





Retrofitting Practical Toolkit for Architects

RIBA South/South East, SusCon, SEEDA, ESF, BSSP; GreenSpec and ECH₂O 2010 Programme Sustainable Construction



Site Visits



- buildings where retrofitting had occurred that will in themselves be the site visits.
- Speakers to arrive early
- Speak with facilities manager
- Speak with receptionists
- Analyse the building

 photographic images of building's parts
- Do a virtual visit
 - describing issues and solutions

1 From Global imperative to Retrofit objectives Reading: 30th March Dorking: 31st March **Brian Murphy of GreenSpec**

From Global imperative to Retrofit objectives

- The following aspects of sustainable retrofit will be covered,
- Global Imperative include an over view of the contribution the built environment makes to climate change focusing on the building types in question.
- Refurbishment/Retrofit statistics
- Retrofit Jargon Buster
- Hierarchies: carbon/energy, water, resources,
- Design Objectives: Is Code Level 5 (energy) enough?
- TSB Retrofit Programme and potential outputs
- Services Issues and strategies for solutions
- Human Issues: equipping the building is not enough the occupants make it work or fail, how to accommodate them
- Retrofit Information Resources and websites
- Why use an Architect?

Retrofitting – Why use an architect?

- Thorough briefing process can lead to tailored solutions
- Designed, planned, anticipated, no surprises
- Can see the vision, can plan the building, can anticipate the construction sequence, can design the whole, can integrate the services, can comply with all the rules.
- Briefing the design team to work towards a coherent environmental solution
- Integrated design: many players, one conductor
- Right first time? Exploring more than one scenario of integrated building fabric and services
- Architects can have a wider understanding of materials and methods to consider
- Green Policing of materials and construction: independently of the builder and his supply chain and financial deals
- Aesthetics: compared with surveyors or technicians?, no exclusivity.
- How do you develop a wide understanding rapidly?
- Joining forces with other green designers in all disciplines.
- Green networking and membership groups.
- Tools at your disposal to justify the solution.

Global Imperative

- include an over view of the contribution the built environment makes to climate change
- focusing on the building types in question.
- Refurbishment/Retrofit statistics

Retrofit Jargon Buster

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Carbon/energy, Hierarchy

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Water, Hierarchy

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Resources Hierarchy

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Waste Hierarchy

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TSB Retrofit Programme

potential outputs

Retrofit Information

Resources and websites

Design Objectives:

Is Code Level 5 (energy) enough?

Human Issues:

- equipping the building is not enough
- the occupants make it work or fail,
- how to accommodate them

Services Issues and strategies for solutions

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Retrofitting – Why use an architect?

• Risks:

- College Knowledge: 10, 20, 30, 40 year old know-how
- Sustainability is complex subject and few have the will or the time to develop the skills
- Tried and tested methods deter use of innovative solutions
- One man bands may not embrace the skills of others in the design process

Thorough briefing process can lead to tailored solutions

 Designed, planned, anticipated, no surprises







Architects Can

- Can see the vision,
- can plan the building,
- can anticipate the construction sequence,
- can design the whole,
- can integrate the services,
- can comply with all the rules.

Briefing the design team

- to work towards a coherent environmental solution
- Integrated design: many players, one conductor
- Right first time?
 - Exploring more than one scenario of integrated building fabric and services







- Architects can have a wider understanding of materials and methods to consider
- Green Policing of materials and construction:
 - independently of the builder and his supply chain and financial deals

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- compared with surveyors or technicians?
- no exclusivity.

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How do you develop a wide understanding rapidly?

- Joining forces with other green designers in all disciplines.
- Green networking and membership groups.

Tools at your disposal

to justify the solution.





Risks:

- College Knowledge: 10, 20, 30, 40 year old know-how
- Sustainability is complex subject and few have the will or the time to develop the skills
- Tried and tested methods deter use of innovative solutions
- One man bands may not embrace the skills of others in the design process

2 Retrofitting Generic Issues & Objectives Winchester: 14th April **Bexley 28th April Brian Murphy of GreenSpec Cath Hassell of EcH2O**

26

Retrofit Generic Issues and objectives

- Core Issues that would apply to all building types:
- Design issues:
- Building Performance, Thermal. Moisture, Acoustic and Airtightness v Leakiness Indoor air quality
- Resource Efficiency: materials, energy, water
- Building use patterns and impact on fabric and services
- Information sources: publications and websites
- Materials and methods
- solar access roofs,
- Green walls, Green roofs
- T&CP Planning issues, One building at a time or many,
- Regulations,
- Finance and funding
- Green Mortgages, Grants, ECA, VAT, PAYS
- Landfill taxes and Aggregates Levy,

- Fuel, Energy & Services:
- Fuel Choices and Carbon impact
- Energy provision and demand reduction,
- Heating, Ventilation & Heat Recovery
- Water demand reduction, use and reuse
- GSHP, WSHP, ASHP, and pavement
- where permitted ST, PV, PV-T and ST pavement
- Energy Supplier Obligations, metering.
- ESCos & MUSCos

Core Issues that would apply to all building types:

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Design issues:

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Building Performance,

- Thermal.
- Moisture,
- Acoustic and
- Airtightness v Leakiness
- Indoor air quality

Building use patterns and impact on fabric and services

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Resource Efficiency:

- materials,
- energy,
- water

Information sources:

- Publications
- websites

Materials and methods

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Solar access roofs,

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Green walls













- One building at a time or many,
- Regulations
- Permitted Development



Planning



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Finance and funding

- Green Mortgages
- Grants
- ECA
- VAT
- PAYS

Landfill taxes and Aggregates Levy,

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- Fuel, Energy & Services:
- Fuel Choices and Carbon impact
- Energy provision and demand reduction,
- Heating, Ventilation & Heat Recovery
- Water demand reduction, use and reuse
- GSHP, WSHP, ASHP, and pavement
- where permitted ST, PV, PV-T and ST pavement
- Energy Supplier Obligations, metering.
- ESCos & MUSCos

3 Retrofitting Domestic Properties Winchester: 19th May **Guildford: 20th May Brian Murphy of GreenSpec Cath Hassell of EcH2O**

Retrofitting: Domestic Properties

- Design issues:
- Building Performance:
- Domestic use patterns
- Decrement delay
- Appearance
- Conservatories v Solar spaces
- Materials and methods,
- Insulation: Internal, external or none
- Party walls
- Glazing issues,

- Planning T&CP issues,
 - Permitted development rules
- Finance and funding:
- Getting beyond the 'Sarah Beeny effect'
 - (Profit before Planet)
- from Sustainable enterprise
 to Sustainable outputs'
- Fuel Poverty
- Aged clients
- Grey economy, pensions and zero running cost aspirations

44

• VAT & DIY rule changes









• Visible metering/monitoring.

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Design issues:

Building Performance:

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Domestic use patterns

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Conservatories v Solar spaces

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Materials and methods,



Insulation:





Internal, external or none

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53















Glazing issues,

T&CP Planning issues,

Permitted development rules

Finance and funding:

- Getting beyond the 'Sarah Beeny effect' (Profit before Planet)
- from Sustainable enterprise to Sustainable outputs'
- Fuel Poverty









- Grey economy,
- Pensions
- zero running cost aspirations
- VAT & DIY rule changes







Cycle Assessment Procedure for Eco-Materials

4 Retrofitting Historic Properties Autumn **Brian Murphy of GreenSpec Cath Hassell of EcH2O**

Retrofitting Historic Properties

- Design issues:
- Building Performance:
- Thermal: to insulate or not to insulate
- Insulation issues: Internal external, none
- Decrement delay
- Party walls
- Air leaky v Airtightness strategy,
- Moisture management
- Moisture permeability and moisture mass
- Flood protection, damage and repair
- Materials and methods,
- Windows and doors: Upgrades, refurbishment if permitted
- Glazing issues with conservation solutions,
- Autonomous site

- Fuel and Energy demand reduction,
- Resource Efficiency: energy, water
- Planning T&CP issues,
- Listing
- Conservation Officers
- Permitted development rules do not apply
- Planning Portal
- solar access and existing roofs,
- Limitations on Renewable Energy and Insulation







Design issues:

Building Performance:

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Thermal: to insulate or not to insulate

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Insulation issues: Internal external, none

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Air leaky v Airtightness strategy,

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Moisture management

- Moisture permeability
- Moisture mass

Flood protection, damage and repair

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Materials and methods,

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Windows and doors: Upgrades, refurbishment if permitted

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Glazing issues with conservation solutions,

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Fuel and Energy demand reduction,

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Resource Efficiency: energy, water

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Limitations on Renewable Energy and Insulation

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Planning T&CP issues,







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Conservation Officers

Permitted development rules do not apply















5 Retrofitting on a Larger Scale

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Retrofitting On The Larger Scale

- Community Issues:
 - Community engagement
 - Communal activity
 - Communal Composting and waste
 - Community funding
- Design issues:
- Building Performance: Multi use, use patterns
- Materials and methods,
- Blocks of flats: overcladding
- Terraces: one at a time or many
- Green walls, Green roofs

- Community Services
 - Communal energy
 - Communal water
 - Communal Heating (District Heating) CH&P,
 - ESCOs & MUSCOs
 - Fuel and Energy demand reduction,
- Use patterns and energy demand spread and balance
- Heating and Ventilation.
- Metering and monitoring to drive down waste
- Interlocks between fabric and services
- Resource Efficiency: energy, water

Community Issues:

- Community engagement
- Communal activity
- Community funding
- Communal Composting and waste







Design issues:

Building Performance:

- Multi use,
- use patterns

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Materials and methods,

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Blocks of flats:

overcladding

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one at a time or many

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Green walls, Green roofs

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Community Services

- Communal energy
- Communal water
- Communal Heating (District Heating) CH&P,
 ESCOs & MUSCOs

Fuel and Energy demand reduction

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Use patterns and energy demand spread and balance

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Heating and Ventilation.

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Metering and monitoring to drive down waste

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Interlocks between fabric and services

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Resource Efficiency: energy, water

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6 Retrofitting: Public Buildings

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Public Building Retrofitting

- Government Issues:
- Learning opportunity for all occupants
- Government departments: Showing by example:
- Setting standards by example
- Infrastructure
- Sustainable Drainage Systems
- Private communications, Private power and Private heat
- Municipal Waste Segregation and Composting
- Flood protection, damage and repair
- CRC Carbon Reduction Commitment
- Major obligations, targets must be met Operational as well as Capital

- Building Use patterns:
- Schools, Hospitals, Government and mixed use
- Time tables v extensions
- PFI or not
- Legacy and new working together Replacement & Demolition
- Reuse by others?
- Design issues:
- Building Performance:
- Health(y) Buildings
- Finance and funding:
- Resource efficiency: Money
- CAPEX v OPEX

Government Issues:

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Learning opportunity for all occupants

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Government departments: Showing by example:

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Setting standards by example

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Infrastructure

Sustainable Drainage Systems

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Private communications, Private power and Private heat

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Municipal Waste Segregation and Composting

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Flood protection, damage and repair

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CRC Carbon Reduction Commitment

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Major obligations, targets must be met Operational as well as Capital

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Building Use patterns:

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Schools, Hospitals, Government and mixed use

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Time tables v extensions

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PFI or not





Legacy and new working together Replacement & Demolition









Design issues:

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Building Performance:

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Health(y) Buildings

Finance and funding:

Resource efficiency: Money

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CAPEX v OPEX





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Another GreenSpec CPD file to download soon







- 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 rights









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