BARR + WRAY

Sport + Leisure

SWIM IRELAND | An island of swimmers

WHO ARE WE ??

UK headquartered company, specializing in design and engineering for pools, leisure, spa and wellness.

- 1959 – founded as supplier of Pumps + Filters
- 1967 – 1st Swimming Pool project
- 1978 – 1st Wave Machine
- 1998 – 1st Myrtha Pool
- 1999 – 1st Spa Project
- 2008 – Barr + Wray FZE (Dubai) opened
- 2024 – Acquisition by Kohler

- Offices in Glasgow and Dubai
- Over 120 employees worldwide
- Live projects in over 20 countries

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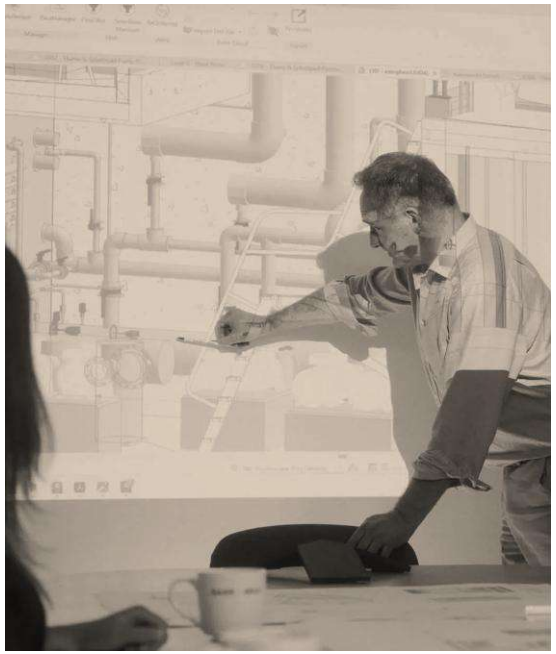
WHAT DO WE DO ??

- **POOL + SPA ENGINEERING**
  - Full compliment of engineers covering the pool and thermal requirements for leisure, hotel and wellness projects.
- **DESIGN, SUPPLY AND INSTALLATION**
  - Pool and Spa complete scope of supply and installation globally.
- **INTERIOR DESIGN**
  - Interiors department, specialising in Spa only works with complete design in house.



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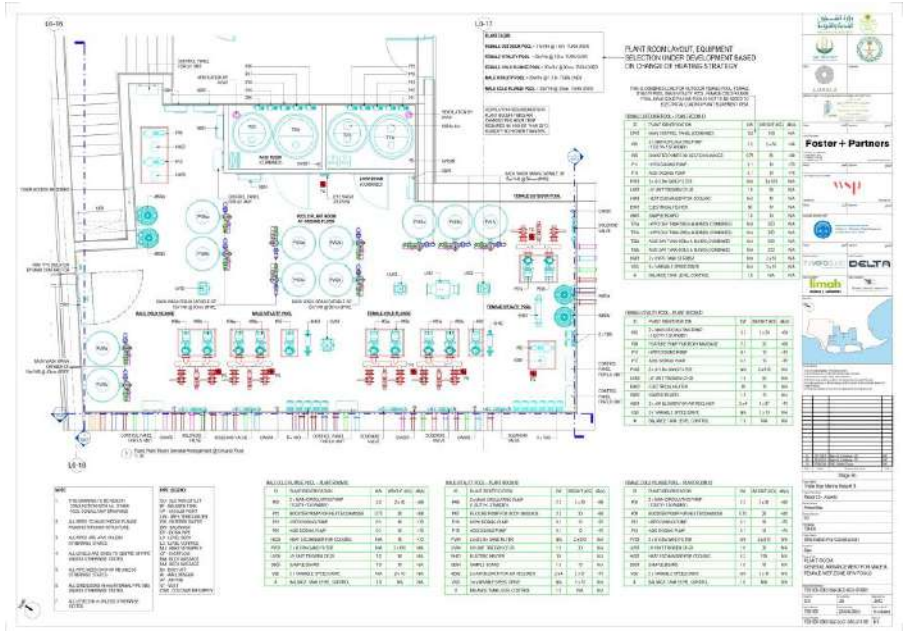
POOL ENGINEERING CONSULTACY

At Barr + Wray, we provide world-class pool and spa consultancy services across the globe.

- **Feasibility** – Early-stage technical input and planning
- **Hydraulic Design** – Flow rates, pipework sizing, and pump selection
- **Filtration + Water Treatment** – System design and sustainability
- **Technical Documentation** – Drawings, specifications, and compliance reports
- **Energy Audits** – reports on current usage and potential savings
- **Condition Surveys** – intrusive or non-intrusive survey works of existing plant, including life-expectancy, suggested improvements and firm costs
- **Capex / Opex analysis** – to support business cases



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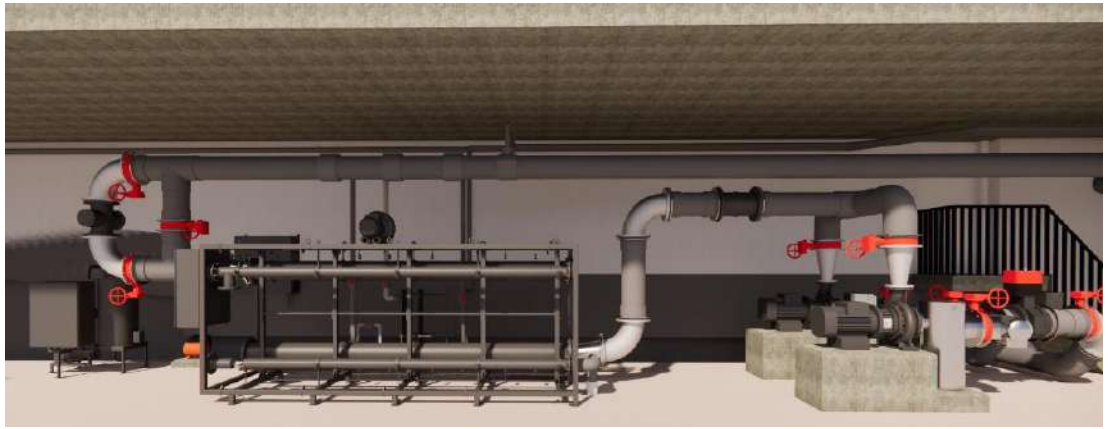
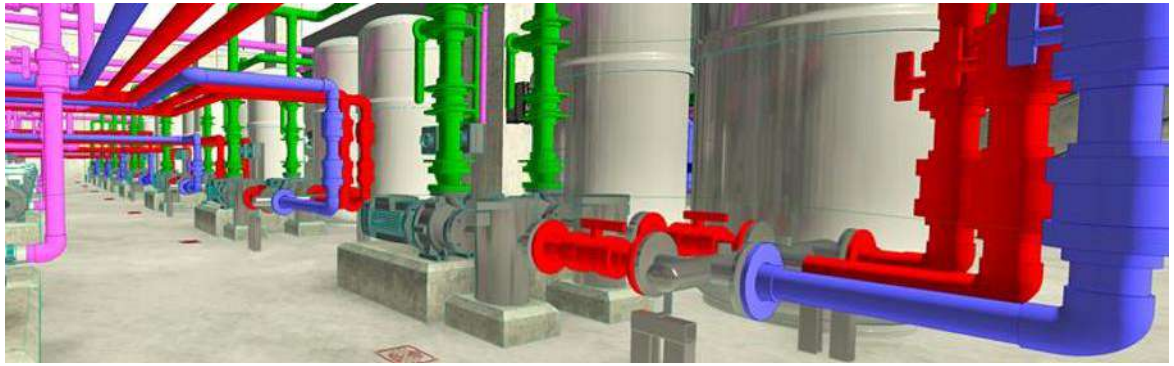
DESIGN, SUPPLY AND INSTALLATION

We design, supply, and install swimming pools, vitality pools, pool shells, moveable floors, water slides, rides, features, and all manner of thermal cabins and wellness equipment. GLOBALLY.

- **Project Management** – Remote site / team project management
- **Logistics for delivery** – Experienced in delivering projects worldwide.
- **Installation, Testing and Commissioning** – On-site Barr+Wray experienced engineers, to install and handover to Client satisfaction.





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OPPERTUNITIES FOR IMPROVING EFFICIENCY

We look at two key principles: Energy & Water Consumption in the water treatment process.

1. **The power required to circulate each m3/h of water.**

2. **The amount of circulated water required to ensure that the water is safe & appealing (i.e. that well-defined water quality targets are met)**

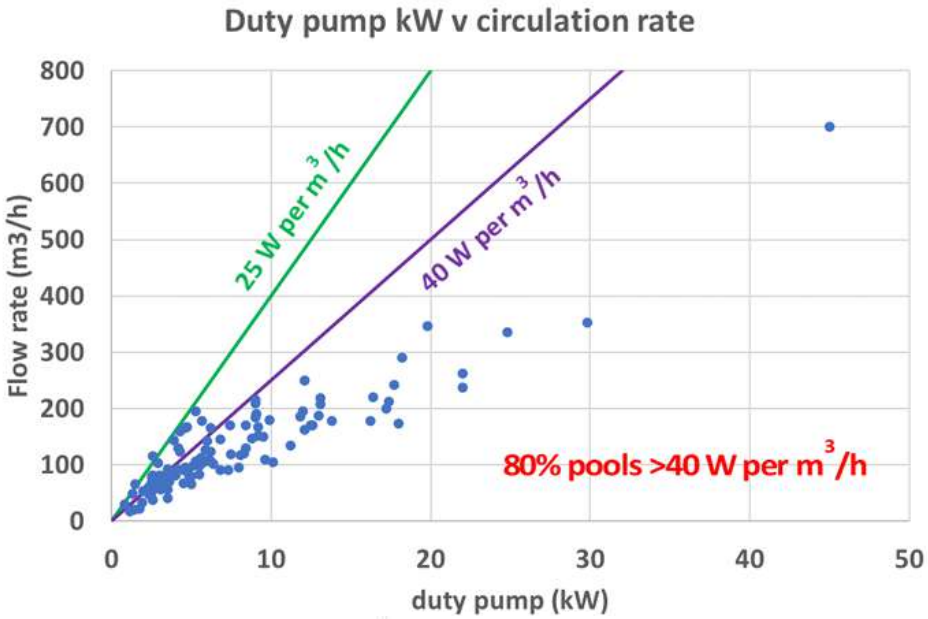
- The Passive House target is for 1m3/h of flow to require between 25 and 40W. How does this compare with the current situation in leisure centres across the UK?

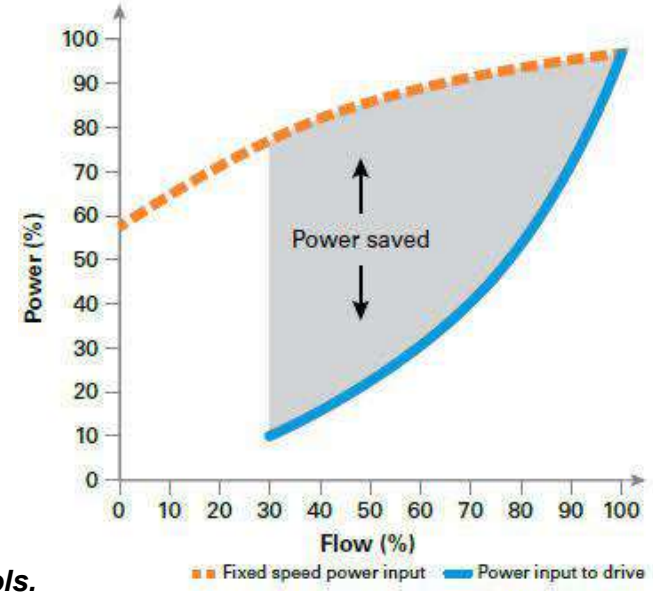
    - **The amount of power needed to circulate 1m3/h of flow depends on many factors, that in essence fall into three categories:**

    - **Gravity –** energy requirement needed to lift the water. Static loss incurred from balance tank or plant room level.

    - **Frictional Resistance –** aka head loss due to friction. Equipment selection overall system design; filter type, pipework layouts/velocities.

    - **Overall Pump Efficiency –** as % of hydraulic power





Sources: Pool Senty. PWTAG Guidance on Net Zero Carbon Pools. Passive House Guidance for Indoor Pools.

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CITADEL LEISURE CENTRE
South Ayrshire Council

Barr + Wray carried out condition report on existing filtration water treatment plants, for the Main 25m 6-lane Pool, Flexi Diving Pool and Teaching pool.

- **Centre opened in early 1970's.**
- **Much of the plant is original.**
- **Ultrasonic testing on the vessels**
- **Inspection of cast-iron pipework**
- **Energy audit of main circulating pumps**

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CITADEL LEISURE CENTRE
South Ayrshire Council

Grundfos engaged to carry out an Energy Audit Report on Main Pool circulating pumps.

Measurements taken over one month of operation.

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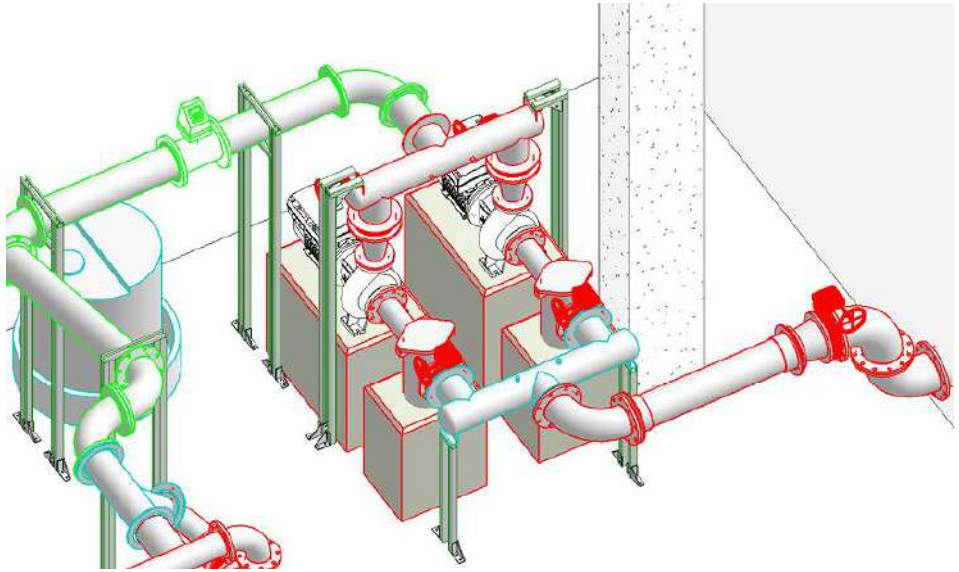
CITADEL LEISURE CENTRE
South Ayrshire Council

- Flow (m^3/h)
- Differential head(m)
- Consumed electric energy (kW) – with data logging*

- Proposed replacement with high-efficiency permanent magnet MGE motor pumps, with build-in variable frequency drives

RESULT OF THE MEASUREMENT

Annual energy consumption actual	108,610	kWh
Annual energy consumption after optimisation	24,254	kWh
Annual energy costs actual	27,153	GBP
Annual energy costs after optimisation	6,063	GBP
Annual saving potential after optimisation	21,090	GBP
Annual savings potential [%]	77.67	%
Annual CO2 emission actual	26.6	Tons
Annual CO2 emission after optimisation	5.94	Tons
CO2 savings in a period of 15 years:	309.9	Tons
Payback in years*	1	Years
*The values calculated with actual energy price of:	0.25	GBP
*The values are calculated with annual increase energy price	1	%



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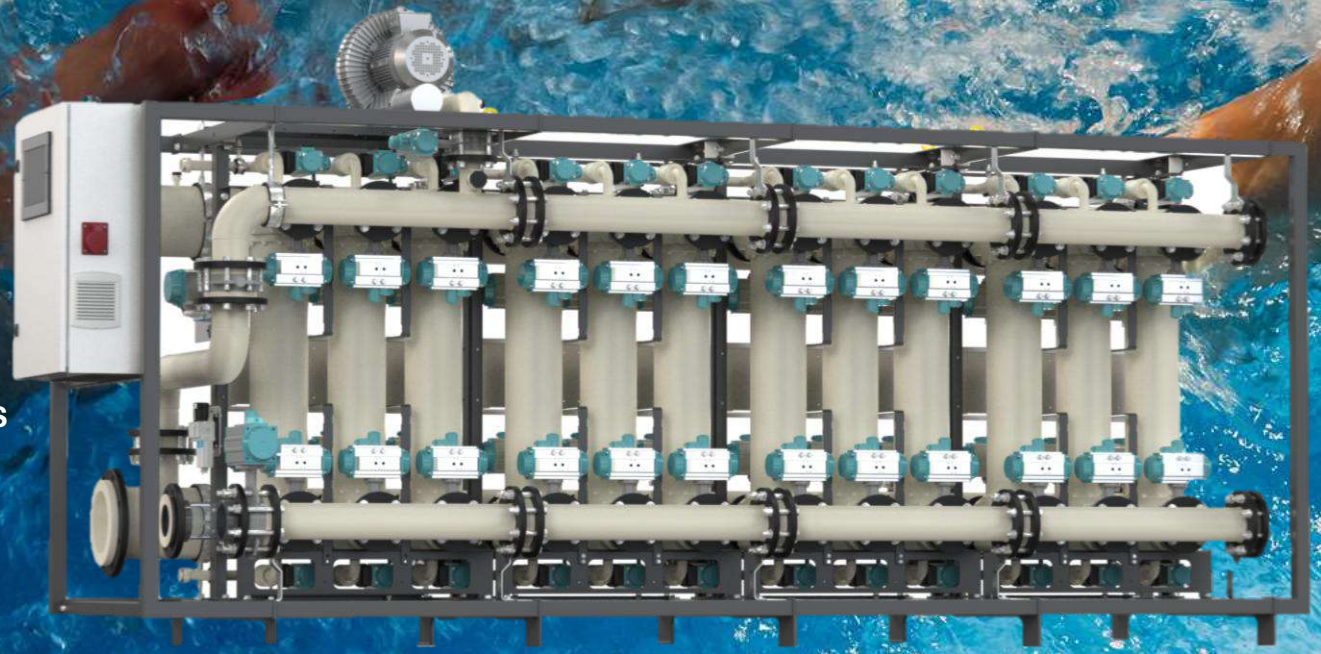
COMMERCIAL POOL FILTRATION SYSTEM



Your success is our success

Sustainable Filtration for Commercial Aquatics

LIQTECH improving our future

WHY USE CERAMIC MICRO FILTRATION?

CMF – AT A GLANCE:

- **Superior water quality**
  - Filters down to 3 micron
- **Space saving design**
  - Fits through 900mm doorways
  - Perfect for new build or refurbishment
- **Low Maintennace**
  - Remote support & optimisation
  - No more media changes
- **Fully Automated Operation**
  - No manual backwashing
- **More Sustainable**
  - Lower pressure drop
  - Reduced water & chemical usage
- **Flexible & Modular**
  - Can be moved or adapted over time

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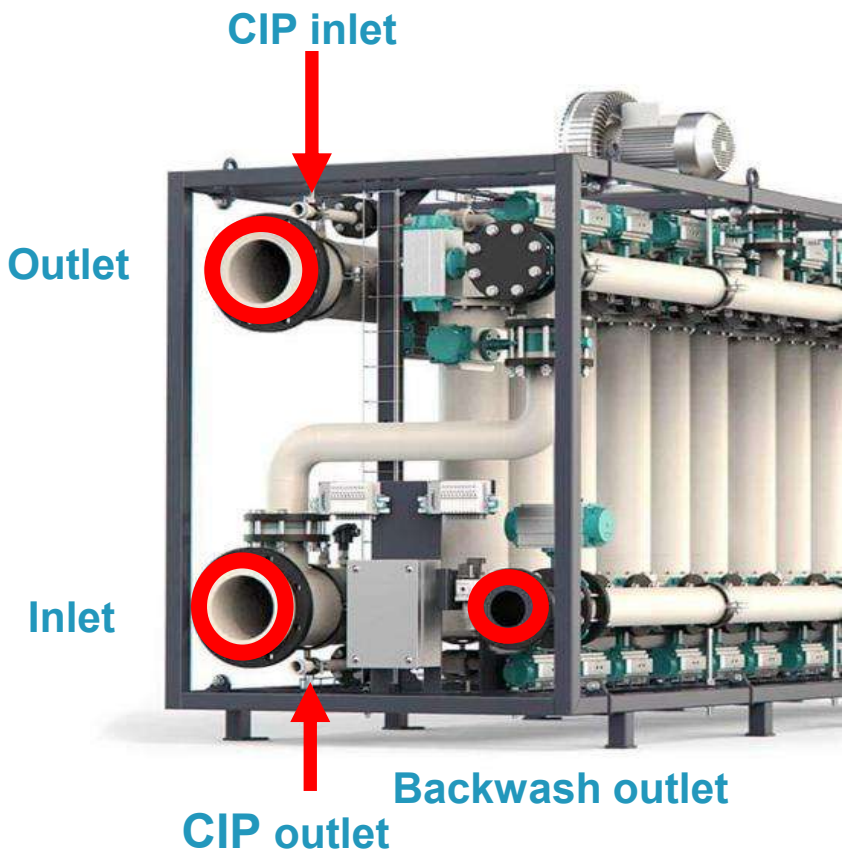

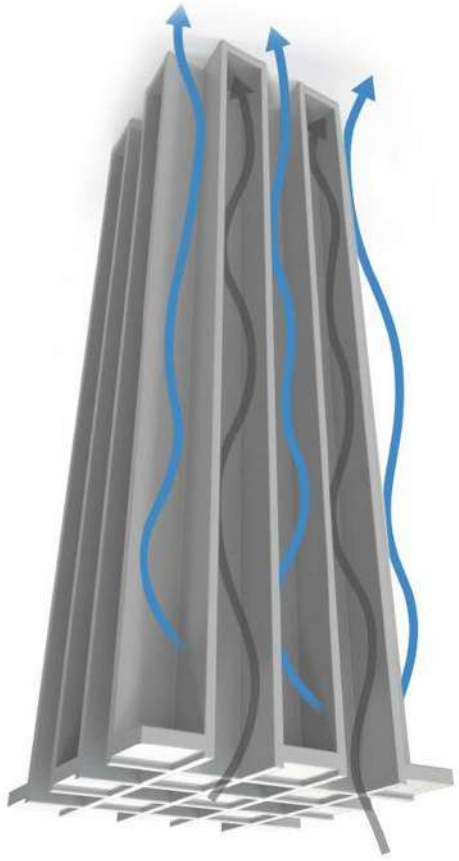

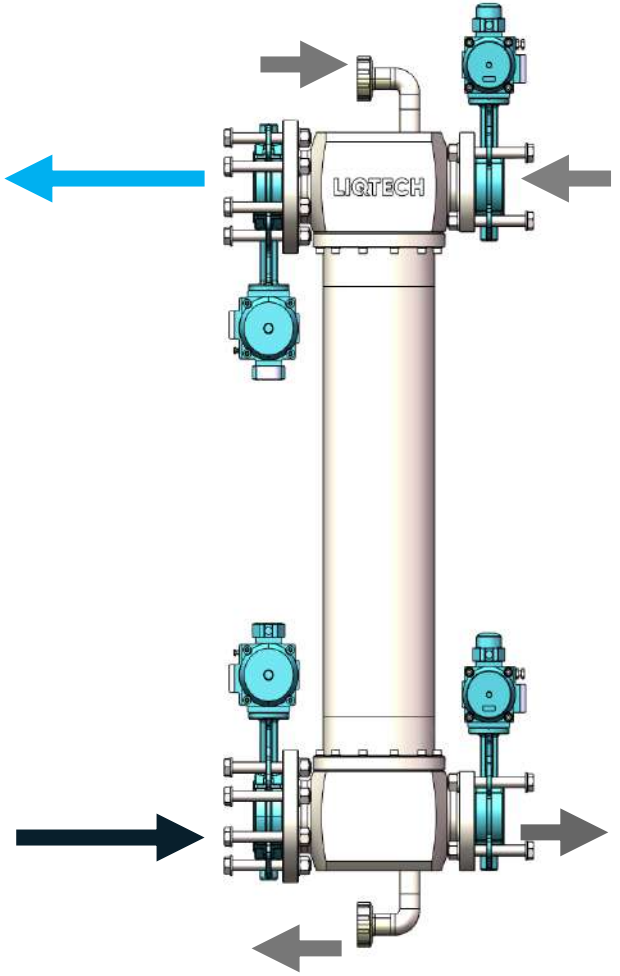

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LIQTECH

Capture. Release. Restore.

How the filtration cycle works

The ceramic membrane acts as a physical barrier, retaining fine particles and selected precursors associated with combined chlorine before further breakdown.

As differential pressure rises, the controller initiates a compact water-and-air backwash to reverse flow and relieve the membrane

If pressure recovery remains insufficient, the system automatically initiates a clean-in-place cycle to restore filtration performance.

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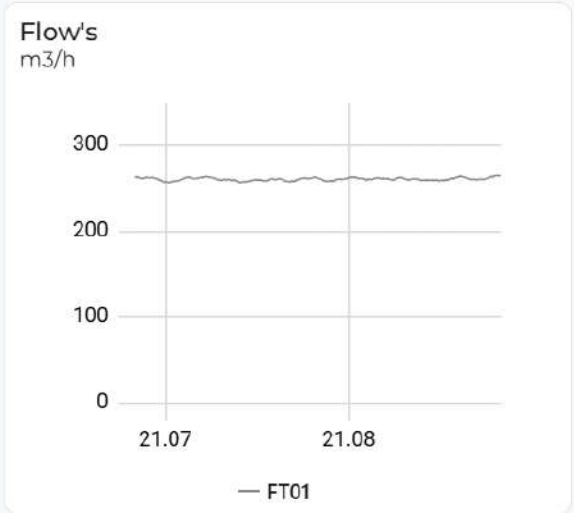
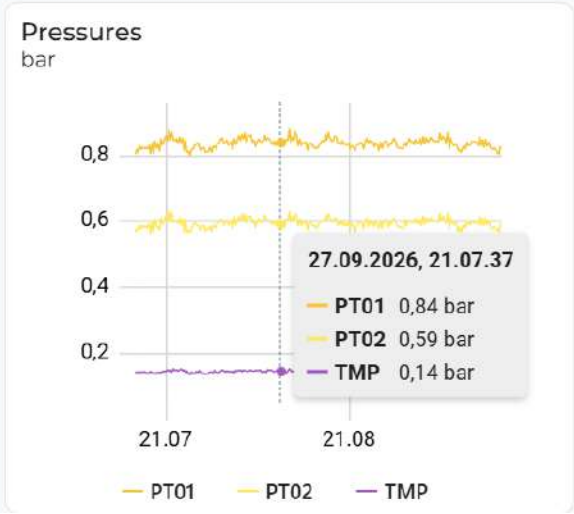
Automated

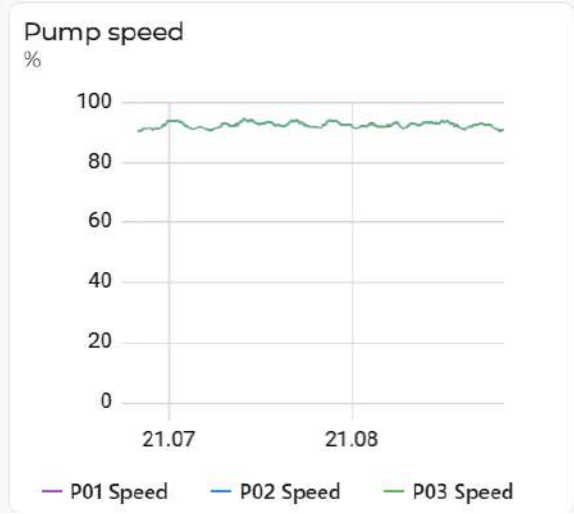
Pressure-led backwash, automatic CIP and night mode

- FM01 - 14 membrane
- FM02 - 14 membrane
- FM03 - 12 membrane
- FM04 - 11 membrane
- FM05 - 5 membrane

Live Values







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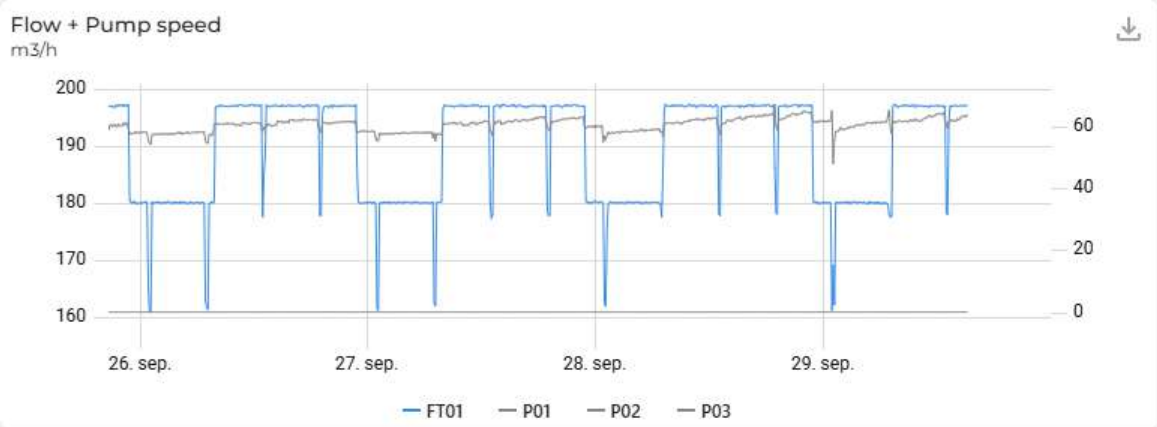

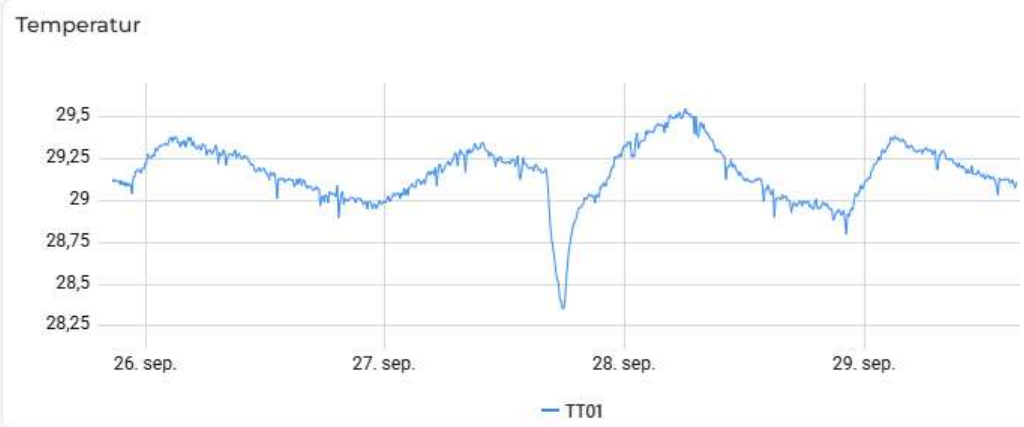

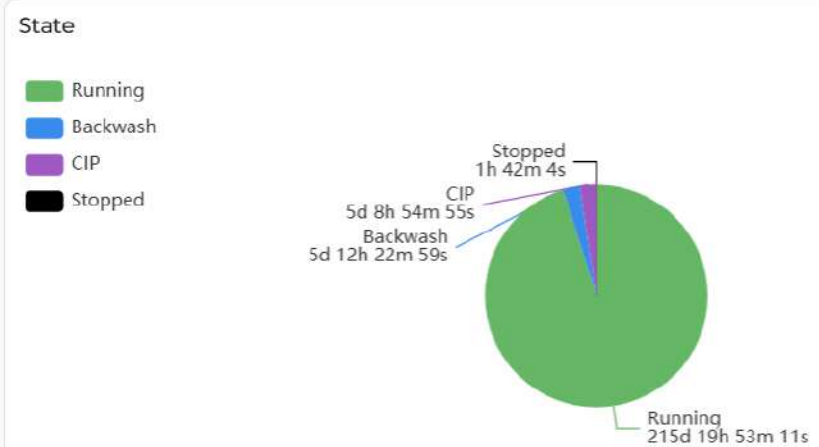

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QLARIFLOW™ ANNUAL OPEX
€38,412
€ / year

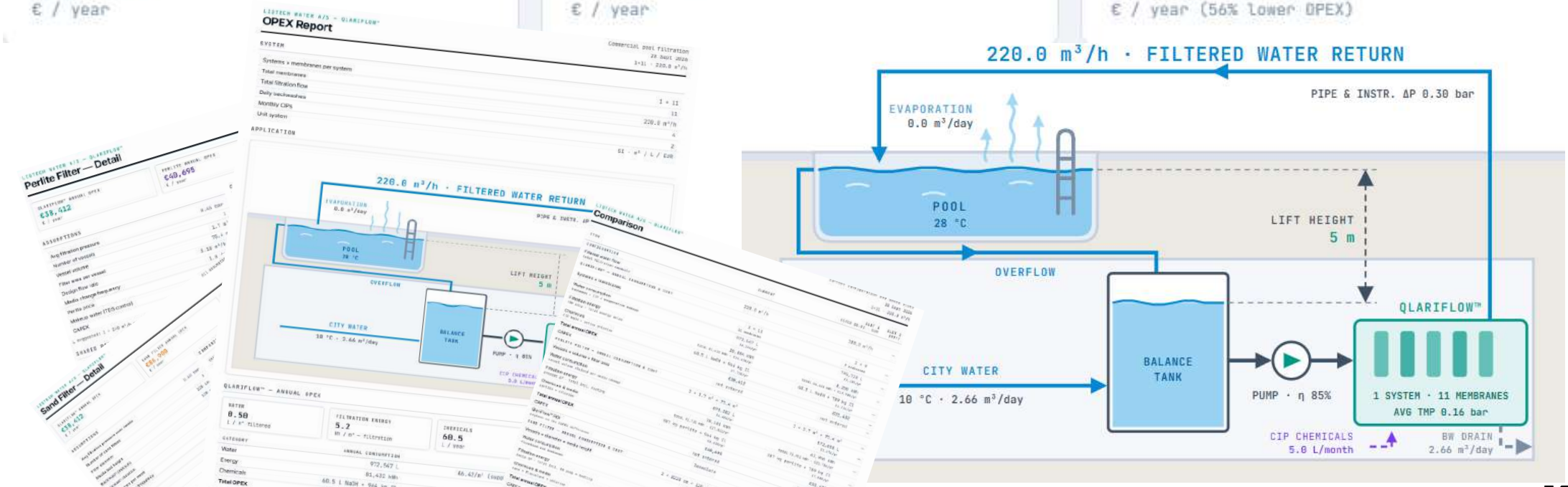
PERLITE FILTER ANNUAL OPEX
€40,695
€ / year

ANNUAL SAVINGS WITH QLARIFLOW™
€2,284
€ / year (6% lower OPEX)

QLARIFLOW™ ANNUAL OPEX
€38,412
€ / year

SAND FILTER ANNUAL OPEX
€86,900
€ / year

ANNUAL SAVINGS WITH QLARIFLOW™
€48,488
€ / year (56% lower OPEX)



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CORAL REEF WATERWORLD BRACKNELL

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CORAL REEF WATERWORLD, BRACKNELL

Summary:

- Originally opened in 1989
- Refurbished 2017
- Over 1200 visitors per day

- Circulation rate: 600m3/hr
- 6 no. 2.44m diameter steel vessels
- Basement plantroom

Actual water consumption for pool:

- 904,000 litres per week
- Over 47 million litres per year

- *Metered Water Usage*
- *Sewerage Usage*
- *Trade Effluent Charge*
- *Unit Costs*

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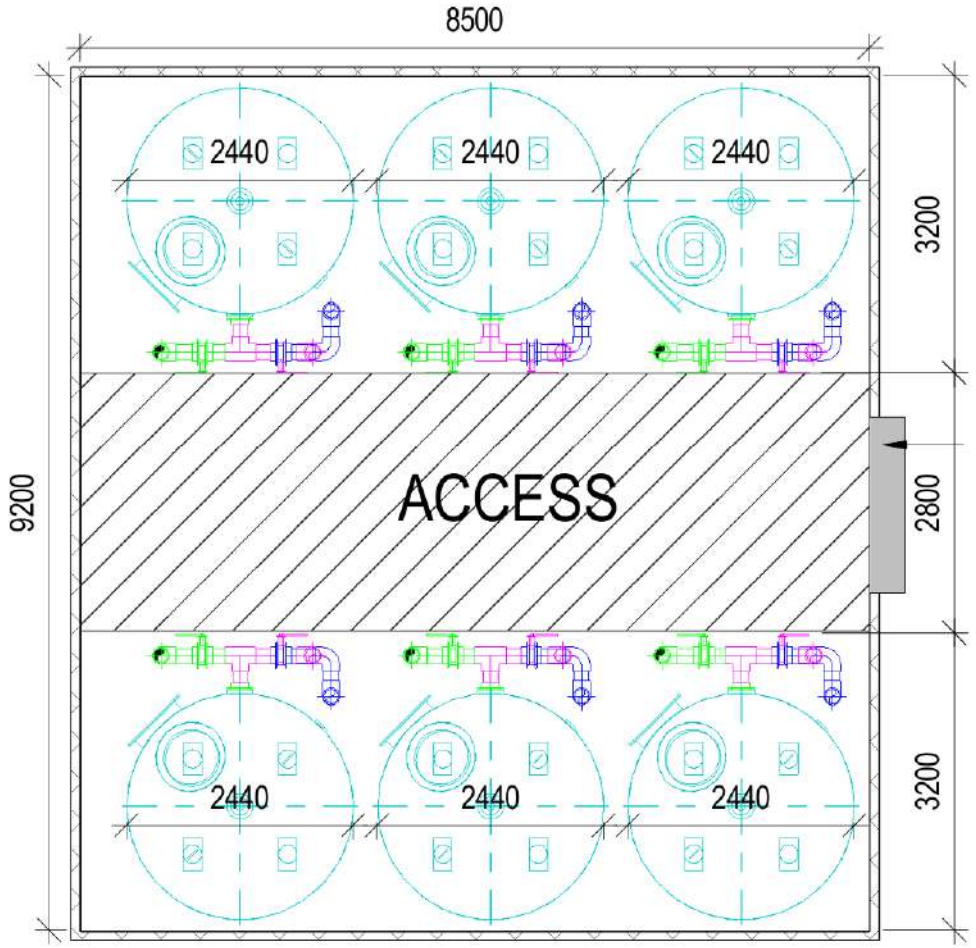
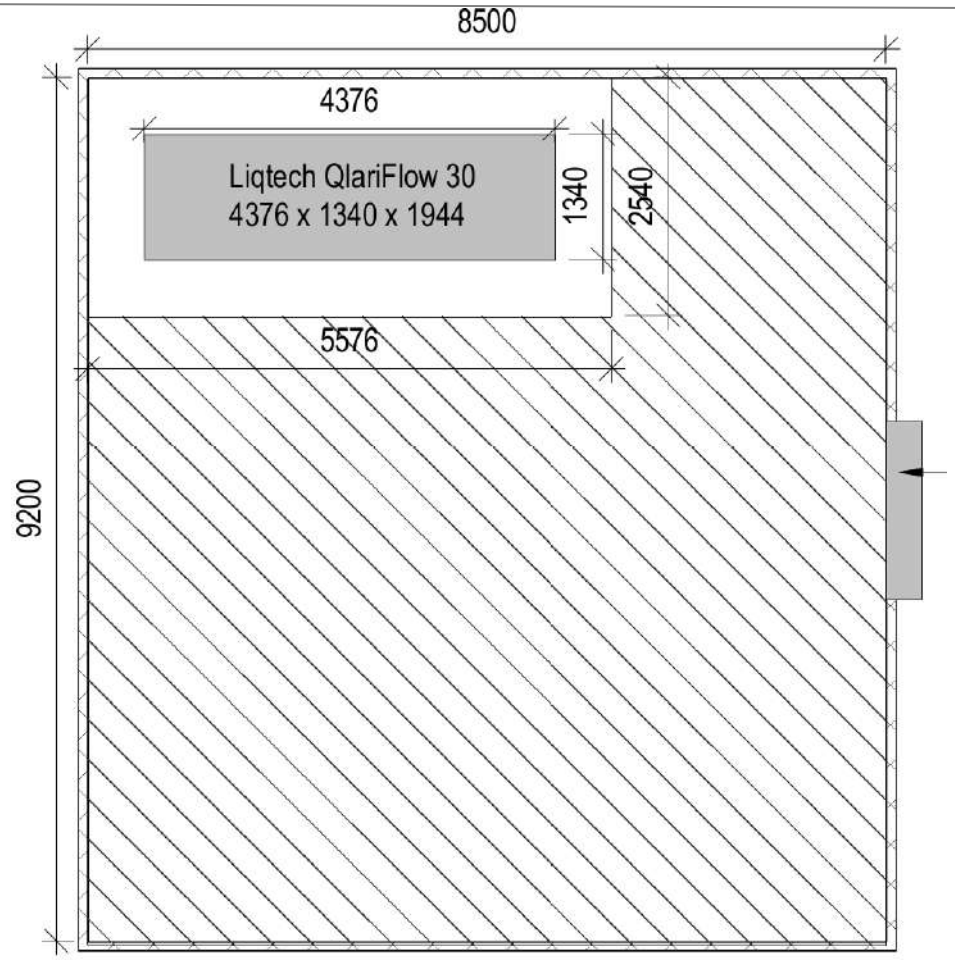
CORAL REEF WATERWORLD



Area - 78m²



Area Gain - 70.5m²

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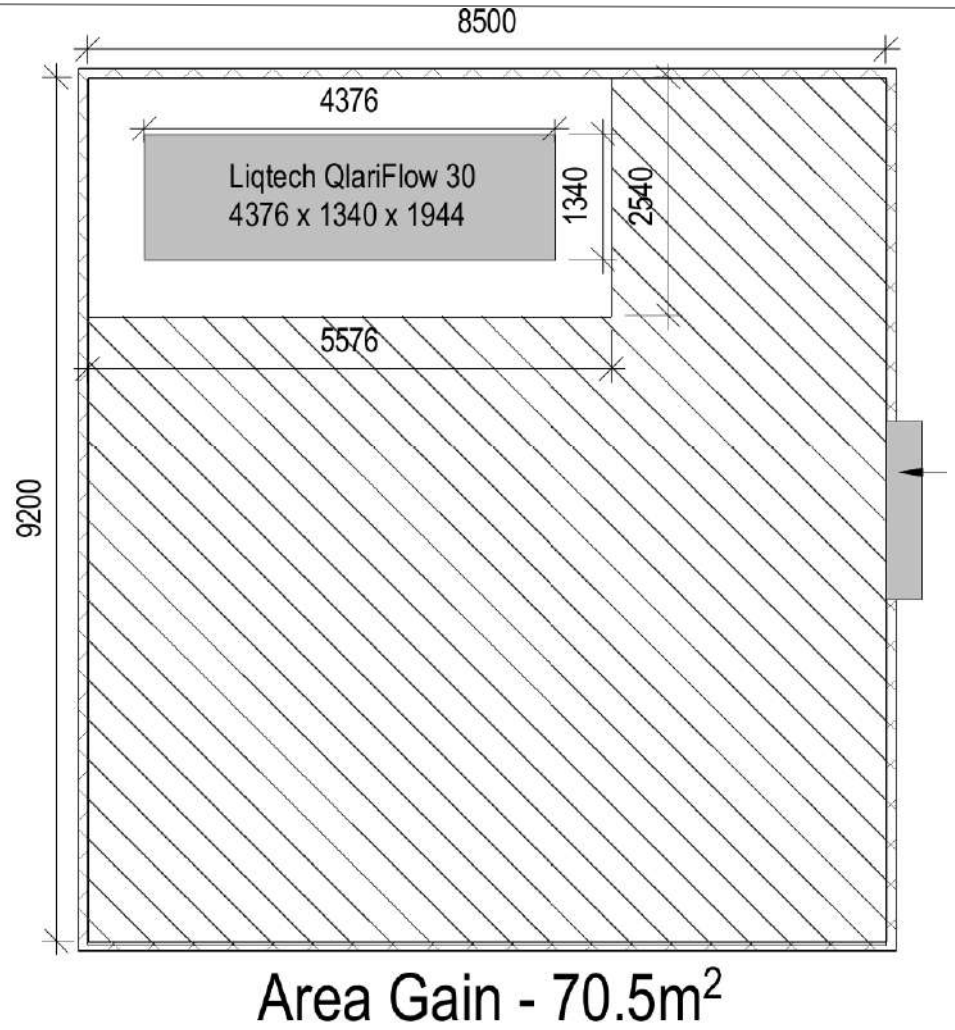
CORAL REEF WATERWORLD

CORAL REEF WATERWORLD, BRACKNELL

Summary:

- **50% reduction in water usage.**
- **90% reduction on filtration plant footprint.**
- **Over £150,000 saved per year.**
- **3-year ROI.**



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BLAIRGOWRIE RECREATION CENTRE

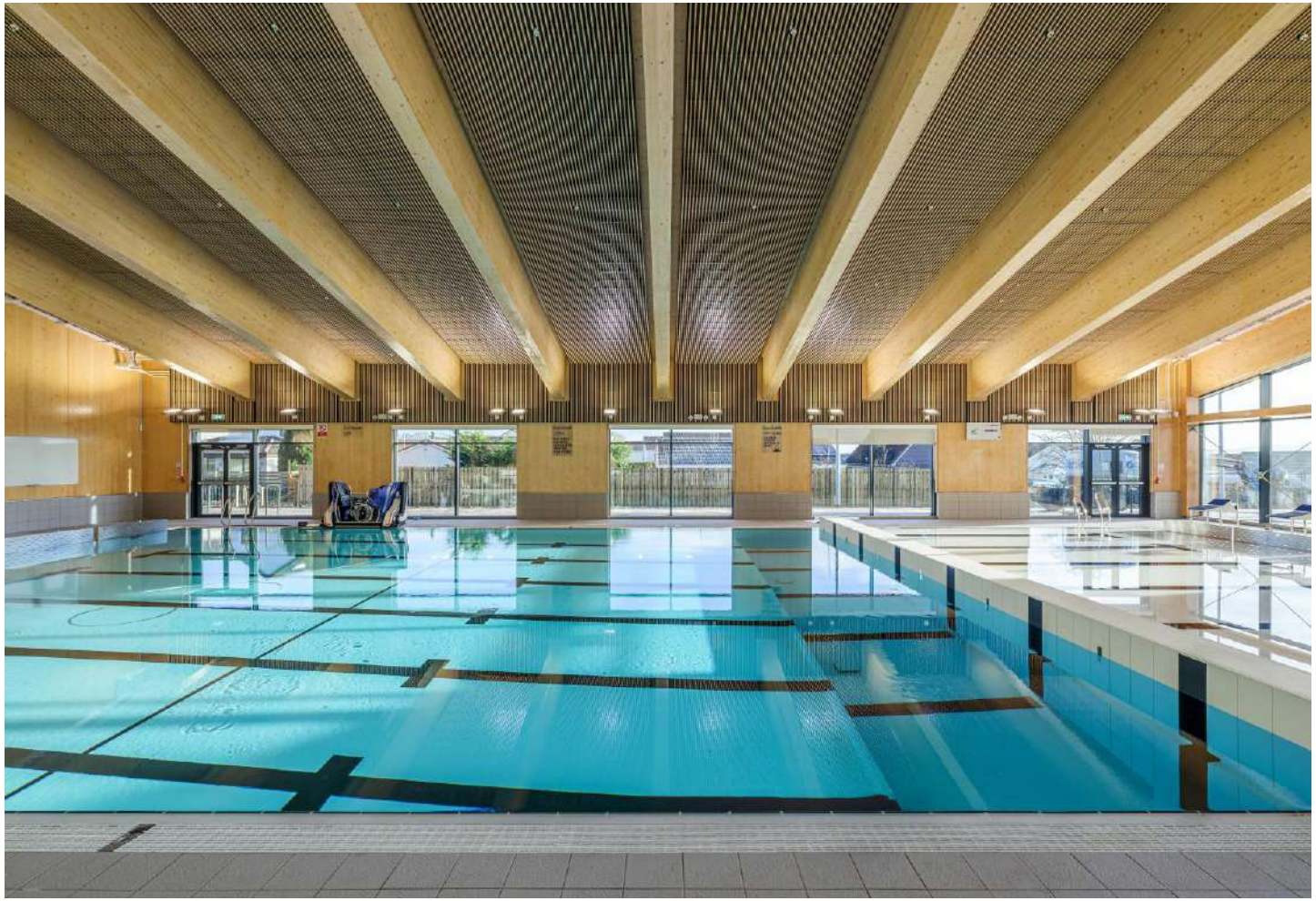
Scotland's first Passivhaus leisure development

Lead Architect: Holmes Miller

Scotland's First Passivhaus Leisure Centre: It is the first leisure facility in Scotland (and only the second in the UK) built to full Passivhaus standards, designed to be ultra-low energy.

Significant Energy Reduction: energy consumption reduced by up to **80%** compared to a typical leisure centre.

Low-Carbon Construction: The centre is fully constructed from Cross Laminated Timber (CLT) and Glulam, which contributes to its thermal and acoustic insulation.



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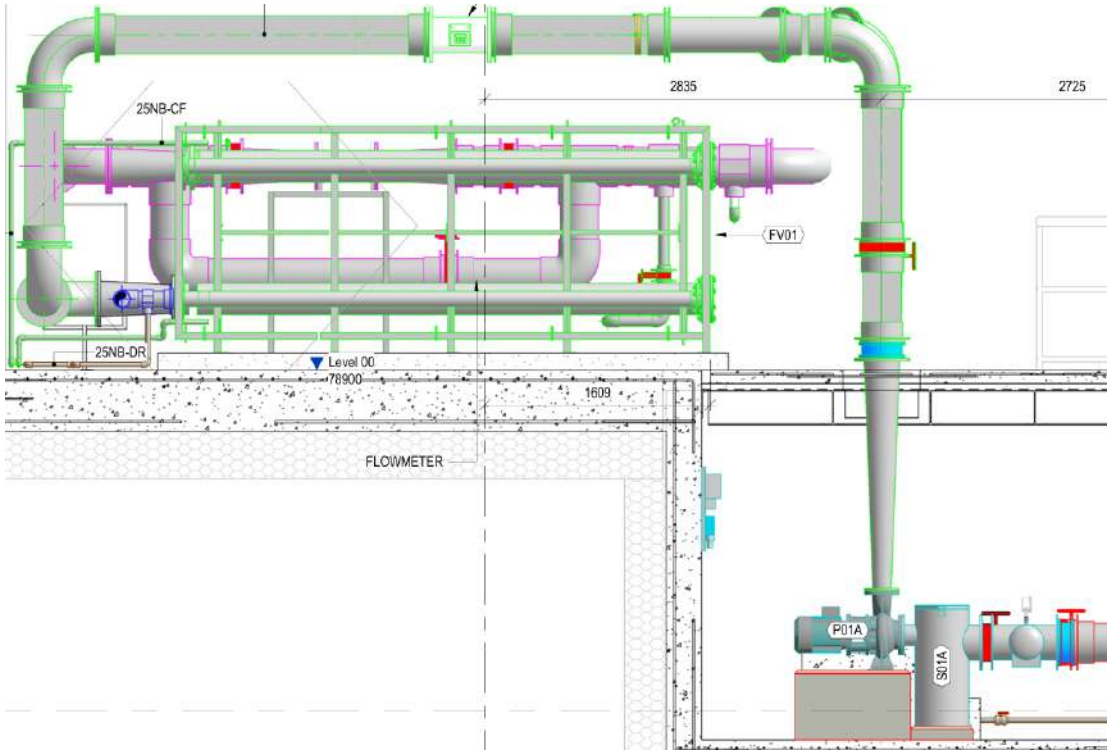
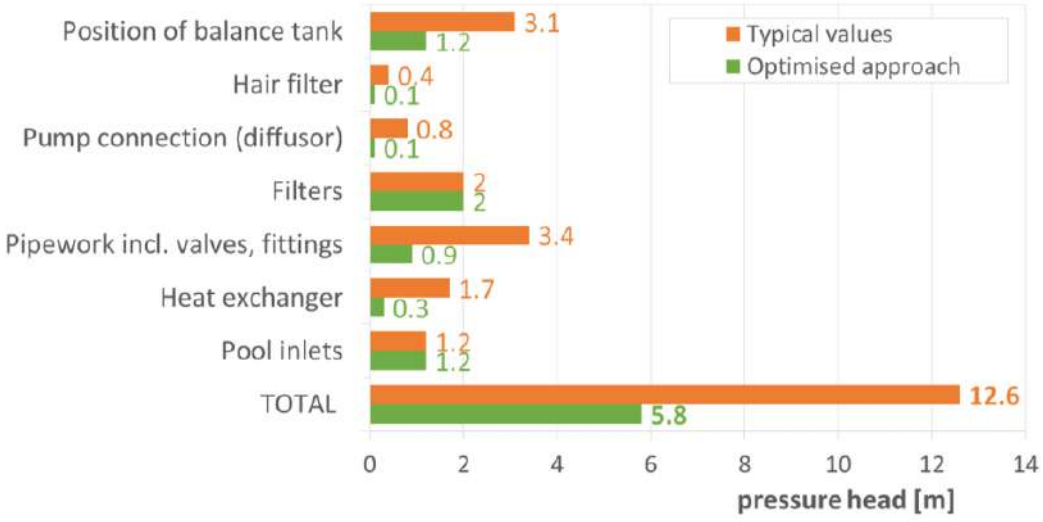
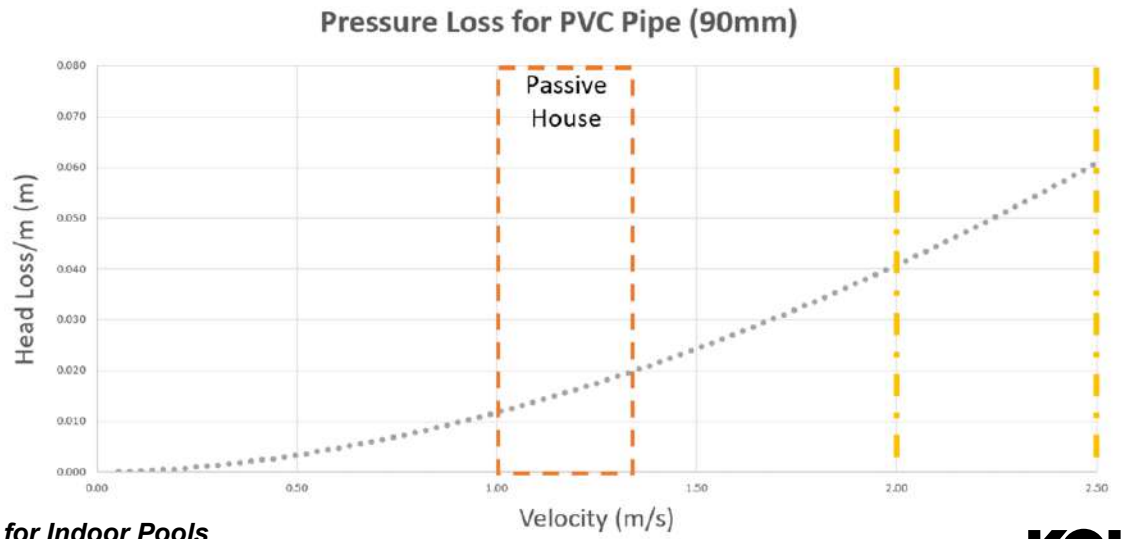
BLAIRGOWRIE RECREATION CENTRE

Passive House Principles:

- Target a specific circulation power demand of 25–40 W per m³/h.
- Efficient layout (pool, balance tank and plantroom)
- Equipment selection
- Reduce system losses







Sources: PWTAG Guidance on Net Zero Carbon Pools and Passive House Guidance for Indoor Pools

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Site	Filtration	Circulation Rate	Pump Head (m)	Energy Usage (W/m3/hr)
Typical	Sand	180	18.0	65
Example Good Design	Sand	180	10.0	40
25m Leisure Centre	CMF	192	8.25	33
25m Leisure Centre (Passivhaus)	CMF	197	6.4	24.9

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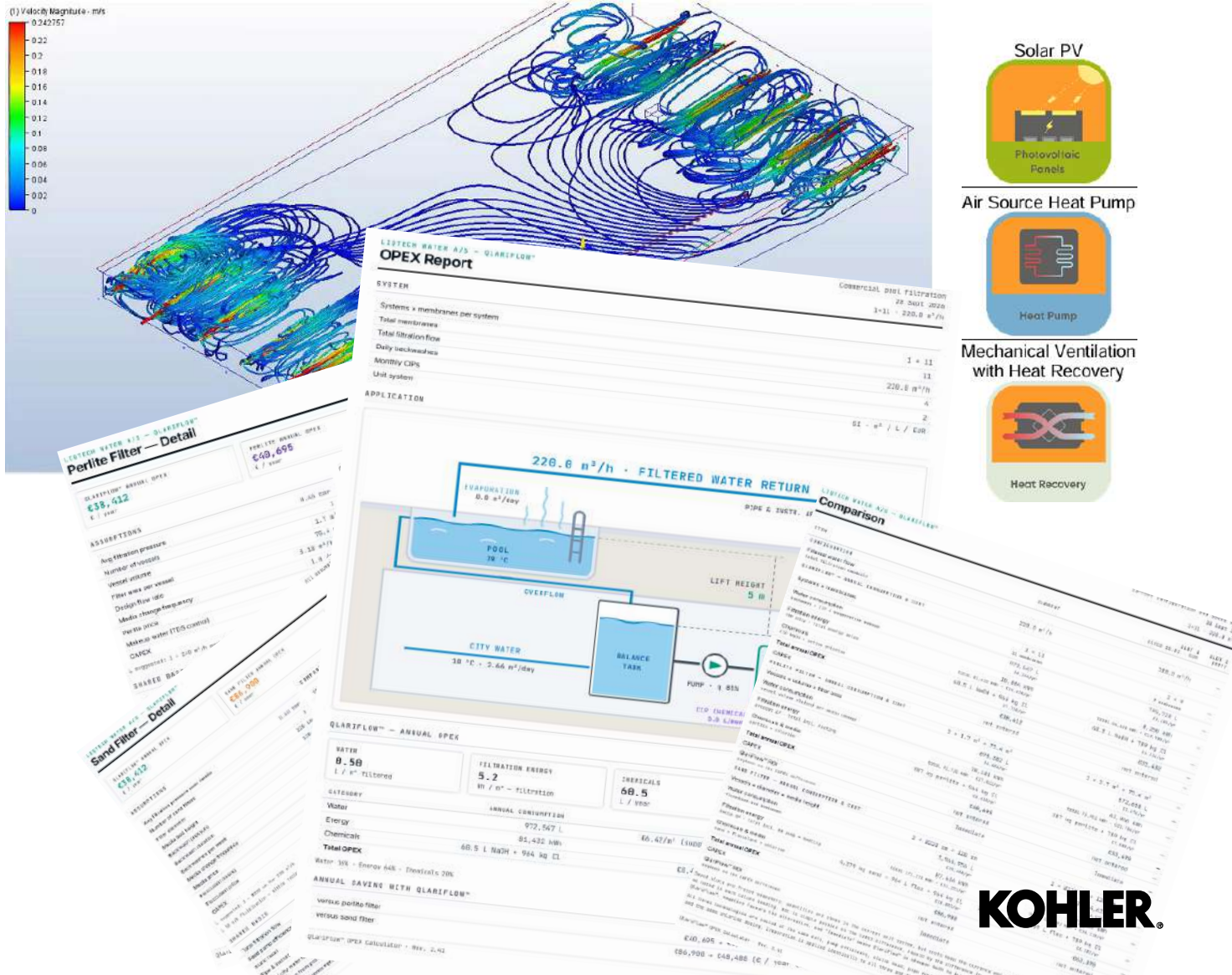
IN SUMMARY:

- Early engagement is key
- Feasibility Studies must include pool plant
- Balance of Cap-ex / Op-ex
- Full life-cycle costs
- Design for peak & off-peak (CFD model)