ACT Government | Suburban Land Agency

North Wright Compact Housing Project - Useful Definitions

OVERVIEW OF STAGE 1 SUSTAINABILITY OBJECTIVES

Stage 1 townhouses shall achieve +**7 stars energy efficiency** performance (NatHERs/EER). Stage 2 (future stage) is a mix of 8 stars and Passivhaus Classic. All townhouses shall have **integrated energy monitoring**.

Townhouses will be **whole of life cycle assessment (LCA)** carbon-modelled for their initial construction and embodied carbon materials use; operational energy use and maintenance and end of townhouse life considerations. Designs will be informed by their total carbon impacts and townhouses shall halve their carbon footprints (or better) when compared to 'business as usual' (180sqm average Canberra residential dwelling with 6.5 stars EER).

Key sustainability considerations, requirements and features include:

1. Reduced house size

- Through flexible, space-saving design strategies, we seek demonstrable occupant amenity within compact two to three-bedroom townhouse forms.
- Townhouses are **around 90-130sqm in size** (excluding carports or garages).
- Research describes house size reductions of this order as contributing around a 20-30% carbon footprint reduction (over the townhouse life cycle), before other measures such as improved energy efficiency are introduced.

2. Passive solar design and thermal mass

- Comfortable, energy efficient townhouses, well-oriented for **solar passive** heating, combined with the use of internal thermal mass to capture, store, and release the sun's energy.
- North facing private open spaces and windows for living areas with appropriate eaves and sunshade devices to minimise unwanted summer sun and for weather protection more broadly.
- Designs optimised to maximise energy efficiency, use of natural light and for crossflow ventilation to passively cool the townhouse. Some mechanical ventilation and cooling systems may be necessary for heatwaves or extreme weather events. Active heating systems may be necessary for colder periods.

We acknowledge the Ngunnawal people, the Traditional Custodians of the lands and waters where we live and work, and pay our respects to the elders past, present and future.

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3. Airtight and insulated

- Quality construction of the townhouse's external envelope. The detailing, materials specification, use of double glazing, gap sealing and insulation should be designed and delivered to maintain desirable indoor temperatures and to minimise heat/coolth loss.
- A 'blower door' air leakage test will be conducted.
- In Stage 1 and the designed and constructed townhouse envelopes shall achieve 4-8 air changes (ACH) @ 50pa.

4. Energy efficient appliances

- Townhouses designed for energy efficiency feature **supplemental or active heating and cooling** for peak season and/or extreme weather events. This may take the form of efficient mechanical heating and cooling units (such as inverter air-conditioning or the like).
- **Energy efficient appliances** will include induction cooktops, hot water units and lighting.

5. Energy efficient, all-electric

- The ACT Government has committed to transitioning to a 100 per cent renewable electricity supply by 2020 and to a net zero Canberra by 2045.
- Reducing the operational energy used by townhouses is crucial to meeting these targets.
- The improved thermal performance of townhouses not only improves their energy efficiency performance, reduces the cost to run, but it can also make them more comfortable places to live and work.
- Townhouses will be climate-wise and will prioritise passive heating and cooling, supplemented as necessary by energy efficient mechanical heating and cooling units.
- Townhouses will meet or exceed the minimum energy rating required by the National Construction Code.
- Townhouses will not be connected to natural gas.

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6. Rooftop solar, battery, energy monitoring and electric vehicle charging

- Each townhouse shall be all-electric, have roof top photo voltaic (PV) solar panels, battery energy storage, an electric vehicle charging point and energy monitoring and demand management.
- As all-electric townhouses they shall not connect (or permit connection of) any development on the block to any form of supply of gas for heating, cooking, hot water, or other systems.
- The design of the roof including its pitch should allow the optimal installation of solar water heater collector panels and solar PV resulting in an integrated 'roofscape'.

7. Low carbon and recycled materials

- Previously we mentioned the example and benefit of reduced house size. More broadly, we have a 'stretch target' to reduce the carbon impact of materials by 20% compared to BAU and there are several strategies available to help reduce carbon

8. Climate-wise buildings and living infrastructure

- 'Adaptation' is the process by which vulnerability to climate hazards is minimised. In Canberra, bushfires, extreme heat/cold and severe storms have been identified as posing an increasingly significant threat in the future.
- The SLA seeks climate-wise designs to provide safe and comfortable living and home-working conditions for residents.
- By designing townhouses to better suit our current and future climate we can reduce demand for electricity, save money, improve comfort levels through all seasons, and be more resilient to climate change impacts.

Canberra's *Living Infrastructure Plan: Cooling the City* (2019) identifies opportunities for living infrastructure measures to increase climate resilience, while providing access to nature, and health and wellbeing for all Canberrans.

Living infrastructure principles applying to public and private realm landscaping include:

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- delivering water sensitive urban design features;
- maximise landscape permeable surface (SLA *Sustainability Strategy* 2021-2025 and DV369);
- maximise tree canopy cover precinct target (SLA *Tree Canopy Cover Framework);*
- use of sustainable, recycled, and innovative landscape materials and use of local contractors and suppliers;
- use of lighter roof and cladding colours; and
- at precinct scale, the landscape design aim is to re-envisage underutilised open spaces as community- and habitat-creating places for the residents and wider community to gather, play, connect and grow.

Guidance on design considerations for land use, permeable surface, tree canopy cover and building envelopes can be found in the SLA's Your Resilient Home Guide and the Climate Wise Garden Design booklet. Landscape design considerations continue into the next section on water-wise design.

9. Water-wise townhouses and landscapes

- The previous section touched on climate-wise and resilient landscape design considerations and here we touch on low water demand and low maintenance landscape including:
- increasing the permeability of surfaces for reduced stormwater run-off;
- heat mitigating landscape design;
- planting tree species that respond to the local climate and provide shade during summer;
- locating screening plants adjacent to fences, retaining walls;
- consideration of the potential impact/management of bushfires;
- local native planting to encourage bird life; and
- use drought tolerant species which may include natives and exotic species.

Within the townhouses themselves:

- water-efficient design appliances and fixtures as close to the hot water heater as possible;
- managing roof water as a valuable resource and locate at least a 5000 litre rainwater tank close to the wet areas for toilet flushing and laundry use;
- use low WELs rated flow fittings.

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10. Healthy precincts

- The project has proximity to public transport, schools, shops, nearby parks, and to Stromlo Forest.
- The place-led precinct landscape design will be designed to foster community connection through pedestrianised, activated, and vegetated public spaces as part of a regenerative landscape strategy.
- A cycling theme for the precinct will also be explored through the introduction of shared e bikes and shared bike facilities/storage.

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