



## Energy efficient air conditioning technology delivers optimal learning environments in Australian schools.

**In Australia, research has been undertaken in regards to the importance of fresh air in learning environments. When the concentration of carbon dioxide falls, students achieve better test results, showing a direct correlation between air quality and a students ability to concentrate. Meeting fresh air requirements in an enclosed space also has a positive impact on dealing with factors associated with sick building syndrome.**

Temperature control and improved IAQ (indoor air quality) are the two factors that play a key role when it comes to creating an optimal and healthy learning and working environment.

### Supporting Student and Staff Well-being

Seeley International is Australia's largest air conditioning manufacturer and a global leader in developing ingenious, energy efficient cooling and heating products. Leading the charge is Climate Wizard, coupled with any HVAC technology, is able to provide the total climate control solution. Generating 100% fresh, cool, outside air, at temperatures that rival refrigerated systems, with up to 80% lower energy costs using no synthetic refrigerants or chemicals to harm the environment.

### Proven Performance

Climate Wizard technology has been specified and installed in over 30 schools and educational facilities in recent years, across New South Wales, Victoria, Western Australia and South Australia. This demonstrates the recognition and commitment to Seeley International and Climate Wizard by leading consulting HVAC engineers across Australia for delivering against key project requirements in this sector. Addressing current industry priorities including:

- Green building design
- Resilience – extreme weather events
- Sick building syndrome
- Carbon footprint
- Peak power demand.





## Recent Climate Wizard School Installations

| School                             | City        | State | Units                       | Building                          | Application         |
|------------------------------------|-------------|-------|-----------------------------|-----------------------------------|---------------------|
| Boort District School              | Boort       | VIC   | 15 x CW-H10,<br>16 x CW-H15 | Classrooms, Labs                  | Stand-alone cooling |
| University of Adelaide             | Adelaide    | SA    | Custom HVM<br>solution      | Learning Hub                      | Stand-alone cooling |
| Mercy College                      | Perth       | WA    | 2 x CW-H15                  | General Learning Area             | Stand-alone cooling |
| Regency TAFE                       | Adelaide    | SA    | 25 x CW-H15                 | Classrooms                        | Stand-alone cooling |
| West Leederville Primary School    | Perth       | WA    | 5 x CW-H10                  | Classrooms                        | Pre-cooling         |
| Flinders University Tonsley Campus | Adelaide    | SA    | 2 x CW-H15                  | Lecture Pods                      | Pre-cooling         |
| UniSA Mawson Lakes                 | Adelaide    | SA    | 2 x CW-H15                  | Laboratory                        | Make-up air cooling |
| Charles Sturt University           | Albury      | NSW   | 3 x CW-80                   | Office blocks                     | Stand-alone cooling |
| PICAC Geelong                      | Geelong     | VIC   | 1 x CW-H15                  | Training facility                 | Stand-alone cooling |
| UniSA City West                    | Adelaide    | SA    | 2 x CW-H10                  | Classrooms                        | Lab make-up air     |
| University of Adelaide Waite       | Adelaide    | SA    | 3 x CW-H15                  | Offices                           | Pre-cooling         |
| Strathabryn Christian College      | Geraldton   | WA    | 2 x CW-H10                  | Early learning centre             | Pre-cooling         |
| Aveley Secondary College           | Perth       | WA    | 7 x CW-P15                  | Resource Area & Common Rooms      | Stand-alone cooling |
| Coastal Lakes College              | Perth       | WA    | 7 x CW-P15                  | Library                           | Stand-alone cooling |
| Aquinas College                    | Perth       | WA    | 2 x CW-H15                  | Chapel                            | Pre-cooling         |
| Salesian College                   | Melbourne   | VIC   | 1 x CW-80                   | Sports Hall                       | Stand-alone cooling |
| PICAC Narre Warren                 | Melbourne   | VIC   | 2 x CW-80,<br>11 x CW-H15   | General Learning Area             | Stand-alone cooling |
| Flinders University Bedford Park   | Adelaide    | SA    | 1 x CW-H15                  | Physical Sciences Lecture Theatre | Pre-cooling         |
| Winmalee High School               | Winmalee    | NSW   | 1 x CW-80                   | Hall                              | Stand-alone cooling |
| Saint David's Parish School        | Adelaide    | SA    | 3 x CW-H15                  | Kitchen & Art Room                | Stand-alone cooling |
| Ocean View College*                | Adelaide    | SA    | 8 x CW-P15                  | Computer Lab                      | Stand-alone cooling |
| Mt Barker High School*             | Adelaide    | SA    | 1 x CW-80                   | Home Ec Room                      | Stand-alone cooling |
| Flagstaff Hill R-7*                | Adelaide    | SA    | 3 x CW-H15                  | Music Hall                        | Stand-alone cooling |
| Coober Pedy Area School*           | Coober Pedy | SA    | 3 x CW-H15                  | Classrooms                        | Stand-alone cooling |
| Aberfoyle Park Pre-School*         | Adelaide    | SA    | 2 x CW-H15                  | General Learning Area             | Stand-alone cooling |
| Brighton Secondary*                | Adelaide    | SA    | 2 x CW-H15                  | Canteen                           | Stand-alone cooling |
| Aberfoyle Park High School^        | Adelaide    | SA    | 2 x CW-H15                  |                                   |                     |
| Paralowie R-12^                    | Adelaide    | SA    | 3 x CW-H15                  | Tech Study Rooms                  | Stand-alone cooling |
| Clare High School^                 | Clare       | SA    | 2 x CW-H15                  | Science class rooms               | Pre-cooling         |
| Blackwood High School^             | Adelaide    | SA    | 3 x CW-H15                  | Classrooms                        | Pre-cooling         |
| Airdale Primary School^            | Pt Pirie    | SA    | 2 x CW-H15S Plus            | Classrooms                        | Pre-cooling         |
| Roxby Downs Area School^           | Roxby Downs | SA    | 2 x CW-H15                  | Classrooms                        | Stand-alone cooling |

\*DPTI Project ^STEM Projects

### Total HVAC Solution

Seeley International has the capability to deliver large HVAC projects both in Australia and internationally, with cutting-edge hyper-efficient technology to build a total HVAC solution across varied applications.

- Experience with supplying Government and Private education HVAC projects
- Ability to provide solutions that don't require power upgrades or additional infrastructure. Eliminating the cost of electrical upgrades & keeping operating costs to a minimum
- Cooling & Heating solutions for learning environments - 100% fresh, outside air
- Flexible design and engineering configurations – bespoke options
- Australian manufactured - Albury, NSW and Lonsdale, SA
- National technical support and service division to tackle challenges that schools face when it comes to climate control.



# A hyper-efficient climate control solution for a new mega school in WA

## WA Schools PPP

### Project Address

Aveley Secondary College  
Ellenbrook, Perth, WA

### HVAC Consultant

Lucid Consulting  
Senior Project Engineer  
Luke Faranda

### Equipment

59 x Braemar Evaporative Coolers  
7 x Climate Wizard CW-P15  
1 x Aira HCV

## Performance

The below table outlines the cooling performance of Climate Wizard specific to this design application.

| Model                            | CW-P15         |
|----------------------------------|----------------|
| Location                         | Ellenbrook, WA |
| DB (°C)                          | 36.6           |
| WB (°C)                          | 22.4           |
| Supply Air Temperature (°C)      | 17.4           |
| Standalone Cooling Capacity (kW) | 13.1           |
| Standalone COP                   | 7.3            |

## Project Requirements

The construction of Aveley Secondary College in Perth's north-eastern suburbs was completed in 2017. The college intake covers years 7 to 12. The college required a total climate control solution to provide comfortable temperatures throughout general learning areas, open learning areas and information resource centre. The air conditioning plant specification required energy efficiency, a proprietary switch plate (reducing supply and install costs) and variable speed control.

## Challenges

Project challenges included:

- Finding a control solution that could be used across different product technologies. Avoiding the use of different control panels for each unit.
- Delivering an energy efficient solution with less humidity for preserving the life of books in the library application. Reverse cycle systems were too costly to run as a stand-alone solution.

## Solution

Stand-alone Braemar RPC (51) and RPA (8) evaporative units were installed to provide a comfortable, consistent temperature and fresh air to the many general learning and open areas throughout the site. Smart drain kits measure total dissolved solids (TDS) to maximise water quality and minimise waste.

The information resource centre and staff common rooms are cooled by 7 Climate Wizard CW-P15 units which improved the absolute humidity of the space in comparison with a standard evaporative cooling solution.

Natural Gas heating and ventilation was provided using an AIRA HCV unit.

**“Seeley International were able to provide a total solution using different technologies with only a common proprietary control panel.”**

— Luke Faranda, *Lucid Consulting*

## Benefits

The decision to go with a combined HVAC solution servicing general learning areas, information resource centre and common areas has provided:

- Reduced electrical demand and energy consumption
- A cooling solution that integrates with the school's solar power performance objectives
- Improved Indoor Air Quality, particularly where needed in learning environments
- A flexible system allowing Free Cooling in mild conditions
- Specified climate conditions supporting individual building requirements
- A common control platform for ease of operation by school personnel
- Exceeds minimum O/A requirements from Australian Standard AS1668.2.





## Delivering a lower carbon footprint with no power upgrades for hyper-efficient cooling in Schools

### Winmalee High School

#### Project Address

Winmalee, NSW

#### Contractor

Coral Air Conditioning  
Project Engineer  
Darryl Sullivan

#### Equipment

1 x Climate Wizard CW-80

### Project Requirements

Provide a cooling solution to the school’s main Hall/Gymnasium that:

- Meets outdoor air requirements to AS 1668 part 2 for large volumes of people
- 100% Heat/Cool reclaim
- Accommodates existing power infrastructure
- Delivers specified temperature and comfort levels in periods of peak load.

### Challenges

The project’s main pressure points centred around:

- Mains power board had limitations of electrical capacity for additional cooling requirements
- Sub-board had limitations of power available
- Sizing of an air conditioning packaged system required 140kw total of cooling for the space, plus a 100% Heat/Cool Reclaim System. A proposed upgrade to the sub-board would add significant cost to the project.

### Solution

The Climate Wizard CW-80 is rated at 100 kW Sensible Cooling under local design conditions. This allowed it to service the space and satisfy all project requirements.

The building did not require heating and was more cost effective to not only provide the Outdoor Air requirements, but Free Cooling as well. Climate Wizard was well placed to cater for these requirements.

The main power supply to the Climate Wizard only had to accommodate a 10kW load, not the 60kW load for the Air Conditioning Packaged (DX) System. This meant the power sub-board did not need upgrading, saving much needed funds for the school.

### Benefits

Since the installation and commissioning of the CW-80, the school has experienced the following benefits:

- Significantly reduced running costs (up to 80%) to cool the space compared to an equivalent reverse cycle system
- Temperatures and comfort levels similar to reverse cycle systems, with cooling performance increasing as temperatures rise
- Supporting student and staff well-being - improved Indoor Air Quality (IAQ) as 100% outside air is cooled and supplied to the space
- Contributing to reducing the school’s carbon footprint, supporting public infrastructure green building requirements
- Exceeds minimum O/A requirements from Australian Standard AS1668.2.

### Performance

The table below outlines the cooling performance of Climate Wizard in New South Wales conditions.

| Model                             | CW-80         |
|-----------------------------------|---------------|
| Location                          | Winmalee, NSW |
| DB (°C)                           | 29.6          |
| WB (°C)                           | 17.2          |
| Room Temperature (°C)             | 25            |
| Supply Air Temperature (°C)       | 16.9          |
| Stand-alone Cooling Capacity (kW) | 100           |
| Stand-alone COP                   | 10            |



For more information, please call 1300 475 091 or email [commercial@seeleyinternational.com](mailto:commercial@seeleyinternational.com)



We provide full technical support to ensure optimal design for each application.

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