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PrefabNZ's Submission on
Building for Climate Change

Introduction

PrefabNZ is a non-profit membership organisation that informs, educates, and advocates for innovation and excellence in offsite design and construction in New Zealand. PrefabNZ represents 245 businesses and individuals, including designers, architects, engineers, builders, developers, clients, and researchers.

PrefabNZ has been at the forefront of the offsite sector over the last 10 years and is confident that modern methods of construction (MMC) and new technologies can achieve a better built environment; high quality, smarter, greener, safer, faster, more innovative and efficient building solutions. PrefabNZ's vision is for offsite construction in New Zealand to be mainstream, with productivity high and value created for clients and society.

General Comments

PrefabNZ agrees with the need to increase the operational efficiency of buildings, and to reduce the embodied carbon across the lifecycle of buildings as part of the Building for Climate Change programme.

Transforming Operational Efficiency

PrefabNZ is supportive of the need to reduce operational carbon emissions, reduce water use and improve the overall health and wellbeing of occupants by improving the indoor environmental quality of buildings.

Whole-of-life embodied carbon emissions reduction framework

PrefabNZ agrees that the whole-of-life embodied carbon emissions of buildings should be reduced, including emissions across the full supply chain of construction materials and processes.

PrefabNZ sees an opportunity to promote the use of MMC given the sustainability benefits of reducing whole-of-life embodied carbon emissions through the prefabrication process. BRANZ (Steward, 2011) identified a number of environmental benefits of prefabricated construction, including:

- less raw material needed – the use of materials in factory assembly can be more precise, and there is less chance of materials getting damaged on site.

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- the ability to recycle – it is easier to recycle off-cuts and excess material within a factory environment than on site.
- the reuse of structures – it is more practical to disassemble a modular project and salvage or reuse significant components of the building.
- less site disturbance – this is because the prefabricated structure is constructed off site simultaneously with the foundation and other site work, reducing the time and impact on the surrounding environment, as well as the number of vehicles and amount of equipment needed on site.

Later BRANZ researched identified that prefabrication in New Zealand reduces the waste material generated at construction sites (Burgess, Buckett and Page, 2013).

One key shortcoming of the current proposed framework is therefore the lack of focus on how a building is built. The current focus of the framework is on building size, the amount and type of construction materials and products used, and the carbon emissions associated with these materials and products. The framework should also clearly identify the impact of how a building is constructed and the benefits of utilising MMC for achieving reduced whole-of-life embodied carbon emissions.

PrefabNZ also believe that the broad adoption of MMC/OSM should be a key strategy, and a specific target, within the framework to drive the building and construction sector's contribution to New Zealand's goal of net zero carbon emissions by 2050.

This is already occurring in other countries. The 'Next Normal In Construction' McKinsey report (June 2020), for example, highlighted that governments are increasingly actively mandating modern methods of construction. For example, all government housing projects in Singapore must use prefinished volumetric modules.

Vehicle movement. If the framework is not explicit regarding MMC/OSM then considerations such as vehicle movement will be overlooked. OSM reduces vehicle movement to and from site, including vehicles transporting goods and people to site. Miles and Whitehouse (2013) use a simple calculation to demonstrate how fewer large vehicles could produce less emissions than smaller vehicles. BRANZ research has also identified that prefabricated construction can reduce the transportation of materials, components and labour, and thereby the emissions resulting from vehicle movements in construction activities (Burgess, Buckett and Page, 2013). Furthermore, Heathrow Airport's 3rd Runway strategy factored in vehicle movement when deciding to move to an offsite centre network for pre-assembly and consolidation.

Recommendation

- That the framework explicitly references modern methods of construction as a key strategy, with accompanying targets for uptake, to achieve net zero carbon emissions by 2050.

Listed overleaf are some recommended reading resources regarding current global trends in relation to the contribution of MMC to sustainability outcomes in the built environment. PrefabNZ welcomes the opportunity to discuss these matters further with MBIE, if required.

Please do not hesitate to contact me should you have any queries in relation to this submission.

Yours sincerely,

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Miles, J & Whitehouse N (2013) Offsite housing review, Construction Industry Council, London, UK.

Stewart, P., 2011. Bright future for prefab. *Build*, [online] (127), pp.38-39. Available at: <https://www.buildmagazine.org.nz/articles/show/bright-future-for-prefab> [Accessed 7 October 2020].

Recommended reading resources

The Next Normal In Construction, McKinsey & Company, June 2020.

Methodology for quantifying the benefits of Offsite Construction, Tercia Jansen van Vuuren, Prof Campbell Middleton, University of Cambridge. 2020.

Construction 2025 (HM Government) 2013.

The Farmer Review (Farmer 2016).

Construction Sector Deal (HM Government) 2018.

Offsite Manufacture for Construction: Building for change (House of Lords 2018).