

Refurbishment of Nitrifying Trickling Filters (NTF) – Duckinfield WwTW

Project profile

Background

Refurbishment works were required to the Nitrifying Trickling Filters (NTF) at Duckinfield WwTW. The original concrete block and beam framework supporting the filter media in the existing four tanks had suffered various states of collapse putting at risk the site compliance.

Objective

Hewitech were tasked with the design, manufacture and deliver of new Filter media for the 3 No. existing NTF and 1 No. new NTF to ensure continued site compliance. This included the removal and disposal of the existing collapsed filter media.

Water Authority

United Utilities

Principle Contractor

Eric Wright Water

Media profile

- Hewi-Fill CF19
- Specific Surface Area 150 m²/m³
- Diagonal 60° Crossfluted Structure
- Polypropylene and UV protected
- Thermally Welded
- 8x 600mm layers with different Strength Grades depending on layer depth

Solution

The NTF overhaul involved the complete strip out and removal of the existing plastic media. Hewitech completed this by removing the media layer by layer working down to the tank floor until completely removed. The media was then disposed of and the walls and internals of each tank were jet washed.

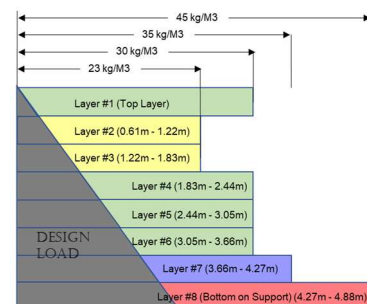
Hewitech took on the responsibility for the full contract lift craneage, providing lift plans, Lift supervisor and Banksman. This allowed full control over the removal of the existing media, which was compacted onsite for disposal, adding the benefit of 70% reduced traffic by maximising the disposal loads. Resulting in a reduced CO2 footprint, which was a big positive for United Utilities and their design partner Nomenca.

Our process team determined that the CF19 modular Crossflow plastic media was the best option for this application, with 662m³ of media supplied per filter for the three existing units and the new build filter. With the fourth existing NTF being removed from service.

For supporting the plastic media new concrete Lintels were designed to receive the applied load of 990kg per m² of the Plastic media.

Manufactured from polypropylene in a one step-forming process from molten mass to a formed foil to ensure stronger edges and uniform thickness throughout, the plastic media has a Specific Surface Area of 150 m²/m³. The modular media, which is thermally welded into the 600mm blocks at our UK factory, was packed in 8 layers to a depth of 4.80m in each of the 13.25 metre diameter tanks. Each layer has a relevant strength grade (kg/m³), to adhere to the design load. Also included in the scope of supply were GRP Access Walkways for the top of the NTF, to allow operational access to the distributor arms.

Once seeding of the media and commissioning were carried out, the filters returned to full service with Site achieving full compliance.



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