

## Wiley delivers award-winning innovation for Primo Smallgoods—Stage One



### CLIENT

Primo Smallgoods is the largest producer of ham, bacon and smallgoods in Australia. Catering for both the domestic and export markets, Primo holds a unique position in the industry by owning and operating abattoirs, food manufacturing and processing facilities and distribution warehouses.

Controlling these critical stages of the production and distribution process ensures Primo maintains the highest level of quality control in the industry.

### OBJECTIVES

Wiley was contracted to master plan, design and construct a \$136 Million integrated smallgoods processing plant that would consolidate several smaller Primo production operations and incorporate:

- A 10,566 pallet freezer for the storage of meat products used in the manufacture of Primo products
- A 7,656 pallet distribution chiller for the storage, picking and distribution of finished products.

The development, located at Wacol in Brisbane, Queensland, was to include process areas able to produce up to 1,800 tonne of smallgoods per week on a double shift with amenities for 600 workers.

Due to the scale of this undertaking, the project was delivered in two stages:

**Stage One**—Cold storage and distribution

**Stage Two**—Process and production facilities and administration building

This profile will detail **Stage One** of the project.

### CHALLENGES

The selected 8.6 hectare site was overgrown and contained a number of derelict buildings. Held under various title deeds, the land was unserviced and had parcels listed on the Contaminated Land Register.

All design for this stage had to make allowances for future stage two developments, including a smallgoods manufacturing facility to be built on the same site.

Specific challenges included:

- Delivery of each stage to bring the completed plant online by September 2012, enabling timely production of Christmas hams and smallgoods
- Design energy efficient refrigeration system, with lowest possible carbon footprint and zero greenhouse impact, whilst maintaining operational temperatures
- Design and construction to achieve international food grade standards and AQIS approval
- Achieve freezer pallet storage for 10,566 pallets within site constraints, whilst maximising production floor area
- Create safe floor conditions for forklifts working at height
- Eliminate subfloor freezing in the freezer building
- Improve lightning performance and reduce heat load of traditional cold storage lighting solutions

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### SOLUTIONS

#### Advice

Wiley's integrated model and collaborative approach to project delivery was important to Primo. The staged approach—following logical phases with stringent approval gates—provided Primo with early confidence in the critical areas of design, budgeting and the delivery timeframe.

A master plan was created to ensure timely delivery of design and construction over both stages of the project as well as flexibility for any future developments required by Primo.

#### Design

- **BIM: a complete project tool**—The Wiley design team collaborated and developed Building Information Modelling (BIM) to import and model all key elements. This consolidated communication platform was an integral project delivery tool which provided 100% confidence in construction details and clash detection.
- All design documentation was aligned with programmed construction cycles from the beginning of the detailed design phase. This provided opportunities for:
  - Multiple work faces and rapid construction
  - Resolution of services installation challenges in the 3D model that were then reflected in the construction cycles

- Prescription of service routes and place holding of large items during the design modelling phases to avoid clashes and disputes in construction

- Ammonia was selected as the primary cooling source—meeting key ESD criteria of zero ODP, GWP and minimal carbon footprint
- Refrigeration system is fully controlled by PLC, with user-friendly HMI and SCADA, and remote from base dial-in and control
- A sub-system was designed for the collection and recycling of condensate from various areas in the facility for reuse in the refrigeration plant
- The freezer rooms were designed to optimise the limited space for storage and picking operations by use of wire-guided Very Narrow Aisle (VNA) forklifts that operate within a pallet width.

#### Engineering

- A hydronic heating system was installed in the structural slab. By controlling the temperature of this slab, the subfloor freezing and frost heave issues were resolved.
- Designed and constructed Superflat floors (beyond normal techniques and tolerances) to for stable operation of VNA forklifts at high speeds and extended heights

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- Investigated, tested and developed custom-designed LED lighting solution, delivering:
  - Instantaneous strike allowing lights with rooms to be turned off without affecting operations
  - Sensor beams on specific racking aisles, illuminating only the portion of the room where people are working
  - Significant reduction in heat output of light fittings and increased efficiency of lighting in -28°C freezers

### Construction

- 8,760m<sup>2</sup> total building floor area—Freezer building
- 9,270m<sup>2</sup> total building floor area—Distribution building
- 400m<sup>2</sup> offices and amenities
- 1,000m<sup>2</sup> Plant room, Utilities and Workshop.
- Trade sequencing within the construction program ensured structural steel and roofing work was completed prior to highest rainfall periods. This allowed all in-ground services, concrete and insulated panel works to be completed with minimal inclement weather impact
- Services gantry system within the ceiling space provided safe access during construction and ongoing long-term maintenance access
- The BIM model was used extensively during construction site meetings, via an on-site PC, to communicate and co-ordinate daily operations.

### RESULTS

Wiley consolidated several smaller Primo operations into a unified, efficient and custom-designed solution.

Stage one was delivered on time and to the highest international food-grade standards ensuring Primo would be on-track to have both stages completed by September 2012, enabling the timely production of Christmas hams and smallgoods.

This facility has been recognised for its outstanding level of design and innovation with numerous industry awards:

- 2013 Australian Institute of Building Excellence in Building National Awards
  - Professional Builder of the Year
  - Research, Development and Technology
- 2013 Australian Institute of Project Management, Project Management Achievement Award
  - Construction/Engineering Project over \$100 Million
- 2013 Queensland Master Builder's Brisbane Regional Awards
  - Industrial Building over \$5 Million
  - Innovation in Environmental Management

