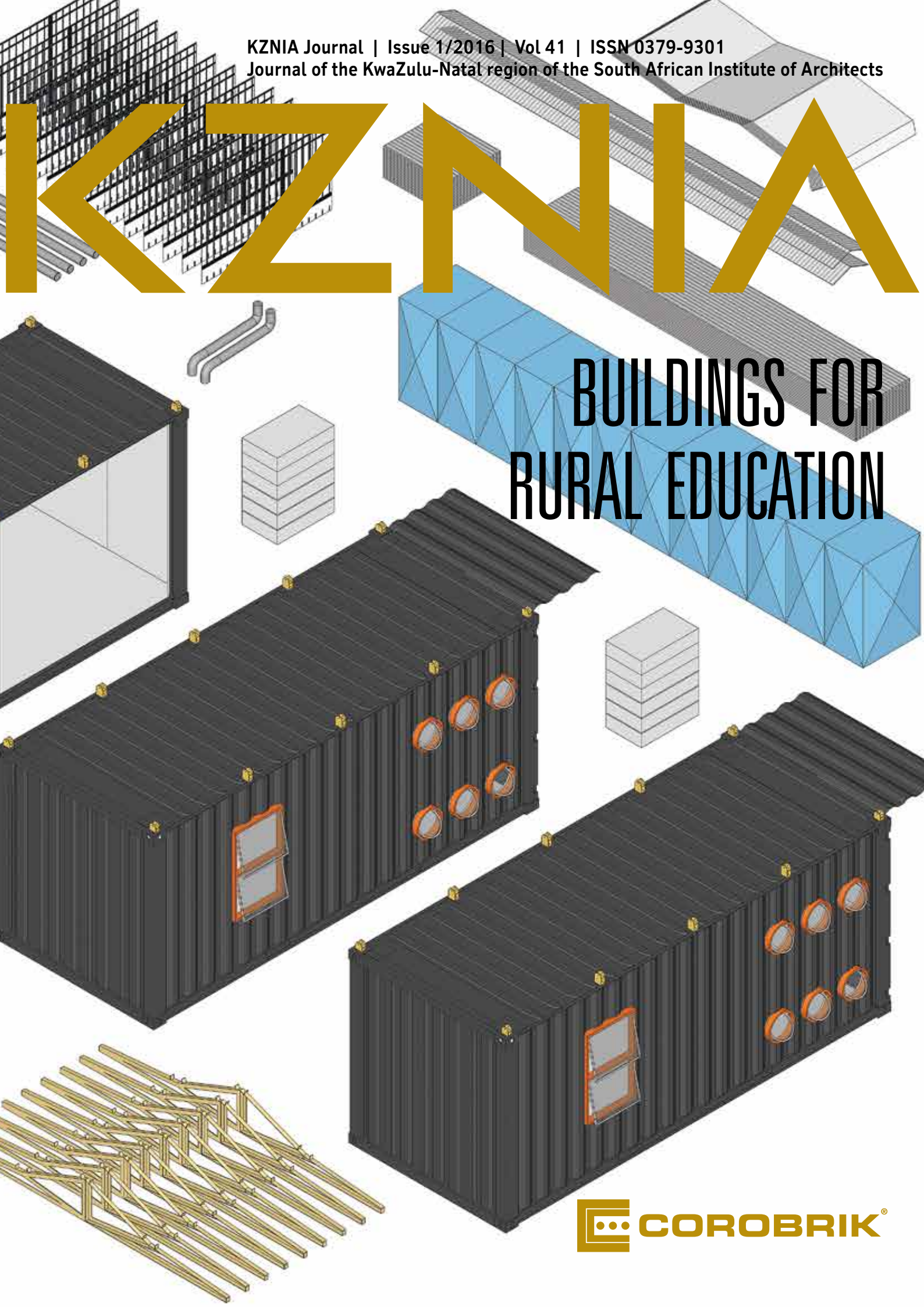
KZNIA Journal | Issue 1/2016 | Vol 41 | ISSN 0379-9301
Journal of the KwaZulu-Natal region of the South African Institute of Architects

KZNIA



BUILDINGS FOR RURAL EDUCATION

KZNIA Journal • Issue 1/2016 • Vol 41 • ISSN 0379-9301

Editorial Board: Nina Saunders (*Chair*) • Ivor Daniel • Kevin Lloyd • Lauren Haiden • Deborah Whelan
Chantal Pieterse • Louis du Plessis
Editor: Walter Peters • **Assistant:** Janet Whelan • **Design:** Mister Walker
Published by the KwaZulu-Natal region of the South African Institute of Architects
160 Bulwer Road Glenwood Durban 4001
Telephone: 031 201 7590 • **Fax:** 031 201 7586 • **email:** info@kznia.org.za • **Website:** www.kznia.org.za

KZNIA

KZNIA NEWS

40 years of Corobrik sponsorship of KZNIA Journal, 1976-2016.

This year marks 40 years of sole and continuous sponsorship of KZNIA Journal by Corobrik. The prized association has its origins in 1976 when Dick Kemp, director of Corogroup, extended an invitation to concurrent South African and (KwaZulu-) Natal Institute President, Hans Hallen, to address an in-house seminar. One outcome was a meeting between Hallen's partner, Danie Theron, and Corobrik's then sales Manager, Keith Nurcombe, which resulted in NPIA Newsletter, now KZNIA Journal, with Danie as founder editor (KZNIA Journal 1/2001).

What began as a 4-page newsletter has since 1998 been a cover + 18page insert at tri-annual frequency, and KZNIA is the only regional Institute of the South African Institute of Architects with its own Journal. But, what distinguishes the Journal is the involvement of guest editors, members of KZNIA who have an idea for an issue, and put this forward at a meeting of the editorial committee. The idea is then workshopped, and if feasible is assembled in collaboration with the editor. In this way many more have an opportunity of venting interests and concerns in shaping the unique means of communication of KZNIA.

In 1996, KZNIA conferred on Corobrik the honour of Patron of Architecture, the citation of which acknowledged Corobrik "for its generous sponsorship of the Journal over 21 continuous years, which has provided the profession with an opportunity for reflecting on the art, science, research and practice of architecture; and the Institute with a means of promoting a wider public understanding of the built environment in the Province of KwaZulu-Natal". These remain the objectives of the profession and the Institute, and KZNIA is indeed grateful to Corobrik for the innings, now almost doubled.

It is significant that the 40th anniversary of this Journal coincides with a visit by Hans Hallen to the land of his birth, schooling, education and practice. Having left our shores for Sydney end-1987, it is indeed time for retrospection, and the reason for the inclusion of an article on the triad of his UKZN campus architecture. Good bricks endure, as does good design, graphic or architectural.

Walter Peters, *Editor*

Global award for sustainable architecture

East Coast Architects are among this year's five winners of the GLOBAL AWARD FOR SUSTAINABLE ARCHITECTURE made by the LOCUS Foundation under the patronage of UNESCO. Having been declared "pioneers in research, making and transmission" Derek van Heerden and Steve Kinsler have been invited to Paris for the conferment of the award on 9th May and are to participate in the symposium by winners. The only other South African architect to win this prestigious award is Carin Smuts of Cape Town in 2008. *Congrats!* Editor

EDITORIAL

Buildings for rural education

Education is arguably the most important challenge of the new South Africa, and architects are involved, making architecture of what could otherwise be utilitarian teaching structures, even in remote rural areas. For this reason the editorial committee has chosen as the topic for issue 1/2016, educational buildings in rural areas.

Education is a process by which people acquire knowledge, a process which for many learners ranges from pre-schooling through primary and secondary levels, and for some extends to tertiary levels such as universities, which provide for higher education.

Most often the public thinks of the facilities for education being located in urban areas, yet rural education accounts for a large and growing segment of learners, and their needs have often been overlooked. If the nation as a whole is to make marked gains in student outcomes, rural education must be made a priority.

Definitions of 'rural' vary, yet a common understanding is the marked distance from urban centres, where transport is often a problem and learners and teachers face unique challenges and opportunities. Many rural areas contain concentrated poverty, just as urban centres do, but the situation is exacerbated by the difficulty of recruiting and retaining teachers and principals.

Different from their urban and suburban counterparts, these schools often lack libraries, laboratories, sporting facilities, and sometimes even a landline which puts the internet beyond reach. At the same time rural schools possess unique strengths and opportunities, and they often enjoy strong community support e.g. Four Fountains primary school at Shayamoya, Kokstad, see KZNIA Journal 2/2006 & 1/2009. Having been educated in rural schools myself, I can also vouch that it's healthy out there.

The architects' task is limited, namely to create the constructed environment of buildings and to some extent the concomitant landscape, with conditions that will encourage and stimulate education, both for teachers and for learners. This issue covers a few recent contributions of buildings and landscapes for rural education by KZNIA members, the environments of which I trust will prove conducive but especially to learners in their acquisition of knowledge.

Walter Peters, *Editor*

SCHOOL OUT OF THE BOX

East Coast Architects, Durban

I am a young newly qualified teacher *and my first post is to a remote, rural primary school about 45 minutes from Bizana toward the coast. I find lodgings in the town and I make the daily trek to and from my school, which is typical – 3 rows of classrooms around a dusty courtyard with rows of tin clad pit latrines against the furthest fence – in an un-roadworthy taxi across very bumpy gravel roads. The first thing I need to do when I get to school – relieve myself! But in those toilets? How undignified! I must start looking for a transfer – or another job!*

I ***am a 15 year old girl*** *attending a secondary school in the remote hills of Limpopo. The school gets good results and the teachers are committed and dedicated but because of the lack of decent ablution facilities my mother has agreed that I can stay home during 'that time of the month' – I get bored at home and I know I'm missing out on important stuff but I really can't face having to keep myself clean under such unhygienic conditions.*

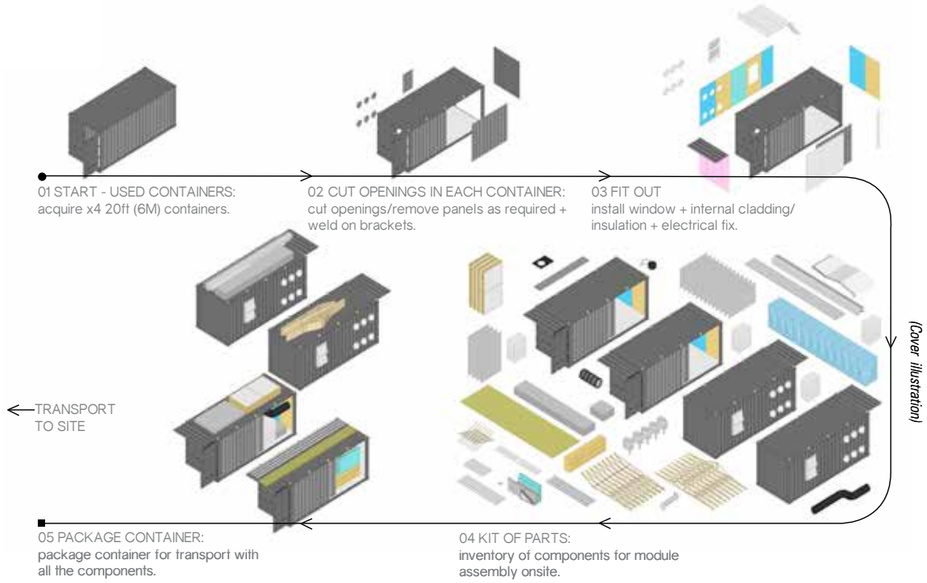
I am a 5 year old boy *– last born – from Dududu just inland from Scottburgh on KZN south coast. I am in my first year at the nearby primary school – Grade R. When my mom told me I was coming to school she enticed me with exciting stories about the games I would play and the friends I would make. Instead I'm sitting in a classroom all day and the window sills are so high you can't even see out. There are no toys or play equipment and there are so many of us cooped up all day. This isn't fun!*

I am 10 years old girl *and my single mom recently moved from the Northern Cape to Thaba Nchu in the Free State, specifically because of the good schools in the area that my siblings and I could attend. We rely heavily on social grants – my mom is too ill to work – and the fact that the school I go to has a feeding scheme is a big help – it means my mom can skip breakfast. The problem is that I am so hungry when I get to school that I can't concentrate on my lessons. The prepared meal of the day is only served after the first break (at about 10.30) – after the women who prepare the food have arrived at the school at 5 in the morning to light the open fires to cook the beans or rice that are on the menu. Can't they find a way of feeding us earlier?*

'School Out Of The Box' represents a targeted response to the declared basic norms for infrastructure for ALL schools in South Africa – rural and urban alike – gazetted in 2013 by Angie Motshekga, minister of Basic Education, but yet to be acted on – by provincial (implementing agent) departments or anyone else as far as we know. The Department (of Basic Education) identifies that of the 23,500 public schools in South Africa:

10,419 use dangerous and unhealthy (non-VIP) pit toilets
11,280 have no kitchen for their nutritional programmes
16,000 lack Grade R facilities

Given this 'commitment' by government and within East Coast's field of experience and concern – the thousands of



(Cover illustration)

Toy factory and site assembly

poorly resourced rural schools across SA – we directed the project toward the above deficiencies:

- the **SAND-box** - Toilets for teachers and pupils
- the **LUNCH-box** - Kitchens for feeding pupils in terms of the SNP (School Nutrition Programme)
- the **TOY-box** - Grade R facility - usually accommodated in one or more (scarce) standard classrooms.

The decision to use shipping containers as the primary design component for the programme arose from their (extreme) availability, their robustness and sturdiness and the speed with which they can be put to purpose once an efficient supply chain has been established. Altough we recognize the contradiction inherent in the fact that rural schools are often far from container ports – typically ocean ports or larger inland cities – preliminary costing suggests that transport represent a small proportion of overall development costs. While we have always looked for opportunities in our work to support 'local' economies by employing labour-intensive techniques and locally acquired materials, we suggest that School Out Of The Box WILL generate 'city jobs' for welders and shop fitters, and the high degree of finish achievable under factory conditions will be a fair trade-off.

Containers are re-purposed and fitted out with high end materials. Systems and components are manufactured to minimal tolerance and stored in or on the containers for transport to site and erection as a 'kit of parts'. In situ construction comprises excavation, foundations, and floors as well as screen walls and rainwater tank bases – all utilizing locally available materials – sand, stone, cement and concrete blocks – all other materials will be supplied with the container.

The proposal suggests non-parasitic buildings – they require no service linkages, they harvest energy and water and deal with waste – they can literally 'parachute in' and make no 'demand' on already meagre resources.

School Out Of The Box also suggests some innovations:

Human waste treatment by evaporation through induced airflow through a lined pit (similar to Enviro-loo) has the advantages of reduced water use, non-contamination of ground water, odourless interiors AND the annual harvest of decomposed waste which makes perfectly (saleable) fertilizer.

The introduction of hand showers and incinerators for use by women students (and teachers) who are menstruating.

Perfectly insulated cooking pots in the LUNCH-box (based on the traditional farmer's hay box or the more up to date 'wonder bags') – this to both reduce costly cooking fuel (usually gas) AND to invert the cooking/serving process so that preparation and cooking (bringing to the boil) can happen at the end of the day – actual cooking happens at night in the insulated jackets without the danger of fire. Food is served 'first thing' when kids get to school.

Simple thermal water heaters (black coil pipe) to both pre-heat water for cooking and for wash up – both of which now occur at the end of the day when water is likely to be hottest.

Rainwater is harvested in 'banks' of rectangular tanks connected in series and at height so that water can be delivered by gravity to hand wash basins and wash-up areas. Depending on rainfall patterns these tanks may need 'topping up' from an external source – tanker, mains – from time to time.

The conversion of containers as 'kids' caves' with mezzanines and climbing nets – all in 'scale' with the 5-year old child. The use of light steel structural elements, that use the container as a stable base for staging roofs, over, between or alongside spaces to both increase use AND water harvestable area.

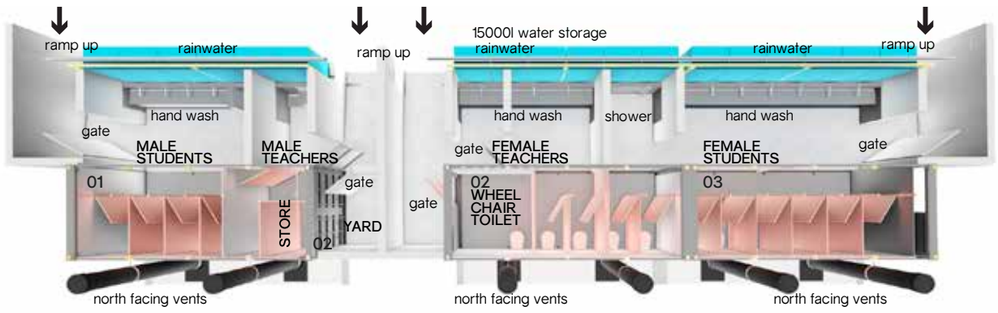
The project is at the implementation phase and funding is being sought for a prototype rollout in 2016. Early costings as Rands per learner reveal that the modules can be delivered at about 60% of the cost of 'traditional' construction – concrete block walls and sheeted roofs. The real advantage however is in the speed of rollout – there is a crisis out there!

Derek van Heerden assisted by Bartjan Hooft

Offloading a container

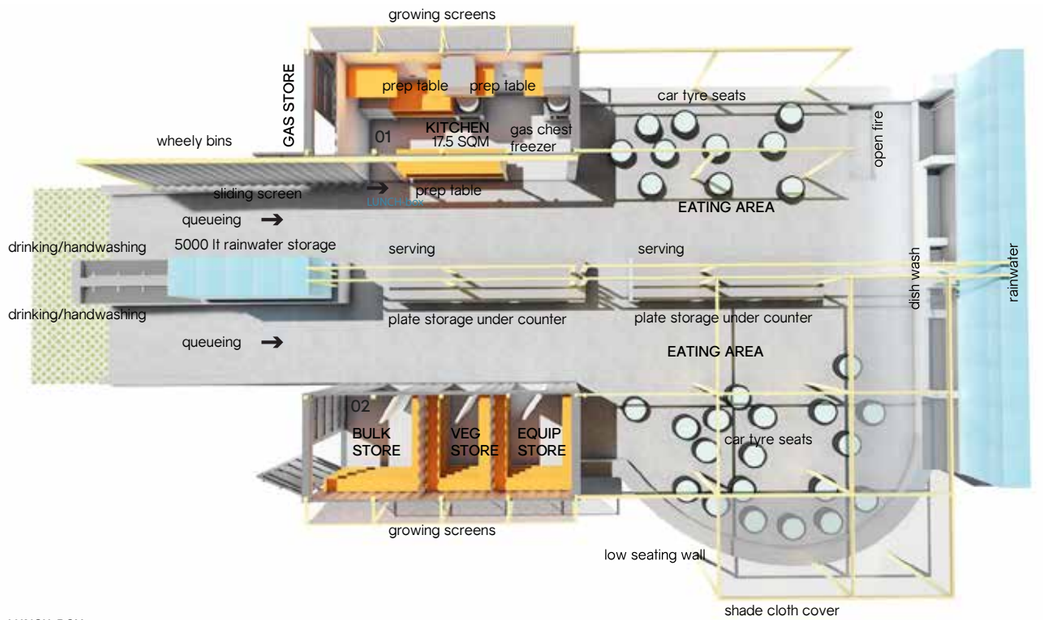
Sand-Box interior

Lunch-Box interior



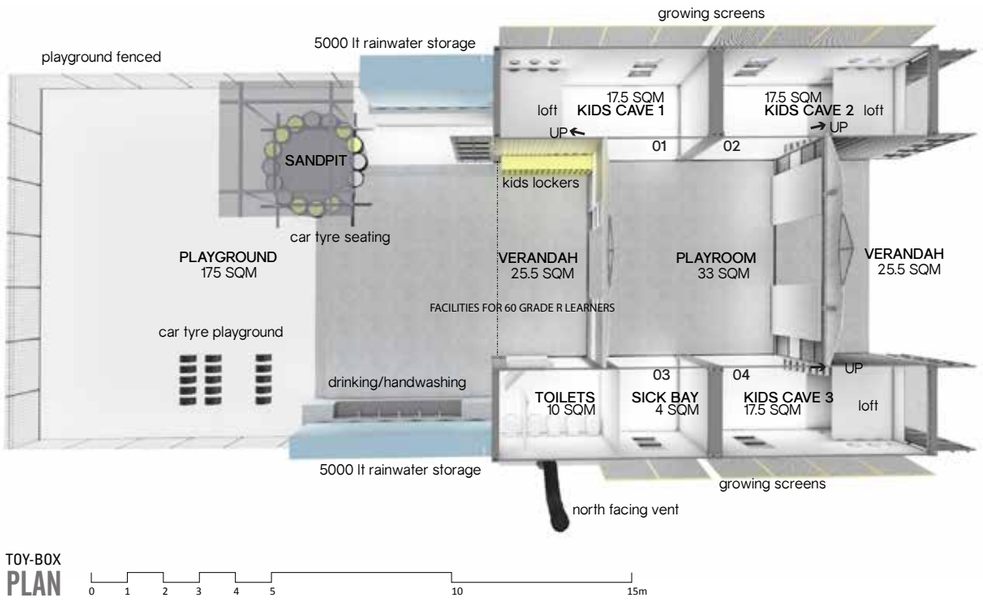
SAND-BOX
PLAN
0 1 2 3 4 5 10 15m

Toilets for 620 Learners (3 x 20ft containers)



LUNCH-BOX
PLAN
0 1 2 3 4 5 10 15m

Facilities for the school nutrition programme (2 x 20ft containers)



TOY-BOX
PLAN
0 1 2 3 4 5 10 15m

Facilities for 60 Grade R learners (4 x 20 ft containers)

EDUCATION STARTS HERE:

BHOBHONONO AND ENKANGALA EARLY CHILDHOOD DEVELOPMENT CENTRES

Architecture Fabrik, Durban

The bulk of Early Childhood Development (ECD) budget allocations are made at a provincial level by the Department of Social Development (DSD) and Education (DOE). Local Government is under no obligation to fund ECD activities, but they may include ECD into their Integrated Development Plan (IDP).

A prerequisite for DSD funding is that the ECD centre must be registered with DSD. Registration includes compliance with research intensive norms and standards which are often difficult, if not impossible to achieve, particularly those in poor or rural communities. Registration is also dependent on compliance with the local municipality's health and safety by-laws (Giese et al., 2011).

eThekwini Municipality, in its adopted 2015/2016 IDP, sets out an Eight Point Plan. Plan 4 aims to 'foster a socially equitable environment', with the goal 'to promote and create a safe, healthy and secure environment'. A strategic focus goal of this plan is to promote the health of citizens, which includes working with ECD centres to improve facility conditions and monitor early childhood health and developmental milestones (eThekwini Municipality, 2015).

Infants and young children undergo rapid neurological and developmental processes in their first two years of life which creates an established blueprint for future learning, language and cognitive functioning (Martin et al., 2014).

eThekwini Municipality has therefore identified two ECD centres in Bhobhonono and Enkangala (both north of Cato Ridge) for infrastructural upgrades. The first is operating in very poor conditions and the other has been closed down due to concerns that the building may collapse. It operates with one standpipe on the property, a leaky roof over precarious mud walls, hand-made posters on the walls and a small pile of broken toys in the corner.

The prerequisite sick bay is a cot mattress propped up against the wall of the principal's 'office'. Each child pays R80/month, and the women who run the school remarkably manage to feed the children four times a day with fruit, porridge and bread.

Funding has been allocated by eThekwini to rebuild these ECD centres, with a multi-functional brief. The centres must accommodate about 100 children each from 0-6 years of age in 3 groups. The building must also serve as a voting station, community hall and as an adult learning centre in the evenings.

The buildings have been designed as versatile, robust, simple structures with the key architectural objective to instil a sense of pride in the users and establish a higher quality of learning/development through careful use of proportion, scale, materiality and colour.

Chantal Pieterse

The author gratefully acknowledges the assistance of Ingrid Dixon, principal, Westville pre-primary school.

Project Team:
Architect: eThekwini City Architects in association with Architecture Fabrik | *Client Department:* eThekwini Community Development Department

1. Giese, S and Budlender, D. (2011). Government funding for early childhood development, ilafa Labantwana. Learning Brief No. 1. Cape Town.
2. eThekwini Municipality. (2015). 2015/2016 IDP Final Adopted version.
3. Martin, P., Berry, L., Biersteker, L., Desmond, C., Harrison, D., Naicker, S., Richter, L., Saloojee, H. and Slemming, W. (2014). Early Childhood Development: National ECD Policy. Pretoria: HSRC .

UPGRADING INACCESSIBLE RURAL SCHOOLS

AT NKANDLA

CNN Architects, Durban

These three schools are placed in the depth of rural KwaZulu-Natal

New classroom block at Qhobo

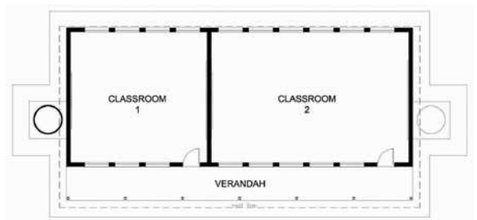
The well-lit interior of a classroom at Qhobo

The district of Nkandla is situated north of the Tugela. The area has few economic activities, remains under-developed, and lacks basic infrastructure and services. Nkandla town is the centre of local government and home to civil servants. People live on traditional land within rural homesteads. The inaccessibility of areas limits development and access to education, health and social facilities. As idyllic as it may appear, life is difficult.

Nkandla is an area of dramatic scenery: wide rivers, deep valleys, mountains, gorges, streams, indigenous rainforests, stone and mud structures, thatched roofs, sparse vegetation and rock. It was the final site of the Bambatha Rebellion.

We were appointed by the Independent Development Trust to design and administer the contracts of classroom blocks at three schools. Their locations were rural and remote, and they were part of a batch of 'inaccessible rural schools' that required to be upgraded by the provincial Department of Education (DOE).

KwaBiyela Primary School is in Bongela, south-east of Nkandla near the forest, and was accessed from the road between Eshowe and Nkandla. There were two means of access to the site, one along a long road which involved driving across a stream which often flooded after the rains, and the other down a much shorter but more dangerous steep road.

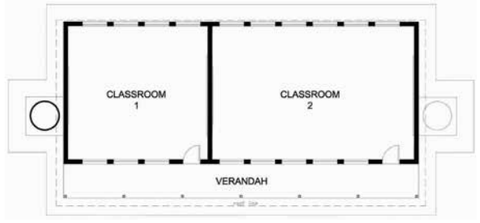


KwaBiyela Classrom Block 1 plan

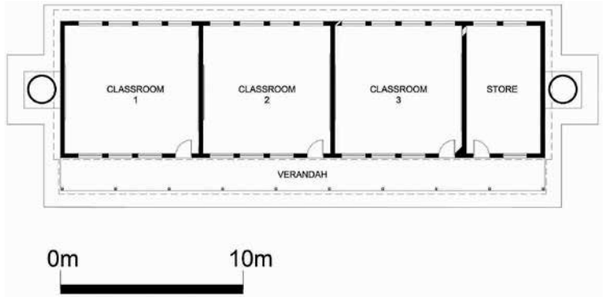
KwaBiyela Classrom Block 2 plan

KwaBiyela Site Plan

Nsundukazi Primary School is in Ntolwane, south of Nkandla near the private residence of President Jacob Zuma, and was accessed from the road between Eshowe and Kranskop. Access to the school was difficult and involved driving over two unpredictable streams.



Nsundukazi Classrom Block 1 plan

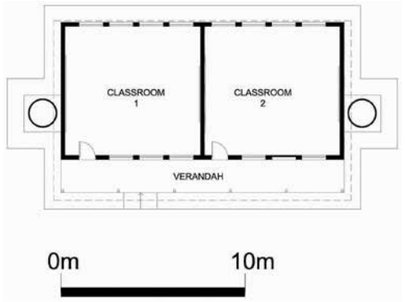


Nsundukazi Classrom Block 2 plan

Nsundukazi Site Plan

Qhobo Secondary School is in the remote area of Vezimanzi, west of Nkandla on a steep, rocky mountainside overlooking the Buffalo and Tugela river valleys. It was accessed from Kranskop, across Jameson's Drift, through the Qudeni forest towards Qudeni. The scenery was spectacular, but the journey was long and the roads poor. The school was located on the upper slope of a mountain with access across a river then up a very steep poorly surfaced road.

After many hours spent locating the sites, we conducted a quick but thorough site investigation, and agreed on the location of the new classrooms, toilets and the extent of new fencing. There were no site plans or land surveys. The existing structures were all of poor quality and were not suitable spaces for teaching. The sites were not fenced-off. There was no piped water, inadequate toilets and no electricity.



Qhobo Classroom Block

Qhobo Site Plan

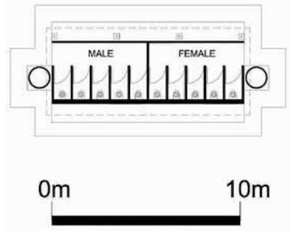
We designed three types of classroom blocks, each with two, three and four classrooms. Whilst we had received the standard DOE floor plans, we chose to redesign these in section to introduce additional natural lighting and ventilation. We prepared a motivation and obtained DOE sketch plan approval for these. The standard double-pitched roof with ceiling was replaced by monopitch roof with no ceilings. We introduced clerestory windows and louvres, and larger steel windows on all south facing elevations.

Roof trusses were exposed and painted white adding to the light quality. Highlighted coloured walls were introduced into classrooms. The toilet blocks were similarly designed as more open structures, with monopitch roofs over walls up to door head height for natural lighting and ventilation. Other DOE standards were maintained in terms of construction and finishes. We successfully completed the classroom blocks within the same budget as that for the DOE standard.

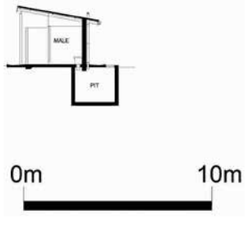
Karuni Naidoo

Typical Section 1

KwaBiyela Classroom



Typical Ablution Block



Typical Ablution Block Section

KwaBiyela Ablution Block

LANGA SECONDARY SCHOOL

PONGOLA DISTRICT, NORTHERN KWAZULU-NATAL

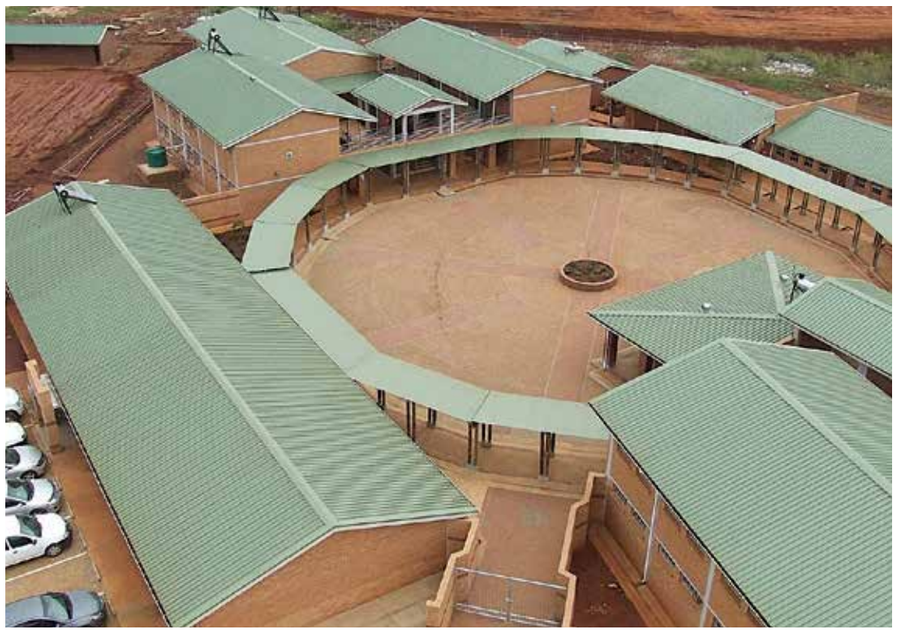
MNI Architects, Vryheid

This school for 1100 learners and 33 educators lies a kilometre off the N2, some 40km west of Pongola en route to Piet Retief. *Editor*

Brief
Like many rural schools the original school was constructed over a long period, by various organisations and of varying materials and specification. A 'condition assessment' was made, and it was decided to replace the entire school, due to structural inadequacies, incapacity and the incoherent arrangement of buildings.

Scope of work
The scope of work was based on the 'accommodation scheduling model' as prepared by the Department of Education. A site was earmarked immediately adjacent to the existing school premises, which allowed for construction to take place without impacting on the functioning of the existing school. After completion of the new school most of the existing structures were demolished and the area was converted to sports fields.

Classrooms before demolition

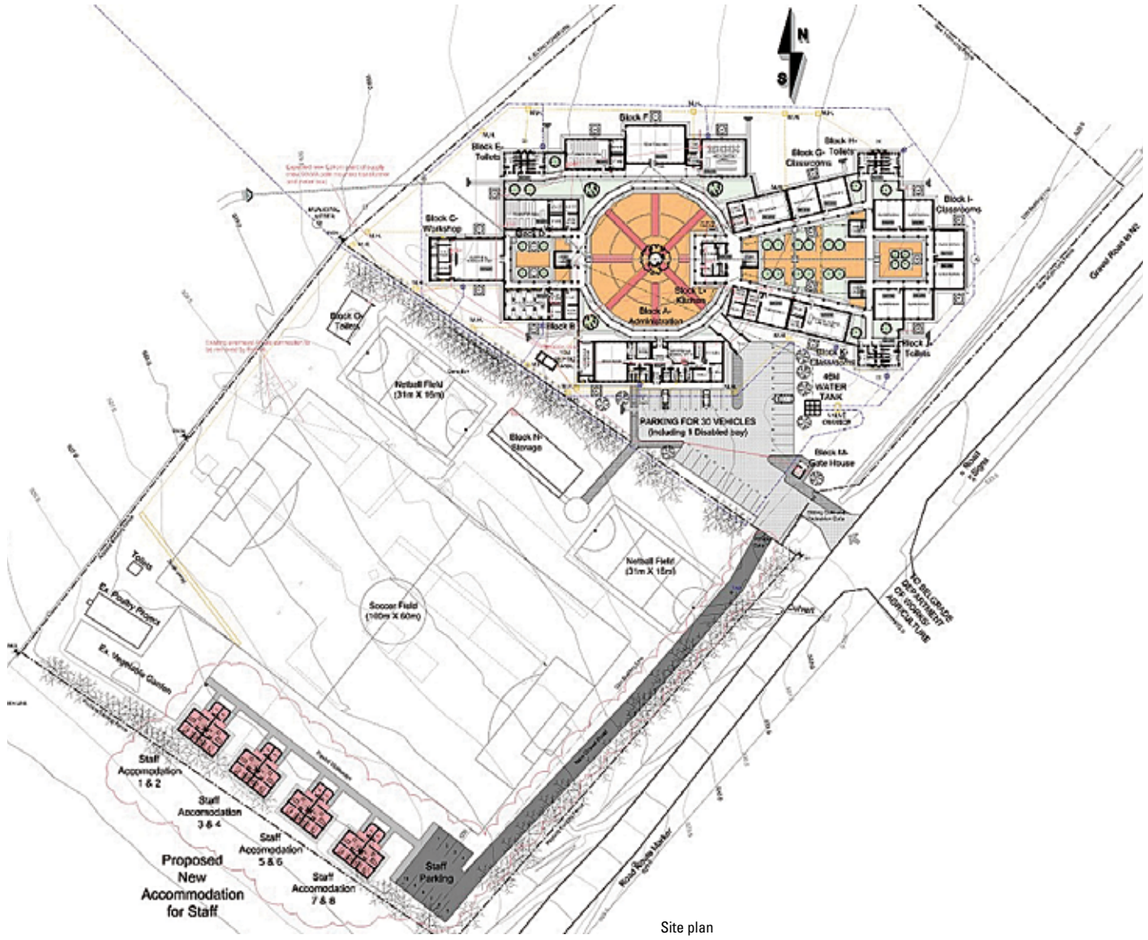


Aerial view of Langa Secondary School

Concept
The concept aspired to arrange the various buildings according to the programme to function as an interconnected complex with appropriate spaces between buildings, which allows for supervision as well as social assembling and interaction. The geometrical focal point of the complex is a circular assembly area expanding to secondary court-yard spaces linked with covered walkways. The objective was to create an interesting plan dimension so that the spaces between buildings become more meaningful than the buildings themselves. Energy efficiency was addressed through appropriate building orientation, ceiling and roof insulation, while solar water heating, gas cooking equipment and rainwater harvesting and filtering was also included.

Challenges
To regulate cost and space norms, standard drawings were stipulated and the challenge was to achieve an element of "delight" within the limitations of these nondescript prescripts.

Casper Louw



Site plan

Construction and technology details

View of the ambulatory

First floor plan

ECONOMIC EMPOWERMENT THROUGH EDUCATION

MIDLANDS COMMUNITY COLLEGE EXPANSION PROJECT

Architecture Fabrik, Durban

For over 30 years, Midlands Community College (MCC) has provided education opportunities to the most disadvantaged of South Africans throughout the Umgeni and Uthukela districts. The emphasis has always been on the disadvantaged and therefore learners at MCC are predominantly black Africans.

During 2014 alone, the College provided some form of education to over 8000 learners through various programmes and short courses. These programmes focus on young children through Early Childhood Development (ECD) courses and mobile toy libraries; supporting teachers and learners at primary and secondary schools through their mobile science laboratories. Over the last 16 years the College has had enormous success in the Technology, English, Accounting, Maths and Science Programme (TEAMS), giving post-matric learners the opportunity to improve their matric results and access tertiary education. 950 learners have passed through the TEAMS recovery programme since its inception. The College has maintained a 100% pass rate with 85% of those learners accepted into maths and science related degrees and diplomas at tertiary institutions. It is these high pass rates that have allowed the college to successfully leverage funding from the private and business sectors to heavily subsidise learners and attract qualified teaching staff from around the country.

The biggest challenge now facing rural communities is growing youth unemployment and there is a strong causal relationship between economic hardship and access to quality basic education. The statistics are daunting. According to CENSUS SA 2011, 75% of the local population is Black African with a youth unemployment rate of 32%. Only 15.5% of the local population has completed secondary schooling and only 2.2% has some form of higher education. This is well behind the national average where Black Africans make up 79.6% of the population but, at the very top of the education spectrum, only 8.3% has attained some form of post matric higher education.

Since 1996 the access to basic education between the ages of 5 to 9 has vastly improved, yet from the age of 18 onwards, there is a declining trend in accessing higher education (Fig 1).

Of the provinces, KwaZulu-Natal has seen the sharpest decline in matric pass rates, with a 7.7% drop from 77.4% in 2013 to 69.7% in 2014. This is a concerning trend as there is an undeniable link between education and economic empowerment. A study was published by STATS SA in 2010 showing the relationship between the level of education obtained and monthly earnings. The statistics are compelling; a person's monthly earning potential doubles with a matric certificate and triples with a tertiary qualification, when compared to only completing primary schooling (see Fig 2).

It is the local demand for access to tertiary education to which the college has responded. Unlike a normal school environment, fundamental to the success and high pass rates of the college is the residential programme for full-time learners. Not only are these learners given a second chance to excel, but are immersed in an environment which allows them to fully focus on their education. This programme also provides many with their first experience in living away from home, a vital life skill when continuing with tertiary and further learning, often in a distant urban centre.

The College, however, is operating at the limits of its physical capacity, only able to accommodate around 100 full-time learners with the demand ever increasing. In 2015, the College had to turn away over 340 eligible learners from their matric recovery program, unable to accommodate more in the existing dormitories.

To remedy this, the college embarked on a master planning and feasibility study to increase the number of full-time learners accommodated on site to a total of 240. This increase in students will require additional residences, classrooms, support facilities, teaching and support staff, upgrade of existing infrastructure and buildings. Student residences are critical to grow capacity in the matric recovery programme, but the master plan also includes a new pre-school to consolidate the on-site ECD learning programme and a dedicated Community Learning Centre to improve the delivery of the College's other community and skills development programmes.

A certain degree of detailed research was also necessary to future-proof the master plan. Existing and new accommodation was designed around the Draft Policy for Student Housing issued by the Department of Higher Education and Training (DHET). This prescribed norms for more generous accommodation with ancillary areas like student common rooms and dedicated study spaces. The design of the buildings also had to consider alternative energy and water heating methods to reduce operating costs in the business plan, requiring a relatively high level of thermal efficiency in the building envelope. There was also an initial desire to reuse the existing buildings, but the infrastructure survey and geotechnical investigations confirmed poor soil conditions and quite flimsy construction. While demolishing the buildings was considered, there was a general reluctance to erase the physical memory of the College.

Phasing of the development had to be carefully planned to allow the college to keep educating its students uninterrupted. The interactive workshops had shown that all stakeholders, students and professionals believed that the new college should be concentrated in its current location. The engineers later determined that much of the undeveloped site downhill would be necessary to treat and disperse increased volumes of waste water. In order to meet the brief, the college would have to be planned over two levels. Retaining existing buildings would also allow for phasing during construction. A structural steel frame system was therefore conceived to bridge over the old buildings without bearing on existing walls. Double storey also meant ramps to comply with universal access regulations. While it could be argued that the final master plan was compromised by adhering to the relics of the past, there is a certain poetic narrative that the past three decades should actively shape the future college spatially. Rather than being discarded, these face brick buildings informed an aesthetic language of a literal rustic base, over which the new college wraps and emerges. Gone are the ubiquitous gabled classrooms of a bygone era, redefined by steel framed structures that bridge over the past towards a new future.

Martin Kluger

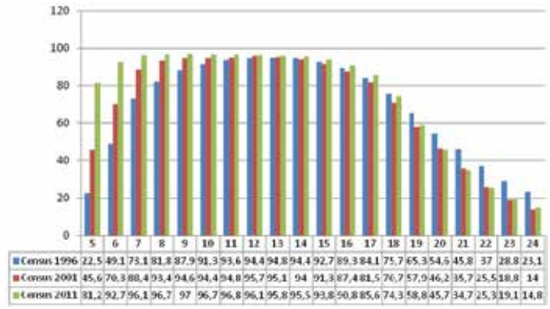


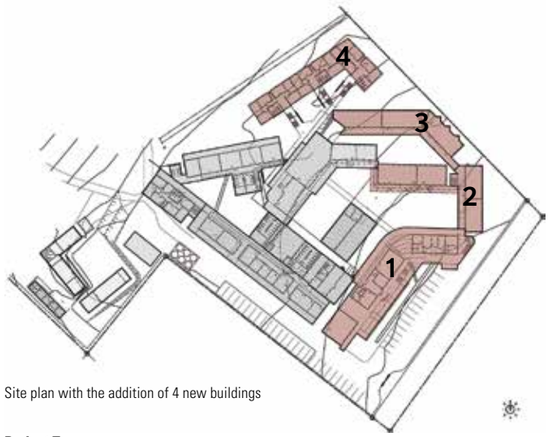
Fig 1. Percentage of persons aged 5–24 years attending an educational institution
Censuses 1996, 2001 and 2011

Table C: Distribution of monthly earnings by education

Education level	Employees	Bottom 5%	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%	Top 5%
	Thousand	Rand						
All levels of education	**11 058**	**570**	**845**	**1 500**	**2 800**	**6 500**	**12 000**	**17 000**
No schooling	307	400	450	700	1 100	1 950	3 800	5 500
Less than primary completed	897	390	470	800	1 300	2 167	4 000	5 000
Primary completed	512	450	600	975	1 500	2 600	4 333	5 000
Secondary not completed	3 607	500	750	1 200	1 993	3 467	6 000	8 950
Secondary completed	3 455	900	1 200	2 000	3 500	7 000	11 000	15 000
Tertiary	2 134	1 500	2 500	5 500	10 000	15 000	23 333	33 000
Other	146	500	700	1 300	2 380	5 400	10 000	15 000

Fig 2. Monthly Earnings of South Africans, 2010
Source: Statistics SA.

Existing site plan



Site plan with the addition of 4 new buildings

Project Team:
Development economists: Urban Econ
Engineers: ARUP
Geotechnical engineers: Drennan Maud
Quantity Surveyors: Akha Izwe

Building 1 seen from the south-west

Building 4 seen from the south-west

LECTURE THEATRES

UNIVERSITY FO ZULULAND - KWADLANGEZWA CAMPUS

M.A. Gafoor Architects, Durban

The Kwadlangezwa or main campus of the University of Zululand, is located some 10km inland from Mtunzini and 19km south of Empangeni. *Editor*

The brief was to create a new building for the University of Zululand (Unizulu). The site for the new building is located centrally within the campus, occupying the space of a disused amphitheatre. Adjoining the site, to the east is the prominent five storey, glass clad, Arts Department building and to the west are the prefabricated Nursing Science buildings.

The new building was to replace a disused amphitheatre and provide additional lecture theatre venues along with smaller flexible classroom/discussion rooms. The various existing pedestrian linkages were critical to the formation of the conceptual design. Acknowledging these links, along with the topography of the site led to the expression of the form of the building.

On the western edge of the site, adjoining the Nursing Science buildings is a large concourse which acts as the primary link between the staff parking (on the south edge) and the Library and Geography buildings to the north. The classrooms are situated above the concourse and the depth of the slab over provides adequate solar control against the harsh western sunlight. A similar south-north linkage exists at the eastern edge of the site adjacent the Arts building. The upper level concourse provides stair and lift access to the classrooms and lecture rooms on the first and second floors and ablutions at the lower ground level. Alongside both upper and lower level concourses, social spaces have been provided for students. The lecture theatres follow the contour of the existing site, raking down from the concourse level through to the lower level concourse on the eastern edge. East-west linkages on either side of the lecture theatres link the lower and upper levels and stitch the spatial fabric of the existing spaces.

The architectural palette is based on the vocabulary of much of the existing campus buildings, featuring satin red facebrick and off-shutter concrete. The requirements for enclosed lecture theatres informed the form and mass of the theatre block. The primary axis of the main concourse along with multi-level voids attempts to break down the mass of the theatre block. On the eastern edge, air handling units have been housed within concrete rendered towers, around which social spaces have been arranged. These towers isolate the noise from the HVAC machinery and allow servicing of equipment without interrupting lectures and classes. The two stories of classrooms, accessed via the first and second floors, feature stacking doors that allow flexible use of the spaces. These classrooms are shielded from the western sunlight by means of aluminium louvres, housed within the wall cladding which forms a natural extension of the building's roof sheeting. The southern edge features natural timber slats to act as a sun screen device and shield the south-westerly winds and rain. They pay homage to the indigenous building materials found within the Zululand area.

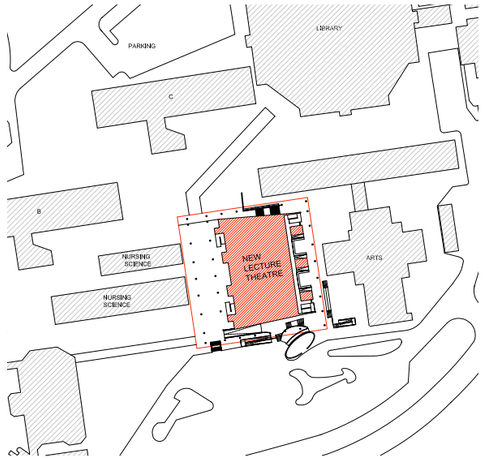
Gaf Gafoor

View from the south west

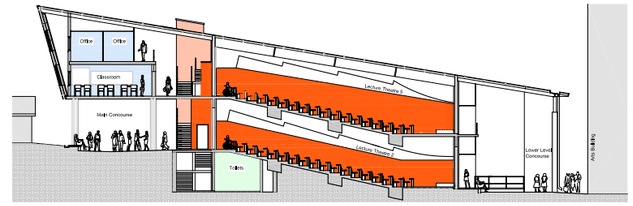
View of the piazza from the east

The architect presenting the design

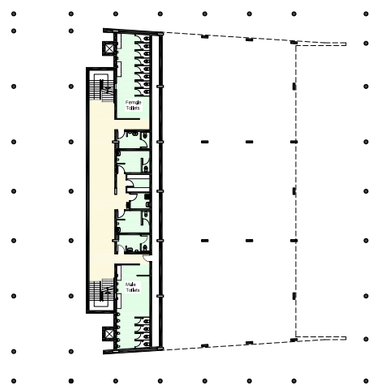
Project Team:
Structural & Civil Engineers: Young and Satharia Consulting Structural and Civil Engineers
Quantity Surveyor: Akha Izwe Quantity Surveyors & Project Consultants
Electrical Engineers: Sydney Naidoo Associates
Mechanical Engineers: Dihlase Consulting Engineers
Geotechnical Engineers: Davies Lynn & Partners
Contractor: Grinaker LTA Ltd
Photographer: Eric Brinkman Photo & Video



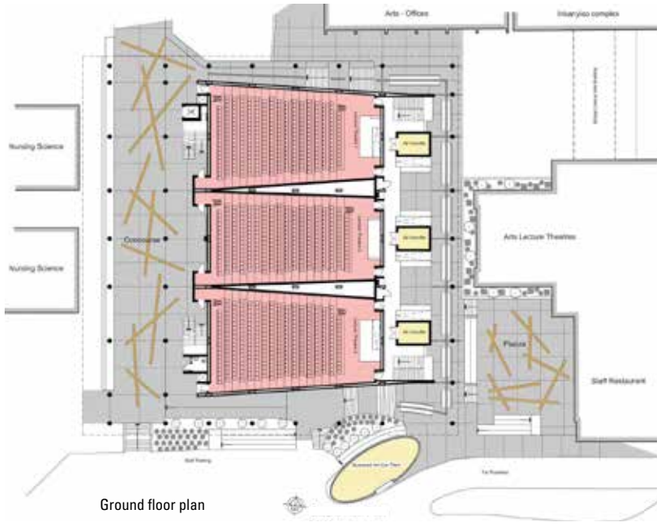
Site / locality plan



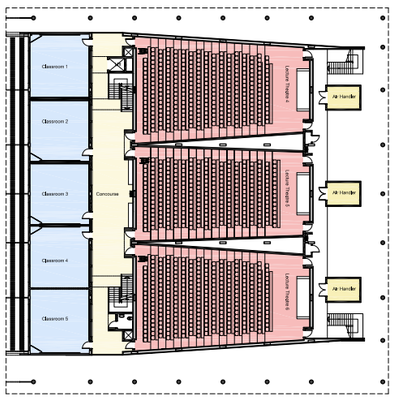
Section



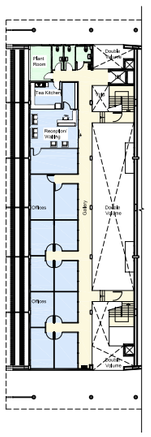
Basement plan



Ground floor plan



First floor plan



Second floor plan

HANS HALLEN'S 1960s RESIDENTIAL ACCOMMODATION

HOWARD COLLEGE CAMPUS, UKZN

Walter Peters

Photographs by Angela Buckland

Half-a-century ago, the practice of Hallen & Dibb landed in succession, and produced as a triad, what are arguably the best examples of Brutalism in South Africa. This overview captures the achievements on the occasion of the visit of Hans Hallen to Durban in May 2016.

John Bews hall, 1964

Residential accommodation for female students was in high demand and it was important that this be sited as close as possible to the academic centre of campus, hence the investigation of available land meeting this criteria and the necessity therefor to build on steep land. The first hall for 100 female students was named after the inaugural rector of the University.

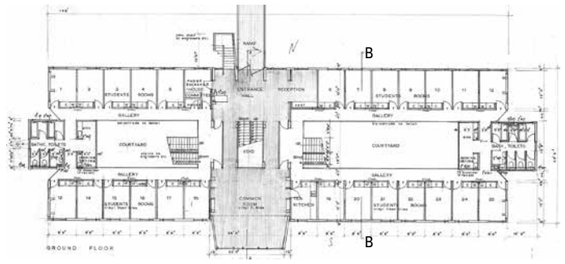
Due to a shortage of bricks Hallen had to consider reinforced concrete, a method of construction he had experienced while working in the architects' department of the London County Council in 1956. What is more, the construction is without beams or columns.

University halls of residence have a long tradition of cells placed off an internal corridor, single or double-loaded, a mould Louis Kahn broke in his Erdman hall at Bryn Mawr College, Pa., 1960-65, which building was among Kahn's first works to achieve international recognition. It was probably in this context that Hallen investigated exploding the traditional internal corridor to create a top-lit atrium space.

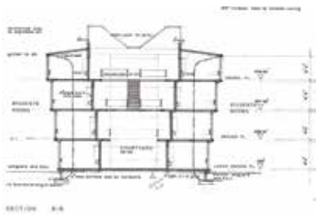
As the section shows, each stem of rooms to the H-shape plan is stacked above the other, and stepped so that each floor cantilevers outward in both the longitudinal direction and on the end returns. The cross-bar of the H contains the main staircase and communal facilities with the 'common room' on the entrance level projecting southward from the building mass, and up the staircase, the senior common room designed as a gallery, which overlooks the double-height, outer portion of the lower.

The canted cross-sections of both stems of the H-plan result in funnel-like volumes to the interior atriums, penetrated by staircases and bridges linking to the access-ways off which the students' rooms are entered, with day light and the sun flooding the spaces through roof monitors facing both north and south and running the lengths of each atrium.

Topography had suggested that the main entrance be from the north, connected to a pedestrian route by way of a bridge leading into the upper ground floor, and that the secondary entrance be from the south on the lower ground floor, accessible by vehicle from the access road off John Turner (Francois) Road.



John Bews Hall upper ground floor plan



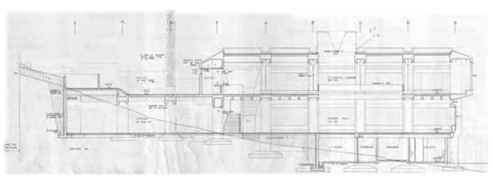
Section BB

Interior of atrium

Northern elevation

GC Scully dining hall, 1965

The concomitant dining hall and lounge was named after the chairman of the Natal University Development Fund. To accommodate this building on the steeply sloping land, Hallen dug the kitchen into the ground but left two sides free for daylighting and cross ventilation by way of exaggerated intake scoops. He designed a stepped piazza over the kitchen roof as an outdoor social focus area from which the lounge was directly accessible. Below was the dining room, linked spatially by the void in the middle of the floor, and surrounded by built-in seating under the central skylight.



Longitudinal section through Scully hall

Mabel Palmer residence, 1966

A further 200 female student residence was to be hemmed in on the incline cut for the existing tennis courts, which prompted Hallen to propose a residence in two blocks for 100 students, each the size of John Bews hall, with shared communal facilities. This residence was named after Dr Mabel Palmer, champion for maintaining 'non-European' education at the whites-only University.

Again, one must look to Erdman Hall as a source of inspiration, because of its compelling geometric composition of three interlocking, tilted squares in series. However, in detail the design of Mabel Palmer residence differs fundamentally. First, while indeed concatenated, the two squares lock into a common minor square, which provides the common spaces. Second, the perimetric rooms are planned around courts and the whole of the interior volume is clerestory lit, by way of a hyperbolic paraboloidal roof of thin reinforced concrete membrane.

Stairs descend to each courtyard directly from the common area as well as on the opposite corners. Getting to the upper floors is only possible along the passages designed as bridges that converge in the centre of the volume where at the crossing of four columns – set on the diagonal – staircases ascend in both opposite directions directly up to the top floor, while veering off diagonally a the landing to the 3rd floor.

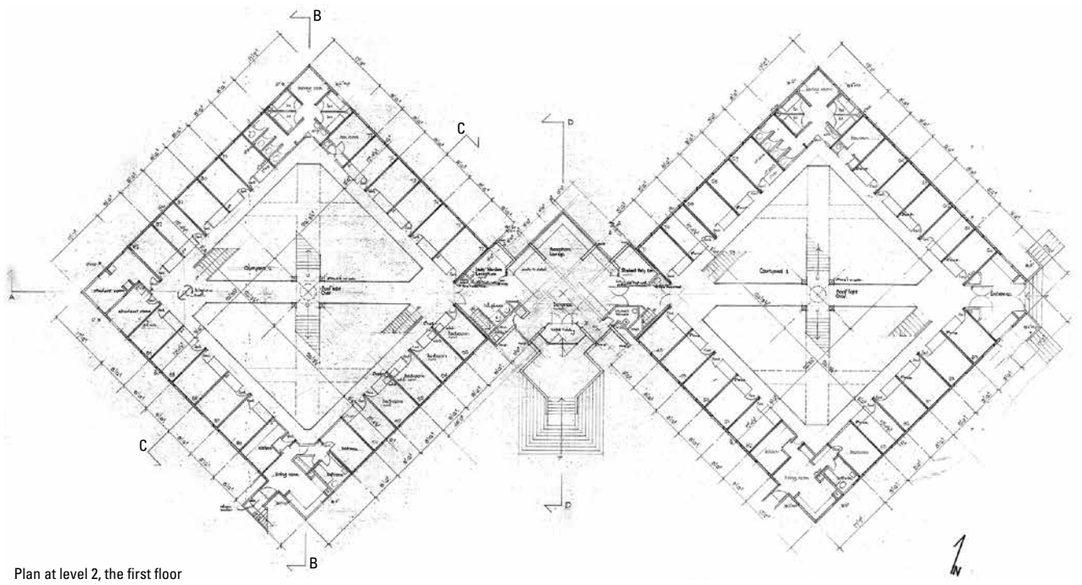
The floors jetty like John Bews residence, as do this time the ablutions. As before, the residence building is four floors high and construction of in situ, reinforced concrete, and the exterior is also vertically striated, to control staining and weathering. Luckily the residence was designed in two blocks for on opening the northern had to accommodate male students.

While in this triad one cannot deny traces of Le Corbusier, especially his La Tourette monastery, Kallmann's Boston city hall, the works of Paul Rudolph, particularly his Creative Arts Center at Colgate University, Hamilton, NY, 1963-66, and, of course, Bryn Mawr College by Louis Kahn, there are no direct borrowings. Hallen was more self-reliant, his designs always surprised.

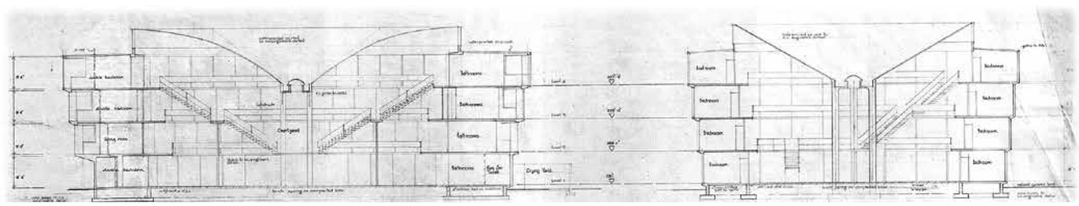
Northern elevation

Interior volume

The author gratefully acknowledges the assistance of Michele Jacobs of the Biermann Architecture Library, UKZN, in which the Hallen drawings collection is housed.



Plan at level 2, the first floor



Section B-B, clearly showing the hyperbolic section of the roof

Section C-C

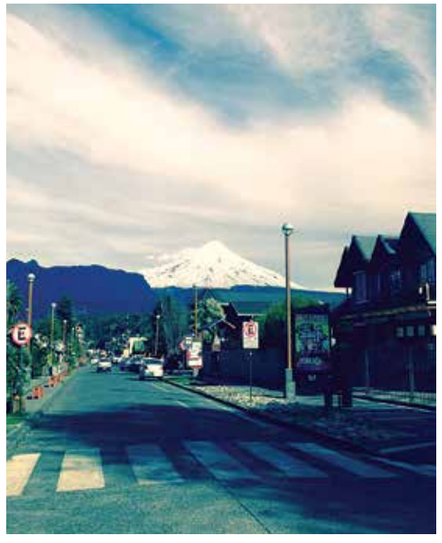
TRAVEL DIARY CHILE

Jono James

The plan was to stay with a Chilean family whom we had met during a school exchange in Durban many years before, and tour Chile. We had done very little research on what or where we would go and relied quite heavily on our host family's direction. We had just over two weeks for our trip.

We flew into Santiago where our host family resides, after a brief stopover and airport change in Argentina. We got to see a small part of Buenos Aires en-route to the next airport; the classical architecture gives way rather dramatically to favela style slums as you exit Buenos Aires.

Our first long stay destination in Chile was in Villarrica alongside the Villarrica lagoon.



View of Volcán Villarrica from Pucón

It's a local holiday destination and in the summer months it's packed with holiday makers. In the autumn months while we were there the towns are less populated. We spent a week here touring Pucón, Licanray, and many of the thermal hot springs.

Pucón

Termas Geométricas Licanray

I got to climb the Volcano which erupted this year in March after having been dormant since the '80s.

Jono James on top of the world

We ate and drank - coffee or local beers - at every opportunity. The buildings here make use of whole log construction and timber is used in many parts of the architecture from structure to fine details. In some buildings the timber still resembles the tree it once was.

Timber detailing

Santiago was again our turn-around spot and we went from here to our first visit of the Pacific Ocean the port city of Valparaiso. Valparaiso specifically has many of the Spanish influences we see in some of our own Architecture here in Durban having been built around a similar epoch. Located on steep coastal mountains the City is made accessible by a network of funiculars and a multitude of stairways moving in between tightly spaced buildings on narrow pedestrian orientated streets. Many of the buildings are accessed through celebrated yet antiquated doorways.

One of many beautiful doorways in Valparaiso

Back in Santiago we finally got to tour this flamboyant city, there are many examples of classical architecture here hosting civic offices and museums interspersed with modern institutional and cultural buildings of which the Gabriela Mistral Cultural Centre by architect Cristian Fernandez is a standout example with its expansive punched Corten steel facade.

Gabriela Mistral Cultural Centre by Architect Cristian Fernandez

We did most of our sightseeing on foot here as we were guided by a young architect, the sister of one of our hosts. We toured varying interest locations: we walked the Santiago Patrimonial pathway which links Santiago's monuments and historic buildings; climbed the Cerro (hill) San Christóbal and visited the 22m statue of the 'blessed Virgin Mary' as the second highest point in the city the top of the Cerro affords views of the whole city; we meandered through the old traders market still in daily use and took in the sheer dominance of the Metropolitan Cathedral of Santiago built between 1748 and 1800 (the seat of the archbishop of Santiago) opposite the Plaza de Armas.

View from Japanese gardens at foot of San Cristobal towards Costanera Skyscraper complex

We finally deviated from the Santiago Patrimonial juxtaposing our cathedral visit with a visit to a modern cathedral in the form of the Costanera Skyscraper shopping complex the tallest building in Latin America at 300 metres which opened in 2012.

Being an avid surfer and with no opportunity to sample the waves of the Pacific in Valparaiso we made a quick trip to Punta de Lobos near Pichilemu towards the end of our stay in Santiago.

Punta de Lobos, Pichilemu.

It is a renowned big wave world tour spot with a dramatic coastline and frigid water. The big wave tour were in town for a possible event, which meant the waves were good and I had an opportunity to surf some of the longest waves I've ever had the good fortune of surfing.

Back in Santiago for a couple days before our flights back home we ventured out on our own when our hosts were at work and managed to negotiate the public trains, even though we got a little turned around, the little bit of Spanish I had picked up saw us finding our way safely back to our hosts' apartment.

We flew home via a long layover in Sao Paulo, Brazil which afforded us time to reflect; the Chileans are a social and friendly people with an amazing and diverse country. Chile is divided into five geographical zones and a further 15 regions divided into 54 provinces, we only had time to explore a small portion of Chile and would love to return given the opportunity to do so.

The trip together with his wife and sister-in-law took place during April 2014. Jono is the director of *Maker d+a*. Editor

KZNIA JOURNAL SPONSORED BY COROBRIK

COROBRIK®