Let's talk about TWILIGHT Sustainable TALKS building.

Explore emerging topics in sustainable construction at our free and informal online discussions.

5-6PM MONDAY 13TH SEPTEMBER

Futuregrid: A discussion on the impact of electric vehicles on our infrastructure and lifestyles

5-6PM MONDAY 11TH OCTOBER

Franklin and

Green Building Calculator vs Carbon Terminator: A step-by-step guide to calculating and costing the embodied and in-use carbon load of your building

5-6PM MONDAY 8TH NOVEMBER

EnerPHit, the Passivhaus standard for retrofit: How it fits into the zero carbon agenda

REGISTER FREE AT WWW.GREENREGISTER.ORG.UK/EVENTS

WILIGHT TALKS ARE SUPPORTED BY ECOMERCIANT COMERCIANT







Green Building Calculator Vs Carbon Terminator?

Step by step guide to calculating and costing the embodied and in use carbon load of your building TGR Twilight Talk 5-6:30pm 11 Oct 2021



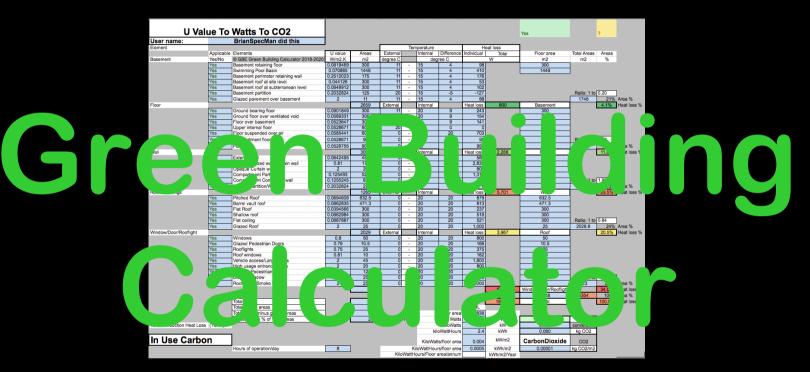


Welcome and Thank you

- So many of you: 100 No. capacity booked and a few more in reserve 113 total
- From UK
- From EU (so sorry)
- From International
- GBC Version 1 users
- GBC Version 2 preview
 - Some curious
 - Some challengers perhaps
 - Some prospects I hope
- And many familiar faces, lovely to see you all again







© NGS GBE GBC 2011-2021 BrianSpecMan Murphy GBC Number-Cruncher Version 2 launch 1st March @ FutureBuild 2022 Digital Arena Stand L68

GAME CHANGING EXHIBITORS



This Presentation on GBE:

- Find this file on GBE website at:
- https://GreenBuildingEncyclopaedia.uk/?p=40045
 - PDF Show: TGR Twilight Talk
 - Also find:
 - Full version of GBC CPD PDF (353 slides)
 - Links to all GBC related pages
 - Links to GBC website
 - <u>https://GreenBuildingCalculator.uk</u>



Green Building Calculator

https://GreenBuildingEncyclopaedia.uk

Programme

- x minute Polls scattered throughout
- 10 minutes intro to GBC V2 %%%
- 25 minutes tour of GBC V2 %%%
- 5 minutes demonstration of GBC V2 %
- 2 minutes case study in use
- 45 minutes Q&A including polls





Poll 1 State of the Industry

- Where do the construction industries problems lie?
 - Education & Training
 - Legislation & Interpretation
 - Clients & Briefing
 - Quantity Surveyors & Cost Planning
 - Procurement
 - Manufacturers, Suppliers & Product data & test evidence
 - Brexit (temporary or long term?)
 - COVID (temporary or persistent)
 - BREEAM & other EAM
 - Environment & Biodiversity Crisis & Declarations
 - Meeting RIBA Carbon Challenge
 - All or many of the above





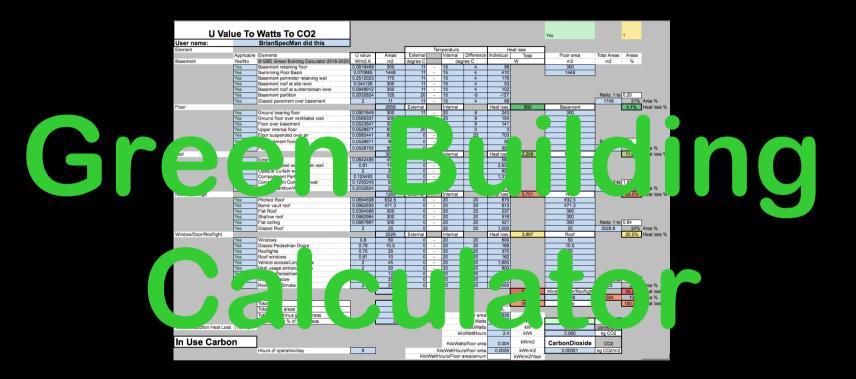
Poll 2: Who is out there?

What professions are in the audience?

- Clients, Client Bodies, Self-builders, Facilities managers, Property managers
- Architects and other design professionals including: Technicians, Surveyors, Engineers
- Quantity Surveyors, Cost Planners, Estimators, Buyers
- BREEAM etc. assessors, carbon counters, environmental advisors
- Manufacturers, Makers, Fabricators, Suppliers, Agents, Retailers,
- Constructors, Tradesmen, Artisans, Installers, Applicators, Subcontractors, Contractors
- Project managers
- Others







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





I am coming at this problem:

- As a(n):
- Technician and Architect by training
- Specification Writer by choice
- Side Line spectator with frustration
- Observer of projects going wrong:
 - Briefing battens dropped at each interchange
 - Because of cost plans and procurement
 - Lack of joined up management of it all
 - Loss of scrutiny of competency of anything





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



- 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 yourselves up or a fall
 - without a QS
 - Who 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 their construction or refurbishment methods
 - Help make better informed choices of materials or produc
 - Become carbon literate

- 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



- Know where a product was invented to be used
 - not risk its inappropriate application
 - 'Post-Grenfell function' Version 3
- Close the performance gap:
 - Energy now,
 - Airtightness, later
 - Fire, acoustics, indoor air quality, etc. later
 - Services design, lighting design, later
- Have access to competent elemental assembly datasets
 - 892 already for Version 3
 - For use in the absence of know-how to assemble their own
 - Choose from and adopt or adapt competently

- 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 Quantity Surveyors to:

• Become a useful part of procurement process

- 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







I want procurement to:

- Focus on the client expectations
 - No more novated designers without whistleblowing clauses
- Not focus 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 enough





I want manufacturers to:

- Make multi-functional materials, products and systems:
 - But avoiding composites and mixing natural with technical materials
 - To replace many singular function alternatives
 - That succeed in Value Engineering processes
 - Because they are difficult to substitute
- Make low impact materials and products
 - Not hide behind BRE GGtS Generic Materials Assessments
 - at industry sector level: aggregated average grey not green or violet
- Make their independently verified credible data available
 - as 'big open data' in 'consistent formats'
 - Readily interrogated by calculators with intelligent search functions
- Populate GBC Product Data Collection tables to create a single robust source and allow integration into GBC & bespoke Calculators
 - Or share NBS Source datasets
- 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 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 client





I am reminded to Be the change you want to see in the world

Mahatma Gandhi





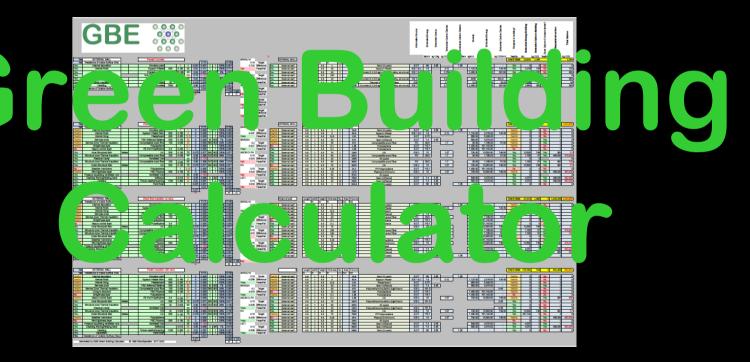




https://GreenBuildingCalculator.uk







Case study: International Timber Competition 28th May 2020

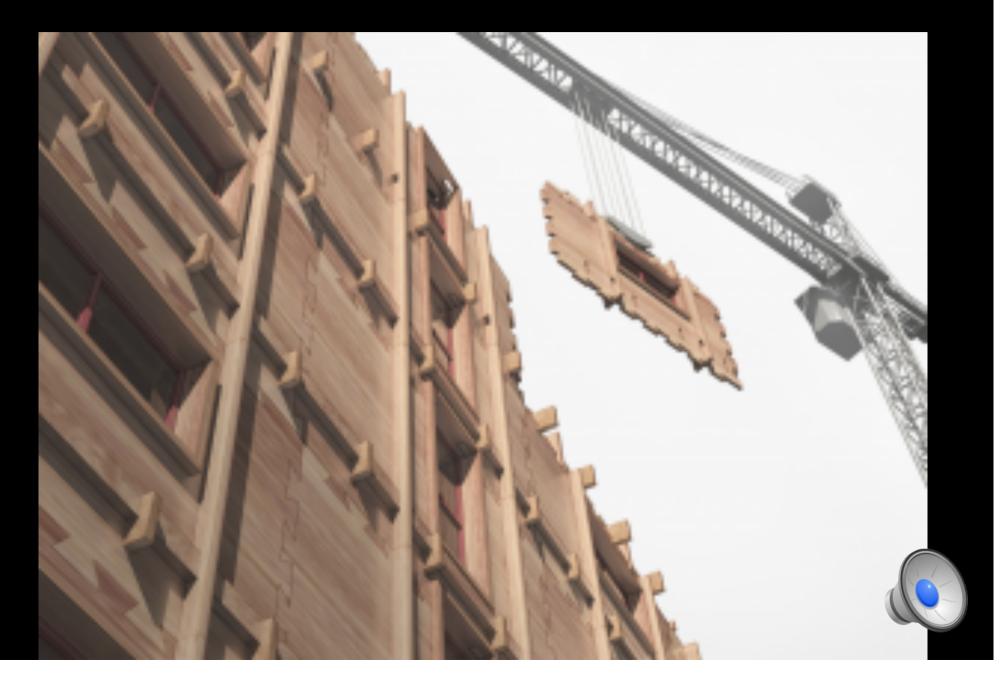




Design Review and Carbon Data

- Architectural Competition Entry
 - Metsa Timber Technology Competition 2020 Entry
- exStudent Samael Coco LSBU Post Graduate Architecture EREID Module
- Entry requires carbon data
 - Samael needed help
 - Called on GBC to provide it

Int. Timber Competition Entry









GBC prepared and provided:

- U value calculations with each insulation
 option
- In use Energy & Carbon comparisons:
 - Building Regulations AD L
 - AECB Carbon lite,
 - Passivhaus
 - LETI U values
- Embodied Energy, Embodied Carbon and Sequestered carbon
- before and after calculations

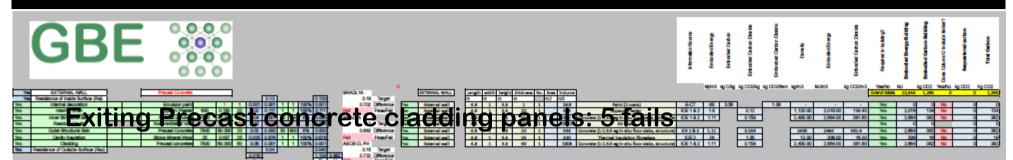
Elemental U values comparisons



Elemental Embodied Energy, Embodied Carbon and Sequestered Carbon

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Int. Timber Competition Entry



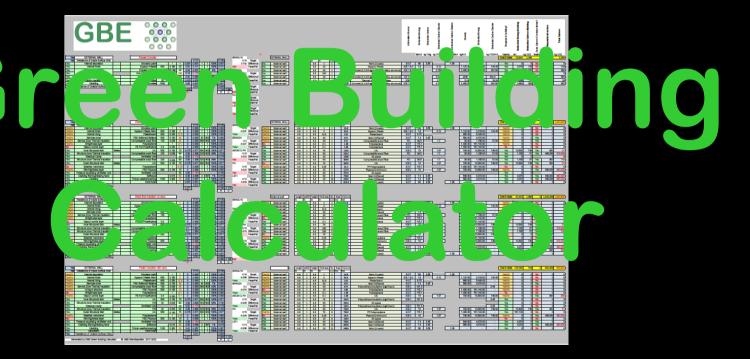
Elements > U values > Regs/Stds > Embodied Energy > Sequestered carbon

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1946	Resistance of Outside Surface (Rec)						0.04	0.0	C Fel	- Pa	IN FIL																						









Q&A A few Polls first







Poll 3: Your wants?

- What do you want in a MS Excel based Design & Decision Tool focused around carbon counting?
 - Blue sky thinking: no holes barred, no pebbles unturned
 - Write down as many as possible
 - Short phrases initials or acronyms if possible?
 - And ranking of most popular

Poll 4: Scope of Costs What would be useful to you soonest?

- Bill of Materials > Bill of Quantities
- Green Building Price Book within GBC
- Cost Planning function:
 - Record recent tender rates into look up table
 - Record Sub-contract quotes into cost plan
 - Build Cost
 - Prelims profits overheads and Fees
- Tendering
- In use fuel Cost
- Cost pay back
- Carbon pay back
- Value Engineering (Not cost cutting)

Poll 5: Scope of Calculations What would be useful to you?

- Areas, Volumes, Quantities & Weight calculations
- Form factor calculation
- Insulation thickness per U value calculations
- Analysis at levels:
 - Component
 - Element
 - Building
- U value Calculator
- Condensation check: Version 3or4
- Decrement Delay Overheating check: Version 2or3







GBE V2 In Detail Tour of GBC V2 (WIP Work in Progress)





V2 Singular/Multiple Switches

Autofiled	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	To be completed by GBC user
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Practice Name:	Over type with Practice name											Autofiled
Client Name:	Over type with Client name											Autofiled
Project name:	Over type with Project name									4 Nominal Room	2	Autofilled
	Over type with Project address											Autofiled
	Over type with Building User Activity	or Purpos	se									Autofilled
Project Brief Employer Req												
Whole Bu	ilding	No.	No.	m	m	m2	m	m3	Yes/No	Hours	Degrees C	
Building(s)	One or many Tall or short	Number of buildings	Number of floors	Length(s)	Width(s)	Floor Area Ceiling Area Roof Area	Room heights	Volumes	Confirm achieved in Design	Operation	Internal Temperature	
© GBE Green Building Ca	iculator 2011-2021	1 to 1000	1 to 50	1 to 1000	1 to 1000	1 to 1 million	2.4 to 10	1 to 10 million		1 to 24	-20 to +30'	
Whole Building	All rooms	1	4	10	6	240	2.5	600	m3 Yes	8	20	Multiple
Terrace(s)	One or many	Number of terraces	Number of units in terrace	Depth front to back in terrace	Party wall to party wall	Position of single unit in terrace	Number of party walls	Number of end walls	Confirm achieved in	Season (summer)	Winter	Choose
© GBE Green Building Ca	alculator 2011-2021	1 to 1000	1 to 100	1 to 25	1 to 10	N/A, End or Mid			Design No. Yes			AL ADA
	Other Geometry					17		1	NO. TES			Multiple
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on calar ocontexty	to be developed (prompted by the video vo)	J							All year	Swimming pool water Subsoil	10	Review
	Options	Drop Down List							Winter	Unheated Communal Space	10	Yes
Rooms v Multible Rooms	Schedule of Accommodation: Room Functions v Room by Room Heat losses	Singular	Schedule of Accommodation: Room Functions v Room by Room Heat losses	To be deploye	d, developed (elsewhere			Winter	Basement	15	Multible
Singular v Multiple sizes	When for example there are windows of a 'Singular' size or 'Multiple' sizes choose the appropriate item in the lists against each work section. They can be edited individually later.	Singular 🧹	Building Areas: Singular v Multiple Size Building Elements	To be deploye	d, developed (sisewhere			Winter	Other Unheated Spaces	6	Multible
Sub-Element v Components	Prices and performance may be available as whole sub- elements (windows or doors) or can be worked out to a chosen specification	Sub-element	ndows, doors, rooflights, glazing as sub-elements v components	Deployed and	developed els	ewhere e.g. Uva	alueToWattsTo	CO3	Winter	Winter outdoors	0	Multible
Components costs v Elemental Cost Analysis	Prices and performance may be available as whole sub- elements (windows or doors) or can be worked out to a chosen specification	Choose 🗸	emental/Component Bill of Materials v Elemental Cost Analysis	To be deploye	d and develop	ed elsewhere lat	er		Summer	Attic Loft	50	Multible
Seasons: Summer v Winter	Need to investigate the beuilding performance in winter with heating and summer overheating potential with/out cooling	Winter <	Summer v Winter analysis	To be deploye	d, developed (elsewhere						Choose
New Build v Refurb	To account for some components are existing, some are removed, replaced and others are new. Affects pricing and impacts	Pending	Pending Elemental/Components: New Build, Refurbishment, Reclaimed, Reused to be developed and deployed developed elsewhere									Choose
Generic Materials v Products	When assembling elements made of components choose between Generic materials, Products or Both	Pending Elemental Components: Materials v Products to be developed										Choose
Elements, Bespoke, Readymade	Engages Summary sheets with correct elments	Pending										
Domestic v Non-Domestic	Choose Structures MEP Services	Pending		to be develope	bd							Choose

V2+V12 Cell colour codes & symbols Excel and BIM

- Was on every page
- Now on it own page

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





V2 Schedule of Accommodation

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Pic Besent (m) Mean (m)			© GBE Green Building Calculator 2017-2021	1 to 1000	1 to 50	1 to 1000						1 to 24	-20 to
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MMM		Basement floor(s)	Room Subtotal										-
Nome Nome <th< td=""><td>Yes</td><td></td><td></td><td>1</td><td>1</td><td>10</td><td>6</td><td></td><td>2.5</td><td></td><td></td><td>8</td><td>1</td></th<>	Yes			1	1	10	6		2.5			8	1
NomeNomeNom				1	1								-
Participant of the second o				1	1	10			2.5	-		8	<u> </u>
short short <td< td=""><td></td><td></td><td>Operating theatre</td><td>1</td><td>1</td><td>10</td><td>5</td><td></td><td>2.5</td><td>-</td><td></td><td>8</td><td></td></td<>			Operating theatre	1	1	10	5		2.5	-		8	
negation			wc	1	1	10	5	50	2.5	-		8	
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hgron 1 <td>Yes</td> <td>Upper floor(s)</td> <td></td> <td>1</td> <td>1</td> <td>10</td> <td></td> <td></td> <td></td> <td>150</td> <td></td> <td></td> <td></td>	Yes	Upper floor(s)		1	1	10				150			
persing the service of the s													
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ker Garge Garge Componing Componing <td></td> <td></td> <td>wc</td> <td></td>			wc										
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Mppefand(s) Semiphical Semiphical </td <td></td>													
Yes Op Floor(s) under Roof(s) Mole tog floor 1 1 1 0 6 6 2.5 150 Befroon 1 1 1 5 10 50 2.5 6 8 0 8 8 8 8		Lippor floor(s)			1	,	10		2.3			0	-
Bedroom 1 1 5 10 50 2.5 6 8 1 Hay room 1 1 1 5 10 50 2.5 6 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 1 1 5 10 50 2.5 8 8 1 <td< td=""><td>Vac</td><td></td><td></td><td>1</td><td>1</td><td>10</td><td>6</td><td></td><td>2.5</td><td></td><td></td><td>8</td><td>—</td></td<>	Vac			1	1	10	6		2.5			8	—
Play room 1 1 5 00 50 2.5 8	10.5	Top Hoon(s) and a Noon(s)		1									
Operating theatre 1 1 5 10 50 2.5 6 WC 1 1 1 5 10 50 2.5 6 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>													
WC 1 1 5 10 50 2.5 Show Garge 1 1 5 10 50 2.5 8													
Shower 1 1 5 10 50 2.5 8 6 8 6 Garge 1 1 5 10 50 2.5 6 8 8			wc		_	-							
Garge 1 1 5 10 50 2.5 Storeroom 1 1 5 10 50 2.5 8 <td></td> <td></td> <td>Shower</td> <td></td>			Shower										
Kitchen 1 1 5 10 50 2.5 - 8 8			Garage	1	1	5	10		2.5	-		8	
			Storeroom	1	1	5	10	50	2.5	-		8	
Top Floor(s) Room Subtotal 400			Kitchen	1	1	5	10	50	2.5	-		8	
		Top Floor(s)	Room Subtotal					400		-			

V2 Roofs Parts

Roofs	Shapes	Which roof shape?	Roof Pitch	Ridge/Apex Height above eaves	Quantity	Width party wall to party wall	Length of roof surface front to back in terrace	Area	Total	Volume	Solar heat	gain duration to be overcome by decrement delay	Solar heat gain maximum temperature
		Yes/No	Degrees	m	No.	m	m	m2	m2	m3		11	50
	22 Flat Roof (FR)	Yes	8	0.25	1	6	10.00	60.02		7.50		11	~
	23 Shallow Roof (SR)					6	10.01	60.07		15.02		114	
	24 Pitched Roof (PR)					6	10.44	62.64		93.96		11	
	25 Barrel Vault Roof (BVR)				Ļ	6	9.43	56.56		133.32		11	50
	26 Domed Roof (DR)	Yes		3	1	6	9.43	84.83		56.56		11	50
	27 Hipped/Pyramid Roof (HPR)	Yes	35	3	1	6	10.44	62.64		93.96		11	50
_	28 Mono-Pitched Roof (MPR)	Yes	30	3	1	6	10.44	62.64		93.96		11	50
	29.1 Mansards Roof Flat (MR:F))	Yes	8	0.25	1	6	9.75	58.52	74	147.19		11	50
	29.2 Mansard Roof Vertical (MR:V)	Yes	80	2.5	1	6	2.51	15.07	14				
	33 Other Geometry Roof (OGR)	Yes	?	3	1	6	13	80.50		120.75		11	50
Dormers	Parts	Dormers or not?	Roof Pitch	Ridge/Apex Height above eaves	Quantity	Width party wall to party wall	Depth	Area					
		Yes/No	Degrees	m	No.	m	m	m2					
	30 Dormer Flat Roofs (DFR)	Yes	8		1	6	3.5	21				11	50
-	31 Dormer Side Wall (DSW)	Yes			2		3.5	18	_			11	50
	32 Dormer Window Wall (DWW)				1	6		15				11	50
Parapets	Positions	Parapets	Roof Pitch	Parapet height above roof	Quantity		Length of roof surface front to back in terrace	Area					
		Yes/No	Degrees	m	No.		m	m2					
	66 Eaves Parapet Walls (EPW)	Yes	35	0.6	30		12	2203.2					50
	67 Party Wall Parapet (PWP)	Yes	35	0.6	\neg Σ		20	1800					50
	68 End of terrace Gable Wall Parapet (GWP)	Yes	35				20	72					50
Overhangs	Positions	Overhangs	Roof Pitch	Dist of overhang	Quantity	Width party wall to party wall		Area					
		Yes/No	Degrees	m	No.	m		m2					
	Eaves overhang	Yes	30	0.3	6	7.8		14.04					
	Verge overhang	Yes	35	0.3	6		11.8	21.24					
Gable Walls	Positions	Gable wall	Roof Pitch	Ridge/Apex Height above eaves	Quantity		Length of roof surface front to back in terrace	Area					
		Yes/No	Degrees	m	No.		m	m2					
	Gable wall upper triangle (Roof)	Yes	35	3	6		20	180					
Party Walls	Positions	Party Wall	Roof Pitch	Ridge/Apex Height above eaves	Quantity		Length front to back of terrace	Area					
		Yes/No	Degrees	m	No.		m	m2					
	Party wall roof triangles	Yes	35	3	150		10	2250					
			Not used in calcs so far										

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

Future: Other Roof Geometry

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

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

User na	ame:		Multiple nis	Multiple					Auto-filled			
	t name:	Over ty with	ct na				ab					
	address:	Over type with Proj		155								
	g Facility Fuction/Use:	Over type with Buik			r Purnose							
				Activity 0	ruipose							
Project	Brief Employer Requirement		ai	1	1	1		1	1			
	Form Fact	or	No.	No.	m	m	m2	m	m3			
	Building(s)	Room Functions	Number of buildings	Number of floors	Length(s)	Width(s)	Floor Area Ceiling Area Roof Area	Room heights	Volumes			
	© GBE Green Building Calculator 2	011-2021	1 to 1000	1 to 50	1 to 1000	1 to 1000	1 to 1 million	2.4 to 10	1 to 10 million	1		
	Whole Building	All rooms	1	4	10	6	240	2.5	600	m3	Volume	
	Terrace(s)	One or many	Number of terraces	Number of units in terrace	s Depth front to back in terrace	Party wall to party wall	Position of single unit in terrace	Number of party walls	Number of end walls			
	© GBE Green Building Calculator		1 to 1000	1 to 100	1 to 25	1 to 10	N/A, End or Mid			1		
			3	51	10	6	End	1	1	No.		
			Number of buildings	Number of floors	Length(s)	Width(s)	Floor Area Ceiling Area Roof Area	Room heights]			
	External wall		1	4	80	48	1280	2.5				
	Ground floor footprint		1		10	6	60		•			
Groun	nd or upper Floor suspended over external air		NV of	Nug of	10	6	60			1		
		_	b gs			Width(s)	Roof Area	Roof height	Roof Volume			
		22 Flat Roof (FR)	1	1	10	6	60	0.25	0	m3		
		23 Shallow Roof (SR) 24 Pitched Roof (PR)	1	1	10	6	60 60	0.5	15 90	m3 m3		
		25 Barrel Vault Roof (BVR)		1	10	6	60	3	283	m3		
	Roof area, Roof shape and Attic volume	26 Domed Roof (DR)	ΠĘ	1	10	6	60	3	113	m3		
		27 Hipped/Pyramid Roof (HPR) 28 Mono-Pitched Roof (MPR)	1	1	10	6	60 60	3	45 90	m3 m3		
		29 Mansard Roof (MR)	1	1	10	6	60	0.25	14	m3		
		33 Other Geometry Roof (OGR)	1	1	10	6	60	3	121	m3	Used Laws	
			No.	Number of floors	Depth	Width	Floor/Roof Area	Height	Volume		Heat Loss Surface Area	
	Terraced House Rear Extension			1	5	3.5	17.5	2.5	43.75	m3	51 m2	
	Weather Porch Conservatory/Sun Space	-	ΗÈ	1	2	2	4	3	12 82.5	m3 m3	25 m2 73.5 m2	
	Bay window		1	1	1	3	3	2.5	7.5	m3	16.5 m2	
	Oriel Window (upper floor bay window)		1	1	1	3	3	2.5	7.5	m3	16.5 m2	
	28-30 Dormer roof/window		1	1	4	5.5	22	2	44	m3	37.5 m2	
	Heat Loss Surface Area	SA	1	1			1766	m2	797.25	m3	220 m2	
	Treated Floor Area	TFA	1	4	10	6	240	m2		•		
	Form Factor (FF) range	0	1	2	3	4	5	6	7	8	9 10	
	Form Factor (FF						8.28	Used by Zero Carbo				
	Target Form Factor FF	Typology/Shape ology Apartment Block or uniform term	208				FF <2	1	Target U values 0.2 to 0.15	Y/N N	Unit W/m2.K 4	
		Semi-detached or compact detac	ched houses				2 to 3	2	0.15 to 0.12	N	W/m2.K 3	
		Less compact detached houses o	r compact det	tached bungalows	1		3 to 4	3	0.12 to 0.10	N	W/m2.K 2	
		Complex shaped detached bung	alows				>4	4	<0.1	Y	W/m2.K 1	
	Passivhaus Heat Loss Factor (HLF)	0.7	1.1	1.5	2	2.4	2.8	3	3.3	3.7	4 4.5 No	n.
	Store ool insulation (mm)	70	110	150	200	240	280	300	330	370	400 450 mm	
	The second secon	0.54	0.35	0.25	0.19	0.16	0.14	0.13	0.12	0.10	0.10 0.0B U	
L	ightweight Expanded Sewage Aggregate	116	158	211	253	295	316	347	347	389	421 474 mg	n
					Rule of	thumb: Halve the heat los	s area, halve the insulation this	kness				
Surface to	Volume Ratio	0.6	1	1.5	2	2.5	3.5	5				
	Volume Ratio	SAV	This row		e at the moment, n		2.49			ssivhausUk	K columns in worksheet 'U	

Building Uv Envelop Elements	User name:	BrianSpecMan did this	Non-Uv Envelop Elements		
Buildings Use/Function	Over type with Bulk	Foot print: ding User Activity or Purpose	240	Ploon	4
External Writer low temperature Subsoll temperature	0	degrees C degrees C	Get local Met Office data for your site 1 m below ground constant 10 to 12 (UK)	-	
Internal Winter Temperature Communal Area Winter Temperature	20	degrees C degrees C	Replace with bespoke temperature 0 to 30 Replace with bespoke temperature 0 to 30	-	
Basement Winter Temperature Other Internal Temperatures	15	degrees C degrees C	Replace with bespoke temperature 0 to 30 Other parts of building at diff temp 0 to 30	-	
Hours of operation Storey helioht (default if consistent)	8	Hs.	0 to 247 2.5 to 10 You can add different heights later	1	
Basement (B)	- Marca	Marikin	Basement External Entrance Well (BEEW)	-	Machila
1 Basement Floor (BF) 2 Basement Perimeter Retaining Walls (BPRW)	Yes	Yes/No Yes/No	54 Basement External Entrance Well Retaining Pavement (BEEWRP) 55 Basement External Entrance Well Retaining Wall (BEEWRW)	Yes	Yes/No Yes/No
3 Basement External Wall (SEW) 5 Conservent Roof at Proceed (BRSL)	Yes	YesNo	56 Basement External Entrance Well Staincase (BEEWS) 26 Basement Entrance Well Party wal (BEEWPW)	Yes	Yes/No Yes/No
ATD. THREAT ATD. WAS KNOT (SRSTL) Here HOver Start Pay COP	Yes				
A Rest Are Dear Have Area and	Yes				Alena Yena Yena
Floor Over States (D. 31)	Vies Vies		1 MA VIE 21 Is AN Description (IC) - Back and best in the International Water and MA		Yes1 Yes1
10 Ground Floor Over Ventilated Void (GFOV) 11 Upper Floor (UF)	Yes	Yes/No Yes/No	63 Internal MEP Service Reser Wats (MSR N4 Internal LB Sheft Wats / 1597)	Yes	Yes/No Yes/No
12 Services Riser Upper Floor (SRUF)	Yes	Yes/No	Internal Start Rear Walk (SRW Outside Uv Envelop Building Elements (OUE)	Yes	YesNo
13 External Floor & Soffe (EFS) (over air) 14 Top Floor (TF)	Yes	Yes/No Yes/No	66 Eaves Parapet Walls (EPW)	Yes	Yes/No
Compartmentation (C)			67 Party Wall Parapet (PWP) 88 End of terrace Gable Wall Parapet (GWP)	Yes	Yes/No Yes/No
15 Party Floor (PF) 16 Party Wall (PW)	Yes Yes	Yes/No Yes/No	69 Chimneys/Chimney Breast (C/CB) 70 Attached Party Site Boundary Wall (APWBW)	Yes Yes	Yes/No Yes/No
17 Communal Compartment Ploors (CCP) 18 Communal Compartment Wall (CCW)	Yes Yes	Yes/No Yes/No	L 71 Party Wall Roof Triangle (FWRT) Secondary Elementa (SE)	Yes	Yes/No
19 Riser Concentrent Upper Floor (RCUF) Walls (W)	Yes	Yes/No	93 L30 Staircase Landro Wakwasa N Furniture Flatures Equipment (FFE)	Yes	YesNo
20 External Walls (EW) 21 Integral Unheated Space Wall (IUSW)	Yes Yes	Yes/No Yes/No	94 N10 Attic Eaves Furniture (AEF) 95 N10 Other Furniture (OF)	Yes	Yes/No Yes/No
Roofs (R) 22 Fist Roof (FR)	Yes	Yes/No	98 N11 Domestic Kitchen Fumiture (DKF) 97 N12 Catering Equipment (CE) (Non-Domestic)	Yes	Yes/No Yes/No
23 Shallow Roof (SR) 24 Pitched Roof (PR)	Yes	Yes/No Yes/No	28 N13 Sathroom Furnizae (SP1 P Building Fabric Sundrise	Yes	YesNo
26 Barrel Vault Roof (BVR) 26 Domed Roof (BVR) 26 Domed Roof (DR)	Yes	Yes/No Yes/No	59 P10 Sundry Insulation/Proofing work 100 P11 Foamed/Rison/Bead cavity wall insulation	Yes	Yes/No Yes/No
27 HppedPyramid Roof (HPR)	Yes	Yes/No	101 P12 Fire Stopping Systems	Yes	Yes/No Yes/No
28 Mono-Pitched Roof (MPR) 29 Mansard Roof (MR)	Yes	Yes/No	102 P14 Air/Wind Tightness Systems 103 P20 Untramed isolated Trime/Skinlings/Sundry Items	Yes Yes	Yes/No
30 Dormer Flat Roofs (DFR) 31 Dormer Side Wall (DSW)	Yes Yes	Yes/No Yes/No	104 P21 Ironmongery 105 P22 Sealart Joints	Yes Yes	Yes/No Yes/No
32 Dormer Window Wall (DWW) 33 Other Geometry Roof (OGR)	Yes Yes	Yes/No Yes/No	108 P23 Movement Joints (Non-domestic) 107 P30 Trenches/Pipeways/Pits for buried engineering services	Yes Yes	Yes/No Yes/No
Internal Callings (IC) 34 Flat Calling (FC)	Yes	Yes/No	108 P31 Holes/Chases/Covers/Supports for Services 109 P32 Services Painting (And Identification?)	Yes Yes	Yes/No Yes/No
35 Pitched Vault Celling (PVC) 36 Barrel Vault Celling (BVC)	Yes Yes	Yes/No Yes/No	110 P33 Pinths and Bund Systems 111 P39 Cable Pass Throughs (Non-Domestic)	Yes	Yes/No Yes/No
37 Domed Vault Celling (DVC) 38 Hipped/Pyramid Vault Celling (HPVC)	Yes	Yes/No Yes/No	Landscape (L) 112 Q10 Raised Beds	View	Yes/No
39 Mono-Pitch Vault Ceiling (MPVC)	Yes	Yes/No	113 O 10 Stains 114 O 10 Stains	Yes	Yes/No Yes/No
40 Mansed Vault Celling (MVC) 41 Other Geometry Celling (IOGC)	Yes	Yes/No	115 020 Drive	Yes	Yes/No
Giazino Windows Roofilohts/vents and Doors (G) 42 Windows (W)	Yes	Yes/No	116 Q20 Paths 117 Q20 Ramps	Yes Yes	Yes/No Yes/No
43 Glazed Pedestrian Doors (GPD) 44 Opeque Pedestrian Doors (OPD)	Yes	Yes/No Yes/No	118 Q30 Lawn 119 Q31 Soarders	Yes	Yes/No Yes/No
45 Large Wall Opening (UWO) 46 High Usage Entrance Door (HUED)	Yes Yes	Yes/No Yes/No	120 Q40 Fence and Gates 121 Q41 Railings and Gates	Yes Yes	Yes/No Yes/No
47 Display Window (DW) 48 Glazed External Walls (GEW)	Yes Yes	Yes/No Yes/No	122 Q51 Sports Equipment 123 Q53 Bat or Bird Accommodation	Yes Yes	Yes/No Yes/No
49 Opaque External Walls (OEW) 50 Glazed Roof (GR)	Yes	Yes/No Yes/No	124 Q55 Decking 125 Q55 Balcony & Independent Supports	Yes	Yes/No Yes/No
51 Rooflights (RL) 52 Roof Windows (RW)	Yes Yes	Yes/No Yes/No	126 Q80 Pond/Water Feature/Swimming Pond 127 Q70 Compositer and Wormeries	Yes	Yes/No Yes/No
53 Roof Ar & Smoke Verts (RASV) Foundations (F)	Yes	Yes/No	128 Q70 ProstRear Garden Bin/Sike/Delivery Store 129 Q70 Pergolas/Solar Shading & Independent Supports	Yes	Yes/No Yes/No
72 Brickwork Footings (BF) 73 Strip Foundation (SF)	Yes	Yes/No Yes/No	130 Q70 Rear Carden Shed 131 Q75 Retaining walts	Yes	Yes/No Yes/No
74 Foundation Wall (FW) (over strip foundation or trench foundation) 75 Trench III Foundation (TF)	Yes	Yes/No Yes/No	Demestic MEP Services (DMEPS) 132 J00 Besement Internal Drainage	Yes	YesNo
76 Sleeper Wall (SW) (below suspended ground floor)	Yes	Yes/No	133 R10 Rainwater Gutters Pipework	Yes	Yes/No
77 Raft Foundation Reinforced Concrete Stab, Edge & Internal Beams (RFRC) 78 Insulating Permanent Fortmack Raft Foundation (PFRF) 9 Rei Services Reinforced Raft Foundation (PFRF)	Yes Yes	Yes/No Yes/No	134 R11 Above ground chainage 135 R12 Below ground chainage	Yes Yes	Yes/No Yes/No
79 Pad foundation & columns (PF+C) 80 Pile foundation & Grounds beams (PFGB)	Yes Yes	Yes/No Yes/No	136 R14 Land Drainage 137 R15 Sustainable Urban Drainage System (SuDS)	Yes Yes	Yes/No Yes/No
	Yes	Yes/No	138 R91 Refuse Disposal System Domestic	Yes Yes	Yes/No Yes/No
81 Sheet Pile and Top Soffener (SPTS) 82 Vibrated Aggregate Pile (VAP)	Yes	Yes/No	139 S14 Intigation Systems		
81 Sheet Pile and Top Stifferer (SPTS) 82 Vibruted Aggregate Pile (VAP) 83 Steel Conkstew/Auger Pile (SCAP) 84 Disphragm will (DW)	Yies Yies Yies	Yes/No Yes/No Yes/No	139 S17 Reinwater Hervesting Systems 140 S90 Hot and Cold Water Domestic	Yes Yes	Yes/No Yes/No
82 Vibrated Aggregate Pile (VAP) 83 Steel Conkscrew(Auger Pile (SCAP)		Yes/No Yes/No Yes/No	120 S17 Rainwater Harvenfing Systems 140 S90 Hot and Cold Water Domestic 141 S91 Hot and Cold Water Domestic	Yes Yes	Yes/No Yes/No
82 Vitrated Aggregate Pile (VAP) 83 Steel Contextew(Auger Pile (SCAP) 84 Disphragm wall (CW)	Yes	Yes/No Yes/No	138 317 Natiwater Harvesting Systems 149 SBO Hard Cold Water Domestic 141 SBH Gas Supply Domestic 142 SB2 Spirkler System Domestic 143 3114 Ar Water Gound Source Heat Pumps	Yes Yes Yes	Yes/No Yes/No Yes/No Yes/No
CV Printed Aggregate Pile (VAP) State CrockwarkAgger Pile (SCAP) 45 Dagthragm wal (DVN) 65 Securct Pile Velki (SPMV) 60 Underprinting Teach (UT) 71 Underprinting Teach (UT)	Yes Yes Yes Yes	YiasNo YeaNo YeaNo YeaNo YeaNo YeaNo	190 B17 Rahvater Harvesting Systems 140 B30 that and Cold Water Domestic 141 B31 Can Supply Domestic 142 B32 Sprinker System Domestic 143 T14 Ak Water Count Source Heat Pumps 144 T16 Solar Collectors 144 T00 Telair Collectors	Yes Yes Yes Yes Yes	Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No
CV Vbrakel Aggregate Pile (VMP) State Conclusive/Aggre Pile (SCAP) State Conclusive/Aggre Pile (SCAP) Source Pile Vell (SPAV) Source Pile Vell (SPAV) State Conclusive Pile (SPAV) State Conclusive Pile (SPA) State Pile (SPA)	Yes Yes Yes Yes Yes Yes	YesNo YesNo YesNo YesNo YesNo YesNo YesNo YesNo	190 817 Rainwater Harvesting Systems 140 800 Harvestic 141 801 Gas Supply Domestic 142 802 Sprinker System Domestic 143 114 Ar Water Gound Source Heat Pumps 144 116 Solar Collectors 145 1104 Animity Gomestic 146 1104 Collectors 147 116 Solar Collectors 146 100 Ventilation Domestic 147 100 Demestic 147 100 Demestic	Yes Yes Yes Yes Yes Yes Yes	Yen/No Yen/No Yen/No Yen/No Yen/No Yen/No Yen/No
22 Vibraid Aggregate Pile (VMP) 25 Steel Cohorker(Agger Pile (SCAP) 45 Dispfragm well (DW) 45 Dispfragm well (DW) 26 Underpriving: Treat-6 (UT) 27 Underpriving: Treat-6 (UT) 28 Praines: Reams (Supporting from and flat rooth) 29 Praines: Pilat rooth/# Nove: Toogh Decke 39 Praines: Pilat rooth/# Nove: Toogh Decke 39 Praines: Pilat rooth/# Nove: Toogh Decke	Yes Yes Yes Yes Yes	Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No	190 S17 Rainwater Harvesting Systems 140 S00 Harvesting Domestic 141 S01 Gas Supply Domestic 142 S02 Sonther System Domestic 142 S02 Sonther System Domestic 144 S16 Sourd Source Heat Pumps 144 T16 Sourd Collectors 145 T00 Finating Domestic 145 T00 Finating Domestic 145 T00 Finating Domestic 146 T00 Ventation Domestic 147 VE0 Electrical Installation Domestic 148 VE1 Electrical Systems Landscape 149 WE0 Communication & Security Domestic	Yes Yes Yes Yes Yes Yes	Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No
22 Vibraid Aggregate Pile (VMP) 23 State CarcheverAgger Pile (SCAP) 34 Dightngm wal (DVN) 34 Dightngm wal (DVN) 36 Underpriving Teach (UT) 37 Or Lower State 39 Franse: Dearbar (State) 30 Frate) 30 Franse: Dearba	Yes Yes Yes Yes Yes Yes	Yes No Yes No Yes No Yes No Yes No Yes No Yes No Yes No Yes No	129 517 Halvwater Havvesting Systems 140 500 Hot and Cold Water Domestic 141 501 Gas Supply Domestic 142 502 Sprather System Domestic 143 174 Are Water Cound Sources Heat Pumps 144 176 Source States 144 176 Source States 144 176 Source States 145 1701 Heating Domestic 146 100 Heating Domestic 147 176 Source States 147 176 Sources 148 171 Exercical Systems Landscource 147 176 Sources	Yes Yes Yes Yes Yes Yes Yes Yes	Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No
22 Vibraid Aggregate Pile (VAP) 23 State CrackwarAgger Pile (VAP) 24 Daphragm wal (DVN) 24 Daphragm wal (DVN) 26 Underprinting Teach (UT) 27 Underprinting 27 Parases, Electron Pile (UP) 10 Dasserret Pileranter (UP) 10 Dasserret Pileranter (UP)	Yes Yes Yes Yes Yes Yes	Yean No Yean No Yean No Yean No Yean No Yean No Yean No Yean No Yean No Yean No	T93 517 Halrwater Harvesting Systems 140 530 Hu and Cold Water Domestic 144 530 Hu and Cold Water Domestic 142 532 Spraker System Domestic 143 517 Har Water Chourd Source Heat Pumps 144 116 Source Colorands 144 116 Source Colorands 145 117 Har Water Chourd Source Heat Pumps 144 116 Source Colorands 144 116 Source Colorands 145 117 Hutting Domestic 146 1100 Hutting Domestic 147 117 Source Colorands 148 118 Directional Pumps Landscape 148 118 Directional Pumps Landscape 148 119 Hutting Domestic 149 119 Exercial Systems Landscape 149 119 Exercial Systems Domestic	Yes Yes Yes Yes Yes Yes Yes Yes	Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No
82 Vibriotal Aggregate IPie (VMP) 83 Disploy Characterization (SCAP) 84 Disploy and (SCMP) 85 Disploy and (SCMP) 85 Disploy and (SCMP) 86 Underpriving Transfer (UT) 87 Underpriving Transfer (UT) 87 Underpriving Transfer (UT) 87 Indexer (SCMP) 87	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	Yess No	T93 517 Halrwater Harvesting Systems 140 530 Hu and Cold Water Domestic 144 530 Hu and Cold Water Domestic 142 532 Spraker System Domestic 143 517 Har Water Chourd Source Heat Pumps 144 116 Source Colorands 144 116 Source Colorands 145 117 Har Water Chourd Source Heat Pumps 144 116 Source Colorands 144 116 Source Colorands 145 117 Hutting Domestic 146 1100 Hutting Domestic 147 117 Source Colorands 148 118 Directional Pumps Landscape 148 118 Directional Pumps Landscape 148 119 Hutting Domestic 149 119 Exercial Systems Landscape 149 119 Exercial Systems Domestic	Visa Vies Vies Visa Visa Vies Vies Vies Vies Vies Vies	Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No
82 Vibraid Aggregate Pile (VMP) 83 Distain Concerning (SCAP) 84 Diaphragm wall (CVN) 85 Diaphragm wall (CVN) 85 Diaphragm wall (CVN) 86 Underpriving Transfer (UT) 87 Underpriving Transfer (UT) 87 Underpriving Transfer (UT) 80 Frainss: Color Diaphram (SCAP) 81 Diapersent Research (SCAP) 82 Groupe Frain Court Neel (SCAP) 83 Frains 84 Frains 85 Frains	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	Yess No.	129 317 Halvwater Harvesting Systems 140 330 Harvesting Alexandrometers 141 337 Gas Supply Domests 142 332 Sandrometers 143 317 Aar Water Cound Startes Heat Pumps 144 116 Sandrometers 144 116 Sandrometers 144 116 Sandrometers 145 110 Heating Domestic 146 100 Ventilison Domestic 147 116 Sandrometers 147 117 Sandrometers 148 110 Ventilison Domestic 147 117 Sandrometers 147 117 Sandrometers 147 117 Sandrometers 148 117 Dentation Domestic 147 117 Sandrometers 148 117 Dentation Domestic 149 118 Dentation Do	Vies Vies Vies Vies Vies Vies Vies Vies	YisanNo YisanNo YisanNo YisanNo YisanNo YisanNo YisanNo YisanNo YisanNo YisanNo YisanNo YisanNo YisanNo YisanNo YisanNo YisanNo
82 Vibraical Aggregate Pile (VAP) 84 Dispfragm wall (CVV) 84 Dispfragm wall (CVV) 85 Dispfragm wall (CVV) 85 Dispersive Pile (CV) 86 Underpriving Teach (UT) 87 Underpriving Teach (UT) 88 Underpriving Teach (UT) 89 Underpriving Teach (UT) 80 Underpriving Teach (UT	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	Yess No.	129 317 Halvwater Harvesting Systems 140 330 Harvesting Contention 141 331 Gas Supply Domestic 142 332 Supply Domestic 143 317 Aar Water Cound Startes Heat Pumps 144 116 Start Collectors 144 116 Start Collectors 145 100 Heating Domestic 146 100 Ventilizer Domestic 147 116 Start Collectors 148 117 Detentilizer Domestic 147 117 Start Collectors 148 120 Ventilizer Domestic 147 17 30 Electrical Traination Domestic 147 17 30 Control Systems Landscape 148 120 Ventilizer Domestic 149 120 Electrical Traination Domestic 149 120 Electrical Traination Domestic 148 120 Ventilizer Domestic 149 120 Electrical Traination Domestic <td>Ves Ves Ves Ves Ves Ves Ves Ves Ves Ves</td> <td>Yisa No Yisa No</td>	Ves Ves Ves Ves Ves Ves Ves Ves Ves Ves	Yisa No Yisa No
22 Vinited Aggregate Pile (VMP) 32 State CrockwerkAgger Pile (VMP) 48 Daghrung wall (DVN) 48 Daghrung Wall (DVN) 48 Daghrung Teach (UT) 47 Undershring Teach (UT) 48 Couse Teach (UT) 48 Couse Teach (UT) 48 Couse Teach (UT) 48 Couse Teach (UT)	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	Yean No	129 S17 Halvador Plavvading Dyttema 140 S80 Hold and Coll Water Domestic 141 S81 Gas Dapply Domestic 142 S82 Control Control Source Head Pumps 143 Tito Anting Domestic 144 TITO Hauting Domestic 145 Statistical Control Source Head Pumps 146 TITO Hauting Domestic 147 Statistical Control Source Head Pumps 148 LIO Vention Domestic 147 VID Electrical Putterina Landscape 148 LIO Vention Domestic 149 TID Lington Domestic 149 TID L	Vites Vites Vites Vites Vites Vites Vites Vites Vites Vites Vites Vites Vites Vites Vites Vites Vites	Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho Yesho
22 Vibraid Agregate Pie (VAP) 22 Vibraid Agregate Pie (VAP) 23 Vibraid Agregate Pie (VAP) 24 Diaphragm wall (CAP) 24 Diaphragm wall (CAP) 25 Jacot Pie Viel (CAP) 25 Vibraid (CAP) 25 Vibr	Yes Yes	Yean No	129 S17 Halvador Havvading Dyttema 140 S80 Hol and Coll Water Domestic 141 S81 Gas Dapply Domestic 142 S82 Control Tomestic 143 Tito Andre Colladora 144 TITO Hasting Domestic 145 S10 Hasting Domestic 146 S10 Hasting Domestic 147 S10 Hasting Domestic 148 VID Excitosi Domestic 147 VID Excitosi Domestic 147 VID Excitosi Domestic 147 VID Excitosi Domestic 148 VID Excitosi Domestic 147 VID Excitosi Domestic 148 VID Excitosi Domestic 149 VID Excitosi Ex	Ves Ves Ves Ves Ves Ves Ves Ves Ves Ves	YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo
82 Vibriold Aggregate Pie (VMP) 83 Steel Cockarve/Aggre Pie (SCAP) 84 Dispfragm wall (OW) 85 Secart File Well (SPW) 85 Dodgerving: Teach-(VT) 85 Presens: Resona Stephen Teach-(VT) 80 Presens: Pietrode Roch: Teach, Robert Teach-(VT) 80 Presens: Pietrode Roch: Teach, Robert Teach 80 Presens: Teach-(VT) 80 Presens: Disposed Roch: Teach, Robert Teach 80 Presens: Protocol Roch: Teach, Robert Teach, 80 Presens: Protocol Roch: Teach, 80 Presens: Protocol Roch: Teach, 80 Presens, Protocol Roch: Teach, 80 Presens, 80 Protocol Roch, 80 Presens, 80 Protocol Roch: Teach, 80 Presens, 80 Protocol Roch: 80 Presens, 80 Protocol Roch, 80 Presens, 80 Protocol, 80 Presens, 80 Protocol Roch, 80 Presens, 80 Protocol Roch, 80 Presens, 80 Protocol Roch, 80 Presens, 80 Protocol, 80 Presens, 80 Protocol, 80 Presens, 80 Protocol, 80 Proto	Vies Vies Vies Vies Vies Vies Vies Vies	Yean No. Yean No.	129 3317 Halvwater Havvesting Dystems 140 3387 of and Cold Water Domestic 141 3387 of and Cold Water Domestic 142 3312 Carlot Cold Boards 143 144 of 163 Carlot Domestic 144 1163 Carlot Cold Constraint 144 1163 Carlot Cold Constraint 145 1164 Carlot Cold Constraint 146 1101 Vestilion Domestic 147 1163 Carlot Constraint 148 1161 Constraint 147 1163 Cold Cold Constraint 148 1161 Cold Cold Constraint 148 1161 Cold Constraint Constitic 148 1161 Constraints and Constitic 149 1163 Constraints and Searce Treatmande 149 1164 Constition Boards 140 1164 Constition Boards 141 1164 Constition Boards 142 1164 Constition Boards 143 1164 Constition Boards 144 1164 Constition Boards	Viss Viss	YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo YessNo

V2 Building Element Areas

Outside Uv Envelop Building Elements (OUE)

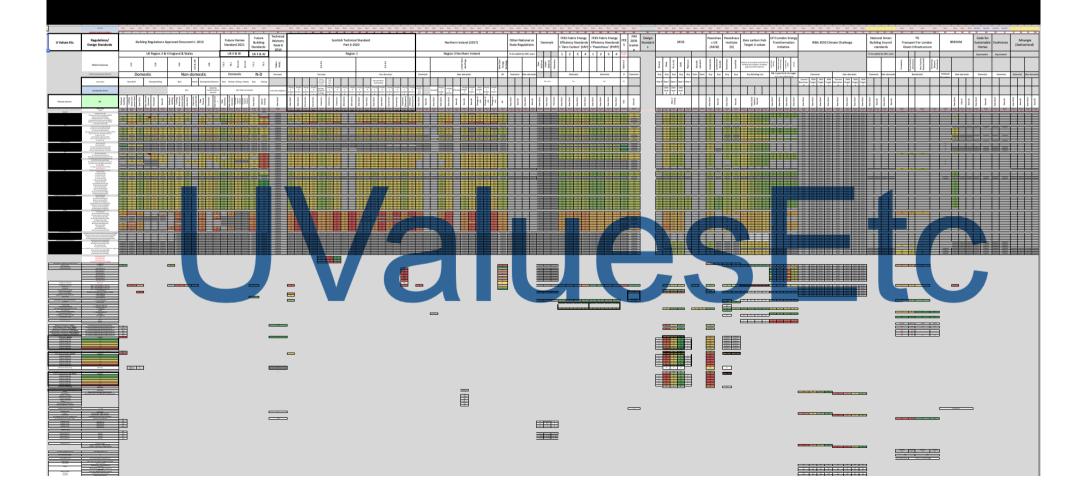
Yes						
	66 Eaves Parapet Walls (EPW)				Multiple	DropDownList
	Number of Eaves Parapet Walls	306	No.	Area of Eaves Parapet Wall	3.600	m2
	Thickness of Eaves Parapet Walls	0.215	m	Total Area of Eaves Parapet Walls	1,101.600	m2
	Length of Eaves Parapet Walls		m	Volume of Eaves Parapet Wall	0.774	m3
	Height of Eaves Parapet Walls	0.6	m	Total Volume of Eaves Parapet Walls	236.844	m3
Yes	67 Party Wall Parapet (PWP)				Multiple	DropDownList
	Number of Party Wall Parapets	153	No.	Area of Party Wall Parapet	6.000	m2
	Thickness of Party Wall Parapets	0.215	m	Total Area of Party Wall Parapet	918.000	m2
	Length of Party Wall Parapets	10	m	Volume of Party Wall Parapet	1.290	m3
	Height of Party Wall Parapets	0.6	m	Total Volume of Party Wall Parapet	197.370	m3
Yes	69 Chimneys/Chimney Breast (C/CB)				Multiple	DropDownList
	Number of Chimney/Chimney Brest (C/CB)	306	No.	Area of Chimney/Chimney Brest (C/CB)	16.875	m2
	Thickness of Chimney/Chimney Brest (C/CB)	Q.215	m	Total Area of Chimney/Chimney Brest (C/CB)	5,163.750	m2
	Length of Chimney/Chimney Brest (C/CB)	25	m	Volume of Chimney/Chimney Brest (C/CB)	3.628	m3
	Height of Chimney/Chimney Brest (C/CB)	.25	m	Total Volume of Chimney/Chimney Brest (C/CB)	1,110.206	m3
Yes	70 Attached Party Site Boundary Wall (APWBW)				Multiple	DropDownList
	Number of Attached Party Site Boundary Wall (APWBW)	2	No.	Area of Attached Party Site Boundary Wall (APWBW)	5.000	m2
	Thickness of Attached Party Site Boundary Wall (APWBW)	0.215	m	Total Attached Party Site Boundary Wall (APWBW)	10.000	m2
	Length of Attached Party Site Boundary Wall (APWBW)	5 1	m	Volume of Attached Party Site Boundary Wall (APWBW)	1.075	m3
	Height of Attached Party Site Boundary Wall (APWBW)		m	Total Volume of Attached Party Site Boundary Wall (APWBW)	2.150	m3
Yes	71 Party Wall Roof Triangle (PWRT)			· · · · · ·	Multiple	DropDownList
	Number of Party Wall Roof Triangle (PWRT)	2	No.	Area of Eaves Parapet Wall	10.000	m2
	Thickness of Party Wall Roof Triangle (PWRT)	1.215	m	Total Area of Eaves Parapet Walls	20.000	m2
	Length of Party Wall Roof Triangle (PWRT)	5	m	Volume of Eaves Parapet Wall	12.150	m3
	Height of Party Wall Roof Triangle (PWRT)	2	m	Total Volume of Eaves Parapet Walls	24.300	m3
	Foundations (F)					
Yes	72 Brickwork Footings (BF)				Muhole	DropDownList
Yes	72 Brickwork Footings (BF) Number of buildings with brick footings	153	No.	Cross Section Area of wall above brick footings (BF)	Multiple	DropDownList
Yes		153 0.215	No. m	Cross Section Area of wall above brick footings (BF) Cross Section Area of wall brick footings	Muhole	
Yes	Number of buildings with brick footings				0.921	m2
Yes	Number of buildings with brick footings Width of wall at top	0.215	m	Cross Section Area of wall brick footings		m2 m2
Yes	Number of buildings with brick footings Width of wall at top Width of brick foorings at base Length of brick footing (perimeter and internal loadbearing walls) Number of courses of brick footings	0.215 0.44	m m	Cross Section Area of wall brick footings Volume of wall above brick footings	0.921	m2 m2 m3
Yes	Number of buildings with brick footings Width of wall at top Width of brick foorings at base Length of brick footing (perimeter and internal loadbearing walls)	0.215 0.44 42	m m m	Cross Section Area of wall brick footings Volume of wall above brick footings Volume of wall brick footings	0.921 2.724	m2 m2 m3 m3
Yes	Number of buildings with brick footings Width of wall at top Width of brick foorings at base Length of brick footing (perimeter and internal loadbearing walls) Number of courses of brick footings	0.215 0.44 42 2	m m m No.	Cross Section Area of wall brick footings Volume of wall above brick footings Volume of wall brick footings Total Volume of wall above brick footings (BF)	0.921 2.724 140.890	m2 m2 m3 m3 m3 m3
	Number of buildings with brick footings Width of wall at top Width of brick foorings at base Length of brick footing (perimeter and internal loadbearing walls) Number of courses of brick footings Depth of brick footing	0.215 0.44 42 2	m m m No.	Cross Section Area of wall brick footings Volume of wall above brick footings Volume of wall brick footings Total Volume of wall above brick footings (BF)	0.921 2.724 140.890 416.743	m2 m2 m3 m3 m3 m3 m3
	Number of buildings with brick footings Width of wall at top Width of brick footings at base Length of brick footing (perimeter and internal loadbearing walls) Number of courses of brick footings Depth of brick footing 73 Strip Foundation (SF)	0.215 0.44 42 2	m m No. m	Cross Section Area of wall brick footings Volume of wall above brick footings Volume of wall brick footings Total Volume of wall above brick footings (BF) Total Volume of wall brick footings (BF)	0.921 2.724 140.890 416.743 Multiple	m2 m2 m3 m3 m3 m3 m3 DropDownList
	Number of buildings with brick footings Width of wail at top Width of brick foorings at base Length of brick footing (perimeter and internal loadbearing walls) Number of courses of brick footings Depth of brick footing 73 Strip Foundation (SF) Number of buildings with strip foundations	0.215 0.44 42 2 0.3	m m No. m	Cross Section Area of wall brick footings Volume of wall above brick footings Volume of wall brick footings Total Volume of wall above brick footings (BF) Total Volume of wall brick footings (BF) Cross Section Area of Strip Foundation (SF)	0.921 2.724 140.890 416.743 Multiple 0.135	m2 m2 m3 m3 m3 m3 m3 DropDownList m2
	Number of buildings with brick footings Width of wall at top Width of brick foorings at base Length of brick footing (perimeter and internal loadbearing walls) Number of courses of brick footings Depth of brick footing 73 Strip Foundation (SF) Number of strip foundations Thickness of strip foundation	0.215 0.44 42 2 0.3 1 0.225	m m No. m No. m	Cross Section Area of wall brick footings Volume of wall above brick footings Volume of wall brick footings Total Volume of wall brick footings (BF) Total Volume of wall brick footings (BF) Cross Section Area of Strip Foundation (SF) Volume of Strip foundation (SF)	0.921 2.724 140.890 416.743 Multiple 0.135 17.550	m2 m2 m3 m3 m3 m3 DropDownList m2 m3
	Number of buildings with brick footings Width of wall at top Width of brick footings at base Length of brick footing (perimeter and internal loadbearing walls) Number of courses of brick footings Depth of brick footing 73 Strip Foundation (SF) Number of strip foundation Length of strip foundation	0.215 0.44 42 2 0.3 1 0.225 130	m m No. m No. m Mo. m	Cross Section Area of wall brick footings Volume of wall above brick footings Volume of wall brick footings Total Volume of wall brick footings (BF) Total Volume of wall brick footings (BF) Cross Section Area of Strip Foundation (SF) Volume of Strip foundation (SF)	0.921 2.724 140.890 416.743 Multiple 0.135 17.550	m2 m2 m3 m3 m3 m3 DropDownList m2 m3
Yes	Number of buildings with brick footings Width of wall at top Width of brick footing (perimeter and internal loadbearing walls) Number of courses of brick footings Depth of brick tooting 73 Strip Foundation (SF) Number of buildings with strip foundations Thickness of strip foundation Length of strip foundation	0.215 0.44 42 2 0.3 1 0.225 130	m m No. m No. m Mo. m	Cross Section Area of wall brick footings Volume of wall above brick footings Volume of wall brick footings Total Volume of wall brick footings (BF) Total Volume of wall brick footings (BF) Cross Section Area of Strip Foundation (SF) Volume of Strip foundation (SF)	0.921 2.724 140.890 416.743 Multiple 0.135 17.550 17.550	m2 m3 m3 m3 DropDownList m2 m3 m3
Yes	Number of buildings with brick footings Width of wail at top Width of brick footing (perimeter and internal loadbearing walls) Length of brick footing (perimeter and internal loadbearing walls) Number of courses of brick footings Depth of brick footing 73 Strip Foundation (SF) Number of buildings with strip foundations Thickness of strip foundation Length of strip foundation Width of strip foundation Vidth of strip foundation Vidth of strip foundation Vidth of strip foundation Vidth of strip foundation	0.215 0.44 42 2 0.3 1 0.225 130	m m No. m No. m m m	Cross Section Area of wall brick footings Volume of wall above brick footings Volume of wall above brick footings Total Volume of wall above brick footings (BF) Total Volume of wall brick footings (BF) Cross Section Area of Strip Foundation (SF) Volume of Strip foundation (SF) Total Volume of Strip Foundation (SF)	0.921 2.724 140.890 416.743 Multiple 0.135 17.550 17.550 Singular	m2 m3 m3 m3 m3 DropDownList m2 m3 m3 DropDownList
Yes	Number of buildings with brick footings Width of wall at top Width of brick footings at base Length of brick footing (perimeter and internal loadbearing walls) Number of courses of brick footings Depth of brick footing 73 Strip Foundation (SF) Number of strip foundation Length of strip foundation Length of strip foundation Width of strip foundation Width of strip foundation Width of strip foundation Width of strip foundation Vidth of strip foundation Width of strip foundation Width of strip foundation Vidth of strip foundation Vidth of strip foundation Width of strip foundation	0.215 0.44 42 2 0.3 1 0.225 130 0.6	m m No. m No. m m m	Cross Section Area of wall brick footings Volume of wall above brick footings Volume of wall brick footings Total Volume of wall brick footings (BF) Cross Section Area of Strip Foundation (SF) Volume of Strip Foundation (SF) Total Volume of Strip Foundation (SF) Cross Section Area of Foundation (SF)	0.921 0.921 2.724 416.743 Multiple 0.135 17.550 17.550 5.50 0.045	m2 m3 m3 m3 DropDownList m2 m3 DropDownList m2





V2 U values Etc. Targets

Regulations, Public Consultations, Design Standards, Campaigns

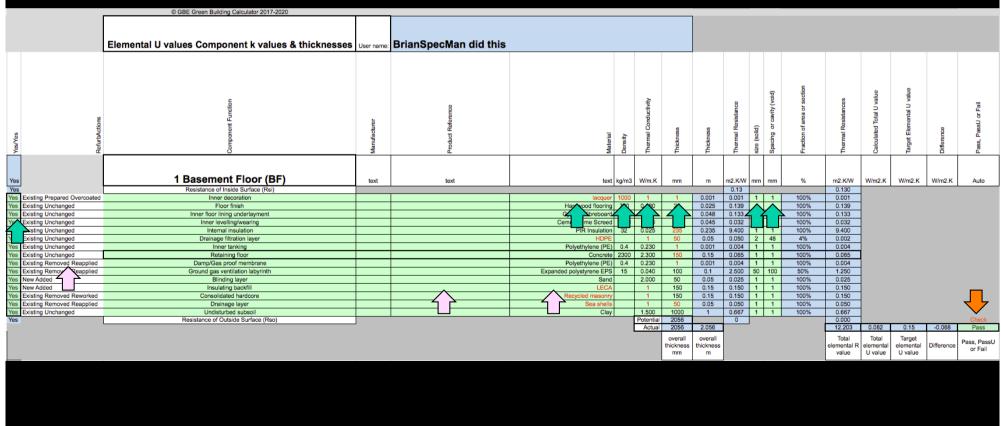


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		Material		Ö	5		às in	S S	Ö	ÖÖ	ŏ	ŠČ	s, L	Ö		₹ŏ		A¢	<u> </u>
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	k values	Worst	W/m.K	0.045	0.045	0.040	Don't	Don't	0.060	0.060	0.100			0.059	0.390	0.110	0.550	0.160	0.230
	k values	Best	W/m.K	0.031	0.031	0.031	Use	Use	0.037	0.039	0.100			0.059	0.270	0.110	0.550	0.160	0.120
	k values	Average	W/m.K	0.038	0.038	0.036	lt	lt	0.049	0.050	0.100	0.000	0.000	0.059	0.330	0.110	0.550	0.160	0.175
Floor Yes	© GBE Calculator 2018 Basement Floor	U values	W/m2.K W/m2.K	mm 253	mm	mm 237	mm		mm 323	mm 330	667	mm	mm	mm 393	2200	mm 733	3667	mm 1067	mm 1167
Yes	Swimming Pool Basin		W/m2.K	253	253 253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Upper floors (including ground floor over basement)	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes Yes	Ground floor over ground Ground floor over ventilated void		W/m2.K W/m2.K	253 253	253 253	237 237			323 323	330 330	667 667			393 393	2200	733	3667 3667	1067 1067	1167
Yes	Floor with underfloor heating	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes Yes	External floor over air Compartment Floor		W/m2.K W/m2.K	253 253	253 253	237 237			323 323	330 330	667 667			393 393	2200	733	3667 3667	1067	1167
Yes	Party Floor	0.15	W/m2.K	253	253				323	330	667			393	2200	733	3667	1067	1167
Walls Yes	Basement Perimeter Wall	0.00	W/m2.K	253	050	237			323	330	007			393	2200	700	0007	40.07	1167
Yes	Basement internal Wall/Partitions		W/m2.K	253	253 253	237			323	330	667 667			393	2200	733	3667	1067	1167
Yes	External wall	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
No No	External wall Insulated Cavity External wall Solid wall insulated (Int or Ext)		W/m2.K W/m2.K	253 253	253 253	237 237			323 323	330 330	667 667			393 393	2200	733 733	3667 3667	1067 1067	1167 1167
Yes	Internal partition/wall	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes Yes	Compartment Wall Party Wall		W/m2.K W/m2.K	127	127	118			162 162	165 165	333 333			197 197	1100	367 367	1833	533 533	583 583
No	Solid Wall	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
No No	Unfilled cavity unsealed edges Unfilled cavity sealed edges thermal breaks		W/m2.K W/m2.K	253 253	253 253	237 237			323 323	330 330	667 667			393 393	2200 2200	733 733	3667 3667	1067 1067	1167 1167
No	Filled cavity sealed edges thermal breaks		W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Roof	Roofs (includes opaque parts of dormers)	0.00	1	050	050	007			000	000	007			000	0000	700	0007	4007	
Yes Yes	Flat roof Shallow roof		W/m2.K W/m2.K	253 253	253 253	237 237			323 323	330 330	667 667			393 393	2200	733	3667	1067	1167 1167
Yes	Pitched roof (insulation at rafter)		W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes Yes	Loft ceiling (insulation at ceiling) Barrel Vault roof	0.45	W/m2.K W/m2.K	253 253	253 253	237 237			323 323	330 330	667 667			393 393	2200	733	3667 3667	1067 1067	1167 1167
Yes	Domed Roof	0.15	W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes Yes	Eaves overhang Verge overhang	Unregulated Unregulated	W/m2.K W/m2.K																
Yes	Basement roof at site level	0.15	W/m2.K		253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Basement roof at subterranean level		W/m2.K	253	253	237			323	330	667			393	2200	733	3667	1067	1167
Yes	Glazing (Maximum % of total area) Windows (whole window value)	0.00	% W/m2.K	40	40	37			51	52	105			62	347	116	579	168	184
Yes	Glazed Pedestrian Doors	0.95	W/m2.K	40	40	37			51	52	105			62	347	116	579	168	184
Yes Yes	Vehichle access and similar large doors High usage entrance doors		W/m2.K W/m2.K	51 51	51 51	47			65 65	66 66	133 133			79 79	440 440	147	733 733	213 213	233 233
Yes	Opaque Door	0.75	W/m2.K	51	51	47			65	66	133			79	440	147	733	213	233
Yes Yes	Rooflights Roof windows		W/m2.K W/m2.K		40 40	37 37			51 51	52 52	105 105			62 62	347 347	116 116	579 579	168 168	184
Yes	Roof ventilation including smoke vents	0.75	W/m2.K	51	51	47			65	66	133			79	440	147	733	213	233
Yes	Glazed mof	0.95	W/m2 K	40	40 alues Etc	37	ion Lo	gend	51 Elements	52	105	12 600	tc Parm?	62 Mate	347 rialCostT	116 hickness	579 Pavis	168	184 tesistances
	instructions / schedule	EAccommodation 7 Buil	ungarei	is ∡ UVi	arues Etc.	a insulat	lion / Le	gend 🖌	ciements	1 UTOW	atts i occ	12 A COS	usrerm2	A Mate	naicosti	nickness	A Revis	ions / R	esistances

V2 39 Elements U or R value 12 secondary element U/R values Refurb Actions

E	Elemental U values Component k values & thicknesses	User name:	BrianSpecMan did this													
E	Elemental U values Component k values & thicknesses	User name:	BrianSpecMan did this													
E	Elemental U values Component k values & thicknesses	User name:	BrianSpecMan did this													
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ous	L F	2				No			OSI	0 10	lan	GSI	0 D	Ē		SU
Act	ē	di la constante da la constante	<u>e</u>	-	~	alo	SS	SS	mal Re	(solid)	2	1	ă	<u>e</u>	90	as
urb	ě	ji ji		eri:	nsity	Ē	ş	동	Ë	s is	cti-	E	and and a	ac	20	92
Ref	ð	Ma	Ê	Mai	Der	Ĕ	Ē	Ē	Ĕ	Sne	- E	Ĕ	(B)	Ta.	1	Pas
	1 Basement Floor (BF)	text	text	text	ka/m3	W/m K	mm		m2 K/W		o %	m2 K/M	W/m2 K	W/m2 K	W/m2 K	Auto
		LOAL .	toxt	text	Ngrillo	Think (TO MALIX	VI/IIIZ.IX	TUTILE.IX	Auto
pared Overcoated				lacquer	1000	1	1	0.001		1 1	100%					
changed	Floor finish				700	0.180	25			1 1		0.139				
changed	Inner floor lining underlayment			Gypsum fibreboard		0.360	48	0.048		1 1	100%	0.133				
changed	Inner levelling/wearing					1.400	45			1 1	100%	0.032				
changed	Internal insulation				32		235	0.235				9.400				
changed																
changed																
noved Reapplied									2.500							
					<u> </u>											
						1										
changed	Undisturbed subsoil			Clay		1.500	1000	1				0.667				
	Resistance of Outside Surface (Rso)					Potential	2056		0			0.000				Check
						Actual	2056	2.056				12.203	0.082	0.15	-0.068	Pass
							overall	overall				Total	Total	Target		Pass, Pass
															Difference	or Fail
							mm	m				value	U value	U value		
sh sh sh sh no	anged anged anged anged anged anged anged anged vved Reapplied vved Reapplied vved Reworked vved Reapplied	anged Floor finish anged Inner floor lining underlayment anged Inner levelling/wearing anged Internal insulation anged Drainage filtration layer anged Inner tanking anged Retaining floor ved Reappiled Dam/Cas proof membrane wed Reappiled Ground gas ventilation labyrith Blinding layer Insulating backfill ved Reappiled Consolidated hardcore ved Reappiled Drainage layer anged Undisturbed subsoil	Resistance of Inside Surface (Rsi) arged Inner decoration anged Floor finish anged Inner floor lining underlayment anged Inner levelling/waaring anged Inner levelling/waaring anged Inter levelling/waaring anged Inter levelling/waaring anged Inter levelling/waaring anged Inter lawing floor anged Retaining floor anged Ground gas ventilation hayer anged Binding layer Binding layer Binding layer Insulation layer Consolidated hardcore ved Reapplied Consolidated hardcore Ved Reapplied Drainage layer anged Undisturbed subsoil	Resistance of Inside Surface (Rs) Inner decoration red Overcoated Inner decoration Inner decoration anged Floor finish Inner decoration anged Inner leveling/wearing Inner leveling/wearing anged Inner lawsing Inner leveling/wearing anged Inner lawsing Inner leveling/wearing anged Inner lawsing Inner leveling/wearing wed Reapplied Damp/Gas proof membrane Inner leveling/wearing ved Reapplied Ground gas vertilation labyrinth Inner leveling/wearing wear Reapplied Consolidated hardcore Inner leveling/wearing vead Reapplied Drainage layer Inner leveling/wearing wead Reapplied Drainage layer Inner leveling/wearing	Resistance of Inside Surface (Rsi) Iscauer ared Overcoated Inner decoration Iscauer arged Floor finish Hardwood flooring anged Inner leveling/wearing Cerment Lines Screed anged Inner leveling/wearing Cerment Lines Screed anged Inter leveling/wearing Playtimes (Reis) anged Inter leveling screed Playtimes (Reis) anged Inter lawing floor Polytelytimes (Reis) anged Retaining floor Concrete ved Reapplied Ground gas ventilation labyrith Expanded polystymes (PE) Blinding layer Istallaring backfill LECA ved Reapplied Consolidated hardcore Recycled masony ved Reapplied Drainage layer Sea shtilis ved Reapplied Drainage layer Sea shtit	2 3 5 6 Image: Image and the experiment of the experim	B B B B Image Im	Note Note Note Note Note Note Note Note Image Image Image Image Image Image Image Image Image Image	P B P	no no<	g g	g g	n n	no no<	j j	no no<

V2 39 Elements U or R value 12 secondary element U/R values Refurb Actions

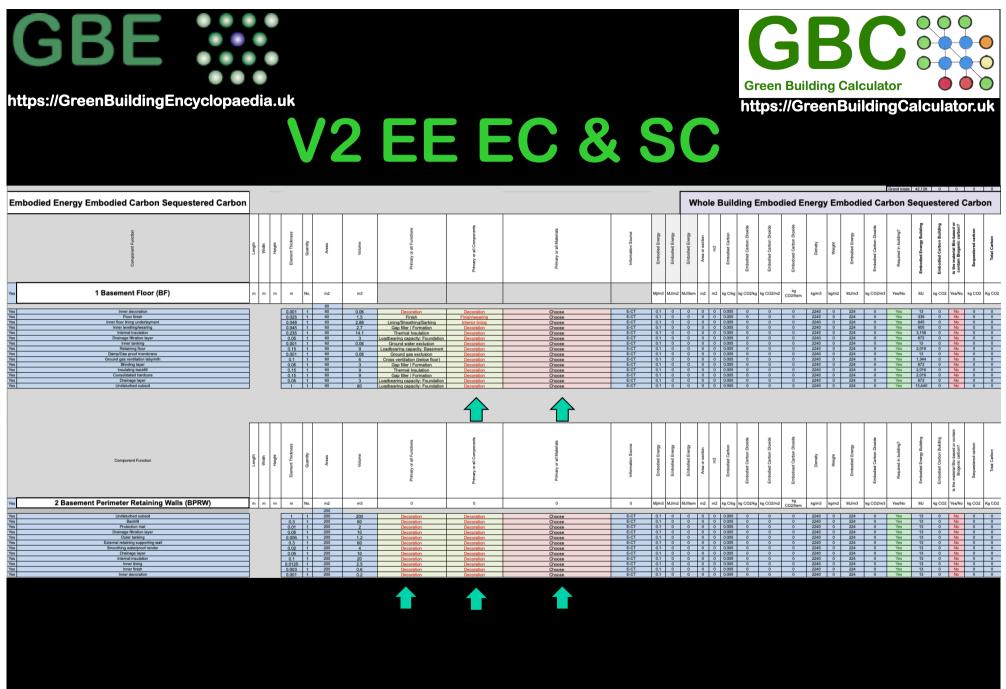






V2 Bill of Materials Quantities Labour Accessories Products Costs

	Bill of	Materia	Is Quantities	Cost	s						
	Component Fundion	Refurb Actions	Materia	Area GIFA	Labour rate	Labour Cost	Accessories rate	Accessories Cost	Products or Materials rate	Products or Materials Cost	Total Cost
Yes	1 Basement Floor (BF)			m2	£/m2	£	£/m2	£	£/m2	£	£
Mar	have describe			60	£1.00	000	£1.00		04.00	000	0400
Yes	Inner decoration Floor finish	New	lacquer Hardwood flooring	60 60	£1.00 £1.00	£60 £60	£1.00 £1.00	£60 £60	£1.00 £1.00	£60 £60	£180 £180
Yes	Inner floor lining underlayment	New	Gypsum fibreboard	60	£ 1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Inner levelling/wearing	New	Cement Lime Screed	60	K 🏹	£60		£60	┝┽╞╴	£60	£180
Yes	Internal insulation	New	PIR Insulation	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Drainage filtration layer	New	HDPE	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Inner tanking	New	Polyethylene (PE)	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Retaining floor	New	Concrete	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Damp/Gas proof membrane	New	Polyethylene (PE)	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Ground gas ventilation labyrinth	New	Expanded polystyrene EPS	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Blinding layer	New	Sand	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Insulating backfil	New	LECA	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Consolidated hardcore	New	Recycled masonry	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Drainage layer	New	Sea shells	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Undisturbed subsoil	New	Clay	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
				£45.00	£15	£900	£15	£900	£15	£900	£2,700
				2.10.00	2.10	2000	210	2.500	210	2000	Elemental
				Elemental	Elemental	Elemental	Elemental	Elemental	Elemental	Elemental	Cost:
				Cost/m2	Labour Rate/m2	Labour Cost	Accessories	Accessories	Material Rate/m2	Material	Materials
					Raterniz	Cost	rate/m2	Cost	Rateriniz	Costs	& Labour
										<u> </u>	



ICE 3.0 database carbon reporting options

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





V1 Resistances V2 no change

		Direction of heat f	ow	
	Upwards	Horizontal	Downwards	
inside resistance	0.10	0.13	0.17	
outside resistance	0.04	0.04	0.04	
				*These values should be used for the upper and
				lower surfaces of the underfloor space
underfloor space*	-	0.13	0.17	according to BS EN ISO 13370:1998
Below Ground Exterior Surface		0		
		BS EN ISO 6946		
	Roof	s, walls and expose	d floors	
	Air s	pace resistanes (m	2.K/W)	
		Direction of heat f	ow	
thichness of air spae	Upwards	Horizontal	Downwards	
0	0	0	0	
5	0.11	0.11	0.11	
7	0.13	0.13	0.13	
10	0.15	0.15	0.15	
15	0.16	0.17	0.17	
25	0.16	0.18	0.19	
50	0.16	0.18	0.21	
100	0.16	0.18	0.22	
300	0.16	0.18	0.23	
		BS EN ISO 6946		
	Scaling fact	ors for ceiling fixing	gs and wall ties	





V2 Conductivities

	Choose	Choose	Choose	Choose	Multiple	Multiple	Multiple							-		
			Gilddae	Choose	Muspie	muspie	nauspie			Note: If available, certified test values should be used in preference to				-		
0	Conductivities	© GBE Green Building Calculator 2011-2021								those in this table				4		4
CAWS	Element	Component	Primary Function	Generic Material/Product	Manufacturer	Product Reference	Product Code	Initials	Format	Common Building Materials	Density p	Thermal Conductivity λ	Thickness	5 Thickness	Resistivity	U value
0	Wall/Floor/Roof/Etc.	Position/Application	Insulation/Structure/VCL/BM		Company name	Product Name	Model No.	Individual codes	Quilt/Batt/Foam/Board/Block/etc.	Wood fibre/Sheep's wool/Fired clay/straw board/etc.	kg/m ^a	W/m.K	mm	m	m2.K/W	W/m2.K
	Choose from Drop Down List	Choose from Drop Down List	Choose from Drop Down List	Choose from Drop Down List	Type information below										L	
K10	20 External Walls (EW) 20 External Walls (EW)	Choose	Choose	Sector Generic material	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable		Boards	Gypsum plasterboard	900	0.250	12.5	0.0125	#REF1	#REF!
K10	20 External Walls (EW) 20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Boards/Linings	Gypsum plasterboard	900	0.160	12.5		#REF!	
K13 F10	20 External Walls (EW) 20 External Walls (EW)	Outer leaf	Structure	Sector Generic material Sector Generic material	Not applicable	Not applicable	Not applicable		Boards/Linings/Patrass Brick/Wall	Gypsum fibre reinforced board Brickwork (outer leaf)	1700	0.360	12.5		#REF!	
F10	20 External Walls (EW) 20 External Walls (EW)	Outer leaf	Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Brick/Wall	Brickwork (outer leaf) Brickwork (inner leaf)	1700	0.560	102		#REF!	
F10	20 External Walls (EW)	Cow ha	Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Block/Wall	Concrete block (medium density)	1400	0.570	102		#REF!	
F10	20 External Walls (EW)		Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Block/Wall	Concrete block (low density)	600	0.180	100		#REF!	
F10	20 External Walls (EW)	Inner leaf	Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Block/Wall	Concrete (medium density) (inner leaf)	1800	1.130	100	0.1	#REF!	#REF!
F10	20 External Walls (EW)	Inner leaf	Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Block/Wall	Concrete (medium density) (inner leaf)	2000	1.330	100		#REF!	#REF!
F10	20 External Walls (EW)	Inner leaf	Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Block/Wall	Concrete (medium density) (inner leaf)	2200	1.590	100	0.1	#REF!	#REF!
E10	20 External Walls (EW)		Structure	Sector Generic material	Not applicable	Not applicable	Not applicable		Insitu cast	Concrete (high density)	2400	1.930	600	0.6	#REF!	#REF!
E10	20 External Walls (EW) 20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Insitu cast	Reinforced concrete (1% steel)	2300	2.300	300	0.3	#REF!	#REF!
E10	20 External Walls (EW) 20 External Walls (EW)			Sector Generic material	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable		Insitu cast	Reinforced concrete (2% steel)	2400	2.500	300	0.3		#REF!
Z21 Z21	20 External Walls (EW) 20 External Walls (EW)	inner leaf mortar bedding inner leaf mortar bedding		Sector Generic material Sector Generic material	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable		Joints Joints	Mortar (protected) (inner leaf)	1750	0.880	100	0.1	#REF!	#REF!
Z21 M20	20 External Walls (EW) 20 External Walls (EW)	inner lear monar beoding		Sector Generic material	Not applicable	Not applicable	Not applicable		Plaster coat	Mortar (exposed) (outer leaf)	600	0.940	100		#REF!	
M20	20 External Walls (EW) 20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Plaster coat	Gypsum lightweight Gypsum (medium density)	900	0.300	13		#REF!	
M20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Plaster coat	Gypsum (medulin dense)	1200	0.430	13		#REF!	
F20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Blocks/Stones/Slabs/Tiles/	Sandstone	2600	2.300	100	0.1	#REF!	#REF!
F20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Blocks/Stones/Slabs/Tiles/	Limestone, soft	1800	1.100	100	0.1	#REF!	#REF!
F20	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Blocks/Stones/Slabs/Tiles/	Limestone, hard	2200	1.700	100	0.1	#REF!	#REF!
P10	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Boards/Insulation	Fibreboard	400	0.100	10	0.01	#REF!	#REF!
K10	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Boards/Linings	Plasterboard	900	0.250	12.5	0.0125	#REF!	#REF!
K10	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Boards/Linings	Plasterboard foil faced	900	0.250	12.5		#REF!	#REF!
M40	20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Tiles	Tiles ceramic	2300	1.300	5		#REF!	#REF!
G20	20 External Walls (EW) 20 External Walls (EW)			Sector Generic material	Not applicable	Not applicable	Not applicable		Timber sections	Timber (softwood)	500	0.130	150		#REF!	
G20				Sector Generic material	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable		Timber sections	Timber (softwood)	700	0.180	150	0.15		#REF!
G20 G20	Floors			Sector Generic material Sector Generic material	Not applicable	Not applicable	Not applicable		Timber sections	Hardwood timber softwood timber	700	0.180	25 18	0.025	#REF!	#REF!
G20 G20	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Timber sections Timber sections	softwood timber	1000	0.130	18		#REFI	
K11	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Panels	Softwood plywood	500	0.130	18		WREF!	
K11	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Panels	Softwood plywood	1000	0.240	18	0.018		#REF!
K11	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Panels	softwood chipboard	500	0.130	18	0.018	#REF!	#REF!
K11	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Panels	softwood chipboard	1000	0.240	18	0.018	#REF!	#REF!
G10	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable			Stoel	7800	50.000	5	0.005	#REF!	#REF!
Z113	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid sheet	Stainless steel	7900	17.000	1	0.001	#REF1	#REF!
M20	Walls			Sector Generic material	Not applicable	Not applicable	Not applicable		External render	External rendering	1300	0.570	19		#REF!	
M20	Walls			Sector Generic material	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable		Internal plaster	Plaster (dense)	1300	0.570	19		#REF!	
M20 E10	Walls Walls			Sector Generic material	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable		Internal plaster	Plaster (lightweight)	600 2300	2.300	12 300		#REF! #REF!	
E10	Walls			Sector Generic material Sector Generic material	Not applicable	Not applicable	Not applicable	RC	Insitu	Reinforced concrete (1% steel) Reinforced concrete (2% steel)	2300	2.500	300		#REF!	#REF1
E10	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable	ACS	Slab	Aerated concrete slab	500	0.160	150		#REF!	#REF!
J21	Roofs/Floor/Tanking			Sector Generic material	Not applicable	Not applicable	Not applicable	A.	Coating	Asphatt	2100	0.700	20		#REF!	#REF!
J	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable	~	Flexible membrane	Felt/bitumen layers	1100	0.230	7		#REF!	#REF!
M10	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable		Levelling Screed/Wearing surface/Structural Topping	Screed	1200	0.410	25	0.025	WREFI	#REF!
Q23	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable		Loose gravel	Stone chippings	2000	2.000	10	0.01	#REF!	#REF!
H6	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid overlap tiles	Tiles (clay)	2000	1.000	6		#REF!	#REF!
0	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid overlap tiles	Tiles (concrete)	2100	1.500	10		#REF!	
	Roofs			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid slab	Wood wool slab	500	0.100	50	0.05		#REF!
E10	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Cast insitu	Cast concrete	2000	1.350	300	0.3	#REF!	#REF!
E10	Floors			Sector Generic material Sector Generic material	Not applicable	Not applicable	Not applicable		Cast insitu	Reinforced concrete (1% steel)	2300	2.300	300	0.3	#REF!	#REF!
E10	Floors			Sector Generic material Sector Generic material	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable		Cast insitu Rigid sheet	Reinforced concrete (2% steel) Metal tray (steel)	2400	2.500	300	0.3	#REF!	WREFT HDCCI
M10	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Levelling Screed/Wearing surface/Structural Topping		1200	0.410	45		#REF!	
G20	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid sections	Hardwood timber	700	0.180	25		#REF!	
G20	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid sections	softwood timber	500	0.130	18		#REF!	
G20	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid sections	softwood timber	1000	0.240	18		#REF!	
K11	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Sheet	softwood phywood	500	0.130	18		#REF!	#REF!
K11	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Sheet	softwood plywood	1000	0.240	18	0.018	#REF!	#REF1
K11	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Sheet	softwood chipboard	500	0.130	18	0.018		#REF!
K11	Floors			Sector Generic material	Not applicable	Not applicable	Not applicable		Rigid Sheet	softwood chipboard	1000	0.240	18	0.018		#REF!
P10	Thermal or acoustic Insulation		Insulating	Sector Generic material	Not applicable	Not applicable	Not applicable		Board	Expanded polystyrene (EPS) board	15	0.040	400		#REF!	
P10	Thermal or acoustic Insulation		Insulating	Sector Generic material	Not applicable	Not applicable	Not applicable		Quilt	Mineral wool quilt	12	0.042	420	0.42		#REF!
P10	Thermal or acoustic Insulation		Insulating	Sector Generic material	Not applicable	Not applicable	Not applicable		Batt	Mineral wool batt	25	0.038	380		#REF!	#REF!
P10 P10	Thermal or acoustic Insulation		Insulating	Sector Generic material Sector Generic material	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable		Boards, Foam Boards, Foam	Phenolic foam board Phenolic foam board	30 35	0.025	250		#REF!	#REF!
P10	Thermal or accuratic Insulation		Insulating	Sector Generic material		Not applicable			Boards, Foam	Prinenolic toam board	35	0.025				
200	a constant of all parts instanting											- V / V /				





V1 Properties of Products

Products		© GBE Calculator 2018-2020																	
CAWS+	Elements	Companent/Function	Format	Supplier	Manufacturer	Product Reference	Material	Density	Thermal Conductivity	Thickness	Thickness	Thermal resistance	Width or thickness (solid) Spacing or cavity (Void)	Fraction of area or section	Thermal resistance	U value on own	Source	Source	Year Updated
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre		0.042	50	0.05	1.190	1 1	100%	1.190	0.840	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre	180	0.042	60	0.06	1.429	1 1	100%	1.429	0.700	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre	180				1.905	1 1	100%	1.905	0.525	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre		0.042	100	0.1	2.381	1 1	100%	2.381	0.420	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Board	Ecological Building Systems	Gutex	Multitherm	Wood Fibre	140		40	0.04	1.000	1 1	100%	1.000	1.000	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Board	Ecological Building Systems	Gutex	Multitherm	Wood Fibre	140		60	0.06	1.500	1 1	100%	1.500	0.667	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Board	Ecological Building Systems	Gutex	Multitherm	Wood Fibre	140	0.040	80	0.08	2.000	1 1	100%	2.000	0.500	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	- <u>-</u> <u>-</u> <u>-</u>	0.039	20	0.02	0.513	1 1	100%		1.950	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre		~3 9	40	0.04	1.026	1 1	100%		0.975	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	130		60	0.06	1.538	1 1	100%		0.650	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	130		N.	0.08	2.051	1 1	100%		0.488	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	130	0.039	00		2.564	1 1	100%	2.564	0.390	EBS 2018	Supplier	2018 24/05/202
P10	Flat roof	Insulation	Board and bonded insulation	Direct from Manufacturer	Kingspan	Thermaroof TR31	6 mm ply and 120 Insulation			TZ0.0		#DIV/0!	$\sqrt{1}$	100%	#DIV/0!	#DIV/0!	LSBU EREID 2017	manufacturer	r 2017 24/05/202
P10	Flat roof	Insulation	Rigid Board insulation	Direct from Manufacturer	Kingspan	Thermapitch TP10			0.022			2.72727272727	<u>1</u>	100%	2.72727272727	0.367	LSBU EREID 2017	manufacturer	r 2017 24/05/202
P10			Rigid Board insulation	Direct from Manufacturer	Kingspan	Thermapitch TP10			0.042			0.952380952		100%			LSBU EREID 2017		r 2017 24/05/202
P10	External wall	Thermal insulation		Direct from Manufacturer	Kooltherm	Rigid Insulation			0.018	100.0		5.55555556	14	100%			LSBU EREID 2017	manufacturer	r 2017 24/05/202
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	220		5.789473684	1	100%	5.789473684	0.173	LSBU EREID 2017	manufacturer	r 2017 24/05/202
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	200	0.2	5.263157895	1 1	100%	5.263157895	0.190	LSBU EREID 2017		r 2017 24/05/202
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	30	0.03	0.789473684	2 2				LSBU EREID 2017		r 2017 24/05/202
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	100	0.1	2.631578947	2 2		2.631578947	0.380	LSBU EREID 2017		r 2017 24/05/202
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool		0.039	100		2.564	1 1	100%		0.390	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool	18			0.075	1.923	1 1	100%		0.520	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool	18		50		1.282	1 1	100%		0.780	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool	18		140		3.590	1 1	100%		0.279	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38		40	0.04	1.000	1 1	100%		1.000	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38		60	0.06	1.500	1 1	100%		0.667	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38		80	0.08	2.000	1 1	100%		0.500	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38		100		2.500	1 1	100%		0.400	EBS 2018	Supplier	2018 24/05/202
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38		140		3.500	1 1	100%		0.286	EBS 2018	Supplier	2018 24/05/202
P10	Floor	Impact Sound Isolation	Sheet	Direct from Manufacturer		ISO Rubber	Ober 1		0.075	6	0.006	0.08	1 1	100%	0.08	12.500	LSBU EREID 2017		r 2017 24/05/202
P10	6	Miner and the second set		Direct from Manufacturer		Lambatherm	Sheep's wool		0.03			5.733333333	1 1	100%			LSBU EREID 2017		r 2017 24/05/202
P10	Flooring	Thermal Insulation	Bread	Direct from Manufacturer		Earthwool Building Slab RS140	Mineral wool		0.034			4.411764706	11	100%			LSBU EREID 2017		r 2017 24/05/202
P10	E	The second date of all	Board	NBT	1	Pavatex	Palauritaria	6	0.04	300.0		7.5	1 1	100%		0.133	LSBU EREID 2017		r 2017 24/05/202
P11	External Wall	Thermal Insulation	Foam	Direct from Manufacturer	Icynene	Spray foam Insulation	Polyurethane	8	0.04	40	0.04		550 600			1.000	ND LSBU EREID 2018		r 2018 24/05/202
P14	External Wall	Air tightness layer	Membrane	Ecological Building Systems	Proclima	Intello Plus	Polyolephene	-	0.17		0.0005	0.003	1 1	100%		340.000	ND LSBU EREID 2018		r 2018 24/05/202
P14	External Wall	Wind tightness layer	Membrane	Ecological Building Systems	Proclima	Solitex Fronta	Polyolephene	-	0.2	0.1	0.0001	0.001	1 1	100%	0.001	2000.000	ND LSBU EREID 2018	manufacturer	r 2018 24/05/202





V2 Secondary Elements Windows & Glazing options

Churren	×				Ver		v v										~~ ~~						1 1	View					. 1 1	1 2 2			¥		To be completed by Manufacturer Supplier >
Children	Seco	ndary I	Elements Ma	terials Pe	rformar	nce Cost	ts	E GRE G	ineen Building Calculate	2011-2021																				1 1					Suppose -
-			ProductReference						Gas Parforma		e Performence	Performance	Orientation	Pannive Solar gains	Performance	Performance		U velues	Paix	shues loorer	ongent Ope	ening Second	lary Element 1	Size P	-	sealed unit a	piacer	Giazing	Perimeter	Coat/w2 Un7	cost So	44704	Date	Version Actions	Yes
To be																		U velue	Sealed																
completeed									Solar Heat	Visible Ligh	t Internal surface temperature	Solar	NESW and between	Annual energy	Armuel emergy in losses	Annual energy balance	U velue	Frame U va	ue unit		and and and and and and and	10000	and a second	a sint firm with the	Elements Errore M	spacer	Spacer	and buried and the	Perimater Perin	auto					No.
Yeally									Stat Press	San Danasana	degrees C	factor	PRESERVE AND DEPARTMENT	gains kWihim2	kWhim2	kWhim2	Vehr2.K	Win2.K Wind	K uno	wital Fire	ahea mm	000 000	men má	i ingraffic deser	No. 5	0000 000	m2 m	an mm m2 m	ten men mi	1 E1v2 E 2 E1v2 E 018 E480.00 E388 018 E520.00 E421	2	0	DRAM(YYYYY		Yes
Спосан	External Wall	NicaDesign	Ergineered Pine Seah	Windows Windows	Sanh	Engineered Pine												0			910	910 900	900 0.0	50	2 11.19%	10 3280	6.033 8	20 820 0.672	5 3540 0.0	18 £460.00 £38	8.80 NosDer	signeral .	13/05/2020		Yes
				Windows	Sanh	Hardwood												0			910	910 900	900 0.8	50	2 11.19%	10 3280	0.033 8	20 820 0.672	5 3540 0.0	38 £520.00 £42	1.20 NosDer	oignererail	13/05/2020		Yes
Спосан	External Wall	NeaDesign	Engineered Pine Casement Hardwood Casement	Windows	Casement	Engineered Pine	_											0												018 £390.00 £315 018 £440.00 £356			13/05/2020		Yes
Choces	External Wall	NesDesign		French Doora	Side hung pair	Hardwood												0			910	2110 900	2100 1.5	75	1 16.70%	10 5480	0.055 7	70 1970 1.517	5 6040 0.0	192 £540.00 £1.02	20.60 NosDec	oioremail .	13/05/2020		Yes
Спосея	External Wall External Wall	NesDesign	Front Door Bi-fold Door Silding Door Aluminium Bi-fold Door	Entrance Doors	2	?												0			910	2110 900	2100 1.5	75	1 16.70%	10 5480	0.055 7	70 1970 1.517	5 8340 0.0	190 £1,005.29 £1,90	00.00 NcsDer	liamangéo	13/05/2020		Yes
Спосан	External Wall	NcaDesign	Bi-fold Door	Doors	Bi-fold	2 Alumiralum												0			2110	2110 2100	2100 4.4	3	2 14.37%	10 7550	0.079 15	270 1270 3.881	5 8440 0.0	M2 £560.00 £2.46 M2 £450.00 £1,98	69.60 NosDer	signamal ·	13/05/2020		Yes
Спосек	External Wall External Wall	NeaDesign	Siding Door	Doors Doors	Silding	Aluminium Aluminium												0			2110	2110 2100	2100 4.4	75	2 14.37%	10 7880	0.079 15	370 1970 3.881	5 8440 0.0	42 £450.00 £1,98	84.50 NosDer	lamargio	13/05/2020		Yes
Chocke	External Wall	McaDesign	Steel-look door	Doors	2	Auminium	_											0.01			910	2110 2100	2100 4.4	50	2 10.55%	10 5540	0.097 8	20 2020 1.695	5 8340 0.0	2 E460.00 E2.02	28.00 PecaDer	ologramul .	13/05/2020		Yes
					2	Abamirian												man	JE1		910	910 920	900 0.8	50	1 2	10 3280	0.033 8	20 820 0.672	5 3540 0.0	18 6450.00 639	4.50 NosDer	olgramal	13/05/2020		Yes
				Windows	Tit & Tum	Aluminium												0			910	910 900	900 0.0	75	1 16.74%	10 3080	0.031 7	70 770 0.593	5 3540 0.0	Editor Editor Editor M2 E480.00 E2.02 M3 E520.00 E383 M3 E450.00 E384 M3 E450.00 E384 M3 E450.00 E384 M3 E245.00 E384 M3 E245.00 E384	6.45 NosDer	olgramal	13/05/2020		Yes
Спосан			Aluminium Till & Turn Door															0			910	910 900	900 0.6	1 75	1 16.74%	10 3080	0.031 7	70 770 0.593	5 3540 0.0	48 £330.00 £267	7.30 NonDer	signemal	13/05/2020		Yes
Yesites	Glass	Glazino	Sealed Unit	s Snacers	Gasse	es Coatir	nas l	0.000	inaars Building Calculate																										
Charges	External Wal	Ciuzing	oculea onic	For windows & doors	- Guode	An and	2 x Char	Note		815					· · · ·		2/84 0.48	8454 845		2454 B	446			50		50	1 0 1 9	00 000 000 000	_	<u> </u>			2100/2520		Vez
			Clear	For windows & doors	hey	Arry Arry	3 x Chur	Note	2 x Dry air 0 ritt	74%							3.221 0.31	NUX NUX	N/A	NA N	410		_	90	1	100		00 900 0.81		+			21/05/2020		Yes
Спосан	Externel Wall		Low-e	For windows & doors	Any	Any				79%							3.846 0.26	NeX Nex	NWA N	NA N	4%			50			9	00 900 0.81		_					Yes
			Low-e	For windows & doors	Any	Any	3 x Clear	1 x LowE	2 x Argon 0.615	73%							5.433 0.184	NWA NWA	K NW	NW N	4VA			50	1		9	00 900 0.81					2105/2020		Yes
Спосан	External Wall External Wall External Wall		Low-e	For windows & doors	Any	Any	3 x Clear	2 x LowE	2 x Argon 0.56	70%							7.521 0.133	NUA NUA NUA NUA NUA NUA	L NA	NA N	414			50	1		9	00 900 0.81					21/05/2020		Yes
Спосан	Estarral Vial	Eurogea/	SunStop SunStop SunStop	For windows & doors For windows & doors	Any	Any	2 x Char	1 x Solar 1 x Solar 2 x Solar 2 x Solar	1 x Argon 0.367	70%							4.De4 0.2e5	PEVA PEX	L P694	P695 P	494.			50	-		9	00 900 0.81					2103/2020		Tes
			SunStop	For windows & doors		Any	3 x Clear	2 x Solar	2 x Argon 0.31	54%														50	1		2	00 900 0.81					21/05/2020		Yes
Chocese	External Wall			For windows & doors			2 x dear	2 x LowE 1 x LowE 1 x Solar	1 x Argon 0.623	77%							4.783 0.202	NA NA	NA NA	NA N	414.			50	1		9	00 900 0.81					21/05/2020		Yes
Спосан	External Wall		System V	For windows & doors	Any	Any	2 x dear	1 x LowE 1 x Solar	1 x Argon 0.361	83%							4.935 0.2	N/A N/A	L NA	NA N	4/A			50	1		2	00 900 0.81				3	21/05/2020		Yes
	External Wall External Wall		Ordinary Single glazing Standard Double Glazing	For windows & doors	Any	Any	1 x dear	Note Note	Note		_							NA 5.8	N/A	NA N	4/A						_				ZeroEne ZeroEne	Horishey	0101/2016		Yes
			Double Glazing + Argon	For whiteway & doors	Any Any	Atty	2 x dear	None	1 x depart		-							NA 25												+	ZardEra	rguffatroft	01001/2016		Yes
	Enterrol Wat	Garagie	Double Glasters # Loss E	For windows & doors	Arry	Atti					-							N/A 2.0	P4VA.	N/A N	4\A									+	ZaroErw	inguillation it	01/01/2016		Yes
Слосан	External Wall	Gerwic	Double Glazing = Low E +Arpon	For windows & doors	Any	Arty Arty	2 x dear	1 x LowE	1 x Argon									N/A 1.6	r NVA	NVA N	4VA.										ZaroEria	to MeriaRege	01/01/2016		Yes
Chocese	External Wall	Gerwic	Double Glazing + Low E +Argon Triple Glazing + Low E Triple Glazing + Low E +Argon	For windows & doors	Arry	Arry	3 x dear	1 x LowE 1 x LowE 1 x LowE 1 x LowE Note Note	2 x Dry Air									N/A 1	NVA	NVA N NVA N NVA N	4\A						_				ZarcEria	sygyftafrofd I	01/01/2016		Yes
Chocan	Externel Wall	Gerwie	Ordinary Single glazing	For writiows & doors	Arry	Any	3 x dear	1 x LowE	2 x Argon None NiA	2012	1.00	0.00		131.46	211.22	212.22		NEVA DEV	5 P4VA	P494 P	494			_							ZaroEria	In via AECB	0101/2016		Yes
Chocan	Externel Wal	Generic	Standard Double Glazing	For writing & doors	hey	Any	2 x dear	Note	1 x Dry air NiA	PEX PEX	9.10	0.02		125.00	230.00	105.00	N44 2.80	7600 760	NAVA	NA D	410		_				+ +			+		a va AECB	0.02020		Yes
Спосан	Externel Wal	Generic	Double Glazing = Low E +Argon	For windows & doors	Arry	Arry	2 x dear	1 x LowE	1 x Arpon NiA	NEVA	15.30	0.62	8	80.00	100.00	23.03															Passivitat	LIB VIB AECB	0/0/2/020		Yes
Спосан	Esternal Wal	Genatic	Triple Glassing + Low E +Argon	For windows & doors	Any	Any	3 x dear	1 x LowE	2 x Argon N/A	NeiA	17.50	0.48	8	55.03	40.00	-10.03	NW 0.65	NAVA NAV	L NWA	NA N	414											Le vie AECB			Yes
Спосан	External Wal	Genuic	Ordinary Single glazing	For windows & doors	Any	Any	1 x dear	Note	Note N/A	NA	-1.80	0.92	15 degrees from 5: (E or W)	121.86	475.00	353.13	NW 5.00	NeA Nea	L NA	NA N	414										Passivhau	La via AECB La via AECB	0.02020		Yes
Chocae	External Visit	Generatic	Standard Double Glazing Double Glazing + Low E +Arpon	For windows & doors	Arry Arry	Any	2 x dear	Note 1 x LovE	1 x Arrow Nia	N/A N/A	25.92	0.62	15 damage from S: (E or W)	78.03	100.00	22.00	N/A 1.20	NAME PAGE	N PAVA	NA N	10						+ +			+	Passidat	La Va AECB	0.02020		Yes
		Generic	Triple Glazing + Low E + Argon	For windows & doors	Any		3 x dear	1 x LowE	2 x Argon N/A None N/A	NA		0.48	15 degrees from S: (E or W)	48.75	40.00	-8.75	N/A 0.65	N/A N/A	N/A	NA N	414												0/0/2020		Yes
Спосан	External Wall	Generic	Ordinary Single glazing	For windows & doors	Any	Any	1 x dear	Note	None NIA	NA	-1.80	0.92	30 degrees from S: E or W	109.69	475.00	365.31	NA 5.80	N/A N/A	N/A	NA N	414.										Passivhau		0/0/2020		Yes
Спосан	External Wal	Generic	Standard Double Glazing	For windows & doors	Any	Any	2 x dear	Note	1 x Dry air NiA	NA	2.10	0.80	30 degrees from S: E or W	109.69	230.00	120.31	NA 2.80	N/A N/A	L NA	NVA N	418.						-				Passivitas	La via AECB	0/0/2020		Yes
Chocae	External Wall	Generatic	Double Glazing + Low E +Argon Triple Glazing + Low E +Argon	For whoows & doors	ANY ANY	Any Any	2 x dear	1 x LowE	1 x Argon NIA 2 x Argon NIA	NA	15.30	0.62	JU Degrees more S. E or W	10.20	100.00	21.83	120	PEPS 1945	N/A	1905 N	404										Passivitat	LIS VIS AECS	002020		No.
Chocae	External Wal	Generic	Ordinary Single glazing	For windows & doors	Any	Atty	1 x data	Note	Note NiA	NA		0.92	At darring from S. SF or SW	87.75	475.00	387.25	NA 5.00	74/0 74/0	140	24/4 2	10										Passida	Is vis AECB	002020		Yes
Chocese	External Wall	Generic	Standard Double Glazing	For windows & doors	Any	Any				NIA	9.10	0.80	45 degrees from S: SE or SW	87.75	230.00	142.25	NA 2.80	N/A N/A	N/A	NA N	4/A										Passivitat	Lts via AECB			Yes
Спосая	External Wall	Gervaric	Double Glazing + Low E +Argon Triple Glazing + Low E +Argon	For windows & doors		Any	2 x dear	1 x LowE 1 x LowE 1 x LowE None None	1 x Argon N/A	NEA	15.92	0.62	45 degrees from S: SE or SW	56.16	100.00	43.84	N/A 1.20	N/A N/A	N/A	N/A N	414										Passivitat	Lts via AECB	0/0/2020		Yes
Слосая	External Wall	Gervaric	Triple Glazing + Low E +Argon	For windows & doors	Arry	Arty	3 x dear	1 x LowE	2 x Argon N/A	NEA	17.90	0.48	45 degrees from S: SE or SW	35.10	40.00	4.90	N/A 0.65	NeVA NeV	N/A	N/A N	4\A						_		_		Passivhau	LIS VIS AECB	0/0/2020		Yes
Chicks	Esternel Vial	Gervate	Ordinary Single glazing Standard Double Glazing	For windows & doors	nety here	Arry Arry Arry	2 x dear	reste Note	None NiA 5 x Dry air NiA	761A	-1.80	0.82	102 degrees more 5: E or W	61.43	230.00	108.35	NW 280	760A P60	N 1940	Page 1	4/6						+ +		+ +	+		La va AECS	0102020		Yes
Chocan	External Wal	Generic	Double Glazing + Low E +Arpon	For windows & doors	Any	Ary	2 x dear	1 x LowE	1 x Arpon NiA	76VA	15.30	0.62	60 degrees from 5: E or W	39.31	100.00	03.03	N4W 1.20	74X 74X	NVA NVA	NA N	4/A		_				-			+	Passivitat	LIB VIB AECB	0.02020		Yes
Спосан	External Wall	Generic	Double Glazing + Low E +Argon Triple Glazing + Low E +Argon	For windows & doors	Ney	Any	3 x dear	1 x LowE	2 x Argon N/A	NeXA	17.90	0.48	60 degrees from S: E or W	24.57	43.00	15.43	NW 0.00	NeW NeW	NAVA.	NWA N	4VA										Passivhas	Le vie AECB			Yes
Спосан					Arry	Any	1 x dear	Note	None NoA	NEW	-1.80	0.92	75 degrees from S: E or W	38.70	475.00	436.30	NW 5.00	NeW New	L NVA	NW N	414											Le vie AECB			Yes
Спосан			Standard Double Glazing Double Glazing + Low E +Arpon		Any	Any	2 x dear	Note	1 x Dry air NiA	PEX.	9.10	0.80	75 degrees from S: E or W 75 degrees from S: E or W	38.70	230.00	191.30	N44 2.80	NEW NEW	NAVA.	NAVA N	414											La via AECB	0.0.2020		Yes
Chocae	External Visi	Germin	Triple Gauting + Low E +Argon	For writeling & doors	Acres	Ally	a X Geor	1 x LowE	2 x Argon NiA	NUA NUA	12.50		75 degrees from 5: E or W	15.43	40.00	24.52	N/A 0.05	Para Para	N PAVA	NA N	10						+ +			+	Passidae	La via AECB La via AECB	0.02020		Yes
							1 x dear	Note		NA					475.00	452.56	N/A 5.80	N/A N/A	NA NA	N/A N	414.		_							+	Passivhau	La via AECB	0/0/2020		Yes
Спосан	External Wall	Generic	Standard Double Glazing Double Glazing = Low E +Argon Triple Glazing + Low E +Argon	For windows & doors	Any	Any	2 x dear	Note	1 x Dry air NiA	NA	2.10	0.80	90 degrees from S: E or W	22.44	230.00	207.56	NA 2.80	N/A N/A	NA NA	NA N	4/A										Passivhau	La via AECB	0/0/2020		Yes
Спосан	External Wall	Genetic	Double Glazing * Low E +Arpon	For windows & doors	Any	Arty	2 x dear	1 x LowE	1 x Argon N/A	NA	15.30	0.82	90 degrees from S: E or W	19.35	100.00	85.64	NA 1.20	N/A N/A	L NA	NA N	4/A										Passivhas	La via AECB	0/0/2020		Yes
																																LIS VIS AECS			

V2 Element Summary Ext Env For U Value Calculations

	Element Summary:	Calculated Total U	Target		Pass, PassU or	Form Factor		Pass, PassU or	Embodied	Traget	-	Pass, PassU or	Embodied	Sequestered				Pass, PassU or
	External Envelope	value	Elemental U value	Difference	Fail	target U value	Difference	Fail	Energy	Embodied Energy	Difference	Fail	Carbon	carbon	Total Carbon	Target Carbon	Difference	Fail
	© GBE Green Building Calculator 2017-2020	W/m2.K	W/m2.K	W/m2.K	%%%	W/m2.K	W/m2.K											
Yes	1 Basement Floor (BF)	0.082	0.15	-0.07	Pass	0.110	-0.028	Pass	0.00	0.00	0.000	Fail	1.00	-1.00	0.00	0.00	0.000	Fail
Yes	2 Basement Perimeter Retaining Walls (BPRW)	0.251	0.15	0.10	Fail	0.110	0.141	Fail	0.00	0.00	0.000	Fail	2.00	1.00	1.00	0.00	1.000	Fail
Yes	3 Basement External Wall (BEW) 4 Basement Roof at Site Level (BRSL)	0.064	0.15	-0.09 -0.11	Pass Pass	0.110	-0.046 -0.066	Pass Pass	0.00	0.00	0.000	Fail Fail	0.00	0.00	0.00	0.00	0.000	Fail Fail
Yes Yes	5 Basement Roof at SubTerranean level (BRSTL)	0.044	0.15	-0.11	Pass Pass	0.110	-0.066	Pass Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	6 Basement Overhead Glazed Pavement (BOGP)	2.000	0.750	1.250	Fass	0.110	1.890	Fail	<u>~0.00</u>	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	7 Swimming Pool Basin (SPB)	0.071	0.15	-0.08	$\boldsymbol{\zeta}$	0.110	-0.039	Pass	45	0.00	0.000	Fail	0.00		0.00	0.00	0.000	Fail
Yes	8 Ground Floor Over Basement (GFOB)	0.052	0.15	0.15		0.110	-0.058	Pass	00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	9 Ground Floor Ground Bearing (GFGB)	0.090	0.15	-0.06	Pass	0.110	-0.020	Pass	0.00	0.00	0.000	Fail	0.00		0.00	0.00	0.000	Fail
Yes	10 Ground Floor Over Ventilated Void (GFOV) 11 Upper Floor (UF)	0.057	0.150	-0.093	Pass	0.110	-0.053	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	13 External Floor & Soffit (EFS) (over air)	0.102	0.15	0.15	Fail Pass	0.110	-0.008	Pass Pass	0.00	0.00	0.000	Fail Fail	0.00	0.00	0.00	0.00	0.000	Fail Fail
Yes	14 Top Floor (TF)	0.118	0.75	-0.63	Pass	0.110	0.008	Fail	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	15 Party Floor (PF)	0.053	0.150	-0.097	Pass	0.110	-0.057	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	16 Party Wall (PW)	0.125	0.300	-0.175	Pass	0.110	0.015	Fail	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	17 Communal Compartment Floors (CCF)	0.053	0.15	-0.10	Pass	0.110	-0.057	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	18 Communal Compartment Wall (CCW) 20 External Walls (EW)	0.126	0.300	-0.174	Pass	0.110	0.016	Fail	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	21 Integral Unheated Space Wall (IUSW)	0.064	0.15	-0.09	Pass Pass	0.110	-0.046 -0.046	Pass Pass	0.00	0.00	0.000	Fail Fail	0.00	0.00	0.00	0.00	0.000	Fail Fail
Yes	22 Flat Roof (FR)	0.039	0.150	-0.111	Pass	0.110	-0.071	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	23 Shallow Roof (SR)	0.086	0.150	-0.064	Pass	0.110	-0.024	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	24 Pitched Roof (PR)	0.069	0.150	-0.081	Pass	0.110	-0.041	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	25 Barrel Vault Roof (BVR)	0.086	0.150	-0.064	Pass	0.110	-0.024	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	26 Domed Roof (DR) 25 Hipped/Pyramid Roof (HPR)	0.049	0.150	-0.101	Pass	0.110	-0.061	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	25 hipped/Pyramid Roof (HPR) 26 Mono-Pitched Roof (MPR)	0.070	0.00	0.070	Fail Fail	0.110	-0.040 -0.040	Pass Pass	0.00	0.00	0.000	Fail Fail	0.00	0.00 0.00	0.00	0.00	0.000	Fail Fail
Yes Yes	27 Mansard Roof (MR)	0.070	0.000	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	28 Dormer Flat Roofs (DFR)	0.070	0.00	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	29 Dormer Side Wall (DSW)	0.070	0.00	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	30 Dormer Window Wall (DWW)	0.070	0.00	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	31 Other Geometry Roof (OGR)	0.070	0.00	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes Yes	34 Flat Ceiling (FC) 33 Pitched Vault Ceiling (PVC)	0.087	0.150	-0.063 0.000	Pass Pass	0.110	-0.023 -0.021	Pass Pass	0.00	0.00	0.000	Fail Fail	0.00	0.00	0.00	0.00	0.000	Fail Fail
Yes	34 Barrel Vault Ceiling (BVC)	0.089	Unregulated	N/A	PassU	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	35 Domed Vault Ceiling (DVC)	0.089	0.000	0.000	Pass	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	36 Hipped/Pyramid Vault Ceiling (HPVC)	0.089	0.000	0.000	Pass	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	37 Mono-Pitch Vault Ceiling (MPVC)	0.089	0.000	0.000	Pass	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	38 Mansard Vault Ceiling (MVC) 39 Other Geometry Ceiling (OGC)	0.089	0.000	0.000	Pass	0.110	-0.021 -0.021	Pass Pass	0.00	0.00	0.000	Fail Fail	0.00	0.00	0.00	0.00	0.000	Fail Fail
Yes Yes	39 Other Geometry Ceiling (OGC) 42 Windows (W)	0.800	0.000	-0.150	Pass Pass	0.110	-0.021	P-855	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	43 Glazed Pedestrian Doors (GPD)	0.790	0.950	-0.150	Pass		0.790		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	44 Opaque Pedestrian Doors (OPD)	2.000	0.750	1.250	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	45 Large Wall Opening (LWO)	2.000	0.750	1.250	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	46 High Usage Entrance Door (HUED)	2.000	0.750	1.250	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	47 Display Window (DW) 48 Glazed External Walls (GEW)	2.000 0.810	0.950	1.050 -0.140	Fail Pass		2.000 0.810		0.00	0.00	0.000	Fail Fail	0.00	0.00	0.00	0.00	0.000	Fail Fail
Yes	40 Glazed External Walls (GEW) 49 Opaque External Walls (OEW)	0.810	0.950	-0.140	Pass		0.810		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	50 Glazed Roof (GR)	2.000	0.950	1.050	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	51 Rooflights (RL)	0.750	0.950	-0.200	Pass		0.750		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	52 Roof Windows (RW)	0.810	0.950	-0.140	Pass		0.810		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	53 Roof Air & Smoke Vents (RASV)	2.000	0.750	1.250	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
			16.25	51	40	4.29			0.00	0.00	0.00	54	3.00	0.00	1.00	0.00	1.00	-
				51	18 Fail	of 51		5 Fail				51 Fail						Fail
					32	of 51		34	of 51			0	of 51					0 0
					Pass			Pass				Pass						Pass
					1	of 51		0	of 51			0	of 51					0 at
					PassU			PassU				PassU						PassU
					0 N/A	of 51		0 N/A	of 51			0 N/A	of 51					0 of N/A
					B/A			N/A				D/A						N/A

V2 Element Summary: Non-Ext Env for EE EC SC LCA

51 12																		
Element Summary:	Calculated Total U value	Target Elemental U		assUlor Farm Factor target	Difference	Pass, PassU or Fail	r Embodied Energy	Traget Embodied	Difference	Pass, PassU or Fall	Embodied	Sequestered	Total Carbon	Target Carbon	Difference	Pass, PassUlor Fail	Element	Secondary
Non-External Envelope	and a	value		U value		14	C. M. F.	Energy		140	Canadia	Carbon				14		Lieren.
© GBE Green Building Calculator 2017-2020 52 Basement External Entrance Well Retaining Pavement (BEEWRP)	to be developed						0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
53 Basement External Entrance Well Retaining Wall (BEEWRW) 54 Basement External Entrance Well Staincase (BEEWS)	to be developed to be developed						0.00	0.00	0.000	Fail Fail Fail	0.00	0.00	0.00	0.00	0.000	Fall Fall Fall		
55 Basement External Entrance Weil Party wall (BEEWPW)	to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00		0.000	Fall		
Basement Walls, Partitions and								$\langle \rangle$						<u>א</u>	•			
Cubicles	to be developed																	
55 Basement Internal Walls (SIW) 59 Basement Internal Partitions (BIP)	0.000	0.00	0.00 0.00 0.00 0 0.00 0	00 0.110 0.110	-0.110	Pass Fall	0.00	0.00	0.000 0.000 0.000 0.000	Fail Fail Fail Fail	0.00	0.00	0.00	0.00	0.000	Fall		
60 Internal Walls (IW)	stal elemental U valu	0.00	0.00 0	00 0.150	WALLER	MONLUE!	0.00	0.00	0.000	Fail	0.00 0.00 0.00	3.00 3.00 0.00	-1.00	0.00	-1.000 -1.000	Pass Pass	÷.	
61 Internal Partitions (IP) 62 KG2 Internal Cublicles (IC) & Back Panels (ICBP) & Inernal Wall Linings (IWL)	to be developed	0.00	0.00 0	00 0.150	0.045	Par.	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail Fail		
	to be developed																	
61 Exves Parapet Walls (EPW) 62 Party Wall Parapet (PWP)	to be developed to be developed						0.00	0.00	0.000	Fail Fail Fail	0.00	0.00	0.00	0.00	0.003	Fail Fail Fail		
63 Chimneys/Chimney Breast (C/CB)	to be developed						0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fall		
64 Attached Party Flank wallSite Boundary Wall (APFWSBW) Foundations	to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.000	Fall		
65 Foundation (F) (Sirlp or trench)	to be developed to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.05	0.00	0.000	Fall		
66 Foundation Wall (FW) (over strip)	to be developed						0.00	0.00	0.000		0.00	0.00	0.00	0.00	0.000 0	Fall		
67 Sleeper Wall (SW) 68 Raft Foundation Stab & Strips	to be developed to be developed						0.00	0.00	0.000	Fail Fail Fail Fail Fail	0.00	0.00	0.00 0.00 0.00	0.00 00.0 00.0 00.0	0.000	Fail Fail Fail		
69 Pad foundation & column 70 Pile foundation & Grounda beams	to be developed to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.000	Rail Rail Rail		
71 Disphragm wal	to be developed						0.00	0.00	0.000	Fail Fail	0.00	0.00	0.00	0.00	0.000	Fall Fall		
Secondary Elements (SE)	to be developed						0.00	0.00	0.000	140	0.00	0.00	0.00	0.00	0.000	140		
L30 StaticaseLandrojWalkways	to be developed to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.000	Fail		
Furniture Fixtures Equipment																		
(FFE)																		
N10 Adic Eaves Fumiture (AEF)	to be developed to be developed						0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
N10 Other Fumiliate (OF)	to be developed to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.003	Fall		
N11 Kitchen Fumiture (KF) N12 Catering Equipment (CE) (Non-Domestic)	to be developed to be developed						0.00	0.00	0.000	Fail Fail Fail Fail	0.00	0.00	0.00	0.00	0.000	Fail Fail Fail Fail Fail		
N13 Sanitaryware Bathroom Furniture (SDF)	to be developed						0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P Building Fabric Sundries	to be developed																	
P10 Sundty insulation/Proofing work P11 Fearned/Fibrea/Bead cavity wall insulation	to be developed to be developed						0.00	0.00	0.000	Fail Fail	0.00	0.00	0.00	0.00	0.000	Fail Fail		
P12 Fire Stopping Systems P14 AleWind Tightness Systems	to be developed to be developed						0.00	0.00	0.000	Fall Fall	0.00	0.00	0.00	0.00	0.000 0.000 0.000	Fall Fall Fall		
P20 Uniterned isolated Trims/Skirlings/Sundry items P21 Ironmongery	to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.000	Fall		
P22 Sealant Jointa	to be developed						0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.003	Fail Fail Fail		
P23 Movement Joints (Non-domestic) P30 Trenches/Pipeways/Pits for buried engineering services	to be developed to be developed						0.00	0.00	0.000	Fall Fall	0.00 0.00 0.00	0.00	0.00	0.00 00.0 0.00	0.000	Fail		
P31 Hoks/Chases/Covers/Supports for Services P32 Services Painting (And Identification?)	to be developed to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.000	Fall		
P33 Pinfrs and Bund Systems	to be developed						0.00	0.00	0.000	Fall Fall Fall Fall Fall Fall Fall Fall	0.00	0.00	0.00	0.00	0.000 0.000 0.000	Rall Rall Rall Rall		
Landscape (L)	to be developed						0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
O10 Raised Beds	to be developed to be developed						0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fall		
Q10 Stairs	to be developed						0.00	0.00	0.000		0.00	0.00	0.00	0.00	0.000	Fail		
Q10 Steps Q20 Drive	to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.000 0.000 0.000 0.000	Fail Fail Fail		
Q20 Paths Q20 Ramps	to be developed to be developed						0.00	0.00	0.000	Fall Fall	0.00	0.00	0.00	0.00	0.000	Fail Fail		
Q30 Lawn Q31 Boarders	to be developed						0.00	0.00 0.00	0.000 0.000 0.000	Fall	0.00	0.00	0.00 0.00 0.00	0.00 0.	0.003	Fail Fail Fail		
Q40 Fence and Gates	to be developed						0.00	0.00	0.000	Fall	0.00 0.00 0.00	0.00	0.00	0.00	0.000	Fall		
041 Rallings and Gates 051 Sports Equipment	to be developed						0.00	0.00	0.000	Fail	0.00	0.00 0.00	0.00	0.00	0.000	Rall Rall Rall Rall		
Q53 Bat or Bird Accommodation Q55 Decking	to be developed to be developed						0.00	0.00	0.000	Fall Fall	0.00	0.00	0.00	0.00 0.	0.000	Fail Fail		
Q60 Pond/Water Feature/Swimming Pond Q70 Compositer and Womenies	to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.003	Fall Fall Fall		
Q70 Front/Rear Garden Bin/Bike/Delivery Store	to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.000	Fall		
QT0 Pergolas QT0 Rear Garden Shed	to be developed to be developed						0.00	0.00	0.000	Fall Fall Fall Fall Fall Fall Fall Fall	0.00	0.00	0.00	0.00	0.000	Rail Rail Rail		
Q75 Retaining walls	to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.000	Fall		
Domestic MEP Services																		
(DMEPS)	to be developed																	
J00 Basement Internal Drainage R10 Rainwater Gutters Pipework	to be developed						0.00	0.00	0.000	Fail Fail	0.00	0.00	0.00	0.00	0.000	Fail Fail		
R11 Above ground drainage	to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.000	Fall		
R12 Below ground drainage R91 Refuse Disposal System Domestic	to be developed to be developed						0.00	0.00	0.000 0.000 0.000	Fail Fail Fail Fail Fail Fail Fail Fail	0.00	0.00	0.00	0.00	0.000 0.000 0.000 0.000	Tal Tal Tal Tal Tal Tal Tal		
S17 Rainwater Harvesting S90 Hot and Cold Water Domestic	to be developed to be developed						0.00	0.00	0.000	Fail Fail	0.00	0.00 0.00	0.00	0.00	0.000	Fail Fail		
591 Gas Supply Domestic 592 Solnkar System Domestic	to be developed						0.00	0.00	0.000	Fail	0.00 0.00 0.00	0.00	0.00 0.00 0.00 0.00 0.00 0.00	0.00	0.000	Fail		
T14 Air Water Ground Source Heat Pumps	to be developed						0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
T16 Solar Collectors T90 Heating Domestic	to be developed to be developed						0.00	0.00	0.000	Fail Fail	0.00	0.00	0.00	0.00 0.00 0.00	0.003	Fail Fail Fail		
U90 Ventilation Domestic V90 Electrical Installation Domestic	to be developed						0.00	0.00	0.000	Fail Fail	0.00	0.00	0.00	0.00	0.000	Fail Fail		
V91 Electrical Systems Landscape	to be developed						0.00	0.00	0.000	Fall	0.00	0.00	0.00	0.00	0.000	Fall		
W90 Communications & Security Domestic X90 Transport Systems Domestic	to be developed to be developed						0.00	0.00	0.000	Fail Fail	0.00	0.00 0.00	0.00	0.00	0.000	Fail Fail		
	to be developed						0.00	0.00	0.00	6	0.00	0.00	0.00	0.00	0.00	63		

U Value To Watts To CO2

User name:		BrianSpecMan did this									105		
Element		brianopeoinan dia tris				Ter	nperature	_	н	leat loss	7		
Lionon	Applicable	Elements	U value	Areas	External		Internal	Difference		Total	Floor area	Total Areas	Areas
Basement		© GBE Green Building Calculator 2018-2020	W/m2.K	m2	degree C			ree C	marriada	W	m2	m2	%
Basement			0.0819469	300	11	· ·	15	4	98		300		<i>,</i> ,,
		Swimming Pool Basin	0.070865	1448	11		15	4	410		1448	1	
			0.2512023	175	11	-	15	4	176			J	
	Yes	Basement roof at site level	0.044126	300	11	-	15	4	53				
	Yes		0.0848912	300	11	-	15	4	102	1			
		Basement partition	0.2032824	125	20	-	15	-5	-127	1		Ratio: 1 to	0.20
		Glazed pavement over basement	2	11	11	-	15	4	88	1		1748	21% Area %
Floor			-	2659	External		Internal		Heat loss	800	Basement		4.1% Heat loss %
	Yes	Ground bearing floor	0.0901849	300	11	-	20	9	243		300	1	
	Yes		0.0569331	300	11		20	9	154		300	1	
	Yes		0.0523647	300	11	-	20	9	141		300	1	
	Yes		0.0528671	600	20	-	20	0	0		600	1	
		Floor suspended over air	0.0585441	600	0	-	20	20	703		600	1	
		Compartment floor	0.0528671	90	0	-	20	20	95		90	Ratio: 1 to	0.32
		Party floor	0.0528755	900	0		20	20	952		900	3090	37% Area %
Wall	163	r arty noor	0.0020100	3090	External	-	Internal	20	Heat loss	2,288	Floor	3030	11.8% Heat loss %
Tall	Yes	External wall	0.0642495	455	External		20	20	585		455		17.0% Heat 1055 %
		External glazed wall/Curtain wall	0.0042433	175	0	-	20	20	2,835		175	4	
		Opaque Curtain wall	2	20	0		20	20	800		20	1	
		Compartment Party wall	0.125493	525	0		20	20	1,318	1	525	1	
	Yes	Compartment Communal wall	0.1255245	65	Ő	-	20	20	163	1	65	Ratio: 1 to	1.95
	Yes	Internal Partition/Wall	0.2032824	25	20		20	0	0	1	25	1265	15% Area %
Roof & Ceilings	100		0.2002024	1265	External		Internal		Heat loss	5,701	Wall	1200	29.5% Heat loss %
rtoor a conings	Yes	Pitched Roof	0.0694608	632.5	0		20	20	879		632.5	4	20.070 110001000 70
	Yes		0.0862835	471.3	0		20	20	813		471.3	1	
	Yes		0.0394566	300	Ő		20	20	237	1	300	1	
	Yes		0.0862984	300	0	-	20	20	518	1	300	1	
	Yes		0.0867887	300	0		20	20	521	1	300	Ratio: 1 to	0.84
	Yes	Glazed Roof	2	25	0		20	20	1,000	1	25	2028.8	24% Area %
Window/Door/Rooflight				2029	External		Internal		Heat loss	3,967	Roof		20.5% Heat loss %
	Yes	Windows	0.8	50	0	-	20	20	800		50	1	
		Glazed Pedestrian Doors	0.79	10.5	0	-	20	20	166		10.5	1	
		Rooflights	0.75	25	0	-	20	20	375		25	1	
		Roof windows	0.81	10	0	-	20	20	162	1	10	1	
	Yes	Vehicle access/Large doors	2	45	0	-	20	20	1,800	1	45	1	
	Yes	High usage entrance doors	2	20	0	-	20	20	800	1	20	1	
	Yes	Opaque Pedestrian Doors	2	12	0	-	20	20	480	1	12	1	
	Yes	Display window	2	25	0	-	20	20	1,000	1	25	Ratio: 1 to	12.78
	Yes	Roof Vents/Smoke vents	2	25	0	-	20	20	1,000	1	25	223	2.7% Area %
	-			223						6,583	Window/Door/Rooflight		34.0% Heat loss %
											4838	8354	100% Area %
		Total areas		9043						19,339	Total		100.0% Heat loss %
		Total glazed areas		223					TCHL			•	
		Total areas minus glazed areas		8820				Floor area		m2			
		Glazed areas % of Total areas		2.5%		TCHL		Watts	19,339	w	Biomass	Fuel	
Total Conduction Heat Los	s (TCHL)							KiloWatts	19		0.025	conversion	
							kil	oWattHours			0.060	kg CO2	
In Line Oaster													
In Use Carbo	on in						KiloWatt	ts/floor area	0.004	kW/m2	CarbonDioxide	CO2	
		Hours of operation/day	8			к	iloWattHour	rs/floor area	0.0005	kWh/m2	0.00001	kg CO2/m2	
					Kild			area/annum		kWh/m2/Year			
						aread I							

Yes



Green Building Calculator.uk

V2 Carbon Mains Electricity EU

2020 Provisional Data YTD	Wartsila Eneergy Transition lab	
Europe	Electricity carbon Intensity	
Country	gCO2/kWh	kgCO2/kWh
Norway	10	0.01
Sweden	18	0.018
France	30	0.03
Austria	88	0.088
Lithuania	118	0.118
Spain	126	0.126
Portugal	134	0.134
Finland	136	0.136
Latvia	138	0.138
Belgium	148	0.148
Denmark	168	0.168
UK	186	0.186
Slovenia	222	0.222
Slovakia	224	0.224
Hungary	228	0.228
Romainai	234	0.234
Ireland	238	0.238
Germany	240	0.24
Italy	290	0.29
Greece	380	0.38
Estonia	385	0.385
Bulgaria	395	0.395
Czechnia	430	0.43
Netherlands	530	0.53
Poland	700	0.7







V2 UK Fuel Carbon Factors 2020

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V2 Fuel Costs Dataset

F													
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?
	U Switch.com	19/04/21	£0.1829	£0.1154	£0.2174	£0.1137	£0.0293	£0.0333					/kWh
British Gas Evolve + E.ON		19/04/21	£0.1906	£0.1109	£0.2174	£0.1137	£0.0319	£0.0333					/kWh
	U Switch.com	19/04/21	£0.1947	£0.1054	£0.2174	£0.1137	£0.0283	£0.0333					/kWh
	U Switch.com	19/04/21	\$0.1632	£0.1632	£0.2174	£0.1137	£0.0319	£0.0333					100% renewable elec + 100% Carbon offset gas
	U Switch.com	19/04/21	£0.2045	£0.1052	£0.2174	£0.1137	£0.0298	£0.0333					/kWh
	U Switch.com	19/04/21	£0.1818	£0.1351	£0.2174	£0.1137	£0.0302	£0.0333					/kWh
	U Switch.com	19/04/21	£0.1664	\$0.1664	£0.2174	£0.1137	£0.0305	£0.0333					/kWh
	U Switch.com	19/04/21	£0.2176	£0.0812	£0.2174	£0.1137	£0.0322	£0.0333					/kWh
	U Switch.com	19/04/21	£0.2102	£0.1026	£0.2174	£0.1137	£0.0314	£0.0333					/kWh
SSE Souther Electric	U Switch.com	19/04/21		£0.1401	£0.2174	£0.1137	£0.0340	£0.0333					/kwh
			Average	Average	Average	Average	Average	Average					
			£0.1903	£0.1225	£0.2174	£0.1137	£0.0309	£0.0333					/kWh
		Average	£0.1610	I			£0.0321						/kWh
19/04/21	19/04/21	19/04/21	19/04/21	19/04/21	19/04/21	19/04/21	19/04/21	19/04/21	21/04/21	21/04/21	21/04/21	21/04/21	19/04/21
Liquid Fuel	Cost Coll	lectio	Red Diesel (Gas Dil)	Paraffinic Diesel	Diesel	Biodiesel	Furnace Fuel	AdBlue	Lubricants	Industrial heating oil	Crown CHP Biofuel	Home heating Oil	Notes
					<u> </u>								
			1 1	I 1								aka HHO,	
			1 1									Kerosene,	
Prices flutuate and idelly				I 1	aka White	HVO 90%		Nox reducing			B100 100%	Burning Oil,	
should be checked and			aka 35		Diesel,	less GHG		agent for		ak IHO	renewable	Paraffin, C2	aka and CD2 or GHG
updated monthly or			Second	I 1	DERV, Road	FAME free		Dielel			87% lower	kero,	and and sold of ship
quarterly			1 1		Diesel			engines			CO2	Standard	
			1 1									kero, Fuel	
			1 1									oil	
			\vdash		EN	<u> </u>	H			BS 2869			
			BS 2869	I 1	EN 15940-2016					Class A2	OFGEM ROC	1	
Domestic Supplier	Data source	Date	Class A2	85 15490	Class A	85 142142	BS EN 2869	Aus 32,		10ppm	approved	BS 2869	Standards
contesec supplier	Carle SOLFCE	wate:	EN 590:	49 10490	ASTM	49.942.947	Class D	150 2241		Class D	Exceeds EN	Class C2	Journal and St.
			2018	I 1	ASTM D975:196					1000ppm	14214	1	
Course Oil	conversition of	33.055.054	45.4		6975:190	<u> </u>				Tooobbu	'	45.0	Millio George Coloridio Malaina
	crownoil.co.uk	22/04/21 22/04/21	45.4			42						45.9	MJ/kg Gross Calorific Value
	crownoil.co.uk		20.0			42						43	MI/kg Net Calorific Value
	crownoil.co.uk	22/04/21 22/04/21	38.8			<u> </u>						4222	MI/Litre Gross specific energy
	crownoil.co.uk crownoil.co.uk		860		782	780	-				875	1220	Litres/torne Specific Volume
		22/04/21	860								875	300	kg/m3 Density at 15 degres C
Crown Oil	crownoil.co.uk	22/04/21			3000	300							kg CO2e/1000litres
	crownoil.co.uk	22/04/21	0	0	3	0.3	0	Û	0	0	0	0	kg CO2e/litres
510101010	crownoil.co.uk	22/04/21				8.13							g CO24/Mj
	crownoil.co.uk	22/04/21				0.00813							kg CO2e/Mj £/kWh
	crownoil.co.uk	22/04/21 23/04/21	£0.57			2				2	2	60.39	
	watsonfuels.co.uk	25/04/21 26/04/21	£0.57 £0.57		'	· ·				/	,	£0.39 £0.39	ppl pence per litre @1000 litres delivery ppl pence per litre @1000 litres delivery
	certasenergy.co.uk	26/04/21	20.57							£0.44		20.39	ppi pence per litre @1000 litres delivery opi pence per litre
ONS Office of nat stats	certatemengy.co.uk	26/04/21 01/01/19								20.44		£0.53	ppi pence per litre Awa
	tanktopper.co.uk	22/04/21										£0.53 £0.41	ppl pence per litre
rank ropper	and an appendix and a second	22/04/21	August	Augure	August	Augura	Augura	Augure	Autoration	Automatica	August		here been the state
				Average abrv/01	Average			Average	Average ADIV/01	Average	Average ADIV/DI	Average £0.4676	0wb
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Solid Fuel C	Cost Colle	ction	House Coal	House Coal	House Coal	Smokeless Ovals	Superhear Smokeless	Anthracite Small Nuts	Burnright Smokeless	Stovemaster	Homefire Ovals	Smokeless Fuel	Notes
Jona ruere	Solution Conte					orats	ampioness	amai: Nuts	amoioness		units	FSE	
			1						Smoke			1	
			Scottish	Scottish coal	Selected	HETAS &	Smoke		control	HETAS	HETAS	1	
pence/kWh			coal	trebles	Mixed	DEFRA	control	Smoke	Areas &	approved	approved	1	
			doubles		Ovoids	approved	Area	control Area	HETAS	-she ored	-pp. ored	1	
							approved	approved	approved				
			40 x 25 kg	50 x 20 kg	40 x 25 kg	40 x 25 kg	25 x 50kg						
Domestic Supplier	Data source	Date	40 x 25 kg bags pallets	bags pallets	40 x 25 kg bags pallets	40 x 25 kg bags pallets	25 x 50kg bags pallets						
			-stelenorg	for particular	-sterious to	-ste buiet		sells building	- alle bannets	~ Be barrary	Be banary	- strike in moto	
	Housefuel.co.uk												
House Fuel NSO	c2mn/mm23	Dec-2020	£239.99	£319.99	£249.99	£296.99	£294.99	£364.99	£359.99	£354.99	£499.99	£608.75	/torne
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	±0.01	£0.01	/kWh
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			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
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				20.01	£0.01	£0.01	£0.01	£0.01	20.01	£0.01	£0.01	£0.01	/kWh
					40.04	40.04	40.04	40.04			40.04		0.00
			£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	£0.01	/kWh
			£0.01 £0.01	£0.01 £0.01	£0.01	£0.01	£0.01	£0.01	£0.01 £0.01	£0.01 £0.01	£0.01	£0.01 £0.01	/kWh /kWh
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			£0.01 £0.01	£0.01 £0.01	£0.01	£0.01	£0.01	£0.01	£0.01 £0.01	£0.01 £0.01	£0.01	£0.01 £0.01	1

V2 In-use Energy Carbon Costs

Total Conduction Heat Loss	Areas		
Total Envelope Area Conducted Heat Loss (TEACHL)	5395	m2	Total
Total Transparent Area Conducted Heat Loss (TTACHL)	359	m2	Window/Door/Rooflight
Total Opaque Area Conducted Heat Loss (TOACHL)	5036	m2	Walls Roof Floor
Transparent area as % of whole	7.12%	%	Window/Door/Rooflight

In-Use Energy

Floor area	5,395	m2
Watts	14,114	W
KiloWatts	14	kW
kiloWattHours	112.9	kWh
KiloWatts/floor area	0.003	kW/m2
KiloWattHours/floor area	0.0209	kWh/m2
KiloWattHours/Floor area/annum	60.9464	kWh/m2/Year

V2 Then add: Carbon targets Pass or Fail

LETI Standard ACAN standard

RIBA Challenge

In-Use Carbon Dioxide

Fuel Choice	Mains Electricity Late 2020	Drop Down List
CO2 equivalent		kg CO2eq/kWh
CO2		kg CO2/kWh
conversion	#REF!	
kg CO2	#REF!	
CO2	CarbonDioxide	CarbonDioxide
kg CO2/m2	#REF!	

In-Use Hours

Hours of operation/day (Spaces thermally conditioned)	8	h/d
Days Per week	7	d/wk
Weeks per year	52	w/y
Hours/Year	2912	h/y
Hours/Year maximum potential	potential 8736	
Percentage of maximum potential	33.33%	%

Change at ScheduleAccommodation N11 or edit here

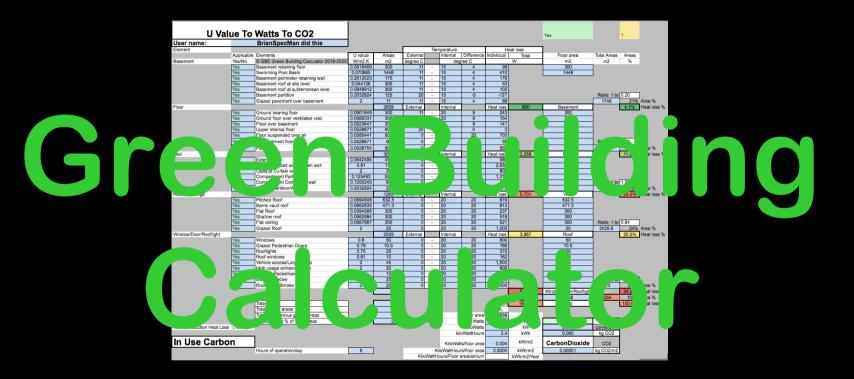
V2 Then add: Cost Pay Back Carbon Pay Back Value Engineering

In-Use Costs

Fuel Choice	Mains Electricity Late 2020	Drop Down List
£ costs/unit of fuel		£/
£ costs/Building		£/
£ costs/m2		£/
£ costs/annum		£/
£ costs/hour		£/







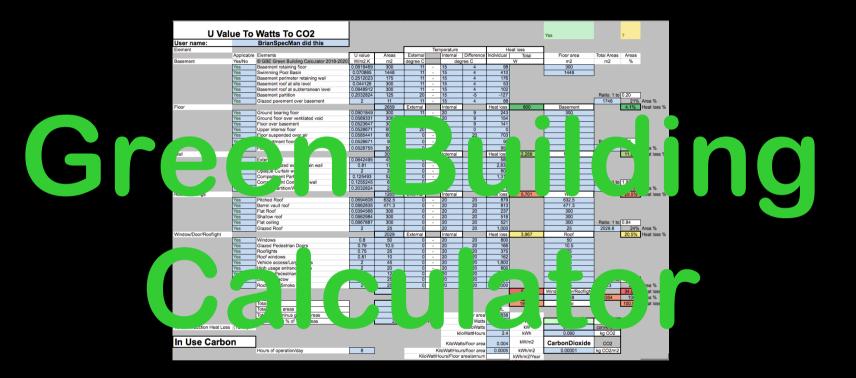
Demonstration

file://localhost/Users/BrianSpecMan/Documents/GBC Green Building Calculator/

GBC Green Building Calculator Working PC.xlsx







Q&A

file://localhost/Users/BrianSpecMan/Documents/GBC Green Building Calculator/

GBC Green Building Calculator Working PC.xlsx

Poll 6: Scope of Work What would be most useful to you soonest?

- New Build,
- Retrofit,
- Domestic,
- Non-domestic
- All of the above

Poll 7: Scope of Parts What would be most useful to you soonest?

- Building
- Structure
- Interiors
- Services
- Landscape
- Infrastructure
- All of the above

Poll 8: Scope of Analysis What would be most useful to you soonest?

- In use Energy
- In use Carbon
- Embodied Energy
- Embodied Carbon
- Sequestered Carbon
- Life Cycle Assessment

Poll 9: Performance Targets: What would be most useful to you soonest?

- Building Regulations AD L, (E, W, S, NI)
- Design Standards: AECB, PHI, LETI,
- Campaigns: ACAN, Superhomes,
- Challenges: RIBA
- Client Standards: TfL,
- Planning Standards: WAG TAN6
- Other national Regs or design standards

Poll 10: Scope of datasets: What would be most useful to you soonest?

- Materials & properties
- Insulation materials & properties
- Products, Accessories & properties
- Materials & Product Costs
- Fuel & costs
- ICE 3 Embodied Carbon
- LCA & EPD datasets

Poll 11: Scope: Future Versions What would be most useful to you soonest?

- Selection from 33 versions planned:
- Post-Grenfell competency
- Links to GBE websites:
 - Low carbon materials guidance
 - Self build guidance
 - Waste reduction in design guidance
- Plastic avoidance, plastic %, recycled plastics
- Recycled content,
- Circular economy:
 - Dismantle-ability, reclaim-ability, reuse-ability,
- Waste awareness:
 - Waste calculator,
 - Waste cost calculator
 - Embodied energy and carbon in Waste





File Updates

Rev No.	Comments	Author	Date
A00	Created for CPD Whole Building Calculator	BRM	30/06/2012
A01		BRM	11/09/2020
A02	Update for STBA SPAB event with EH Bespoke	BRM	06/10/2020
A03	Update after STBA SPAB Event	BRM	07/10/2020
A04	Update for WiSR CIOB Event Infrastructure	BRM	27/05/2021
A05	Update for LSI RISE awards 2021 poster file	BRM	18/06/2021
A06	Update for COINS Awards 2021 V32 & 33	BRM	26/06/2021
A07	Funding Enquiry	BRM	16/09/2021
A08	GBC Expansion BQ Enquiry Diagram	BRM	28/09/2021
A09	Update for TGR TT reduce for short presentation	BRM	10/10/2021





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- Brian Murphy BSc Dip Arch (Hons+Dist)
 - Architect by Training
 - Specification Writer by Choice
 - Environmentalist by Actions
 - Writer and Editor by necessity (Websites)
 - Educator by calling
 - Number Cruncher by necessity (Calculators)
- Greening up my act since 1999
- Founded National Green Specification 2001
- Funded and Launched www.greenspec.co.uk 2003
- Created: GBE at https://greenbuildingencyclopaedia.uk 2015
- Launched: GBE Learning <u>https://GBELearning.com</u> 2020
- Green Building Calculator <u>https://GreenBuildingCalculator.uk</u> 2020
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