

In Tongrinne (Building n°2), west wall seems to have a problematic behavior as the relative humidity in the straw under the bracing panel is often higher than 91.4%. In addition, simulation results indicate that the wall may have a moisture accumulation problem. However, other simulations using test reference year (TRY) in Belgium did not confirm this result, and a new analysis of monitored data should take place after summer period. This uncertainty may come from unknown material parameters of outer render added on prefabricated straw bale walls.

The second wall in Tonginne is a retaining wall. Unfortunately, one sensor (under bracing panel) does not send any data. The simulation is rather positive as it shows that on a longer period, the humidity of the wall should decrease under critical value. A special attention will be given to this wall in the future as it is normally avoid designing retaining wall with straw bales.

In Building n°3 (in Uccle), simulation results did not fit measurements. Again, this could be due to unknown material parameters of outer render added on prefabricated straw bale walls. In addition, west wall is submitted to driving rain, but no rain measurement was implemented in this case. Further analysis of this building is needed to validate hygrothermal behavior of the walls. Nevertheless, measured values are not considered to be critical (only few days over 91.4%) in this case.

If many data can still be not explored, the monitoring implemented in three straw bale buildings can already confirms that it is possible to design and validate straw bale walls based on a single quantified criteria: moisture content of straw few centimeters under the bracing panel. More research is needed to understand the link between critical moisture content and other parameters (density of the straw bale, type of plant, forming process of the bale...).

In the meantime, straw bale walls can be trusted to design high efficiency house and to offer comfortable and sustainable living places.

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