	0	0	0 m2	0	0	0	0	500	0 0	0	No	0.000	0.000	Yes	0	0
No	Chipboard		0.012	25 1	0.00	0	Choose	Choose	Plasterboard	ICE 1 & 2	6.75	0	0	0 m2	0	0.38	0	0	800	0 5400	304	No	0.000	0.000	0.16	0	0
No	Mineral wool, rock		0.000	01 1	0.00	0	Choose	Choose	Rockwool (slab)	ICE 1 & 2	16.8	0	0	0 m2	0	1.05	0	0	24	0 403.	2 25.2	No	0.000	0.000	No	0	0
No	PE foil Polyethylene		0.100	00 1	0.00	0	Choose	Choose	HDPE High Density Polyethylene	E-CT	84.4	0	0	0 m2	2	0	0	0	1400	0 11816	0 0	No	0.000	0.000	No	0	0
No	Ceramic Tile																										
No	Screed		0.040	00 1	0.00	0	Choose	Choose	Mortar (cement:sand mix)	ICE 2 (2011) via HE	0	0	0	0 m2	0	0	0	0	1900	0 0	0	No	0.000	0.000	No	0	0
No	Softwood		0.100	00 1	0.00	0	Choose	Choose	Sawn Softwood	ICE 2 (2011) via HE	0	0	0	0 m2	0	0	0	0	500	0 0	0	No	0.000	0.000	Yes	0	0
No	Undisturbed Soil		0.300	00 1	0.00	0	Choose	Choose	Soil	ICE 2 (2011) via HE	0	0	0	0 m2	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)	(Interport
Yes/No	Component	Length Width Height	Component	Quantity	Areas	Volume	Primary or all Functions	Primary or all Components	Primary or all Materials	Information Source	Embodied	Embodied	Embodied	Area or section m2	Embodied Carbon	Embodied Carbon Dioxide	Embodied Carbon Dioxide	Embodoed Carbon Dioxide	Density	Weight	Embodied Carbon Dioxide	Required in building works	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**

Eı	nbodie	EEC SC Datasets d Energy & Embodied & equestered 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	CANVS Title	Material	Information Source	Emboded Energy	Emboded Energy	Embodied Emergy	Area or section	mz Emboded Carbon	Emboded Carbon Dioxide	Emboded Carbon Disside	Embodoad Carbon Dioxida	Density	specific spe	Emboded Enegy	Emboded Carbon Dioxide	Volume Raqued in Building	Emboded Energy in Building	Emboded Carbon in Bubbing	t biobasad? Does it contain Bioganic Carbon?	Sequestored carbon is Building	Total Carbon in Building
					Mj/m3	MI/m2	MI/ltem	m2	n2 ke C	/kg kg CO2/kg	ke CO2/m2	ke CO2/Item	kg/m3	kg/m2	MI/m3	kg CO2/m3	m3	MJ	kg CO2	± Yes/No	kg 002	Kg CO2
Materials	F10	Brick/block walling	Aerated block	ICE 1 & 2	3.5					0.3			750		2,625.00	225.00	1.00	2625	225.00	No	0.00	225.00
Materials Materials	F10 E10	Brick/block walling Concrete	Agregate Aggregate	ICE 1 & 2	3.5 0.083					0.3			750 2240		2,625.00 185.92	225.00 10.75	1.00	2625 185.92	225.00 10.75	No No	0.00	225.00 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					0.006			2240		224.00	11.20	1.00	224	11.20	No	0.00	11.20
Materials Materials	D20 D20	Excavation & Filing Excavation & Filing	Aggregate Quarried Aggregate Recycled	ICE 2 (2011) via HE ICE 2 (2011) via HE									2000 2000				1.00	0	0.00	No No	0.00	0.00
Materials	E10	Concrete	Aggregates	E-CT	0.1				0.00	16			2240		224.00	0.00	1.00	224	0.00	No	0.00	0.00
Materials	Z11	Metals	Aluminium (general & incl 33% recycled)	ICE 1 & 2	155					8.24			2700		418,500.00	22,248.00	1.00	418500	22,248.00	No	0.00	22248.00
Materials	Z11	Motals	Aluminium (general & incl 33% recycled) Aluminium (recycled)	ICE 1 & 2 E-CT	155 27				4.0	8.24			2700 2700		418,500.00 72,900.00	22,248.00	1.00	418500 72900	22,248.00 0.00	No No	0.00	22248.00
Materials	H11	Metals	Aluminium (vicycled) Aluminium (virgin)	E-CT	154.3				1.6	6			2700		416.610.00	0.00	1.00	416610	0.00	No	0.00	0.00
Component	L10	Windows	Aluminium / timber frame double casement 1200 x 1200 2x glazed, air or argon filled					1.44	n2			75			2,102.40	108.00	1.00	2102.4	108.00	%	0.00	108.00
Components	L10	Windows	Aluminium / timber frame double casement 1200 x 1200 2x glazed, krypton filled	ICE 2			1970		m2			101 304			2,836.80	145.44	1.00	2836.8	145.44	%	0.00	145.44
Components	L10 L10	Windows Windows	Aluminium / timber frame double casement 1200 x 1200 2x glazed, xeon filled Aluminium clad timber frame 1200 x 1200 2x glazed, air or argon filled	ICE 2			5960 950		n2 n2			304 48			8,582.40 1,368.00	437.76 69.12	1.00	8582.4 1368	437.76 69.12	%	0.00	437.76 69.12
Components	L10	Windows	Aluminium clad timber frame 1200 x 1200 2x glazed, krypton filled	ICE 2			1460		n2			74			2,102.40	106.56	1.00	2102.4	106.56	%	0.00	106.56
Components		Windows	Aluminium clad timber frame 1200 x 1200 2x glazed, xeon filled	ICE 2			5450		m2			277			7,848.00	398.88	1.00	7848	398.88	56	0.00	398.88
Components	L10	Windows	Aluminium clad timber, 2x glazed, argon filed, window	ICE 1			1200	1	n2			61			1,200.00	61.00 61.00	1.00	1200 1200	61.00 61.00	%	0.00	61.00
Components	L10	Windows	Aluminium clad timber, 2x glazed, argon filed, window Aluminium frame 1200 x 1200 2x glazed, air or argon filed	ICE 1 & 2			5470	1.44	m2.			279			7,876.80	401.76	1.00	7876.8	401.76	No.	0.00	61.00 401.76
Components	L10	Windows	Aluminium frame 1200 x 1200 2x glazed, krypton filled	ICE 2			5980	1.44	m2			305			8,611.20	439.20	1.00	8611.2	439.20	No	0.00	439.20
Components	L10	Windows	Aluminium frame 1200 x 1200 2x glazed, xeon filled	ICE 2			9970	1.44	n2			508			14,356.80	731.52	1.00	14356.8	731.52	No	0.00	731.52
Materials Materials	Z11 Q22	Metals Asphalt Paving	Aluminium: general Asphalt	ICE 2 (2011) via HE ICE 2 (2011) via HE									2700 1700		0.00	0.00	1.00	0	0.00	No No	0.00	0.00
Materials	Q22	Asphalt Paving	Asphalt paving	ICE 1	2.41					0.14			2100		5,061.00	294.00	1.00	5061	294.00	No	0.00	294.00
Materials	Q22	Asphalt Paving	Asphalt paving	ICE 1	2.41					0.14			2100		5,061.00	294.00	1.00	5061	294.00	No	0.00	294.00
Materials	Q22	Asphalt Paving	Bitumen	ICE 2 (2011) via HE	47								1000				1.00	0	0.00	No No	0.00	0.00
Materials	J41	Built up felt roofing	Bitumen (general) max.	ICE 2	51					0.43					0.00	0.00	1.00	0	0.00	No	0.00	0.00
Materials	J41	Built up felt roofing	Bitumen (general) min.	ICE 2	51					0.38					0.00	0.00	1.00	0	0.00	No	0.00	0.00
Materials Materials	F30 F10	Brick/block walling	Bituminous Damp Proof Course Brick Standard	E-CT	134				4.2	2			1850		247,900.00	0.00	1.00	247900	0.00	No No	0.00	0.00
Materials	F10	Brick/block walling Brick/block walling	Brick Standard Bricks	ICE 2 (2011) via HE E-CT	-				0.2	2			2.30 1700	tonnes / 1000 bricks	5,100.00	0.00	1.00	5100	0.00	No No	0.00	0.00
Materials	F10	Brick/block walling	Bricks (common)	ICE 2	3				0.2	0.24			1700		5,100.00	408.00	1.00	5100	408.00	No	0.00	408.00
Materials	F10	Brick/block walling	Bricks (common)	ICE 2	3					0.24			1700		5,100.00	408.00	1.00	5100	408.00	No	0.00	408.00
Materials	F10	Brick/block walling Brick/block walling	Bricks (common)	ICE 1	3					1.46			1700 1700		13,940.00	2,482.00	1.00	5100 13940	374.00 2,482.00	No No	0.00	374.00
Materials	F10	Brick block waiting	Bricks (facing)	ICE 1	8.2					1.46			1700		13,940.00	2,482.00	1.00	13940	2,482.00	No No	0.00	2482.00 2482.00
Materials	M50		Carpet Nylon												#WALUE!	#WALUE!	1.00	#WALUE!	#VALUE!	No	0.00	WVALUE
Materials	M50	Flexible floor coverings	Carpet tiles, nylon (Polyamide), pile weight 770g/m2	ICE 2		279					13.7			4.6	1,283.40	63.02	1.00	1283.4	63.02	No	0.00	63.02
Materials	P10	Proofing: Insulation	Collular glass insulation	ICE 1 & 2	0.94								42		40,42	0.00	1.00	40.42	0.00	No Yes	0.00	0.00
Materials	P10	Proofing: Insulation Proofing: Insulation	Cellulose insulation (loose fill)	ICE 1 & 2	3.3								43 43		141.90	0.00	1.00	141.9	0.00	Yes	0.00	0.00
Materials	Z21	Mortar	Cement mortar (1:3)	ICE 2	1.33					0.208					0.00	0.00	1.00		0.00	No	0.00	0.00

### GBE :::

https://GreenBuildingEncyclopaedia uk RC V1 GBC B6 https://GreenBuildingCalculator.uk



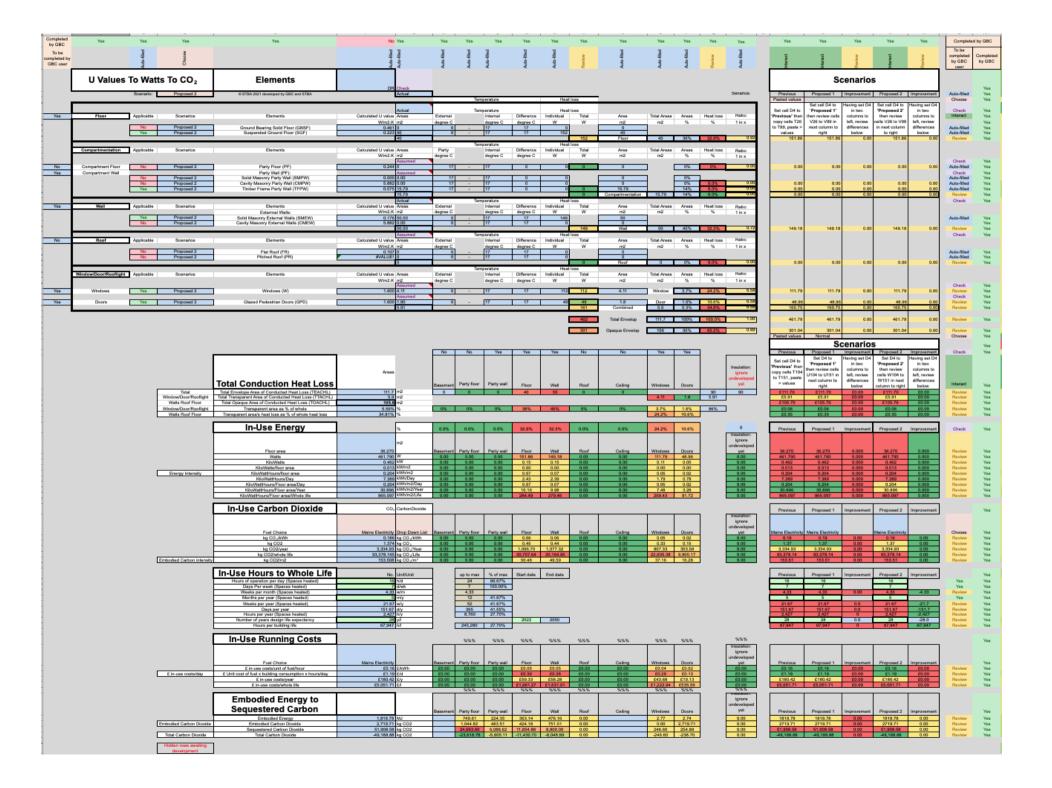
Elements EEECSC Summary

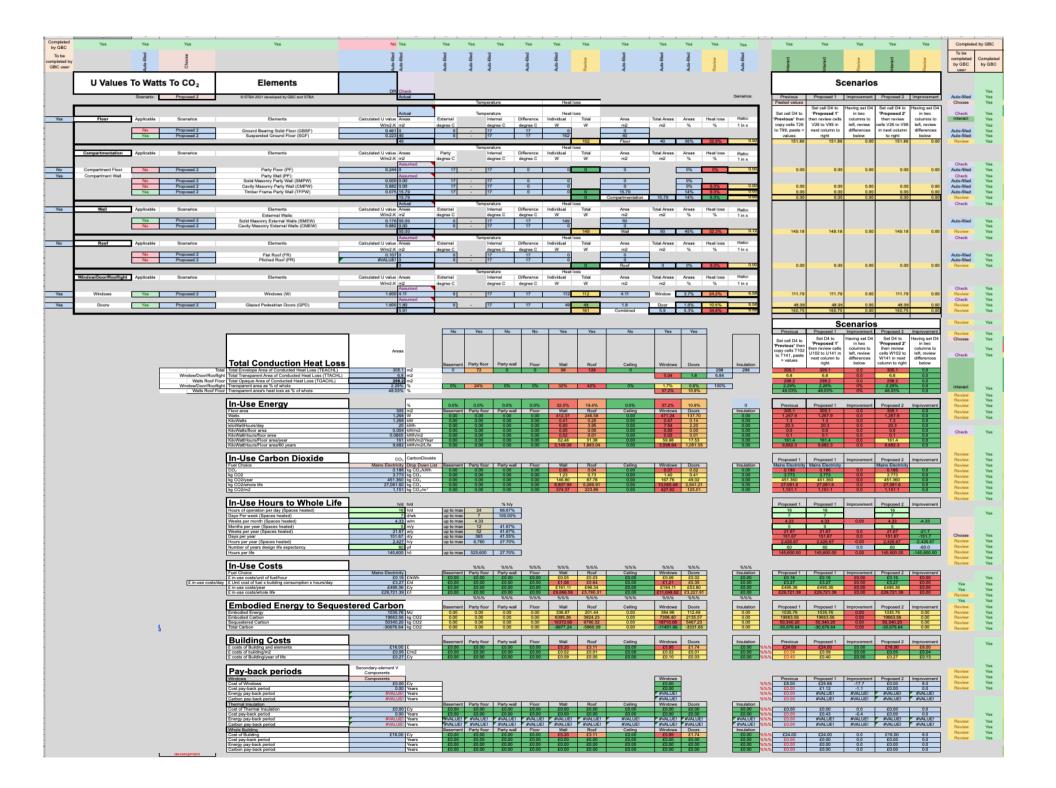
EE EC SC Embodied Energy Embodied Carbon Sequestered Carbon >>>	Embodied Energy (Intervention)	Embodied Carbon dioxide (Intervention)
Ground Bearing Solid Floor (GBSF) EE EC SC	2.10	16.18
Suspended Ground Floor (SGF) EE EC SC	0.00	0.00
Ground Floor total	2.10	16.18
Solid Masonry External Walls (SMEW)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

Sequestered Carbon dioxide (Intervention)	Total Carbon dioxide (Intervention)
197.28	-181.10
0.00	0.00
197.28	-181.10
9416.64	-8443.57
0.00	0.00
9416.64	-8443.57
12983.40	-12680.21
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
27545.60	-23848.75
0.00	0.00
27545.60	-23848.75
0.00	14658.08
197.28	-181.10
50340.20	-30676.64

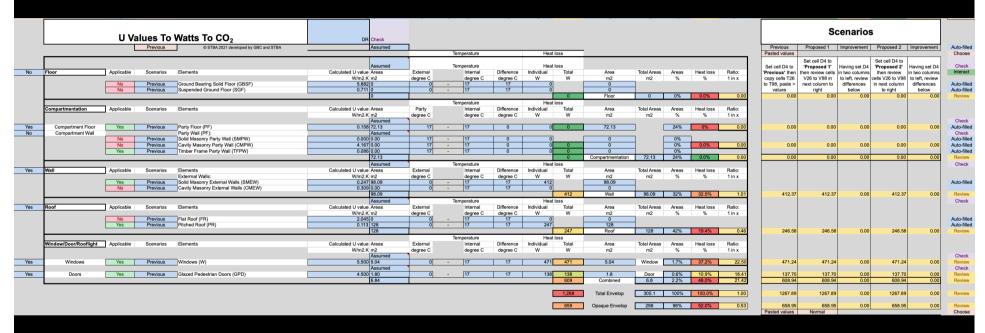
### **GRC V1 GBC B2 Window Door Rooflights Existing & Previous Interventions**

						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 Refurbishme nt Actions		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	Propose	d Updrade to Triple Glazed	Laminated softwood aluminium face composite												•	
	d or me ns	te c	tu -	>	al vity	88	so so	_ ®	h or	or sid)	ָם ב	Total elemental R value	Total elemental U value	value		Pass, PassU or Fail
Yes/No	New Build or Refurbishme nt Actions	Componen	Сотро nen Material	Density	Thermal	Thicknes	Thickness	Thermal Resistance	size: width o thickness (solid)	Spacing cavity (voi	Fraction of area or section	Thermal Resistance	Calculated Total U value	Target Elemental U value	Differenc	Pass, PassU or Fail
Yes		Glazed Pedestrian Doors (GPD)	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	S Uninsulated	PVC											4.50		
No	Propose	d Updrade to Insulated	???											1.00		
																1
												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



- Scenarios
- Column 1: Existing and Previous interventions
- Columns 2-3 & 4-5: 2 alternative insulation options



https://GreenBuildingEncyclopaedia.uk



https://GreenBuildingCalculator.uk

#### **GRC V1 IUE > Total ECO2**



### **GRC V1 GBC B2 Fuel CO2-Factors**

B2 Fuel Factors				i	a	4	7	8	9	<b>Fuel Cost Assumptions</b>	36	27
Year	Country	Data Source	Fuel group/Activity	Energy Source/Fuel Type/Fuel	Fuel Format	Domestic use?		Fuel carbon Intensity	Fuel factor	Fuel Cost Assumption	Efficiency Assumptions	Calerific Value
					Abbreviation	Yes/No	gCO3/kWh	kgC02/kWh	5.4	penca/kWh	%	KWh/Litre
3013-16	us	BRAD LSA		Any fluel with a CO2 emissions factor		Yes		0	0			
	us	TGR GRE CPD	Renewables	ASHP for DHW SCOP		Yes		0	0		125	
	us	TGR GRE CPD	Renewables	ASHP to 5 Heating SCOP @ 35 deg C flow temp.		Yes		0	0		499	
	us	TGR GRE CPD	Renovables	ASHP to 5 Heating SCOP @ 40 deg C flow temp.		Yes		0	0		453	
	us	TGR GRE CPD	Renowables	ASHP to S Heating SCOP @ SS dag C flow temp.		Yes		0	Û		346	
2009	LIK	Carbon Trust via TGR CRD	Renewables	Biomass		Yes		0	Û			
2009	ux	Carbon Trust via TGR CPD	Renovables	Biomass within 30 km	Mildkin	Yes	25	2000	0.135			
2009	us	Carbon Trust via TGR CPD	Fassil Fuels	Coal		Yes	390	0.33	1.782			
3904	uc	PHPP 2004	DH District Heating	District heading	C CP 70% PHC	Yes		0	0			
2004	ux	PHPP 2004	DH District Heating	District heading	C CP 35% PHC	Yes		0	0			
2004	ux	PHPP 2004	DH District Heating	District heading	CHPOSEPHC	Yes		0	Û			
3994	LIK	PHPP 2004	CHP Combined Heat and Power	Gas Cogeneration Station	GCS 70% PHC			0	Û			
3004	ux	PHPP 2004	CHP Combined Heat and Power	Gas Cogeneration Station	GCS 35% PHC			0	0			
3004	UK	PHPP 2004	CHP Combined Heat and Power	Gas Cogeneration Station	HSS 0% PHC			0	0			
2013-16	us	BRAD LSA	Electricity	Grid Electricity Miss		Yes		0	0	60.56		
2004	us	PHPP 2004	Electricity	Grid Electricity Misc Sweden 2000 UK 2004		Yes		0	0	69.56		
2009	us	Carbon Trust via TGR CPD	Electricity	Grid Electricity Misc. Sweden 2000 UK 3009		Yes	597	0.537	2.8998	69.56		
20157	us	TER GRE CPD	Electricity	Grid Electricity Misc Sweden 2000 UK 30157		Yes	298	0.298	2.1492	69.56		
1450	110	700.000.000	Photobe	0.4 Part 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10		Mare	187	0.187	1004	48.44		
3820	UK	TGR GRE CPD PAPP 2004	Electricity	Grid Electricity Misc. Sweden 2000 UK 3020		Yes	186	0.186	1.0046	69.56		
2004	ue	PHPP 2004 TER GRE CPD	Fassil Faels Fassil Faels	Hard Coal Liquid Gas for Domestic Hot Water	Liquid Gas for DHIII	Yes	242	0.343	1,3122	62.08	75	
					-							
2009	us	Carbon Trust via TGR CPD	Fassil Faels	Liquid Gas for SH	Liquid Gas for SH	Yes	342	0.342	1.3068	60.08	98	
3934	us	PHPP 2004	Fassil Fuels	Liquid Petroleum Gas	LPG	Yes		0	0			
3013-16	ue	BRAD LSA	Fassil Fuels	Liquid Petroleum Gas	LPG	Yes	254	0.254	1.1556			
				Mains Electricity		Yes		0.186	1.004	69.56		
				Mains Gas		Yes		0.308	1.1232	60.03	98	
3934	us	PHPP 2004	Fassil Fuels	Natural Gas			185	0.185	0.999	60.03		
3009	UK	Carbon Trust via TGR CPD	Fassil Fuels	Natural Gas			185	0.185	0.999	60.03		
3	UK	TGR GRE CPD	Fassil Fuels	Natural Gas to Domestic Hot Water	NG to DHW	Yes	208	0.308	1.1232	60.03	75	
3009	UK	TER GRE CPD	Fassil Fuels	Natural Gas to SH	NG to 94	Yes	208	0.308	1.1232	60.03	98	
3004	UK	PHPP 2004	Fassil Fuels	Gil	Oil	Yes		0	0			
2013-16	us	BRAD LSA	Fassil Fuels	GII	Oil	Yes		0	0			
3009	us	Carbon Trust via TGR CPD	Fassil Fuels	OH (Gast OH)			252	0.252	1.3608			
2004	us	PHEP 2004	CHP Combined Heat and Power	Gil Cogeneration Station	C CP 70% PHC			0	0			
3004	us	PHPP 2004	CHP Combined Heat and Power	Oil Cogeneration Station	C CP 35% PHC			0	0			
3004	ue	PHER 2004	CHP Combined Heat and Rower	Oil Cogeneration Station	CHROWAR			9	0			
3	us	TER GRE CPD	Facili Fuels	Oil to Domestic Hot Water	Oil to DHW	Nex	298	0.298	1.6892	69.846	75	10.85
2009	us	TGR GRE CPD	Facili Facili	Olite SH	Gilto SH	Yes	298	0.298	1.6892	62.046	85	10.85
2004	us	PHPP 2004	Renovable Electricity	PV-Sectricity	OH DO SHI	785	288	0.288	0	12.0%	85	12.63
3013-16	UK UK	BRAD LIA	Facilifiant	Solid Mineral Fuel				0	0			
								0	D n			
2012-16	ue	BRAD LSA	Fassil Fuels	Solid Multi-Fuel				D	D			
2004	us	PHPP 3004	Bonau	Wood		Yes		0	D			
Many	Many	Many Sources	Many Sources	Many Sources	PHPP 2004		WETL+Gov+CT 2009	Calculated mixed	Calculated CT2009	TGR GBE CPD 2015	TGR GBE CPD 2015	TGR GBE CPD 20
3820		3820 Provisional Data YTD Wartsila Eneergy Transition lab	Grid Electricity Mis:	Grid Electricity Mis:			gCO3/kWh	lgC02/kWh				
3020	Nonway	3820 Provisional Data YTD Wartolia Eneergy Transition lab	Grid Electricity Mic	Grid Electricity Mis: Narway 3020			10	0.01				
3820	Sweden	3820 Provisional Data YTD Wartsila lineergy Transition lab	Grid Electricity Misc	Grid Electricity Mis: Sweden 2020			18	0.008				
3820		3820 Provisional Data YTD Wartsila Eneergy Transition lab	Grid Electricity Miss	Grid Electricity Misc. France 2020			30	0.09				
3820	Austria	3820 Provisional Data YTD Wartsila Eneergy Transition lab	Grid Electricity Mis:	Grid Electricity Misc. Austria 2020			58	0.088				
3820	Lithuania	3820 Provisional Data YTD Wartsila Eneergy Transition lab	Grid Electricity Misc	Grid Electricity Mic. Lithuania 2000			118	0.118				
3020	Spain	3820 Provisional Data YTD Wartsila Eneergy Transition lab	Grid Electricity Misc	Grid Electricity Mis: Sgain 3820			126	0.126				
3020	Portugal	3820 Provisional Data YTD Wartsila Eneergy Transition lab	Grid Electricity Misc	Grid Electricity Misc. Portugal 2008			134	0.134				
3020		3820 Provisional Data YTD Wartsila Eneergy Transition lab	Grid Electricity Mis:	Grid Electricity Misc. Fielland 3820			136	0.136				
3020	Latvia	3820 Provisional Data YTD Wartella Energy Transition lab	Grid Electricity Misc	Grid Electricity Misc Latvia 3820			138	0.138				
3020	Beiglure	3820 Provisional Data YTD Wartella Eneergy Transition lab	Grid Electricity Misc	Grid Electricity Mic. Belgium 2020			148	0.148				
3020	Denmark	2020 Provisional Data YTD Wartella Eneergy Transition lab	Grid Electricity Misc	Grid Electricity Misc Denerark 3820			168	0.168				
3020	ux	3820 Provisional Oata YTD Wartolla Eneergy Transition lab	Grid Electricity Misc	Grid Electricity Mile: UK 2000		Yes	186	0.186	1.0844	69.56		
3820	Slovenia	3820 Provisional Data YTD Wartella Eneergy Transition lab	Grid Electricity Mis:	Grid Electricity Misc Slovenia 2000			222	0.222				
3820		3820 Provisional Data YTD Wartella Eneergy Transition lab	Grid Electricity Misc	Grid Electricity Misc Signakia 2020			224	0.324				
3020	Hungary	2020 Provisional Data YTD Wartella Eneergy Transition lab	Grid Electricity Mis:	Grid Electricity Mis: Hungary 2000			228	0.228				
3820	Remains	2820 Provisional Data YTD Wartella Eneergy Transition lab	Grid Electricity Mis:	Grid Electricity Mic. Romainai 2000			294	0.234				
2020	ireland	2020 Provisional Data YTD Wartella Energy Transition lab	Grid Electricity Miss	Grid Electricity Mic. Ireland 2000			228	0.238				
3020	Geometri	2020 Provisional Data YTD Wartella Eneergy Transition Iab	Grid Electricity Misc	Grid Electricity Mic. Germany 2000			240	0.24				
3020			Grid Electricity Misc	Grid Electricity Mic. Italy 2008			293	0.29				
2020	George	3820 Provisional Data VTD Wartella Energy Transition lab	Grid Electricity Misc	Grid Electricity Mis: Greece 2020			380	0.38				
		3820 Provisional Data YTD Wartella Eneergy Transition lab										
2020	Estania	3820 Provisional Data YTD Wartella Eneergy Transition lab	Grid Electricity Mis:	Grid Electricity Mic: Estania 3820			385	0.385				
3820		3820 Provisional Data YTD Wartsila Eneergy Transition lab	Grid Electricity Mis:	Grid Electricity Misc Bulgaria 2020			385	0.395				
3820	Czechela	3820 Provisional Data YTD Wartsila Eneergy Transition lab	Grid Electricity Mic	Grid Electricity Mic. Czechela 2000			490	0.49				
							590	0.53				
2020 2020		3820 Provisional Data YTD Wartella Energy Transition lab 3820 Provisional Data YTD Wartella Energy Transition lab	Grid Electricity Mis: Grid Electricity Mis:	Grid Electricity Milc. Netherlands 3020 Grid Electricity Milc. Paland 2020				0.7				

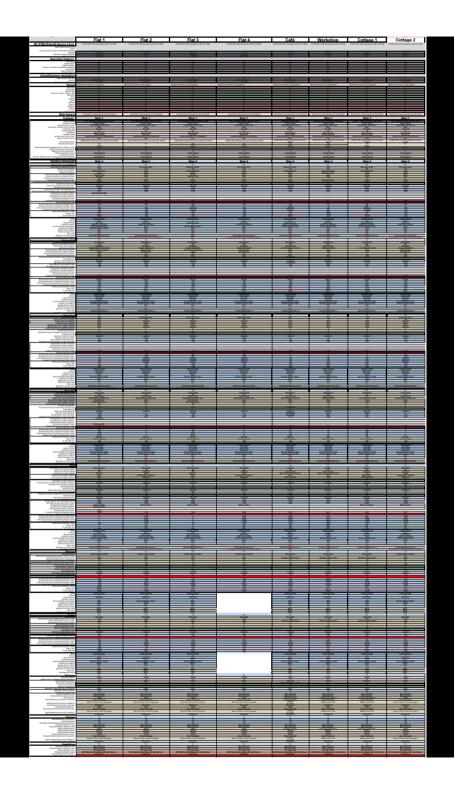
#### **GRC V1 GBC B2 Fuel Costs**

Fuel Cost C	ollection		Electricity	Electricity	Electricity	Electricity	Gas	Gas					Notes
pence/kWh			Day	Day	Night	Night							Day or night?
Domestic Supplier	Data source	Date	Fixed	Variable	Fixed	Variable	Fixed	Variable					Fixed or variable tarrif?
Ovo energy + E.ON	U Switch.com	19/04/21		60.1154	60.2174	60.1137	60.0293	60.0033					/kWh
British Gas Evolve + E.DN	U Switch.com	19/04/21	10.1906	60.1109	60.2174	60.1137	60.0319	60.0033					/kWh
Bulb + E.ON	U Switch.com	19/04/21	£0.1947	£0.1054	60.2174	60.1137	60.0283	60.0333					/kWh
Pure Planet + E.ON	U Switch.com	19/04/21	60.1632	60.1632	60.2174	60.1137	60.0319	60.0333					100% renewable elec + 100% Carbon offset gas
Octopus Energy + E.ON	U Switch.com	19/04/21	60.2045	60.1052	60.2174	60.1137	60.0296	60.0333					/kWh
SD Energy + E.ON	U Switch.com	19/04/21		60.1351	60.2174	60.1137	60.0002	60.0033					/kWh
Auro Energy + E.ON	U Switch.com	19/04/21		60.1664	60.2174	60.1137	60.0005	60.0033					/kWh
EDF + E.ON	U Switch.com	19/04/21	60.2176	60.0612	60.2174	60.1137	60.0322	60.0333					/kWh
Scottish Power +E.ON	U Switch.com	19/04/21	60.2102	60.1026	60.2174	60.1137	60.0014	60.0033					/kWh
SSE Souther Electric	U Switch.com	19/04/21	£0.1907	ED.1401	60.2174	60.1137	£0.0340	60.0033					/kWh
			Average	Average	Average	Average	Average	Average					
			£0.1903	60.1225	60.2174	£0.1137	60.0309	60.0333					/kWh
	-	Average	60.1610				60.0021						/kWh
	_	Print age	EU 1010				10.0321						/scen
31/30/21	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
			Red Diesel	Paraffinis						Industrial	Crown CHP	Home	
<b>Liquid Fuel</b>	Cost Colle	ction	(Gas Oil)	Diesel	Diesel	Diodesel	Furnace Fuel	AdBlue	Lubricants	heating oil	Diofuel	heating Oil	Notes
Prices flutuate and identy					aka White	HIVO 90% less		Nox reducing			H100 100%	asa mnu,	
should be checked and updated monthly or		/	aka 35 Second		Diesel, DERV, Road Diesel	GHG FAME free		agent for Dielel engines		ak IHO	enewable 87% lower	Kerasene, Burning Oil,	aka and CD2 or GHG
		+	$\overline{}$		EN	PANEL TIES	$\vdash$	Date: ang.		$\vdash$			·
Domestic Supplier	Data source	Date	BS 2869 Class		15940-2016	i '	1 /	Aus 32.	1 !	05 2860	OFGEM ROC		l "
Domesoc suppres	Data source	Date	A2	1	Class A	i '	'	Mas 32,	1 !	113 2 2 2 2 2	approved		l p
1		+	$\leftarrow$				BS EN 2869		1 !		T	05 2869	To the first
Domestic Supplier	Data source	Date	EN 590: 2018	BS 15490	ASTM	85 14214?	Class D	150 2241		Class A2	Esceeds EN	Class C2	Standards
Deliceson supplies	Data sasse.			1	D975:19b	i '			1 !	10ррт	14214		l p
Domestic Supplier	Data source	Date	[ ]	1		i '	'		1 !	Class D			l p
Domesoc suppeer	Data source	Date	1		l	i	l	l	l	1000ррт	l	l	l
Crown Oil	crownoil.co.uk	22/04/21	45.4									45.9	MU/kg Gross Calorific Value
Crown Oil	crownoll.co.uk	22/04/21				42						43	MU/kg Net Calorific Value
Crown Oil	crownoll.co.uk	22/04/21	38.8										MU/Litre Gross specific energy
Crown Oil	crownoil.co.uk	22/04/21										1220	Litres/tonne Specific Valume
Crawn Oil	crownall.co.uk	22/04/21	860		782	790					875	800	kg/m3 Density at 15 degres C
Crown Oil	crownoll.co.uk	22/04/21			3000	300							kg CO2e/1000litres
Crawn Oil	crownall.co.uk	22/04/21	0	0	3	0.1	0	0	0	0	0	0	kg CO2e/litres
Crawn Oil	crownall.co.uk	22/04/21				8.13							g CD2e/Mi
Crawn Oil	crownall.co.uk	22/04/21				0.00613							kg CO2e/Mj
Crawn Oil	crownal.co.uk	22/04/21											E/kWh
Crawn Oil	crownal.co.uk	23/04/21	60.57		7	7				7	7	60.19	ppi pence per litre @ 1000 litres delivery
Watson Oil	watsonfuels.co.uk	25/04/21	£0.57									£0.39	ppi pence per litre @ 1000 litres delivery
Certes Energy	certasenengy.co.uk	26/04/21								£0.44			ppi pence per litre
ONS Office of nat stats	Certaterer by A.M. a.s.	01/01/19	$\overline{}$		$\vdash$			-	-			£0.53	/kWh
	Continuos en uk	22/04/21	$\overline{}$		$\vdash$			$\overline{}$	-			£0.53 £0.41	
Tank Topper	tanktopper.co.uk	Express	t	Average	Average	Average	Average	Average	Average	Average	Average	EU.41 Average	ppi pence per litre
1		+	Retrage	RATE age	Retrage market	Retrage	Average	Retrage	Average married	Participa (Control of Control of	Average energy	E0.4676	Aswh
			#DN/01	HON/OI	WORKYOI	MONYOL	MONYOL	#DN/01	#Df/(0)	MON/OI	MONYON	£0.4676	/kWh
Solid Fuel C	ast Caller	tion	House Coal	House Coal	House Coal	Smokeless	Superhear	Anthracite	Burnright	Stovemaster	Homefire	Smokeless	Notes
John Fuer	JOSE COILEC	LIUII	Price Cont.	Piccore Co.	Piccare co.	Ovals	Smokeless	Small Nuts	Smokeless	attaces and	Ovals	Fuel	110000
		7				HETAS &							
pence/kWh		1 1	Scottish coal	Scottish coal	Selected		Smoke		Smoke control	HETAS	HETAS		
penceyeven		1 7	doubles	trebles	Mixed Ovoids	DEFRA	control Area	Smoke control	Areas & HETAS	approved	approved		
		1 1	1			approved	approved	Area approved	approved		-,,		l I
		<u> </u>	40 x 25 kg	40 x 25 kg	40 x 25 kg	40 x 25 kg	40 x 25 kg	40 x 25 kg	50 x 20 kg	40 x 25 kg	40 x 25 kg	25 x 50kg	
Domestic Supplier	Data source	Date	bags pallets	bags pallets	bags pallets	bags pallets	bags pallets	bags pallets	bags pallets	bags pallets	baga pallets	bags pallets	
	Housefuel.co.uk	+	maga-	ango pass	mega pass	mag- para	maga pass	mogo pass	maga pass	ungo para	maga para	maga para	
House Fuel NSO	comn/mm23	Dec-2020	£239.99	£319.99	6249.99	£296.99	6294.99	£364.99	£359.99	£354.99	£499.99	0608.75	/tonne
HUMBE FUEL HUM	tarring and a	DEC SOL	60.01	60.01	60.01	00.01	60.01	60.01	60.01	60.01	60.01	60.01	/sante /kWh
		+	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	Auth
		+	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	/kWh
			60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	/kWh
		+	60.01	60.01	60.01	00.01	60.01	60.01	60.01	60.01	60.01	60.01	/kWh
1			60.01	EU.01	60.01	EU.01	60.01	EU.01	EU.01	EU.01	EO.01	EU.01	/kWh
		+	60.01	£0.01	EO.01	00.01 00.01	ED.01	E0.01	£0.01	EO.01	EO.01	£0.01	/kWh
	-	+		£0.01									1
1		+	60.01		60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	/kWh
1			20.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	/kWh
1			20.01	60.01	60.01	60.01	60.01	80.01	80.01	60.01	60.01	60.01	/kWh
			00.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	60.01	/kWh
			00.01	60.01	60.01	60.01	60.01	80.01	£0.01	60.01	60.01	60.01	/kWh
		/	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	
			£239.99	£319.99	£249.99	£296.99	£294.99	£364.99	£359.99	£354.99	£499.99	0508.75	/kWh
			£359.07	Average									

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



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

		61 .																								
0 0	Project Sumr	nary Sheet		Scenarios			Scenarios			Scenarios			Scenarios			Scenarios			Scenarios			Scenarios			Scenarios	
0 1	Scenarios Location		Previous Westray	Proposed 1 Westray	Proposed 2 Westray	Edisting/Pevious Westray	Proposed 1 Westray	Proposed 2 Westray	Existing/Pevious Westray	Proposed 1 Westray	Proposed 2 Westray	Edsting/Pevious Westray	Proposed 1 Westray	Proposed 2 Westray	North Roraldsay	Proposed 1 North Ronaldsay	Proposed 2 North Roraldsay	North Ronaldsay	Proposed 1 North Ronaldsay	Proposed 2 North Ronaldsay	North Ronaldsay	Proposed 1 North Roraldsay	Proposed 2 North Ronaldsay	North Roraldsay	Proposed 1 North Ronaldsay	Proposed 2 North Roraldsay
0 3	Property		Flat 1	Flat 1	Flat 1	Flat 2	Flat 2	Flat 2	Flat 3	Flat 3	Flat 3	Flat 4	Flat 4	Flat 4	Café	Café	Café Scottish	Workshop	Workshop	Workshop Scottish	Cottage 1	Cottage 1	Cottage 1 Scottish	Cottage 2	Cottage 2	Cottage 2
Ι.			As Existing	STBA Traditional Conservation	Scottish Technical Standards	Existing	STBA Traditional Conservation	Scottish Technical Standards	Existing	STBA Traditional Conservation	Scottish Technical Standards	Existing	STBA Traditional Conservation	Scottish Technical Standards	Existing	STBA Traditional Conservation	Technical Streetents	Existing	STBA Traditional Conservation	Technical Standards	Existing	STBA Traditional Conservation	Technical Standards	Existing	STBA Traditional 5 Conservation	Scottish Technical Standards
0 5	Regulation/Design Standard B2 Uvalues Etc (column reference)		DP	DP	DO	DP	DP	DO	DP	DP	00	DP	DP	DO	DP	DP	DO	DP	DP	DO	DP	DP	DO	DP	DP	DO
1 1	Element Element Format		Ground Floor Solid floor	Ground Floor Solid floor	Ground Floor Solid floor	Ground Floor	Ground Floor Solid floor	Ground Floor				Ground Floor	Ground Floor	Ground Floor	Ground Floor	Ground Floor	Ground Floor	Ground Floor Solid Roor	Ground Floor Solid floor	Ground Floor Solid floor	Ground Floor	Ground Floor	Ground Floor	Ground Floor	Ground Floor	Ground Floor
1 3	Element U value	W/m².K	0.14	0.25	0.25	0.14	0.25	0.25							2 Suspended Famour	0.25	0.25	Sold noor	0.25	0.25	0.75	0.25	0.25	Suspended Ember	0.25	0.25
1 4	Insulation Position Insulation Format		Below slab Board	Below slab	Below slab	Below slab	Below slab	Below slab							None	Between joists	Between joists	None	Below slab	Below slab	None	Between joists	Between joists	None	Below slab	Below slab
1 6	Insulation Material		Phenolic	Foamed glass	Foamed glass	Phenolic	Foamed glass	Foamed glass							None	Wood Fibre	Wood Fibre	None	Foamed glass	Foamed glass	None	Wood Fibre	Wood Fibre	None	Foamed glass	Foamed glass
1 7	Insulation Thickness Notes	mm	100	200	200	100	200	200							None	200	200	None	200	200	None	200	200	None	200	200
1 9	Embodied minus sequestered carbon	kg CO <sub>2</sub>	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
1 10	Whole life In use Carbon	kg CO <sub>2</sub>	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls	0.00 External Walls
2 2	Element Format		Solid Masonry	Solid Masorry	Solid Masonry	Solid Masonry	Solid Masonry	Solid Masonry	Solid Masorry	Solid Masonry	Solid Masorry	Solid Masonry	Solid Masonry	Solid Masorry	Solid Masonry	Solid Masorry	Solid Masonry	Solid Masonry	Solid Masorry	Solid Masonry	Solid Masonry	Solid Masonry	Solid Masorry	Solid Masonry	Solid Masorry	Solid Masorry
2 3	Element U value Insulation position	W/m².K	0.21	0.45	0.3	0.21	0.45	0.3	0.21	0.45	0.3	0.21	0.45	0.3	1.48 None	0.7	0.3 IWI	1.48 None	0.7 IWI	0.3 IWI	1.48 None	0.7 IWI	0.3 IWI	1.48 None	0.7 IWI	0.3 IWI
2 5	Insulation Format		IWI	IWI	IWI	None	IWI	IWI	None	IWI	IWI	None	IWI	IWI	None	IWI	IWI									
2 6	Insulation Material Insulation Thickness	mn	Phenolic 120	Wood Fibre 60	Wood Fibre 100	Phenolic 120	Wood Fibre 60	Wood Fibre 100	Phenolic 120	Wood Fibre 60	Wood Fibre 100	Phenolic 120	Wood Fibre 60	Wood Fibre	None None	Wood Fibre 40	Wood Fibre 130	None None	Wood Fibre 40	Wood Fibre 130	None None	Wood Fibre 40	Wood Fibre 130	None None	Wood Fibre 40	Wood Fibre 130
2 8	Notes														140.00			- TWATE						THAT IS		
2 9	Embodied minus sequestered carbon Whole life In use Carbon	log CO <sub>2</sub>	-9977.24 8.807.99	-9977.24 8.807.99	-9977.24 8.807.99	-9977.24 8.807.99	-9977.24 8.807.99	-9977.24 8.807.99	-9977.24 8.807.99	-9977.24 8.807.99	-9977.24 8.807.99	-9,977.24 8,807.99	-9,977.24 8,807.99	-9,977.24 8,807.99	-9977.24 8.807.99	-9977.24 8.807.99	-9977.24 8,807.99									
3 1	Whose life in use Carbon Element	Ag CO <sub>2</sub>	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor	Party Floor
3 2	Element Format	W/m².K				Suspended Floor 0.19	Suspended Floor 0.2	Suspended Floor 0.2	Suspended Floor 0.19	Suspended Floor 0.2	Suspended Floor 0.2	Suspended Floor 0.19	Suspended Floor 0.2	Suspended Floor 0.2												
3 4	Element U value Insulation Position	wym:.k				Between joists	Between jobits	Between joists	Between jobts	Between joists	Between joists	Between joists	Between joists	Between joists												
3 5	Insulation Format Insulation Material					Board Phenolic	Batt Wood Fibre	Batt Wood Fibre	Board Phenolic	Batt Wood Fibre	Batt Wood Fibre	Board Phenolic	Batt Wood Fibre	Batt Wood Fibre												
3 7	Insulation Thickness	mm				100	200	200	100	200	200	100	200	200												
3 8	Notes Embodied minus sequestered carbon	ler CO.	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
3 10	Whole life In use Carbon	kg CO <sub>2</sub>	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
4 1 4 2	Element Element Format		Party wall Solid Masonry	Party wall Solid Masonry	Party wall Solid Masonry	Party wall Solid Masonry	Party wall Solid Masonry	Party wall Solid Masonry	Party wall Solid Masonry	Party wall Solid Masonry	Party wall Solid Masonry	Party wall Solid Masonry	Party wall Solid Masonry	Party wall Solid Masonry	Party wall Solid Wall	Party wall Solid Wall	Party wall Solid Wall	Party wall Solid Wall	Party wall Solid Wall	Party wall Solid Wall	Party wall Solid Wall	Party wall Solid Wall	Party wall Solid Wall	Party wall Solid Wall	Party wall Solid Wall	Party wall Solid Wall
4 3	Element U value	W/m².K	0.22	0.39	0.39	0.22	0.39	0.39	0.22	0.39	0.39	0.22	0.39	0.39	?	0.78	0.78	?	0.78	0.78	?	0.78	0.78	?	0.78	0.78
4 4	Insulation Position Insulation Format		IWI between batters Board	IWI between batters Batt	IWI between batters Batt	IWI between batters Board	IWI between batters Batt	IWI between batters Batt	IWI between batters Board	IWI between batters Batt	IWI between batters Batt	IWI between batters Board	IWI between batters Batt	IWI between batters Batt	None None	IWI Batt	IWI Batt	None None	IWI Batt	IWI Batt	None None	IWI Batt	(W) Batt	None None	(W) Batt	IWI Batt
4 6	Insulation Material Insulation Thickness		Phenolic 100	Wood Fibre 100	Wood Fibre 100	Phenolic 100	Wood Fibre 100	Wood Fibre 100	Phenolic 100	Wood Fibre	Wood Fibre 90	Phenolic 100	Wood Fibre	Wood Fibre 90	None None	Wood Fibre 40	Wood Fibre 40	None	Wood Fibre 40	Wood Fibre 40	None None	Wood Fibre 40	Wood Fibre 40	None	Wood Fibre 40	Wood Fibre 40
4 8	Notes	Assumed only 100mm available	200	200			200		200	~		200			Techno	40		195116		π.		40		10,110		
4 9	Embodied minus sequestered carbon Whole life in use Carbon	leg CO <sub>2</sub>	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
5 1	Element	log CO <sub>2</sub>	Reof	Roof	Roof	Roof	Roof	Roof	Roof	Roof	Roof	Pitched Roof	Pitched Roof	Pitched Roof	Flat roof	Flat roof	Flat roof	Flat roof	Flat roof	Flat roof	Flat roof	Flat roof	Flat roof	Flat roof	Flat roof	Flat roof
5 2	Element Format											Timber framed	Timber framed 0.23	Timber framed 0.23	Solid Roof	Solid Roof 0.15	Solid Roof 0.15	Solid Roof	Solid Roof 0.15	Solid Roof 0.15	Timber framed 0.21	Timber framed 0.15	Timber framed 0.15	Solid Roof 0.21	Solid Roof 0.15	Solid Roof 0.15
5 4	Element U value Insulation Position	W/m².K										0.18 Between rafters	0.23 Between rafters	Between rafters	None	Between framing	Between framing	None	Between framing	Between framing	Between framing	Between framing	Between framing	Between framing	Between framing	Between framing
5 5	Insulation Format Insulation Material											Board Phenolic	Batt Wood Fibre	Batt Wood Fibre	None None	Batt Wood Fibre	Batt Wood Fibre	None	Batt Wood Fibre	Batt Wood Fibre	Roll Mineral wool	Batt Wood Fibre	Batt Wood Fibre	Roll Mineral wool	Batt Wood Fibre	Batt Wood Fibre
5 7	Insulation Thickness (mm)											160	200	200	None	280	280	None	280	280	200	280	280	200	280	280
5 8	Notes Embodied minus sequestered carbon	ke CO.	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5966.09	-5166.00	-5966.09	-5,966.09	-5,966.09	-5,966.09	-5966.09	-5966.09	-5966.09
5 10	Whole life In use Carbon	log CO <sub>2</sub>	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91	5,266.91
6 2	Element Element Format		Windows	Replacement	Windows Replacement	Windows Existing	Windows	Windows Replacement	Windows	Windows Replacement	Windows Replacement	Windows	Windows Replacement	Windows Replacement	Windows	Windows Replacement	Windows Replacement	Windows Existing	Windows Replacement	Windows Replacement	Windows Existing	Windows Replacement	Windows Replacement	Windows	Windows Replacement	Windows Replacement
6 3	Element U value	W/m².K	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6 Timber	1.6	1.6	1.6	1.6	5.5	1.6	1.6 Timber	5.5	1.6 Timber	1.6	5.5	1.6	1.6	5.5	1.6	1.6
6 5	Element Material Notes	Assumed 1.6 BRAD L minimum	PVCu	Timber	Timber	Timber	Timber	Timber	Timber	Timber	Timber	Timber	Timber	Timber	Timber	Timber	Timber									
6 6	Embodied minus sequestered carbon	kg CO <sub>2</sub>	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11401.66	-11,401.66	-11,401.66	-11,401.66	-11401.66	-11401.66	-11401.66
7 7	Whole life in use Carbon Element	kg CO <sub>2</sub>	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door	10,065.48 Door									
7 2	Element Format		Existing	Replacement	Replacement	Existing	Replacement	Replacement	Existing	Replacement	Replacement	Existing	Replacement	Replacement	Existing	Replacement	Replacement									
7 3	Element U value Element Material	W/m².K	Uninsulated Timber	1.6 Timber	1.6 Timber	Uninsulated	1.6 Timber	1.6 Timber	Uninsulated Timber	1.6 Timber	1.6 Timber	Uninsulated Timber	1.6 Timber	1.6 Timber	Uninsulated Timber	1.6 Timber	1.6 Timber									
7 5	Notes Embodied minus sequestered carbon		-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3331.65	-3131.65	-3331.65	-3331.65
7 6	Embodied minus sequestered carbon Whole life In-use Carbon	kg CO <sub>2</sub>	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21	-3331.65 2,941.21									
8 1	Heating		ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP .	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP	ASHP
9 0	Whole Scenarios		Whole	Whole Proposed 1	Whole Proposed 2	Whole Existing/Pevious	Whole Proposed 1	Whole Proposed 2	Whole Existing/Perious	Whole Proposed 1	Whole Proposed 2	Whole Existing/Pevious	Whole Proposed 1	Whole Proposed 2	Whole Existing/Previous	Whole Proposed 1	Whole Proposed 2	Whole Existing/Previous	Whole Proposed 1	Whole Proposed 2	Whole Existing/Previous	Whole Proposed 1	Whole Proposed 2	Whole Edsting/Previous	Whole Proposed 1	Whole Proposed 2
9 2	Location		Westray Flat 1	Westray Flat 1	Westray Flat 1	Westray Flat 2	Westray Flat 2	Westray Flat 2	Westray Flat 3	Westray Flat 3	Westray Flat 3	Westray Flat 4	Westray Flat 4	Westray Flat 4	North Roraldsay Café	North Ronaldsay Café	North Ronaldsay Café	North Roraldsay Workshop	North Ronaldsay Workshop	North Roraldsay Workshop	North Ronaldsay Cottage 1	North Roraldsay Cottage 1	North Ronaldsay Cottage 1	North Roraldiay Cottage 2	North Ronaldsay Cottage 2	North Roraldsay Cottage 2
3	Property Regulation/Design Standard		As Existing	STBA Traditional	Scottish Technical	Flat 2 Existing	STBA Traditional	Scottish Technical	Existing	STBA Traditional	Scottish Technical	Flat 4 Existing	STBA Traditional	Scottish Technical	Existing	STBA Traditional	Scottish Technical	Workshop Existing	STBA Traditional	Scottish Technical	Cottage 1 Existing	STBA Traditional	Scottish Technical	Cottage 2 Existing	STBA Traditional	Scottish Technical
9 4		leg CO <sub>2</sub>	-30,676.64	-30,676.64	Standards -30,676.64	-30,676,64	-30,676.64	Standards -30,676.64	-30,676.64	-30,676.64	Standards -30,676.64	-30,676.64	-30,676.64	-30,676.64	-30,676.64	-30,676.64	Standards -30,676.64	-30.676.64	-30,676.64	Standards -30,676.64	-30,676.64	Conservation -30.676.64	Standards -30,676.64	-30.676.64	-30,676.64	Standards -30,676.64
9 6	Whole life In use Carbon	kg CO <sub>2</sub>	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60	27,081.60

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





https://GreenBuildingEncyclopaedia.uk



**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







### GBE :::

https://GreenBuildingEncyclopaedia.uk

















GBC

Green Building Calculator

https://GreenBuildingEncyclopaedia.uk

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

### Worksheet revisions record

eted by				•					Comments/Notes/
-	Yes	Yes	Yes	Yes	Complete	d by GBC	Updated	Initials	Future Development Aide Memoir
	Ī					Completed			·
						by GBC	02/10/20	BRM	
	Logond	In Excel		In BIM					
	Legend	III EXCEI		III DIIVI		Yes	26/09/20	BRM	
	Cell colour code/content	Explanation	Examples			Yes	27/02/21	BRM	
	Orange	Row or Column titles	Complete	n/a		Yes	07/12/21	BRM	
	Pale Green	Multiple cells require different responses by user	Multiple			Yes	07/12/21	BRM	
	Green	User Input cell, feeds into calculations throughout GBC	Yes	From Bill of Materials		Yes	07/12/21	BRM	
	Green with Red text	User input cells with sample entries to populate calculations (replace as required)	0,00	By User if required		Yes	07/12/21	BRM	
	Red	User to select option from drop down list GBC will apply choice to calculations	Choose	From Bill of Materials?		Yes	07/12/21	BRM	
		GBC calculated results, applying user inputs in other cells or sheets	0	From Bill of Materials		Yes	07/12/21	BRM	
	Brown	GBC delivers results from Look Up Tables triggered by choice from Drop Down Lists				Yes	07/12/21	BRM	From STBA RRCC
	Turquoise	GBC calculated results, that the user can overwrite. e.g. for variables	0	From Model?		Yes	07/12/21	BRM	
	Turquoise with red text	GBC example calculated results, that the user can overwrite. e.g. for variables, can be overwritten	0	By User if required		Yes	07/12/21	BRM	
	Violet	GBC totals up, User to check if correct OR use the information elsewhere in the calculator	Check	By User if required		Yes	07/12/21	BRM	
	Yellow	Information to be collected if readily available quickly		n/a		Yes	02/12/20	BRM	
	Yes/No	User input cell requiring user choice from drop down list		By User from list		Yes	24/04/21	BRM	
	No	Not complete by GBC OR Users to ignore this row's cells. 'No' will turn red automatically		n/a		Yes	27/09/20	BRM	
	Review	GBC awaiting information OR User to interrogate this row's cells and review decisions so far		User to interrogate result		Yes	24/04/21	BRM	
	Yes	Started by GBC OR To be completed by Users. 'Yes' will turn Green Automatically		By User if required		Yes	24/04/21	BRM	
	%%%	In development incomplete		GBC Aide memoir		Yes	15/02/21	BRM	
	///	Pending development		GBC Aide memoir		Yes	15/02/21	BRM	
	>>>	Date related update		GBC Aide memoir		Yes	15/02/21	BRM	
	***	Seperator in Drop Down Lists		GBC Aide memoir		Yes	07/12/21	BRM	
	Grey cell no text	Cells not containing calculations nor containing text or other information				Yes	23/08/21	BRM	
				Disconnected from source files		None	07/12/2021	BRM	None
				Spell checked		Yes	07/12/2021		Elsewhere in ScheduleAccommoda
				Cells (un)locked		None	15/02/21	BRM	None to do
				Cells/rows/ columns to hide		None	13/10/21	BRM	None to do
				Sheet (un)protected		None	15/02/21	BRM	None to do
				Currency Check		Yes	07/12/21	BRM	
				Screen Shots		Yes	07/12/21	BRM	To PPTX
				Screenshot file		?	07/12/21	BRM	GBC CellColourBIM V2 071221.png
				Set Print Area		Yes	23/04/21	BRM	020 001100100101111 12 01 122 11011
				Print settings		Yes	23/04/21	BRM	
				Custom Views		Yes	24/04/21	BRM	
				Instructions worksheet		None	07/12/21	BRM	None to do
				Instructions in cell or popup		None	07/12/21	BRM	110110 10 00
								BRM	RIM
						2	23/04/21		
				Version		2 No	23/04/21		None expected
				Version Exported to file		2 No	23/08/21	BRM	None expected
				Version Exported to file Deployed to GBE or GBC website page		No	23/08/21 18/10/21	BRM BRM	
				Version Exported to file Deployed to GBE or GBC website page Worksheets feed it		No Yes	23/08/21 18/10/21 18/10/21	BRM BRM BRM	ScheduleAccommodation
				Version Exported to file Deployed to GBE or GBC website page		No	23/08/21 18/10/21	BRM BRM BRM	
	-	_	F	Version Exported to file Deployed to GBE or GBC website page Worksheets feed it It feeds other worksheets	-	No Yes To do	23/08/21 18/10/21 18/10/21 07/12/21	BRM BRM BRM BRM	ScheduleAccommodation It will support many
	721	121	3/2.1	Version Exported to file Deployed to GBE or GBC website page Worksheets feed it It feeds other worksheets	1/21	No Yes To do	23/08/21 18/10/21 18/10/21 07/12/21	BRM BRM BRM BRM	ScheduleAccommodation It will support many
	Y1021	710/21	V08/21	Version Exported to file Deployed to GBE or GBC website page Worksheets feed it It feeds other worksheets	/04/21	No Yes To do	23/08/21 18/10/21 18/10/21 07/12/21	BRM BRM BRM BRM	ScheduleAccommodation It will support many
	02/10/21	02/10/21	23/08/21	Version Exported to file Deployed to GBE or GBC website page Worksheets feed it It feeds other worksheets	24/04/21	No Yes	23/08/21 18/10/21 18/10/21	BRM BRM BRM	ScheduleAccommodation



https://GreenBuildingEncyclopaedia.uk



(ambitions)







GBPFMS GBMP GBMS









**GBC Look Up Table** 

**GBC Drop Down Lists** 

Post-Grenfell Golden Thread: Selective filtering for competency

### **GBC Elemental Assembly** Component choices

#### **Outputs:**

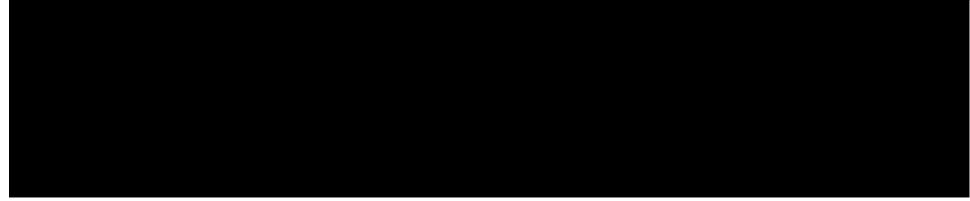
Embodied & In use Energy & Carbon Data, Build & Running costs GBRobustSpec GBFMSpec GBMethodsStatement GBMaterialsPassport





# Green Building Product Data Collection





### **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





# Green Building Price Book





# GBPB Green Building Price Book Retrofit





https://GreenBuildingCalculator.uk

#### 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.ukGRCGRPDC>

**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





# Green Building Robust Specification



https://GreenBuildingEncyclopaedia.uk



https://GreenBuildingCalculator.uk

## **GBS** Robust Specification

```
→ WINDOWS/ROOFLIGHTS/SCREENS/LOUVRES
        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
        BS EN-ISO 12543-2:1998. Glass in building -Laminated glass and laminated safety glass. Laminated safety
        EN-13501:....:Fire-classification-of-construction products and building-elements.
        EN-13501-2:: A1: Classification-using data from fire resistance tests, excluding ventilation services 1
        EN-15254: www.Extended application of results from fire resistance tests - Non-loadbearing walls T
        EN-15254-4:2008;+A1:2011:Glazed constructions] 47

    LOSS PREVENTION COUNCIL-(LPC)-DOCUMENTS referred to in, or relevant to, £10 include:

        LPS 1056:2014:issue 6.2: Requirements for the LPCB approval and listing of fire dograets, lift landing doors-
        LPS 1158:2014:Issue 2.2:Requirements and tests for fire resistant glazing systems 1
98 - LPCB-CERTIFICATE OF PRODUCT APPROVAL, CERTIFICATES referred to in, or relevant to, 1.10
         1406a/01:Issue: 01-Date of Issue: 15-March 2017 - 11
         1406a/02:Issue: 01-Date of Issue: 45-March 2017 -
         1406a/03:Issue: 01-Date of Issue: 15-March 2017 - 11
         1406a/04:Issue: 01-Date of Issue: 45-March 2017-9
         1406a/05:Issue: 01-Date of Issue: 15-March 2017 5
   → LPCR-CLASSIFICATION-REPORTS-referred to in, or relevant to 4.10 include: ■
         00749.1/15/ZOONP/e Date of Issue: 05-June 201
         00749 2/15/ZOONP/e Date of Issue: 28-May 2015/0
         00749.3/15/ZOONP/e Date of Issue: 24-May-2015 T
         03125/16/R35NP-Date-of-Issue: 30 April 2016 9
         03125/16/R35NP + Annex 1 Date of Issue: 10 October 2016 9
560A → METAL FRAMED, (GLAZED), FIRE SCREEN SYSTEM (CAD/BIM tag-reference) ***
        Reference Drawing(s): -

    Architect's: I

    → Manufacturer's: {Dczwl-1-sk €160 -- prezekról-poziomy dwg}

        Location: f
        Exposure: (External/Internal) 5
         Surround:

    → Standard Rigid Masonry: See F10/___A

    → Standard Flexible Partition: See K10/115A-K10/125A 

         Surround fire performance: El30 5
         Surround thickness: 100 mm minimum 5
         Testing Standard: LPS1056
        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 T
         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 T
        Self-closing/Smoke-leakage-classification: to EN 13501-2 1
         Manufacturer: Alufire Sp. z.o.o. Sp.k. Ul. Warszawska-64a, 87-148 Lysomice k Torunia, Poland ■
         Suppliers/Installers: Checkmate Fire Solutions Limited, The Second Floor, Rosemount House, Rosemount
        Estate, Huddersfield Road, Elland, West Yorkshire, HX5-0EE T
        E → info@checkmatefire.com → W → www.checkmatefire.com ♥
        W → www.aluffre.co.uk *
```

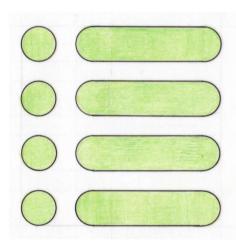
- Product Clauses <1p</li>
  - [Options to select from]
  - [Blanks for populating by project specifier]
- Material Clauses
- Bespoke Component Clauses
- Accessory Clauses
- Fixings Fastener Clauses
- Proofing Clauses
- Elemental Clauses
- System Clauses
- MEP Services Clauses
- Samples Mock-ups Clauses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





## GBMP

**Green Building Material Passport** 



## GBMP Green Building Materials Passport 16 pages!! For one product

### GBMP Green Building Materials Passport

Materials Passport
Unique Product Identifiers
Product nameBrand name
Product article Number
Manufacturer's name/details
Manufacturer Name

GBMP-Materials-Passporti

GBE

OCCUPATION OF THE PASSPORTION OF THE PA

Review for to Physicians and Sparing 1	1.0
CHICAGO TO A CONTROL OF THE CONTROL	_
and the second s	
tagaty company	-
Table 1	
SALES PROPERTY.	_
TOTAL STREET,	-
POLICE ET	
NAME OF TAXABLE PARTY.	-
toops:	-
III) III III III III III III III III II	_
THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TW	-
O O O O O O O O O O O O O O O O O O O	-
TOTAL CONTRACTOR OF THE PARTY O	-
Springer Scrippy and company Springers	-
Colonia Pione	-
Colorado Para Para Colorado De Para Para Para Para Para Para Para Par	
THE STREET STREET, STR	-
174%	-
TARREST TARREST CONTRACTOR CONTRA	-
F-11-11-1	
and company	_
- Control of the Cont	
and the same of th	_
47020	_
Energy Manager	
COLUMN TARRET	
WY TO SEE	_
THE RESERVE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NA	-
CAR STANCE	-
Pit-turing 1	-
1745	
1745	-
THE SECRET PROPERTY.	-
Pamaging Regulariana i	-
THE RESIDENCE OF THE PARTY OF T	_
TATION STATE OF THE PARTY OF TH	-
1745	
000014101	
00000	_
Augu	
Talanta GOOK	
CONTRACTOR	_
TARGET STATE OF THE STATE OF TH	-
THE CHARGOOD	
WARRIAN CONTRACTOR	_
CONTRACT DE CERCOS	_
AND THE PROPERTY AND TH	-

STOREST TO STATE OF THE STATE O	
Contaction and Contac	_
ppp care and care	
ALL THE PARTY OF T	
TRANS CONTRACTOR	
Maria Capation & Company of Saltana	_
419	
manny -	-
100	
Pri tidada	
45	
maging .	
The regions of the process of the pr	
and State and Spirit Print	-
and the same of th	
45	-
46	
SUPERING STREET	-
HISTORIAN CONTRACTOR C	-
Action 1	-
45	-
portur -	-
my n	-
menterini :	-
TANKAN TA	_
A STORE LINE	-
-	-
A CONTRACT	-
more entitle :	
11122	
and the same of th	-
CONTRACT CONTRACT	-
AAINDING .	
reproduction to	
taging .	-
UNIX.	-
000	-
Topic Control	
	-
na wije i	-
age of the second of the secon	-
DE TOUR STATE OF THE STATE OF T	-
THE RESERVE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NA	-

Operation (	-
CONTRACT.	-
CONTROL CONTRO	
740	_
1745	_
TOTAL PROPERTY.	_
AND ADDRESS OF THE PARTY OF THE	_
troublement :	_
	_
triping virial practice.	_
1745	_
The state of the s	_
Charlesto .	_
CONTRACTOR CO.	_
Tray:	
manung i	-
1745	-
1745	_
Windows Committee of the Committee of th	_
manual contract of the contrac	-
Total States	_
Table 1	_
	_
Tanktop 1	-
1745	
Eurolg Virginia .	
the professional and the second	
ELECTRICAL PROPERTY.	_
Thomas to an	
Manage State 1	_
	_
Thematicularly 1	-
****	-
Fagination by 1	-
TADAS STREET	-
0000	_
Thursday Contract I	-
1745	_
CONTRACTOR VISION	_
CONTROL OF	
	_
TOWNS THE SAME	
****	
Carriering Amphibias	-
Tarristan .	_
anghies .	-
	-
NAME OF TAXABLE PARTY OF TAXABLE PARTY.	_

1745	
NOW THE REAL PROPERTY.	
TOP RESIDENCE TO	
THE PARTY OF THE P	-
The state of the s	-
THAT I	
Facilitie I	_
Para 1	-
Wallet S	-
Early Allegan (Control of	-
900	
1819116881	_
1810/8811	
District Control of the Control of t	_
CONTRACT CON	_
743	
ALIEU CARROLL CONTRACTOR CONTRACT	_
HISTORY.	_
accessor.	
	_
A CONTRACTOR OF THE PARTY OF TH	
COLUMN TO A STATE OF THE PARTY	_
THE PARTY OF THE P	_
1981777	_
The state of the s	
1749	
OTATION .	
CONTROL OF THE PROPERTY OF THE	_
	-
Appeared & Policy 1	-
Hara I	-
(Pigating)	
1945	
CONTRIBUTE T	
CHARLES .	
COLUMN TO SERVICE STATE OF THE	-
ym war and the	-
AND DESCRIPTION OF THE PARTY OF	
ARTICLE STATE OF THE STATE OF T	
Europe Product	
stripes/control.	-
The state of the s	-
CONTRACTOR PROPERTY.	-
receiling in	-
AND THE PERSON NAMED IN COLUMN TO SERVICE AND THE PERSON NAMED IN COLUMN	-
1745	-
CONTRACTOR OF THE PROPERTY.	-
THE PARTY AND THE PROPERTY OF THE PARTY OF T	
	•

Execution designs opposite to	
Burnalius (PRES Right STEERS FRANCE)	-
Buckey	-
EMILION GEORGE	
6745	
LEAVER STREET,	-
Emilian Services	-
***************************************	-
5745	
DOMESTIC PROPERTY.	-
Control Contro	-
Company Company	_
LABORATOR CO.	
MATERIAL STATE OF THE STATE OF	_
RECORD COMPANIES CONTROL	-
6745	
COLUMN STREET,	_
CHARLES WITH STREET	_
AFFECTAL TO SECURE	_
No.	_
THE PARTY OF THE P	_
CONTRACTOR OF THE PROPERTY OF	-
DESTRUCTION .	_
THE PERSON NAMED OF THE PERSON NAMED IN	_
THE STATE OF THE PARTY OF THE P	_
EUR COURTS	_
TORREST CONTROL STATE OF THE ST	_
Tomas and the second	_
Reported, Contract Co	-
CONTROL OF THE PROPERTY OF THE PARTY OF THE	_
Principality	
Total 6000000	_
Europe -	_
No. of Contract of	_
Particular de la constantina della constantina d	_
Partie state state and the sta	_
Research Company of the Company of t	_
5745	_
	_
Particular Concession of the C	_
TOT FERRE IN THE PERSON NAMED IN THE PERSON NA	_
STORY SHOWER A SHOW SHOWS	_
Extractive and a first annihing	_
National Communication (Communication Communication Commun	
COLUMN CONTRACTOR TO THE PROPERTY OF THE	
ESSENTIAL CONTRACTOR C	_
Paringing*pi.i.Pj.*	-
Technique Commence Constitution (1974)	-

Reduction of Control (Service)	
	-
Europeania error	-
CARL PORT -	-
an en operativant	
treating 4.4 artistance 4 eventure 1	
Maratina	
EDVIN AND STREET, STRE	
Control for Square San	
EU	
Continues Committees 1	_
map :	
nev :	_
000	
College Colleg	
The same of the sa	_
Palata	_
1745	
1741	
CHICAGO CALCO	-
RESERVICES 1	
Equipment of the control of the cont	_
RESIDENCE COLUMN TO	
RESIDENCE MANAGEMENT !	-
Exemples Adaptating 1	-
All harmonistanan -	
conjustative op-	
Total present Wateries	
111100000	-
Part and Control Physical Control Physic	-
POLICE CONTRACTOR OF THE PROPERTY OF THE PROPE	-
Racjump'systems:	-
Tata hati poratica i	-
REPER PROPERTY.	-
1946	
E-COPPERCIPATION CO.	-
ELECTRONIC VALUE OF THE PARTY O	
ELICOTONIO I	
ELITATION TO STATE OF THE PARTY	
FOREIGN CO.	
Earlies :	
STORY PARTY.	_

Paragraphy Community		
		_
Manufacturing States and 1	_	
eminance and an elementary		
National County	-	
Sam Charge and		
CONTRACTOR :		
Walter Sagnaria Caraci	-	
Tall Comparation	_	
CIT TIMES THE COUNTY OF THE CO		
Participant Ca.	-	
POSSESS CONTRACTOR		_
ELECTRONIC STREET	-	=
KIRKYONIA WIT		
ASSESS OF ASSESSED.		-
Principle of Company o	-	-
National Visited 1		-
00000		_
THE COUNTY I	-	-
Francis		-
No. No. of the last of the las	_	-
STATE OF		-
Rosper		-
Texts detti		-
Enthurs and .		-
SALUTA SA		-
18 YOUR PROPERTY.	_	-
	_	-
Pra Service III		-
DV-211511511111100Personalities		-
PORT SAID		-
Principles of the Control of the Con	_	-
EFTSHEET		
EPONESSES IN CO.		-
SAME AND PROPERTY.		-
AFTERNOON .	_	
PRODUCTO .	_	-
THE PERSON		-
111 5 111		-
TOW		-
EPSEIGNING C		-
THE COLUMN TWO IS NOT		
EPOLICIA DE LA CONTRACTOR DE LA CONTRACT	_	_
ENGLISHED TO THE PARTY OF THE P	_	-
RESIDENCE STATE OF THE STATE OF	_	-
Property Property	_	
May Copyright		
and Contracts	_	-

HV00pmanpermanusymment	-
Reproducting Colonia	
Report Frank Standards	_
Printed Section Control Section 1	_
DESCRIPTION OF THE PARTY OF THE	_
Mark .	_
THE PARTY NAMED IN COLUMN TWO IS NOT THE PARTY N	_
TORK THE PARTY OF	_
	_
Total Control Control	
	-
MILES W.	
***	
1000	-
11.11	
000	-
9000	
11011	_
STRUK :	_
	_
Em.	_
NAT.	_
5821	
0000	
00000	
1746	
ILOURISM.	-
THE COMPANY OF THE CONTRACT OF	
Energy Morrant	-
BOOK STREET, S	_
CONTRACTOR STATE OF THE STATE O	_
Turnania	
	_
WITHING THE SERVICE	_
errogene com equal :	
EXILITIZED TO THE PROPERTY OF	_
Party Season	
Terreno	
Production	-
Trains.	
New York Control of the Control of t	
NIL ST	
Final I	-
THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TW	
Participatives of the state of	-
NAME OF TAXABLE PARTY.	+
THE REAL PROPERTY AND ADDRESS OF THE PERSON	_
Paragraph	_
	_

III. III III.	_
Name Andreas Control	
	_
TOTAL	_
unigate :	-
many Manager I	
Change Sales	
TOTAL	-
	_
DISTRIBUTE SERVICE SER	_
Control of the Contro	
	_
WILLIAM .	_
CARL TORK	_
Mary Visite	-
	_
Maria Carange Maria	
MINISTRAL CO.	_
HEAT THE THE TOTAL	_
	_
Tangangan Kalungkan	
Tarrian State Control	
	_
and a superior of the superior	_
Partition of the Control of the Cont	-
Table Committee	_
Transaction Control of	_
NAME OF TAXABLE PARTY O	_
5011	
	_
artists.	_
W-1/104	_
Land By Chapter Sala	-
Control of the Contro	
	_
PRINT:	_
WHITE !	-
CONTRACT!	
THE COLUMN TWO IS NOT THE PERSON	_
Temperatry	
SEE SEE SEE SEE STANDARD SEE SEE SEE SEE SEE SEE SEE SEE SEE SE	-
utus Miljapotusi	1
ante e responserenti Sergana e e e e e e e e e e e e e e e e e e	
Application and the control of the c	
1749	-

TOTAL	
	-
1111	-
Brist Light	-
0000	-
LPENNESS.	
NHII.	-
CHICACOM CONTROL CONTR	_
1745	-
Patrick Company Valley Company	-
Environment Control (Section 1974)	
Printed and Company of the Company o	
Contract Contracting Contracting Contract	
PARTECULAR	-
1745	
Colonia de Caración de Caració	-
Contraction of Assert Asset 1	_
transparing the state of the st	-
Liston Vangenari 5 (6) 1	-
Education Confession	-
TANGER CONTRACTOR OF THE PARTY	
THE COST CLERKS IN THE	
CONTRACTOR	
Est Competed 1	-
Estational approximation of the control of the cont	-
ELYVER THE PROPERTY OF THE PERSON OF T	
THE COOL	_
Error Victoria	-
EUROPETON TANK MARKET PROTECT.	-
Environment suspens	-
Equipment Community (Control of Control	-
Control of the Contro	-
RAW THE RES	
CONTRACTOR THE CONTRACTOR OF T	_
DIARCAY SERVICE	-
Programma Vogazio Filippini	
1741	
1741	
Patricketts	-
Higher Collection Co.	
119an	
ELECTRICAL STREET	
Turning Kompaning	-
II/OOK	-
MACHINE.	
FIRST CONTRACT OF THE PROPERTY	
EU.	

Parenta :	
Partition	-
Carl County	
that except	-
POLIPHER THE CONTRACTOR OF	
Marie Constitution	
Table 1	
OOO CHILDREN INC.	-
HAVEE!	
ESSISTANCE:	
900	
THE PARTY OF THE P	
Economic Company	_
0000	
000	
DESCRIPTION OF THE PROPERTY OF	
1011	_
170000	
PERMIT	_
EIPHINE:	
Formonia I	-
•	
SUCCES.	
***************************************	
Europe Proposition (Control of Control of Co	
Enter Constitution	-
000000000000000	
THE RESIDENCE AND PARTY OF THE	-
THE CONTRACT OF THE PARTY OF TH	-
The state of the s	-
THE REPORT OF THE PARTY OF THE	
STORY COLORS OF STORY COLORS	
STORY COLORS OF STORY COLORS	
THE PROPERTY OF THE PROPERTY O	
The Section of Control	
The Section of Control	2 2 2 2 3 3 4 3 4 3 4 3 4 4 4 4 4 4 4 4
THE EXECUTION OF THE PROPERTY	2 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
THE STRENGTH OF THE STRENGTH O	2 2 2 3 3 3 4 3 4 3 3 3 3
THE EXECUTION OF THE PROPERTY	2 2 2 3 3 4 3 4 3 4 3 4 3 4 3 4 4 4 4 4
THE TEN PROPERTY OF THE TE	
THE EXECUTION OF THE STATE OF T	2 2 2 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 4
THE TABLE SHAPE AND AN EXCHANGE SHAPE SHAP	
THE TENNE OF THE THE TENNE OF T	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
THE TENNE OF THE THE TENNE OF T	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
THE TABLE SHAPE AND AN EXCHANGE SHAPE SHAP	

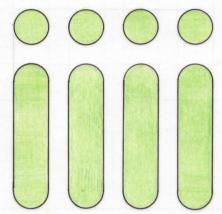
Contract and Contract	
Tribationing 1	-
RESERVED FROM ROOM AND ADDRESS OF THE PARTY	-
	-
CENTER OF THE PERSON NAMED IN COLUMN NAMED IN	
Charles to the printing of the country of the count	
Water Committee	
FOR Many Control to Ballion	-
1741	-
Polaria Portina de la California de la C	-
Parampooning on Associately 8	
	-
COCCOOCHUM (COCCOOCHUM (COCCOC	-
COOK THE PROPERTY OF THE PROPE	
Emile Print (State Control of Con	
manager (m)	
E-INCOMPRISONS -	
Registrative Company of the Company	
EPISE .	_
Epopulatus:	
TOTAL STREET	_
EMPLOYMENT	
ENGLISHED ENGLISHING TO THE REAL PROPERTY.	
RESIDENCE OF THE PROPERTY OF THE PERSON OF T	_
ESTATE CATALOGUES	
Million N. Marrison of The Control o	_
EUR PRODUCTION OF THE PROPERTY	_
Express :	-
EUROS CARLOS	-
OTTO STATE OF THE PARTY OF THE	_
	-
MUNICIPALITY:	
tings:	
Factorians	
Partitions	-
1725	-
Establish and the second secon	1
ET CIAL	
marking:	-
BOUNDS -	1
The second secon	-
KINDOLLING:	-
tuen.	
8715	
But Antonio Control of the State of Sta	
Partie V. Sangraph C. L.	

Engineer 1	-
TOTAL CO.	
Services :	
ransovapin .	-
1945	-
managers are assumed.	-
ESTATUTED SUSPENIORANIA	
Project Contract of the Contra	-
TIPTIESTINE:	_
1001	-
Harri .	
Tatalana Carpany	
National Value I	
ESTENDED I	-
Hampingson Corpora	
Teachtrie !	-
Barro Programa S	
Facilitie/Contages 1	_
1100000000	-
Edward departure	-
ETIPOLIS .	
1745	
EDUCATION COLUMN TO THE PARTY OF THE PARTY O	-
THE O'THE PERSON NAMED IN	-
THE RESERVE OF THE PERSON NAMED IN	-
an extensive contract	
THE STREET PROPERTY OF THE PERSON OF T	
THE WATER THE PARTY OF T	-
an extraoresidentime triani-	
THE CONTRACTOR OF THE PROPERTY	
*iniprate:	-
employeem and the second of th	-
annual designation of the second control of	
Employment of the Particular State of the Particular S	





# Green Building FM Specification







# Green Building Method Statement



https://GreenBuildingEncyclopaedia.uk



https://GreenBuildingCalculator.uk

tic canting possessions, storage and reinstatement upon completion: ¶

decanting necessary, possessions relocated onto deck as the work progresses ¶

Return to stock: full refund for returned to warehouse within 28 days (phone in advance 01483 600304 To

Decanting of occupants, temporary accommodation and returning to homes: Not required but keep rooms below clear of occupants in case of accide

Return to stock: but returned for returned to warehouse within 26 days (p) Officut take back. It a visible in the control of t

Offcuts: avoid obstructions, keep modular, avoid cutting:

• → Workmanship: \_\_\_/\_\_

© GBE NGS ASWS Brian Murphy aka BrianSpecMan +

• → Waste: / • → End of Life: \_\_/\_\_\_

### **GBE Method Statement**

### **GBE Method Statements**



**GBE** 



### Green Building Encyclopaedia

GBE Method Statements

Company: LoftZone¶
Address: 82 Coast Road, West Mersea, Colchester, Essex, CO5 8LS¶

Product: StoreFloor Manufacture: Made in the UK¶

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: 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: 5
- StoreFloar 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: 9

- · None, to enable handling through ceiling access hatch
- · → All parts premade to size but not preassembled Transport: by courier or collected 5

Palivery logistics: None offered by LoftZone 
Consolidation centers: None provided by LoftZone; delivery to your consolidation centre, optional

- → 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 t mm and 290 h x 75 w x 50-250 t mm 
   → Loft ladders: \_\_\_ I x \_\_\_ w x \_\_ h mm ¶
- → Thermal Insulation: Polyethylene wrapped rolls mineral fibre quilt
- → Flooring grade decking: Chipboard 1220 x 325 x 18 mm, 3 No. per pack

- → On pallets by forklift truck: \_\_\_kg (maximum weight)

  → Deck packs: manual handling: 15 kg 

  →
- StoreFloor Kits: In cardboard boxes: kg (maximum weight) → StoreFloor components: In cardboard boxes: \_\_\_ kg (maximum weight) =

0.0.0.0 

Sequence of assembly: 1

→ Decking boards

Equipment for installation:

→ None needed

Modification of protection: Not applicable 1

Warranty maintenance: None available Final removal of protection: Not applicable 75 datapoints

 - 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! → no limitations anticipated, 5 → 8 minutes to lay 2 m2, ¶
 → portable electric drill/screwdriver battery life ¶ → 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: T → Work from hatch and temporary landing platform, away from hatch towards extremity, assembling you progress, working from platform already created ¶ you progress, winking from paidorn areasy treated. 

If you progress from extremity 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. → Move aside occupant's belongings/possessions to enable creation of first area of StoreFlor → 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 Insity 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 insula Consider safety harnesses, "
 Risk Assessment: Co-ordinate with the Contractors CDM Risk Assessments and comply" Interdependence of trades: 5 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 T
Congested working: Only if electricians are not complete before commencing sequency by the minimise h
Methods of pre-assembly; Not applicable, to enable handling through ceiling attic hatch. T

→ 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

• → 17 04 04 • → 17 04 05 → zinc (galvanizing)

→ iron and steel (cross-beams)

□ ins ation materials containing asbestos \*\* oft insulation materials consisting of or containing DS\*\* insulation materials consisting of or containing DS\*\* satisfies materials other than those mentioned in 17 06 01 and 17 06 03 (thermal insulation) \*\* CASE CONTROLLOTION MATERIALS \*\* → 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 mention gypsum-based construction materials other than those mentioned in 17 08 01 (in case of Offering up: Not applicable T

Craning: not anticipated, use hoist and fork lift trolley for pallets · → Follow instruction manual or instruction video; ¶ Value Engineering Opportunities: ¶ → Multi-functional: ៕
 → Protects installation team and helps to avoid falls from height. → Previous trades, preparation, setting out, props, screws, beams, screws, decks, screws, poss 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 ceilin → 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

▼ Staff: StoreFloor is available via an installer network (Enquire by phone 01483 600304) Skills: StoreFloor is suitable for Do-it-yourself o → Creates its own work platform for extending the platform Lean Construction: → Screws 'Snay' Wood Screws 4 x 40 mm No. 8 x 1.5" countersunk head, and self-drill into steel 5. → All parts premade to size but not preassembled < · → Simple, easy to handle, fast to install, ¶ Specifications: → Products: / • → System: \_\_\_/\_\_\_ → String, chalk line or lazar and pencil® • + Portable battery drill/screwdriver with countersink and drill bits and spare battery on larger jobs 1 → Accessories: / → Installation:





# Green Building Readymade Elemental 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

https://GreenBuildingEncyclopaedia.ukFile Updates 4



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





https://GreenBuildingCalculator.uk

### © GBE GBC GRC 2012-2023

- Brian Murphy ONC HNC Construction BSc (Hons) PGDip (Dist) Architecture

   Technician and Architect by Training

   Specification Writer by Choice

  - Environmentalist by Actions
    Writer and Editor by necessity (Websites & Book parts)
    Educator by calling (CPD, University Lecturer & Studio Tutor)
    Number Cruncher by necessity (Calculators)

  - Tour guide for fun
- Greening up my act since 1999
  Founded National Green Specification 2001
- Funded and Launched www.greenspec.co.uk 2003 Created: GBE at https://GreenBuildingEncyclopaedia.uk 2015
- Launched: GBE Learning <a href="https://GBELearning.com">https://GBELearning.com</a> 2020
  Green Building Calculator <a href="https://GreenBuildingCalculator.uk">https://GreenBuildingCalculator.uk</a> 2020-2023
  Green Retrofit Calculator <a href="https://GreenBuildingCalculator.uk">https://GreenBuildingCalculator.uk</a> 2022-2023
- E BrianSpecMan@icloud.com
- Twitter: @BrianSpecMan http://twitter.com/brianspecman + /GreenBuild + /GBELearning
- LinkedIn Handle: BrianSpecMan-Murphy
- LinkedIn: https://uk.linkedin.com/pub/brianspecman-murphy/9/494/492/
- Facebook Handle: BrianSpecMan
- Facebook: http://www.facebook.com/brianspecman
- Pinterest: Brian Murphy GBE Green Building Encyclopaedia
- Instagram: https://www.instagram.com/brianmurphy1811/
- YouTube: Handle: BrianSpecMan Murphy
- YouTube Channel: https://www.voutube.com/channel/UCOKfss57bwNZeYhGYq30NKq