

# Green Building & Retrofit Calculators

© NGS GBE GBC GRC 2011-2023  
 BrianSpecMan Murphy GBC Number-Cruncher  
 GBC V2 GRC V1 Grand Designs Live 2023  
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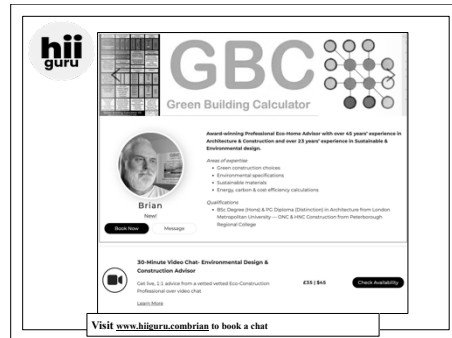
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**hii guru** **GBC** Green Building Calculator

**Brian**  
 Award-winning Professional Eco-Homes Advisor with over 45 years' experience in Architecture & Construction and over 13 years' experience in Sustainable & Environmental design.

**Areas of expertise:**


- Green construction phases
- Sustainable specifications
- Sustainable materials
- Energy, carbon & cost efficiency calculations

**Qualifications:**

- BSc Degree (Hons) & PGD Diploma (Distinction) in Architecture from London Metropolitan University - ONC & GBC Construction from Westborough Regional College

30-Minute Video Chat: Environmental Design & Construction Advisor  
 Call No. 02 9388 9186 or email: brian@hii.com  
 Professional team video chat | 4381 844 | [Book a chat](#)

Visit [www.hiiguru.com/brian](http://www.hiiguru.com/brian) to book a chat



**Brian Murphy**

- ONC & HNC Construction
- BSc Degree Architecture (Honours)
- PG Diploma Architecture (Distinction)
- Technician and Architect by training
- Specification Writer by choice (e.g. British Library)
- Environmentalist by action
- Educator by calling
- Carbon Counter by necessity
- Building Tour Guide for Fun (E.g. British Library)
- 45 Years of experience in construction
- 39 years in specification (£2420m)
- 23 years in environmental
- 15 years in education
- 11 years building carbon calculators
- Pensioned off but not finished

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**British Library**  
 £511m

**1st Freelance commission**

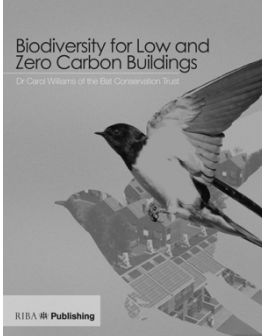
**Contract Specification writing**

**8 years** © 2020-23 GBC Green Building/Retrofit Calculator



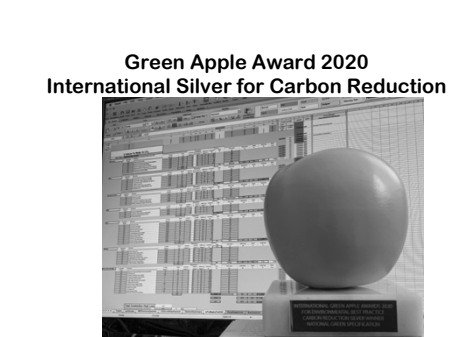

**BCT & RSPB**  
**RIBA Publishing**  
**1st & 2nd editions**  
**BRM Wrote 50% of book**

**10 Future proof construction methods**  
**3D cutaways**  
**2D Sections**  
**Details and Specifications**  
**Product Critique**

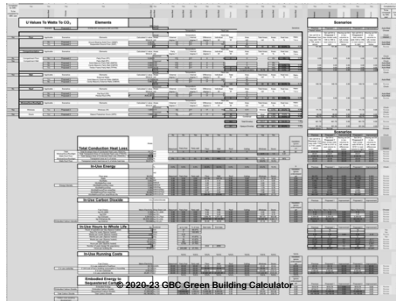


**Biodiversity for Low and Zero Carbon Buildings**  
 Dr Carol Williams of the Bat Conservation Trust

RIBA Publishing



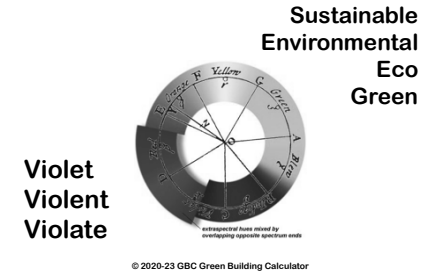
Green Retrofit Calculator



GBE GBC  
Green Building Calculator  
What did you do during COVID?

- I combined two whole building calculators
  - In-use energy and carbon
  - Embodied energy and carbon
  - Added much more to make a design and decision tool
- I made Green Building Calculator
  - (GBC V2 April 2022 preview at Futurebuild '22 London)
- Working on Green Retrofit Calculator
  - (GRC V1 November 2022 at Regen '22 Liverpool)
- Built in Bill of Quantities to carryout:
  - Green cost planning
  - Collecting sub-contract pricing
  - Tenders
  - Intelligent value engineering

GBE GBC  
Green Building Calculator  
Sustainable Environmental Eco Green



GBE GBC  
Green Building Calculator  
'Violet' Materials

- 'Violet' meaning:
- 'any material, construction product, construction method or building
- unfriendly to humans or the environment or adjacent materials
- whose performance diminishes in use or over time
- Deleterious materials might sum them up but many 'normal' materials are violet

GBE GBC  
Green Building Calculator  
'Violet' Industry

- Clients/employers, self-builders, developers, designers, Quantity Surveyors, contractors, manufacturers, applicators/installers, advisory organisations, manufacturer associations
- anyone that does not care about the environment
- or anyone that does not act on its behalf
- Virtually the whole industry
- It has been changing, slowly driven by legislation
- But far too slowly, until XR, Greta, David A,
- Watch out post-Brexit diminishing legislation
- And a Government that has not got a clue how

GBE GBC  
Green Building Calculator  
Violet Materials

- Non-renewable, finite
  - Fossil derivatives, fuel, hydrocarbons, high embodied carbon
  - Petrochemical, chemicals, synthetics:
    - + Plastics (from hydrocarbons)
- Unsustainable
  - Carbon based: e.g. Fuel
  - Release Carbon in manufacture or use: e.g. Cement 9%, Steel 7% (global man made carbon)
- High embodied energy: e.g. energy intensive manufacture
  - Metals: Steel, Aluminium (was made with renewable energy, today more gas and coal)
  - Plastics
  - Cement (UK uses more waste as fuel but tyres are fossil fuel)
- Hazardous materials and hazardous waste:
  - Wet, sticky, gooey or flows:
    - + resins, paints, sealants, chemicals,
  - Fine particulate: e.g. cement, asbestos, ceramic fibre
  - Corrosive, acidic, alkali
- Ozone depleting & Global Warming
  - Foamers plastics HFCs HCFCs
  - Aluminium production PFCs

Green: Environmentally Sustainable Materials

- Renewable: timber,
- Rapidly renewable: Plant based materials
- Abundant: Site subsoil, rocks, sand, gravel, stone
- Recycled & Recyclable:
  - post consumer content,
- Reclaimed & Reused:
  - on site materials, timber as timber not chipboard
- Carbon already out there:
  - reclaimed bricks, slates, stone
- Carbon sequestration: low, neutral or Carbon negative:
  - Plant and timber based
  - Grown aggregate by carbonation C8Systems
- Low embodied energy: Plant based, minerals
- Local: low transport miles, fuel, emissions and congestion

GBE GBC  
Green Building Calculator  
Deleterious Materials

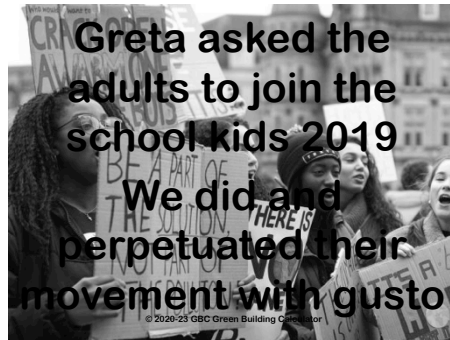
- Hazardous materials to builders and occupants and demolition
- Unhealthy materials
- Materials that are incompatible or incompetent within an application
- Materials that are not effective in their role

GBE GBC  
Green Building Calculator  
Healthy Materials

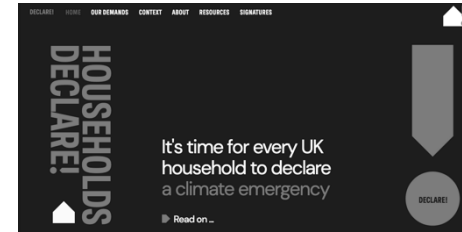
- Low VOC Volatile Organic Compounds:
  - but not loads of other chemicals to achieve it
- No hazardous materials in application and use
- No hazardous waste
- Low allergy (ignored by BRE GG)
- Low to Zero toxicity
- Good IAQ Indoor air quality
  - (ignored by BRE GG)



Self-build  
Self-manage  
Custom-build



ACAN launch  
Householdsdeclare.org



Green Building  
Calculator

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

Why did I start making GBC?

- I want I want I want..... us all to do better, first time
  - Clients: to get what they asked for not what we gave them
  - Quality Surveyors: to do VE not Cost cutting, WLC not cheap; carbon & costs
  - Procurement: to focus on management of competency of end result
  - Manufacturers: to provide all important data, multi-functional products
  - Environmental Assessors: to guide designers with facts and figures
  - Building Designers: to do their own cost planning & technical analysis
  - Enable non-BIMers to do BIM app type analysis outside of BIM
  - Tenders: to price a proper job and aim to claim no extras
  - Advisory Bodies: To be able to give more robust guidance
- To have better information at hand when they make all specification decisions
  - Evidence Based Design
  - Competent as was intended



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

Mahatma Gandhi



Green Building  
Calculator  
Website

https://GreenBuildingCalculator.uk

GBC V2+GBC V12 Cell colour codes & symbols Excel and BIM

- Was on every page
- Now on its own page
- Updated by GBC B2 Bespoke developments
- Brown not yet deployed

Legend	In Excel	GBC V2	In BIM
Cell colour	Red or Column Head	Complete	OK
Cell symbol	Blue or Column Head	Complete	OK
Green	User input cell. Needs into calculations through GBC	Yes	From list of Materials
Green with two text	User input cell with special entries to support calculation (product as required)	OK	By User if required
Blue	User to select option from Drop Down list GBC will apply choice to calculations	Choice	From list of Materials
Brown	GBC calculated result, applying user inputs or other cells or sheets	OK	From list of Materials
Orange	GBC delivers results from Links to Tables triggered by choice from Drop Down Lists	OK	From Model
Complete with red text	GBC calculated result, that the user can reference, i.e. the variables	OK	By User if required
Yellow	GBC calculation result, that the user can reference, i.e. the variables, can be used to drive a calculation in the calculator	OK	By User if required
Yellow with red text	Information to be calculated if results available locally	OK	By User if required
Red	User input cell, but not used in calculations	OK	By User if required
Green with red text	GBC calculation information Cell User to interrogate this data cells and make decisions on it	OK	User to interrogate result
Blue	Number determined	OK	By User if required
%/%	In development, calculation	OK	Auto memory
OK	Number determined	OK	Auto memory
OK	Data entered (output)	OK	Auto memory
OK	Information from Drop Lists	OK	Auto memory
Copy cell as text	Cells will contain calculations not containing text or other information	OK	Auto memory



GBC V2.3 Buildings

GBE GBC  
<https://greenbuildingcalculator.com>  
**GBC V2.3 Option Switched**

Option Switches	GBE V2.3 Option Switched	Default	Description
Rooms - Multiple Rooms	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.
Singular v Multiple sizes	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.
Sub-Element v Components	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.
Component costs v	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.
Elemental Cost Analysis	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.
Seasons: Summer v Winter	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.
New Build v Retrofit	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.
Generic Materials v Products	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.
Elements: Basecode, Ready-made	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.
Domestic v Non-Domestic	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.
Terrace with steps	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.
Demolition v Retrofit v New	Multiple Rooms	Yes	Rooms are considered as separate entities for energy modelling.

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GBE GBC  
<https://greenbuildingcalculator.com>  
**GBC V2.3 Hours Temperatures**

GBE V2.3 %%	In-Use Hours to Whole Life	Unit	up to max	% of
Days per week	7	days	7	100.00%
Hours per day	24	hours	24	100.00%
Minutes per hour	60	minutes	60	100.00%
Seconds per minute	60	seconds	60	100.00%
Days per year	365	days	365	100.00%
Hours per year	8760	hours	8760	100.00%
Minutes per year	525600	minutes	525600	100.00%
Seconds per year	31536000	seconds	31536000	100.00%
Normal (24/7/365)	8760	hours	8760	100.00%
Change Life: Number of years	1	years	1	100.00%
Hours per building life	8760	hours	8760	100.00%
Days per year	365	days	365	100.00%
Hours per day	24	hours	24	100.00%
Minutes per hour	60	minutes	60	100.00%
Seconds per minute	60	seconds	60	100.00%
Days per year	365	days	365	100.00%
Hours per year	8760	hours	8760	100.00%
Minutes per year	525600	minutes	525600	100.00%
Seconds per year	31536000	seconds	31536000	100.00%
Normal (24/7/365)	8760	hours	8760	100.00%

GBE GBC  
<https://greenbuildingcalculator.com>  
**GBC V2 Schedule of Accommodation**

Room Functions	Area	Volume	Use	Occupancy	Temperature	Lighting	Power	Equipment	Control	Notes
...	...	...	...	...	...	...	...	...	...	...

**GBC V2 Roofs Parts**

Roofs	Area	Volume	Use	Occupancy	Temperature	Lighting	Power	Equipment	Control	Notes
...	...	...	...	...	...	...	...	...	...	...

**GBC V2: Other Roof Geometry**

User name:	BrianSpecMan did this																		
Project name:	Over type with Project name																		
Project address:	Over type with Project address																		
Other Geometry Roofs	<table border="1"> <thead> <tr> <th>Roof name</th> <th>Roof pitch</th> <th>Roof slope</th> <th>Roof area</th> <th>Quantity</th> <th>Width</th> <th>Length</th> <th>Area</th> <th>Volume</th> </tr> </thead> <tbody> <tr> <td>...</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> </tr> </tbody> </table>	Roof name	Roof pitch	Roof slope	Roof area	Quantity	Width	Length	Area	Volume	...	...	...	...	...	...	...	...	...
Roof name	Roof pitch	Roof slope	Roof area	Quantity	Width	Length	Area	Volume											
...	...	...	...	...	...	...	...	...											

GBE GBC  
<https://greenbuildingcalculator.com>  
**GBC V2 Room By Room Heat Losses**

Room Functions	Area	Volume	Use	Occupancy	Temperature	Lighting	Power	Equipment	Control	Notes
...	...	...	...	...	...	...	...	...	...	...

© 2020-23 GBC Green Building Calculator

**GBC V2 Room by room Heat losses**

Boiler Size Check	Room By Room Heat Losses
...	...

**GBC V2 Form Factor**

Form Factor	Room Functions	Area	Volume	Use	Occupancy	Temperature	Lighting	Power	Equipment	Control	Notes
...	...	...	...	...	...	...	...	...	...	...	...

GBE GBC  
<https://greenbuildingcalculator.com>  
**GBC V3 Building Plan Shapes**

Building Shapes	Area	Volume	Use	Occupancy	Temperature	Lighting	Power	Equipment	Control	Notes
...	...	...	...	...	...	...	...	...	...	...

GBE Green Building Calculator  
<https://GreenBuildingRetrofit.com>

GBC Green Building Calculator  
<https://GreenBuildingRetrofit.com>

### GBC V2 U values Etc. Targets

U Values Etc

### GBC V2 Thermal Insulation Conductivities

- Violet columns: Violet materials: do not use:
  - (asbestos, ceramic fibre, CFC, HCFC plastics)
- Dark blue columns: need more properties

Insulation Conductivity

>150 Materials/formats >  
 k values > U values > Thickness

>150 Materials/formats >  
 k values > U values > Thickness

>150 Materials/formats >  
 k values > U values > Thickness

### GBC V3 Insulation k density she

rd

Insulation Conductivity

Winter Conductivity Thermal Insulation keep heat in

Decrement Delay calculator

Summer Radiant Thermal Insulation keep heat out

© 2020-23 GBC Green BuildingRetrofit Calculator

GBE Green Building Calculator  
<https://GreenBuildingRetrofit.com>

GBC Green Building Calculator  
<https://GreenBuildingRetrofit.com>

### GBC V2 Elements

- Component rows: Yes, No
- Choose: New, Retrofit, Demolition
- Choose: Generic materials, Products
- Components: Choose materials
- Check: U value Pass or fail

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

- Retrofit bespoke development
- Existing, previous & proposed interventions
- Individual rates or overall rates

GBE Green Building Calculator  
<https://GreenBuildingRetrofit.com>

GBC Green Building Calculator  
<https://GreenBuildingRetrofit.com>

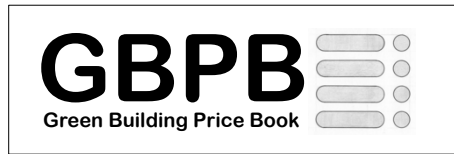
### GBC V2 Elemental Cost Planning

SPCA 4th Edition

Detailed (Elemental) Cost Analysis

Element (and sub-components)	Area of Quantity?	Cost per m <sup>2</sup> (GA)	Cost per m <sup>2</sup> (GA) (Over Internal Floor Area)	Total Area	Unit Quantity	Unit Rate	Cost
Substructure	25	688.00	66	1,000	12,700.00		

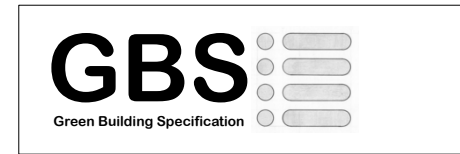
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### GBC V2 Element EE EC & SC

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### GBC V2 EE EC SC Look Up Table More datasets needed

### ICE 3.0 database carbon reporting options

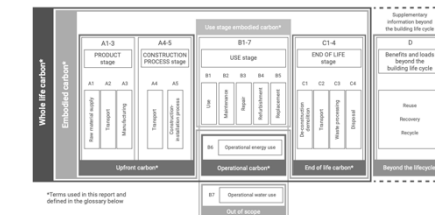
Mass/Declared Unit	kg/Declared Unit
Embedded Energy only	
Embedded CarbonO2 (only)	kgCO2/kg
Embedded CarbonO2 (only)	kgCO2/m2
Embedded CarbonO2 equivalent	kgCO2e/kg
Embedded CarbonO2 equivalent	kgCO2e/tonne
Embedded CarbonO2 equivalent	kgCO2e/m2 per 1 mm
Embedded CarbonO2 equivalent	kgCO2e/m2 per 100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

### GBC B2 ICE Database EC datasets: more calculations to enable comparison

© 2020-23 GBC Green Building Calculator



### EN 15978



\*Terms used in this report and defined in the glossary below

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**GBC GBC V3 LCA EPD**

- Each row is a component of an element (3 to 20 components make up an element) (framing insulation lining)
- Each group of components makes an element (up to 39 make up a building) (partition, wall, floor, roof)
- Each column is an EN 15804 stage A-D or subdivision column
- Each group of columns is an environmental impact (7 groups 7 impacts 1 is carbon=)

**GBC V2 Conductivities**

**GBC V2 Conductivities right columns inconsistent format Reformatted**

**GBC V2 Conductivities updated**  
**More data needed**

**GBC V2 & GBC V3 Intelligent DDL & LUT**

Table showing Intelligent DDL & LUT for GBC V2 & GBC V3. Columns include: ilue Total DDL (23/03/2022), Elemental U value Blocks, EUVDDL Name, and EUVDDL shorter M. Rows list various building components like Accessory Floor spaces and ADME Sinks.

**GBC V2 Material Product Data EEECS EPD Data Collected becomes Look Up Table**

**GBC V2 Secondary Elements Windows & Glazing options**

**GBC V2 U value > Watts > CO2 In Use**

**GBC V2 In-use Energy Carbon Costs**

GBC V2 Then add: Carbon targets Pass or Fail  
GBC V2 Then add: Cost Pay Back Carbon Pay Back Value Engineering

**GBC V2 Costs to users**

Completed by GBC	GBC V2	Yes	Yes	Yes
	<b>V2 Prices</b>	V1 One off payment (no longer available when V2 is launched)	V2 One off (with corrections but no future developments)	V2 Annual renewal subscription (with future developments)
	Larger practice	£98.88	£98.88	£98.88
	Six to ten person practice	£78.88	£78.88	£78.88
	One to five person practice	£48.88	£48.88	£48.88
	Graduate, employee (Own use)	£8.88	£8.88	£8.88
	University Professor, Tutor, Lecturer (to show/demo)		£8.88	£8.88
	University Professor, Tutor, Lecturer (to hangout to one student cohort)		£98.88	£98.88
	Student (own use only)	£4.88	£4.88	£4.88
	Self Builders, TANIS OPD Wales	£4.88	£4.88	£4.88
	Other Self Builders, BIV, OIV, Self-Managers	£48.88	£48.88	£48.88
	GBC V1.1 (Lite demo)		£1.88	
	GBC V2 (view only non-functioning) explore before you buy		£1.88	

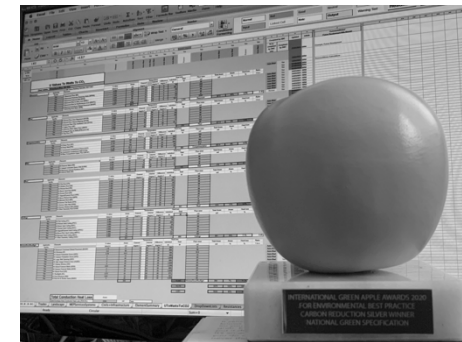
## GBC V2-GBC V36 Planned Development

- Priorities to bring forward:
  - GBC V1 Retrofit, Terraces, Community level, MEP Services,
  - GBC V2 Decarbonised Delay, Form factor refinements
  - GBC V3 Building Services Cooling, Compressed Application,
  - RF2 ready made elements, Bespoke Assemblies,
  - Accessories, Specification Generator
  - GBC V4 Non-Domestic, Retrofit and Newbuild more refinement
  - GBC V6 Embodied Energy, Carbon and Sequestered carbon,
  - Non-internal envelope elements
  - GBC V7 Condensation Check, Thermal Bridge, Secondary
  - Element Calculator, Thermal mass calculator
  - GBC V8 LCA Calculator
  - GBC V9 Landscape
  - GBC V10 Chills and Infrastructure: scope increased
  - GBC V11 Waste Calculator using WasteCostEstimator
  - GBC V12 Plastic free / Recycled Plastic
  - GBC V13 Interiors: Scope increased, Bxa fit-out, re-fit
  - GBC V14 Circular economy: Reclaim Reuse
  - GBC V15 Self-build interface
  - GBC V16 CAD BIM Apps
  - GBC V17 Whole Project Budget Calculations, Full Fee bid calculation based on cost plan
  - GBC V18 EU and International versions
  - GBC V19 Services Design, Heating, Occupancy, Heat, Energy Sources and uses
  - GBC V20 Lighting Design: Metrics: Health & Wellbeing, Light
- Nutrition
  - GBC V21 Biodiversity Inclusion, Biodiversity Net Gain
  - GBC V22 Local Climate Appropriate construction and materials
  - GBC V23 Versatile/ local materials, trades, economy
  - GBC V24 OSPB Green Building Price Book
  - GBC V25 O&M Operation & Maintenance Manuals
  - GBC V26 FM Specification
  - GBC V27 Local Procurement, Transport to site, distance search facility
  - GBC V28 On Site Construction Emissions
  - GBC V29 Design Life, Durability and Competent Products
  - GBC V30 Air Lightness & Energy Loss
  - GBC V31 Value Engineering Opportunities: in not out
  - GBC V32 Healthy Building
  - GBC V33 Screening Priorities
  - GBC V34 Indoor Air Quality
  - GBC V35 Natural Lighting Levels
  - GBC V36 Demolition Embodied carbon in waste
- Bespoke
  - GBC B1 Retrofit Window & Insulation Calculator
  - GBC B2 Responsible retrofit Carbon Calculator
  - GBC B3 Window Calculator
  - GBC B4 Screens Calculator
  - GBC B5 NRM3 QS interface



## GBC V1 Awards/Shortlist

- 3 months after GBC V1 launch
  - Green Apple 2020-21 Award Winner
    - Category and metal to be announced
  - Central England Prestige 2020-21 Winner
    - November announcement
  - Construction Computing 2020 Awards Shortlisted but no award
    - Innovation of the year 2020
    - One to watch Company 2020
    - Too new, no results, collect results & reapply
  - LSI RISE Awards 2021:
    - Highly Commended
    - Category: Education & Training



## GBRC B6 Retrofit

STBA & HES Responsible Retrofit Options Appraisal & Carbon Calculator



# GRC

Green Retrofit Calculator

<https://GreenBuildingCalculator.uk>

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## Green Retrofit Calculator GRC V1

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



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

Scottish equivalent data



English Housing Survey Floor Space in English Homes - main report



## GBC B2 House Type Data Sets > 1 England and Scotland

B2 Standard House Types	England		Scotland	
	Count	Area	Count	Area
1.1 Semi-detached (2 storeys)	1000	100000	500	50000
1.2 Semi-detached (1.5 storeys)	800	80000	400	40000
1.3 Semi-detached (1 storey)	600	60000	300	30000
1.4 Terraced (2 storeys)	1200	120000	600	60000
1.5 Terraced (1.5 storeys)	900	90000	450	45000
1.6 Terraced (1 storey)	700	70000	350	35000
1.7 Detached (2 storeys)	400	40000	200	20000
1.8 Detached (1.5 storeys)	300	30000	150	15000
1.9 Detached (1 storey)	200	20000	100	10000
1.10 Bungalow (1 storey)	100	10000	50	5000

© 2020-23 GBC Green Building Calculator



## GRC V1 B6 Paper Based Site Survey

B2	B2 Paper based site survey	© STBA 2021-2022 developed by GBC and STBA
Survey File: House of the Day	Core Data Source	Site survey
Construction Era	Site Location Predefine	
Site Location City	Existing Wall Material	
Existing Wall Material	Existing Wall Formset	
Existing Wall Thickness (mm)	Existing Internal Finish	
Previous External Wall Insulation Position	Previous External Wall Insulation Material	
Previous External Wall Insulation Thickness	Previous External Wall Insulation Thickness	
habitable rooms	Bathrooms	
Bedrooms	Basement	
Roof Floor Area	Number of Storeys in House	
Area of ground floor	Ground floor construction	
Ground floor insulation	Ground floor insulation material	
Ground floor insulation thickness	Ground floor insulation thickness	
Area of Roof	Existing Roof Pitch	
Previous Roof Insulation Position	Previous Roof Insulation Material	
Previous Roof Insulation Thickness	Previous Roof Insulation Thickness	
House depth	H/F Wall Area Permetre per floor	
Floor to ceiling height	Roof to ceiling height	
Roof to floor height		

- Can be developed as iPad survey sheet
- To auto-feed bespoke building types into house types table
- Choose the one new bespoke building type to populate calculation cells



**GBE**  **GBC**   
 https://www.greenbuildingcalculator.com/  **GRC V1 Tablet Survey Feed**

**B2 Tablet site survey**

Category	Item	Value	Unit	Notes
General	Project Name			
	Project Address			
	Project Postcode			
	Project Type			
	Project Status			
	Project Start Date			
	Project End Date			
	Project Duration			
	Project Manager			
	Project Contact			
Building	Building Name			
	Building Address			
	Building Postcode			
	Building Type			
	Building Status			
	Building Start Date			
	Building End Date			
	Building Duration			
	Building Manager			
	Building Contact			

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

Building ID	Building Name	Address	Postcode	Type	Status	Start Date	End Date	Duration	Manager	Contact
1	100 Broad Street	Birmingham	B1 2LP	Office	Completed	2010	2015	5	John Smith	0121 123 4567
2	101 Broad Street	Birmingham	B1 2LP	Office	Completed	2010	2015	5	John Smith	0121 123 4567

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## GBC B2 Survey Sheet v 1 populated

**B2 STBA Retrofit Survey Form** © STBA 2018 designed by GBC and STBA

Client Name: [ ]  
 Project Name: [ ]  
 Project Address: [ ]  
 Project Postcode: [ ]

**Appraisal Options**

Cost saving	Yes	Drop Down List	Choose
Carbon saving	Yes	Drop Down List	Choose
Good indoor air quality	Choose	Drop Down List	Choose
No Surface or Inherent Contamination and Moisture	Choose	Drop Down List	Choose
Health & Wellbeing	Yes	Drop Down List	Choose
Wider benefits	Yes	Drop Down List	Choose

**Client/Designer Aspiration**

Experimental or Innovative	Yes	Drop Down List	Choose
Designing for the future	Yes	Drop Down List	Choose
Meeting or Exceeding	Yes	Drop Down List	Choose
Meeting or Exceeding	Yes	Drop Down List	Choose

**Scope**

Normal or Reference Building

Ground floor	Yes	Drop Down List	Choose
External walls	Yes	Drop Down List	Choose
Party floor	Yes	Drop Down List	Choose
Party wall	Yes	Drop Down List	Choose
Roof	Yes	Drop Down List	Choose
Windows	Yes	Drop Down List	Choose
Doors	Yes	Drop Down List	Choose
Services	Yes	Drop Down List	Choose
Heating	Yes	Drop Down List	Choose
Ventilation	Yes	Drop Down List	Choose
Lighting	Yes	Drop Down List	Choose
Hot water	Yes	Drop Down List	Choose
Electricity	Yes	Drop Down List	Choose

**Risk factors** See below for each element's own risk analysis

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## GBC B2 Survey Sheet v 2 Populated Scotland

Context:	Step 1	Drop Down List
Project Address	Project Name	Drop Down List
Project Address Country	Project Address	Drop Down List
Project Address Postcode	Project Address	Drop Down List
Construction: Mixture (open or closed)	Project Address	Drop Down List
Construction: Flat	Project Address	Drop Down List
Heritage status	Project Address	Drop Down List
Risk Status	Project Address	Drop Down List
Building type: Link to GBC	Project Address	Drop Down List
Building Fabric Condition	Project Address	Drop Down List
Choose between: Emission Report, Construction Report	Project Address	Drop Down List
B2: Use the B2 column	Project Address	Drop Down List
Standardised dwelling: standard Assessment: Above or below	Project Address	Drop Down List
Outside winter average temperature	Project Address	Drop Down List
Below ground floor temperature	Project Address	Drop Down List
Lifestyle temperature Choice	Project Address	Drop Down List
Temperature Choice	Project Address	Drop Down List
Assumed: Retrofit choice for parties beyond party walls/floors	Project Address	Drop Down List
Surface temperature choice	Project Address	Drop Down List

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## GBC B2 Moisture Risk Factors & Feedback

Element	Risk Factor	Feedback
Roof	Roof type	Drop Down List
Roof	Roof condition	Drop Down List
Roof	Roof insulation	Drop Down List
Roof	Roof ventilation	Drop Down List
Roof	Roof waterproofing	Drop Down List
Roof	Roof drainage	Drop Down List
Roof	Roof maintenance	Drop Down List
Roof	Roof replacement	Drop Down List
Roof	Roof repair	Drop Down List
Roof	Roof cleaning	Drop Down List
Roof	Roof inspection	Drop Down List

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

Element	Assembly	Intervention	Value	Unit	Notes
Roof	Roof type	Roof type	1.0	m²	
Roof	Roof condition	Roof condition	1.0	m²	
Roof	Roof insulation	Roof insulation	1.0	m²	
Roof	Roof ventilation	Roof ventilation	1.0	m²	
Roof	Roof waterproofing	Roof waterproofing	1.0	m²	
Roof	Roof drainage	Roof drainage	1.0	m²	
Roof	Roof maintenance	Roof maintenance	1.0	m²	
Roof	Roof replacement	Roof replacement	1.0	m²	
Roof	Roof repair	Roof repair	1.0	m²	
Roof	Roof cleaning	Roof cleaning	1.0	m²	
Roof	Roof inspection	Roof inspection	1.0	m²	

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## GBC B2 Energy > Fuel Choice > In Use CO2 > In Use £ & By Element And Retrofit Scenarios

Element	Energy	Fuel Choice	In Use CO2	In Use £	By Element	Retrofit Scenarios
Roof	Roof type	Roof type	Roof type	Roof type	Roof type	Roof type
Roof	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition
Roof	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation
Roof	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation
Roof	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing
Roof	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage
Roof	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance
Roof	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement
Roof	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair
Roof	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning
Roof	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection

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## GBC B2 In Use Energy > CO2 > £ EE EC SC and Retrofit Scenarios Build Costs and Pay back Periods

Element	In Use Energy	CO2	£	EE	EC	SC	Retrofit Scenarios	Build Costs	Pay back Periods
Roof	Roof type	Roof type	Roof type	Roof type	Roof type	Roof type	Roof type	Roof type	Roof type
Roof	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition
Roof	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation
Roof	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation
Roof	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing
Roof	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage
Roof	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance
Roof	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement
Roof	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair
Roof	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning
Roof	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection

Element	Energy	CO2	£	EE	EC	SC	Retrofit Scenarios	Build Costs	Pay back Periods
Roof	Roof type	Roof type	Roof type	Roof type	Roof type	Roof type	Roof type	Roof type	Roof type
Roof	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition	Roof condition
Roof	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation	Roof insulation
Roof	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation	Roof ventilation
Roof	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing	Roof waterproofing
Roof	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage	Roof drainage
Roof	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance	Roof maintenance
Roof	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement	Roof replacement
Roof	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair	Roof repair
Roof	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning	Roof cleaning
Roof	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection	Roof inspection



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