McMAHON SERVICES

Project Profile

Wetherill Park Building Works

Client	Lion Diary & Drinks (Lion)
Location	Wetherill Park, Sydney, New South Wales
Duration	June 2016 to September 2017
Contract	Upgrade of existing facilities
Cost	$14.0 million

Project Overview

Lion Dairy & Drinks (Lion) needed to upgrade to their existing dairy manufacturing site at Wetherill Park in New South Wales to create a milk based beverages manufacturing hub for the Eastern Seaboard. This investment included the installation of new milk based beverages processing and packaging plant as well as supporting logistics improvements. The existing manufacturing plant was originally constructed around 1985 and has had numerous extensions over the past 30 years, but a major overhaul was required to modernise the facility. The optimisation project objectives were to lower the cost of production and enable flexibility and agility for Lion to compete in the current and future dairy market.

Scope of Work

McMahon Services was engaged to engineer, procure and construction manage new additions to the existing facility. Works included a 900m² extension to the South West portion of the existing facility for a cool room housing packaging and palletising, additional building works for raw clean in place and process clean in place plants, a new packaging and warehouse upgrade, an additional 15m high 150,000L raw milk silo on the Western side of the facility adjacent to two existing milk silos, and numerous processing and services upgrades.

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Several internal areas were refurbished to house the upgraded milk based beverage process plant, packaging equipment and storage of raw materials and finished goods. These areas included:

- Refurbishment of an existing mezzanine area for batching, process plant and pre-filler storage tanks
- Refurbishment of the existing 'Rio' building for storage of packaging materials
- Refurbishment of the existing packaging hall to suit the final layout for one gable top carton line and two plastic bottle lines
- Refurbishment of the existing cool room areas to create one large open area for storage of finished goods and packaging and palletising equipment
- Connection of new roof areas to existing stormwater reticulation
- Upgrades to trade waste drainage, including new branch lines and upgrade of the main trade waste line from the packaging hall.

Other works included demolition of existing structures, painting, signage, epoxy flooring, and testing and commissioning of completed electrical and mechanical works. Mechanical equipment included pumps, chillers, cool rooms, fire services, and heating, air conditioning and ventilation (HVAC).

At project conclusion, approximately 15km of pipes, 150t of structural steel, 21,000m² of epoxy flooring, 2,000m² of roofing, 450m of stormwater piping, 13 bored piles installed to depths of 6m, 900m³ of cast in place concrete and 20 panels of 9m x 3m precast concrete were installed on site. Earthworks totalled 80,000m³.

Engineering and Procurement Management

McMahon Services worked closely with Lion during the engineering design and procurement phases of the project to ensure optimal cost, program and safety savings were achieved across the works. This included managing constructability, sequencing and packaging the works, coordination of design documentation, managing long lead-time item procurement, ensuring fit for purpose design requirements and ensuring design met food and beverage standards and practices. McMahon Services also prepared all NSW Building certificates for the works.

Food and beverage industry standards were met at all stages during engineering, procurement and construction. This included engineering details such as curved wall edges and 45° slip surfaces for hygienic cleaning, stainless steel pipework, and mechanical and piping systems design to meet food and beverage processing and 3-5% diluted caustic solution cleaning.

One of the major challenges facing the project was ongoing scope, schedule and timeline changes. This required a diligent approach to engineering and procurement activities so alterations did not impact the overall delivery program.

Project Challenges

Construction in a fully operational site

At no time during the construction process could the site be shutdown except for extremely short duration shutdown periods due to the requirements working within fresh dairy products which require cold chain compliance at all times. On a daily basis the facility produces fresh and extended shelf life dairy products. Generally, tie in works to the existing plant occurred during the weekend periods from late Saturday night to late Sunday afternoon during normal plant downtime periods. Construction works schedules were continuous at these times with rolling day and night shifts in operation.

Eight major shutdowns were undertaken for ammonia removal line tie-ins and six minor shutdown tie-ins for service works, such as electrical, fire systems and pipe systems.
Despite these challenges, all tie in and shutdown work occurred to schedule without any unplanned interruptions to process operations.

Restricted site

The Wetherill Park dairy Facility was a highly-constrained site with limited access, limited areas for laydown and site amenities, and highly trafficked with 6-12 tanker truck movements every day bringing raw milk from farm to site and a similar number of trucks taking finished goods milk products off site. Vehicles could only enter the site through one gate and leave through another, with a fixed route they had to pass through to collect or deposit their goods.

Major works effected by the constrained site were the delivery and installation of the 20 precast panels which had to be installed

using 60t and 80t cranes, and the construction of the 15m high 150,000L tank. Despite these restrictions, all works were completed as scheduled without impacting operations, production and without any adverse effect on milk product quality.

Safety Performance

Safety was extremely important at all stages of the project. Identified project risks included working at heights, mobile plant and equipment, electrical hazards, demolition of structures, falling objects, hot works, manual handling, crane works, truck and forklift traffic, automated guided vehicles, container unloading, confined space and unauthorised entry and restricted access.

During the course of the project, over 300 safety inspections and 50 safety audits were completed identifying over 350 potential hazards that were immediately rectified or mitigated. As a result of the diligence approach to safety, the project achieved 680 days with zero recordable injuries over 400,000 hours worked, with 75,000 of those hours being delivered by direct McMahon Services personnel.

Environmental Performance

Hygienic construction in an operational processing facility

All works had to be completed in an operational facility that had to meet strict environmental and hygiene requirements. Each area of the Wetherill Park facility had different hygiene specification requirements from low, medium and high ratings. Hygiene requirements included the wearing face masks, hair and beard nets and clean coats at all times, removal of all jewellery, and passing all footwear through foot wash stations before entering site. Floors were mopped every 45 minutes and other cleaning continued on an ongoing basis.

The challenge for McMahon Services was completing construction works in such an environment. Two of the most challenging tasks were the construction of a trench to install services in one process area, and the installation of a 30m structural steel beam under an internal suspended concrete slab to support the tanks constructed above operational plant. No dust or dirt could enter any designated hygiene areas during the works.

McMahon Services succeeded in meeting this objective by constructing plastic separation sheets between processing and construction sites. Constant monitoring of material ensured that any breaches in the sheeting was immediately sealed. Extraction fans with ducted piping removed dust and other air particles outside and far from the building. Dust monitoring was performed at all times.

Despite the challenges, no incidents occurred and the milk production processes were never effected by construction works.

Recycling

A significant component of the works was the demolition of existing building structures. Demolition products were transported off site to an accredited recycling facility where 90% of all demolished steel, concrete, sandwich panels, piping, wiring and service infrastructure was recycled.

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