

REPORT: October 2009

NATURAL SWIMMING POOL

using Flowform™ eco-technology in Horowhenua, New Zealand

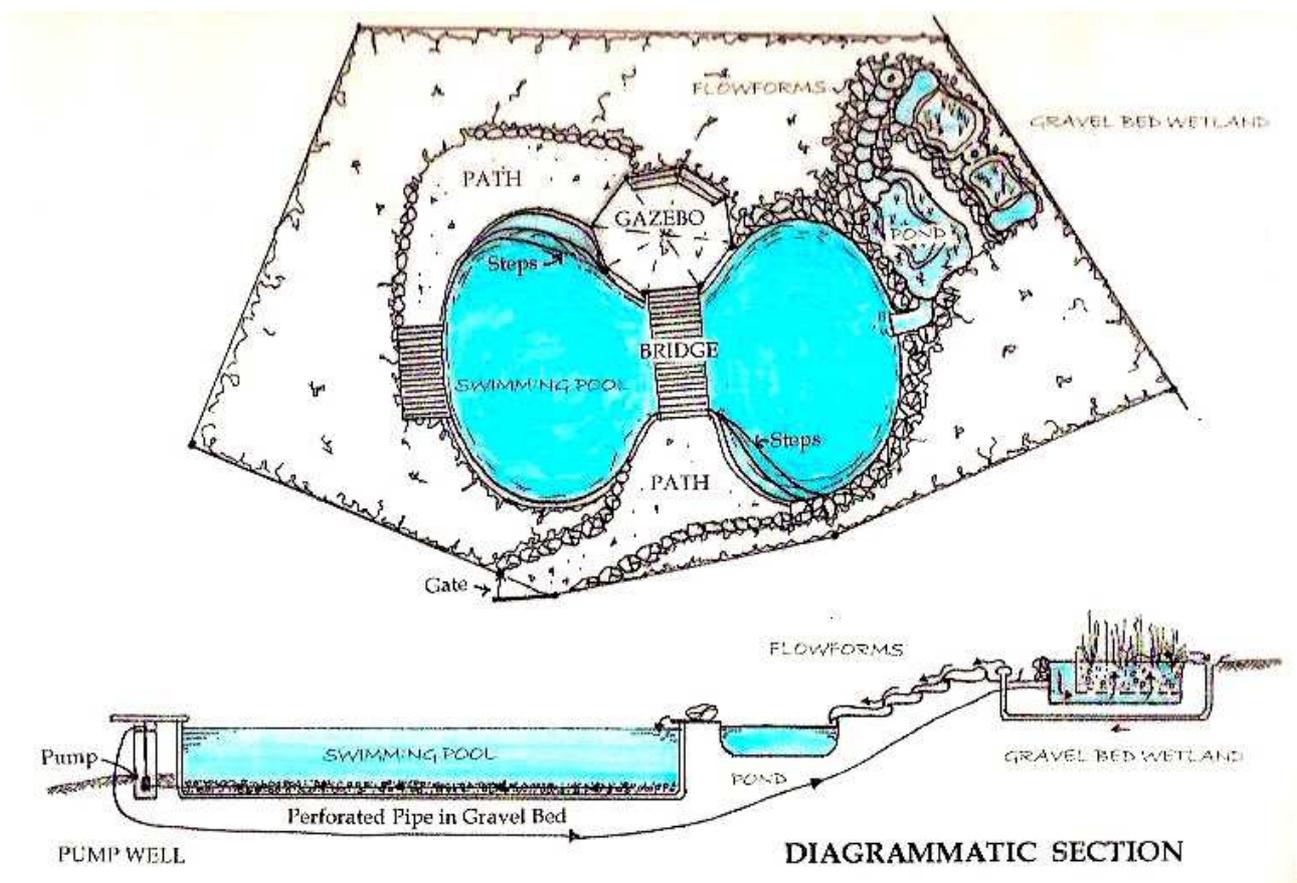
Introduction

The swimming pool is a small domestic pool, with a figure 8 shape about 9 m long and 6 m wide. It is about 50 sq m in area and 1.5 m deep. It has been designed to mimic a stream pool, with re-circulating water passing through a small wetland, a **Flowform** cascade and a holding margin pond. There is about 300 mm of river gravel on the bottom, and the **Flowform** cascade provides the stream sound effects, as well as their regenerative and energising functions.

No chlorine is used in the pool, and the design indicator criterion was that frogs would live in the pool. The pool remains very pleasant and cool even during hot summer periods, and is really refreshing to swim in. We built it because our kids wanted a swimming pool at home, rather than having to drive to the local river — and we were interested in trying out a wetland-based pool, but one more like the pools of the fast-flowing gravel bed rivers of New Zealand.

Overview

The plan and section of the pool shows its overall layout and the recirculation system.



A small submersible dewatering pump takes the pool water, through perforated pipes in the gravel layer at the bottom of the pool, and delivers it to bottom-up flow filter ponds of gravel and reeds. From these wetland ponds, the water flows down a

vortex-generating pipe, to the **Flowform** cascade, into the holding pond and back into the swimming pool.

The pump flow rate was chosen to match the **Flowform** flowrate capacity, otherwise the design was based on an overall pattern approach. The system, thus, has the features of a stream environment, linked together in a specific arrangement. It includes:

- an area of flow through a gravel matrix with water reeds on top (of the wetland filter ponds);
- a still water holding pond of floating plants, like a stream backwater (of the lower pond);
- a gravel bed in the main swimming pool;
- and a **pulsating 'superstream' Flowform cascade**, like a stream riffle flow, upstream of a deep still water pool.

The pond areas are quite small, compared to the main pool size, and the vitalising and energising action of the **Flowform** cascade is important in the maintenance of water clarity and purity of the whole system.

The area around the pool has been planted with a range of species, from grasses, to shrubs, to small trees, to give rise to a complementing outdoor space. River stones have been used as a visual connecting form between the ponds and pool. The arch bridge over the centre of the figure 8, has been a platform for much fun — on and under the bridge — and the narrow connection under a bridge gives rise to two water spaces. The bridge is also the access to a shade gazebo, and a more sheltered area on one side.

Maintenance

The swimming pool has been in use for many years, and throughout has provided a refreshing swim in a pleasant and restful environment. At the same time, it has provided an interesting place for our kids to swim and play in, and an especially exciting place for our dog.

We have not tested the water for bacterial loads, but have never had any problems. Our younger daughter especially appreciated the lack of chlorine, as she was affected by the chlorine in public and school pools.

The main maintenance issue is the build up of algae on the sides of the pool. Any build up on the **Flowform** units is easily controlled by turning off the water recirculation for a short time (when it is warm and dry).

To manage the algae in the pool, we dose it with both alum and gypsum. This was based on research in Australia on how to make small water holes drinkable in droughts, and is very effective. Essentially, it starves the algae of phosphorus, and coagulates and settles the dead algae out onto the gravel bed. It is much cheaper than chlorine-based algaecides, and very much more effective — and unlike the chlorine products, does not affect the frogs.

We do clean off some of the dead algae from the bottom, and occasionally add microbial preparations to break it down and allow it to be worked into the gravel matrix on the bottom of the pool.

The pool is covered in winter and the water circulation stopped. Water clarity is maintained over winter, but we apply a heavier dose of alum and gypsum at the beginning of the season to clear away the algae.

This maintenance effort is much less than would be required for a chlorine-dosing and sand filtering system. It is also much cheaper, and requires much less energy.

Comments

The swimming pool is based on an integrated system that mimics the natural processes of a gravel-bed stream. **The water recirculation and the Flowform cascade are vital for the creation of this type of stream environment.**

The gravel filtering and plants are useful in developing complex plant/microbial communities to remove and take up nutrients, which both clarifies the water and helps maintain a healthy living water system.

The pool is sited in a valley area, which is naturally wet, and groundwater flowing under the pool, with its gravel bed, probably helps to maintain its coolness in summer. **The water circulation, Flowform dynamics and biological activity within the system, undoubtedly assist in maintaining good temperature stability.**

On a couple of occasions, in severe storms, flood waters with a high silt load have entered the swimming pool. This has not been the disaster we thought it would be, and the pool water has become clear again surprisingly quickly. We have, though, improved the flood security for the pool!

Vortex formation is very important for the vitality and health of water, and the circulation system, but especially the Flowform cascade, generates healthy vortices. **The Flowform figure 8 flow pattern in the cascade creates both a pulse dynamic and a spiral vortex generation. The pulse has a natural rhythm, and develops the sound of a flowing stream. We, thus, have an all-senses swimming experience, within a healthy environment.**

There are different possible arrangements of this natural pool system, and we have designed and overseen another similar swimming pool, where the pool is clear water (with no gravel bed) and the plant and gravel filtering is in separate ponds.



An ozonator or colloidal silver unit could be added if there were concerns about bacterial loading, or the pool was a public swimming pool. However, we have not had the need to do this.

For us, the pool is a great place to cool off and recharge in summer. It has the complex water/land and ecological margins of a stream pool, with its healthy water quality and sounds. It is a constructed pool, but to a natural pattern and with a

natural quality and feel.

Flowform cascade

Lower end, with the holding pool below



The Author:

Gary Williams lives on a small permaculture farm in the Horowhenua, New Zealand, with his partner Emily. It has a diversity of garden, farm, forest and wilderness, and we use an organic management approach and the practices of biodynamics.

He works from home as a consulting engineer on water and soil resource management, and provides advice, design and supervision services to a wide range of clients from individuals to councils and government departments.

His latest book, "Out of the Helix", is a series of (word & picture) essays about cultural transformation, and how we can bring about the shift in world-view required to achieve a healthy, just and sustainable way of life.

If you want to contact him please email us at info@flowform.net