

Strengthening the resilience of the built environment – the role of the 2020 Group

23 April 2015 – University of Strathclyde



Scotland's Climate Group

Working together to deliver a low carbon future for Scotland through smarter collaborations and better conversations

About the 2020 Group

- Formed in 2009
- Supported by the Scottish Government
- Purpose is to ensure that all sectors of Scotland's economy and civic society contribute fully to achieving Scotland's ambitious climate change targets

The Group encourages greater collaboration and shared best practice between all sectors of Scottish society – and has *140 members across 100 organisations*

Scotland has a target of 42% carbon reduction by 2020 (from 1990 levels)

How this will be achieved

- By supporting projects that either directly reduce CO2 emissions or which enable CO2 emission reductions elsewhere
- Mobilising resource to support CO2 emission reductions
- Disseminating Information – to wider member networks, to share best practice
- Leading by example to exemplify and promote best practice
- Leading creative discussions and in particular allowing difficult conversations not being held elsewhere, to happen in a ‘safe’ space where people and organisations are free to talk.

2020 Group structure

Main Group – including Project/Delivery Team, Chair, Vice Chair (x 5 people), Chairs of sub-groups

Sub-groups covering; Transport, Built Environment, Finance, Behaviour Change Research and Innovation



RETROFIT SCOTLAND



RETROFIT SCOTLAND

www.retrofitscotland.org

Disseminating best practice in
refurbishment within Scotland

Providing essential technical
information on refurbishment for local
authorities, housing associations and
professionals.

Sharing knowledge, research and case
studies as a valuable industry resource.





We cannot neglect refurbishment as 99% of buildings already exist - 80% of the buildings in use in 2050 are already standing today



Drivers for Retrofit Scotland

It is estimated that 700,000 households in Scotland – almost 1 in 3 are in fuel poverty.

Scottish Government Strategic Target:

- end fuel poverty by 2016;
- 80% reduction of CO₂ emissions by 2050



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Case study materials

Best Practice in Fuel Poverty Schemes
 Progress and recommendations for the future of fuel poverty schemes in Scotland
 National Grid

Energy Saving Measure	Cost (£/m²)	Payback (years)
Boiler replacement	100	1.5
Boiler replacement with condensing boiler	150	1.5
Boiler replacement with condensing boiler and radiators	200	1.5
Boiler replacement with condensing boiler and radiators and controls	250	1.5
Boiler replacement with condensing boiler and radiators and controls and controls	300	1.5
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Boiler replacement with condensing boiler and radiators and controls and controls and controls and controls and controls and controls and controls and controls and controls and controls and controls and controls and controls and controls and controls and controls	1000	1.5

Easthall: Years On

GENERAL INFORMATION REPORT 46

Agency in Scottish Housing refurbishment projects

393 CALEDONIA ROAD, MULTI STOREY REFURBISHMENT 4
 1992-5
 community heating scheme
 hard-wired system
 high level of insulation
 spacious interiors
 environmental strategy

BUFFER HOUSES NEAR STORROWAY, ISLE OF LEWIS 5
 1995
 low energy housing
 warm outdoor "buffer" spaces surrounding a central family house
 passive solar heat gains

JAMES WILBY STREET REHABILITATION 9
 1991-3
 tenant participation
 low embodied energy
 new external insulation

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Breakdown of Scottish Housing by date and type

Type %	< 60% >					< 37% >				3%		TOTALS
	Pre 1919– 1964					1965 - 1997				1997 - 2002		
Total 2.1m	Cavity	Solid	Non Traditional		Cavity	Solid	Non Traditional		Cavity			
			Cavity	Solid			Cavity	Solid	Timber	Traditional		
	32%	24.50%	2%	1.50%	26%	0%	6%	5%	1%	3%		
Houses 62%												
Detached (19%)	4%	4%			8%		1%	1%	0.50%	0.50%	19.0%	
Semi (21%)	8%	4.50%			6%		1%	1%	0.50%	0.50%	21.5%	
Terraced (22%)	7%	3%	0.50%	0.50%	7%		1.50%	1.50%			21.0%	
Flats (38%)												
Tenement (23%)	6%	9%	0.50%	0.50%	5%		1%	1%		0.50%	23.0%	
4 in Block (11%)	6%	2%	0.50%	0.50%	1%			0.50%		0.50%	11.0%	
Tower/Slab (3%)	1%		0.50%				1.50%				3.0%	
Conversion (2%)		2%									2.0%	

Case Studies by date and type

Type	<20%>			<15%>		
	1919			1919 - 1944		
	Solid			Cavity		
	20%			12%		
Houses 62%						
	% Share of stock	Retrofit case study (number)	Comments	% Share of stock	Retrofit case study (number)	Comments
Detached (19%)	4%	14 + TBC - 4 in total, awaiting reports	(10, Edinburgh Napier: Viewpark House - Alyth/ Blairgowrie, HS Culross, HS Hill of Tarvit, HS Colbeck Place & Columnshill St - Rothesay, HS Daliburgh & Kildonan - South Uist, HS Well O Werie - Edinburgh, HS Milton of Buchanan, Cellardyke Passive House retrofit.) (4, CIC Start: 1. Uist; 2. Aberdeenshire - testing and 3. POE; 4. Fife; 5. Perth) (TBC, HS: Several Historic Scotland Pilots in this sector - see http://www.historic-scotland.gov.uk/index/technicalpapers)	2%	1	(1, HWU: The E.ON 2016 House is located on the campus of the University of Nottingham. The property was recently constructed but to 1930's building standards, and fitted with extensive monitoring equipment to record data on building and occupant behaviour.)
Sem (21%)	2%			2%		
Terraced (22%)	2%	3	(1, Edinburgh Napier: HS Newtongrange) (1, CIC Start: 1. Dumfries) (1, GSOA: Municipal Terrace. Attempt as Passivhaus refurbishment of solid brick terrace in Dumfries)	2%	2	(2, A+DS: Lesley Court and Menzies Court Fairfield Housing Co-op - Perth - Healthy Refurbishment - low VOC Case Study - Sust. 2004 www.ads.org.uk/sust See also - North Lanarkshire Fuel Poverty Study)

Scottish Case Study Projects measures adopted:

improved insulation levels	28
breathing wall construction	12
thermal mass	5
passive ventilation systems	15
dynamic insulation	2
solar sunspaces	12
solar panels (water only)	5
communal heating	10
ground source heat pumps	4
biomass energy/CHP	5

The Retrofit Challenge

How to tackle the problem:

- adopt a blanket 'area-based' approach to investment?
- 'fabric first' or technological?
- strategic, based on house type?
- or a 'construction-based' rather than 'house type' approach also gained traction.
- 'top down', or 'bottom up' with a community based approach addressing behavioural and attitudinal change?



ASSIST Architects - Roystonhill

IAN
SPRINGFORD
ARCHITECTS

BRIDGEGATE
HOUSE
REFURBISHMENT



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Case study – Bridgegate House

Location: Irvine New Town

Date of Construction: early 1970s

Retrofit Project Date: 2012

Architect: Ian Springford Architects

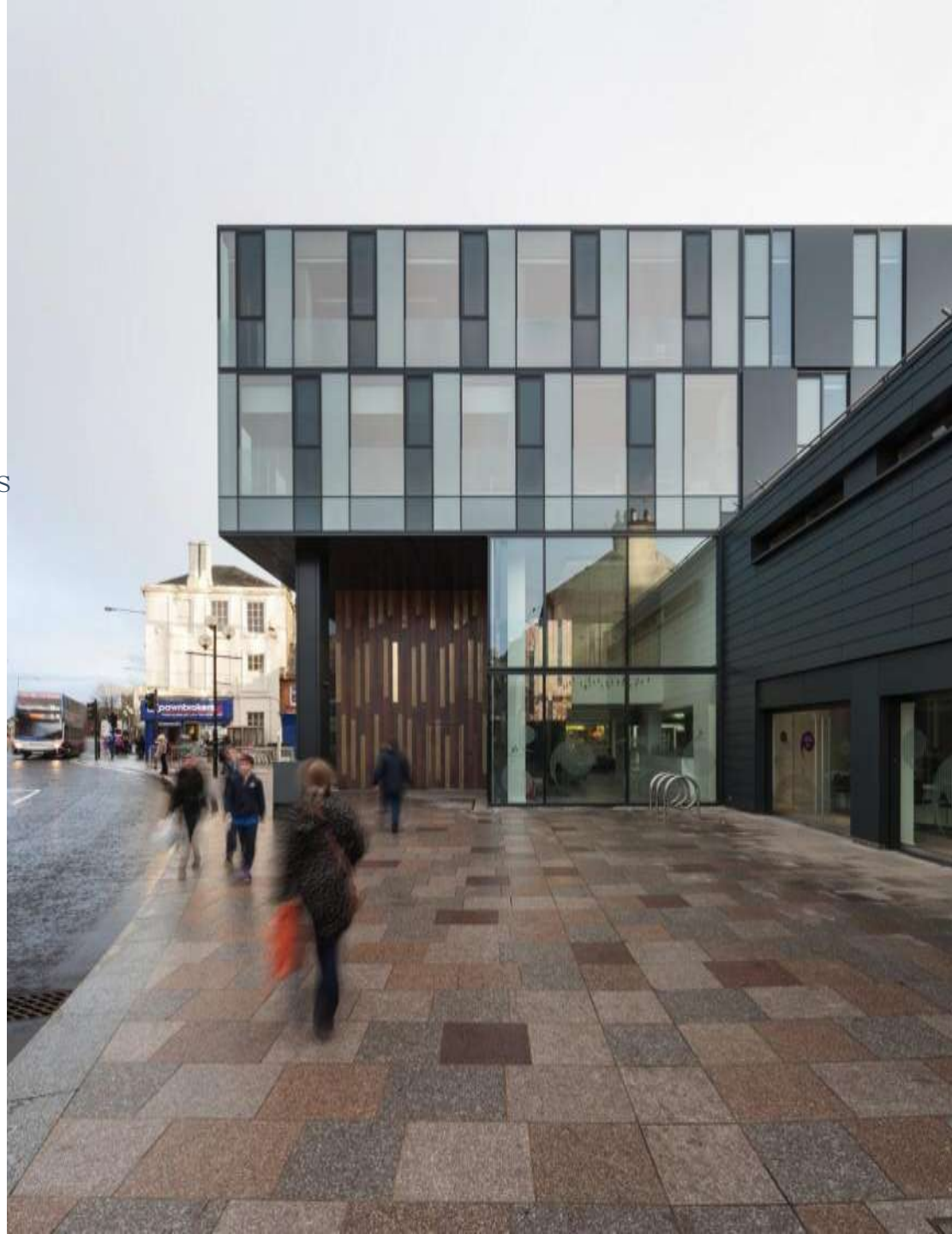
Client: North Ayrshire Council

Radical facelift and internal renovation with glazed, insulated overcladding to improve energy performance.

Building stripped back to basic structure in order to make use of the fabric mass for free cooling.

Cellular offices dismantled to allow natural cross-ventilation.

Upgraded thermal performance through enhanced insulation and replacement of single glazing.





CANCER RESEARCH UK

MARCHENNETTE 104 2708

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PARKING

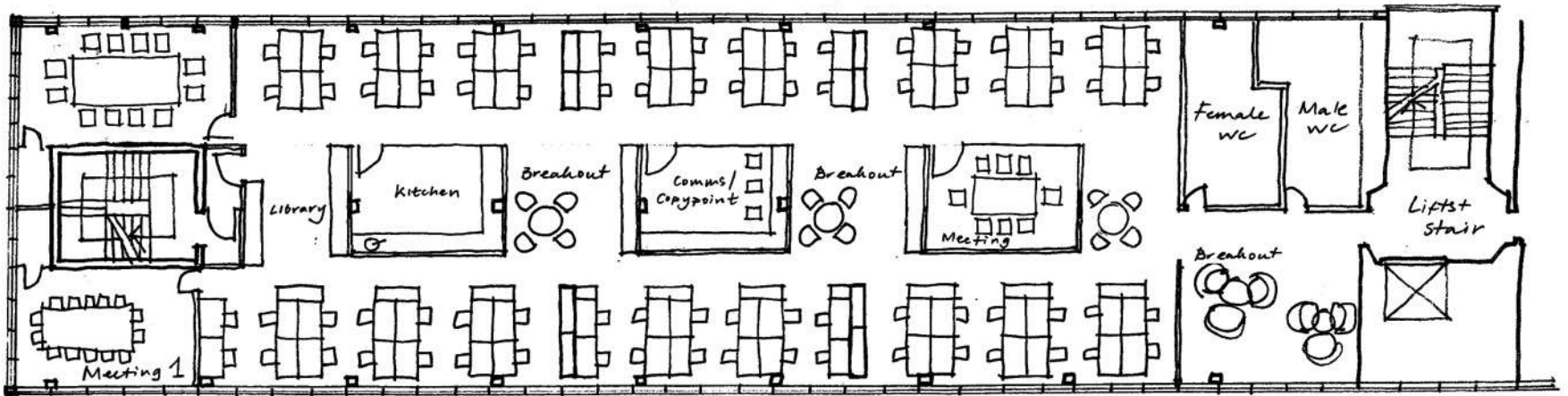
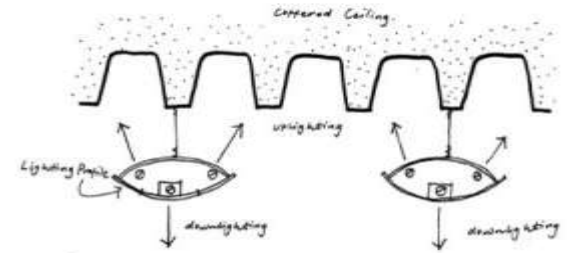
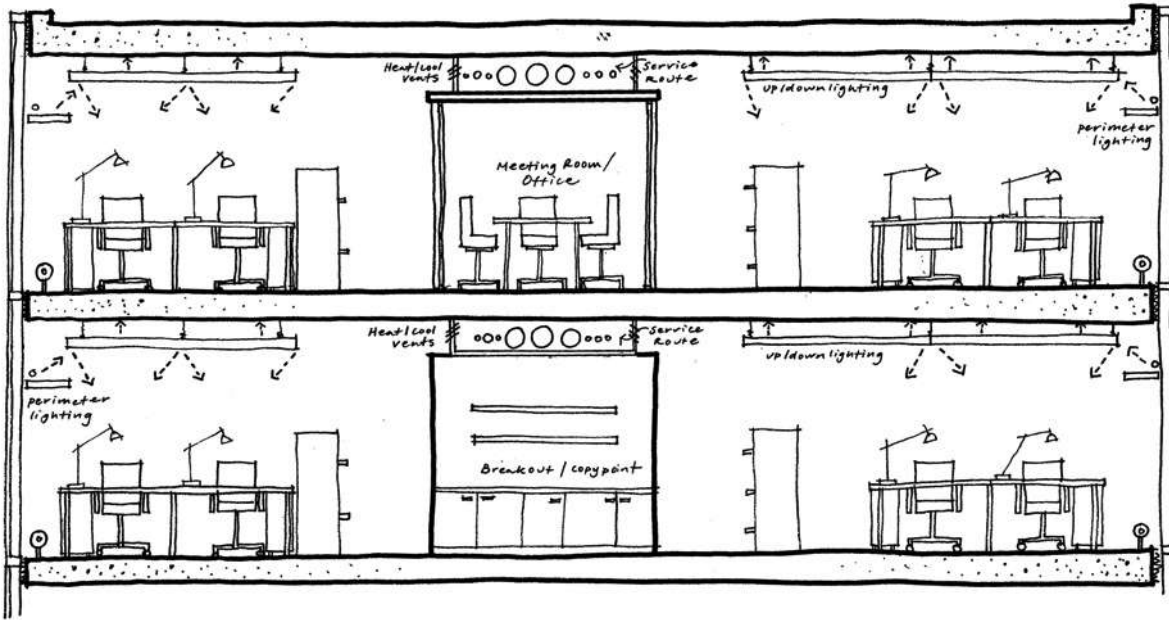
EMERGENCY
VEHICLES
ONLY

No Smoking
Please

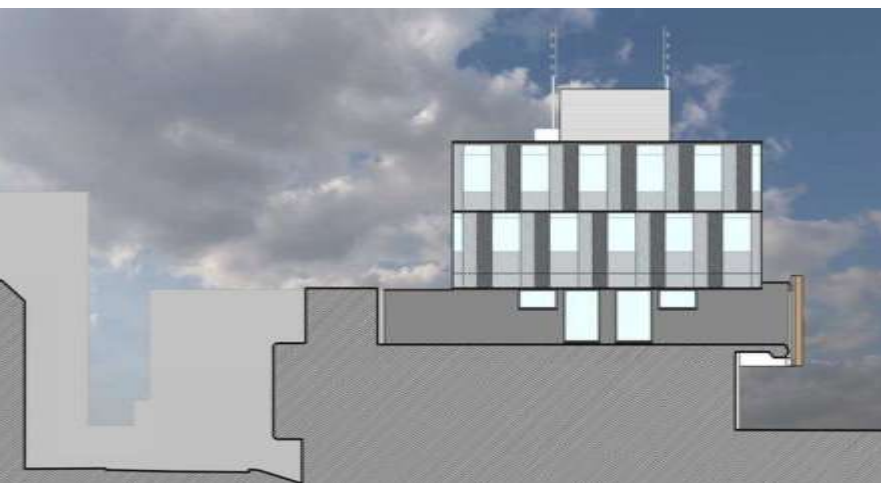
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Bookings
Club

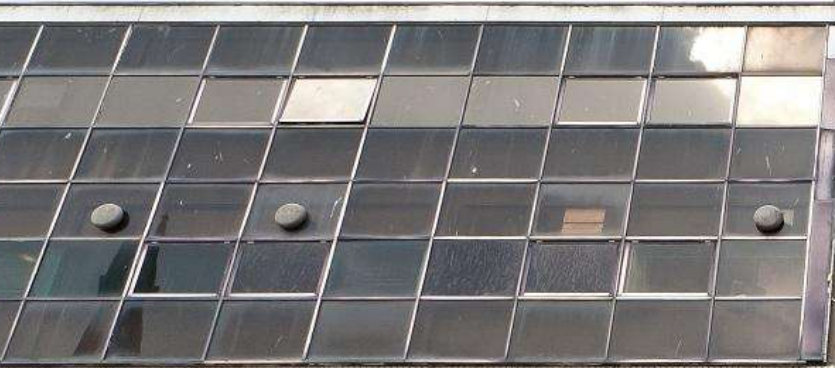






Option 1. Office Divisions to Centre

















Bowls



Fairways Sports
The best in town.

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£2.00



IAN
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ARCHITECTS

BRIDGEGATE
HOUSE
REFURBISHMENT





Knowledge base

- use of innovative products and materials
- energy strategy
- water strategy
- monitoring and dissemination
- up-scaling opportunities
- supply chain developments
- cost/benefit information
- links to ongoing research and demonstration projects.

Modelling tools and decision support

Retrofit Scotland have used contacts throughout the industry and academic community to identify and assess various simulation and assessment tools which can be used to define retrofit interventions.

Information on these tools will be presented alongside the case study information within the Retrofit Scotland website and made accessible to the industry and members of the public.

Funding and support

Retrofit Scotland will provide information on finance mechanisms that are available to support retrofit programmes. This will be a continual process and allow funding sources to be identified and disseminated when they become available.

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Disseminating best practice in
refurbishment within Scotland

Providing essential technical
information on refurbishment for local
authorities, housing associations and
professionals.

Sharing knowledge, research and case
studies as a valuable industry resource.



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Edinburgh Napier
UNIVERSITY



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