



A regular maintenance programme is helping Scottish Water to enhance the efficiency of its waste water treatment sites with the latest improvements being made to a pair of Archimedes screw pumps. The task of replacing the bottom bearings and re-screeding the concrete trough was completed by ECS Engineering Services, which is supported by the pump manufacturer Landstätt.

Scottish Water is one of the largest operators of Archimedes screw pumps in the UK and maintaining them is an important task if the treatment works are to continue operating effectively. For one site near Hamilton, South Lanarkshire, a pair of Archimedes screw pumps had been identified as requiring new bottom bearings and remaking of the concrete troughs.

Archimedes screw pump refurbishment

Case Study: 027 Archimedes screw pump refurbishment



In pumping installations such as these, the bottom bearings must perform in completely submerged conditions and many bearing designs feature a lubrication feed line which supplies grease to the bearing on a regular basis. If the bearing fails the load on the drive motor will increase significantly and the efficiency of the pumping station will be greatly reduced.

The Archimedes screw pump design also relies on the trough in which it lies to guide the water to the top of the screw. The efficiency of this process is determined by the gap between the screw pump flights and the trough. Over time the motion of the water will wear the concrete and the gap will increase, allowing more water to fall back to the bottom of the screw.

This particular project was carried out by ECS who

have considerable experience in maintaining these assets being the UK sales and service partner for Landustrie. Using the OEM drawings for the bottom bearing, ECS was able to specify a new stainless steel, eco-friendly bearing which is sealed for life and requires no annual maintenance. The design of the bearing allows for 3-dimensional self alignment, which absorbs the expansion and contraction of the screw in changing temperatures.

The project required a mobile crane to lift out the screws and allow the existing screeded troughs to be broken out and 5mm tolerance bars to be welded temporarily onto the full length of the flights of the screws. In this way the original bearings can be removed and replaced with the Eco bearings before the screw is replaced in the trough and connected to a special screeding drive motor.

Fresh screed was then hand formed to create the basis of the new trough utilising the special screeding drives to turn the screw very slowly. The temporary screeding bars shape the concrete to form a perfect fit for each screw and the remainder of the trough is hand finished. Once the materials have gone off, the screeding bars are removed and the service motor connected to allow normal operation.

Jamie Wesley, Commercial Manager - Water Control Division at ECS comments: "This type of project requires very special skills, it is very important to maintain the efficiency and reliability of Archimedes screw pumps. ECS has the skills and expertise to ensure that we have extended the service lives of these Scottish Water assets to allow trouble free pumping for years to come."

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