CASE STUDY:
HŌHEPA SCHOOL, HAWKES BAY

Big pumps meet big demand

Davey have designed a large pumping system for a unique live-in learning community in the Hawkes Bay – providing efficient irrigation and a system which meets an ever-changing demand.

Situated in the Poraiti Hills just outside of Napier, Hōhepa School is a unique live-in learning environment for students with intellectual disabilities. The property, a beautiful biodynamic farm, consists of the school, children's residential community in several family houses, land area which is cropped, citrus areas and several worker and support houses.

The school caters for students from age seven to twenty-one with many twenty-one-year-olds entering into vocational programmes on the property, providing meaningful work centred around craft, farming and agriculture.

THE CHALLENGE:
With multiple residential dwellings, shared facilities, and crops over the twenty-hectare site, the Hōhepa community had expanded to the point that the previous infrastructure was unable to support the demand.

The property's primary water source is from a bore and was previously being pumped "haphazardly" around the property which was both inefficient and inconsistent in delivering the desired pressure.

With approximately ninety full-time adult residents along with thirty-five children, plus up to 260 additional part and full-time workers on site during the workday, they needed a solution that would meet the demands of this busy community, provide water for irrigation of their crops and ensure adequate water quantity was available to its residents and workers when required.

The Davey Solution

Because there was a considerable variance between the lowest possible usage rate (someone getting up for a glass of water in the night) and the highest (end of day when workers are coming in for showers and the irrigation is running at the same time), we had to design a pumpset that had the capability to do very low flow (0.5 litres per second) to a much higher flow (20 litres per second).

We went with a staged approach involving three large vertical multistage pumps. Each pump is 11kw, so one of the benefits of using a staged approach is that you're using less power to operate the system. For example, if someone gets up in the night for a glass of water, one pump runs slowly to meet that demand. If it's the end of the day and the workers are all having showers and the irrigation is running at the same, all three pumps could be running. The pumps automatically kick in as required.

WHAT ARE THE BENEFITS?

- One system for multiple applications
- Energy efficient – only running pumps when required
- Seamlessly adapts to demand
- Easy monitoring

WHAT'S IN THE SYSTEM?

- 3 x 11kw vertical multi-stage pumps
- Flow rate up to 25l/second (1,500L/minute)
- Danfoss Vacon 100 Flow Variable Speed Drives

Each pump has a Danfoss Vacon Flow 100 Variable Speed Drive (VSD) which operates in a hierarchy of operation controlled by the software in each of the VSDs. Designed to improve flow control and save energy, they also enhance pump performance and protect pipes and equipment to ensure reliable operation. There are also three transducers in the system which monitor pressure and transfer water pressure into an electrical signal.

"Since installing the system we've heard very little from the customer and in this case, no news is good news. They did tell me they have now been able to throw away the shower roster. Until this pumpset was installed only a few people could shower at any one time, now they can all have a shower at the same time because they have more than sufficient water and water pressure," Anthony Waites from Think Water Hawkes Bay says. "They can also now proceed with their planned development of an additional twenty or so residential dwellings."

Davey Master Dealer, Anthony Waites from Think Water Hawkes Bay completed the installation and says the pumpset "runs beautifully."