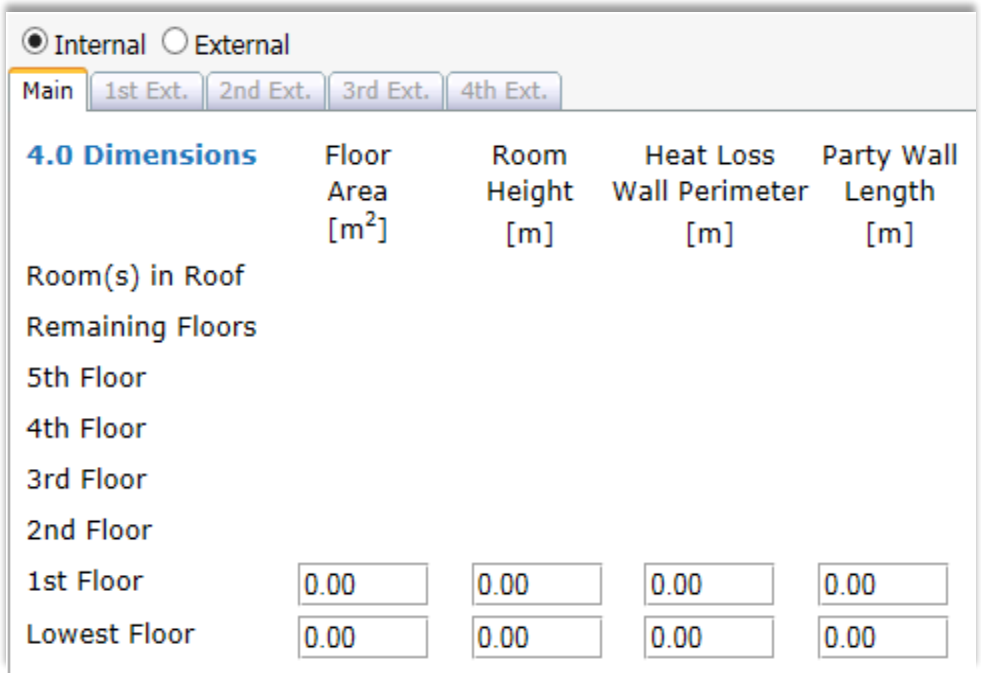
Measurement formulas

When carrying out an Assessment to produce an energy performance certificate you will be required to obtain the following information from the dwelling:

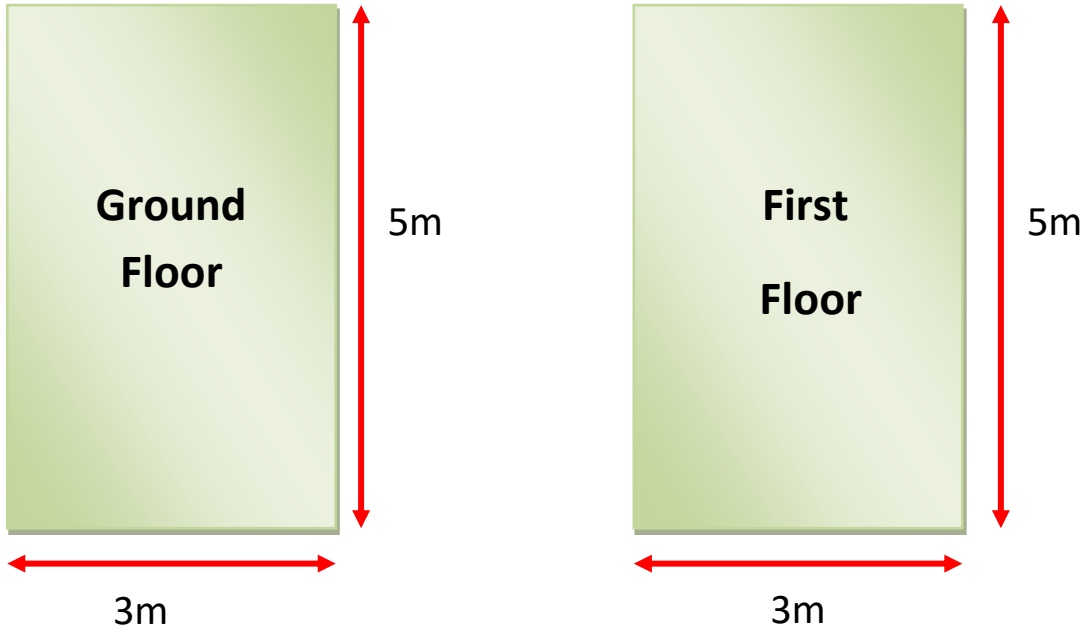
- **Floor Area (m^2)**
- **Room Height (m)**
- **Heat Loss Wall Perimeter (m)**
- **Party Wall Length (m)**

This information is required for each floor of the dwelling and for each building part (original building plus any extensions), here is a screen shot of the RdSAP software;



Floor area

Floor area is the width of the dwelling space multiplied by the length on each floor, for example (bird's eye view):

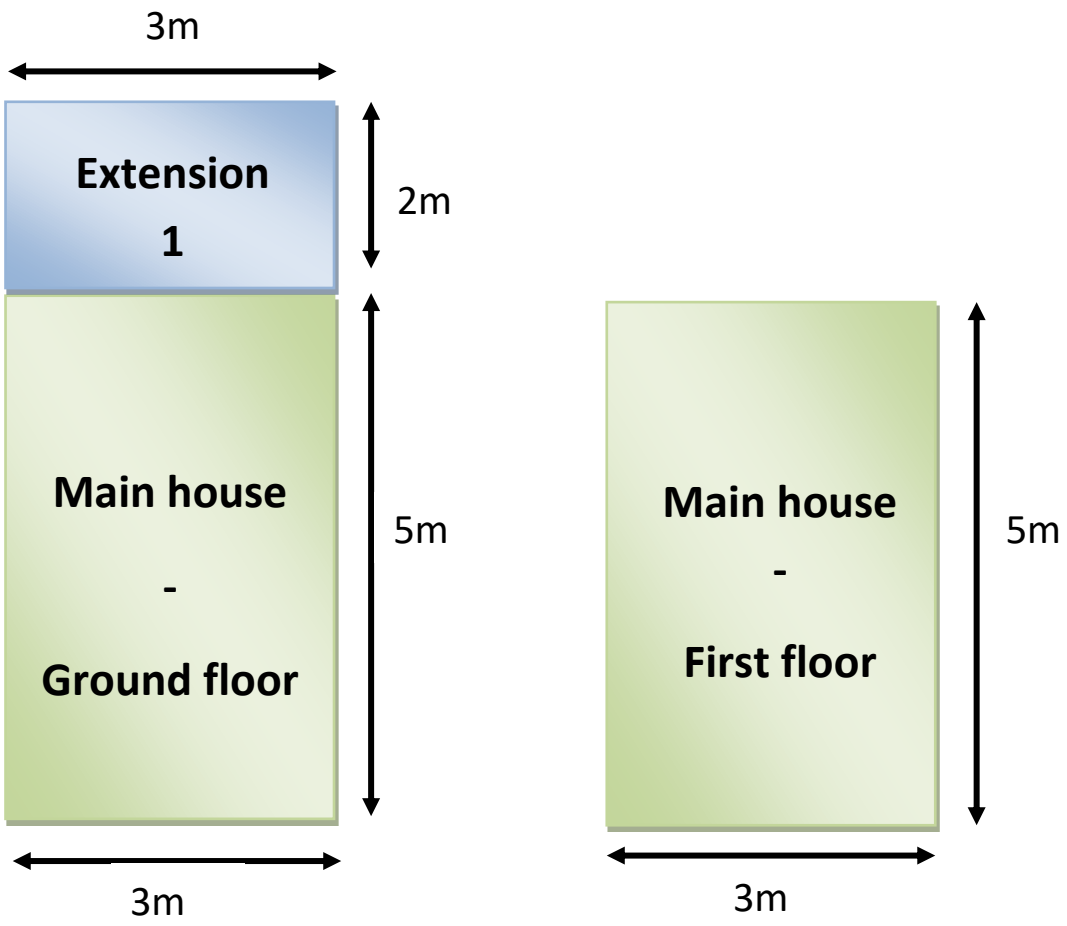


Ground Floor 5m x 3m = **15m²**

First Floor 5m x 3m = **15m²**

Floor area - Extensions

Where an extension is present these are treated as separate building parts and should be calculated individually, for example:



Main house

Ground floor 5m x 3m = **15m²**

First Floor 5m x 3m = **15m²**

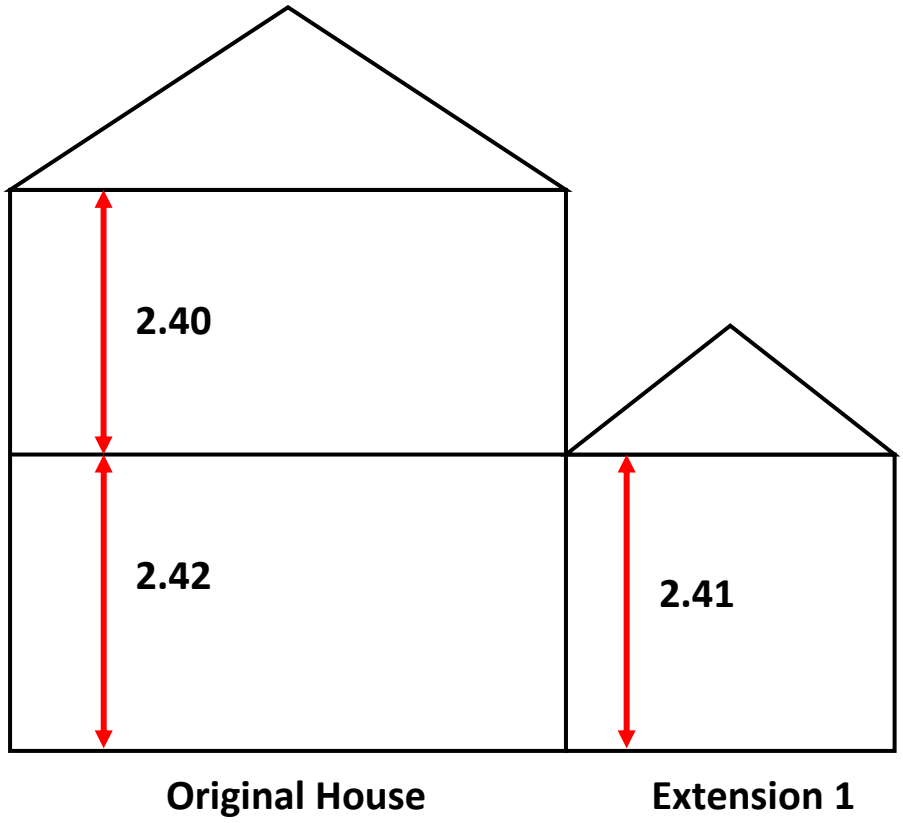
Extension 1

Ground floor 2m x 3m = **6m²**

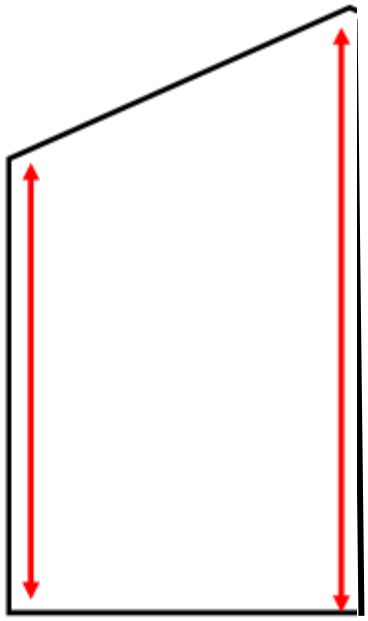
Please see Appendix 1 at the back of this booklet for formulas on calculating bay windows and awkward shapes

Ceiling Heights

Ceiling heights will need to be taken in each storey of the dwelling and any additional extensions; these are taken from the floor to the ceiling, for example (sideways view):



Where a storey has a varying ceiling height an average should be calculated, for example with a vaulted ceiling the highest point should be measured and the lowest, then by adding them together and multiplying by two this provides an average:



Calculating the average ceiling height

2.40 + 2.90 x 0.5= 2.65

Heat loss wall perimeter length (HLP)

The length of the Heat loss perimeter walls (**indicated in red lines on the examples below**) should be added up and entered into the software as one measurement for all storeys of the dwelling and all building parts (original dwelling, extensions etc).

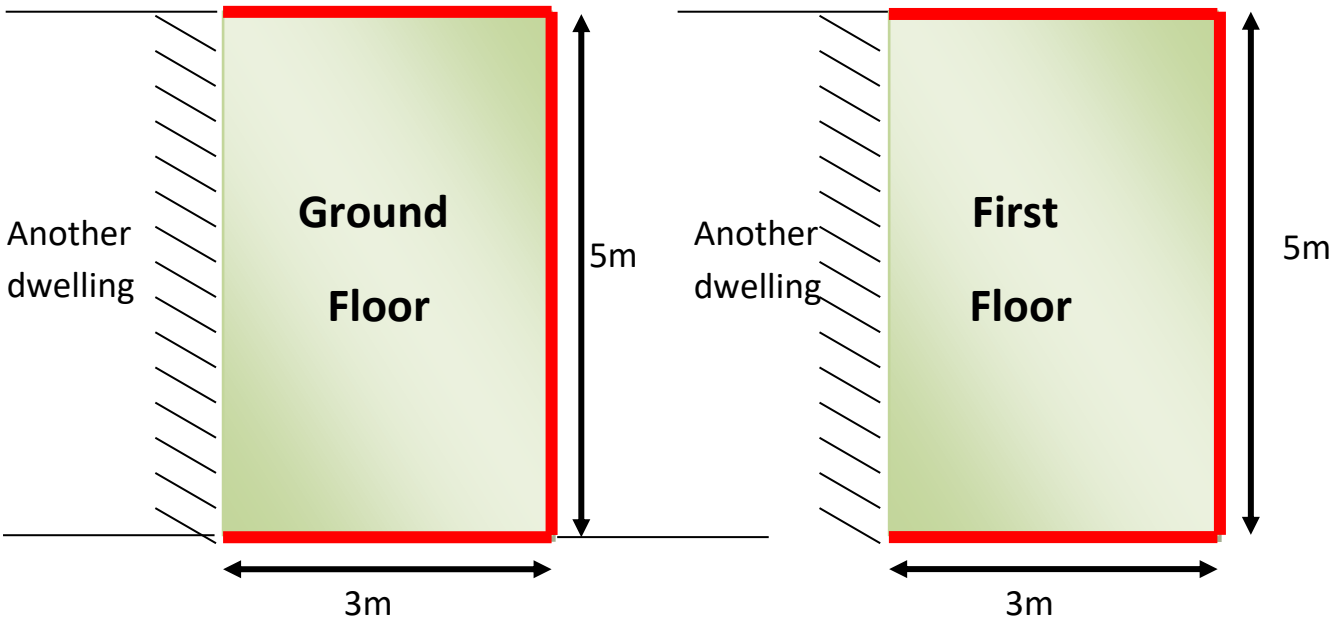
A heat loss perimeter wall is an exterior wall of a dwelling that is:

- ✓ **Exposed to outside air**
- ✓ **Adjoining a Conservatory separated from the house by external quality doors**
- ✓ **Adjoining an unheated garage/thermally separate unheated porch**
- ✓ **Adjoining a thermally separate unheated outbuilding/space that does not form part of the dwelling**
- ✓ **Adjoining an unheated corridor/staircases leading to flats**

Calculating the Heat loss perimeter:

Here are some bird's eye view examples of the different types of heat loss perimeters of a dwelling (indicated by red lines):

1. **<u>Exposed to outside air</u>**

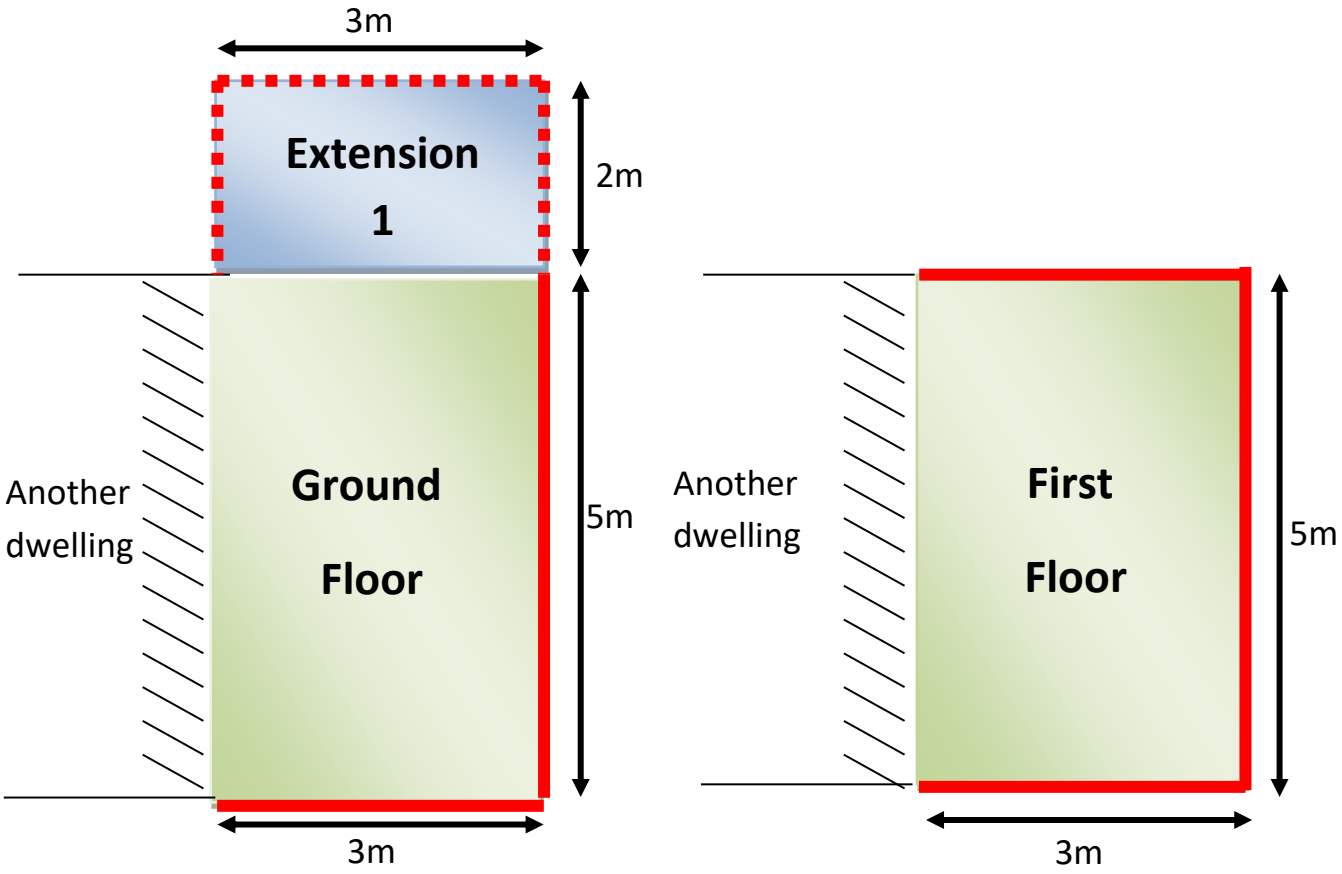


Heat loss perimeter	
Ground floor	5m + 3m + 3m = **<u>11m</u>**
First floor	5m + 3m + 3m = **<u>11m</u>**

The party wall adjoining 'Another dwelling' is dealt with later.

Extensions

Any connecting wall between a house and what you are including as an extension is not classed as heat loss perimeter and should be ignored, however, we have now gained heat loss wall in our extension, for example:



Heat loss perimeter

<u>Main house:</u>

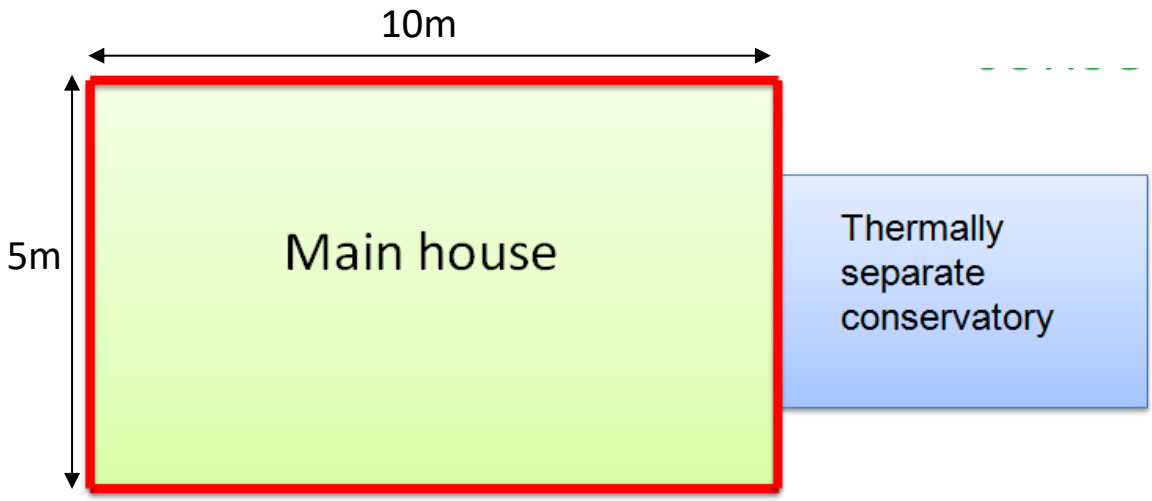
Ground floor 5m + 3m = **<u>8m</u>**

First floor 5m + 3m + 3m = **<u>11m</u>**

<u>Extension 1:</u>

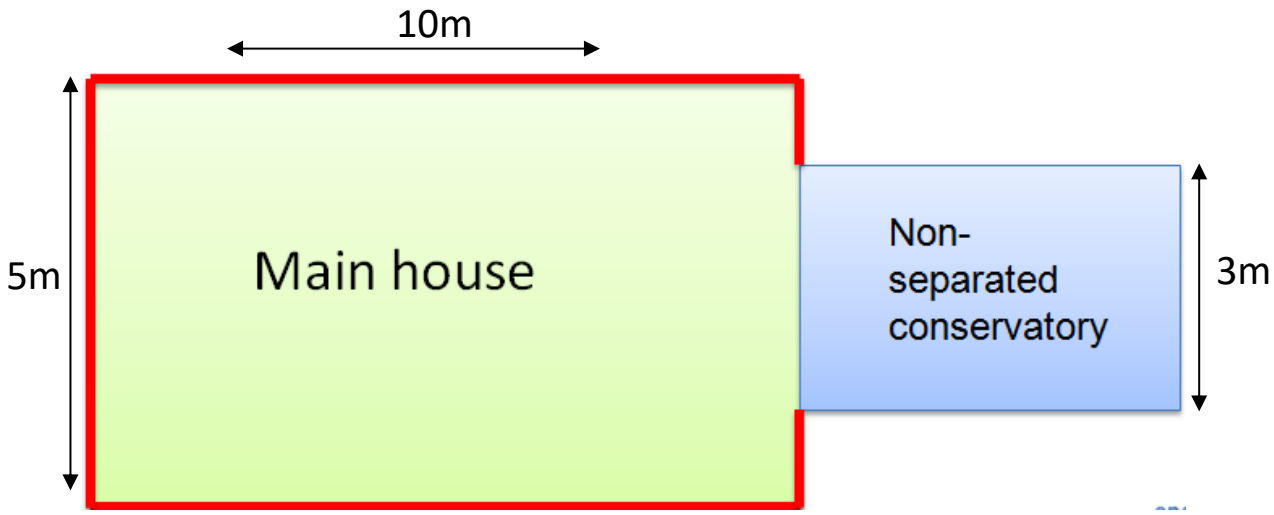
Ground floor 3m + 2m + 2m = **<u>7m</u>**

2. Conservatories separated from the house by external quality doors



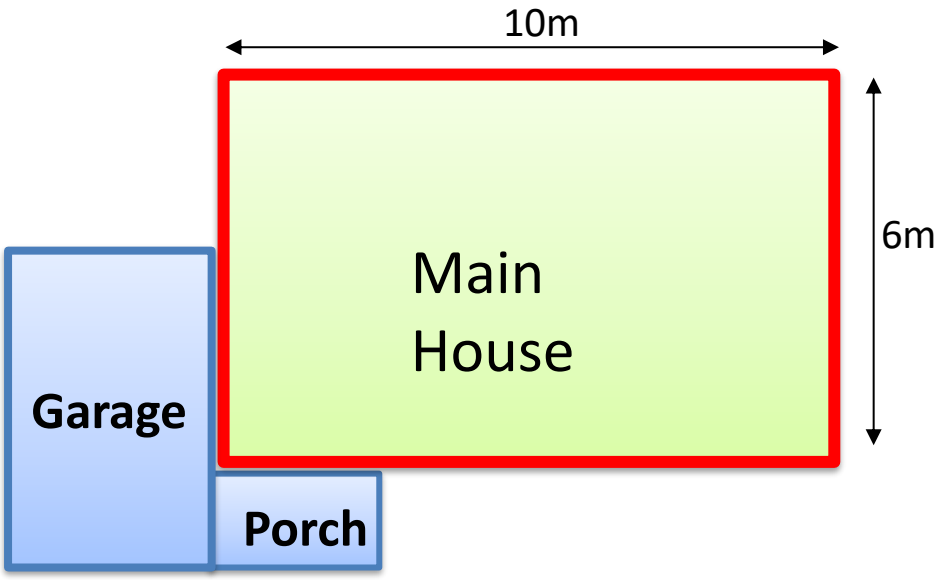
HLP = 10m + 10m + 5m + 5m = **30m**

However, if the conservatory is open to the house then the wall adjoining the conservatory is not counted as heat loss, the conservatory heat loss walls are dealt with in a later section.



HLP = 10m + 10m + 5m + 2m = **27m**

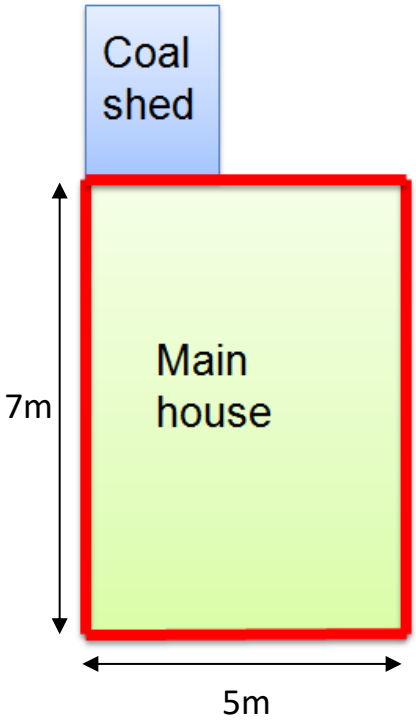
3. Unheated garages and thermally separate unheated porches



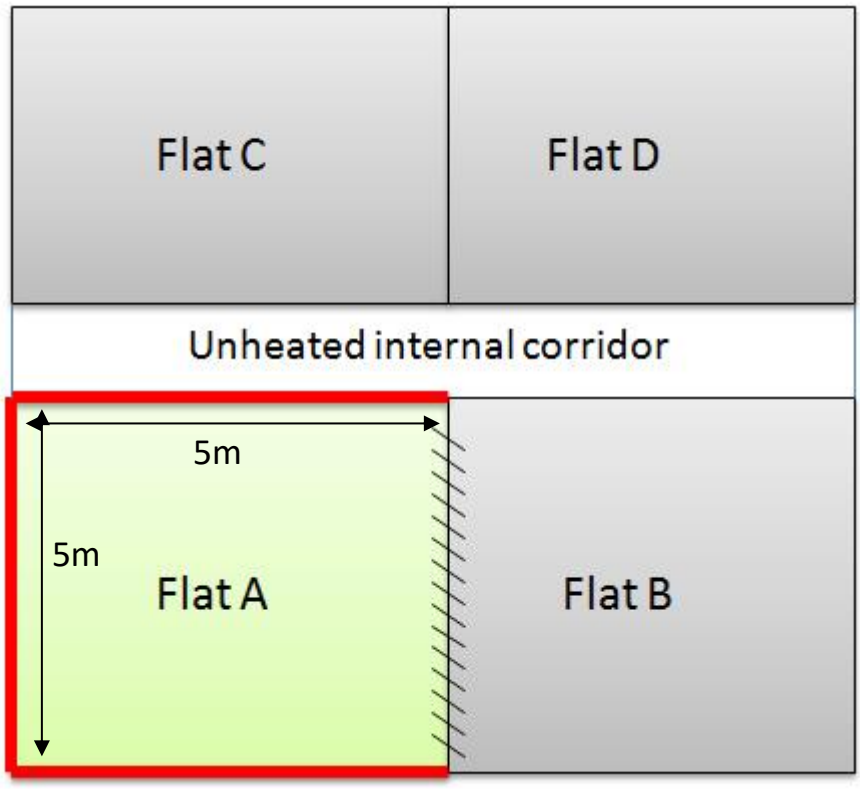
HLP = 10m + 6m + 10m + 6m = **32m**

4. Thermally separate unheated outbuildings/ spaces that do not form part of the dwelling

HLP = 7m + 7m + 5m + 5m
= **24m**



5. Unheated corridors/staircases leading to flats



HLP = 5m +5m + 5m = **15m**

For Flat A the 5m length of heat loss wall adjoining the unheated internal corridor will be specified again in a later 'sheltered wall' section.

Party Wall length

Party walls are defined when you are adjoined to:

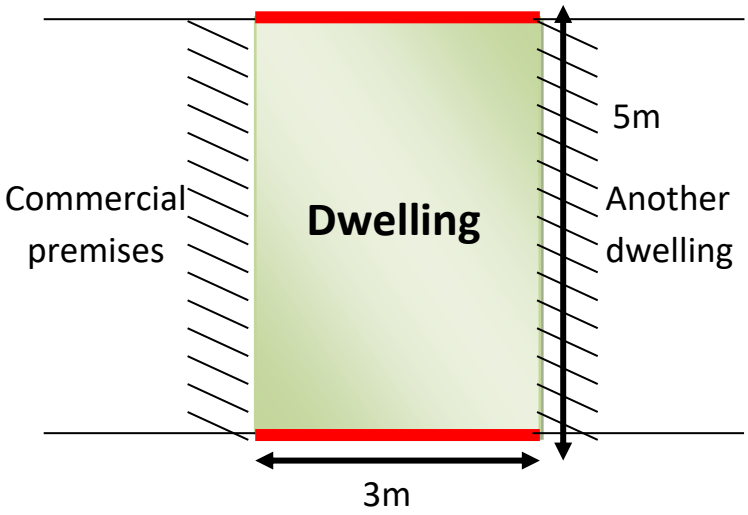
- ✓ **Commercial premises**
- ✓ **Another dwelling**
- ✓ **A heated corridor/ stairwell in a block of flats**
- ✓ **A heated common area**

All party walls lengths on each storey should be added up and entered into the software as one measurement for all building parts.

Calculating the party wall length:

Here are some bird's eye view examples of the different types of party walls of a dwelling:

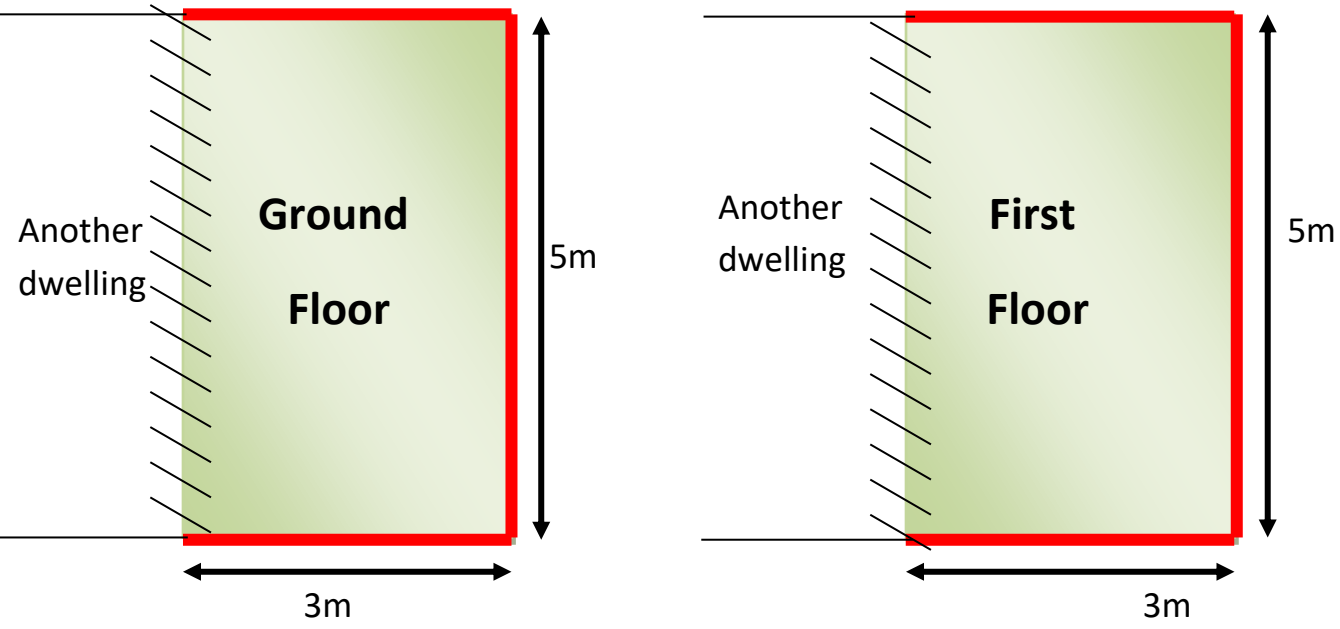
1. A commercial premises (and a another dwelling)



Party Wall length

5m + 5m = **10m**

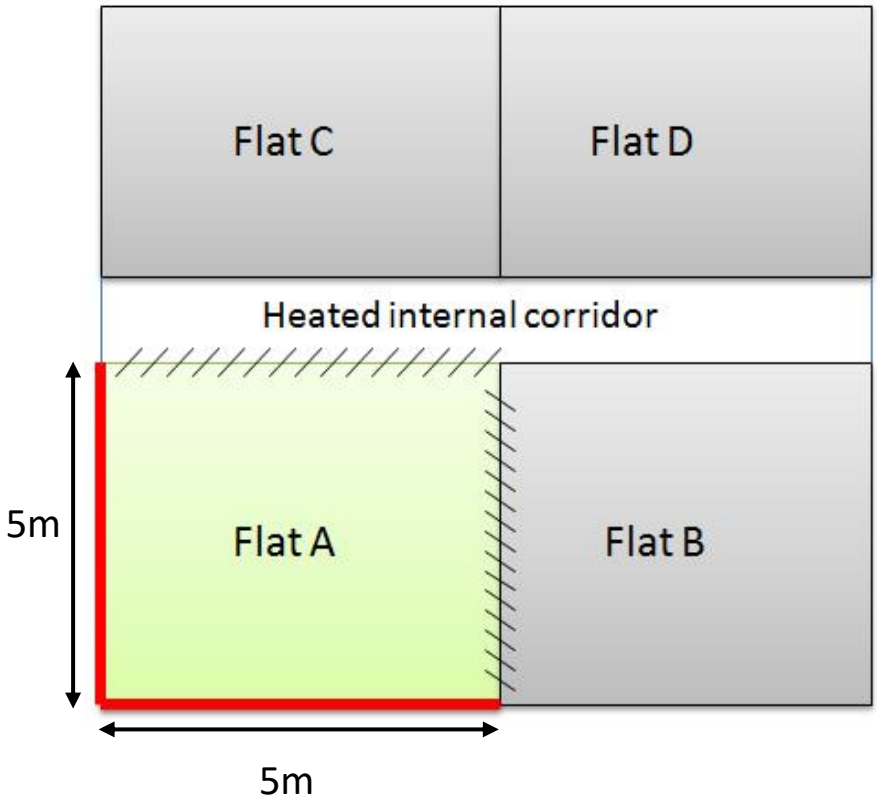
2. Adjoining another dwelling



Party Wall length

Ground floor	5m
First floor	5m

3. A heated corridor/ stairwell in a block of flats (and another dwelling)



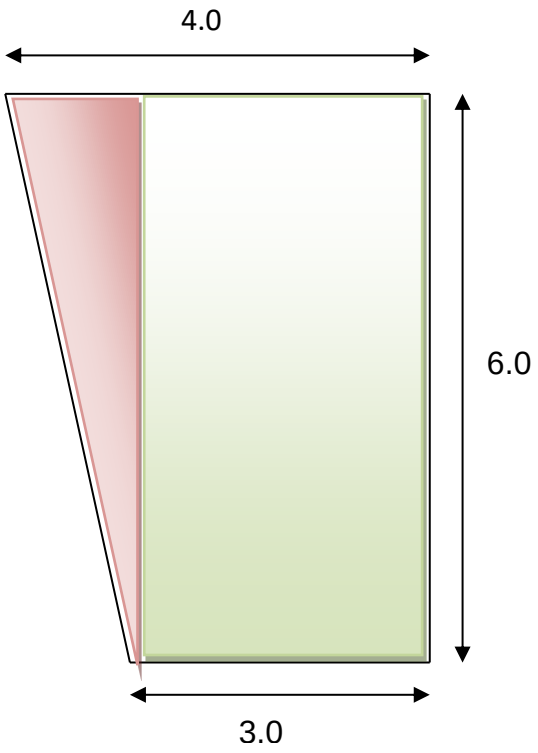
Party Wall length

Flat A

5m + 5m = **10m**

Appendix 1

Awkward shaped houses – Example 1

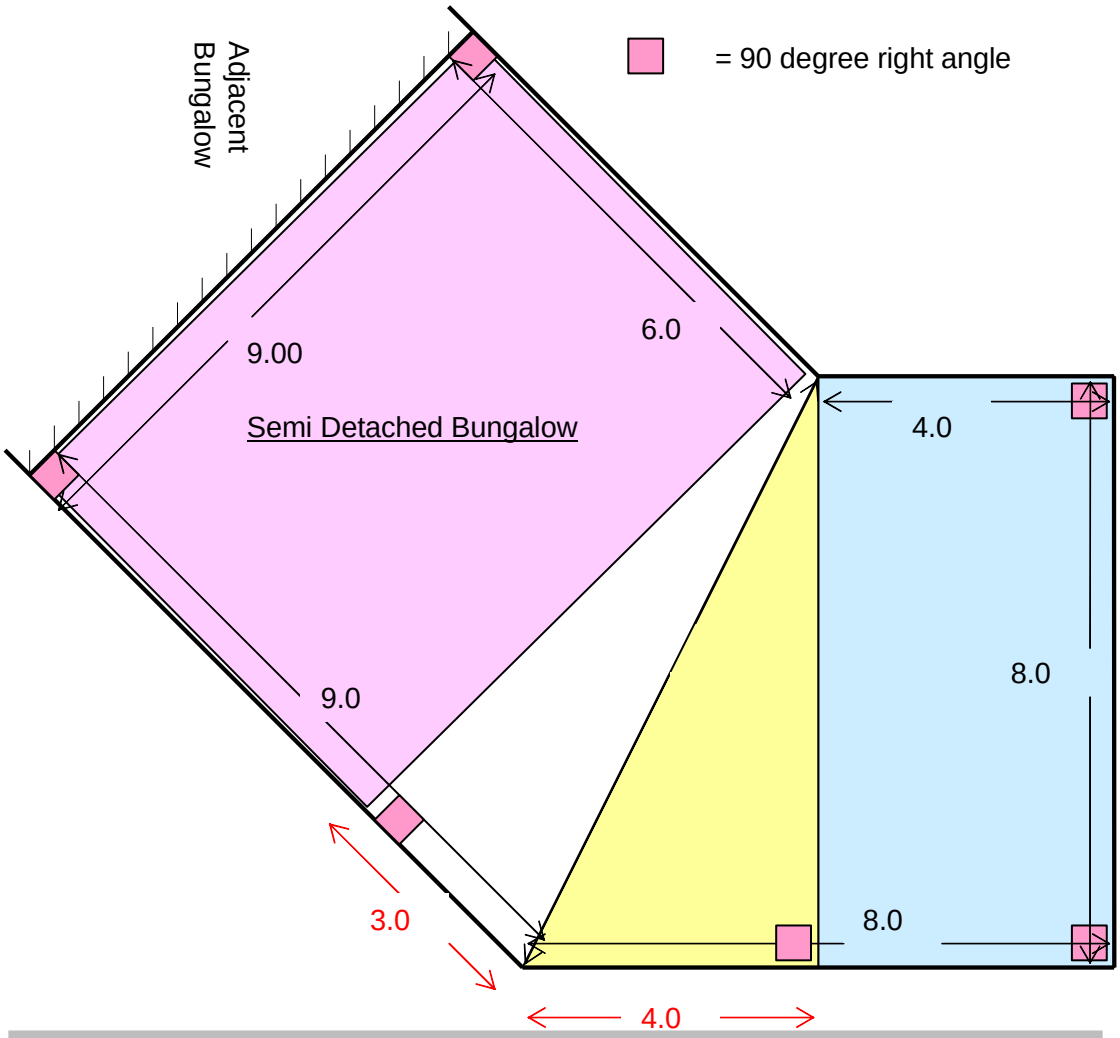


Floor areas:

Green: 3m x 6m = 18m^2 **Red:** 1m x 6m x 0.5 = 3m^2

Total floor area = <u>21m^2</u>

Awkward shaped houses- Example 2



Floor areas:

Pink: 6.0 x 9.0 = 54.0

White: 3.0 x 9.0 x 0.5 = 13.5

Yellow: 4.0 x 8.0 x 0.5 = 16.0

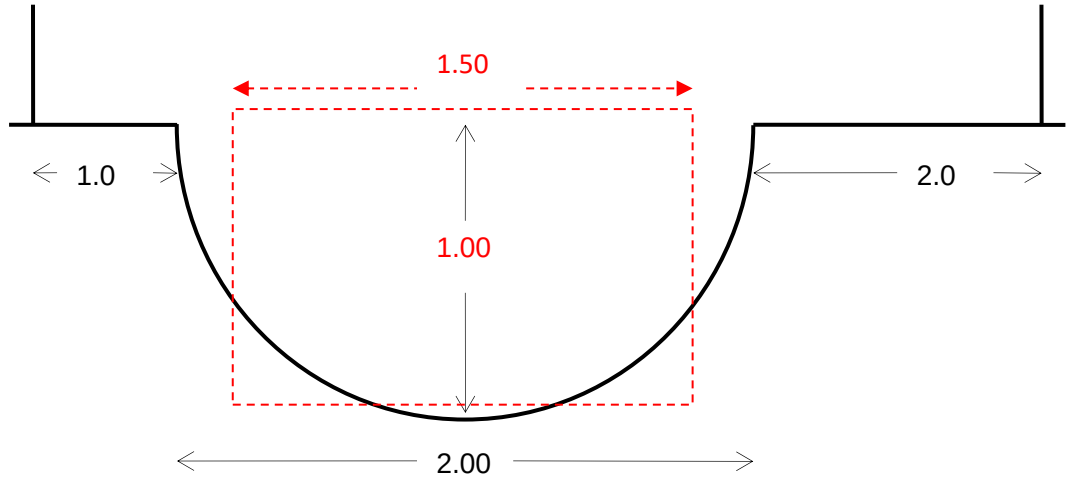
Blue: 4.0 x 8.0 = 32.0

Total = 115.5 m²

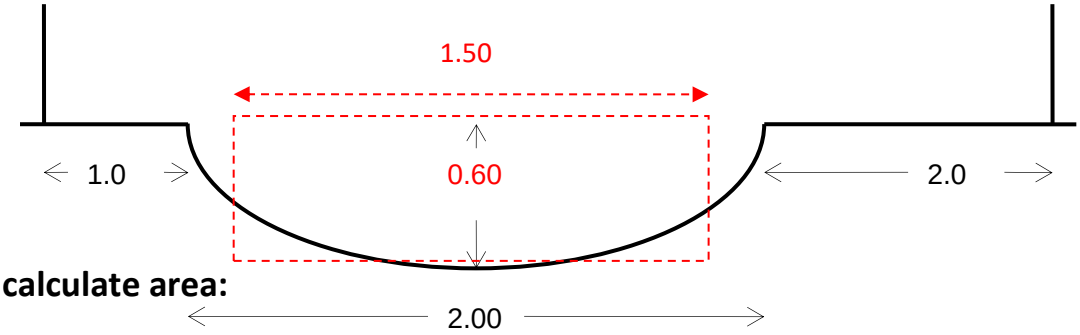
Where a bay window is present this should be calculated and added to the overall floor area for that floor, here are the different

formulas:

Semi circular bay



Curved Bay



To calculate area:

Reduce the width of the bay by 25% and multiply by the depth.

Semi circular 1.50m x 1.00m = **1.50 m²**

Curved 1.50 x 0.60 = **0.90 m²**

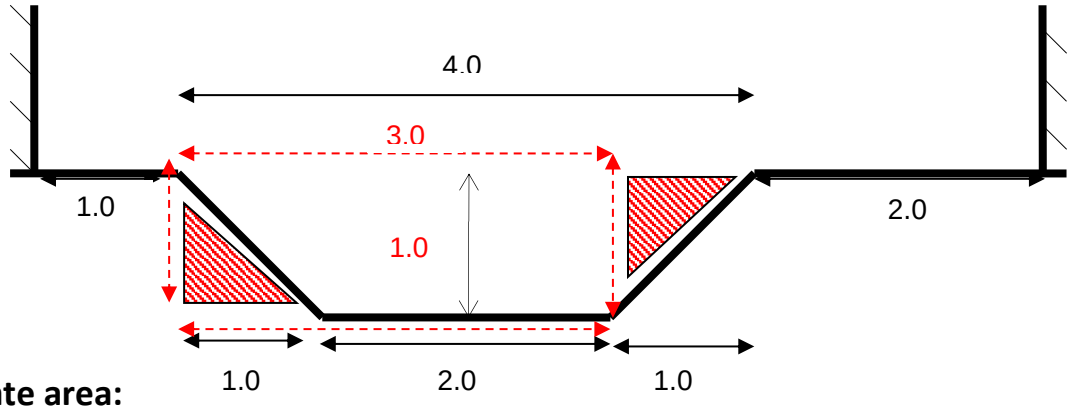
To calculate heat loss perimeter:

Add on the depth of the bay to the width of the wall

Semi circular 1m+2m+2m +1m = **6m**

Curved 1m + 2m + 2m + 0.60 = **5.60m**

Triangular or splayed bay



To calculate area:

Measure a rectangle shape in the bay (red dotted lines). Effectively losing the red triangle on the right and gaining that triangle on the left.

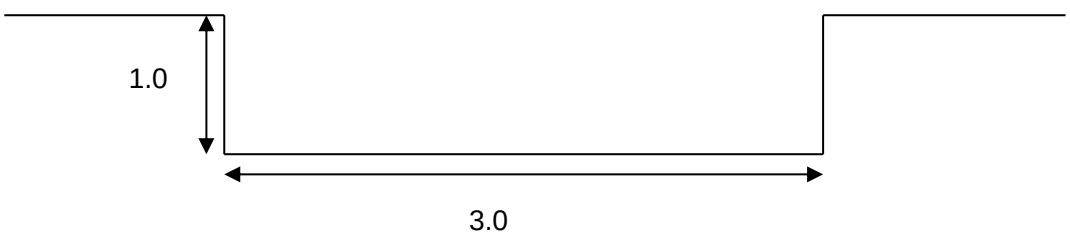
3m x 1m = **3m²**

To calculate the heat loss perimeter:

Add the depth of the bay to the width of the wall

1m + 4m + 2m + 1m = **8m**

Rectangular Bay



Area 1m x 3m = **3m**

HLP 1m + 3m + 1m = **5m**