Stroma Certification Ltd

CPD Guide: Wall Thickness and Measurements

This Guide has been created to highlight EPC failures relating to wall thickness and measurements. There is a question section at the end of the Guide for you to complete in order to pass this section of the CPD.

If you have any questions regarding topics covered in the Guide, please email info@stroma.com with details of your enquiry. Alternatively, please call Stroma Certification on 0845 621 11 11.
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Wall thickness and measurements

During the course of the EPC Assessment you should be able to provide an accurate wall thickness measurement; this has several uses for you as a DEA, however the wall thickness measurement is a basic part of the assessment process and is a requirement under the Conventions as follows;

“Convention 2.22: Measure wall thickness in mm of each external wall (elevation) and any alternative wall within a building part.

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 the thickness varies for the same construction, use the average of the measured values.”

By failing to provide a wall thickness measurement, an assessor is not meeting the compliance requirements of the Accreditation Scheme, as they are not producing an accurate EPC or meeting the mandatory and legal requirements of the assessment.

Accuracy in recording the wall thickness is imperative since the wall thickness measurement can have an impact on the overall SAP rating of the property (depending on the wall construction). For example, for a property of stone: granite or whinstone, the wall thickness figure impacts the U-value. The wall U-value is the rate at which heat is lost through windows, walls, floors and roof of a dwelling, hence an important factor in the software’s calculations of the SAP rating. Variations on the wall thickness impacting the U-value only affect properties of stone construction. This is because the greatest variations in wall thicknesses are usually associated with stone construction properties, i.e. a stone property of one age band can be 500mm thick, however can greatly vary in the next age band and do not necessarily follow a set pattern.
A wall thickness measurement is also an ideal feature used to determine the type of wall construction of a property when it is not clearly identifiable. Typical figures of wall thickness for the age band of the property it falls in can be found in the table below, however it is advised that an assessor uses features of the property in question to determine the wall construction type, rather than relying on the data in the table alone.

Table S3: Wall thickness (mm)

<table>
<thead>
<tr>
<th>Wall type</th>
<th>Age band</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I, J, K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone as built</td>
<td></td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>450</td>
<td>420</td>
<td>420</td>
<td>420</td>
<td>450</td>
</tr>
<tr>
<td>Stone with internal or external insulation</td>
<td></td>
<td>570</td>
<td>570</td>
<td>570</td>
<td>570</td>
<td>520</td>
<td>490</td>
<td>490</td>
<td>490</td>
<td>520</td>
</tr>
<tr>
<td>Solid brick as built</td>
<td></td>
<td>220</td>
<td>220</td>
<td>220</td>
<td>220</td>
<td>240</td>
<td>250</td>
<td>270</td>
<td>270</td>
<td>300</td>
</tr>
<tr>
<td>Solid brick with internal or external insulation</td>
<td></td>
<td>290</td>
<td>290</td>
<td>290</td>
<td>290</td>
<td>310</td>
<td>320</td>
<td>340</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td>Cavity</td>
<td></td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>260</td>
<td>270</td>
<td>270</td>
<td>300</td>
</tr>
<tr>
<td>Cavity with internal or external insulation</td>
<td></td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>310</td>
<td>320</td>
<td>320</td>
<td>330</td>
</tr>
<tr>
<td>Timber frame (as built)</td>
<td></td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>250</td>
<td>270</td>
<td>270</td>
<td>270</td>
<td>270</td>
<td>300</td>
</tr>
<tr>
<td>Timber frame with internal insulation</td>
<td></td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>290</td>
<td>310</td>
<td>270</td>
<td>270</td>
<td>270</td>
<td>300</td>
</tr>
<tr>
<td>Cob</td>
<td></td>
<td>540</td>
<td>540</td>
<td>540</td>
<td>540</td>
<td>540</td>
<td>540</td>
<td>560</td>
<td>560</td>
<td>590</td>
</tr>
<tr>
<td>Cob with internal or external insulation</td>
<td></td>
<td>590</td>
<td>590</td>
<td>590</td>
<td>590</td>
<td>590</td>
<td>590</td>
<td>610</td>
<td>610</td>
<td>640</td>
</tr>
<tr>
<td>System build</td>
<td></td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
</tbody>
</table>

Appendix S, RdSAP 2009 version 9.91
Wall thickness measurements also impact the total floor area specified on an EPC. When assessors take external measurements, they are including the additional floor area covered by the thickness of the wall. A background software calculation takes into account the wall thickness and deducts the sum of the external wall thickness from the floor area. This is then shown on the EPC at the reduced size m².

![Diagram showing inclusive and exclusive floor area]

The floor area inclusive of the wall thickness:

- Party walls are now a required measurement as per new specifications and conventions. An assessor should measure the party wall length and note its construction. The party wall is defined as the wall between two adjoining properties.

The main types of party walls that are relevant are:

- A wall that stands on the lands of 2 (or more) owners and forms part of a building - this wall can be part of one building only or separate buildings belonging to different owners
- A wall that is on one owner’s land but is used by 2 (or more) owners to separate their buildings

Varying wall thickness

Where a wall thickness varies for a building part of the same construction type, an assessor should calculate a weighted average. For example a detached house with all four sides of equal length, the rear wall being 250mm thick and the remaining walls being 350mm thick. The average is calculated as below:

\[(0.25 \times 250) + (0.75 \times 350) = 325\text{mm}\]

Only walls of stone construction with varying thickness are considered alternative walls. For stone walls assess the thickness at each external elevation and at each storey. Use the alternative wall feature if the thickness varies by more than 100mm.

Photographic evidence is required for each different thickness. An assessor must support the wall thickness data with images, measurements and site notes to support data entry in accordance with this convention.
Taking the wall measurement

The easiest method of measuring the wall thickness is to take the measurement at an open recess, e.g. external door frame opening or open window opening. The use of a locking type extending roller tape is ideal as the tape can be used to define almost any wall thickness, has clear markings and in most cases, the yellow or white background provides clear evidence of the measurement in question in most photographic evidence.

The two pictures below show the incorrect and correct way to measure wall thickness:

![Incorrect measurement](image1)

*The measurement is incomplete and does not show the full measurement taken of both wall edges.*

![Correct measurement](image2)

*This measurement provides the full measurement taken, both inside and outside wall edges.*

When measuring externally, for a dwelling joined on to another dwelling (semi-detached and terraced houses) the measurement is to the mid-point of the party wall.

**Note that it is crucial not to vary between internal and external measurements on the same survey as it is not possible for the software to account for these variations.**

Providing evidence of the measurement

A “picture tells a thousand words” and confirms that what you are stating in your data is also evident in the photograph; it provides accurate information to support your data entry and is visual evidence of the assessment process. Photographs should be clear and annotated with the time and date stamp and they should clearly show the measurement value on the tape measure.
It is important to clearly show the tape measure against the wall in the photograph. An edited image with a tape measure pasted on to the photograph is not acceptable. Similarly, a photo showing solely a tape measurement labelled ‘Wall thickness’ is not acceptable. Below is an example of a photo that would fail an audit for not supplying acceptable evidence of a wall thickness measurement.

Identification of construction type of the property

Wall types in construction have a different thickness due to the use of types of materials, insulation and age of the property in question. Wall thickness can vary:

- **Pre 1950**: 250mm
- **1950-70**: 260-270mm
- **1970-2000**: 270mm+
- **2000 onwards**: 300mm+

**System Build** tends to have unusual wall thicknesses, too narrow for cavity wall but too thick for solid wall.

**Solid Walls**: In order to provide adequate strength, a solid brick wall must be 215mm thick - known as a ‘one brick thick’ wall. A solid wall thickness of 220-250mm can be used to identify solid brick walls if the walls of the property are rendered or a narrow cavity (hard to treat).
Summary

- Wall thickness is crucial in identifying the wall construction and also very useful for the auditor to verify the EPC is correct.
- The wall thickness is therefore a mandatory photograph, and failing to provide this evidence could result in the audit failing for insufficient evidence.
- The wall thickness is important for stone walls as the u-value is to change in line with the wall thickness entered into the software.
- You should measure an opening at each exposed elevation (front, back and sides) where applicable and take a photograph for your evidence.
- The photograph should show the full wall thickness, not just the end of the tape measure.
Wall Thickness Question Sheet

Now that you have read and digested the CPD provided due to the failed audit, you are now required to complete this sheet. Below are a set of questions relating to wall thickness and the associated entry into the RdSAP software. Each question is multiple choice and you must answer ALL questions correctly to pass this section of the CPD.

1. How should a wall thickness measurement image look?

   a)  
   ![Image a) sample image]

   b)  
   ![Image b) sample image]

   c)  
   ![Image c) sample image]

   d)  
   ![Image d) sample image]

2. If you are struggling to take a wall thickness measurement with an iPad, what should you do? (Select 2 answers)

   a) Nothing, don’t take a thickness

   b) Use a different camera

   c) Take a wall thickness measurement but don’t evidence it and make a note

   d) Take the wall thickness measurement then place the measure on the floor near the wall and take a picture and make a note

   e) Take the wall thickness measurement then place the measure on the floor away from the wall and take a picture and don’t make a note
3. When is it appropriate to **NOT** collect evidence of wall thickness?
   a) Never
   b) If you are in a hurry
   c) If you can guess the thickness
   d) If there are access issues

4. If a wall has internal or external wall insulation at 50mm and the wall construction ALONE is 220mm, what thickness would you record in the software?
   a) 270mm
   b) 220mm
   c) 300mm
   d) 250mm

5. What should you do where there are varying wall thicknesses on a cavity wall?
   a) Use an alternative wall
   b) Use an extension
   c) Find the average and enter that
   d) Record the thickest wall only

6. If a cavity wall is 300mm in one area and 400mm in another area what should you do?
   a) Use an alternative wall
   b) Use an extension
   c) Find the average and enter that
   d) Record the thickest wall only

7. How many decimal points should a wall thickness be rounded to? (e.g. 0.123456)
   a) 0
   b) 3
   c) 1
   d) 2

8. Is it a minimum requirement to supply a wall thickness measurement for audit?
   a) No
   b) Yes
9. What thickness would this enter as?

![Wall Thickness Diagram]

- a) 200mm
- b) 300mm
- c) 100mm
- d) 250mm

10. Where is a wall thickness measurement taken from?

- a) A party wall
- b) An internal
- c) A window/door reveal
- d) The floor

11. You have calculated the total floor to be 94m² however the EPC generated by the software shows the floor area as much lower than this. What is the reason for this?

- a) The software takes into account that you have taken external wall measurements and has deduced the floor area covered by the wall thickness from the total floor area figure
- b) The software has not included the floor area of any extensions
- c) The software has calculated the floor area incorrectly
- d) The calculation takes into account the floor construction and reduces the floor area based on this

12. Why is it important to take a wall thickness measurement?

(Select 2 answers)

- a) To find out what thickness of insulation can fill the cavity
- b) To find how thick the wall is
- c) To help identify the wall construction type
d) To find out the age of the property  
e) The measurement affects the U-value of the wall  

13. When is it appropriate to take an average of the wall thickness?

   a) For a stone construction property  
   b) When there are varying measurements recorded for different elevations  
   c) When one elevation is an alternative wall  
   d) When you are rushed for time and can only take one measurement.  

14. A property has an extension of the same cavity construction as the main building however it falls in a different age band to the main building. Do you:

   a) Assume the same wall thickness since it is of the same construction type as the main building  
   b) Add 50mm to the wall thickness measurement of the main building and record this as the extension’s wall thickness, since it falls in the next age band  
   c) Take a wall thickness measurement for the main building and the extension and record them separately  
   d) Take an average of the two  

15. You are unable to take a measurement of the wall thickness at the door or window reveal. Do you:

   a) Take an internal wall thickness measurement only  
   b) Visit the neighbour’s property which looks similar and record the wall thickness measurement at that property as the measurement of the property you are visiting  
   c) Ignore it completely  
   d) Carry out an internal/external wall measurement comparison where the internal measurement is subtracted from the external measurement to give the wall thickness