# Dennis Manning Associates

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**12 High Street Arundel**

**Rebuilding of Chimney between First Floor and Roof**

Further to recent verbal instructions received from Jason Fellner Esq we visited the above site to inspect the condition of the chimney as existing and then prepare a report as to the sequence of events to allow it to be repaired.

The original chimney was thought to be roughly rectangular in plan with a large open fireplace under and a tall exposed brickwork chimney over. During its lifetime the chimney between first and roof has been modified to allow access past it leading to a staircase and a small ante room. This process entailed the chamfering off of one corner and rebuilding it in a mismatched bond and thickness of wall.

Since the modification it appears that there has been substantial movement along the notional joint lines and subsequent bowing of the wall which in turn has led to additional cracking at first floor level towards the rea of the chimney as viewed.

The original chimney construction appears to be 100 mm brickwork with an occasional buttress but whether or not this is the case everywhere in the construction cannot be determined until repair work commences.

The present condition of the chimney is a real cause for concern as the movement which has occurred has left the support for the external chimney above possibly reduced and certainly from a structural viewpoint less than satisfactory. Without the proposed works it is likely that further deterioration could take place which would not be acceptable.




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**Suggested Sequence of Work for Repair and Partial rebuild of Chimney**

The wholesale rebuild of the chimney between first floor and roof is in general deemed unacceptable as is the removal of large areas of brickwork at any one time. Therefore it is proposed that a width of brickwork equal to no more than three bricks is allowed to be removed at any one time and not for the full storey height.

This sequence will therefore require a degree of propping to ensure the structural integrity of the existing is maintained. The first floor surrounding the chimney must be propped out for a width of between 1000-1500 mm down to the ground floor using Acrow props and double scaffold boards as spreaders at both the ground floor and the underside of the first floor.

In the first instance Strong Boy props are to be inserted in the chimney stack at mid storey height on the two sides to be repaired at no more than 750 mm centres and supported at first floor level with spreaders to ensure a reasonable dispersion of load. This spacing figure can be adjusted on site after discussion with the engineer and client if necessary for improved working conditions and space.

The stipulation that no more than a width equal to three bricks can be removed at any one time is to be adhered to which ensures that the chimney over and the external chimney retain nearly all of their present support during the works. The brickwork can then be removed sequentially and rebuilt ensuring that full bonding occurs and that the final line of the rebuilt brickwork is vertical to ensure that in its very final condition it provides support to the external chimney as originally intended The Strong Boy props are to remain in place until the repair work has been carried out up to the their level and the bed joint between rebuilt and old brickwork has been filled with dry pack well rammed home.

A period of say 48 hours is to be left to allow the mortar to harden enough to provide adequate support throughout. The mortar to be used in the partial rebuild is to match the existing in make up and proportion which may require for this time period to be extended to ensure that sufficient hardening occurs but it must not be shortened in any way.

The Strong Boy props are then removed the brickwork locally to be dry packed as previously noted and then pointed up to suit. The Strong Boy props are reinstated at say a position of three quarters of the storey height above the first floor and the whole process as previously described repeated throughout.

A further of 48 hours or more is to be allowed as previously described.

In respect of the final lift of repair and rebuilding it may not be totally necessary for the Strong Boys to be used but it is considered prudent to utilise them as an additional support and precaution during this phase of the works.

Once the props are in place the final lift of works can be carried out as previously described which should restore the chimney to and acceptable level of structural support. Consideration should be given to restoring the chimney to its original shape which should further enhance its support of the chimney over.

During the works the relationship of the external chimney and the internal chimney should be inspected and if further alterations are required to enhance continuity of support then they will need to be agreed and implemented as necessary.

Is also considered prudent that the support of the chimneys should be inspected at first floor level including the beams over the fireplace at ground floor level to ensure that the overall construction is sound throughout.

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