Airbus, North Factory, Broughton, Flintshire

Size of project		£71.3m
Type of project		Factory
Demonstration themes		Committed leadership, integrated teams, sustainability, waste management
Team	Client	Airbus Operations Ltd
	Main contractor	Morgan Sindall
	Designer	Morgan Professional Services
Other		Supply chain partners – Ash Group, Murraywood Construction, Atlas Ward, Bachy Soletanche, Roofdec, Balfour Beatty, Tier
Contract		Design and Build JCT D4B05

The Demonstration

Airbus has established itself as a leading European aircraft manufacturer by challenging the big American brands and adopting a radical approach to its production processes. In 2005, when Airbus Operations Ltd wanted to create a specialist factory unit for its new hi-tech composite wing assembly, it envisaged a first-rate facility incorporating best practice that would be an exemplar to both aviation and the construction industry.

The project was a massive 52,000m2 scheme based on a steel frame structure in a three-bay configuration, requiring complex machine bases and concrete floors with around 8,000 piles. Airbus wanted a collaborative procurement method and an integrated project team that would 'design, construct and deliver a fully integrated and industrialised factory of the future, which achieves all safety, quality, cost, delivery and people (SQCDP) targets and objectives from day one'.

The Delivery

A clear vision, a 'one team' approach and personal commitment from all involved were key to the project. Airbus was committed to a Latham and Egan agenda and was fully involved from the beginning. The client chose the 'prime contracting' model, appointing Morgan Ashurst (now Morgan Sindall) as lead contractor because of its experience with the model and commitment to best value.

In order to ensure that everyone understood the project objectives, a unique 'partnering charter' was jointly developed and owned by the whole team. The SQCDP objectives were displayed on a board in the project briefing room and progress in each category was reviewed on a daily basis. The team was based in a single open-plan office and a communications strategy was developed to ensure that information, ideas and progress were shared throughout the project. Informal meetings, briefings and focus groups all reinforced the open-book working approach. Organic groups formed as clusters to deal with specific issues aimed at improving design or costing. A newsletter was produced and a reporting wall with a traffic-light code for prioritising issues installed.

The Outcomes

As a result of this integrated approach, the SQCDP objectives were largely achieved. With a total of 950,000 man hours worked there have been no reportable injuries or occurrences. Quality is excellent, with zero defects; monthly costs were within 10% of planned expenditure, and delivery was on schedule. There was consistently high morale among everyone involved and a genuine 'no blame' culture was achieved. It was clear to the judges that the entire workforce bought into the approach.

The project has been awarded a BREEAM Excellent rating, a significant achievement given that there was no external requirement to deliver to a set BREEAM standard. The team wished to support the Airbus Global vision of reducing CO2 emissions by 50% and energy consumption by 30% by 2020. A holistic approach towards design and construction ensured that sustainability has been embedded into the lifecycle of the project, making it as 'future proof' as possible.

Key sustainability features include use of passive ventilation, air-sourced heat pumps and a biomass boiler with an annual output of 830,000kWh. Cladding thickness of 120mm with air permeability ratio of 5 provides improved insulation. There is 140m2 of photovoltaic solar tracking arrays with an annual output of 22,550kWh, solar bulbs are used to heat up 75% of the hot water, and the design of the facility has increased natural lighting by 10%. The team is working locally with two quarries to re-establish natural habitat.

As a result of these initiatives, 42% of all energy for the facility is supplied by renewable sources and there is a 47.5% improvement in CO2 emissions compared with a notional building. There is also a 27.5% improvement against the target CO2 emission rate, and energy consumption recurring costs are being reduced by up to 30%. This data is being tracked live on site.

Waste minimisation has been a key theme, and the team set a target of 80% recycling or better. The first step was bringing in a full-time waste manager to oversee the strategy and ensure it was clearly communicated. Waste was segregated at source and fabrication took place off site whenever possible.

All spoil was either reused on site or kept for the restoration project. Concrete was also crushed and reused. Packaging was reused or returned – such as the Kingspan panel packaging, which comprised over 4,000 pallets and 10,000kg of plastic sheeting. An innovative process known as the 'siltbuster' was exclusively developed to process wash water from ready-mixed concrete, resolving a major contamination issue common on projects involving large quantities of delivered concrete.

The Airbus team has delivered a project that fully embraced the core principles of the rethinking construction agenda, notably in terms of client leadership, integrated team working and sustainable construction. The project team has now been engaged to implement the approach on other Airbus projects worldwide – the true hallmark of a Demonstration.

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