

ENERGY UPGRADE TO PASSIVE HOUSE STANDARD FOR HISTORIC PUBLIC HOUSING IN NEW ZEALAND

Manfredo Manfredini¹

Paola Leardini¹

Maria Callau

1. University of Auckland, School of Architecture and Planning

A large part of the current New Zealand housing stock was built prior to the policy of mandatory insulation introduced in 1978, thus its low energy efficiency has significantly contributed to health inequality, fuel poverty and building decay. The State housing stock in particular, includes a relevant portion of problematic buildings. A consistent and significant cohort of them was built in the 1940s and 50s under the government funded social housing scheme introduced in 1937 by the Labour Party administration. Those houses, built with the iteration of few similar types, good quality materials and sound construction prove to be suitable candidates for effective energy upgrade interventions.

This paper discusses findings of long term research at the University of Auckland, presenting problems, opportunities, strategies and predictable effects of retrofitting interventions on 1940s-1950s State houses in the Auckland conurbation. It also advocates future strategic national policies and initiatives for housing retrofitting based on more challenging performance thresholds.

The research focused on the definition and virtual implementation of different retrofitting packages to a pilot project in Auckland. Pre-retrofitting indoor and outdoor environmental parameters of a selected house and two control houses were monitored over one year period and data used to establish a “base case” for thermal simulation. Several upgrade options were then modelled to assess their impact on the house’s thermal performance. Finally, annual heating requirements and comfort conditions of various insulation and ventilation options were compared.

This paper explores the different upgrade options tested in the study and reports on ways of improving a typical stand-alone State house in Auckland to high thermal performance levels, using the German “Passive House standard” as a target. The study investigated the feasibility of this model in the New Zealand context, specifically looking at criteria of the retrofit standard ‘EnerPHit’.

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Presenting authors name and email: Manfredo Manfredini - m.manfredini@auckland.ac.nz

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