



WILLIAMSGATE WATER TREATMENT WORKS

Client:

United Utilities



Location:

Williamsgate
Cumbria



Project:

Lamella Separator
Packages



Williamsgate Water Treatment Works forms part of the £300M West Cumbria Water Supplies Project. This is a brand-new facility and it's overall purpose is to help provide a resilient, sustainable water network for West Cumbria, which all began back in 2017. Once the wider network and infrastructure is complete, the site will be capable of treating 80 million litres of water every day when it's completed in 2022.

A great final result will be achieved and Ian Tomlinson, Project Manager from United Utilities puts this down to great partnership working, not only with contractors but with process colleagues who will eventually operate the treatment works.

Colloide designed, supplied and commissioned the Williamsgate Water Treatment Works Lamella Separator packages. One system was installed as part of a potable water treatment plant and the other was required to treat filtrate from a sludge dewatering process. This was in partnership with Advance JV, for their client United Utilities.





OUR POTABLE WATER LAMELLA SEPARATOR PACKAGE

This system is a 3-stream system to handle a peak flow of 7,776m³/day (324m³/hr). Colloides package included a full set of stainless-steel Lamella Separators which are approved by the DWI for use in public water supply in the UK. These were mounted within stainless steel tanks with flocculation tanks upstream of these separators. Sludge is collected under the Lamella Settlers and concentrated up to 3% Dry Solids.

Colloide's, Lamella Settler System consists of:

- 3 No. Lamella Separators
- 3 No. Sludge Collection Hoppers
- 3 No. Flocculation tanks
- 1 No. Flow splitter chamber
- Associated Actuated Valves
- Access Stairs & Structural Steelwork

OUR SLUDGE PLANT LAMELLA SEPARATOR PACKAGE

This system is a 2-stream system to handle a peak flow of 10m³/hr (10m³/hr per stream) with a maximum solids load of 500mg/L. Colloides plan included two flocculation tanks upstream of the two Lamella Separator Packages to treat the overall flow on the site. Our full set of 2 stainless steel Lamella Separators, certified to DWI standards were supplied and are mounted within stainless steel tanks. Sludge is collected under the Lamella Separators in sludge collection hoppers. The sludge is removed from the base of these cones via actuated valves, discharged via gravity and pumped to the sludge holding tanks.

Colloide's, Lamella Settler System consists of:

- 2 No. Lamella Separators
- 2 No. Sludge Collection Hoppers
- 2 No. Flocculation tanks
- Associated Actuated Valves
- Access Stairs & Structural Steelwork

CASE STUDY



Colloide



SYSTEM COMPONENTS

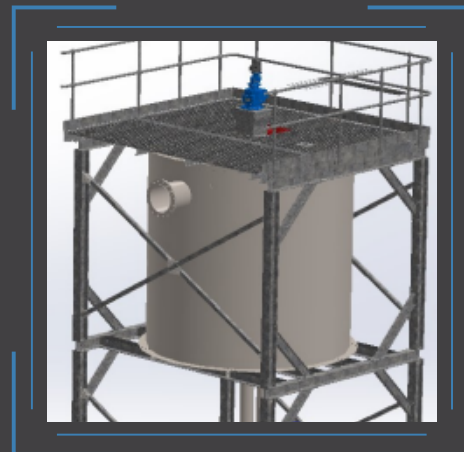
The main components of the potable Water Lamella Separator Package are as follows:

3 No. flocculation tanks

Each flocculation tank to have a working volume of 16m³ giving a retention time of 10 minutes at the max loading of 108m³ /hr per clarifier.

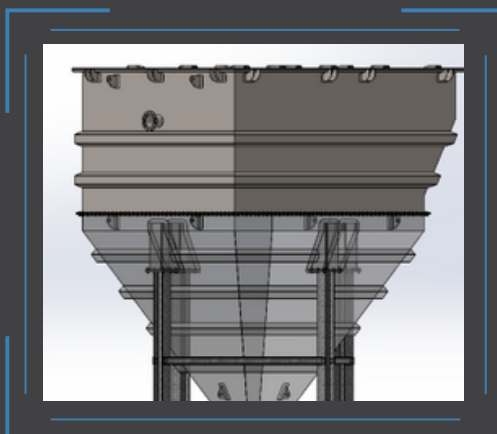
Each flocculation tank included:

- Cylindrical tank (stainless steel) with inlet and outlet connections
- Base frame
- Main drive motor (low speed)
- Stainless steel flocculator
- Pipework from low level to the top of the tank including in line mixer
- Structural Steel, open mesh flooring with integrated lifting davit sockets.



3 No. lamella separators

Each lamella separator tank to have an actual surface area of 11.69m² with a minimum projected area of 146m². This gives the following velocities [at a flow of 108m³/hr per clarifier]. Actual velocity = 9.2m³ /m² /hr. Velocity on Projected Area = 0.74m³ /m² /hr.



Each lamella separator tank included:

- Separator tank with inlet and outlet connections, sludge collection hoppers and outlets.
- Stainless steel lamella settler plates
- Collection launders
- Outlet and inlet pipework
- Sludge collection & thickening tank
- Sludge thickener
- Desludge system



SYSTEM COMPONENTS

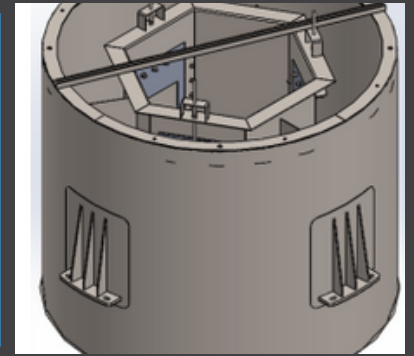
The main components of the potable Water Lamella Separator Package are as follows:

1 No. flow splitting tank

1 No. Stainless steel flow splitting chamber which allows equal flow to each clarifier tank.

Tank is provided with:

- Cylindrical tank (Stainless steel) with inlet and outlet connections
- Base frame
- 3no. Adjustable V notch weirs
- Walkway and handrail



Walkways

Common walkway on top of the lamella separator tanks



SYSTEM COMPONENTS

The main components of the Sludge Plant Lamella Separator Package are as follows:

2 No. Flocculation tank

Each flocculation tank is to have a working volume giving retention time of 10 minutes at the peak loading.

Each flocculation tank included:

- Cylindrical tank (stainless steel) with inlet and outlet connections
- Base frame
- Main drive motor (low speed)
- Stainless steel flocculator
- Pipework from low level to top of tank
- Drip tray



2 No. Lamella Separators

Each lamella separator tank to have an actual surface area giving the following velocities [at a flow of 10.1m³/hr per clarifier]. Velocity on projected area = <math><0.46\text{m}^3/\text{m}^2/\text{hr}</math>.

Each lamella separator tank included:

- Separator tank with inlet and outlet connections, sludge collection hoppers and outlets.
- Stainless steel lamella settler plates
- Collection launders
- Desludge system

Walkways

Common walkway on top of the lamella separator tanks



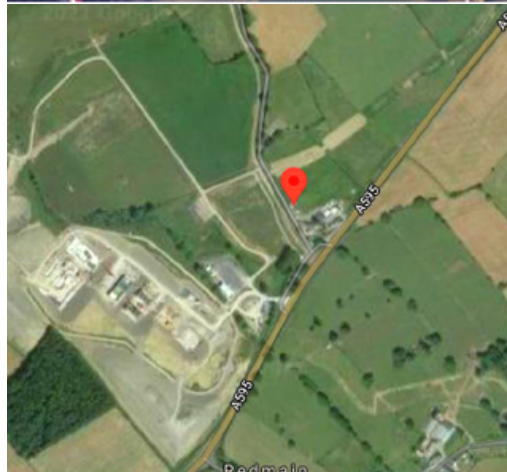
ENVIRONMENTAL IMPACT TOP PRIORITY

The site has been designed to blend in with the natural contours of the surrounding area, and the design also incorporates a green roof to blend seamlessly into the landscape.

“We’ve moved around 300,000m³ of earth to reshape the site and create a deeper valley into which the works sit,” explains Advance Project Manager Stewart Lucas. “Approximately 100,000m³ of that total will be later used as backfill, to bury the treatment water tank and thereby lessen the impact on the landscape.”



IMAGE © OF UNITED UTILITIES



INCREASED FLOW AND REDUCED FOOTPRINT

One of the pressing issues currently faced by the water industry is incorporating sustainability considerations into design practice and reducing the carbon emissions of energy-intensive processes. At Colloide, we focus on continued innovation across all our technologies, in order to help work towards these environmental considerations.

Our use of Lamella Separators in a clarifier is a prime example of this. They greatly increase the clarifier capacity and enable a much greater flow to be treated in the same footprint as conventional clarification. Our design also ensures maximum efficiency in terms of upward flow velocities.

OUR INSTALLATION CAPABILITIES

Offsite construction is used in many of Colloides projects and offers huge benefits to our clients. Colloides plant was tested and any M&E assemblies and modules were built in a clean and protected manufacturing facility. The plant was then built on site in modular sections to reduce build time, errors and costs. This method also leads to a reduction of waste and quality is greatly improved. One of the most important aspects of this approach is its sustainability due to the reduction in carbon footprint and reduced impact upon local environments.



WHY CHOOSE COLLOIDE?

Colloide Engineering Systems are one of a few Lamella Separator Package (LSP) suppliers that are in the list of Approved Products and Processes for use in Public Water Supply published by the DWI and our systems can be designed in a wide range of sizes and configurations to suit the individual needs of each of our clients. The clarifier can be used as a standalone system, taking the full plant flow, with or without additional equipment such as sand filters, screens, etc.

OUR CAPABILITIES MEET YOUR NEEDS

Our experience is accumulated over a 20 year period. During this time, we have gained extensive experience in Design, Manufacture, Installation and Commissioning of Lamella Separator Systems.

CAPABILITIES

Location – We have the capability to deliver your requirements anywhere across the UK, Ireland, Scotland, and Wales.

Supply Chain – We have sourced suppliers and developed a reliable relationship, with suppliers based across the UK and Ireland. Our supply chain is accredited to high Quality, Health and Safety and Environmental standards.

Availability – We have the capacity to engineer equipment on a short lead time, due to our ability to design and build off-site.

Customised Requirements - Our standardised design can be adapted to meet bespoke requirements for drinking water sites and a range of industries.

