

P.A.T.S.S

PRIMARY ALL-TERRAIN SEPTIC SANITATION



Emergency – Disaster Recovery Sanitation

- PATSS provide prompt and effective deployment into areas that usually have no safe sanitation systems by Humanitarian Aid Organisations.
- PATSS provides an immediate infield flush or pour flush facility for natural or civil disaster emergency response crews and victims. Logistically, with each chamber flat packed in a cardboard carton (1m x 0.57 x 0.2 x 15kgs) PATSS economically resolves emergency sanitation problems in compliance with AS/NZS1546.1:1998, *Onsite domestic wastewater treatment units, Septic Tanks*
- PATSS in civil emergencies has eliminated reliance on specialist sewage removal contractors to service sanitary facilities; ie: the required frequency of pumping out and chemical dosing for 'portable' toilets
- PATSS significantly reduce disease risk; used in conjunction with cistern or pour flushing standard western or Asian squat toilets, they may be located inside buildings or stand alone positioned on top of the PATSS chambers with the water seal significantly reducing the risk of disease and negating insect vectors
- PATSS used in warm climates where higher digestion rates are achieved may require desludging at intervals of up to six months
- PATSS is essentially a mini septic tank that enables the use of standard flushing or squat toilets by providing primary sewage treatment that separates solids from the wastewater stream and facilitates digestion of the separated solids. Unlike conventional septic tanks, PATSS require minimal installation excavation.
- PATSS are of robust lightweight construction, less than 15kgs per pack for easy transport to remote locations
- PATSS units are complete, ready for easy assembly with no specialist supervision or machinery for installation

- PATSS have been designed for installation into highly reactive soils and areas with high ground water tables (see photograph below where in Dili the ground water was 300 mm below the surface)
- PATSS use no moving parts or chemicals because the operation uses only natural physical and biological processes
- PATSS are flexible and cater from 1 person up to complete camps serving several hundred people per ablution block

Remote – Difficult Terrain Sanitation

PATSS provides a safe and environmentally acceptable primary sewage treatment and disposal system that overcomes the problem of providing water closet toilets in remote areas and difficult terrain.



PATSS are ideal where site limitations of shallow or non absorbent soils, high water tables, shallow rock, adjacent lagoons or high precipitation prevent the use of conventional ground absorption trenches by restricting the function of natural treatment and disposal mechanisms the PATSS technology resolves these issues without chemicals or prescriptive servicing.



PATSS can be used where reticulated water is not available; a 'frog mouth' toilet bowl flush assembly' is used instead of cisterns; a drum of water is positioned beside the toilet for washing of hands, then a dipper is used to draw water then poured into the 'frog mouth', to flush the bowl and ensure the continuing provision of a water seal to combat the spread of disease.

PATSS are designed for situations where 20 litres per person per day is considered a reasonable volume. That is, three toilet flushes plus a 2 litre allowance for other liquids.

PATSS are made up of two or more 'in series' chambers, acting as mini septic tanks by separating and facilitating digestion of the solids from the wastewater stream and providing the required 24 hours wastewater detention - with scum and sludge storage.

Therefore, each system is designed to provide for a specified number of personnel simply by varying the number of chambers, for example: -

Nominal Persons per Day	PATSS Chambers - Series Indicatives*
> 15	1 x A + 1 x C
> 25	1 x A + 1 x B + 1 x C
> 50	1 x A + 3 x B + 1 x C
> 75	1 x A + 5 x B + 1 x C
> 100	1 x A + 8 x B + 1 x C
> 150	1 x A + 13 x B + 1 x C
> 200	1 x A + 18 x B + 1 x C
> 300	1 x A + 28 x B + 1 x C
> 400	1 x A + 38 x B + 1 x C

- The above 'series indicatives' are subject to site design requirements.

PATSS are manufactured with a 100% recyclable uPVC outer carcass and a flexible, RF welded (above ground swimming pool material) internal liner clamped to the carcass top. A three chamber system provides up to 500 litres per day capacity + 100 litres wastewater storage. The prescribed wastewater flow path of 1200 mm from the 100 mm 'A' Chamber inlet to the 100 mm 'C' Chamber outlet, is achieved partly in the pipe connecting the chambers.

Wastewater Primary Treatment

Because the chamber liner is a flexible 'bag' and the carcass has hollow sides and no bottom any hydrostatic uplift applies only to the flexible bag which is neutrally buoyant due to the wastewater. The chambers are installed so that the water table cannot rise above the C Chamber outlet pipe.

Wastewater Secondary Treatment

The second significant advance has been the development of Absorption Trench systems that permit the full secondary treatment of all site generated wastewater (black and grey). Prior to the development of various absorption trench systems, the use of the in-ground wastewater treatment and disposal was restricted to sites with well-drained absorbent soils and no other site limitations. Where the site allows secondary treatment may be a considerable distance from the ablution facilities by using gravity and poly pipe or a liquid effluent bladder and contract cartage.

Sustainability and Flexibility

PATSS complete sewage treatment and disposal system is based on the combined use of 'A' + 'C' or 'A' + 'B' + 'C' Chambers for the primary treatment of toilet wastewater. In ground absorption or above ground evaporative systems are then used to provide the complete secondary treatment of the primary treated toilet wastewater and all other sullage or grey water generated from field kitchens, ablution and laundry facilities.

PATSS are designed as a stand-alone unit for the maximum number of personnel using the facilities on a continuous basis.

The use of a small electric (powered sites - solar or generator) or petrol pump (non-powered sites) is only required if the elevated evaporation system is needed due to large wastewater loadings or site limitations such as non-absorbent soil types, shallow rock or very high water tables are present.

Flexibility is achieved through the PATSS and absorption systems ability to deal with intermittent or shock loads.

PATSS do not require recommissioning after extended periods of non-use unlike other wastewater & composting systems, simply recharge with water to the C chamber outlet level and de-sludge if required.

PATSS have also been used to service small townships and extensive commercial and remote mining developments.

Decommissioning of a PATSS (not to be used again) is straightforward and must be in full compliance with local Authority requirements with most of the PATSS components being recoverable (see PATSS 'Recovery Procedure' Document).