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A Sludge Thickening Case Study: Anglian Water, Great Dunmow WRC



Installed HUBER DISC Thickener S-DISC at Great Dunmow

HUBER Technology have been involved with a large, high profile project with the @One Alliance. Our involvement consisted of the supply of preliminary treatment equipment for a newly constructed inlet works and the addition of mechanical sludge thickening plant to accept sludge from the new Nereda activated sludge process.

Objective

The main objective of this project was to provide adequate protection upstream of a Nereda process. At the time we understood that this would be one of the first sites on which a full scale Nereda system would be operated within mainland UK. Hence this project was under scrutiny from the start.

Nereda is the wastewater treatment technology that purifies water using the unique features of aerobic granular biomass. It is claimed that Nereda requires a quarter of the area of conventional activated sludge installations and the process can reduce up to 50% on energy-costs. [The award-winning technology](#) was invented by the Delft University of Technology in the Netherlands and developed in a unique public-private partnership between the University, the Dutch Foundation for Applied Water Research (STOWA), the Dutch Water Authorities and [Royal HaskoningDHV](#).

Performance Requirements

SLUDGE THICKENING PLANT REQUIREMENTS	
Sludge type	Activated from the NEREDA process

Minimum dry solids content of incoming sludge	0.55 % DS
Maximum dry solids content of incoming sludge	0.81 % DS
Maximum outlet sludge concentration	6.5 % DS.
Minimum outlet sludge concentration	5.5 % DS
Minimum throughput required	15 m ³ /hour
Maximum throughput required	20 m ³ /hour
Life cycle costs based on	6% DS output
Operating periods	8 hours per day 6 days per week
Solids recovery minimum	95%
Polymer type	Liquid

Project Background

In late 2016, HUBER Technology were contacted by the @One Alliance to look at providing sludge thickening plant that would be located within an existing blower building. Due to space and time restrictions the approach taken was to design a DfMA (Design for Manufacture and Assembly), "build off site" or "plug and play" solution.

This requirement for the DfMA approach suits our products very well, as we provide modular solutions right through from preliminary treatment to tertiary treatment, as well as equipment for sludge screening, thickening, dewatering and drying.

Our Initial offer involved a standard DfMA solution incorporating:

- 1 No. Size 2 **HUBER DISC Thickener S-DISC** c/w flocculation reactor.
- Polymer mixing valve and injection ring.
- Thin sludge flow meter.
- Thin sludge supply pump.
- Thickened sludge pump.
- Poly make-up and dosing plant.
- Form 2 control panel to control all plant.
- All interconnecting pipework, cabling and connections.

We proposed that all of the above would be mounted on a G.M.S. skid for ease of installation and space saving.

Detailed discussions took place which meant that our standard solution had to be further developed to meet stringent specifications and client preferences and to be integrated into what in effect became a mezzanine floor.

These changes from the standard design involved:

- The inclusion of a polymer day tank.
- The provision of duty/standby liquid poly feed pumps.
- Addition instrumentation and control panel modifications.
- The removal of the thin sludge supply pumps from the skid.
- Redesign of the skid to include support legs to allow the skid to be incorporated into the proposed mezzanine floor.
- Redesign of the skid to incorporate additional bunds and a sump underneath the poly make-up and dosing plant c/w level probe.

All these changes were discussed and agreed through a series of HAZOP meetings conducted by the @One Alliance.

This departure from the standard DfMA solution and the additional scope did lead to an increase in the overall cost, however, some of this was dictated by the limited space available to fit the plant into the existing blower room. There was very little space available and the introduction of the mezzanine floor meant that additional equipment associated with the sludge thickening process could also be located within the blower room. The overall design was developed to meet the space challenge.

HUBER Technology Scope:

The design, manufacture, supply, delivery, mechanical & electrical installation, commissioning and the training of O&M staff of:

1 No. DfMA HUBER Sludge Thickener S-DISC Package comprising of:

- 1 No. Size 2 **HUBER DISC Thickener S-DISC** Sludge thickener c/w flocculation reactor.
- Polymer mixing valve and injection ring.
- Thin sludge flow meter.
- Thin sludge supply pump.
- Thickened sludge pump (now located outside the bloomer room).
- Poly make-up and dosing plant.
- Form 2 control panel to control all plant.
- Polymer day tank.
- All interconnecting pipework, cabling and connections.
- Modifications to the G.M.S. skid.

*"The complex challenges of this project meant that it was imperative we engaged early and effectively with @One Alliance. This was made easier by a team of engineers from all disciplines who understood the nature of the problems and worked closely with us to develop a robust but cost-effective solution. We are confident that the DfMA **S-DISC** sludge thickening package supplied will provide the end user with a robust and reliable sludge thickening solution that can be cost-effectively repeated on other sites. Over several years, the **S-DISC** has proven to be an excellent space saving solution for sludge thickening that has a number of advantages over more conventional sludge thickening technologies."*

Dale Foster, HUBER Technology Area Manager

HUBER DfMA Solutions

- Thickener, flocculation reactor, thin and thickened sludge pumps, polymer make-up and dosing system and control panel.
- All prewired, fitted and tested prior to delivery.
- Saves, time and cost compared to conventionally installed solutions.
- Reduces H&S risk on site.
- Results in smaller carbon footprint.
- Improves quality whilst also reducing commissioning and optimisation times and waste.
- With agreement on our standard solution lead times are more certain.

Related Products:

- [HUBER Disc Thickener S-DISC](#)

Related Solutions:

- [HUBER Solutions for efficient Sludge Treatment](#)

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