

EVERYTHING FOR YOUR HOME, VILLA & OFFICE

HOME OWNER

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More daylight! Use of
glass in interiors

Living in a Villa:
Pros and Cons

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What a Swimmably Good Idea



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Pro Art
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Build a Swimming Pool What a Swimmingly Good Idea

Swimming as an organized activity has been recorded as far back as 2500 B.C. in Egypt and at some point later in ancient Greece, Rome, and Assyria. In Rome and Greece, swimming was part of the education of elementary age boys and the Romans built the first swimming pools (separate from bathing pools). The first heated swimming pool was built by Gaius Maecenas of Rome in the first century BC. Gaius Maecenas was a rich Roman lord and considered one of the first patrons of the arts - he financially supported the famous poets Propertius and Horace Virgil making it possible for them to live and write without fear of poverty.

However, swimming pools did not become popular until the mid 19th century. By 1837, six indoor pools with diving boards were built in London, England. When the modern Olympic Games began in Athens in 1896 swimming competitions were among the original events, this led to the activity becoming more popular with the general public and swimming as a recreational activity has gained in popularity since with succeeding generations. Due in part to the enjoyment attained and the proven health benefits of regular swimming as an exercise.

In modern times many people have been fortunate enough to be able to afford their own private swimming pools attached to their property. There are various systems of construction available along with a multitude of filtration techniques to ensure that the water quality is kept clear and pristine thus preventing any detrimental health risks.

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Modern house with concrete swimming pool



Residential inground swimming pool in backyard with waterfall



The ladder in pool with a handrail

Concrete Swimming Pool Construction

Concrete swimming pools are considered to be the best and most durable of all the swimming pool construction options. Finishes, including hand placed mosaic tiles in various patterns can create a bold statement and thing of beauty. Indoors or outdoors, small or large - a swimming pool will undoubtedly enhance your life, providing you with a peaceful oasis, somewhere to relax, entertain or exercise, or to have fun. Once you have made the decision to have a swimming pool, the next stage is to work out the size and choose the location, look and style. Mosaic tiles are one of the most practical options for lining your pool and surrounds, so whatever your budget and taste, you will find something to inspire you in your choice of mosaics for your pool.

Shuttered Poured Concrete

This design and construction is considered to be the most 'basic' type of swimming pool construction using concrete. Once the excavation has been completed the contractor should place a compactable material over the area of not less than 20cm in depth and compact to approved solidity. The next stage is to install the base sump drainage point, then lay 5 cm 'blinding concrete over the complete area of the swimming pool base. Once this layer has set concrete re-inforcing grid steel sheets should be laid on spacers (chairs) which will keep the mesh raised 5cm 'minimum' from the previously laid concrete. This will allow the 'floor slab' concrete when poured to completely encompass the mesh to maximise strength and prevent erosion of the re-inforcing. 'Starter bars' should be placed and connected to the floor mesh where the vertical walls will be located to ensure both wall and floor are strongly connected. A 'kicker' or 10cm concrete up-stand should also be formed to aid the stabilization of wall shutters

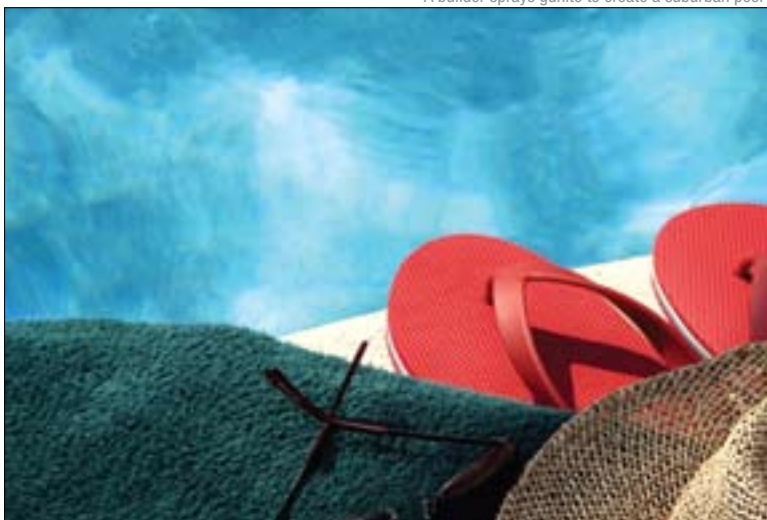
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Modern house with swimming pool at night



A builder sprays gunite to create a suburban pool



Shot of a towel, sunglasses, hat and sandals by the pool

during wall construction. Timber shuttering (plywood) is used to form the walls and steps. Competent carpentry skills are required to form a perfect swimming pool shape.

Specific pipe works and pool fittings are installed prior to concrete pouring and will be connected up to the filtration system later. Once the concrete floor slab and vertical walls have been poured it is normal practice to allow one week for the concrete to cure and gain strength before any other works are carried out. After the concrete has set the ply timber sheets (shuttering) are removed to expose a neatly formed concrete shell. The walls can be 'topped' using coping stones to match surroundings. varied finish options are available to form a smooth interior finish. Walls can be rendered using waterproof sand and cement and then painted using emulsifying pool paint. Although considered a basic finish, a painted pool can last many years between coats.

Top of the range concrete pools can be finished using hand placed mosaic tiles. These can be made of ceramic, glass or porcelain material and together with chosen motif designs can create a bespoke thing of beauty. These mosaics now come in 'matting's' which greatly expedites the work at site while still attaining an 'expensive' finished look.

Gunite or Shot Concrete Swimming Pools

Gunite or shot concrete (shotcreting) is a type of swimming pool construction that uses compacted concrete shot from a high pressure gun hose straight onto the reinforcing steel. This technique relies on the high pressure to compact the concrete both in the walls and floors. This is a highly approved and accepted method as there are no joints in the completed structure which in turn 'lessens' the potential for leaks. However problems can occur if the contractor does not remove



Swimming pool cleaning equipment



Swimming pool filtration system



Water filtering system

'bounced' material from the floor and 're-shoot it instead of just tamping the rebounded concrete smooth. This could result in the concrete being weaker and possibly cracking or flaking which may facilitate 'leaks'. The interior of the swimming pool is then finished with one of the options mentioned previously.

SWIMMING POOL FILTRATION SYSTEMS

The first principal in any filtration system in a swimming pool is to remove the suspended matter from pool water and make the pool a safe environment for bathers. Filtration is achieved by passing the water through a suitable medium contained in a vessel. It is generally accepted that there are two types of filters associated with swimming pools, A. Disposable Cartridge and B. Graded Aggregate (Sand or other suitable material, in conjunction with or without layered Shingles, anthracite etc). Particle removal from 10 to 5 microns can be achieved with these systems and has long been established as acceptable in swimming pools.

The efficiency of filtration is affected by the speed of the water through the filter medium and this is expressed as the volumetric flow through a square metre of medium per hour ($\text{m}^3/\text{m}^2/\text{hr}$). The number of bathers in any swimming pool will also affect the design and selection of the filter therefore it is essential that this is discussed and specified at the pool design stage and allow for 'extra' filtration capacity. Consequently there is a marked difference between the design of a commercial and a domestic pool. The Filtration system, the Circulation system and the Treatment system form an integral part of the swimming pool and without one the others cannot function correctly.

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Luxury beautiful swimming pool with blue water



Swimming pool cleaner during his work



Swimming pool cleaning tools in the bottom

DISPOSABLE CARTRIDGE

The cartridge filter is a formed folded roll of dense porous material which is inserted into a vessel. As with the DE filter the water flow is engineered so that the water enters the vessel surrounds cartridge and in order to leave the vessel must pass through the material. Once the material has been saturated with both water and debris the cartridge is removed from the vessel, cleaned and replaced. Once the cartridge has become worn with use and cleaning it is replaced. Again particulate removal to 5 Microns can be achieved. While these filters are efficient and light their use is limited to small or specialised pools due to cartridge cleaning difficulties.

GRADED AGGREGATE (Sand or alternative equivalent filtration)

The sand filter vessel contains a bed of graded sand through which the water is pumped. The pressure of the water compresses the sand and makes the microscopic gaps between each grain of sand even smaller and therefore effecting the removal of the suspended matter. At the bottom of the container there are a collection of outlet pipes (under drains) which allow the passage of the water but not the sand. The top influent pipes (spreader) should be above the surface of the sand bed to allow expansion of the bed when the water flow is reversed through it for cleansing purposes. The bed of sand can be supported by a secondary bed of shingle or even layers of graded shingle depending on the design of the filter. It is important that the filter designer stipulates the depth of sand bed to be used.

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Two happy little girls splashing around in the pool



Cleaner tool cleaning the ground of the swimming pool under water



Spring Cleaning

BACKWASHING

As sand bed depths are greater, from 1 metre in commercial filters, it is necessary to ensure that the backwashing flow rate at least $30\text{m}^3/\text{m}^2/\text{hr}$. Some systems use a layer of coarse grade shingle at the base of the sand so that the water flow around the under drains is less restricted and a better flow can be achieved. However it is sometimes difficult to level this layer. It is also common to pump air through the filter during backwashing in order to assist the fluidisation of the sand bed. Any backwash water must be discharged into an appropriate drain close to the filter and the water disposed according to local regulations. Backwash pipe work should be fitted with a viewing glass to allow the operator to properly gauge the length of the backwash.

FILTER VESSELS

All filter vessels should be designed and manufactured according to approved national and international standards. In general they should be designed to work at a pressure equivalent to 1.5 times the shut off pressure of the pump employed, they should be fitted with a pressure gauge and if necessary influent and effluent gauges, air relief valve, and in the case of manual valve backwashing have a manifold comprising five valves to allow for rinsing

ALTERNATIVE FILTRATION SYSTEMS

Membrane filtration for swimming pool water treatment is still in the development stage. However initial tests appear to confirm the efficiency of membrane filters compared to sand filters or multiplayer filters is higher. Various types of membrane

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Two stylish recliners overlooking a swimming pool in luxurious



Little girl swimming in outdoor pool and have a fun



Cleaning swimming pool of fall leaves with blue skimmer

filters are used i.e. Reverse Osmoses, Ultra filtration or Microfiltration depending on the size of particles which should be removed. Sand filters can remove particles down to 10 microns, Ultra filtration down to 0.01 micron. Zeolites are an active filtration medium and can remove ammonia and some heavy metals. It is essential that the material is free from dust as this can block the flow of water. Additionally zeolites have to be regenerated by soaking in sodium hypochlorite.

MAINTENANCE

All filters and filter media must be inspected regularly to ensure that there is not a build-up of detritus thus preventing good filtration. The design should incorporate a satisfactory means of removing sand and where necessary this should include access hatches to allow full entry into the filter. Care should be taken to ensure the safety of the operatives and the regulations regarding working in confined spaces. Ventilation of these spaces should be incorporated when designing a system as a routine. The disposal of any used sand should also be in accordance with local regulations.

PUMPS

The design of the filtration system will depend entirely on the correct selection of the filter pump. Its size and performance should be matched to the size of the filter and the filtration rate required. The pipe work sizing to account for the head loss in the system will have been carefully calculated however a balancing valve on the immediate pressure side of the pump should be fitted so that the correct flow rate can be achieved either by using the in-line flow meter or the published pump performance curve. Pumps should be fitted with a pre-filter or coarse strainer, It is not an integral part of the pump,

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Luxury salt water pool and patio in a residential backyard



Swimming pool | Blue spa swimming pool with small pine tree



Little girl swims in a pool in an orange life preserver

but its implementation would prevent objects from fouling the impeller. Where practical they should be fitted below water level and mounted on a plinth and/or anti-vibration mounting. All pumps must have the electrical rating IP55 and be electrically connected according to local regulations by a qualified, competent electrician.

APPLICATION

The selection of the correct filtration system by the designer will depend on many factors however the overriding consideration is that of water quality as defined by local regulations. Domestic pools invariably use high rate filtration. However it is the duty of the pool designer to select the correct filtration rate depending on the use of the pool, volume of water, the design bathing load and the chemical treatment design.

SOUND INVESTMENT

Once the initial cost of the pool construction has been absorbed there should then be many years of enjoyment and recreational benefits accrued from having your own pool. There are also the added benefits of increased property values and higher rental income which will ensure the commissioning of a swimming pool is likely to be one of the best investments you can make.

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