

AH 21 018

11 March 2021

Minister of Housing
cc: Vui Mark Gosche, Board Chair

Update – Off-site Manufacturing

Purpose

This paper updates you on the current Off Site Manufacturing (OSM) activity across Kāinga Ora – Homes and Communities.

Background

The overarching goal for OSM is to assist Kāinga Ora to deliver faster, better quality homes. At the same time playing a part in solving New Zealand's housing issues. It is envisioned that OSM can:

- reduce the time, cost and urban disturbance of delivering housing
- contribute to achieving governments broader objectives, including regional economic development, skills development, and aligning with Māori and Iwi Housing Innovation Framework for Action (MAIHI)
- deliver better quality homes for occupants, with reduced environmental impact.

Current constraints

The building sector is one of the least innovative sectors and most resistant to change. System level change in this sector is constrained by:

- the investment in construction, which is significant (6.2 percent GDP¹) along with its complex value chain comprised of many Small and Medium Enterprises, meaning that change requires alignment of multiple influences
- fewer large vertically integrated companies like we see in other countries, meaning that in some cases new partnering models such as joint venture's, are needed to deliver the final product of an OSM house
- a 'switching cost' for companies to change their processes and learn new skills in areas such *Logistics, Consenting, and Design*
- the cyclical boom-bust nature of the construction sector, which makes longer term horizons hard to model and invest in
- risk adverse legislative environment.

¹ <https://www.mbie.govt.nz/dmsdocument/11600-construction-factsheet>

Learning from international experience

The path toward increased use of OSM has already been charted in other countries, and we can therefore learn many lessons from our counterparts (e.g. Sweden, UK and Japan). What we observe from their experience is:

- Government leadership is required to stimulate enough demand for businesses to pivot, or invest, enabling these early adopters to move rapidly along the innovation adoption curve
- these early adopters require:
 - steady demand and supply aggregation/pipeline
 - common language and definitions for supply chain interoperability
 - new delivery and procurement models
 - skills and training
 - fit-for-purpose regulation and accreditation
 - understanding of differences by finance and insurance sectors.

The greater the collaboration across government the greater the impact. Kāinga Ora is leading the establishment of an inter-government OSM working group to ensure all government levers are used to enable this system transformation.

How we intend to reach our goals

Kāinga Ora will:

- increase momentum towards market uptake of OSM solutions for housing
- use all of the levers available to increase the amount of OSM in its portfolios and work with industry to remove barriers and build momentum for the increased use of OSM solutions - such that they become common place due to the time, cost, quality outcomes for both the supply chain and the customer.
- Resource the OSM implementation plan to deliver tangible actions

Kāinga Ora will set targets to increase the use of OSM, and measure how this activity will contribute towards achieving our goals. Our measurement will include a broad set of criteria including:

- supply chain capacity and capability growth
- time, cost, quality and health and safety improvements
- contribution to broader whole of government regional economic development, social and environmental outcomes.

The Kāinga Ora OSM Implementation Plan includes the following strategic actions:

- *stimulate demand*: defining our requirements and clearly and transparently articulating them to the market

- *take measured risk*: a preparedness to take measured risk to be able to prioritize OSM opportunities that maybe outside BAU. This will enable management to develop a detailed understanding of what changes may be needed in the business case, and be able to quantify the additional benefits delivered (e.g. time, cost and other)
- *deliver on broader government objectives*: to support government's overall economic development objectives we will where possible, support the establishment of local manufacturing capacity and capability, whilst learning from mature markets overseas
- *be the matchmaker*: we will play an important role as 'matchmaker' between sector parties e.g. manufacturers, developers, and builders
- *organise internally*: Our process is designed for traditional build, we will understand the different needs of OSM and tailor our systems accordingly
- *partner with others*: we will cooperate across agency boundaries, with non-governmental organisations and private sector entities.

Industry Background

OSM Factories:

There are currently two fully operational OSM factories in New Zealand (Concision and Clevercore), with Hector Edgar, BuildPartners, and RedStag factories becoming operational in 2021. There are several other companies who are discussing OSM factories within the next two years.

Our plan is to work with these factories and their delivery partners/installers to give them predictable demand to match their availability to supply Kāinga Ora.

According to PreFabNZ there are approximately 50 suppliers of "OSM" products and services. These range from production of components such as bathroom pods. to wall panels. PreFabNZ are currently updating their industry capacity and capability report, which will be available for our use in July/August 2021.

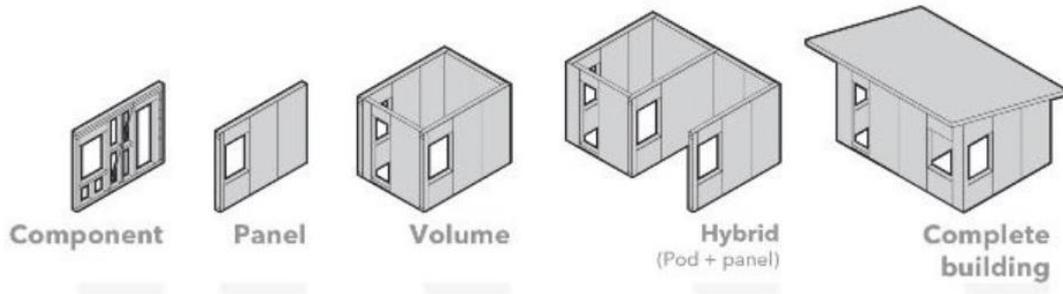
The Frame and Truss evolution:

In addition to the higher tech factories coming online in New Zealand, there are a number of suppliers who are transitioning towards OSM in a gradual manner. We consider these companies will play an important role in the market transformation. As they increase their use of OSM, they increase their skill and potential to innovate and use more technology themselves (micro factories) and potentially start using product from the more high-tech factories.

Industry Engagement:

Our internal OSM mapping across all panels and Urban Development Delivery projects has approximately 40 companies that have engaged with us with an interest for Kāinga Ora to use their OSM products and services. We are in the process of categorising these solutions and reviewing our due diligence and procurement process to use a balanced score card approach.

Below are the types of OSM classified by PreFabNZ, we intend to align with industry norms where possible in our definitions of OSM across our portfolio.



Current Activity

The state construction portfolio currently has 550 units, which equates to approximately 12 percent (post resource consent in construction, excluding tilt slab) utilising OSM solutions. The range of OSM used varies from cross laminated timber in three level walk ups, to wall panels, bathroom pods, to full volumetric solutions delivered to site across all typologies. These companies are a mixture of onshore and offshore providers.

Pilot projects within Construction and Innovation/ State Portfolio:

s 9(2)(j)

s 9(2)(j)

s 9(2)(j)

The Urban Development Delivery portfolio currently has 300 units utilising OSM solutions. s 9(2)(j)

KiwiBuild Invitation to Pitch

The KiwiBuild Off-Site Manufacturing Invitation to Pitch (OSM ITP) which Kāinga Ora assumed responsibility for on establishment in October 2019. This is an update on all remaining activity under this work stream, which is now managed under the governance of the OSM Steering Committee.

s 9(2)(j)

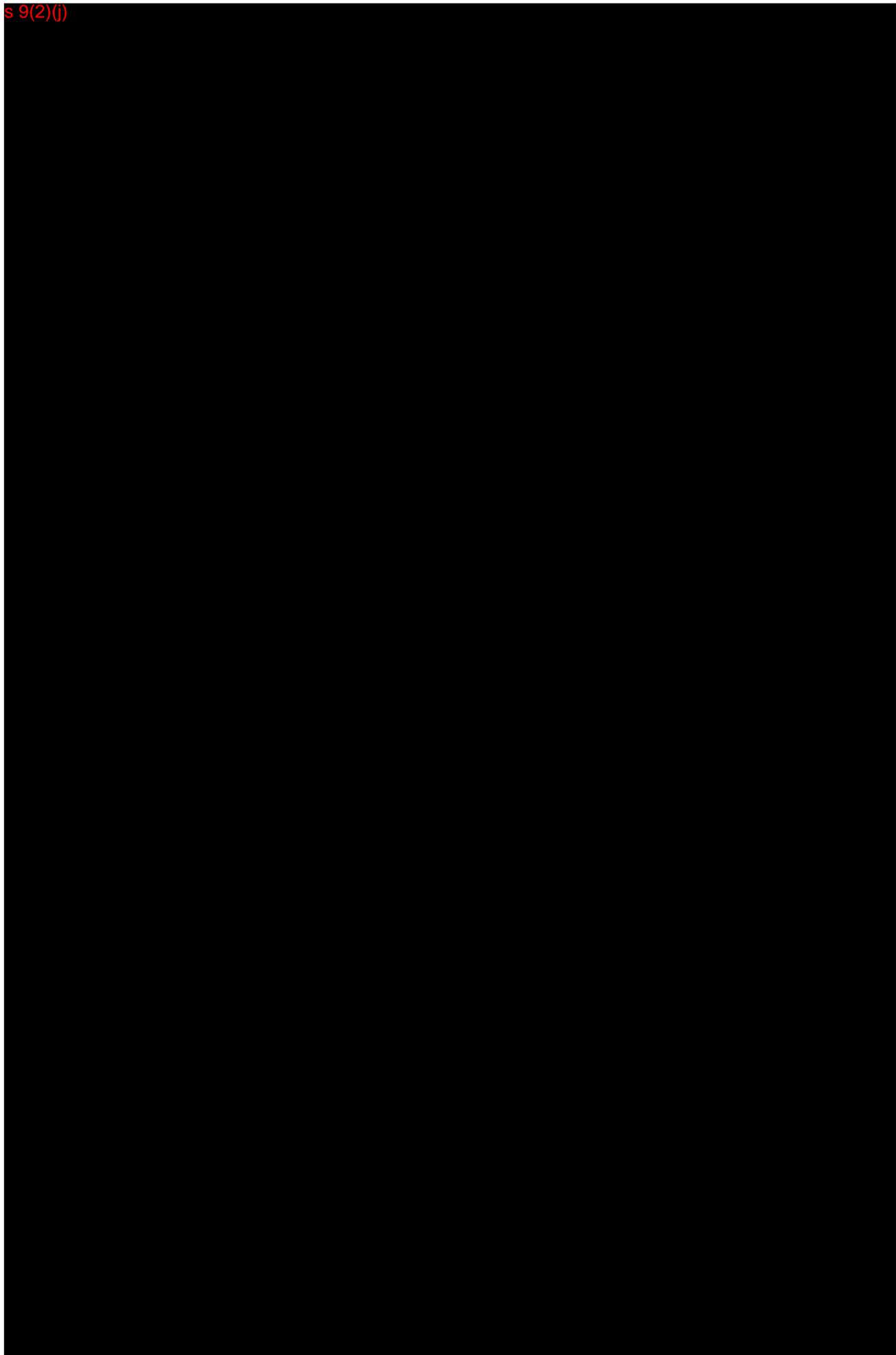
s 9(2)(j)

Panasonic Homes / Mike Greer

s 9(2)(j)

MG and Pana have agreed a joint venture which promises scale and speed, operational efficiencies, de-risking potential and other synergies. Pana brings world leading OSM technology and assembly methodologies, coupled with a large balance sheet and pre-existing capacity to supply New Zealand. Pana has built over 800,000 homes in Japan. MG brings local knowledge and connection, credibility with domestic partners and buyers, and is proactively seeking to bring greater OSM into New Zealand.

s 9(2)(j)



s 9(2)(i)



A handwritten signature in blue ink, appearing to be 'PD'.

Patrick Dougherty
General Manager Construction and Innovation