Technical Description

WaSH Centre.ORG

WATER SANITATION HYGIENE

Technical Description

SANITATION AMBASSADORS

WaSH Centre 1.0

WaSH Unit

THE WASH CENTRE

Our product range features two primary designs of our innovative superstructure, tailored to meet diverse sanitation needs in a variety of contexts.

WaSH Centre 1.0 - with Undercover Patio

The WaSH Centre 1.0 stands as our flagship model, characterised by its container-based technology (CBS) and a dedicated space for containers, pump, electronics, and accumulator tank. This original design is customisable to support either the CBS with a substructure, or the flat version designed for areas with access to water, for flush toilets and squat pans, and sewage management infrastructure. The modular nature of the WaSH Centre allows for the connection of multiple units to cater to the specific needs of any location. The inclusion of a patio facilitates easy access, while the extended roofing offers shelter from the sun and rain.

WaSH Unit Basic

The WaSH Unit Basic differentiates itself with a more straightforward design, featuring direct stair access to the entrance, which reduces the amount of material used and therefore the cost. Despite these differences, it maintains the same high standards of construction and building methodology as our more advanced models.

WaSH Express

The WaSH Express is engineered for rapid assembly, making it an ideal choice in emergency situations where swift deployment is critical. This model leverages our proven technology and method but with a focus on speed, providing a reliable sanitation solution for large groups over the short to medium-term. It is specifically designed for more sustained use than temporary facilities, such as those needed for weekend festivals, ensuring durability and functionality for months or even years.

Each of these models is designed with the end-user in mind, ensuring ease of access, durability, and adaptability to various environmental conditions and community needs.

Size WaSH Centre 1.0. 3600 x 2400 mm

WaSH Unit: 1200 x 1200 mm

WaSH Express: 1000 x 1000 mm

WaSH Centre
WATER SANITATION HYGIENE

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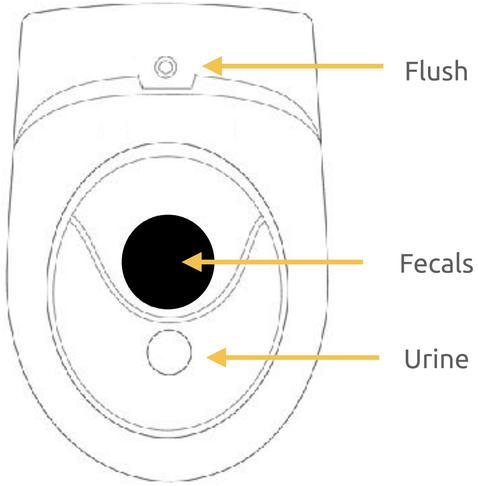
SANITATION AMBASSADORS

EcoDry - UDDT



Wind turbine

URINE SEPARATION UDDT
DRY TOILET WITH FLUSH

Configuration Overview WaSH WaSH Centre

The beautifully designed porcelain toilet features a flush mechanism powered by a 12V solenoid. This solenoid activates a valve when the flush button is pressed, releasing approximately 100ml of water. The flush serves two primary purposes: firstly, it replaces urine in the water trap to prevent odours, and secondly, it generates a flushing for user satisfaction. Water pressure is maintained at 3 bar (43.5 PSI) by a pump, with an accumulator tank ensuring a steady flow through-out the system.

Water Supply Options

There are two main methods for water supply:

- Direct connection to a piped water source, if available.
- Utilisation of collected rainwater, in areas lacking piped water. The design of the WaSH Centre emphasises efficient water use.

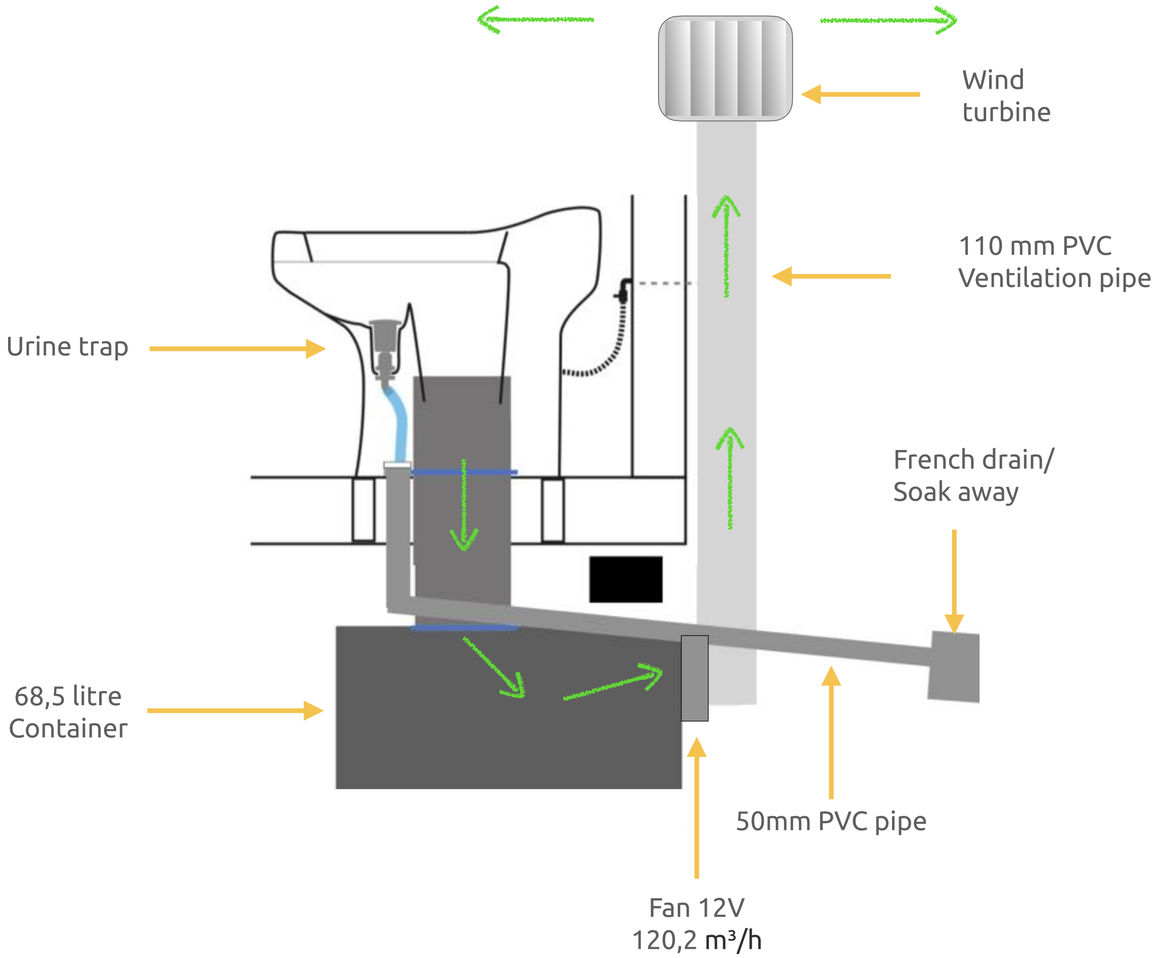
Grey water Management

The system uses approximately 100ml of water per flush and an additional 200ml for hand-washing. Grey water management options include:

- Disposal of grey water and urine through a French drain or a soak away system using perforated pipes underground.
- Collection and repurposing of urine and grey water for activities such as irrigation.

Ventilation and Waste Dehydration

The unit is equipped with a 12V fan, positioned within an air chamber, which extracts air at a rate of 120m³ /h through the chamber and out via a vent pipe. This setup aims to minimise odours and dehydrate solid wastes. Considering the erratic availability of electricity in rural areas, a wind turbine is installed at the end of the vent pipe to ensure continuous operation during power outages (load shedding) or in solar-powered units during overcast conditions.



URINE SEPARATION UDDT DRY TOILET WITH FLUSH

Technical Specifications

Toilet

- Model: EcoDry UDDT (Urine Diversion Dry Toilet)
- Material: Ceramic
- Flush volume: 100ml per flush for urine
- Operating voltage: 12V

Ventilation

- Fan dimensions: 120x120x25 mm
- Airflow capacity: 120.2 m³/h
- Noise level: 25.1 dB(A)
- Maximum power input: 1.08 W
- Operating voltage: 12V

Wind Turbine

- Capacity: 500 m³/h at 15km/h wind speed
- Material: High quality virgin polypropylene with UV stabiliser.

Pump & Accumulator Tank

Automatic Demand Diaphragm Pump

- Operating voltage: 12V
  Flow: 3 liter/minute
  Max draw: 4.2A
- Waterproof grade IPX54
  Pre-pressurized Accumulator Tank 1 Litre

URIMAT®
WATERLESS TECHNOLOGY

WATERLESS URINAL

We offer two types of urinals: one crafted from high-quality ceramic and the other from durable plastic. Both models incorporate the cutting-edge Urimat technology, renowned for its leadership in the European market.

This innovative system is designed to direct urine from the urinal bowl through a funnel into a sophisticated odour trap. From there, it passes through a vertically aligned membrane that leads directly into the sewage system. The membrane plays a crucial role in this process; it remains open to allow urine to pass through when in use. Once the flow ceases, the membrane automatically closes, effectively sealing off any gases from the pipes and maintaining a clean and odor-free environment.

To enhance this system further, we've integrated the MB-ActiveCube within the odour trap. This addition significantly boosts hygiene levels by reducing deposits and preventing the accumulation of organic residues, urine sediment, and fats inside the odour trap and the waste pipe. This technology not only ensures optimal functionality but also contributes to the longevity and cleanliness of the urinal system.

Altered Nozzle Dome®

0,4 l/ minute

Time delay faucet

Altered Nozzle Dual-Flow

TAP & NOZZLE

Nozzle (standard)

When want to maximise saving water.
The Altered Nozzle Dome®
Material : Ecobrass®
Water flow: 0.4 L/Min or 96% savings.

Nozzle Dual-Flow (option)

The Altered:Nozzle Dual Flow Pro saves water without losing functionality. With patentented atomisation technology millions of droplets instantly drench your hands. Making it possible to give you 98% less without loss.

If you need more turn the handle to the spray mode. Still 85% savings compared to regular taps, but all the water you need.

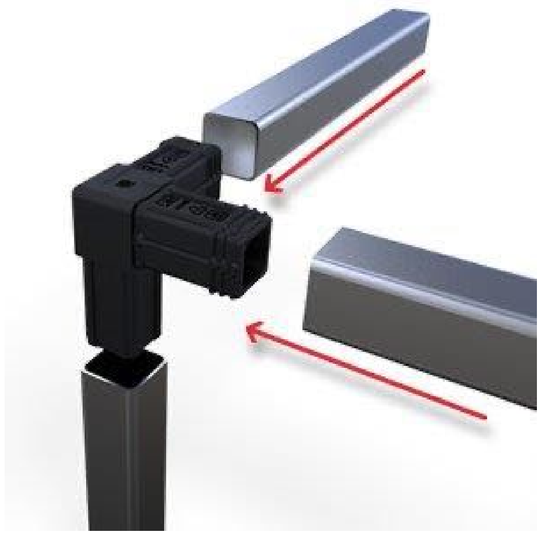
Time Delay Basin Faucet

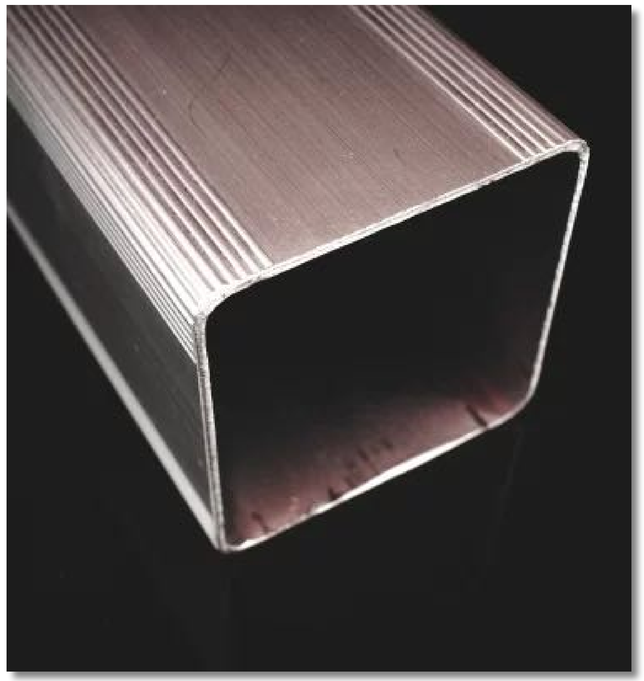
Incorporating a top-button mechanism on the faucet offers a practical and efficient solution for water conservation. By pressing this button, water is released for a brief period of 2-3 seconds just enough time to wet your hands, ensuring minimal waste. This design effectively eliminates the risk of leaving the tap running unintentionally, promoting responsible water use and contributing to environmental sustainability.

Material: Brass
Running period: 2-3 seconds

Technical Description

SANITATION AMBASSADORS





BUILDING TECHNOLOGY

The WaSH Centre's design integrates two key components: the structural framework and the exterior cladding. The entire structure is supported by aircraft-grade, 50mm powder-coated aluminium extrusions, chosen for their durability and longevity, with minimal maintenance required.
For the connections, we utilize specially designed nylon and composite connectors, allowing for a seamless assembly without the need for welding. This design choice facilitates ease of construction, akin to assembling Lego pieces, with all aluminum parts pre-cut to size at the WaSH Factory, for efficient on-site assembly.

The only tool required for this process is an electric screwdriver, streamlining the construction process. The construction materials for the walls and floors are manufactured from plastics typically destined for landfills, including non-recyclable materials such as toothpaste tubes. These materials undergo rigorous testing for strength and fire resistance, ensuring they provide durable and long-lasting construction.

For the roofing, we've chosen specially manufactured polycarbonate sheets that are high-impact resistant and translucent to allow light in. These 1.2mm thick sheets include a co-extruded UV protective layer to enhance durability and adaptability to various weather conditions. A critical aspect of the WaSH Centre's design is its weight management. By meticulously reducing the overall weight, we aim to lower transportation and construction costs without compromising the structure's sturdiness, reliability, and longevity.

Technical description:

Aluminium extrusion: *Aircraft grade 50 x50mm - 6061-T6, powder coated*

Cladding: *Boards of mixed recycled plastic*

Floor: *Boards of mixed recycled plastic*

Roof: *Polycarbonate sheets with UV a protective layer*

The smart gutter

13 vs 0.6 litre - RAIN WATER HARVESTING

The WaSH Centre 1.0 is designed to operate using minimal water. It features a toilet that only needs 100ml of water to flush urine and simulate a flushing experience, and a faucet equipped with a water-saving nozzle that uses just 200ml of water for a thorough hand wash.

For comparison, we looked at a typical setup in South Africa, where a toilet flush uses 9 litres and a proper hand wash requires about 4 litres, totalling 13 litres of water per visit.

Let's break down the numbers:

Traditional Setup:

Toilet flush: 9 litres
Hand washing: 4 litres

Total per visit: 13 litres/ person/visit

2 days

Assuming each person uses the toilet twice daily, this amounts to 26 litres per person per day. With a 2700-litre rainwater tank, it would be depleted after 100 visits, or in roughly 2 days.

WaSH Centre 1.0:

Toilet flush: 0.1 litres
Hand washing: 0.2 litres

Total per visit: 0.3 litres/ person/ visit

45 days

With two visits per day, the total is 0.6 litres per person, which means the same 2700-litre tank would last for 2250 visits, or about 45 days. This demonstrates a significant improvement in water conservation.

WaSH Centre - Smart gutter

The smart gutter, designed with a circular shape, easily attaches to the roof and effectively reduces debris entering the rainwater tank.

Resource & Treatment

WATER SANITATION HYGIENE

SANITATION AMBASSADORS

SERVICE & EXCHANGING CONTAINERS

Container maximum weight 20 kg

Easy to handle

The most crucial component in the sanitation value chain is the servicing and maintenance of the facilities, whether privately by users themselves, as a paid service through designated and trained Sanitation Ambassadors or other service providers, or as a subsidised public service through local municipalities.

Sanitation Ambassadors offers a proactive, user-paid Sanitation as a Service (SaaS) approach, where containers are collected and replaced once they reach a certain weight of < 20kg. Our research highlights the significant benefits of this practice, particularly for individuals involved in physically demanding roles, such as luggage handlers in the aviation industry. A 20kg limit not only prevents undue stress on the body but also promotes quicker recovery compared to consistently handling heavier weights, which can lead to long-term wear and tear. We are committed to ensuring that the essential role of the Sanitation Ambassador is as safe as possible.

In principle, the replacement of the containers is scheduled at regular intervals to guarantee the weight does not exceed 20kg: every 6-8 weeks in residential settings and 3-6 weeks in educational environments.

- In areas serviced by Sanitation Ambassadors, residents and/or the municipality can subscribe to a comprehensive service (SaaS) that includes the regular exchange of containers. This service also ensures the optimal functioning of pumps, fans, and taps, with routine checks on locks and hinges to guarantee everything operates smoothly.

- In regions where Sanitation Ambassadors are not available, we actively collaborate with municipalities and other existing sanitation service providers as well as communities, by providing education, training, and remote support. It is vital for the users to understand why and how the technology works, and for them to have the capability to undertake the servicing and maintenance themselves. By empowering communities with the knowledge and skills to manage their own sanitation systems they will become more sustainable and less reliant on outside entities to provide this essential basic need.

Treatment Method

SANITATION AMBASSADORS

Exchange the container

Add the AnnCec mixture

Put in storage - Done!

SAFE TREATMENT & THE MAGIC SAUCE

Our innovative treatment method is the result of a collaborative effort with the Swedish University of Agriculture (SLU) and is grounded in extensive research. Ammonia Sanitation effectively neutralises harmful pathogens found in fecal matter, such as E. coli, various bacteria, and the resilient eggs of intestinal worms like Ascaris Lumbricoides.

The process, while straightforward, requires expertise and appropriate safety precautions:

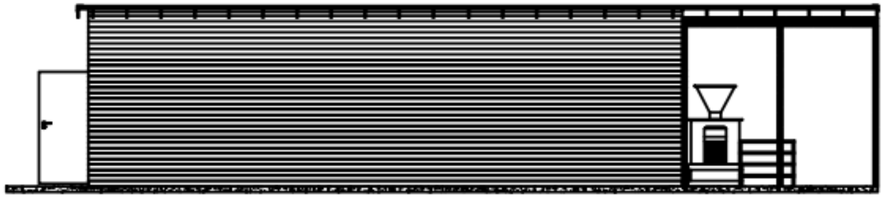
1. Replace the full container with an empty one.
2. Seal and transport the container to our treatment facility.
3. Weigh the container to determine the precise dosage of our Urea-based mixture, adjusted for the container's weight and moisture level.
4. Securely close the container and store it at an average temperature of +20°C for three weeks.
5. After this period, the contents are completely safe and ready to be processed further, as a beneficial soil conditioner, or disposed of.

To speed up the treatment process in high density areas, we can integrate a heating system. By raising the average temperature to +32°C, we can reduce the treatment duration by approximately 50%, with higher temperatures correlating to progressively quicker treatment.

SLU
SWEDISH UNIVERSITY OF AGRICULTURAL SCIENCES

SANITATION AMBASSADORS

Micro RTC



RTC Medium

RTC Medium

RESOURCE & TREATMENT CENTRE (RTC)

We are strong proponents of minimising transportation to reduce costs, time, and carbon emissions. This belief has shaped our approach to favour smaller, decentralised treatment centres over larger, centralised facilities. Our Micro Resource & Treatment Centre (MRTC) epitomises this philosophy. Designed as a compact and cost-efficient solution, the MRTC is akin to a storage room that can be quickly assembled at a minimal expense.

Micro RTC

The Micro RTC is capable of processing up to 50 containers per month, adequately serving around 50 households. This model is an example of efficiency and sustainability, aligning with our commitment to environmentally conscious practices.

RTC Medium

For larger communities, our RTC - Medium offers a more substantial solution. It has the capacity to manage approximately 400 containers per month. Thoughtfully designed, it includes amenities such as a hot shower and a toilet, ensuring the comfort and convenience of the staff. To further enhance our service, we can equip these centres with a heating chamber.

This addition not only doubles the capacity but also multiplies it several times, significantly accelerating the treatment process and expanding our ability to serve more communities efficiently.

RTC Express

Based on the technology and method but prioritised for speed of assembly. For emergency situations and temporary sites.

Foundation

SANITATION AMBASSADORS

Hammer IT - Splint

FOUNDATION OPTIONS

For setting up one or two WaSH units, the simplest method is to pour a traditional concrete slab, around 75-100 mm thick, and then secure the superstructure to this slab if you add a rainwater tank and extend the slab to fit the tank.

For multiple units in the same location, we have an innovative solution from Sweden called Hammerit. It's a galvanised metal splint that's driven into the ground using machinery. This technique is widely used in Sweden for constructing solar parks, storage spaces, decks, and for installing charging stations for electric vehicles. This method is especially effective in areas with clay or sandy soil.

Sanitation Ambassadors NPC is a non profit organisation

www.sanitationambassadors.org

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