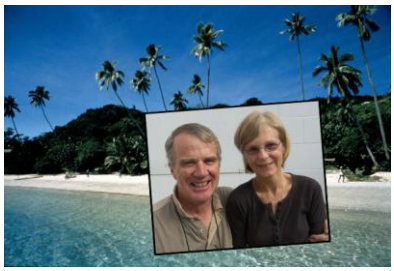
DraftSight On Tap: Engineer quenches thirst in Papua New Guinea



Engineer David Hall and his wife Rosie relocated from New Zealand to Papua New Guinea to help improve drinking water and sanitation conditions.

Like everything else he packed for his South Pacific jungle island adventure, David Hall needed his 2D CAD tool to be light and portable.

Hall is a civil engineer in the middle of a two-year assignment for Volunteer Services Abroad, a New Zealand economic development agency similar to the American Peace Corps. Along with his wife Rosie, he's stationed in West New Britain, Papua New Guinea, an impoverished nation of 6 million where most of the population lives in remote rural areas without plumbing.

Coordinating with another volunteer service NGO called "Live and Learn," Hall is helping local villagers:

- Install basic water supply systems to provide water in taps within the village and relieve the women and children of the daily chore of fetching water, often from miles away.

- Construct ventilated "longdrop" toilets as a sanitary alternative to the current practice of using the bush or beaches as bathrooms. The main component is a concrete slab with a hole in it (to squat over) and a ventilation pipe to minimize odors.

- Establish a hygiene education program to teach people the links between health and sanitation.

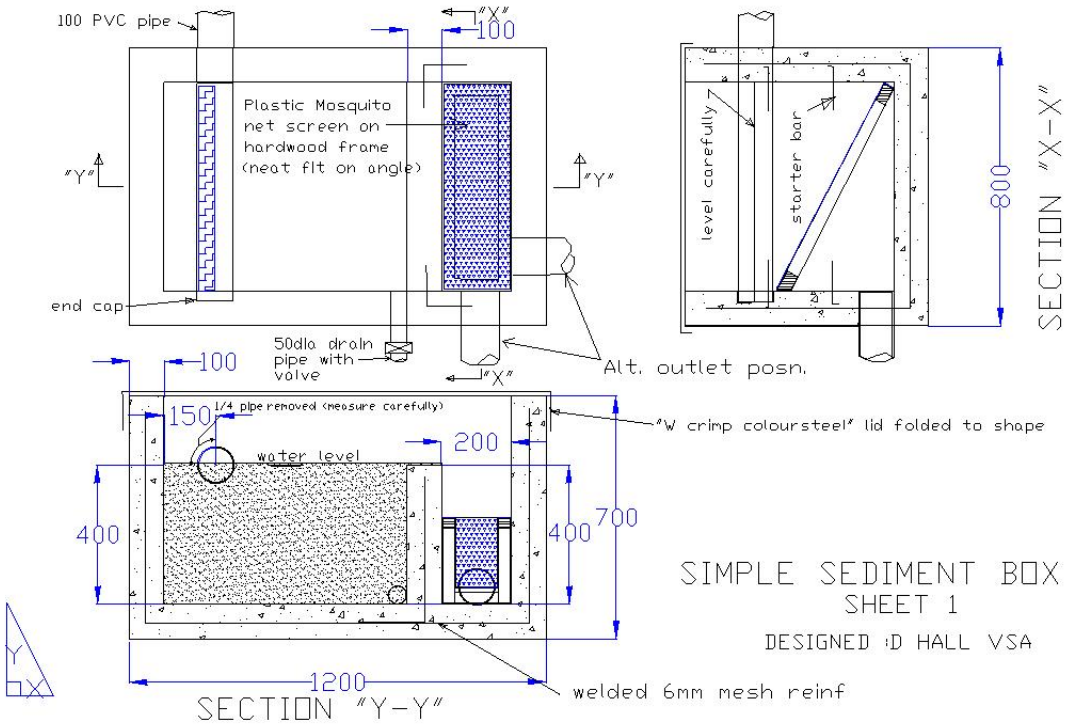
Because islanders cannot depend on a power supply for pumping, the water harvesting and filtration systems are based on gravity from either an elevated natural spring or a collection tank on a roof.

Before leaving for Papua New Guinea, Hall searched the Internet for a convenient drawing program that would work on his Mac laptop and he stumbled across DraftSight, a free 2D CAD tool from Dassault Systèmes.

“Having never used AutoCAD or any other drawing packages, I had to start from scratch and work through the manual which I found useful,” says Hall, who previously sketched by hand. “I was able to produce the drawings I needed.”

DraftSight’s free unlimited use is especially advantageous for non-profit organizations, which can use the savings from software licensing fees to allocate to other resources.

Here is a DraftSight drawing of a new sediment box that Hall designed to improve the filtering of a spring-fed water supply. The system keeps dirt and particles out of the water storage tanks.



DraftSight is being used to improve the quality of local drinking water supplies

“It can be a very rewarding experience when one sees the pride in the villagers’ faces as the water system starts working after they have worked out for themselves -- with some thoughtful guidance – what needs to be done,” Hall says. “They did all the hard work, such as digging pipe trenches, pouring concrete, etc. There is a direct correlation between effort involved and a sense of ownership.”

“Aid work can also be pretty frustrating at times,” he adds. “One has to learn to go with the flow!”

As for the flow of longdrop toilets, Live and Learn volunteers recently helped construct 50 Ventilated Improved Pit (VIP) units in the village of Potpot on Vitu Island. Improving sanitation in Potpot could save some unnecessary trips to the island’s only health clinic, which is a 40-minute trip by boat and a few hours drive by tractor.

A rudimentary structure is built above the concrete slab for privacy, with the frames sometimes covered with large coconut fronds. PVC ventilation pipes are painted black to absorb heat and create convection currents that help disperse odors.

Potpot villagers construct Ventilated Improved Pit (VIP) toilets in Papua New Guinea. The finished bathroom is on the right.

“The new toilets should make quite a difference to the health of the community,” Hall says. “Unfortunately the wandering pigs, dogs, chickens and naked toddlers will still need to be toilet trained and that could be more difficult!”

“Problems still remain and flies may continue to be a health problem, hopefully less so than now. At least the beach won’t be used any longer and we’ll see a clean up of the sea,” he adds.

Plumbing issues aside, Hall says that he is awed by the gorgeous scenery around the toilets.

“It’s like a veritable Garden of Eden around here,” he says.

Civil engineer David Hall teaches children on Vitu Island how to squeeze a stream of water out of their hands.

If you’d like to learn more about engineer David Hall’s ongoing volunteer assignments in Papua New Guinea, visit his blog at http://daveandrosie.wordpress.com/