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Meadowhead STW Wastewater Case Study



Huber Technology has completed the upgrade of the inlet works at Meadowhead STW. The project involved the installation of 4-off HUBER RakeMax® Multi-Rake Bar Screen 6300/2752/19 Coarse Screens and 2-off 12 m³/hr HUBER WAP-L Wash Press Screening Handling units for the Coarse Screens and 2-off 15 m³/hr WAP-L Wash Press Screening Handling units for the retrofitting into the existing inlet works for handling screenings from the Fine Screens.

Project Profile

- Area of catchment and contributing towns: Major towns included within the catchment are: Ayr, Prestwick, Troon, Kilmarnock, Irvine and other small towns.
- Population equivalent. 220,000
- Number of contributing pumping stations. 6 large Sewage Pumping Stations
- Dry weather flow. 1,000 – 1,500 l/sec
- Maximum Flow. 4,500-5,500 l/sec

Objective

The existing works at Meadowhead STW consisted of both coarse screening and fine screening areas with the coarse screenings located in an enclosed ATEX rated building. The problem that was presented to HUBER was that the 4-off large grab screens had to cope with large variations in flow from catchment pumping stations that are located around a very flat area. The old screens were proving unreliable and required continual maintenance and tender loving care in order to keep them running.

In addition to the coarse screen issue HUBER were also asked to look at a problem that Scottish Water were having with their existing fine screens screenings handling units. Scottish Water approached HUBER to investigate potential solutions available from Huber to solve the issue regarding these large flow variations, high screenings removal rates, improve the equipment reliability, and fit any new

equipment within the existing building with limited space whilst complying to the ATEX zoning requirements.

Because of the lack of reliability of the existing screens a very tight timescale was given from Scottish Water in order to carry out the necessary investigation, discussions, and agreement on type of screens.



RakeMax® installation had to be completed through the roof of the building





Solution

After assessing the works along with investigations and observations regarding the nature of the flow and screenings being presented to the site, HUBER established that the best solution for the works would be the HUBER RakeMax® Multi-Rake Bar Screen. HUBER had already installed a number of these units throughout the UK and in particular the large inlet works at [Belfast \(Duncrue Street\)](#) and to give Scottish Water operatives and engineers confidence in the units a site visit to Ireland took place. Subsequently after further discussion between HUBER and Scottish Water, Huber prepared a final proposal for the equipment offered.

During the design phase there was significant focus on the issue of handling the large volumes of screenings being presented to the screens and how this would be addressed when presenting the screenings into any launder trough from our Huber unit. Unlike large grab screens the HUBER RakeMax® unit has multiple screenings removal rakes and as such more, but smaller volumes, of screenings would be removed from the screen face and placed into the launder trough. Huber assess each application with regards to the number of rakes fitted to ensure that sufficient small volumes of screenings are presented to the launder trough and flow, allowing them to be easily transported and removed from the discharge area.

HUBER assessed the merits of reuse of existing equipment (launder, access platforms and sundry items) to enable the most cost effective solution to be given. From layouts and calculations it was found that the existing launders with some minor modifications could be used, reducing the overall project costs to Scottish Water.

Huber were awarded the contract and immediately started work on the project, reducing the project time from March delivery to December, improving the installation date by 3 months.

One of the major challenges on this site (in addition to compliance with ATEX zonings of the existing building) was that HUBER also had to consider during the design of the works, issues with planned maintenance activities and lifting strategies caused by constraints arising from utilising the existing building, gantry, launder system and existing civils. As a result of this a great deal of thought and consideration had to be taken at the design and installation phase. Some of the issues resulting are detailed below.

Transportation of the four large RakeMax® 6300/2752/19 from HUBER's parent company in Germany required careful consideration. The most cost effective way entailed splitting the RakeMax® screens down into sections for transportation with re-assembly on site.

To reduce delivery times, HUBER had the RakeMax® units shipped straight to site. This, however, meant HUBER needed to ensure that their Scottish installation teams had the required drawings, parts and detailed information to reassemble the units onsite, work which would normally be undertaken in HUBER's workshop.

Further consideration was required regarding the phases and order in which the machines would be installed.

HUBER worked closely with Scottish Water to formulate a plan which met their fundamental requirement of keeping the plant operational whilst the new plant was installed mechanically, electrically and commissioned.

Whilst the installation of the Coarse Screens was being completed, HUBER also replaced the fine screens screenings handling units with large variable speed HUBER WAP-L Wash Press screenings handling units. Each WAP-L was rated at 12 m³/hr at standard speed with the possibility of increasing the speed of the motors up by the use of VSD's to give an output in excess of 15 m³/hr per unit. This

was achieved by the sensing of the screenings level within the units inlet hopper and when a set criteria was reached, and only at that time, the VSD would come into play and give the necessary high speed removal capacity. VSD's were also fitted to the coarse screen washpress units to improve flexibility .

The project budget, timescale, and operational requirements were achieved as a result of the good working relationship and close collaboration and communication between all parties.

Large storms have already been experienced at this site and from the site operational feedback and response no issues have arisen and HUBER have yet another satisfied and happy client.

Huber Technology Supplied

- 4 HUBER RakeMax® Multi-Rake Bar Screen 6,300mm long 2,752mm wide with 19mm bar spacing each handling 2200 l/s per screen working in a duty/ assist/ assist/ standby mode with control panels for each unit.
- 2 HUBER WAP-L Washpress units for coarse screenings handling with each unit handling 9.18 m³/hr per unit working on a duty and standby basis with the facility of working on a duty and assist basis if required with control panels for each unit.
- 2 HUBER WAP-L Washpress units for the fine screens with each unit handling 12 m³/hr working on a duty and standby basis with the facility of handling up to 15 m³/hr per unit with control panels for each unit.

Product Profile

▪ RakeMax – Multi Rake Coarse Bar Screen

- High screenings removal capacities available
- Low hydraulic screen loss
- Easy retrofit into existing channels
- Suitable for deep channels
- Variable number of rakes to suit site specific needs.

▪ WAP-L– Launder Wash Press

- Different sizes for up to 18m³/hr of throughput
- Volume, weight and disposal cost reduction of up to 85%
- Compaction of up to 50% DS
- Washed screenings
- Over 370 UK installations

Jim Gordon, Project Manager Scottish Water: *“The Meadowhead Inlet Refurbishment was a very challenging project on a number levels including a very tight timescale. Key to the success of delivering this on time was an effective and efficient working relationship between Huber, SW Managed Delivery, SW Operations and the main contractor with all parties meeting their respective project commitments on or ahead of schedule. Huber as the principal supplier and installer of screens and screening handling kit had a key role to play in meeting the aspiration of the delivery team to better the agreed programme and have all screening equipment installed and operational by Christmas 2014 rather than March 2015. This was achieved with Huber's in house, highly experienced staff working in a flexible, responsive and effective manner with all the other parties involved to deliver a first class job ahead of schedule.”*

Kelly Nightingale, HUBER Contracts engineer commented: *“Although this was a challenging project from the offset, the end result proved very rewarding, achieved through close working and collaboration by all parties involved, the outcome being a successfully, maintainable solution.”*

Fred Neumann, Huber Area Sales Manager: *“The success of this project was down to all the associated stakeholders being involved early in the project design and execution. Everyone involved, adopted a very professional, flexible approach and can do attitude, which resulted in a very good installation on the ground for all to see. Personally, I would have no problems undertaking future projects with such a hands-on end user / Project manager and contractor involvement.”*

For more information please contact HUBER Technology UK on Tel +44 1249 765000 or via email rotamathuber.co.uk.

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