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URBAN GREEN FILE

Incorporating Urban Management

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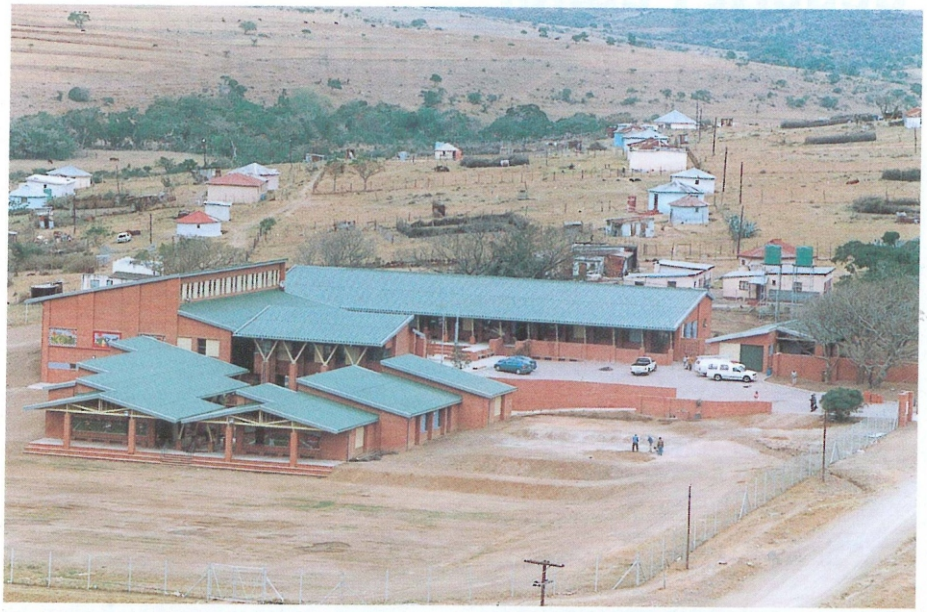

A view of the school from the north-east: the classrooms in the foreground; the hall – with north-facing clerestory lighting – and the clinic to the south; the west wing accommodates the crèche and the library and resource centre; the central building above the classrooms houses the principal's and staff offices. The tower-mounted storage tanks for rainwater and borehole water can be seen in the north-west corner of the site.

Water supply and conservation at Wesleyville School, Eastern Cape

The construction of the Wesleyville School and Community Centre in the Chalumna district of the Eastern Cape, about 40km inland from East London, was funded by DaimlerChrysler at the behest of former president Nelson Mandela. The school was formally opened in September 2000. **Leigh Darroll** ***spoke to architect Sue Clark, from AUB Projects, and consulting engineer Vollie Brink, from DSB Consulting, about the supply and conservation of water in this remote settlement.***

The generous forecourt provides direct access to the community facilities which are ordered around it; in this picture – the principal's and staff offices. The forecourt is also a place for community gatherings as well as school functions.

The funding for this project was approved by DaimlerChrysler at the end of 1998 and the site of the old Wesleyville School was selected for the new development. Eastern Cape premier Makhenkesi Stofile, in consultation with the provincial department of education and local government representatives, had identified the Wesleyville/Chalumna community as the most needy and the community itself, working through an elected committee, indicated the old school site as that most suitable for the project. The old school had been built in 1906 and is on tribal land. Although still in use it was in a state of severe disrepair and the facilities were clearly inadequate for the schooling of some 400 children from the district.

The Chalumna community was also keen to establish a clinic and a hall for community gatherings and thus the scope of the project escalated from the moment it began. The buildings are designed to accommodate these different needs by incorporating multi-functional spaces. Some offices and administration rooms double to provide space for a weekly visit from the staff of the mobile clinic that serves the district. The school hall serves also for community functions and outdoor spaces between the school buildings are open to public gatherings and market days at weekends. Ten classrooms provide dedicated teaching and learning spaces for the primary grades.

One of the main problems presented by the site is that district services of water and electricity are unreliable. At present the Chalumna community does not have a reticulated potable water system. Although this is planned and partially constructed its completion date is uncertain. Currently, water is brought into the village by trucks. At Wesleyville, Vollie Brink designed the water supply and wastewater systems to enable the school to function self-sufficiently.

Rainwater conservation

Rainwater runoff from the roofs of the school buildings is harvested, filtered and chlorinated to provide drinking water and for use in the showers at the school. Banks of drinking fountains are located in all the courtyards and pupils, teachers and the community are advised that only this water – from the fountains – is for drinking.

The corrugated fibre-cement roofs of the school buildings are pitched at 30° and hollow fibre-cement columns, which catch the rainwater from downpipes, are made a feature of the design. Runoff from the roofs is captured and channelled into two underground tanks which have a combined capacity of 15 000ℓ and are installed at the lowest point of the 20 000m² site, below the terraced playing fields.

Robust, submersible, electrically powered pumps are positioned in the underground tanks to transfer the stored rainwater to a 5 000ℓ elevated tank, situated at the highest position on the site. The pumps are controlled by float switches in the elevated tank. The elevated tank is three metres above the highest water flow fitting in the school, in

order to provide a minimum water pressure of 30kPA to operate the fittings, which were specified to suit this low pressure system (rather than a typical 200kPA system).

Borehole water

A borehole on the site provides water for the hand basins and flushing toilets and urinals. The borehole water is pumped directly from the borehole to a second 5 000ℓ tank located on the same tower as the rainwater tank.

District water supply

Provision has been made in the water reticulation system installed on site to incorporate a district mains supply, should it become available in future. This would be used to top up the stored rainwater if and when necessary.

Ablution facilities

In the ablution facilities, hand basins, urinals and toilets are of low-maintenance stainless steel and cisterns built into the walls are closed with stainless steel panels. Brink explains that the low pressure flushing system uses a six-litre flush instead of the standard nine litres. As is typically the case in schools, water reticulation pipes are sized to provide for quick reflushing to suit peak demand.

Wastewater treatment

Wastewater is managed on site via a septic tank, which incorporates three consecutive chambers and a trans-evaporation bed. The septic tank provides for anaerobic breakdown of solid waste so that the effluent issuing from it is quite clear and free of solids. The evaporation bed was constructed because the heavy clay soil of the site will not readily absorb the processed wastewater. The filtered water is transferred to the evaporation bed – a compact, contained, sunken system of sand, rocks and building rubble – which enables it to evaporate quickly. The intention is to establish plants on and around the evaporation bed in order to increase the rate of water absorption.

By installing these simple and robust water supply and treatment systems at this remote settlement, the project ensures that running water is always available to the school; that scarce water resources are conserved by substituting rainwater runoff where suitable; that consumption – and costs – of water from the district service are minimised and that the school can manage its own wastewater treatment without relying on district sewerage services.

Photographs by Sue Clark & Meyer Erlank

Clockwise from top: The rainwater collection system is made a feature of the design. Throughout, the structure is clearly expressed, in itself an ever-present lesson in design and construction for the pupils.

Drinking fountains in the lower courtyard. The glazed ceramic covers for the fibre-cement pipes which hold the fountains were made by the architect. The murals are the work of school children, youths and adults from the community, who were given some guidance by graphic arts students from the East London Technikon. "The murals bring some life and colour to what might otherwise have become solemn, face-brick wall planes. They were painted quickly – over about four days – and with great enthusiasm from the community. They also serve as picture symbols for the different spaces and functions in the community centre – replacing standard signage," says Clark

Stainless steel toilets with wall-recessed cisterns provide low maintenance fittings that suited the low pressure plumbing system.

Some of the men and women from Chalumna who were involved in the construction of the school and were trained on-site in various trades.

Skills training for the community

People from the Wesleyville community were employed on site and trained in the wet trades of building during the course of construction of the new school. This training was conducted as part of the construction programme by Meyer Erlank, project manager at AUB, who spent a year 'in residence' on the site, and three trainers from the Soweto Builders Training Centre (BTC). Thirty-nine men and women in Wesleyville are now qualified artisans, with certificates in bricklaying, plastering, painting, concreting and plumbing. Because the BTC is an accredited training institution with approved training modules, the certificates awarded to the trainees who were involved in the project are recognised nationally by the CETA – Construction Education and Training Authority.