



THE  
**RETROFIT**  
ACADEMY



# THE PAS 2035 COMPLIANCE PROCESS MAP

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# Purpose

For many of the nearly 400 learners working towards their Level 5 Diploma in Retrofit Coordination and Risk Management, the key concepts and theories of Whole House Retrofit should now be familiar. We make no apology here at The Retrofit Academy for, frankly, ramming them down your throats – often at the risk of repeating ourselves.

But putting this theory in to effective practice is a challenge for many. It doesn't matter how many times you read PAS 2035, it is still challenging to know that you are doing everything by the book. What's more, **compliance for the sake of compliance is not what we should be aiming for. Instead you should be asking how this can help you to grow your business in a growing marketplace.**

## Our solution?

We asked the recognised experts in this field to produce this guide. Referring not only to PAS 2035 but also to the well of best-practice knowledge that underpins it, Academy tutors Dr Peter Rickaby and Alan Pither have produced this step-by-step guide to full compliance. Follow this guide and you should be doing all the right things - and heading towards excellence.

It might seem onerous at first. Rather like cooking a new recipe, the first attempt is pretty slow but after that it gets far quicker as the unfamiliar becomes habit.



Ask yourself "How can this help me to grow my business in a growing marketplace?"




# About this Guide

The Guide consists of three “Process Maps” – one for each of the key professional roles in the PAS 2035 process: Retrofit Assessor, Retrofit Coordinator and Retrofit Designer. It builds upon our previous Guide, PAS 2035 Explained, which sets out what the new Standards are attempting to do and how the new roles interrelate. It is intended to be used by people fulfilling one of those three roles, as well as their employers and the accreditation schemes of which they are members.

Each Process Map is broken down by PAS 2035’s Stages – Preliminaries, Assessment, Design etc. Each Stage is sub-divided into Activities – the steps the individual in that role must complete. It then details that Activity and makes it clear which of the three Risk Pathways the Activity applies to.

It is easy to be overawed by the sheer number of Activities – there are 114 for the Coordinator alone. But many of these tasks are very short and will become habits quickly, if they are not already. They need to be. However, the amount of work involved should not be underestimated by anybody designing or procuring services in this sector. **We would advise caution about any service that offers a price point so low that it can not feasibly include these steps, however light touch some of the Activities may be.**

The whole purpose of PAS 2035 is to raise Standards by introducing deeper, whole house retrofit in place of shallow, measures-based installs. This transition is underpinned by cradle-to-grave Retrofit Coordination and Risk Management, which must ensure the core principles are followed. It is not a process that can be done retrospectively on jobs. It is not a tick-box exercise and it should not be seen as a means of securing enhanced funding. **Building the processes outlined in this Guide into your business will help you become a whole house retrofit company.** So use it to review your roots and your branches too and in no time you will not be worrying about compliance – you’ll be building a business capable of delivering deep retrofit at a scale that you can be proud of.

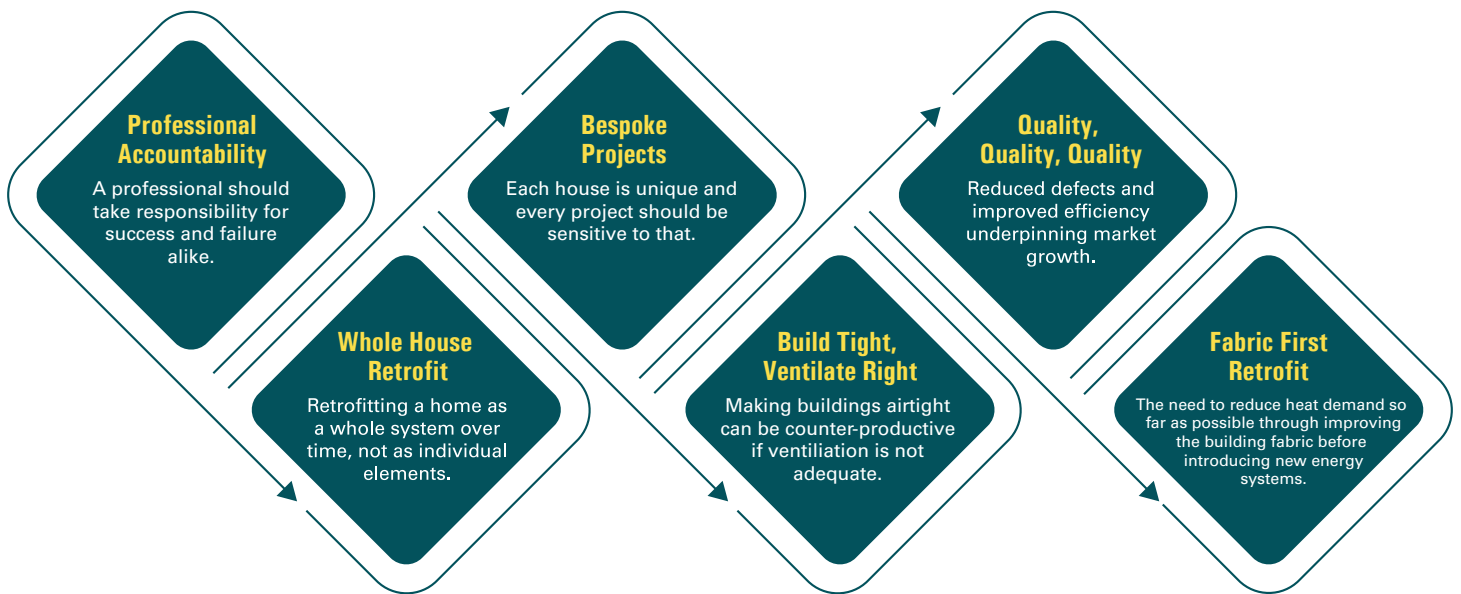


**“Building the processes outlined in this Guide into your business will help you become a whole house retrofit company.”**

# PAS 2035 – Remember the Basics

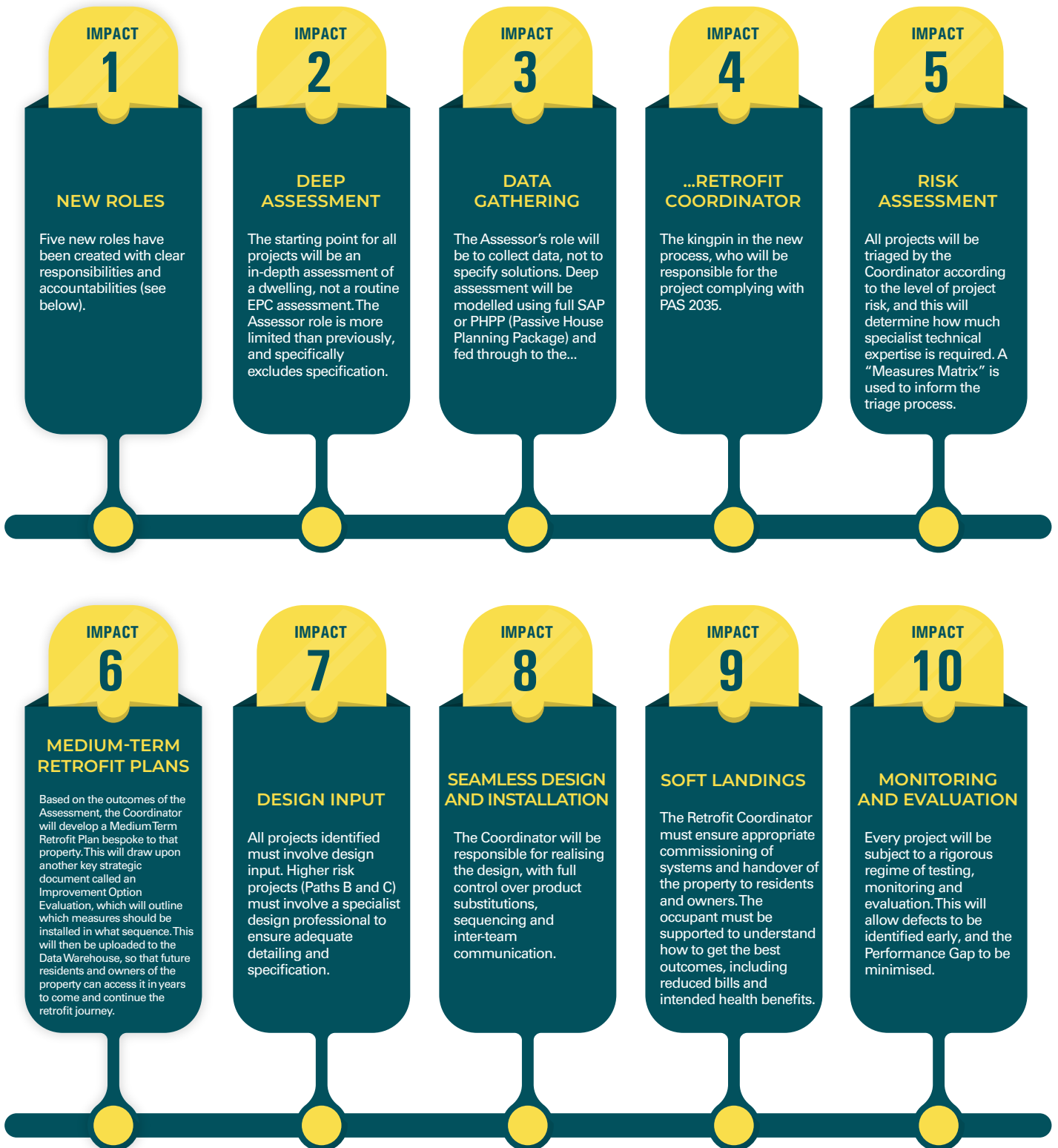
## The core principles of PAS 2035 explained

A set of core principles underpin PAS 2035. These are often mistaken for jargon and it is crucial that your business develops a thorough understanding of these.

































**“Build a business capable of delivering deep retrofit at a scale that you can be proud of.”**

## PAS 2035 – The top 10 impacts



## 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



Temporary whilst Evaluators are trained and accredited.

Advanced Evaluation can not be performed by the same Coordinator leading on the wider project.



Indicates "oversight"

# Need more support?

The Retrofit Academy is the national centre of excellence for retrofit. We are here to help support your business through training, mentoring and sharing best practice.

We have developed a range of tools and CPD to help you put PAS2035 into effective practice. For example, we have created templates for two mandatory reports that are central to PAS2035 – Medium Term Retrofit Plans and Improvement Option Evaluation Reports. You can access these tools and resources as a Member of the Centre of Excellence for Retrofit.

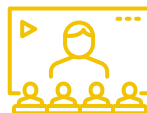
What is more, Membership gives you access to a range of services that will provide intelligence, access and inspiration for companies transitioning to whole house retrofit. These include:

## Online Retrofit Knowledge Portal



Providing access to new resources that can help you achieve excellence

## Online Events



Technical conferences and themed meetings throughout the year

## Retrofit Product & Project Reviews



Helping you identify what you can and can't trust

## CPD



A programme of online CPD that will satisfy your annual requirements and help you build more knowledge and skills into your business

## Retrobook



An App that connects freelance retrofit professionals with clients

## Tools & Templates



Access to template resources designed by Academy tutors with wrap-around support

For more information, please visit [www.retrofitacademy.org](http://www.retrofitacademy.org)

# PAS 2035 RETROFIT COORDINATION PROCESS MAP

ACTIVITY	PAS 2035 STAGE	PAS 2035 REFERENCE	RISK PATH	RETROFIT COORDINATION ACTIVITY	
1	<b>PRELIMINARIES</b>	6.1 and Annex A	All	Confirm and record the Retrofit Coordinator's appointment and qualification	
2		4 and 5	All	Review guidance	
3		13	All	Ensure that engagement advice originated or reviewed by the Retrofit Advisor is provided to client	
4		6.2	All	Agree and record intended outcomes in consultation with client	
5	<b>RISK ASSESSMENT</b>	7.1 and Annex B	-	Collate 'triage' data for risk assessment as defined in Annex B; consider site inspection to supplement online data	
6		7.1, 7.2, Annex B	-	Determine and record the risk path (A, B or C) for the project in accordance with the criteria defined in Annex B	
7	<b>WHOLE-DWELLING ASSESSMENT</b>	8.2 and Annex A	All	Confirm and record the Retrofit Assessor's appointment and qualification, appropriate to risk path	
8		8.3	A	Ensure whole-dwelling assessment is carried out	
9		8.3.2	A	Where appropriate, ensure collection of data for RDSAP or SAP assessment	
10		8.3 - 8.4	B	Ensure whole-dwelling assessment is carried out, including collection of RDSAP or SAP data	
11		8.3 - 8.5	C	Ensure whole-dwelling assessment is carried out, including collection of RDSAP or SAP data, and following RICS guidance	
12		8.5.1	C	Ensure that an air permeability test is carried out and key leakage points are identified.	
13		8.4.1 (6) Annex C	B and C	Ensure that a ventilation assessment is carried out in accordance with the adequacy criteria defined in C.2	
14		8.4.3	B and C	If the dwelling is traditionally constructed, ensure that a simplified BS 7913 significance assessment is carried out	
15		8.5.2	C	If the dwelling is protected, ensure that a BS 7913 significance assessment is carried out and consider a structural report	
16		8.6.1 8.6.2	All	Report the whole-dwelling assessment to the Retrofit Designer, together with photographs and RDSAP, SAP or PHPP data	
17		8.6.3	All	Ensure that the whole-dwelling assessment report identifies any defects that must be rectified prior to retrofit	
18		8.6.5 9.1.5	All	Ensure that any additional information required by the Retrofit Designer is requested and added to the assessment report	
19		<b>RETROFIT DESIGN</b>	9.1.2 Annex A	All	Confirm and record the Retrofit Designer's appointment and qualification, appropriate to risk path
20			8.6.5 9.1.5	All	Ensure that the Retrofit Designer identifies any information missing from the assessment report and request it
21	9.1.3 9.1.4		All	Obtain the Retrofit Designer's confirmation that the whole-dwelling assessment report is sufficient for design preparation	
22	9.1.12 Annex C		All	If the existing ventilation is assessed as inadequate, arrange for repairs compliant with C.2 Notes 2-5 if possible	
23	9.1.12 Annex C		All	If the existing ventilation is assessed as inadequate and cannot be repaired, ensure a upgrade compliant with C.3 is specified	
24	9.1.9 - 9.1.21		All	Ensure that the Retrofit Designer prepares a PAS 2035 compliant design for the improvements and any ventilation upgrade	
25	9.1.13 Annex D		All	Ensure that the retrofit design includes provision for managing interactions between measures	
26	9.1.14 Annex D		All	Ensure that the retrofit design includes appropriate construction details for measure interactions coded yellow in Figure D.1	
27	9.1.15		All	Ensure that the specified construction details eliminate thermal by-pass, minimise thermal bridging and maintain airtightness	



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28	<b>RETROFIT DESIGN</b> <i>(continued)</i>	9.1.16 Annex D	All	Ensure that the retrofit design includes compatible specifications for interactions coded orange in Figure D.1
29		9.1.17 Annex D	All	Ensure that the retrofit design does not include combinations of measures coded red in Figure D.1
30		11.1.1	All	Ensure that the Retrofit Designer includes in the retrofit design appropriate requirements for testing installed measures
31		11.2.1	All	Ensure that the Retrofit Designer includes in the retrofit design appropriate requirements for commissioning installed measures
32		11.2.2	All	Where multiple measures are proposed ensure that the design requires building services to be finally commissioned together
33		12.1.1 12.1.2	All	Ensure that the Retrofit Designer includes in the retrofit design appropriate requirements for handover of installed measures
34		9.1.6	A	Ensure that the Retrofit Designer identifies all the technically applicable improvement options
35		9.1.7	A	Ensure that the Retrofit Designer reviews the technically applicable measures with the client and agrees which to apply
36		9.2.2	B and C	Carry out an improvement option evaluation using RDSAP, SAP or PHPP data to determine an appropriate package of measures
37		9.2.2	B and C	Ensure that the improvement option evaluation includes calculations of simple payback and carbon cost effectiveness
38		9.2.3	B and C	Ensure that the improvement option evaluation uses capital costs, fuel costs and emissions factors from specified sources
39		9.2.3	B and C	If the occupancy pattern is known, adjust the improvement option evaluation calculations to allow for actual occupancy
40		9.2.4	B and C	If the dwelling is traditionally constructed, ensure that the retrofit design is consistent with the guidance in BS 7913
41		9.2.5 Annex C	B and C	If fabric measures are proposed, assess existing ventilation and if appropriate include ventilation upgrade in the improvements
42		9.2.6	B and C	Prepare a tabular summary of the evaluation and identify recommended measures for the medium term retrofit plan
43		9.2.7	B and C	Review the improvement option evaluation, the recommended measures and the medium term retrofit plan with the client
44		9.2.7	B and C	Agree with the client the scope of the project, the intended outcomes, appropriate performance targets and the budget
45		9.2.8	B and C	Ensure that the retrofit design includes appropriate measures to inhibit overheating during the installed life of the measures
46		9.2.9	B and C	Ensure that measures to inhibit overheating include load reduction, solar shading, ventilation and thermal capacity
47		9.3.10	B and C	Ensure that the retrofit design specifies an appropriate sequence of installation of the proposed measures
48		9.3.2	C	If the dwelling is protected, ensure that significance is considered, and measures are identified in accordance with BS 7913
49		9.3.3	C	If fabric measures and/or a ventilation upgrade are proposed, ensure that the retrofit design includes an airtightness standard
50		9.3.3	C	If the retrofit design specifies an airtightness standard, ensure that it also requires compliance to be demonstrated by testing
51		9.3.3 Note	C	Where the dwelling shares envelope with other(s), consider and establish a strategy for airtightness testing
52		9.1.8	All	Advise the client on the need for statutory approvals, and either make applications or coordinate applications by others
53		9.1.22	All	Provide the Retrofit Installer with the retrofit design for the agreed measures and any ventilation upgrade
54		9.1.23	All	Provide the Retrofit Installer with a copy of the report of the retrofit assessment

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ACTIVITY	PAS 2035 STAGE	PAS 2035 REFERENCE	RISK PATH	RETROFIT COORDINATION ACTIVITY
55	<b>RETROFIT DESIGN</b> <i>(continued)</i>	9.1.25	All	Request identification by the Retrofit Installer of any additional information required to be included in the retrofit design
56		9.1.24	All	Request confirmation from the Retrofit Installer that the retrofit design is sufficient for costing and installation to proceed
57		9.1.26	All	If installation cost exceeds budget, agree amendments with client and arrange for Retrofit Designer to revise the design
58		9.1.26	All	Provide the Retrofit Installer with any revised design for the agreed measures and any ventilation upgrade
59		9.3.4	C	On request, before installation starts, provide the Retrofit Installer's team with a briefing on key points of the design
60		9.3.4	C	Always provide a briefing if the dwelling is traditionally constructed or protected or challenging targets are proposed
61		9.1.27 and 13	All	Ensure that any advice provided to the client during the design stage complies with clause 13
62	<b>INSTALLATION</b>	10	All	Oversee the installation of improvement measures by the Retrofit Installer in accordance with PAS 2030 and/or MCS
63		10 Note	All	Obtain from the Retrofit Installer copies of evidence of compliance of the installation with PAS 2030 and/or MCS
64		PAS 2030	All	Ensure that the Retrofit Installer uploads installation documentation to the TrustMark data warehouse (for ECO)
65	<b>TESTING AND COMMISSIONING</b>	11.1.2	All	Ensure that testing of installed measures is carried out in accordance with the retrofit design, PAS 2030 and MCS
66		11.2.3	All	Ensure that commissioning of installed measures is carried out in accordance with the retrofit design, PAS 2030 and MCS
67		11.3.1	All	Obtain copies of testing and commissioning certificates as required by the retrofit design and pass copies to the client
68		PAS 2030	All	Ensure that the Retrofit Installer uploads testing and commissioning documents to the TrustMark data warehouse (for ECO)
69	<b>HANDOVER</b>	12.2	All	Ensure that the Retrofit Installer hands over the installed measures to the client and occupants
70		12.1.3	All	Obtain copies of the O&M instructions, manuals, warranty and guarantee certificates for all installed products and systems
71		12.1.3	All	Provide the client with copies of all testing and commissioning certificates and all handover documentation
72		12.1.4	All	Recommend to the client that a new or updated Energy Performance Certificate is prepared for each improved dwelling
73		12.1.14	All	If new or updated Energy Performance Certificates are requested, arrange for them to be prepared by a DEA
74		PAS 2030	All	Ensure that the Retrofit Installer uploads handover documents to the TrustMark data warehouse (for ECO)
75	<b>RETROFIT ADVICE</b>	13.1 Annex A	All	Confirm and record the Retrofit Advisor's appointment and qualification
76		31.1.1	All	Ensure that appropriate retrofit advice is delivered as part of every domestic retrofit project
77		31.2.1	All	Ensure that the Retrofit Advisor uses the specified guidance
78		31.2.2	All	Ensure that retrofit advice is delivered to all occupant(s) of retrofitted dwelling(s) and to any landlord(s)
79		31.2.3	All	Ensure that retrofit advice is delivered in a format that takes account of occupants' language, age, etc.
80		31.3.1	A	Ensure that retrofit advice is delivered on initial engagement of a household and at the time of or shortly after handover
81		13.3.2	A	Ensure that engagement advice is originated or approved by a Retrofit Advisor even if delivered online or by telephone

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ACTIVITY	PAS 2035 STAGE	PAS 2035 REFERENCE	RISK PATH	RETROFIT COORDINATION ACTIVITY
82	<b>RETROFIT ADVICE</b> <i>(continued)</i>	13.3.3 13.4.2	All	Ensure that engagement advice is customised to the occupants' needs and covers the specified topics
83		13.3.4 13.4.5	All	Ensure that handover advice is coordinated with the Retrofit Installer and customised to measures and intended outcomes
84		13.3.4	A	Ensure that handover advice coordinated with the Retrofit Installer covers the specified topics
85		13.4.1	B and C	Ensure that advice is delivered at engagement, on completion of IOE, on completion of the design and at or shortly after handover
86		13.4.3	B and C	Ensure that advice delivered after completion of the improvement option evaluation covers the specified topics
87		13.4.4	B and C	Ensure that advice delivered on completion of the design is delivered by the Retrofit Designer or the Retrofit Coordinator
88		13.4.4	B and C	Ensure that advice delivered on completion of the design covers key features of the design, measures and installation process
89		<b>MONITORING AND EVALUATION</b>	14.1	All
90	14.2		All	Confirm and record the Retrofit Evaluator's appointment and qualification, appropriate to risk path
91	14.3		All	Ensure that Basic evaluation is applied to every completed domestic retrofit project, irrespective of risk path
92	14.3		All	If outcomes are not as intended or there are unintended consequences, apply Intermediate evaluation
93	14.3.1		All	If Intermediate evaluation does not explain unintended outcomes or consequences apply Advanced evaluation
94	14.3.2		All	Ensure that Intermediate and Advanced evaluation are only applied with the client's and occupants' consent.
95	A.6.1 Annex A		All	For Intermediate or Advanced evaluation, ensure that the Retrofit Coordinator and Evaluator are not the same person
96	14.4.1		All	For Basic evaluation, use a measure-specific questionnaire delivered to the client and occupants (if different)
97	14.4.1		All	Ensure that the Basic evaluation questionnaire covers the specified topics
98	14.4.2		All	Ensure that Basic monitoring data are collated, summarised and reported with any recommendations to client and project team
99	14.4.3		All	Ensure that Basic evaluation is completed and reported within three months of handover of the retrofit work
100	14.5.1		All	Ensure that Intermediate evaluation covers the specified topics, as appropriate to any identified problems
101	14.5.2		All	Ensure that Intermediate monitoring data are collated, summarised and reported with recommendations to client, etc.
102	14.5.3		All	Ensure that Intermediate evaluation is completed and reported within six months of completion of basic evaluation, if possible
103	14.6.1		All	Ensure that Advanced evaluation covers the specified topics, as appropriate to any unresolved problems
104	14.6.2		All	Ensure that Advanced monitoring data are collated, summarised and reported with recommendations to client and project team
105	14.6.3		All	Ensure that Advanced evaluation is completed and reported within two years of completion of basic evaluation, if possible
106	14.6.3 Note		All	Consider whether evaluation reports should be made available to quality assurance bodies, with the client's approval

## PAS 2035 RETROFIT COORDINATION PROCESS MAP

ACTIVITY	PAS 2035 STAGE	PAS 2035 REFERENCE	RISK PATH	RETROFIT COORDINATION ACTIVITY
107	<b>CLAIMS OF COMPLIANCE</b>	15.2.1	All	Identify the type of compliance claim: independent third-party certification, other-party validation or self-assessment
108		15.2.2	All	If providing independent third-party certification, arrange assessment of compliance by a body itself accredited by UKAS
109		15.2.3	All	If providing other-party validation, arrange assessment of compliance by an appropriately qualified independent body
110		15.2.4	All	If self-assessing compliance, collate and present evidence of compliance with PAS 2035 in accordance with EN ISO 14021
111		15.2.4	All	If appropriate upload the qualifications of the Retrofit Advisor, Assessor, Coordinator, Designer and Evaluator to QA body
112		15.2.4	All	If appropriate upload copies of the risk assessment, dwelling assessment, retrofit design and evaluation reports to QA body
113		15.3	All	When claiming compliance by any of the three available methods, use the appropriate specified form of words
114	<b>QUALIFICATIONS</b>	A.6 Note Annex A	All	Where one person fills more than one retrofit role, report any conflict of interest to the client and manage it appropriately



# PAS 2035 RETROFIT ASSESSMENT PROCESS MAP

ACTIVITY	PAS 2035 STAGE	PAS 2035 REFERENCE	RISK PATH	RETROFIT ASSESSMENT ACTIVITY
1	<b>PRELIMINARIES</b>	8.2 Annex A	All	Confirm Retrofit Assessor's qualifications, appropriate to the expected risk path
2		4 and 5	All	Review guidance
3		13	All	Review any energy advice (engagement advice) that has already been provided to the client by a Retrofit Advisor
4		7.1.3	All	Review any information already collated by the Retrofit Coordinator, e.g. for the Risk Assessment, objectives of the client, etc.
5	<b>RISK ASSESSMENT</b>	7.1 and Annex B	-	If necessary (i.e. if not already done by a Retrofit Coordinator), collate 'triage' data for risk assessment as defined in Annex B and identify any additional data needed from the site inspection to supplement online data
6		7.1 and Annex B	-	If necessary, collect any additional data needed for the risk assessment from the site inspection to supplement online data
7		7.3 and Annex B	-	Repeat the risk assessment if necessary and confirm the risk path (A, B or C) for the project in accordance with the criteria defined in Annex B
8		8.2 and Annex B	C	If necessary, refer the assessment to another Retrofit Assessor with the appropriate qualifications
9	<b>RETROFIT ADVICE</b> <i>(if provided by the Retrofit Assessor)</i>	13	All	Confirm whether energy advice (engagement advice) is also to be provided by the Retrofit Assessor assuming they are appropriately qualified and if this has not already been provided to the client by a Retrofit Advisor
10		13.2.1	All	Provide general domestic energy efficiency advice based on the specified guidance
11		13.3.3	All	Ensure that engagement advice is customised to the occupants' needs and covers the specified topics
12		13.2.2	All	Report to the Retrofit Coordinator a summary of the advice provided and who it was delivered to so that the Retrofit Coordinator can ensure that consistent retrofit advice is also delivered to any other occupants of retrofitted dwelling(s) and to any landlord(s)
13		13.2.3	All	Report to the Retrofit Coordinator if additional retrofit advice is needed in a format that takes account of occupants' language, age, etc.
14	<b>CONFIRMATION OF THE SCOPE OF THE SITE INSPECTION</b>	8.3.2	A	Whether collection of data for RdSAP or SAP is required
15		8.4.2	B and C	Whether collection of data for RdSAP, SAP or PHPP assessment is required
16		-	All	Whether an EPC is required as part of the assessment (e.g. to confirm eligibility for funding)
17		4.3.3 and 8.3 - 8.5	All	Identify any additional information required from the site inspection to enable additional calculations to be carried out, e.g. U-values, psi-values, etc.
18		8.4.2	B and C	Whether the Retrofit Assessor will carry out the RdSAP, SAP or PHPP calculation or if the data is to be provided to the Retrofit Coordinator or Retrofit Designer so that they can do this. (Also agree the full details of the additional information required for SAP or PHPP)
19		8.4.3	B	Whether the dwelling to be assessed is of traditional construction, and thus needs a simplified assessment of significance in accordance with the guidance in BS 7913
20		8.5.2	C	Whether the dwelling to be assessed is a protected building, or forms part of a protected building, and thus needs a full assessment of significance in accordance with the guidance in BS 7913
21		8.5.1	C	Agree who will arrange for the test of the air permeability of the building envelope to be carried out (the RC or the RA) and whether the result of this is to be fed back into a SAP or PHPP assessment

## PAS 2035 RETROFIT ASSESSMENT PROCESS MAP

ACTIVITY	PAS 2035 STAGE	PAS 2035 REFERENCE	RISK PATH	RETROFIT ASSESSMENT ACTIVITY
22	<b>CONFIRMATION OF THE SCOPE OF THE SITE INSPECTION</b> <i>(continued)</i>	8.5	C	Whether a structural engineer's report on the structural condition of the building and its suitability for any proposed improvement measures, or any in-situ tests, are to be carried out and who will arrange this (and whether the results of these are to be accounted for in the Retrofit Assessor's report)
23		8.6.5	All	Whether the Retrofit Designer has specified any other additional information that they will need in the report
24	<b>SITE INSPECTION</b>	8.2	All	Agree and record the scope of the assessment with the Retrofit Coordinator
25		8.3.1	All	Carry out an appraisal of the dwelling's heritage, architectural features, structure, construction and condition, in sufficient detail to establish the suitability of the dwelling for improvement
26		8.3.1	All	Identify the installed building services (ventilation, heating, hot water and lighting systems and their controls)
27		8.3.1	All	Identify any constraints imposed by the local planning authority (including requirements for planning permission, Listing as of Special Architectural or Historic Interest, Conservation Area constraints, Tree Preservation orders, etc.)
28		8.3.1	All	Identify the location and severity of any existing construction defects or structural defects or leaks, and of any condensation and/or mould growth in the dwelling
29		8.3.1	All	Identify any energy efficiency measures already installed or proposed
30		8.3.2	A	If required, carry out a measured survey to establish the overall dimensions of the dwelling's heat loss envelope (including any basements and attics), the dimensions of all building elements (exposed floors, external walls, roofs, etc.) and the dimensions of all window and door openings
31		8.3.2	A	If required, carry out an appraisal of the dwelling's construction in sufficient detail to establish the thermal transmittances (U values) and moisture properties of the main building elements (exposed floors, walls and roofs) and the suitability of the dwelling for improvement
32		8.4.1	B and C	Carry out a measured survey to establish the overall dimensions of the dwelling's heat loss envelope (including any basements and attics), the dimensions of all building elements (exposed floors, external walls, roofs, etc.) and the dimensions of all window and door openings
33		8.4.1	B and C	Carry out an appraisal of the dwelling's construction in sufficient detail to establish the thermal transmittances (U values) and moisture properties of the main building elements (exposed floors, walls and roofs) and the suitability of the dwelling for improvement
34		8.4.1	B and C	Identify full details of the installed building services (ventilation, heating, hot water and lighting systems and their controls), the locations of the equipment, the areas served and confirm that the systems are working (or otherwise).
35		8.4.1	B and C	Identify any constraints imposed by the site, e.g. elevation and exposure (to sun, wind and rain, major roads and industrial activity), access, party walls, rights of light, consideration of adjoining properties, etc.
36		8.4.1	B and C	Carry out an appraisal of occupancy, including the number of occupants and any special considerations such as the presence of vulnerable persons, e.g. children or elderly people or those with disabilities

## PAS 2035 RETROFIT ASSESSMENT PROCESS MAP

ACTIVITY	PAS 2035 STAGE	PAS 2035 REFERENCE	RISK PATH	RETROFIT ASSESSMENT ACTIVITY
37	SITE INSPECTION <i>(continued)</i>	8.4.1	B and C	Carry out an assessment of the existing ventilation in accordance with Annex C, including: <ul style="list-style-type: none"> <li>• identification of the location and severity of any condensation and/or mould growth in the dwelling;</li> <li>• any intermittent extract ventilation fans or passive stack ventilators and where they are located;</li> <li>• any background ventilators (air inlets or "trickle ventilators"), and where they are located;</li> <li>• any other ventilation system and where it is located, including single-room heat recovery ventilators (srHRVs), positive input ventilation (PIV), whole-house mechanical extract ventilation (centralized cMEV or decentralized dMEV), and mechanical ventilation with heat recovery (MVHR); and</li> <li>• whether the identified ventilation systems are functional</li> </ul>
38		8.4.2	B and C	Estimate the annual fuel use, fuel costs and carbon dioxide emissions, under standard or actual occupancy (as appropriate) using a recognized domestic energy model such as the Reduced Data Standard Assessment Procedure (RDSAP), the Standard Assessment Procedure (SAP) or the Passive House Planning Package (PHPP), or provide the data required to the Retrofit Coordinator or Retrofit Designer so that they can do this
39		8.4.3	B	If the dwelling to be assessed is of traditional construction, an assessment of significance shall be carried out in accordance with the simplified version of the guidance in BS 7913
40		8.5.1	C	Carry out the assessment in accordance with the principles set out in the RICS guidance note Surveys of residential properties [N1], at "survey level three", as defined in that document
41		8.5.1	C	Arrange a test of the air permeability of the building envelope, using an approved method, including identification of key leakage locations
42		8.5.1	C	Arrange for any relevant in situ tests to be carried out
43		8.5.2	C	If the dwelling to be assessed is a protected building, or forms part of a protected building, the assessment shall also be carried out in accordance with the guidance in BS 7913 and include an assessment of the significance of the building as defined in BS 7913
44		8.5.2	C	If agreed in the scope (item 22 above), carry out or arrange a structural engineer's report on the structural condition of the building and its suitability for any proposed improvement measures (or recommend this is added if the site inspection identifies a need for this)
45	ASSESSMENT REPORT	8.6.1	All	The whole-dwelling assessment, including the ventilation assessment, shall be recorded and reported to the Retrofit Designer and/or the Retrofit Coordinator. This should include any RDSAP, SAP or PHPP data file and a photographic record of all recorded features of the building and any identified defects
46		8.6.2	All	Where the project involves an assessment of similar dwellings located in blocks (e.g. blocks of flats) the assessments can be combined in a single report for each block, but the data presented shall be dwelling specific, and any RDSAP, SAP or PHPP assessment data shall be provided for at least one example of each dwelling type in each block.
47		8.6.3	All	Where the assessment has identified construction defects or structural defects or leaks, or condensation and/or mould growth in any dwelling(s), the report shall include identification of such defects in two categories: <ul style="list-style-type: none"> <li>• defects that need to be repaired before any retrofit work can proceed; and</li> <li>• defects whose repair is recommended but not an essential prerequisite to retrofit.</li> </ul>

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ACTIVITY	PAS 2035 STAGE	PAS 2035 REFERENCE	RISK PATH	RETROFIT ASSESSMENT ACTIVITY
48	<b>ASSESSMENT REPORT</b> <i>(continued)</i>	8.6.5	All	If the Retrofit Designer identifies any missing information in the assessment that is needed to provide the basis of a retrofit design that complies with this PAS, the Retrofit Coordinator shall arrange for the Retrofit Assessor to collate and include this in an updated assessment report
49		8.6.5	All	If required, upload the final assessment report, data files and photographic records to the TrustMark data warehouse once the Retrofit Coordinator and/or the Retrofit Designer has confirmed that the assessment is sufficient to provide the basis of a retrofit design that complies with PAS 2035



# PAS 2035 RETROFIT DESIGNER PROCESS MAP

ACTIVITY	PAS 2035 STAGE	PAS 2035 REFERENCE	RISK PATH	RETROFIT DESIGNER ACTIVITY
1	<b>PRELIMINARIES</b>	9.1.2 and Annex A	All	Provide confirmation of Retrofit Designer's qualifications, appropriate to risk path
2		4 and 5	All	Review guidance
3		8.6.5 9.1.5	All	Review the assessment report(s) and identify any information missing from this and request it
4		9.1.3 9.1.4	All	Confirm that the whole-dwelling assessment report is sufficient for the design preparation
5		9.1.1	All	Confirm any activities to be provided by the Retrofit Designer that would generally be provided by the Retrofit Coordinator (e.g. improvement option evaluation, advice on the design)
6	<b>RETROFIT DESIGN</b>	9.1.9	All	Agree and record the scope of the design with the Retrofit Coordinator taking into account the intended outcomes and any agreed performance targets for the dwelling(s), and the budget
7		9.1.9	All	Prepare a PAS 2035 compliant design and specification information about the measures proposed, including materials, products, processes and standards, as appropriate, and in sufficient detail for contractors and installers to work from
8		9.1.9	All	Take into account the information in the assessment report(s), including the assessment of any existing ventilation and any consequent requirement to upgrade it
9		9.1.9	All	Take into account the condition of the existing building, including the need to repair any structural defects, to eliminate the ingress of liquid water or moisture prior to the installation of retrofit measures, and to fit leak protection devices to mitigate the risk of escape of water from internal services
10		9.1.9	All	If applicable, allow for any conditions imposed by the local planning authority or the Building Control Body as part of a statutory approval
11		9.1.10	All	Specify materials and products that are compatible with the building and with each other and work as an integrated system, where appropriate; and that are consistent with any relevant manufacturers' instructions and with any relevant British or European standards
12		9.1.11	All	Include in the retrofit design appropriate provision for the management of moisture within the construction and adopt a coherent approach to managing moisture risk, consistent with the guidance in BS 5250
13		9.1.12 Annex C	All	If the existing ventilation is assessed as inadequate and cannot be repaired, include an upgrade compliant with C.3
14		9.1.13 Annex D	All	Include in the retrofit design provision for managing interactions between measures
15		9.1.14 Annex D	All	Ensure that the retrofit design includes appropriate construction details for measure interactions coded yellow in Figure D.1
16		9.1.15	All	Ensure that the specified construction details eliminate thermal by-pass, minimise thermal bridging and maintain airtightness
17		9.1.16 Annex D	All	Ensure that the retrofit design includes compatible specifications for interactions coded orange in Figure D.1
18		9.1.17 Annex D	All	Ensure that the retrofit design does not include combinations of measures coded red in Figure D.1
19		9.1.18	All	Ensure that the retrofit design provides: <ul style="list-style-type: none"> <li>• ventilation for the safe operation of all combustion appliances;</li> <li>• resilience against rainwater ingress or flood, where appropriate;</li> <li>• no compromise to the fire safety of the building and, if necessary, includes an updated fire safety strategy; and</li> <li>• details of any maintenance requirements necessary to ensure the long-term integrity of the installation</li> </ul>
20		9.1.19 9.1.20 16.1	All	Identify the relevant technical standards from those listed in Clause 16, and specify their application to the work that is the subject of the design (including any relevant MCS standards for LZC technologies)

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ACTIVITY	PAS 2035 STAGE	PAS 2035 REFERENCE	RISK PATH	RETROFIT DESIGNER ACTIVITY	
21	<b>RETROFIT DESIGN</b> <i>(continued)</i>	9.1.21	All	Specify the sequence of installation of the improvement measures, especially where incorrect sequencing might adversely affect their resilience, the integrity of the building, its historic significance or its energy performance	
22		9.2.2	B and C	Ensure that the Retrofit Coordinator has all the information needed to carry out an improvement option evaluation using RDSAP, SAP or PHPP data to determine an appropriate package of measures	
23		9.2.4	B and C	If the dwelling is traditionally constructed, ensure that the retrofit design is consistent with the guidance in BS 7913 and takes account of the significance of the building as defined in the BS 7913 assessment	
24		9.2.5 Annex C	B and C	If fabric measures are proposed and the existing ventilation has been identified as inadequate, include a ventilation upgrade in the improvements	
25		9.2.8	B and C	Include appropriate measures to inhibit overheating during the installed life of the measures in the retrofit design	
26		9.2.9	B and C	Include load reduction, solar shading, ventilation and thermal capacity measures to inhibit overheating	
27		9.2.10	B and C	Specify an appropriate sequence of installation of the proposed measures in the retrofit design	
28		9.3.2	C	If the dwelling is protected, consider the significance and identify measures in accordance with BS 7913	
29		9.3.3	C	If fabric measures and/or a ventilation upgrade are proposed, include an airtightness standard in the retrofit design	
30		9.3.3	C	If the retrofit design specifies an airtightness standard, require compliance with this to be demonstrated by testing	
31		11.1.1	All	Ensure that the retrofit design includes appropriate requirements for testing installed measures	
32		11.2.1	All	Include appropriate requirements for commissioning installed measures in the retrofit design	
33		11.2.2	All	Where multiple measures are proposed require in the design that building services are to be finally commissioned together	
34		12.1.1 12.1.2	All	Include appropriate requirements for handover of installed measures in the retrofit design	
35		9.1.26	All	If necessary, revise the design if amendments are required e.g. due to the installation cost exceeding the budget	
36		<b>IMPROVEMENT OPTION EVALUATION AND CONFIRMATION OF THE SCOPE OF THE PROJECT</b> <i>(if delivered by the Retrofit Designer)</i>	9.1.6	A	Identify all the technically applicable improvement options
37			9.1.7	A	Review the technically applicable measures with the client and agree which to apply
38			9.1.8	All	Advise the client on the need for statutory approvals, and either make applications or facilitate applications by others
39			9.2.2	B and C	Carry out an improvement option evaluation using RDSAP, SAP or PHPP data to determine an appropriate package of measures
40			9.2.2	B and C	Include calculations of simple payback and carbon cost effectiveness in the improvement option evaluation
41	9.2.3		B and C	Use capital costs, fuel costs and emissions factors from specified sources in the improvement option evaluation	
42	9.2.3		B and C	If the occupancy pattern is known, adjust the improvement option evaluation calculations to allow for actual occupancy	
43	9.2.6		B and C	Prepare a tabular summary of the evaluation and identify recommended measures for the medium term retrofit plan	
44	9.2.7		B and C	Review the improvement option evaluation, the recommended measures and the medium term retrofit plan with the client	
45	9.2.7		B and C	Agree with the client the scope of the project, the intended outcomes, appropriate performance targets and the budget	

## PAS 2035 RETROFIT DESIGNER PROCESS MAP

ACTIVITY	PAS 2035 STAGE	PAS 2035 REFERENCE	RISK PATH	RETROFIT DESIGNER ACTIVITY
46	<b>LIAISON WITH THE RETROFIT INSTALLER REGARDING THE RETROFIT DESIGN</b> <i>(if delivered by the Retrofit Designer)</i>	9.1.22	All	Provide the Retrofit Installer with the retrofit design for the agreed measures and any ventilation upgrade
47		9.1.23	All	Provide the Retrofit Installer with a copy of the report of the retrofit assessment
48		9.1.25	All	Request identification by the Retrofit Installer of any additional information required to be included in the retrofit design
49		9.1.24	All	Request confirmation from the Retrofit Installer that the retrofit design is sufficient for costing and installation to proceed
50		9.1.26	All	If installation cost exceeds budget, agree amendments with client and arrange for Retrofit Designer to revise the design
51		9.1.26	All	Provide the Retrofit Installer with any revised design for the agreed measures and any ventilation upgrade
52	<b>RETROFIT ADVICE</b> <i>(if delivered by the Retrofit Designer)</i>	9.1.27 and 13	All	Ensure that any advice provided to the client during the design stage complies with clause 13
53		13.4.3	B and C	Ensure that advice delivered after completion of the improvement option evaluation covers the specified topics
54		13.4.4	B and C	Ensure that advice delivered on completion of the design covers key features of the design, measures and installation process



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