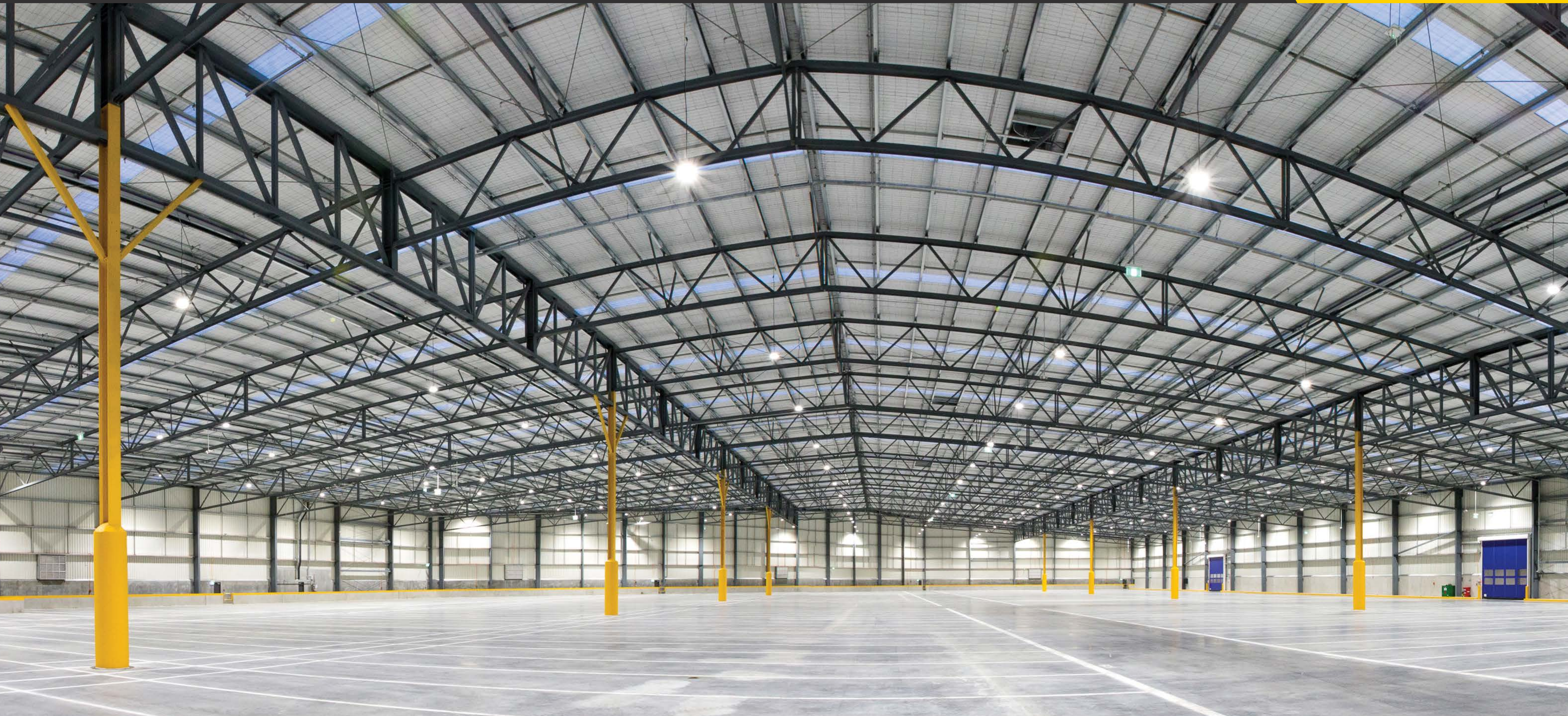


FONTERRA PAHIATUA DRY STORE



DESIGNERS STATEMENT

The project brief was to light Fonterra's new 20,900 sqm dry store at Pahiatua, which operates 12-24/7 to retrieve and place bulk supplies of milk powder.

The objective of the design incorporates 3 main elements:

1 SAFETY

Safety is paramount for Fonterra. FES Standards (Fonterra Electrical Standards) have been adhered to during design stages.

Critical factors:

- To eliminate height safety risk associated with re-lamp maintenance.
- Reduction of luminaire glare whilst increasing light levels and visual comfort for forklift drivers. This was an important consideration for accessing product from a variety of different heights. Priority was given to the safe illumination of walkways and forklift access paths without compromising overall general lighting. This allows flexibility in repositioning of milk powder product.
- Mounting of luminaires was not to interfere with daylight from skylights. Using an intelligent lighting control system, we were able to provide an unnoticeable transition from daylight to artificial light.

2 COST EFFECTIVE OPERATION

Maximise energy efficiency utilising LED technology.

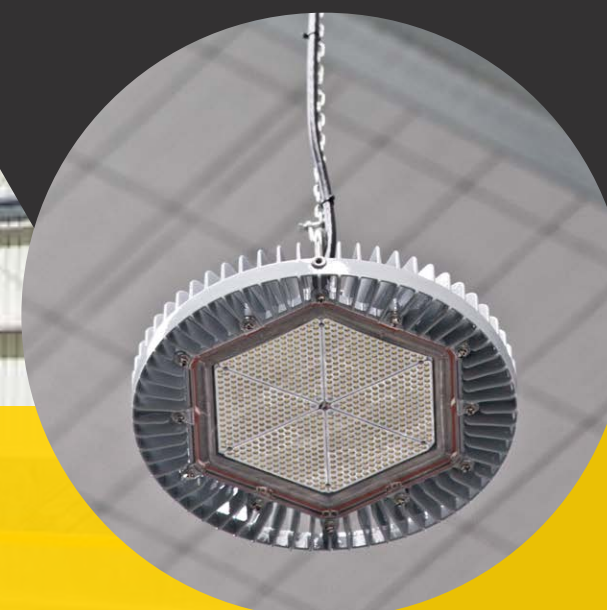
Achieve overall reduction in lighting maintenance.

- Energy savings of more than 50% are gained using LED over traditional 400w HID conventional lighting.
- 10m spacing between fittings helped to reduce the quantity of luminaires while still maintaining uniformity.
- Further savings were achieved by incorporating an effective lighting control system into the design of this large dry store.
- This design allows for the flexibility of lighting occupied areas. The electrical contractor Elektron installed a control system with the ability to dim to minimal levels or enable a timed switch off. Minimal light levels are still provided where necessary, maintaining safety throughout the store.

3 FUNCTIONALITY

The dry store is a 12-24 hour operation of bulk milk powder placement and retrieval.

- During design stages careful selection of the correct luminaire was paramount. A luminaire with a large surface area of light was required to maximise visual comfort by reducing glare. We chose to use a Dialight 212w 700 multi-chip industrial LED luminaire, which provides 26,000 lumens and a significant reduction in energy consumption when compared with conventional 400w HID lighting. Frequent retrieval and placement of stock from a high level requires correct distribution of light and minimal glare. This helps to provide the fork lift operators with visual comfort, and accuracy.
- As can be seen from the photos taken at dusk, visual comfort is further enhanced by providing a colour temperature as close as possible to mimic midday daylight. This can be maintained via DALI dimmable controls throughout the entire 12/24 hour operation.
- An excellent vertical lighting level was achieved on the stored product surface. Some previous HID luminaire technology made accurate recognition of product and bar code labels difficult to read. This potentially made product retrieval unreliable, especially if using high pressure sodium fittings. Although satisfactory lux levels were maintained, the human eye does not visualise well with the low colour temperature of a high pressure sodium fitting the same way as it does with a 5000K luminaire with a higher CRI of 75.



"In our experience designing lighting for industrial environments is predominantly functional. However each client has specific criteria to be incorporated. This design has met those requirements and provided effective and efficient lighting to contribute to the overall safety, functionality and wellbeing of people working in this new dry store."



Phil Fuller
Company Director
Infinity Lighting Limited
PO Box 15269
Tauranga

29th August, 2016

Dear Phil

Further to our recent conversation, we are delighted and proud to support Infinity Lighting's plan to submit the Pahiatua P3 dry store lighting design into the 2016 IES Lighting Design Awards.

Fonterra are committed to reducing energy we use in our factories. As part of the new Pahiatua drier project, the new dry store was a key building identified to benefit from a well-designed LED lighting solution. The dry store has many hours of inactivity, but when lighting is required, it is required quickly and with effective lighting levels. Infinity lighting have designed a cost effective and fit for purpose solution that's producing excellent results for our dry store team - and helps us continue to increase energy efficiency.

The final design incorporates Dali control system complete with daylight photo sensors to reduce the light levels for day light harvesting.

The system involves sensors that pick up movement around building and control lighting in front of motion at all times. There are 74 separate zones contained within the dry store.

These sensors turn Infinity Lighting Vigilant LED High Bay lights on for a pre-determined time period. The Dali day light harvesting sets the light level of the light once this time has elapsed, and if no movement has been detected then the lights turn off to conserve energy.

Fonterra Pahiatua are very happy with the final result within the dry store and will be using the design as a basis for future installs.

The solution has so far been found to be robust, trouble free and ideal for our demanding environment.

Regards

Derek Burrough
Group Manager Electrical Engineering