Future Systems: Sustainability



Quotes for the Day

- "If we were not committed to BREEAM we could have made a greener building"
- BRE EcoHomes and Code For Sustainable Homes: unintended consequences forced an industry response:
- Fabric First Eco Bling Last
- BRE Green v GBE Green

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Week 26	21.01.2019 Lecture 09.	Regulatory Framework	Design Task 03
Week 27	28.01.2019 Lecture 10.	Site Analysis	
Week 28	04.02.2019 Lecture 11	Ruilding Costs	
Week 28	05.02.2018	Technology Champion	
Week 29	11.02.2019 Lecture 12.	Future Systems: Sustainability	Design Task 04
Week 30	18.02.2019 Lecture 13.	Guest Lecture: Structural Engineer	
Week 31	25.02.2019 Lecture 14.	Design to Perform & Detailing	
Week 32	01.03.2019 -	Class Trip (TBC)	
Week 33	11.03.2019 -	Independent Study Week	
Week 34	18.03.2019 Lecture 15	Future Systems: Technologies	
Week 35	25.03.2019 Lecture 16.	Module Review	
Week 36	01.04.2019 -	Formative Review	Present your Semester B Work
Week 37	08.04.2019 -	No Lecture	
Week 38	15.04.2019 -	Spring Break	
Week 39	22.04.2019 -	Spring Break	
Week 40	29.04.2019 -	No Lecture	
0040	@ 005 NO0	ACINIC ADAG. E. Lung Contament	Custola shills

>40 years into 1 Hour won't go • So I am providing links to other information if you want to know more

- Question Everything
- Don't assume that I know everything
- Don't assume I have cherry picked the best bits
- Don't assume what your being told is the whole story
- Some will hide what they don't want you to know
- Do your best with what you know
- When you know better
- Do better

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GBE CAPEM		GBE XXX	
Glass External		(21) Timber	(66) Transport
Walls		External Walls	Systems
(21.4) Curtain Walls		CI/SIB (21.1) Load-bearing (21.3) Non Load-bearing	
	GBE 💥 CAPEM 📑		GBE 💥 CAPEM G
	(21) Masonry		(21) Timber
	External Walls	Control of Street of Control	Frame
	CMMB: (21.1) Load-bearing (21.3) Non Load-bearing		Construction Critique
GBE WE TO BE BE		GBE W CAPEM	
	Territoria de la constante de	BDA Illustrated	
(21) Other		Introduction to	
External Walls		Brickwork Design	
CISHB (21.1) Load-bearing (21.3) Non Load-bearing		© Brick Development Association 1975 To Rought AADquittibA A shining example of how to communicate with Architecte	
	GBE 💥 CAPEM 🐨		GBE W CAPEM O
(24) Stairs Ramps	(22) Internal		GBE GBS H21
+Slides	Partitions		Timber Cladding
14/02/19 _{bogunt} croation 0	014 Lafet also Exam + 026 Lafet Tonius Romad + A V Parat Participation + 820 Parat Participation - 820 Salada Participation	ure Systems: Sustainabilt	Issues: Designers, Stewardship, Warket Bojutions: Expert system, Design Guide, Certification scheme, Definitive Specification



This Presentation on GBE:

- Find this file on GBE website at:
- https://GreenBuildingEcyclopaedia.uk/?P=20396

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 <u>https://www.pinterest.co.uk/bmurphy1390/</u> <u>Bioregional</u>

Definitions/Jargon Busters

Sustainability

- Carbon Targets v Building Regulations
- Goals: Global v National v Sector
- Future Systems v Now Systems
- Environmental Assessment Methods
- Energy Standards
- Water Standards
- Health & Wellbeing Standards
- 14/02/19• Retrofit Standards







*		
***	Culture and community	Respecting and reviving local identity, wisdom and culture; encouraging the involvement of people in shaping their community and creating a new culture of sustainability
918	Land use and wildlife	Protecting and restoring biodiversity and creating new natural habitats through good land use and integration into the built environment
	Sustainable water	Using water efficiently in buildings, forming and manufacturing. Designing to avoid local issues such as floading, drought and water course pollution
ő	Local and sustainable food	Supporting sustainable and humane farming, promoting access to healthy, low impact, local, seasonal and organic diets and reducing food waste
¢	Sustainable materials	Using sustainable and healthy products, such as those with low embodied energy, sourced locally, made from renewable or waste resources
ð Þo	Sustainable transport	Reducing the need to travel, and encouraging low and zero carbon modes of transport to reduce emissions
0	Zero waste	Reducing waste, reusing where possible, and ultimately sending zero waste to landfill
4	Zero carbon	Making buildings energy efficient and delivering all energy with renewable



Environmental Assessment Methods (EAM)

- · When Business as Usual (BAU) is bad, - EAM are invented
- Sadly quite often BAU with a green tick
- Just a sticking Plaster
- "If we were not committed to BREEAM we could have made a greener building"
- Don't assume following EAM means you are being Environmental
- You may be being less bad
- Less bad is not good enough

Environmental Assessment Methods

- BRE EcoHomes (was UK wide then Scotland only)
- SPEAR (Arup's own, makes nice diagrams but no robust scorina)
- NEET (Healthcare sector invented by Architects practice (Gone now) (Swallowed by BREEAM Healthcare)
- DREAM (Defense Related Environmental Assessment Method) (BRE prevented its development) • BREEAM (UK+Global) Many Building Types; New, Refurb, In-use
- LEED (USA+Global Invented by ExBREEAM staff) DCLG's Code for Sustainable Homes (CfSH) developed by BRE
- (no longer in statute, parts added to other legislation)
 BRE Homes for Good (to fill the gap left by CfSH)
- · Ska (Fit-out, Refit; Retail, Office, Higher Education; Broader and better than BREEAM) CEEQUAL (Civils; now BREEAM Infrastructure)
- GreenStar (Australia) (Business focus)

BREEAM

- Applies to non-domestic buildings
- · Pass levels: Fail, Pass, Good, Very Good, Excellent, Outstanding.
- Works with Green Guide to Specification - Pushing the boat out?
- Boat never left the dock
- My project brainstorm sessions address real issues but frequently fail to score a **BREEAM** credit
- except 1 for having the brainstorm session

BREEAM Ticks boxes

- BDP invited NGS to brainstorming session with 5 Architect teams on city centre regeneration project
- · Teams described proposed actions
- NGS proposed one team's problems were another team's solutions Real solutions for real problems - BDP said 'what great ideas, wish we had recorded them'
- · BREEAM assessor said 'but you won't get a BREEAM credit for that' And so it went on all day
- What would you do?
 Drop BREEAM and do the greener thing?
- It was a BREEAM assessed project so what did they do? - BAU

Green & Blue	BREEAM Commu) EAM
Infrastructure	BREEAM Civils] & EP
Existing	*BREEAM In Use	BRE Groon
C C	EcoHomes XB	Guide to
Ļ	BREEAM Refurb	Specification Generic
Non-domesti	BREEAM	materials
	BREEAM Material	or buildings &
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nomes	EcoHomes Scotlar	Profiling
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Sus Trains Green & Blu	Or Equivalent	GBE Green Building Encyclopaedia
	BREEAM Civils	GBE HERACEY
<u>p</u>	·	GBE PASS Product Accessory
ExistPldit	BREEAM In Use	GBE Compare
		GBE Services
ត្	EcoHomes XB	GBE Civils & Infrastructure
		GBE Echo
Ska.	BREEAM Refurb	GBE BEST
·	f.,	GBE BEACON
Non-stamesti		GBE SWMP
lệ	BREEAM Materials	GBE End Of Life
		GBE Product Passport
DSPEAR.	DREAM NEET	RIP GBE LCA
Homes		GBE EPD
	EcoHomes Scotla	nd
AECB Water	CfSH > BREEAM R	esi



BRE Green Guide To Specification (GGtS)

- Green Guide expressly excludes Indoor Air Quality from its assessment.
- If you assume Green Includes Healthy
- How can GGtS be promoted as a guide to Greenness?
- Its has so few 'Green' materials that it can only be regarded as a guide to the 'least Violet of the Violets'

BRE: Environme Negative manufa	ental Profiles: cturing impacts
 Abiotic depletion 	Petrochemical
 Global warming 	oxidation
Ozone laver	 Acidification
depletion	 Eutrofication
 Human Toxicity 	 Solid waste
Fresh water aquatic	 Radioactivity
ecotoxicity	Mineral extraction
 Terrestrial ecotoxicity 	• Water extraction 31





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802.1	and POE)			E28	Reduce water in use			
D01	Energy efficient lighting		51	P11	Reduce small power	energy in use		
602	Energy efficient light fittings		9.1	1525	Paduce total wante in	1 100		
028	Thermal comfort assessment		9.1	P05	increase recycling of	wantle in use		
202	Lighting controllability		91.1	073	Return rackasing w	and a		
E14	Efficient taps							
0.90	Lighting design							
029	Acoustic design							
032	Ventilation rates							
0.72	Pre-relationment audit							
1405	Hardwoods							
3612	Soft flooring							
022	Low-GWP insulation							
080	Designing out waste							
Q12	Reduce gypsum wasla							
022	Low impact refrigerants							
069	Soft landings: design workshops							
009	Resource management plan (RMP)							
502	Energy efficient white LEDs							
601	Lighting controls							

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	+ D2	8 Thermal comfort assessment	008	Welbeing				0 included
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	+ E	d Efficient taps	008	Water				4 poi - 4 anni - 6 anni 4
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	+ 02	2 Acoustic design	008	Welbeing				Measures (11.0000)
	+ 03	2 Ventilation rates	898	Welbeing				0 targeted
	÷ 22	2 Pre-refurbishment audit	008	Waste				@ gold - @ silver - @ bronze
	÷ 55	E Hardwoods	008	Materials				Gold rating requires
	Ф <u>М</u>	2 Suit fooring	008	Materials				94 measures 24 gold gateway
	+ 00	2 Low-GWP insulation	0.00	Pollution				Silver rating requires
	+ DI	0 Designing out waste	898	Waste				15 silver gateway
	+ 21	2 Reduce gypsum waste	898	Waste				Bronze rating requires
	+ 52	2 Low impact rehigerants	008	Pollution				B bronze gateway
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D25	Thermal comfort assessment	120				
D32	Lighting design					
D29	Acoustic design					
D33	Ventilation rates					
D22	Outside views					
D52	Breakout space					
0.75	Personal storage					
077	Biophilic design					
D21	Daylight glare control					
D:62	CO2 monitors					
D32	Occupant HNAC control					
D25	Cleaning of existing air supply ductwork					
D35	Specialist and printer-copier equipment area ventila	don 🛛				
Q3 7	Fine air fiters					
D53	Low-VOC finishes					
255	VOC monitors					
P12	Fit-out VOC monitoring					

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Water Design Standards

- Building Regulations Approved Document G
 Part L update was found too hard to take
 Part G update was easy to address but postponed
- BREEAM water credits
 Calculation made no sense
- Fill the bath to overflow then get in
 Freedom of Information Act
- BRE Staff: 'Calculator does not work'
 BRE Management: 'We go live tomorrow
- AECB Water standard
- Realistic standards

1/02/10

avoiding retrofit of power showers

Biodiversity

- BCT Biodiversity for Building tool
- BCT Biodiversity for Planning tool website
- BCT RSPB RIBA Book Biodiversity & Building
 Brian Murphy: produced 50% of book content
- 1st Edition: Biodiversity for Low and Zero carbon Buildings: A Technical Guide for New Buildings
- 2nd Edition: Added refurbishment and Green Infrastructure ISBN: 9-781859-463536
- 3^{rd} Edition: being discussed now: MMC to add



Wider issues

- GBE HERACEY™
- Healthy Environmental Resourceful Appropriate Competent Effective Yardstick (400 criteria)
- Minergie P + Eco (Swiss)
- Energy, Passivhaus and Eco
- Passivhaus + Eco (Austria) IBO Book

Health and Wellbeing (H&W)

Ska

- Fit-out & Refit; Good Practice Measures (GPM)
- Retail (R), Office (O), Higher Education (HE);
 Broader scope and better application than BREEAM
- Broader scope and better application than BREE
 HE addresses H&W substantially
- BREEAM
- Addresses H&W superficially
- WELL (USA) Health and Wellbeing
 in the UK already
- in the UK already
 £££ assessments and tests carried out in USA
- Building Biology Association (BBA)
 German Institute's standards developing since 1960's
- Choice of healthy materials and method of construction
 4
- 2 day TGR training course with design manual

Future Systems: Sustainability

14/02/19













Plan the Journey

- Know your destination
- Then your meanderings all lead to the same destination
- · Without detours
- · Without going round in circles
- Without treading the same path twice

House plan

- Showing the final insulation regime
- Modify the services installations with the final insulation regime in mind
- Avoid servicing > undoing services > insulating > re-servicing
- Or avoid services and insulation in the same place or insulate first
- Radiators not on the external wall
- Insulate in patches then service
- Insulate wall then boiler
- Insulated underfloor heating and no radiators









· You will find a large number of other files there too 102/10

Feedback · These files are created by generalists with a big dollop of green flavour • These files are updated from time to time

- We are not experts so from time to time these file may get out of date or may be wrong
- · If you feel that we have got it wrong please let us know so we can put it right
- ^{102/19}• From time to time they will get updated

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