

# CASTLE GRANGE

HILLS DISTRICT

2154

## Sustainable Design Statement

24-34 Fishburn Crescent & 2-12 Sexton Ave,  
Castle Hill, NSW

### 1. PASSIVE DESIGN

The development achieves an average 6.2 Star NatHERS rating across the development. A high NatHERS score reflects that the dwelling offers enhanced sustainability and cost savings on energy in the long term. Furthermore, the below factors reduce the need for mechanical heating and cooling, lowering energy consumption and improving indoor comfort.

#### 1.1 WALLS

Using high-quality wall materials and insulation enhances a home's ability to retain warmth in winter and stay cool in summer. Dense, thermally efficient wall materials can absorb and release heat gradually, while insulation minimizes heat transfer. The development includes thermally efficient Hebel power panel with an additional R2.0 insulation to external.

#### 1.2 ROOF

A thermally efficient material and well-insulated roof plays a crucial role in passive design by reducing unwanted heat gain in summer and heat loss in winter. The development includes thermally efficient concrete roof with an additional R2.5 insulation to external areas.

#### 1.3 GLAZING

High-performance glazing allows natural light in while minimizing heat transfer, reducing the need for artificial lighting and managing temperature fluctuations. This balance optimizes solar gain in winter, limits overheating in summer, and contributes significantly to passive heating and cooling. This development includes high-performance double glazed and single glazed window systems.

#### 1.4 FLOOR AND THERMAL MASS

Thermally efficient flooring materials, such as concrete, can store and slowly release heat, enhancing thermal mass for passive heating and cooling. Insulation beneath flooring reduces heat loss to the ground, especially in colder climates, keeping floors warmer in winter and reducing the need for heating systems. The development includes thermally efficient concrete flooring with an additional R2.0 insulation to external areas.



### 2. ACTIVE ENERGY EFFICIENCY

Active energy efficiency in a dwelling helps occupants by reducing energy consumption, improving comfort and increases cost savings. The development exceeds the BASIX 25% compliance standard and achieves a BASIX score of 30%.

The following active energy efficiency features are proposed to be included in the design:

#### 2.1 AIR CONDITIONING

Energy-efficient air conditioning minimizes energy consumption by delivering targeted cooling and heating, often incorporating smart technology that adapts to occupancy and weather. This efficiency reduces reliance on energy-intensive climate control and enhances comfort with lower environmental impact and reduced operating costs.

The development includes an efficient zoned air conditioning system of EER 3.0-3.5 to the bedrooms and living rooms in the dwellings.

#### 2.2 LIGHTING

High-efficiency lighting, like LEDs, reduces energy usage and emits less heat compared to traditional lighting. In an apartment setting, this minimizes the additional cooling load on air conditioning systems while providing bright, quality lighting, contributing to an overall lower energy footprint and creating a comfortable living environment.

The development includes highly efficient LED lightings to the dwellings.

#### 2.3 LIGHTING CONTROLS

Smart lighting controls, such as motion sensors and timers, adjust lighting levels based on occupancy and daylight availability. This setup minimizes energy use, enhances energy savings, and reduces heat output from lighting, contributing to a stable indoor climate and further lowering the building's energy demands.

Motion sensors and zoned switching lighting controls will be included in the basement and lobby areas of the development.

#### 2.4 VENTILATION CONTROLS

Ventilation controls that adjust airflows based on occupancy or CO<sub>2</sub> levels help maintain air quality without excessive energy use. By optimizing air exchange only when needed, these controls reduce the demand on HVAC systems, support passive cooling, and contribute to a healthier and more energy-efficient environment.

Carbon monoxide monitors, thermostatically controlled sensors and time clocks will be included in the basement and lobby areas of the development.

#### 2.5 APPLIANCES

Energy-efficient appliances contribute to reducing overall energy consumption in daily activities like cooking, clothes and dish washing, and clothes drying. These appliances perform optimally with less electricity, decreasing the building's carbon footprint and creating a more sustainable living environment for the occupants.

The below energy efficient appliances are included in the development:

- 4 Star Energy Efficient Dishwasher
- 4 Star Energy Efficient Clothes Dryer

#### 2.6 PHOTOVOLTAIC SYSTEM

A photovoltaic (PV) system positively impacts the active energy efficiency of a development by generating clean, renewable energy on-site, which can offset traditional energy needs and provide a range of benefits to the building and its occupants.

Roof top solar panel systems will be incorporated on the roof of each building where possible with a target for total system size of 40kW.

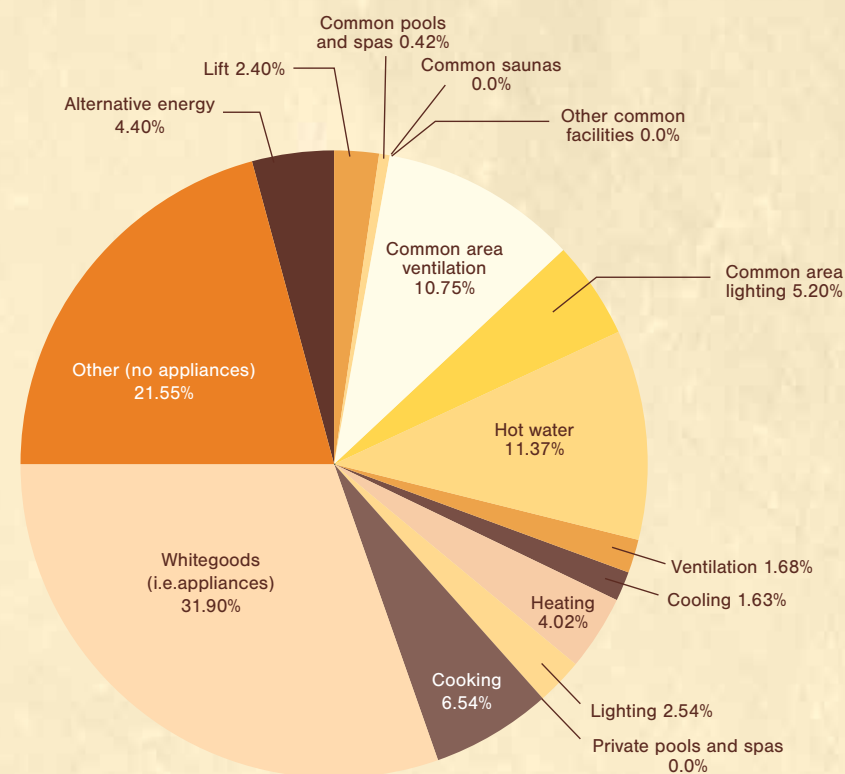
- A 40 kW PV solar system will offset approximately 55.5 MWh/year of energy usage.
- The estimated greenhouse gas CO<sub>2</sub> emission saving is approximately 45,493 kgCO<sub>2</sub>/annum

The electrical energy supply from the solar panel systems would be used primarily to provide power to common area services such as hot water, car park lighting and ventilation.

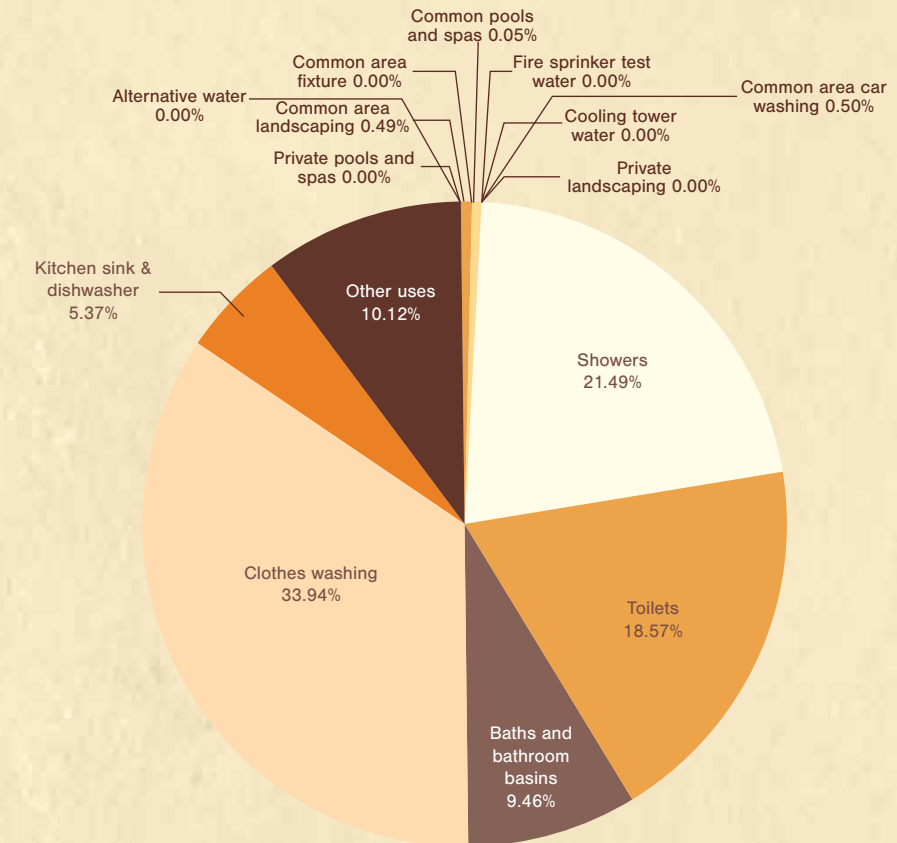




## PERCENTAGE CONTRIBUTION TO ENERGY SCORE



## PERCENTAGE CONTRIBUTION TO WATER SCORE



## 3. WATER EFFICIENCY

Water efficiency in a dwelling helps occupants by reducing water consumption and increases cost savings. The development meets the BASIX 40% compliance standard and achieves a BASIX score of 40%.

The following water efficiency features are proposed to be included in the design:

### 3.1 WATER-EFFICIENT FIXTURES

Installing water-efficient fixtures, such as low-flow taps and showerheads, reduces the amount of water used during daily activities without compromising performance. These fixtures limit water flow or aerate the water stream, which helps residents conserve water, lower utility bills, and reduce the building's overall water demand.

The below water efficient fixtures are included in the development:

- 4 Star WELS Rating Showerhead (> 6 but <= 7.5 L/min)
- 4 Star WELS Rating Toilet
- 4 Star WELS Kitchen Taps
- 4 Star WELS Bathroom Taps

### 3.2 WATER-EFFICIENT APPLIANCES

Water-efficient appliances, like dishwashers, are designed to use significantly less water per cycle

compared to conventional models. These appliances help residents conserve water during everyday tasks, resulting in substantial water savings over time.

The below water efficient appliances are included in the development:

- 4 Star WELS Rating Dishwasher

### 3.3 INDIGENOUS AND LOW-WATER LANDSCAPING SPECIES

Using native and drought-tolerant plants in landscaping around the apartment complex significantly reduces the need for irrigation. Indigenous plants are adapted to the local climate and typically require less water than non-native species, thriving naturally with minimal maintenance.

The development includes a significant portion of Indigenous landscaping to reduce the water usage for the building.

## 4. TRANSPORT

When designing a sustainable development, it is important to minimise the use of individual motorised transport where possible and thus enhance energy savings and environmental impact through reduced fossil fuel consumption and improved regional air quality. This can be achieved by encouraging the use of energy efficient public transport that is immediately at hand, reducing car parking facilities, and providing adequate bike storage facilities to minimise the requirement for individual motorised transport.

Developments that are within walking proximity of significant transport nodes with frequent service should be encouraged. The proposed development is located near mass transit (Hills Showground Station and Showground Road Bus Corridor). The proposed development will encourage occupants and users of the development to use public transportation and minimise automobile use. Furthermore with the inclusion of bike storage facilities the development promotes use of mass transit or non-motorised transportation.

