

HUBER SCREENINGS AND SLUDGE TREATMENT EQUIPMENT IN NORTHERN IRELAND

CASE STUDY



THE CLIENT

Almost a year ago we started up our screenings and sludge treatment equipment that we had supplied to Northern Ireland. Our equipment is installed in the newly constructed North Coast wastewater treatment plant of Northern Ireland Water at Craigtownmore.

OVERVIEW

Our contract included supply, installation and start-up of our systems for screenings handling, for mechanical sludge thickening and sludge dewatering, and the contract also included supply of control panels for all systems in compliance with the customer's specifications. For screenings washing and compacting we supplied two super-laundry Wash Presses WAP/SL Size 6 whereby one of the units serves for redundancy. The screenings are fed to the WAP/SL through a launder channel. The WAP/SL units are designed to intensively wash up to 4 m³/h wet screenings, and at peak times, when all screens are operating, the units automatically alter their operating cycle to increase the unit's capacity to 6 m³/h. Duty and stand-by status of the units are controlled by means of actuated knife gate valves that are installed in the launder channel system

Within the launder tank of the WAP/SL batches of screenings are washed under high turbulence, like in a laundry machine. Then the wash water is drained and the screenings are pushed through a perforated pressure pipe whereby they are dewatered and compacted. The

discharged screenings have a solids content consistently above 45 %DS. For sludge dewatering we supplied four ROTAMAT® Screw Presses RoS 3 Size 3. The screw presses were selected because they are entirely closed, operate automatically, perform well and have low operating and maintenance costs.

A pair of ROTAMAT® Screw Thickeners RoS 2 size 4 was installed as a backup system for time periods when land application of sludge cake will not be possible. If this is the case thin sludge is thickened to reduce the necessary on-site sludge storage volume.

HUBER SCREW PRESS DESIGN

The Screw Presses are designed to process 70 m³/h of wet sludge with a solids concentration of 1 % DS. They produce cake solids with a concentration of over 25 % DS. Sludge is pumped to the presses from a sludge blending and storage tank. Polymer is dosed into the sludge feed pipe as a flocculant. Strong flocs are formed in flocculation tanks that are located immediately in front of the screw presses. At the other end of the inclined presses dewatered sludge cake drops into a screw conveyer system and is finally discharged on trailers. The screw thickeners are also designed to process 70 m³/h of wet sludge with 1% DS. They produce thickened sludge with a solids concentration of over 6 % DS. Here too, sludge is pumped from the sludge blending tank, mixed with polymer and allowed to flocculate prior to entering the screw thickeners. The thickened sludge is pumped

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into a thick sludge holding tank.

Design features of the Screw Presses and of the Screw Thickeners are similar. Both types of machine are provided with a shafted screw that slowly rotates within a stationary wedge wire drum. The wedge wires of both machines are spaced with an aperture of 0.25 mm (250 microns). As with all Huber machines, all metal parts are made of stainless steel. All our equipment was supplied with control panels that were designed, built and programmed by Huber engineers in England. Each control panel contains a Siemens PLC and HMI system along with intelligent starters and variable frequency drives (VFD) where required. A Profibus network is provided to communicate with the customer's MCC and SCADA system..

OUTCOME

The new wastewater treatment plant began operation in April 2007. At the same time the WAP/SL screenings wash-presses were commissioned. Our RoS 3 Screw Presses were started up during May 2007 after sludge production of the plant was sufficient. The RoS 2 Screw Thickeners were commissioned after performance testing of the screw presses was finished with satisfying results.

