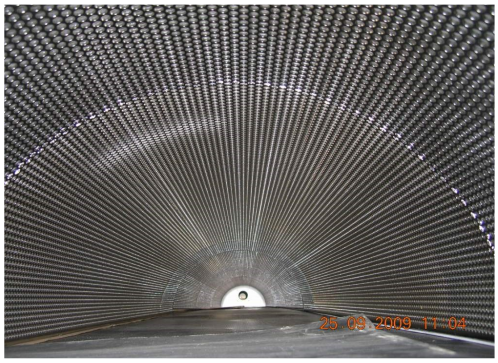
Case Study:

Pump Action Screen (PAS) - Mechanical Screen

CSO Group
AD & Pollution Solutions

Site:	**Chester the Bache**	**Key Project Partners:**	
Client:	**Welsh Water**	**Client:**	**Welsh Water**
Application:	**CSO**	**Consulting Engineers:**	**Imtech/Welsh Water**
Completion Date:	**June 2010**	**Main Contractor:**	**Imtech Process**



▲ Under basket of the PAS screen.

Scope of Contract:

Supply, deliver and supervise mechanical installation and commissioning of a double PAS system.

▲ Twin screen arrangement

Background:

Imtech Process approached CSO Group with a requirement for a mechanical CSO screen to protect the storm overflow at Chester the Bache.

The CSO chamber is located below ground in a wooded area in close proximity to the river Dee and receives raw and combined sewage from the local area of Chester.

Operational Description:

The PAS is installed on the flow side of the overflow weir and is not operation during dry weather flow. As the water level rises to the underside of the screen, an ultrasonic head detects the level and sends a signal via the control panel to start the pump.

Once the pump has started it then drives the water passed a Venturi that entrains air into the flow. The air and water are combined in the mixing section, prior to entering the screen basket. The air/water mixture scours the underneath of the screen removing debris and preventing the screen from blinding.

The power of the scouring action transports the screening debris past the end of the screen keeping them in the continuation flow. Once the flow has subsided, a second signal from the ultrasonic unit switches the pump off.

Project Details:

Spill Flow:	2500 l/s
Screen Size:	Double PAS500 x 6000
Pump:	Flygt
Material:	304 Stainless Steel

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Site:	**Chester the Groves**	**Main Contractor:**	**Imtech Process Ltd**
Client:	**Dwr Cymru**	**Installed:**	**2009**

◄ Flygt pump mounted on a guide rail to allow above ground maintenance.

2 No. 5,600 x 500 x 6mm pump action screens mounted in underground chamber. ▼

Data

Spill Flow:	650 l/s per screen
Model:	PAS 500
Screen Length:	5,600 mm
Screen Diameter:	500 mm
Screen Perforation:	6 mm
Material:	304 stainless steel
Pump Type/Size:	2 No. Flygt 4.7 kW

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Case Study:

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Site:	**Craigwen**	**Key Project Partners:**	
Client:	**Welsh Water**	**Client:**	**Welsh Water**
Application:	**CSO**	**Consulting Engineers:**	**Welsh Water/Imtech Process**
Completion Date:	**March 2007**	**Main Contractor:**	**Imtech Process**

▲ Single screen arrangement, venturi and guide rail.

Scope of Contract:

Design, manufacture, supply, install and commission 1 No. CSO-PAS300 screen for Craigwen CSO in south west Wales.

▲ Scouring action during the operational stage of the Pump Action Screen

Background:

Craigwen CSO had a requirement for a 1 No. semicircular screen adjacent to the weir to remove screenings from storm overflow. A wash system must be installed to remove screenings from the screen and retain the into the forward flow to the treatment works and its screening system.

CSO Group were approached my Imtech Process to design, manufacture, supply, install and commission a Pump Action Screen equipped with a submersible pump and an air entrapment venturi system.

System Overview:

The Pump Action Screen (PAS) is a simple and robust CSO mechanical screen which consists of a half round Stainless Steel basket with 6mm perforations, submersible pump, distribution pipework and a venturi. It is designed to prevent the discharge of non-biodegradable solids greater than 6mm in two directions. The screening debris is scoured from the underside of the screen basket and punched passed the end of the screen eliminating potential representation.

Project Details:

Spill Flow:	40 l/s
Screen Size:	PAS300 x 1000
Pump:	Flygt
Material:	304 Stainless Steel

Maintenance:

After every storm even the screen should be visually inspected to insure the pump is operational and the screen basket has been cleaned effectively.

The screen has no moving or maintainable parts. The pump is installed on a guide rail system for easy maintenance outside the chamber.

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Project Name:	**Ibiza Port**	**Main Contractor:**	**Aquambliente-Sogeosa**
Product:	**Pump Action Screen**	**Consultant:**	**Segurpresa**
Installed:	**2019**	**End Client:**	**Spanish Government**

The screens were required to prevent the combined storm overflow from discharging visible pollutants into the port. Due to the potential for high chlorides and salinity in the flow the screens were manufactured from 316Stainless Steel. The screens were manufactured under license by our Spanish Partners —Hidrostank .

Technical Data:

Spill Flow:	4892 l/s
Model:	4 x 500 x 6000
Screen Length:	3 no. 5m x 2m x 2m (approx.)
Screen Diameter:	500 mm
Screen Perforation:	6mm
Material:	316 stainless steel
Pump Type/ Size:	4 No. Flygt 4.7kW

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Case Study:

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Site:	**Pontardowe - Dilwyn Arms**	**Key Project Partners:**	
Client:	**Welsh Water**	**Client:**	**Welsh Water**
Application:	**CSO**	**Consulting Engineers:**	**Welsh Water/Imtech Process**
Completion Date:	**April 2007**	**Main Contractor:**	**Imtech Process**

▲ Single screen arrangement

Scope of Contract:

Design, supply, install and commission 1 No. Pump Action Screen for Dilwyn Arms CSO.

▲ Scouring action during the cleaning stage of the Pump Action Screen

Background:

Imtech Process approached CSO Group with a requirement for a mechanical CSO screen to handle normal and storm flows at the Pontardowe Dilwyn Arms Pumping Station.

Operational Description:

The PAS is installed on the flow side of the overflow weir and is not operation during dry weather flow. As the water level rises to the underside of the screen, an ultrasonic head detects the level and sends a signal via the control panel to start the pump.

Once the pump has started it then drives the water passed a Venturi that entrains air into the flow. The air and water are combined in the mixing section, prior to entering the screen basket. The air/water mixture scours the underneath of the screen removing debris and preventing the screen from blinding.

The power of the scouring action transports the screening debris passed the end of the screen keeping then in the continuation flow. Once the flow has subsided, a second signal from the ultrasonic unit switches the pump off.

Project Details:

Spill Flow:	362 l/s
Screen Size:	PAS500 x 1700
Pump:	Flygt
Material:	304 Stainless Steel

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Site:	**Piscataway, MD**	**Main Contractor:**	**WSG & Solutions**
Client:	**Washington Sanitary Suburban Commission**	**Installed:**	**2015**

▲ Overflow weir—screen is positioned just below the weir on the inlet side.

▲ Twin 6,000 x 500 x 6 mm screen baskets

Technical Data:

Spill Flow:	723 Gallons/ second (3286 l/s)
Model:	Twin 6000 x 500 mm
Screen Length:	19.7 ft (6000 mm)
Screen Diameter:	2 x 1.6 ft (500 mm)
Perforation:	6 mm (0.236 inches)
Material:	304 Stainless Steel
Pump Type/Size:	2 No. EMU FA 10.51 E**7.5 hp (5.5 kW)

▼ Control Panel

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Site:	**Redditch Spernall**	**Main Contractor:**	**Costain**
Client:	**Severn Trent Water**	**Installed:**	**2013**
Consultant:	**MWH**		

◄ Existing inlet which reqiured the offset pump arrangement. Normally pumps are mounted inline.

▼ The twin 5,000 x 300 x 6 mm screen was retrofitted into the existing chamber .

Technical Data:

Spill Flow:	800 l/s
Model:	Twin PAS 300
Screen Length:	5,000 mm
Screen Diameter:	300 mm
Perforation:	6 mm
Material:	304 Stainless Steel
Pump Type/Size:	2 No. Flygt 4.7 kW

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