

Today

- 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

Calculator on GBC:

- Find GBC V1.0.0. file on GBC website at:
- <https://GreenBuildingCalculator.uk>
 - V0.0.0. Video
 - V1.0.0. Video Soon
 - Shop: XLSX file
 - Different prices for different users
 - GBC and GBE Newsletter: 1st last week
 - 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 (84/227 slides)
 - To be updated after this event
 - Handout/print/read: PDF file to print
 - Shop: PPTX file
 - GBE & GBC Newsletter: 1st last week
 - Video show: PPTS file
 - Zoom Recording on YouTube

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
 - 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

© GBE 2020 GBC Green Building Calculator

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 good
 - Datasets can be orderly, in one place, are better
 - Open datasets are best
 - 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 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

I am reminded to

Be the change you want to see in the world

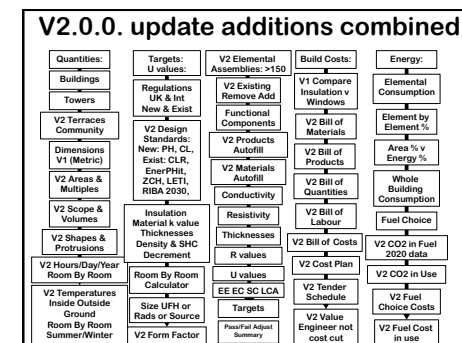
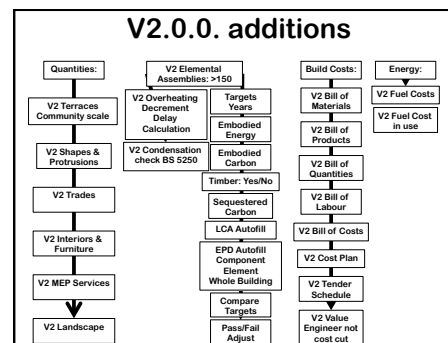
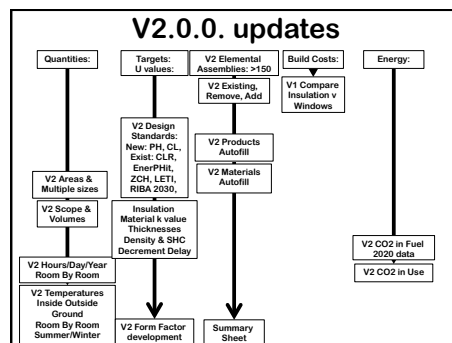
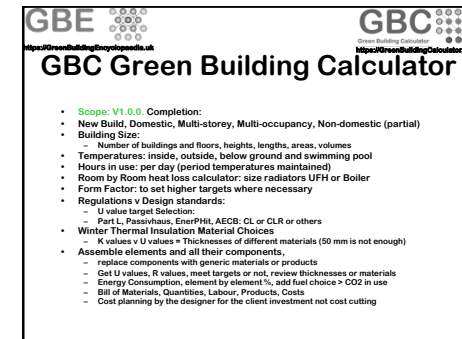
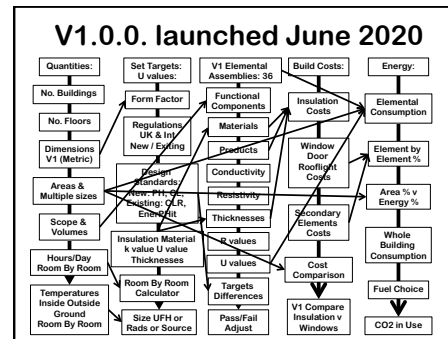
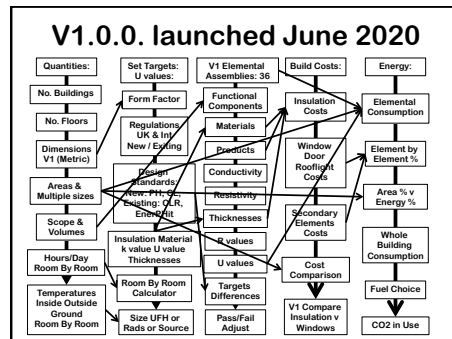
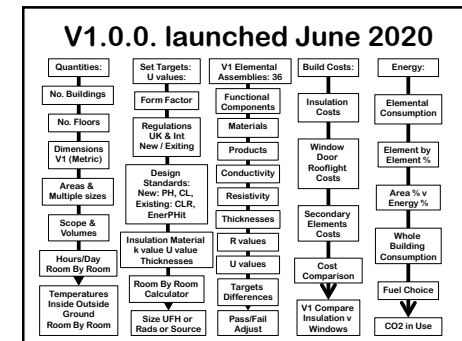
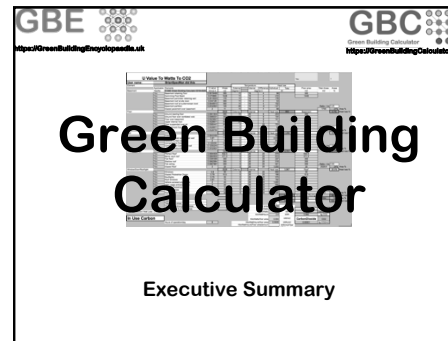
Mahatma Gandhi



20 years collection of idle information

- 1000s Product Information
 - Product properties from many databases
 - Spreadsheets
 - Specifications
- 892 Elemental Assemblies from GreenSpecStudio
 - Elemental Assemblies to Passivhaus
 - Competent Construction assemblies
 - Specification Generator
- Calculators, Equations

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 1.0.0. Launched
 - 440 hours to assemble V1.0.0.
 - 4-5 months to V2.0.0. (end of October 2020?)
 - 395 hours so far V2.0.0. (835 total so far V1 and V2)
 - Excluding marketing, website and CPD
 - 21 versions planned: >24 months of development?



GBE  **GBC** 
<https://GreenBuildingCalculator.co.uk> <https://GreenBuildingCalculator.co.uk>

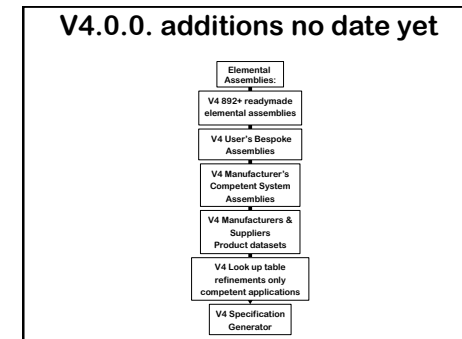
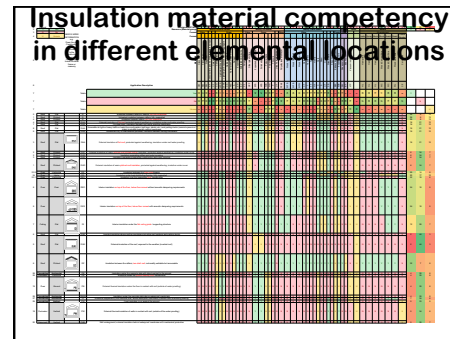
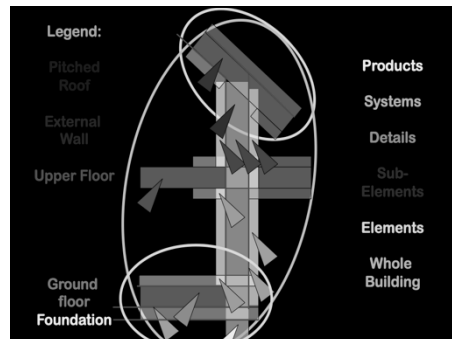
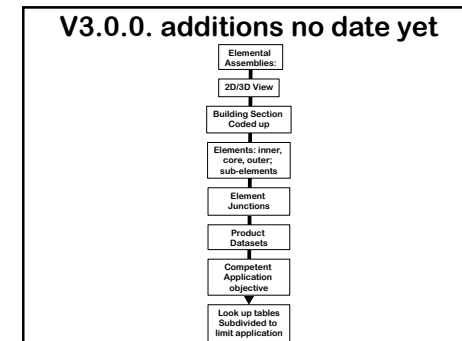
V2 Current Development

- **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

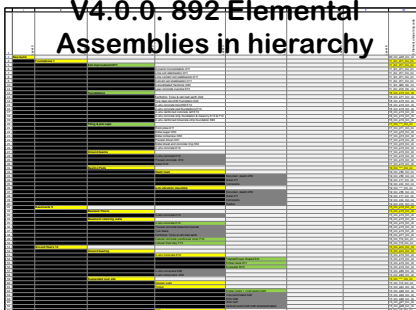
GBE  **GBC** 
<https://GreenBuildingCalculator.co.uk> <https://GreenBuildingCalculator.co.uk>

V2-V15 Planned Development

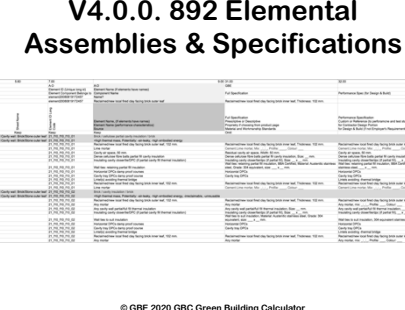
- Priorities to bring forward:
- **V2** Retrofit, Terraces, Community level, MEP Services,
- **V3** Decrement Delay, Form Factor refinements: dormers, bays, porches
- **V4** Building Section Coding, Competent Application, 892 ready made elements, Bespoke Assemblies, Accessories, Specification Generator
- **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** Civils and Infrastructure: scope Increased
- **V10** Waste Calculator Using WasteCost@Lite
- **V11** Plastic free v Recycled Plastic
- **V12** Interiors: Scope increased, Ska fit-out, refit
- **V14** Circular economy: Reclaim Reuse
- **V15** Self-build Interface





V4.0.0. 892 Elemental Assemblies in hierarchy



V4.0.0. 892 Elemental Assemblies & Specifications



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GBE  **GBC** 
<https://GreenBuildingCalculator.co.uk> <https://GreenBuildingCalculator.co.uk>

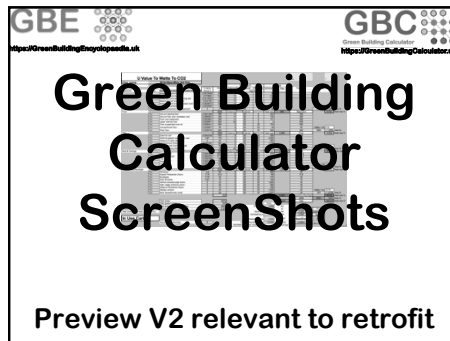
Future Development Versions

- **V5** Thermal Bridge, Thermal mass calculator
- **V6** Civils and Infrastructure
- **V7** Waste Calculator Using WasteCost@Lite
- **V8** Plastic free v Recycled Plastic
- **V9** Interiors: Scope increase, Ska fit-out, refit
- **V10** Circular Economy Reclaim Reuse
- **V11** Self-build Interface links back to GBE Encyclopaedia
- **V12** BIM App (conversations started)
- **V13** Whole Project Budget calculations: Prelims and fees
- **V14** EU, International & Regional versions (USA: Feet inches)
- **V15** Services Design Module: Occupancy level, Energy Sources and uses,
- **V16** Lighting Design Module: Health & Wellbeing
- **V17** Biodiversity Inclusion
- **V18** Local Climate Appropriate construction and materials
- **V19** Vernacular, local: materials, trades, economy
- **V20** GBPB Green Building Price Book
- **V21** Value Engineering Opportunities
- **V22** Design Life and Durability

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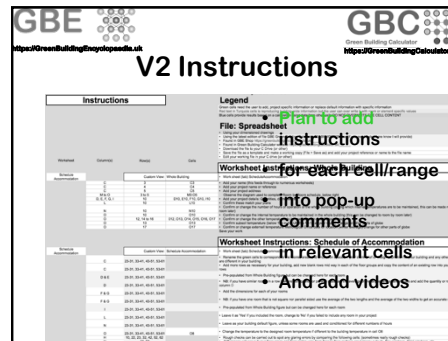
Window frame, Glazing, Coating, Partition, Spacer, Gas, Finishes, Specifications	U-value	Energy in use	Carbon in use	Carbon saved in use	V2 Carbon	Material	Finishes	V1-V2 Profiles	Initial Cost	B1 Pay back period	Embodied Carbon	V1-B1 Carbon in waste	Sequestered carbon	Carbon break period
Greenosework gut Institut														
Turn v., A 7 to numbers Evidence based design specification														
Existing Single glazing	-	++++	+++++	0	+++++	0	+++++	0	0	2	+/	+	0	7
Existing to Double glazing	-	++++	+++++	0	+++++	0	+++++	0	0	2	+/	+	0	7
+Secondary Glazing	----	++++	+++++	++	++++	++	++++	++	++	2	+/	++	++	7
+Secondary Double Glazing	----	++++	+++++	++	++++	++	++++	++	++	2	+/	++	++	7
Replace with double glazing	++	++	++	++++	++	++++	++	++	++	2	+/	++++	++	7
Replace with triple glazing	++++	++	++	++++	++++	++	++++	++	++	2	+/	++++	++	7

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Green Building Calculator Screen Shots

Preview V2 relevant to retrofit



V2 Instructions

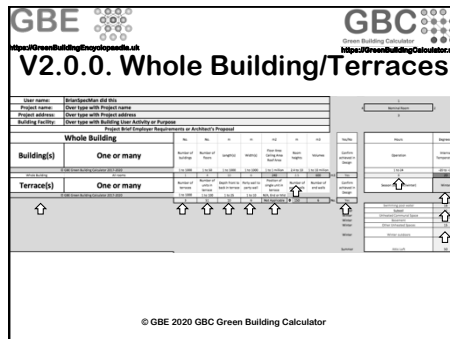
Plan to add instructions into pop-up comments in relevant cells

And add videos

V2 V12 Cell colour Legend

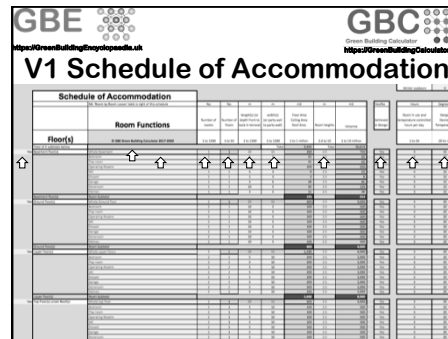
Legend	In Excel	In BIM
Cell colour code/content	Explanation	
	User input cell, feeds into calculations throughout GBC	From Bill of Materials
	GBC calculated results, that the user can overwrite, e.g. for variables	From Model?
	GBC calculated results, applying user inputs in other cells or sheets	From Bill of Materials
	User to select option from drop down list GBC will apply choice to calculations	From Bill of Materials?
	Row or Column titles	n/a
Yes/No	User input cell requiring user choice from drop down list	n/a
No	Not complete by GBC OR User to ignore this row's cells. Not will turn red automatically	n/a
7	GBC awaiting information OR User to interrogate this row's cells and review decisions so far	n/a
Yes	Started by GBC OR To be completed by Users. 'Yes' will turn Green Automatically	n/a

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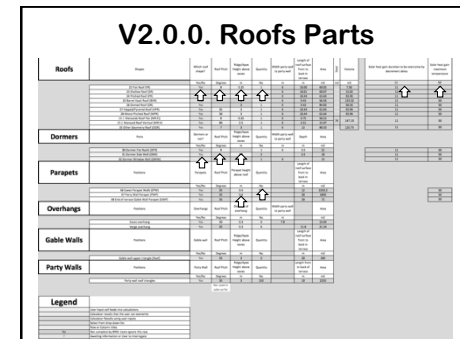


V2.0.0. Whole Building/Terraces

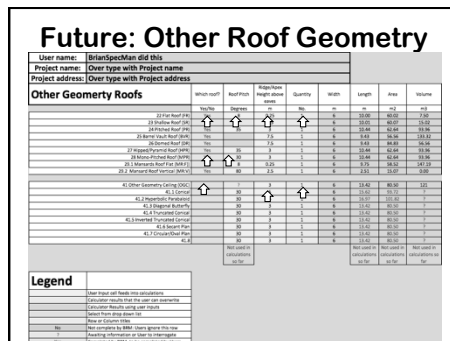
© GBE 2020 GBC Green Building Calculator



V1 Schedule of Accommodation

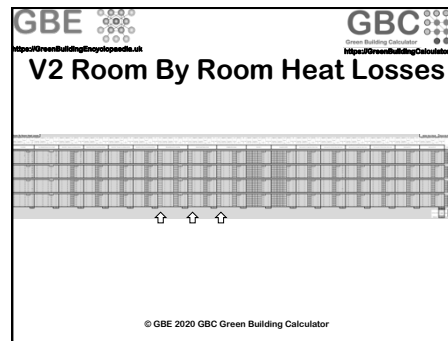


V2.0.0. Roofs Parts



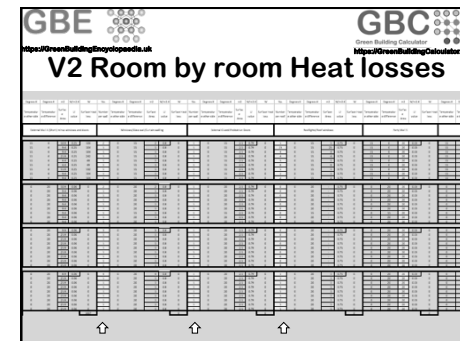
Future: Other Roof Geometry

© GBE 2020 GBC Green Building Calculator




V2 Room By Room Heat Losses

© GBE 2020 GBC Green Building Calculator




V2 Room by room Heat losses

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GBE
Green Building Experts



GBC
Green Building Calculator

<https://www.greenbuildingcalculator.com>

V1.0.0. Scope: Building Elements

Building Elements		User Name	User Email	User Type with User's name	Status	ID
Roof	Yes	Yes	Yes	Roof	Yes	1
Roof	Yes	Yes	Yes	Roof	Yes	2
Roof	Yes	Yes	Yes	Roof	Yes	3
Roof	Yes	Yes	Yes	Roof	Yes	4
Roof	Yes	Yes	Yes	Roof	Yes	5
Roof	Yes	Yes	Yes	Roof	Yes	6
Roof	Yes	Yes	Yes	Roof	Yes	7
Roof	Yes	Yes	Yes	Roof	Yes	8
Roof	Yes	Yes	Yes	Roof	Yes	9
Roof	Yes	Yes	Yes	Roof	Yes	10
Roof	Yes	Yes	Yes	Roof	Yes	11
Roof	Yes	Yes	Yes	Roof	Yes	12
Roof	Yes	Yes	Yes	Roof	Yes	13
Roof	Yes	Yes	Yes	Roof	Yes	14
Roof	Yes	Yes	Yes	Roof	Yes	15
Roof	Yes	Yes	Yes	Roof	Yes	16
Roof	Yes	Yes	Yes	Roof	Yes	17
Roof	Yes	Yes	Yes	Roof	Yes	18
Roof	Yes	Yes	Yes	Roof	Yes	19
Roof	Yes	Yes	Yes	Roof	Yes	20
Roof	Yes	Yes	Yes	Roof	Yes	21
Roof	Yes	Yes	Yes	Roof	Yes	22
Roof	Yes	Yes	Yes	Roof	Yes	23
Roof	Yes	Yes	Yes	Roof	Yes	24
Roof	Yes	Yes	Yes	Roof	Yes	25
Roof	Yes	Yes	Yes	Roof	Yes	26
Roof	Yes	Yes	Yes	Roof	Yes	27
Roof	Yes	Yes	Yes	Roof	Yes	28
Roof	Yes	Yes	Yes	Roof	Yes	29
Roof	Yes	Yes	Yes	Roof	Yes	30
Roof	Yes	Yes	Yes	Roof	Yes	31
Roof	Yes	Yes	Yes	Roof	Yes	32
Roof	Yes	Yes	Yes	Roof	Yes	33
Roof	Yes	Yes	Yes	Roof	Yes	34
Roof	Yes	Yes	Yes	Roof	Yes	35
Roof	Yes	Yes	Yes	Roof	Yes	36
Roof	Yes	Yes	Yes	Roof	Yes	37
Roof	Yes	Yes	Yes	Roof	Yes	38
Roof	Yes	Yes	Yes	Roof	Yes	39
Roof	Yes	Yes	Yes	Roof	Yes	40
Roof	Yes	Yes	Yes	Roof	Yes	41
Roof	Yes	Yes	Yes	Roof	Yes	42
Roof	Yes	Yes	Yes	Roof	Yes	43
Roof	Yes	Yes	Yes	Roof	Yes	44
Roof	Yes	Yes	Yes	Roof	Yes	45
Roof	Yes	Yes	Yes	Roof	Yes	46
Roof	Yes	Yes	Yes	Roof	Yes	47
Roof	Yes	Yes	Yes	Roof	Yes	48
Roof	Yes	Yes	Yes	Roof	Yes	49
Roof	Yes	Yes	Yes	Roof	Yes	50
Roof	Yes	Yes	Yes	Roof	Yes	51
Roof	Yes	Yes	Yes	Roof	Yes	52
Roof	Yes	Yes	Yes	Roof	Yes	53
Roof	Yes	Yes	Yes	Roof	Yes	54
Roof	Yes	Yes	Yes	Roof	Yes	55
Roof	Yes	Yes	Yes	Roof	Yes	56
Roof	Yes	Yes	Yes	Roof	Yes	57
Roof	Yes	Yes	Yes	Roof	Yes	58
Roof	Yes	Yes	Yes	Roof	Yes	59
Roof	Yes	Yes	Yes	Roof	Yes	60
Roof	Yes	Yes	Yes	Roof	Yes	61
Roof	Yes	Yes	Yes	Roof	Yes	62
Roof	Yes					

The screenshot displays a complex table titled "V2.0.0 Scope: Building Elements". The table is organized into two main vertical sections, each with a header "Building Element Summary" and "Inventory Building Elements". The left section contains a list of building elements with columns for "Element Name", "Element ID", "Element Type", "Element Category", "Element Subcategory", "Element Description", "Element Location", "Element Status", and "Element Date". The right section contains a list of building elements with columns for "Element Name", "Element ID", "Element Type", "Element Category", "Element Subcategory", "Element Description", "Element Location", "Element Status", and "Element Date". The table is divided into multiple rows, with some rows highlighted in light blue and others in light green. The table is also divided into multiple columns, with some columns highlighted in light blue and others in light green. The table is also divided into multiple rows, with some rows highlighted in light blue and others in light green. The table is also divided into multiple columns, with some columns highlighted in light blue and others in light green.

[illegible][illegible][illegible]

APPROVED LIST		
111-210	Animal Beds	Yes
111-212	Baths	Yes
111-213	Beds	Yes
111-220	Shirts	Yes
111-222	Shirts	Yes
111-223	Shirts	Yes
111-230	Shirts	Yes
111-232	Shirts	Yes
111-233	Shirts	Yes
111-240	Shirts	Yes
111-242	Shirts and Goggles	Yes
111-243	Shirts and Goggles	Yes
111-250	Shirts	Yes
111-252	Shirts	Yes
111-253	Shirts	Yes
111-260	Shirts	Yes
111-262	Shirts	Yes
111-263	Shirts	Yes
111-270	Shirts	Yes
111-272	Shirts	Yes
111-273	Shirts	Yes
111-280	Shirts	Yes
111-282	Shirts	Yes
111-283	Shirts	Yes
111-290	Shirts	Yes
111-292	Shirts	Yes
111-293	Shirts	Yes
111-300	Shirts	Yes
111-302	Shirts	Yes
111-303	Shirts	Yes
111-310	Shirts	Yes
111-312	Shirts	Yes
111-313	Shirts	Yes
111-320	Shirts	Yes
111-322	Shirts	Yes
111-323	Shirts	Yes
111-330	Shirts	Yes
111-332	Shirts	Yes
111-333	Shirts	Yes
111-340	Shirts	Yes
111-342	Shirts	Yes
111-343	Shirts	Yes
111-350	Shirts	Yes
111-352	Shirts	Yes
111-353	Shirts	Yes
111-360	Shirts	Yes
111-362	Shirts	Yes
111-363	Shirts	Yes
111-370	Shirts	Yes
111-372	Shirts	Yes
111-373	Shirts	Yes
111-380	Shirts	Yes
111-382	Shirts	Yes
111-383	Shirts	Yes
111-390	Shirts	Yes
111-392	Shirts	Yes
111-393	Shirts	Yes
111-400	Shirts	Yes
111-402	Shirts	Yes
111-403	Shirts	Yes
111-410	Shirts	Yes
111-412	Shirts	Yes
111-413	Shirts	Yes
111-420	Shirts	Yes
111-422	Shirts	Yes
111-423	Shirts	Yes
111-430	Shirts	Yes
111-432	Shirts	Yes
111-433	Shirts	Yes
111-440	Shirts	Yes
111-442	Shirts	Yes
111-443	Shirts	Yes
111-450	Shirts	Yes
111-452	Shirts	Yes
111-453	Shirts	Yes
111-460	Shirts	Yes
111-462	Shirts	Yes
111-463	Shirts	Yes
111-470	Shirts	Yes
111-472	Shirts	Yes
111-473	Shirts	Yes
111-480	Shirts	Yes
111-482	Shirts	Yes
111-483	Shirts	Yes
111-490	Shirts	Yes
111-492	Shirts	Yes
111-493	Shirts	Yes
111-500	Shirts	Yes
111-502	Shirts	Yes
111-503	Shirts	Yes
111-510	Shirts	Yes
111-512	Shirts	Yes
111-513	Shirts	Yes
111-520	Shirts	Yes
111-522	Shirts	Yes
111-523	Shirts	Yes
111-530	Shirts	Yes
111-532	Shirts	Yes
111-533	Shirts	Yes
111-540	Shirts	Yes
111-542	Shirts	Yes
111-543	Shirts	Yes
111-550	Shirts	Yes
111-552	Shirts	Yes
111-553	Shirts	Yes
111-560	Shirts	Yes
111-562	Shirts	Yes
111-563	Shirts	Yes
111-570	Shirts	Yes
111-572	Shirts	Yes
111-573	Shirts	Yes
111-580	Shirts	Yes
111-582	Shirts	Yes
111-583	Shirts	Yes
111-590	Shirts	Yes
111-592	Shirts	

V1.0.0. Building Element Areas

V2.0.0. Building Element Areas

V2.0.0. Building Element Areas

V2.0.0. Building Element Areas

V2.0.0. Building Element Areas (V9.0.0. Landscape Pending) MEP in development

The screenshot displays the 'Building Element Areas' section of the GBC Green Building Calculator. The interface is organized into three main columns: 'Landscape (L)', 'Domestic MEP Services (DMEPS)', and 'Building Element Areas'. The 'Landscape (L)' column lists various landscape elements such as 'Grass', 'Trees', and 'Shrubbery', each with associated area and volume values. The 'Domestic MEP Services (DMEPS)' column lists services like 'Heating', 'Cooling', and 'Ventilation', also with area and volume values. The 'Building Element Areas' column is currently empty, with a red arrow pointing to it from the text 'MEP in development'.

Below the table, there is a section for 'Building Element Areas' with a red arrow pointing to it. This section is currently empty, indicating that the MEP (Mechanical, Electrical, and Plumbing) services are still in development.

At the bottom of the interface, there is a footer that reads '© GBE 2020 GBC Green Building Calculator'.

V5.0.0. Services Systems									
V4.0.0. Building Element Areas									
Non-Domestic MEP Services (N-DMEPS)									
Wsp	2001				2001				
Wsp	2002				2002				
Wsp	2003				2003				
Wsp	2004				2004				
Wsp	2005				2005				
Wsp	2006				2006				
Wsp	2007				2007				
Wsp	2008				2008				
Wsp	2009				2009				
Wsp	2010				2010				
Wsp	2011				2011				
Wsp	2012				2012				
Wsp	2013				2013				
Wsp	2014				2014				
Wsp	2015				2015				
Wsp	2016				2016				
Wsp	2017				2017				
Wsp	2018				2018				
Wsp	2019				2019				
Wsp	2020				2020				
Wsp	2021				2021				
Wsp	2022				2022				
Wsp	2023				2023				
Wsp	2024				2024				
Wsp	2025				2025				
Wsp	2026				2026				
Wsp	2027				2027				
Wsp	2028				2028				
Wsp	2029				2029				
Wsp	2030				2030				
Wsp	2031				2031				
Wsp	2032				2032				
Wsp	2033				2033				
Wsp	2034				2034				
Wsp	2035				2035				
Wsp	2036				2036				
Wsp	2037				2037				
Wsp	2038				2038				
Wsp	2039				2039				
Wsp	2040				2040				
Wsp	2041				2041				
Wsp	2042				2042				
Wsp	2043				2043				
Wsp	2044				2044				
Wsp	2045				2045				
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Wsp	2047				2047				
Wsp	2048				2048				
Wsp	2049				2049				
Wsp	2050				2050				
Wsp	2051				2051				
Wsp	2052				2052				
Wsp	2053				2053				
Wsp	2054				2054				
Wsp	2055				2055				
Wsp	2056				2056				
Wsp	2057				2057				
From Redesignate Elements (BPSI)									
Wsp	2058				2058				
Wsp	2059				2059				
Wsp	2060				2060				
Wsp	2061				2061				
Wsp	2062				2062				
Wsp	2063				2063				
Wsp	2064				2064				
Wsp	2065				2065				
Wsp	2066				2066				
Wsp	2067				2067				
Wsp	2068				2068				
Wsp	2069				2069				
Wsp	2070				2070				
Wsp	2071				2071				
Wsp	2072				2072				
Wsp	2073				2073				
Wsp	2074				2074				
Wsp	2075				2075				
Wsp	2076				2076				
Wsp	2077				2077				
Wsp	2078				2078				
Wsp	2079				2079				
Wsp	2080				2080				
Wsp	2081				2081				
Wsp	2082				2082				
Wsp	2083				2083				
Wsp	2084				2084				
Wsp	2085				2085				
Wsp	2086				2086				
Wsp	2087				2087				
Wsp	2088				2088				
Wsp	2089				2089				
Wsp	2090				2090				
Wsp	2091				2091				
Wsp	2092				2092				
Wsp	2093				2093				
Wsp	2094				2094				
Wsp	2095				2095				
Wsp	2096				2096				
Wsp	2097				2097				
Wsp	2098				2098				
Wsp	2099				2099				
Wsp	2100				2100				

[illegible]

V2.0.0. Engage Singular/Multiple

V2 U values Etc. Energy Targets Regulations & Design Standards

[illegible]

Material		U values γ	Thicknesses
1	Brickwork	0.18	215 mm
2	Brickwork	0.18	215 mm
3	Brickwork	0.18	215 mm
4	Brickwork	0.18	215 mm
5	Brickwork	0.18	215 mm
6	Brickwork	0.18	215 mm
7	Brickwork	0.18	215 mm
8	Brickwork	0.18	215 mm
9	Brickwork	0.18	215 mm
10	Brickwork	0.18	215 mm
11	Brickwork	0.18	215 mm
12	Brickwork	0.18	215 mm
13	Brickwork	0.18	215 mm
14	Brickwork	0.18	215 mm
15	Brickwork	0.18	215 mm
16	Brickwork	0.18	215 mm
17	Brickwork	0.18	215 mm
18	Brickwork	0.18	215 mm
19	Brickwork	0.18	215 mm
20	Brickwork	0.18	215 mm
21	Brickwork	0.18	215 mm
22	Brickwork	0.18	215 mm
23	Brickwork	0.18	215 mm
24	Brickwork	0.18	215 mm
25	Brickwork	0.18	215 mm
26	Brickwork	0.18	215 mm
27	Brickwork	0.18	215 mm
28	Brickwork	0.18	215 mm
29	Brickwork	0.18	215 mm
30	Brickwork	0.18	215 mm
31	Brickwork	0.18	215 mm
32	Brickwork	0.18	215 mm
33	Brickwork	0.18	215 mm
34	Brickwork	0.18	215 mm
35	Brickwork	0.18	215 mm
36	Brickwork	0.18	215 mm
37	Brickwork	0.18	215 mm
38	Brickwork	0.18	215 mm
39	Brickwork	0.18	215 mm
40	Brickwork	0.18	215 mm
41	Brickwork	0.18	215 mm
42	Brickwork	0.18	215 mm
43	Brickwork	0.18	215 mm
44	Brickwork	0.18	215 mm
45	Brickwork	0.18	215 mm
46	Brickwork	0.18	215 mm
47	Brickwork	0.18	215 mm
48	Brickwork	0.18	215 mm
49	Brickwork	0.18	215 mm
50	Brickwork	0.18	215 mm
51	Brickwork	0.18	215 mm
52	Brickwork	0.18	215 mm
53	Brickwork	0.18	215 mm
54	Brickwork	0.18	215 mm
55	Brickwork	0.18	215 mm
56	Brickwork	0.18	215 mm
57	Brickwork	0.18	215 mm
58	Brickwork	0.18	215 mm
59	Brickwork	0.18	215 mm
60	Brickwork	0.18	215 mm
61	Brickwork	0.18	215 mm
62	Brickwork	0.18	215 mm
63	Brickwork	0.18	215 mm
64	Brickwork	0.18	215 mm
65	Brickwork	0.18	215 mm
66	Brickwork	0.18	215 mm
67	Brickwork	0.18	215 mm
68	Brickwork	0.18	215 mm
69	Brickwork	0.18	215 mm
70	Brickwork	0.18	215 mm
71	Brickwork	0.18	215 mm
72	Brickwork	0.18	215 mm
73	Brickwork	0.18	215 mm
74	Brickwork	0.18	215 mm
75	Brickwork	0.18	215 mm
76	Brickwork	0.18	215 mm
77	Brickwork	0.18	215 mm
78	Brickwork	0.18	215 mm
79	Brickwork	0.18	215 mm
80	Brickwork	0.18	215 mm
81	Brickwork	0.18	215 mm
82	Brickwork	0.18	215 mm
83	Brickwork	0.18	215 mm
84	Brickwork	0.18	215 mm
85	Brickwork	0.18	215 mm
86	Brickwork	0.18	215 mm
87	Brickwork	0.18	215 mm
88	Brickwork	0.18	215 mm
89	Brickwork	0.18	215 mm
90	Brickwork	0.18	215 mm
91	Brickwork	0.18	215 mm
92	Brickwork	0.18	215 mm

[illegible]

V2.0.0. Decrement Delay

Insulation Thickness (Dev)

[illegible]

V1>V2 24 of 39 Elements
U or R value
12 secondary element U/R values
Refurb Actions

The screenshot displays the 'Energy' tab of the GBC Green Building Calculator. The interface is structured with a top navigation bar, a left sidebar, a central data table, and a bottom summary section.

Top Navigation Bar: Contains tabs for 'Energy', 'Materials', 'Water', and 'Indoor Air Quality'.

Left Sidebar: Lists categories for 'Energy', 'Materials', 'Water', and 'Indoor Air Quality'.

Central Table: A large table with columns: 'Component', 'Value', 'Unit', 'Weighted Value', and 'Weighted Value (kg CO2e/m2)'. It lists various energy components and their associated values and units.

Bottom Summary Table: A table with columns: 'Category', 'Value', 'Unit', and 'Weighted Value'. It provides a summary of the energy components and their weighted values.

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V1>V2 24 of 39 Elements
12 secondary element U/R values
Insulation v Window Costs

[illegible]

V2 Condensation Check (Dev)



[illegible]

V2 Decrement Delay Overheating Avoidance

[illegible]

**V2 Bill of Materials Quantities
Labour Products Costs
Refurb actions**

[illegible]

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V2 EE EC SC

Whole Building Life Cycle Analysis

Estimated Energy To Secondary Carbon

1 Basement Floor (B1)

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V2 LCA EPD (Dev)

Whole Building Life Cycle Analysis

1 Basement Floor (B1)

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V1 Resistances

Direction of heat flow

	Upwards	Horizontal	Downwards
inside resistance	0.10	0.17	
outside resistance	0.04	0.04	
underfloor space*		0.13	0.17
Below Ground Exterior Surface		0	

*These values should be used for the upper and lower surfaces of the underfloor space according to BS EN ISO 13370:1998

BS EN ISO 6946

Floors, walls and exposed floors



Air space resistances (m²·K/W)

Direction of heat flow

thickness of air space	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
20	0.16	0.18	0.18
30	0.16	0.18	0.21
100	0.16	0.18	0.22
300			

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BS EN ISO 6946

Scaling factors for ceiling ceilings and wall ties



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V1 Conductivities of Materials

Material Properties

Material	Thermal Conductivity (W/m·K)	Density (kg/m ³)	Thickness (mm)	U-value (W/m ² ·K)
Insulation	0.025	35	100	4.00
Concrete	1.7	2400	100	0.16
Brick	0.75	1800	100	0.13
Plaster	0.25	1000	10	0.25
Window	1.0	1200	12	0.83
Door	1.0	1200	40	0.25
Roof	0.04	1000	100	2.50
Floor	0.1	1000	100	1.00
Wall	0.1	1000	100	1.00
Basement	0.1	1000	100	1.00
Roof	0.04	1000	100	2.50
Floor	0.1	1000	100	1.00
Wall	0.1	1000	100	1.00
Basement	0.1	1000	100	1.00
Roof	0.04	1000	100	2.50
Floor	0.1	1000	100	1.00
Wall	0.1	1000	100	1.00
Basement	0.1	1000	100	1.00

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V1 Properties of Products

Products

Product	Thermal Conductivity (W/m·K)	Density (kg/m ³)	Thickness (mm)	U-value (W/m ² ·K)
Insulation	0.025	35	100	4.00
Concrete	1.7	2400	100	0.16
Brick	0.75	1800	100	0.13
Plaster	0.25	1000	10	0.25
Window	1.0	1200	12	0.83
Door	1.0	1200	40	0.25
Roof	0.04	1000	100	2.50
Floor	0.1	1000	100	1.00
Wall	0.1	1000	100	1.00
Basement	0.1	1000	100	1.00
Roof	0.04	1000	100	2.50
Floor	0.1	1000	100	1.00
Wall	0.1	1000	100	1.00
Basement	0.1	1000	100	1.00

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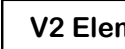

GBE  **GBC** 
Green Building Calculator <https://GreenBuildingCalculator.co.uk>

V1 Secondary Elements Data Collection and Calculator

Secondary Elements Materials Performance Data

Material	Thermal Conductivity (W/m·K)	Density (kg/m ³)	Thickness (mm)	U-value (W/m ² ·K)
Insulation	0.025	35	100	4.00
Concrete	1.7	2400	100	0.16
Brick	0.75	1800	100	0.13
Plaster	0.25	1000	10	0.25
Window	1.0	1200	12	0.83
Door	1.0	1200	40	0.25
Roof	0.04	1000	100	2.50
Floor	0.1	1000	100	1.00
Wall	0.1	1000	100	1.00
Basement	0.1	1000	100	1.00
Roof	0.04	1000	100	2.50
Floor	0.1	1000	100	1.00
Wall	0.1	1000	100	1.00
Basement	0.1	1000	100	1.00

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V2 Element Summary Ext Env For U Value Calculations

Element Summary: External Envelope

Element	Thermal Conductivity (W/m·K)	Density (kg/m ³)	Thickness (mm)	U-value (W/m ² ·K)
Insulation	0.025	35	100	4.00
Concrete	1.7	2400	100	0.16
Brick	0.75	1800	100	0.13
Plaster	0.25	1000	10	0.25
Window	1.0	1200	12	0.83
Door	1.0	1200	40	0.25
Roof	0.04	1000	100	2.50
Floor	0.1	1000	100	1.00
Wall	0.1	1000	100	1.00
Basement	0.1	1000	100	1.00
Roof	0.04	1000	100	2.50
Floor	0.1	1000	100	1.00
Wall	0.1	1000	100	1.00
Basement	0.1	1000	100	1.00

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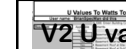
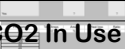
GBE  **GBC** 
Green Building Calculator <https://GreenBuildingCalculator.co.uk>

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

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

Element	Thermal Conductivity (W/m·K)	Density (kg/m ³)	Thickness (mm)	U-value (W/m ² ·K)
Insulation	0.025	35	100	4.00
Concrete	1.7	2400	100	0.16
Brick	0.75	1800	100	0.13
Plaster	0.25	1000	10	0.25
Window	1.0	1200	12	0.83
Door	1.0	1200	40	0.25
Roof	0.04	1000	100	2.50
Floor	0.1	1000	100	1.00
Wall	0.1	1000	100	1.00
Basement	0.1	1000	100	1.00
Roof	0.04	1000	100	2.50
Floor	0.1	1000	100	1.00
Wall	0.1	1000	100	1.00
Basement	0.1	1000	100	1.00

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V2 U value to Watts to CO2 In Use

U Value to Watts to CO2 In Use

U-value (W/m ² ·K)	Watts (W)	CO2 (kg)
0.1	10	0.1
0.2	20	0.2
0.3	30	0.3
0.4	40	0.4
0.5	50	0.5
0.6	60	0.6
0.7	70	0.7
0.8	80	0.8
0.9	90	0.9
1.0	100	1.0
1.1	110	1.1
1.2	120	1.2
1.3	130	1.3
1.4	140	1.4
1.5	150	1.5
1.6	160	1.6
1.7	170	1.7
1.8	180	1.8
1.9	190	1.9
2.0	200	2.0

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http://www.GreenBuilding.com.au		
<h2>V1 > V2 Fuel Carbon Factor</h2>		
FuelOptions	kgCO2/kWh	
Biomass	0.025	0.025
Coal	0.33	0.33
Grid Electricity	0.537	0.186
LPG	0.214	0.214
Natural Gas	0.185	0.185
Oil (Gas oil)	0.252	0.252
Renewable		
	2009	2020

Drop Down List Manufacturer Supplier Request (MSR)				
Element	Component	PrimaryFunction Alphabetic order	Format	MSR Material
Value Envelope Elements				
Envelope ID		Alphabetic		
Envelope Name		Alphabetic		
Envelope Number		Alphabetic		
Envelope Description		Alphabetic		
Envelope Material		Alphabetic		
Envelope Manufacturer		Alphabetic		
Envelope Supplier		Alphabetic		
Envelope Price		Alphabetic		
Envelope Weight		Alphabetic		
Envelope Volume		Alphabetic		
Envelope Length		Alphabetic		
Envelope Width		Alphabetic		
Envelope Height		Alphabetic		
Envelope Thickness		Alphabetic		
Envelope Color		Alphabetic		
Envelope Texture		Alphabetic		
Envelope Finish		Alphabetic		
Envelope Coating		Alphabetic		
Envelope Treatment		Alphabetic		
Envelope Protection		Alphabetic		
Envelope Security		Alphabetic		
Envelope Identification		Alphabetic		
Envelope Tracking		Alphabetic		
Envelope Monitoring		Alphabetic		
Envelope Maintenance		Alphabetic		
Envelope Repair		Alphabetic		
Envelope Replacement		Alphabetic		
Envelope Disposal		Alphabetic		
Envelope Recycling		Alphabetic		
Envelope Reuse		Alphabetic		
Envelope Storage		Alphabetic		
Envelope Handling		Alphabetic		
Envelope Transport		Alphabetic		
Envelope Distribution		Alphabetic		
Envelope Delivery		Alphabetic		
Envelope Receipt		Alphabetic		
Envelope Confirmation		Alphabetic		
Envelope Acknowledgment		Alphabetic		
Envelope Notification		Alphabetic		
Envelope Alert		Alphabetic		
Envelope Warning		Alphabetic		
Envelope Error		Alphabetic		
Envelope Exception		Alphabetic		
Envelope Incident		Alphabetic		
Envelope Event		Alphabetic		
Envelope Activity		Alphabetic		
Envelope Operation		Alphabetic		
Envelope Process		Alphabetic		
Envelope Procedure		Alphabetic		
Envelope Protocol		Alphabetic		
Envelope Policy		Alphabetic		
Envelope Rule		Alphabetic		
Envelope Guideline		Alphabetic		
Envelope Standard		Alphabetic		
Envelope Specification		Alphabetic		
Envelope Requirement		Alphabetic		
Envelope Condition		Alphabetic		
Envelope State		Alphabetic		
Envelope Mode		Alphabetic		
Envelope Setting		Alphabetic		
Envelope Configuration		Alphabetic		
Envelope Setup		Alphabetic		
Envelope Initialization		Alphabetic		
Envelope Calibration		Alphabetic		
Envelope Adjustment		Alphabetic		
Envelope Modification		Alphabetic		
Envelope Update		Alphabetic		
Envelope Change		Alphabetic		
Envelope Alteration		Alphabetic		
Envelope Transformation		Alphabetic		
Envelope Conversion		Alphabetic		
Envelope Translation		Alphabetic		
Envelope Interpretation		Alphabetic		
Envelope Explanation		Alphabetic		
Envelope Clarification		Alphabetic		
Envelope Elaboration		Alphabetic		
Envelope Expansion		Alphabetic		
Envelope Amplification		Alphabetic		
Envelope Enhancement		Alphabetic		
Envelope Improvement		Alphabetic		
Envelope Optimization		Alphabetic		
Envelope Refinement		Alphabetic		
Envelope Perfection		Alphabetic		
Envelope Completion		Alphabetic		
Envelope Finalization		Alphabetic		
Envelope Conclusion		Alphabetic		
Envelope End		Alphabetic		
Envelope Close		Alphabetic		
Envelope Shut		Alphabetic		
Envelope Seal		Alphabetic		
Envelope Lock		Alphabetic		
Envelope Secure		Alphabetic		
Envelope Protect		Alphabetic		
Envelope Safeguard		Alphabetic		
Envelope Shield		Alphabetic		
Envelope Guard		Alphabetic		
Envelope Defense		Alphabetic		
Envelope Resist		Alphabetic		
Envelope Withstand		Alphabetic		
Envelope Endure		Alphabetic		
Envelope Survive		Alphabetic		
Envelope Last		Alphabetic		
Envelope Remain		Alphabetic		
Envelope Persist		Alphabetic		
Envelope Continue		Alphabetic		
Envelope Proceed		Alphabetic		
Envelope Advance		Alphabetic		
Envelope Progress		Alphabetic		
Envelope Move		Alphabetic		
Envelope Shift		Alphabetic		
Envelope Transfer		Alphabetic		
Envelope Transport		Alphabetic		
Envelope Convey		Alphabetic		
Envelope Carry		Alphabetic		
Envelope Move		Alphabetic		
Envelope Relocate		Alphabetic		
Envelope Relocate		Alphabetic		
Envelope Relocate				

V2 Manufacturer Supplier Request Product Data Sheet



<https://www.greenbuildinginspector.co.uk>



Green Building Council
<https://www.gbci.co.uk/en/2020/01/>

V1 Awards/Shortlists

- 3 months after V1.0.0. launch
 - Green Apple 2020 Award Winner
 - Category and metal to be announced
 - Central England Prestige 2020-21 Winner
 - November announcement
 - Construction Computing 2020 Awards Shortlisted: (Announcement Nov/Dec 2020)
 - Innovation of the year 2020
 - One to watch Company 2020
- Submitted Applications:
 - CIBSE Building Performance Award 2021
 - PEA Awards 2020




GREEN APPLE
AWARD
TRANSPARENT AWARD




CENTRAL ENGLAND
PRESTIGE AWARDS
2020-21
2020-21



CONSTRUCTION
COMPUTING AWARDS
2020
FINALIST



Green Building Education



Green Building Council

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- **Brian Murphy BSc Dip Arch (Hons+Dist)**
 - Architect by Training
 - Specification Writer by Choice
 - Environmentalist by Actions
 - Writer and Editor by necessity (Websites)
 - Educator by calling
 - Number Cruncher by necessity (Calculators)
- **Greening up my act since 1999**
- **Founded National Green Specification 2001**
- **Funded and Launched what www.greenspec.co.uk 2003**
- **Created: GBE+ <https://greenbuildingencyclopedia.uk/> 2015**
- **Launched: GBC+ Learning <https://GBCLearning.com>**
- **Green Building Calculator <https://GreenBuildingCalculator.co.uk> 2020**
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- **LinkedIn: [BrianSpecMan](https://www.linkedin.com/company/brianspecman)**
- **Facebook: [BrianSpecMan](https://www.facebook.com/brianspecman)**
- **Facebook: <http://www.facebook.com/brianspecman>**
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