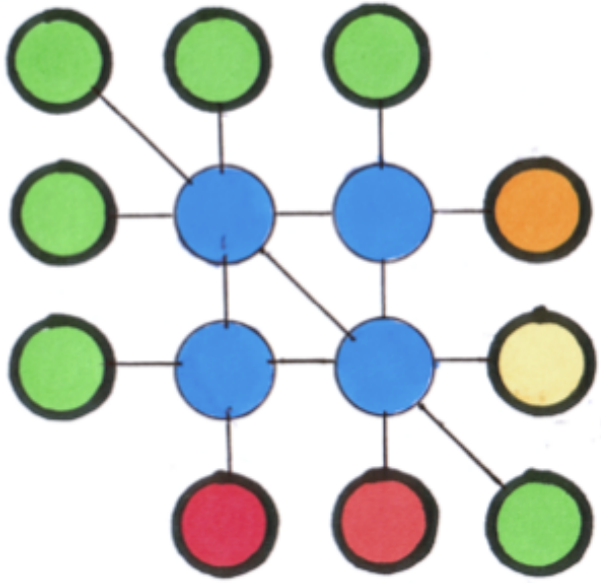
GBC



Green Building Calculator

https://GreenBuildingCalculator.uk

Version 2

GBE

https://GreenBuildingEncyclopaedia.u

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

LSI RISE Awards 2021 Submissions Poster, Slides & Exhibition Display

GBC Green Building Calculator
https://GreenBuildingCalculator.uk

LSI RISE Awards 2021 Submissions

What need did the calculator fill?

Why is it different/ special/ unique?

What challenges were faced and how were they overcome?

What did it achieve?

- Version 1 was created and launched during 2020 COVID lockdowns
- It merged existing calculators developed for students;
  - added layers of sophistication,
  - along with sufficient published and collated materials and product datasets
  - to prove and launch a first milestone calculator
- Version 2 includes Embodied Energy, Carbon & Life Cycle Assessment of new and existing building features
  - arrives nearly a year later
  - It is too early to claim any achievements
  - other than 3 awards that have been given to V1

What are the current and future benefits?

- Version 2 is too new to have a track record, but GBC will initiate user and steering groups where we will invite users to share data so that we can do annual reports on 'Carbon saved with the help of GBC'
- Version 2 is only the beginning of 31 versions already planned (See other slide)
- It is planned that all versions will continue to include interrelated calculations so instantaneous results can be read together and compared easily.

GBE Green Building Encyclopaedia
GBC Green Building Calculator

BIM is not popular yet

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

Green Building Calculator Version 2

V2+V12 Cell colour codes & symbols Excel and BIM

V2 Instructions

V2 Singular/Multiple Switches

V2 Form Factor

V2 Building Areas

Counting Carbon

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

V2 Sections to Volumes

Product Information Providers
Product Data Collection
Excel mechanisms
Data Sources
Data inputs
Generic Materials Datasets
Choosing targets & Data sources
Option Switches for more detail
Choosing
Price information
Chosen Elements
Choosing Components
Choosing Materials or Products
Number Crunching
Checking Targets Met
GBC Users
Dashboard
Summary Sheets

Green Building Calculator V 2

Green Building Calculator V3-29

Product Information Providers
Product Data Collection
Elemental & Sub-elemental
Assemblies
Specifications
Prices
Scope of Work
Other Disciplines
Choosing targets & Data sources
Impacts
LCA & design Life
Interiors
Waste
Plastics
Circular Economy
Self Build
Biodiversity
Preliminaries
MEP Services
Regional International Variations
Bespoke Modules

V2 Schedule of Accommodation

V2-V31 Planned Development

Datasets>Equations>Calculators>Apps

V2 Secondary Elements Windows & Glazing options

V2 Roofs Parts

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

20+ years collection of idle information

- 1000s Product Information & datasets
  - Product properties from many databases
  - Spreadsheets
  - Specifications
- 892 Elemental Assemblies developed for GreenSpecStudio that was later abandoned
  - Elemental Assemblies to Passivhaus
  - Competent Construction assemblies
  - Specification Generator
- Calculators, Equations

V2 Element Summary Ext Env For U Value Calculations

V2 update additions combined

Quantities:	Targets: U values:	V2 Elemental Assemblies: >150	Build Costs:	Energy:
Buildings	Regulations UK & Int New & Exist	V2 Existing Remove Add	V1 Compare Insulation v Windows	Elemental Consumption
Towers	Functional Components	V2 Products Autofill	V2 Bill of Materials	Element by Element %
V2 Terraces Community	V2 Design Standards: New: PH, CL, Exist: CLR, EnerPHit, ZCH, LETI, RIBA 2030,	V2 Materials Autofill	V2 Bill of Products	Area % v Energy %
Dimensions V1 (Metric)	Insulation Material k value Thicknesses	Conductivity	V2 Bill of Quantities	Whole Building Consumption
V2 Areas & Multiples	Density & SHC Decrement	Resistivity	V2 Bill of Labour	Fuel Choice
V2 Scope & Volumes	Room By Room Calculator	Thicknesses	V2 Bill of Costs	V2 CO2 in Fuel 2020 data
V2 Shapes & Protrusions	Size UFH or Rads or Source	R values	V2 Cost Plan	V2 CO2 in Use
V2 Hours/Day/Year Room By Room	V2 Form Factor	U values	V2 Tender Schedule	V2 Fuel Choice Costs
V2 Temperatures Inside Outside Ground Room By Room Summer/Winter		EE EC SC LCA	V2 Value Engineer not cost cut	V2 Fuel Cost in use
		Targets		
		Pass/Fail Adjust Summary		

U Value To Watts To CO2

In Use Carbon

V2 U values Etc. Targets
Regulations, Public Consultations, Design Standards, Campaigns
UValuesEtc
Materials > k values > U values > Thicknesses

I want advisory bodies

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

I want BIM

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

GBE Whole Building Calculators

V1 Properties of Products

Desire to drive environmental

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

V2 Conductivities

V2 LCA EPD

V2 EE EC & SC

V2 Bill of Materials Quantities Labour Accessories Products Costs

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

Insulation material competency in different elemental locations

I want tenderers

I want clients

I want Quantity Surveyors to:

I want manufacturers to:

I want environmental and energy assessors to

I want building designers to be able to

I want building designers to be able to

I want building designers to be able to

I want building designers to be able to

https://GreenBuildingCalculator.UK LSI RISE Award 2021 Application https://GreenBuildingCalculator.UK

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October 2020

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

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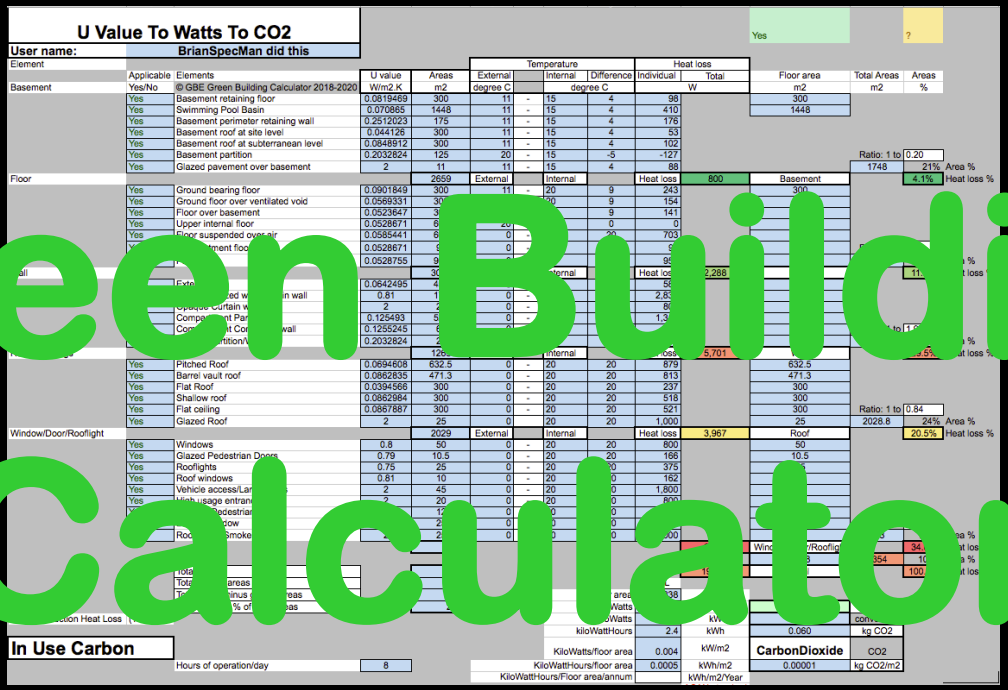

U Value To Watts To CO2

User name: BrianSpecMan did this

Element	Applicable	Elements	U value	Areas	External		Internal	Difference	Individual	Total	Floor area	Total Areas	Areas
	Yes/No	© GBE Green Building Calculator 2018-2020	W/m2.K	m2	degree C		degree C		W		m2	m2	%
Basement	Yes	Basement retaining floor	0.0819469	300	11	-	15	4	98		300		
	Yes	Swimming Pool Basin	0.070865	1448	11	-	15	4	410		1448		
	Yes	Basement perimeter retaining wall	0.2512023	175	11	-	15	4	176				
	Yes	Basement roof at site level	0.044126	300	11	-	15	4	53				
	Yes	Basement roof at subterranean level	0.0848912	300	11	-	15	4	102				
	Yes	Basement partition	0.2032824	125	20	-	15	-5	-127			Ratio: 1 to 0.20	
	Yes	Glazed pavement over basement	2	11	11	-	15	4	88			1748	21% Area %
Floor				2659	External		Internal		Heat loss	800	Basement		4.1% Heat loss %
	Yes	Ground bearing floor	0.0901849	300	11	-	20	9	243		300		
	Yes	Ground floor over ventilated void	0.0569331	30			20	9	154				
	Yes	Floor over basement	0.0523647	3				9	141				
	Yes	Upper internal floor	0.0528671	6			20	0	0				
	Yes	Floor suspended over air	0.0585441	6	0	-	20		703				
		tment floo	0.0528671	9	0	-			9				
			0.0528755	9					95				
all				30			ternal		Heat los	2,288			11
		Exte	0.0642495	4					5				
		ed w n wall	0.81	1	0	-			2.83				
		Curtain w		2	0	-			6				
		Compa t Par	0.125493	5	0	-			1.3				
		Co t Co wall	0.1255245	6									
		tition/	0.2032824	2									
				126			nternal			5,701			t loss %
	Yes	Pitched Roof	0.0694608	632.5	0	-	20	20	879		632.5		
	Yes	Barrel vault roof	0.0862835	471.3	0	-	20	20	813		471.3		
	Yes	Flat Roof	0.0394566	300	0	-	20	20	237		300		
	Yes	Shallow roof	0.0862984	300	0	-	20	20	518		300		
	Yes	Flat ceiling	0.0867887	300	0	-	20	20	521		300	Ratio: 1 to 0.84	
	Yes	Glazed Roof	2	25	0		20	20	1,000		25	2028.8	24% Area %
Window/Door/Rooflight				2029	External		Internal		Heat loss	3,967	Roof		20.5% Heat loss %
	Yes	Windows	0.8	50	0	-	20	20	800		50		
	Yes	Glazed Pedestrian Doors	0.79	10.5	0	-	20	20	168		10.5		
	Yes	Rooflights	0.75	25	0	-	20	20	375				
	Yes	Roof windows	0.81	10	0	-	20	0	162				
	Yes	Vehicle access/La	2	45	0	-	20	0	1,800				
	Yes	Mixed usage entran	2	20	0	-	20	0	800				
		edestrian		12	0		0	0					
		ow		2	0		0	0					
		Roo Smoke	2	2	0		0	0	200				
											Wind /Rooflig		34
												354	10
										15			100
		Tota areas											
		inus oas							area	38			
		% of as							Watts				
sion Heat Loss									oWatts	kWh		conv	
									kiloWattHours	2.4	kWh	0.060	kg CO2
In Use Carbon									KiloWatts/floor area	0.004	kW/m2	CarbonDioxide	CO2
		Hours of operation/day	8				KiloWattHours/floor area			0.0005	kWh/m2	0.00001	kg CO2/m2
							KiloWattHours/Floor area/annum				kWh/m2/Year		

Green Building Calculator

I was reminded to:

Be the change you want to see in the world

Mahatma Gandhi

Calculator on GBC:

- Find GBC V1 file on GBC website at:
- https://GreenBuildingCalculator.uk
  - V0 Video
  - V2 Video
  - Shop: XLSX files
    - Different prices for different users
  - GBC and GBE Newsletter: 1st October 20
  - Video show: PPTS file
  - Zoom Recording on YouTube

This Presentation on GBE:

- Find this file on GBE website at:
- https://GreenBuildingEncyclopaedia.uk/?p=38491
  - PDF Show: from V0, V1 & V1+ PowerPoint
  - Full version of this presentation (287 slides)
  - To be updated after this event
  - Handout/print/read: PDF file to print
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Why did I start making GBC?

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

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Datasets>Equations>Calculators>Apps

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

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I want clients

- with aspirations and objectives for a Healthy, Environmental, Useful building:
  - To know they can engage a building designer who has 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
  - To know that their aspirations & objectives will survive all the way to completion on site

I want Quantity Surveyors to:

- Be Quality Surveyors not Quantity Surveys
- Create the 'Green Building Price Book'
  - Alistair McConnochie proposed 20 years ago
  - to become a reality, inside GBC
- Do Green Cost Planning
  - not win the 'race to the bottom'
- Do real Value Engineering
  - not cost-cutting disguised as Value Engineering;
  - but they never look at the bigger picture
- Do Whole Life Value without charging an extra fee
  - TOTEX = CAPEX + OPEX

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I want manufacturers to:

- Make multi-functional materials, products and systems
  - 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

I want environmental and energy assessors to

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

I want building designers to be able to

- Do their own Cost Planning without a QS
  - based on the cost of doing it greener and better
  - not just cheapest wins every time
- Immediately understand the environmental impact
  - of their construction or refurbishment methods
  - Help make better informed choices of materials or products
  - Become carbon literate

I want building designers to be able to

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

I want building designers to be able to

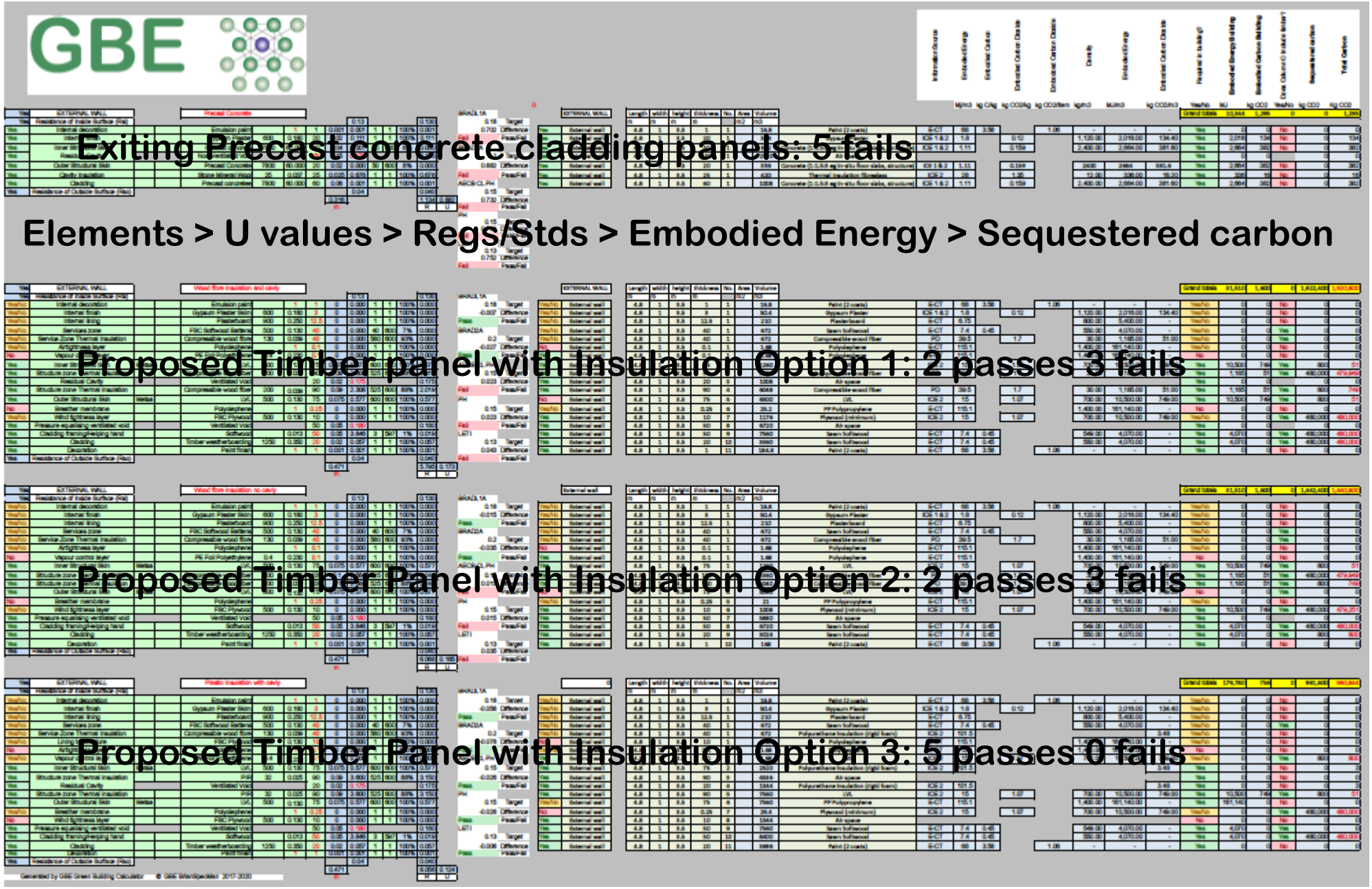
- Know where a product was invented to be used
  - not risk its inappropriate application
  - ‘Post-Grenfell function’ Version 3
- Close the performance gap:
  - Energy now,
  - Airtightness, later
  - Fire, acoustics, indoor air quality, etc. later
  - Services design, lighting design, later
- Have 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

I want building designers to be able to

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

Int. Timber Competition Entry

Int. Timber Competition Entry



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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
  - Especially on GMP domestic tenders
- To be able to price the job properly:
  - not chasing some false cost plan,
  - to allow trades people to have the time to care
  - and do a competent job using proper materials
- **I want Specification Substitution to be done:**
  - **with all the facts and figures available**
  - **about the consequence of every change,**
  - **other than just cost savings for the contractor**

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GBE Whole Building Calculators

- Previous GBE Green Building Encyclopaedia
  - Elemental calculator: for a student's office task
  - ICE datasets into Excel for practical comparison
  - Whole Building Calculators:
    - Embodied energy, Embodied Carbon, Sequestered Carbon
    - Energy and CO2 in use
    - Created for Post graduate Architectural students 2015-18
  - Waste Cost® lite: created from SWMP workshops
  - Psi values: created for a manufacturer
- GBE Green Building Calculator
  - https://GreenBuildingCalculator.uk
  - Bring them all together in one place, one file
  - 10th June 2020 Version 1 Launched
    - 440 hours to assemble V1
  - 9 months to V2 (end of July 2021?)
    - 800 hours so far V2 (1240 total so far V1 and V2)
    - Excluding marketing, website and CPD
  - 23 versions planned: >36 months of development?

Desire to drive environmental

- Bio-based Construction
  - Low to negative carbon products and materials
  - CAPEM Partner's know-how
  - LCA know-how and LCA datasets
- Plastics Avoidance
  - Changing Streams plastics avoidance campaign
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LSI RISE Awards 2021

What need did the calculator fill?

- Elemental cost planning is not working,
  - leading the industry into financial melt down over the last decade;
  - effectively bankrupt but for supply chains suffering:
  - over 3 month late payments and consequential severe mental stress.
- GBC tries to take cost control out of the hands of cheap-focussed quantity surveyors and offer it to quality-focussed designers.
- Enables real big-thinking value engineering and avoids single component cost cutting
  - by showing the consequence of all specification substitution decisions,
  - so well informed decisions can be made.
- Enable architecture students, graduates and building design and maintenance practitioners:
  - to understand the costs, energy and other performance and environmental life cycle impacts of their building design.
- Take environmental design out of the hands of BREEAM Assessors
  - and enable carbon literacy within the design professions

Why is it different/ special/ unique?

- A design and decision tool
  - with embedded multi-functional interrelated calculators
  - for the significant numbers of designers that have not and are unlikely to engage with BIM.
- Engages with:
  - in use energy and carbon,
  - embodied energy, embodied and sequestered carbon in materials
  - full life cycle assessment
  - at component, element and whole building levels.
- Enables the user to choose between the plethora of Regulations, Design Standards and Campaigns,
  - set, monitor targets and be warned if they are not met,
  - instantly see thickness of different insulation materials needed.

What challenges were faced and how were they overcome?

- The time needed to compile all components and their areas in all elements and then find datasets,
  - will put most people off doing carbon accounting:
  - GBC has all readymade elements with all components ready to be populated by user to speed the process
- Keeping it simple:
  - using familiar MS Excel,
  - colour coded cells with different functions,
  - comprehensive instructions for all cells,
  - drop down lists to choose from,
  - materials and product datasets to populate cells
- Carbon counting cannot be ‘Top-Trumps’ in building design:
  - all other design issues have to be accounted for:
  - GBC is multifunctional and all calculators are interlinked so any change is recalculated throughout them instantaneously so informed decisions can be made.

What did it achieve?

- Version 1 was created and launched during 2020 COVID lockdowns
- It merged existing calculators developed for students;
  - added layers of sophistication,
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- Version 2 includes Embodied Energy, Carbon & Life Cycle Assessment of new and existing building features arrives nearly a year later.
  - It is too early to claim any achievements other than the 3 awards that have been given to V1 already.

What are the current and future benefits?

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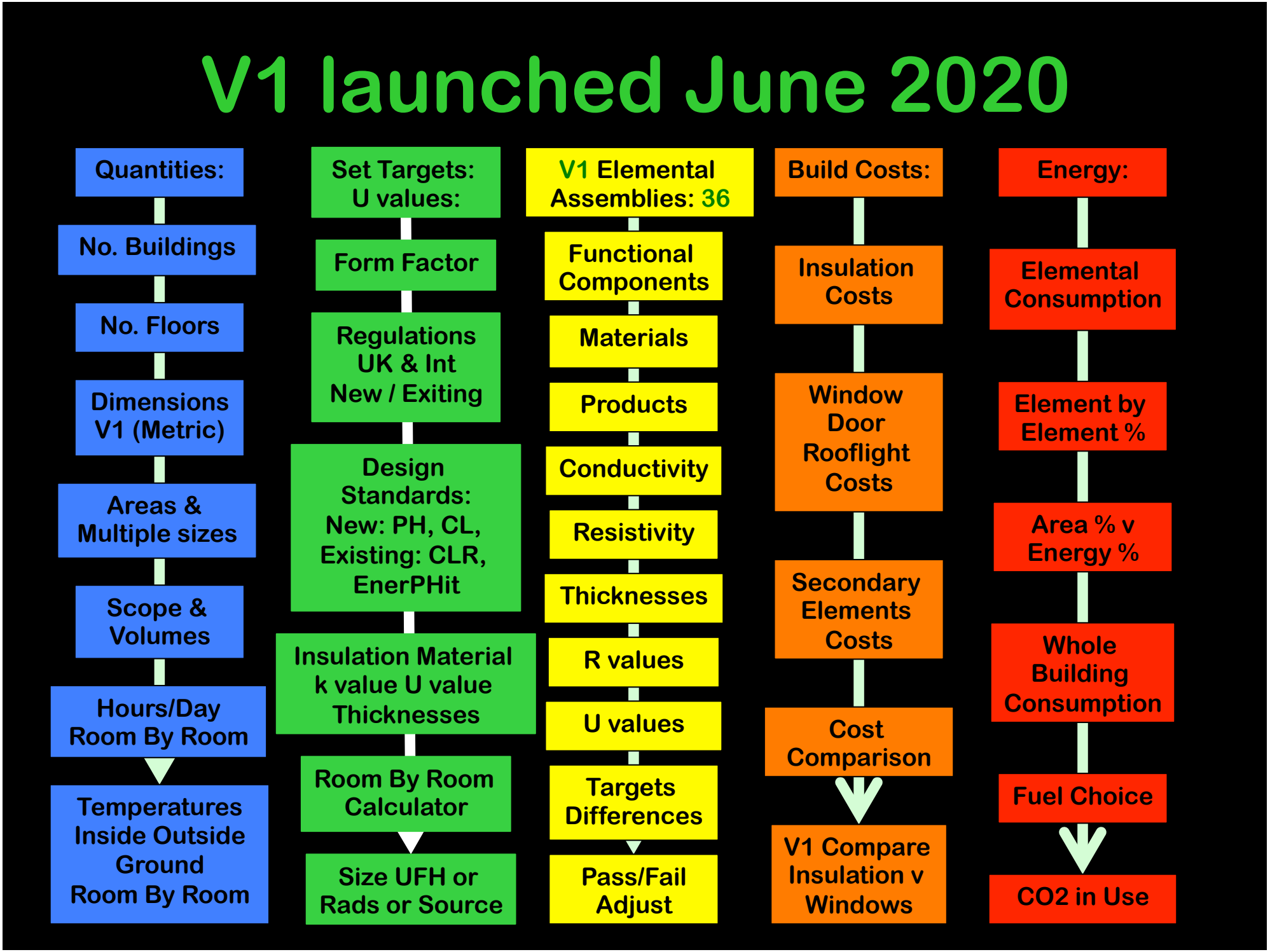

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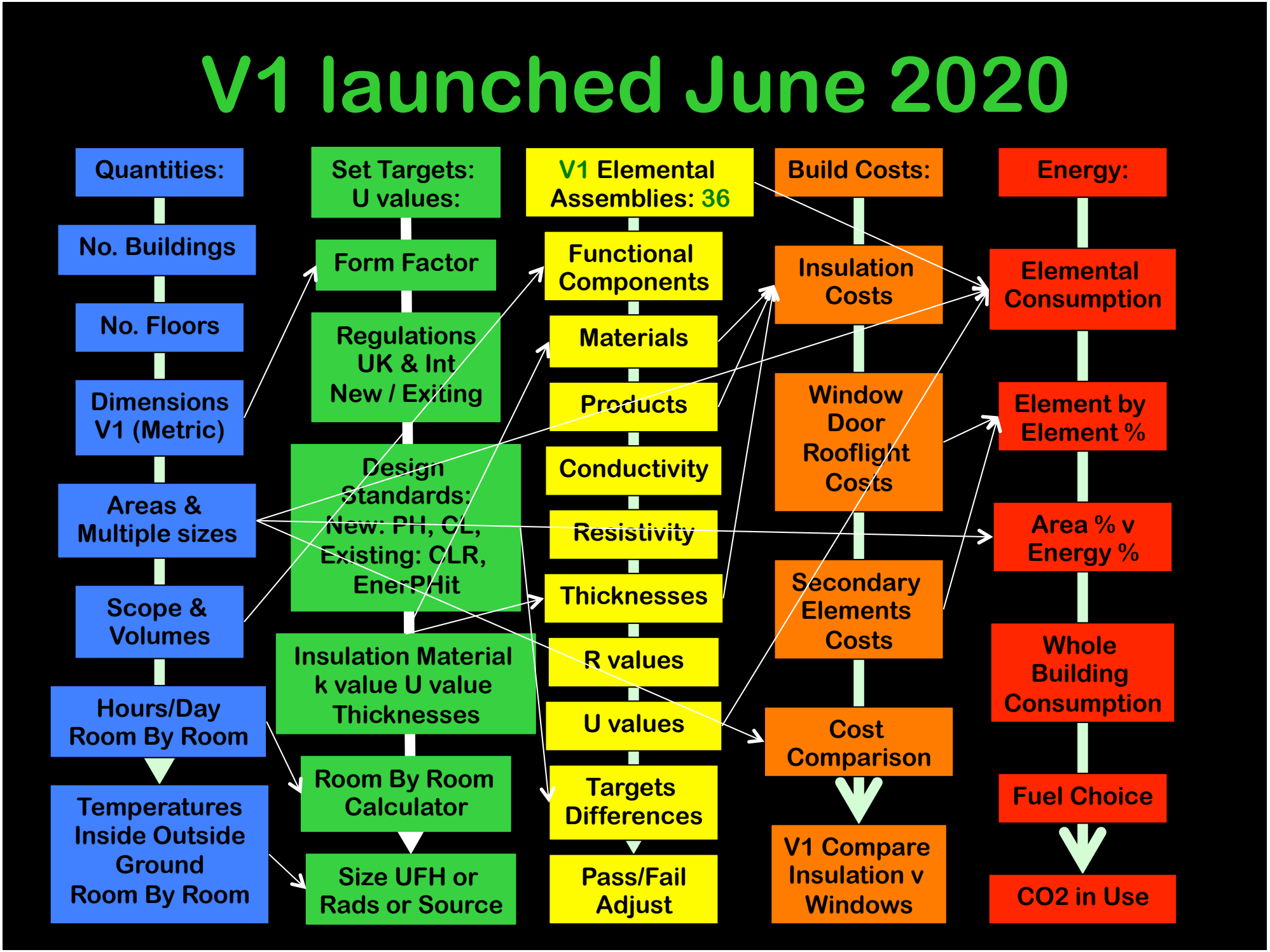

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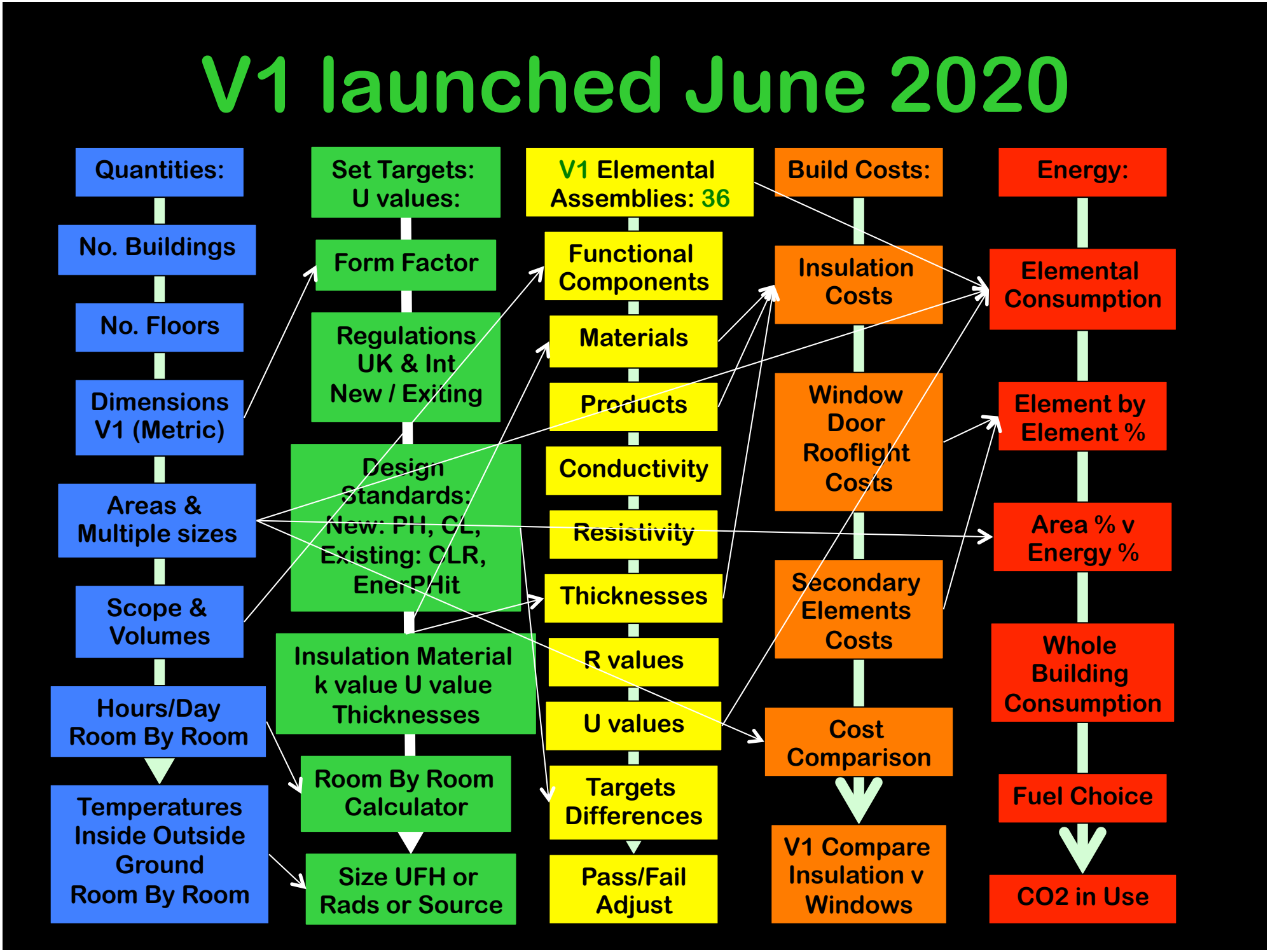

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V2 Current Development

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

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

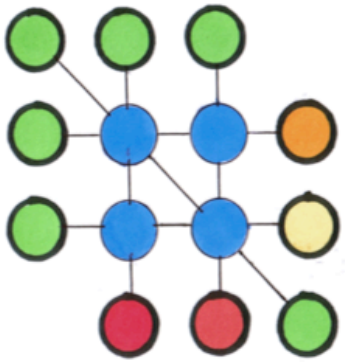
https://GreenBuildingCalculator.uk

Local calculator Ÿ Products Factory gate to site Ÿ Products/materials and miles Ÿ Transport Emissions LCA Ÿ Product Data Sets: Ÿ Building Section Coding Ÿ Appropriate and Competent Application Ÿ Building Elemental Assembly Code Numbers Ÿ Readymade Competent Elemental Assemblies Ÿ Bespoke Elemental Assemblies Ÿ Manufacturers Accredited Systems Ÿ Specification Generator Ÿ Climate Appropriateness Ÿ Non-Domestic Retrofit Ÿ Domestic Newbuild Ÿ Non-Domestic New build Ÿ ICE database V3.0 Ÿ EE EC SC Calculator Ÿ Bill of Materials Quantities Costs Ÿ Non-External Envelope Components Ÿ Condensation Check Ÿ Thermal Bridge Calculator Ÿ Secondary Element Calculator: Ÿ Thermal Mass Calculator: Ÿ GBE Green Building LCA Calculator Ÿ LCA Database Ÿ Landscape Ÿ Civils and Infrastructure Ÿ Waste Calculator Ÿ EE & EC in Waste Ÿ EE & EC in Reclaim Ÿ Sequestered Carbon in Reclaimed Timber Ÿ Plastic Free V Recycled Plastic Products Ÿ Plastics & Recycled Plastic Content Dataset Ÿ Alternatives to Plastics Dataset Ÿ Plastics Diverted from landfill Ÿ Plastics Avoided Ÿ Carbon Consumed or Avoided Ÿ Interiors Fit out, Refit Ÿ Furniture Dataset Ÿ Finishes Products Dataset Ÿ Furniture Impact calculator Ÿ Circular Economy Ÿ Reclaim & reuse Ÿ Reclaimable & Reusable Ÿ Value Ÿ Self-build Interface Ÿ Construction Primer Ÿ Links to GBE website Ÿ Jargon Buster Ÿ Checklist Ÿ 2D or 3D View Ÿ CAD BIM App for numerous CAD BIM software Ÿ BIM template dimensions > cells Ÿ 2 direction application Ÿ Export Dataset Ÿ Product Datasets Ÿ Materials Datasets Ÿ Elemental Datasets Ÿ Whole Project Budget calculations Ÿ Fees Ÿ Overheads Ÿ Profits Ÿ Preliminaries Ÿ EU and International versions Ÿ Regional Product Datasets Ÿ Money conversion Ÿ Imperial measurements Ÿ Services Design Module Ÿ Renewable Energy Sources Ÿ Lighting Design Module Ÿ Lighting Nutrition Ÿ Biodiversity Inclusion Ÿ Local Climate Appropriate Ÿ Vernacular Ÿ GBPB Green Building Price Book Ÿ Bespoke developments Ÿ EH Retrofit windows calculator Ÿ Operation & Maintenance Manuals Ÿ Facilities Management Specification Ÿ Local Procurement Ÿ On-site construction emissions Ÿ Durability and Competency Ÿ Airtightness & Energy loss

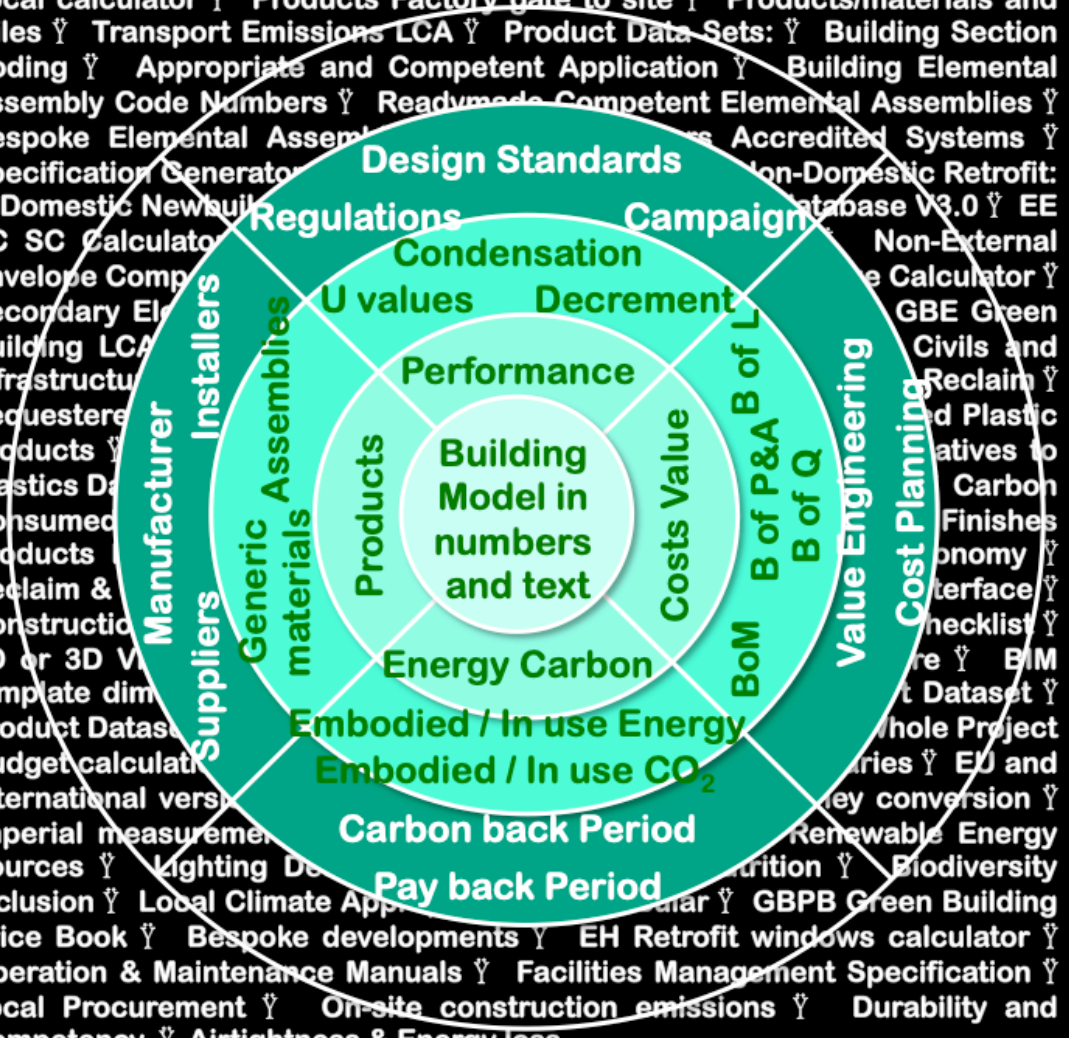
GBC

Green Building Calculator

https://GreenBuildingCalculator.uk V1 so far



Local calculator ♆ Products Factory gate to site ♆ Products/materials and miles ♆ Transport Emissions LCA ♆ Product Data Sets: ♆ Building Section Coding ♆ Appropriate and Competent Application ♆ Building Elemental Assembly Code Numbers ♆ Readymade Competent Elemental Assemblies ♆ Bespoke Elemental Assem rs Accredited Systems ♆ Specification Generato lon-Domestic Retrofit: ♆ Domestic Newbuil tabase V3.0 ♆ EE EC SC Calculato Non-External Envelope Comp e Calculator ♆ Secondary El GBE Green Building LCA Civils and Infrastructu Reclaim ♆ Sequestere d Plastic Products ♆ atives to Plastics Da Carbon Consumed Finishes Products onomy ♆ Reclaim & terface ♆ Constructio necklist ♆ 2D or 3D V re ♆ BIM template dim t Dataset ♆ Product Datas hole Project Budget calculati ries ♆ EU and International vers ey conversion ♆ Imperial measureme Renewable Energy Sources ♆ Lighting De trition ♆ Biodiversity Inclusion ♆ Local Climate App ar ♆ GBPB Green Building Price Book ♆ Bespoke developments ♆ EH Retrofit windows calculator ♆ Operation & Maintenance Manuals ♆ Facilities Management Specification ♆ Local Procurement ♆ On-site construction emissions ♆ Durability and Competency ♆ Airtightness & Energy loss



Product Information Providers

Product Data Collection

Excel mechanisms
Data Sources
Data inputs
Generic Materials Datasets
Choosing targets & Data sources
Option Switches for more detail
Choosing
Price Information

Chosen Elements
Choosing Components
Choosing Materials or Products
Number Crunching
Checking Targets Met

GBC Users

Dashboard
Summary Sheets
Purpose of Green Building Calculator

GBE

https://GreenBuildingEncyclopaedia.uk

GBC Green Building Calculator

https://GreenBuildingCalculator.uk

V2-V33 Planned Development

Priorities to bring forward:

- V2 Retrofit, Terraces, Community level, MEP Services,
- V3 Decrement Delay, Form Factor refinements: dormers, bays, porches
- V4 Building Section Coding, Competent Application,
- 892 ready made elements, Bespoke Assemblies, Accessories, Specification Generator
- V5 Non-Domestic, Retrofit and Newbuild more refinement
- V6 Embodied Energy, Carbon and Sequestered carbon; Non-external envelope elements
- V7 Condensation Check, Thermal Bridge, Secondary Element Calculator, Thermal mass calculator
- V8 LCA Calculator
- V9 Landscape
- V10 Civils and Infrastructure: scope Increased
- V11 Waste Calculator using WasteCost®Lite
- V12 Plastic free v Recycled Plastic
- V13 Interiors: Scope increased, Ska fit-out. refit
- V14 Circular economy: Reclaim Reuse
- V15 Self-build Interface
- V16 CAD BIM App
- V17 Whole Project Budget Calculations, full Fee bid calculation based on cost plan
- V18 EU and International versions
- V19 Services Design Module: Occupancy level, Energy Sources and uses,
- V20 Lighting Design Module: Health & Wellbeing, Light Nutrition
- V21 Biodiversity Inclusion, Biodiversity Net Gain
- V22 Local Climate Appropriate construction and materials
- V23 Vernacular, local: materials, trades, economy
- V24 GBPB Green Building Price Book
- V25 O&MM Operation & Maintenance Manuals
- V26 FM Specification
- V27 Local Procurement, Transport to site, distance search facility
- V28 On Site Construction Emissions
- V29 Design Life, Durability and Competent Products
- V30 Air tightness & Energy Loss
- V31 Value Engineering Opportunities: in not out
- V32 Healthy Building
- V33 Screening Priorities

B Bespoke

- B1 Retrofit Window & Insulation Calculator
- B2 Screeds Calculator
- B3 Window Calculator

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

Green Building Calculator V 2

https://GreenBuildingCalculator.uk V1 so far

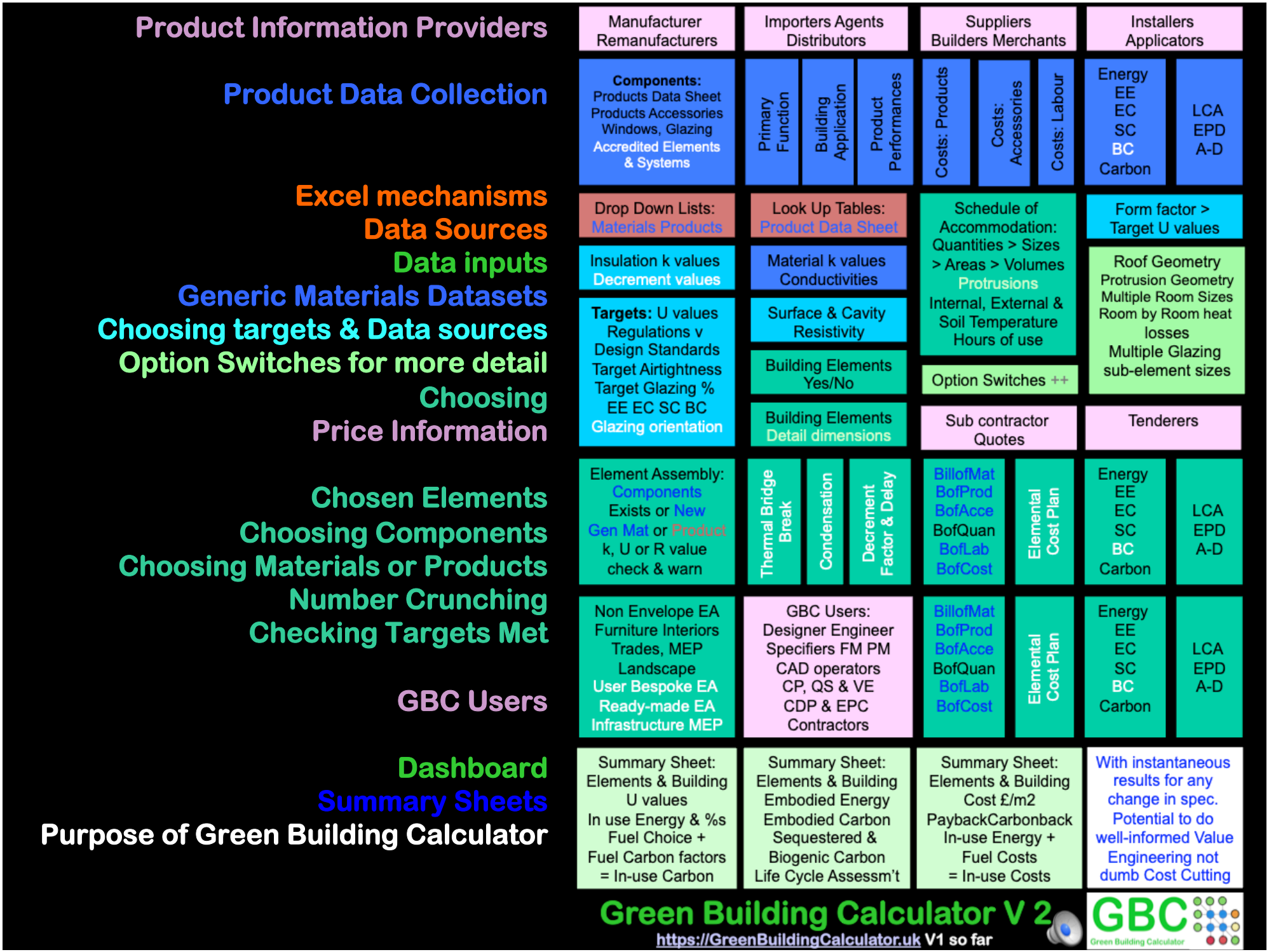
GBC Green Building Calculator

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

Green Building Calculator V3-29

https://GreenBuildingCalculator.uk V1 so far

GBC Green Building Calculator


Product Information Providers
Product Data Collection
Excel mechanisms
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Generic Materials Datasets
Choosing targets & Data sources
Option Switches for more detail
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Chosen Elements
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Summary Sheets
Purpose of Green Building Calculator
Manufacturer Remanufacturers
Importers Agents Distributors
Suppliers Builders Merchants
Installers Applicators
Components: Products Data Sheet Products Accessories Windows, Glazing Accredited Elements & Systems
Primary Function
Building Application
Product Performances
Costs: Products
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Surface & Cavity Resistivity
Building Elements Yes/No
Option Switches ++
Building Elements Detail dimensions
Sub contractor Quotes
Tenderers
Element Assembly: Components Exists or New Gen Mat or Product k, U or R value check & warn
Thermal Bridge Break
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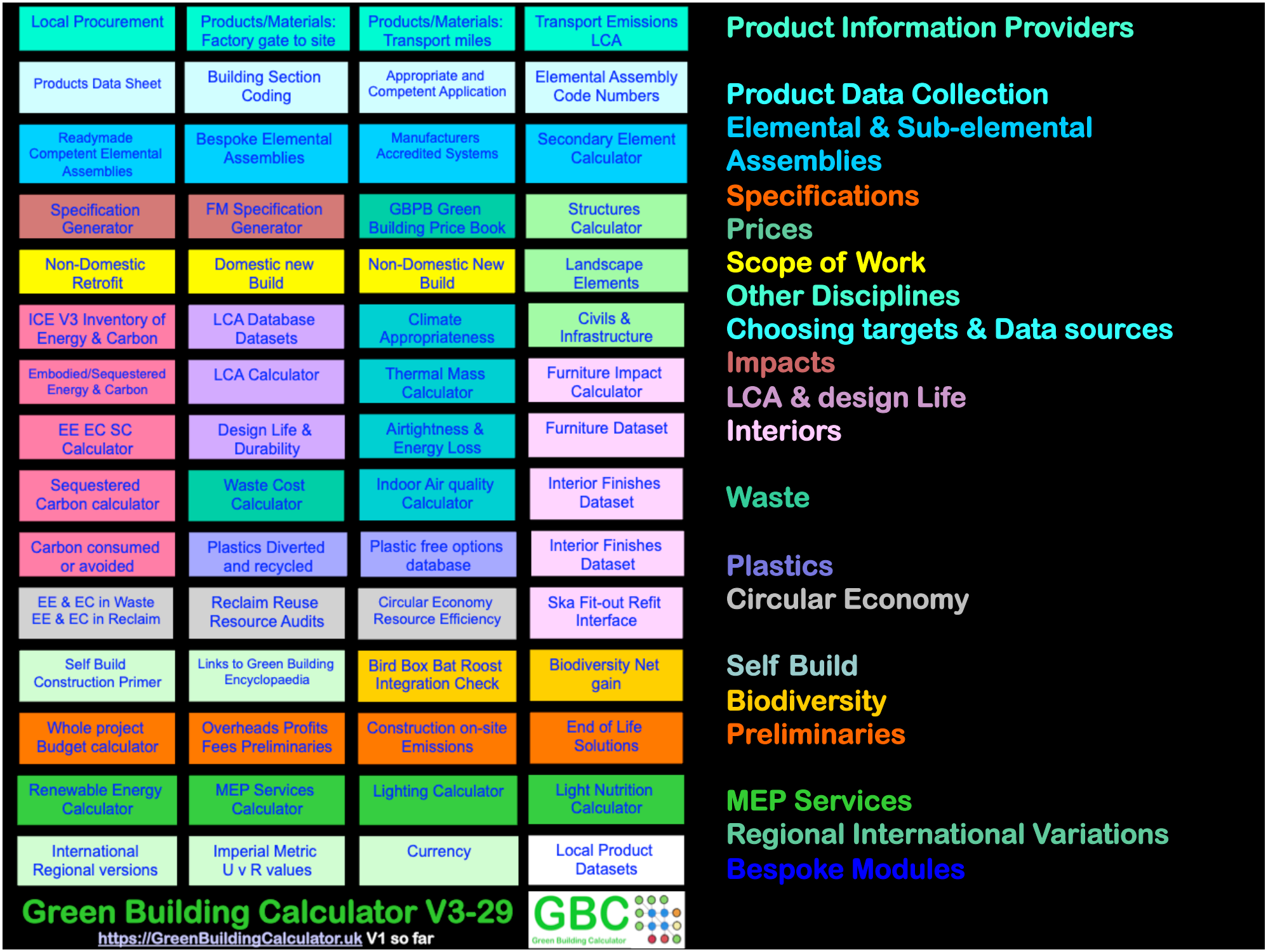
https://GreenBuildingCalculator.uk V1 so far
GBC
Green Building Calculator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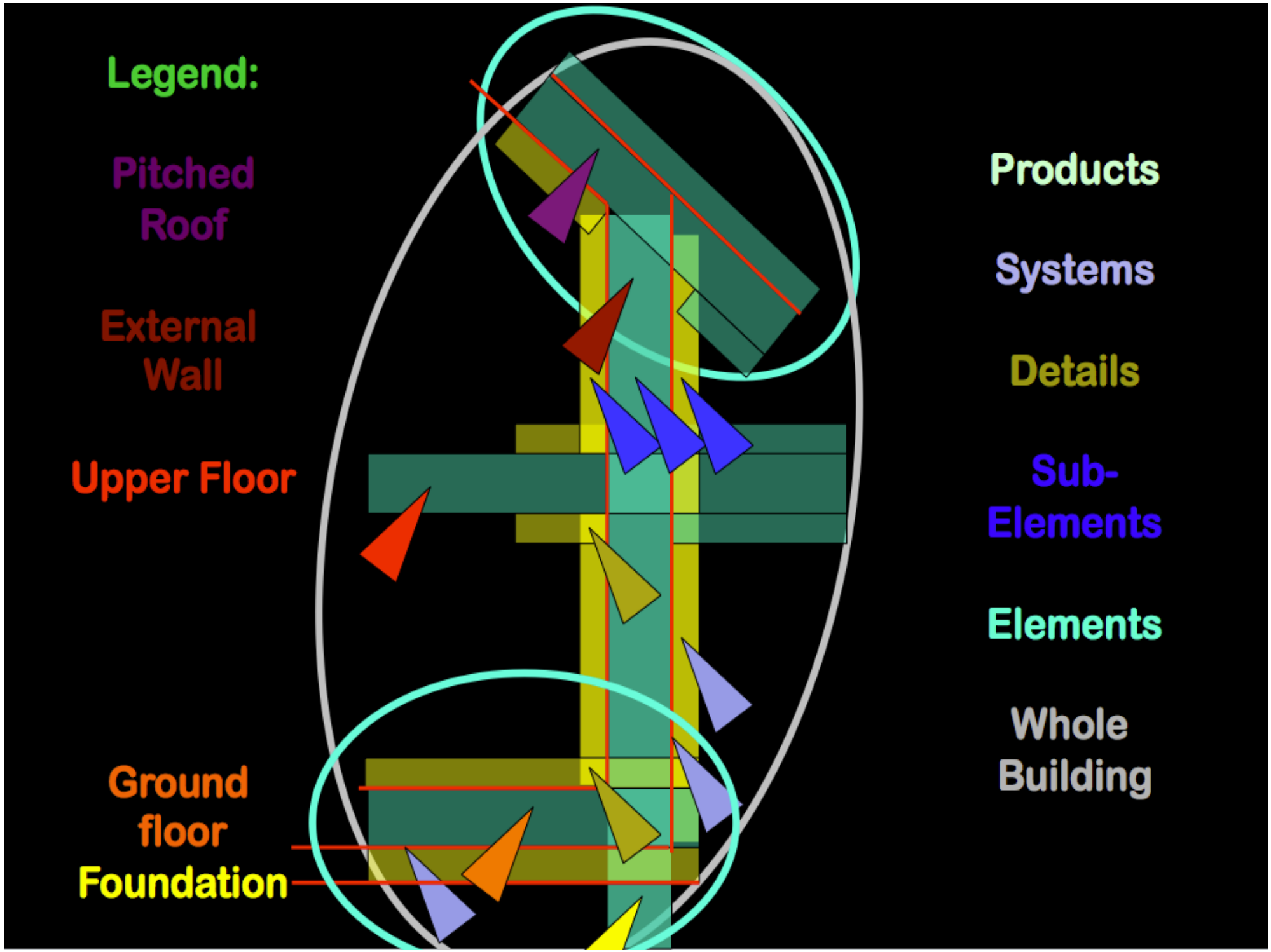
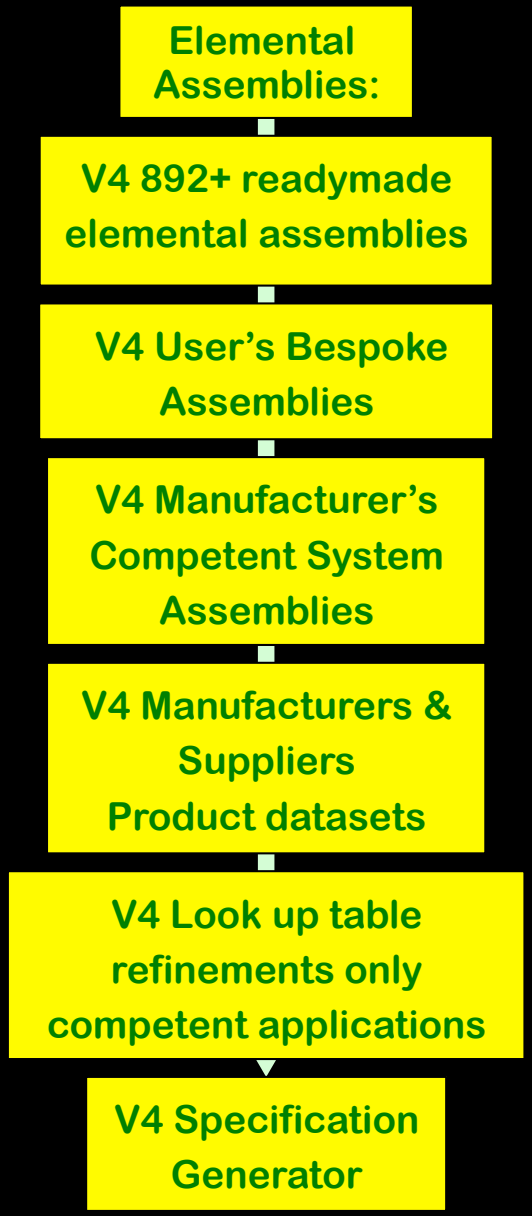
Specifications
Prices
Scope of Work
Other Disciplines
Choosing targets & Data sources
Impacts
LCA & design Life
Interiors
Waste
Plastics
Circular Economy
Self Build
Biodiversity
Preliminaries
MEP Services
Regional International Variations
Bespoke Modules


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

Insulation material competency in different elemental locations

					Application Description	GW	RW	SW	AF	CF	CG	LECA	LESA	CS	AAC	A	EP	EV	PF	OPF	EPS	XPS	PUR	PIR	P	UF	PEML	WFB	WFB	WFW	CF	T	FF	HF	C	S	GF	SB		BBP	ECB	SW	BF	VIP		HL	HL	HL	WC	WC	WL	CE			
7				Totals	Yes	22	31	22	0	0	25	11	11	7	9	15	15	17	0	43	47	29	29	16	3	6	34	24	23	20	19	19	28	18	36	7	2	25	10	4	1	0	20	22	15	17	28	28	8	Y		
7				Totals	No	23	18	23	50	50	12	30	30	41	39	33	33	28	15	5	1	3	3	15	47	40	16	21	22	29	28	31	31	3	23	23	10	41	8	3	36	19	0	27	26	30	27	19	19	37		N	
7				Totals	Unsure	5	1	5	0	0	13	8	8	0	1	1	2	2	5	35	2	2	18	18	19	0	4	0	5	5	1	3	0	0	19	9	9	4	2	40	22	4	10	30	50	3	2	5	6	3	3	5			U
5	Roof	Flat		D	Insulation between rafters or beams, not fully supported	Y	Y	Y	N	N	U	U	U	N	N	N	Y	Y	Y	U		Y	Y	Y	Y	U	N	U	Y	Y	Y	Y	Y	Y	Y	U	U	U	U	Y	U	U	Y	Y	N	U		Y	Y	Y	Y	Y	Y	N			
1	Roof	Pitched		D	Unloaded insulation between rafters, fully supported	Y	Y	Y	N	N	U	U	U	N	N	N	Y	Y	Y	U		Y	Y	Y	Y	U	N	U	Y	Y	Y	Y	Y	Y	Y	U	U	U	U	Y	U	U	Y	Y	N	U		Y	Y	Y	Y	Y	Y	N			
4	Roof	Pitched		D	Insulation beneath rafters, not fully supported	Y	Y	Y	N	N	U	U	U	N	N	N	Y	Y	Y	U		Y	Y	Y	Y	U	N	U	Y	Y	Y	Y	Y	Y	Y	U	U	U	U	Y	U	U	Y	Y	N	U		Y	Y	Y	Y	Y	Y	N			
4	Roof	Flat		DAA	External insulation of flat roof protected against weathering, insulation under roof water proofing	U	Y	U	N	N	Y	N	N	N	Y	N	N	N	N	U		Y	Y	U	U	U	N	N	Y	U	U	N	N	N	N	Y	Y	Y	Y	N	N	U	N	N	N	U		Y	Y	Y	Y	Y	Y	N			
7	Roof	Flat		DAA	On steel deck, insulation beneath roof water proofing membrane	U	Y	U	N	N	Y	N	N	N	Y	N	N	N	N	U		Y	Y	U	U	U	N	N	Y	U	U	N	N	N	N	Y	Y	Y	Y	N	N	U	N	N	N	U		Y	Y	Y	Y	Y	Y	N			
8	Roof	Flat		DAA	Accessible to light or heavy traffic or loads from roof garden (soil layer, plants, etc.) and parting decks (concrete pavers or slabs) insulation beneath roofing membrane	U	Y	U	N	N	Y	N	N	N	Y	N	N	N	N	U		Y	Y	U	U	U	N	N	Y	U	U	N	N	N	N	Y	Y	Y	Y	N	N	U	N	N	N	U		Y	Y	Y	Y	Y	Y	N			
9	Roof	Flat		DAA	Accessible only to maintenance personal, insulation beneath roofing membrane	U	Y	U	N	N	Y	N	N	N	Y	N	N	N	N	U		Y	Y	U	U	U	N	N	Y	U	U	N	N	N	N	Y	Y	Y	Y	N	N	U	N	N	N	U		Y	Y	Y	Y	Y	Y	N			
3	Roof	Flat	DAA	DAA	External insulation of flat roof, protected against weathering, insulation under roof water proofing	U	Y	U	N	N	Y	N	N	N	Y	N	N	N	N	U		Y	Y	U	U	U	N	N	Y	U	U	N	N	N	N	Y	Y	Y	Y	N	N	U	N	N	N	U		Y	Y	Y	Y	Y	Y	N			
2	Roof	Pitched		DAC	External insulation of warm pitched roof pitched ceiling insulation, protected against weathering, insulation under cover	N	N	N	N	N	N	N	N	N	N	N	N	N	U		N	Y	Y	Y	Y	N	N	Y	N	N	N	N	N	N	U	U	U	Y	N	U	U	N	N	N	U		N	N	N	N	N	N	N			
2	Roof	Pitched		DAD	Insulation separating rafters and outer covering	N	N	N	N	N	N	N	N	N	N	N	N	N	U		N	Y	Y	Y	Y	N	N	Y	N	N	N	N	N	N	U	U	U	Y	N	U	U	N	N	N	U		N	N	N	N	N	N	N			
3	Roof	Pitched		DAD	Insulation separating supporting construction and outer covering	N	N	N	N	N	N	N	N	N	N	N	N	N	U		N	Y	Y	Y	Y	N	N	Y	N	N	N	N	N	N	U	U	U	Y	N	U	U	N	N	N	U		N	N	N	N	N	N	N			
1	Roof	Pitched	DAD	DAD	External insulation of warm pitched roof insulation, protected against weathering, insulation under cover	N	N	N	N	N	N	N	N	N	N	N	N	N	U		N	Y	Y	Y	Y	N	N	Y	N	N	N	N	N	N	U	U	U	Y	N	U	U	N	N	N	U		N	N	N	N	N	N	N			
23.2	Floor	Horizontal		DE	Insulation between the floor joists/beams	Y	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	Y	U		Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	U	Y	Y	U	U	Y	U	Y	U	U	U		Y	N	N	N	N	N	N			
24	Floor	Under		DE	Insulation under load distributing flooring, fully supported	Y	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	Y	U		Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	N	N	Y	U	U	Y	N	N	Y	U	U	U	U		N	N	N	U	U	U	Y			
23.1	Floor	Horizontal		DEO	Insulation over the supporting floor construction	Y	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	Y	U		Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	U	N	N	Y	Y	Y	Y	N	U	N	U	U	U	U		N	N	N	N	N	N	Y			
8	Floor	Over	DEO	DEO	Interior insulation on top of the floor, below floor screed without acoustic dampering requirements	Y	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	Y	U		Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	U	N	N	Y	Y	Y	Y	N	U	Y	N	N	U	U		N	N	N	Y	Y	Y	N			
9	Floor		DES	DES	Interior insulation on top of the floor, below floor screed with acoustic dampering requirements	Y	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	Y	U		Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	U	N	N	Y	Y	Y	Y	N	U	Y	N	N	U	U		N	N	N	Y	Y	Y	N			
7	Ceiling	Flat	DI	DI	Interior insulation under the flat ceiling joists / supporting structure	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	U		Y	Y	Y	Y	Y	N	N	Y	Y	N	N	N	N	N	N	Y	U	U	Y	N	U	U	N	N	U	U		N	N	N	N	Y	Y	N			
6	Roof	Flat		DUK	Inverted insulation above roofing membrane including roof gardens and parking decks	N	N	N	N	N	N	N	N	N	N	N	N	N	N	U		U	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	U		N	N	N	N	N	N	N			
5	Roof	Flat	DUK	DUK	External insulation of the roof, exposed to the weather (inverted roof)	N	N	N	N	N	N	N	N	N	N	N	N	N	N	U		U	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	U		N	N	N	N	N	N	N			
6	Roof	Pitched	DZ	DZ	Insulation between the rafters, two-shell roof, not readily walkable but accessable	Y	Y	Y	N	N	U	U	U	N	N	U	Y	Y	Y	U		Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	Y	Y	U	N	U		Y	Y	Y	Y	Y	Y	N			
26	**Foundation**	**Horizontal**		PB	Insulation under the concrete slab with direct contact to the ground	N	N	N	N	N	U	Y	Y	N	N	N	N	N	N	Y		Y	U	U	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	U	U		N	N	N	N	N	N	N			
25	Perimeter	Horizontal		PB	Insulation under the ground bearing floor construction	N	N	N	N	N	U	Y	Y	N	N	N	N	N	N	Y		Y	U	U	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	U	U		N	N	N	N	N	N	N			
19	Floor	Ground	PB	PB	External thermal insulation under the floor in contact with soil (outside of water proofing)	N	N	N	N	N	U	Y	Y	N	N	N	N	N	N	Y		Y	U	U	N	N	N	N	N	N	N	N	N	N	N	U	N	N	N	N	N	U	N	N	U	U		N	N	N	N	N	N	N			
28	**Foundation**	**Horizontal**		PBAW	Insulation under the concrete slab above waterproof membrane	N	N	N	N	N	U	Y	Y	N	N	N	N	N	N	Y		Y	U	U	N	N	N	N	N	N	N	N	N	N	N	U	N	N	N	N	N	U	N	N	U	U		N	N	N	N	N	N	N			
27	**Foundation**	**Horizontal**		PI	Insulation supported by the concrete slab, above waterproof membrane, beneath load distributing flooring	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	Y		Y	U	U	N	N	N	N	N	N	N	N	N	N	N	U	N	N	Y	N	N	U	N	N	U	U		N	N	N	N	Y	Y	N			
29	**Foundation**	**Vertical**		PW	Frost insulation in or against the ground	N	N	N	N	N	Y	U	U	N	N	N	N	N	N	Y		Y	U	U	N	N	N	N	N	N	N	N	N	N	N	U	N	N	Y	N	U	Y	N	N	U	U		N	N	N	N	N	N	U			
18	Perimeter	Vertical	PW	PW	External thermal insulation of walls in contact with soil (outside of the water proofing)	N	N	N	N	N	Y	U	U	N	N	N	N	N	N	N		Y	Y	U	U	N	N	N	N	N	N	N	N	N	N	U	N	N	N	Y	N	U	Y	N	N	N	U		N	N	N	N	N	N	U			
20	Basement	Vertical		PWE	Wall underground, external insulation behind waterproof membrane with mechanical protection	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N		Y	Y	U	U	N	N	N	N	N	N	N	N	N	N	U	N	N	N	Y	N	U	Y	N	N	N	U		N	N	N	N	N	N	U			

V4 additions no date yet



V4 892 Elemental Assemblies in hierarchy

New build							
	Foundations 1						11_lnn_d11_lnn_nn
		Soil improvement D11					11_lnn_d11_lnn_nn
		Foundations					16_lnn_e10_lnn_nn
		Piling & pile caps					17_lnn_***_lnn_nn
		Ground beams					
			in-situ concrete E10				
			Precast concrete E10				
			Metal G10				
		Bearing Pads					19_lnn_***_lnn_nn
			Static load				
				Recycled plastic Z50			
				Metal Z11			
				Composite			
			Anti-vibration mounting				
				Recycled plastic Z50			
				Metal Z11			
				Composite			
				Rubber			
	Basements 9						13_lnn_e10_lnn_nn
		Basment Floors					13_lnn_e10_lnn_nn
			in-situ concrete E10				
		Basement retaining walls					
			in-situ concrete E10				
			Precast concrete basement panels				
			Tyre bales				
			Earthship: Tyres & rammed earth				
			Cellular concrete (reinforced core) F10				
			Cellular fired clay F15				
	Ground floors 12						13_lnn_enn_lnn_nn
		Ground bearing					13_lnn_enn_lnn_nn
			in-situ Concrete E10				
				Floated/Power-floated E41			
				Timber deck K11			
				Screeded M10			
			in-situ Limecrete E80				
			in-situ hempcrete E82				
		Suspended over site					13_lnn_***_lnn_nn
			Sleeper walls				
			Timber				
				Timber joists + I composits G20			
				cross laminated G22			
				SIPs G26			
				ISPs G27			
				stacked wood G28 G28 dowelled/nailed			
			Clay				

V4 892 Elemental Assemblies & Specifications

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

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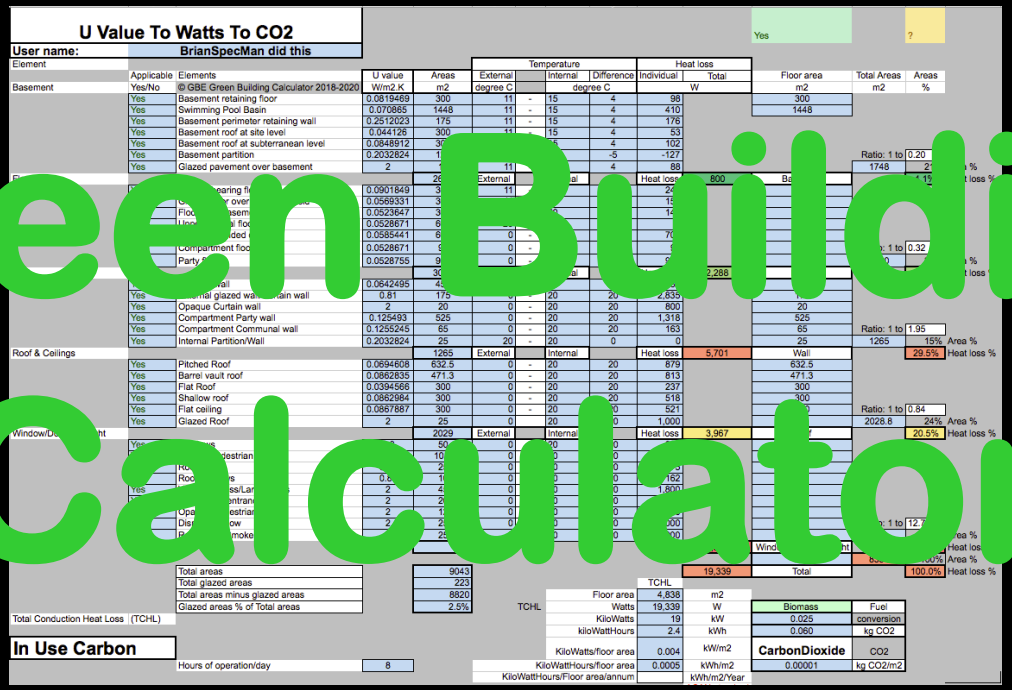

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Bespoke Development Opportunities

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Bespoke 1
Historic Fabric Upgrades

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

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

B1 Evidence-based Guidance
Secondary Element Upgrades

Secondary-Element Upgrade

Yes/No	Secondary Element	U value	Energy in use	Carbon In use	Carbon saved in use	Cost in use	Materials	Finishes	Profiles	Initial Cost	Payback period	Embodied Energy	Embodied Carbon	Carbon in waste	Sequestered carbon	Carbon back period
	Planned development Version	V1	V1	V1		V2	V1	V1	V1>V2	V1		V2	V2	V11	V2	
	Bespoke Version				B1						B1			B1		B1
Yes/No	Existing Single glazing	-	++++++	++++++ +/-	0	++++++	0	+	0	0	?	+/-	+/-	0	0	?
Yes	Existing to Double glazing	- -	+++++	+++++ +/-	+	+++++	+	+	++	++	?	+/-	+/-	+	0	?
No	+Secondary Glazing	- - -	++++	++++ +/-'	++	++++	++	++++	+++	+++	?	+/-	+/-	+	++	?
?	+Secondary Double Glazing	- - - -	+++	+++ +/-	+++	+++	+++	++++	++++	++++	?	+/-	+/-	+	++	?
?	Replace with double glazing	- - - - -	++	++ +/-	++++	++	+++++	+++	+++	+++++	?	+/-	+/-	++++	+++	?
?	Replace with triple glazing	- - - - - -	+	+ +/-	+++++	+	++++++	+++	+++	+++++	?	+/-	+/-	++++	+++	?

B1 Evidence-based Guidance

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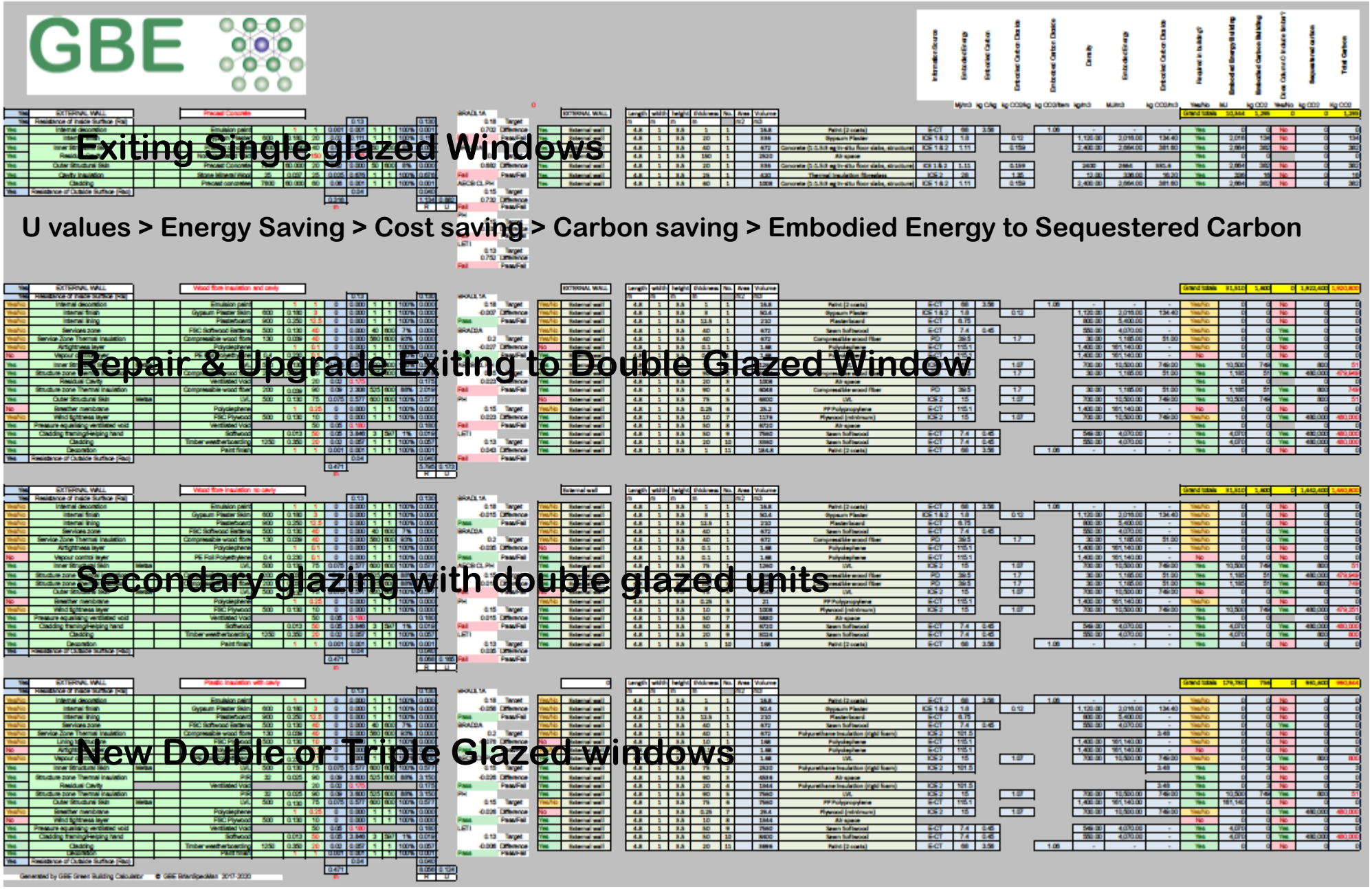

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Bespoke 2 Screed Calculator

- Construction methods v Permissible minimum thickness:
  - Bonded: 25 mm v
  - In contact with substrate: 30 mm v
  - Unbonded: (25 mm) 30 mm v 50 mm S:C and reinforced
  - Floating commercial: 40 mm v 75 mm Sand:Cement
  - Floating domestic: 35 mm v 65 mm S:C
  - Underfloor heating: 20-30 mm v 25-35 mm S:C
- Product Recipes: Flowing or dry screeds
- Material choices & Recipe:
  - sand choices, cement, lime, gypsum, anhydrite, synthetic anhydrite, calcium sulfate, clay, limecrete, hempcrete
- Alternatives: Dry boards, Biobased
- Binders and additives: Embodied Chemistry
- Recycled Content & Percentages:
  - synthetic anhydrate, aggregates, cement replacements
- Transport: Cradle to gate, Gate to mixing plant, Mixing plant to Site
- Environmental impacts:
  - Embodied Energy & Carbon & Full LCA Embodied water
- Challenge EPD methods and promote Peer-Previewed EPD system

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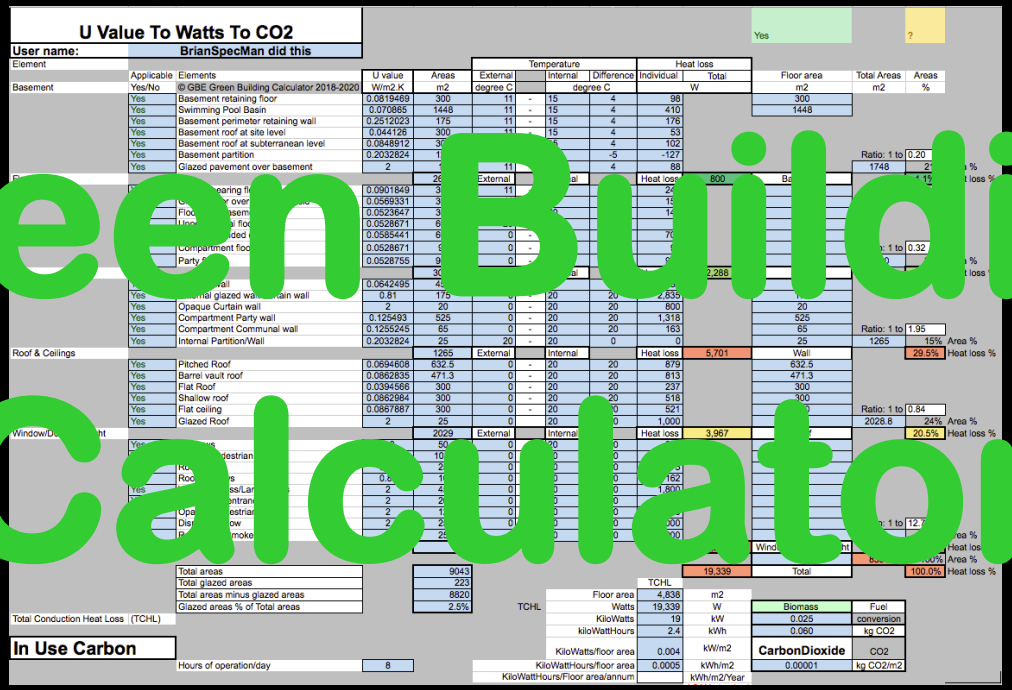

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User name: BrianSpecMan did this

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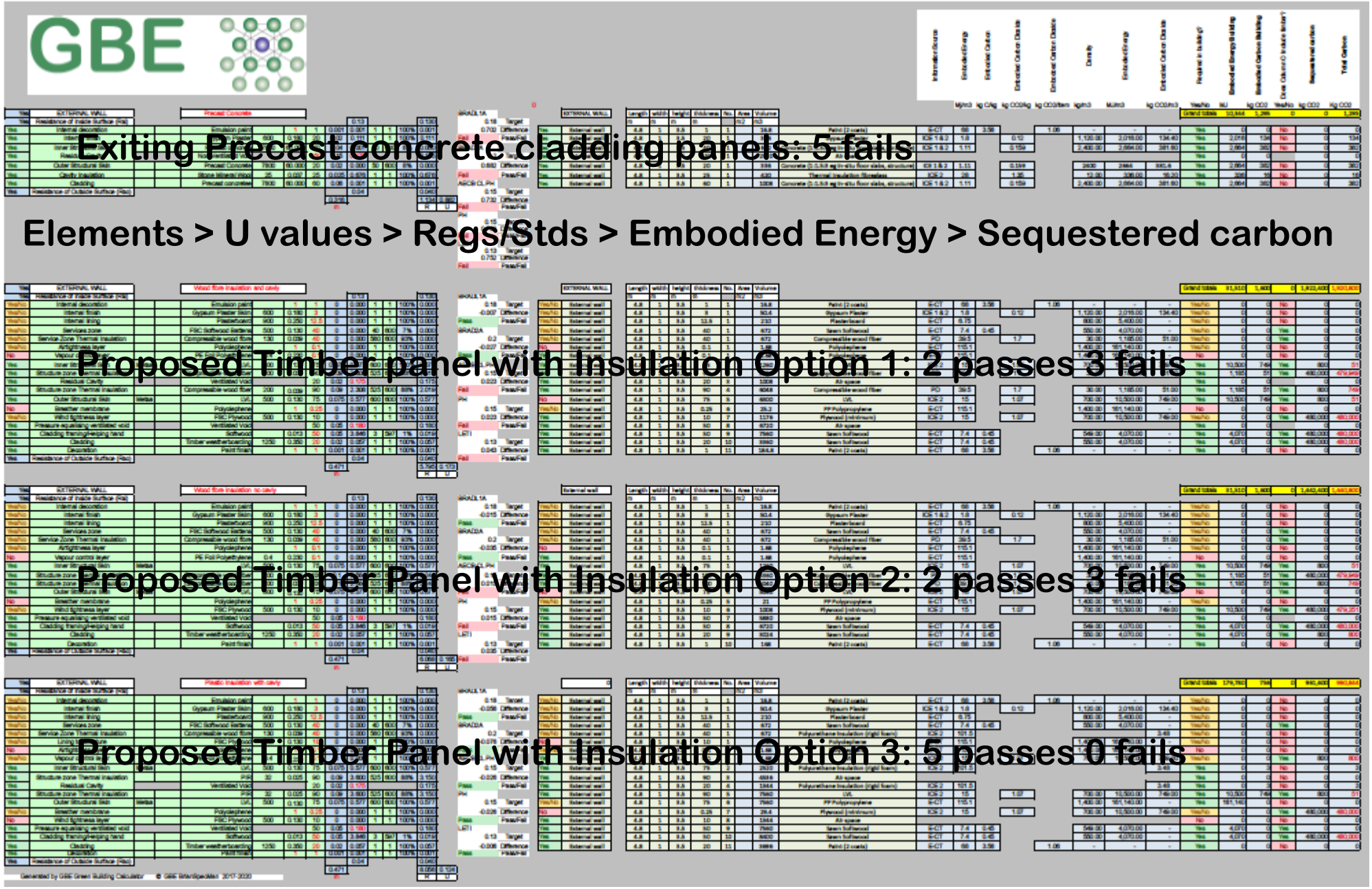
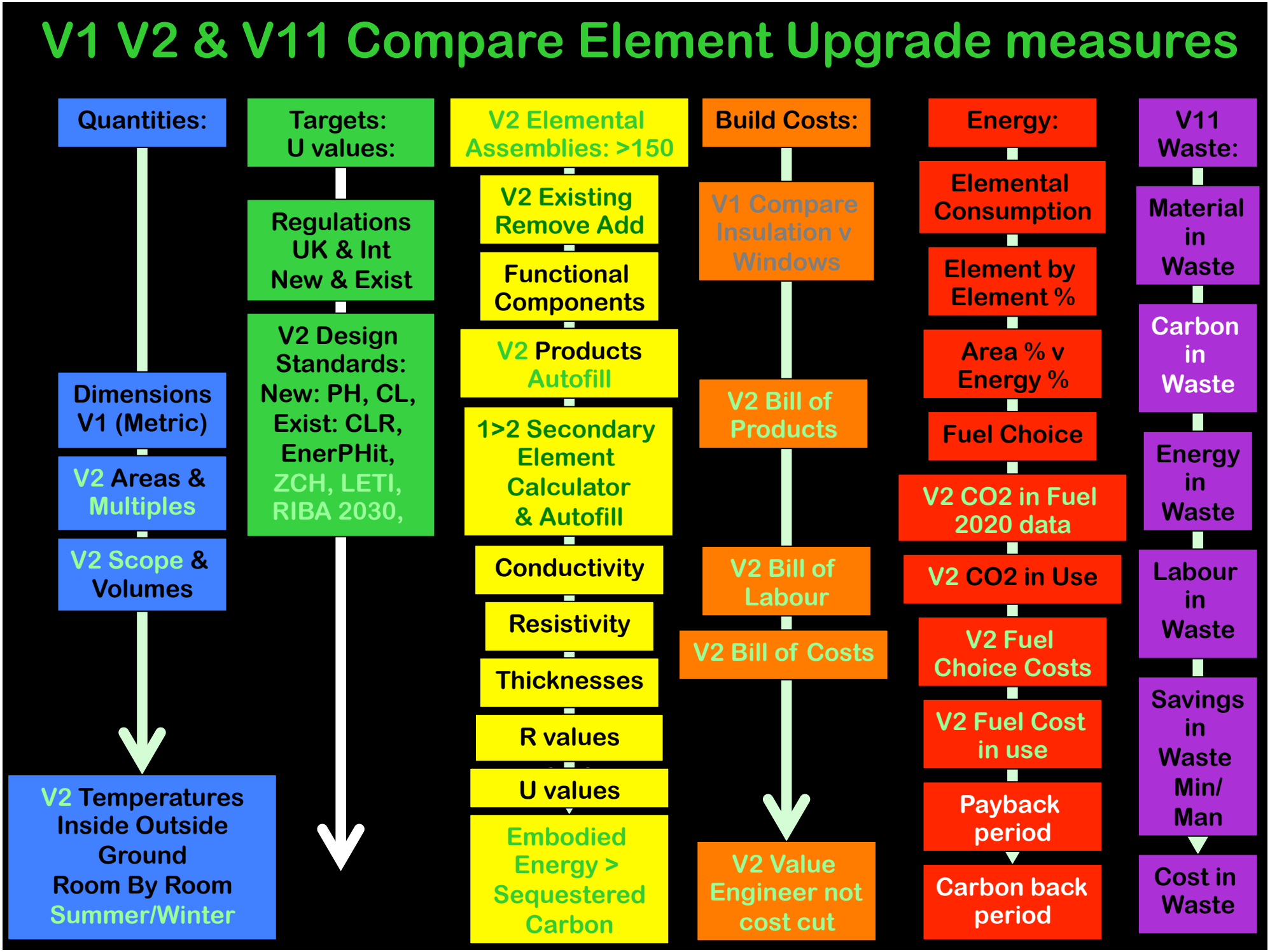
Design Competition Entries

Supporting Evidence Datasets

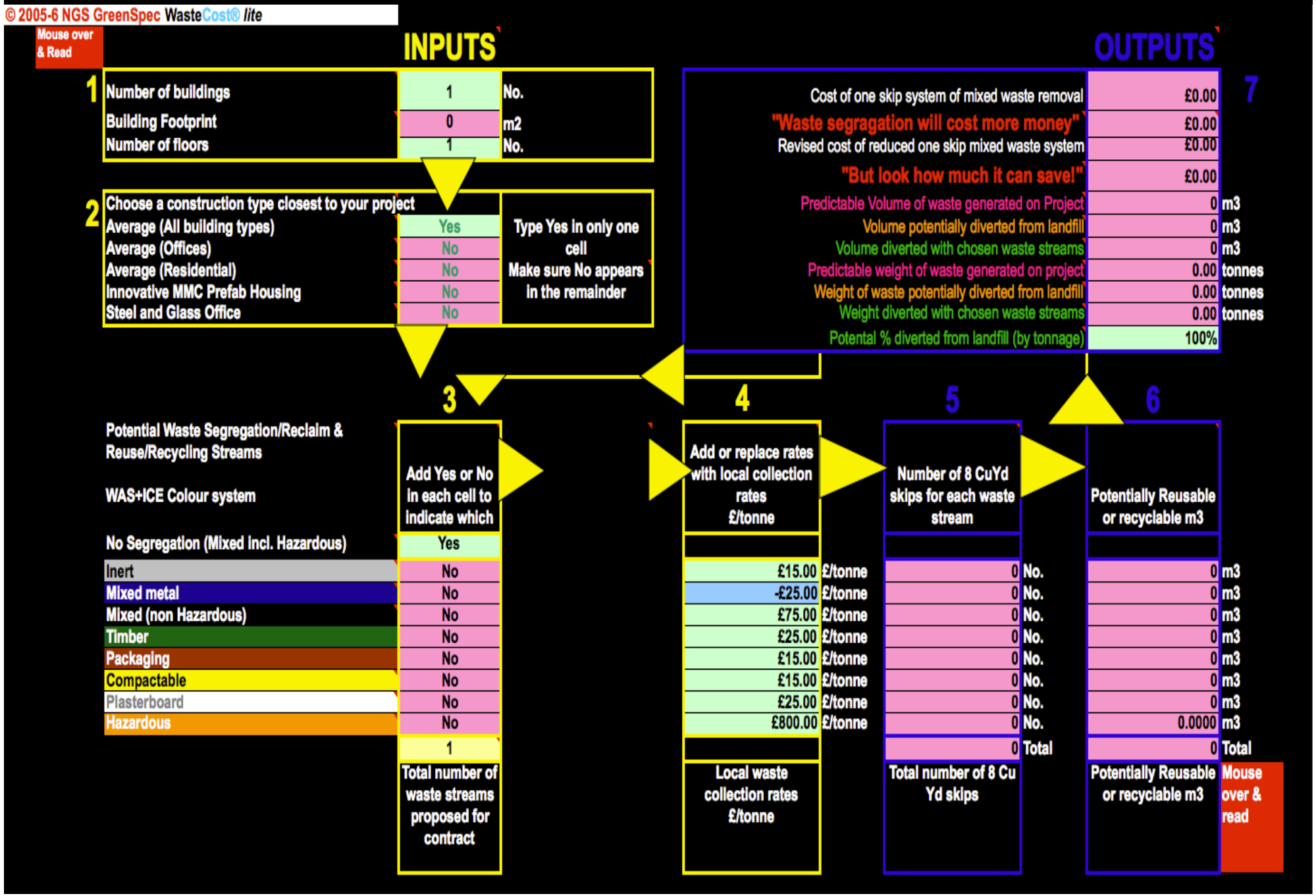
Int. Timber Competition Entry



V1 V2 & V11 Compare Element Upgrade measures



V11 NGS WasteCost® *Lite* 2005 + new datasets



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2019-2030 Future Development:

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

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Affiliate Marketing Partners?

- James Allen
  - AECB members
- RDE Peter Draper Cardiff Wales
  - STBA & SPAB Annual Conference 2020
- Peter Linnell: Wales TAN6 OPD
  - Self builders
- TGR Green Register: Lucy Pedler:
  - TGR Members
- FutureProof: Charlotte & Malcolm:
  - Retrofit Builders
- Sandy Halliday: GAIA Architects
  - SEDA Members
- Richard
  - ASBP members

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V1 User Survey

User Survey

Please email the survey as a PDF or excel to BrianSpecMan@icloud.com

GBE thinks it knows what is needed and the right order for its development
Some tasks are dependent on others being in place first to build upon
GBE would like to know from users if they would like to see some parts developed sooner
GBE would like to know from users if they would like to see other parts added to the tasks
Please rearrange the numbers in columns E & F into your preferred order and add any comments or requests in column G
Please complete 'Your Requests' below

			Please arrange the numbers in your preferred order		
			Preferred Version Order	Preferred sub-item order	Comment
About	A description of what GBE Green Building Calculator is, how it started and how it has developed	Launch Version 1.1	1	1	
Features Benefits	What is does and how that helps users	Launch Version 1.2		2	
Development	Aid memoir for development	Launch Version 1.3		3	
Phased Development Prices	This page: What is included in the launch version of GBE Green Building Calculator and GBE's suggested development order: Subject to user survey	Launch Version 1.4		4	
Instructions	Read these if GBE Green Building Calculator is not intuitive (it probably won't be if you have not done a U value calculation before)	Launch Version 1.5		5	
Revisions	A record of updates to GBE Green Building Calculator to enable an audit trail through the development process	Launch Version 1.6		6	
Project Revisions	Not part of GBE Green Building Calculator For users record keeping on design projects	Launch Version 1.7		7	
Whole Building	Whole Building: The start of GBE Green Building Calculator Input page: Sizes, Areas and Volumes, hours of operation, design temperatures, inside and out	Launch Version 1.8		8	
Schedule of Accommodation	Schedule of Accommodation Room by Rooms Input page: more specific than whole building if required; Areas and volumes, hours of operation, design temperatures, inside and out	Launch Version 1.9		9	
Room By Room Heat Losses	Input and Put-put page: Room by room heat loss calculator to determine Boiler size, radiator or under floor heating requirements, Developed to help designer to make the insulation thicknesses or window specifications to match a boiler capacity when it's a tight fit	Launch Version 1.10		10	
Form Factor	Results page: Analysis of Form Factor and optimal U values to respond to them To help designers see the importance of compactness, or the consequence of fragmentation of the building volume, on the energy consumption See Update 2.3	Launch Version 1.11		11	
Building Elements	Input page: simple yes/no Building Elements and secondary-elements are selected from readymade lists of 29 Elements and 12 Secondary Elements to match the scope of the project	Launch Version 1.12		12	
Building Element Areas	Input and output page: Building Elements and secondary-elements: their dimensions are added by user and their areas are automatically calculated.	Launch Version 1.13		13	
Multiple Size Building Element Areas	Input and output page: Since windows and doors come in a multitude of sized then a GBE Green Building Calculator schedules allows you to incorporate them all	Launch Version 1.14		14	
U values Etc. Energy Targets	Results page: Allows the users to compare and choose between Building Regulations Part L, other national regulations or standards, LETI, AECB CarbonLite, Passivhaus, EnerPHit, EAMs, etc. including: U values, Airtightness, Form factors, Elevational window %.	Launch Version 1.15		15	
Insulation Thicknesses	Input and output table: Information Resource: Quick look up table Users apply the chosen U value targets from the previous worksheet GBE Green Building Calculator automatically displays the thickness of different k valued insulation materials needed to meet U values targeted in each element.	Launch Version 1.16		16	
Decrement Delay Insulation Thickness	Input and output page: (incomplete at launch) Automatically see what thickness of different k valued insulation materials is needed to avoid overheating on summer See Update 2.1	Launch Version 1.17 Version 3.1		3.1	
Legend	Information Resource: A list of terms used in GBE Green Building Calculator with some explanation of their meaning in a tabulated format Potential link to GBE Jargon Buster pages	Launch Version 1.18		18	
Elements	Input and output page: Yes/No then choose from drop down menu, followed by automatic cell population Allows the user to populate and assemble elements by choosing their combination of functional components and then choosing the materials for each component. Components are in the right sequence but it may needs some know-how to choose the right one (Update 3 will help with readymade assemblies) Costs of insulation and windows are added here to help persuade architects and clients to spend money on insulation and higher performance windows and glazing.	Launch Version 1.19		19	
Bill of Materials Quantities Costs	Input and output page: Allows user to cost plan their Building with a Bill of materials, quantities, labour and costs based on building fabric only so far. It will be reliant upon users interrogating recent tender rates or building price books Services are planned to be addressed in update 1.4-1.7 (unless users say otherwise) Non-external envelope components are planned to be developed in Phase 5.4 (unless users want it sooner) See Update 1.2 & 1.3	Launch Version 1.20		20	

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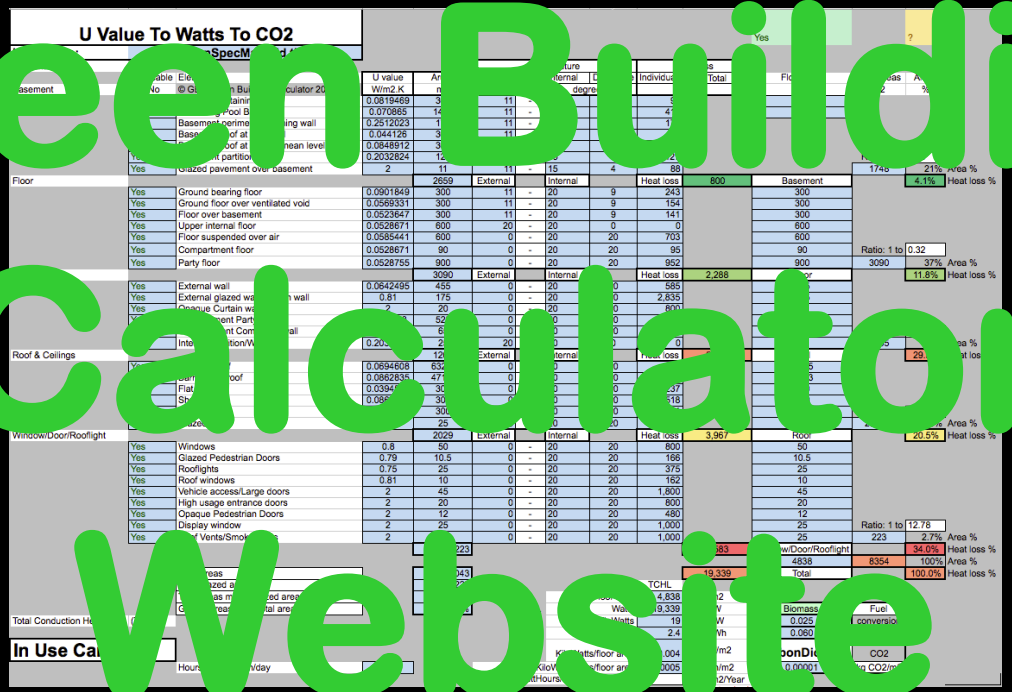

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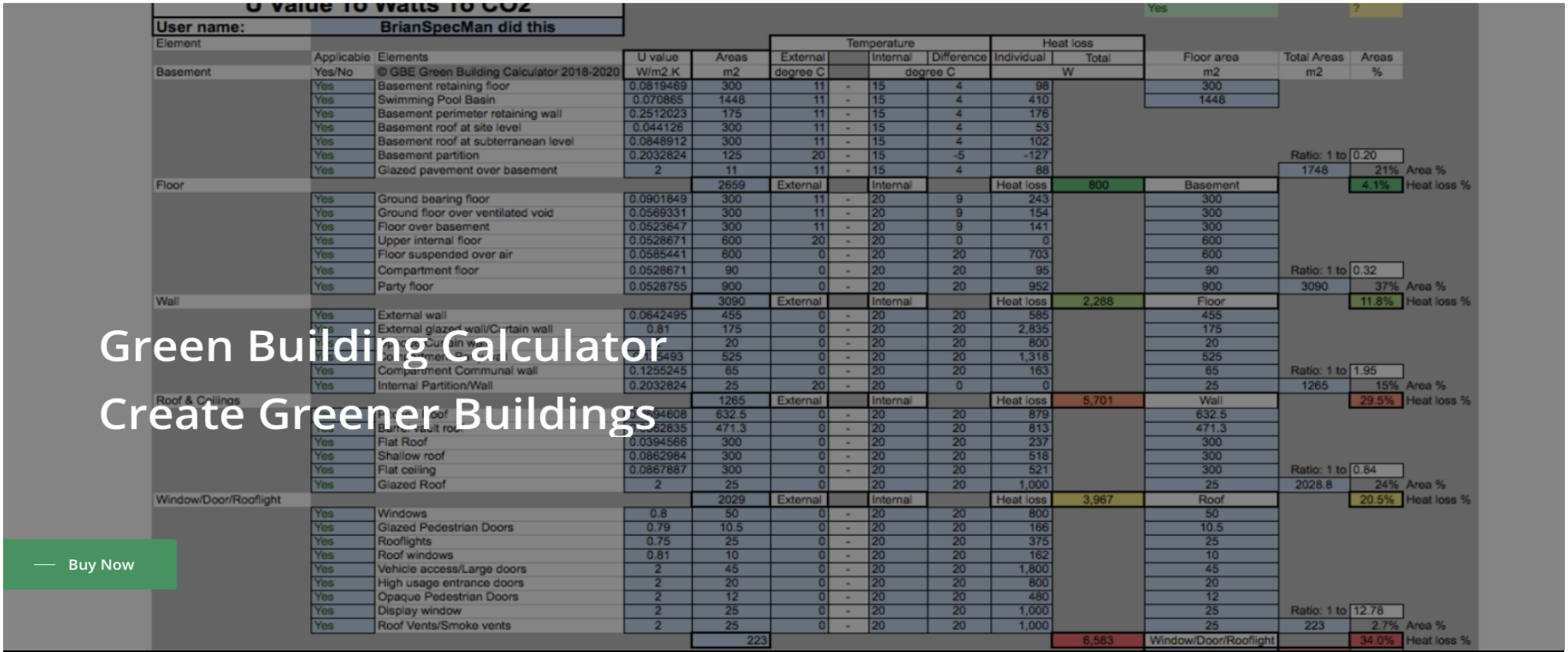
Website Home page



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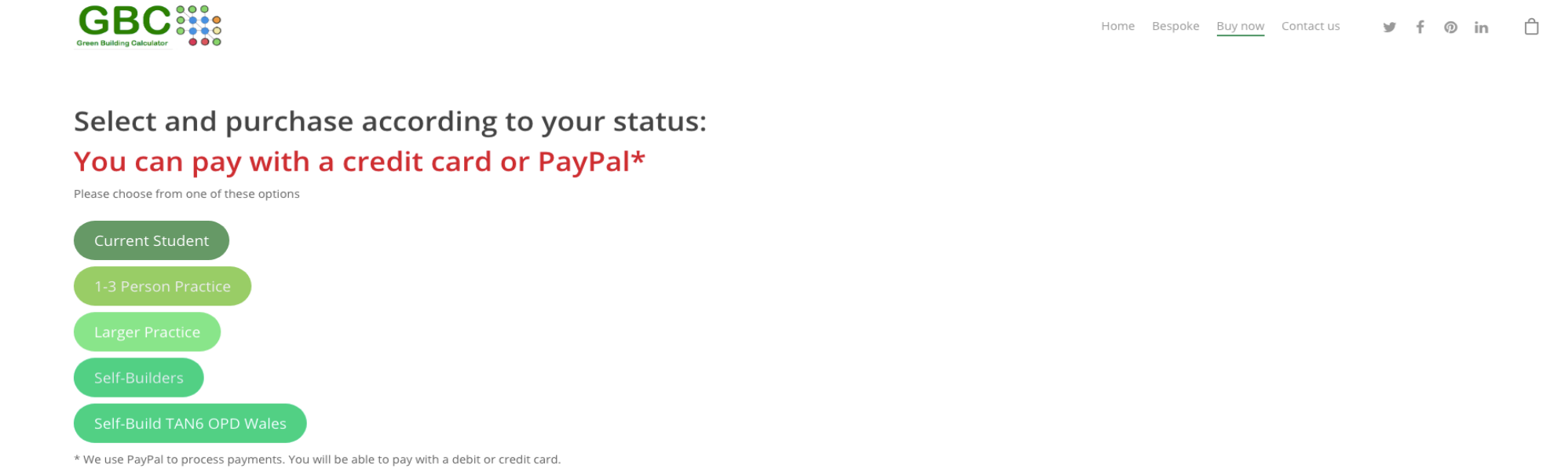
GBC V1 for sale



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GBC V1 Excel file on GBC:

- GBE Green Building Calculator (Shop)
  - Big practice version: £98.88
  - Small practice version: £48.88
  - Student version: £4.88
  - Self Build version: £48.88
  - Welsh TAN 6 Self Build version: £4.88
- Price of versions to increase with more functionality
  - Target: prices above x 4 at end of V23 planned development in 3-4 years

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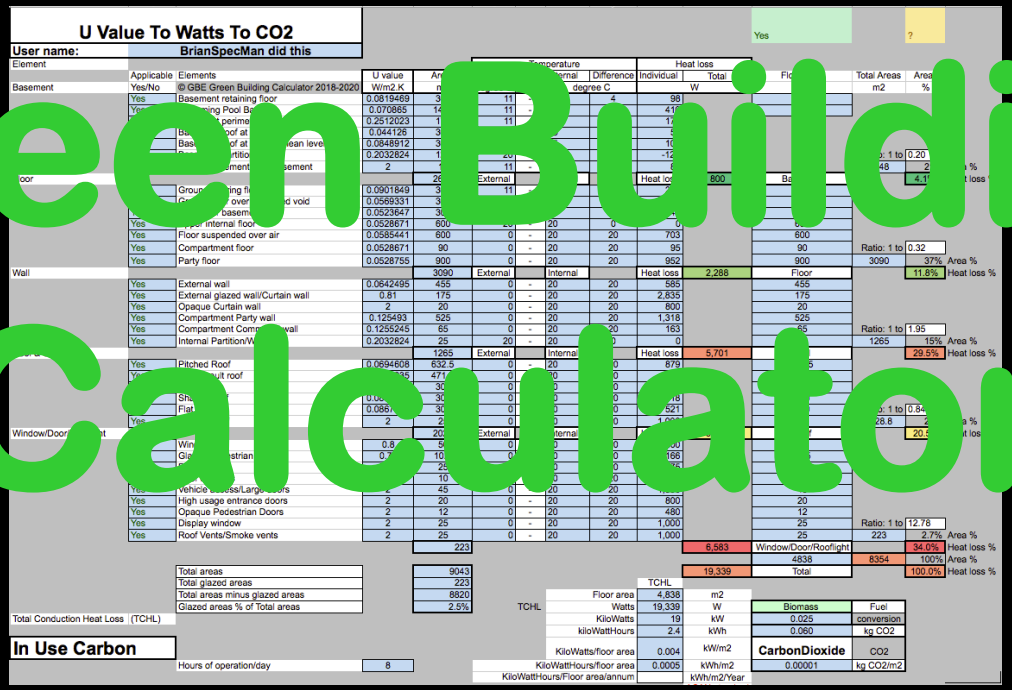

U Value To Watts To CO2

User name: BrianSpecMan did this

Element	Applicable	Elements	U value	Area	External	Internal	Difference	Heat loss Individual	Heat loss Total	Floor	Total Areas	Area
Basement	Yes/No	© GBE Green Building Calculator 2018-2020	W/m2 K	m		degree C		W			m2	%
	Yes	Basement retaining floor	0.0819469	3	11		4	98				
	Yes	Swimming Pool Ba	0.070865	14	11	-		41				
		perime	0.2512023	1	11			17				
		Ba oof at	0.044126	3				5				
		Bas of at ean leve	0.0848912	3				13				
		titio	0.2032824	1				-12				
		sement	2	1	11	-		6			48	2
oor				26	External		Internal	Heat lo	800	Ba		4.1
		Groun ing fl	0.0901849	3	11							
		over d void	0.0569331	3								
		basem	0.0523647	36								
	Yes	Internal floor	0.0528671	800		20	0	0				
	Yes	Floor suspended over air	0.0585441	800	0	- 20	20	703		600		
	Yes	Compartment floor	0.0528671	90	0	- 20	20	95		90	Ratio: 1 to	0.32
	Yes	Party floor	0.0528755	900	0	- 20	20	952		900	3090	37% Area %
Wall				3090	External		Internal	Heat loss	2,288	Floor		11.8% Heat loss %
	Yes	External wall	0.0642495	455	0	- 20	20	585		455		
	Yes	External glazed wall/Curtain wall	0.81	175	0	- 20	20	2,835		175		
	Yes	Opaque Curtain wall	2	20	0	- 20	20	800		20		
	Yes	Compartment Party wall	0.125493	525	0	- 20	20	1,318		525		
	Yes	Compartment Comp wall	0.1255245	65	0	- 20	20	163		65	Ratio: 1 to	1.95
	Yes	Internal Partition/W	0.2032824	25	20	- 20	0	0			1265	15% Area %
				1265	External		Internal	Heat loss	5,701			29.5% Heat loss %
	Yes	Pitched Roof	0.0694608	632.5	0	- 20	0	879		5		
	Yes	ut roof		471	0	0	0					
				30	0	0	0					
		Shi	0.0	30	0	0	0	18				
		Flat	0.0861	30	0	0	0	521			0.1 to	0.84
	Yes		2	2	0	0	0	1,000			28.8	2
Window/Door/				20	External		Internal					20.5
		Win	0.8	5	0	0	0	0				
		Gl strian	0.7	10	0	0	0	168				
				25		0	0	0				
				10		0	0	0				
	Yes	Vehicle access/Large doors		45	0	- 20	20					
	Yes	High usage entrance doors	2	20	0	- 20	20	800		20		
	Yes	Opaque Pedestrian Doors	2	12	0	- 20	20	480		12		
	Yes	Display window	2	25	0	- 20	20	1,000		25	Ratio: 1 to	12.78
	Yes	Roof Vents/Smoke vents	2	25	0	- 20	20	1,000		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								
		Total areas minus glazed areas		8820								
		Glazed areas % of Total Areas		2.5%								

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

Total Conduction Heat Loss (TCHL)

In Use Carbon

Hours of operation/day 8

Green Building Calculator

GBE V2 In Detail

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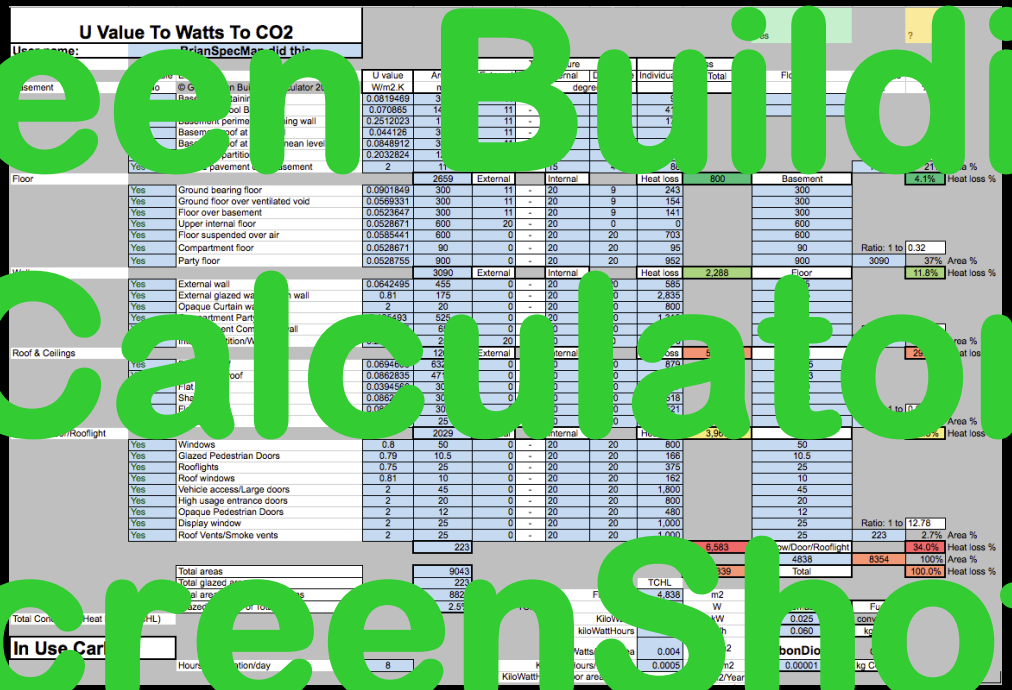
Green Building Calculator ScreenShots



Preview V2 relevant to retrofit

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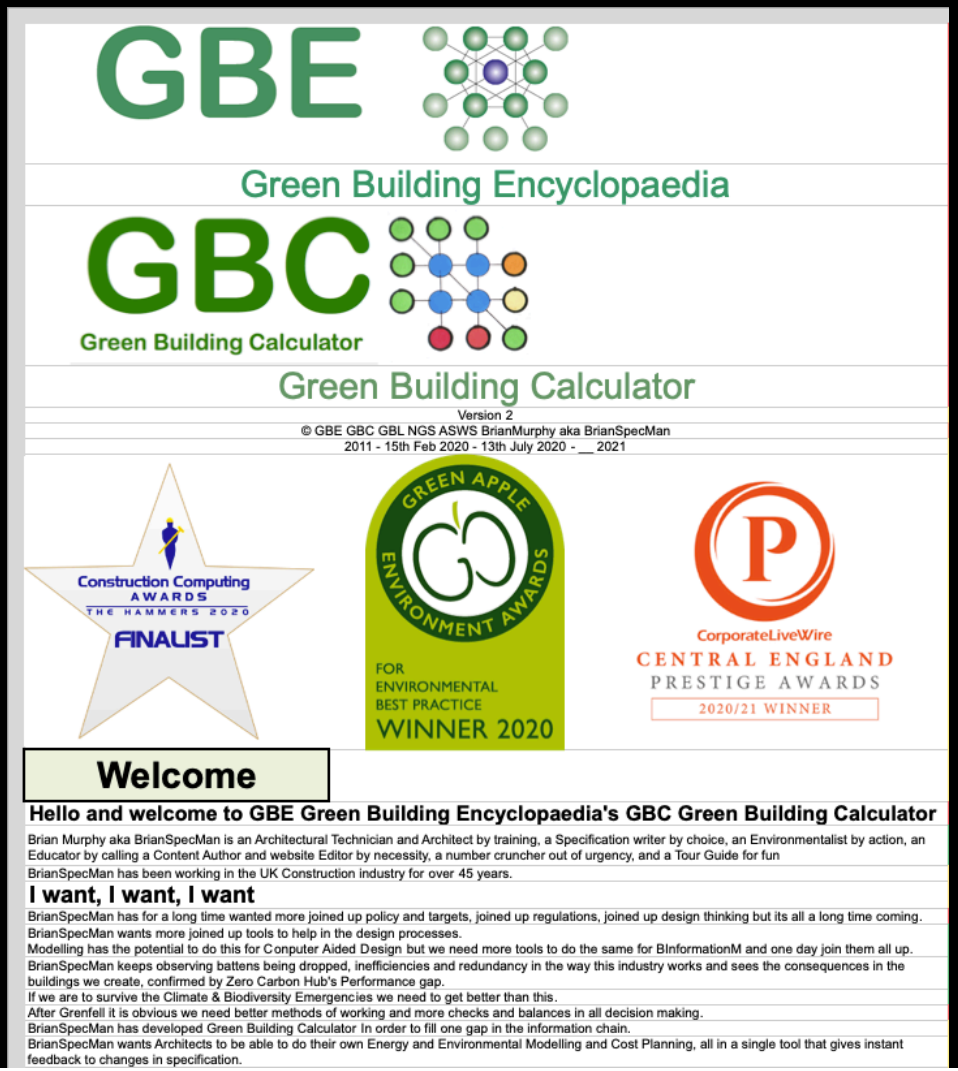
V2 Welcome



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Version 2

2011 - 15th Feb 2020 - 13th July 2020 - __ 2021

Construction Computing AWARDS THE HAMMERS 2020 FINALIST

GREEN APPLE ENVIRONMENT AWARDS FOR ENVIRONMENTAL BEST PRACTICE WINNER 2020

CorporateLiveWire CENTRAL ENGLAND PRESTIGE AWARDS 2020/21 WINNER

Welcome

Hello and welcome to GBE Green Building Encyclopaedia's GBC Green Building Calculator

Brian Murphy aka BrianSpecMan is an Architectural Technician and Architect by training, a Specification writer by choice, an Environmentalist by action, an Educator by calling a Content Author and website Editor by necessity, a number cruncher out of urgency, and a Tour Guide for fun

BrianSpecMan has been working in the UK Construction industry for over 45 years.

I want, I want, I want

BrianSpecMan has for a long time wanted more joined up policy and targets, joined up regulations, joined up design thinking but its all a long time coming.

BrianSpecMan wants more joined up tools to help in the design processes.
Modelling has the potential to do this for Conputer Aided Design but we need more tools to do the same for BInformationM and one day join them all up.

BrianSpecMan keeps observing battens being dropped, inefficiencies and redundancy in the way this industry works and sees the consequences in the buildings we create, confirmed by Zero Carbon Hub's Performance gap.

If we are to survive the Climate & Biodiversity Emergencies we need to get better than this.

After Grenfell it is obvious we need better methods of working and more checks and balances in all decision making.

BrianSpecMan has developed Green Building Calculator In order to fill one gap in the information chain.

BrianSpecMan wants Architects to be able to do their own Energy and Environmental Modelling and Cost Planning, all in a single tool that gives instant feedback to changes in specification.

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V2 About

No No

To be completed by GBC user

GBE Green Building Encyclopaedia

GBC Green Building Calculator

About GBC

Topic:	Information	
Brand Name:	GBC Green Building Calculator 'GBE GBC'	
Working File Name:	GBC Green Building Calculator Working.xlsx	
Issue File name:	GBC Green Building Calculator A14BRM110620.xlsx	
Publishing Issue File Name:	GBC Green Building Calculator V100.xlsx	
WordPress import and export file name	GBC Green Building Calculator V100-bapiwy.xlsx	
GBC Create date:	13/01/2018 (previous calculators from 2011 stated to be merged into this file)	
GBC V2 Last edited date:	29/05/2021	
When opening file	Links to other file: press 'ignore' button	Yes
When opening file	Excel cannot calculate a formulae: Press 'Cancel' button	Yes
When opening file	Correct circular calculation: Press ' ' burron	Yes
When downloaded to your C drive or servers	Feel free to delete "-bapiwy" from file name or rename the file to suit your filing naming system	Yes
Make the file a Template	To preserve the file as created by GBC, make this file a template available to Excel. File > Save As > Format: Drop down list > Choose > Excel Template (.xltx) or (.xlt) > Where: Excel automatically chooses 'My Templates' Folder > File Name: Partially rename 'Working' to 'Template' > Save	Yes
Using Template in Excel	File > New from template > Scroll to find the GBC V2 template file > Click it > Press 'Choose' button > start working	Yes
Purpose:	To provide a low cost Energy Performance, Environmental Impact and Cost analysis tool for design of new buildings or refurbishments, for those not engaging in PHPP, SAP, SBEM, IES, etc. calculations.	
History:	This MS Excel calculator was originally developed as two files to permit Post Graduate Architecture students to analyse their own studio building projects during a parallel technology module EREID Energy And Resource Efficiency in Design at London South Bank University 2014-2018. Due to the high risk of inability by the 5th year students, potential differing approaches and inconsistency of results, GBE's BrianSpecMan created two spreadsheet's, developing their worksheets week by week as the students progressed through the module under weekly time pressures. The consistent results meant we could compare different building shapes, methods of construction, materials choices and resultant energy demand and consumption.	

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V2 Instructions

Instructions

Legend

Green cells need the user to add, project specific information or replace default information with specific information
Red text in Turquois cells is reproducing building-wide information but the user can over write it with room or element specific values
Blue cells provide results based on a calculation using data from other cells DO NOT OVERWRITE THE CELL CONTENT
Red cells indicate a drop down list is available to choose from options

File: Spreadsheet

- Using your dimensioned drawings
- Using the latest edition of file GBE Green Building Calculator B01BRM080620.xlsx (if you need *.xls let me know I will provide)
- Found in GBE Shop https://greenbuildingencyclopaedia.uk/product-category/gbe-calculators-shop/
- Found in Green Building Calculator website https://greenbuildingcalculator.uk/buy-now/
- Download the file to your C Drive (or other, on the server, ask your IT department)
- Save the file as a Microsoft Excel Template file (Save As > *.XLTX) in the Template folder (automatically offered if set up corrrectly)
- Make a working copy (File > New from Template > Scroll > Choose > File > Save as > name file) add your project reference or name to the file name
- Edit your working file in your C drive (or other on your server, dictated by you're IT department)

Worksheet	Column(s)	Row(s)	Cells	Worksheet Instructions: Whole Building
Schedule Accommodation		Custom View:	Whole Building (B3:P21)	• Work sheet (tab) ScheduleAccommodation
	C	3	C3	• Add your name (this feeds through to numerous worksheets)
	C	4	C4	• Add your project name or reference
	C	5	C5	• Add your project address
	C	6	C6	• Add your building User Activity or Purpose
	M to O	3 to 5	M3:O5	• Observe the diagram used to complete Room by Room schedule, below right
	D, E, F, G, I	11	D11, E11, F11, G11, I11	• Add your project details: Quantities, dimensions.
	L	11	L11	• Confirm these match your plans using the drop down list
	N	11	N11	• Confirm or change the number of hours of operation of the whole building (during which internal temperatures are to be maintained, this can be made room by room later below)
	D, E, F, G	14	D14, E14, F14, G14	• Add your project details: Quantities, dimensions.
	H	14	H14	• Confirm one house position in terrace using the drop down list (or not applicable if whole terrace)
	L	14	L14	• Confirm these match your plans using the drop down list
	O	11	O11	• Confirm or change the internal temperature to be maintained in the whole building (this can be changed to room by room later below)
	O	12	Not yet developed	• Choose Summer or Winter issues using the drop down list
	O	15, 17 to 19, 21	O15, O17, O18, O19, O21	• Confirm or change the other temperatures to be maintained in specific locations
	O	16	O16	• Confirm subsoil temperature (below 1 m in the UK this 10-12 all year round) change for other parts of globe
	O	20	O20	• Confirm or change externall temperature Metrological Office data lor location (winter average) change for other parts of globe
				Save your work

Worksheet Instructions: Terraces

Schedule Accommodation		Custom View:	Terraces (B12:O14)	• Work sheet (tab) ScheduleAccommodation
	D, E, F, G	14	D14, E14, F14, G14	• Add your project details: Quantities, dimensions.
	H	14	H14	• Use the drop down list to select mid terrace or end of terrace or if whole terrraces then N/A
	L	14	L14	• Confirm these match your plans using the drop down list

Worksheet Instructions: Schedule of Accommodation

Schedule Accommodation		Custom View:	Schedule Accommodation	• Work sheet (tab) ScheduleAccommodation
	A	27, 37, 47, 57	A27, A37, A47, A57	• Choose Yes or No according to your project using the drop down list
	C	27-35, 37-45, 47-55, 58-65		• Rename the green cells to correspond to the rooms, areas and circulation spaces in your client brief or design aspiration for your building and any others that are different in your building
	C	27-35, 37-45, 47-55, 58-66		• Add more rows as necessary for your building, add new blank rows mid way in each of the floor groups and copy the content of an existing row into your new rows
	D & E	27-35, 37-45, 47-55, 58-67		• Pre-populated from Whole Building figure but can be changed here for each room
	D	27-35, 37-45, 47-55, 58-68		• NB: if you have similar rooms in a row that are not square nor parallel sides use the average of the largest and smallest sizes and add the quantity or rooms to column D
	F & G	27-35, 37-45, 47-55, 58-69		• Add the dimensions for each of your rooms

Future Developments

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

GBC Green Building Calculator

Version Development

This Design & Decision tool is created as a standalone MSExcel file, and will continue to be developed after development of any BIM App

Worksheet	Custom view	Scope of phased development	Versions
Welcome		Introduction, links to website content, Awards	Launch Version 1.0
About		A description of what GBE Green Building Calculator is, how it started and how it has developed	Launch Version 1.1
Features Benefits		What is does and how that helps users	Launch Version 1.2
Development		Aid memoir for development	Launch Version 1.3
Version Development Prices		This page: What is included in the launch version of GBE Green Building Calculator and GBE's suggested development order: Subject to user survey	Launch Version 1.4
Instructions		Read these if GBE Green Building Calculator is not intuitive (it probably won't be if you have not done a U value calculation before)	Launch Version 1.5
Revisions		A record of updates to GBE Green Building Calculator to enable a partial audit trail through the development process	Launch Version 1.6
Project Revisions		Not part of GBE Green Building Calculator For users record keeping on design projects	Launch Version 1.7
Schedule of Accommodation	Whole Building	Whole Building: The start of GBE Green Building Calculator Input page: Sizes, Areas and Volumes, hours of operation, design temperatures, inside and out	Launch Version 1.8
Schedule of Accommodation	Schedule of Accommodation	Schedule of Accommodation Room by Rooms Input page: more specific than whole building if required; Areas and volumes, hours of operation, design temperatures, inside and out	Launch Version 1.9
Schedule of Accommodation	Room By Room Heat Losses	Input and output page: Room by room heat loss calculator to determine Boiler size, radiator or under floor heating requirements, Developed to help designer to make the insulation thicknesses or window specifications to match a boiler capacity when it's a tight fit	Launch Version 1.10
Form Factor		Results page: Analysis of Form Factor and optimal U values to respond to them To help designers see the importance of compactness, or the consequence of fragmentation of the building volume, on the energy consumption See Update 2.3	Launch Version 1.11
Building Elements		Input page: simple yes/no Building Elements and secondary-elements are selected from readymade lists of 29 Elements and 12 Secondary Elements to match the scope of the project	Launch Version 1.12
Building Element Areas		Input and output page: Building Elements and secondary-elements: their dimensions are added by user and their areas or volumes are automatically calculated.	Launch Version 1.13
Building Element Areas	Multiple Size Building Element Areas	Input and output page: Since windows and doors come in a multitude of sized then a GBE Green Building Calculator schedules allows you to incorporate them all. Other elements may also have the same issues these have been allowed for and the schedule developed.	Launch Version 1.14
U values Etc. Energy Targets		Results page: Allows the users to compare and choose between Building Regulations Part L, other national regulations or standards, LETI, AECB CarbonLite, Passivhaus, EnerPHit, EAMs, etc. including: U values, Airtightness, Form factors, Elevational window %.	Launch Version 1.15
Insulation Thicknesses	Insulation Thicknesses	Input and output table: Information Resource: Quick look up table Users apply the chosen U value targets from the previous worksheet GBE Green Building Calculator automatically displays the thickness of different k valued insulation materials needed to meet U values targeted in each element.	Launch Version 1.16
Insulation Thicknesses	Decrement Delay Insulation Thickness	Input and output page: (incomplete at launch) Automatically see what thickness of different k valued insulation materials is needed to avoid overheating on summer See Update 2.1	Launch Version 1.17 Was Version 3.1
Legend		Information Resource: A list of terms used in GBE Green Building Calculator with some explanation of their meaning in a tabulated format Potential link to GBE Jargon Buster pages	Launch Version 1.18
Elements		Input and output page: Yes/No then choose from drop down menu, followed by automatic cell population Allows the user to populate and assemble elements by choosing their combination of functional components and then choosing the materials for each component. Components are in the right sequence but it may needs some know-how to choose the right one (Update 3 will help with readymade assemblies) Costs of insulation and windows are added here to help persuade architects and clients to spend money on insulation and higher performance windows and glazing.	Launch Version 1.19
Bill of Materials Quantities Costs		Input and output page: Allows user to cost plan their Building with a Bill of materials, quantities, labour and costs based on building fabric only so far. It will be reliant upon users interrogating recent tender rates or building price books Services are planned to be addressed in update 1.4-1.7 (unless users say otherwise)	

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V2 Project Revisions

User name:	BrianSpecMan did this
Practice Name:	Over type with Practice name
Client Name:	Over type with Client name
Project name:	Over type with Project name
Project address:	Over type with Project address
Building Facility Fuction/Use:	Over type with Building User Activity or Purpose

Project Revisions

Revisions:	Organisation:	Individual	Comments:	Date:	Worksheet:	Cells:	Input	Input File name	Output file name:
Reference No.	name or initials	Initials							
A00	GBE	BRM	Template file rev A14 Version 1	09/06/2020	All	All		GBE Calculator Whole Building B100 BRM090620.xlsx	.
A01			Save as template file file	__/__/2021	All	All		.	_____.xlst
A02			Save as project file	__/__/2021	All	All			_____.xlss
				__/__/2021					
				__/__/2021					

V2+V12 Cell colour codes & symbols Excel and BIM

Legend	In Excel	In BIM
Cell colour code/content	Explanation	
Green	User Input cell, feeds into calculations througout GBC	From Bill of Materials
Green with Red text	User input cells with sample entries to populate calculations (replace as required)	By User if required
Turquise	GBC calculated results, that the user can overwrite. e.g. for variables	From Model?
Turquise with red text	GBC example calculated results, that the user can overwrite. e.g. for variables, can be overwr	By User if required
Blue	GBC calculated results, applying user inputs in other cells or sheets	From Bill of Materials
Violet	GBC totals up, User to check if correct	By User if required
Red	User to select option from drop down list GBC will apply choice to calculations	From Bill of Materials?
Orange	Row or Column titles	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
?	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

V1 Whole Building

- Users add for the whole building:
  - Sizes
  - Number of floors
  - Hours of operation
  - Design temperatures, inside, out, ground
- GBC works out areas and volumes,

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V2 Development

- Terraces:
  - Community sized projects
  - Energy Company Obligations (ECO)
  - GreenDeal replacement?
- Position in terrace or one house
  - Number of party walls and end walls
- Singular v Multiple sizes
- Glazing Elemental v Components
- Bill of Materials v Elemental Pricing

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V2 Singular/Multiple Switches

Autofilled	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	To be completed by GBC user
User name:	BrianSpecMan did this									1		Autofilled
Practice Name:	Over type with Practice name											Autofilled
Client Name:	Over type with Client name											Autofilled
Project name:	Over type with Project name									4 Nominal Room	2	Autofilled
Project address:	Over type with Project address									3		Autofilled
Building Facility Fuction/Use:	Over type with Building User Activity or Purpose											Autofilled
Project Brief Employer Requirements or Architect's Proposal												
Whole Building		No.	No.	m	m	m2	m	m3	Yes/No	Hours	Degrees C	
Building(s)	**One or many 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 Calculator 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 Design	Season (sum… …mer)	Winter	Choose
© GBE Green Building Calculator 2011-2021		1 to 1000	1 to 100	1 to 25	1 to 10	N/A, End or Mid						
		2	1	10	4	End	1	1	No. Yes			Multiple
	Other Geometry											
Circular Geometry	To be developed (prompted by the Video V0)											
										Swimming pool water	16	Yes
									All year	Subsoil	11	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 deployed, 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 deployed, developed elsewhere					Winter	Other Unheated Spaces	5	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	…dows, doors, rooflights, glazing as sub-elements v components	Deployed and developed elsewhere e.g. UvalueToWattsToCO3					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 deployed and developed elsewhere later					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 deployed, 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	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		to be developed								Choose
Domestic v Non-Domestic	Choose Structures MEP Services	Pending		to be developed								Choose

Future development: Hours of operation

- Heating / Cooling season durations
  - Hours per day
  - Days per week
  - Weeks per year
- Hours/year:
  - energy consumption/year
  - in-use carbon/year
- Other Geometries: Circular, etc.

V1 Schedule of accommodation:

- Be more specific about: each room
- Room sizes
- Room temperatures
- Hours of operation

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V2 Schedule Accommodation

- Temperatures:
  - Inside, outside, ground
  - low temperatures spaces
- Future: Summer Winter temperatures
- Roof geometry
  - Overhangs
  - Parapets

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V2 Schedule of Accommodation

Schedule of Accommodation

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

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

V2 Roofs Parts

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

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

Future: Other Roof Geometry

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

Other Geomerty Roofs	Which roof?	Roof Pitch	Ridge/Apex Height above eaves	Quantity	Width	Length	Area	Volume
	Yes/No	Degrees	m	No.	m	m	m2	m3
22 Flat Roof (FR)	Yes	8	0.25	1	6	10.00	60.02	7.50
23 Shallow Roof (SR)	Yes	15	1	1	6	10.01	60.07	15.02
24 Pitched Roof (PR)	Yes	35	3	1	6	10.44	62.64	93.96
25 Barrel Vault Roof (BVR)	Yes		7.5	1	6	9.43	56.56	133.32
26 Domed Roof (DR)	Yes		7.5	1	6	9.43	84.83	56.56
27 Hipped/Pyramid Roof (HPR)	Yes	35	3	1	6	10.44	62.64	93.96
28 Mono-Pitched Roof (MPR)	Yes	30	3	1	6	10.44	62.64	93.96
29.1 Mansards Roof Flat (MR:F))	Yes	8	0.25	1	6	9.75	58.52	147.19
29.2 Mansard Roof Vertical (MR:V)	Yes	80	2.5	1	6	2.51	15.07	0.00
41 Other Geometry Ceiling (OGC)		?	3	1	6	13.42	80.50	121
41.1 Conical		30	5	1	6	15.62	93.72	?
41.2 Hyperbolic Parabaloid		30	4	1	6	16.97	101.82	?
41.3 Diagonal Butterfly		30	3	1	6	13.42	80.50	?
41.4 Truncated Conical		30	3	1	6	13.42	80.50	?
41.5 Inverted Truncated Conical		30	3	1	6	13.42	80.50	?
41.6 Secant Plan		30	3	1	6	13.42	80.50	?
41.7 Circular/Oval Plan		30	3	1	6	13.42	80.50	?
41.8		30	3	1	6	13.42	80.50	?
		Not used in calculations so far				Not used in calculations so far	Not used in calculations so far	Not used in calculations so far

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

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Green Building Calculator

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V1 Room by Room

- Room by room heat loss calculator
- Includes all surrounding surfaces, doors and windows
- to determine radiator or under floor heating requirements
- Or insulate to reduce demand to match a boiler size

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V2 Room By Room Heat Losses

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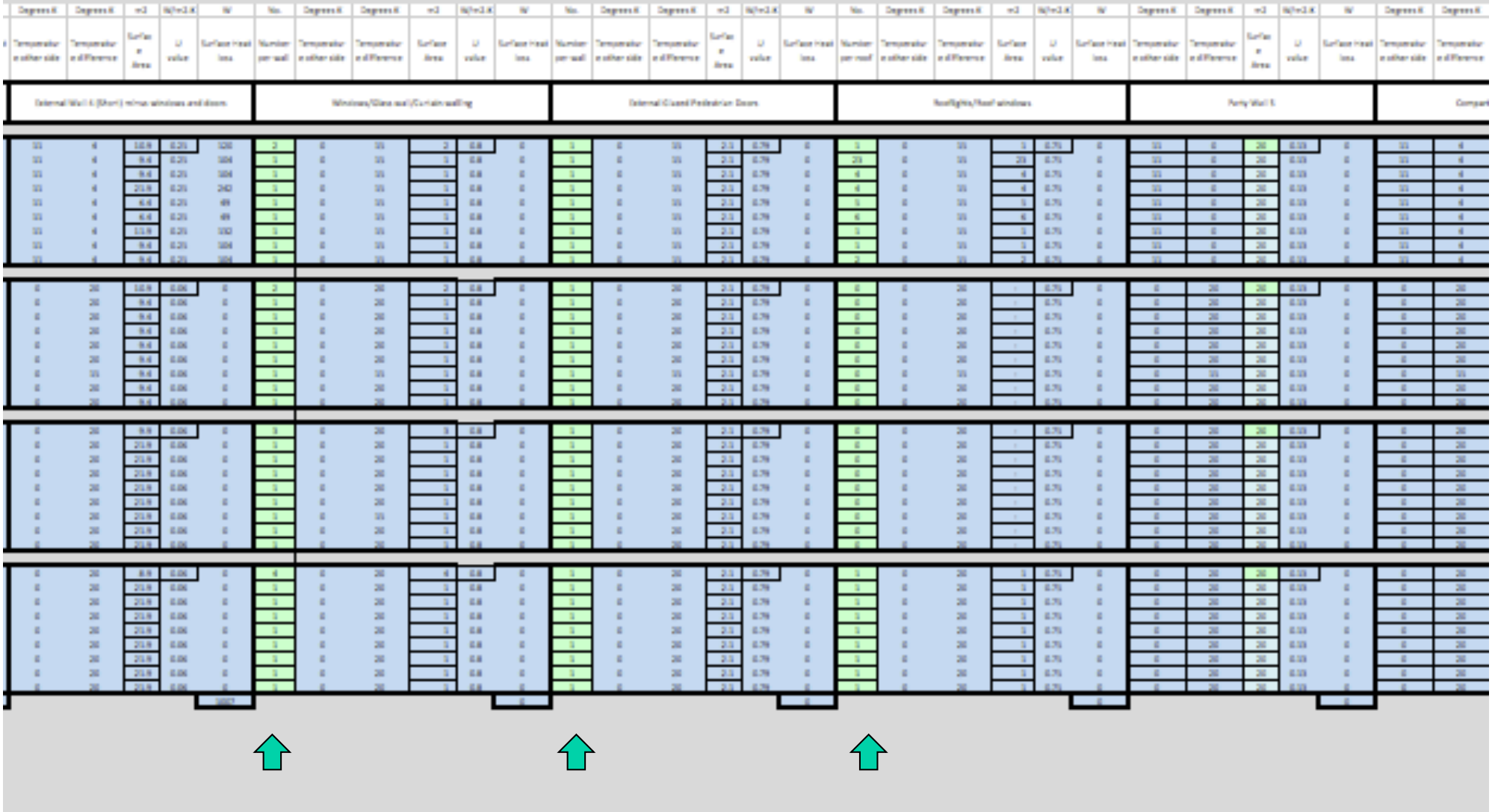
Green Building Calculator

https://GreenBuildingCalculator.uk

V2 Room by room Heat losses



Boiler Size Check

Room By Room Heat Losses

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

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

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V1 Form Factor:

- A quick analysis of the building form factor
- Is it terrace or multi-storey
- Is it cubic, linear, lumpy or has wings,
- Sets target U values
- Which go beyond regulations
  - For a low energy consumption building
  - Or worse in a block or terrace (ignore!)

V2 Form Factor

- Passivhaus design principles:
  - Heat Loss Form Factor (HLF)
  - Correlation between form factor and insulation thicknesses,
  - Mineral wool example
  - Choose material to see its required thicknesses
- Roof geometry: Flat, Pitched, Domed, etc.
- Projections: To refine FF for dormers, bay windows, oriel windows, porches, conservatories, colonnades, etc.

V2 Form Factor

User name:	Brian Sheridan dit this
Project name:	Over type with Project name
Project address:	Over type with Project address
Building Facility Fuction/Use:	Over type with Building User Activity or Purpose
Project Brief Employer Requirements or Architect's Proposal	

Form Factor

Building(s)	Room Functions	No. of buildings	No. of floors	Length(s) m	Width(s) m	Floor Area / Ceiling Area / Roof Area m2	Room heights m	Volumes m3			
© GBE Green Building Calculator 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			
Whole Building	All rooms	1	4	10	6	240	2.5	600	m3	Volume	Auto-filled
Terrace(s)	**One or many**	Number of terraces	Number of units in terrace	Depth front to back in terrace	Party wall to party wall	Position of single unit in terrace	Number of party walls	Number of end walls			
© GBE Green Building Calculator 2011-2021		1 to 1000	1 to 100	1 to 25	1 to 10	N/A, End or Mid					
		3	51	10	6	End	1	1	No.		Auto-filled

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

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

Roof area, Roof shape and Attic volume

	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	Multiple
Weather Porch		1	2	2	4	3	12	m3	25	m2	Multiple
Conservatory/Sun Space		1	3	5.5	16.5	5	82.5	m3	73.5	m2	Multiple
Bay window	1	1	1	3	3	2.5	7.5	m3	16.5	m2	Multiple
Oriel Window (upper floor bay window)	1	1	1	3	3	2.5	7.5	m3	16.5	m2	Multiple
28-30 Dormer roof/window	1	1	4	5.5	22	2	44	m3	37.5	m2	Multiple

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

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

	Passivhaus Heat Loss Factor (HLF)	0.7	1.1	1.5	2	2.4	2.8	3	3.3	3.7	4	4.5	No.	
0.0	Sto bol insulation (mm)	70	110	150	200	240	280	300	330	370	400	450	mm	Auto-filled
K	s U values of:	0.54	0.35	0.25	0.19	0.16	0.14	0.13	0.12	0.10	0.10	0.08	U	Auto-filled
0.04	Lightweight Expanded Sewage Aggregate	116	158	211	253	295	316	347	347	389	421	474	mm	Choose
	Rule of thumb: Halve the heat loss area, halve the insulation thickness													

Surface to Volume Ratio		0.6	1	1.5	2	2.5	3.5	5					
Surface to Volume Ratio	SA/V	This row feels unreliable at the moment, needs more research					2.49	Used by AECB, CarbonLite and PassivhausUK columns in worksheet 'U values Etc'.					Hide

Project Size: If areas vary between floors and/or if rooms need different temperatures go to 'ScheduleAccommodation: Floors and Rooms'

Review

V2 Development:
Scope: Building Elements >150

- Building Envelop: Dormers, Porches, Sun Spaces, Bays, Oriels,
- Non-Building Envelop: Stairs, Furniture,
- Landscape: Decking, Solar Shading, Bike/Bin/Delivery Store, Shed
- Services Systems: RWD, RWH, DHCW, Heating, MVHR, RE, A/W/GSHP, etc.

Building Uv Envelop Elements

Uv = U value	User name:	BrianSpecMan did this
Buildings	1	Feet grid
Use/Function	Over type with Building User Activity or Purpose	
External Winter low temperature	0	degrees C
Subsoil temperature	11	degrees C
Internal Winter Temperature	20	degrees C
Communal Area Winter Temperature	10	degrees C
Basement Winter Temperature	15	degrees C
Other Internal Temperatures	15	degrees C
Hours of operation	8	Hrs.
Storey height (default if consistent)	2.5	m

Basement (B)

1 Basement Floor (BF)	Yes	Yes/No
2 Basement Perimeter Retaining Walls (BPRW)	Yes	Yes/No
3 Basement External Wall (BEW)	Yes	Yes/No
[illegible] Roof at [illegible] (BRSL)	Yes	Yes/No
[illegible] Roof at [illegible] Open level (SRSTL)	Yes	Yes/No
[illegible] Overh[illegible] (BSP)	Yes	Yes/No
[illegible] Pool [illegible]	Yes	Yes/No
[illegible] (W)	Yes	Yes/No
[illegible] Floor Ov[illegible] (GFOV)	Yes	Yes/No
[illegible] Floor Ground [illegible] (GFGB)	Yes	Yes/No
10 Ground Floor Over Ventilated Void (GFOV)	Yes	Yes/No
11 Upper Floor (UF)	Yes	Yes/No
12 Services Riser Upper Floor (SRUF)	Yes	Yes/No
13 External Floor & Soffit (EFS) (over air)	Yes	Yes/No
14 Top Floor (TF)	Yes	Yes/No

Compartmentation (C)

15 Party Floor (PF)	Yes	Yes/No
16 Party Wall (PW)	Yes	Yes/No
17 Communal Compartment Floors (CCF)	Yes	Yes/No
18 Communal Compartment Wall (CCW)	Yes	Yes/No
19 Riser Compartment Upper Floor (RCUF)	Yes	Yes/No

Walls (W)

20 External Walls (EW)	Yes	Yes/No
21 Integral Unheated Space Wall (IUSW)	Yes	Yes/No

Roofs (R)

22 Flat Roof (FR)	Yes	Yes/No
23 Shallow Roof (SR)	Yes	Yes/No
24 Pitched Roof (PR)	Yes	Yes/No
25 Barrel Vault Roof (BVR)	Yes	Yes/No
26 Domed Roof (DR)	Yes	Yes/No
27 Hipped/Pyramic Roof (HPR)	Yes	Yes/No
28 Mono-Pitched Roof (MPR)	Yes	Yes/No
29 Mansard Roof (MR)	Yes	Yes/No
30 Dormer Flat Roofs (DFR)	Yes	Yes/No
31 Dormer Side Wall (DSW)	Yes	Yes/No
32 Dormer Window Wall (DWW)	Yes	Yes/No
33 Other Geometry Roof (OGR)	Yes	Yes/No

Internal Ceilings (IC)

34 Flat Ceiling (FC)	Yes	Yes/No
35 Pitched Vault Ceiling (PVC)	Yes	Yes/No
36 Barrel Vault Ceiling (BVC)	Yes	Yes/No
37 Domed Vault Ceiling (DVC)	Yes	Yes/No
38 Hipped/Pyramic Vault Ceiling (HPVC)	Yes	Yes/No
39 Mono-Pitch Vault Ceiling (MPVC)	Yes	Yes/No
40 Mansard Vault Ceiling (MVC)	Yes	Yes/No
41 Other Geometry Ceiling (OGC)	Yes	Yes/No

Glazing Windows Rooflights/vents and Doors (G)

42 Windows (W)	Yes	Yes/No
43 Glazed Pedestrian Doors (GPD)	Yes	Yes/No
44 Opaque Pedestrian Doors (OPD)	Yes	Yes/No
45 Large Wall Opening (LWO)	Yes	Yes/No
46 High Usage Entrance Door (HUED)	Yes	Yes/No
47 Display Window (DW)	Yes	Yes/No
48 Glazed External Walls (GEW)	Yes	Yes/No
49 Opaque External Walls (OEW)	Yes	Yes/No
50 Glazed Roof (GR)	Yes	Yes/No
51 Rooflights (RL)	Yes	Yes/No
52 Roof Windows (RW)	Yes	Yes/No
53 Roof Air & Smoke Vents (RASV)	Yes	Yes/No

Foundations (F)

72 Brickwork Footings (BF)	Yes	Yes/No
73 Strip Foundation (SF)	Yes	Yes/No
74 Foundation Wall (FW) (over strip foundation or trench foundation)	Yes	Yes/No
75 Trenchfill Foundation (TF)	Yes	Yes/No
76 Sleeper Wall (SW) (below suspended ground floor)	Yes	Yes/No
77 Raft Foundation Reinforced Concrete Slab, Edge & Internal Beams (RFRC)	Yes	Yes/No
78 Insulating Permanent Formwork Raft Foundation (IPFRF)	Yes	Yes/No
79 Pad foundation & columns (PF+C)	Yes	Yes/No
80 Pile foundation & Grounds beams (PFGB)	Yes	Yes/No
81 Sheet Pile and Top Stiffener (SPTS)	Yes	Yes/No
82 Vibrated Aggregate Pile (VAP)	Yes	Yes/No
83 Steel Corkscrew/Auger Pile (SCAP)	Yes	Yes/No
84 Diaphragm wall (DW)	Yes	Yes/No
85 Secant Pile Wall (SPW)	Yes	Yes/No
86 Underpinning: Trench (UT)	Yes	Yes/No
87 Underpinning: Pile (UP)	Yes	Yes/No

Structural Frame (SF)

88 Frames: Columns	Yes	Yes/No
89 Frames: Beams (supporting floors and flat roofs)	Yes	Yes/No
90 Frames: Flat roofs/Floors: Trough Decks	Yes	Yes/No
91 Frames: Pitched Roofs: Portal, Ridges, Eaves, Rafters, Purlins	Yes	Yes/No
92 Frames: Diaphragm walls/Diagonal Bracing	Yes	Yes/No

Bespoke Project Specific Items (BPSI)

160 Basement Retaining Floor (BRF)	Yes	Yes/No
161 Basement Perimeter Retaining Walls (BPRW)	Yes	Yes/No
162 Ground Floor Over Basement (GFOB)	Yes	Yes/No
163 Ground Floor Ground Bearing (GFGB)	Yes	Yes/No
164 Ground Floor Over Void (GFOV)	Yes	Yes/No
165	Yes	Yes/No
166	Yes	Yes/No
167	Yes	Yes/No
168	Yes	Yes/No
169	Yes	Yes/No
170 _	Yes	Yes/No
171	Yes	Yes/No
172	Yes	Yes/No
173	Yes	Yes/No

Non-Uv Envelop Elements

[240]	Floors	4
Get local Met Office data for your site		
1 m below ground constant 10 to 12 (UK)		
Replace with bespoke temperature 0 to 30		
Replace with bespoke temperature 0 to 30		
Replace with bespoke temperature 0 to 30		
Other parts of building at diff temp 0 to 30		
0 to 24?		
2.5 to 10 You can add different heights later		

Basement External Entrance Well (BEEW)

54 Basement: External Entrance Well Retaining Pavement (BEEWRP)	Yes	Yes/No
55 Basement: External Entrance Well Retaining Wall (BEEWRW)	Yes	Yes/No
56 Basement: External Entrance Well Staircase (BEEWS)	Yes	Yes/No
[illegible] Entrance Well Party wall (BEEWPW)	Yes	Yes/No
[illegible] walls (Wells dividing) (IW)	Yes	Yes/No
[illegible] Wall (IW)	Yes	Yes/No
[illegible] Floor (IF)	Yes	Yes/No
[illegible] Roof (IR)	Yes	Yes/No
[illegible] Below (IC) [illegible] Internal Wall Straight (IWS)	Yes	Yes/No
63 Internal MEP Service Riser Walls (MSR)	Yes	Yes/No
64 Internal Lift Shaft Walls (LSW)	Yes	Yes/No
65 Internal Stair Riser Walls (SRW)	Yes	Yes/No

Outside Uv Envelop Building Elements (OUE)

66 Eaves Parapet Walls (EPW)	Yes	Yes/No
67 Party Wall Parapet (PWP)	Yes	Yes/No
68 End of terrace Gable Wall Parapet (GWP)	Yes	Yes/No
69 Chimneys/Chimney Breast (CICB)	Yes	Yes/No
70 Attached Party Site Boundary Wall (APWBW)	Yes	Yes/No
71 Party Wall Roof Triangle (PWRT)	Yes	Yes/No

Secondary Elements (SE)

93 L30 Staircase/Landing/Walkways	Yes	Yes/No

N Furniture Fixtures Equipment (FFE)

94 N10 Attic Eaves Furniture (AEF)	Yes	Yes/No
95 N10 Other Furniture (OF)	Yes	Yes/No
96 N11 Domestic Kitchen Furniture (DKF)	Yes	Yes/No
97 N12 Catering Equipment (CE) (Non-Domestic)	Yes	Yes/No
98 N13 Bathroom Furniture (BF)	Yes	Yes/No

P Building Fabric Sundries

99 P10 Sundry Insulation/Proofing work	Yes	Yes/No
100 P11 Foamed/Fibres/Bead cavity wall insulation	Yes	Yes/No
101 P12 Fire Stopping Systems	Yes	Yes/No
102 P14 Air/Wind Tightness Systems	Yes	Yes/No
103 P20 Unframed isolated Trims/Skirtings/Sundry Items	Yes	Yes/No
104 P21 Ironmongery	Yes	Yes/No
105 P22 Sealant Joints	Yes	Yes/No
106 P23 Movement Joints (Non-domestic)	Yes	Yes/No
107 P30 Trenches/Pipeways/Pits for buried engineering services	Yes	Yes/No
108 P31 Holes/Chases/Covers/Supports for Services	Yes	Yes/No
109 P32 Services Painting (And identification?)	Yes	Yes/No
110 P33 Plinths and Bund Systems	Yes	Yes/No
111 P39 Cable Pass Throughs (Non-Domestic)	Yes	Yes/No

Landscape (L)

112 Q10 Raised Beds	Yes	Yes/No
113 Q10 Stairs	Yes	Yes/No
114 Q10 Steps	Yes	Yes/No
115 Q20 Drive	Yes	Yes/No
116 Q20 Paths	Yes	Yes/No
117 Q20 Ramps	Yes	Yes/No
118 Q30 Lawn	Yes	Yes/No
119 Q31 Boarders	Yes	Yes/No
120 Q40 Fence and Gates	Yes	Yes/No
121 Q41 Railings and Gates	Yes	Yes/No
122 Q51 Sports Equipment	Yes	Yes/No
123 Q53 Bat or Bird Accommodation	Yes	Yes/No
124 Q55 Decking	Yes	Yes/No
125 Q55 Balcony & Independent Supports	Yes	Yes/No
126 Q60 Pond/Water Feature/Swimming Pond	Yes	Yes/No
127 Q70 Composter and Wormeries	Yes	Yes/No
128 Q70 Front/Rear Garden Bin/Bike/Delivery Store	Yes	Yes/No
129 Q70 Pergolas/Solar Shading & Independent Supports	Yes	Yes/No
130 Q70 Rear Garden Shed	Yes	Yes/No
131 Q75 Retaining walls	Yes	Yes/No

Domestic MEP Services (DMEPS)

132 J00 Basement Internal Drainage	Yes	Yes/No
133 R10 Rainwater Gutters Pipework	Yes	Yes/No
134 R11 Above ground drainage	Yes	Yes/No
135 R12 Below ground drainage	Yes	Yes/No
136 R14 Land Drainage	Yes	Yes/No
137 R15 Sustainable Urban Drainage System (SuDS)	Yes	Yes/No
138 R91 Refuse Disposal System Domestic	Yes	Yes/No
139 S14 Irrigation Systems	Yes	Yes/No
139 S17 Rainwater Harvesting Systems	Yes	Yes/No
140 S90 Hot and Cold Water Domestic	Yes	Yes/No
141 S91 Gas Supply Domestic	Yes	Yes/No
142 S92 Sprinkler System Domestic	Yes	Yes/No
143 T14 Air Water Ground Source Heat Pumps	Yes	Yes/No
144 T16 Solar Collectors	Yes	Yes/No
145 T90 Heating Domestic	Yes	Yes/No
146 U90 Ventilation Domestic	Yes	Yes/No
147 V90 Electrical Installation Domestic	Yes	Yes/No
148 V91 Electrical Systems Landscape	Yes	Yes/No
149 W90 Communications & Security Domestic	Yes	Yes/No
150 X90 Transport Systems Domestic	Yes	Yes/No

Non-Domestic MEP Services (N-DMEPS)

200	Yes	Yes/No
201	Yes	Yes/No
202	Yes	Yes/No
203	Yes	Yes/No
204	Yes	Yes/No
205	Yes	Yes/No
206	Yes	Yes/No
207	Yes	Yes/No
208	Yes	Yes/No
209 _	Yes	Yes/No
210	Yes	Yes/No
211	Yes	Yes/No
212	Yes	Yes/No
213	Yes	Yes/No

Building Uv Envelop Elements

Uv = U value	User name:	BrianSpecMan did this
Buildings	1	Enter grid
Use/Function	Over type with Building User Activity or Purpose	
External Winter low temperature	0	degrees C
Subsoil temperature	11	degrees C
Internal Winter Temperature	20	degrees C
Communal Area Winter Temperature	10	degrees C
Basement Winter Temperature	15	degrees C
Other Internal Temperatures	15	degrees C
Hours of operation	8	Hrs
Storey height (default if consistent)	2.5	m
Basement (B)		
1 Basement Floor (BF)	Yes	Yes/No
2 Basement Perimeter Retaining Walls (BPRW)	Yes	Yes/No
3 Basement External Wall (BEW)	Yes	Yes/No
4 Basement Roof at Site Level (BRSL)	Yes	Yes/No
5 Basement Roof at SubTerranean level (BRSTL)	Yes	Yes/No
6 Basement Overhead Glazed Pavement (BOGP)	Yes	Yes/No
7 Swimming Pool Basin (SPB)	Yes	Yes/No
Floors (F)		
8 Ground Floor Over Basement (GFOB)	Yes	Yes/No
9 Ground Floor Ground Bearing (GFGB)	Yes	Yes/No
10 Ground Floor Over Ventilated Void (GFOV)	Yes	Yes/No
11 Upper Floor (UF)	Yes	Yes/No
12 Services Riser Upper Floor (SRUF)	Yes	Yes/No
13 External Floor & Soffit (EFS) (over air)	Yes	Yes/No
14 Top Floor (TF)	Yes	Yes/No
Compartmentation (C)		
15 Party Floor (PF)	Yes	Yes/No
16 Party Wall (PW)	Yes	Yes/No
17 Communal Compartment Floors (CCF)	Yes	Yes/No
18 Communal Compartment Wall (CCW)	Yes	Yes/No
19 Riser Compartment Upper Floor (RCUF)	Yes	Yes/No
Walls (W)		
20 External Walls (EW)	Yes	Yes/No
21 Internal Unheated Space Wall (IUSW)	Yes	Yes/No
Roofs (R)		
22 Flat Roof (FR)	Yes	Yes/No
23 Shallow Roof (SR)	Yes	Yes/No
24 Pitched Roof (PR)	Yes	Yes/No
25 Barrel Vault Roof (BVR)	Yes	Yes/No
26 Domed Roof (DR)	Yes	Yes/No
27 Hipped/Pyramid Roof (HPR)	Yes	Yes/No
28 Mono-Pitched Roof (MPR)	Yes	Yes/No
29 Mansard Roof (MR)	Yes	Yes/No
30 Dormer Flat Roofs (DFR)	Yes	Yes/No
31 Dormer Side Wall (DSW)	Yes	Yes/No
32 Dormer Window Wall (DWW)	Yes	Yes/No
33 Other Geometry Roof (OGR)	Yes	Yes/No
Internal Ceilings (C)		
34 Flat Ceiling (FC)	Yes	Yes/No
35 Pitched Vault Ceiling (PVC)	Yes	Yes/No
36 Barrel Vault Ceiling (BVC)	Yes	Yes/No
37 Domed Vault Ceiling (DVC)	Yes	Yes/No
38 Hipped/Pyramid Vault Ceiling (HPVC)	Yes	Yes/No
39 Mono-Pitch Vault Ceiling (MPVC)	Yes	Yes/No
40 Mansard Vault Ceiling (MVC)	Yes	Yes/No
41 Other Geometry Ceiling (OGC)	Yes	Yes/No
Glazing Windows Rooflights/vents and Doors (G)		
42 Windows (W)	Yes	Yes/No
43 Glazed Pedestrian Doors (GPD)	Yes	Yes/No
44 Opaque Pedestrian Doors (OPD)	Yes	Yes/No
45 Large Wall Opening (LWO)	Yes	Yes/No
46 High Usage Entrance Door (HUED)	Yes	Yes/No
47 Display Window (DW)	Yes	Yes/No
48 Glazed External Walls (GEW)	Yes	Yes/No
49 Opaque External Walls (OEW)	Yes	Yes/No
50 Glazed Roof (GR)	Yes	Yes/No
51 Rooflights (RL)	Yes	Yes/No
52 Roof Windows (RW)	Yes	Yes/No
53 Roof Air & Smoke Vents (RASV)	Yes	Yes/No
Foundations (F)		
72 Brickwork Footings (BF)	Yes	Yes/No
73 Strip Foundation (SF)	Yes	Yes/No
74 Foundation Wall (FW) (over strip foundation or trench foundation)	Yes	Yes/No
75 Trenchfill Foundation (TF)	Yes	Yes/No

Non-Uv Envelop Elements

240	Floors	4
Get local Met Office data for your site		
1 m below ground constant 10 to 12 (UK)		
Replace with bespoke temperature 0 to 30		
Replace with bespoke temperature 0 to 30		
Replace with bespoke temperature 0 to 30		
Other parts of building at diff temp 0 to 30		
0 to 24?		
2.5 to 10 You can add different heights later		
Basement External Entrance Wall (BEEW)		
54 Basement External Entrance Wall Retaining Pavement (BEEWRP)	Yes	Yes/No
55 Basement External Entrance Wall Retaining Wall (BEEWRW)	Yes	Yes/No
56 Basement External Entrance Wall Staircase (BEEWS)	Yes	Yes/No
57 Basement External Entrance Wall Party wall (BEEWPW)	Yes	Yes/No
Internal walls partitions dividers (IW)		
58 Basement Internal Walls (BIW)	Yes	Yes/No
59 Basement Internal Partitions (BIP)	Yes	Yes/No
60 Internal Walls (IW)	Yes	Yes/No
61 Internal Partitions (IP)	Yes	Yes/No
62 K32 Internal Cubicles (IC) & Back Panels (ICBP) & Internal Wall Linings (IWL)	Yes	Yes/No
63 Internal MEP Service Riser Walls (MSRW)	Yes	Yes/No
64 Internal Lift Shaft Walls (LSW)	Yes	Yes/No
65 Internal Stair Riser Walls (SRW)	Yes	Yes/No
Outside Uv Envelop Building Elements (OUE)		
66 Eaves Parapet Walls (EPW)	Yes	Yes/No
67 Party Wall Parapet (PWP)	Yes	Yes/No
68 End of terrace Gable Wall Parapet (GWP)	Yes	Yes/No
69 Chimneys/Chimney Breast (CICB)	Yes	Yes/No
70 Attached Party Site Boundary Wall (APWBW)	Yes	Yes/No
71 Party Wall Roof Triangle (PWRT)	Yes	Yes/No
Secondary Elements (SE)		
93 L30 Staircase/Landing/Walkways	Yes	Yes/No
N Furniture Fixtures Equipment (FFE)		
94 N10 Attic Eaves Furniture (AEF)	Yes	Yes/No
95 N10 Other Furniture (OF)	Yes	Yes/No
96 N11 Domestic Kitchen Furniture (DKF)	Yes	Yes/No
97 N12 Catering Equipment (CE) (Non-Domestic)	Yes	Yes/No
98 N13 Bathroom Furniture (BF)	Yes	Yes/No
P Building Fabric Sundries		
99 P10 Sundry Insulation/Proofing work	Yes	Yes/No
100 P11 Foamed/Fibres/Bead cavity wall insulation	Yes	Yes/No
101 P12 Fire Stopping Systems	Yes	Yes/No
102 P14 Air/Wind Tightness Systems	Yes	Yes/No
103 P20 Unframed isolated Trims/Skirtings/Sundry Items	Yes	Yes/No
104 P21 Ironmongery	Yes	Yes/No
105 P22 Sealant Joints	Yes	Yes/No
106 P23 Movement Joints (Non-domestic)	Yes	Yes/No
107 P30 Trenches/Pipeways/Pits for buried engineering services	Yes	Yes/No
108 P31 Holes/Chases/Covers/Supports for Services	Yes	Yes/No
109 P32 Services Painting (And identification?)	Yes	Yes/No
110 P33 Plinths and Bund Systems	Yes	Yes/No
111 P99 Cable Pass Throughs (Non-Domestic)	Yes	Yes/No
Landscape (L)		
112 Q10 Raised Beds	Yes	Yes/No
113 Q10 Stairs	Yes	Yes/No
114 Q10 Steps	Yes	Yes/No
115 Q20 Drive	Yes	Yes/No
116 Q20 Paths	Yes	Yes/No
117 Q20 Ramps	Yes	Yes/No
118 Q30 Lawn	Yes	Yes/No
119 Q31 Boarders	Yes	Yes/No
120 Q40 Fence and Gates	Yes	Yes/No
121 Q41 Railings and Gates	Yes	Yes/No
122 Q51 Sports Equipment	Yes	Yes/No
123 Q53 Bat or Bird Accommodation	Yes	Yes/No
124 Q55 Decking	Yes	Yes/No
125 Q55 Balcony & independent Supports	Yes	Yes/No
126 Q60 Pond/Water Feature/Swimming Pond	Yes	Yes/No
127 Q70 Composter and Wormeries	Yes	Yes/No
128 Q70 Front/Rear Garden Bin/Bike/Delivery Store	Yes	Yes/No
129 Q70 Pergolas/Solar Shading & Independent Supports	Yes	Yes/No
130 Q70 Rear Garden Shed	Yes	Yes/No
131 Q75 Retaining walls	Yes	Yes/No
Domestic MEP Services (DMEPS)		
132 J00 Basement Internal Drainage	Yes	Yes/No

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V2 Building Areas

Multiple | Auto-filled | Multiple | completed by GBC user

Building Areas

Building Uvalue Envelop Elements

Uv = U value | User name: | BrianSpecMan did this

Basement (B)		
1 Basement Floor (BF)	Yes	DropDownList
2 Basement Perimeter Retaining Walls (BPRW)	Yes	DropDownList
3 Basement External Wall (BEW)	Yes	DropDownList
4 Basement Roof at Site Level (BRSL)	Yes	DropDownList
5 Basement Roof at SubTerranean level (BRSTL)	Yes	DropDownList
6 Basement Overhead Glazed Pavement (BOGP)	Yes	DropDownList
7 Swimming Pool Basin (SPB)	Yes	DropDownList
Floors (F)		
8 Ground Floor Over Basement (GFOB)	Yes	DropDownList
9 Ground Floor Ground Bearing (GFGB)	Yes	DropDownList
10 Ground Floor Over Ventilated Void (GFOV)	Yes	DropDownList
11 Upper Floor (UF)	Yes	DropDownList
12 Services Riser Upper Floor (SRUF)	Yes	DropDownList
13 External Floor & Soffit (EFS) (over air)	Yes	DropDownList
14 Top Floor (TF)	Yes	DropDownList
Compartmentation (C)		
15 Party Floor (PF)	Yes	DropDownList
16 Party Wall (PW)	Yes	DropDownList
17 Communal Compartment Floors (CCF)	Yes	DropDownList
18 Communal Compartment Wall (CCW)	Yes	DropDownList
19 Riser Compartment Upper Floor (RCUF)	Yes	DropDownList
Walls (W)		
20 External Walls (EW)	Yes	DropDownList
21 Integral Unheated Space Wall (IUSW)	Yes	DropDownList
Roofs (R)		
22 Flat Roof (FR)	Yes	DropDownList
23 Shallow Roof (SR)	Yes	DropDownList
24 Pitched Roof (PR)	Yes	DropDownList
25 Barrel Vault Roof (BVR)	Yes	DropDownList
26 Domed Roof (DR)	Yes	DropDownList
27 Hipped/Pyramid Roof (HPR)	Yes	DropDownList
28 Mono-Pitched Roof (MPR)	Yes	DropDownList
29 Mansard Roof (MR)	Yes	DropDownList
30 Dormer Flat Roofs (DFR)	Yes	DropDownList
31 Dormer Side Wall (DSW)	Yes	DropDownList
32 Dormer Window Wall (DWW)	Yes	DropDownList
33 Other Geometry Roof (OGR)	Yes	DropDownList
Internal Ceilings (IC)		
34 Flat Ceiling (FC)	Yes	DropDownList
35 Pitched Vault Ceiling (PVC)	Yes	DropDownList
36 Barrel Vault Ceiling (BVC)	Yes	DropDownList
37 Domed Vault Ceiling (DVC)	Yes	DropDownList
38 Hipped/Pyramid Vault Ceiling (HPVC)	Yes	DropDownList
39 Mono-Pitch Vault Ceiling (MPVC)	Yes	DropDownList
40 Mansard Vault Ceiling (MVC)	Yes	DropDownList
41 Other Geometry Ceiling (OGC)	Yes	DropDownList
Glazing Windows Rooflights/vents and Doors (G)		
42 Windows (W)	Yes	DropDownList
43 Glazed Pedestrian Doors (GPD)	Yes	DropDownList
44 Opaque Pedestrian Doors (OPD)	Yes	DropDownList
45 Large Wall Opening (LWO)	Yes	DropDownList
46 High Usage Entrance Door (HUED)	Yes	DropDownList

Non-Uvalue Envelop Elements

Auto-filled

Basement External Entrance Well (BEEW)			
54 Basement External Entrance Well Retaining Pavement (BEEWRP)	Yes	DropDownList	Choose
55 Basement External Entrance Well Retaining Wall (BEEWRW)	Yes	DropDownList	Choose
56 Basement External Entrance Well Staircase (BEEWS)	Yes	DropDownList	Choose
57 Basement External Entrance Well Party wall (BEEWPW)	Yes	DropDownList	Choose
Internal walls partitions dividers (IW)			Choose
58 Basement Internal Walls (BIW)	Yes	DropDownList	Choose
59 Basement Internal Partitions (BIP)	Yes	DropDownList	Choose
60 Internal Walls (IW)	Yes	DropDownList	Choose
61 Internal Partitions (IP)	Yes	DropDownList	Choose
62 K32 Internal Cubicles (IC) Back Panels (ICBP) Internal Wall Linings (IWL)	Yes	DropDownList	Choose
63 Internal Service Riser Walls (ISRW)	Yes	DropDownList	Choose
64 Internal Lift Shaft Walls (ILSW)	Yes	DropDownList	Choose
65 Internal Stair Riser Walls (ISRW)	Yes	DropDownList	Choose
Outside Uv Envelop Building Elements (OUE)			Choose
66 Eaves Parapet Walls (EPW)	Yes	DropDownList	Choose
67 Party Wall Parapet (PWP)	Yes	DropDownList	Choose
68 End of terrace Gable Wall Parapet (GWP)	Yes	DropDownList	Choose
69 Chimneys/Chimney Breast (C/CB)	Yes	DropDownList	Choose
70 Attached Party Site Boundary Wall (APWBW)	Yes	DropDownList	Choose
L 71 Party Wall Roof Triangle (PWRT)	Yes	DropDownList	Choose
Secondary Elements (SE)			Choose
93 L20 Internal Doors (ID)	Yes	DropDownList	Choose
94 L30 Staircase/Landing/Walkways (SLW)	Yes	DropDownList	Choose
N Furniture Fixtures Equipment (FFE)			Choose
95 N10 Attic Eaves Furniture (AEF)	Yes	DropDownList	Choose
96 N10 Other Furniture (OF)	Yes	DropDownList	Choose
97 N11 Domestic Kitchen Furniture (DKF)	Yes	DropDownList	Choose
98 N12 Catering Equipment (CE) (Non-Domestic)	Yes	DropDownList	Choose
99 N13 Bathroom Furniture (BF)	Yes	DropDownList	Choose
P Building Fabric Sundries (BFS)			Choose
100 P10 Sundry Insulation/Proofing work	Yes	DropDownList	Choose
101 P11 Foamed/Fibres/Bead cavity wall insulation	Yes	DropDownList	Choose
102 P12 Fire Stopping Systems	Yes	DropDownList	Choose
103 P14 Air/Wind Tightness Systems	Yes	DropDownList	Choose
104 P20 Unframed isolated Trims/Skirtings/Sundry items	Yes	DropDownList	Choose
105 P21 Ironmongery	Yes	DropDownList	Choose
106 P22 Sealant Joints	Yes	DropDownList	Choose
107 P23 Movement Joints (Non-domestic)	Yes	DropDownList	Choose
108 P30 Trenches/Pipeways/Pits for buried engineering services	Yes	DropDownList	Choose
109 P31 Holes/Chases/Covers/Supports for Services	Yes	DropDownList	Choose
110 P32 Services Painting (And Identification?)	Yes	DropDownList	Choose
111 P33 Plinths and Bund Systems	Yes	DropDownList	Choose
112 P39 Cable Pass Throughs (Non-Domestic)	Yes	DropDownList	Choose
Landscape (L)			Choose
113 Q10 Raised Beds	Yes	DropDownList	Choose
114 Q10 Stairs	Yes	DropDownList	Choose
115 Q10 Steps	Yes	DropDownList	Choose
116 Q20 Drive	Yes	DropDownList	Choose
117 Q20 Paths	Yes	DropDownList	Choose
118 Q20 Ramps	Yes	DropDownList	Choose
119 Q30 Lawn	Yes	DropDownList	Choose
120 Q31 Boarders	Yes	DropDownList	Choose
121 Q40 Fence and Gates	Yes	DropDownList	Choose

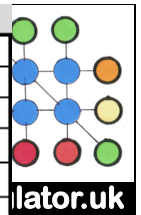
Building Uv Envelop Elements

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

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

Non-Uv Envelop Elements

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



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

V1 Building Element Areas

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

V2 Building Element Areas

Outside Uv Envelop Building Elements (OUE)

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

Foundations (F)

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

V2 Building Element Areas

Structural Frames (SF)

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

V2 Building Element Areas

Secondary Elements (SE)

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

N Furniture Fixtures Equipment (FFE)

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

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

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

V5 Services Systems
V4 Building Element Areas

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

V1 Multiple Sizes: Secondary-Elements

- V1 To accommodate a multitude of secondary-element sizes an additional schedule is included
  - Windows Doors Rooflights etc.
- V2.Choose between Multiple or Singular
  - Automatically feeds the calculator

V1 Building Elements Multiple sizes

Multiple Size Building Elements

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

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V2 Singular/Multiple Switches

Autofilled	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple	To be completed by GBC user
User name:	BrianSpecMan did this									1		Autofilled
Practice Name:	Over type with Practice name											Autofilled
Client Name:	Over type with Client name											Autofilled
Project name:	Over type with Project name									4 Nominal Room	2	Autofilled
Project address:	Over type with Project address									3		Autofilled
Building Facility Fuction/Use:	Over type with Building User Activity or Purpose											Autofilled
Project Brief Employer Requirements or Architect's Proposal												
Whole Building		No.	No.	m	m	m2	m	m3	Yes/No	Hours	Degrees C	
Building(s)	**One or many 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 Calculator 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 Design	Season (summer/winter)	Winter	Choose
© GBE Green Building Calculator 2011-2021		1 to 1000	1 to 100	1 to 25	1 to 10	N/A, End or Mid						
		3	51	10	6	End	1	1	No. Yes			Multiple
	Other Geometry											
Circular Geometry	To be developed (prompted by the Video V0)											
										Swimming pool water	16	Yes
									All year	Subsoil	11	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 deployed, 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 deployed, developed elsewhere					Winter	Other Unheated Spaces	5	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	Windows, doors, rooflights, glazing as sub-elements v components	Deployed and developed elsewhere e.g. UvalueToWattsToCO3					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	Elemental/Component Bill of Materials v Elemental Cost Analysis	To be deployed and developed elsewhere later					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 deployed, 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	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		to be developed								Choose
Domestic v Non-Domestic	Choose Structures MEP Services	Pending		to be developed								Choose

V2 Engage Singular/Multiple

Non-U-value Elements

Basement External Entrance Well (BEEW)

Yes	54 Basement External Entrance Well Retaining Pavement (BEEWRP)					Singular	DropDownList
	Number of Buildings with Basement External Entrance Wells	1	No.		Area Basement External Entrance Wells	8.000	m2
	Number of Basement External Entrace Well Retaining walls	1	No.		Total Area Basement External Entrance Wells	8.000	m2
	Width of Basement External Entrance Wells (Across frontage)	6	m		Total Area multiple sizes of Basement External Entrance Wells	126.000	m2
	Depth of Basement External Entrance Wells (Footpath to Building)	3	m		**Total Area Basement External Entrance Wells (chosen single or multiple)**	18.000	m2
Yes	55 Basement External Entrance Well Retaining Wall (BEEWRW)					Singular	DropDownList
	No. of Buildings with Basement External Entrace Well Retaining walls	1	No.		Area of Basement External Entrace Well Retaining walls	7.100	m2
	Number of Basement External Entrace Well Retaining walls	1	No.		Total Areas Basement External Entrace Well Retaining walls	17.100	m2
	Width of Basement External Entrace Well Retaining walls	6	m		Total Areas multiple sizes of Basement External Entrace Well Retaining walls	132.000	m2
	Height of Basement External Entrace Well Retaining walls	2.85	m		**Total Areas Basement External Entrace Well Retaining walls (chosen single or multiple)**	17.100	m2
Yes	56 Basement External Entrance Well Staircase (BEEWS)					Singular	DropDownList
	No. of Buildings with Basements External Entrance Well Staircase	1	No.		Area Basements External Entrance Well Staircase	3.150	m2
	Number of Basement External Entrance Well Staircases	1	No.		Total Area Basement External Entrance Staircase	3.150	m2
	Rise of Basements External Entrance Well Staircase	2.85	m		Total Area multiple sizes of Basement External Entrance Staircase	252.000	m2
	Going of Basements External Entrance Well Staircase	3.5	m		**Total Area Basement External Entrance Staircase (chosen single or multiple)**	3.150	m2
	Lenght of Basements External Entrance Well Staircase	4.5	m		Thickness of Basements External Entrance Well Staircase	0.300	m
	Width of Basements External Entrance Well Staircase	0.9	m		Volume of Basements External Entrance Well Staircase	0.945	m3
Yes	57 Basement External Entrance Well Party wall (BEEWPW)					Singular	DropDownList
	No. of Buildings with Basement External Entrance Well Party Walls	1	No.		Area of Basement External Entrance Well Party Wall	8.550	m2
	Number of Basement External Entrance Well Party Walls	1	No.		Total Area of Basement External Entrance Well Party Walls	8.550	m2
	Width of Basement External Entrance Well Party Walls	0.315	m		Total Area multiple sizes of of Basement External Entrance Well Party Walls	504.000	m2
	Length of Basement External Entrance Well Party Walls	3	m		**Total Area of Basement External Entrance Well Party Walls (chosen single or multiple)**	8.550	m2
	Height of Basement External Entrance Well Party Walls	2.85	m		Total Volume of Basement External Entrance Well Party Walls	2.693	m3

Internal Walls Partitions Cubicles

Yes	58 Basement Internal Walls (BIW)	(Probably loadbearing)				Singular	DropDownList
	Number of Buildings with Basements	1	No.		Area of Basement Internal Walls (BIW)	5.000	m2
	Thickness of Basement Internal walls (BIW)	0.215	m		Total Area Basement Internal Walls (BIW)	25.000	m2
	Length of Basement Internal Walls (BIW)	10	m		Total Area Basement Internal Walls (BIW)	504.000	m2
	Height of Basement Internal Walls (BIW)	2.5	m		**Total Area Basement Internal Walls (BIW) (chosen single or multiple)**	25.000	m2
					Volume of Basement Internal Walls (BIW)	5.375	m3
					Total Volume of Basement Internal Walls (BIW)	5.375	m3
Yes	59 Basement Internal Partitions (BIP)	(Probably non-loadbearing)				Singular	DropDownList
	Number of Buildings with Basements	1	No.		Area of Basement Internal Partition (BIP)	5.000	m2
	Thickness of Basement Internal Partitions (BIP)	0.1	m		Total Area of Basment Internal Partitions (BIP)	25.000	m2
	Length of Baement Internal Partitions (BIP)	10	m		Total Area of Basment Internal Partitions (BIP)	384.000	m2
	Height of Basement Internal Partitions (BIP)	2.5	m		**Total Area of Basment Internal Partitions (BIP) (chosen single or multiple)**	25.000	m2
					Total Volume of Basement Internal Partitions (BIP)	2.500	m3
					Total Volume of Basement Internal Partitions (BIP)	0.000	m3
Yes	60 Internal Walls (IW)	(Probably loadbearing, not in basement)				Multiple	DropDownList
	Number of Buildings with Internal Walls (IW)	1	No.		Area of Internal Wall (IW)	5.000	m2
	Thickness of Internal Walls (IW)	0.2	m		Total Area of Internal Wall (IW)	25.000	m2

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V1 U Values Etc.:

- Comparisons between:
  - National Building Regulations (E, W, S, NI and other countries),
  - Energy Designer Standards, FEES, AECB CarbonLite, CLR, Passivhaus, EnerPHit, EAMs, etc.
- Including:
  - U values, Airtightness, Form factors, Primary Energy, Window %, Window orientation etc.
- Allowing users to choose and apply chosen set of targets to projects.

V1 Energy and related design standards

- Building Regulations Approved Document L
  - Will eventually meet carbon targets but not now
  - Most new buildings will need to be retrofit by 2030-2050
- Energy Design Standards
  - (improving on Building Regulations)
  - AECB Bronze, Silver, Gold and Platinum Standard
  - Passivhaus (German) PHPP Software
    - Indoor Air Quality and Thermal Comfort conditions driven
    - Minimise air leakage, minimise thermal bridges
    - EnerPHit (Passivhaus Retrofit)
  - Carbon Lite (UK AECB)
    - Passivhaus interpretation for UK climate and energy mix
    - Carbon Lite Retrofit (CLR)
  - Minergie (Swiss)
  - Super E (Canadian; means to sell their softwood)

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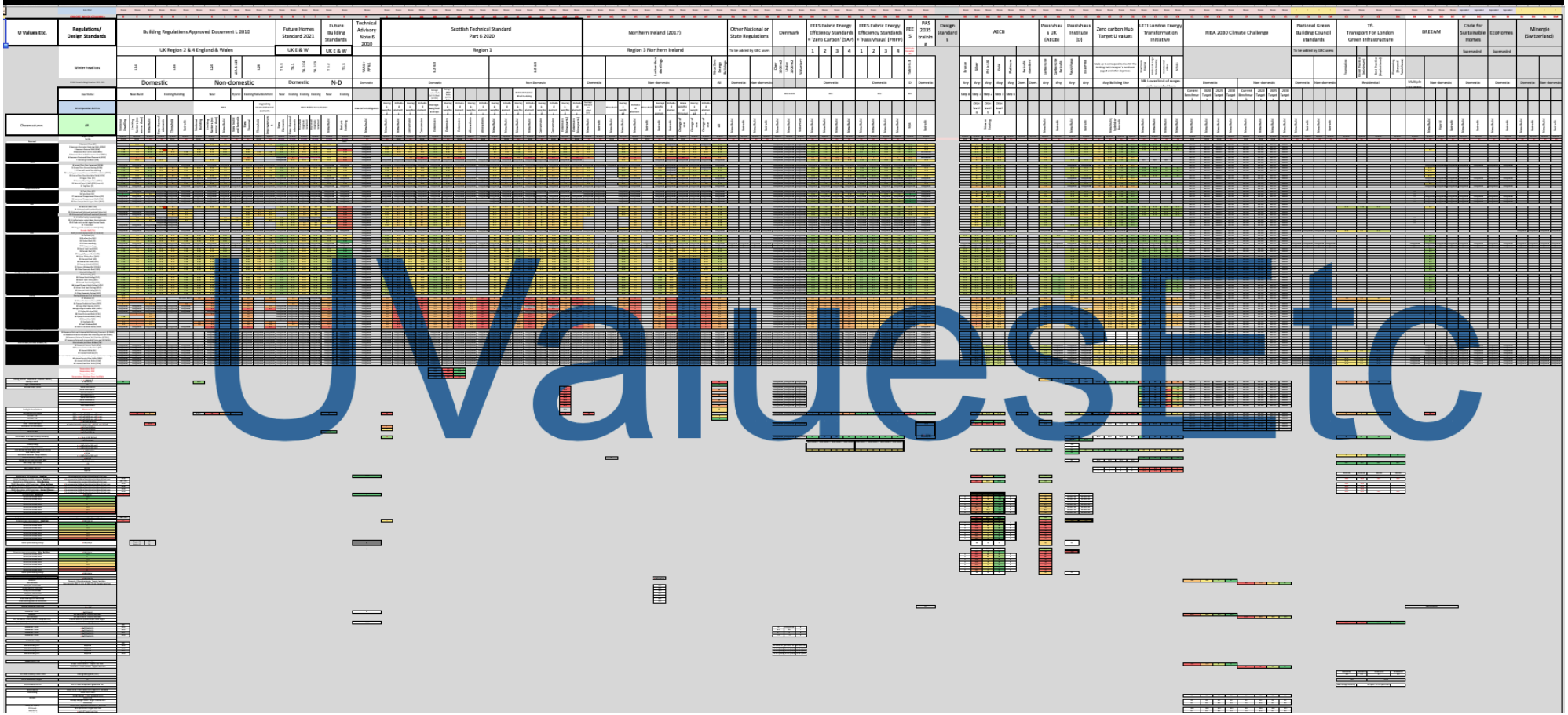
V2 U values Etc. Targets

Regulations, Public Consultations, Design Standards, Campaigns



V2 U values Etc. Energy Targets

- Rationalised:
  - Regulations, Design Standards & Campaigns
- Added: Campaigns
  - Zero Carbon Hub The Buildings Hum
  - LETI London Energy Transformation initiative
  - RIBA 2030 Climate Challenge
  - TfL Biodiversity and Building Performance

V2 Capture National U values

	Regulations/Standards	Other National Standards			
	Winter heat loss				
	© GBE Green Building Calculator 2017-2020	Domestic		Non-domestic	
	User Name:	Other National Regulation or GBC standards			
Chosen column:		New Build	Refurbishment	New Build	Refurbishment
	Target U values	W/m2.K	W/m2.K	W/m2.K	W/m2.K
	Yes/No	Yes	Yes	Yes	Yes
Floor					
	Basement Floor				
	Swimming Pool Basin				
	Upper floors (including ground floor over basement)				
	Ground floor over ground				
	Ground floor over ventilated void				
	Floor with underfloor heating				
	External floor over air				
	Compartment Floor				
	Party Floor				
Wall					
	Basement Perimeter Wall				
	Basement internal Wall/Partitions				
	External wall				
	External wall Insulated Cavity				
	External wall Solid wall insulated (Int or Ext)or Ext)				
	External wall Solid wall insulated (Internal)				
	Internal partition/wall				
	Compartment Wall				
	Party Wall				
	Solid Wall				
	Unfilled cavity unsealed edges				
	Unfilled cavity sealed edges thermal breaks				
	Filled cavity sealed edges thermal breaks				
Roof	Roofs (includes opaque parts of dormers)				
	Flat roof				
	Shallow roof				
	Pitched roof (insulation at rafter)				
	Loft ceiling (insulation at ceiling)				
	Barrel Vault roof				
	Domed Roof				
	Eaves overhang				
	Verge overhang				
	Basement roof at site level				
	Basement roof at subterranean level				
Glazing	Glazing (Maximum % of total area)				
	Windows (whole window value)				
	Glazed Pedestrian Doors				
	Vehicle access and similar large doors				
	High usage entrance doors				
	Opaque Door				
	Rooflights				
	Roof windows				
	Roof ventilation including smoke vents				
	Glazed roof				
	Glazed wall/Curtain walling				
	Display windows				
	Opaque Curtain wall				
	Glazed pavement				

V1 Insulation: Material k values to U Value Thicknesses

- Lists of insulation materials organised by material groups
- k values: best, average and worst
- Applying the chosen U values, this provides an instant comparison of materials and thicknesses

Materials > k values > U values > Thicknesses

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

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Future Development:

- More materials
- More k values
- Add densities
- Add Specific heat capacity
- Overheating calculation

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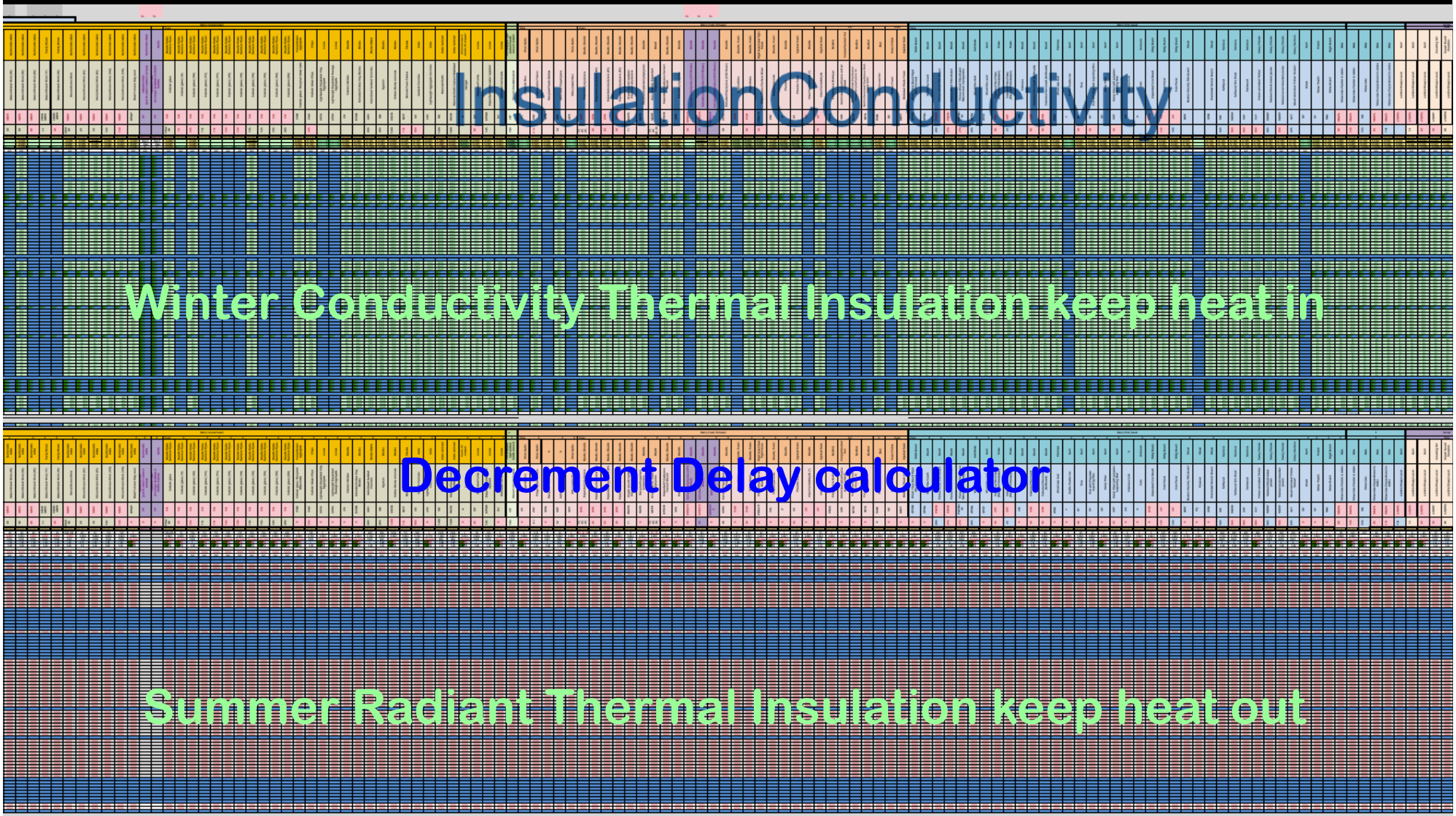
V2 Insulation k density shc dd



V2 Insulation: Materials to Decrement Delay

- Includes the first stages of development of the Decrement Delay calculator

V2 Decrement Delay Insulation Thickness (Dev)

Decrement Delay Insulation Thickness

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

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

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

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

V1 Elements: Assemblies of Components & U or R value

- Detailed descriptions of 24 of 39 potential elements and 12 secondary-elements making up the external envelop of a building
- Allows the user to choose elements and assemble them by choosing their combination of functional components and then choosing the materials for each component.
- Where possible a default size is added
- Where necessary the user adds insulation and other component thicknesses.
- Using each materials k values and set resistances it calculates all of the R and U values automatically

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V1 Elements

- Elemental Assemblies
- Made up of components
- Surfaces and cavities
- Materials or products in place of components
- Conductivities and Thicknesses
- Total R and U values

V2 Elements

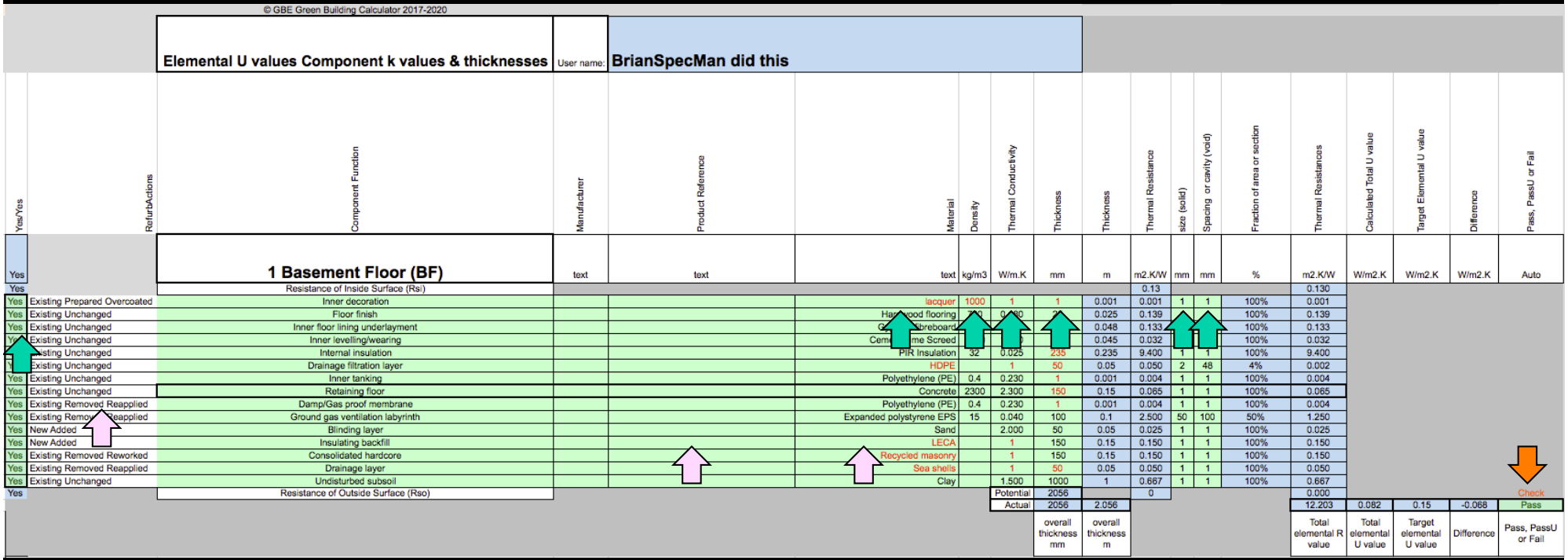
- External envelope elements added
- For EE EC SC and LCA calculations:
  - Non external elements being added
  - Services systems being added
  - Furniture & stairs being added
- Refurbishment:
  - Existing components to stay
  - Components to be removed
  - Components to be refurbished and reused
  - Components to be added

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

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

Yes/Yes	RefurbActions	Component Function	Manufacturer	Product Reference	Material	Density	Thermal Conductivity	Thickness	Thickness	Thermal Resistance	size (solid)	Spacing or cavity (void)	Fraction of area or section	Thermal Resistances	Calculated Total U value	Target Elemental U value	Difference	Pass, PassU or Fail
Yes		**1 Basement Floor (BF)**	text	text	text	kg/m3	W/m.K	mm	m	m2.K/W	mm	mm	%	m2.K/W	W/m2.K	W/m2.K	W/m2.K	Auto
Yes		Resistance of Inside Surface (Rsi)								0.13				0.130				
Yes	Existing Prepared Overcoated	Inner decoration			lacquer	1000	1	1	0.001	0.001	1	1	100%	0.001				
Yes	Existing Unchanged	Floor finish			Hardwood flooring	700	0.180	25	0.025	0.139	1	1	100%	0.139				
Yes	Existing Unchanged	Inner floor lining underlayment			Gypsum fibreboard		0.360	48	0.048	0.133	1	1	100%	0.133				
Yes	Existing Unchanged	Inner levelling/wearing			Cement Lime Screed	1200	1.400	45	0.045	0.032	1	1	100%	0.032				
Yes	Existing Unchanged	Internal insulation			PIR Insulation	32	0.025	235	0.235	9.400	1	1	100%	9.400				
Yes	Existing Unchanged	Drainage filtration layer			HDPE		1	50	0.05	0.050	2	48	4%	0.002				
Yes	Existing Unchanged	Inner tanking			Polyethylene (PE)	0.4	0.230	1	0.001	0.004	1	1	100%	0.004				
Yes	Existing Unchanged	Retaining floor			Concrete	2300	2.300	150	0.15	0.065	1	1	100%	0.065				
Yes	Existing Removed Reapplied	Damp/Gas proof membrane			Polyethylene (PE)	0.4	0.230	1	0.001	0.004	1	1	100%	0.004				
Yes	Existing Removed Reapplied	Ground gas ventilation labyrinth			Expanded polystyrene EPS	15	0.040	100	0.1	2.500	50	100	50%	1.250				
Yes	New Added	Blinding layer			Sand		2.000	50	0.05	0.025	1	1	100%	0.025				
Yes	New Added	Insulating backfill			LECA		1	150	0.15	0.150	1	1	100%	0.150				
Yes	Existing Removed Reworked	Consolidated hardcore			Recycled masonry		1	150	0.15	0.150	1	1	100%	0.150				
Yes	Existing Removed Reapplied	Drainage layer			Sea shells		1	50	0.05	0.050	1	1	100%	0.050				
Yes	Existing Unchanged	Undisturbed subsoil			Clay		1.500	1000	1	0.667	1	1	100%	0.667				
Yes		Resistance of Outside Surface (Rso)					Potential	2056		0				0.000				Check
							Actual	2056	2.056					12.203	0.082	0.15	-0.068	Pass
								overall thickness mm	overall thickness m					Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, PassU or Fail

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



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

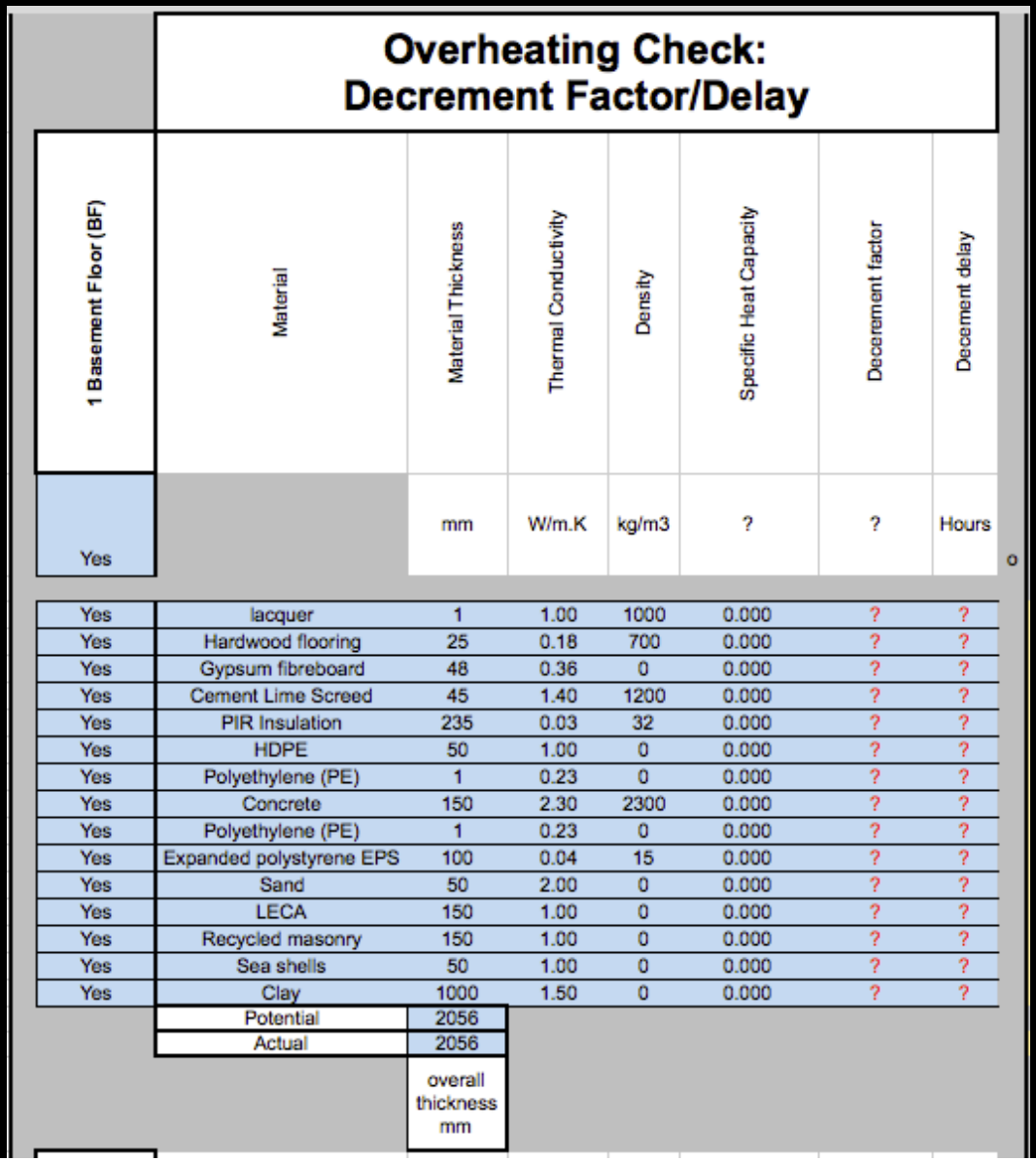
Yes/Yes	RefurbActions	Component Function	Manufacturer	Product Reference	Material	Density	Thermal Conductivity	Thickness	Thickness	Thermal Resistance	size (solid)	Spacing or cavity (void)	Fraction of area or section	Thermal Resistances	Calculated Total U value	Target Elemental U value	Difference	Pass, PassU or Fail
Yes		**1 Basement Floor (BF)**	text	text	text	kg/m3	W/m.K	mm	m	m2.K/W	mm	mm	%	m2.K/W	W/m2.K	W/m2.K	W/m2.K	Auto
Yes		Resistance of Inside Surface (Rsi)								0.13				0.130				
Yes	Existing Prepared Overcoated	Inner decoration			lacquer	1000	1	1	0.001	0.001	1	1	100%	0.001				
Yes	Existing Unchanged	Floor finish			Hardwood flooring	700	0.180	20	0.025	0.139			100%	0.139				
Yes	Existing Unchanged	Inner floor lining underlayment			Gypsum plasterboard				0.048	0.133			100%	0.133				
Yes	Existing Unchanged	Inner levelling/wearing			Cement screed				0.045	0.032			100%	0.032				
Yes	Existing Unchanged	Internal insulation			PIR Insulation	32	0.025	235	0.235	9.400	1	1	100%	9.400				
Yes	Existing Unchanged	Drainage filtration layer			HDPE		1	50	0.05	0.050	2	48	4%	0.002				
Yes	Existing Unchanged	Inner tanking			Polyethylene (PE)	0.4	0.230	1	0.001	0.004	1	1	100%	0.004				
Yes	Existing Unchanged	Retaining floor			Concrete	2300	2.300	150	0.15	0.065	1	1	100%	0.065				
Yes	Existing Removed Reapplied	Damp/Gas proof membrane			Polyethylene (PE)	0.4	0.230	1	0.001	0.004	1	1	100%	0.004				
Yes	Existing Removed Reapplied	Ground gas ventilation labyrinth			Expanded polystyrene EPS	15	0.040	100	0.1	2.500	50	100	50%	1.250				
Yes	New Added	Blinding layer			Sand		2.000	50	0.05	0.025	1	1	100%	0.025				
Yes	New Added	Insulating backfill			LECA		1	150	0.15	0.150	1	1	100%	0.150				
Yes	Existing Removed Reworked	Consolidated hardcore			Recycled masonry		1	150	0.15	0.150	1	1	100%	0.150				
Yes	Existing Removed Reapplied	Drainage layer			Sea shells		1	50	0.05	0.050	1	1	100%	0.050				
Yes	Existing Unchanged	Undisturbed subsoil			Clay		1.500	1000	1	0.667	1	1	100%	0.667				
Yes		Resistance of Outside Surface (Rso)					Potential	2056		0				0.000				Check
							Actual	2056	2.056					12.203	0.082	0.15	-0.068	Pass
								overall thickness mm	overall thickness m					Total elemental R value	Total elemental U value	Target elemental U value	Difference	Pass, PassU or Fail

V2 Condensation Check

Condensation Check BS EN ISO 13788

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

V2 Decrement Delay Overheating Avoidance



Overheating Check: Decrement Factor/Delay

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

Potential	2056
Actual	2056
	overall thickness mm

V1 Elements: Bill of Materials Quantities Costs

- To allow Architects to cost plan their projects
- Bill of materials, quantities, labour and costs is added based on building fabric only so far.
- User add their own researched prices
- Recent tenders for labour rates

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V2 Bill of Materials Quantities Labour Accessories Products Costs

Bill of Materials Quantities Costs

	Component Function	Refurb Actions	Material	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	£	£
				60							
Yes	Inner decoration	New	lacquer	60	£1.00	£60	£1.00	£60	£1.00	£60	£180
Yes	Floor finish	New	Hardwood flooring	60	£1.00	£60	£1.00	£60	£1.00	£60	£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	£1.00	£60	£1.00	£60	£1.00	£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 backfill	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
				Elemental Cost/m2	Elemental Labour Rate/m2	Elemental Labour Cost	Elemental Accessories rate/m2	Elemental Accessories Cost	Elemental Material Rate/m2	Elemental Material Costs	Elemental Cost: Materials Accessories & Labour

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V2 Elemental Costing

SFCA 4th Edition

Detailed (Elemental) Cost Analysis

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

Future Development
Bill of Materials (BoM)

- Being added:
  - Non-envelope items,
  - Services
- National Building Price book datasets? SPON
  - But they are part of BAU
  - ‘race to the bottom’

V20 Future Development

- Green Building Price Book
  - Proposed 18 years ago
  - But proposal rejected by publishers
  - Discussions started
- Embedded in GBC V20
- Products and Materials sheets
  - Add costs
  - Add rates

V2 Embodied Energy & Carbon Sequestered Carbon

- Drop Down Lists
  - Choose Function
  - Application Location
  - Material Choice
  - Choose and auto-populates cells
  - Auto-calculates Energy and Carbon
- Made of Timber? Yes/No
  - Auto calculates Sequestered Carbon

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V2 EE EC & SC

Grand totals	42,128	0	0	0	0

Embodied Energy Embodied Carbon Sequestered Carbon

Whole Building Embodied Energy Embodied Carbon Sequestered Carbon

Component Function	Length	Width	Height	Element Thickness	Quantity	Areas	Volume	Primary or all Functions	Primary or all Components	Primary or all Materials	Information Source	Embodied Energy	Embodied Energy	Embodied Energy	Area or section	m2	Embodied Carbon	Embodied Carbon Dioxide	Embodied Carbon Dioxide	Embodied Carbon Dioxide	Density	Weight	Embodied Energy	Embodied Carbon Dioxide	Required in building?	Embodied Energy Building	Embodied Carbon Building	Is the material Bio-based or contain Biogenic carbon?	Sequestered carbon	Total Carbon
Yes **1 Basement Floor (BF)**	m	m	m	m	No.	m2	m3					MJ/m3	MJ/m2	MJ/Item	m2	m2	kg C/kg	kg CO2/kg	kg CO2/m2	kg CO2/Item	kg/m3	kg/m2	MJ/m3	kg CO2/m3	Yes/No	MJ	kg CO2	Yes/No	kg CO2	Kg CO2
						60																								
Yes Inner decoration				0.001	1	60	0.06	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Floor finish				0.025	1	60	1.5	Finish	Finish/wearing	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	336	0	No	0	0
Yes Inner floor lining underlayment				0.048	1	60	2.88	Lining/Sheathing/Sarking	Interior lining	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	645	0	No	0	0
Yes Inner levelling/wearing				0.045	1	60	2.7	Gap filler / Formation	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	605	0	No	0	0
Yes Internal insulation				0.235	1	60	14.1	Thermal Insulation	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	3,158	0	No	0	0
Yes Drainage filtration layer				0.05	1	60	3	Loadbearing capacity: Foundation	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	672	0	No	0	0
Yes Inner tanking				0.001	1	60	0.06	Ground water exclusion	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Retaining floor				0.15	1	60	9	Loadbearing capacity: Basement	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	2,016	0	No	0	0
Yes Damp/Gas proof membrane				0.001	1	60	0.06	Ground gas exclusion	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Ground gas ventilation labyrinth				0.1	1	60	6	Cross ventilation (below floor)	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	1,344	0	No	0	0
Yes Blinding layer				0.05	1	60	3	Gap filler / Formation	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	672	0	No	0	0
Yes Insulating backfill				0.15	1	60	9	Thermal Insulation	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	2,016	0	No	0	0
Yes Consolidated hardcore				0.15	1	60	9	Gap filler / Formation	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	2,016	0	No	0	0
Yes Drainage layer				0.05	1	60	3	Loadbearing capacity: Foundation	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	672	0	No	0	0
Yes Undisturbed subsoil				1	1	60	60	Loadbearing capacity: Foundation	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13,440	0	No	0	0

Component Function	Length	Width	Height	Element Thickness	Quantity	Areas	Volume	Primary or all Functions	Primary or all Components	Primary or all Materials	Information Source	Embodied Energy	Embodied Energy	Embodied Energy	Area or section	m2	Embodied Carbon	Embodied Carbon Dioxide	Embodied Carbon Dioxide	Embodied Carbon Dioxide	Density	Weight	Embodied Energy	Embodied Carbon Dioxide	Required in building?	Embodied Energy Building	Embodied Carbon Building	Is the material Bio-based or contain Biogenic carbon?	Sequestered carbon	Total Carbon
Yes **2 Basement Perimeter Retaining Walls (BPRW)**	m	m	m	m	No.	m2	m3	0	0	0	0	MJ/m3	MJ/m2	MJ/Item	m2	m2	kg C/kg	kg CO2/kg	kg CO2/m2	kg CO2/Item	kg/m3	kg/m2	MJ/m3	kg CO2/m3	Yes/No	MJ	kg CO2	Yes/No	kg CO2	Kg CO2
						200																								
Yes Undisturbed subsoil				1	1	200	200	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Backfill				0.3	1	200	60	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Protection mat				0.01	1	200	2	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Drainage filtration layer				0.05	1	200	10	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Outer tanking				0.006	1	200	1.2	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes External retaining supporting wall				0.3	1	200	60	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Smoothing waterproof render				0.02	1	200	4	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Drainage layer				0.05	1	200	10	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Internal insulation				0.1	1	200	20	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Inner lining				0.0125	1	200	2.5	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Inner finish				0.003	1	200	0.6	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0
Yes Inner decoration				0.001	1	200	0.2	Decoration	Decoration	Choose	E-CT	0.1	0	0	0	0	0.005	0	0	0	2240	0	224	0	Yes	13	0	No	0	0

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V2 LCA EPD

- Life Cycle Assessment
- Environmental Product Declaration
  - EN 15804 table spread out
- Choose materials
- Auto-populates cells with Datasets
- Auto-Calculates

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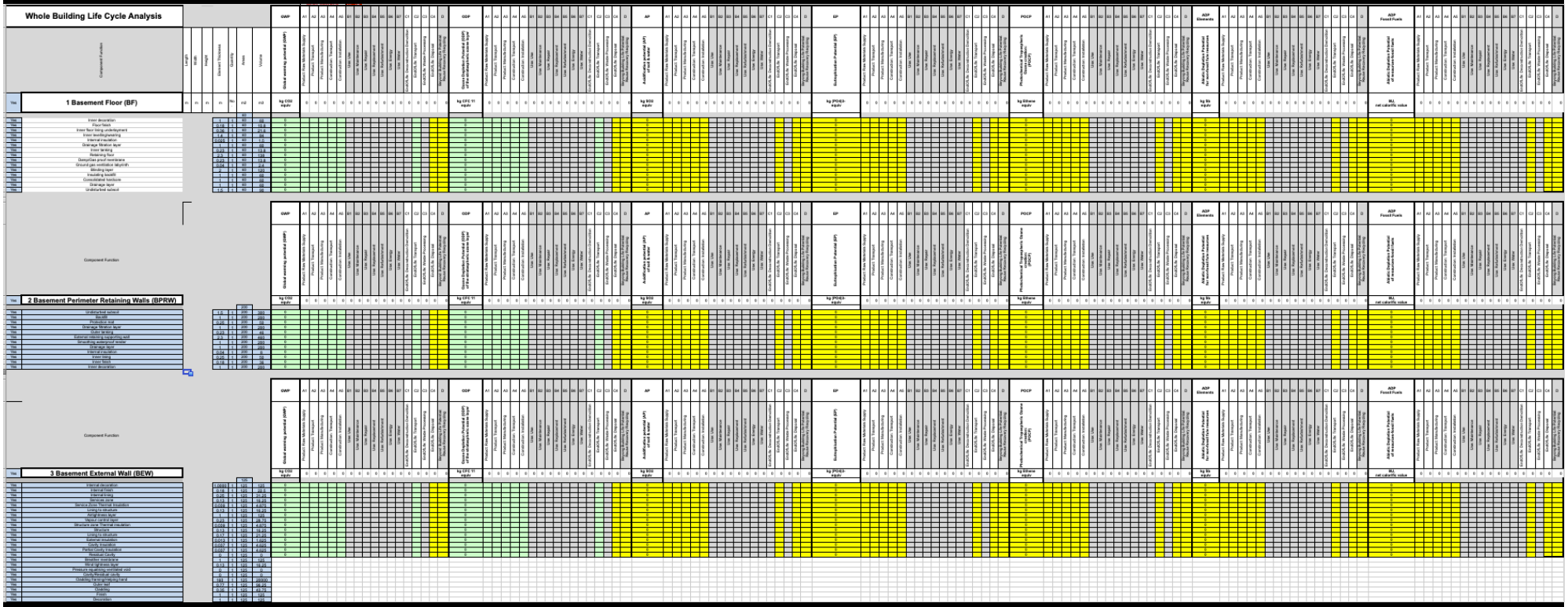
V2 LCA EPD



V1 Resistances:

- Is an information resource for default surface and cavity resistivity's;
- 'Element' obtains values from here and adds to calculations
- Based on ISO standards
  - Updates: none expected

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V1 Resistances

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

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

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

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V1 Conductivities:

- Is an information resource for materials and their properties for use in Components of 'Elements'
- The user can copy information manually into Elements

V2 Conductivities

- Automated cell population to be implemented
- Its is to be developed as a look up table to automatically populate Component of 'Elements'

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V2 Conductivities

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

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V1 Products:

- Lists of manufacturers
- Products
- Dimensions
- Characteristics
- Applications

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V1 Properties of Products

Products

CAWS+	Elements	Component/Function	Format	Supplier	Manufacturer	Product Reference	Material	Density	Thermal Conductivity	Thickness	Thickness	Thermal resistance	Width or thickness (solid)	Spacing or cavity (Void)	Fraction of area or section	Thermal resistance	U value on own	Source	Source	Year	Updated
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre	180	0.042	50	0.05	1.190	1	1	100%	1.190	0.840	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre	180	0.042	60	0.06	1.429	1	1	100%	1.429	0.700	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre	180	0.042	80	0.08	1.905	1	1	100%	1.905	0.525	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	board	Ecological Building Systems	Gutex	Ultratherm	Wood Fibre	180	0.042	100	0.1	2.381	1	1	100%	2.381	0.420	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Multitherm	Wood Fibre	140	0.040	40	0.04	1.000	1	1	100%	1.000	1.000	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Multitherm	Wood Fibre	140	0.040	60	0.06	1.500	1	1	100%	1.500	0.667	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Multitherm	Wood Fibre	140	0.040	80	0.08	2.000	1	1	100%	2.000	0.500	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	130	0.039	20	0.02	0.513	1	1	100%	0.513	1.950	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	130	0.039	40	0.04	1.026	1	1	100%	1.026	0.975	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	130	0.039	60	0.06	1.538	1	1	100%	1.538	0.650	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	130	0.039	80	0.08	2.051	1	1	100%	2.051	0.488	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Board	Ecological Building Systems	Gutex	Thermoroom	Wood Fibre	130	0.039	100	0.1	2.564	1	1	100%	2.564	0.390	EBS 2018	Supplier	2018	24/05/2020
P10	Flat roof	Insulation	Board and bonded insulation	Direct from Manufacturer	Kingspan	Thermaroof TR31	6 mm ply and 120 Insulation			120.0	0.12	#DIV/0!		1	100%	#DIV/0!	#DIV/0!	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10	Flat roof	Insulation	Rigid Board insulation	Direct from Manufacturer	Kingspan	Thermapitch TP10			0.022	60.0	0.06	2.727272727		1	100%	2.727272727	0.367	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10			Rigid Board insulation	Direct from Manufacturer	Kingspan	Thermapitch TP10			0.042	40.0	0.04	0.952380952		1	100%	0.952380952	1.050	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10	External wall	Thermal insulation		Direct from Manufacturer	Kooltherm	Rigid Insulation			0.018	100.0	0.1	5.555555556		1	100%	5.555555556	0.180	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	220	0.22	5.789473684	1	1	100%	5.789473684	0.173	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	200	0.2	5.263157895	1	1	100%	5.263157895	0.190	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	30	0.03	0.789473684	2	2	100%	0.789473684	1.267	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10		Insulation	Board	Direct from Manufacturer	Steico	SteicoTherm	Rigid wood fibre		0.038	100	0.1	2.631578947	2	2	100%	2.631578947	0.380	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool	18	0.039	100	0.1	2.564	1	1	100%	2.564	0.390	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool	18	0.039	75	0.075	1.923	1	1	100%	1.923	0.520	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool	18	0.039	50	0.05	1.282	1	1	100%	1.282	0.780	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Quilt	Ecological Building Systems	Thermafleece	Cosywool	Wool	18	0.039	140	0.14	3.590	1	1	100%	3.590	0.279	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38	0.040	40	0.04	1.000	1	1	100%	1.000	1.000	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38	0.040	60	0.06	1.500	1	1	100%	1.500	0.667	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38	0.040	80	0.08	2.000	1	1	100%	2.000	0.500	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38	0.040	100	0.1	2.500	1	1	100%	2.500	0.400	EBS 2018	Supplier	2018	24/05/2020
P10		Insulation	Flexible Matts	Ecological Building Systems	ThermoNatur	Thermahemp Premium	Hemp	38	0.040	140	0.14	3.500	1	1	100%	3.500	0.286	EBS 2018	Supplier	2018	24/05/2020
P10	Floor	Impact Sound Isolation	Sheet	Direct from Manufacturer		ISO Rubber			0.075	6	0.006	0.08	1	1	100%	0.08	12.500	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10				Direct from Manufacturer		Lambatherm	Sheep's wool		0.03	172.0	0.172	5.733333333	1	1	100%	5.733333333	0.174	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10	Flooring	Thermal Insulation		Direct from Manufacturer		Earthwool Building Slab RS140	Mineral wool		0.034	150.0	0.15	4.411764706	1	1	100%	4.411764706	0.227	LSBU EREID 2017	manufacturer	2017	24/05/2020
P10			Board	NBT		Pavatex			0.04	300.0	0.3	7.5	1	1	100%	7.5	0.133	LSBU EREID 2017	manufacturer	2017	24/05/2020
P11	External Wall	Thermal Insulation	Foam	Direct from Manufacturer	Icynene	Spray foam Insulation	Polyurethane	8	0.04	40	0.04	1.000	550	600	92%	0.917	1.000	ND LSBU EREID 2018	manufacturer	2018	24/05/2020
P14	External Wall	Air tightness layer	Membrane	Ecological Building Systems	Proclima	Intello Plus	Polyolephene	-	0.17	0.5	0.0005	0.003	1	1	100%	0.003	340.000	ND LSBU EREID 2018	manufacturer	2018	24/05/2020
P14	External Wall	Wind tightness layer	Membrane	Ecological Building Systems	Proclima	Solitex Fronta	Polyolephene	-	0.2	0.1	0.0001	0.001	1	1	100%	0.001	2000.000	ND LSBU EREID 2018	manufacturer	2018	24/05/2020

V2 > V3 Products

- Becomes a Look Up Table to populate 'Elements: Components’
- GBC to only permit them to be chosen as intended by manufacturer
- V1 Users can still overwrite
  - but consciously breaking rules
  - At their own risk
- V3 GBC shall prevent it (Protect GBC)
- V20 Green Building Price Book

V1 Secondary Elements: Windows doors rooflights

- Is an information resource
- for secondary elements
- their properties for use in Components of 'Elements'
- The user can obtain their own or copy information manually
- Windows and Glazing options
- Pick and choose

V2 Secondary Elements

- Look up table to automatically populate Component of 'Elements'
- Secondary Element calculator (started)
  - Ug, Uf, Uw, Psi glazing bar, Psi perimeter

GBE

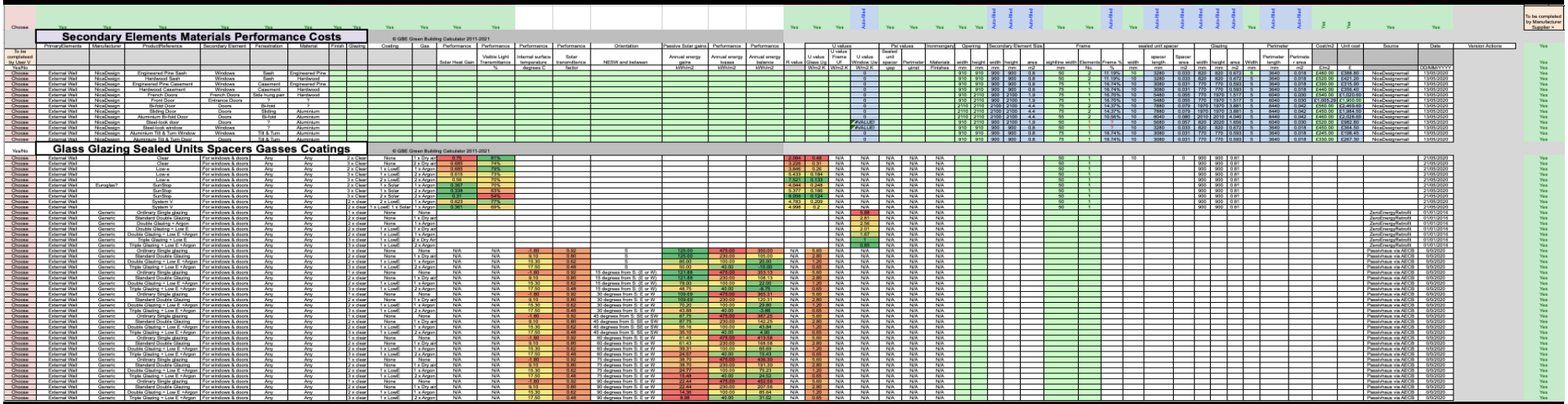
https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V2 Secondary Elements Windows & Glazing options



Secondary Elements Materials Performance Costs

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Glass Glazing Sealed Units Spacers Gasses Coatings

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GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V1 Element Summary:

- Summarises 24 Elements and 12 Secondary Elements
  - Calculated U values,
  - Compares with target U values,
  - highlighting any shortfalls

V2 Element Summary

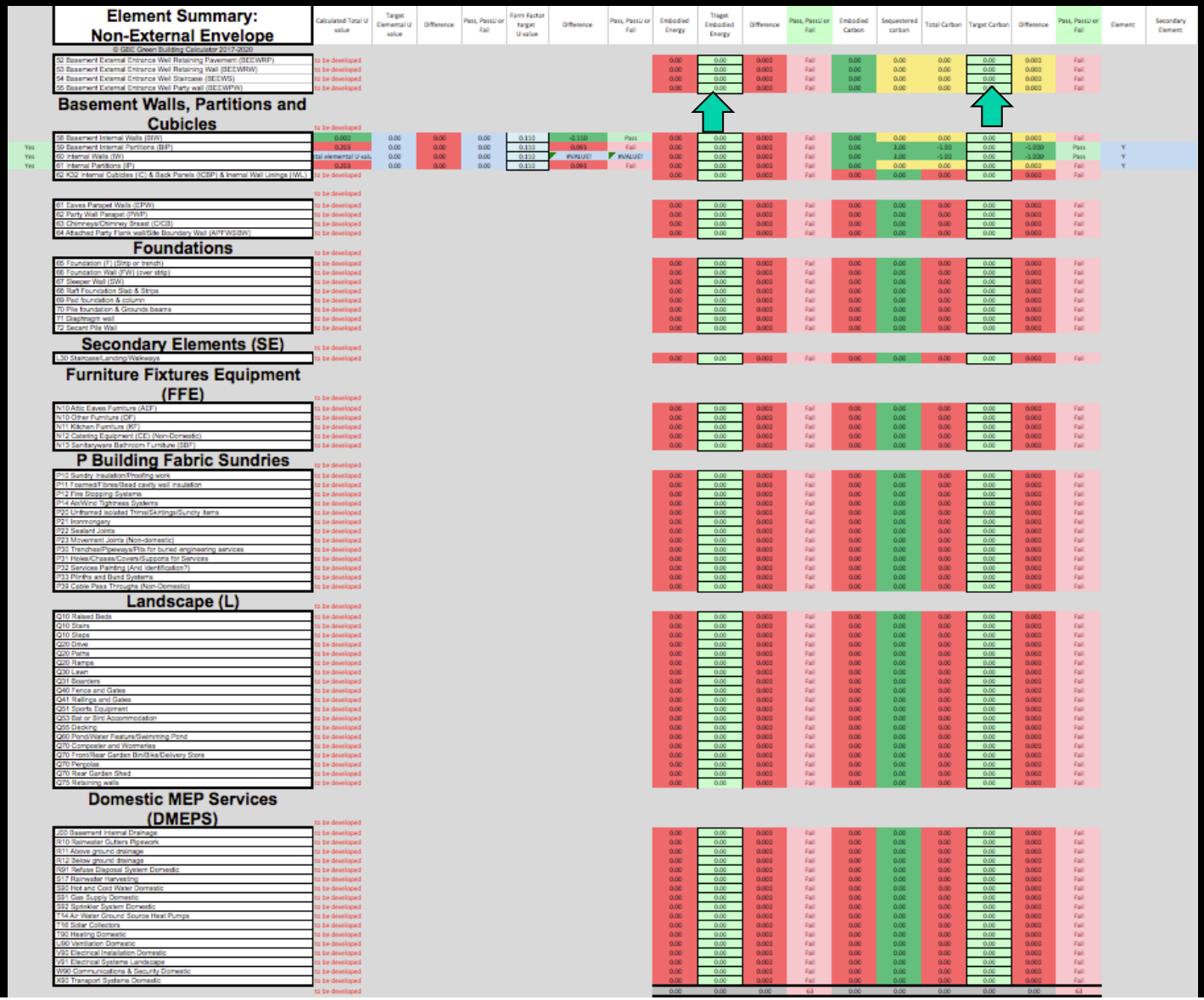
- 39 external envelop elements
- Other parts to be added Porch, Sun space, Extension, Dormer
- V2 Non U value elements:
  - Not for U value calculations
  - But for EE, EC, SC, LCA calculations

V2 Element Summary Ext Env For U Value Calculations

	Element Summary: External Envelope	Calculated Total U value	Target Elemental U value	Difference	Pass, PassU or Fail	Form Factor target U value	Difference	Pass, PassU or Fail	Embodied Energy	Traget Embodied Energy	Difference	Pass, PassU or Fail	Embodied Carbon	Sequestered carbon	Total Carbon	Target Carbon	Difference	Pass, PassU or Fail
	© 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)	0.064	0.15	-0.09	Pass	0.110	-0.046	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	4 Basement Roof at Site Level (BRSL)	0.044	0.15	-0.11	Pass	0.110	-0.066	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	5 Basement Roof at SubTerranean level (BRSTL)	0.085	0.15	-0.07	Pass	0.110	-0.025	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	6 Basement Overhead Glazed Pavement (BOGP)	2.000	0.750	1.250		0.110	1.890	Fail	0.00	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		0.110	-0.039	Pass	0.00	0.00	0.000	Fail	0.00	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	0.00	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	0.00	0.000	Fail
Yes	10 Ground Floor Over Ventilated Void (GFOV)	0.057	0.150	-0.093	Pass	0.110	-0.053	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	11 Upper Floor (UF)	0.102	0.15	0.15	Fail	0.110	-0.008	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	13 External Floor & Soffit (EFS) (over air)	0.059	0.150	-0.091	Pass	0.110	-0.051	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
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)	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	20 External Walls (EW)	0.064	0.15	-0.09	Pass	0.110	-0.046	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	21 Integral Unheated Space Wall (IUSW)	0.064	0.75	-0.69	Pass	0.110	-0.046	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
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)	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)	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	26 Mono-Pitched Roof (MPR)	0.070	0.00	0.070	Fail	0.110	-0.040	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
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	34 Flat Ceiling (FC)	0.087	0.150	-0.063	Pass	0.110	-0.023	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	33 Pitched Vault Ceiling (PVC)	0.089	0.000	0.000	Pass	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
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)	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	39 Other Geometry Ceiling (OGC)	0.089	0.000	0.000	Pass	0.110	-0.021	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	42 Windows (W)	0.800	0.950	-0.150	Pass		0.800		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	43 Glazed Pedestrian Doors (GPD)	0.790	0.950	-0.160	Pass		0.790		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
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)	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	48 Glazed External Walls (GEW)	0.810	0.950	-0.140	Pass		0.810		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
Yes	49 Opaque External Walls (OEW)	2.000	0.750	1.250	Fail		2.000		0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail
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			4.29			0.00	0.00	0.00		3.00	0.00	1.00	0.00	1.00	
				51	18	of 51		5				51						51
					Fail			Fail				Fail						Fail
					32	of 51		34	of 51			0	of 51					0
					Pass			Pass				Pass						Pass
					1	of 51		0	of 51			0	of 51					0
					PassU			PassU				PassU						PassU
					0	of 51		0	of 51			0	of 51					0
					N/A			N/A				N/A						N/A

V2 Element Summary:

Non-Ext Env for EE EC SC LCA



Element Summary: Non-External Envelope	Calculated Total U value	Target Elemental U value	Difference	Pass, Pass1/ or Fail	Form Factor target U value	Difference	Pass, Pass1/ or Fail	Embodied Energy	Tragat Embodied Energy	Difference	Pass, Pass1/ or Fail	Embodied Carbon	Sequestered carbon	Total Carbon	Target Carbon	Difference	Pass, Pass1/ or Fail	Element	Secondary Element
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S2 Basement External Entrance Well Retaining Pavement (SEEWRP)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S3 Basement External Entrance Well Retaining Wall (SEEWRW)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S4 Basement External Entrance Well Staircase (SEEWS)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S5 Basement External Entrance Well Party wall (SEEWPW)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Basement Walls, Partitions and Cubicles																			
S6 Basement Internal Walls (SIW)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S9 Basement Internal Partitions (SIP)	0.003	0.00	0.00	0.00	0.130	-0.110	Pass	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Yes S0 Internal Walls (IW)	0.203	0.00	0.00	0.00	0.130	0.093	Fail	0.00	0.00	0.000	Fail	0.00	3.00	-3.00	0.00	-3.000	Pass	Y	
Yes S0 Internal Walls (IW)	tal elemental U valu	0.00	0.00	0.00	0.130	#VALUE!	#VALUE!	0.00	0.00	0.000	Fail	0.00	3.00	-3.00	0.00	-3.000	Pass	Y	
Yes S1 Internal Partitions (IP)	0.203	0.00	0.00	0.00	0.130	0.093	Fail	0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail	Y	
S2 K32 Internal Cubicles (IC) & Back Panels (ICBP) & Internal Wall Linings (IWL)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
	to be developed																		
S1 Eaves Parapet Walls (EPW)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S2 Party Wall Parapet (PWP)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S3 Chimneys/Chimney Breast (CIC/SI)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S4 Attached Party Flank wall/Site Boundary Wall (APFWS/BW)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Foundations																			
S5 Foundation (F) (Strip or trench)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S6 Foundation Wall (FW) (over strip)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S7 Sleeper Wall (SW)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S8 Raft Foundation Slab & Strips	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S9 Pad foundation & column	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S0 Pile foundation & Grounds beams	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S1 Diaphragm wall	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S2 Secant Pile Wall	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Secondary Elements (SE)																			
L30 Staircase/Landing/Walkways	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Furniture Fixtures Equipment (FFE)																			
N10 Attic Eaves Furniture (AEF)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
N10 Other Furniture (OF)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
N11 Kitchen Furniture (KF)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
N12 Catering Equipment (CE) (Non-Domestic)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
N13 Sanitaryware Bathroom Furniture (SBF)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P Building Fabric Sundries																			
P10 Sundry Insulation/Proofing work	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P11 Foamed/Fibre/Bead cavity wall insulation	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P12 Fire Stopping Systems	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P14 Air/Wind Tightness Systems	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P20 Unframed Isolated Trims/Skirtings/Sundry items	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P21 Ironmongery	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P22 Sealant Joints	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P23 Movement Joints (Non-domestic)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P30 Trenches/Pipeways/Pits for buried engineering services	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P31 Holes/Chases/Covers/Supports for Services	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P32 Services Painting (And identification?)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P33 Plinths and Bund Systems	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
P39 Cable Pass Throughs (Non-Domestic)	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Landscape (L)																			
Q10 Raised Beds	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q10 Stairs	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q10 Steps	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q20 Drive	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q20 Paths	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q20 Ramps	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q30 Lawn	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q31 Boarders	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q40 Fence and Gates	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q41 Railings and Gates	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q51 Sports Equipment	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q53 Bat or Bird Accommodation	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q55 Decking	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q60 Pond/Water Feature/Swimming Pond	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q70 Compost and Wormeries	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q70 Front/Rear Garden Bin/Bike/Delivery Store	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q70 Pergolas	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q70 Rear Garden Shed	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Q75 Retaining walls	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
Domestic MEP Services (DMEPS)																			
J00 Basement Internal Drainage	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
R10 Rainwater Gutters Pipework	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
R11 Above ground drainage	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
R12 Below ground drainage	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
R91 Refuse Disposal System Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S17 Rainwater Harvesting	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S92 Hot and Cold Water Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S91 Gas Supply Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
S92 Sprinkler System Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
T14 Air Water Ground Source Heat Pumps	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
T16 Solar Collectors	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
T90 Heating Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
L90 Ventilation Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
V92 Electrical Installation Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
V91 Electrical Systems Landscape	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
W90 Communications & Security Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
X92 Transport Systems Domestic	to be developed							0.00	0.00	0.000	Fail	0.00	0.00	0.00	0.00	0.000	Fail		
	to be developed							0.00	0.00	0.00	63	0.00	0.00	0.00	0.00	0.00	63		

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GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V1 Uvalue > Watts > CO2 in use:

- Assembles elemental areas and U values to calculates energy losses from
  - each element in groups
  - total secondary elements
  - total losses
  - each element group losses as a % of the whole
- comparisons can be made by the user
  - gives a chance to reconsider earlier decisions
- Particularly useful is the comparison of basement, walls, roofs, floors and all glazing
- Choose fuel source to get CO2 readout

U Value To Watts To CO2

Yes ?

User name: BrianSpecMan did this

Element	Applicable	Elements	U value	Areas	Temperature External		Temperature Internal	Temperature Difference	Heat loss Individual	Heat loss Total	Floor area	Total Areas	Areas
Basement	Yes/No	© GBE Green Building Calculator 2018-2020	W/m2.K	m2	degree C		degree C		W		m2	m2	%
	Yes	Basement retaining floor	0.0819469	300	11	-	15	4	98		300		
	Yes	Swimming Pool Basin	0.070865	1448	11	-	15	4	410		1448		
	Yes	Basement perimeter retaining wall	0.2512023	175	11	-	15	4	176				
	Yes	Basement roof at site level	0.044126	300	11	-	15	4	53				
	Yes	Basement roof at subterranean level	0.0848912	300	11	-	15	4	102				
	Yes	Basement partition	0.2032824	125	20	-	15	-5	-127			Ratio: 1 to	0.20
	Yes	Glazed pavement over basement	2	11	11	-	15	4	88			1748	21% Area %
Floor				2659	External		Internal		Heat loss	800	Basement		4.1% Heat loss %
	Yes	Ground bearing floor	0.0901849	300	11	-	20	9	243		300		
	Yes	Ground floor over ventilated void	0.0569331	300	11	-	20	9	154		300		
	Yes	Floor over basement	0.0523647	300	11	-	20	9	141		300		
	Yes	Upper internal floor	0.0528671	600	20	-	20	0	0		600		
	Yes	Floor suspended over air	0.0585441	600	0	-	20	20	703		600		
	Yes	Compartment floor	0.0528671	90	0	-	20	20	95		90	Ratio: 1 to	0.32
	Yes	Party floor	0.0528755	900	0	-	20	20	952		900	3090	37% Area %
Wall				3090	External		Internal		Heat loss	2,288	Floor		11.8% Heat loss %
	Yes	External wall	0.0642495	455	0	-	20	20	585		455		
	Yes	External glazed wall/Curtain wall	0.81	175	0	-	20	20	2,835		175		
	Yes	Opaque Curtain wall	2	20	0	-	20	20	800		20		
	Yes	Compartment Party wall	0.125493	525	0	-	20	20	1,318		525		
	Yes	Compartment Communal wall	0.1255245	65	0	-	20	20	163		65	Ratio: 1 to	1.95
	Yes	Internal Partition/Wall	0.2032824	25	20	-	20	0	0		25	1265	15% Area %
Roof & Ceilings				1265	External		Internal		Heat loss	5,701	Wall		29.5% Heat loss %
	Yes	Pitched Roof	0.0694608	632.5	0	-	20	20	879		632.5		
	Yes	Barrel vault roof	0.0862835	471.3	0	-	20	20	813		471.3		
	Yes	Flat Roof	0.0394566	300	0	-	20	20	237		300		
	Yes	Shallow roof	0.0862984	300	0	-	20	20	518		300		
	Yes	Flat ceiling	0.0867887	300	0	-	20	20	521		300	Ratio: 1 to	0.84
	Yes	Glazed Roof	2	25	0		20	20	1,000		25	2028.8	24% Area %
Window/Door/Rooflight				2029	External		Internal		Heat loss	3,967	Roof		20.5% Heat loss %
	Yes	Windows	0.8	50	0	-	20	20	800		50		
	Yes	Glazed Pedestrian Doors	0.79	10.5	0	-	20	20	166		10.5		
	Yes	Rooflights	0.75	25	0	-	20	20	375		25		
	Yes	Roof windows	0.81	10	0	-	20	20	162		10		
	Yes	Vehicle access/Large doors	2	45	0	-	20	20	1,800		45		
	Yes	High usage entrance doors	2	20	0	-	20	20	800		20		
	Yes	Opaque Pedestrian Doors	2	12	0	-	20	20	480		12		
	Yes	Display window	2	25	0	-	20	20	1,000		25	Ratio: 1 to	12.78
	Yes	Roof Vents/Smoke vents	2	25	0	-	20	20	1,000		25	223	2.7% Area %
				223						6,583	Window/Door/Rooflight		34.0% Heat loss %
											4838	8354	100% Area %
										19,339	Total		100.0% Heat loss %

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

		TCHL		
	Floor area	4,838	m2	
TCHL	Watts	19,339	W	
	KiloWatts	19	kW	
	kiloWattHours	2.4	kWh	
	KiloWatts/floor area	0.004	kW/m2	
	KiloWattHours/floor area	0.0005	kWh/m2	
	KiloWattHours/Floor area/annum		kWh/m2/Year	

Biomass	Fuel
0.025	conversion
0.060	kg CO2
CarbonDioxide	CO2
0.00001	kg CO2/m2

Total Conduction Heat Loss (TCHL)

In Use Carbon

Hours of operation/day 8

V2 U value > Watts > CO2 In Use

U Values To Watts To CO_2

User name: BrianSpecMan did this

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Basement	Applicable	Elements	U value	Areas	Temperature External		Temperature Internal	Temperature Difference	Heat loss Individual	Heat loss Total	Floor area	Total Areas	Areas	Heat loss	Ratio:	To be completed by GBC user
	Yes/No		W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x	
	Yes	1 Basement Floor (BF)	0.082	60	11	-	15	4	20		60					Auto-filled
	Yes	2 Basement Perimeter Retaining Walls (BPRW)	0.251	200	11	-	15	4	201		200					Auto-filled
	Yes	3 Basement External Wall (BEW)	0.064	125	11	-	15	4	32		125					Auto-filled
	Yes	4 Basement Roof at Site Level (BRSL)	0.044	60	11	-	15	4	11		60					Auto-filled
	Yes	5 Basement Roof at SubTerranean level (BRSTL)	0.085	60	11	-	15	4	20		60					Auto-filled
	Yes	6 Basement Overhead Glazed Pavement (BOGP)	1.747	11	11	-	15	4	77		11					Auto-filled
	Yes	7 Swimming Pool Basin (SPB)	0.071	2296	11	-	16	5	814		2296					Auto-filled
				2812						1,174	Basement	2812	52%	8.3%	0.16	Review

Floor	Applicable	Elements	U value	Areas	Temperature External		Temperature Internal	Temperature Difference	Heat loss Individual	Heat loss Total	Floor area	Total Areas	Areas	Heat loss	Ratio:	
	Yes/No		W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x	
	Yes	8 Ground Floor Over Basement (GFOB)	0.052	60	15	-	20	5	16		60					Auto-filled
	Yes	9 Ground Floor Ground Bearing (GFGB)	0.090	60	11	-	20	9	49		60					Auto-filled
	Yes	10 Ground Floor Over Ventilated Void (GFOV)	0.057	60	0	-	20	20	68		60					Auto-filled
	Yes	11 Upper Floor (UF)	0.102	60	20	-	20	0	0		60					Auto-filled
	Yes	12 Services Riser Upper Floor (SRUF)	0.104	1.80	20	-	20	0	0		1.8					Auto-filled
	Yes	13 External Floor & Soffit (EFS) (over air)	0.059	120	0	-	20	20	141		120					Auto-filled
	Yes	14 Top Floor (TF)	0.105	60	20	-	20	0	0		60					Auto-filled
				421.8						273	Floor	421.8	8%	1.9%	0.25	Review

Compartmentation	Applicable	Elements	U value	Areas	Temperature External		Temperature Internal	Temperature Difference	Heat loss Individual	Heat loss Total	Floor area	Total Areas	Areas	Heat loss	Ratio:	
	Yes/No		W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x	
	Yes	15 Party Floor (PF)	0.053	180	0	-	20	20	190		180					Auto-filled
	Yes	16 Party Wall (PW)	0.125	50	0	-	20	20	125		50					Auto-filled
	Yes	17 Communal Compartment Floors (CCF)	0.053	180	0	-	20	20	190		180					Auto-filled
	Yes	18 Communal Compartment Wall (CCW)	0.126	37.5	0	-	20	20	94		37.5					Auto-filled
	Yes	19 Riser Compartment Upper Floor (RCUF)	0.593	5.4	0	-	20	20	64		5.4					Auto-filled
				452.9						664	Compartmentation	452.9	8%	4.7%	0.56	Review

Wall	Applicable	Elements	U value	Areas	Temperature External		Temperature Internal	Temperature Difference	Heat loss Individual	Heat loss Total	Floor area	Total Areas	Areas	Heat loss	Ratio:	
	Yes/No	0	W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x	
	Yes	20 External Walls (EW)	0.064	80	0	-	20	20	103		80					Auto-filled
	Yes	21 Integral Unheated Space Wall (IUSW)	0.062	49	5	-	5	0	0		49					Auto-filled
	Yes	59 Basement Internal Partitions (BIP)	0.203	25	15	-	15	0	0		25					Auto-filled
	Yes	60 Internal Walls (IW)	0.093	25	20	-	20	0	0		25					Auto-filled
				179						103	Wall	179	3%	0.7%	0.22	Review

Roof	Applicable	Elements	U value	Areas	Temperature External		Temperature Internal	Temperature Difference	Heat loss Individual	Heat loss Total	Floor area	Total Areas	Areas	Heat loss	Ratio:	
	Yes/No		W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x	
	Yes	22 Flat Roof (FR)	0.039	60	0	-	20	20	47		60					Auto-filled
	Yes	23 Shallow Roof (SR)	0.086	60	0	-	20	20	104		60					Auto-filled
	Yes	24 Pitched Roof (PR)	0.069	59	0	-	20	20	82		59					Auto-filled
	Yes	25 Barrel Vault Roof (BVR)	0.086	68	0	-	20	20	118		68					Auto-filled
	Yes	26 Domed Roof (DR)	0.049	31	0	-	20	20	30		31					Auto-filled
	Yes	27 Hipped/Pyramid Roof (HPR)	0.069	59	0	-	20	20	82		59					Auto-filled
	Yes	28 Mono-Pitched Roof (MPR)	0.069	59	0	-	20	20	82		59					Auto-filled
	Yes	29 Mansard Roof (MR)	0.069	48	0	-	20	20	66		48					Auto-filled
	Yes	30 Dormer Flat Roofs (DFR)	0.069	21	0	-	20	20	29		21					Auto-filled
	Yes	31 Dormer Side Wall (DSW)	0.070	9	0	-	20	20	12		9					Auto-filled
	Yes	32 Dormer Window Wall (DWW)	0.069	15	0	-	20	20	21		15					Auto-filled
	Yes	33 Other Geometry Roof (OGR)	0.069	121	0	-	20	20	167		121					Auto-filled
				610						841	Roof	610	11%	6.0%	0.53	Review

Ceilings	Applicable	Elements	U value	Areas	Temperature External		Temperature Internal	Temperature Difference	Heat loss Individual	Heat loss Total	Floor area	Total Areas	Areas	Heat loss	Ratio:	
	Yes/No		W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x	
	Yes	34 Flat Ceiling (FC)	0.087	60	0	-	20	20	104		60					Auto-filled
	Yes	35 Pitched Vault Ceiling (PVC)	0.089	41	0		20	20	73		41					Auto-filled
	Yes	36 Barrel Vault Ceiling (BVC)	0.089	131	0		20	20	234		131					Auto-filled
	Yes	37 Domed Vault Ceiling (DVC)	0.089	31	0		20	20	55		31					Auto-filled
	Yes	38 Hipped/Pyramid Vault Ceiling (HPVC)	0.089	59	0		20	20	105		59					Auto-filled
	Yes	39 Mono-Pitch Vault Ceiling (MPVC)	0.089	41	0		20	20	73		41					Auto-filled
	Yes	40 Mansard Vault Ceiling (MVC)	0.089	97	0		20	20	172		97					Auto-filled
	Yes	41 Other Geometry Ceiling (OGC)	0.089	101	0		20	20	179		101					Auto-filled
				561						995	Ceilings	561	10%	7.1%	0.68	Review

Window/Door/Rooflight	Applicable	Elements	U value	Areas	Temperature External		Temperature Internal	Temperature Difference	Heat loss Individual	Heat loss Total	Floor area	Total Areas	Areas	Heat loss	Ratio:	
	Yes/No		W/m2.K	m2	degree C		degree C	degree C	W	W	m2	m2	%	%	1 in x	
	Yes	6 Basement Overhead Glazed Pavement (BOGP)	1.75	11	0	-	20	20	384		11					Auto-filled
	Yes	42 Windows (W)	0.8	50	0	-	20	20	800		50					Auto-filled
	Yes	43 Glazed Pedestrian Doors (GPD)	0.79	10.5	0	-	20	20	166		10.5					Auto-filled
	Yes	44 Opaque Pedestrian Doors (OPD)	2	12	0	-	20	20	480		12					Auto-filled
	Yes	45 Large Wall Opening (LWO)	2	45	0	-	20	20	1,800		45					Auto-filled
	Yes	46 High Usage Entrance Door (HUED)	2	20	0	-	20	20	800		20					Auto-filled
	Yes	47 Display Window (DW)	2	25	0	-	20	20	1,000		25					Auto-filled
	Yes	48 Glazed External Walls (GEW)	0.81	80	0	-	20	20	1,296		80					Auto-filled
	Yes	49 Opaque External Walls (OEW)	2	20	0	-	20	20	800		20					Auto-filled
	Yes	50 Glazed Roof (GR)	2	25	0		20	20	1,000		25					Auto-filled
	Yes	51 Rooflights (RL)	0.75	25	0	-	20	20	375		25					Auto-filled
	Yes	52 Roof Windows (RW)	0.81	10	0	-	20	20	162		10					Auto-filled
	Yes	53 Roof Air & Smoke Vents (RASV)	2	25	0	-	20	20	1,000		25					Auto-filled
				359						10,063	Window/Door/Rooflight	359	7%	71.3%	10.73	Review
										14,114		5396	100%	100.0%	1.00	Review
										4,051		5036	93%	28.7%	0.31	Review

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V2 U value > Watts > CO2 > costs In Use

- Choose fuel source to get costs in use
- Whole Building
- Elemental
- Secondary Elemental (windows/doors)
- Components
- Full element upgrade analysis

GBE

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GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V2 FuelCarbonFactor:

- Current data ^ RE %
  - Information resource
  - Used as a ‘look up table’
  - used by 'UToWattsToCO2’
  - Calculates: Carbon In Use
- Add Current Fuel costs
  - Choosing fuel also applies costs
  - Calculates: Energy in Use costs

V2 Fuel carbon factor 2020

- Data from Defra or other sources
  - GBC updated
- Can add national datasets to choose from
- V14 International Versions to develop
  - USA already asking
    - looking for development partner
  - Latest data:
    - EU wide 2020 CO2 in mains supply incl. electricity
    - EU partners interested

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Carbon in 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

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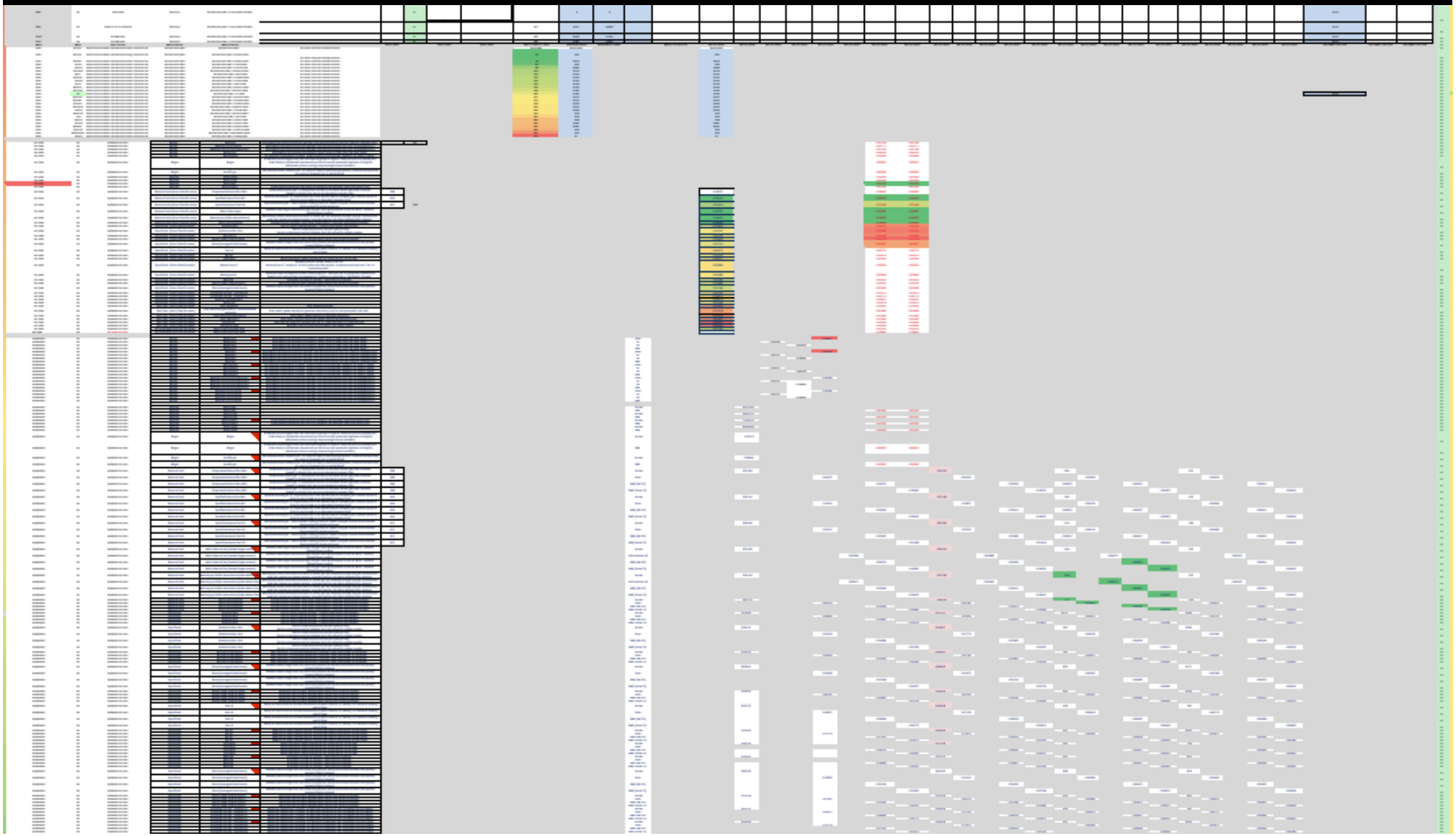
UK Fuel Carbon Factors 2020



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V1 Cost Per m2:

- Not part of the calculator
- This is a converter:
- If the information provided by Manufacturers/Suppliers is not in £/m2
- This calculator will help with converting the information provided to the required format
- Manually or Copy & Paste results into calculator

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V2 Cost per m2

	Yes	Auto-filled			Yes	Auto-filled			Yes	Auto-filled			Yes	Auto-filled			To be completed by GBC user
Cost per m2																	
					© GBE Green Building Calculator 2011-2021												
User name:	BrianSpecMan did this																
Loose insulation materials					**Sized insulation pieces**				**Compressed insulation materials**				**Windows/Doors/Rooflights**				
Cost per Container/Package	5	£			Cost per Container/Package	6	£		Cost per Container/Package	25	£		Cost per item	100	£		Yes
Package size: Length	900	mm	0.9	m	Pieces: Length	1200	mm	1.2	m	Package size: Length	900	mm	0.9	m	Item Size: Length	900	mm	0.9	m	Yes
Package size: Width	300	mm	0.3	m	Pieces: Width	560	mm	0.56	m	Package size: Width	300	mm	0.3	m	Item Size: Height	900	mm	0.9	m	Yes
Package size: Depth	300	mm	0.3	m	Pieces: Thickness	150	mm	0.15	m	Package size: Depth	300	mm	0.3	m	Item Size: Area			0.81	m2	Yes
Package size: Volume			0.08	m3	Pieces volume:			0.1008	m3	Package size: Volume			0.08	m3	Cost per m2			123.46	£/m2	Auto-filled
Applied thickness	300	mm	0.3	m	Number of pieces	5	No.	0.02016	m3	Packed volume			0.08	m3	Copy table above to below for different materials/products					Yes
			0.270	m2	Applied thickness/area	300	mm	0.3	m	Unpacked volume			No	m3	Cost per item	200	£			Yes
Cost per m2			1.35	£/m2				0.067	m2	Applied volume			No	m3	Item Size: Length	900	mm	0.9	m	Yes
Copy table above to below for different materials/products					Cost per m2			0.40	£/m2	Applied thickness	300	mm	0.3	m	Item Size: Height	900	mm	0.9	m	Yes
Cost per Container/Package	10	£			Copy table above to below for different materials/products								0.27	m3	Item Size: Area			0.81	m2	Yes
Package size: Length	900	mm	0.9	m	Cost per Container/Package	18	£			Cost per m2			6.75	£/m2	Cost per m2			246.91	£/m2	Yes
Package size: Width	300	mm	0.3	m	Pieces: Length	1200	mm	1.2	m	Copy table above to below for different materials/products										Yes
Package size: Depth	300	mm	0.3	m	Pieces: Width	560	mm	0.56	m	Cost per Container/Package	50	£			Cost per item	300	£			Yes
Package size: Volume			0.08	m3	Pieces: Thickness	150	mm	0.15	m	Package size: Length	900	mm	0.9	m	Item Size: Length	900	mm	0.9	m	Yes
Applied thickness	300	mm	0.3	m	Pieces volume:			0.1008	m3	Package size: Width	300	mm	0.3	m	Item Size: Height	900	mm	0.9	m	Yes
			0.270	m2	Number of pieces	5	No.	0.02016	m3	Package size: Depth	300	mm	0.3	m	Item Size: Area			0.81	m2	Yes
Cost per meter2			2.7	£/m2	Applied thickness/area	300	mm	0.3	m	Package size: Volume			0.08	m3	Cost per m2			370.37	£/m2	Yes
					Cost per m2			0.067	m2	Packed volume			0.08	m3						Auto-filled
Cost per Container/Package	20	£			Cost per m2			1.21	£/m2	Unpacked volume			No	m3	Cost per item	400	£			Yes
Package size: Length	900	mm	0.9	m						Applied volume			No	m3	Item Size: Length	900	mm	0.9	m	Yes
Package size: Width	300	mm	0.3	m	Cost per Container/Package	32	£			Applied thickness	250	mm	0.25	m	Item Size: Height	900	mm	0.9	m	Yes
Package size: Depth	300	mm	0.3	m	Pieces: Length	1200	mm	1.2	m				0.27	m3	Item Size: Area			0.81	m2	Yes
Package size: Volume			0.08	m3	Pieces: Width	560	mm	0.56	m	Cost per m2			13.5	£/m2	Cost per m2			493.83	£/m2	Yes
Applied thickness	300	mm	0.3	m	Pieces: Thickness	150	mm	0.15	m											Yes
			0.270	m2	Pieces volume:			0.1008	m3	Cost per Container/Package	100	£			Cost per item	500	£			Yes
Cost per meter2			8.1	£/m2	Number of pieces	5	No.	0.02016	m3	Package size: Length	900	mm	0.9	m	Item Size: Length	900	mm	0.9	m	Yes
					Applied thickness/area	300	mm	0.3	m	Package size: Width	300	mm	0.3	m	Item Size: Height	900	mm	0.9	m	Yes
Cost per Container/Package	50	£						0.067	m2	Package size: Depth	300	mm	0.3	m	Item Size: Area			0.81	m2	Yes
Package size: Length	900	mm	0.9	m	Cost per m2			2.15	£/m2	Package size: Volume			0.08	m3	Cost per m2			617.28	£/m2	Yes
Package size: Width	300	mm	0.3	m						Packed volume			0.08	m3						Yes
Package size: Depth	300	mm	0.3	m						Unpacked volume			No	m3	Cost per item	600	£			Yes
Package size: Volume			0.08	m3						Applied volume			No	m3	Item Size: Length	900	mm	0.9	m	Yes
Applied thickness	300	mm	0.3	m						Applied thickness	300	mm	0.3	m	Item Size: Height	900	mm	0.9	m	Yes
			0.270	m2									0.27	m3	Item Size: Area			0.81	m2	Auto-filled
Cost per meter2			8.1	£/m2						Cost per m2			27	£/m2	Cost per m2			740.74	£/m2	Auto-filled

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V2 Sections to Volumes

Profiles Dimensions Cross Section Areas Lengths Volumes

Pi = 3.142857143

					Yes		Auto-filled		Yes		Auto-filled		Yes		Auto-filled		Yes		Auto-filled		Yes		Result		Yes		Auto-filled		Result		Auto-filled	
		Section profile	Applications	Query	External radius	Units	External Radius	Units	Inxternal radius	Units	Inxternal radius	Units	Wall thickness	Units	Wall thickness	Units	Length wall thickness	Units	Length wall thickness	Units	Cross section Area	Units	Cross section Area	Units	Length	Units	Length	Units	Volume	Units	Volume	Units
•	CSS	Circle Solid Section	Frames, Piles, Reinforcement, ties	Dia. to CSA & Vol.	2	mm	0.002	m													12.571	mm2	0.0126	m2	1000	mm	1	m	12,571.43	mm3	0.013	m3
•	CSS	Circle Solid Section	Frames, Piles, Reinforcement, ties	CSA to Dia.	2	mm	0.002	m													12.5	mm2	0.013	m2	1000	mm	1	m	12,500.00	mm3	0.013	m3
		Section profile	Applications		External radius	Units	External Radius	Units	Inxternal radius	Units	Inxternal radius	Units	Wall thickness	Units	Wall thickness	Units					Cross section Area	Units	Cross section Area	Units	Length	Units	Length	Units	Volume	Units	Volume	Units
O	CHS	Circle Hollow Section	Frames, Pipes, Conduit	Dia. to CSA & Vol.	20	mm	0.020	m	10	mm	0.010	m	10	mm	0.010	m					125.714	mm2	0.126	m2	1000	mm	1	m	125,714.29	mm3	0.126	m3
O	CHS	Circle Hollow Section	Frames, Pipes, Conduit	Dia. to CSA & Vol.	20	mm	0.020	m	10	mm	0.010	m	10	mm	0.010	m					125.714	mm2	0.126	m2	1000	mm	1	m	125,714.29	mm3	0.126	m3
O	CHS	Circle Hollow Section	Frames, Pipes, Conduit	CSA to Dia.	20	mm	0.020	m	10	mm	0.010	m	10	mm	0.010	m					125.714	mm2	0.126	m2	1000	mm	1	m	125,714.29	mm3	0.126	m3
		Section profile	Section profile		Width	Units	Width	Units	Length	Units	Length	Units									Cross section Area	Units	Cross section Area	Units	Length	Units	Length	Units	Volume	Units	Volume	Units
■	SSS	Square Solid Section	Frames, Piles, Reinforcement	Dims. to CSA & Vol.	15	mm	0.015	m	15	mm	0.015	m									225.000	mm2	0.225	m2	1000	mm	1	m	225,000.00	mm3	0.225	m3
■	SSS	Square Solid Section	Frames, Piles, Reinforcement	CSA to Dims.	15	mm	0.015	m	15	mm	0.015	m									225.000	mm2	0.225	m2	1000	mm	1	m	225,000.00	mm3	0.225	m3
		Section profile	Section profile		Width	Units	Width	Units	Length	Units	Length	Units	Wall thickness	Units	Wall thickness	Units					Cross section Area	Units	Cross section Area	Units	Length	Units	Length	Units	Volume	Units	Volume	Units
□	SHS	Square Hollow Section	Frames, ducts,	Dims. to CSA & Vol.	15	mm	0.015	m	15	mm	0.015	m	3	mm	0.003	m					81.000	mm2	0.081	m2	1000	mm	1	m	81,000.00	mm3	0.081	m3
□	SHS	Square Hollow Section		CSA to Dims.	9	mm	0.009	m	9	mm	0.009	m	3	mm	0.003	m					81.000	mm2	0.081	m2	1000	mm	1	m	81,000.00	mm3	0.081	m3
		Section profile	Applications		Width	Units	Width	Units	Height	Units	Height	Units									Cross section Area	Units	Cross section Area	Units	Length	Units	Length	Units	Volume	Units	Volume	Units
■	RSS	Rectangular Solid Section	Frames, Bars,	Dims. to CSA & Vol.	16	mm	0.016	m	20	mm	0.020	m									320.000	mm2	0.320	m2	1000	mm	1	m	320,000.00	mm3	0.320	m3
■	RSS	Rectangular Solid Section		Dims. to CSA & Vol.	16	mm	0.016	m	20	mm	0.020	m									320.000	mm2	0.320	m2	1000	mm	1	m	320,000.00	mm3	0.320	m3
■	RSS	Rectangular Solid Section		Dims. to CSA & Vol.	16	mm	0.016	m	20	mm	0.020	m									320.000	mm2	0.320	m2	1000	mm	1	m	320,000.00	mm3	0.320	m3
		Section profile	Applications		Width	Units	Width	Units	Height	Units	Height	Units	Wall thickness	Units	Wall thickness	Units	Length wall thickness	Units	Length wall thickness	Units	Cross section Area	Units	Cross section Area	Units	Length	Units	Length	Units	Volume	Units	Volume	Units
□	RHS	Rectangular Hollow Section	Frames, ducts, conduits	Dims. to CSA & Vol.	20	mm	0.020	m	25	mm	0.025	m	10	mm	0.010	m	12	m	0.012	m	370.000	mm2	0.370	m2	1000	mm	1	m	370,000.00	mm3	0.370	m3
□	RHS	Rectangular Hollow Section		Dims. to CSA & Vol.	20	mm	0.020	m	18.5	mm	0.019	m	10	mm	0.010	m	12	m	0.012	m	370.000	mm2	0.370	m2	1000	mm	1	m	370,000.00	mm3	0.370	m3
□	RHS	Rectangular Hollow Section		CSA to Dims.	14.8	mm	0.015	m	25	mm	0.025	m	10	mm	0.010	m	12	m	0.012	m	370.000	mm2	0.370	m2	1000	mm	1	m	370,000.00	mm3	0.370	m3
					Web	Units	Width	Units	Flange	Units	Height	Units	Web wall thickness	Units	Web wall thickness	Units	Flange wall thickness	Units	Flange wall thickness	Units	125.7142857	Units	0.126	m2	1000	Units	1	m	125,714.29	Units	Volume	Units
L	REA or PFEA	Rolled or Paralell Flange Equal Angle	Framing, Edge restraints, supports	Dims. to CSA & Vol.	20	mm	0.020	m	20	mm	0.020	m	10	mm	0.010	m	10	m	0.010	m	300.000	mm2	0.300	m2	1000	mm	1	m	300,000.00	mm3	0.300	m3
L	REA or PFEA	Rolled or Paralell Flange Equal Angle		Dims. to CSA & Vol.	20	mm	0.020	m	18.5	mm	0.019	m	10	mm	0.010	m	10	m	0.010	m	370.000	mm2	0.370	m2	1000	mm	1	m	370,000.00	mm3	0.370	m3
L	REA or PFEA	Rolled or Paralell Flange Equal Angle		CSA to Dims.	15.0	mm	0.015	m	20	mm	0.020	m	10	mm	0.010	m	10	m	0.010	m	300.000	mm2	0.300	m2	1000	mm	1	m	300,000.00	mm3	0.300	m3
					Web	Units	Width	Units	Flange	Units	Height	Units	Web wall thickness	0	Web wall thickness	m	Flange wall thickness	0	Flange wall thickness	0	225	Units	0.225	m2	1000	mm	1	m	225,000.00	mm3	0.081	m3
L	RA or PFA	Rolled or Paralell Flange Unequal Angle	Framing, Edge restraints, supports	Dims. to CSA & Vol.	20	mm	0.020	m	26	mm	0.026	m	10	mm	0.010	m	10	m	0.010	m	360.000	mm2	0.360	m2	1000	mm	1	m	360,000.00	mm3	0.360	m3
L	RA or PFA	Rolled or Paralell Flange Unequal Angle		Dims. to CSA & Vol.	20	mm	0.020	m	18.5	mm	0.019	m	10	mm	0.010	m	10	m	0.010	m	370.000	mm2	0.370	m2	1000	mm	1	m	370,000.00	mm3	0.370	m3
L	RA or PFA	Rolled or Paralell Flange Unequal Angle		CSA to Dims.	14.2	mm	0.014	m	26	mm	0.026	m	10	mm	0.010	m	10	m	0.010	m	370.000	mm2	0.370	m2	1000	mm	1	m	370,000.00	mm3	0.370	m3
					Web	Units	Width	Units	Flange	Units	Height	Units	Web wall thickness	mm	Web wall thickness	0	Flange wall thickness	0	Flange wall thickness	0	81	Units	0.081	m2	1000	mm	1	m	81,000.00	mm3	0.32	m3
C	RC or PFC	Rolled or Paralell Flange Channel	Framing, stair strings, floor edges,	Dims. to CSA & Vol.	20	mm	0.020	m	100	mm	0.100	m	10	mm	0.010	m	10	m	0.010	m	1100.000	mm2	1.100	m2	1000	mm	1	m	1,100,000.00	mm3	1.100	m3
C	RC or PFC	Rolled or Paralell Flange Channel		Dims. to CSA & Vol.	20	mm	0.020	m	18.5	mm	0.019	m	10	mm	0.010	m	10	m	0.010	m	370.000	mm2	0.370	m2	1000	mm	1	m	370,000.00	mm3	0.370	m3
C	RC or PFC	Rolled or Paralell Flange Channel		CSA to Dims.	10	mm	0.010	m	100	mm	0.100	m	10	mm	0.010	m	10	m	0.010	m	1000.000	mm2	1.000	m2	1000	mm	1	m	1,000,000.00	mm3	1.000	m3
					Web	Units	Width	Units	Flange	Units	Height	Units	Web wall thickness	mm	Web wall thickness	0	Flange wall thickness	0	Flange wall thickness	0	81	Units	0.081	m2	1000	mm	1	m	81,000.00	mm3	0.32	m3
H	H or I	H or I or Composite section	Columns, Beams, Studs, Rafters, Joists	Dims. to CSA & Vol.	20	mm	0.020	m	28	mm	0.028	m	10	mm	0.010	m	10	m	0.010	m	380.000	mm2	0.380	m2	1000	mm	1	m	380,000.00	mm3	0.380	m3
H	H or I	H or I or Composite section		Dims. to CSA & Vol.	20	mm	0.020	m	18.5	mm	0.019	m	10	mm	0.010	m	10	m	0.010	m	370.000	mm2	0.370	m2	1000	mm	1	m	370,000.00	mm3	0.370	m3
H	H or I	H or I or Composite section		CSA to Dims.	13.2	mm	0.013	m	28	mm	0.028	m	10	mm	0.010	m	10	m	0.010	m	370.000	mm2	0.370	m2	1000	mm	1	m	370,000.00	mm3	0.370	m3
✚	+	Cruciform Section	Columns																													
⊙		concentric circles	Insulated cable, Insulated Pipe																													

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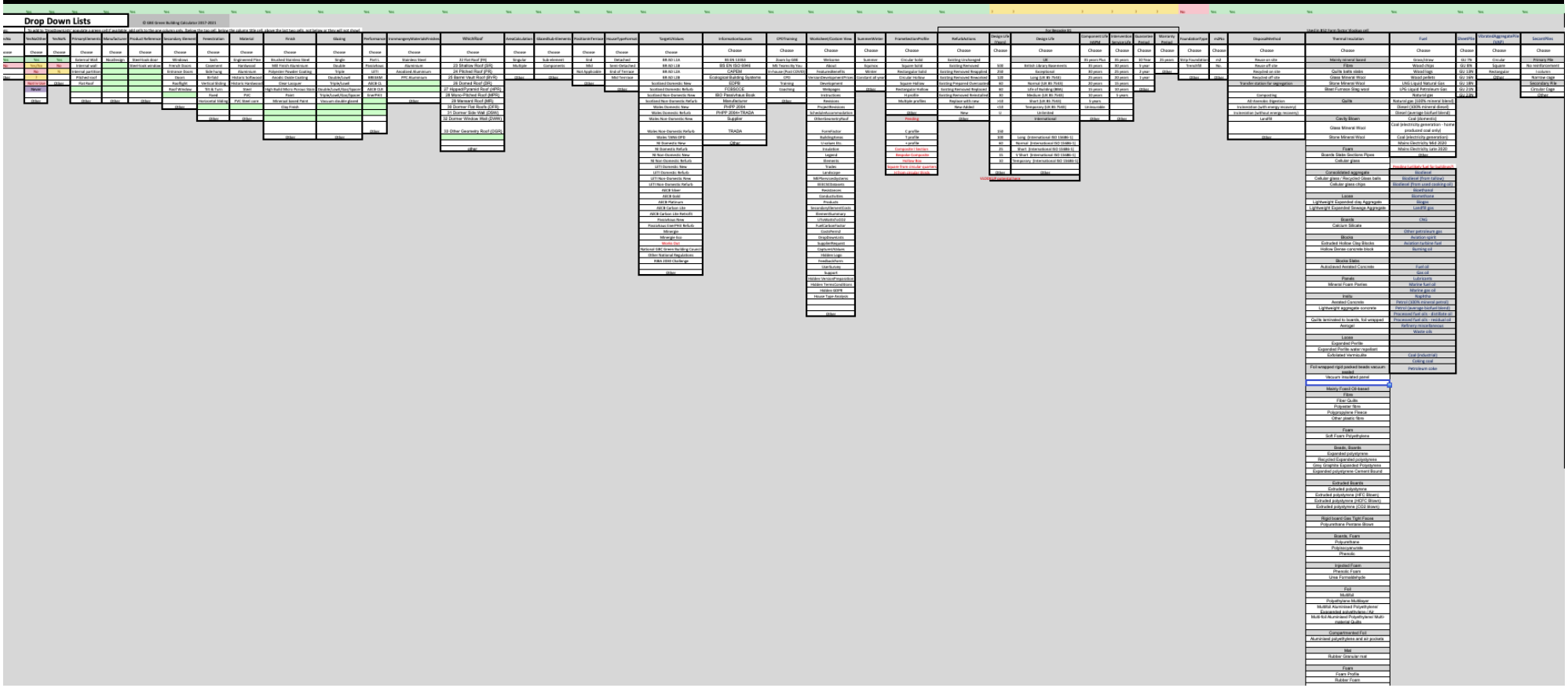
V1 Drop Down List:

- Not part of the calculator
- Used with look up tables to populate cells from readymade datasets
  - To avoid retyping
  - To avoid spelling error
  - To limit choices
- Lists can be added to by user, as long as the last two cells remain at bottom of sets

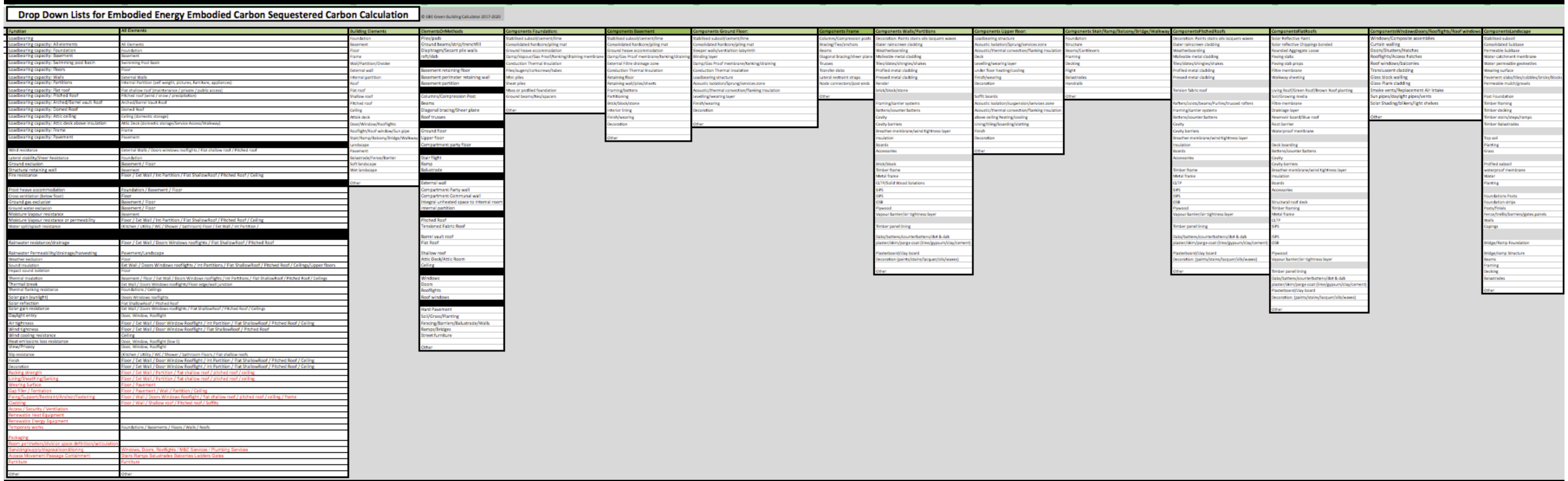
V2 V3 Drop Down Lists

- To ensure products are used in correct applications
  - Manufacturer's recommendation
  - Part of datasets
  - Used intelligently by spreadsheet
- These lists will expand exponentially

V2 Drop Down Lists: Core



V2 Drop Down Lists: EE EC SC



Drop Down Lists for Embodied Energy Embodied Carbon Sequestered Carbon Calculation

Drop Down List Manufacturer Supplier Request (MSR) and Elements: EE EC SC

Element	Component	PrimaryFunction	Format	MSR Materials	Secondary Elements Windows
U value Envelope Elements		Alphabetic order	Alphabetic order	Alphabetic order	Alphabetic order
Choose	Choose	Choose	Choose	Choose	Choose
Basement (B)	**Components Foundation:**	Access	Air space	Adhesive - Synthetic resin-based	Aluminium / timber frame double casement 1200 x 1200 2x glazed, air or argon filled
1 Basement Floor (BF)	Stabilised subsoil/cement/lime	Air tightness	Bale	Aerated block	Aluminium / timber frame double casement 1200 x 1200 2x glazed, krypton filled
2 Basement Perimeter Retaining Walls (BPRW)	Consolidated hardcore/piling mat	Anchor	Batt	Aerogel	Aluminium / timber frame double casement 1200 x 1200 2x glazed, xeon filled
3 Basement External Wall (BEW)	Ground heave accommodation	Cladding	Beads, Boards	Aggregate	Aluminium clad timber frame 1200 x 1200 2x glazed, air or argon filled
4 Basement Roof at Site Level (BRSL)	Damp/Vapour/Gas Proof/tanking/draining membrane	Conditioning	Block	Aggregate Quarried	Aluminium clad timber frame 1200 x 1200 2x glazed, krypton filled
5 Basement Roof at SubTerranean level (BRSTL)	Conduction Thermal Insulation	Containment	Block/Wall	Aggregate Recycled	Aluminium clad timber frame 1200 x 1200 2x glazed, xeon filed
6 Basement Overhead Glazed Pavement (BOGP)	Piles/augers/corkscrews/tubes	Cross ventilation	Blocks Slabs	Aggregate, gravel or crushed rock, 100 mm	Aluminium clad timber, 2x glazed, argon filled, window
7 Swimming Pool Basin (SPB)	Mini piles	Daylight entry	Blocks/Stones/Slabs/Tiles/	Air space (heat flow downwards) 10 mm	Aluminium frame 1200 x 1200 2x glazed, air or argon filled
Floors (F)	Sheet piles	Decoration	Blown Beads	Air space (heat flow downwards) 100 mm	Aluminium frame 1200 x 1200 2x glazed, krypton filled
8 Ground Floor Over Basement (GFOB)	Mass or profiled foundation	Disposal	Blown Fibre Filled Cavity	Air space (heat flow downwards) 15 mm	Aluminium frame 1200 x 1200 2x glazed, xeon filled
9 Ground Floor Ground Bearing (GFGB)	Ground beams/ties/spacers	Fastening	Board	Air space (heat flow downwards) 25 mm	PVC 2x glazed, argon filled, window
10 Ground Floor Over Ventilated Void (GFOV)		Finish	Board Foam	Air space (heat flow downwards) 300 mm	PVC frame 1200 x 1200 2x glazed, air or argon filled (Maximum)
11 Upper Floor (UF)	**Components Basement**	Fire resistance	Board Linings	Air space (heat flow downwards) 5 mm	PVC frame 1200 x 1200 2x glazed, air or argon filled (Minimum)
12 Services Riser Upper Floor (SRUF)	Stabilised subsoil/cement/lime	Fixing	Boards Insulation	Air space (heat flow downwards) 50 mm	PVC frame 1200 x 1200 2x glazed, krypton filled (maximum)
13 External Floor & Soffit (EFS) (over air)	Consolidated hardcore/piling mat	Fixing/Support/Restraint/Anchor/Fastening	Brick Wall	Air space (heat flow downwards) 7 mm	PVC frame 1200 x 1200 2x glazed, krypton filled (minimum)
14 Top Floor (TF)	Ground heave accommodation	Frost heave accommodation	Brick/Block	Air space (heat flow horizontal) 10 mm	PVC frame 1200 x 1200 2x glazed, xeon filled (maximum)
Compartmentation (C)	Damp/Gas Proof membrane/tanking/draining	Furniture	Cast insitu	Air space (heat flow horizontal) 100 mm	PVC frame 1200 x 1200 2x glazed, xeon filled (minimum)
15 Party Floor (PF)	External Filtre drainage zone	Gap Filler	Coating	Air space (heat flow horizontal) 15 mm	Timber frame 1200 x 1200 2x glazed, air or argon filled (maximum)
16 Party Wall (PW)	Conduction Thermal Insulation	Gap filler / Formation	Compartmented Foil	Air space (heat flow horizontal) 25 mm	Timber frame 1200 x 1200 2x glazed, air or argon filled (minimum)
17 Communal Compartment Floors (CCF)	Retaining floor	Gap Formation	Consolidated aggregate	Air space (heat flow horizontal) 300 mm	Timber frame 1200 x 1200 2x glazed, krypton filled (maximum)
18 Communal Compartment Wall (CCW)	Retaining wall/piles/sheets	Ground exclusion	Consolidated layer	Air space (heat flow horizontal) 5 mm	Timber frame 1200 x 1200 2x glazed, krypton filled (minimum)
19 Riser Compartment Upper Floor (RCUF)	Framing/battens	Ground gas exclusion	Cords	Air space (heat flow horizontal) 50 mm	Timber frame 1200 x 1200 2x glazed, xeon filled (maximum)
Walls (W)	Partitioning	Ground water exclusion	Expanded spheres		Timber frame 1200 x 1200 2x glazed, xeon filled (minimum)
20 External Walls (EW)	Brick/block/stone	Heat emissions loss resistance	External render	Air space (heat flow horizontal) 7 mm	Timber frame 2x glazed, argon filled, window
21 Integral Unheated Space Wall (IUSW)	Interior lining	Impact sound isolation	Extruded Cellular Block	Air space (heat flow upwards) 10 mm	Timber frame 2x glazed, argon filled, window
Roofs (R)	Finish/wearing	Lateral stability	Fibre Quilts	Air space (heat flow upwards) 100 mm	
22 Flat Roof (FR)	Decoration	Lateral stability/Sheer Resistance	Flake	Air space (heat flow upwards) 15 mm	Other
23 Shallow Roof (SR)		Lining	Flat filled metal panel	Air space (heat flow upwards) 25 mm	
24 Pitched Roof (PR)	**Components Ground Floor:**	Lining/Sheathing/Sarking	Flexible Matts	Air space (heat flow upwards) 300 mm	
25 Barrel Vault Roof (BVR)	Stabilised subsoil/cement/lime	Loadbearing capacity: All elements	Flexible membrane	Air space (heat flow upwards) 5 mm	
26 Domed Roof (DR)	Consolidated hardcore/piling mat	Loadbearing capacity: Arched/Barrel vault Roof	Flexible Sheet	Air space (heat flow upwards) 50 mm	
27 Hipped/Pyramid Roof (HPR)	Sleeper walls/ventialtion labyrinth	Loadbearing capacity: Attic ceiling	Flooring	Air space (heat flow upwards) 7 mm	
28 Mono-Pitched Roof (MPR)	Blinding layer	Loadbearing capacity: Attic deck above insulation	Foam Profile	Aluminised polyethylene and air pockets	
29 Mansard Roof (MR)	Damp/Gas Proof membrane/tanking/draining	Loadbearing capacity: Basement	Foil wrapped rigid board	Aluminium (33% recycled)	
30 Dormer Flat Roofs (DFR)	Conduction Thermal insulation	Loadbearing capacity: Domed Roof	Foil wrapped rigid packed beads vacuum sealed	Aluminium (recycled)	
31 Dormer Side Wall (DSW)	Loadbearing structure	Loadbearing capacity: Flat roof	Gluiam	Aluminium (virgin)	
32 Dormer Window Wall (DWW)	Acoustic Isolation/Sprung/services zone	Loadbearing capacity: Floors	Granules	Aluminium / timber frame double casement 1200 x 1200 2x glazed, air or argon filled	
33 Other Geometry Roof (OGR)	Acoustic/thermal convection/flanking Insulation	Loadbearing capacity: Foundation	Hollow Block	Aluminium / timber frame double casement 1200 x 1200 2x glazed, krypton filed	
Internal Ceilings (IC)	Levelling/wearing layer	Loadbearing capacity: Frame	Hollow section	Aluminium / timber frame double casement 1200 x 1200 2x glazed, xeon filed	
34 Flat Ceiling (FC)	Finish/wearing	Loadbearing capacity: Partitions	Hollow section	Aluminium clad timber frame 1200 x 1200 2x glazed, air or argon filled	
35 Pitched Vault Ceiling (PVC)	Decoration	Loadbearing capacity: Pavement	Injected Foam	Aluminium clad timber frame 1200 x 1200 2x glazed, krypton filed	
36 Barrel Vault Ceiling (BVC)		Loadbearing capacity: Pitched Roof	Insitu	Aluminium clad timber frame 1200 x 1200 2x glazed, xeon filed	
37 Domed Vault Ceiling (DVC)	**Components Frame**	Loadbearing capacity: Swimming pool basin	Insitu cast	Aluminium clad timber, 2x glazed, argon filled, window	
38 Hipped/Pyramid Vault Ceiling (HPVC)	Columns/Compression posts	Loadbearing capacity: Walls	Insitu-Soil & Straw Reinforced	Aluminium Cladding	
39 Mono-Pitch Vault Ceiling (MPVC)	Bracing/Ties/anchors	Moisture Vapour permeability	Internal plaster	Aluminium foil	
40 Mansard Vault Ceiling (MVC)	Beams	Moisture Vapour resistance	Internal render	Aluminium foil vapour check	
41 Other Geometry Ceiling (OGC)	Diagonal bracing/sheer plane	Movement	Joints	Aluminium frame 1200 x 1200 2x glazed, air or argon filled	
Glazing Windows Rooflights/vents and Doors (G)	Trusses	Packaging	Layer	Aluminium frame 1200 x 1200 2x glazed, krypton filled	
42 Windows (W)	Transfer slabs	Passage	Levelling Screed	Aluminium frame 1200 x 1200 2x glazed, xeon filled	
43 Glazed Pedestrian Doors (GPD)	Lateral restraint straps	Privicy	Lining	Aluminium general	
44 Opaque Pedestrian Doors (OPD)	Node connectors/post ends	Racking strength	Loose	Aluminium vapour control layer	
45 Large Wall Opening (LWO)		Rainwater drainage	Loose Aggregate	Aluminium, 1 mm	
46 High Usage Entrance Door (HUED)	**Components Walls/Partitions**	Rainwater harvesting	Loose Granuals	Asbestos fibre (yes its used in eastern Europe)	
47 Display Window (DW)	Decoration: Paints stains oils lacquers waxes	Rainwater permeability	Loose gravel	Asphalt	
48 Glazed External Walls (GEW)	Outer rainscreen cladding	Rainwater Permeability/drainage/harvesting	Masonry wall/leaf	Asphalt paving	
49 Opaque External Walls (OEW)	Weatherboarding	Rainwater resistance	Mat	Asphalt, 8% binder, 10 mm	
50 Glazed Roof (GR)	Malleable metal cladding	Rainwater resistance/drainage	Multi-layer membrane	Autoclaved Aerated Concrete	
51 Rooflights (RL)	Tiles/slates/shingles/shakes	Renewable Energy Equipment	Multifoil	Autoclaved Aerated Concrete	
52 Roof Windows (RW)	Profiled metal cladding	Renewable Heat Equipment	Pane	Autoclaved Aerated Concrete block	
53 Roof Air & Smoke Vents (RASV)	Pressed metal cladding	Restraint	Panel	Autoclaved Aerated Concrete Slab	
Basement External Entrance Well (BEEW)	Framing/carrier systems	Security	Patrass	Bamboo	
54 Basement External Entrance Well Retaining Pavement (BEEWRP)	Battens/counter battens	Servicing	Pipes	Bio based plastic foam	
55 Basement External Entrance Well Retaining Wall (BEEWRW)	Cavity	Servicing	Plaster coat	Bird Feather	
56 Basement External Entrance Well Staircase (BEEWS)	Cavity barriers	Shealhing	Plaster Render	Bitumen	
57 Basement External Entrance Well Party wall (BEEWPW)	Breather membrane/wind tightness layer	Sheer Resistance	Quilt	Bitumen Aluminium layer	

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https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

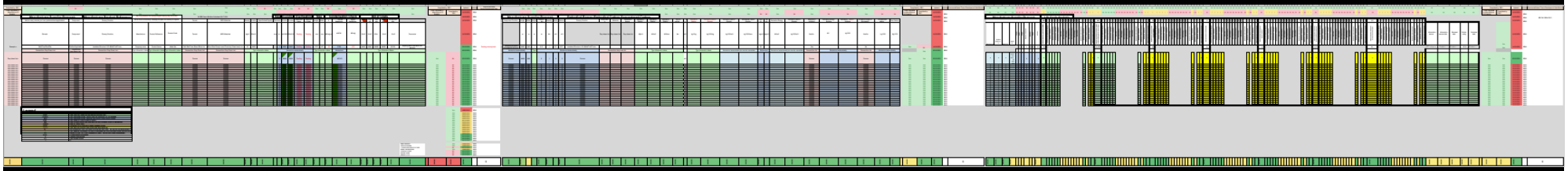
V1 Supplier Request Form:

- Will be available to download
- Used to request information on products from manufacturers or suppliers
- Collect intelligence about applications
- Collect product property datasets

V2 Manufacturer Supplier Intelligent Products Data Collection

- Some refinements to capture all necessary for:
- Drop Down Lists to control inputs from look up tables
  - Competent Application (e.g. certified)
  - Manufacturer's intention only (not architects inventions?)
- EE, EC, SC datasets if they have them
  - And more from LCA & EPD
- Screening Client/Designer Priorities
- Costs:
  - Manufacture: at factory gate
  - Supplier: to site
  - Approved Installers: installed rate
  - Not best price with discounts
  - But realistic price to avoid substitutions later

V2 Manufacturer Supplier Intelligent Product Data Collection



	Manufacturer Supplier Request:		Manufacturer Product Reference	NB This Schedule can be downloaded directly from the Green Building Calculator website Https://GreenBuildingCalculator.uk			© GBE Green Building Calculator 2017-2021				Size		Insulation		Overheating		Size			Condensation Check		Bill of Costs					
	Add as many rows as you have products/sizes/applications	Component	Primary Function	NB as more functionality is added this table will develop to capture more information			Format	MSR Materials	Density	k value	SpecificHeatCapatity	Thickness		R value	U value	Decrement Value	Decrement Delay	Length	Width	lv	Thermal Resistance R layer	Vapour Resistance Rv layer	Labour rate	Product rate	Item rate	Material rate	Accessories rate	
	Element	Component	Primary Function	Manufacturer	Product Reference	Product Code	Format	MSR Materials	kg/m³	W/m.K		mm	m	m2.K/W	W/m2.K	Pending	Pending	mm	mm	MN s/g.m	m2K/W	MN s/g	£/m2	£/m2	£/No.	£/m2	£/m2	Comments
Example >	Wall/Floor/Roof/Etc.	Position/Application	Insulation/Structure/ VCL/BM/ATL/WTL/etc.	Company name	Product Name	Model No.	Quilt Batt Foam Board Block etc.	Wood fibre Sheep's wool Fired clay Straw board, etc.	20	0.160		150	0.15	0.938	1.067	Pending	Pending	1000	450	25	0.938	3.75	£25.00	£30.00	£25.00	£56.00	£20.00	anything else to be taken into account
	Choose from Drop Down List	Choose from Drop Down List	Choose from Drop Down List	Type information below	Type information below	Type information below	Choose from Drop Down List	Choose from Drop Down List	Type information below			Worked out automatically						Type information below			Worked out		Type information Below					
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V2 Manufacturer Supplier EE EC SC & LCA datasets

Manufacturer Supplier Request: | Embodied Energy Embodied Carbon Sequestered Carbon

Component Function	Length	Width	Height	Component Thickness	Quantity	Areas	Volume	Primary Function	Components	Materials	Information Source	Embodied Energy	Embodied Energy	Embodied Energy	Area or section	m2	Embodied Carbon	Embodied Carbon Dioxide	Embodied Carbon Dioxide	Embodoed Carbon Dioxide	Density	Weight	Embodied Energy	Embodied Carbon Dioxide	Required in building?	Embodied Energy Building	Embodied Carbon Building	Is material timber or Bio-based?	Sequestered carbon	Total Carbon
	m	m	m	m	No.	m2	m3		Drop down list	Drop down list	Drop down list	Mj/m3	MJ/m2	MJ/Item	No.	m2	kg C/kg	kg CO2/kg	kg CO2/m2	kg CO2/Item	kg/m3	kg/m2	MJ/m3	kg CO2/m3	Yes/No	MJ	kg CO2	Yes/No	kg CO2	Kg CO2
Insulation/Structure/ VCL/BM/ATL/WTL/etc.	1.000	0.450	1	0.15	1	0.45	0.0675	Insulation/Structure/ VCL/BM/ATL/WTL/etc.								m2					20				Yes			No		
Worked out automatically			Type	Worked out automatically					Choose from drop dowl list			Type information below					Type information below		Worked out automatically but can be overwritten		Worked out		Worked out automatically but can be overwritten		Choose from list	Worked out automatically		Choose from list	Worked out automatically	
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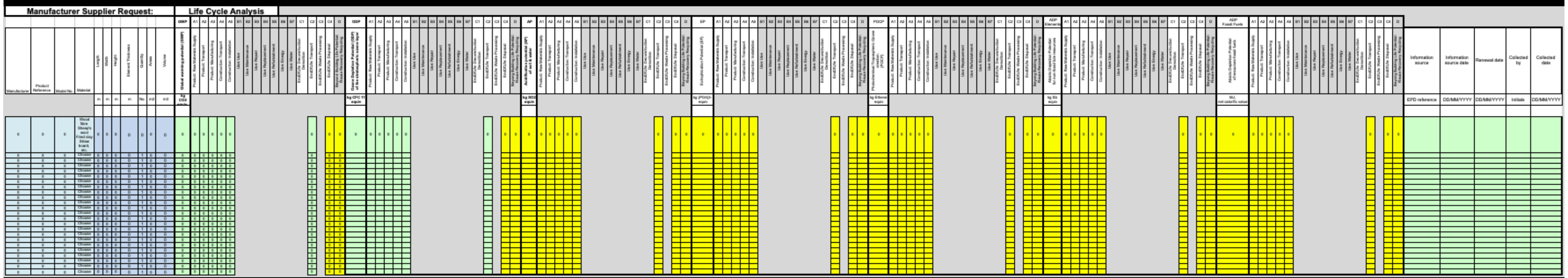

V2 Letter to Manufactures & Suppliers: Product Data Request

Manufacturer Supplier Letter

Dear Suppliers, Manufacturers and DataSet Providers

I hope you will have already attended a Zoom meeting to address this GBC Product Data Collection task.
If not GBC have recorded the meeting and posted it here: Https://GreenBuildingCalculator.uk/ _____

GBC are aware that there are many U value calculators out there but most are by individual manufacturers and inevitably they are designed to sell more of their own stuff.
In the absence of comprehensive data for a diverse range of products out there these calculators help to maintain business as usual

GBC originally created a calculator for RIBA Part 2 Architectural students who would be out there choosing and specifying materials in a year or two.
It turned out that all the part-time students took it to their office and used it on real live projects.
During Covid Lockdown BrianSpecMan developed a multi-functional version of the calculator to engage robustly with Climate Emergency and provide a tool for all building designers to join in.
There is a lot to be said for putting product information in front of students, Metza have put loads of samples into Uni workshops to great effect.
So GBC want this calculator to be as comprehensive as possible populated with real building products and materials with a full set of product data.
GBC is now updated and expanded for professional use and is available online: Version 1.0.0. already addresses:

- New Build
- Whole building areas and volumes
- Elemental areas and component volumes
- Form Factors (to help guide the U value targets)
- Regulations and Design Standards to choose Targets R and U values
- Elemental Assemblies (to address thermal bridges and work out R or U values and engage the many other parts of the calculator)
- Components parts: (with function, material choice and thicknesses)
- Materials datasets with an emphasis on Bio-based construction (part of the Climate Emergeny solution)
- Room by Room Heating demands (for radiator and UFH manifold sizing)
- Energy Source Sizing (or isulating to match energy source)
- Whole building energy demands
- Elemental breakdowns
- Element area % v element heat loss % (allows real value engineering VE dicsussions with the client)
- Fuel choice carbon factors
- Carbon In use (part of the Climate Emergeny discussion)
- Compare cost and performance of insulation and windows (real VE)
- And other features

It is being updated now to Version 2 addressing:

- Updates to many of Version 1 worksheets
- Retrofit Specifics developed (for one off or community scale projects, historic fabric features added)
- Bill of materials, Accessories, Quantities, Labour, Costs (For Cost planning, price gathering and tendering)
- Embodied energy and carbon (Engaging with Climate Emergency)
- Sequestered carbon (Emphasising Bio-based construction advantages)
- Life Cycle Assessment (LCA) (Engaging with Climate Emergency)
- Fuel choice costs
- Cost in use (adding to the VE discussions)

It is being updated Version 3 to 20 over the next 2 years with more datasets and more functionality addressing:

- Competent Construction (Post-Grenfell avoiding permitting products being used incorrectly)
- Condensation Check (Avoiding incompetent)
- Decrement delay calculation (Avoiding overheating)
- Readymade Elemental Assemblies, Manufacturer's Competent solutions and Bespoke Elemental Assemblies (892 readymade, manufacturers and users contrubuting their own)
- Waste Cost and Embodied Carbon calculator (to encourage waste segregation and cost savings)
- Plastics content and plastics avoidance (removing fire hazards and reducing opportunities for microplastics at large)
- Recycled Content Products
- Circular economy, (Reclaim and Reuse, Recovery, Recycling)
- Multi-purpose Multi-functionality and Value Engineering
- Green Building Price Book (20 years after it was suggested)
- BIM App (to speed up the population of the excel cells and creating BIM Models from calculator)
- And much more

GBC will continue to develop the calculator after this current update if you are unable to respond to this request immediately, your information will always be welcome for later additions
GBC has put GBC Green Building Calculator V1 into the public domain for general consumption. V2 is to follow shortly.
Posts about GBC Calculator can be found on GBE website at https://GreenBuildingEncyclopaedia.uk/?p=38491
it can also be found at https://GreenBuildingCalculator.uk
GBC has attached an excel spreadsheet for you to populate with your information
If your products do not fit into this spreadsheet, sorry to have bothered you this time.
If your products do fit please complete this as soon as possible, this week would be nice, within 3 weeks to make the next Version release, later still will still be useful.
If you cannot help immediately but will later, do let GBC know.
If your product needs more columns please add them to the right of the existing or add notes in the comment column.

Your help in this matter will be much appreciated and acknowledged and we hope it will generate more real enquiries for your products
Good luck with filling in the table
We have added a legend towards the bottom of worksheets to explain the meaning of the cell colours
GBC has also drop down lists to prompt you with the potential information to add and to maintain a degree of consistency, avoid typos and engage other calculator functions
Thank you for your time and patience.
If you need help do not hesitate to call me

Regards
Brian Murphy ONC HNC Construction, BSc Dip Architecture (Hons+Dist) aka BrianSpecMan
National Green Specification
Green Building Encyclopaedia
https://GreenBuildingEncyclopaedia.uk
Green Building Learning
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07973 281024 0044 7973 281024
01733 238148 0044 1733 238148

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V1 User Feedback Form:

- Users can let us know of any problems and potential improvements
- Version Upgrades as rewards

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V2 User Feedback form

User Feedback Form

User name:	BrianSpecMan did this	Format
Green Builiding Calculator		
Date:	25/02/21	DD/MM/YY
GBC Version:	Launch Version 2	Autofilled
Worksheet:	Choose	DropDownLIst
Column:		Letter/Letters
Column Range:		Letter(s):Letter(s)
Row:		Number
Row Range:		Number:Number
Cell:		Letter:Number
Cells:		LetterNumber:LetterNumber
Fault:		Text
Circular fault:		Text
Cell needs unlocking:		Text
Suggestion:		Text
Request:		Text
Potential Improvement:		Text
Potential Development:		Text
Suggested Data Sources:		Text
Volunteering Datasets:		Text
Requesting Datasets:		Text
Contact Name:		Text
Contact Phone:		Numbers
Contact Email:		Email
Satified Customer Quotes:		Text
Permission to Quote you?:	Choose	Yes/No
Any Other Comments:		Text
If required will you email a faulty file to GBE to interrogare?	Choose	Yes/No
Would you like an introduction CPD?	Choose	Yes/No
Would you like training?	Choose	Yes/No
Would you like coaching?	Choose	Yes/No
How Zoom/MSTeams/In-house?	Choose	DropDownLIst

NB: Please complete the User Survey on Version Development Order

GBE

https://GreenBuildingEncyclopaedia.uk

GBC

Green Building Calculator

https://GreenBuildingCalculator.uk

V1 User Survey:

- Invites Users to review and priorities development sequence and suggest desirable functionality

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https://GreenBuildingEncyclopaedia.uk

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Green Building Calculator

https://GreenBuildingCalculator.uk

V1 User Survey

User Survey

Please email the survey as a PDF or excel to BrianSpecMan@icloud.com

GBE thinks it knows what is needed and the right order for its development
Some tasks are dependent on others being in place first to build upon
GBE would like to know from users if they would like to see some parts developed sooner
GBE would like to know from users if they would like to see other parts added to the tasks
Please rearrange the numbers in columns E & F into your preferred order and add any comments or requests in column G
Please complete 'Your Requests' below

			Please arrange the numbers in your preferred order		
			Preferred Version Order	Preferred sub-item order	Comment
About	A description of what GBE Green Building Calculator is, how it started and how it has developed	Launch Version 1.1	1	1	
Features Benefits	What is does and how that helps users	Launch Version 1.2		2	
Development	Aid memoir for development	Launch Version 1.3		3	
Phased Development Prices	This page: What is included in the launch version of GBE Green Building Calculator and GBE's suggested development order: Subject to user survey	Launch Version 1.4		4	
Instructions	Read these if GBE Green Building Calculator is not intuitive (it probably won't be if you have not done a U value calculation before)	Launch Version 1.5		5	
Revisions	A record of updates to GBE Green Building Calculator to enable an audit trail through the development process	Launch Version 1.6		6	
Project Revisions	Not part of GBE Green Building Calculator For users record keeping on design projects	Launch Version 1.7		7	
Whole Building	Whole Building: The start of GBE Green Building Calculator Input page: Sizes, Areas and Volumes, hours of operation, design temperatures, inside and out	Launch Version 1.8		8	
Schedule of Accommodation	Schedule of Accommodation Room by Rooms Input page: more specific than whole building if required; Areas and volumes, hours of operation, design temperatures, inside and out	Launch Version 1.9		9	
Room By Room Heat Losses	Input and Put-put page: Room by room heat loss calculator to determine Boiler size, radiator or under floor heating requirements, Developed to help designer to make the insulation thicknesses or window specifications to match a boiler capacity when it's a tight fit	Launch Version 1.10		10	
Form Factor	Results page: Analysis of Form Factor and optimal U values to respond to them To help designers see the importance of compactness, or the consequence of fragmentation of the building volume, on the energy consumption See Update 2.3	Launch Version 1.11		11	
Building Elements	Input page: simple yes/no Building Elements and secondary-elements are selected from readymade lists of 29 Elements and 12 Secondary Elements to match the scope of the project	Launch Version 1.12		12	
Building Element Areas	Input and output page: Building Elements and secondary-elements: their dimensions are added by user and their areas are automatically calculated.	Launch Version 1.13		13	
Multiple Size Building Element Areas	Input and output page: Since windows and doors come in a multitude of sized then a GBE Green Building Calculator schedules allows you to incorporate them all	Launch Version 1.14		14	
U values Etc. Energy Targets	Results page: Allows the users to compare and choose between Building Regulations Part L, other national regulations or standards, LETI, AECB CarbonLite, Passivhaus, EnerPHit, EAMs, etc. including: U values, Airtightness, Form factors, Elevational window %.	Launch Version 1.15		15	
Insulation Thicknesses	Input and output table: Information Resource: Quick look up table Users apply the chosen U value targets from the previous worksheet GBE Green Building Calculator automatically displays the thickness of different k valued insulation materials needed to meet U values targeted in each element.	Launch Version 1.16		16	
Decrement Delay Insulation Thickness	Input and output page: (incomplete at launch) Automatically see what thickness of different k valued insulation materials is needed to avoid overheating on summer See Update 2.1	Launch Version 1.17 Version 3.1		3.1	
Legend	Information Resource: A list of terms used in GBE Green Building Calculator with some explanation of their meaning in a tabulated format Potential link to GBE Jargon Buster pages	Launch Version 1.18		18	
Elements	Input and output page: Yes/No then choose from drop down menu, followed by automatic cell population Allows the user to populate and assemble elements by choosing their combination of functional components and then choosing the materials for each component. Components are in the right sequence but it may needs some know-how to choose the right one (Update 3 will help with readymade assemblies) Costs of insulation and windows are added here to help persuade architects and clients to spend money on insulation and higher performance windows and glazing.	Launch Version 1.19		19	
Bill of Materials Quantities Costs	Input and output page: Allows user to cost plan their Building with a Bill of materials, quantities, labour and costs based on building fabric only so far. It will be reliant upon users interrogating recent tender rates or building price books Services are planned to be addressed in update 1.4-1.7 (unless users say otherwise) Non-external envelope components are planned to be developed in Phase 5.4 (unless users want it sooner) See Update 1.2 & 1.3	Launch Version 1.20		20	

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V1 Capture National U values

	Regulations/Standards	Other National Standards			
	Winter heat loss				
	© GBE Green Building Calculator 2017-2020	Domestic		Non-domestic	
	User Name:	Other National Regulation or GBC standards			
Chosen column:		New Build	Refurbishment	New Build	Refurbishment
	Target U values	W/m2.K	W/m2.K	W/m2.K	W/m2.K
	Yes/No	Yes	Yes	Yes	Yes
Floor					
	Basement Floor				
	Swimming Pool Basin				
	Upper floors (including ground floor over basement)				
	Ground floor over ground				
	Ground floor over ventilated void				
	Floor with underfloor heating				
	External floor over air				
	Compartment Floor				
	Party Floor				
Wall					
	Basement Perimeter Wall				
	Basement internal Wall/Partitions				
	External wall				
	External wall Insulated Cavity				
	External wall Solid wall insulated (Int or Ext)or Ext)				
	External wall Solid wall insulated (Internal)				
	Internal partition/wall				
	Compartment Wall				
	Party Wall				
	Solid Wall				
	Unfilled cavity unsealed edges				
	Unfilled cavity sealed edges thermal breaks				
	Filled cavity sealed edges thermal breaks				
Roof	Roofs (includes opaque parts of dormers)				
	Flat roof				
	Shallow roof				
	Pitched roof (insulation at rafter)				
	Loft ceiling (insulation at ceiling)				
	Barrel Vault roof				
	Domed Roof				
	Eaves overhang				
	Verge overhang				
	Basement roof at site level				
	Basement roof at subterranean level				
Glazing	Glazing (Maximum % of total area)				
	Windows (whole window value)				
	Glazed Pedestrian Doors				
	Vehicle access and similar large doors				
	High usage entrance doors				
	Opaque Door				
	Rooflights				
	Roof windows				
	Roof ventilation including smoke vents				
	Glazed roof				
	Glazed wall/Curtain walling				
	Display windows				
	Opaque Curtain wall				
	Glazed pavement				

V2 Support: Users, Manufacturers, Consultancy

User Support Services	Time	Cost	Notes
Email helpline:			
Email helpline: info@greenbuildingcalculator.uk Manned by the author of GBE Green Building Calculator Email questions and responses will be added to new page or FAQ		Free	Free GBC Version or upgrade for: faults identified (if not part of the proposed developments) development ideas not previously considered by GBC
Telephone Helpline:			
To be announced, if found necessary (use email above until then)		Free	Free GBC Version upgrade for: faults identified (if not part of the proposed developments) development ideas not previously considered by GBC
Zoom Webinar Learning			
Live Zoom: GBC Excel introduction including 1 to many demonstration (Cost of office CPD)	1 hour	£188.88	
Live Zoom: GBC Excel introduction including 1 to many training (Cost of office training session)	3 hours	£488.88	
Live Zoom: GBC Excel introduction including 1 to 1 coaching (Cost per delegate)	3 hours	£388.88	
Live Zoom: Powerpoint CPD: GBE Green Building Calculator + GBC Future Development. (Per delegate)	1 hour	£4.88	
Vimeo/YouTube: (none yet)			
Recorded Zoom: on Vimeo/YouTube after live GBE Excel introduction including demonstration	1 hour	£0.88	
Recorded Zoom: Powerpoint CPD: GBE Green Building Calculator + GBC Future Development.	1 hour	£0.88	
GBE Learning Website:			
Live Zoom: GBC Excel introduction including 1 to many demonstration (cost per delegate)	1 hour	£4.88	
In house CPD: Green Building Learning (select from 1000 topics) (Per office CPD)	1 hour	£288.88	
Zoom Meetings:			
User Steering Group	2 hours		Free GBC Version or upgrades for attendance and contributions
Manufacturer and Supplier meeting: To explain the Products dataset collection sheet and the importance of collecting 'Competent Application Only' dataset and how it will be implemented in GBC	1 hour	Free	
Post COVID-19 In-house Learning			
GBC Excel introduction including 1 to many demonstration (Cost of in-office CPD)	1 hour	£388.88	includes UK travel expenses
GBC Excel introduction including 1 to maximum 10 training (Cost of in-office training session)	3 hours	£588.88	includes UK travel expenses
GBC Excel introduction including 1 to 1 coaching (cost per delegate)	3 hours	£388.88	includes UK travel expenses
Powerpoint CPD: GBE Green Building Calculator + GBC Future Development. (Cost of in-office CPD)	1 hour	£4.88	includes UK travel expenses
Building Project Analysis by GBC user, Audit by GBC author face to face		£488.88	includes UK travel expenses
Manufacturer and Supplier Services			
Zoom Meetings:			
Manufacturer and Supplier Steering Group	2 hours		
Manufacturer and Supplier meeting: To explain the Products dataset collection sheet and the importance of collecting 'Competent Application Only' dataset and how it will be implemented in GBC	1 hour	Free	Latest updated Worksheet: Products Accessory & Systems
Manufacturers & Suppliers Product Datasets added to GBC			
Manufacturer or Supplier adds product/accessory/system datasets to GBE latest version of Worksheet		Free	GBE to check currency of worksheet at time
Simple datasets (GBC users choose applications which may be at odds to manufacturer's intention)		Free	Manufacturer or supplier's own time to complete datasets
Competent application only dataset (Products cannot be chosen in wrong applications)		Free	Manufacturer or supplier's own time to complete datasets
Competent application only datasets with specification clause		Free	Manufacturer or supplier's own time to complete datasets
GBC to review datasets and request clarification or correction clauses		POA	Price on Application dependent upon quantity
GBC write specification for manufacturer or supplier			
'Simple specification clauses'		POA	Price on Application dependent upon quantity
'Robust specification clauses'		POA	Price on Application dependent upon quantity
GBC incoporate datasets into GBC Product Worksheet (added to next available Version issue)			
Simple datasets (GBC users choose applications which may be at odds to manufacturer's intention)		POA	Price on Application dependent upon quantity
Competent application only dataset (Products cannot be chosen in wrong applications)		POA	Price on Application dependent upon quantity
Competent application only datasets with specification clause		POA	Price on Application dependent upon quantity
Non-User Support Services			
Manufacturers/Constructors/Developers			
Consultancy Services: examples			
Building Project Analysis using GBC Green Building Calculator by its author		£988.88	
House Type Analysis using GBC Green Building Calculator by its author		£989.88	See House Type Analysis (Information Schedule)
Project Scenario Analysis: E.g. House Types, Plot widths, Passivhaus v Part L, Insulation thicknesses		£988.88	
Building Project Analysis by GBC user, Audit by GBC author		£188.88	
Building Project Analysis by GBC user, Audit by GBC author item by item report		£388.88	

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GBC V1 Excel file on GBE:

- Green Building Calculator
  - GBE (Shop)
  - https://GreenBuildingEncyclopaedia.uk/
  - Big practice version /?p=38525 £98.88
  - Small practice version /?p=38524 £48.88
  - Student version /?p=38520 £4.88

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GBC V1 Excel file on GBC:

- Green Building Calculator (Shop)
  - Big practice version £98.88
  - Small practice version £48.88
  - Student version £4.88
  - Self Build version £48.88
  - Welsh TAN 6 Self Build version £4.88

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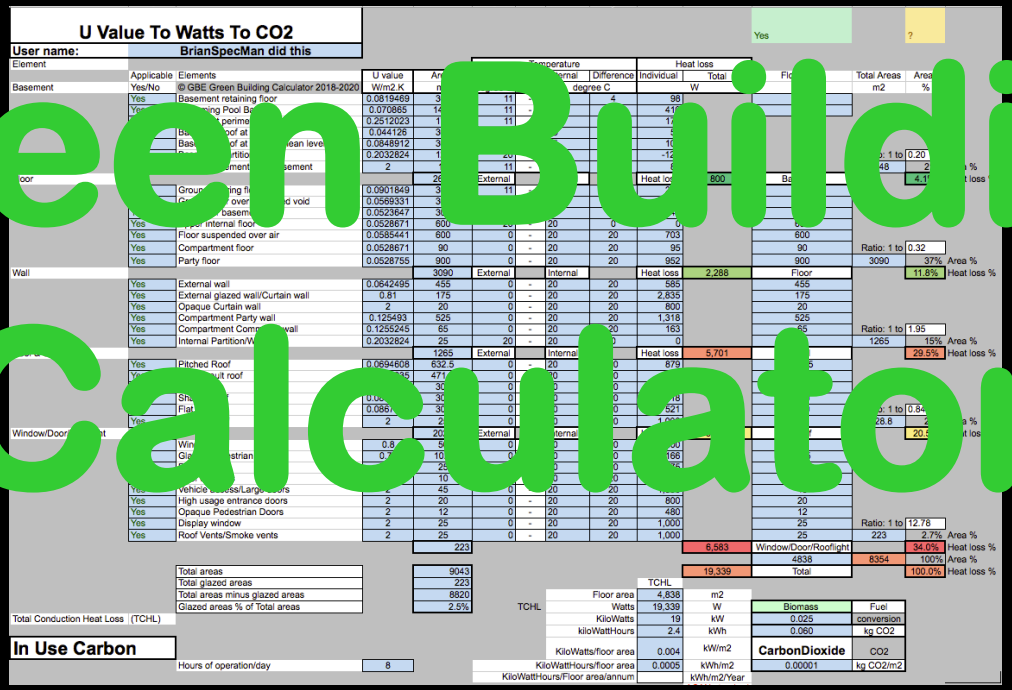

U Value To Watts To CO2

User name: BrianSpecMan did this

Element	Applicable	Elements	U value	Area	Temperature External	Temperature Internal	Difference	Heat loss Individual	Heat loss Total	Floor	Total Areas	Area
	Yes/No	© GBE Green Building Calculator 2018-2020	W/m2.K	m2	degree C			W			m2	%
Basement	Yes	Basement retaining floor	0.0819469	3	11	-	4	98				
	Yes	Swimming Pool Ba	0.070865	14	11	-		41				
		perime	0.2512023	1	11	-		17				
		Ba oof at	0.044126	3				5				
		Bas of at ean leve	0.0848912	3				13				
		titio	0.2032824	1				-12				
		sement	2	1	11	-		6			48	2
oor				26	External			Heat lo	800	Ba		4.1
		Groun ing fl	0.0901849	3	11	-						
		over d void	0.0569331	3								
		basem	0.0523647	36								
	Yes	Internal floor	0.0528671	800	0	-	20	0		0		
	Yes	Floor suspended over air	0.0585441	800	0	-	20	703		600		
	Yes	Compartment floor	0.0528671	90	0	-	20	95		90	Ratio: 1 to	0.32
	Yes	Party floor	0.0528755	900	0	-	20	952		900	3090	37% Area %
Wall				3090	External		Internal	Heat loss	2,288	Floor		11.8% Heat loss %
	Yes	External wall	0.0642495	455	0	-	20	585		455		
	Yes	External glazed wall/Curtain wall	0.81	175	0	-	20	2,835		175		
	Yes	Opaque Curtain wall	2	20	0	-	20	800		20		
	Yes	Compartment Party wall	0.125493	525	0	-	20	1,318		525		
	Yes	Compartment Comp wall	0.1255245	65	0	-	20	163		65	Ratio: 1 to	1.95
	Yes	Internal Partition/W	0.2032824	25	20	-	20	0		0	1265	15% Area %
				1265	External		Internal	Heat loss	5,701			29.5% Heat loss %
	Yes	Pitched Roof	0.0694608	632.5	0	-	20	879		5		
	Yes	ut roof	225	471	0		20	0				
				30	0		0	0				
		Shi	0.0	30	0		0	0				
		Flat	0.0861	30	0		0	521			0.1 to	0.84
	Yes		2	2	0		0	0			28.8	2
Window/Door/ t				20	External		Internal			7		20.5
		Win	0.8	5	0		0	0				
		Gl strian	0.7	10	0		0	168				
				25			0	0				
				10			0	0				
	Yes	Vehicle ss/Large ors	2	45	0	-	20	1,800				
	Yes	High usage entrance doors	2	20	0	-	20	800		20		
	Yes	Opaque Pedestrian Doors	2	12	0	-	20	480		12		
	Yes	Display window	2	25	0	-	20	1,000		25	Ratio: 1 to	12.78
	Yes	Roof Vents/Smoke vents	2	25	0	-	20	1,000		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								
		Total areas minus glazed areas		8820								
		Glazed areas % of Total Areas		2.5%								

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

Total Conduction Heat Loss (TCHL)

In Use Carbon

Hours of operation/day 8

V3 to V33

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V2-V33 Planned Development

Priorities to bring forward:

- V2 Retrofit, Terraces, Community level, MEP Services,
- V3 Decrement Delay, Form Factor refinements: dormers, bays, porches
- V4 Building Section Coding, Competent Application,
- 892 ready made elements, Bespoke Assemblies, Accessories, Specification Generator
- V5 Non-Domestic, Retrofit and Newbuild more refinement
- V6 Embodied Energy, Carbon and Sequestered carbon; Non-external envelope elements
- V7 Condensation Check, Thermal Bridge, Secondary Element Calculator, Thermal mass calculator
- V8 LCA Calculator
- V9 Landscape
- V10 Civils and Infrastructure: scope Increased
- V11 Waste Calculator using WasteCost®Lite
- V12 Plastic free v Recycled Plastic
- V13 Interiors: Scope increased, Ska fit-out. refit
- V14 Circular economy: Reclaim Reuse
- V15 Self-build Interface
- V16 CAD BIM App
- V17 Whole Project Budget Calculations, full Fee bid calculation based on cost plan
- V18 EU and International versions
- V19 Services Design Module: Occupancy level, Energy Sources and uses,
- V20 Lighting Design Module: Health & Wellbeing, Light Nutrition
- V21 Biodiversity Inclusion, Biodiversity Net Gain
- V22 Local Climate Appropriate construction and materials
- V23 Vernacular, local: materials, trades, economy
- V24 GBPB Green Building Price Book
- V25 O&MM Operation & Maintenance Manuals
- V26 FM Specification
- V27 Local Procurement, Transport to site, distance search facility
- V28 On Site Construction Emissions
- V29 Design Life, Durability and Competent Products
- V30 Air tightness & Energy Loss
- V31 Value Engineering Opportunities: in not out
- V32 Healthy Building
- V33 Screening Priorities

B Bespoke

- B1 Retrofit Window & Insulation Calculator
- B2 Screeds Calculator
- B3 Window Calculator

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Version 2 initial proposal

- Carbon in use/annum
  - Hours of use per day
  - Days/week days/year
- Domestic Retrofit:
  - One off and community
- Bill of materials; add
  - Building Labour Rates
  - Materials Rates
  - Services Scope and quantities
  - Services Rates
  - Services Labour Rates
  - Services Costs

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Version 2 Actual (@1Year)

- Domestic Retrofit: development one off and community scale
- Bill of Materials, Quantities, Labour, Materials, Accessories, Costs; development: Building and Services
- Form Factor Calculator development (V2)
  - Insulation thicknesses for materials
- Decrement Delay Calculator: (V2?)
- EE EC SC Calculator: (V2)
- ICE database 1.3 > 3 (V2?)
- Non-External Envelope Components (Foundations, Frame, Stairs, Partitions, Furniture, Interiors, Landscape)
- Services: systems of kit, appliances cables, pipes, ducts, conduits, accessories, insulation,
- Guidance on how to populate the Bill of Rates (BoR) Bill of Costs (BoC) (Tender document?)

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Versions 3 Initial proposal

- Decrement Delay Calculator
  - to avoid summer overheating
- Condensation check:
  - static to BS 5250
- GBE Product Datasets
- GBE Form Factor Calculator
  - Other Method
  - Different materials & Thicknesses

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Versions 3 Adjustments

- Decrement Delay Calculator (in version 2?)
  - to avoid summer overheating
- Condensation check: (in version 2?)
  - static to BS 5250
- GBE Form Factor Calculator (in version 2)
  - Other Methods (AECB?)
  - Thicknesses of insulation to meet U values (V2)
  - Different materials thicknesses to meet U values (V2)
- GBC Product Datasets
- GBC Materials Datasets
- GBC Product Specifications
- GBE Product Pages (later if GBC sales are good)

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Version 4 initial proposal

- Building Section Coding
  - Elements, Sub-elements and Junctions
- Material Appropriateness to Application
- Building Elemental Assembly Code Numbers
  - Outer face-Core-Inner face
  - CAWS-CI/SfB-CAWS-Instance
  - To Passivhaus U values
  - 892 Readymade Competent Elemental Assemblies
  - Bespoke invite collection and incorporation
- Specification Generator

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Version 4 Adjusted

- GBE 2D View
- Building Section Coding
  - Elements, Sub-elements and Junctions
  - Not component level (could be a different coding too)
- Material Appropriateness to Application
  - Existing matrix to incorporate
- Building Elemental Assembly Code Numbers
  - Outer face/Core/Inner face
  - CAWS-CI/SfB-CAWS-Instance (Uniclass is impractical)
  - To Passivhaus U values
  - 892 Readymade Competent Elemental Assemblies
  - Bespoke incorporated (flagged in version 2)
- Feedback loop
  - Invite Users Bespoke datasets to add to Look up tables
- Specification Generator
- Feedback on CO2 savings from users to GBC (EBD awards)

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Version 5 Initial proposal

- More specific interfaces:
  - Non-Domestic Retrofit:
  - Domestic new build
  - Non-Domestic New build

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Version 5 Adjustments

- One interface: more options
  - Domestic new build
    - (it started here)
  - Non-Domestic Retrofit:
  - Non-Domestic New build
    - Version 2: More elements added: Frames, Foundations, Cubicles, IPS, etc.
- Add grouped ‘switch off elements’

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Versions 6 Initial proposal

- GBE EE EC SC Calculator
  - ICE database: 1.3 > 3.0
  - Will provide Embodied Energy, Embodied Carbon and Sequestered Carbon data
- Bill of Materials Quantities Costs
  - Non-External Envelope Components
  - Landscape Assemblies

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Versions 6 Adjustments

- GBE EE EC SC Calculator
  - added to Version 2
  - ICE database: 1.3 > 3.0
  - Will provide Embodied Energy, Embodied Carbon and Sequestered Biogenic Carbon data
- Bill of Materials Quantities Costs
  - Started Adding to Version 2
  - Non-External Envelope Elements & Components
  - Sub and super-structure Elements & Components
  - Landscape Assemblies
  - Services Systems

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Version 7 initial proposal

- Condensation Check
- Thermal Bridge Calculator
- Secondary Element Calculator
  - Glazing and framing specifications
  - Ug Uf & Uw and Psi perimeter and spacers

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Version 7 adjustment

- Condensation Check in V2
- Thermal Bridge Calculator
- Secondary Element Calculator (in version 1)
  - Glazing and framing specifications
  - Ug Uf & Uw and Psi perimeter and spacers
  - More Product datasets

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Version 8 initial proposal

- Life Cycle Assessment (LCA) Whole Building Calculator
- LCA Dataset

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Version 8 Adjustment

- Life Cycle Assessment (LCA) Whole Building Calculator
  - In version 2
- LCA Dataset
  - In version 2?
  - Add more products datasets

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Version 9

- Landscape
  - (Version 2 started)
  - (select from GBE's 862 Readymade Assemblies)
  - Hard, Soft and Wet landscape
  - Objects in landscape
    - Sheds, stores, decking, pergolas, bridges
  - Services & lighting in landscape
  - Landscape Materials Rates
  - Landscape Labour
  - Landscape Costs

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Version 10

- Civils & Infrastructure (Residential initially)
  - (select from GBE 862 Readymade Assemblies
  - Roads, Pavement, Soft Landscape
  - Services above and Below ground
    - Pipes Ducts Cables (added profiles)
  - Culverts Ducts
  - Street Furniture
- Civils & Infrastructure Rates
- Civils & Infrastructure Labour
- Civils & Infrastructure Costs

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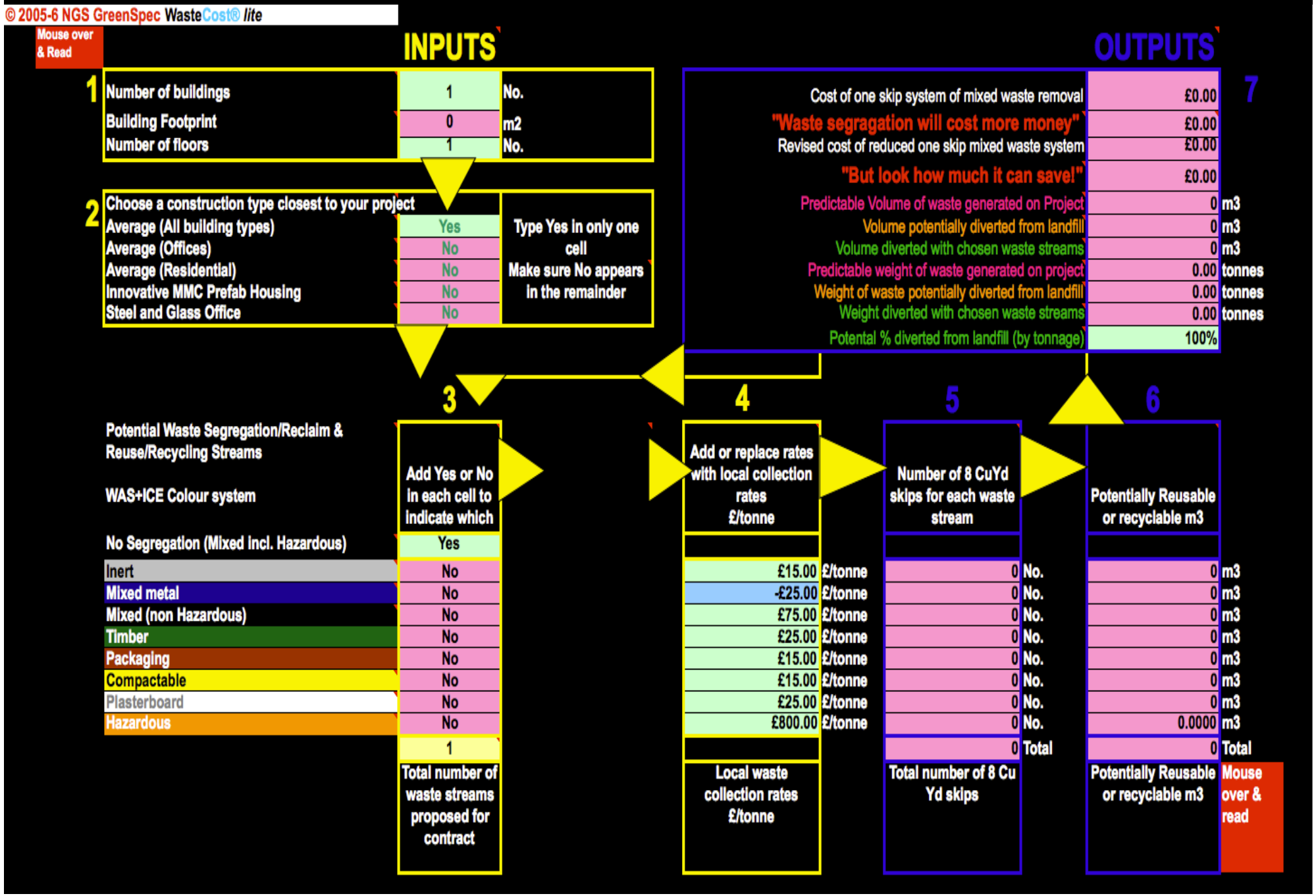
Version 11

- Waste Calculator
  - Waste Cost ® lite exists
- Modular design approach
  - Off cut waste calculator
  - Matching product sizes to space sizes
- Embodied Energy and Carbon
  - in Waste
  - in Reclaim
- Sequestered Carbon
  - in Reclaimed and Reused Timber

V11 NGS WasteCost® *Lite* 2005 + new datasets



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Version 12

- Plastic Free V Recycled Plastic Products
- Plastics & Recycled Plastic Content Dataset
- Avoiding plastics in:
  - historic fabric
  - Facades
  - Interiors
- Alternatives to Plastics Dataset
- Plastics Diverted from landfill
- Plastics Avoided
- Fossil Carbon in plastics: Consumed or Avoided
- 2 EU funded projects to learn from

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Version 13

- Interiors Fit out, Refit Furniture Dataset
  - (Domestic Retrofit started v2)
- Finishes Products Dataset
- Specification tool
- Calculator:
  - Stand alone and integrated in GBC
  - Furniture Impact
  - Finishes Impact

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Version 14

- Circular Economy
  - Reclaim & reuse
  - Reclaimable & Reusable
  - Value
- Paola Sassi Research:
  - Reclaim-ability, reusability & value scores
- BAMP
  - >400 products with Product Passports
- FCRBE futuREuse projects

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Version 15

- Self-build Interface
  - Town & Country Planning
  - Wales Technical Advisory Note 6
  - One Planet Development
  - Zero Carbon evidence requested
- More graphic user interface to explain construction
- Links to GBE website:
  - Jargon Buster, Checklist, 2D View

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Version 16 Initial Proposal

- BIM Building Information Management
- CAD Computer aided Design
- BIM App to interrogate Building Model and extracting physical and dimensional information
- BIM interrogate BOM to feed the calculator

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Version 16 Adjustments

- CAD BIM App
  - Make it interrogate BoM Bill of Materials
  - Interrogate physical and dimensional information
  - Create a template with all dimensions for all cells
- 2 direction application?
  - Import <> Export datasets
  - Feedback an elemental assembly that can be cad'd up as a Library object and deployed into model
  - 892 Elemental assemblies CAD BIM Models
  - x000 Materials and Products as Component Objects

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Version 17 Addition

- Whole Project Budget calculations
- Fees
- Overheads
- Profits
- Preliminaries

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Version 18 Addition

- EU and International versions
  - Regional Product datasets?
  - Money conversion
    - £ to Euros and other currencies as requested
    - build in a converter to all totals cells?
    - Choose currency, update exchange rates
  - Imperial measurements
    - Unlikely for UK
      - I hope Brexit goes no further
    - US audience have requested it
      - Engage somebody to develop it

V19 Services Design Module: Energy Sources,

- Matching demand to source capacity
- Optimising technology mix
- Design Tool
- Specification Tool

V20 Lighting Design Module: Health & Wellbeing

- Matching light nutrition to user demands
- Optimising technology mix
- Design Tool
- Specification Tool

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V21 Biodiversity Inclusion

- Mismatch of animal to roost sizes
- Mismatch of roost sizes to build sizes
- Products datasets
- Specification Tool

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V22 Local Climate Appropriate

- Guidance on appropriate materials
- Emphasis on Local made materials
- Interact with V23 & V27

V23 Vernacular, local: materials, trades, economy

- Goods Transport calculator
- Labour Travel calculator
- Addition to Impacts calculator
- Localise Regionalise Product Datasets

V24 Green Building Price Book (GBPB)

- Price data added to Product Datasets
- Embed into BoM BoP
  - Drop Down Lists
  - Look Up Tables

V25 O&MM Operation & Maintenance Manuals

- More datasets
- O&MM Specification Tool

V26 Facilities Management

- FM Interface
- Segregation, Storage, Reclaim and Reuse
- More Product datasets
- FM Specification

V27 Local Procurement,

- Transport to site,
- distance search facility

V28 On Site Construction Emissions

- Based on RICS guidance
- Bring forwards to V3?

V29 Design Life and Durability and Competence

- Based on Component Life manuals
- HAPM, Spons, etc.
- BSI Kitemarked Products
- BBA Certified Products
  - (Not UKCA marked)
- ETA Certified (If BCO permit)
  - (Not CE marked)

V30 Air tightness & Energy Loss

- **Set targets:** (bring forwards to V3?)
  - Regulations: E&W, S NI, RI, others
  - Design Standards: Passivhaus, AECB CL
  - Campaigns: LETI,
- Air leakage rates
- Energy loss

V31 Value Engineering Opportunities

- Synergistic combinations
- Cost v value
- Whole system v individual
- Pay-back periods v Carbon-back periods

V32 Healthy Building

- Healthy materials
- low-chemistry, low-irritant, healthy solutions
- Learn about their positive properties and help promote their competent application
- Including planet-friendly and human-healthy materials and products to make, install, use, maintain, deconstruct, reuse and recycle
- Address indoor air quality, reduce indoor pollution

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V33 Screening Priorities

- Consider screening to match client/designer priorities
- Consider which issues are to be addresses and how robustly
- Screening options:
  - healthy, carbon, water, waste minimisation, circular economy: recycled content, reclaimed for reuse; plastic-avoidance, bio-based, durability, product quality, self-build, etc.
- Use IPDC collecting additions data points to enable screening appropriate materials and product

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V2-V33 Planned Development

Priorities to bring forward:

- V2 Retrofit, Terraces, Community level, MEP Services,
- V3 Decrement Delay, Form Factor refinements: dormers, bays, porches
- V4 Building Section Coding, Competent Application,
- 892 ready made elements, Bespoke Assemblies, Accessories, Specification Generator
- V5 Non-Domestic, Retrofit and Newbuild more refinement
- V6 Embodied Energy, Carbon and Sequestered carbon; Non-external envelope elements
- V7 Condensation Check, Thermal Bridge, Secondary Element Calculator, Thermal mass calculator
- V8 LCA Calculator
- V9 Landscape
- V10 Civils and Infrastructure: scope Increased
- V11 Waste Calculator using WasteCost®Lite
- V12 Plastic free v Recycled Plastic
- V13 Interiors: Scope increased, Ska fit-out. refit
- V14 Circular economy: Reclaim Reuse
- V15 Self-build Interface
- V16 CAD BIM App
- V17 Whole Project Budget Calculations, full Fee bid calculation based on cost plan
- V18 EU and International versions
- V19 Services Design Module: Occupancy level, Energy Sources and uses,
- V20 Lighting Design Module: Health & Wellbeing, Light Nutrition
- V21 Biodiversity Inclusion, Biodiversity Net Gain
- V22 Local Climate Appropriate construction and materials
- V23 Vernacular, local: materials, trades, economy
- V24 GBPB Green Building Price Book
- V25 O&MM Operation & Maintenance Manuals
- V26 FM Specification
- V27 Local Procurement, Transport to site, distance search facility
- V28 On Site Construction Emissions
- V29 Design Life, Durability and Competent Products
- V30 Air tightness & Energy Loss
- V31 Value Engineering Opportunities: in not out
- V32 Healthy Building
- V33 Screening Priorities

B Bespoke

- B1 Retrofit Window & Insulation Calculator
- B2 Screeds Calculator
- B3 Window Calculator

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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 for 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

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  - Environmentalist by Actions
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- Funded and Launched www.greenspec.co.uk 2003
- Created: GBE at https://greenbuildingencyclopaedia.uk 2015
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