

JOB REF: XXXX

# SPECIFIC DEFECTS REPORT

Relating to Thermal Efficiency

XXXX Bucks. SL8 XXX



Ms X

Prepared by:

**XXXXXXXXXX**

INDEPENDENT CHARTERED SURVEYORS

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## **INTRODUCTION AND INSTRUCTION**

We have been instructed by X to prepare a report on XXXBuckinghamshire.  
SL8 XXX

We have carried out a visual inspection of the property on XXX

The weather was a cool winter's day with temperatures ranging from 6 to 10 degrees during the course of the survey with some early morning frost.

We are Independent Chartered Building Surveyors. We are registered with the Royal Institution of Chartered Surveyors and are members of the Independent Surveyors Association.

The Report has been carried out by XXX BSc MSc FBEng Chartered Building Surveyor for and on behalf of XXXX

The work has been carried out as per our standard Terms and Conditions of Contract which have been emailed to you as part of the confirmation of our instructions. If you would like further clarification please do not hesitate to contact us.

## **SYNOPSIS**

We have been advised that you moved into the property in XXX with a major extension and alterations being carried out soon after. During the building work you vacated the property and moved back in the following year.

Since the extension has been carried out you have felt that the property is cold in the kitchen area and the playroom and you have asked us to investigate this.

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# CONSTRUCTION SUMMARY

Original property circa 1963

## External

Chimneys:	One brick chimney front right hand side
Main Roof:	Hipped concrete roof Roof boarded and insulated to approximately 200mm where it can be seen
Two storey extension roof	Pitched roof clad with a concrete tile, insulated to approximately 200mm
Single storey extension roof	Flat roof, mono pitched roof to the front and rear, no access so not known if insulated
Gutters and Downpipes:	Cast Iron and plastic
Soil and Vent Pipe:	
Walls: Original	Stretcher bond (assumed) brickwork and vertical tiling to the bays
Walls: Extension	Left hand side of the property – stretcher bond (assumed) brickwork with dry lining
External Joinery:	Windows plastic, newer windows having trickle vents particularly to the rear
Foundations:	Not opened up assumed a strip concrete foundation.

## Internal

Ceilings:	Plasterboard (assumed)
Walls	Studwork and solid (assumed)
Floors:	
Ground Floor:	Solid concrete (assumed)
Original construction	
New construction	Drawings refer to a suspended floor
First Floor:	Joist and floorboards (assumed)

We have used the term 'assumed' as we have not opened up the structure.

There is a Potterton Suprima Boiler wall mounted in the kitchen.

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## EXECUTIVE SUMMARY

Executive summaries are always “dangerous” as they try and encapsulate relatively complex problems in a few precise and succinct words. Having said that here is our executive summary and recommendations:

We have considered the thermal efficiency of the building in three areas:-

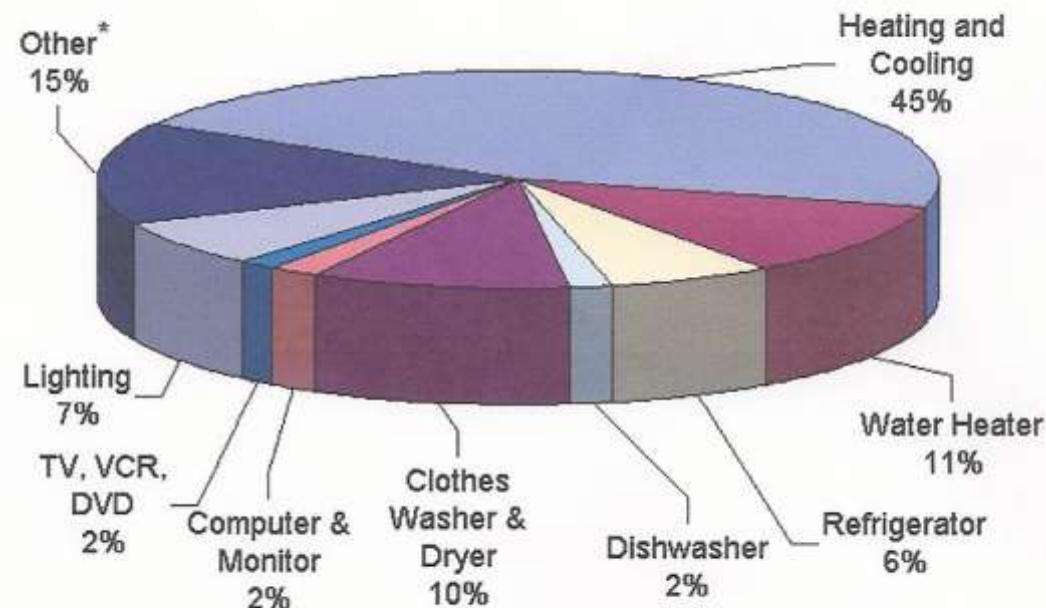
1. Thermal efficiency of the construction
2. Your ability to heat the areas
3. General comfort considerations

### **1. Thermal efficiency of the construction**

#### **General information on thermal efficiency**

You may or may not be aware that typically energy loss from a property so heating makes up a considerable portion of your costs.

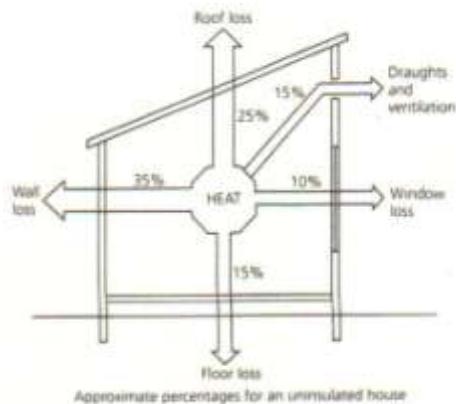
#### **What does my energy bill pay for?**



\* "Other" represents an array of household products, including stoves, ovens, microwaves, and small appliances. Individually, these products account for no more than about 2% of a household's energy bills.

## Calculation of heat loss

- Heat losses from a building can be classed as either a 'fabric loss' or a 'ventilation loss'.

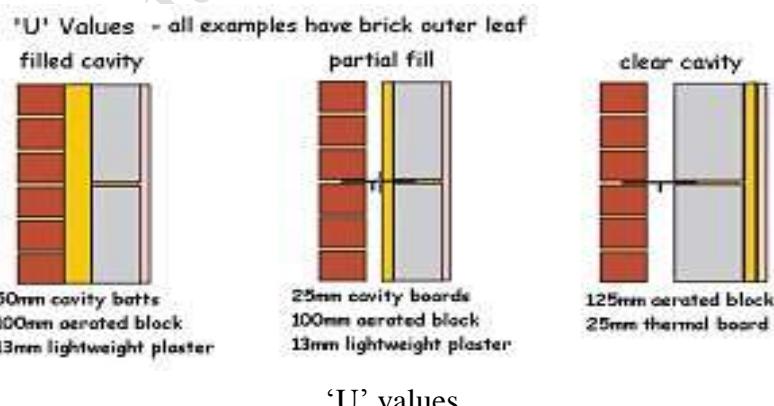


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This is what happens to the heat that is generated.

### **'U' values defined**

The measure of thermal efficiency generally used is the 'U' value, this measures the transmission of heat flow through an element, the lower the 'U' value the better the insulation.



### Original property

Your original construction is likely to be in the form of the filled cavity shown above. We have calculated the U value (making various assumptions on the construction based on the era of this property) at 1.47 W/M<sup>2</sup>K non-insulated cavity and 0.41 W/M<sup>2</sup>K with an insulated cavity. The details with regard to our assumptions and these calculations can be seen within Appendices 1. Whilst this is a very general calculation it does show that the original constructions has a relatively poor U value compared with today's properties.

### New Build Construction

With the new build construction typically the average U value requirement for a wall is 0.35 W/M<sup>2</sup>K, as you can see however this is slightly lower than is achieved in the older property assuming the cavity wall is filled.

### Extension Construction

This means that we are comparing relatively equal properties comparing relatively equal structures thermally with regard to the walls.

### Glazed areas

The glazing to the original property and the extension is double glazing, we have assumed that it is of a similar quality considering the bay windows, the front door and the adjacent window to the rear kitchen door, kitchen window and patio doors there is probably slightly more glazing to the rear, this would mean that the overall wall area has lower thermal efficiency to the rear than the front.

### Ceilings and Roofs

Our concern relates to the single storey extension. The main roofs have similar levels of insulation in the roof space from what we can see, 250mm of insulation it should achieve approximately 0.25 W/M<sup>2</sup>K. It is however the single storey roofs that are the unknown factor where we refer you back to the earlier diagram where most of your heat will be going.

**ACTION REQUIRED:** Check is needed on the single storey roof construction and the thermal efficiency with an infrared camera.

## **More about flat roofs**

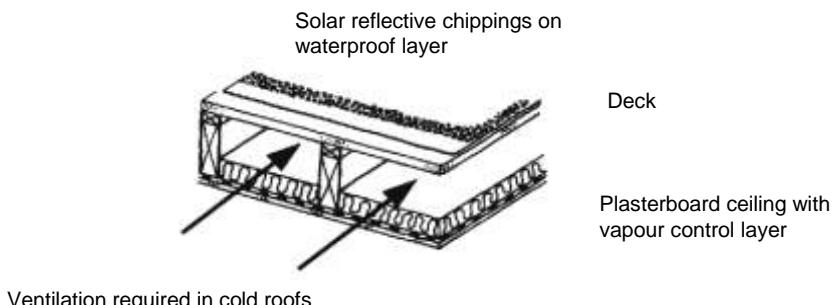
Not wishing to bore you too much with construction technology there are effectively three types of roof:-

1. A cold roof
2. A warm roof
3. A warm inverted roof

From the look of the roof it is likely to be a cold roof, these do not tend to meet current Building Regulations. There are drawings below which we hope explains this further.

### **Cold Roofs**

Approved Document 'L' of the Building Regulations and increased thicknesses of insulation mean that this type of flat roof is all but obsolete.



#### **Advantages of Cold Roofs**

The waterproof covering is easily accessible and quilt insulation can be used.

#### **Disadvantages of Cold Roofs**

Adequate ventilation of flat roof voids is difficult (impossible?) to achieve, an effective vapour control layer is also difficult and moisture from the exterior can enter through the ventilation openings and increase the risk of condensation.

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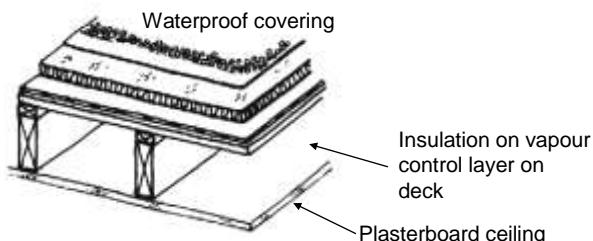
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## Warm Roofs - Sandwich roofs

Warm roofs are of 2 types - Sandwich and Inverted (also known as "upside down").

**Sandwich Roof**



### Advantages of Sandwich Roofs

The waterproof covering is easily accessible.

### Disadvantages of Sandwich Roofs

A vapour control layer is required to prevent condensation occurring between the insulation and the waterproof layer. Any water from leaks or condensation passing through the vapour control layer may be trapped in the insulation.

Thermal movement in the insulation could damage the waterproof layer. The waterproof membrane is exposed to a greater range of temperature changes which may cause it to deteriorate.

## **Mono Pitched Roof**

These are to the side and to the rear of the property and need to be checked for insulation.

### **2. Your ability to heat the areas**

This is often known as space heating, within your property this is carried out via a wall mounted boiler located in the kitchen and a mixture of different types of radiators.

The front room has a radiator traditionally located underneath the window which, as we discussed, allows the warm air to circulate in the room. The dining area also has a radiator on an internal wall and then we have the kitchen, which if you recall we calculated approximate areas, whilst it is of a similar size to your lounge it has a much smaller radiator and shares its designer radiator with the playroom.

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### **Air Circulation**

Interestingly the warm air generated in the front of the property does not appear to circulate around to the cooler rear parts of the property. We feel there is not enough air movement downstairs to allow this circulation, the warm air generated in the front part of the property does not get circulated to the cooler rear parts of the property.

### **3. General comfort considerations**

Heat is very subjective typically between men and women! It will vary as to our ideal temperature however typically we would like this temperature to be relatively constant. To the front of the property where you advised that you were happiest with the temperature it seems to be possible to achieve a relatively constant heat level, possibly due to the lack of trickle vents in this area, to the windows.

It maybe that the trickle vents to the rear of the property in the kitchen and the playroom give a chilled wind that reduces your comfort factor in these areas. You advised us that wind seems to be driven through the building and through the socket points, we can only think that this is a wind localised factor caused possibly by the building.

And finally the kitchen, having three sides exposed externally we feel will add almost a cooling effect to this area. We certainly have been in properties where they are noticeably colder where there are three external walls.

In summary you need to check the insulation levels within the flat roofs and the mono pitched roof and then look at how best to generate more heat within the kitchen and playroom area. As you know we suggested a heated floor maybe a solution as additional radiators placed on the internal wall will make it uncomfortable to sit at the nearby table area in the kitchen. There are also the practicalities of installing a radiator to the perimeter walls.

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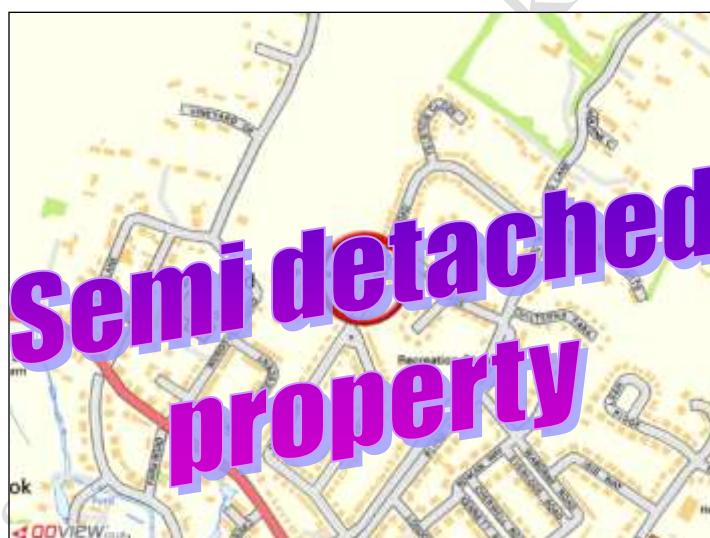
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**Time Line – A brief history of the structure**

This has been based upon a discussion with X but needs to be checked and confirmed.

<b>DATE</b>	<b>DESCRIPTION</b>
XX	XXX and her husband moved into the property
XX	Extension carried out
XX	XX and her husband moved back into the property
XX	Extension completed on the property
XX	Winter concerns about the heat levels in the property

## **INSPECTION**

Our inspection has been specifically related to the cold areas of the property issues detailed below.:.

### **Visual Inspection**

Our inspection has taken the format of a visual inspection:

1. External of the property of the
  - i. Front – we noted double glazed windows without trickle vents which is an older style
  - ii. Rear – the windows had trickle vents and fascias and soffits had trickle vents to the new extension. The low level single pitched roofs were also vented with a plastic tile vent
  - iii. Side – our view is limited of this area



Vented front soffit board



Vented soffit to the side



Rear vent to soffit board

We have had the benefit of a x16 zoom lens on a digital camera

2. Internal of the property

We have viewed:

### **Ground Floor**

- i. kitchen
- ii. playroom
- iii. lounge
- iv. dining room area
- v. study
- vi. hallway

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First Floor

- vii. front right hand bedroom
  - viii. front left hand bedroom
  - ix. rear right hand bedroom
  - x. rear master bedroom to left hand side with en suite shower
  - xi. bathroom on left hand side
3. Roof space – there is insulation of approximately 200-250mm, part of the roof is boarded over.
4. Surrounding areas
- i. front area
  - ii. rear area
  - iii. overview of area
5. Interview with the owner/occupier
6. We have utilised a Gann resistance meter for the measurement of the wall materials to help establish construction.



Insulation to roof with part of the roof boarded over

## **SURVEY FINDINGS**

1. From our visual external inspection we noted:

- i. roofs – three roofs to the property, the main roof, the rear extension roof (approximately 250mm of insulation which is what we would expect) and the low level single storey roofs (we were unable to establish the insulation level or the construction).
- ii. walls – original property assumed cavity brick or block and plaster with insulation, please see our calculations within the Appendices, the walls in the new construction from the drawing details we have is 102 facing brick with 75mm cavity, 75 dry thermal insulation, 100mm blockwork and 12mm of plaster
- iii. windows – all the windows to the front of the property with the exception of hallway do not have trickle vents and to the rear they all have trickle vents, side not noted. The plans advised that the minimum thermal resistance to the windows is 0.45 m<sup>2</sup> K/W

2. From our visual internal inspection we noted

- i. ceilings assumed construction of plasterboard
- ii. walls assumed plasterboard finishes, we have dry lining to the left hand wall, interestingly this is not how it is shown on the drawing, however we would refer you to our Gann resistance meter readings
- iii. floors – ground floor assumed concrete, 1<sup>st</sup> floor assumed suspended
- iv. radiators – these are positioned as follows:-  
Ground floor:-  
Front lounge – under window  
Kitchen – small radiator to left hand side inner wall  
Playroom – designer radiator (shared with the kitchen)  
Dining room – to inner wall  
Hallway – right hand wall  
1<sup>st</sup> floor:-  
Not identified

3. Resistance Meter Readings taken by Gann meter

<b>Room</b>	<b>Readings Obtained</b>	<b>Typical Readings</b>
<b>Ground Floor</b>		
Hallway left hand wall	23-30	Dry lined would normally have readings 15-30
Lounge right hand party wall	29 and 29	
Dining Room right hand party wall	29	Normal brick cavity construction would have readings of between 30 and 60
Dining Room dividing wall	36	
Playroom right hand side	19 and 21	
WC Cloakroom	28	
Study	25 and 21	
Kitchen	19, 20 and 23 – either side of window	
<b>1<sup>st</sup> Floor</b>		
Front right hand bedroom These readings indicate that there is a studwork and batten construction to the bay windows	26 right hand party wall 25	
Rear right hand	27 right hand party wall	
Front left hand bedroom	25 to front wall 24 to left hand wall	
Rear master bedroom	15 right wall and 14 rear wall	
En suite	23	

4. Discussions with the owner/occupier.

## **SUMMARY UPON REFLECTION**

The Summary Upon Reflection is a second summary so to speak, which is carried out when we are doing the second or third draft a few days after the initial survey when we have had time to reflect upon our thoughts on the property. We would add the following in this instance:

Without opening up the walls we cannot confirm their construction and therefore we have made the assumptions we will however check the roofs without causing too much damage.

If you would like any further advice on any of the issues discussed or indeed any that have not been discussed! Please do not hesitate to contact us on 0800 298 5424.

## **LIMITATIONS**

### **Specific Defects Report**

#### **1. Conditions of Engagement**

Please note: references to the masculine include, where appropriate, the feminine.

Subject to express agreement to the contrary (which in this particular case has been none) and any agreed amendments/additions (of which in this particular case there have been none), the terms on which the Surveyor will undertake the Specific Defects Report are set out below.

Based upon a visual inspection as defined below the Surveyor will advise the Client by means of a written report as to his opinion of the visible condition and state of repair of the specific problem or problems only. In this instance the basis of our inspection has been on the energy efficiency of the property.

#### **2. The Inspection**

##### a) Accessibility and Voids

The Surveyor will base this report on a visual inspection and accordingly its scope is limited. It does not include an inspection of those areas, which are covered, unexposed or inaccessible. Our visual inspection will relate to the specific defects shown to us only.

##### b) Floors

We have not opened up the floor structure. We have only carried out a visual inspection and any conclusions will be based upon our best assumptions. We can open up the floor if so required at an extra fee.

##### c) Roofs

The Surveyor has inspected the roofs in this instance.

##### d) Boundaries, Grounds and Outbuildings

The inspection will not include boundaries, grounds and outbuildings unless specifically stated (none stated).

##### e) Services

No services inspected.

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f) Areas not inspected

The Surveyor will have only inspected those areas identified within the report. His report will be based upon possible or probable defects based upon what he has seen together with his knowledge of that type of structure. If you feel that any further areas need inspection then please advise us immediately.

g) Specific Defects Report

As this is a report upon a Specific Defect we do not offer any comment or guidance upon reactive maintenance and/or planned or routine maintenance items.

h) Whilst we have used reasonable skill and care in preparing this report, it should be appreciated that the Chartered Surveyors cannot offer any guarantee that the property will be free from future defects or that existing defects will not suffer from further deterioration;

### **3. Deleterious and Hazardous materials**

- a) Unless otherwise expressly stated in the Report, the Surveyor will assume that no deleterious or hazardous materials or techniques have been used in the construction of the property. However the Surveyor will advise in the report if in his view there is a likelihood that high alumina cement (HAC) concrete has been used in the construction and that in such cases specific enquiries should be made or tests carried out by a specialist.

### **4. Contamination**

The Surveyor will not comment upon the existence of contamination as this can only be established by appropriate specialists. Where, from his local knowledge or the inspection he considers that contamination might be a problem he should advise as to the importance of obtaining a report from an appropriate specialist.

### **5. Consents, Approvals and Searches**

- a) The Surveyor will assume that the property is not subject to any unusual or especially onerous restrictions or covenants which apply to the structure or affect the reasonable enjoyment of the property.
- b) The Surveyor will assume that all bye-laws, Building Regulations and other consents required have been obtained. In the case of new buildings and alterations and extensions, which require statutory consents or approval the Surveyor will not verify whether, such consents have been obtained. Any enquiries should be made by the Client or his legal advisers.

Drawings and specifications will not be inspected by the Surveyor. It is the Clients responsibility to forward any drawings and specifications that he has or knows the whereabouts of to us to include information in our report. If these are not forthcoming we will make our best assumptions based upon the information available.

- c) The Surveyor will assume that the property is unaffected by any matters which would be revealed by a Local Search and replies to the usual enquiries or by a Statutory Notice and that neither the property nor its condition its use or intended use is or will be unlawful.

## 6. Fees and Expenses

The Client will pay the Surveyor the agreed fee for the Report and any expressly agreed disbursements in addition.

## 7. Restrictions on Disclosures

- a) This report is for the sole use of the Client in connection with the property and is limited to the current brief. No responsibility is accepted by the Chartered Surveyors if used outside these terms.
- b) Should any disputes arise they will be dealt with and settled under English law;
- c) This report does not fall under the Third Parties Rights Act.

## 8. Safe Working Practices

The Surveyor will follow the guidance given in Surveying Safely issued by the Royal Institution of Chartered Surveyors (RICS).

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## APPENDIX

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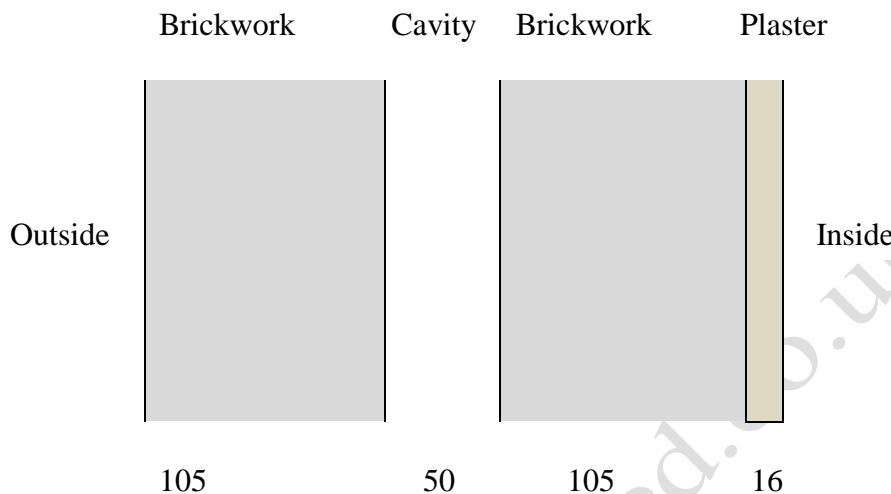
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## **Worksheet U W/M<sup>2</sup>K values**

1a)



<b>Layer</b>	<b>Thickness (m)</b>	<b>Thermal conductivity</b>	<b>Thermal resistance</b>
Outside surface	-	-	0.055
Outside Brickwork	0.105	0.73	$0.105 / 0.73 = 0.144$
Cavity	0.050	-	0.18
Inside Brickwork	0.105	0.73	$0.105 / 0.73 = 0.144$
Plaster	0.016	0.46	$0.016 / 0.46 = 0.035$
Inside surface	-	-	0.123

$$\begin{aligned} \text{Total thermal resistance} &= 0.055 + 0.144 + 0.180 \\ &\quad + 0.144 + 0.035 \\ &\quad + 0.123 \\ &\equiv 0.681 \end{aligned}$$

$$\begin{aligned} \text{U value} &= \frac{1}{R} \\ &= \frac{1}{0.681} = 1.47 \text{ W/M}^2\text{K} \end{aligned}$$

b) New thermal resistance of cavity

$$\begin{aligned} &= \frac{0.05}{0.026} = 1.923 \end{aligned}$$

New total thermal resistance

$$\begin{aligned} &= 0.055 + 0.144 + 1.923 + 0.144 \\ &\quad + 0.035 + 0.123 \\ &= 2.424 \end{aligned}$$

$$\begin{aligned} \text{U value} &= \frac{1}{R} \\ &= \frac{1}{2.424} = 0.41 \text{ W/M}^2\text{K} \end{aligned}$$