

Deploy – an evolution in water engineering

Recognised by the Ancients as one of the 'Four Elements', water is essential to sustaining life: and trying to maintain its availability has therefore preoccupied humankind since the earliest civilisations. For one family of engineers that has been involved in water infrastructure projects for three generations, it has also inspired the development of an innovative new storage system, which they hope can now help control that most destructive element – Fire – as well as assisting in agriculture, ground maintenance and other activities dependant on potable supplies.

Paul Mendieta came to the UK from Ecuador, where his grandfather had originally used his skills and his tipper truck to help locals build basic water storage tanks and reservoirs; planning to further his education here. But in addition to achieving an MA from the Royal College of Art, in London, Paul has gone on to establish a strong working relationship with two of the institution's past students, and now heads up a nascent manufacturing enterprise that is attracting government backing - and wide interest from several sectors which rely on water.

It was also through his involvement with the RCA that Paul got to know Beren Kayali who was to become co-founder of Deploy Tech. Beren is a graduate of both Imperial College and the RCA, who holds an MSc and MA as well as an honours degree in mechanical engineering. She gained extensive experience in the airline industry and with Siemens as well as working in the field of human-machine interface (HMI). At Deploy she has taken the lead in establishing the company's first automated production line.

The Deploy team today includes three generations who combine many decades of experience in potable water, sanitation schemes and other water related infrastructure projects. Paul Mendieta himself, who is a qualified civil engineer with an MSc from Imperial College as well as his MA and wide experience, worked in Ecuador as a design engineer and project supervisor, contributing to the delivery of more than 70 infrastructure projects since 2014.

Paul Mendieta commented: "Our mission as a family started by committing to help rural communities around the world obtain easier access to safe drinking water. Now, we have expanded our commitment to agriculture and decreasing the detrimental impacts of wildfires.

"The Deploy project itself was born after interacting with close to 200 communities in Ecuador and analysing their water-related issues; from which we realised that water storage is an essential component for any water supply system. At the same time, it is the most expensive feature of the system due to its magnitude."



THE DEPLOY RANGE

Designated 'R' for Rural, there will be three separate sizes in the range, all two metres in height but varying in diameter. The entry level 14R is three metres in diameter and has a capacity of 14,000 litres. The 25R is four metres across and has a capacity of 25,000 litres while the largest, 40R is five metres in diameter and will hold 40,000 litres.

The key to their 'deploy-ability' is the fact the nature of the Concrete Canvas – a cement filled geotextile used for their construction - means they can be folded up for shipment and delivered to site in a timber crate, measuring just 2.5m by 1.2m. The two-man installation team then simply connects a compressor to one of the PVC-U taps to inflate the structure before the outer surface is hydrated and left to cure. Ready for use at the end of the second day, the versatile tanks will give robust, weather resistant service for 20+ years in applications including drinking water supply, farming, rainwater harvesting and emergency situations including firefighting.

Concrete Canvas Ltd was actually founded back in 2005 by fellow students and now Co-Directors William Crawford and Peter Brewin, who conceived a rapidly deployable emergency shelter in response to a competition at university. They later realised that the cement-filled geo-synthetic they had developed could revolutionise civil engineering work across multiple sectors worldwide. Deploy is the latest in a series of other innovative enterprises with which they have successfully collaborated.

Recalling his early interaction with Concrete Canvas, Paul Mendieta said: "I applied for a summer internship and Will contacted me a few days later; leading to my working closely with the company: conducting market research for them. After that project, it seemed like a natural progression to merge my ideas for Deploy with their existing GCCM/B products and we started working on and exploring the possibility of developing a water storage unit using the material.

"For my graduation project I needed to combine innovation and design engineering principles to develop a new product with genuine mass market appeal: as a result Deploy was created, becoming the first ever air-deployed, ready-to-use water storage tank. In working with Concrete Canvas, we have leveraged our relationship with an extraordinary UK company to develop this water storage unit that can address some of the main issues seen in the field."

Paul and his co-founder, Beren Kayali, remain passionate about environmental issues as well as public health and other life challenges faced by people across the globe. This includes the fact that an estimated 2.2 billion people lack access to safe drinking water and that in just a few years from now half the world's population will be living in water-stressed regions. This fact also impacts on the difficulty in dealing with the growing number of wildfires which break out every year in countries from Australia to the northern parts of Europe.

Paul confirmed: "Our intermediate and long-term goals are to evolve the product so it can be used for rural water systems in developed, as well as developing countries. We want to help vulnerable populations around the world that do not have access to safely managed drinking water. We have calculated that a single Deploy water tank could help communities of up to 2,000 people."

Referring to the recent progress made on the Deploy project and support the company has received from the Welsh Government and backing from other sources, Paul concluded: "Myself and my family are very grateful for the support we have received since coming to the UK, and being able to engage with such technology focussed people at the Imperial College, the RCA and the founders of Concrete Canvas. As well as trying to expand Deploy commercially - in terms of building a manufacturing line and finding fresh marketing opportunities, we are now also starting to look at the use of Deploy for fire mitigation programmes following the horrible wildfires witnessed in the last few years. We would love to be able to provide easier access to water sources for firefighters when wildfires occur."

