

Case study: NG Bailey utilises offsite construction methods to deliver for Arla Foods

Arla Foods' new £150m flagship dairy in Aylesbury, Buckinghamshire, is one of the biggest in Europe and with plans for it to be the first ever zero carbon milk processing facility, it will be one of the most environmentally advanced in the world.



It is also the world's first dairy with the capacity to process one billion litres of fresh milk a year.

Off-site construction proved instrumental in the construction of the dairy, with NG Bailey playing a crucial role in its development. By using off-site construction methods, NG Bailey delivered the dairy's main services distribution corridor

project in just five weeks - compared to the usual 12 weeks it would have taken using more traditional construction methods.

Off-site methods also helped deliver sustainability benefits by reducing site traffic and material wastage during construction.

The company was contracted to provide all mechanical and electrical work, as well as facilities management services, at the next-generation dairy, which spans a 70-acre site at Aston Clinton.

Completed over two phases, the initial stage involved the development and construction of the dairy's main services distribution corridor. To meet the brief, NG Bailey incorporated a variety of innovative methods into the design, which included special pipework made from modern and progressive materials such as thin-walled stainless steel.

When it came to the corridor's construction, in line with Arla's commitment to use the best available construction techniques and most advanced technologies available, NG Bailey utilised off-site manufacturing techniques to create 17 pre-fabricated modules, in order to deliver the project as quickly and efficiently



as possible. These modules were bolted together on-site to form a 204 metre run of main services for the new dairy. This equates to close to 70 per cent of the total main services distribution required to operate the dairy.

Each module at the Arla site contains all process piped services including: chilled water; low temperature hot water heating; steam and condensate; process ice water and glycol circuits.

They also include high and low voltage distribution, and separate containment runs for data and building management system control cabling. Pre-wired lighting trunking with plug-in rockrose connections are also included in every module. This enables the light fittings, which will provide the corridor lighting, to be easily installed.

The second phase of work saw NG Bailey deliver an innovative, high-specification purpose-built energy centre, using off-site manufacturing techniques and 3D modelling. Providing a bespoke service to Arla, the energy centre measures 90m long by 60m wide - equivalent to 20 tennis courts - and will generate the services required to operate and support the dairy.

The purpose-built energy centre includes steam and low-pressure hot water. Utilising the waste heat from two combined heat and power plants, it can produce more than 14 mega-watts of connected heat output, which is enough to heat more than 2,000 homes.

In addition, ammonia refrigeration provides iced water for the process and cooling of HVAC loads. This delivers more than 7.5 mega-watts of cooling capacity - enough to cool 150,000 fridges. Power equivalent to operating 130,000 televisions is provided by the 11KV sub-station, which generates an electrical load of 6.5 mega-watts for the energy centre alone.



Six heavy duty plant skids, six high level multi-service frames and two heavy duty, floor standing, multi-service frames were also used in the construction of the energy centre. The second phase of NG Bailey's work was installed by a team of two operatives in less than two weeks.

Following the completion of the Arla dairy, NG Bailey's Facilities Services division will now maintain the site for the next 15 years.