

Pilot Study of Moisture Control in Stuccoed Straw Bale Walls

Report to

Canada Mortgage and Housing Corporation
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INTRODUCTION

This report presents the findings of pilot work exploring straw bale house performance in resisting or controlling moisture. The field work was done in Quebec's Outaouais region, just north of Ottawa. Canada Mortgage and Housing Corporation helped fund this pilot work, which was carried out in May 1997.

Background:

Today's resurgence of interest in stuccoed straw bale building construction is driven by the realization that we must use resources much more efficiently - certainly including renewable resources, energy resources and "wastes", and pollute much less while so doing. The watchword is surely sustainability.

The building industry has not been doing very well: Even wood frame construction, clearly the most successful system based on renewable fibre, is consuming its forest resources at a questionably sustainable rate. The forest product innovators have been responding for decades, striving to assure sustainability and "value added" profitability by getting much more house from any tree, including what were "weed trees". Their innovations all take the form of "reconstituted wood" composites that yield more from less, but all at a price in terms of energy, money and pollution.

The remarkable innovators of one hundred years ago, the "folk engineers" who devised the Nebraska Straw Bale load bearing house walls, were simply using the resources they had: straw and the new horse-drawn straw baler. Their watchword was survival; their ingenuity led to a singular model of sustainable and non-polluting housing production. Their handsome houses still serve well.

Today's engineers are striving to simplify and streamline the Nebraska Straw Bale wall building method, make it even more resource-efficient in material, labour and energy terms, and ensure enduring performance as its usage spreads far indeed from the dry plains of Nebraska. We recognize its strengths and we can see it becoming a substantial market for our "waste" straw resource. Its structural, thermal, and fire resistance performance are exemplary. Our concern is the old one, the nemesis of cellulose fibre that is continually fought in wood frame housing: moisture.

THE PROBLEM

The problem addressed in this project is to determine the nature and severity of the moisture threats to the durability of the stucco-strawbale sandwich wall including modern stucco cases, and to do that well enough to allow designers and building authorities to deploy this building method with surety and to its full potential.

On the one hand, plastered straw bale house construction offers a long and successful performance record - but under rather ideal conditions: 100 years on the dry plains of Nebraska. On the other hand, experience with wood frame constructions as well as wood fibre and other cellulose fibre materials has

