

RETROFITTING TIMBER FRAMES TO BUILDING INSULATION

INTRODUCTION

This report will propose the retrofitting of Timber Frames to achieve the necessary Building Insulation.

BACKGROUND

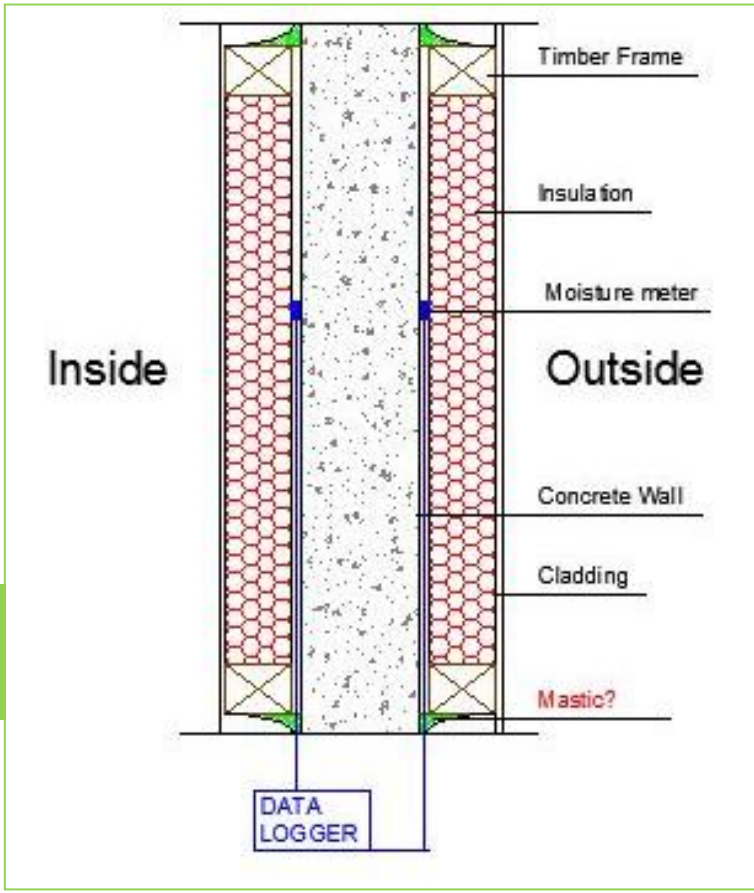
A great quantity of the buildings in Norway in the 1970s were built with timber frames walls (Statics Norway 2009) and now these constructions need to be retrofitted to provide insulation. (TEK; Traditional Ecological Knowledge, 1997).
The application of Timber Frames as a form of insulation in buildings is very common when is performed by the inner side of the wall, but this retrofitting is complex. Therefore, the research question is if retrofitting Timber Frames, on the outside of the facade, would provide insulation to Buildings.

RESEARCH AIM AND OBJECTIVES

Against the background earlier outlined, this research project will be undertaken with the aim of test the hypothesis that external timber frames in facade, work better than internal ones.

To achieve this aim, the following main objectives will be pursued:

- Objective #1- Search the extant literature with regard to comparable studies about timber frames as internal insulation and critique this literature in order to justify the methodology adopted with the help of supporting documents.
- Objective #2- Conduct laboratory tests for a period of time. For that, an insulation panel will be produced and adapted to the proof wall.
- Objective #3- Collect data obtained from tests about the two options discussed.
- Objective #4- Analyse data by developing comparison charts and diagrams, proving or disproving the proposal.



SCOPE

The scope will be limited to buildings without any kind of internal insulation, focusing on how to adapt buildings through timber frames and insulating material, sheltered of the weather.

LITERATURE REVIEW

The experimental comparable study, (Sveipe, Jelle, Wegger, Uvsløkk, Thue, Grynning, Aunrønning, Rognvik, Gustavsen, 2010), had been carried out on a test module consisting of four fields. One reference field representing a timber frame wall built according to regulations from the 1970s in Norway and three fields represent different ways of improving the thermal insulation of the reference field. During this work, a new sensor for measuring surface condensation called the wetness sensor was introduced.

The results of the experiment show that this method of retrofitting may be acceptable with respect to condensation risk in certain structures within limited climate zones, humidity classes, and building envelopes.

RESEARCH METHODOLOGY

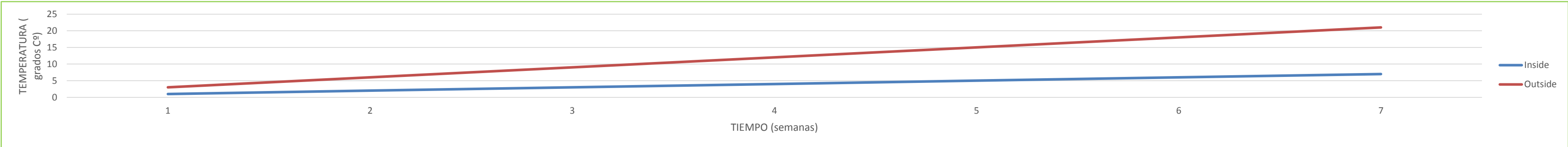
The proposed research methodology that will be adapted from “Retrofit Insulation in Existing Wooden Walls” (Alaska Building Research Series, 2000), where the strategy surveyed is the use of timber-framed with mineral wool as insulation, on the external face of timber walls, being able to adapt this to any other type of wall, as we will see in the laboratory.

The comparable study has been analysed from *Application of Vacuum Insulation Panels in Retrofitting of Timber Frame Walls – An Experimental Investigation*. (Erland Sveipe, Bjørn Petter Jelle, Erlend Wegger, Sivert Uvsløkk, Jan Vincent Thue, Steinar Grynning, Ole Aunrønning, Egil Rognvik, Arild Gustavsen, 2010), and shows the results of tests conducted with the insulation on the inside wall.

The resources required will be those necessary to find out if the investigated method complies with the thermal insulation levels. Carrying out the necessary tests to achieve the results that determine whether the solution adopted for the outside insulation, meets the minimum requirements.

DATA ANALYSIS

An example of how analyze the information (explanation below):



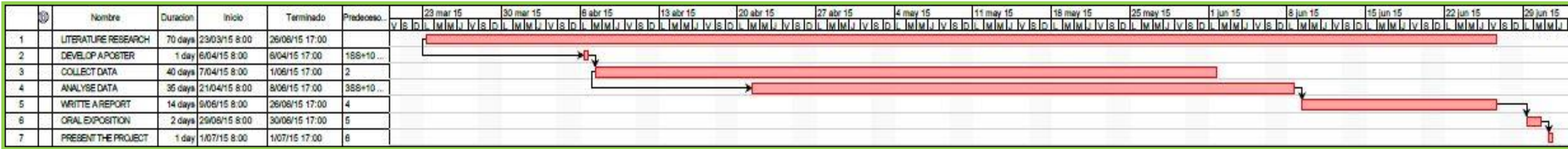
The proposed method of data analysis is arguing if the retrofitting of timber frames panels with any insulation material outside walls. Therefore it will be need to check if this method of insulation acts better on the outside than inside.

For this, tests measuring temperature and moisture will be performed in the laboratory.

From the tests, once we get the obtained values, will be made diagrams that relate the variables of time, temperature and moisture.

In these two diagrams, the values of the inner face and the outer one will be reflected.

GANTT CHART



ANTICIPATED OUTCOMES

The findings based on the methodology employed may yield the following outcomes:

1. That the results obtained of external timber frames can be discussed with the comparable study of internal insulation method.
2. Successfully perform the tests in the laboratory for the results will be representative.
3. Obtain, from tests performed, consistent results that can be analysed and compared.
4. That aforementioned results lead to the conclusion that the investigated proposal is better than the comparative study.

REFERENCES

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