

Build a Swimming Pool

“NSPI of SA” Specifications for the Construction of Gunited or Handpacked Concrete Domestic Pools under Normal Conditions

Reinforcing for Guniting Pools

Minimum Reinforcing

1. A single layer of reference 156 or 200 high tensile steel fabric.
2. An additional layer of steel fabric for cover which must overlap 1 meter both sides.
3. 4 x Y10 high tensile bars in ring beam spaced 100 mm and to be continuous or 2 x Y10 bars with double reinforcing or steel fabric.

Alternative Method

R8 rods placed throughout the pool at 200 mm centers tied at each intersection. Note: For both methods as stipulated above, it would mean that approximately 2.8 kg steel is to be used per 1 meter square.

Reinforcing for Handpacked Pools

1. Approximately 4 kg's of steel reinforcing bars per one meter square.
2. The steel ring beam to be continuous.

Guniting

1. The standard mix shall comprise 1 part of Portland cement and 4 parts of coarse, sharp, well graded river sand. The aggregate shall be clean and free from organic impurities; the maximum size of particles not to exceed 10 mm.
2. Gauge boxes may be used when mixing on site or alternatively ready mixed with a guarantee by the supplier of 4 : 1 mix, or
3. 2 Pockets of Portland cement to 5 level concrete wheelbarrows of guniting sand – aggregate 7 mm.
4. Average thickness of guniting to be 100 mm.
5. The guniting shall be applied at a pressure of not less than 3 bars and the distance of the nozzle from the guniting surface shall be between 900 mm and 1200 mm to ensure sufficient compaction of the guniting.
6. The guniting shall be initially applied to the floor of the swimming pool, to cove and sides up to a height of approximately 300 mm from the bottom, until the reinforcement has been covered. The balance of the sides and covings shall then be shot. All rebound shall be swept and discarded. Excessive application of guniting forming lumps or irregularity shall be removed.
7. When necessary, prior to guniting, the soil floor to be compacted.
8. Reinforcing steel/mesh must be raised to ensure coverage on both sides by the concrete mix.

Material Strength - Handpacked Pools

1. A mix of double washed river sand, Portland cement on aggregate, the minimum size of which to be 13 mm.

2. Average thickness of the concrete to be 150 mm.
3. The initial concrete to have a strength of 30 m.p.a. at 28 days.
4. If concrete to be mixed on site, a cement mixer is to be used.
5. The concrete to be laid in situ within 3 hours of adding water to the mix.
6. Ring beam to be 300 mm x 150 mm.

Curing Period - Handpack / Gunite

During the first five days after the construction of the shell, the shell is to be watered intermittently daily by the owner.

Coping and Paving

An expansion joint is only essential if over 1 meter width of paving is laid or if paving adjoins another wall. Such joint to be filled with acceptable expansion joint material. The joint should be filled to the full depth of the coping tile thickness.

Mosaic or similar Tile Paving

Mosaic or similar tiles to be laid at water line with an approximate width of 150 mm.

Paving Surround

The ground to be thoroughly compacted in layers of 150 mm or necessary piling provided for.

Electrical

1. A time switch to be fitted.
2. Wiring to be done in accordance with local authority and / or Eskom regulations.

Pump / Motor Filter

Size to be provided as per manufacturer's instructions.

Piping and Fittings

All piping to be class 6: when P.V.C. rigid piping is used 50 mm O.D. (outer dimension); or 50 mm I.D. (inner dimension) when Polythene piping is used.

Final Interior Finish

Where marble plaster is used, the final interior finish to be applied by a steel trowel to an even finish. The finish not to be less than an average thickness of 6 mm. The marble plaster to consist of an approved mix.

Specifications for Renovations

Marble Plaster Finish of Pools (Used as a finish to a Gunite / Handpack Concrete Pool)

The under mentioned specifications are only applicable to re-marbeliting of existing marble plastered, painted or plastered pools.

i. The surface to be marble plastered, must be clean and free of any foreign material which can be detrimental to the binding process of the marble plaster to the surface to be covered by marble plaster.

ii. The surface to be marble plastered, must be chipped to provide a proper binding between the marble plaster and surface to be covered. Each chip mark must be at least 3 mm deep and not further away from each other than 10 cm. If the surface to be covered were painted, glass-fibred or epoxy coated, the surface must be suitably prepared to accept a marble plaster finish.

After abovementioned preparations, the marble plaster must be mixed and applied in accordance with suppliers specifications.

i. Marble plaster must be mixed with clean water until a sturdy mixture is obtained. (In the event of rain or cold weather, calcium chloride flakes must be added at a rate of 160 g / 40 kg bag).

ii. A 6 mm layer of marble plaster must be applied by means of a trowel and smoothed down.

iii. The pool must be filled at the renovator's request.

Specifications for Fibreglass Lining and Repairs

Directions for the lining of swimming pools with G.R.P. which apply to the lining of both new and old concrete pools, as well as old pools finished with marble plaster.

Both the so called "cosmetic" lining and the lining to re-surface a leaking pool, that has only plaster cracks, are both in fact cosmetic; as the liner is not a structural part of the pool shell, and only provides a water barrier which should be installed on pool shells which conform to NSPI specifications.

Primer / Seal Coat: A first priming layer of a low viscosity resin to be used to give good penetration into concrete or marble plaster and left for at least four (4) hours to gel before further work is done.

Preparation

The pool must be clear and free from dirt, sand or any residue. Inspect for any defects such as cracks, leaks, crumbling plaster, etc. which must be repaired before application of Primer. **Pool must be dry!**

When the liner is not carried under the coping stones, then a horizontal groove must be cut as high as possible above the water level to a depth of at least 20 mm, which should be dovetailed-shaped and the liner (fibreglass) then secured into this groove.

Liner (Fibreglass)

A wax free chemical resistant thixo tropic pre-accelerated resin is preferred (for safety reasons) and not pigmented: pigmentation hides the presence of air bubbles which must be removed – "A-Grade" Chopped Strand Mat is to be used: a mass per square meter of 450 gsm or 600 gsm, a heavier mat will give better results.

Cosmetic Linings

a. Pools in good condition **and in stable ground**, a single layer of 450 gsm can be used.

b. Pools that require **repair work**, a minimum of 2 x 300 gsm layers of mat to be used giving you a total of 600 gsm.

Resin / Glass Ration

Must be 3 : 1 by mass i.e. 25 % glass content by mass.

The Lining Operations

The pool surface must be divided into sections, each of which can easily be covered with the fibreglass well within the gel time of the resin batch. The catalyst and content (if resin not pre-accelerated) can be varied to alter gel time at different temperatures.

The glass fibre mat must be cut and trimmed to fit the divided sections. Approximately 80% of the resin should be applied evenly to the pool surface, followed by the glass fibre mat which must then be rolled out with an air bubble removing roller ([» see images](#)), this is to ensure consolidation of the laminate and removal of air bubbles. Additional resin can now be applied to obvious "dry spots". The fibreglass and resin layer must be allowed to gel before application of the top coat. Once the walls (sides) have been completed, the liner is then applied to the floor, also in sections working from the deep end to shallow end and steps. Floor to wall joints must be overlaid by a minimum of 100 mm.

Top Coat Resin (Flow Coat)

Pool must be sanded carefully by hand removing all sharp fibreglass edges before applying the top coat. Top Coat must be catalysed (and accelerated if necessary), to afford reasonable pot life (gel time), at the prevailing temperature and must be stirred thoroughly (careful not to add air into the resin) to ensure uniform distribution of the wax content. Paint brushes may be used to apply the flow-coat, which can be pigmented to a white or pale blue colour. Avoid dark colours, they carry the wax bloom (white marks or blotching from the high wax content surfacing).

The flow-coat must be allowed to cure fully (approximately 24 hours), before inspection. Any defect areas identified during inspection **must be sanded down to remove wax surface**, washed with styrene and painted over with the flow-coat.

Notes

Construction of the pool liner must not begin when air temperature lower than 15°C or higher than 35°C, nor if there is possibility of rain before completion of the final top coat. The PH value of the water should be maintained at 7 ppm at all times. Chlorine, acid, other pool care additions must always be added in diluted form.

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