# CASE STUDY

# Baillie Eco-Home


## PRODUCTS USED

Earthwool® glasswool: Ceiling, R4.1
Earthwool glasswool: Wall, R2.6
Earthwool glasswool: Acoustic, R1.4
ClimaFoam® XPS Board, R1.1
ClimaFoam XPS Board, R1.8

## PROJECT

Baillie Eco-Home

## ARCHITECT

RTA Studio
Ben Hayes

## MAIN CONTRACTOR

Eco Construct
David Anstis

## CONTRACTOR

Eco Insulation

"We were delighted with the range of insulation solutions that Knauf Insulation offered us to help achieve our objective of building a net-zero energy, 10 Homestar rated home," said Russell Baillie.

## CHALLENGE

Baillie Eco-Home is a new family home in Mt Eden, Auckland. At the design stage there were two requirements that needed to be met - achieve 10 star Homestar rating and be wheelchair friendly.

"We wanted the house to be super healthy, warm and as sustainable as possible," said Russell Baillie, Baillie Eco-Home owner.

"We also wanted to ensure no space heating would be required during a 'normal' winter."

## SOLUTION

Earthwool® glasswool: Wall batts, R2.6 were installed in both the internal and external walls of Baillie Eco-Home. It was important to use a high rating insulation in the walls in order to help regulate the temperature in the home and help meet the objective to not use heating to maintain a comfortable temperature.

To ensure optimal thermal performance of the external walls, Earthwool glasswool: Wall batts, R1.4 were laid perpendicular between battens as an extra layer to the R2.6 insulation. Thereby increasing the thermal rating and also helping to reduce thermal bridging.

In addition to the wall insulation, Earthwool glasswool: Ceiling batts, R4.1 were used in the upper ceiling level to help stabilise the internal temperature. A home can lose most of its heating and cooling energy through an un-insulated ceiling and by installing an R-Value that is higher than the recommended minimum standard the home will be highly energy-efficient and future proof.

The Baillie Eco-Home ceiling structure consisted of trusses with 50mm metal battens spanning the roof line between the trusses and the plasterboard. This created an extra cavity allowing for additional insulation to be installed. Earthwool glasswool: Wall batts, R1.4 were chosen to fill this space in order to reduce thermal bridging.

As the owners of Baillie Eco-Home were aiming to achieve a net-zero energy home, ClimaFoam® XPS Board, R1.1 was installed around the perimeter and ClimaFoam XPS Board, R1.8 was used underneath in key locations. Perimeter insulation is essential to ensuring heat is not lost through the edge of the slab to the outside, and raising surface temperatures inside to reduce the risk of any condensation or mould. ClimaFoam XPS Board, R1.8 was also added to the external masonry wall where a high R-Value was required in a tight space. ClimaFoam XPS Board has high compressive strength, 300kPa, and a closed-cell structure, which makes it highly water resistant.

## RESULT

"We were delighted with the range of insulation solutions that Knauf Insulation offered us to help achieve our objective of building a net-zero energy, 10 Star Homestar design rated home," said Russell.

"We had quite specific requirements for insulation and Knauf Insulation provided a range of solutions that would best achieve our thermal performance requirements. As a result we were able to ensure all areas of the home were super insulated."

Achieving a Homestar rating meant Baillie Eco-Home would demonstrate New Zealand best practice for thermal performance and sustainability.

As well as contributing to the eco-credentials of the home, Earthwool glasswool insulation is also a highly sustainable product. It is made using recycled glass and with ECOSE® Technology, a formaldehyde-free binder based on rapidly renewable materials instead of petro based chemicals. Earthwool glasswool with ECOSE Technology reduces the impact on the environment through lower embodied energy and also pollutant manufacturing emissions making it the ideal product to meet Homestar requirements. Furthermore, Earthwool glasswool insulation has GreenTag Level A certification, which is testament to Knauf Insulation's high manufacturing standards and commitment to sustainable building design.

Knauf Insulation
Building 1, Unit 2, 15 Accent Drive
East Tamaki 2013, Auckland
New Zealand

For further information contact:
Tel: 0800 562 834
Email: info.nz@knaufinsulation.com

www knaufinsulation.co.nz

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