The use of Mud & Straw in Modern Building & House Construction

During the past 10-15 years there has been renewed interest for the use of the combination of mud and straw as important components in housing construction.

Possibly the largest straw-bale house in Europe was erected on a farm near Hamar about 150 kms North of Oslo in Norway last month [August 1998].

The large two-storey two-family house with a full-size concrete-cellar-basement was designed by Architect Alice Reite. The two individual homes are separated by a vertical fireproof wall. The house framework itself - is a so-called American "wooden-frame" construction - ordered and delivered as a complete assembly-kit direct from the saw-mill.

Straw-bales were placed on top of a damp-proof course - on the outer concrete perimeter as a wall surrounding and enclosing the wooden-frame, so that the wooden skeleton framework is open and visible from the inside.

The Construction Process

About 20 people participated in this hand-on project under the trojka-leadership of Architects Alice Reite and Rolf Jacobsen and Carpenter Piet Jensen - the later, possibly two of Scandinavia's most experienced straw-bale-construction experts.

Due to the great size of the building - the work crew was split into 3 teams. This writer was responsible for one of these team's - made-up of 3 friends from Lithuania and 2 from Norway.
The weather during the construction period was bad with much wind and rain - so all work had to be immediately covered at the end of the working day.

The straw-bales were positioned like huge building-blocks and fastened by hammering long sharpened stakes about 90 cms in length right down through the bales. The top end of these stakes were then fastened with tightened galvanized wire to 4½ inch nails hammered-in directly to the frame construction itself. Around the windows and other openings - chicken wire was placed, attached, fastened and tightened.

I was very impressed with the potential in this technology - however what I consider is really most interesting is the interior use of the clay-straw plastering technique - and a short description follows:

1: First plaster layer - directly onto the rough straw-bales:
1 part of liquid clay + 1 part of chopped straw + 2 parts of sand [from sandpit on land]

2: Second layer of plaster:
1 part liquid clay + 2 parts of fine chopped straw + 3 parts sand [as above]

3: Third layer of plaster:
1 part liquid clay + 1 part of fine chopped straw + 4 parts of sand [as above] - different colours can now be added if desired.

It is recommended that before plastering - one first experiments with the strength of different mixture combinations - by placing these different mixtures on short pieces of planks or boards.
One should observe which of these different trial mixtures has a tendency to show signs of cracks in the clay after drying.

It is important to realize that the use of modern machinery is highly suitable to straw-bale and clay-straw construction.
Exterior plastering can be done with the assistance of spray technologies to "layer-on" the plaster.
A horizontal rotary drum mixer should be used - although great attention must made concerning the order in which the different materials are loaded into the drum to avoid difficulties with mixer-clogging.
A sharp "clay trench-digging spade" is extremely useful.
Normal individual hand tools are used and likewise normal plastering hand-tools are quite adequate during the plastering phase. However it is perhaps surprising for normal construction workers to find that such tools as a normal gardening rake - are highly suitable and indeed necessary during the difficult process to tighten the chicken wire around the window-openings.

It is my belief that this clay-fiber technology can or should have a big future both in modern new construction but especially in repair and re-conditioning of older buildings and apartments. I stayed for a few days in an older apartment in Central Oslo - where the interior walls were plastered with coloured clay/leca-clay-fiber by Carpenter Piet Jensen. The interior atmosphere and "climate" was fantastic - not a trace of "building or paint smell or odour" - no steam or moisture problems with long soaks in the bath or shower, no dust problems, etc etc.

I can strongly recommend - apart from several books from the USA: -
Architect Rolf Jacobsen's own book - " **"Halm som Byggemateriale"** -
price about 150 NKr. from Gaia Hurum, Fugleklo, 3483 Kana, NORWAY.
Architect Alice Reite - a-reite@online.no

This article is translated from Danish and was originally published in the Danish energy and environment magazine - "Energi Aarhus" # 39 - October 1998

John Furze - furze@post.tele.dk - 20 March 2003