

Memo

To: Joshua Lunch
From: Paul Stoller
Cc: Michael Baker

16 December 2020
By Email
Warriewood Community Centre / Atelier Ten project number 1469

Energy and water conservation memo

Dear Joshua,

This memo summarises the approach to energy efficiency and carbon neutrality taken by the project team for the Warriewood Community Centre.

Low energy use building

The Community Centre will minimise operational energy use by:

- Incorporating Passive Design principles throughout the architecture to maximise the hours of indoor comfort without need for mechanical cooling or heating. Design measures that do so include:
 - Well insulated walls and thermally efficient double glazing that outperform Section J minimum requirements
 - A highly insulated roof
 - Limited glazing areas sized for great views and ample daylight
 - Shaded windows and clerestory glazing
 - Operable windows positioned for effective natural ventilation
- Daylighting major spaces throughout the Centre to limit the need for electric lighting use during the day.
- Using a modular air-conditioning equipment approach, so that equipment runs efficiently in both low-occupancy and high-occupancy modes.
- Using energy-efficient heat pumps instead of gas boilers for space heating needs.
- Highly efficient LED electric lighting.
- Premium efficiency domestic hot water systems, heat pumps, fans, refrigeration, and other building systems.
- High quality building controls configured with energy efficiency as an operational factor.

The project team is targeting annual energy use savings of 20% or better relative to the requirements of 2019 National Construction Code Section J.

Additionally, the project team has designed the building roof to accommodate a PV array sized to generate annually the same amount of energy used across a year by the building. This Net Zero Energy Building ambition would mean that under sunny daytime conditions, the building would often be a net exporter of energy to the grid; during cloudy days and

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evenings, the building would import energy. Across the year, the total amount of energy exported will equal or exceed the energy imported.

Space will be allocated adjacent to the building for the future installation of electricity batteries in case the Council should ever wish to minimise or energy export and import to this property or maintain building operations during times of power grid outages.

Low carbon emissions building

The Community Centre will minimise Scope 1 and 3 greenhouse gas (GHG) emissions by:

- Using a timber structure, which typically has sequestered carbon capacity that can be used to offset some or all of the embodied emissions of other building materials.
- Reducing operational energy needs (described above).
- Supplying most of the daytime electricity demand with emissions-free renewable power generated by the rooftop PV array.
- Eliminating any on-site fossil-fuel use (all-electric, gas-free building).

Scope 2 emissions from purchased electricity are under the control of Council, who purchase power for this building and other Council assets. As the overall grid decarbonises, which is happening rapidly in NSW, this building's energy-related emissions will go down. If the Council chooses to procure renewable power, the building's operational emissions will decline commensurately.

Water savings

The Community Centre will minimise potable water use by:

- Using dry heat rejection equipment (air-cooled chillers, or an alternative ground-source heat pump system) rather than wet cooling towers.
- Using native landscape plantings to minimise irrigation need.
- Capturing rainwater from building roofs and using this for toilet flushing and landscape irrigation.
- Specifying highly water efficient fixtures and appliances.

All of these design measures are spelled out in more detail in the appended sustainable design report that was completed as part of the Concept Design stage of the project, "ESD Report – Sustainability Initiatives, Warriewood Valley Community Centre" dated 26 May 2020.

Sincerely,



Paul Stoller
Director