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Solar Shading or Brise Soleil

L15 External Solar Shading

2006-2023

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This Presentation on GBE:

- Find this file on GBE websites at:
- https://GreenBuildingEcyclopaedia.uk/?p=41122
- Also
- https://GreenBuildingEcyclopaedia.uk/?p=41115
- Go there for:
  - the latest update
  - versions presented to different audiences
  - the whole presentation, all of the hidden slides
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    - Handout, Show, PDF, PPTX
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Pinterest

- https://www.pinterest.co.uk/bmurphy1390/l15-solar-protection/

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Shading for Housing

- Good Homes Alliance
- Tom Dollard @ PTEa
- Max Fordham
- Oxford Brookes Uni
- British Blinds & Shutters Association
- Supported by manufacturers
- Download free PDF

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11/11/2023 Another GBE CPD seminar to consider 7

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Software Package Makes Solar Shading Calculations Easy

- Schüco International
- Schüco ALB systems solar shading systems
- both passive and active
- software package that enables designers to make best use of their product
- automatically computing optimum shading configuration for a particular building and calculating its overall cost.
- The software, is intuitive and simple to navigate
- It requires no specialised knowledge of shading technology

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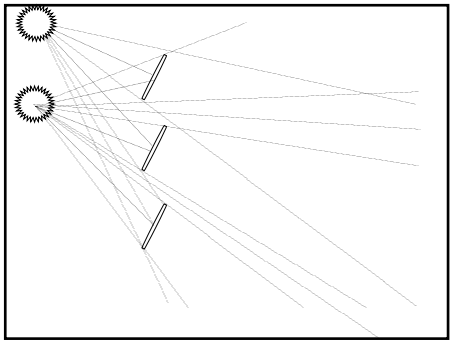

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Solar Shading

- What is it?
- What is it used for?
- Information systems
- What standards apply?
- What is it made of?
- Things to avoid?

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Solar Shading

- NBS (National Building Specification)
- ASWS Specification
- Manufacturers
- Frippery or Functional Building Elements
- Projects
- Greening the Solar Shading

11

What is it?

- It comes in many forms
- From blinds inside to blades outside
- Victorian shutters inside
- Mediterranean Shutters outside,
- large eaves overhangs in Switzerland
- Low window head heights in UK sheltered housing

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What is it?

- located in different places with varying effect
- It might be opaque, transparent or translucent or reflective
- wisteria over the window,
- Stain glass in the fanlight

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What is it used for?

- It controls the amount of sunlight and daylight entering a building directly or indirectly
- it can be used to maximize daylight and minimize sunlight entering a building
- has an effect on the comfort and working conditions of the occupants inside the building

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What is it used for?

- It can be used to control the quality of light entering
- it can cause or reduce glare for users inside

15

Information Systems

- CI/SfB
- CAWS
- Uniclass
- EPIC
- CSI Master Format

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CI/SfB classification Products:

- (31.4) Windows
- Window awnings, shutters, louvres
- Louvres, including brise soleil systems
- solar control access walkways
- fixed and motorised solar control louvres
- window blinds
- Including photovoltaic and glass louvres

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CI/SfB classification Products:

- (68.7) Controls for services, energy recovery
- Controls (Manufacturer)
- Energy monitoring controls
- For solar control

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CI/SfB classification Products:

- (76.7) Blinds and curtain tracks
- Blinds
- Roller blinds/spring roller blinds
- Black out blinds
- Fabric (linen, cotton, holland etc)
- Solar controlled blinds
- External

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CI/SfB classification Products:

- (T) Green applications, resources
- Renewable energy systems
- Photovoltaics
- Energy management systems

20

CAWS classification:

- L10
  - Windows/Screens/Louvres/Rooflights
- NGS Specification:
  - L15 External Solar Shading

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Uniclass:

-

22

EPIC:

-

23

CSI Master Format:

- 06470 Architectral Woodwork
  - Wood Screens Blinds Shutters
- 08500 Windows with integral louver blinds
- 08600 Skylights with solar shading installations
- 10530 Protective Covers
  - Awnings canopies

24

CSI Master Format:

- 10700 Exterior Protection
  - Includes Louvres, fins, shutters, demountable panels and sunscreens
  - To provide sun control, privacy, security, insulation & storm protection,
  - On exterior of windows and entrances
  - Fixed and movable, manually and electrically operated, automatically controlled devices

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CSI Master Format:

- 10700 Exterior Protection
- 10705 Exterior Sun Control Devices
  - Fixed sunscreens, rolling and coiling exterior shutters
- 10710 Exterior Shutters
  - Decorative shutters and side hinged shutters
- 10715 Storm Panels
- 10720 Exterior Louvres

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CSI Master Format:

- 12490 Window Treatment
  - Blinds
  - Curtains and Drapes
  - Interior Shutters
  - Solar Control Film
  - Window Treatment Hardware

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Solar Shading: What standards apply?

- Regulations
- Performance Requirements
- Code of Practice
- Standards
- Accreditation
- Test methods

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Building Regulations

- No Regulation requires solar shading
- but if you have some then regulations apply to the installation.
- Wind loading
- Access loading
- Strength stability integrity
- Durability

29

Building Regulations Part L

- In-use carbon chasing can be helped by external solar shading
- Glazed facades will create areas of overheating
- Ventilation, air cooling or air conditioning is likely to demand energy
- In use carbon demands rise

30

Performance Requirements

- Exclusion of direct midday sunlight in summer
- May permit entry of sunlight in winter
- They must acknowledge:
  - orientation of all elevations
  - Sun's path during 24 hour cycle & year
  - and storey heights and window sizes

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Performance Requirements

- Sun angles in London at 12.00 midday
- Summer 55 degrees from horizontal
- Spring Autumn 35 degrees from horizontal
- Winter 15 degrees from horizontal
- shallower angles occur at other times of day

32

Performance Requirements

- They might also be used for access for maintenance of the external envelope of the building.
- They may include walkways and access safety lines to connecting safety harnesses.

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Codes of Practice

- Code of Practice
- Cleaning of windows
- Daylighting

34

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Standards

- No British Standards
- except British Standards for Materials

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Other Standards

- CWCT
- Methods of test for strength and stability
- wind and rain action

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Health and Safety

- Requires the user to be able to work safely

37

CDM

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Accreditation

- Building Regulations Regulation 7 refers to:
- Construction Products Regulations
- Construction Products Directive
- EC Marking
- BSI Kitemark
- Agrément Certificate

39

British Standards

- No British Standards for product
- ∴ No Kitemark

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Agrément Certificates:

- None have been awarded

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Solar Shading: What is it made of?

- Metals, timber, plastics, glass, fabric
- You can use almost anything

42

Things to avoid?

- Colours
- Whistling or rattling in the wind
  - Aerodynamic design
- Damaging the external envelope
  - Independent support

43

Choice of colours:

- Too dark and the glare between dark coloured shading in silhouette and bright sky causes discomfort for those looking out
- Use of two colours on same item causes difficulty unless of 2 pieces
- Polyester Powder Coated guarantees do not apply to overcoating

44

NBS National Building Specification

- Did not include solar shading
- If it is to be added it might be part of
  - L10 Windows/Screens/Louvres/Rooflights
  - And ____ in Uniclass

45

ASWS Specification

- Has been around since preparing the New British Library spec '85 - '92
- added to over the years including Oxford Blue '99
- It addressed numerous issues in detail
- Including sun angles, solar shading performance and testing

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Manufacturers:

- Luxaflex Blinds Hunter Douglas Ltd.
- Colt International
- Technical Blinds
- Daylight Insulation
- Merlin Sunscreening Systems

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Luxaflex Blinds (Hunter Douglas Ltd)

- Swanscombe Business Centre, 17 London Road, Swanscombe, Kent, DA1 0HL.
- Telephone: 01322 624580
- Fax: 01322 624558
- Website https://www.luxaflex.com/uk/projects

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Colt International Ltd.

- New Lane, Havant, Hampshire, PO9 2LY
  Telephone: 023 9245 1111
  Fax: 023 9245 4220
  email: info@coltgroup.com
  Website: www.coltgroup.com

49

Technical Blinds Ltd

- Tufthorn Avenue, Coleford, Gloucestershire
  L16 8PR.
- Telephone: 01594 832010
- Fax: 01594 835318

50

Daylight Insulation Ltd.

- Riverside Industrial Estate, Clydebank, Glasgow, Scotland, G81 1UF
- Telephone : 0141 952 4956
- Fax : 0141 951 1211
- OkaSolar Passive Variable Sun Control Glass

51

Merlin Sunscreening Systems

- 163 Dukes Road, London, W3 0SL
- Telephone : 020 8993 0499

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Frippery or Functional Building Elements?

- Architects have been using Solar Shading for some time
- Others are beginning to take an interest in them as visual elements of buildings
- Sometimes just to add a High-Tech flavour to help let properties
- Many designs fail to function as solar shading at all

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Projects:

- New British Library Euston
- Powergen Operational HQ Coventry
- Inland Revenue Office Nottingham
- Swanlea School Whitechaple London
- Stoneyard Lane Isle of Dogs London
- Bluewater Shopping Centre Kent
- Oxford Blue

54

New British Library RBRR

- Solar Shading to the Rooflights over the Rare Books Reading Room
- Protection of the books from Ultra Violet light is of highest priority
- Clerestorey Windows & Rooflight design sets out to minimize the amount of direct sunlight entering
- whilst maximizing the amount of daylight

55

New British Library RBRR

- Clerestorey Windows face North and East and use PVB Interlayers in laminated glass to reduce UV as it passes through the glass.
- UV absorbent paint is applied to all ceilings and walls to absorb more.

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New British Library RBRR

- White coated actuated solar shading blades cover the Rooflights
- These are controlled by the BEMS computer program
- to know the optimum angle to be at to face the sun at any time of the day on any day of the year

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New British Library RBRR

- to maximize the number of times the sunlight bounces between the blades
- before it passes through the glass,
- absorbs UV light without significantly diminishing the amount of daylight on each bounce

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New British Library RBRR

- The light then passes through a light filigree of GRG
- offering more surfaces to bounce off
- and absorb more UV light.

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New British Library SRIS

- SRIS Science Reference Information Service reading rooms,
- clerestorey window solar shading and office window solar shading

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60

New British Library SRIS

- The Clerestorey windows include a multi-storey assembly of solar shading and access walkways.
- The walkways themselves form part of the solar shading

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New British Library SRIS

- The Office window solar shading is simple blades
- set vertically on a cantilever truss's horizontal and sloping top surfaces
- and allow light to be bounced between the blades

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New British Library SRIS

- At midday sun passes vertically straight through the east and west elevation shading
- but slides straight down the face of the building

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63

New British Library SRIS

- The colour choice of dark green polyester powder coating was found to be too dark when see from inside looking out
- The contrast between dark metal against bright sky was uncomfortable on the eye, the inside face was over-coated with white,

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New British Library SRIS

- this annulled the Guarantee on the over-coated side only.
- It improved the contrast but not significantly

65

New British Library CP

- The Completion Phase has a Staff Restaurant on the north side
- it is semi-circular on plan and fully glazed with curtain walling
- solar shading could combat morning and evening sunlight
- the north face solar shading is redundant but will reduce daylight.

66

Powergen Operational HQ Coventry

- This uses a solar shading element to stop sunlight entering the windows
- by bouncing the sunlight up through a high level window
- onto the smooth white concrete floor soffit above
- reflected & diffused sunlight & daylight penetrate deep into building

67

Inland Revenue Office Nottingham

- Has an external balustrade which stops sunlight entering whilst still permitting a view
- allows reflected light from the roads, pavement and landscape to pass
- reflects onto the smooth white concrete soffit above
- penetrating deep into the building

68

Swanlea School Whitechaple

- Reviewed in AJ on 20 Oct 1993
- The Mall acts a focus to the school linking all the buildings
- The Glazed mall roof collects solar radiation but could have been a source of overheating in summer

69

Swanlea School Whitechaple

- OkaSolar glass uses solar reflective profiled blades
- within the double glazed sealed units,
- to reflect sunlight to varying degrees at different times of the year
- kept dust free to minimizing potential maintenance

70

Swanlea School Whitechaple

- In Summer it permit 25% daylight to pass
- In Spring/Autumn it permits 40% to pass including some direct sunlight
- In winter it permits 62% to pass including a greater proportion of direct sunlight

71

Stonyard Lane Sports/Community Centre

- AJ 12th Nov 98 & RIBAJ April 99
- The early scheme included a large roof running the length of the site
- providing large eaves overhangs and covered outdoor spaces
- and a roof over the edge of a new public square on Poplar High Street

72

Stonyard Lane Sports/Community Centre

- The somewhat smaller building actually built includes
- HDG steel and WR Cedar trellis over the entrance
- small projecting metal lids over west facing office windows

73

Stonyard Lane Sports/Community Centre

- Projecting horizontal WR Cedar blades within a HDG circular hood on west facing circular windows to the sports hall
- Sloping WR Cedar blades in a large screen to the southern end of the east side of the sports hall

74

Bluewater Shopping Centre

- Solar shading is extensive on the roofs of the 3 Anchor stores as plant area screens
- Marks and Spencer has solar shading on the North end of the building which then runs along the East elevation as part of the canopy and on into the Bus station canopies.

75

Reading Oracle Seven Bridges House

- Seven Bridges House a Listed Building has got a new lease of life
- which included reinstating the shutterboards inside the windows
- It's a reminder that there are other methods to consider which have other uses, in this case to keep the cold out at night

76

Oxford Blue

- Architects Journal 21/10/99,
- Solar Shading at Plot 4 Oxford Science Park,
- High level solar shading on the west side provides some protection to all floor windows in early afternoon
- later its benefit is reduced until it only protects the top floor

77

Greening the Solar Shading

- Oxford Science Park Landscape
- includes a curved gabion wall
- topped with a garden fence
- topped by solar shading which has
- climbers trained to grow up wires
- to cover the shading with masses of green

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Solar Shading

Used to shade or permit sun passage

79

Solar shading: Common in mainland Europe Will become more important in the UK if only we knew how

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100% glazed façade requires 100% air conditioned office

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Operational Energy

Passive solar control avoids mechanical ventilation and air-conditioning in summer

City Place, Gatwick Wessex Water

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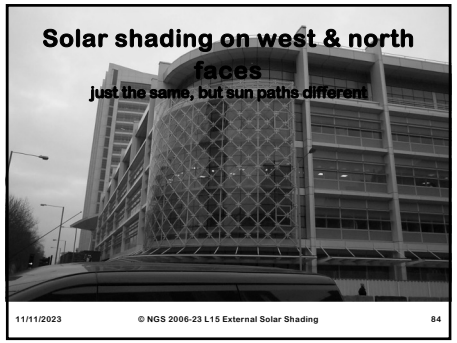

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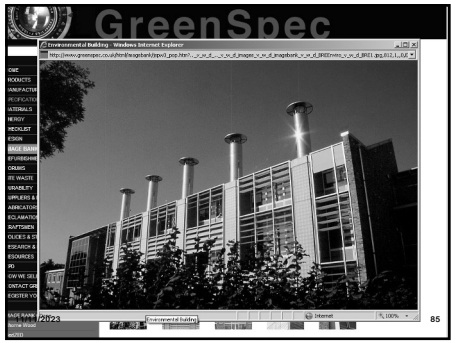

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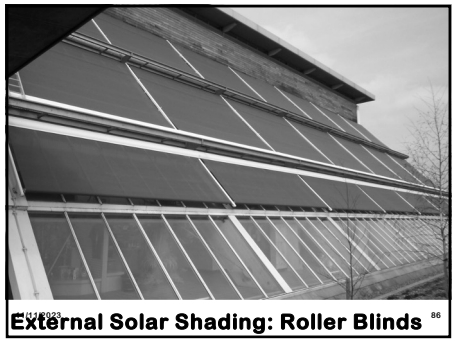

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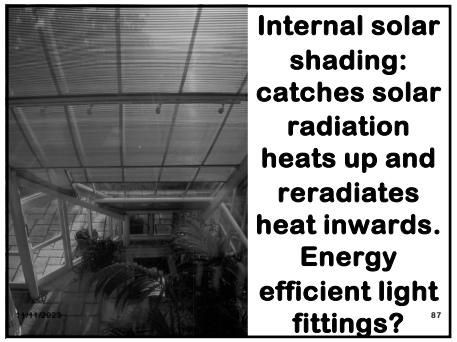

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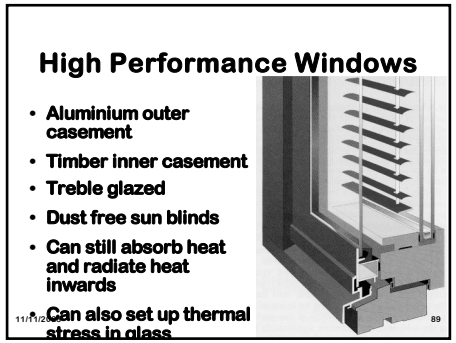

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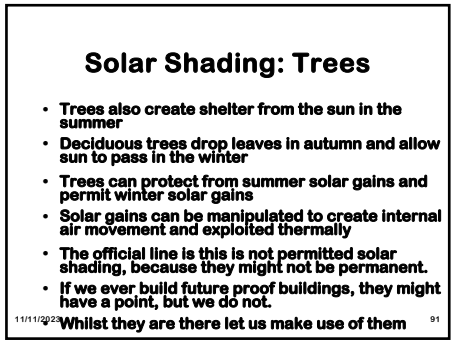

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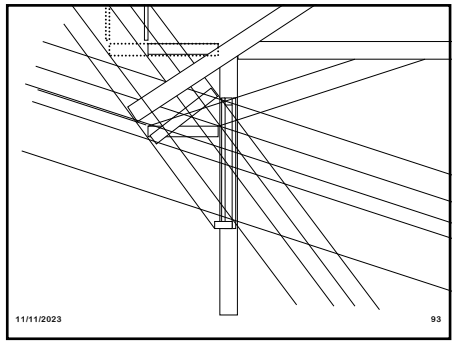

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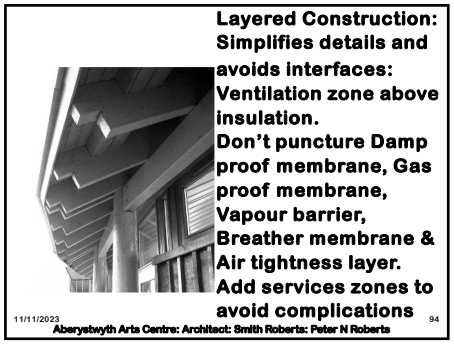

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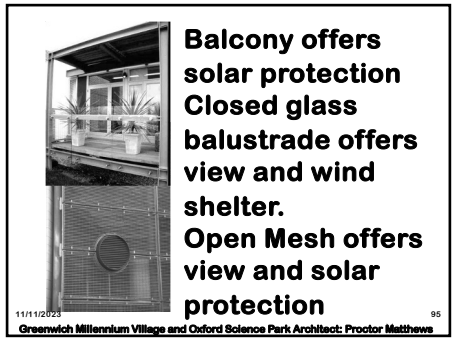

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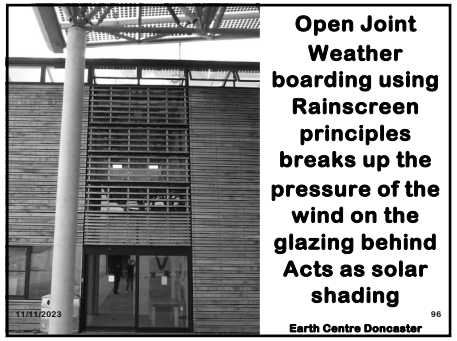

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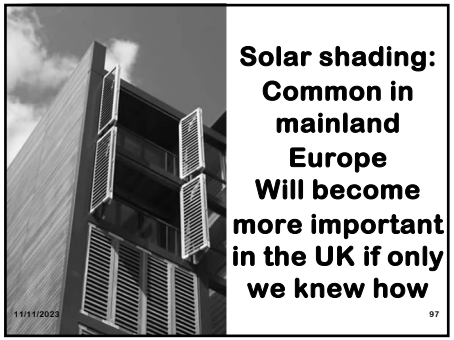

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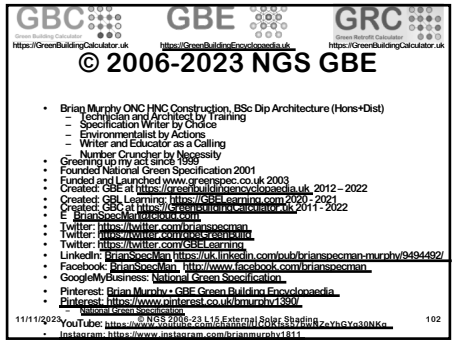

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