



# EARTH USA 2011

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**Title:**

Historic buildings and cities including their stabilization, preservation and conservation

**Abstract:**

This study researches the building process, aspects of indoor climate, thermal comfort and energy use on the workman houses erected between 1870/71 and 1882 at Koengen in Oslo, Norway.

A study of the historical data about planning and organisation of the historical houses has been done as a diploma in 1976 by student of architecture Hilde Almar-Næss. The study gives important information about the building material, construction and the condition of the historical buildings. The historical buildings are measured, drawn and documented by photographs.

A polish originated industrialist named Fritz Heinrich Frølich (1807-1877) experimented in the 1860th on earth as a cheaper building material in order to offer houses to the employees in his factories.

He developed together with the well-known Norwegian architect Georg Andreas Bull (1829-1917) a common housing type for families on a property at the outskirts of Kristiania, the former Oslo.

Twelve one and half storey houses were built. The cellars are of quarry stone. Between the earthen wall and the natural stone wall is a layer of coal tar to prevent moisture from ground and terrain. All the houses have typical roofs with long overhang. The walls are made by bricks (adobe) measuring 3 inches to 6 inches to 12 inches. It is said that all the earthen building material was taken out of the ground at the property. The bricks are made by a mixture of sawdust and earth. The facade is covered with a layer of coal tar and lime painting/plaster to prevent weather impact.

Today there are eleven buildings as part of an urban quarter, called Frølichbyen, Lerbyen ("claytown") left.

In an on-going study the residents have been asked about their experience living in an earthen building in a climate zone standing for long and cold winters. Taken the statement that earthen buildings are cool in the summer and warm in the winter as a hypothesis, the questionnaire informs about the experience with thermal conditions in an earthen building. The questionnaire is basic documentation for a measurement of indoor and outside temperature and humidity cycles in one of the historical houses. By autumn 2011 technical measurements in cooperation with the Norwegian technological institute SINTEF in Oslo are planned to start. The results will be investigated by students of architecture and engineering.