

TRAINING OFF THE PAGE - JON PALFREY

THE FUTURE OF TRAINING IS HERE NOW

As the plumbing industry leads the way with sustainability and innovation in the building sector, it is vital that our new influx of tradespeople have the benefit of first-hand training about what is being designed into new project applications. **Jon Palfrey** comments.

The Plumbing Industry Climate Action Centre (PICAC) is a center of excellence for learning and education for the plumbing industry. It is an industry leading training hub that was formed via a national collaboration between key industry stakeholders in the plumbing, fire protection and HVAC industries.

The first PICAC/Master Plumbers campus opened in Brunswick, Victoria in 2009 and has since expanded to Breakwater (Geelong), Glenwood (NSW) and Beenleigh (QLD).

The successful collaborative learning model has generated further demand, and with support from the Victorian State Government and ARENA, a flagship campus has been developed on a 2.5ha site at Fullard Road, Narre Warren.

As a leader in education and training for the plumbing industry, PICAC wanted to ensure that the Narre Warren hub showcased the world's very best leading-edge technology and equipment centered around achieving Net Zero Energy (NZE) and water-related sustainability in order to directly display these technologies to the students who will be learning at the center.



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Building designers have the expectation that trades have the awareness and understanding of these innovations, both in a working context as well as functional understanding.

If it's to design and install or to service and maintain, trainees in the plumbing industry are now faced with the expectations for community, governments, and designers to make these innovations work and function with energy reduction and sustainability in mind.

Never before in the plumbing and mechanical industry has there been more interest in innovation driven from the general public and decision makers to seek and find alternative ways to perform fundamental plumbing solutions.

BUILDING AS 'TEXTBOOK'

The NZE-designed building at Naree Warren expresses and brings together

these lessons to production linkages. The comprehensive building services are installed on display throughout the open structure, with the building becoming an expression of a legible textbook. Heating water for generations has seen a conventional reliance on either gas or electricity to take water from an annual average temperature of 15°C and raise it to 65°C for ablution use or higher temperatures for sanitising or industrial applications.

Today the ever-increasing desire to see fossil fuels reduced and the expectation for innovation to achieve this objective has created the need to examine and produce alternative methods to provide energy solutions.

Plumbing is and has always been at the forefront of energy and water conservation, and at PICAC these technologies can be demonstrated and taught and learnt in a practical sense.



Solar PV is quickly becoming the alternative energy source as a means of providing pre-heated water in a stored capacity, referred to as a thermal battery. See the accompanying photo of Enermax Smart cube tanks at Naree Warren.

This system pictured shows the combination of solar tubes used in conjunction with solar PV direct injection into a vertical heating element located in both tanks.

As highlighted in a previous edition of *Plumbing Connection*, Energy Smart Water training module systems are currently in all national PICAC facilities including Sydney, Brisbane, Geelong, and Brunswick.

NET ZERO ENERGY

PICAC Narre Warren has been designed with the benefit of knowledge and accumulated learnings of the successful Brunswick campus. The facility is also supported by IAPMO, an International Testing and Certification organisation, already established in Victoria, but aiming to extend its services throughout Australia and becoming a leader in education and training for the plumbing industry.

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All PICAC facilities contain hands-on training modules.

A key contributor to the NZE success is the incorporation of a ground source heat pump system to heat and cool the insulated ground slab. The field pipework for geothermal heat exchange flow and return water pipelines were installed into the structural screw piles during the foundation and substructure works.

The screw pile geothermal heat exchange lines supply the facility's heat pumps, servicing the in-slab heating and cooling network to provide a continually adjusted, heat-monitored, insulated ground slab.

Another innovation in the facility is the domestic water heating system and its energy sources, comprising the combination of solar PV solar thermal and the energy storage batteries, being the Enermax Smart Cube tanks

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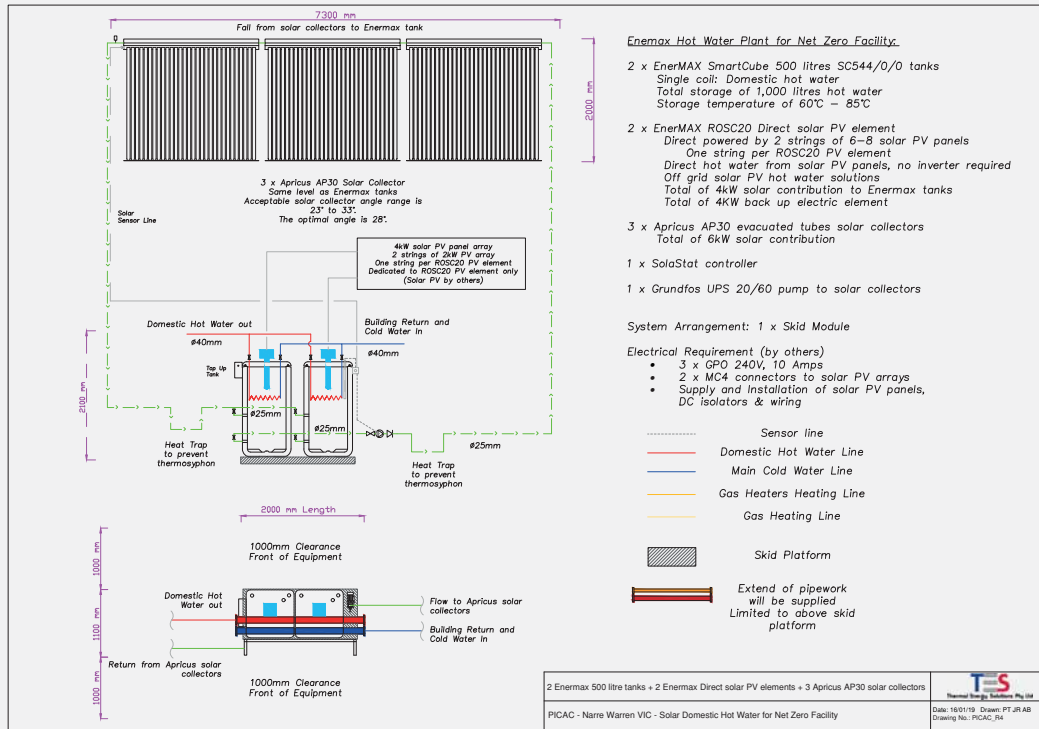
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DELIVERING PUMPING SOLUTIONS

DIAGRAM 1: PICAC NARRE WARREN, VICTORIA.



that hold the solar yield and maintain temperatures for the building's heated water use. [See Diagram 1.]

OTHER SPECIAL FEATURES

Other building features supporting NZE consumption goals include:

- Indirect Evaporative Cooling – a system that uses an evaporative cooling process to deliver air conditioning, but without humidifying the air to the space. The main advantage is their low cost and high effectiveness, compared to traditional air conditioning. Since the units operate with 100% outside air, they are perfect for high-occupancy spaces where a wider tolerance for acceptable indoor air conditions is appropriate.
- An extensive roof-mounted solar PV installation with the primary target to achieve an annual generation of 273MWh, to enable the site to achieve a net zero consumption target. The advanced system has inbuilt optimisers which provide diagnostic

maintenance tracking, and the poor performance of a panel does not result in the performance of an entire string being compromised.

- Full LED lighting solution with sensor management and dimmable response systems.
- Roof decking is constructed throughout with the Structural Insulated Panel System [SIPS]. The integrated insulation within a sandwich of color-bonded steel decking provides greater spanning capability with stable insulation properties.
- Exterior walls are constructed with Thermomass Insulated precast concrete sandwich panels. Extruded polystyrene insulation is layered between two concrete panels being held together by specifically designed Thermomass connectors.
- Double glazing with thermal break window framing and high-performance solar tinting.
- Strategic window solar louvers and eyebrow shading.

- Stormwater capturing for toilet flushing.
- Airtightness thoroughly specified and tested for all building elements, walls, openings, and seals.

By showcasing the world's very best and engaging leading edge technology, PICAC has created an exciting training environment engaging employees, employers, and a research authority to educate the plumbers of tomorrow today.

"Innovation and technologies are only effective when installers and related tradespeople can understand a system's operation and purpose"...

Yours in training. Jon Palfrey ■

