

# Building a traditional fireplace



# The Traditional Style Fireplace

It would be best to construct this fireplace as part of a new building or an extension to an existing building, which will enable the chimney breast and flue brickwork to be bonded into the external wall which backs it. This will give it structural strength.

However, it is possible to add the fireplace to an existing wall by using metal rods and ties between the two walls as shown in one of the illustrations. To avoid a possible unsightly crack appearing at the visible junction, between the new and existing walls, a "shadow line" recess should be left, as shown in the same illustration. Another alternative would be to run a small timber moulding in the corner junction to hide any cracking caused by heat expansion.

The construction at ground level will depend on whether you have a suspended timber floor (boards and joists) or an oversite concrete floor slab. The cutaway illustration (page 4/5) shows a wooden suspended floor construction, but obviously a concrete floor would provide a simpler starting point.

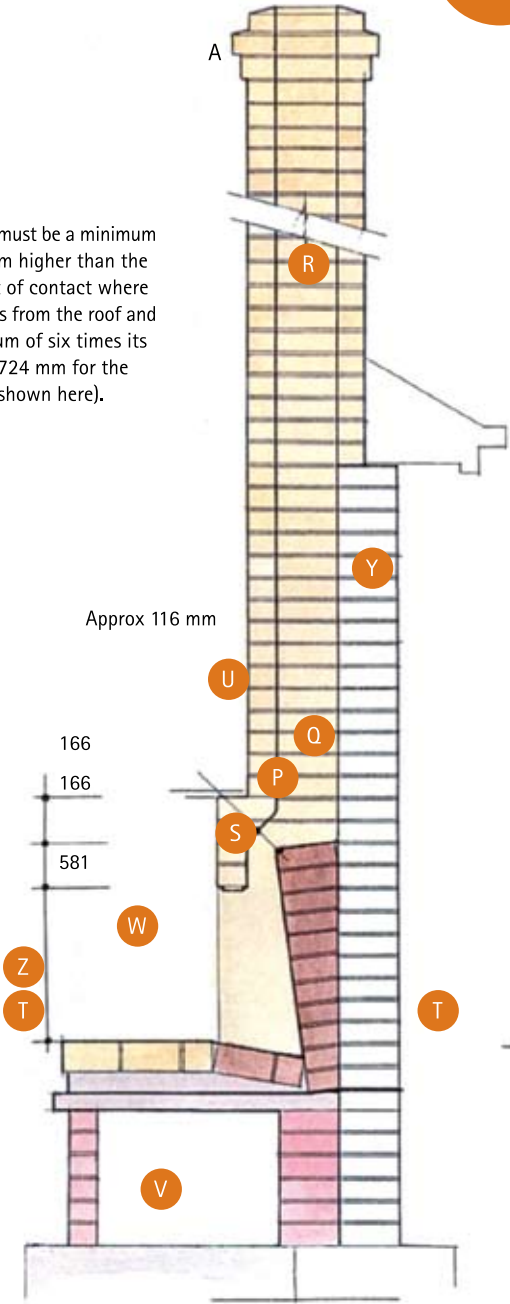
It is important to obtain specifications from a registered structural engineer for either type of foundation, to ensure a safe structure and we strongly advise that you submit drawings to your local authority for permission to build a fireplace of your choice. Another aspect is that you should let your house insurer know that you will have a newly-built fireplace, as this may not be covered in the fire cover that you presently have.

The size of the chimney breast in the illustrations is 1846mm wide and from floor to ceiling in height. The depth from the inside face of the outside wall is 338mm for the upper part and 455mm for the lower part (below the mantelpiece shelf level) and the hearth projects a further 560mm forward from this.

It is important to have an adequate depth and width of hearth to prevent burning coals from falling onto your wooden floor or carpets. In addition, a curb rail in wrought iron or hard wood will go a long way to preventing this.

Vertical Cross Section

Chimney must be a minimum of 915 mm higher than the last point of contact where it emerges from the roof and a maximum of six times its width: (2724 mm for the chimney shown here).



The chimney flue structure can rise vertically from this point to the top cap (all bends in the flue below this must be rounded and smooth).



Remove wall plate for floor joists from its existing position to the new position in front of the hearth on the new wall.

O Air vent holes

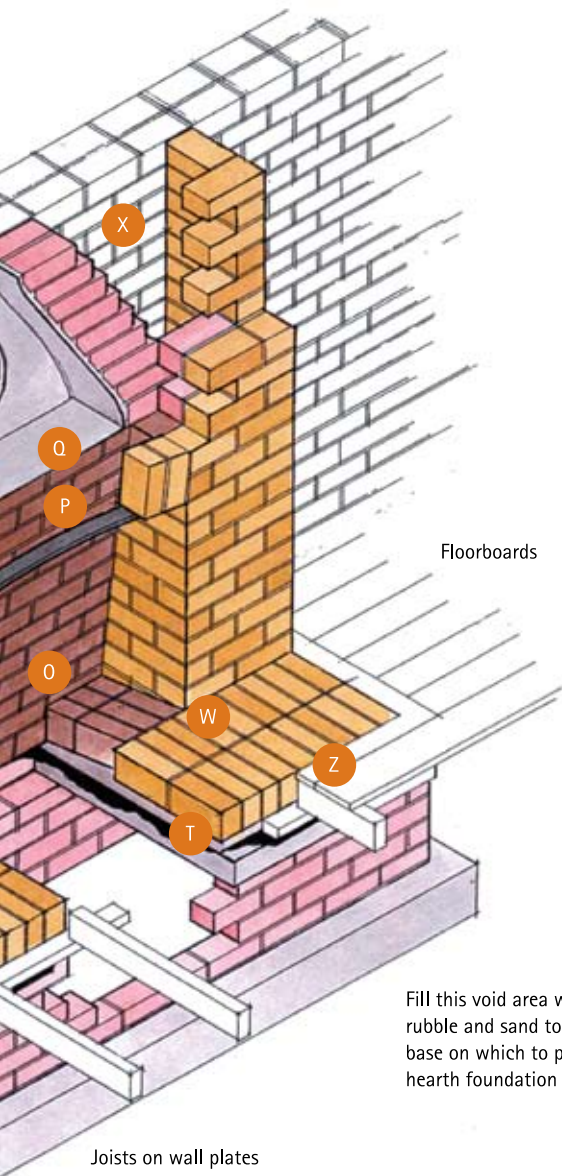
P Throat

Q Smoke Shelf

R Chimney flue

S Steel support bar

T Damp-proofing



Fill this void area with brick rubble and sand to create a base on which to pour the hearth foundation concrete.

- U** Mantel shelf level (see front elevation illustration overleaf)

**V** Concrete footing (Timber floor) See front elevation illustration overleaf
- W** Hearth

**X** Open "pocket" in brickwork

**Y** Existing (or new) wall

**Z** Floor joists and floorboards

The thickness of the brick and the concrete base must not be less than 125mm. You could change the sizes to suit your requirements but you must always keep the relationship between the flue (R) area to that of the fireplace opening to between 10% and 7% to ensure an efficient draft ratio. You can also change the shape of the upper area by allowing the external side edges to be corbelled over to reduce the mass in a random way, which will achieve a "country farmhouse" look.

Another important aspect of good fireplace design efficiency is to ensure that the throat (P) of the flue at the smoke shelf (Q) level does not exceed 120mm over the full width of the opening. This is achieved by creating a sloping back to the fireplace aperture as shown. This also prevents the generated heat of the fire from rising straight up and being effectively wasted.

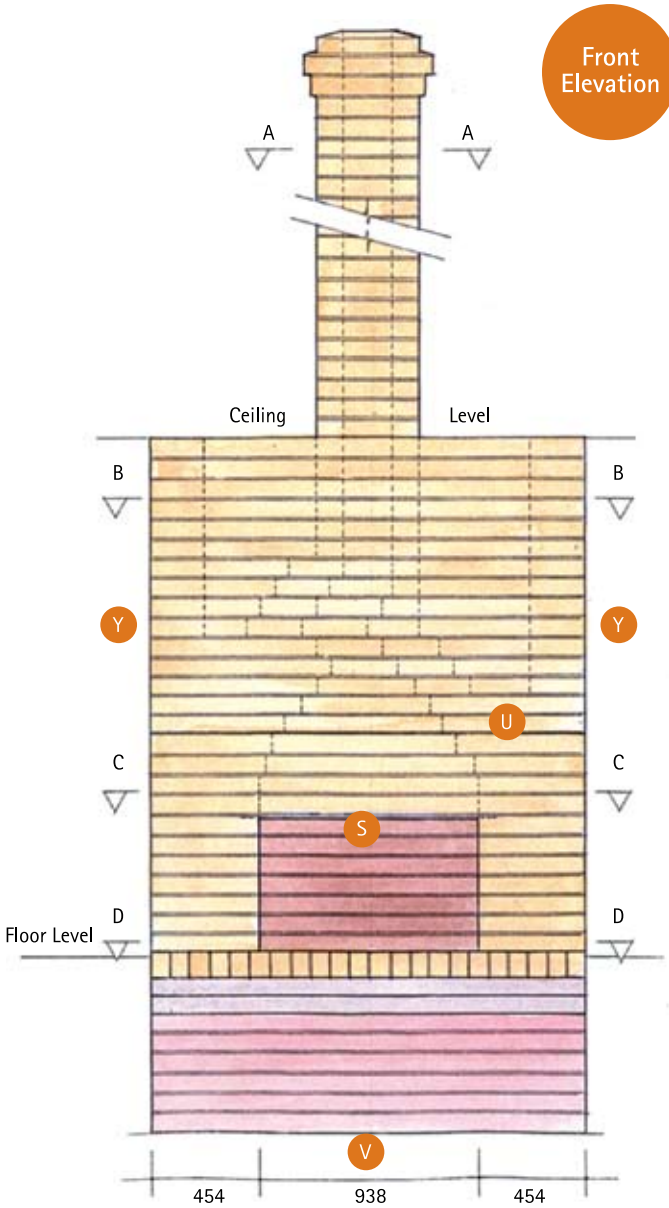
Air vent holes also assist efficient combustion. These can be drilled through the outer wall (4 x 15mm diameter holes) at the level of the back of the new hearth and four open joints in the sloping fire back at the base to align with these will allow air in but prevent most insects from gaining access.

The throat and the adjacent smoke shelf (Q) and the whole of the length of the chimney flue (R) must also be lined with smoothly finished mortar to assist the flow of hot gases. The normal 1:6 mortar mix used for the bricklaying can be used and the throat and flue rendering is best done as the work progresses every four or five courses. Rope with a sack of straw filling the flue aperture can be used during plastering to catch and remove the droppings. Socketed fibre cement flue liners are an excellent substitute and may be required by your local authority, so check with them before finalising the project.

The damp proofing (T) must also be included at the appropriate lower level and also above roof level in the chimney stack.

We have shown a cambered 10mm x 76mm steel support bar (S) in the cutaway drawing, which could be flat and level as shown in the plan drawing. The choice depends on the aesthetic style you wish to achieve.

Front Elevation



Roof flashing and chimney dampproof course must be fitted and is probably best left to professional waterproofing specialists.

**IMPORTANT:** Ensure that all timber (roof trusses, wall plate, purlins etc) must be at least 225 mm away from the flue to prevent any fire risk. Plan your fireplace position with this in mind, also provide adequate thermal insulation between any timber and the chimney.

Above the throat/smoke shelf level the brickwork is corbelled over to form the balance of the "throat" area above the smoke shelf and reducing into the required flue size. Ideally this should be shaped to prevent a direct line of sight from the fireplace to the chimney top, which will help prevent downdraughts and ingress of rain. Also ensure that the height of the chimney stack is sufficiently high to avoid these downdraughts.

Use a brick as a sizing gauge when corbelling the throat over to the flue shape, to ensure that the area is not smaller than the flue in any part of this space reduction. Also ensure that there are no sharp angles or protrusions; everything should be softly rounded to ensure efficient combustion.

On these designs it is important to use the metal reinforcing rod anchors (as shown in the detailed illustration) to tie the new brickwork into the existing wall (see page 11). Obviously, if the fireplace is part of a new extension area in your house, this is not necessary as you can bond in the brickwork. You can also, in this case, project part of the chimney breast and flue to the exterior of the house wall and have it flush or only slightly protruding on the room side.

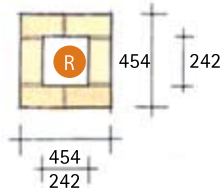
The choice of clay face brick will enable you to choose a modern or traditional appearance to suit your lifestyle. Similarly, the choice of a mantle shelf sitting on top of the brick setback can be modern or rustic to blend in with the overall style.

## Materials

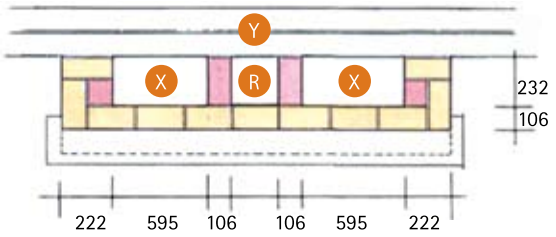
- 600 Face Bricks
  - 285 (chimney breast)
  - 135 (angled back and hearth)
  - 180 (chimney above ceiling)
- 200 NFP bricks (plaster/common)
- Mortar: Buy bags of "Mortar-Mix" as required
- Concrete: Buy bags of "Concrete-Mix" as required
- Mild Steel (Camber Bar): Approximately 1m x 75mm x 10mm
- Reinforcing Rod 6mm DIA- 28 pieces 150mm long



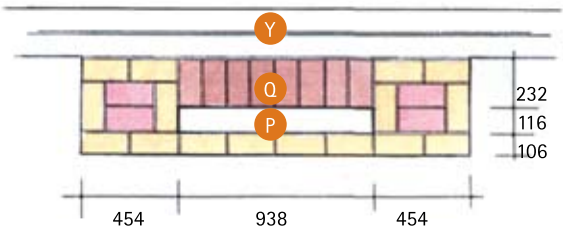
Section A-A



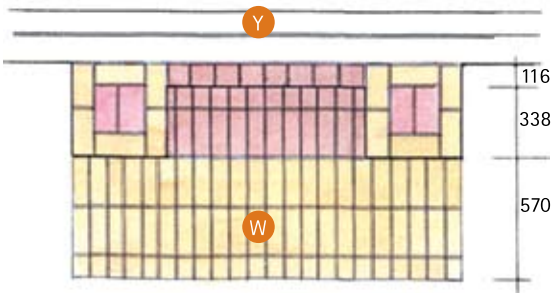
Section B-B



Section C-C



Section D-D



## Method of Bonding the New Fireplace Brickwork to an Existing Brick Wall (All Fireplace Types)

At all contact points between the new fireplace brickwork it will be necessary to drill the existing wall at every fourth joint vertically and in the points of contact horizontally.

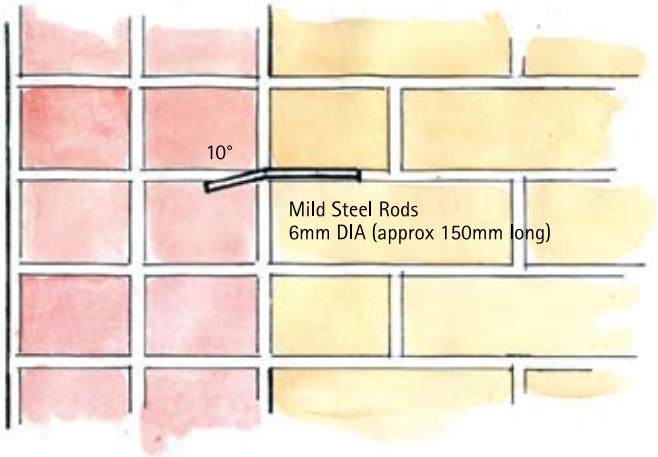
Drill at a slight downward angle ( $\pm 10^\circ$ ) as shown. Put some epoxy adhesive into this hole and drive in a 6mm diameter reinforcing rod (overall 150mm long) into the prepared hole to about half its length. Bend the 75mm part protruding down into a horizontal position and build this into the mortar joint of the new fireplace wall to create a mechanical bond between the wall units which will minimise any cracking problems when using your fireplace in the future.

Also create a neat rebated mortar and plaster joint detail at the external junction between the existing and the new (fireplace) walls so that if any cracking takes place due to the heat differential it will be hidden. Alternatively you could put a timber moulding here, which could be varnished or painted to blend with the walls.

### NOTE:

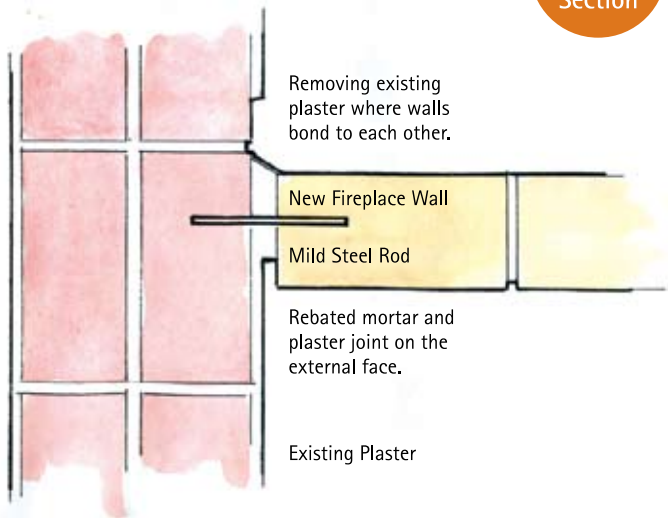
This method of securing the new brickwork to the existing wall is very important, for safety as well as appearance aspects, and will apply to all of the fireplaces shown in this leaflet.

Vertical  
Cross  
Section



Existing Brick Wall

Horizontal  
Cross  
Section



Existing Brick Wall

For this project you will need to have some bricklaying experience, because if you don't get it right your fireplace could be smoky and inefficient. If you do a good job it will add value to your lifestyle. As a result it may be worth using a qualified and experienced builder/bricklayer to tackle the work.

## Build your own fireplace

A correctly designed and built fireplace will ensure that the fire draws well and a minimum amount of heat is "lost" up the chimney. This leaflet focuses on design and construction principals, which will ensure a fireplace, which is both efficient and effective.

The appearance of the fireplace can be developed or modified to suit individual tastes or styles.

Alternative fireplaces can be found in the companion brochure entitled "Build your own ready made fireplace".

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