

Building a future

F. Ball and Co. Ltd called on Fairport's expertise to design and build a new materials processing and handling plant

Market leading F. Ball and Co. Ltd of Leek in Staffordshire is probably one of the few construction associated organisations in the country that is currently actively pursuing a significant capital investment programme. As the premier manufacturer of flooring adhesives and floor preparation products for the contract flooring industry in the UK F. Ball and Co. Ltd, established in 1886, moved to its current eight and a half acre site in Cheddleton in 1989 where it first encountered Fairport Engineering Ltd during the construction of its then new materials processing and handling plant.

A growing market share driven by continual investment in product research, development and innovation over the next two decades led F. Ball and Co. Ltd to contact Fairport Engineering Ltd again in 2007 to consider the feasibility of various new state of the art processing & plant design scenarios. These activities were undertaken in parallel with specialist architects and planners and resulted in the project gaining planning consent in January 2008.

Fairport was then engaged to work in partnership with F. Ball and Co. Ltd in March 2008, to conduct an open book FEED (Front End Engineering Definition) assignment. Over the next four months the FEED developed the project, technically and commercially, to a sufficient level of detail and confidence to allow the investment to be considered for sanction by F. Ball and Co. Ltd.

On July 1st F. Ball and Co. Ltd instructed Fairport to proceed with the design and build of the project. The basis of this instruction was to achieve construction completion of the plant in April 2009 and that Fairport were to act as F. Ball and Co. Ltd's Managing Contractor on a fixed fee plus target cost basis for the £7.0M project.

It was further agreed that F. Ball and Co. Ltd would purchase and provide the mixer, bagging and palletising systems directly. Fairport would undertake all design, engineering and purchase



the "balance of plant", civils, structures, electrics & control systems on a competitive, open book basis in conjunction with F. Ball and Co. Ltd. Fairport would also provide the overall technical and commercial management of the project together with the site construction, commissioning and HSE supervision.

The plant is designed to work on a 16 hour and 5.5 days a week basis with a minimum of operating staff and produce, for a given recipe, 50 tonnes per hour (20 x 2,500 kgs batches) of a cementitious product and subsequent bagging at the following throughput rates: -

Rotary packer: - 1,275 bags/h on 6 spouts of 20 kg & 25 kg paper sacks.

Twin spout packer: - 383 bags/h of 12.5 kg, 20 kg & 25 kg paper sacks.

Each packer is fitted with an automatic sack feed facility and delivers weighed paper sacks to individual take away conveyors where the bags are check weighed, printed and palletised using robot packers. Having been palletised the two lines come together prior to hood wrapping and final storage in the adjoining warehouse. The plant is capable of producing a wide variety of recipes at various throughput rates depending upon ingredient quantities and bulk densities.

As part of the planning permission the existing flood plain had to be maintained and so a 1.5 m high x 3050 m² suspended concrete floor containing some 2,500 tonnes of concrete, rebar, ground beams and some three hundred, 20 m deep piles has been installed. This allows water to flood onto the flood plain, under the building and eventually drain back into the nearby river at a controlled rate.

The layout and equipment has been designed to ensure containment of dust, a minimum amount of spillage with access and facilities arranged to allow for easy clean out between materials and or recipes. The cleaning of all equipment and any spillages is by a central vacuum system.





The site of the Silo Tower required more substantial piling and foundations than the rest of the facility

The plant is ATEX rated as required by the relevant legislation taking into account the particular ingredients used within the processes.

Site was established at the end of July 2008, recognising that with the significant civil works required construction progress needed to be maximised during the summer and autumn months. Consequently an immediate start was made on piling activities in August 2008.

The tallest and heaviest part of the plant is the Silo Tower, which required more substantial piling and foundations than the rest of the facility, which is predominantly a single storey warehouse building. This part of the construction was concentrated on as a priority in September.

Other peripheral piling and civil works around the Silo Tower had been continuing in parallel during September including outlying pile caps. During October it was possible to start casting the upstands for the steel lattice beams, which were installed in early November.

Once the steel lattice beams were in place this allowed a pre-cast decking to be located in preparation for the arrival of the main structural steel in late November (see picture below).

The project consists of a steel frame building containing approx 450 tonnes of galvanised structural steelwork, sheeting rails and purlins and 7,000 m² of insulated cladding compliant with the L2 building regulations for heated industrial buildings.



During the early stages of the Silo Tower construction various key pieces of equipment needed to be installed as progress was made – screw conveyors, weigh hoppers and the mixer – in order to allow the structural construction to proceed in an effective manner.

Moving into the New Year, and with the upcoming installation of the Silos every effort needed to be made to progress the Tower and other building steelwork installation. Bulk ingredients are delivered and transferred by road tankers and stored in 6 x 100 tonne (64 m³) and 4 x 50 tonne (32 m³) capacity bulk silos measuring 3.1 m dia x 7.15 m long barrel & 3.34 m long cone and each weighing 5.5 tonnes. These were installed on 20th January 2009.

Major/minor ingredients are delivered via road transport in big bags or sacks and are delivered into 16 x 2.3 m³ capacity pencil silos each measuring 600 dia x 9.0 m long barrel & 0.2 m long cone and weighing 1.0 tonne via pneumatic conveying systems from two separate combined big bag/sack tip stations. These were installed on 21st January 2009.

The building steelwork could now be completed having installed the Silos in the Tower and just prior to fixing the cladding rails the pneumatic pipe ranges were installed.

With the onset of some poor wintry weather in February the need to provide a sheltered working environment inside the facility became urgent and so cladding progress was of vital importance.

In parallel with the external cladding works three overnight



ABOVE: The cladding progress became even more important with the onset of harsh winter conditions

internal concrete pours were undertaken to the packing and warehousing areas of the facility.

By the middle of March 2009 the electrical works had begun in earnest and the packing and palletising equipment was delivered and installed. Electrical and control system installation and process testing carried on through April and into May with the entire plant being formally handed over to F Ball and Co. Ltd on 5th June 2009.

For more information contact Fairport Engineering on tel: 01257 484 000 or visit: www.fairport.co.uk