

New winery employs energy saving design

Medhurst Wines 2011 vintage will be the first in its new winery. Winemaker Matt Steel shares the design concepts and process, with a particular focus on the new refrigeration elements.

Vintage this year at Medhurst Wines will be extra sweet for owners Ross and Robyn Wilson and winemaker Matt Steel, when their new winery kicks into operation at their Warramate Hills vineyard in the Yarra Valley.

Ross and Robyn Wilson decided to take a leap of faith – despite the current challenging environment and forecasts – and began an almost three-year design and building process in 2008.

Winemaker Matt Steel said Tim Wilson and Christie Petsinis, of Folk Architects, were given a brief to design a winery to sit at the centre of the 15 hectare vineyard. It was to complement the style of other buildings already on the property, provide an open and flexible layout for the winemaking cellar and be as energy efficient as possible.

Key design features

“The winery has been designed for up to 250 tonnes capacity, so Medhurst will be

making their own wines as well as some contract winemaking services,” Steel said

“Sensitive integration of the building in the site was important. The building’s linear elements echo the natural contours of the site and the building volume is minimised with the barrel store recessed into the fall of the site and covered by a green roof.

“The barrel hall is underground to reduce the cooling requirement. The cooling system in the barrel hall uses low speed, low temperature-differential air handling units to maintain high humidity, reducing the evaporative loss of wine from barrels”.

Steel says the winery building is set into the side of a hill, with the majority of the winery below natural ground level, which provides insulation.

The materials, concrete, and orientation of the buildings were also designed to ensure maximum energy-savings and ultimately reduce lighting, heating and cooling costs.

The winery will harvest all its rainwater

for use in the winery and all wastewater will be recycled onsite using an aerobic digestion system that will enable the water to be used for irrigation in the vineyard and grounds.

“The northern façade of the winery building is made from reflective grey Danpalon, which is a translucent plastic with insulating properties,” he said.

“The Danpalon emits about 20% sunlight, reflecting 33% of sunlight, therefore the solar energy transmitted is only 28% that hits the surface.”

The winemaking cellar has also been designed around very gentle fruit handling, with use of gravity for handling all fruit and must.

Skate Constructions is building the winery, having previously built other well-known Yarra Valley wineries Domaine Chandon and Yering Station.

Medhurst used NKS Refrigeration and Thermowrap Australia to build and fit-out the winery. Wilfab Stainless Engineering will ▶

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Medhurst Winery, photographed from the south-east angle, showing the main wall and what will be the vintage area. It was 6 weeks from completion and first vintage.

complete all refrigeration and insulation for the winery and JMA Engineering and A&G Engineering will complete and install all tanks, fermenters and associated infrastructure.

Key features for refrigeration

Steel said he and the architects investigated using geothermal refrigeration for the project but it couldn't meet the capacity required for the ultimate winery design size, which is for 250 tonnes of fruit.

In the end, the refrigeration system was designed with consultation from Linney Engineering, who are winery design engineers and ISECO refrigeration engineers with wine industry expertise.

Steel said the key elements of the refrigeration design include the barrel hall design, which provides low temperature differential and low air speed air handling units to maximise ambient humidity.

"There's also a cool room that can chill hand-picked fruit from 28°C to 10°C in 18 hours," he said.

"This is a key requirement for the quality of Medhurst wines, particularly with harvest dates moving forward into February, causing harvest fruit temperatures to be warmer than ideal.

"The main chiller set has a heat recovery circuit that will be used to pre-heat water to 50°C for use in the winery."

The system has a large brine capacity which acts as a heat store and its control is linked to the VinWizard system so that any component (cool room, barrel hall, individual tanks, chiller set) or the whole system can be programmed to run during off-peak, reducing power costs and increasing exchange efficiency, he said.

The refrigeration system utilises an air-cooled Australian Fluid Chillers chiller set with R507 refrigerant.

It's all in the timing

Until now, Medhurst had its wine made under contract at Dominique Portet winery.

Steel said the number one rule on this sort of project was to allow plenty of time to develop the winery design and to gather as much inspiration and ideas from visits to other wineries as possible.

"You also need to ensure that winemaking requirements are well understood and included in the building design," he said.


"Allow for future proofing by creating a layout that can be easily configured to cope with expansion, if required.

"And finally – engage the experts to assist with detailed areas of the project. Medhurst used Folk Architects, Linney Engineering for winery design, JJC Consulting for waste treatment and recycling and ISECO for refrigeration design."

The Wilsons want to take Medhurst Wines to the next level, which Steel says meant the next logical step was to build their own winery which would give them greater flexibility, control and allow more attention to detail.


The winery will also serve as a home for Medhurst and complement the existing cellar door and Red Shed Café.

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