Retford STW

high level inlet works refurbishment with DFMA in mind, collaborative working with the supply chain to drive innovation

by Chris Palmer

Retford STW is located to the north of the town of Retford, Nottinghamshire. It serves a population of approximately 26,000. The project was to address capital maintenance works which includes the replacement/refurbishment of expired life items and the addressing of operational risks. The inlet works screens were capturing approximately 15% rags which was creating a high impact on the treatment process and creating high operator involvement on a daily basis with high OPEX cost. Adopting the Design for Manufacture and Assembly (DfMA) approach the project team delivered the solution minimising operational and process impact during the construction phase.

Stainless steel tank being lowered into position - Courtesy of North Midland Construction

Introduction and project background

An innovative DfMA approach to the refurbishment of the inlet works was taken to reduce the operational and process impact of the scheme during the construction phase.

A stainless steel tank and frame was designed and manufactured which would house the new inlet screens. The whole assembly would be delivered to site, pre-assembled and be lowered into position within the inlet structure. High level scaffolding was designed and erected to enable temporary pipework to be installed to control and bypass the sewage flow during the construction phase. This eliminated the need for high risk issues associated with overpumping.

Collaborative working and a factory thinking approach enabled safe but fast construction on site, delivering the project ahead of a very tight programme and minimising the risk to the sewage treatment process.

Innovation

Early supplier engagement was key to the success of the project. The NMCNomenca project delivery team worked closely with the supply chain to ensure the correct solution was obtained. Designs were created and reviewed in a collaborative manner to ensure the innovation potential was being met.

Using tradition construction methods, the refurbishment of the high level inlet works would involve heavy civil engineering techniques and lengthy construction programme. By innovating with the pre-manufacture frame, this was greatly reduced and health and safety risk greatly decreased due to the factory thinking, off-site build.

Sustainability

As traditional construction methods were not used, the site's operational carbon footprint was significantly reduced. The pre-assembled frame was lowered into place with bypass walls etc. pre-fabricated within the channels. Usual methods would mean raw materials such as timber for formwork and concrete would have been used.

The steel frame and inlet screens were transported to site in one visit which greatly reduced the CO_2 emissions associated with multiple material deliveries during traditional methods.

Planning and communication

Engagement of the supply chain and the client was maintained throughout the project. The project team held collaborative planning sessions with stakeholders to ensure focus at strategic hold points within the programme.

NMCN held consultation meetings with Severn Trent Water Wholesale Operations (End User) throughout the project and incorporated their feedback into the final design ensuring operational safety and full compliance with the CDM Regulations.

Safety

Consideration to safety was at the forefront of the project. The final solution was designed with safety in mind. The construction programme was reduced by two weeks by constructing in this way. Traditional construction methods would have involved increased risks to the workforce including:

- Working at height.
- Plant movements.
- Lifting activities.
- HAVS.
- Exposure to COSHH.

Project management and procurement

A collaborative approach was given to the entire project from initial proposals to hand over to the client. Collaborative planning sessions were held with the supply chain and client to build up the project timeline. These key dates were then fed into the main construction programme which ensured greater visibility of the critical path to all involved.

Early procurement of the inlet screens to the supplier with design acceptance agreed ensured the usual manufacture period was within programme.

A manufacture programme was issued to NMCN from the supplier showing key dates. The dates were used for regular programme updates either via conference call or at the suppliers' premises.

During the construction phase, weekly collaborative planning sessions were held in the site cabin with all stakeholders to ensure the programme was not only being met but challenged.

This collaborative approach by the client, design and build contractor and suppliers throughout the life of the project enabled the innovative solution to be delivered within its tight timescales.

Whole project impact

The project has made a drastic improvement to the sewage treatment process at Retford and significantly reduce STW operator time required on the site.

The client is more than happy with the outcome, not only was the project innovative, it was also the TOTEX solution.

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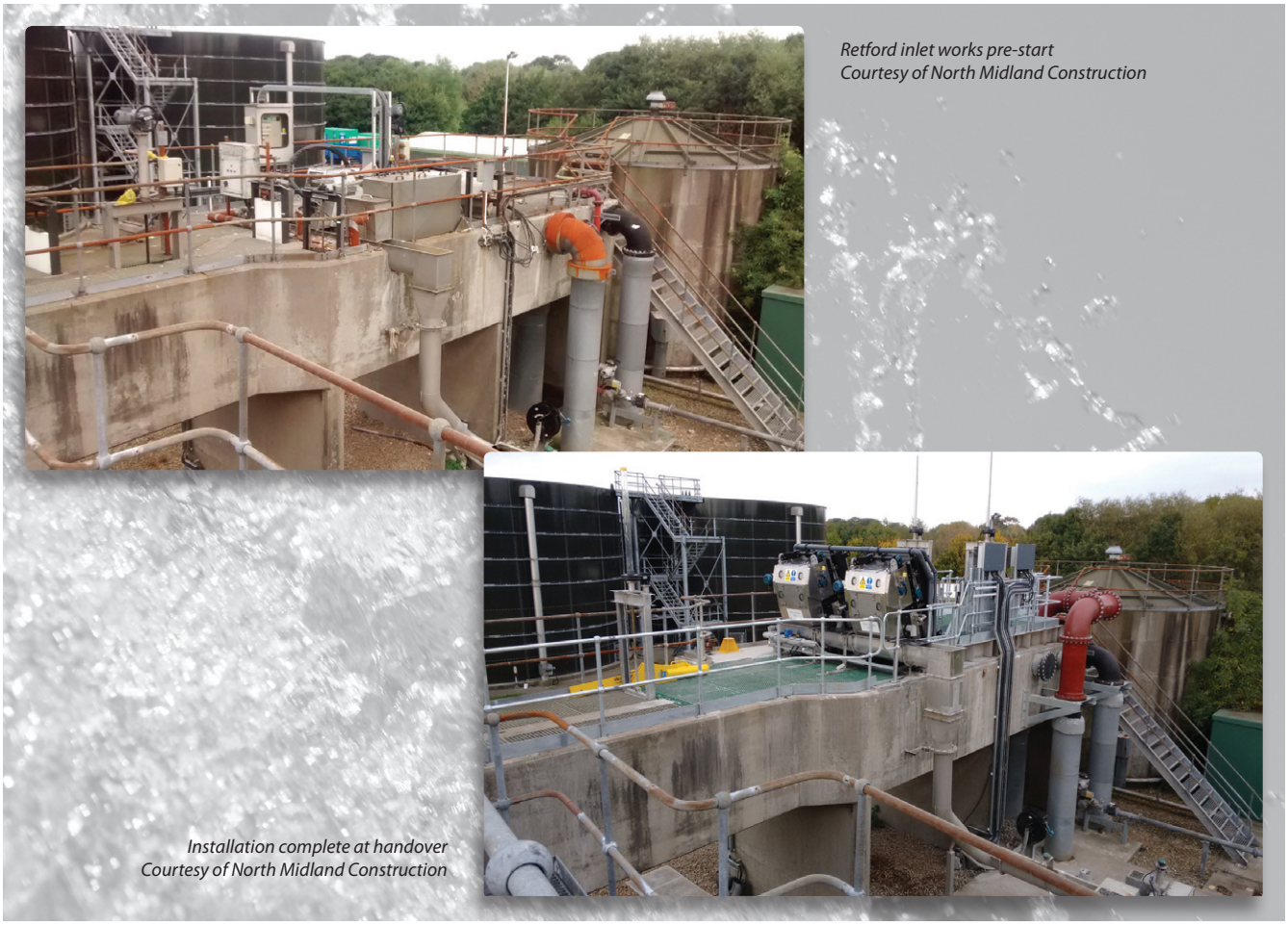

Retford inlet works pre-start
Courtesy of North Midland Construction

Installation complete at handover
Courtesy of North Midland Construction