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# **Suitability of external walls for filling with cavity wall insulation**

## **Part 1 existing buildings**



## FOREWORD

This guide could not have been produced without the support of:



1st Insulation Partners Ltd

**British Gypsum-Isover**

British Gypsum-Isover Ltd



BIP Ltd



Certainfil Ltd



Instafoam and Fibre Ltd



Knauf Insulation Ltd



Rockwool Ltd



Tebway Ltd

This guide should be used together with other relevant documents, including:

- The Agrément Certificate or British Standard for the system of insulation to be installed.
- CIGA Technician's guides to best practice, including:

*Installing cavity wall insulation  
Flues, chimneys & combustion air ventilators  
Technical notes  
Assessment report form*

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## 1.2 INTRODUCTION

For cavity wall insulation to perform correctly, three criteria must be met:

- The building must be suitable.
- The insulation system must have been tested, assessed and approved.
- A trained Technician must carry out the installation to a high standard.

Each building must be assessed individually, since no two buildings are identical.

The responsibility for deciding if a building is suitable for cavity wall insulation lies with the Assessor.

## 1.3 ASSESSOR'S TASK

The Assessor has to answer two questions:

- Can the building be insulated?
- Should the building be insulated?

However, in order to answer these questions, the Assessor must consider many factors and have sufficient knowledge to come to a sound decision, both on behalf of the installing firm and the customer.

The Assessor is assessing the risk and considering a number of factors. These cannot be set down in formulae to be followed without knowledge, thought or consideration.

The rules of assessment are:

- Assess with care – do not guess
- Be expert – know building practice
- Reject unsuitable buildings
- Document all salient facts
- If in doubt, seek advice

This is to ensure that:

- Minor defects are noted and either corrected before insulating the house, or documented and agreed as defects by the customer.
- The walls to be insulated, are clearly identified to the customer.
- The Technician is forewarned of the need for special equipment or materials.
- All information is made available for administration and work planning to promote a trouble free installation.

Inadequate assessments waste time and lead to dis-satisfied customers.

## 1.4 EQUIPMENT

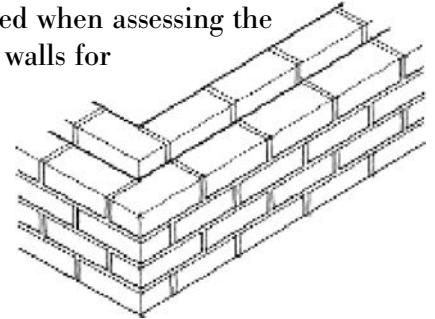
An Assessor should have the following:

- Means of identity – business card etc.
- Assessment report form
- Copy of the Technical Approval – e.g. Agrément Certificate
- Measuring tape, rod or rule
- Ladder

- Drill and drill bits
- Borescope
- Torch
- Meter box key
- Best practice guides

## 2.1 SCOPE

This guide provides Assessors with guidance on factors to be considered when assessing the suitability of external walls for installing cavity wall insulation.

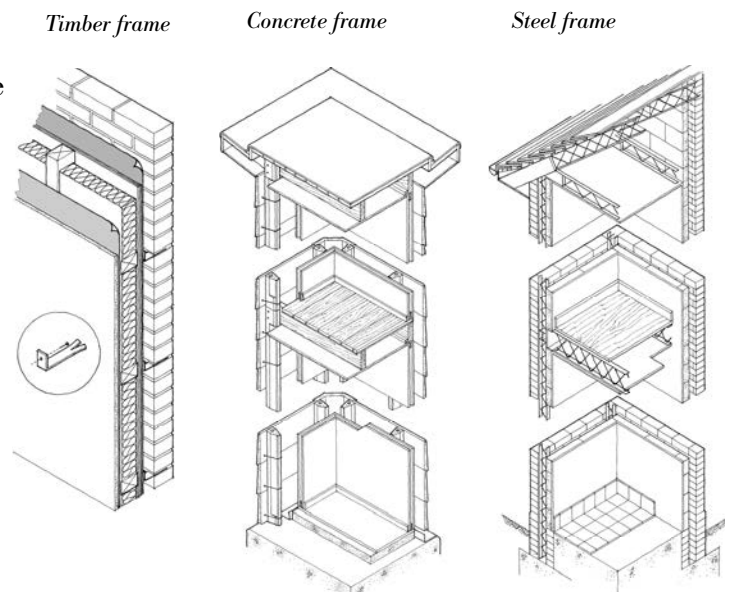


It is appropriate to an existing building that:

- Is built of traditional masonry construction
- Has the external walls built as cavity walls
- Has no insulation in the cavities
- Has a cavity width of 50mm or greater
- Is less than 12 metres in height

It is not appropriate to:

- Timber frame construction
- Steel framed construction
- Concrete construction including no-fines
- Other system built buildings



## 2.2 TERMINOLOGY

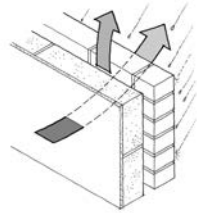
### Assessor

The person trained and approved to undertake an assessment of a building for suitability for cavity wall insulation.



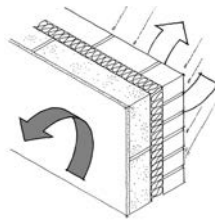
### Cavity

The space between the two leaves of a cavity wall



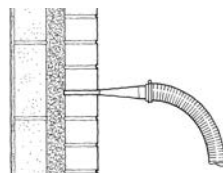
### Cavity wall insulation

The insulation material injected into a cavity to improve the thermal insulation of the wall.



### Cavity wall insulation system

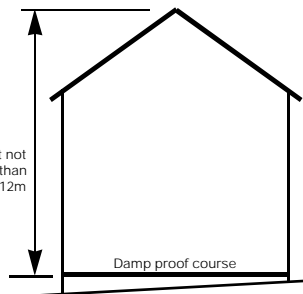
The insulation material and its system of installation



### Height of the wall

The height of the tallest wall measured from the lowest damp proof course to the top of the wall, including any associated gable wall.

Height not greater than 12m



### Installer

The company that undertakes the installation of cavity wall insulation.

### System supplier

The company that holds a Technical Approval for the system of insulation to be used for insulating the cavity walls, for example:



### Technical approval

A certificate or approval from an independent Certification body for the cavity wall insulation system that has determined that the product and installation system is suitable for use.



### Technician

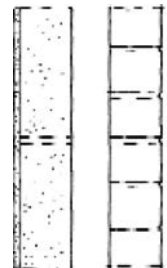
The person trained to install cavity wall insulation and approved by the system supplier.



### Traditional masonry construction

External walls that comprise two leaves of masonry construction.

Masonry includes clay and calcium silicate bricks, concrete blocks, natural stone and reconstituted stone blocks



### Existing building

Any building notified to a Local Authority as having been completed.

### Building under construction (New build)

Not yet notified to a Local Authority as completed.

## 2.3 GENERAL

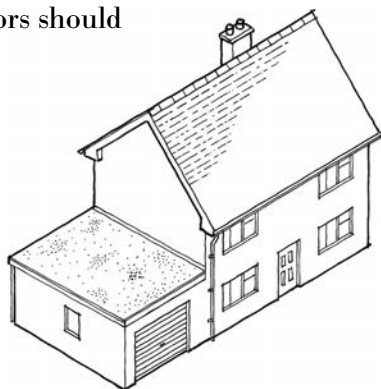
When assessing the suitability of a building for filling with cavity wall insulation the full contents of this guide and related documents should be considered.

The assessment should be undertaken together with the information given in Agrément Certificates, British Standards and other pertinent information.

Special considerations particular to the construction or locality may need to be taken into account. The Assessor may seek specialist advice from the installer, system supplier or other expert.

## 2.4 FORM OF CONSTRUCTION AND SITE CONDITIONS

The following factors should be considered:



- Is the external wall of cavity construction?
- Is each leaf of masonry construction?
- Is the height of the wall less than 12m?
- Is the construction appropriate to the locality, including its exposure?

Are the following within normal expectations?

- The exposure to wind driven rain
- The nature of the site
- The form of construction

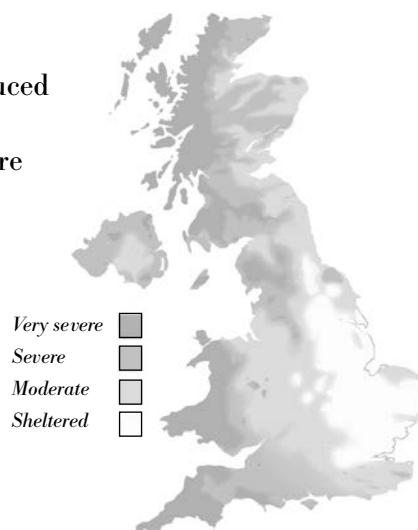
### 2.4.1 EXPOSURE TO WIND DRIVEN RAIN

Almost all of the systems on the market are approved for use in all parts of the UK. However, this assumes that the outer leaf is constructed in accordance with the requirements for local exposure conditions – so that water penetration of the outer leaf is minimal.

The exception is urea formaldehyde foam, which is subject to restrictions in parts of the country and some forms of construction. BS 5617 and BS 5618 provide further information.

However, this ‘all exposure’ classification should not be taken as giving carte blanche to all installations. The form of construction, the quality of construction, local exposure and state of maintenance can conspire to defeat the classification of ‘all exposure’ and could lead to water penetration through to the internal walls.

Maps are produced that show the relative exposure



### 2.4.2 LOCATION

Historically towns in the UK have been built in sheltered locations.

However, it should be recognised that new towns and developments have been built in places that are more exposed to the prevailing winds, particularly from the prevailing southwesterly wind. Some of these locations, which may be a short distance away from the historic town, can be considerably more exposed.

When a more exposed location has housing built, which is not in the local style (e.g. without render) it could be that the CWI may be in danger of being compromised by the out of character construction style.

### 2.4.3 BUILDINGS OUTSIDE OF NORMAL PARAMETERS

Where it is identified that the exposure, building or external walls fall outside normal expectations or parameters, specialist advice should be sought from the Assessor’s management, from the system supplier or other expert.

## 2.5 AGE OF THE BUILDING

The age of the building may provide pointers to the form of construction.

However, the following factors must be considered:

- Is the building free from signs of dampness or water penetration?
- If the building has signs of previous dampness or water penetration has it been rectified?

## 2.6 STRUCTURAL CONDITION

Cracks in the external walls exceeding 1mm in width must be investigated. The reason for the cracks should be ascertained and resolved before the installation of cavity wall insulation can be considered.



Any other signs of distress such as bulging or leaning should be investigated and resolved, before cavity wall insulation is installed.

### 2.6.1 CAVITY

The following factors should be assessed, so far as it is possible to undertake a visual assessment:

- Is the cavity width greater than 50 mm?

A cavity width of less than 50 mm is more likely to be bridged by mortar and debris and is therefore unsuitable for cavity wall insulation.

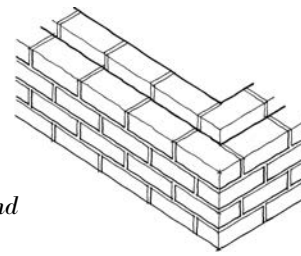
- Extensions and alterations should be carefully considered to assess their impact on the cavity wall.

- A cavity built from natural stone is likely to have an irregular face within the cavity and significant mortar droppings. During construction stone 'pins' may have been used to provide support to the wall whilst 'green'. These pins are often left in place and can cause water penetration with or without cavity wall insulation. This form of construction is not suitable for CWI.

### 2.6.2 IDENTIFYING CAVITY WALLS

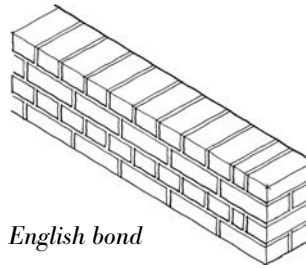
There is no hard and fast rule for identifying a solid wall, or a cavity construction, but the appearance of the outer leaf may give an indication.

Stretcher bond brickwork on the outer wall normally indicates cavity wall construction although stretcher bond is also used on single leaf walls such as garages.

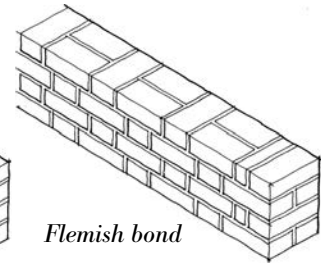


*Stretcher bond*

The first indication that a wall may be solid is when you can see 'header' bricks in the wall construction. There are two main patterns, Flemish Bond and English Bond.

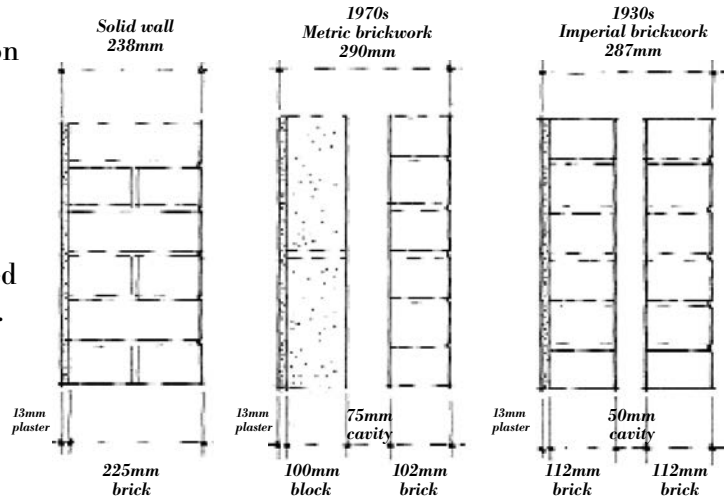


*English bond*



*Flemish bond*

If these are identified, measure the width of the wall at window or door reveals. If the overall measurement is approximately 230mm the wall is likely to be solid. However if the width of wall is 265mm plus, it indicates a cavity construction.

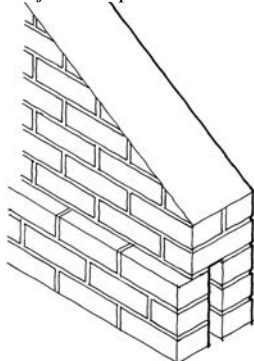


Older houses need to be carefully checked for unusual forms of wall construction.

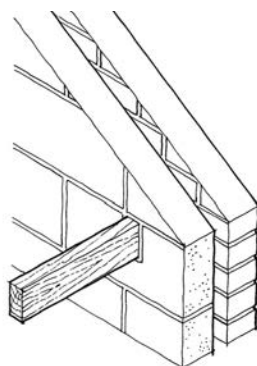
Some pre-1939 houses have cavity wall construction on the ground floor and a rendered upper floor with no cavity. The ground floor can be insulated if the rendered area is in good condition.

Houses should not be insulated where the inner leaf of the gable wall stops at the upper floor ceiling, and the top of the wall is open and unprotected .

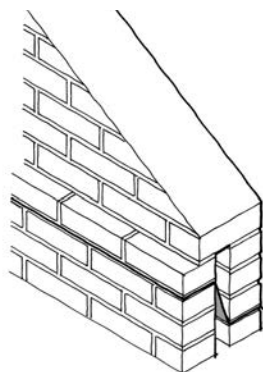
*Suitable  
subject to exposure*



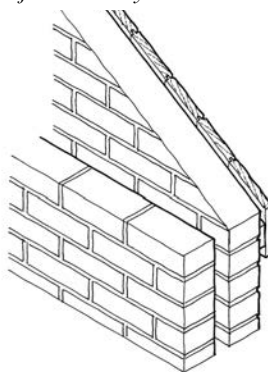
*Suitable*



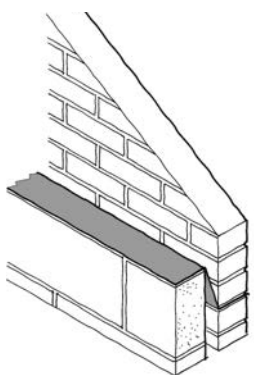
*Suitable*



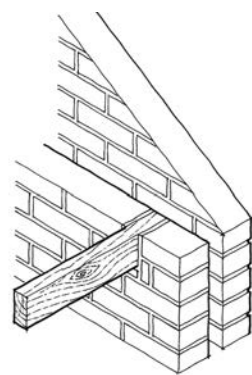
*Cladded gable end  
Suitable - subject to sealing  
of head cavity*



*Suitable*



*Unsuitable*



Houses with integral garages built in the 1960s and 1970s may have a single brick wall between the garage and house for all or part of the garage. These houses need careful investigation before the wall is drilled.

## 2.7 EXTENT OF THE CAVITY TO BE FILLED

The following factors may need to be considered:



- Is the cavity likely to continue into an adjoining property? A cavity barrier will be required, unless the adjoining property has been already insulated.
- Are all wall areas to be filled? Areas that are not to be filled must be documented and the client informed. Examples are tile hanging, timber boarding and recessed panels which may be solid walls.

Partial filling is only allowed:

- When separately insulating semi-detached or terraced properties, (in which case a cavity barrier must be used - see 2.7.3).
- Up to the under side of a horizontal boundary, other than the roof, where that horizontal boundary is protected by a cavity tray or similar waterproof barrier.
- Where filling is carried out above a horizontal boundary.
- When treating properties where the wall to be insulated is below a waterproof cladding (e.g. tile hung) and this cladding either extends up to the roof or is protected at the top by other means (e.g. window sills).
- Or where the Technical Approval specifies.

### 2.7.1 SEMI DETACHED AND TERRACED BUILDINGS

Ascertain whether the adjoining building has had cavity wall insulation installed, and if possible identify the system used.

This knowledge will inform the Technician that extra care is required should the original insulant have overflowed the party wall line.

Where substantial trespass of material has taken place, perhaps due to the lack of a cavity barrier it is unwise to mix insulant types. A similar system should be installed in the second installation.

Where a cavity barrier has been properly installed in the first installation there is no problem in abutting alternative systems.



## 2.7.2 MAISONNETTES AND FLATS

Maisonettes and flats are usually an arrangement of housing accommodation divided up horizontally and/or vertically within one building shell. In many cases, the cavity is continuous from one dwelling to another.

If cavity filling is required by a resident on an upper floor, the job can only be undertaken if the occupant of the floor below agrees to have it as well, because the fill must be continuous from ground level to the upper limit of the cavity. In the same way, the owner of the ground floor unit cannot proceed without the agreement of the upper floor resident. In multi-storey arrangements, all walls must be insulated.

## 2.7.3 CAVITY BARRIERS

Where a semi-detached or terraced building is to be insulated it is essential that no insulation is injected into the adjoining building, as this would constitute a trespass and could, in some circumstances, lead to water penetration in the adjoining building.



## 2.7.4 WALLS BELOW GROUND LEVEL

Walls below ground level should not be insulated unless there is a **certainty** that water is positively drained from the bottom of the cavity and that the insulation will not interfere with the free water flow of water down the cavity.

Many walls that are below ground level survive for long periods without experiencing water penetration. However, storm conditions can overwhelm the drainage behind the wall and lead to water penetration. The cavity wall insulation will become involved in the subsequent action.

Whilst walls below ground level can either be of solid or of cavity construction, in either case some form of waterproof tanking may be incorporated in the wall. The tanking must not be damaged due to the installation of cavity wall insulation.

## 2.7.5 CONSERVATORIES

Conservatories come in many guises from the small greenhouse type to the fully furnished, double-glazed, room extension type.



Some will be plastered and the client may impose conditions on internal access and drilling.

Where the client imposes restrictions that limit the walls to be insulated, it is important to document the agreement and inform CIGA of the details of the partial installation at the time of submission of the guarantee application.

Due to difficulties of access, both within and over the conservatory, some elevations or part elevations may be unavailable for the installation of cavity wall insulation.

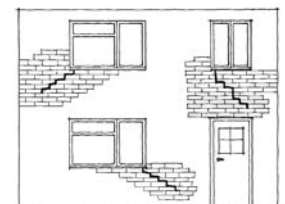
Every possible attempt and technique must be employed to insulate all of the walls. Inserting cavity barriers and leaving areas of wall uninsulated must be a last resort.

## 2.8 OUTER LEAF

Areas of cladding, tiling and boarding must be documented. The client should be informed in writing of the areas that are not to be insulated.

### 2.8.1 CONDITION

The state of repair of the external walls should be assessed, to ensure that the building is suitable for cavity wall insulation.



If defects are not identified during the assessment, the installing firm may inherit the blame and liability for the problems.

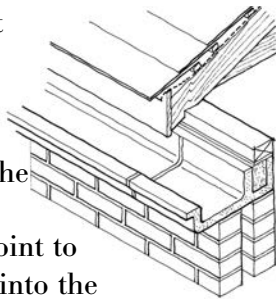
The following factors should be considered:

- Is the paint or wall coating in good condition?
- Is the render in good condition?
- Is the render soundly adhered to the substrate?
- Is the brickwork in good condition?

- Is the mortar in good condition?
- Are the walls free from cracking?
- Are the walls free from un-pointed holes and joints?
- Are the walls free from spalled brickwork?
- Are there signs that the gutters and down pipes are leaking?

## 2.8.2 FINLOCK GUTTERS

Finlock gutters are pre-cast concrete sections, with a mortar joint between the sections. It is the joint in the unlined gutter that is the weakness, as any building movement will cause this joint to crack and discharge water into the top of the cavity.



A building with Finlock gutters should not be insulated until they have been waterproofed, usually by lining.

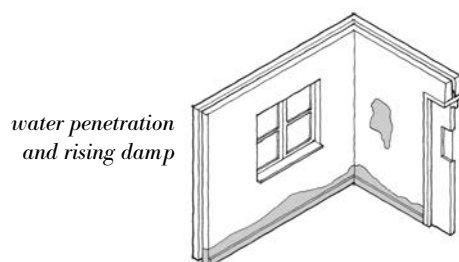
## 2.9 INNER LEAF

The nature of the internal leaf and finish should be identified. A plasterboard inner face could indicate a dry lined masonry block or a timber-framed building. Checking the construction of the gable wall within the loft space can identify timber framed construction.

Plasterboard has a hollow sound when tapped.

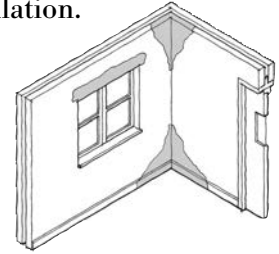
All internal surfaces should be inspected for water staining (indicative of water penetration or rising damp) or mould (indicative of condensation).

Cavity wall insulation should not be undertaken where water penetration or rising damp is evident.



Cavity wall insulation may help reduce condensation in general wall areas, but mould around windows is indicative of cold bridging, leading to condensation. This will not be changed by cavity wall insulation.

*condensation and mould*



## 2.10 SERVICES THROUGH THE CAVITY

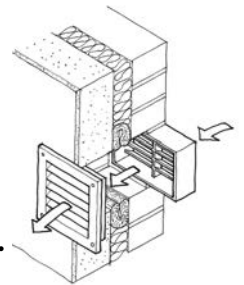
Some services are carried through the cavity to appear elsewhere in the building e.g. TV aerials, outside electrical switches, boiler flues.

Services that disappear into, or emerge from the cavity should be documented.

## 2.11 VENTILATION

For further information refer to CIGA's best practice guides including:

***Installing cavity wall insulation.  
Flues chimneys & combustion  
air ventilators.***

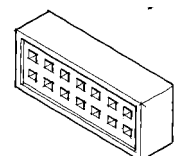


All active ventilators must be identified and documented in order that they are safeguarded during the installation of cavity wall insulation.

**The identification, documentation and safeguarding of combustion air ventilators is the most important task in the installation of cavity wall insulation. Failure to observe all precautions at any stage of the works could lead to loss of life**

### 2.11.1 UNDER FLOOR VENTILATION

The number, type and position of underfloor airbricks should be identified and documented.



## 2.11.2 ROOM VENTILATORS

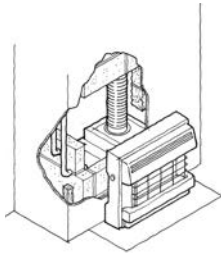
These may no longer be required and may, with approval of the client, be sealed by the Technician. However, **they must not be confused with combustion air ventilators.**

## 2.11.3 CAVITY VENTILATORS

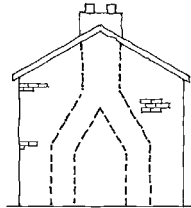
An airbrick serving only as a cavity vent is redundant.

## 2.12 MEANS OF SPACE AND WATER HEATING

The means of space and water heating shall be identified and documented, including the location of the appliances.



The identification and documentation of flues, chimneys and combustion air ventilators, is extremely important.



## 2.13 MODIFICATIONS TO THE EXTERNAL WALLS SINCE ORIGINAL BUILD

Any modifications to an external cavity wall should be identified and recorded including:

- Bricked up windows either with a cavity or as a single leaf
- Doors converted to windows
- Internal leaf cut away

Since the cavity may not be continuous, the Technician may have to drill extra injection holes to ensure a complete fill. The detailing of the modifications may not be to best practice and may need further work by the Technician. In extreme cases the modification may render the building unsuitable for cavity wall insulation.

The Technician could drill a single leaf, causing damage to the property.

## 2.14 ACCESS AND OBSTRUCTIONS

It is important that all impediments to the installation are identified and documented for the benefit of the Technician, for example:

- Vehicular access
- Excessive distance of the furthest wall from the vehicle parking place
- Proximity of adjacent buildings that may restrict safe ladder access
- Oil tanks close to the external wall
- Sheds and small buildings close to the external wall.
- Lean-to greenhouses
- Storage of material against the wall

Most systems of CWI employ a drilling pattern based on 1.2 to 1.5 metre grid. Therefore, any impediment that is larger than 1.2 metres may require a modification to the drilling pattern or in extreme cases, preclude insulation to that wall or building.

In some cases it may be necessary to gain approval to enter the neighbouring property for drilling and safe ladder use. In the case of linked detached houses it may be necessary to drill inside the neighbouring garage.

Permission should be sought from the neighbour wherever it is necessary to enter or work within another property.

## 2.15 EXTENSIONS AND ADDITIONS

Buildings with extensions should be carefully assessed since the cavity walls of the extension may or may not have been insulated during construction.

Where a single storey extension has been added to a two storey house, the external wall of the house must be insulated at first floor level. The Assessor should consider ladder access particularly in respect of a sloping, tiled roof to the extension.

## 2.16 MEASUREMENT OF CAVITY WALL AREAS

Whilst many installing firms and scheme managers operate a 'price by building type' technique, nevertheless it is important to measure the external walls, since it provides information to be used throughout the job enabling and improving:

- Correct and competitive pricing
- Work planning
- Material requirements
- Material usage
- Productivity payments
- Claims for extras
- Material yield and installed density

### 2.16.1 CALCULATION OF CAVITY WALL AREA

The area of walls to be insulated should be calculated by subtracting the area of the windows and doors and non-insulated areas from the external wall area. No allowance should be made for minor items such as window reveals etc.

The result should be documented on the Assessment report.

## 2.17 ADVISING THE CLIENT

The assessor should advise the client of all aspects of the works including:



- The likely schedule for the installation
- The estimated duration of the works
- Precautions in respect of breakable items
- Access for installation vehicles
- Access to walls
- Access to the loft
- The method of making good the injection holes
- The making good of decorated areas
- Any areas that will not be insulated
- When the CIGA guarantee might be received

Where the client has imposed restrictions such as the extent of the cavity to be filled, these must be documented and signed by the client.

## 2.18 PROVISION AND RETENTION OF RECORDS

The client should be provided with a copy of the assessment report.

The documented assessment report should be provided to the Technician.

After installation the documented assessment report should be retained at the installer's office together with other records relating to the installation.

Records should be retained for 10 years.

## 2.19 BUILDING REGULATIONS

The installation of cavity wall insulation in existing buildings is subject to the Building Regulations in England and Wales.

To comply with the Building Regulations a notice must be given to the relevant Building Control Office –refer to the Technician's guide to best practice, *Installing cavity wall insulation*.

The Assessor should identify and document the name of the Local Authority.