

RdSAP Conventions for RdSAP 9.92

Issued 12 August 2016 (v9.0)

New and amended conventions for v9.0 are indicated by light blue background.

Note: This list will be extended as appropriate. It contains additional conventions to those given in the RdSAP 2012 specification (SAP 2012 Appendix S). This edition of the Conventions supersedes all previous editions and, where any Convention is in conflict with the published SAP specification, the Convention takes precedence.

#	Topic	Conventions	Issue date
1. General			
1.01	Use of RdSAP	<p>RdSAP is for assessment of existing dwellings only. Where an EPC is required for a new dwelling under building regulations it must be a SAP EPC. Any new dwelling, including dwellings created by change of use, must be assessed using SAP. For this purpose a new dwelling is, in England, Wales or Northern Ireland, one completed on or after the relevant date. In Scotland this applies to a new dwelling submitted for building warrant on or after the relevant date. The relevant date is 6 April 2008 in E&W, 30 September 2008 in NI, or 1 May 2007 in Scotland.</p> <p>For a new dwelling, where no on-construction EPC has been lodged a SAP EPC is still required, irrespective of whether the dwelling has been occupied. However, if</p> <ul style="list-style-type: none"> - the SAP data set (i.e. the full set of data used for building regulation compliance) is not available and the evidence for its lack of availability has been provided, or - the SAP data set is available but the dwelling has been altered in such a way that the data is no longer applicable and the details of the alteration are unknown (evidence that the dwelling has been altered and evidence for lack of building regulation approval providing details of the alterations to be provided) <p>it can be assessed using RdSAP.</p> <p>Note. In Scotland, a new dwelling for which the building warrant application was submitted before 1 May 2007 or a dwelling created by change of use (a defined conversion) does not require a SAP EPC under building regulations but will, under EPB regulations, require an RdSAP EPC when offered for sale or rental.</p>	<p>Sept 2009 amended Jan 2012 amended Dec 2012 amended April 2015</p>

#	Topic	Conventions	Issue date
1.02	Flat or maisonette	A dwelling that does not extend to all storeys of the building is a flat or maisonette. RdSAP makes no distinction between flats and maisonettes as regards calculations; it is acceptable to select either type as definitions vary across the UK.	March 2010 amended Mar 2011
1.03	Address close to England/Scotland border	Assessors must ensure that the correct country is identified so that the EPC will be lodged in the appropriate register.	April 2015
1.04a	Self-contained dwelling attached to or forming an extension of another building	<p>A property can have an additional building unit (e.g. an 'annexe') which, if it is self-contained, and meets the dwelling definition of building, needs to have its own EPC.</p> <p>The annexe may share a party wall(s) with the main dwelling. Standalone buildings (i.e. physically separate from the main building) with a total useful floor area of less than 50 m² do not require an EPC.</p> <p>A building unit designed or altered for separate, self-contained use could be indicated by the accommodation having its own cooking and bathing facilities and its own access (from the outside, or via a communal corridor, without having to enter via the main dwelling), and may have separate or shared provision of heating and ventilation, but with the ability by the occupier of each dwelling to independently control those services. An example might be a self-contained flat in a building.</p> <p>If the 'annexe' is not self-contained and is heated by the main system serving the main dwelling, assess as part of the main dwelling.</p>	April 2015 amended Aug 2016
1.04b	Not self-contained separate part of dwelling	<p>If there is a separate part of the dwelling which is not self-contained but contains rooms that are used as part of the main dwelling, e.g. bedrooms, study etc. in a large detached garage or outbuilding converted into part of the living accommodation of a main property:</p> <ul style="list-style-type: none"> - if heated by the main heating system (as defined for the main dwelling), include in the assessment of the main dwelling and a single EPC for the main dwelling to be issued - otherwise omit from the assessment. 	June 2016

#	Topic	Conventions	Issue date
2. Measurements and geometry			
2.01	Measurements	<p>State on site plans whether the dimensions recorded are external or internal. Where a combination of external and internal is used this must be made clear for each dimension indicated.</p> <p>When measuring internally, measure between the finished internal surfaces of the walls bounding the dwelling. Where that cannot be done directly (i.e. when measuring room by room) include an allowance for the thickness of internal partitions.</p> <p>Measure all perturbations (e.g. bay windows) but disregard chimney breasts unless assessor considers significant e.g. large inglenook.</p>	Sept 2009 amended Aug 2014
2.02	Precision of lengths	Measure to one decimal place (0.1 m) or better. Retain higher precision when that has been measured (especially room heights).	Sept 2009
2.03	Sheltered wall length (unheated corridors)	<p>Include in the heat loss perimeter.</p> <p>When a dwelling (flat or maisonette) has a sheltered wall to an unheated corridor on more than one storey the sheltered length is the total for all storeys with a sheltered wall (example: 2 storeys with sheltered wall on each storey, length of sheltered wall is 5 m on each storey: enter 10 m for the sheltered length).</p> <p>The sheltered wall can be in any building part but must be recorded as an alternative wall (see 2.13).</p> <p>Where the sheltered wall extends over more than one building part, e.g. it extends across the main building and an extension, assign the sheltered wall length to the building part with the longer sheltered wall and deduct the relevant amount from the heat loss perimeter of the other. Example: total unheated corridor length is 10m of which 2m is in the main building part and 8m in the extension. Record the extension as having the sheltered alternative wall of length 10m, increase the heat loss perimeter of the extension by 2m and deduct 2m from the heat loss perimeter of the main dwelling.</p>	Sept 2009 amended Oct 2010 amended April 2015 amended Aug 2016

#	Topic	Conventions	Issue date
2.04a	Habitable room count	<p>Habitable rooms include any living room, sitting room, dining room, kitchen/diner, bedroom, study and similar; and also a non-separated conservatory.</p> <p>Excluded from the room count are: any room used solely as a kitchen, utility room, bathroom, cloakroom, en-suite bathroom/shower room/toilet or similar; any hallway, stairs or landing; and also any room not having a window.</p> <p>For a kitchen to be a kitchen/diner it must have space for a table and 4 chairs.</p> <p>A lounge/dining room where the door was temporarily removed (i.e. architrave and hinges still there) is two habitable rooms.</p> <p>A lounge/dining room with the door permanently removed (hinge holes filled etc) is one habitable room.</p> <p>A non-separated conservatory adds to the habitable room count if it has an internal quality door between it and the dwelling. If a conservatory is open to the rest of the dwelling it is NOT counted as a separate room.</p>	<p>Sept 2009</p> <p>amended April 2015</p> <p>amended Aug 2016</p>
2.04b	Heated habitable room count	Includes all habitable rooms heated by either main heating system(s) or fixed secondary heating	June 2016
2.05	Basements (whether to include in the assessment)	<p>Include when accessed via a permanent fixed staircase such that one is able to walk downwards facing forwards and either:-</p> <ul style="list-style-type: none"> - basement is heated via fixed heat emitters, or - basement is open to the rest of the dwelling, i.e. no door. <p>Does not necessarily contain habitable rooms.</p>	<p>Sept 2009</p> <p>amended April 2015</p>

#	Topic	Conventions	Issue date
2.06	Roof rooms / Attics (whether to include in the assessment and rules for detailed measurements)	<p>Include when accessed via a permanent fixed staircase such that one is able to walk downwards facing forwards. Does not necessarily contain habitable rooms.</p> <p>For a roof room to be classed as such and not a separate storey, the height of the common wall must be less than 1.8 m for at least 50% of the common wall (excluding gable ends or party walls). The common wall is a vertical continuation of the external wall of the storey below.</p> <p>There is no explicit allowance for dormer windows except to include in the floor area of the roof rooms.</p> <p>See appended diagrams.</p> <p>Detailed measurements are required only if evidence exists that the slope/stud wall/gable wall have differing levels of insulation or their U-values are known.</p> <p>If all elements of the roof room (slope/stud/gable) have the same insulation and the U-value is available, the U-value can be overwritten whilst leaving the RDSAP assumed areas as is.</p> <p>Where detailed measurements are made and the floor area of the parts of the dormer windows protruding beyond the roof line is less than 20% of the floor area of the roof room, measure the elements of the roof room as if the dormers were not there. Otherwise total the vertical elements of all dormers in that building part and enter as stud wall and the flat ceiling elements as flat ceiling.</p> <p>A roof room can be "connected" only if there is another building part of the same dwelling with a storey (roof room or normal storey) at the same level; no assumptions are to be made about an adjacent property.</p>	March 2010 amended Jan 2012 amended Aug 2014
2.07	Rooms within a Mansard roof	A storey having non-vertical walls of at least 70° pitch constitutes a separate storey; it is not treated as roof rooms. Use alternative wall if appropriate.	March 2010
2.08	Whole dwelling (or building part) within roof	<p>When the property or a building part of it is a single storey entirely located within a roof, model as:</p> <ul style="list-style-type: none"> - lowest occupied level - timber frame construction of appropriate age band - room height must be entered as 2.2 m - include area and perimeter measurements as a normal storey - enter roof as pitched roof. <p>If there are two storeys within the roof, enter the lower storey as above and the upper storey as rooms-in-roof.</p>	March 2010 amended Dec 2012

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2.09	Porches (whether to include in the assessment)	If heated always include (separated or not). If external and not heated, disregard. If internal, not heated and thermally separated, disregard.	Sept 2009
2.10	Mezzanine floor	Enter the part of the property above and below the mezzanine deck as a two storey extension. Treat the remaining part as a single level with the full floor to ceiling/roof height. If the mezzanine is located such that it has no heat loss perimeter then assign a nominal 1 m perimeter to each floor of the mezzanine part and deduct 1 m from the heat loss perimeter of the other part.	March 2010 amended Oct 2010
2.11	Vertical extension	Where an extension has been built over part of the existing dwelling, divide the part built over into two, one of which has "same dwelling above" and for the other describe the roof construction and insulation. Enter the new upper floor as an extension with "same dwelling below" and the original part with "same dwelling above" for the roof description. It is possible for an extension to be both above and alongside the rest of the dwelling. Such a building part is not defined in RdSAP and in this case divide the extension into two, one above and the other alongside. A roof room cannot be a vertical extension in its own right.	March 2010 amended Mar 2011 amended Dec 2012
2.12	More than 4 extensions	Add together floor areas and exposed perimeters of extensions (or add extension to main dwelling) to reduce to four extensions. Combine parts having the most similar age bands (refer to SAP Appendix S for U-values of relevant constructions). Use alternative wall where appropriate.	March 2010 amended March 2011

#	Topic	Conventions	Issue date
2.13	Alternative wall	<p>In determining whether an alternative wall is applicable the significant features are construction type, dry lining, age band, insulation and whether sheltered by unheated corridor.</p> <p>Walls of the same construction but different thickness within a building part are not considered alternative walls unless they are stone walls.</p> <p>For stone walls assess thickness at each external elevation and at each storey and use alternative wall if the thickness varies by more than 100 mm, see also 2.22.</p> <p>Disregard an alternative wall when less than 10% of total exposed wall area of the building part (including windows and doors) unless documentary or visual evidence exists of different retrofitted insulation either of the alternative wall or of the remaining wall in the building</p> <p>This does not apply to a sheltered wall; treat a sheltered wall as an “alternative wall” and always include it, even when its area is less than 10% of total exposed wall area. When entering an alternative wall area into software exclude the area of any windows and doors contained in the alternative wall.</p> <p>Consolidate walls of same type.</p> <p>If there are two areas of external wall of different construction types within a building part that should be regarded as alternative wall, review the way in which the property has been divided to try and eliminate this situation. Where that is not possible the alternative wall is the one with the larger area.</p>	<p>March 2010 amended Jan 2012 amended Dec 2012 amended April 2015 amended Aug 2016</p>
2.14	Window area	<p>In RdSAP the definition of what is a window and what is a door is defined by the area of glazing in relation to the area of the whole opening, i.e. door and frame. To be classed as a window a glazed door and frame must contain glazing amounting to 60% or more of its surface area. Generally, 60% or more glazing is likely to occur only in a patio door.</p> <p>However, a window with less than 60% glazing is not a door; a door always provides a means of entry to the property.</p> <p>If the property has patio doors, see 2.15.</p>	<p>March 2010 amended Dec 2012 amended April 2015</p>

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2.15	Glazed area	<p>Consider the whole dwelling (windows, glazed doors and roof lights), including any extensions (but not conservatories).</p> <p>Typical applies if the surface area of the glazing in the dwelling is essentially as would be expected of a typical property of that age, type, size and character. Even if there is slightly more or less glazing than would be expected, up to 10% more or less.</p> <p>More than typical applies if there is significantly more surface area of glazing than would be expected (15%-30% more), perhaps because there is a sun room or patio doors have been added.</p> <p>Less than typical applies if there is significantly less glazing than would be expected. This is rare as homeowners tend not to take out windows, but a property may have an unusual design with few windows.</p> <p>Much more than typical and Much less than typical should be used for those dwellings with very unusual amounts of glazing; such as a glass walled penthouse flat or a Huf Haus. Due to this option allowing measurements of each window to be accounted for, it should also be used if a dwelling has a mixture of glazing types e.g. single, double, secondary and triple, or a mixture of glazing gaps. See also convention 3.15</p>	<p>March 2010 amended Mar 2011 amended April 2015</p>
2.16	Secondary glazing	<p>If single glazing with secondary glazing, record as secondary glazing.</p> <p>If double glazing with secondary glazing, record as newer double glazing (newer double glazing means 2002 or later in E&W, 2003 or later in Scotland, 2006 or later in N. Ireland).</p> <p>If secondary glazing has been removed in summer, enter as above only if assessor can confirm that the panels exist and can be re-fitted. Evidence to be recorded on site notes.</p>	<p>March 2010 amended Mar 2011</p>
2.17	Sun room	<p>For a highly glazed part of the dwelling, such as a sun room, which does not meet the criteria for a conservatory (50% of walls and 75% of roof glazed), in most cases use the glazing option of "more than typical". That adds 25% to the total glazed area of the dwelling. If you deem that this is not appropriate, assess window area by either:</p> <p>a) measuring all windows and roof windows throughout the dwelling, or</p> <p>b) measuring all windows and roof windows in the sun room, and use Table S4 to obtain the window area of remaining part of dwelling which is entered as a single window with orientation East.</p> <p>Record method used in site notes.</p>	<p>Oct 2010 amended Dec 2012</p>
2.18	Basements	<p>Do not mix internal and external measurements. If a basement is included in the assessment, it is likely that internal dimensions will be used throughout the dwelling.</p>	<p>Oct 2010</p>

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2.19	Store rooms and utility rooms (whether to include in the assessment)	If heated always include. If accessible only via a separate external door and not heated, disregard. If directly accessible, not heated and thermally separated, disregard.	Oct 2010
2.20	Garages (whether to include in the assessment)	If heated from main heating system, always include. The presence of a boiler within the garage does not make it heated.	Oct 2010
2.21	Dwelling adjacent to commercial premises	If a dwelling or part of a dwelling has commercial premises below record as partially heated space below. If a dwelling or part of a dwelling has commercial premises above record as another dwelling above. If a dwelling has commercial premises alongside it, treat the separating wall as a party wall.	March 2011 amended April 2015
2.22	Wall thickness (per building part)	Measure wall thickness in mm of each external wall (elevation) and any alternative wall within a building part. Photographic evidence is required for each different thickness. It can be measured at door or window reveals or by internal/external measurement comparison (which can be direct measurement or estimated by counting bricks). Where thickness varies for the same construction use the average of the measured values. See also 2.13.	January 2012 amended Dec 2012 amended Aug 2014

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2.23	Sloping sites	<p>Where an individual wall (elevation) is not heat loss for its full height (because of stepped arrangements either within the dwelling or between the dwelling and an adjacent one) obtain the “effective heat loss perimeter” for the individual wall as follows:</p> <ol style="list-style-type: none"> 1. Where documentary evidence is available use it to calculate the wall’s heat loss area. Divide this area by the room height to obtain the “effective heat loss perimeter”. 2. Where documentary evidence is not available but the assessor is able to measure the heat loss area, this area is divided by the room height to obtain the “effective heat loss perimeter”. 3. If neither 1 nor 2 is possible, make a visual estimation and use these guidelines: <ol style="list-style-type: none"> a. if height of heat loss area is not more than 25% of the room height, the “effective heat loss perimeter” is zero (disregard as heat loss wall); b. if height of heat loss area is more than 75% of the room height, “effective heat loss perimeter“ is equal to the actual heat loss perimeter; c. if height of heat loss area is more than 25% and less than or equal to 75% of the room height, the “effective heat loss perimeter” should be considered to be 50% of the wall’s actual heat loss perimeter. 4. If estimation cannot be made, use 3 c. <p>The “effective heat loss perimeter” of the individual wall is then included in the heat loss perimeter of the building part.</p>	August 2014
2.24	Party wall lengths	<p>To be recorded in all cases (except detached properties).</p> <p>A flat in a block having only an unheated corridor adjacent to it is treated as detached (no party wall).</p>	April 2015
3. Construction and insulation			
3.01	Cavity wall type	Where a cavity wall has been identified, enter as such irrespective of the width of the cavity.	March 2010
3.02	System build type	<p>If there is a system built wall that has evidence of retro cavity fill, record as system build with internal insulation and include Addendum 1.</p> <p>See also convention 3.14 relating to high rise.</p> <p>Timber frame should be recorded as such and not as system build irrespective of the external cladding.</p>	<p>March 2010</p> <p>amended Jan 2012</p> <p>amended Aug 2014</p> <p>amended April 2015</p>

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3.03a	As built (walls, floors, roofs)	Assume as-built if there is no evidence of retro-fitted insulation, including: <ol style="list-style-type: none"> 1. a pitched roof with sloping ceiling insulation or a flat roof where there is no documentary evidence. 2. a roof with rafter insulation if no evidence of retro-fitted insulation 3. roof rooms where there is no access and no documentary evidence. 	April 2015
3.03b	“Unknown” insulation type (walls, floors, roofs)	This convention refers to unknown insulation type, not unknown insulation thickness. Do not use the “unknown” option for insulation inappropriately as this automatically suppresses any insulation recommendation. “Unknown” should be used only in exceptional circumstances, such as: <ul style="list-style-type: none"> • when there is conflicting evidence (inspection and/or documentary) of added insulation whose presence cannot be ascertained conclusively • for a fully boarded loft unless householder has documentary evidence (maximum thickness is depth of joists) or is prepared to lift the boards. • where there is a pitched roof and no access to the loft space or access prevented (see 3.04) and no documentary evidence In these cases clarification must be provided in site notes. Note: if the floor construction cannot be determined, “unknown” construction is appropriate.	March 2010 amended April 2015 amended Aug 2016
3.03c	Unknown insulation thickness	This convention refers to unknown insulation thickness. “Unknown insulation thickness” should be used only in exceptional circumstances, such as: <ul style="list-style-type: none"> - conflicting evidence of insulation thickness (visual and/or documentary) - when you can see insulation present but cannot measure it 	June 2016

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3.04	Loft insulation and rafter insulation	<p>Where the loft is accessible, loft insulation should be measured and photographic evidence provided of its measured thickness.</p> <p>“No access” means there is no loft hatch or other means of gaining access to the loft space.</p> <p>If there is a loft hatch or other means of gaining access but it could not be used on the date of the site visit (e.g. painted over, obstruction preventing access for health and safety reasons) record as “access, loft insulation unknown”.</p> <p>If loft insulation is fully obstructed (e.g. boarded or obscured by items stored) enter “pitched, access, loft insulation unknown” unless householder has documentary evidence (maximum thickness is depth of joists) or lifts the boards or removes the obstructions.</p> <p>If the property has multi-foil or foam insulation at joists or rafters, see convention 3.07.</p> <p>If joist and rafter insulation are both present base the assessment on the joist insulation only, unless the rafter insulation has greater equivalent thickness in which case base the assessment on the rafter insulation only.</p> <p>If varying levels, apply an area-weighted average. However, if there is an area with no insulation the dwelling should be split to give different roof scenarios.</p> <p>Partly obstructed lofts are treated as follows:</p> <ul style="list-style-type: none"> - <= 25% obstructed: treat as not obstructed and record thickness of visible insulation - >25 to 75%: divide into extensions - > 75%: treat as fully obstructed <p>In the case of a thatched roof for age band J onwards use 'as built' rather than rafter insulation if there is rafter insulation in addition to the thatch.</p>	<p>March 2010</p> <p>amended Mar 2011</p> <p>amended Jan 2012</p> <p>amended Aug 2014</p> <p>amended April 2015</p> <p>amended Aug 2016</p>
3.05	Age band for conversions (see also convention 1.01)	<p>For a conversion which was a change of use (e.g. barn converted to a dwelling) or where a dwelling has been sub-divided (e.g. house to flats) use the original construction date, unless there is documentary evidence that all thermal elements have been upgraded to the building regulation standards applicable at the conversion date. Enter insulation levels only for those elements for which evidence is available.</p>	<p>March 2010</p> <p>amended Dec 2012</p> <p>amended Aug 2014</p>
3.06	Internal wall lining (creating an airspace behind)	<p>This includes any type of internal lining that creates an airspace behind it, e.g. plasterboard on dabs, lath and plaster. Use tap test for plaster board on dabs or on battens. If tap test is inconclusive regard as not dry-lined. Dry lining alone does not confirm the presence of insulation.</p> <p>Note. Applies only to stone, solid brick and cavity walls in age bands A to E.</p>	<p>January 2012</p> <p>amended April 2015</p> <p>amended Aug 2016</p>

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3.07	Insulation thickness	<p>If insulation is multi-foil, the thickness is entered as twice its actual thickness.</p> <p>Any foam-type insulation can be doubled in thickness if there is documentary evidence of the type of insulation and manufacturer's information that the lambda-value (thermal conductivity) is less than 0.025.</p> <p>If there is both internal and external wall insulation add the insulation thicknesses together and enter as external</p>	January 2012 amended Aug 2016
3.08	U-value entry (walls, roofs, floors)	<p>The U-values of existing elements (walls/roofs/floors, etc.) must be the RdSAP default values (e.g. entered "as built") and not overwritten unless specific documentary evidence of the thermal conductivity of the individual materials of the building element of the property being assessed is provided and was undertaken in accordance with BR 443 "Conventions for U-value calculations" (BRE, 2006).</p> <p>The U-value is that of the whole element, including any added insulation.</p> <p>Documentary evidence applicable to the property being assessed (see convention 9.02) must be provided and recorded if overwriting any default U-value. This evidence shall be either:</p> <ul style="list-style-type: none"> - relevant building control approval, which both correctly defines the construction in question and states the calculated U-value; or - a U-value calculation produced or verified by a person with suitable expertise and experience. <p>Evidence of suitable expertise and experience can be demonstrated by, but is not limited to, membership of a recognised U-value calculation competency scheme or OCDEA¹ or Level 4 non-domestic energy assessor membership, or any other process recognised by Accreditation Schemes/Approved Organisations and Government.</p> <p>U-values for sheltered walls should not include a shelter factor, since it is added by RdSAP.</p> <p>The assumed insulation thickness or U-values from tables in the current edition of SAP (e.g. Table 6e for windows) or RdSAP (e.g. Table S10 for roofs and Table S15A for doors) can also be treated as documentary evidence provided that the evidence on which it is based is demonstrably robust (e.g. in relation to the age band for Table S10 or S15A).</p> <p>Where it is known that only part of an element has been insulated use the alternative wall if possible for the insulated part, or use extensions.</p>	January 2012 amended Aug 2014 amended April 2015 amended Aug 2016

¹ In Scotland, membership of an Approved Organisation scheme for EPCs for new domestic buildings

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3.09	External doors	<p>An external door is a door that forms part of the heat loss perimeter of the dwelling. See 2.14 for treatment of highly glazed doors.</p> <p>A multiple door should be recorded as such, e.g. a double door should be counted as 2 doors.</p> <p>A door to a <u>heated</u> access corridor is not included in the door count.</p> <p>A door to an <u>unheated</u> access corridor is part of the sheltered wall. If there is a second external door in the property it is directly to the outside.</p> <p>It is possible for a property to have no external door in the RdSAP data set (when any entrance to the property is via patio doors with more than 60% glazing which are counted as windows in SAP, or via a heated corridor).</p> <p>A door is counted as insulated only if documentary evidence is provided, which must include U-value or manufacturer reference enabling the assessor to ascertain the U-value from the manufacturer. If there is more than one insulated door and they have different U-values, enter the average U-value.</p>	<p>January 2012 amended Dec 2012 amended April 2015</p>
3.10	Windows (U-values and g-values)	<p>U-values and g-values can be overwritten only if documentary evidence is provided, which can be either a Window Energy Rating certificate (as defined by BFRC) or manufacturer's data. The U-value is for whole window, not centre pane.</p>	<p>January 2012</p>
3.11	Draught proofing (of openable windows and doors)	<p>In this convention windows refers only to openable panes.</p> <p>All external doors and at least 2 windows per building part should be examined.</p> <p>If a window is locked or inaccessible then endeavour to check another one.</p> <p>If the state of the draught proofing cannot be determined then take triple, double or secondary glazed as being draught proofed, and single glazed windows and doors as not draught stripped.</p> <p>Include glazing in a non-separated conservatory.</p> <p>The percentage draught proofed is [(number of draught proofed openable windows & doors) divided by (total number of openable windows & doors)] x 100</p>	<p>January 2012 amended Dec 2012</p>
3.12	Glazing age	<p>For double glazed windows, the year of manufacture can often be found either on the spacer bar at the edge of the glazed unit, or the year is stamped into the frame.</p> <p>Choose unknown date if there is no evidence of the date (on spacer bar or frame or documentary evidence such as a FENSA certificate or manufacturer guarantee).</p> <p>If no evidence available from the above sources, use the building age as the default. An image showing the gap between panes is not sufficient to infer glazing age.</p>	<p>August 2014 amended April 2015 amended Aug 2016</p>

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3.13	Age band for roof room	Same as the building part unless evidence proves otherwise. Evidence includes documentary evidence (e.g. planning applications), dated photographs of the property concerned validating date of construction (the evidence might establish the earliest possible date of construction if roof room is absent in the photograph).	August 2014 amended Aug 2016
3.14	High rise properties	<p>High rise properties (greater than 4 storeys) built with non-traditional construction methods (i.e. <u>not</u> timber frame, solid brick, cavity brick, stone) are deemed to be system built and should be recorded as such.</p> <p>For high rise properties built during or after 1967, that have a cavity/stretcher bond exterior wall, enter the wall as 'Cavity Wall' and select 'Access Issues' in Hard to Treat Cavities and include Addendum 1, 'Wall type does not correspond to options available in RdSAP'.</p> <p>If the high rise property has multiple exterior wall types of cavity and other constructions, e.g. concrete panels, record the construction as system built and deal with the cavity wall following convention 2.13, Alternative wall. If a cavity wall is entered as an alternative wall, select 'Access Issues' in Hard to Treat Cavities and Addendum 1 'Wall type does not correspond to options available in RdSAP'.</p> <p>For high rise properties with cavity walls and evidence of retro cavity fill, record as 'Filled Cavity' and include Addendum 1.</p>	August 2014 amended April 2015
3.15	Glazing gap	<p>This is the width of the spacer bar between the two panes of glass. It is required for windows with PVC frames pre 2002 or unknown when that is the most prevalent type of window. Select the nearest value to 6, 12 or 16 mm. If the gap cannot easily be identified, select either 6 or 16.</p> <p>Where a mixture of glazing gaps are present, all window areas should be measured.</p> <p>If there is a mixture of PVC and non-PVC frames record the frame type according to which is prevalent.</p>	April 2015 amended Aug 2016

#	Topic	Conventions	Issue date
3.16	Party wall construction in loft space	<p>The essential party wall characteristic to identify is masonry construction with a cavity which could be filled. Solid masonry and other constructional types are classified as "solid masonry or timber frame or system built".</p> <p>The primary method of identification is from a view of the party wall within the loft space. With brickwork, solely stretcher bonds indicate cavity construction while stretchers and headers indicate solid wall construction. A solid blockwork wall has blocks laid flat; the pattern looks like stretcher bond but the unit size is much larger. Note that it is only the construction in the loft space that is relevant; a cavity wall can separate the dwellings themselves but change to solid in the loft space.</p> <p>Where identification is not possible the construction is indicated as "unable to determine".</p> <p>The party wall should be indicated as filled cavity only where it is known to have been filled.</p> <p>Where a property is divided into two or more building parts the party wall is assessed for each building part bounded by a party wall.</p> <p>If two party walls in a building part where one can be determined but not the other (e.g. one to a heated corridor and one to another dwelling), or the constructions differ, divide into two building parts.</p> <p>(If "unable to determine" in a flat/maisonette RdSAP assumes no party wall loss.)</p>	April 2015
4. Main heating			
4.01	Heat emitters	<p>If one heating system feeds both underfloor and radiators, enter radiators. This is because for radiators a higher flow temperature is assumed (unless flow temperature is known).</p> <p>Where known the design flow temperature should be entered for condensing boilers and heat pumps. This applies to both radiators and underfloor systems.</p> <p>The design flow temperature for condensing boilers and heat pumps should be recorded as unknown unless there is documentary evidence that the system has been designed and commissioned as a low temperature one.</p>	Sept 2009 amended Jan 2012 amended April 2015
4.02	Storage heaters	<p>If storage heaters are present as main heating but there is only a single rate meter – enter as panel heaters and include addendum 6. If the storage heaters are fan-assisted or high heat retention suppress the recommendation for high heat retention storage heaters.</p> <p>A storage heater can be classified as high heat retention only if the model is located in the database. If there are both high heat retention storage heaters and other types, treat as two main heating systems.</p>	Sept 2009 amended Mar 2010 amended April 2015

#	Topic	Conventions	Issue date
4.03	Boiler missing or not working	If boiler/heating system is fitted/installed but not working (or condemned) it should still be entered as the main heating system. If boiler not fitted/installed but intended – enter no heating system	Sept 2009 amended Aug 2016
4.04	Micro-CHP	If micro-CHP and the system cannot be found in the database enter as condensing boiler and include addendum 5.	Sept 2009 amended Mar 2011
4.05	Definition of community heating	A system in which a heat generator provides heat and/or hot water to more than one premises. Each dwelling to be assessed individually. If the heat generator is in the dwelling, it is the heating system for that dwelling. If the heat generator is not in the dwelling treat as community heating	Sept 2009 amended April 2015
4.06	Heat sources and fuel used by community heating	Where the community scheme can be identified in the community network database, it is to be selected. If there is more than one data record only the current record can be used. Otherwise try to find out what the fuel is. If it cannot be ascertained select mains gas.	Sept 2009 amended April 2015

#	Topic	Conventions	Issue date
4.09	Two main systems	<p>If second main heating system is used only for domestic hot water see 6.04.</p> <p>Main systems 1 and 2 cannot be room heaters except in the case of the dwelling's heating consisting solely of room heaters.</p> <p>When there are two main systems,</p> <ul style="list-style-type: none"> - system 1 always heats the living area; - when both systems heat the living area, main system 1 is the one that heats the most habitable rooms; - when both systems heat the same number of habitable rooms; main system 1 is the system that provides water heating; - when neither or both main heating systems heat water, main system 1 is the system which is cheapest to run (fuel cost from SAP Table 12 divided by the efficiency of heating system). <p>Where two systems serve different spaces, the percentage recorded for each system is in proportion to the floor area served by each system;</p> <p>Where two systems serve the same heating circuit the default assumption should be a 50/50 split. A different ratio can only be used if there is clear documentary evidence to back this up.</p> <p>When there are two main systems and a recommendation is made for heating system upgrade, include addendum 9.</p> <p>A second main system is not to be confused with a secondary heater. See section 5.01 to 5.03 for rules on secondary heaters.</p> <p>If there is more than one type of storage heater (old large-volume, fan-assisted, integrated storage/direct acting, high heat retention): treat as two main systems. If then either main system 1 or main system 2 has more than one type, choose the most prevalent.</p> <p>If there are more than two main heating systems, use the rules above for determining main systems 1 and 2 and disregard the third.</p>	<p>March 2011</p> <p>amended Jan 2012</p> <p>amended April 2015</p> <p>amended Aug 2016</p>
4.10	Liquid biofuels	Used only for appliances selected from the database.	March 2011
4.11	LPG subject to special condition 18	Applies only if documentary evidence confirms that the property receives LPG at mains gas prices.	March 2011
4.12	Straw bales and other biomass	For straw bales and other types of biomass fuel that are not available in RdSAP, select wood logs and include addendum 12.	December 2012

#	Topic	Conventions	Issue date
4.13	TRVs	Include when on 50% or more of the radiators. For this purpose include all radiators including those not in a habitable room (e.g. in a hallway).	August 2014 amended April 2015 amended Aug 2016
4.14	Electric heating appliances	Treat electric underfloor heating mats and infra-red heaters as electric panel heaters.	April 2015 amended Aug 2016
4.15	Electric CPSU	An electric CPSU uses 10-hour or 18-hour tariff. If on 7-hour tariff treat as water storage boiler. If on single tariff record as direct-acting electric boiler.	April 2015
4.16	Weather compensators	Include only if located in database.	April 2015
4.17	Time and Temperature Zone Control	Can be either a. separate plumbing circuits, either with their own programmer, or separate channels in the same programmer, or b. programmable TRVs or communicating TRVs that are able to provide time and temperature zone control (conventional TRVs without a timing function provide only independent temperature control). In this case the device must be located in the database; in both cases subject to conditions in SAP 9.4.14 In the case of direct-acting electric systems, including underfloor heating, it can be achieved by providing separate temperature and time controls for different rooms.	April 2015
4.18	Central heating pump age	Separate pump only, not within boiler. Record age as unknown if cannot be seen (including pumps within the boiler). Age is 2013 or later if it has a label stating the EEI (energy efficiency index); otherwise it is 2012 or earlier.	April 2015
4.19	Heating controlled by mobile app	Heating controls adjustable via a mobile app only, where there are no visible controls in the dwelling, are not included in the assessment, i.e. no time or thermostatic control.	June 2016

#	Topic	Conventions	Issue date
5. Secondary heating			
5.01	Secondary heating	<p>Include if fixed emitter present regardless of whether main system(s) heat all rooms.</p> <p>If more than one secondary: select the device that heats greatest number of habitable rooms.</p> <p>If the same choose cheapest fuel – if same fuel select the device with the lowest efficiency.</p> <p>Electric focal point fires are included even if not wired by fixed spur.</p>	Sept 2009 amended Mar 2011
5.02	Open fireplaces (for heating)	<p>An open fireplace is to be considered in the heating assessment if capable of supporting an open fire (that includes having a grate suitable for holding fuel), even if no fuel is present. The fuel to be specified is smokeless fuel in smoke control areas and dual fuel outside smoke control areas.</p> <p>Open fires in bedrooms are disregarded when identifying the heating systems (main and secondary) and heated habitable room count. They are counted in the number of open chimneys (for ventilation), if appropriate.</p>	March 2010 amended Oct 2010 amended April 2015
5.03	Fuels for solid fuel fires and room heaters	<p>If it can burn only one fuel, specify that fuel (includes exempted appliances burning wood in Smoke Control Areas). Otherwise:</p> <p>Smoke control area: Open fire – smokeless fuel; closed heater – anthracite</p> <p>Not smoke control area: Open fire – dual fuel; closed heater – wood logs if capable otherwise anthracite.</p>	Oct 2010
6. Water heating			
6.03	Dual immersion with single tariff	Enter as a single immersion and include addendum 6.	Oct 2010 amended Mar 2011
6.04	Separate boiler or heat pump for DHW	<p>Sometimes there is a separate boiler or heat pump providing DHW only. A generic boiler can be selected from the water heating options. If the boilers or heat pumps are located in the database, specify two main heating systems with:</p> <ul style="list-style-type: none"> - main system 1 is the one providing space heating - main system 2 is the one providing DHW - percentage of main heat from system 2 is zero - water heating is from main system 2. 	March 2011 amended April 2015

#	Topic	Conventions	Issue date
6.05	Enclosed hot water cylinders	For an unvented pressurised steel or plastic encased hot-water cylinder (e.g. Megaflo), treat insulation value as 50 mm factory-applied foam and assume cylinderstat is present. For Elson (wooden box) type record the actual thickness and check for the presence of a cylinderstat (unless "no access").	August 2014 amended April 2015
6.06	Hot water thermal store	Treat as cylinder.	August 2014
6.07	Hot water cylinderstat	Include only when mounted on the side of the cylinder and has an electric connection.	April 2015
6.08	Instantaneous water heater	Disregard a small water storage volume. A "small" volume means less than or equal to 55 litres; If the storage volume exceeds 55 litres, it is specified as an electric immersion or gas boiler for water heating only.	June 2016
6.09	Electric shower	If the only water heater is an electric shower, specify as "electric instant water heating"	June 2016
7. Lights			
7.01	Lights	Include only fixed fittings. The number of light fittings is counted (not the number of bulbs, e.g. a chandelier is one fitting). LEDs are considered as low energy lights. Where there are 4 or more recessed downlighters / ceiling lights divide the bulb count by 2. Include fixed under-cupboard kitchen strip lights. If no lamp is present: do not treat as a low energy outlet unless it can be fitted only with a low energy lamp.	Sept 2009 amended Aug 2014 amended Aug 2016
8. Recommendations			
8.01	Suppression of recommendations	Recommendations should be removed only if there is documentary evidence showing that a specific recommendation is not appropriate. A listed building or a property in a conservation area is not sufficient grounds in its own right to suppress a recommendation. If a recommendation is removed this must be recorded in site notes. Further guidance on specific recommendations can be sought from an appropriate professional organisation, for example heating engineers, building control officers, product manufacturers, trade associations, etc.	Sept 2009 amended Dec 2012

#	Topic	Conventions	Issue date
8.02	Mains gas available	<p>Only if a gas meter or a gas burning appliance (e.g. gas cooker) is within the property. A closed-off gas pipe does not count.</p> <p>Where a boiler is present attached to a heating system (not in a box), and the mains gas meter has been removed for security reasons, enter a gas boiler as the main form of heating and indicate that mains gas is present.</p>	<p>Sept 2009</p> <p>amended Mar 2010</p>
9. Miscellaneous			
9.01	Open fireplace count (for ventilation)	<p>Include all open chimneys/fireplaces in the fireplace count (both downstairs and upstairs). The definition is a vertical duct with a flue diameter of at least 200 mm or its equivalent. The following are <u>not</u> counted as open fireplaces:</p> <ul style="list-style-type: none"> • Any open flue that is less than 200 mm diameter • A permanently blocked up fireplace, even if fitted with an airbrick • Any heating appliance with controlled flow of air supply i.e. appliance has closing doors • A flexible gas flue liner sealed into the chimney (because the diameter is less than 200 mm) • A chimney fitted with a damper enabling the flue to be mechanically closed when not in use <p>Temporary means of blocking a flue, e.g. cardboard, newspaper bungs and similar, are not a permanent means of controlling ventilation and therefore the chimney is counted as an open fireplace.</p> <p>Note that this relates only to the number of open fireplaces (it affects the ventilation rate assumed for the calculation). Other rules apply when considering the choice of main or secondary heating systems.</p>	March 2010
9.02	Documentary evidence	<p>Acceptable documentary evidence includes, but is not limited to, official letters from the applicable Registered Social Landlord (RSL) or certificates, warranties, guarantees. The assessor must be confident, and able to demonstrate, that any documentation relates to the actual property being assessed and that there is no physical evidence to the contrary. Evidence of intent to install does not qualify as acceptable documentary evidence.</p>	<p>March 2010</p> <p>amended Aug 2014</p> <p>amended Aug 2016</p>
9.03	Lodgement of incorrect EPC	<p>If you lodge an EPC in error and lodge a corrected EPC, inform your accreditation scheme so that the erroneous one can be marked “not for issue”.</p>	March 2010
9.04	Cooling system present	<p>Fixed systems only, do not include reversible heat pumps.</p>	March 2011

#	Topic	Conventions	Issue date
9.05	Photovoltaics	<p>If photovoltaics are present, look for a schematic wiring diagram which may be adjacent to the electricity meter or the consumer unit, or an MCS installation certificate, either of which should state the peak power (kWp) of the PV array. Record the following:</p> <ul style="list-style-type: none"> - kWp; - estimate of pitch of the PVs (as the nearest to horizontal, 30°, 45°, 60° or vertical; if midway between two of these use the higher value); - if not horizontal, the orientation of the PVs (N, NE, E, SE, S, SW, W, NW); - overshadowing of PVs (very little, modest, significant or heavy; if in doubt select modest). <p>If the kWp cannot be ascertained, do not allocate the PV, except where it is connected to a meter serving a single dwelling. Where the meter is serving a single dwelling, record the percentage of the total roof area occupied by PVs. The total roof area includes main dwelling and all extensions where present.</p> <p>If there are PV panels on different planes of the roof, enter as separate systems. If a single kWp figure is provided, in this case estimate the relative area of each and apportion the kWp accordingly.</p> <p>PV connection to the dwelling's meter must be verified by the presence of a PV generation meter or documentary evidence. In all cases, the PV-generated electricity is included in the assessment of a dwelling only if the dwelling has a PV generation meter serving it.</p> <p>Where it cannot be determined that the PV supply is feeding into a meter serving the dwelling being assessed then no PV should be allocated to that dwelling.</p> <p>Where the PV supply is serving more than one building, or multiple dwellings within the building, the total capacity of the PV is allocated between the buildings on an area weighted basis based on an estimate of the total floor area of all of the buildings or dwellings served by the PV. This applies in all scenarios where the PV supplies more than one building, or multiple dwellings within the building, including where the other buildings are either all dwellings, a mix of dwellings and non-domestic buildings or all non-domestic buildings.</p>	<p>March 2011 amended Jan 2012 amended April 2015 amended Aug 2016</p>
9.06	Flue gas heat recovery	<p>Include only if found in database, identified in same way as for heating systems. When the model cannot be found no default option is available but the presence of the device should be recorded in site notes.</p>	<p>January 2012</p>
9.07	Wind turbine	<p>Documentary evidence is required to overwrite default values.</p>	<p>January 2012</p>

#	Topic	Conventions	Issue date
9.08	Waste water heat recovery	<p>Include only if found in database. When the model cannot be found no default option is available but the presence of the device should be recorded in site notes.</p> <p>For instantaneous types:</p> <ul style="list-style-type: none"> - Number of rooms with bath and/or shower includes rooms with only an electric shower. If two showers found in a room, count as one. - Only mixer showers count for instantaneous waste water heat recovery. Mixer shower means a shower where the hot water is provided by a boiler (combi or regular), heat pump or immersion heater, and the shower must be permanent i.e. not temporarily attached to bath taps when in use. - The shower must be permanent i.e. not temporarily attached to bath taps when in use' - In the case of a shower that is integral with bath taps, i.e. designed as part of a unit switchable between shower and taps, it is counted as a mixer shower only if there is a shower bracket at least 1.5 m above the plughole and there is a curtain or screen present. <p>For storage types:</p> <ul style="list-style-type: none"> - Record the total number of baths and showers of any type - Record the total number of baths and showers connected to the waste water heat recovery system. 	<p>January 2012 amended Dec 2012 amended April 2015 amended Aug 2015</p>
9.09	Solar water heating	<p>Documentary evidence is required to over-write collector or solar store values. Orientation, tilt and overshadowing can be overwritten with visual evidence.</p> <p>If the panel/collector details are available but the solar store information is not, the default values can be used for the solar store.</p> <p>If the solar store is combined and details are being recorded the volume of the combined cylinder must also be recorded.</p> <p>Shower type is required when solar water heating details are known. In this context "electric shower" means a shower where the water is heated by electricity as the shower runs. If the shower is supplied from a hot-water cylinder it is classified as non-electric even though the cylinder is electrically heated.</p>	<p>January 2012 amended April 2015</p>

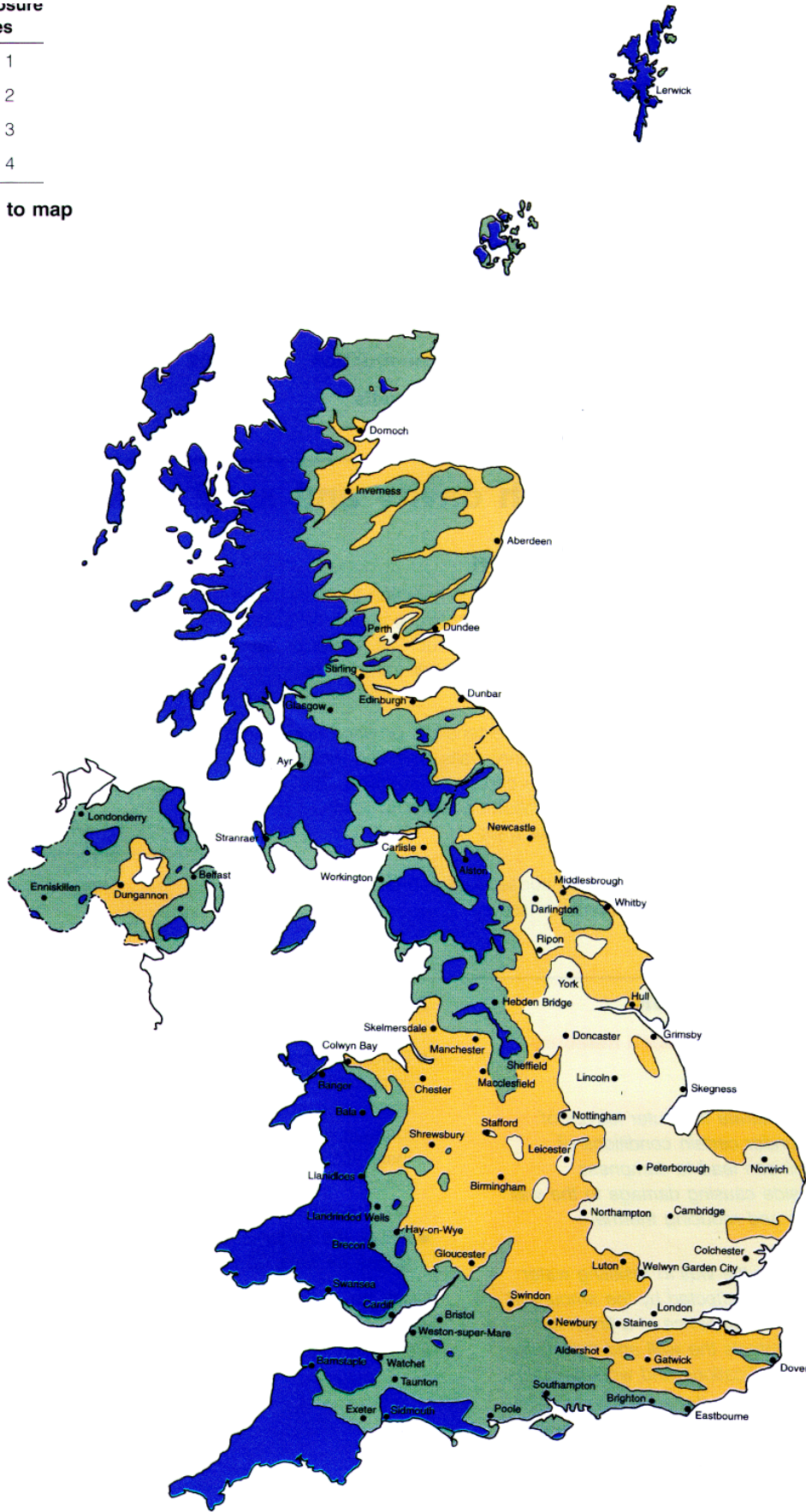
#	Topic	Conventions	Issue date
9.10	Hard to treat cavity walls	<p>An <u>access</u> issue is any façade where it is not possible to pitch a 5 metre ladder considering health and safety requirements. This includes e.g. a narrow passageway, a busy thoroughfare next to a building of more than 2 storeys, a conservatory or large outhouse attached to the property, etc.</p> <p>A <u>narrow cavity</u> is indicated by a stretcher bond brick pattern with wall thickness 220 to 250 mm.</p> <p>Possible high exposure should be recorded for any dwelling in exposure zones 3 or 4 (see map at end of these conventions). If in doubt record as possible high exposure.</p>	January 2012
9.11	Transaction type	<p>If more than one transaction type is applicable, seek clarification from the client and in case of doubt select the one nearest the top of the list.</p> <p>“None of the above” should be avoided where possible; the case below should be treated as follows:</p> <p style="padding-left: 40px;">Right to Buy transactions should be recorded as “Non-marketed sale”</p>	December 2012 amended Aug 2016
9.12	Tenure	<p>When transaction type is rental, tenure must be rented (social) or rented (private).</p> <p>When transaction type is marketed or non-marketed sale, the tenure will usually be owner-occupied (although there can be exceptions, such as the sale of a property with a sitting tenant).</p> <p>If the property is vacant on the inspection date, try to find out the last tenure and select this e.g. owner occupied, rented (social) or rented (private).</p>	December 2012

#	Topic	Conventions	Issue date
9.13	Electricity meters	<p>Usually the dwelling uses either the standard domestic tariff (single meter) or an off-peak tariff (dual meter). In these cases select single or dual meter and an addendum is not required.</p> <p>In some cases of older installations the property may have two separate single rate meters present and it is unclear whether dual meter or single meter should be identified. If that applies:</p> <ul style="list-style-type: none"> - if the main space heating is electric, select dual meter if the main space heating is an off-peak electric device, and single meter otherwise (direct-acting heaters); - if the main space heating is not off-peak electric but the water heating is electric, select dual meter if it has a dual immersion and single meter if it has a single immersion; - if neither of the above applies, select single meter <p>and</p> <ul style="list-style-type: none"> - if dual meter selected include addendum 10; - if single meter selected include addendum 11. 	December 2012
9.14	Park homes	<p>For the purposes of RdSAP a park home is a pre-fabricated dwelling of modular lightweight construction without its own foundations (although it may sit upon a concrete base) and which is capable of being moved from one place to another.</p> <p>Convention 3.08 applies to U-values. For U-values of existing park homes, documentation obtained from the manufacturer can be used.</p> <p>Park homes have their own set of age bands.</p>	August 2014 amended April 2015

Exposure zones

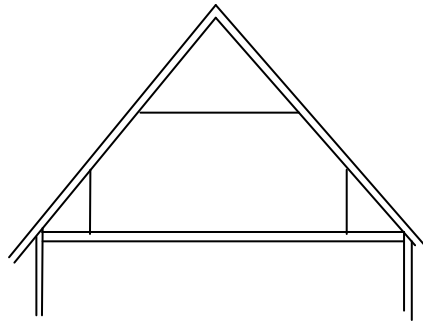


Key to map

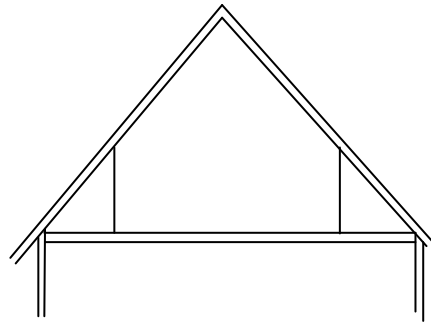


Illustrations of roof rooms (see convention 2.06)

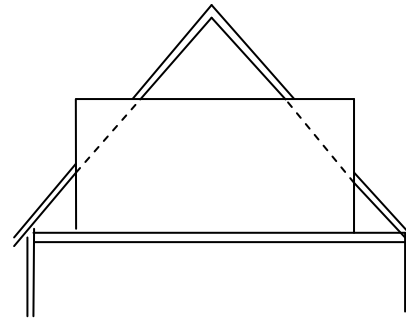
The following are all classified as roof rooms:



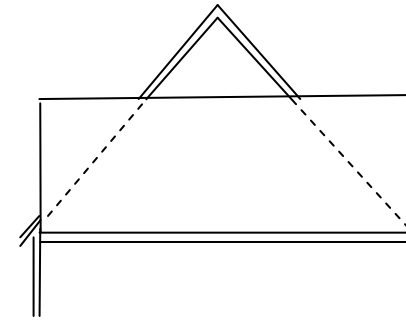
Basic roof room



Roof room with vaulted ceilings



Roof room with dormer windows



Roof room with large dormer windows (chalet style)

Where there is a common wall it is:

- a roof room if the common wall is less than 1.8 m;
- a separate storey if greater or equal to 1.8 m:

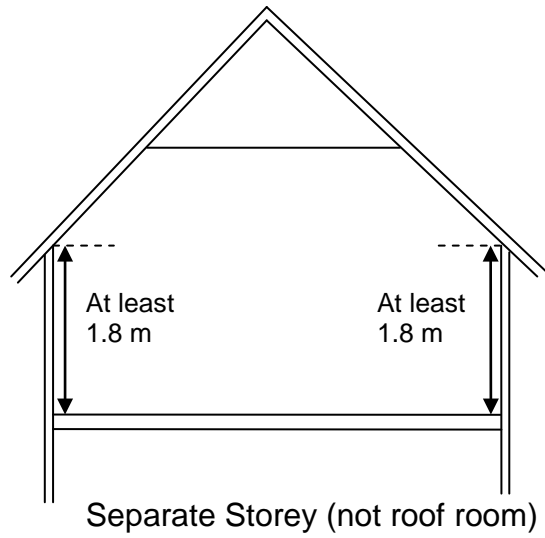
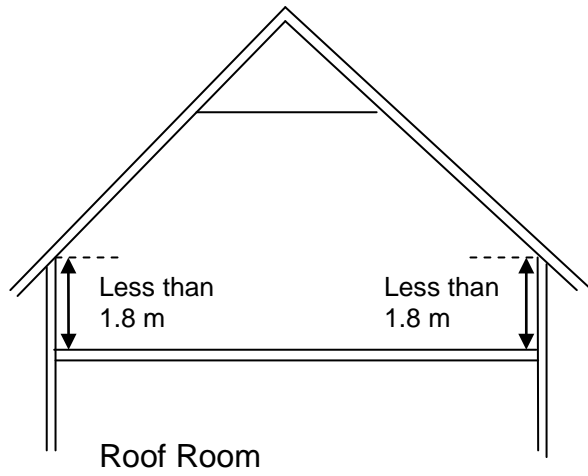
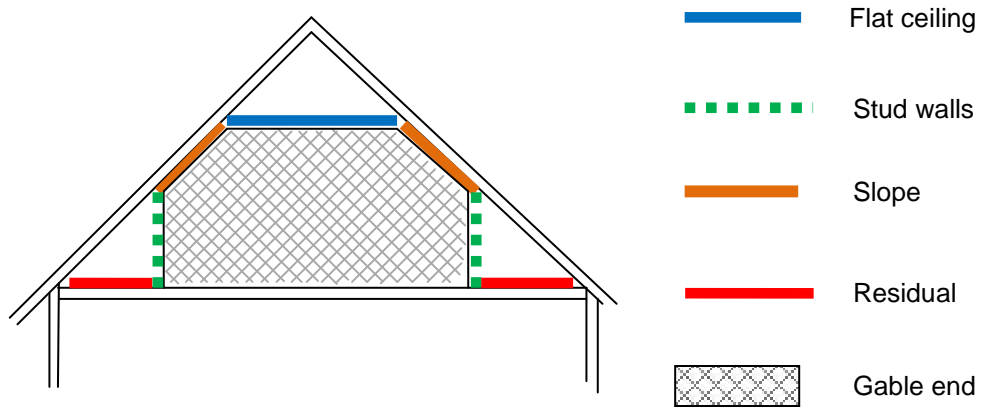


Illustration of the different parts of room rooms when detailed measurements are being made (convention 2.06)



Revision history

September 2009	First issue Conventions: 1.01, 2.01, 2.02, 2.03, 2.04, 2.05, 2.09, 4.01, 4.02, 4.03, 4.04, 4.05, 4.06, 5.01, 6.01, 6.02, 7.01, 8.01, 8.02
March 2010	Second issue Amended: 4.02, 8.02 Added: 1.02, 2.06, 2.07, 2.08, 2.10, 2.11, 2.12, 2.13, 2.14, 2.15, 2.16, 3.01, 3.02, 3.03, 3.04, 3.05, 4.07, 5.02, 9.01, 9.02, 9.03
October 2010	Third issue Amended: 2.03, 2.10, 5.02 Added: 2.17, 2.18, 2.19, 2.20, 4.08, 5.03, 5.04, 5.05, 6.03
March 2011	Fourth issue Amended 1.02, 2.11, 2.12, 2.15, 2.16, 3.04, 4.04, 5.01, 5.04, 6.03, Deleted: 4.07, 4.08, 5.05, 6.01, 6.02 Added: 2.21, 4.09, 4.10, 4.11, 6.04, 9.04, 9.05
January 2012	Fifth issue Amended: 1.01, 2.06, 2.13, 3.02, 3.04, 4.01, 4.09, 9.05 Added: 2.22, 3.06, 3.07, 3.08, 3.09, 3.10, 3.11, 9.06, 9.07, 9.08, 9.09, 9.10 Deleted: 5.04
December 2012	Sixth issue: Amended 1.01, 2.08, 2.11, 2.13, 2.14, 2.17, 2.22, 3.05, 3.09, 3.11, 8.01, 9.08, Added: 4.12, 9.11, 9.12, 9.13
August 2014	Seventh issue: Amended 2.01, 2.06, 2.22, 3.02, 3.04, 3.05, 3.08, 7.01, 9.02 Added 2.23, 3.12, 3.13, 3.14, 6.05, 6.06, 9.14, Appendix 1

April 2015	<p>Eighth issue:</p> <p>Amended 1.01, 2.03, 2.04, 2.05, 2.13, 2.14, 2.15, 2.21, 3.03a, 3.04, 3.06, 3.08, 3.09, 3.12, 3.14, 4.01, 4.02, 4.05, 4.06, 4.09, 4.13, 5.02, 6.04, 6.05, 9.02, 9.05, 9.08, 9.09, 9.14</p> <p>Added 1.03, 1.04, 2.24, 3.02, 3.03b, 3.15, 3.16, 4.14, 4.15, 4.16, 4.17, 4.18, 6.07</p>
August 2016	<p>Ninth issue:</p> <p>Amended 1.04a, 2.03, 2.04a, 2.13, 3.03b, 3.04, 3.06, 3.07, 3.08, 3.12, 3.13, 3.15, 4.03, 4.09, 4.13, 4.14, 7.01, 9.02, 9.05, 9.11</p> <p>Added 1.04b, 2.04b, 3.03c, 4.19, 6.08, 6.09</p>