City of Melville Piney Lakes

Sustainable Building and Living at PLEEC

Set within an urban bushland reserve containing sensitive wetland areas, Piney Lakes Environmental Education Centre (PLEEC) reduces carbon output and minimises environmental impact in a number of ways.

Passive Design

Passive design makes use of the local climate to reduce the need for heating or cooling while maintaining a comfortable temperature. Buildings that use passive design use features such as orientation, thermal mass, shading and insulation to take advantage of sun and breezes. The effectiveness of passive design also often relies on having active occupants – willing to open windows, close blinds, and dress to suit the weather.

Passive design elements at PLEEC:

- North-facing orientation and solar pergolas shade the interior of the building from direct, high-angle sun in summer, reducing the need for active cooling.
- Thick limestone walls and earth berms provide high thermal mass and insulation properties to limit undesirable heat transfer in and out of the building.
- Roof insulation to lower heat flow through the roof
- Extractor fans to remove hot air from the building during the summer months.
- Ceiling fans can be used to circulate air in summer or be adjusted to move warm air downward in winter.
- Clear glass windows to allow penetration of winter sun and thermally glazed glass to prevent heat loss.

Materials and Construction

- Recycled, locally sourced construction materials and sustainable design features help minimise the centre's ecological footprint.
- Recycled timber, recycled road bitumen and rammed earth have been used to lessen the embodied energy of the building and its surrounding pathways.
- A non-chemical termite barrier was used prior to construction.
- The original architect Garry Baverstock, designed the centre in a boomerang shape as a symbolic acknowledgement to the Noongar history of the Piney Lakes region.

Energy

- The Centre utilises renewable resources such as solar and wind energy to generate a significant proportion of its power requirements.
- Electricity generated by the solar panels and wind turbine is fed into a bank of batteries to be stored, and then passed through an inverter for use, when required. The renewable technologies at Piney Lakes are capable of providing an output of 12 000 Watts (12kW) of clean, green power. The use of renewable energy means the venue forgoes an estimated 8 tonnes of greenhouse gas emissions per year
- Energy requirements are minimised where possible within the centre. Low energy artificial lighting is utilised in light fittings and movement sensors control many of the internal lights within the centre. The hot water system and (where practical) outdoor lights around the centre are solar powered.

Switch Your Thinking Rewards for Residents – discounts on solar panels, solar hot water systems, solar batteries, LED lights and insulating paint (and some of these to businesses as well).
Sign up for EnergySmart Tips by text – get an energy smart tip once a month by text

Water

- All water used on site is drawn from groundwater bores or rainwater collected on-site, the centre is not connected to mains water or sewerage. The centre utilises water saving technology such as flow reduction devices and hybrid toilet systems.
- A 60 000L rainwater tank collects rainwater from the roof surface which is then treated on-site via filtration and ultra-violet sterilisation for use as potable water within the building.
- Water saving toilets used at the venue use bacteria to efficiently break down waste products, reducing water use by up to 80%. Toilets include waterless urinals, hybrid toilets that use no water ("long-drop" toilet), or only minimal water (300mL per flush), and conventional domestic dual flush toilets. All waste from these systems is treated on site through biological treatment tanks as part of the hybrid toilet systems.
- All waste from toilets, basins and sinks is treated in a Hybrid Toilet System consisting of biological treatment tanks. This system is very similar to a conventional septic system, however utilises anaerobic bacteria to break down toilet wastes. Waste slowly passes through the tanks and is discharged through an underground tank and leach drain below the soil surface. These tanks should never need to be emptied as the bacteria continuously break down the waste and are a self-sustaining population.
- All our taps in the centre are fitted with flow reduction devices, similar to those available for domestic application.
- The gardens surrounding PLEEC are all native Australian plants, a water-saving garden design feature. Any water use outside the confines of the building are strictly bore-water connections and used efficiently, following the guidelines of the Water Corporation.

Switch Your Thinking Rewards for Residents – discount on pool covers and rainwater tanks

Garden

- The gardens surrounding the centre feature locally native plants. Being adapted to the local climatic and soil conditions these plants are water-wise and do not require fertilisers. They also support local biodiversity by providing food and habitat.
- Mulch has been used to help reduce water evaporation from the soil.
- Several raised beds are located around the centre where fruit and vegetables are grown. Growing your own food can reduce your ecological footprint, by reducing waste, water, transport and energy. Any organic waste from growing can be used to make compost and put back into the gardens.
- Large trees surround the centre and provide shading and cooling through evapotranspiration.
- There are several bird baths around the centre, and an automated bird watering station. With our climate changing to be hotter and drier, it is important to provide a reliable source of fresh water for our native animals.

The City of Melville runs an annual Native Plant Giveaway during May. We also provide free street trees to residents.
If you are looking for help choosing native plants check out the Waterwise Plant tool by Water Corporation, ReWild Perth, APACE suburb selector or River Guardians Grow Local Plants Brochures.

Waste

- Piney Lakes Environmental Education Centre has a Community Recycling Hub for visitors to drop of household batters, household light globes and fluoro tubes , printer cartridges, mobile phones and chargers.
- Recycled fridge worm farms are used to compost some of the food and other organic waste from the centre.
- Three raised garden beds in our children's garden are filled with FOGO (food organics, garden organics) derived soil.

The City of Melville offers rebates, subsides and workshops for modern cloth nappies, compost bins and worm farms. We also run a monthly Repair Lab where you can bring broken items to be fixed and regular e-waste drop off days.

For more information about reducing waste and how to recycle visit Recycle Right , Zero Waste + Plastic Free Living, Perth, and join your local Buy Nothing Group .

For more in depth information about sustainable building and living visit the Your Home website.