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TESTING OF THATCHED ROOF PANELS COVERED
WITH CEMENT SLURRY

by

B. LANGFORD and G. H. J. ELKINS

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Introduction

A method of reducing the fire hazard of the thatched roof in tropical countries by covering the surface of the roof with a thin layer of cement slurry has been described elsewhere⁽¹⁾. This layer varied between $\frac{1}{4}$ in and $\frac{1}{2}$ in thick, the mixture being 4 parts sand to 1 part cement. The thatch panels constructed in this manner were weathered for 18 months and then tested according to a modified B.S. 476 : Part 3 test.

Experimental

Thatching advisers of the Rural Industries Bureau constructed panels of thatch for use in the tests. Three thatching materials were used: Norfolk Reeds, Combed Wheat Reeds and Random Straw. These materials were thatched on to wooden frames constructed to simulate a typical roof structure. The finished panels measured 4 ft x 4 ft, the tops being bounded by $\frac{3}{4}$ in thick wood boards.

One panel of each thatching material was covered with cement slurry and a single unmodified panel of Random Straw was used as a control, control panels for the other two materials having been tested previously. All four panels were placed on an exposed roof for 18 months. At the end of this period they were brought down and placed under cover for three weeks. During moving cracks in the cement surface were initiated, these were repaired before testing.

Tests

The four panels were subjected to a modified version of B.S. 476 : Part 3. The panels were mounted on a sub-frame 33 inches square which fitted into the B.S. apparatus. Exposed areas at the back and sides of the cement-covered panels were sealed with vermiculite plaster. The wooden frames were re-treated with intumescent paint to preserve the frames during the course of the test.

Because of the difficulty of sealing the panels effectively into the frame of the B.S. apparatus no attempt was made to achieve the pressure difference of 1.5 mm water gauge across the panel.

Results

The results of the modified B.S. 476 : Part 3 tests are shown in Table 1. According to these tests the application of cement slurry, especially to Norfolk Reeds and to Combed Wheat Reeds, affords a high degree of protection to the thatch. In the case of Random Straw, although there was no penetration during the test, there was smouldering of the straw underneath the cement covering at the completion of the 1 hr. test. This was probably due to the difficulty of

applying the cement covering without straws projecting through the cement surface. By comparison the control panel ignited rapidly and penetration soon followed.

Discussion

The method of increasing the fire resistance of thatched roofs by covering them with a cement slurry, described above, makes thatch so treated capable of passing the modified B.S. 476 : Part 3 test even after ageing for 18 months.

It is in tropical countries, where aesthetic considerations are assumed to be minimal, that this method of fire-proofing thatched roofs may be applicable.

One of the defects of this method is the added loading of roof members caused by the weight of the cement shell, being as high as 6 lb/sq. ft. for a $\frac{1}{2}$ in layer of cement. Further investigation might be useful to find ways of lessening this weight by using a different shell, e.g. a mud, consolidated with cement shell, a vermiculite cement mixture shell, or a thinner shell of the same material.

Conclusion

Covering a normal thatched roof with a shell of cement makes ignition from an external source almost impossible. This fire resistance is virtually unaffected by weathering for 18 months.

The higher quality thatches, Norfolk Reeds and Combed Wheat Reeds are more satisfactory bases for cement shells than Random Straw although the latter will still pass the modified B.S. 476 : Part 3 when so treated.

References

1. F.R. Note 525. The Reduction of the Fire Hazard of Thatched Roofs. G. H. J. Elkins.

TABLE 1

RESULTS OF MODIFIED B.S. 476 PART 3 TESTS

Test No.	Thatch Material	Treatment of Thatch	Time to Ignite Mins.	Time to penetrate Mins.	Remarks
1*	Norfolk Reed	None	N.I.	26	Weathered for one year)
2*	Combed Wheat Reed	None	1m. 55 secs	17	
3	Random Straw	None	1m. 43 secs	6m. 43 secs	Weathered for 18 months
4	Norfolk Reed	Cement Slurry	N.I.	N.P.	Weathered for 18 months
5	Combed Wheat Reed	Cement Slurry	N.I.	N.P.	Weathered for 18 months
6	Random Straw	Cement Slurry	N.I.	N.P.	After 1 hr. test the straw was seen to be smouldering in the eaves. Smoke was observed issuing from the top of the Specimen indicating that smouldering was taking place in the thatch under the cement in the centre of the panel.

N.P. No penetration in the test period (1 hr.)

N.I. No ignition after 3 minutes exposure to a radiant source in accordance with B.S. 476 : Part 3.

*These results are quoted from F.R. Note 525. The Reduction of the Fire Hazard of Thatched Roofs by G. H. J. Elkins