



The arena has become popular for weddings

### Specialised block provides practical – and attractive – seating arenas

*Since earliest times, humans have felt the need to gather around a focal point to relax, negotiate and entertain each other, and since earliest days this has been made possible by seating arenas or amphitheatres. Today, these structures are still very popular, except that the method of construction has become easier and building material more varied and versatile.*

One of the more cost-effective ways to build a seating arena is to use precast, solid concrete units or interlocking concrete blocks that are relatively easily transported and installed. In addition, concrete is durable, doesn't burn and can be readily repaired or recycled. Most products on the market offer some sort of benefit, but the most all-rounded, and increasingly popular, is a specialised segmental concrete block developed by Terraforce, a concrete product licensor with manufacturing outlets all over the world. This block, the 4x4 Step Block, is part of Terraforce's large range of hollow core, reversible retaining

wall units that offer the most versatile segmental retaining system anywhere. They require low hardware input for manufacture, low transport costs and low inventory requirements at sales outlets. Being hollow, yet strong, less concrete is needed to do the job when compared to solid block systems.

Initially, the 4x4 step block was intended for low retaining walls and smaller steps, but soon became very popular not only for stairway access, but to provide comfortable, practical stairs and seating arrangements at leisure amenities and school sport facilities. The blocks can be stacked, interlocking at the corners to form gentle curves and varying wall angles, but it is by turning the unit on its side to create steps that has made it so successful at creating small to medium-sized seating arrangements.

End of last year, the block was successfully used at the Tourism Centre in Kayamandi, Stellenbosch, to create an eye-catching amphitheatre - a simple neatly curved seating area required for viewing performances around a courtyard. Following the success of that project, two more arenas have recently been completed. Both were installed by Dassenberg Retaining, a Terraforce approved retaining wall installer, who was also involved with the Kayamandi project.

### Lights adds life and character



Comfortable stairs are childs play

The first amphitheatre to be completed is situated on Kronenburg estate, between Paarl and Wellington. Conceptualised by Robin Barnes, Architect with JHP Architects and Town Planners, it has become the ideal social gathering place. According to Barnes it is designed on the same principal as the traditional Greco Roman amphitheatre where acoustics work on the principle that sound travels upwards. The centre of the circle would be the origin of the sound, whether it be a play, a musical or an oration.

The sound travels outward and upward without losing much energy within the bounds of the stepped stair tiers of the amphitheatre. The people sitting on the tiers also absorb the reverberated sound and have a dampening effect on the echoed sound. The clarity and quality of sound is thus carried in concentric sound waves to each part of the amphitheatre and experienced, virtually the same, by each person sitting at any position within the amphitheatre.

Says Barnes: "We decided to use the 4x4 Step Block system as it gave us flexibility in the radius we required and the ease in construction that it provides. The blocks



fit together nicely and provide the correct anthropometric sizes for seating and staircases. Ultimately the client was provided a facility that could be used for weddings, musicals and seminars, whilst still maintaining a cosy and intimate atmosphere within the amphitheatre, with the mountains as a backdrop. The project is a definite success; it not only works acoustically, but is aesthetically pleasing as well."

Designed on strict guidelines supplied by Terraforce the amphitheatre is built on a sturdy concrete foundation, followed by a row of concrete filled L11 retaining blocks, laid to the specified radius. Next, the 4x4 Step blocks, filled with wet concrete, were set on top of the L11 blocks in groups of four to allow for the insertion of two 1.5 m long Y12 reinforcing bars, which facilitated the setting out of the radius. Behind each L11 and 4x4 block is a 400 mm wide layer of 3% cement stabilised sand, with space for a 350 mm wide strip of 50x100x200 Corobrik clay pavers. The above steps were repeated until the desired height was reached. The steps running down each side of the amphitheatre were easily incorporated by doubling up with rows of 4x4 step blocks.

Finally, the arched screen wall across the open side of the amphitheatre was added, causing the reflected sound to enhance the direct sound waves therefore adding to the total sound quality and giving the added advantage of a stage and back stage area.

The second seating arrangement was initiated by Hans Roux of Grinaker-LTA, who, with Group Five, WBHO and Western Cape Empowerment Contractors (WCEC) forms the Berg River Project Joint Venture (BRPJV) that was awarded the R550 million contract for the construction of the dam. Conceptualised by Dassenberg Retaining, it is situated on the eastern bank of the Berg River Dam which captures water in the upper reaches of the Berg River and will augment the supply of water to the City of Cape Town by 18 percent. It filled for the first time in July last year and boast the highest concrete-faced, rock-filled dam wall in South Africa. Hugo Pienaar, quantity surveyor for Dassenberg, says that the seating arena will provide visitors with a comfortable viewing platform to sit and admire the panoramic view of surrounding area and the vast expanse of water.

In terms of landscaping, the downstream face of the dam wall, visible from the main road into Franschoek, has been re-vegetated with indigenous flora. This ensures that the dam and associated structures do not contrast with the surrounding landscape.

Pienaar says that this is the reason the Terraforce 4x4 Step Block was chosen for construction of the seating arena: "A lot of money was spent rehabilitating the area, with new topsoil being placed and fynbos planted. Everything was very environmentally conscious, seeing that the Berg River Dam is the first dam in South Africa to be designed, constructed and operated in strict accordance with the guidelines of the United Nations World



View over the dam

Flared ends for stability and access



Commission on Dams. If you see at how the block and pavers blend in with the surrounding landscape, you can easily see that no other product would have been viable, especially one that is so versatile and durable."

Construction of the arena proceeded the same way as with the Kronenburg amphitheatre, except for an increased radius and a flared design at the edges - instead of intrusive end walls - that provides increased stability to the structure. Another interesting detail involved creating corner pieces for the two 90° bends.

Say Pienaar: "We simply took a 4x4 block and cut it at a 45° angle to form the two pieces that were then joined together with cement slurry. Finally, we have just been given the go-ahead to create a U-shaped stormwater channel, using the same Corobrik pavers, around the entire radius of the arena to prevent structural damage in case of heavy rains."