

TECHNICAL NOTE No. 42

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Chimneys, Flues and Hearths

This note does not contain advice on the repair or history of fireplace surrounds. For information on this item a good source of further information is the:

GEORGIAN GROUP GUIDE NUMBER 4 – FIREPLACES Tel:0207-377 1722

Historical Note

The Chimney is a relative latecomer as a building element. It was only during the 14th century that it became at all common, even for the dwellings of the 'well to do' and very many poorer dwellings remained without any special provision to remove smoke until well into the 19th century. However, the chimney in some form or other will be an essential element of any older building that is in use today.

From the outset, chimneys have always been a prominent characteristic of the building of which they form part, although sometimes their shape has been disguised as an urn or other ornament.

The burning of wood and turf required a wide hearth and flue, but coal, which increased in common use during the late 18th century into the 19th century, burnt best in more confined grates lifted off the hearth stone. The essential fire in every household was the one used for cooking. The use of coal led to the development of closed ranges which were often set into the opening of the old hearth. Most local stone was difficult to dress to form flues, and instead brick was used, some of very poor quality.

With the use of coal came the need for a more efficient draft leading to patented fittings with registers and other contrivances. At the top of the stack, pots were set to reduce turbulence and improve draft. The use of pots became increasingly common from the middle of the 18th century. Set well down into the stack with only a small projection they were often made of cast-iron. Terra Cotta and faience soon became more popular with the result that in the later 19th century an enormous range of standard pots of all sizes and shapes, some very decorative, were generally available. Because of the increased risk of fire from coal, parliamentary enactments of 1774 and 1834 sought to regulate construction materials and design. The most recent development in flue construction has been the liner. All flues until modern times had at best, been 'parged' with lime plaster as they were built but smooth clay or metal liners have very much increased the efficiency and safety of the flue and make it more easily cleaned.

Until recent times, the stack has also been a symbol of social standing. Hearth, bricks and coal have all been subject to tax at one time. To afford them showed wealth. This social importance can be seen expressed in the building of dummy stacks, a fashion very common in the early 19 century. By contrast the poor man, while he had a hearth, could not afford coal to burn nor bricks to build his chimney.

Faults and Repair

(i) Breakdown of the pointing or masonry of the stack:

This may be caused by chemical or local climatic reasons.

Smoke and fumes will escape discolouring the stack or filling the roof space; the stack may lean; mortar and perhaps pieces of masonry may fall; adjacent timbers become charred.

In severe cases the stack must be rebuilt; in less advanced stages the stack may be saved by grouting in a lining to the flue and repointing or rendering.

(ii) Water gaining entry between the stack and the roof covering:

Chimney breasts will become damp and rot is likely to affect any timber built close to the stack.

Renew the flashings around the stack. If this junction is only flashed with mortar it is advisable to repair using full detailed lead flashings (this does not apply to thatch). After the building is made water-proof cut out any powdered bricks, replace and repoint. Repair or replace the damaged timbers.

(iii) Damp trapped inside unused flues:

This can be the cause of damp patches inside the building and be the source of a general fungal attack. The water can enter at the top of the stack or be driven in through the wall of the flue which may be no thicker than 100 mm.

A ventilating cap should be fitted to the top of the stack which will prevent water driving down but allow a circulation of air. If a lead cap is to be specified consideration must be given to maintaining this ventilation. Where fireplaces have been blocked other ventilators should be fitted so that air can travel up the flue and keep it dry.

(vi) Damaged and cracked pots:

Replacement is the only satisfactory answer. There is a wide variety of designs still available and several firms will make 'specials' to order. If the design is unique and a one-off replacement is too costly to consider it may be possible to carry up the fumes using an insert tube and to repair the pot using modern adhesives.

The condition of flues and stacks should be checked every five years.

Notes on the Preparation of Contract Specifications

(a) Preparation and Demolition

Clearly identify which stacks are to be worked on.

Demolition

If there is to be demolition and rebuilding, a record drawing or photograph may be necessary to obtain a proper match. The builder must be told if he is to set aside any materials from the demolition for reuse. Describe the extent of demolition – state if the builder is to use his discretion.

(b) Reconstruction

Workmanship – describe any special requirements or samples for which the builder should get approval before proceeding further.

Materials

Bricks – state whether they are to be reused after demolition or new. It is increasingly difficult to get new large (@ 7/8") bricks so, if these are needed, it is advisable to ensure a supply in advance. If the stack is to be rendered then modern concrete bricks or blocks can be used.

Mortar – if the stack is being patched it may be important that the new pointing matches the old in style and colouring.

Liners – 200 mm diameter vitrified clay sections are most commonly used. Other types should be chosen with specialist advice and may need to be installed by a specialist. The type of fuel burnt will be a factor in the choice.

Pots – old pots can usually be reused but if replacements are necessary then the match will be important and size, colour and manufacturer should be named.

Flashings – lead, code 4, is the most commonly used material for soakers and cover flashings. If it is decided to use a modern synthetic material it should be chosen from those that have been given an independent test by a recognised testing organisation and found to have an expected life span compatible with that of the adjoining roof. These should be agreed with PHB.

Renders – these will usually be specified to match other existing renders. If there is any doubt about getting a good match a sample panel should be specified.

After the work to the stacks is complete the rainwater system must be checked to be sure that it has not been choked by rubbish from the chimney work.

Technical References

British Standards:

B.S. 1181 – Flue Linings in Terminals in Clay.

BS 6461 Installation of Chimneys and Flues for domestic appliances burning solid fuel (including wood and peat), 1984

Building Regulations (NI) Technical Booklet L heat Producing Appliances 1991

D.O.E. Advisory Leaflets Nos. 30 and 21 – Installation of Solid Fuel Appliances; No 44 – Smoky chimneys; No. 50 – Chimneys for Domestic Boilers.

BRE Defect action sheets 93,94,95,138,126,127 - Chimneys

N.B.A. 'Easiguide' to Fire Protection in Houses.

Period Houses, A Conservation Guidance Manual. Dublin Civic Trust 2001.

Chapter 9 Chimneys.

S.P.A.B. 'Chimneys in Old Buildings'. London 1976

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