

BUILDING DIGEST

CENTRAL BUILDING RESEARCH INSTITUTE INDIA



INSERTION OF DAMP-PROOF COURSE IN EXISTING WALLS

Introduction

Most of the old buildings were constructed without damp-proof courses and as such their walls suffer from rising damp. In some buildings, though a damp-proof course might have been provided, due to some reason or the other it becomes ineffective and their walls also suffer from the same defect. The method usually followed to rectify this defect is to insert a damp-proof course after under-pinning the walls, which is both time consuming and expensive. A quicker and more satisfactory method evolved by the Building Research Station, U.K. consisted of cutting through a selected course in short lengths in the brick work by a special saw and inserting the damp-proof course, which could be bitumen felt or copper or zinc sheet. Initial trials of this method of insertion of damp-proof course were carried out at the Central Building Research Institute, Roorkee with an

imported saw and a field trial was conducted on a damp-affected bungalow in Delhi. This method proved to be simple, and inexpensive. Efforts were subsequently made to manufacture the special saw which has now been done and further trials have been conducted.

Masonry saw

The saw is made of steel blade, with inserts of stellite (4 mm. X 4 mm.) in the slots made on one of the edges of the blades (Fig. 1) and brazed with the latter so as to remain fixed in position. The masonry saws have been developed in two sizes; smaller one for starting the cut initially and the bigger one for regular cutting. The smaller saw is 35 cm. by 8 cm. by 3 mm. (thick) and can be operated by one person. The bigger one is 120 cm. by 10 cm. by 3 mm. (thick) and it needs two persons to operate.

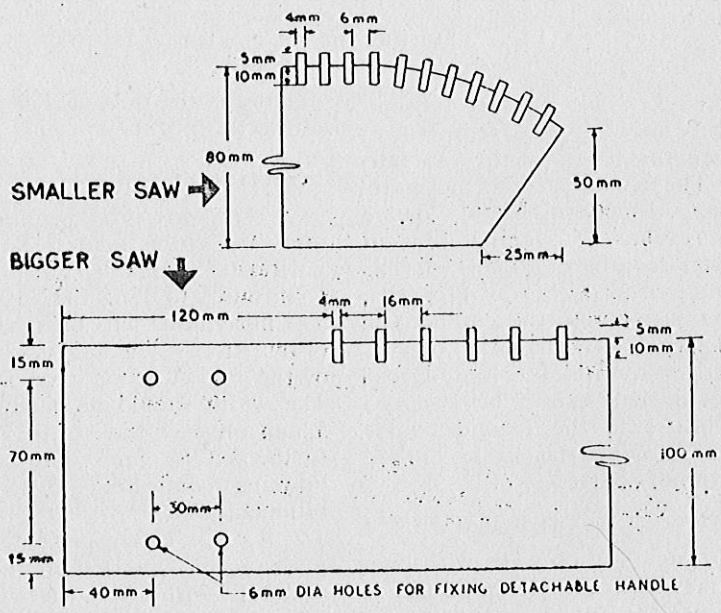


FIG 1. DETAILS OF FIXING STELLITE TEETH

Selection of course and sawing

The level at which the cut should be made is decided after careful inspection of the site taking account of ground levels and the levels of the existing floor. The cut should be made at the bed joint about 15 cm. above the floor or the ground whichever is higher so that it is possible to work the saw.

The cut is started at a corner of the wall (Fig. 2). In case it has to be started from a jamb having door frame

180 cm. per day in 30 cm. walls. The rate depends upon the type of the mortar in the bed joints and the regularity of the courses. Obstacles such as service pipes, built in cupboard, fire place, chimney breasts reduce the progress of work. It is possible to cut walls thicker than 30 cm. also but it may present difficulties if the core is filled with loose rubble. It may also require a longer saw. The progress will be slow as the thickness of the wall increases. The saw removes most of the mortar from the joint when this is dry and of crumbly nature. Sticky mortars such as cement - sand or cement - lime - sand are more difficult



Fig. 2. Starting the cut at a corner

fixed into it, one brick is knocked out to start the cut. Knocking out of the bricks may also be required at corners of thicker walls when the length of the saw falls short for cutting through. The sawing is done normally in lengths of 60 cm. at a time. In case of heavily loaded sections of the wall, such as ends of opening, the cut should be advanced in shorter lengths of 30 cm. It has been found that in case of mud mortar, as the cut proceeds, the bricks in the top course just above the cut become loose and settle down. Therefore the lengths of cuts should be reduced to 45 cm. or so and the loose bricks from the course just above the cut should be removed with least disturbance to bricks in the second course above the cut (Fig. 3). The removed bricks are relaid after the laying of the damp-proof course.

The average rate of cutting in brick walls with lime mortar which is generally met with in old buildings is likely to be about 240 cm. per day in 20 cm. walls and

to cut and the thickness of the slot is little more than that of the teeth of the masonry saw.

Insertion of damp-proof course

The waterproof membrane must be inserted immediately the cut is made. Since copper or zinc sheets are not readily available, only bituminous felts 2.5 mm. thick conforming to IS : 1322-1965 (Revised) are to be used. The fibre based felts being stiff are to be preferred for ease of insertion. The felt is cut in lengths equal to the length of the slot cut at a time allowing for an 8 cm. overlap. The width should be such that it projects out by about 5 mm on each side of the wall. The mica dust sticking to the felt is removed by rubbing with a brush and hot bitumen conforming to IS : 702-1955 for blown type bitumen or IS : 73-1950 for residual bitumen is applied at 1.2 Kg./sq. meter on both sides. The bituminised felt piece is next inserted in the slot after cleaning the joint of debris, with a thin steel flat. Since the slot cut by the saw is about 4 mm while bituminous felt is only 2.5 mm

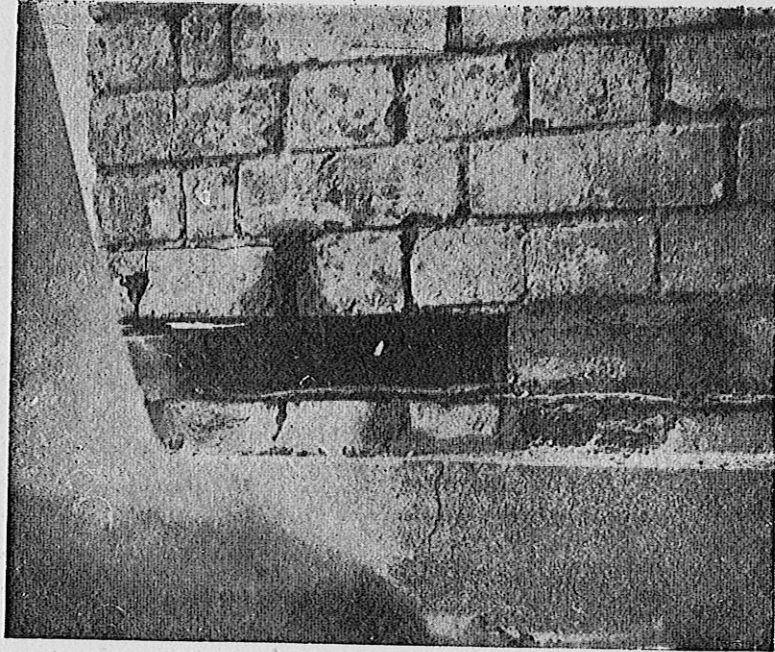


Fig. 3 : Laying Bituminous felt after removing one course of Brick in Mud Mortar Walls

thick the felt can be easily inserted. Some difficulty is experienced, in case of sticky mortars, to accommodate the overlap between the adjoining pieces of the felt. Hence at the overlaps, the cut is somewhat widened by sawing a second time keeping the saw in a slightly inclined position. A little gap is likely to remain at the top between the opened-out joint and the felt which is filled with 1:3 cement sand mortar grout and finally finished flush on both sides of the wall. Even then there will be little gap left and a slight settlement of the building may be expected.

The cycle of cutting the slot and inserting the damp-proof membrane is continued in this manner along the entire wall length. Finally the surface is made good by plastering or pointing the brick work as the case may be in conformity with the existing surface. Since the level of inserted dpc will be about 15 cm. higher than the floor level, it will be necessary to damp proof the portion of the wall between the floor and the new damp proof course. This should be done by painting with bitumen on the exposed brick surface and relaying the skirting.