

Complete Guide To Selecting, Constructing & Managing a Concrete Pool



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Build Pools

For fun, just add water!



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All technical information in this guide is correct at time of print.



For fun, just add water!

For more information, contact us on **029 2070 5059** | sales@allswimltd.com | www.allswimltd.com

Why Buy A Swimming Pool?

Year after year we promise ourselves more leisure time as well as more time spent with the family - we rarely achieve it. The pace of modern life is so fast that it's easy to neglect these things and that's why one of the best ways to make the most of this valued time is to add a swimming pool to your garden. Pools are no longer a luxury purchase and are readily available in a vast range of designs at affordable prices. We can also recommend experienced pool engineers for installing the pool shell fittings and plant room equipment if you do not wish to undertake this element of the work yourself. Just imagine how much fun your children would have splashing around with their friends, or how much you and your family would enjoy swimming in the privacy of your own back garden.

Can I Build It Myself?

Unlike a liner pool, a concrete pool requires a more complex type of construction, this is because in a concrete pool it is the walls and floor that form the waterproof membrane, because of this we would strongly recommend that all concrete pools are undertaken only with the aid of a reputable builder. Additionally, the pool structure **must** be designed by a qualified structural engineer.

Do I Need Planning Permission?

The majority of authorities do not insist on planning permission for the building of a private swimming pool in the back garden of a domestic property in the U.K. However, if you are thinking of erecting an enclosure over the pool, then permission is required and you are advised to consult your local authority before commencement. Even though planning permission is not normally required All Swim still recommend that you contact your local planning authority before commencement of any work in order to check the requirements of local legislation.

What Size Pool Should I Install?

The size of pool you choose is related to the area available in your garden, the required use of the pool, for example, exercising, playing, lane swimming etc. as well as any budgetary constraints. However, historically the most popular size of pool is 30' x 14' (9.1m x 4.3m). In recent years we have seen a trend towards a smaller swimming pool with the addition of a counter current unit to allow you to swim in place. The addition of a counter current unit allows you to swim in place without the requirement of a large swimming pool area. When deciding on a pool size you will need to consider such points as - access for heavy machinery, underground cables and pipes, overhead telephone and electricity wires, the water table and ground structure. When choosing the depth of your pool it is worth bearing in mind, that the water level is normally kept half way up the surface water skimmer - which is approximately 5" (130mm) from the top of the pool wall. Therefore, in a 4ft (1.2m) deep pool, the water depth is only 3' 7" (1.07m).

All Swim supply a range of DIY pool kits in standard sizes but non standard sizes can also be supplied. Please contact All Swim for non standard pool kit prices.

Why Choose a Concrete Pool?

Concrete pools are still the ultimate choice and are composed of a concrete shell with steel reinforcement. A concrete pool can be built to any size, shape or depth, and you can choose from an almost infinite variety of beautiful mosaic tiles or pavelite (white cement premixed with small marble chippings sized from 1mm - 3mm) to decorate the pool interior. A concrete pool also allows you to incorporate a safety ledge around the deep end of the pool and in-built pool steps if required.

A well-constructed concrete pool can stand the test of time but with the exceptional stresses and strains it is subjected to it is imperative that the correct installation methods are followed.

D-I-Y: Briefly - What Is Involved

A pool is dug out by a mechanical excavator or by hand, the pool shell is then constructed by one of the following methods:

- Steel reinforced concrete blocks or reinforced patent blockwork construction.
- Cavity block wall containing reinforced concrete (covered in this guide).
- Traditional reinforced poured concrete using formwork or concrete blockwork as built in permanent shuttering.
- Pneumatically placed concrete e.g. Guniting, Shotcrete.

Unlike a liner pool, the pool shell structure is your water holding membrane, so it is important to note that in accordance with the water regulations that the swimming pool should be water tight and not leak.

Note: All concrete pools should be designed by a qualified structural engineer.

The structure should make allowance for ground conditions and also for the structure to be full of water and empty. Generally speaking it is recommended that the minimum figure used for ground pressure should never be less than 75Kn/m² but this should **ALWAYS** be confirmed with a structural engineer.

Shaped and Free Form Pools

As mentioned previously, concrete pools can be built to any size or shape and a popular variation of the standard rectangular pool is the 'L' shape where the main pool is designed for adults whilst the remainder is devoted to steps and an area for children.

Other popular concrete pool shapes are the 'Kidney' and the 'Teardrop'; although there are limitless different shapes, there is no great advantage in a shaped pool except that the finished appearance is completely individual. It must be remembered when choosing an unusual shape pool the cost of covers will be substantially more than for the standard rectangle shape and covering and uncovering them can be more cumbersome.

What Is Supplied In The Kit?

An All Swim Do-It-Yourself swimming pool kit includes the rapid sand filter and a correctly sized swimming pool self priming pump, surface skimmer(s), inlet(s), low suction, main drain, pipework, valves and sufficient plumbing fittings to position the filter within ten feet (3m) of the pool, coping stones, test strips, pool maintenance kit and initial chemicals.

What we do not provide are the basic building materials such as cement, sand, chippings, concrete blocks or reinforcing bar, however, all these materials are obtainable locally from a builders merchants. For detailed contents of All Swim Pool Kits please consult the current concrete pool kit price list.

All Swim reserve the right to alter our pool kit contents inline with the latest recommendations and guidance.

Note: All Swim D-I-Y pool kits comply with the latest S.P.A.T.A (The Swimming Pool and Allied Trade Association) standards relating to the supply of D-I-Y pool kits: - SPATA is the nationally recognised organisation, which sets the standards within the swimming pool industry and ensures that member companies maintain those standards providing the customer with the highest quality of product and service. Members trade under a code of ethics offering customers both formal safeguards and the peace of mind essential when you want to place an order. All members are carefully vetted on application and must have at least three years proven experience in the industry. Member's work is periodically inspected to ensure that they comply with SPATA standards and are able to maintain the quality of work expected of them.



Indoor Pools

More and more of our customers decide to build their pools indoors giving a truly all year round swimming experience. All Swim can supply all the technical expertise and specialist equipment for indoor pool construction – If you are considering an indoor pool please ask for our additional indoor pool literature.

Delivery

The basic pool kit is normally dispatched free of charge within 3 working days (UK Mainland only). However, coping stones and heating systems are sent direct from the manufacturer and usually take approximately 14 days. As lead times can vary, all customers are notified of approximate delivery dates upon receipt of order.

Location Of A Pool

Once you have decided to invest in a swimming pool, the next decision is where to position it, and as always there are a few points to consider –

- (a) The pool should be positioned away from trees so that it benefits from the sun as much as possible. A pool located in a suntrap not only helps keep the bathers warm but will also help cut heating costs. It also has the advantage that it will help to reduce the amount of work required during the autumn months.

- (b) The proximity of the house for entertaining, changing facilities, toilets and electrical services or for utilising the house heating system for heating the pool.
- (c) The filtration plant will require housing as well as an electrical supply - sometimes an existing building can be utilised.
- (d) Convenience of pumping water to waste when cleaning the filter, this could be to a drain, ditch or soakaway. Approval from the local environment officer and/or water supply company will be required.
- (e) Availability of water supply - usually a garden hose to the nearest outside tap is all that is required.
- (f) The provision of a sitting area at the shallow end of the pool.
- (g) It is also preferable to have pedestrian access to the pool at the shallow end.
- (h) Shelter from the wind.
- (i) If a gas, electric heater or heat pump is used, the cost and supply capacity of electrical or gas connections must also be considered.
- (j) Location of underground cables or drains, a thorough check needs to be undertaken before excavation commences.

Note: Unsure of the best location for your pool? Send us a video of your planned location for further help and advice.

Safety

You must always consider the safety aspects of your swimming pool, particularly when small children, non-swimmers, the elderly or pets are involved. If you have opted for a pool with a deep end it is imperative that all swimmers are aware of its start point and depth, it is recommended if a hopper pool has been chosen that the start of the deep end is visibly identified.

In order to make a pool as safe as possible it is recommended that it be supervised at all times. Also where possible -

- (a) Locate the pool close to the house and in full view of the kitchen window.
- (b) Install a safety cover.
- (c) Install safety fencing, with a fully lockable gate.
- (d) Build internal steps, so if in the unfortunate event someone falls in, these shallower steps are an easier way out.
- (e) Make available floating lifebuoys.

Running Costs

Today's pools when properly looked after, need never be emptied, except in the event of the need for major repair work.

Once the pool has been commissioned for the season, the pool water must be regularly treated to maintain chemical, physical and biological standards, whilst minimising the risk of damage to pool fittings and equipment. There is a wide choice of water treatment products available to help maintain pool water safely and easily, many of which are also environmentally friendly. Taking an average 30' x 14' (9.1m x 4.3m) (10,000 gallon) (45,460 lts) pool, the cost of chemicals would be as little as £300 for a full year. With experience, and the help of modern technology, pool maintenance should take only 20-30 minutes each week in the summer. Off-season, a pool, which has been professionally closed down, may only need one or two checks during the winter months.

Optional Extras

When building a swimming pool it is important to consider, at the planning stage what optional extras are available, as in some instances once the pool is built these products can then only be installed with a great deal of effort and expense. Some products to consider are:- Diving Boards, Slides, Counter Current Systems, Heating, Underwater Lighting, Auto Water Leveller, Automatic Cover and 12' (305mm) Deluxe Coping Stones.

Diving Boards

Diving boards add to the enjoyment of a pool but are not as popular as they used to be a few years ago. This is because the trend for home swimming pools has tended towards shallower, smaller pools in which more family games are played.

Note: If you are considering a diving board you must have a pool 32' x 16' (9.8m x 4.9m) or larger with a minimum water depth of 8'0" (2.45m), also if you decide you wish to dive in the pool then the following rules must be followed - All pools that have a water depth of less than 4.9' (1.5 metres) are deemed to be non diving, where the depth in the deep end is between 4.9' (1.5 metres) and 7' (2.13 metres) only diving off the side of the pool, up to a freeboard of 6" (152mm) is to be permitted. In this case no diving board can be fitted but the diving point must be clearly marked on the paving or coping above the deep end wall. Therefore, diving must only take place from the diving point. Where the water depth in the deep end is 7' (2.13 metres) or greater a diving board can be fitted but the diving point must be clearly defined. It should be in the centre of the deep end wall and if another place is designated, the Cage of Safety, in respect of forward and side clearances, should also be observed.

For further information on installing a diving board please contact us for the latest recommendations.

Slides

Pool slides are becoming more popular as not only do they give more fun to all the family they only require a 3' (0.9m) water depth. They are available either straight or curved and come fitted with water jets to enhance the fun!

Exercise Swimming

Swimmers who want a pool for exercise should enquire about counter current swimming units. These units produce an adjustable current of water to swim against enabling a long swim to be carried out in a small pool - these are available to try in our Cardiff Showroom. These pools are becoming increasingly popular as they allow you to build a much smaller pool and allow you to swim in place against the swim current.

As well as counter current systems, treadmills and aquatic bikes are also available to add to your swimming pool.

Mosaic Tiles

Before completing the inside of your pool the final finish needs to be decided upon, you could either paint or pancelite the pool or alternatively the whole pool can be finished in mosaic tiles. This finish gives a very sophisticated look to the pool and any design can be used, with many standard designs such as dolphins, sea horses, penguins, etc. readily available.

Please contact us for our supplemental Mosaic Tile Brochure.

Pool Heating

Heating a pool is not as expensive as most people imagine, the use of a solar blanket without any other form of heating can raise the pool temperature by as much as 10°F in the summer. Consequently, a solar blanket must be considered to be a basic component of any pool. However, to obtain the maximum and most pleasurable use of your pool, we would recommend the installation of a pool heating system, there are three systems available that All Swim would recommend:

- A Heat Exchanger working from the domestic heating boiler.
- An independent Pool Heater.
- Heat Pump.

Heat Exchanger System

This is a simple system using a heat exchanger, which utilises the domestic heating system. The water returning from the filter to the pool flows through the heat exchanger whilst the primary flow and return are run from the domestic heating boiler. The two waters do not mix as the pool water runs through internal tubes that are heated by the boiler water on the outside of these tubes. The pool water connections to the heat exchanger are made with high temperature unions and a thermostat inserted into the heat exchanger is linked to a motorised valve, this then controls the pool water temperature. It is necessary with this system to keep the high temperature primary flow and return mains as short as possible and insulated in order to prevent high heat losses. This system has the advantage of being the lowest capital cost system for pool heating, however, your existing boiler's output must be sufficient for the pool size chosen. For boiler requirements please refer to All Swim's current product catalogue.

Please be aware with this option the pool can be no further than 20Ft/6m away from the house boiler. Additionally the boiler output needs to be sufficient for the pool water heating requirements.

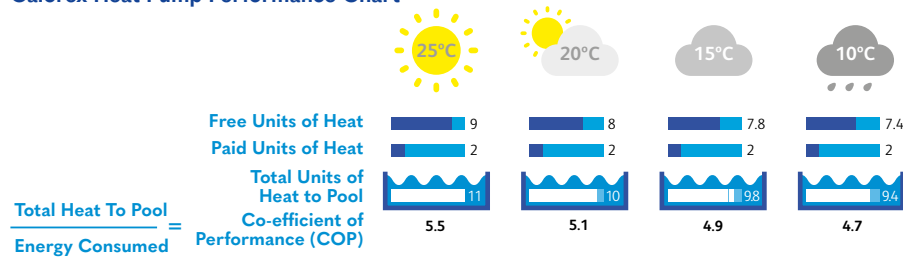
Independent Pool Heater

Oil or gas fired heaters are normally used when the pool is either too far away from the house for the central heating boiler to be utilised, or when the output required is greater than the existing domestic boiler. Electric heaters can be used when oil and gas are not available but this type of heating has a comparatively high running cost.

Heat Pump

Heat pumps are designed for maximum efficiency by making use of dormant heat within the outside air. A heat pump takes full advantage of this heat and upgrades it substantially before transferring it to the pool water. The illustration shows typical ratios between heat output and input at various temperatures.

Calorex Heat Pump Performance Chart

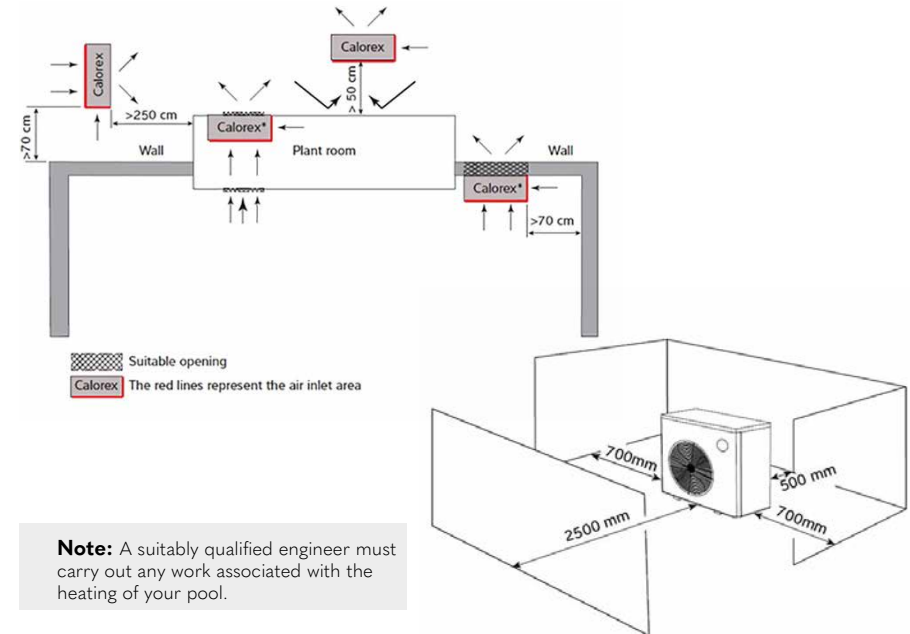


Sunshine is not essential for this system as all it needs is air; A heat pump can work with air temperatures as low as -15°C (dependent on the model chosen) and then becomes more efficient as the air temperature increases.

A heat pump can be sited inside a filter house with adequate ventilation or outside on a concrete plinth adjacent to it. Only basic electrical work and simple plumbing connections are required to connect the unit to the return pipework after the filter.

As a heat pump expels cold air it is important that there is adequate ventilation to remove the exhaust cold air.

The capital cost of this system is comparable to that of a boiler installation, however, once installed this system provides pool owners with the pool temperature they want with a more economical running cost.



When quoting on an All Swim DIY pool kit, we can recommend the best heater for your individual pool project along with projected annual running costs.

Underwater Light

An underwater light certainly transforms a pool during the late evening. One LED light is sufficient for pools up to 215ft² (20m²) but the larger pools do benefit from the use of two lights. All Swim supply both white LED and colour change remote control underwater lights. Underwater lighting can add an extra dimension to your swimming pool.

Autoleveller

An automatic pool water top up system will eliminate the need for manual top up from a hose pipe. To install an autoleveller, a header tank of water is required in the plantroom. An autoleveller is recommended on indoor pool installations.

Note: Direct connection to a mains water supply for filling a swimming pool is unacceptable and the end of a hosepipe cannot be put into the pool when topping up - an air gap of 150mm must be maintained at all times.

Introduction & Planning

Automatic Pool Covers

All Swim supply both automatic slatted covers and automatic safety covers, if installed at the time of construction they have the benefit that the roller mechanism can be hidden underground in a pit. Automatic covers make covering and uncovering your pool as easy as pushing a button plus the addition of a safety cover can give you peace of mind whilst at the same time reducing running costs and reducing the amount of cleaning required.

Coping Stones

A complete set of 9" (230mm) reconstituted Portland stone copings are included in your pool kit but we would recommend, except where space is very limited on pool sizes 28' x 14' (8.5m x 4.3m) and above that the deluxe 12" (305mm) coping be used as the extra fine finish and width will really set off the finish to your pool. Additionally, alternative finished edging stones in natural stone or porcelain are also available.

Preparation & Excavation

Marking Out The Pool

Whatever the shape or size of the pool the following instructions for construction are virtually identical, with the obvious differences in the digging and setting out.

The pool builder has first to determine the length, width and depth required. Once this is done the inside dimensions of the pool are marked out along with the excavation lines, which are 20" (500mm) larger all the way around, to allow for the thickness of the walls and backfilling.

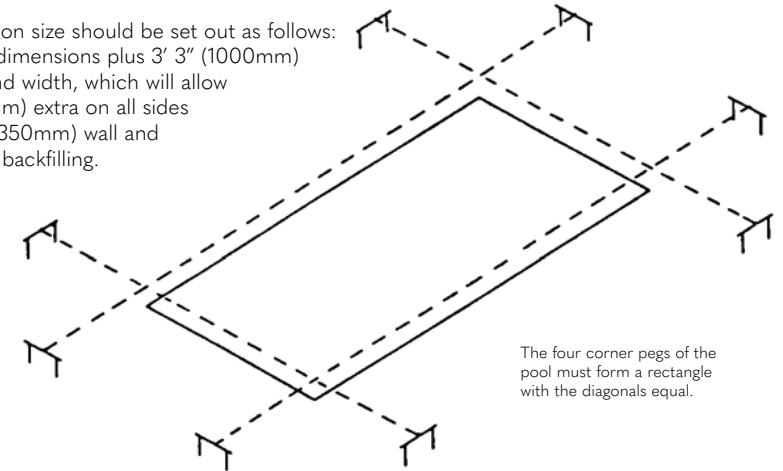
Set the four corner pegs of the finished pool dimensions and ensure that the diagonals are equal. Use a laser measure or steel tape for greater accuracy. Position two profiles made from three short lengths of timber on each corner approximately 4' (1.2m) back from the excavation as per the diagram. When string lines are stretched between nails on the top of each profile, the points of intersection are the corners of the pool, the diagonals must be exactly equal. The nails on the profiles are easily adjusted if required to form the perfect dimensions. This method has the advantage that these lines can be removed during digging, and easily replaced to give the exact position of the pool.

The lines can now be marked on the ground using lime or white cement to provide a readily visible guide for the digger operator. Run your hands along either side of the line and allow the powder to fall through onto the ground below. The excavation lines now need to be marked out at a distance 20" (500mm) beyond the pool's dimensions, thus forming in white, a double tramline around the four sides of the rectangle. Check all excavation dimensions for the relevant pool size, measure and mark on the ground the hopper shape, shallow end line and all transition lines, remembering to mark out the Roman End if one is being built.

Marking Out The Pool With Profiles

The easiest and most accurate way of determining levels is by hiring a laser level from a local hire shop.

The excavation size should be set out as follows:
Inside pool dimensions plus 3' 3" (1000mm)
on length and width, which will allow
19½" (500mm) extra on all sides
for the 14" (350mm) wall and
6" (150mm) backfilling.



Datum Point

The ultimate top height of the pool is obviously very important, as it usually has to join an existing terrace or similar. This height is called the DATUM, and before digging the pool, drive a peg into the ground in an area close to the pool, which will remain undisturbed during operations. The top of this peg is the datum point, and all measurements are taken downwards from this point to determine the depth of digging. In the finished pool the datum point will be equivalent to the top of the coping stone. The easiest and most accurate way of determining levels is by hiring a laser level from a local hire shop.

Excavating The Pool

It is obviously easier and quicker to have a mechanical excavator from your local plant hire company, than to excavate by hand. Nowadays, excavators can be hired which will pass through 36" (914mm) openings but the smaller the excavator, the longer the work will take. A J.C.B. could easily dig a pool 30' x 14' (9.1m x 4.3m) in a day, if the soil is being retained on site.

If the soil can be used in your garden to form a bank, or to fill in a lower area of ground, it will be a lot easier and cheaper than if the soil has to be removed from site by the use of hired lorries or skips and obviously the removal of soil from site also extends the time taken to dig the pool.

The finished deepest point of your pool is a matter of personal choice as is the length of the shallow area of the pool, but should be more than a third of the length of the pool. However, if it is preferred a slope can start immediately at the shallow end wall and continue to the deep end wall (Wedge shaped).

The pool should be dug 12" (300mm) deeper than the finished dimensions to allow for the concrete floor which is 9" (230mm) thick, and for a 3" (75mm) layer of stone rejects (often called crush and run). If, however, the subsoil proves wet and unmanageable it is best to use a 3" (75mm) layer of dry-lean concrete which is porous and allows the passage of water, whilst giving a dry surface to enable work on the pool to proceed. The floor should be shaped perfectly, and if any places are dug too deep then these must be filled with dry-lean concrete to prevent any settlement.

If the subsoil is gravel, shale or good draining rocky strata, the layer of rejects is not necessary and the concrete floor can be laid direct onto the subsoil. In these conditions the over dig would be 9" (230mm) instead of 12" (300mm), except around the perimeter of the pool where the concrete foundations of the pool walls are always 12" (300mm) in depth.

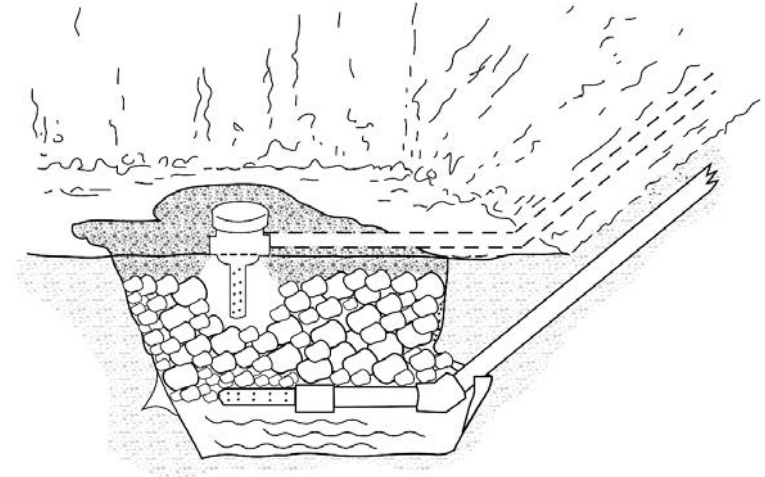
Note: All the dimensions quoted are assuming that the pool is built on normal stable subsoil conditions.

Water Problems

Often when digging the deep end of a pool, water will seep slowly into the excavation or, not so commonly an underground spring may discharge a large volume of water. If this happens it must be dealt with immediately in order to keep the excavation dry during construction of the pool:-

Over dig the pool by a further 24" (600mm) at the deepest point. Purchase three concrete manhole sections and fit these one on top of the other in the pit. Trench a 1.5" (38mm) ABS pipe from the centre of this under pool drainage point to outside the curtilage of the pool. Then cap the end of the pipe and drill into it on one side so that there are numerous small holes for drainage. The pit is then surrounded by reject shingle to allow easy entry of water.

Drainage Pit



A diaphragm pump, which can be hired from your local plant hire company, is connected to the end of this pipe and the excavation is pumped dry. A second pipe and pump can be connected to this drainage pit if necessary.

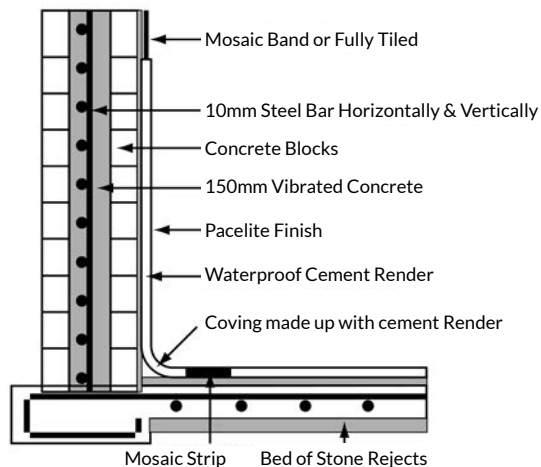
Reinforcement

The most common cause of cracking in concrete pools is the inadequacy of the reinforcement used, whilst 8mm welded steel mesh is normally sufficient for pools of four feet in depth with good foundations, it is not adequate for deeper pools. Therefore, 10mm mild steel bars should be used throughout, these bars can be easily bent to conform with the shape of the pool and are spaced at 230mm intervals, crossed with bars also at 9"(230mm) intervals, making 9"(230mm) squares. All steel calculations should be undertaken by a qualified structural engineer as these are meant as a guide to concrete pool construction only.

The crossing top reinforcement is wired with galvanised wire to the base reinforcement to keep it correctly spaced, this reinforcement fabrication has to be raised from the floor by 2" (50mm) and this is done with steel chairs. These chairs support the fabrication prior to concreting, and can be obtained from steel stockholders.

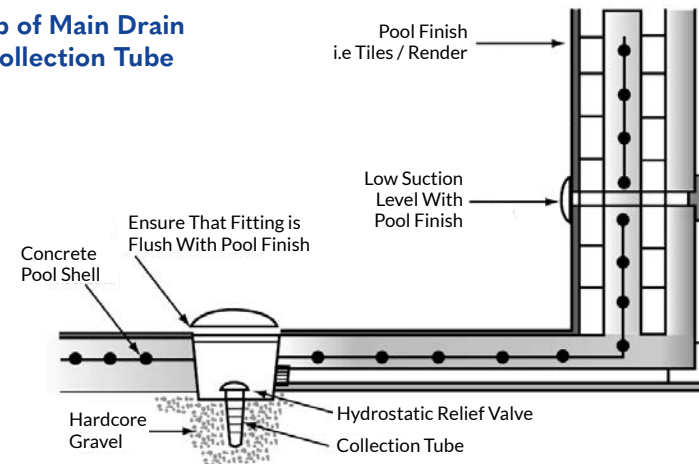
Note: The pipework from the main drains should be positioned before fixing the reinforcement for the pool floor.

Method of Concrete Pool Construction



Wall Cavity 100 - 150mm

Set Up of Main Drain and Collection Tube



Location Of Main Drain and Pipework

The main drain is then placed in the middle of the deep end floor ensuring that the top 1.5"(40mm) will be above the finished concrete slab in order to allow for the rendering and the finishing.

Run the pipe from the main drain through the concrete floor slab to outside the proposed pool walls, then bring the pipe up to the top of the pool. The end of this pipe should then be sealed to prevent any debris falling into the pipework during construction. Similarly, the main drain sump pot should also be protected to keep out concrete during construction.

Note: The main drain comes fitted with a hydrostatic relief valve and collection tube. It is important that this collection tube goes down into the under pool drainage pit. The hydrostatic relief valve and collection tube are there as a protection for the pool structure and in the event of the water pressure being greater outside the pool shell, the valve will open and allow the ground water into the pool. Without this protection the pool shell could possibly float and break its back.

Concreting

With the main drain positioned and all the reinforcing fabricated, the floor is now ready for concreting. It is always best to carry out all the concreting on the same day, as this results in the strongest floor, if this is not possible it should be done on successive days.

It is always advisable to use ready mix concrete as the proportions and mixing are always constant. The concrete should be mixed to a strength of 30-newt and when it is delivered it needs to be a 50-slump mix (this is the amount of moisture that is required). When moving the concrete into the pool it is important that it goes well under the reinforcement, at this stage plenty of labour needs to be available to help with the levelling and vibrating.

After the concrete has been positioned it must be vibrated with a vibrating poker, the purpose of vibrating the concrete is to thoroughly agitate the mixture into a perfect dense structure

with no possibility of air spaces or air pockets. This vibrating is done by pushing a vibrating poker into the concrete, the water then rises through the cement over a circle of approximately 27" (690mm), this is then texture brushed and finished, forming a good base for rendering.

Vibrating pokers can be hired from most plant hire companies.

Building the Walls

All the walls including the Roman End (if being built) are built in 18"x 9"x 4" (455 x 228 x 100mm) solid concrete blocks, there needs to be two walls with a 6" (150mm) cavity. This cavity is then reinforced in the centre and extended to the top.

The back wall is built first, incorporating wall ties and reinforcement which is extended by wiring to take the steel to the top of the wall, remember that the overlap on the steel bar must be twenty times its diameter. Lateral reinforcement is now wired onto the upright bars at intervals of approximately 12" (300mm).

When building the walls take great care that any surplus cement does not fall down the cavity, as the strength of the walls is dependent on the vibrated concrete within it and a layer of cement droppings at the bottom will weaken its construction. After the wall reinforcement has been fabricated the front wall can be built.

Positioning The Pool Fittings

There are several fittings that must be built into the pool walls as work progresses: -

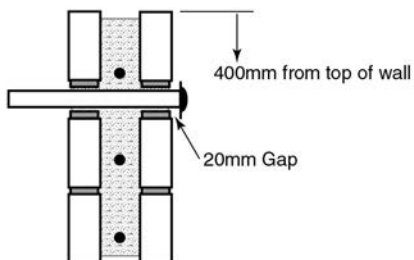
1. Return inlets: - usually two at the shallow end of the pool.
2. Low suction: - usually fitted parallel to the main drain in the long wall.
3. Underwater light: - usually fitted in the centre of a long wall.
4. The surface skimmer is normally positioned on the side, or end, of the pool where the prevailing wind most assists in blowing the surface debris to it.
5. Optionally, cup anchors are built into the walls at the point of the shallow and deep end transition so a rope with floats can be stretched across.

Pool Fittings

The pool fittings are all built into the wall as the correct fitting height is reached. The inlet fittings are installed 16" (400mm) from the top of the wall and a small section of the blocks are chipped away to enable the pipe 23" (600mm) and fitting to lie on a bed of cement; - this should be bedded deep enough to allow a bed of cement before the next row of blocks.

Inlet Fitting(s)

Always remember to have the front face of the fitting $\frac{8}{10}$ " (20mm) from the face of the block to allow for the final rendering and pancelite or mosaic finish.



For fun, just add water!

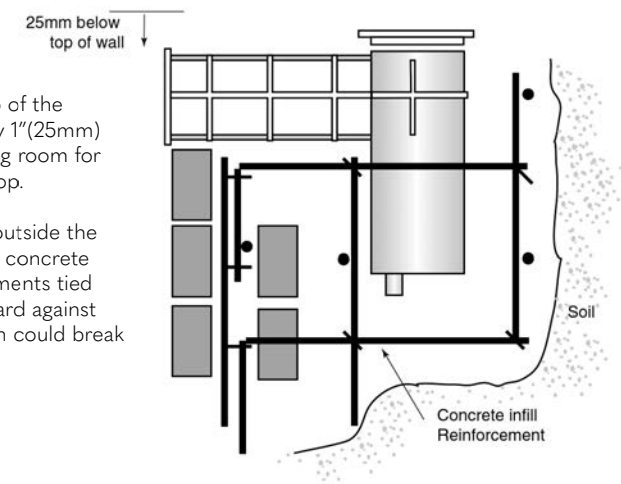


Surface Water Skimmer

The surface skimmer has two functions. It removes surface debris, flies etc., from the pool surface and is also used as the vacuum point for attaching the vacuum kit for cleaning the bottom of the pool. The skimmer is positioned in the centre of the long wall, on the side opposite the prevailing wind, so that the wind will assist in blowing the surface debris to it. If the pool is so placed that the prevailing wind blows down the length of the pool, it is good practice to have a second skimmer installed on the short side of the pool as well as in the normal position.

The skimmer is supplied in two basic parts, the extended throat and the main body of the skimmer; however, it does come with a fitting for the connection of the necessary pipework. The throat and main body must be glued together before fixing the skimmer in the pool wall:- Clean all surfaces to be joined then paint the surfaces with the solvent cement. Hold both faces together until firm. When set, paint the internal and external edges with solvent and leave for 24 hours to fully set. The skimmer rim is then bedded onto a bed of cement with cement carefully tamped around the sides and placed 1" (25mm) down from the top of the pool wall. The front of the skimmer should project 20mm from the face of the blockwork to allow for rendering and mosaic.

The water level in the pool is normally kept half way up the mouth of the skimmer and in consequence the water level of the pool is approximately 5" (130mm) from the top of the pool wall.



The diagram shows that the top of the skimmer throat is approximately 1" (25mm) below the top of the wall, leaving room for 1" (25mm) of cement finish on top.

As the body of the skimmer is outside the pool it is advisable that a box of concrete is built around it with reinforcements tied to the pool wall, this is a safeguard against subsidence of the backfill, which could break the body of the skimmer.

Pool Vacuum Points

These are now normally not fitted to residential pools as the skimmer can be used to vacuum the pool with a kornea fitting on top of the skimmer basket. This allows for any large debris to be trapped within the larger skimmer basket rather than the smaller pump basket which can be easily blocked.



For fun, just add water!

Underwater Light

An underwater light certainly transforms a pool during the late evening. One light is sufficient for pools up to 215ft² (20m²) but the larger pools do benefit from the use of two lights. When deciding the position of a pool light, one should always try and install the light on the side of the pool nearest the house or the sitting area. In this position the pool will be lit up without seeing the light itself. Therefore, the best position for the light, if it complies with the previous rule, is in the centre of one of the long walls.

When positioning the underwater light make sure it is installed 34"(865mm) down from the underside of the pool coping as in the event of bulb failure the light unit can then be lifted out of the water and changed above water level. The conduit from the light is then attached to the niche with a waterproof joint which should then lead out through the back wall up to the deck box fitted at paving level. Great care must be taken to ensure that the conduit is installed as a long slow curve, without any kinks, as the cable from the light has to be threaded up this conduit into the deck box. The niche should be thoroughly concreted with reinforcement and tied into the pool walls in the same manner as the skimmer.

Certikin White LED Underwater Light Transformer To Deck Box Cable Runs

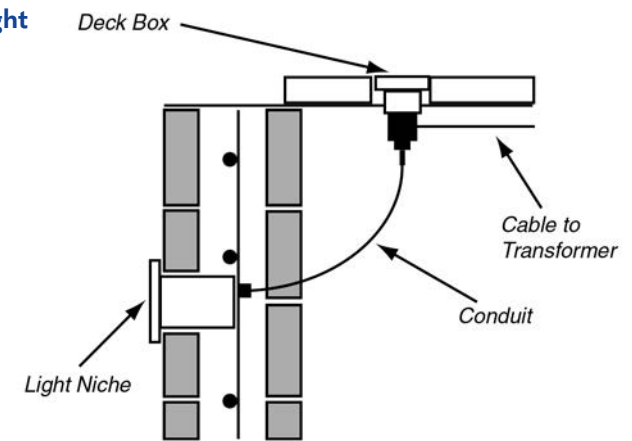
Although detailed instructions are given with the transformer the following information is essential:-

- (a) Under no circumstances can the cable lengths between the deck box and transformer be less than 5 metres or more than 50 metres.
- (b) The cable run between the transformer and the deck box is to be in 2 Core, 4, 6 or 10mm² copper conductor, PVC sheathed, protected within a PVC or alkaline conduit insulated, single wire armoured cable.
- (c) The four output charges of the transformer allow a range of lengths of the above cables to be used to connect the transformer to the deck box. The range is as follows:-

Length Of Cable Run In: -

Output	1.5mm ²	2.5mm ²
13.5V	5 - 22m	13.5 - 37.5m
14.5V	13.5 - 28.5m	22.5 - 50m

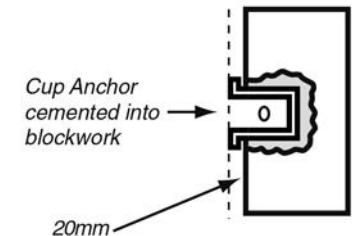
Underwater Light



Note When installing an underwater light it is recommended the gland on the back of the light niche is checked and tightened to avoid water leaks.

Cup Anchors

If required a small hole is knocked into the top course of blocks and the cup anchors are cemented into position. The face of the anchor should be 8/10" (20mm) proud of the block face to allow for the render and finishes.



Infilling Between Walls

The strongest part of the walls is the 6"(150mm) of vibrated reinforced concrete between the two rows of blocks, but before this can be carried out, it is policy to allow the inner wall a few days to set. Whilst the wall is setting supporting buttresses are erected at 3m intervals in order to help stabilise them.

The infill is then carried out with ready mix concrete with a minimum 30 Newt mix (as per the floor). This infill is shovelled around in layers of about 12"(300mm) and vibrated with the poker to ensure even consolidation, again for maximum strength it is preferable that this operation is completed on the same day.

Note: It is important that the infilling is not done in layers of greater than 12"(300mm).

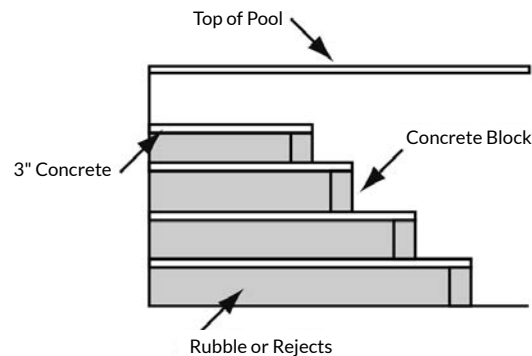
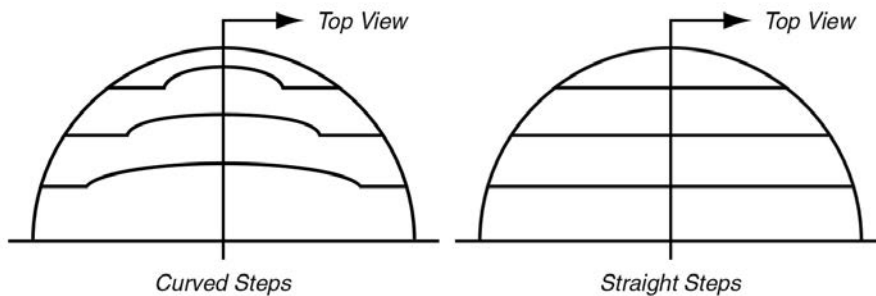
Construction

Formation of Pool Steps

As mentioned before, attractive design and construction of internal steps can greatly enhance a pool and if steps are to be built they are constructed of concrete blocks and concrete and built at this stage. All Swim recommend you consult your local building regulations officer for step height specifications. This is important as local authority regulations vary.

Where internal access steps are formed, the tread should be uniform of height (riser) not exceeding 300mm and width (tread) not less than 200mm. Tread surfaces should be finished with an anti-slip finish and each tread should have a contrasting/defined edge with no sharp edges or protrusions.

Internal Pool Steps



Finishing

Coping Stones

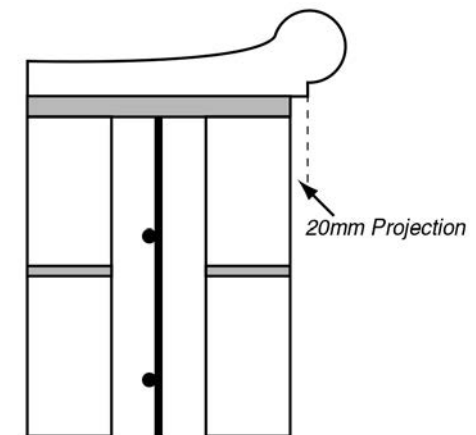
The next operation is to fit the coping stones these must be cemented around the levelled top perimeter of the pool so that the walls can be rendered up to them. Remember that the coping must be perfectly level and protrude $\frac{9}{16}$ " (20mm) over the inside of the pool wall to allow for the rendering and the mosaic.

When a pool is finished all that is visible is the finished render and the coping stones, therefore it is essential that these are finished accurately.

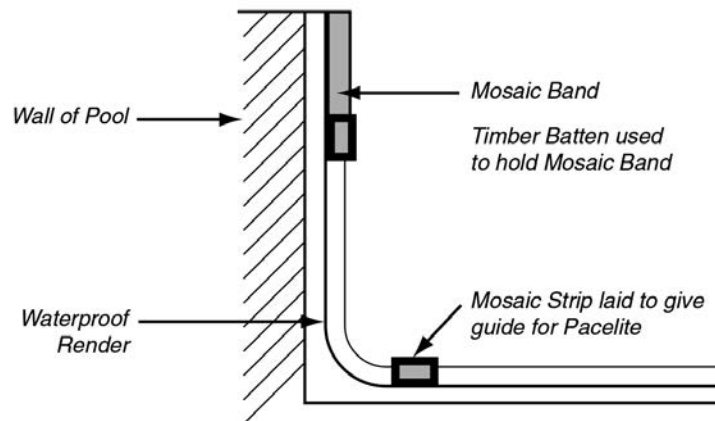
A complete set of 9" reconstituted Portland stone copings are included in your pool kit but we would strongly advise, except where space is very limited, that the deluxe coping be used as the extra fine finish and width really set off the finish to your pool.

A 6:1 cement and sand fillet must be accurately levelled around the top of the pool wall. This should be allowed to fully harden before fitting the coping stones. Mix up a grout of white cement with water in a bucket and mix until a creamy consistency is obtained. Pour this onto the levelled screed and trowel along the surface. The coping is then placed on the wet grout and correctly positioned. Take care to make sure the copings are all level, some stones may need more or less grout due to the fact that they are not all uniform in depth when manufactured, always start with the corner copings and stretch a string line across the front of the copings to ensure a straight accurate line, take time and care to ensure that all the copings are straight and level. Copings are easily cut using a masonry saw or a disc cutter.

An even gap of approximately $\frac{1}{2}$ " (13mm) should be left between the copings and the joint filled with a 1:1 mixture of white cement and silver sand. Make sure the mixture is not too wet or it will run over the edge of the coping and spoil its appearance. When setting the coping stones around the pool ensure a full length is used to bridge the skimmer(s) so that undue stress is not placed on the skimmer extension throat.



Detail of Pool Showing Internal Finishes



Curing

To achieve full design strength correct curing is imperative, a curing period of no less than 6 weeks from completion is recommended.

Recommended Curing Times

Between Completion Of:-

Shell & Render / Screed	6 Weeks
Render / Screed & Tiling	3 Weeks
Tiling & Grouting	3 Days
Grouting & Filling	3 Weeks

Rendering should only be undertaken after the shell has been fully cured and the walls have been thoroughly dried and cleaned off.

The inside of the pool shell must now be rendered with a waterproof render incorporating "Sealocrete", "Vandex" or equivalent. However, before beginning all corners should be rounded out with a 6"(150mm) cove of waterproof cement (if radius corners are required) and all surfaces must be pasted with a mixture of cement and water that incorporates waterproofer;

this sticky mixture will act as a bond between the rendering and the wall or floor preventing it "lifting" off the surface.

When rendering with either the waterproof render or the pacelite only mix up small batches of material and keep it well "knocked up" otherwise the materials will go hard and become unusable. The walls should be rendered first followed by the floor and all the surfaces of the steps. The first render should be scratched when nearly dry to give a good key either for the second render coat or the final pacelite and mosaic finish.

If the top of the pool walls and edge of the floor are going to be finished with a 10"(250mm) band of coloured vitrified glass mosaics and the remainder being finished with pacelite a thin batten of wood 1/4" (5mm - 7mm) thick is nailed around the pool with the bottom of the batten 10"(250mm) from the underside of the coping, another batten is also fitted in a position on the floor. Before finishing the pool with the pacelite, the area should be pasted with a slurry of water and white cement to ensure perfect bonding, the pacelite is then rendered up the walls to the batten. When the pacelite on the walls has set, the battens on the walls are then removed. The sheets of mosaic are then fitted, they come supplied in sheets of 12"(300mm) square these are cut into 10"(250mm) and 2"(50mm) strips which are then fitted around the top perimeter of the pool and fixed with Cerafix or other swimming pool tile adhesive. Similarly the 2"(50mm) strips are fitted around the perimeter of the cove on the floor of the pool. This bottom strip of mosaics then gives a perfect guide for the thickness of the pacelite, which is then rendered on the floor and steps.

The following day, or when dry, the mosaics are then ready for grouting with white cement or a special white grouting. The grouting is made into a paste and rubbed over the entire mosaic front with the surplus being cleaned off with a damp rag or sponge.

Water Tightness Testing

After rendering, a water tightness test can be undertaken by filling the pool to maximum capacity at a steady rate not exceeding 750mm of water depth per 24 hours. Ideally the pool should be left full for a 7 day absorption period before topping up and then left for a 7 day test period and when the required water tightness test has been achieved, the pool can be slowly drained at the required rate. Not only does this test the water tightness but the procedure assists in correct curing and can be accepted as part of the required curing time.

Mosaic on Steps

After waterproof rendering the steps it is recommended that a 2"(50mm) mosaic band is used to make a defining line on the front edge of each step. This looks very effective and marks the front of each step for safety reasons. This mosaic band should be set 3"(75mm) away from the front of the steps to allow for the final pacelite finish.

Pacelite

Pacelite is mixed with water to form a fatty mix and rendered onto the pool surfaces using wooden or stainless steel floats to a thickness of 1/4" (5 – 7mm); - this is to prevent any iron staining to the bright white finish. Pacelite must never be allowed to dry too quickly or crazing of the surface can result, dampening of the pool surfaces is essential in hot weather until the pool is filled. Within twenty-four hours of rendering the pacelite should be lightly buffed with a silicon carbide disc on a flexible head, it is most important after buffing to remove all the pacelite dust from the pool as this can set hard and block up the main drain and pipework.

Backfilling

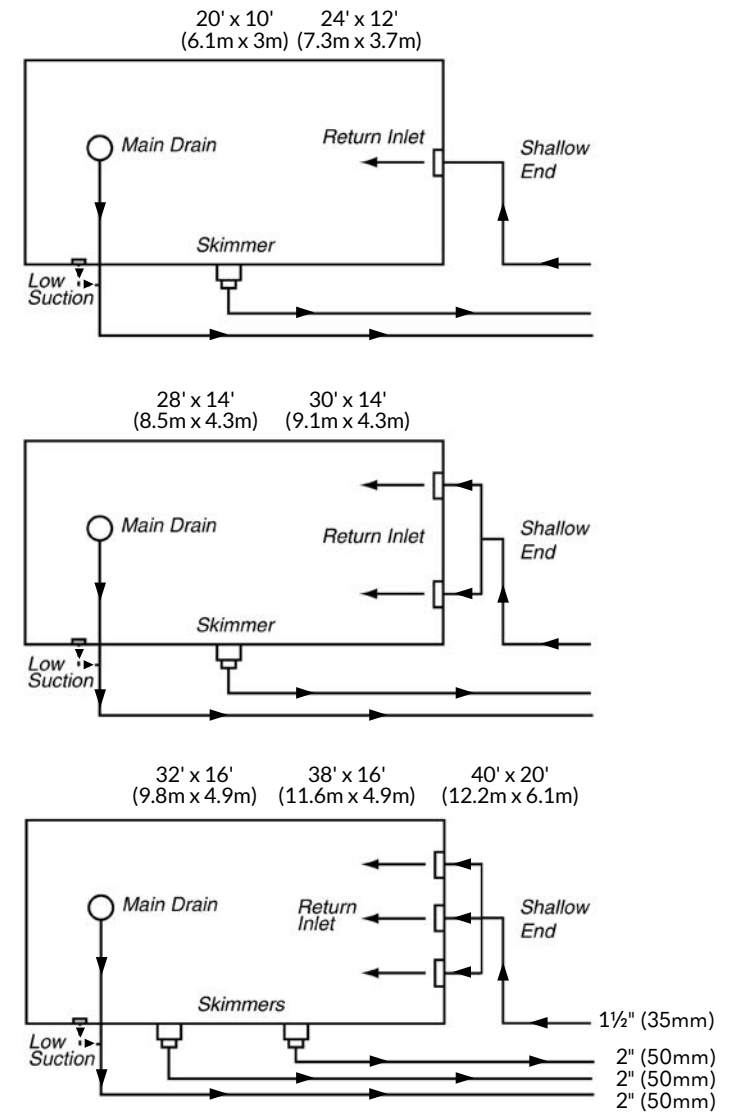
There is usually only a small gap of 6"(150mm) to backfill and this is done using gravel, scalping or rejects. The backfilling is done in layers of 12"(300mm) and continues to just below the piping connections: - it is then thoroughly consolidated. The pipework should then be attached to the bottom of the skimmer(s) and piped back to the filter, the pipe from the main drain, which was positioned earlier on in the installation, should now be cut to the correct height and the pipework taken back to the filter position. The return to the pool from the filter can also be run in the same trench remembering to split it into two as shown in the pool pipework layout drawing. All piping should be laid on a bed of sand and then also covered with sand in order to prevent damage before the backfilling is completed.

Paving

The paving around the pool should be practicable as well as aesthetically pleasing. Paving should be laid where possible with a fall away from the pool so that dirt or dust on the paving does not enter the pool after rain, it needs to be non-slip, as smooth slippery surfaces can be very dangerous.

For indoor pools Draineasy is a simple method of removing splash water enabling the pool surround to be kept dry, if it is being used, it is installed immediately behind the pool coping before the paving.

Pool Piping Runs



Note: 32' x 16' has only two returns.

Plant Room

The pool equipment needs to be sited in a shed or outhouse, preferably the building needs to be located as close to the pool as possible and must have an electrical supply as well as a water supply/tap. Additionally, allowance for a drain gulley in or adjacent to the plant room should also be considered. It also needs to be of an adequate size to contain the pool pump, filter and heating system; ideally there would be enough space to gain easy access to all sides of the pool filter. A plant room size of 6' x 6' (1.8m x 1.8m) is normally suitable and should also be well ventilated.

Electrical Connections

A fully qualified electrician must carry out all electrical work, please refer to manufacturer's handbook for installation procedures. Please note a self certification certificate must be supplied when the installation is complete.

Fitting The Filter

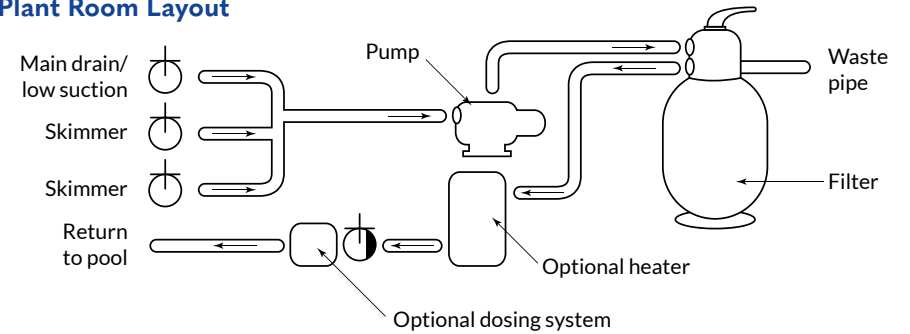
The filter and the required filter media are supplied separately and to fill your filter place the funnel supplied with the filter over the standpipe and then begin filling the filter with the media, make sure that the media is added carefully to the filter and bedded down well around the filter fingers in the bottom of the filter, ensure that all the media supplied is added and that no media gets into the vertical standpipe of the filter. After placing the media wash off the threads at the top of the filter with a hose pipe to prevent any sand damage. When the multiport valve is ready to be fitted remove the funnel, it is also recommended at this time to fill the filter with water to reduce sand bed disruption on initial set-up.

When starting the filter for the first time ensure the multiport valve is in the backwash position to prevent any of the fine carrier in the media being deposited in the pool.

A filter should be run continually in the season to ensure perfect water quality, we do not advise the intermittent use of a filter, by the use of a time clock, as we find the water quality suffers and water quality problems ensue.

The directional lever on your filter is known as a multiport valve. It's purpose is to control water flow to perform various functions. The lever should not be moved to any particular function without first switching off the swimming pool pump. The name plate on the multiport valve indicates the six possible positions.

Plant Room Layout



During normal operation your valves will remain open, but when vacuuming from your skimmer the other valve(s) should be closed to offer maximum suction for your pool vacuum.



Never alter the position of the multiport valve without first turning off the swimming pool pump.

(1) Filter

The normal operating position for the filter when the pool water is being circulated through the filter media contained in the filter chamber. The filter bed removes fine suspended matter as water passes through the filter before being returned to the pool.

(2) Backwash

Over time the filter will trap small particles and become blocked, a rise of about 5lbs/.35 bar above the clean running pressure indicates the filter requires backwashing. The positioning of the multiport lever in the backwash position will reverse the flow of water through the sand bed and direct the water and dirt out through the waste port of the filter - this waste port can be permanently plumbed to discharge over a drain or alternatively a backwash hose can be used.

The filter is run in the backwash position for approximately two minutes during which time a visual check on the sightglass will confirm when all the dirt has been removed. It is recommended a filter is backwashed at least once a week.

How To Backwash

- Turn off pump.
- Depress lever on multiport valve and turn to backwash.
- Run for approximately 2 minutes, the dirty water will be seen passing through the sight glass on the multiport valve, this will clear as the filter will become clean.
- Switch off pump, move lever to rinse position.
- Turn on pump for approximately 15 seconds and then switch off.
- Return lever to filter position and turn pump back on to resume filtration.

(3) Rinse

Having backwashed, or cleaned the filter, the multiport lever is relocated to the rinse position. The pump is run for approximately 15 seconds in this position in order that the filter is rinsed clean. On completion of this function the multi-port lever is returned to the filter position. The frequency of cleaning a filter would depend on the pool usage. Having 'backwashed' and 'rinsed' 'clean running', pressure should now be restored and noted.

(4) Recirculation

A position rarely used. In operation, would circulate pool water via the pipework only and not through the filter giving a higher flow rate. This is occasionally used for rapid dispersal of chemicals to treat particular pool water imbalances.

(5) Closed

A swimming pool pump incorporates a small plastic basket to trap larger particles, which might otherwise foul the impellor of the pump and cause damage. The basket located in the pump housing requires a periodic clean.

A drop in pressure at the pressure gauge would indicate this basket is choked and requires cleaning. Having switched off the pump, the multiport lever is located in the closed position to prevent pool water syphoning from the filter on the removal of the lid. Remember to return the lever to normal filter position on completion and switching on of the plant.

(6) Waste

When the multiport lever is located in this position, water is passed out through the waste port without passing through the filter. The use of this position will lower the pool water level rapidly after periods of heavy rain, and is also useful if there are high concentrations of debris on the pool floor – vacuuming to waste can prevent fouling of the filter media.

Priming The Pump

When an installation is to be started for the very first time the procedure detailed below is carried out.

Note: The pool pump must never be run without first filling the strainer pot on the pool pump with water.

The procedure to prime the pump is as follows:

- Make sure the pool is full. When the water level is low it is very difficult to prime the pump.
- Close the valves on the skimmer(s) and low suction/main drain lines.
- Make sure that the multiport valve on the filter is set at 'FILTER'.
- Remove the pump lid and fill to the top with water. Refit the lid making sure the lid is seating correctly on the rubber 'O' ring.
- Switch on the pump and immediately open one of the valves. After a few minutes the pump should have primed itself and start pumping. The pressure gauge on the filter will rise. If this does not happen within three minutes, turn off the valve, switch off the pump and go through the procedure again.

As the new filter media has a fine carrier in it, it must be removed prior to the normal use of the filter. This is done by setting the multi-port valve to 'BACKWASH' and carrying out the pump priming procedure. The fine carrier will then be separated from the filter media and discharged to waste. By looking at the sight glass on the multiport valve, it can be seen when dirty water has been discharged. When the sight glass is clear, turn off the pump, turn the multiport handle to 'RINSE' and turn the pump on again. This setting will re-bed the filter media, whilst still discharging the water to waste. Normally about 15 seconds is all that is required in this position.

When vacuuming the pool, if the vacuum head is lifted out of the water or if the Skim Vac Kornea is not properly seated, the pump can lose its prime. If this happens normal procedure for priming the pump must be carried out.

If the pump will not prime there is generally an air leak in front of the pump. It could be that the pump strainer lid is not seated correctly or the socket union between the pump and the valves is not fully tightened.

Check that the rubber 'O' ring has been replaced in the socket union.

Pool Safety

When owning a swimming pool, safety is of great importance and a few points to remember are:

General Pool Safety

- No running around the pool.
- Adult supervision is always required.
- No diving except in the deep end of a pool and only when there is a suitable depth of water (current recommendations 2.45m).
- Identify the start of the deep end and its depth.
- Keep glass away from poolside.
- Make available floating lifebuoys.

Chemical Safety

- Read Instructions on each product thoroughly before use.
- Never mix different chemicals, including cleaning products, weed-killers and chlorine products as a dangerous reaction may occur.
- When pre-dissolving chemicals always add chemicals to water and never vice-versa.
- Always pre-dissolve chemicals in a clean plastic container.
- Always handle chemicals in a well-ventilated area, preferably outdoors.
- Never use unlabelled chemicals.
- Store chemicals in a secure, dry and cool place and in accordance with the manufacturers instructions. They should be separated from each other as far as possible.
- Keep chemicals away from children and animals.
- Avoid spillage.
- In the event of a spillage, clean up using clean receptacles and dispose of in the pool. Flush area thoroughly with large volume of fresh water.
- Always add chemicals to pool water when empty of bathers.
- Before disposing of empty containers, rinse them thoroughly in the pool.
- Always wash hands after handling pool chemicals.

Pool And Water Basics

Before you can begin analysing and treating your water you need to know how much water there is to be treated. The gallonage is calculated as follows:-

Length (in feet) x width (in feet) x average depth (in feet) x 6.25

Circular Pools

Radius (in feet) x radius (in feet) x depth (in feet) x 19.625

Irregular Shaped Pools

Take an approximate rectangular shape through the main curves of the pool and then use the square and rectangular pool calculation.

If you are unsure about any of the calculations, don't hesitate to contact us.

Useful Conversions

Inches x 2.540 = Centimetres

Feet x 0.3048 = Metres

Square Feet x 0.0929 = Square Metres

Imperial Gallons x 4.5461 = Litres

Kg x 2.205 = Pounds

Pool Water 'Multi' Test Strips

The pool water multi test strips included in All Swim pool kits, are a simple way to test the water and to allow the pool owner to keep the pool in perfect condition.

A swimming pool has to be kept physically clean, which is carried out by vacuuming the pool, the skimmer and the rapid sand filter and bacteriologically pure, which is carried out by the addition of chlorine to the pool. All bacteria and algae entering the pool are killed by the correct dosage of chlorine to the pool water.

The multi test strips carry out the following simple tests and allows you to keep your pool at the following target values.

Test	Target Value
Chlorine	1.0 - 1.5 mg/l or ppm (parts per million)
pH	7.4 - 7.6
Total Alkalinity	80 - 120 mg/l or ppm
Calcium Hardness	175 - 500 mg/l or ppm
Cyanuric Acid	30 - 60 mg/l or ppm

In concrete rendered or tiled pools it is also important to keep sulphates as $SO_4 < 350mg/l$ to help prevent grout erosion.

Note: Warranties on all pool equipment are null and void if balanced water is not maintained as incorrectly balanced pool water can cause damage to both the pool shell and equipment.

A balanced water test should be undertaken at least weekly and care should be taken to ensure all levels are within the OK range.

We also suggest that all our customers take advantage of our FREE water testing service. This service is particularly beneficial when opening the pool in the Spring and in the Autumn when winterising the pool. This service gives a detailed computerised water analysis and will help you keep your pool in perfect condition.

A starter pack of chemicals is provided with your pool kit and All Swim supply a range of pool chemicals for ongoing pool water maintenance. The addition of Chlorine will chemically treat algae, bacteria etc within the pool water and the filter will remove particles of dust and debris which are in suspension in the water. The pool should always be crystal clear if the water becomes dull or cloudy and the water chemistry is correct then the filter should be run continuously until sparkling water is achieved.

Sanitising

Although your water may look crystal clear, if left untreated it will become a breeding ground for bacteria and algae. This algae can also quickly turn pool surfaces green and in order to prevent this, a programme of sanitisation/disinfection is undertaken. This is the process of killing or removing as many of the micro-organisms as possible.

Chlorine

For safe healthy water chlorine needs to be added until it is present as free chlorine – this is achieved when all the impurities are broken down and further chlorine has been added. Ideally for a private pool a free chlorine level of between 1 - 1.5ppm (parts per million) is required.

There are different products available to achieve the free chlorine level required and the product chosen is mainly down to personal choice. A selection of the products available are:-

All Swim Cyanachlor

For routine treatment in an outdoor swimming pool, All Swim would recommend the use of All Swim Cyanachlor as it already has a stabiliser built into it – this stabiliser helps reduce the amount of chlorine that is broken down by sunlight.

Cyanachlor also has the advantage that it is completely soluble and requires little if any pH balance. It must be remembered, however, that Cyanachlor cannot be used to shock treat a pool as in the event of it turning green the stabiliser causes a slower release of chlorine that is not sufficient to kill the algae.

All Swim Chlorine Tablets

Chlorine tablets are designed to be used with a dispenser and gradually release chlorine over a period of 3-14 days. They should ideally be used in conjunction with a granular chlorine product. Whilst Chlorine tablets can be added to the skimmer basket this is not recommended as their low pH means acidic water could be pumped directly through the plant room equipment, it is therefore recommended either an inline feeder after the heater or a floating dispenser in the pool itself is used.

All Swim Shock Granules/HTH

If unstabilised shock granules are preferred for day to day running it is recommended that stabiliser (All Swim Conditioner) is also used, so the life of the chlorine is prolonged. Unstabilised shock chlorine does, however, have the advantage that it raises sanitiser levels quicker than other products and as such is ideal for treating green pools.

Note: When stabilising your pool with conditioner (Cyanuric Acid), you need to ensure the cyanuric acid level does not exceed 60ppm as at this point chlorine lock can occur and very little chlorine is released into the pool water.

All Swim Quick Dissolve Granular Shock

This product has the advantage over conventional shock treatment in that it's rapid dissolve micro crystals mean that it can be sprinkled directly onto your pool water, eliminating the need for predissolving. (Note: pool water temperature must be above 22°C, otherwise predissolving is still required).

All Swim Multi-Functional Tablets

These tablets contain the most concentrated chlorine available today for domestic pools with each tablet containing approximately 90% chlorine. Multi-Functional Tablets also have a built in algicide to help prevent your pool water from turning green along with a clarifying agent to ensure your pool water remains crystal clear.

Sodium Hypochlorite

Sodium Hypochlorite is very effective at killing algae but has the disadvantage that it has a high pH and the water balance of your pool will therefore need more regular maintenance.

All Swim Non-Chlorine Shock

A non-chlorine oxidiser compatible with both chlorine and non-chlorine systems it destroys non-filterable wastes and creates sparkling water.

Salt Chlorinators

These systems work by a process of electrolysis, using an electrolytic cell they transform salt water into chlorine. This then destroys all the micro organisms and ensures a correct level of free chlorine in the pool at all times.

Balancing the pH

Apart from checking the chlorine it is also important that the pH is measured and balanced. pH is a measure of acidity and alkalinity in the water and it is measured on a scale from 0-14 with 7 being neutral; for swimming pools and spas the pH needs to be kept between 7.4 – 7.6. If the pH level is too high the effectiveness of the chlorine is reduced which could cause the water to turn cloudy, whilst, if the pH is too low, skin, ear and eye irritation may also occur.

pH is reduced by the addition of an acid (All Swim Pool Acid) and increased by the addition of an alkali (All Swim Pak 2).

Controlling The Total Alkalinity

Total Alkalinity is important in your pool water because it can make balancing your pH very difficult and can cause pH bounce (where the pH fluctuates considerably in short periods of time). Total Alkalinity is the measure of the actual amount of alkali (calcium carbonate) present in the water, if it's too high it can buffer the pH and cause cloudy water due to the formation of scale and if too low it makes the pH almost impossible to control.

Like pH the total alkalinity is reduced by the addition of an acid (All Swim Pool Acid or Total Alkalinity Reducer) but is increased by the addition of Sodium Bicarbonate (All Swim Pak 1). The ideal total alkalinity level is between 80 - 120 ppm.

Adjusting The Water Hardness

Water hardness is measured by testing for the amount of calcium and magnesium salts present, the minimum level recommended is 175ppm. If the water is too soft it can affect your pool and spa equipment as the pool water will extract calcium from any available source e.g. pool grouting. If, however, the level is too high it can cause calcium deposits on the pool walls.

Increasing the water hardness is done by the addition of Calcium Chloride (All Swim Pak 3), reduction of calcium hardness is done via the process of dilution.

Pool Care At A Glance

With an outdoor swimming pool an annual maintenance programme should comprise the following:-

- Recommissioning/Spring Opening.
- Weekly servicing.
- Winterisation or Autumn Shutdown.

An indoor pool would also require regular servicing but does not normally require the normal winterisation programme.

Regular maintenance of your pool is essential and it is always easier if you can get into a routine.

Start Of The Season

- Remove winter cover, clean and dry thoroughly; then store for the summer.
- Reconnect pump, filter and heater and thoroughly test.
- Remove expansion bottle in skimmer.
- Refit skimmer and collar assembly and basket.
- Clean pool and remove all leaves.
- Backwash filter.
- Check and adjust pool water.

During The Season Normal Routine Maintenance

(1) Skimmer Check the basket in the surface skimmer frequently, especially in the autumn when leaves are falling, or after high winds. It is possible for the basket to fill up with leaves, so reducing the flow of water and consequently starving the pump of water. Check the water level in the pool and top up when necessary. Ideally the pool water level should be half way up the skimmer.

(2) Filter Check the pressure gauge. Always backwash the filter when the pressure reads 5lbs above clean running pressure. When the filter is dirty only ¼ - ½ of the pool water is being passed through the filter and hence a very poor filtration cycle takes place.

(3) Pump Check the coarse strainer in the pump periodically, especially after cleaning the pool. When replacing the lid of the pump, make sure that there is no dirt or debris on the rubber sealing ring and that the lid is firmly closed. A REDUCED reading on the pressure gauge is indicative of a badly choked strainer basket. The pump refusing to prime or the presence of fine air bubbles being blown into the pool from the pool inlet(s), is indicative of an air leak at the pump strainer lid.

(4) Check Water Balance For pH, Sanitise And Adjust As Necessary

(5) Maintain Water Clarity Sometimes your pool water can look dull and cloudy, this is caused by small particles being suspended in the water. The filter can sometimes remove these particles, however, if they are too small they will remain in suspension and a flocculant/coagulating agent needs to be added. Before adding a flocculant backwash the filter and check the sight glass to ensure the water is clear; then add your flocculant: All Swim recommends the use of Crystal Clear as a flocculating agent.

(6) Prevent Algae Forming This can be done by maintaining the correct sanitiser levels and also by the addition of Kleen Pool, a copper based long life algicide which can help stop algae forming.

Pool Vacuum

A pool vacuum system works in a similar way to a domestic carpet vacuum, but uses water instead of air.

Some wind blown debris is bound to sink to the floor of the pool and to remove this most pool owners vacuum their pools once a week. The vacuum hose and extending handle are attached to the vacuum head, the hose is then filled with water. This is easily done if the vacuum head is allowed to rest on the pool bottom, whilst the hose is pushed vertically down into the water in an overhand manner this will expel all the air easily. The hose is then attached to the Kornea vacuum plate, which in turn is fitted over the skimmer basket after the removal of the floating collar. After vacuuming the pool it is always recommended that you backwash the filter and also check the skimmer basket and empty of debris if required.

Alternatively, an easier way to vacuum the pool is by investing in an automatic suction pool cleaner, the principles of operation are the same, except you no longer need to vacuum the pool yourself, as it can be done automatically either day or night. In addition to automatic suction pool cleaners, electronic pool cleaners are now widely available that offer either floor only cleaning or floor, wall and waterline cleaning all at the touch of a button plus have the added benefit that they will operate underneath your solar cover when the pool is not in use.

Pool Vacuuming Procedure

- Backwash filter to ensure maximum suction.
- Fit vacuum head, hose and handle.
- Fill vacuum hose with water.
- Fit kornea to hose and attach to skimmer.
- Shut off main drain/low suction valve.
- Vacuum Pool.
- Remember to always keep the vacuum head below water level.
- Backwashing of the filter may be necessary during vacuuming, if the pool has been allowed to get very dirty.
- If whilst vacuuming the suction is lost completely or reduced in power, check the following points:
 - Does the filter need backwashing?
 - Is the skimmer basket full?
 - Is the pump strainer basket full?
 - Is the kornea seated on the basket properly?
 - Is the vacuum head or hose blocked with leaves?

Vacuum To Waste

If a pool is very dirty, it is recommended that the pool be vacuumed to waste to stop blocking up of the pool filter. The equipment is setup in the same way but the multiport valve is moved to waste, bypassing the filter and pumping the water to waste. Note this operation reduces the pool water level quite quickly and it is important to not let the water level drop below the level of the skimmer.

Solar Blanket

A necessity for every pool owner. A solar blanket floats on the surface of your pool (bubbles downward) letting the sun raise the water temperature whilst retaining the warmth until you are ready to swim. In season it can raise the pool water temperature by as much as 10°F, and at night it insulates the pool so that a major proportion of the day's heat is retained. For owners of heated pools, the solar blanket means big savings in pool heating costs, whilst the transmission and retention of free solar heating reduces the cost of conventional pool heating.

It is recommended that a solar cover be used in conjunction with both a reel system and leading edge. This will both protect the cover by rolling it away safely when the pool is in use and make putting on and removing the cover much easier.

Winter Debris Cover

A winter debris cover protects the pool from dirt and leaves in the winter when the pool is not in use. It is manufactured from a strong close woven UV stabilised polyethylene yarn that permits controlled seepage of rain water yet screens out leaves and debris. It helps keep the pool in good condition for easy re-opening at the start of the season. The cover is supplied 2' larger than the pool water area to sit neatly over the coping stones: it is then held in place with stainless steel springs and 'P' anchors. Fitting the cover is very easy only necessitating the drilling of small holes in the pool surround.

Winter Care

As previously stated, a pool must be kept full of water at all times. In winter as water freezes, care must be taken to stop damage occurring to the pool as well as the expensive pool equipment.

In order to ensure that the pool water stays clean and sparkling through the winter, make sure that the pH is correct, shock dose the pool with All Swim shock granules and add the required amount of liquid Winterclear (5 Litres per 12,000 gallons).

The pool must be kept clear of leaves otherwise they may stain the pool floor, this can be carried out by the use of a leaf net or by the fitting of a winter debris cover.

The skimmer must be winterised to prevent it being damaged by ice, and this is carried out by first removing the floating collar assembly as well as the skimmer basket. A plastic bottle securely tightened and weighted with stones is then placed in the skimmer; this acts as an expansion bottle and in freezing weather will be compressed by the ice instead of cracking the skimmer body.

The pump, filter and heater must all be drained but before doing so make sure the filter has been well backwashed to prevent the solidifying of dirt in the filter media over the winter period.

The pump has two drain out plugs, one on the bottom of the pump strainer pot and the other on the impellor housing, the pump is then best removed and stored in a warm dry atmosphere for the winter in order to prevent condensation attacking the pump windings. The filter is then drained by opening the plug at the base.

If a heat pump is fitted, the two unions should be loosened and a hosepipe inserted into the top connection to enable the heat exchanger to be flushed out with clean water.

Regular monitoring of the pool in winter is essential, as rainfall will increase the level of water in the pool. If the water level rises to coping level and subsequently freezes, it could cause lifting of the pool coping stones.

Summary Of Winter Care

- Remove solar cover, clean and dry thoroughly; then store for the winter.
- Clean pool and remove all leaves.
- Backwash filter and ensure water level is at normal height (halfway up skimmer).
- Check and adjust pH.
- Add winterising chemicals.
- Put expansion bottle in skimmer.
- Fit winter debris cover.
- Drain pump, filter and heater.
- Store pump in a warm dry atmosphere.
- Ensure pool water level does not rise to coping level.

Problem Solving

Problem	Possible Cause	Reason	Solution	Product Required
Cloudy Water	Build up of dirt & bather pollution	Ineffective chlorine levels or poor filtration	Backwash filter, then Shock treat. Add clarifier to 'polish' water	All Swim Shock, Crystal Clear
	Start of algae growth	Insufficient levels of chlorine	Shock treat. After 24hrs backwash filter. Maintain chlorine level above 1.5ppm. Prevent reoccurrence of algae growth	All Swim Shock, All Swim Cyanachlor Algicide or Kleen Pool
	Chlorine ineffective	Over stabilisation	Dilute pool water and shock treat	All Swim Shock
	Ineffective filtration	Filter blocked or filter media needs renewing	Check filter media or cartridge	See ineffective filtration for more detail
	Suspended particles	Precipitation of salts due to high pH or high alkalinity	Correct pH and/or alkalinity	All Swim Pool Acid, Crystal Clear, Aquasparkle Tabs
Unpleasant Water	High combined chlorines	Free chlorine levels too low	Dilute pool water and shock treat	All Swim Shock
Eye Irritation	Detergents from cleaning compounds getting into pool water	Reaction between chlorine and detergent	Use chlorine compatible cleaners	All Swim Tile & Liner Cleaner
Sore Eyes / Throat	Water too acid or alkaline	pH too low pH too high	Correct pH Correct pH	All Swim Pak 2 All Swim Pool Acid
Chlorine Level Difficult To Maintain	Sunlight destroying chlorine	Chlorine not stabilised	Use stabiliser or stabilised chlorine	All Swim Conditioner All Swim Cyanachlor
	Build up of pollutants	Insufficient chlorine	Shock treat	All Swim Shock
	High water temperature	Organisms multiply more quickly	Increase dose of sanitiser	All Swim Cyanachlor or All Swim Shock
No Chlorine Reading Despite Adding Chlorine	Chlorine level may be too high	High chlorine level bleaches reagent in test tablet	Allow chlorine to reduce naturally over a period of time	Contact All Swim

Problem Solving

Problem	Possible Cause	Reason	Solution	Product Required
pH Too Low	Low pH of local water supply	Insufficient alkali	Add alkali - ideal pH 7.4-7.6	All Swim Pak 2
	Use of acidic chlorine donors	Insufficient alkali	Add alkali - ideal pH 7.4-7.6	All Swim Pak 2
pH Too High	High pH of local water supply	Insufficient dry acid	Add dry acid - ideal pH 7.4-7.6	All Swim Pool Acid
	Use of alkaline chlorine donors	High alkalinity	Reduce alkalinity to 120ppm check pH	All Swim Pool Acid / Total Alkalinity Reducer
	Salts being leached from new concrete pools	Self correcting over a period of time	Add dry acid - ideal pH 7.4-7.6	All Swim Pool Acid
pH Erratic	Insufficient bicarbonate to buffer pH	Low total alkalinity	Add bicarbonate - ideal 80-120ppm	All Swim Pak 1
pH Locked	Too high a level of bicarbonate	Topping up from mains water can increase alkalinity in hard water areas	Reduce alkalinity to 80-120ppm check pH	All Swim Pool Acid
Low Alkalinity	Bicarbonates reduced by dilution, particularly in soft water areas	Mains water has low levels of bicarbonates	Add bicarbonate minimum 80ppm, consult All Swim	All Swim Pak 1
Pool Walls Feel Slimy	Algae growing	Insufficient chlorine	Shock treat to kill algae, sweep and vacuum pool. Prevent recurrence with algicide, brush pools walls	All Swim Shock, Algicide or Kleen Pool
Dirt On Pool Wall At Water Level	Build up of fat, oil & cosmetics	Irregular cleaning of surfaces	Clean with sponge & suitable detergent	All Swim Tile & Liner Cleaner
Sharp Edges Around Tiles	Grout being leached by water	Water too soft	Re-grout pool. Increase calcium levels to minimum 175ppm. Consider changing to All Swim Shock Granules	All Swim Pak 3, All Swim Shock Granules
Ineffective Filtration	Incorrect sand level in filter	Not enough sand to filter out particles	Renew and/or top up sand	
	Correct level of sand	Blocked filter/filter sand	Backwash & use filter aid	Filter Cleaner
	Cartridge filter in poor condition	Filter allowing particles through	Renew Cartridge	Crystal Clear





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