

Retrofit Coordinating in Practice



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About Us

- Established in 1993
- Part of the Phenna Group (TICC Sectors)
- 15,000+ Members
- Largest EPC accreditation scheme



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- Monitoring and Evaluation
- Auditing

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Access Elmhurst



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Access Elmhurst



Visit www.elmhurstenergy.co.uk and click on Members Login

From here you can enter your Assessor I.D. and password

This will then take you to your Home Screen which will include a number of 'tiles'. These contain either software or documents (smaller tiles)



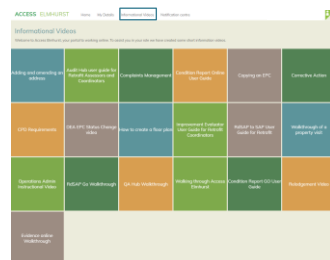
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Informational Videos



- We have a number of useful videos that may assist you in your role. These can be found within 'Access Elmhurst' and 'Informational Videos'



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My documents

We have a number of useful documents that may assist you in your role. These can be found within 'My Documents' and 'Retrofit'

My Documents

Welcome to your documents area. Here you can find Technical Bulletins, Software Manuals, Newsletters and Survey Forms along with downloads, such as Digital Certificates, all tailored to your accreditation(s).

Search

Retrofit

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My Documents

These documents include our Scheme Manual, Software Manuals, Technical Bulletins and a number of templates we have created to assist you, these include:

- Retrofit Advice template
- Intended Outcomes template
- Improvement Option Evaluation template
- Medium Term Plan template
- Compliance with PAS 2035 Sign-off Declarations template
- TB144 Retrofit Coordinating in Practice
- TB159 Improvement Option Evaluation
- TB191 Technical Guidance for PAS 2035:2023

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Software

Currently there are 2 tools available to you as a Coordinator which can be found under the Retrofit tile

- RdSAP to SAP** – convertor tool to create SAP xmls for IOE modelling
- Improvement Evaluator** – IOE modelling based on RdSAP calculations

Retrofit
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RdSAP to SAP
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Improvement Evaluator
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RdSAP to SAP

This tool uses RdSAP XMLs produced by Elmhurst's RdSAP software

- Output is SAP XML which can be imported to Elmhurst's Design SAP
- Design SAP allows you to model more accurate IOEs with much more flexibility than RdSAP

RdSAP to SAP
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Improvement Evaluator

This tool uses RdSAP XMLs produced by Elmhurst's RdSAP software

- Output is a IOE report PDF
- Allows you to model improvement measures based on RdSAP calculations
- All recommended measures that are displayed on Energy Report.

Improvement Evaluator
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TRUSTMARK
Government Endorsed Quality

Trustmark Account

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Claiming account

- RC projects must be lodged directly via TrustMark or EcoSurv
 - EcoSurv is a 3rd Party Software Provider Elmhurst endorse. An additional payment is needed to use their system.
- Prior to attempting any lodgements you will need to claim your business account on TrustMark's website



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If you're a **Homeowner** & you don't have an account - [Register Now](#)
 If you're a **Business** & you don't have an account - [Claim Your Account Here](#)

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Top Up

- Ensure you have added some credit to your TrustMark account balance
- TrustMark will charge a fee upon lodgement for each project. This needs to be covered in advance with the credit balance you have set up.

Account

Profile Details Billing **Top Up** Notifications Invoices Users Third Party Access API Recently Viewed

Top Up

Top up your account

When you top up your account the payment is processed by card payment specialist Stripe, this means that we do not have access to your card details and that industry leading systems are used to protect your details.

Please note that 3D Secure payments are now supported and your card issuer may require you to follow their 3D Secure process when making a payment.

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Framework



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PAS 2030 and PAS 2035

- PAS 2030 and PAS 2035 should work in conjunction with one another.
- PAS 2030 is an independent installation standard of its own, which many are already qualified in.
- PAS 2035 provides a whole building approach to the retrofit process.
- Designs of all retrofit measures should be created in conjunction with PAS 2035 and installed in accordance with PAS 2030, by installers who are TrustMark accredited.

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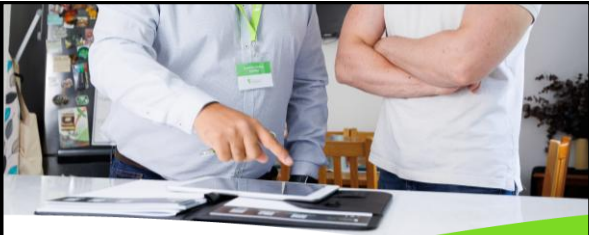


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Where does PAS 2035 apply?

- The Government stipulated that any funding they provide for energy efficiency measures (EEMs) will need to use through the PAS 2035 process.
- Warm Home Social Housing Fund (formerly SHDF), Warm Home Local Grant, GBIS all require PAS compliance.
- ECO 4 requires PAS 2035 compliance and introduced changes to the processes for both RC's and RA's.
- UK banks are also going to be looking into PAS 2035 as a way of having a framework which retrofit will have to adhere to for any funding to be granted.

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Retrofit Process



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The Retrofit Process

- The Retrofit Assessor will carry out the assessment and give information gathered to the Retrofit Coordinator.
- The Retrofit Coordinator will then review the assessment and discuss Intended Outcomes and complete an Improvement Option Evaluation and Medium Term Plan.



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The Retrofit Process



- The Retrofit Coordinator will carry out a Ventilation review.
- The Retrofit Designer will then use the assessment and work with the Retrofit Coordinator to design relevant energy efficiency improvements to the dwelling.

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The Retrofit Process

- The approved designs will be used to carry out improvements on the property.
- All installers will be PAS 2030 (2023) or MCS compliant.



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Additional requirements

- Retrofit Assessments must be submitted to TrustMark to begin the Retrofit Project
 - This can be done by the RA or RC.
- If the RA actions this, an additional charge will need to be paid to TrustMark by the RA - £5.
 - We advise to save on cost, the RC actions this.
- Only an Energy Report can be used, not an EPC - and a LIG XML is required.

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Additional requirements

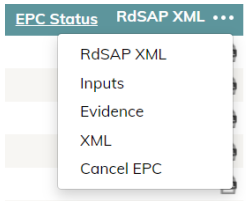
- A post install Energy Report is also required. This can be done in some circumstances without revisiting the property.
- Only the measures that were funded can be updated in the post install Energy Report, with no self-funded measures.
- IOE figures need to match the post install Energy Report.

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Elmhurst's XMLs

- Download from RdSAP Online
- RdSAP XML – for internal use (Improvement Evaluator, RdSAP to SAP convertor)
- LIG XML – from EPC is protected and should not be used. The LIG XML from an Energy Report is used for lodgement of projects.



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New PAS 2035: 2023



- Main changes**
 - Revised Risk Assessment procedure
 - More detailed Ventilation Report from RA
 - Designer qualifications
- Traditional construction is defined as: building with solid brick, stone or earth external walls, constructed with moisture-permeable materials and usually built prior to 1919, or pre-1919 timber-frame external walls with any infill

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Additional requirements

- Retrofit Advice is to be documented
- Monitoring & Evaluation are part of MTP
- Site inspections added

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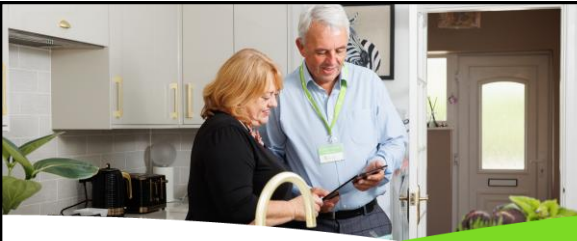
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New PAS 2035: 2023

- Retrofit at scale**
 - Single measure for number of dwellings regardless of location
 - Number of measures for number of dwellings in defined areas or blocks (RA, IOE & MTP can be created for archetypes to start with design prior to all RAs to be finished, then IOE & MTP has to be adjusted for individual properties)
- Distressed replacement of heating appliances has been added
- Heritage Impact Assessment

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Retrofit Advice

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Retrofit Advice

- Can be delivered by any involved party (RA, RC, designer or installer) to occupier and client.
- The topic should be in line with the improvement work and at the stage at which it is delivered
- For multiple dwellings projects this can be delivered through web forums, community meetings or open homes events.



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Retrofit Advice

Should be delivered at several stages of the project:

- 1. Initial engagement and inception of the project** – behavioral issues, maintaining of the building, adjusting energy tariff or supplier, retrofit technologies and considerations and processes including quality assurance.
- 2. On completion of IOE** – delivered by RC, should include any consultations with planning department, explanation of IOE, discuss the capital cost and fuel cost savings, identification of the recommended options for MTP and immediate project.

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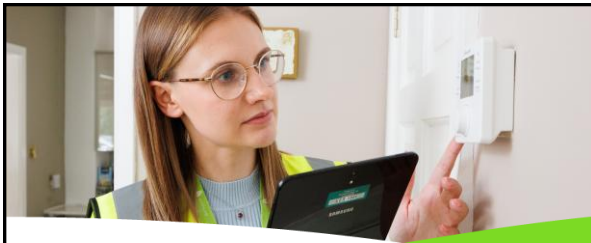
Retrofit Advice

- 3. On completion of the design** – delivered by the Designer or RC and should include the key features of the design including all measures and a brief explanation of the installation process.
- 4. At handover or shortly after** – delivered by the installer but RC must oversee this, it should include details of the measures to be installed, behavioral issues, repair & maintenance and quality assurance process.

Template available on Access Elmhurst – My Documents – Retrofit SF65

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Retrofit Assessment

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Retrofit Assessment

- Energy report certificate + RdSAP inputs & LIG XML
- Condition Report + Occupancy Assessment
- Floorplan
- RdSAP photo evidence
- Energy Efficiency Measures for Older and Traditional Buildings; Level 3 qualification for all traditional properties
- All must be submitted - you should not accept draft versions or if non-approved software has been used
- Example of Retrofit Assessment will be part of Exercise 1

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Retrofit Assessment PAS 2035: 2023

- PAS 2035: 2023 – for distressed replacement of heating appliances the RA can be done during or even after the retrofit process but should be done as soon as possible.
- PAS 2035: 2023 – more detailed ventilation survey is required



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What should an RC be checking on Retrofit Assessment?

Energy Report:

- Fabric construction
- Heating system and secondary heating
- Room Heights
- Check for all required documents to be present



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What to check on Retrofit Assessment?

Floorplan:

- Check all required info is present such as heating, windows, meters, loft hatch, services etc., clearly marked with a key and dimensions



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What to check on Retrofit Assessment?

Condition Report

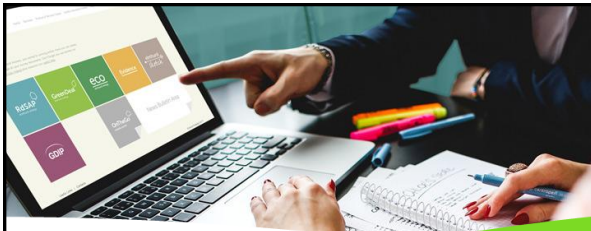
- Ventilation check (purge, trickle vents + measurement, door undercuts, extractor fans make, model/flow rate)
- Good quality of photos to see overall condition of each room & elevation
- All rooms, elevations, loft, etc. are included
- Significance Survey present if required



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Intended Outcomes



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Intended Outcomes

- Important starting point for RCs to establish what needs to be achieved and to understand client's needs
- Should be signed by client
- There are 15 points to be considered, multiple can be chosen

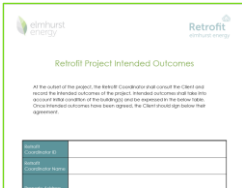


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Intended Outcomes

- It is good to get an understanding of the client's needs and wants and to discuss how can it be achieved.
- RC to establish how to verify achieving the I.O. and prepare pre-retrofit testing if required and the timescales that might be required to do so.
- Template available on Access Elmhurst – My Documents – Retrofit SF68



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Intended Outcomes

Achieving I.O. targets can be done by:

- Air-tightness tests
- Heat lost measurement (MEP)
- Comparison of fuel bills
- Comparison of SAP score in pre & post install Energy report
- Comparison of CO2 emissions in pre & post install Energy report
- Questionnaire for client, etc.



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Intended Outcomes



- Reduction in energy use
- Reduction in energy cost and/or alleviation of fuel poverty
- Reductions in emissions associated with energy use
- Improvement in internal comfort
- Improvement of internal air quality
- Elimination of condensation, damp and mould
- Reducing the risk of overheating
- Improvement in energy rating (e.g. SAP)

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Intended Outcomes

- Meeting a performance standard (e.g. NZEB or Passive House EnerPHit)
- Improving the usefulness or suitability of the building
- Protecting the building against decay or deterioration
- Improving resistance against flood risk
- Improving the resilience of dwellings to existing and/or future risks from climate change
- Protection or enhancement of architectural heritage
- Integration of energy efficiency measures with other improvements (e.g. extension, loft conversion or general refurbishment)

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Exercise 1

- Review the Retrofit Assessment – check all documents required have been supplied + details of Energy Report are correct + level of details of Condition Report are sufficient
- Complete IO template if you were the client and RC for this project

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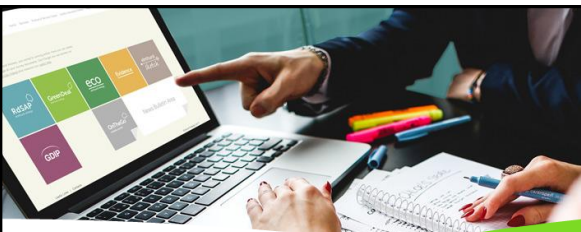
Break

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Improvement Option Evaluation



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Improvement Option Evaluation

There are three ways to get the basic figures for your calculations:

- Improvement Evaluator software
 - Modelling based on RdSAP
 - RdSAP XML only from Elmhurst is needed
 - Can model triggered recommendations, recommendations where SAP increase is too small & alternative measures
 - Limitation – can only improve to Appendix T standard



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Improvement Option Evaluation



- RdSAP modelling in Energy reports (by RA)**
 - More flexibility (insulation thicknesses, exact heating systems, etc.) however the exact instructions must be provided for RA to model
 - May incur extra charge by RA
 - TB159

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Improvement Option Evaluation

- SAP modelling**
 - Will not produce same results as post RdSAP and so depending on funding, may be unsuitable
 - More flexibility (insulation thicknesses, exact heating systems, etc.)
 - TB159
- Template available on Access Elmhurst - My Documents – Retrofit SF52**



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Improvement Evaluator

- Useful video in Informational Videos - Improvement Evaluator User Guide for Retrofit Coordinators
- Manual available in My Documents - Retrofit - IM100
- Need Appendix T, capital costs & RdSAP XML
- Demo



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Improvement Option Evaluation

- Capital cost – from installer or Appendix A of IM100
- Lifetime of measures

Measure	Lifetime	Measure	Lifetime
LI	42	Heat pump	15
FRI	20	Micro CHP	15
RIRI	42	Boiler	12
CWI	42	Flue gas heat recovery	12
EWI/IWI	36	Storage heaters	20
EWI with CWI	36	Warm air unit	20
LFI	42	Solar water heating	25
HWC insulation	10	Waste water heat recovery	20
Draught proofing	10	Windows & glazing	20
LEL	5	Insulated doors	30
HWC slot	12	PV	25
HWC	12	wind turbine	10
Biomass boiler	20	PV diverter	20
Biomass room heater with boiler	20	PV battery	25

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Medium Term Plan

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Medium Term Plan

- MTP is created once the IOE has been discussed with client and measures have been agreed for the next phase of the project
- Should include:
 - A plan for the property for the next 30 years
 - Constraints
 - Installed measures
 - Non-installed measures
 - Monitoring & Evaluation Plan
- Template available on Access Elmhurst - My Documents – Retrofit – SF69**

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Medium Term Plan

- Include the Monitoring and Evaluation plan
 - Outline of the basic evaluation to check if:
 - Intended outcomes have been achieved (this should include a questionnaire as well as any tests that are needed, depending on which Intended Outcomes were selected)
 - There are any unintended consequences
 - Client/occupier are satisfied with the outcomes & process
 - Any points of dissatisfaction
 - Any elements of installation are not working as expected
 - Any further comments

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Exercise 2

- Model IOE
 - Scenario 1: Floor insulation
 - Scenario 2: Heating Controls
 - Scenario 3: Solar PV
 - Scenario 4: Heating Controls + Solar PV
- Using Improvement Evaluator
- Produce MTP with HC & Solar PV to be installed now

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Lunch

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Ventilation

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Ventilation Checklist

Table 11: Checklist for ventilation provision in existing buildings

Measure	Category	Priority
1. Renewing loft insulation, including effective edge sealing at junctions and penetrations	Minor	1
2. Loft conversions or works that include changing a cold loft (insulation at ceiling level) to a warm loft (insulation at roof level)	Minor	1
3. Wall insulation	Minor	1
4. Installing cavity wall insulation to any external wall	Minor	1
5. Installing external or internal wall insulation to less than or equal to 50% of the external wall area	Minor	1
6. Installing external or internal wall insulation to more than 50% of the external wall area	Major	1
7. Replacement of windows and doors	Minor	1
8. Replacing less than or equal to 50% of the total existing windows or door units	Minor	1
9. Replacing more than 50% of the total existing windows or door units	Major	1
10. Draught proofing (other than openings)	Minor	1
11. Replacing a loft hatch with a sealed/insulated unit	Minor	1
12. Sealing around structural or service penetrations through walls, floors or ceiling/roof	Minor	1
13. Sealing and/or insulating a suspended ground floor	Major	1
14. Removing chimney or providing another means of sealing over chimney internally or externally	Major	1

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Project category

Table 11: Energy efficiency measures

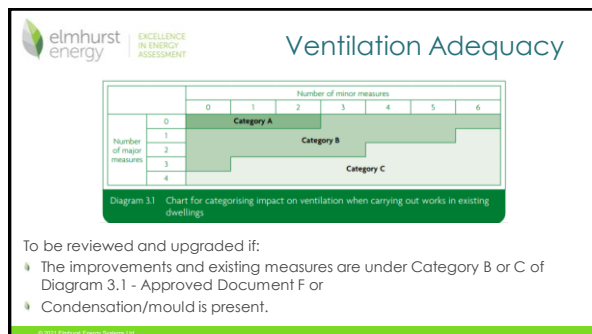
Measure	Category
1. Renewing loft insulation, including effective edge sealing at junctions and penetrations	Minor
2. Loft conversions or works that include changing a cold loft (insulation at ceiling level) to a warm loft (insulation at roof level)	Minor
3. Wall insulation	Minor
4. Installing cavity wall insulation to any external wall	Minor
5. Installing external or internal wall insulation to less than or equal to 50% of the external wall area	Minor
6. Installing external or internal wall insulation to more than 50% of the external wall area	Major
7. Replacement of windows and doors	Minor
8. Replacing less than or equal to 50% of the total existing windows or door units	Minor
9. Replacing more than 50% of the total existing windows or door units	Major
10. Draught proofing (other than openings)	Minor
11. Replacing a loft hatch with a sealed/insulated unit	Minor
12. Sealing around structural or service penetrations through walls, floors or ceiling/roof	Minor
13. Sealing and/or insulating a suspended ground floor	Major
14. Removing chimney or providing another means of sealing over chimney internally or externally	Major

Required for each property

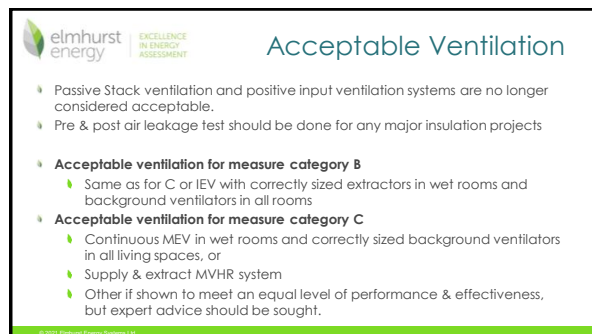
The improvements and any existing measures installed since construction are to be considered

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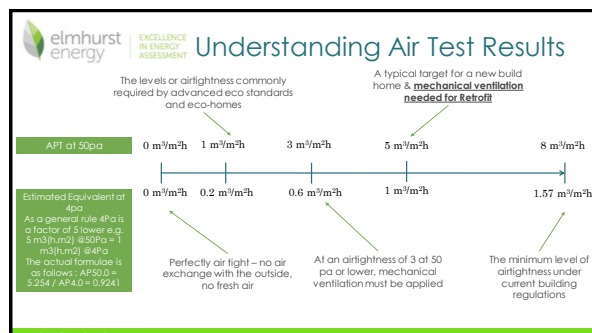
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Background Ventilation
Requirements Summary

Whole House

- Where the whole house test result is **greater than 1.0** air changes per hour at 4 Pascal's
- and the sum of what is already present and planned is equal to **no more than 1x major and 3x minor** EEMs
- the overall level of **background ventilation is adequate**.

Room

- Where the room presents as having a **greater than 1.5** air changes per hour at 4 Pascal's **background ventilation is adequate**.
- If the room under test **does not meet** the above it will require the installation of background ventilators and the undercut on the door will also need to be assessed and increased.

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Design



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Qualifications – New PAS

Roles	1 measure					2 interacting fabric measures		3 interacting fabric measures		Traditional properties	
	General	Proprietary system	Combustion appliance	MCS	MCS	includes historic insulation or replacement windows on a high-level or system built	proposed measures are likely to have an impact on heritage or fabric	Other			
RA	DEA+RA	DEA+RA	DEA+RA	DEA+RA	DEA+RA	DEA+RA	DEA+RA+LVL3	DEA+RA			
RC	LVL5	LVL5	LVL5	LVL5	LVL5	LVL5	LVL5+LVL5	LVL5			
Designer	specialist designer		trained & approved by manufacturer or supplier	MCS certified	trained & approved by manufacturer or supplier	MCIAT/PCAT	same as 3 interacting fabric measures +				
	specialist specifier	trained & approved by manufacturer or supplier	Gas Safe reg (gas install)	competent person reg (for install)	CHSE/AMECH /CABE	RPB/Ofqual	same as 3 interacting fabric measures				
Evaluator*	LVL5	LVL5	LVL5	LVL5	LVL5	LVL5	LVL5	LVL5			

*same as RC if basic evaluation is required

LVL3 = Level 3 Award in Energy Efficiency for Older and Traditional Buildings

LVL5 = Level 5 Diploma in Retrofit Coordinator and Risk Management

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PIBI

- Pre-Installation Building Inspection is required to be completed for the design stage, so that the Designer can amend any details that may have not been picked up by the RA initially
- Often completed by the installers
- PIBI varies for each measure
- PIBI guidance in PAS 2030



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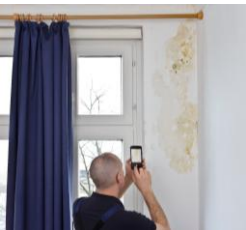
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Design

Design must now address:

- Defects,
- Constraints,
- Repairs,
- Testing requirements for gas & electrical systems,
- Commissioning & handover requirement

Template available on Access Elmhurst - My Documents – Retrofit – SF66



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Ventilation Design

Ventilation Design	
Ventilation Checklist uploaded?	Yes/No
Ventilation Summary uploaded?	Yes/No
Number of Minor Measures	
Number of Major Measures	
Category A, B or C?	A/B/C
Evidence of Condensation/mould?	Yes/No
Ventilation Adequate	Yes/No
Ventilation improvement make & model	
Ventilation improvement placements	

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Insulation Design

Insulation measure Design	
Designer name	
Designer Qualifications	
Measure	
Material make & model	
Thickness of insulation	(Pre thickness required for U as well)
Specification sheet for material included?	To be attached to the Design
Manufacturer's installation guide included?	To be attached to the Design
Thermal bridging included?	To be attached to the Design
Size and area(s) to be treated marked on floorplan?	To be marked on floorplan

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Heating Design

Heating Design	
Designer name	
Designer Qualifications	List qualifications + attach certificates
Measure	
Boiler make & model	
HC make & model	
Heat pump make & model	
HWC make & model	
Radiator make and model	
Placement of all products marked on floorplan?	All products to be marked on floorplan
Heat demand calculation included?	To be attached to the Design
Radiator size calculation included?	To be attached to the Design
Specification sheet for all products included?	To be attached to the Design
Manufacturer's installation guides included?	To be attached to the Design

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Solar PV Design

Solar PV Design	
Designer name	
Designer Qualifications	List qualifications + attach certificates
PV panel make & model	
Number of PV panels	
Inverter make & model	
Specification sheet for material	To be attached to the Design
Manufacturer's installation guide	To be attached to the Design
Schematics & positioning	To be part of the Design

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Openings Design

Openings Design	
Designer name	
Designer Qualifications	List qualifications + attach certificates
Windows make & model	
Number of windows	
Doors make & model	
Number of doors	
Placement of all products marked on floorplan?	All products to be marked on floorplan
Specification sheet for material	To be attached to the Design
Manufacturer's installation guide	To be attached to the Design

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Exercise 3

- ❖ Produce Ventilation Document
- ❖ Who can be the designer?
- ❖ Choose which design is correct to use

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Break

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Toolbox talk

- Required before install
- Required if:
 - Design includes new or unusual materials, products or systems
 - Any fabric insulation measures or replacement windows on a high-rise or system-built dwelling
 - Traditional dwelling and the proposed measures are likely to have an impact on the significance and/or building fabric
 - The design is set to achieve particularly challenging performance standards
 - Installers have not installed the specified measure before

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Installation

- In person or virtual site inspection is required during construction to satisfy RC that PAS 2035 has been met.
- RC shall make a written record of quality and progress from all inspections, whether in-person or from third party.
- TM's guidance: https://www.trustmark.org.uk/media/vo/cnhu40/retrofit-coordinator-update-site-visit-requirements-v1.pdf?utm_campaign=website&utm_medium=email&utm_source=SendGrid



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Site Inspections

In person inspection

- Required for EWI, IWI, RIRI, UFI, FRI and Park Home Insulation
- Done by an active RC or suitably qualified designer
- This should be done to check:
 - the interaction of EEMs,
 - the installation of the air barrier,
 - the installation of thermal bridge details,
 - airtightness testing,
 - the correct products are being installed in line with the retrofit design.

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Site Inspections

Virtual inspection

For all other measures

- Done by a suitable person (e.g. installer, RA, etc.) and ideally should be an independent third party
- RC to gather the digital evidence

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Records of site inspections

- Images specific to the measure installed in accordance with the relevant PAS 2030 annex or MCS standard to include relevant building details, services, structural integrity, fixings and material/equipment as specified in the design either under construction or in situ
- Ventilation in situ at the time of the visit
- Design interface detail for multiple measures
- Any significant building detail, areas of concern and non-conformance with the specified design

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Claim of Compliance

- There are 2 types of Claim of Compliance that are needed:
 - PAS 2035**, which comes from RC. There are 2 forms available:
 - Self-assessment
 - Other party validation
 - PAS 2030 / MCS certificate**, which comes from the installer
- Claim of Compliance PAS 2035 can also be included in the Handover letter.
- Template available on Access Elmhurst - My Documents – Retrofit – SF47, SF48**

The screenshot shows a 'Retrofit Project Claim of Compliance Based on Self-assessment' form with fields for 'Retrofit Coordinator', 'Retrofit Assessor', and 'Retrofit Installer'.

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Post Install

Post install documentation should include:

- Photos from installer from mid and post install
- Post Energy Report with funded measures reflected + LIG XML file
- Handover letter from RC confirming measures that have been installed, user manuals and RC's contact details in case of queries.
- Template available on Access Elmhurst - My Documents – Retrofit – SF67**
- Insurance Backed Guarantees

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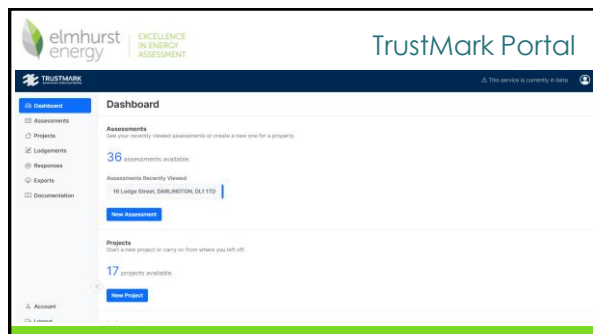
Exercise 4

- Produce Claim of Compliance PAS 2035
- Produce Handover
- Produce Advice Log
- Which Claim of Compliance PAS 2030 is acceptable?
- What other documentation is needed before you can lodge?

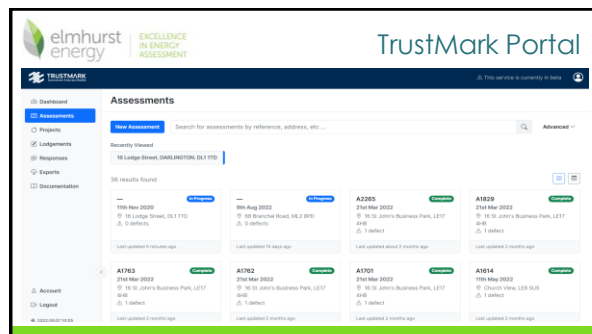
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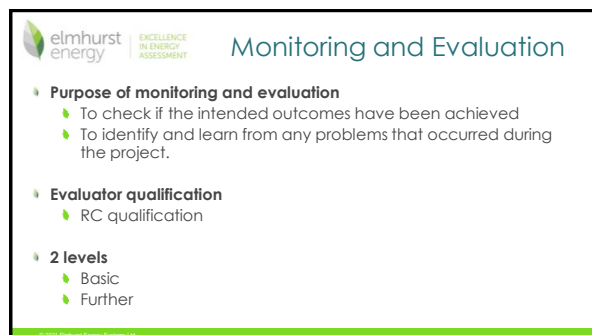
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Basic Monitoring

Applied to every project

- Should use measure specific questionnaire answered by client/occupant and any tests set out in MTP stage to establish details such as:
 - If IO have been established
 - If any unintended consequences occurred
 - If client/occupant is satisfied with the project
- Should be completed within 3 months of handover

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Further Monitoring

- Further monitoring and evaluation shall:**
 - Establish why there was any discrepancy or explain unintended consequences
 - Identify & specify any necessary remedial work
 - Identify areas of learning to avoid this in the future
- Once completed, a summary is needed with recommendation for remedial works, changes to processes and recommendations for further monitoring and evaluation which should be shared with the client, RC, RA, designer and main contractor or installer.

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Auditing

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Auditing

- Minimum of 2% of all lodgments
- Notification via email
- Evidence
 - Zipped file
 - Upload directly to QA Hub & Audit Zone
 - 5 days to comply
- Audit Hub for RC & RA video
- Retrofit Project Audit Submission Form (SF54)

QA Hub & Audit Zone
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Retrofit Coordinator Scheme

Other training opportunities or products that may be of interest to you in your Coordinator role:

- Design SAP for Retrofit Coordinators 3hrs CPD
- ABBE Level 3 Older and Traditional Buildings (On Demand)
- Measured Energy Performance (MEP) Competency Training, 3hrs CPD
- Level 1 Airtightness Testing and Background Ventilation Testing (On Demand/Classroom) Competency Training, 3 days
- U-Value Competency Training, 1 day
- Ventilation Training Competency training for measuring fan flow rates, 2 days
- Design SAP software
- Better Buildings Consultant

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THANK YOU

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