



**BAILY
GARNER**



**WEBINAR:
PRACTICAL PREPARATION FOR
RETROFIT PROJECTS**

WEDNESDAY 15 JUNE - MIDDAY



**EXPERIENCE IN
HERITAGE BUILDINGS**

**5-7 BELSIZE GROVE
THE JOURNEY SO FAR**

ELIZABETH HUNG BSC (HONS), MA

CONTENTS

- Background
- Purpose
- The building
- Current condition
- Major challenges
- Progress



BACKGROUND

- Address: 5-7 Belsize Grove, London, NW3 4UT.
- Shared boundary with a late 1960s apartment block (Straffan Lodge) and a Victorian villa converted flats (similar style as the premise).



BACKGROUND

- Located within Belsize Conservation Area
- **Negative** visual impact on the street
- Demonstrate the possibility of whole house deep retrofit for traditional buildings
- Social Housing Decarbonisation Fund (SHDF) wave 1
- Following PAS 2035 methodology



PURPOSE

- Increase energy efficiency.
- Improve thermal comfort and occupant health.
- Achieve better moisture and ventilation control within the property.
- Reduce CO2 emissions and the reliance on fossil fuels for heating and hot water.
- **Reduce residents' energy bills and fight against fuel poverty.**

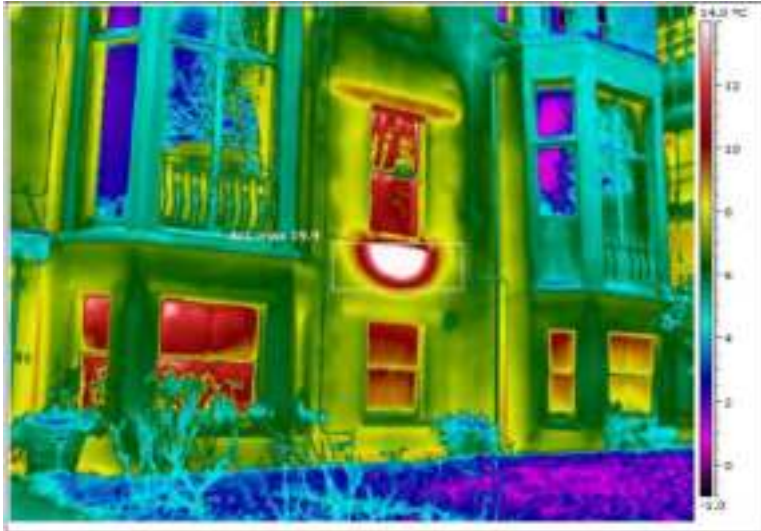
THE BUILDING

- Mid-19th century building, 4-storey
- Originally two symmetrical villas, converted to flats
- Lift was installed in mid-late 20th century, connecting block in the middle
- Traditional brick construction
- 58 bedsits/self-contained units
- Front elevation: Stucco finished with white paint
- Flank and rear elevations: Fair faced London yellow bricks in Flemish bond with arched brick lintels and stucco bay windows



CURRENT CONDITION AND MAJOR CHALLENGES (CONT'D)

- High occupancy
 - Assumed to be occupied during the works
- Lack of internal space
- Full survey required



CURRENT CONDITION AND MAJOR CHALLENGES (CONT'D)

- Continue renovation and maintenance works
- Heated communal corridors
- Four communal bathrooms on each floor shared by some bedsits
- High moisture content within corridor
- Packed ceiling void
- No gas available
- Electric only for hot water, space heating and cooking.



PROPOSED ELEVATIONS (FRONT)



CURRENT CONDITION AND MAJOR CHALLENGES (CONT'D)

- Within conservation area
 - Aesthetic value and heritage impact
- Article 4
 - Planning consideration
- Technical risks and limitation
 - Traditional solid built
 - ‘Breathability’ issue
 - Ventilation
 - Prevention of overheating
 - East facing front elevation
 - Cladding safety



PROGRESS

- Project development
 - Material research
 - Renewable energy source feasibility
- Full Planning Permission application
- Specification



SUMMARY

- Demonstrator project
- Difficult to treat mid-19th Century property
- Not one-size fit all approach
- Ensuring fuel poverty is minimised





**STRATEGIC ASSET
MANAGEMENT AND
NET ZERO CARBON**

BEN NIXON BSC (HONS), MCIQB, MRICS

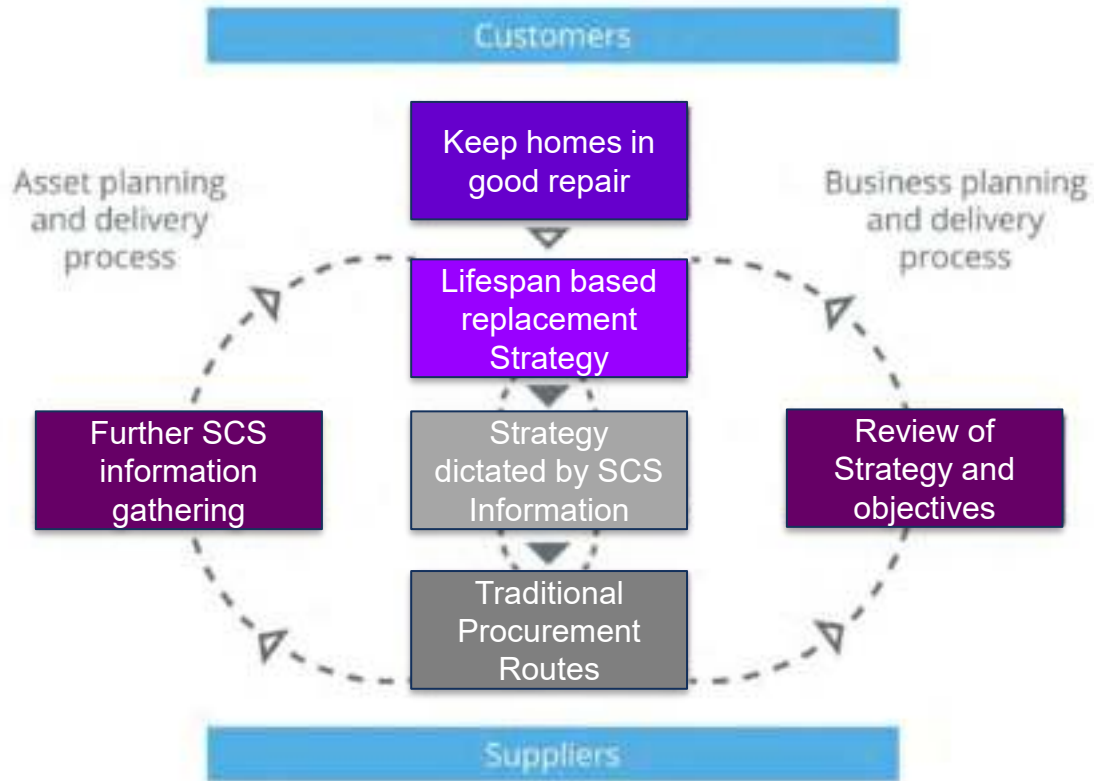
What is Strategic Asset Management?

“The activity of aligning property assets with the **strategic aims** and direction of the organisation and adding both **financial** and **non-financial** value to the organisation as a result.”

- RICS Strategic public sector property asset management, 3rd edition, September 2021



THE ASSET MANAGEMENT CYCLE

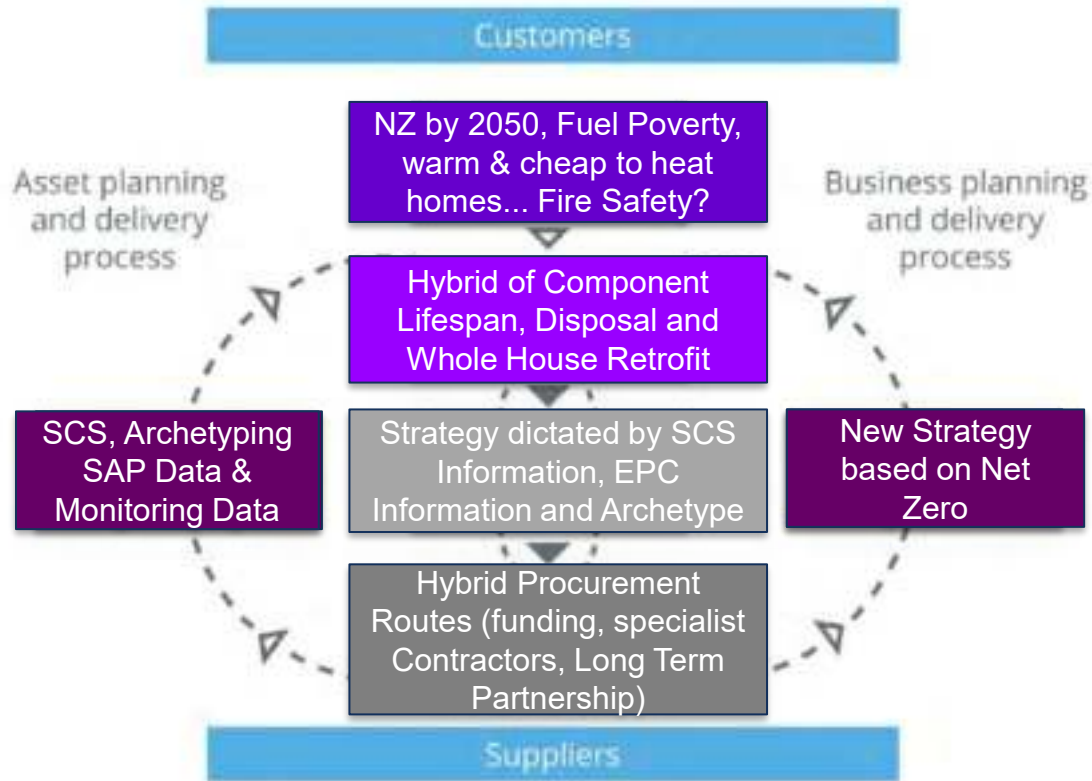


THE CHALLENGE OF NET ZERO

1. Climate Emergency
2. Nearly-net-Zero
3. A 'Just' Transition and Fuel Poverty
4. Difficult Retrofit
5. Stakeholder/Resident engagement
6. Cost

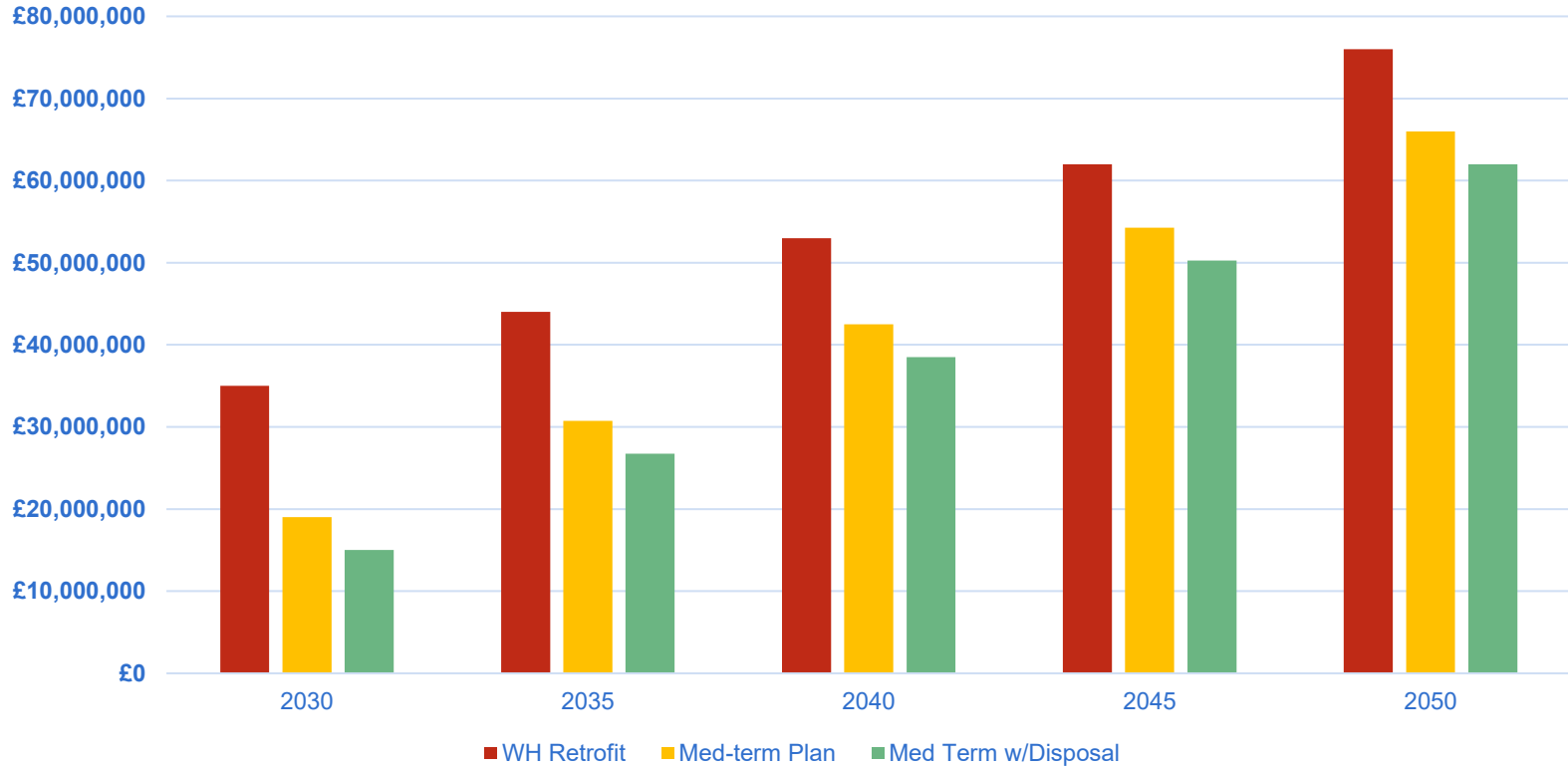
=New Strategy!!!

THE ASSET MANAGEMENT CYCLE



ASSET MANAGEMENT – THE COST OF NET ZERO

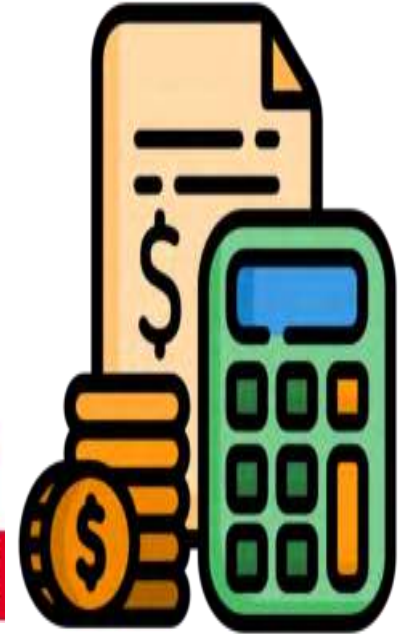
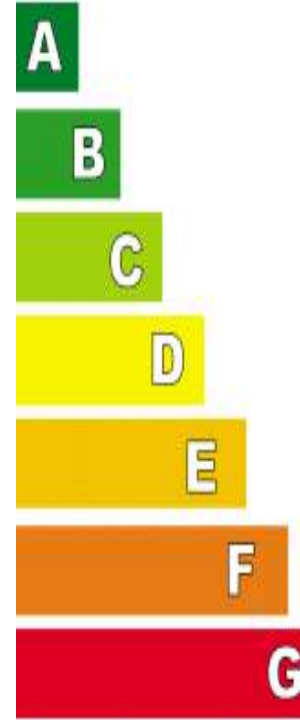
Accumulative cost of Retrofit Strategies



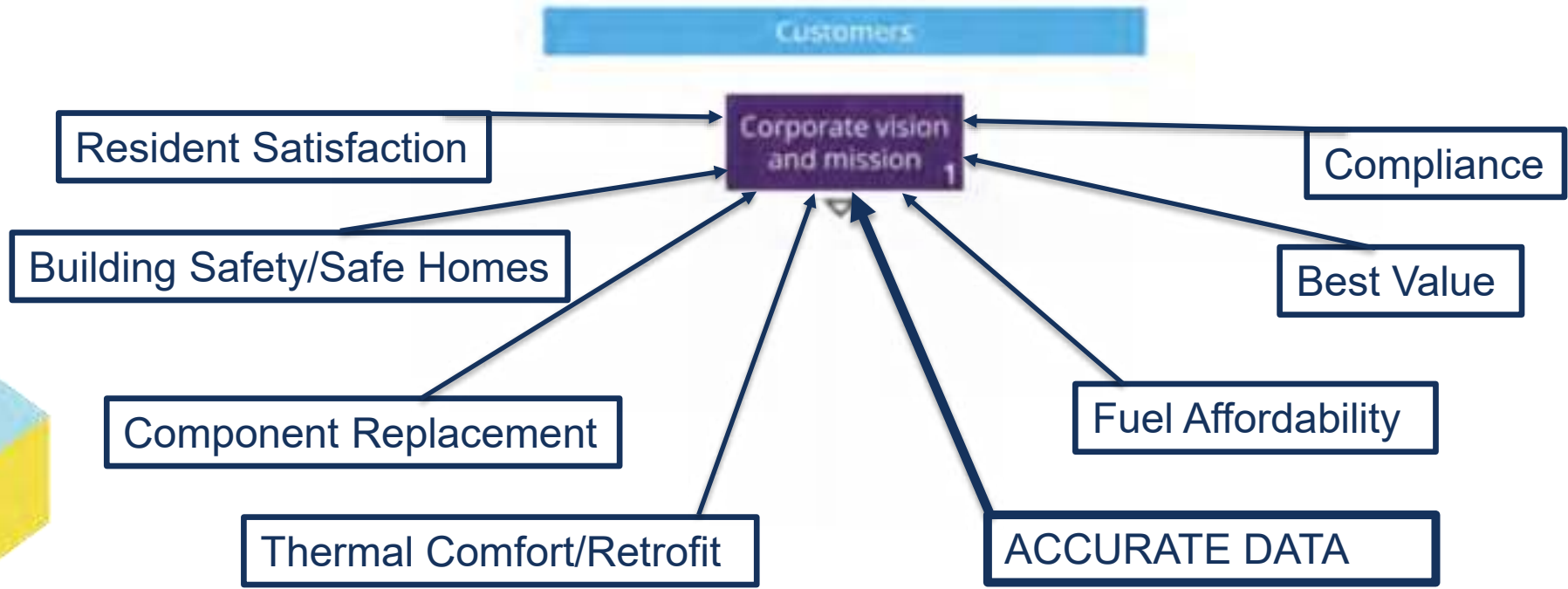
MISSING INFORMATION – SETTING THE STRATEGY

Data Quality issues:

- SCS Data Inadequate/ Incomplete
- EPC Data based on Assumptions
- Poor assumptions around costs



THE IN-DEPTH CORPORATE VISION





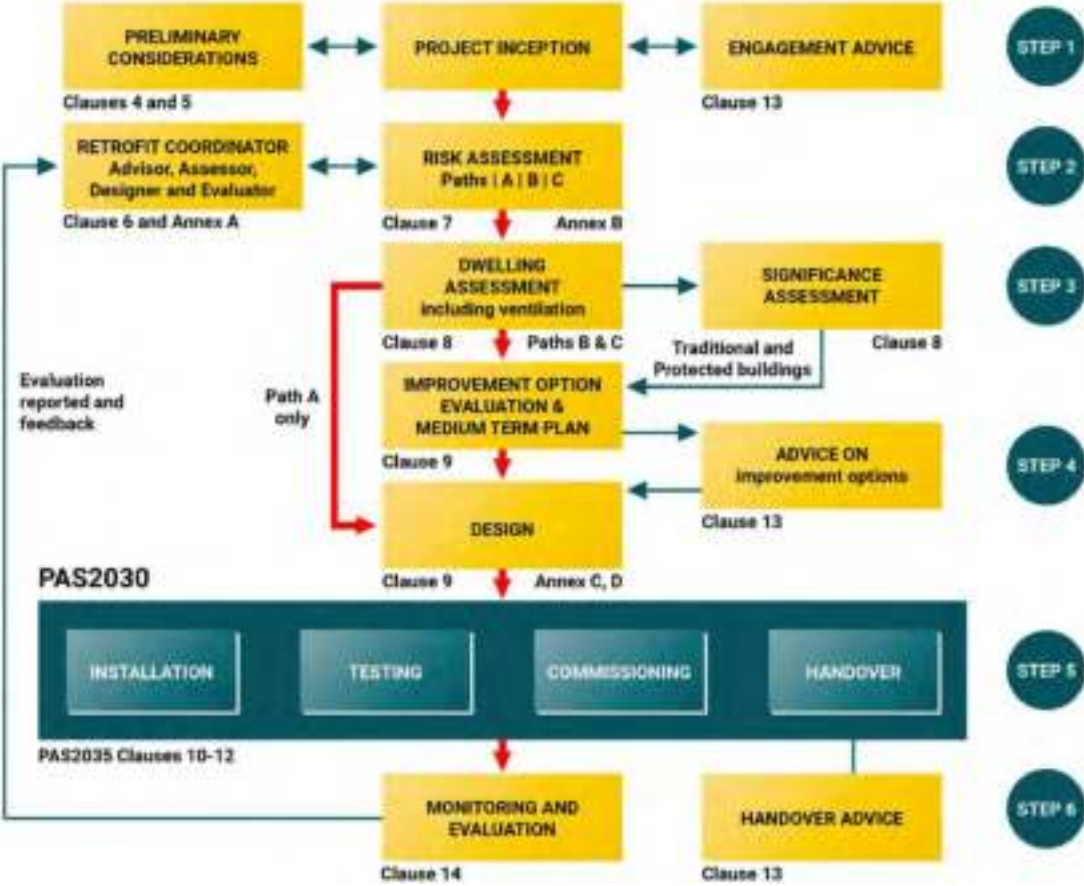
**PAS 2035: PAS,
PRESENT AND FUTURE**

**WILL GREGORY MRICS, BSC (HONS) APMP
MATTHEW ALLCOCK MRICS, BA (HONS), PG DIP**

PAS2035 – CORE PRINCIPLES



PAS 2035 – PROCESS MAP



PAS 2035 – RISK ASSESSMENT

PAS 2035:2019

Annex B (Normative) Risk Assessments

B.1 The risk assessment process (3.8) shall consist of the assessment of risk grades for each of the criteria and their aggregation into an overall risk grade that is used to determine the relevant compliance level for the specific site of the PAS, in accordance with Table B.1 and Table B.2.

Table B.1 – Risk assessment table for determining PAS 2035 Part 1

Criterion 1: Number of dwellings in the project		
The number of dwellings to be proposed	Risk grade	Assessed grade
0-50	A	
51-100	B	
More than 100	C	
Criterion 2: Number of measures per dwelling		
The average number of improvement measures per dwelling	Risk grade	Assessed grade
0.0	A	
0.1	B	
More than 0.1	C	
Criterion 3: Technical proposed		
The lowest technical risk of the highest risk measure (from Table B.2)	Risk grade	Assessed grade
1	A	
2	B	
3	C	
Criterion 4: Combination of measures		
The highest risk combination of measures (from the Measures Assessment Table 1, Figure B1)	Risk grade	Assessed grade
100%	A	
75-99%	B	
50-74%	C	
Criterion 5: Construction and Built Form		
Construction and built form of buildings	Risk grade	Assessed grade
Construction, low height (up to 3 storeys) and ground level	A	
Construction, low height (up to 3 storeys) and ground level	B	
Construction, low height (up to 3 storeys) and ground level	C	
Highways and construction	D	
Highways and construction and built form	E	

Criterion 1: Number of dwellings in the project

Criterion 2: Number of measures per dwelling

Criterion 3: Technical risk of measures proposed

Criterion 4: Combination of measures

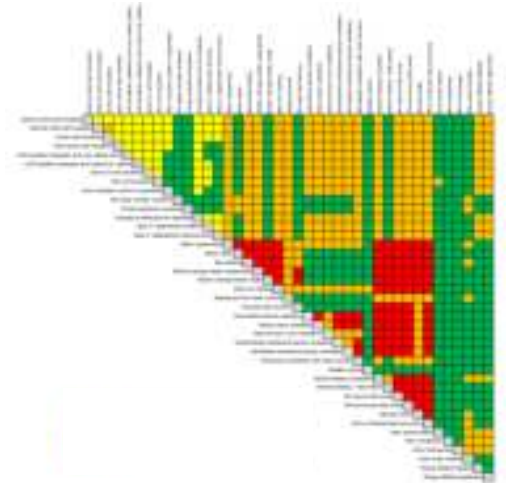
Criterion 5: Construction and Built Form

PAS 2035 – RISK ASSESSMENT

Measures Interaction Matrix

Key

- Measures are independent and do not interact
- Measures interact or may connect and require construction details
- Measures interact and require complementary specification and/or upgrade
- Measures are not appropriate together or should not be combined



Floor insulation  Hot water cylinder insulation

External Wall Insulation  New windows

Heating controls  Insulation upgrades

Air source heat pump  Ground source heat pump

PAS 2035 – RISK ASSESSMENT

Low Risk

PAS 2035 Path A

Medium Risk

PAS 2035 Path B

High Risk

PAS 2035 Path C

Overall Risk Grade		
Highest assessed grade (from Criteria 1 to 5 above)	PAS 2035 Path	Assessed Path
A	A	
B	B	
C	C	

ROLES AND RESPONSIBILITIES – PRE WORKS

Who does what in the new process?

PAS 2030 (2019)

Assessed Project Risk	Assessment	Strategy	Design and Specification	Installation	Handover	Monitoring/Evaluation
A (Low)	Assessor Coordinator	Coordinator	Coordinator Designer	Installer	Installer	Coordinator Evaluator
B (Medium)	Assessor	Coordinator	Coordinator Designer	Installer	Installer	Coordinator Evaluator
C (High)	Assessor	Coordinator	Designer	Installer	Installer	Coordinator Evaluator

ROLES AND RESPONSIBILITIES – RETROFIT COORDINATOR



Retrofit Coordinator

Role Description?

Person with overall responsibility for each stage of the project, sometimes also fulfilling specific project roles for which they are also qualified

Qualifications Required?

Open College West Midlands Level 5 Diploma in Retrofit Coordination and Risk Management.

Must also be able to demonstrate prior experience and competence in professional practices such as contract management, project management, customer service etc.

Accreditations Required?

Once qualified, must be a member of a TrustMark-approved Retrofit Coordinator Scheme (e.g. Elmhurst).

IMPROVEMENT EVALUATION ASSESSMENTS

Upgrades		Results		Total £	Cumulative Total £	Cumulative Total inc. O&M Systems	WLC £ (50 year life span)	
		EPC rating (SAP score)	Space heating demand kWh/m ² /yr SAP (2009) values					
Fabric First Approach	Existing	C (70)	105.50 (16.05)					
	1. Top up roof insulation to 400mm	N/A	N/A					
	2. Replace existing cavity fill insulation	N/A	N/A					
	3. 150mm EWI	C (73)	80.57 (98.64)					
	4. Double glazing	C (75)	78.34 (96.17)					
	5. Air tightness measures	C (78)	63.65 (70.52)					
	6. Thermal Bridging calculations	B (81)	46.21 (50.38)					
HVAC	7. Ventilation	Upgrades	CMEV	MVHR				
		Results	EPC rating C (80)	C (90)				
	8. Low Carbon Heat Source	Upgrades	ASHP	ASHP				
		Results	EPC rating B (87)	B (81)				
Further Fabric	9. Floor Insulation	Upgrades	ASHP	ASHP				
		Results	EPC rating B (84)	B (85)				
Renewable Technology	10. Photovoltaics	Upgrades	PV	PV				
		Results	EPC rating A (93)	A (92)			£00,000.00	
		Results	kWh 160	160				
		Space heating demand kWh/m ² /yr	27.49 (30.24)	20.55 (22.61)				

Notes
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Contingency @ 5%	
Subtotal	
Prelims @ 16%	
O&M @ 8%	
Total £	



Dealing with existing defects



Hidden defects



PAS 2035 ON SITE

Detailing



SPECIFICATION WRITING

3.3.7

The primary risks involved in the retrofit project are:

- Sub-optimal specification of products and poor installation resulting in the planned carbon and energy saving performance not being achieved. This can be mitigated by having the design solution specified by a competent professional, having the installation processes delivered in compliance with PAS 2030 and PAS 2035, and monitoring of the actual post installation performance. Particular care needs to be taken in the design and installation of ventilation measures.

PAS 2030:2017

Specification for the installation of energy efficiency measures (EEM) in existing buildings

4.7.2

Contractors shall have regard to the requirements of PAS 2030:2019 for installation, commissioning, and handover of measures and PAS 2035 for minimising the technical risks of retrofit in respect of sequencing works.

4.7.3

Particular attention shall be paid to thermal bridges, in terms of both identifying them in the property, and designing out or mitigating in the final design and install sequence.

4.5.4

Works are to proceed in strict accordance with the terms of the ITT and installation in full conformance with PAS 2030 and PAS 2035 to ensure key requirements of the grant funding and performance outcomes are met. Works installers must be PAS 2030 accredited and hold valid qualifications.

4.5.5

The Contractor is to note the project has been classified Risk Path C in accordance with PAS 2035 and is deemed to have included for all required activities, surveys, reports, testing, quality assurance, and documentation to satisfy compliance in installation, testing and commissioning, and handover with the standard and required risk path.



ROLES AND RESPONSIBILITIES (MID AND POST WORKS)

Installation	9.3.4	✓	On request, before installation starts, provide the Retrofit Installer's team with a briefing on key points of the design
	9.3.4	✓	Always provide a briefing if the dwelling is traditionally constructed or protected or challenging targets are proposed.
	9.1.27 and 13	✓	Ensure that any advice provided to the client during the design stage complies with clause 13.
	10	✓	Oversee the installation of improvement measures by the Retrofit Installer in accordance with PAS 2030 and/or MCS
	10 Note	✓	Obtain from the Retrofit Installer copies of evidence of compliance of the installation with PAS 2030 and/or MCS
	PAS 2030	✓	Ensure that the Retrofit Installer uploads installation documentation to the TrustMark data warehouse (for ECO)
Testing and commissioning	11.1.2	✓	Ensure that testing of installed measures is carried out in accordance with the retrofit design, PAS 2030 and MCS
	11.2.3	✓	Ensure that commissioning of installed measures is carried out in accordance with the retrofit design, PAS 2030 and MCS

HOW WE CAN SUPPORT CLIENT BIDS?

We can provide:

- Help with funding bids
- Past experience
- Advice on answering the question and key bid considerations





THANK YOU