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## Concrete Masonry Water Tanks and Swimming Pools

Electronic Blueprint and ENVIROSPEC provide building specifications and training, on safe and sustainable buildings, for architects, engineers and builders. In certain circumstances, reinforced hollow concrete blockwork is suitable for the construction of swimming pools and water tanks. Although there are no specific CMAA (Concrete Masonry Association of Australia) recommendations or details, the CMAA document MA51 for reinforced concrete masonry retaining walls (free download from [www.cmaa.com.au](http://www.cmaa.com.au)) gives an indication of the design process that is relevant. Some particular additional considerations would be:

- The tank should be designed for factored water pressure inside (no external pressure); and factored soil and ground water pressure outside (tank empty). The appropriate factors can be determined from Australian Standard, AS/NZS 1170.0.
- The walls and floor should be analyzed for full bending moment transfer around the floor/wall interface.
- It is suggested that the bottom course of masonry be constructed as reinforced cavity construction, with the additional leaf on the outside the tank. This will permit the inclusion of a water-stop. Alternatively, some proprietary means of preventing water seepage should be incorporated. As a very minimum, the slab should be scabbled and coated with a proprietary adhesive.
- The corners of the tank must be fully bonded and include reinforcement that provides full horizontal bending moment transfer.
- If the tank is set in the soil, the floor should include a sump and a pressure relief valve, to prevent floatation of the tank when empty and subjected to groundwater pressure. However, be aware that such an event will contaminate and water remaining in the tank.
- A proprietary waterproofing system, designed specifically for this application must be applied to the inside.
- It is advisable to provide further tanking to the outside, to restrict the seepage of groundwater into the walls, and disruption of the internal waterproofing system.



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