

Building a Brighter Future – Aotearoa’s first Homestar (v5) 10 home

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Disclaimer: Any views represented here is my personal opinion and does not represent those of organisations I may be associated with.

Nelson ↔ Auckland

Flying = 130kg of CO₂eq

EV + Ferry = 27kg of CO₂eq

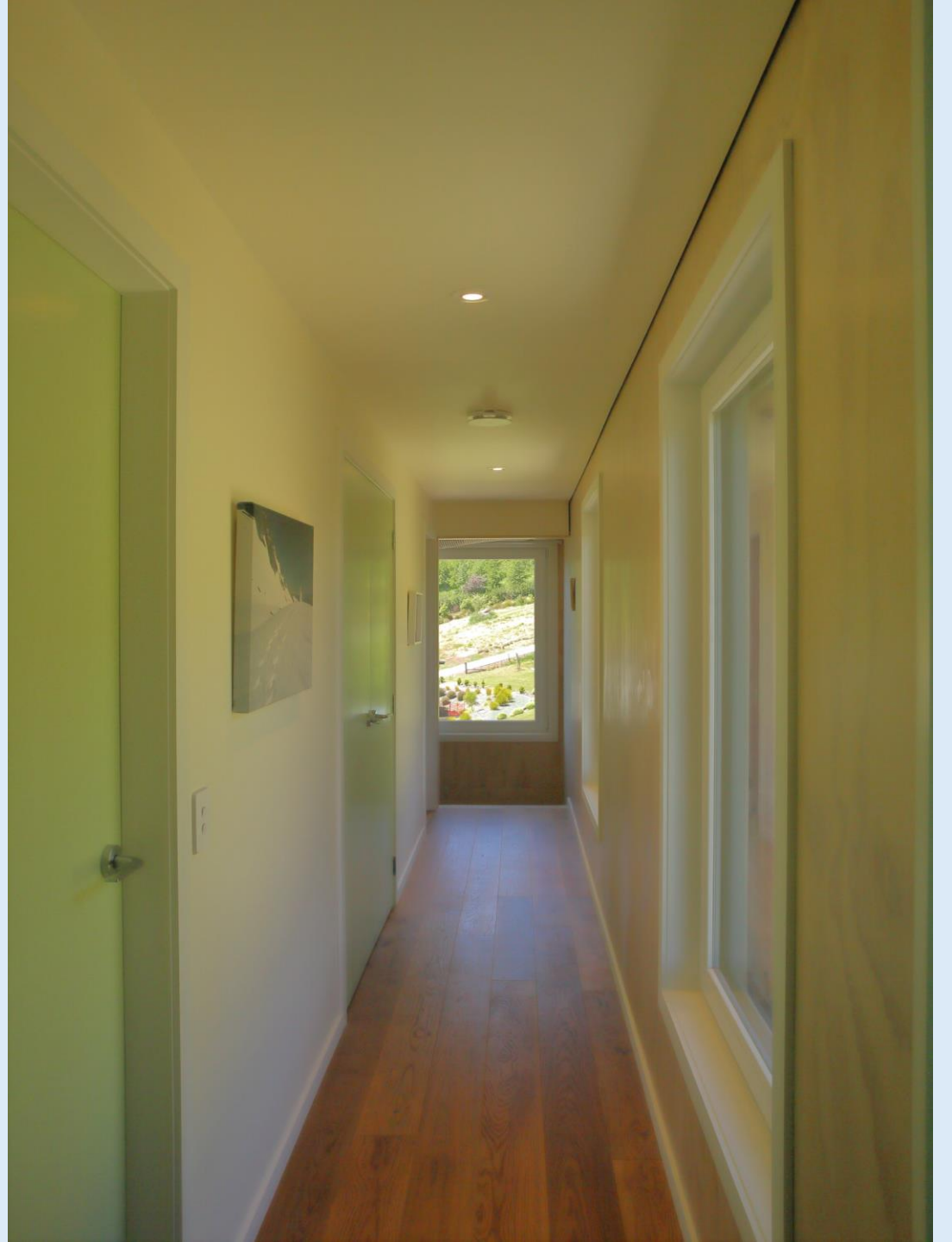


Certified
Passive House

Passive House Institute









Performance

19-23°C with zero heating during winter and natural cooling during summer

Zero heating required in 2023

Power bill approx. \$100 which includes:

- an EV (approx. 50 – 60 kWh/ month);
- \$14 for carbon offsets
- Energy use (<300 kWh/ month)

\$104.22

Due Date

17 Aug 2023

\$84.50

Due Date

17 Mar 2024

Summer Temperatures

20-24°C

Cross / Stack ventilation

No thermal mass



A photograph showing a wooden foundation structure under construction. The structure consists of several wooden beams supported by vertical wooden piles. A large blue tarp is laid out on the ground beneath the structure. The background shows a grassy hillside and some trees.

Benefits of building on piles

Embodied Carbon of Concrete

Only a 5% reduction in emissions is achieved with 'green' concrete (Thinkstep, 2019. Under Construction Report).

Green or not, concrete was NOT compatible with our 1.5°C goal.

Our solution was to minimize use where possible

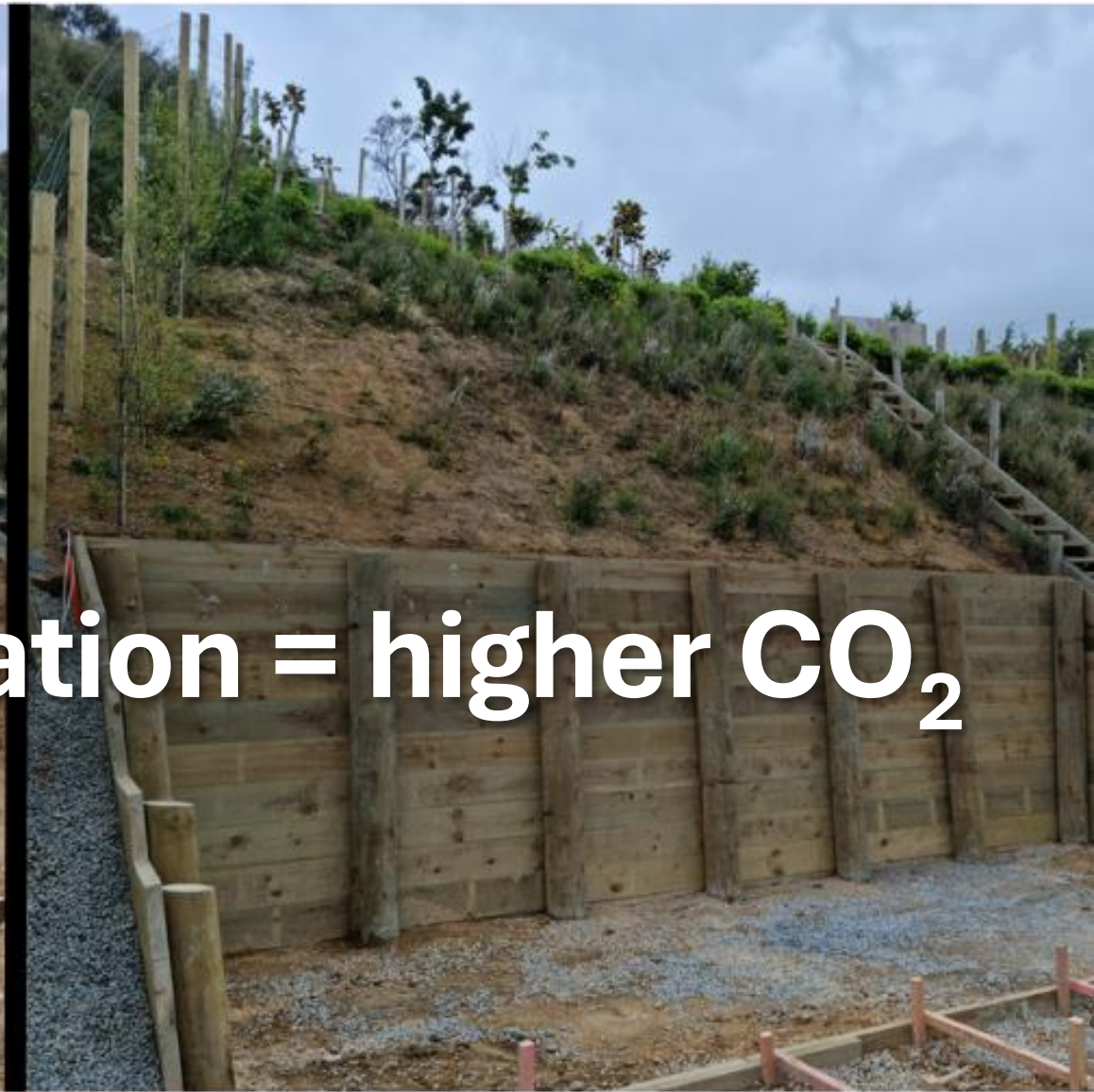


Business As Usual means Higher Embodied Carbon

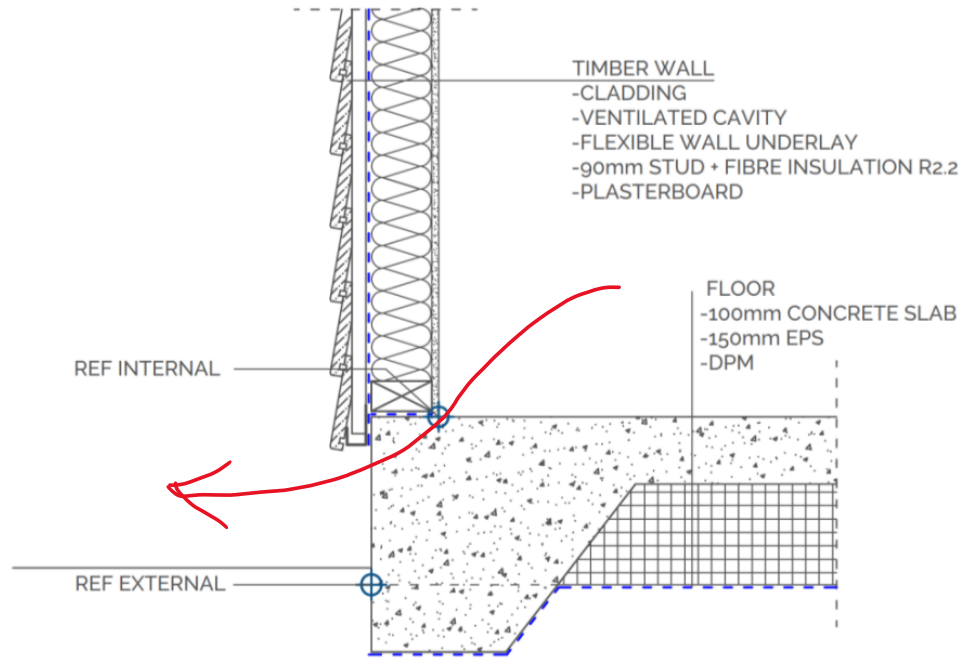
- Concrete raft on grade
- Single storey
- Additional excavation so retaining would be required
- Ground conditions would still require piles
- Concrete driveway

This would require $\geq 70\text{m}^3$ of concrete (17,000 kg CO₂ eq)

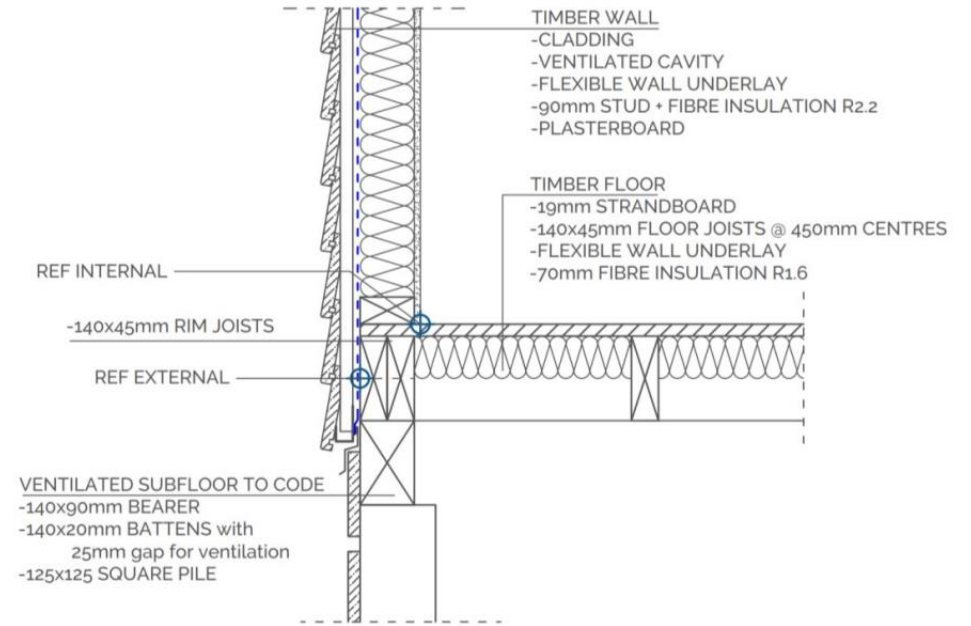
Our house only used 14m^3 of concrete



Retaining and excavation = higher CO₂



X



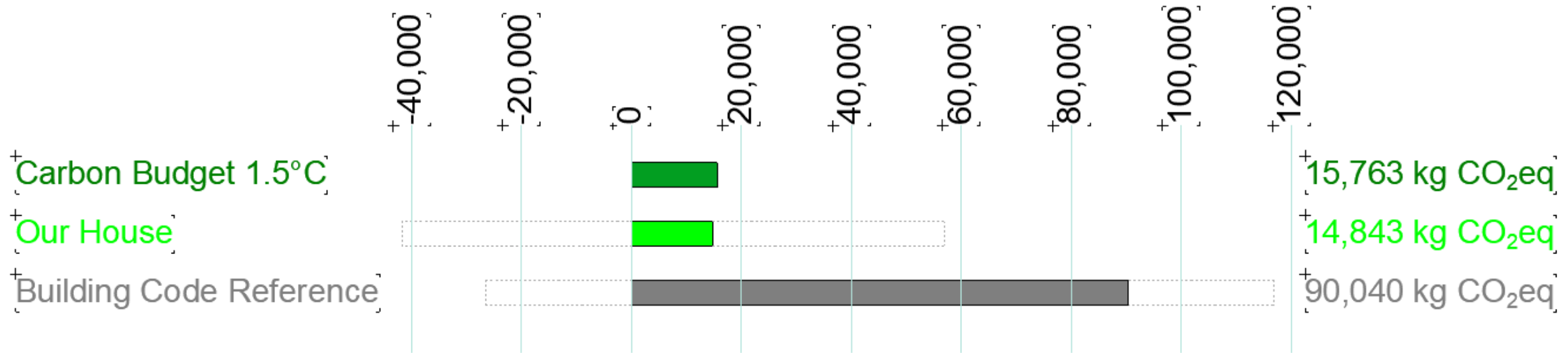
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Better Thermal Envelope



Better access to services

Carbon analysis should be done during design stages.



Lifecycle Carbon: Meeting the 1.5°C goal



In 10 years' time, we want to be able to look into our daughter's eyes and say we did our best.