

NATURAL SWIMMING PONDS HELPSHEET

We have created this help sheet to guide those customers who are planning to build a natural swimming pond. It isn't an exhaustive description of the issues, and we thoroughly recommend reading "Ponds, A practical guide to design, construction and planting" by David Kerr and/or "How to Build a Natural Swimming Pool" by Kircher & Thon for a fuller picture.

We get frequent requests from customers at various stages of natural swimming pond construction, very often at a late stage when the pond is almost finished, but it's important to get good advice before you start. In many cases we are presented with a fait accompli with various built-in problems which could have been avoided, so we will start here from first principles.

A full-blooded natural swimming pond is not a cheap thing to construct, and the biggest mistake early on is to make the pond too large for the available budget. A large percentage of our customers take a DIY approach to construction to save costs, but this brings with it many issues, not the least of which is that they are all doing it for the first time. Involving a professional company is recommended, as they will have seen all the issues before and the build should be trouble free. If you feel that you are well enough informed that you want to give it a go, there's no reason why it won't be successful, but do try to do all your research before you start and set a realistic budget.

At the bottom end are those who think that all that is necessary is to dig a crater and tip in several tons of gravel. This is not and never will be a natural swimming pond. Some people ask the local building contractor, most of whom have no idea of the issues involved, they just know how to dig a hole. Some of the worst ponds we have seen have been built by builders who claimed that they knew all about ponds. The internet is full of traps for the unwary, so when carrying out your research, concentrate on the information available from professional pond suppliers and contractors and several excellent books on the subject.

Whatever you do and whomever you involve, it's imperative to make a proper plan. This involves drawing out dimensioned plans and sections and marking out the site properly before excavation begins. The two critical initial decisions are the size and shape, and the profile when drawn in section. Typically, a natural swimming pond will have a deeper swimming zone devoid of plants and a shallower planted zone to absorb free nutrients and keep the water clear. If it's just a splash pool for children and family, a maximum depth of metre or so is enough and the shape is relatively unimportant, but for serious all-year swimmers the swim zone is usually 1.8 metres deep with a narrow rectangular shape to maximise the travel before turning.

The planted zone is critical to the success of the pond, and this is where many people go wrong. There are many designs out there which show a gravel area sloping at about thirty degrees to the horizontal, from the edge to a depth of about 60cm, thereafter plunging to 2 metres deep. From a planting point of view, this is hopeless and a source of much frustration to ourselves. It results in a very narrow band in which most marginal water plants will thrive, this depth being in the 0-10cm band. As depth increases, the vigour of the marginal plants needed to cope with that depth increases, and at 30-40cm only the most invasive and toughest marginal plants like Norfolk reed, bulrushes and reed mace will survive. You don't want these in your natural swimming pool unless

you want to see nothing but them; they will simply bully out everything else. Some also have sharp shoots or roots which can perforate pond liner, but the risk of this can be overstated.

So, please maximise the area at 0-10cm depth where virtually all marginal plants will thrive. We recommend at least a two-metre band all around at that depth, more is better, and 25-40% of the pond area should be at that depth. In an ideal world, the planted zone is completely separate from the swimming pond for ease of maintenance, and the water is moved continuously from the swim zone via an upflow or downflow system through the planted gravel area and back to the swim zone by pumps and/or airlifts. This is rarely the case however, and most people combine the swimming area with the planted area within a single space. A further area at 40-80cm depth is ideal in which to grow water lilies for colour and surface cover; we would aim for 10-25% of the pond area in this depth range. This leaves 35-65% as the swimming zone, and the larger the pond, the more we would aim for the lower figure here.

The higher the proportion of the planted area to open water there is, the less problems you will have with algae and cloudy water. Gin clear water and zero algae all year round are not realistic aims for DIY ponds and are only really achievable with a relatively sophisticated system involving mechanisation. However, a DIY approach should give you clean water and minimal algae most of the time if you get the basics right.

PLANTING MEDIUM AND THE CATCH 22

The catch 22 is that the aim of planting a natural swimming pond densely and fully is to remove almost all the free nutrients in the water, depriving the algae tribe of nutrition and allowing the water to remain clear. However, in order to thrive, the plants themselves need nutrients, having evolved in a nutrient rich environment like lake or river silt. The result is of course a compromise. Some people are paranoid about introducing the tiniest amount of soil into the pond, while some very experienced natural pond builders plant into plain subsoil covered with a layer of gravel. The fact is that however careful you are at the beginning, silt and debris will build up in the pond from the moment it is dug. This comes mostly from the plants themselves, but also from wind-blown dust and leaves, surface runoff, crashed insects and expired pond animals.

So, to create a broad shallow shelf around the edges you first need to know what depth of gravel is needed. We recommend a minimum of 15cm depth when using just gravel, or min 5cm depth above min 15cm of subsoil, and the particle size is ideally in the range 10-20mm. In order to get a final depth of water above the gravel of 0-10cm, the shelf itself will therefore be at 15-25cm below final water level. **Just to be clear, this means that at the very edge. the gravel will just break the surface, and 2 metres out from the bank the top of the gravel will be at a depth of 10cm below water level.**

There can then either be a steeper sloping section down to the lily zone, or a vertical concrete or sleeper wall retaining the shallow area and dropping down to the 40-70cm lily zone and a further wall or slope down to the final swimming depth. Don't forget to allow

some kind of ramp or access strip for safe access to the swim zone without having to wade through dense planting.

Many authors recommend introducing the plants in bare root form, completely devoid of soil, to eliminate the additional nutrients present in the planting medium in which they are grown. There's no doubt that this is successful with many of the larger and more robust plants like water irises, Pontederias and anything with a big chunky rootstock. There is a lot of debate about the merits and demerits, but we come down on the side of taking plants in P9 or larger pots, washing them lightly to remove any loose soil, and planting the remainder of the soil ball intact. This protects some of the roots and gives the plant a small amount of nutrients to get them off to a good start. By the time they are sold, plants in P9 pots will have used up most of the free nutrients in the pot, and the rest are well locked up in the rootball, so we believe that the fertilizing effect is then very limited. Many smaller plants really benefit from this extra boost at the beginning. It's possible to do the same with well established larger pots too. The situation with water lilies is even more marked, they simply won't establish well if planted in bare root form. They are hungry demanding feeders because they put on a tremendous amount of growth during the growing season, so need enough goodness to get them going. We therefore recommend buying them as established plants in pots and plunging the whole thing into the gravel so that the top of the pot is flush with the surface of the gravel. They soon subsume the pot anyway and then grow outwards into the gravel.

Don't be disappointed if your plants seem very slow to get going, this is perfectly normal, especially with hungry feeders like big leafy marginal plants eg Pontederia and Iris and especially the lilies. They may also look quite yellow for a while until the magic starts to happen, and it will. Please also expect to suffer from some algae at first, until there is sufficient competition from the other plants. In the second year onwards, the pond will begin to mature and settle down.

WATER SOURCE

A large pond requires a lot of water to fill it, and surprisingly sometimes people give little thought to where all the water will come from. In a domestic situation it's usually a clear-cut choice between filling from mains water or waiting for rainwater to naturally fill the pond. While the latter is preferable in terms of the quality of the water (tap water can contain high levels of phosphates and nitrates, the very thing you are trying to minimise), it can take up to a year to fill a typical pond with rainwater. During this time planting is delayed and the whole thing can go green and slimy before you have even started the planting.

If there is a natural source of water nearby from a spring, borehole or stream, care must be taken that this too does not contain high levels of unwanted minerals, especially phosphates and nitrates. If the source is surrounded by agricultural land, then there is a high probability that nitrate and phosphate levels could be an issue. It is possible to buy nitrate and

phosphate stripping devices, but they are not cheap. We highly recommend testing your proposed source of water at an early stage.

PLANTING BUDGET

When it comes to planting, the people best placed to advise are those who grow the plants. For a natural swimming pond to work successfully, the planted area must be large relative to the overall size, and dense. By the time people come to us to buy plants, they have often run out of money, having way underestimated the cost of construction, and they then want to spend the minimum possible on plants. Planting too few plants too thinly will guarantee problems with algae, there's no getting away from it. Frequently this means that the first set of plants are chucked out when they become infested, wasting the money that should have been spent on planting properly in the first place. It's no different to clearing a large area of weeds or grass in your garden and planting too few plants in their place. In the gaps, weeds will rapidly grow until they smother those that you have planted. So, PLEASE, ring-fence your planting budget at the start so that you don't make this common mistake. How much should your budget be? Well, at the time of writing, plants in P9 pots, which are the industry standard for bigger schemes, work out at about £4-£5 each in quantity. You should plant most marginal plants at 5 per square metre or more, giving a rough cost of £20-£25 per square metre. If your pond is 12 metres by 6, a common size, it will be 72 square metres overall. If 30% is marginal planting, that's 22 square metres. Multiply by £25 and you will get £550.

To that you will need to add a reasonable amount for water lilies and oxygenators. Again, in our example above the lily zone could be 10 square metres or so, meaning that 7-10 lilies would work at about £25 each – another £200 or so. A couple of dozen portions of loose oxygenators like hornwort or milfoil would add about another £100.

We also recommend, if budget allows, to include a number of larger specimens, say one 3 litre plant for every 10 smaller ones, to give an immediate impact and make for a more natural looking planting from the start. These bigger plants are actually very good value in terms of bang for your buck, and many people choose to use mostly this size at the outset. Because they don't need to be planted so closely together, typically 1 to 3 per square metre, the effect on cost is not as much as you would think.

In total then a realistic budget for this pond 12 metres by 6 would be in the region of £800 to £1000. This is quite likely way less than the cost of construction and probably only roughly the cost of a liner for the pond alone, so please don't economise on the one thing which will make the pond work!

Please ask for our other spreadsheet "Plants for natural swimming ponds", which provides a synopsis of the requirements of most of the commonly used species.

SYNOPSIS:

WATER SUPPLY: TEST BEFORE COMMENCING BUILD.

LINER: EPDM, 1MM THICK. UNDERLAY OVER AND UNDER.

PLANTING MEDIUM: GRAVEL, 10 TO 20MM SIZE, MIN 15CM THICK LAYER, OR 5CM LAYER OVER SUBSOIL BASE MIN 15CM DEEP.

MARGINAL PLANTING ZONE: MOSTLY 0 TO 10CM DEPTH OF WATER OVER GRAVEL.
MINIMUM 25% OF POND AREA

LILY ZONE: 40 TO 80CM DEPTH OF WATER OVER GRAVEL, MIN 10% OF POND AREA

BOTTOM LEVEL: 1 TO 2 METRES DEPENDING ON USERS

PLANTING DENSITY: 5 PER SQUARE METRE AT P9 SIZE. 1-3 PSQM AT 3 LITRE SIZE

PLANTING BUDGET: APPROXIMATELY EQUAL TO COST OF A 1MM EPDM LINER FOR WHOLE POND.

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