

Close out Report

of the New Universities Project Management Team on the

Development of New Universities in
Mpumalanga and the Northern Cape

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UNIVERSITY OF
MPUMALANGA



SOL PLAATJE
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higher education
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Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

Chapter 10

Design development and Project Delivery Goals



10. Design Development and Project Delivery Goals

10.1 ESTABLISHING DESIGN TEAMS AND BRIEFS

10.1.1 Assembling the team

Renovation of existing buildings for the 2014 academic year provided accommodation for the first small cohort of students and staff at both universities. From then onwards, the NUPMT implementation strategy focused on the construction of new buildings, continued renovation of existing buildings for both 2015 and 2016 and on bulk infrastructure.

The successful conclusion of the two-stage architectural design competition towards the end of 2013 and the related procurement processes culminated in the appointment of architects for the two universities and allowed for the development of the designs of the first phase of new buildings and infrastructure required for the start of the 2016 academic year. Architectural design work commenced towards the end of 2013 at SPU and the beginning of 2014 at UMP. This design work was based on the spatial development and implementation plans previously established.

In February 2014, in accordance with the approved integrated project implementation plan, the Project Management Team (PMT) embarked on the procurement process to appoint a team of design consultants to work with the appointed architects on the detailed design of the new buildings.

Tenders were advertised to appoint as many as 15 additional service providers for each university, including project managers, cost consultants, engineers (civil, electrical, mechanical, structural, geotechnical, acoustic, fire, traffic) landscape architecture, strategic environmental sustainability, wet services, land surveying, health and safety monitoring and environmental compliance monitoring. (see Chapter on Procurement for full details).^[10-1] After their appointment in September 2014, the three contractors at SPU and two at UMP would take their place in the respective design teams, bringing their implementation expertise to the design development. At SPU the selected contractors were Qualicon, Trencon and Murray and Dickson, and at UMP they were Norse and Trencon.

The NUPMT had expedited the detailed design of one building for each university to enable a tendering process for the appointment of the building contractors by August 2014 in order to be on site by September 2014, which was believed to be the latest start date for completion by January 2016. This programme was eventually delayed by one month but readiness for occupation was achieved by the target date.

While the overarching spatial design and development frameworks and the planned 10 to 12 year development period have remained largely unchanged, intensive consultation with the academic leadership continuously shaped and aligned the priorities, forward planning and the design of new buildings. This consultation resulted in an evolving 5-year plan, the first of which formed part of the handover of infrastructure responsibility and is described in the final chapter dealing with handover and close out.

At both universities architects were allocated buildings according to their level of complexity and the relevant experience of the various architects. So, for example at UMP, student residences were assigned to Cohen and Garson Architects, whilst multi-purpose academic and teaching buildings were allocated to TC Design and URBA Architects due to their past

experience with raked auditoria and educational buildings. After their appointment, different quantity surveyors and engineering disciplines were assigned to the architects as the design team leaders, responsible for design integration

The principle of allocating buildings in accordance with capacity would also be applied when assigning work to the appointed contractors.

From the outset it was made clear that the budget derives from the DHET cost norms for university buildings and that an overriding challenge was to design to a control budget. As the budget derived from the Assignable Square Metres (ASMs) in the building, it was critical to ensure the efficiency of the buildings designed.

10.1.2 Design Work Sessions

At the beginning, two extensive briefings were given to the selected architects ^[10-2] firstly highlighting the mission development frameworks of the universities, the process followed towards their establishment as well as the architectural guidelines and spatial qualities expected. The management of the divergent architects required a considered methodology to allow the architects to explore new approaches to higher education architecture but also to provide controls and guidelines in order to achieve synergy and a holistic campus visualisation.

To realise these dual objectives, general campus architectural guidelines were completed for the buildings and campus areas to be constructed during the first phase of the implementation programme. The Spatial and Architectural Guidelines Document ^[10-3] described performance qualities around building form, the functional programming, parking, loading and service accesses, orientation, building heights, entrance locations, building façade and roof treatment, edge conditions and landscaping.

The Architectural Guidelines facilitated an open discourse with the various architects, who contributed critique and added to guidelines specification. The NUPMT endeavoured to avoid being seen as arbiter of all decisions, and in discussion required the five architects at SPU and the four at UMP to monitor and critique each other. Most discussions or changes to the Architectural Guidelines were made through consensus between the architects and the NUPMT. One example of this was the selection of the standard face-brick. The guidelines required that face-brick be the dominant material used at both UMP and SPU, but the architects had the freedom to choose and agree upon the common product for each university. This involved the establishment of performance criteria for the brick, including its manufacturing within close proximity to the universities, its quality and price.

The same discussions and eventual consensus was reached on the final height of the buildings, number of floors, student bedroom configurations, universal access standards, environmental performance standards or goals, and auditorium plan types.

10.1.3 Architectural Briefs

The joint work sessions allowed for improved synergy of the various buildings, and also informed the comprehensive architectural briefs of the individual projects. The functional programmes for the individual buildings were formulated in conjunction with the academic leaders of the university. The first projects were also aligned with the student enrolment numbers of each university.

The first projects prioritised the general teaching, administrative and residential requirements of the universities, with the initial focus on providing all-purpose teaching and lecturing spaces to be shared by various academic programmes. A mixture of smaller and larger teaching venues was provided in central locations at both universities. Specialised teaching venues, for example laboratories or language laboratories, were assigned to subsequent construction phases.

Each project brief to the design teams included specifications and regulation on the general aim and intentions of the building, its location and relationship to the campus and surrounding buildings, access, built form directives, build-to lines, height and edge treatment. [10-4] Together with the design guideline, each project team was issued with a comprehensive accommodation schedule. Architects had to test the accommodation requirements on the selected site, interrogate the requirements against the design guidelines, and confirm the viability of the accommodation schedule. [10-5]

During 2014 the Treasury budget allocation to the New Universities Project was substantially reduced from the amount envisaged in the feasibility study submitted compelling a reassessment of the Implementation Plan. Originally five building projects would have been completed during the first phase of SPU, and six buildings at UMP. The adjustment in budget allowed for only three projects at each university to be implemented within the first phase, meaning that some of the design teams had to defer their input to the following year. At SPU the following projects were prioritised:

- i. Building Project C001 – Student residence, seminar spaces and ICT (Activate Architects);
- ii. Building Project C002 – Student residence, lecture venues, 600 seater dining hall, exam hall, seminar spaces and offices (Savage and Dodd Architects);
- iii. Building Project C003 – Multi-purpose academic building with offices and seminar rooms. (Wilkinson, Lambrechts and GXY Architects).

At UMP the following projects were selected:

- i. Building Project LP01 – Student residence (Cohen and Garson Architects);
- ii. Building Project LP04 – Academic offices, public lecture venue and seater seminar spaces (TC Design Architects);
- iii. Building Project LP06 – Multi-purpose academic building with laboratories, offices a variety of lecture venues, auditorium and seminar rooms. (Conco Bryan Architects).

10.1.4 Campus Design and Architecture

By 2016 R1.5 billion had been invested in the infrastructure development of the two universities enabling both to start their academic programmes in a variety of renovated and new buildings on fledging campuses. The investment included further building projects in the planning pipeline.

South Africa's aspirations for its first universities in the democratic era were, and remain, immense. From the perspective of spatial design, the vision for the new universities as symbols of democracy, inclusiveness and growth requires that both institutions be relevant to, and engaged within their settings - and able to create a growing knowledge environment of the highest standard. A number of spatial principles continue to drive the campus design and architecture of both universities, namely:

- The campus integration with its host city;
- Shared space as driver for the campus plan;
- Accommodating students;
- Student and staff mobility;
- Collaboration and exchange of ideas;
- Environmental sustainability.

10.2 INTEGRATION WITH THE HOST CITY

In order to support the academic mission of each university all solutions to physical planning needed to be comprehensive, with nothing considered in isolation. Issues of building placement, traffic and parking, engineering systems and aesthetics were all woven together to form a tapestry of buildings and spaces that foster a successful academic community.

In the case of the Sol Plaatje University, designing the campus into the fabric of the city requires it to act in a civic manner, participating in all the functions of the host city. To further enhance the principle of full integration and inclusiveness no distinction is drawn between the plan for the university campus and the plan for the City of Kimberley. The reduced impact of the mining industry on Kimberley requires the university to fill a greater role in regeneration of the urban fabric, a responsibility only achieved if the campus is cohesively integrated within the city. Universities are increasingly expected not only to conduct education and research, but also to contribute actively to the economic, social and cultural development of their regions and host cities. The civic nature of the campus plan uses its location to help form the identity of the university and provides opportunities for the growth of learners, businesses and public institutions. (Fig. 10.1 & 10.2)

An example of this involves the integration of the Oppenheimer Memorial Park into the Sol Plaatje University campus. The park was formerly the setting of the Malay Camp, home to thousands of migrant workers in the mining industry, evicted in the 1950s to make way for the expansion of the Kimberley Civic Centre and the creation of a new park. The City of Kimberley and the Sol Plaatje University have made the Oppenheimer Park a shared responsibility, addressing social injustice, commemorating the heritage associated with the land, but also creating a generous, active and eminent urban gathering space for the whole city to enjoy.

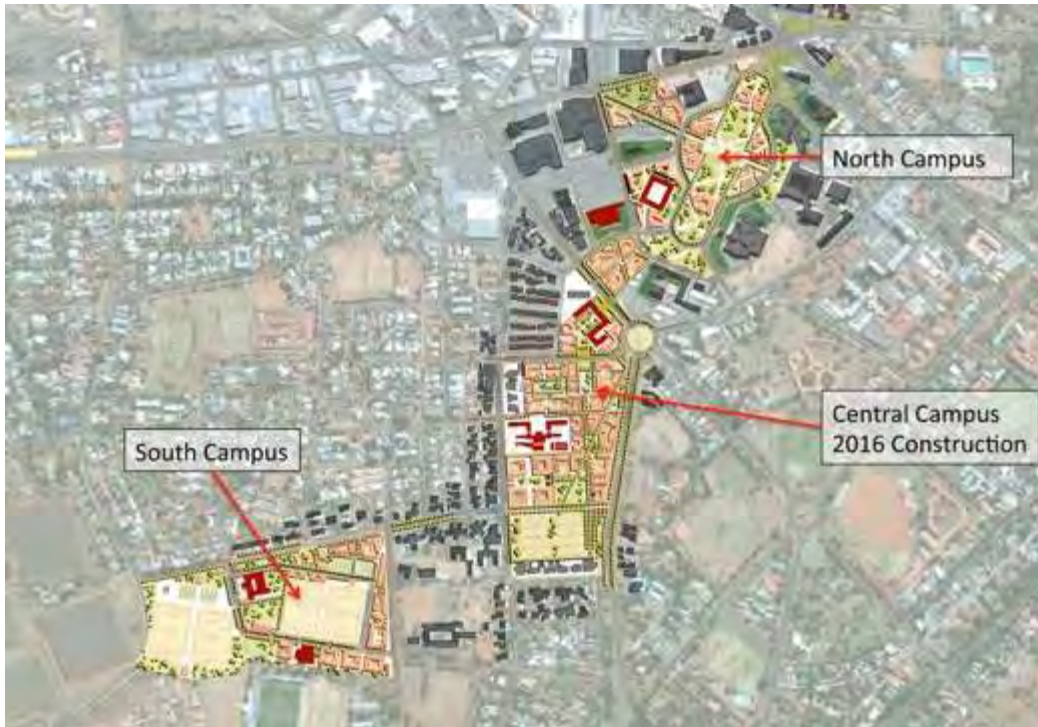


Fig 10.1: Sol Plaatje University Campus plan integrated into existing Kimberley urban fabric



Fig 10.2: Overall development plan of the Mbombela Campus of the University of Mpumalanga

10.3 SHARED AND COMMON SPACE AS DRIVER FOR THE CAMPUS PLAN

The university campuses were designed with the understanding that students come to shared spaces with simple needs: rest, relaxation, recreation and respite, but the spaces

also enable chance meetings, foster exchange, stimulating ideas, giving hope and a sense of possibilities. The idea of sharing, which is a particularly positive African notion, is reinforced by the provision of multiple common spaces on the campus ranging from focal squares, to parks and tranquil courtyards. These common spaces are designed to inspire, foster appreciation of what is good among us, and broaden the student community capacity to imagine and create a better future. They are places with no copyright, students share them and benefit from them. They are the interface of university exchange and a platform for learning with the broader community. (Fig. 10.3)

For too long our university campuses have focused primarily on the individual faculty buildings, with little regard for the surrounding open space, or the greater campus setting. To maximise learning and exchange, both new universities have used shared and common spaces as the drivers and backbone for the campus plan.

Open spaces of varying size, form and function have been planned to link via pedestrian and non-motorised routes, forming the stage onto which all the new university buildings face. Campus buildings have been planned to engage with and focus onto the common spaces, allowing a variety of activities such as restaurants, shops, coffee shops, book stores, banks and laundries to spill out onto these public spaces.

At the University of Mpumalanga, where the setting is more rural, the academic buildings were designed to maximise spaces for chance encounters and exchange amongst students and staff. All buildings have attractive courtyards, designed to provide quiet landscaped contemplative spaces, or for gatherings to discuss and deliberate, or for people to simply enjoy sharing. (Fig. 10.4)



Fig 10.3: Central Campus Square Sol Plaatje University as focus for surrounding academic and residential buildings.



Fig 10.4: Courtyard in the Science Block at the University of Mpumalanga.

10.4 ACCOMMODATING STUDENTS

Until recently, universities tended to emphasise their role as places for teaching and research, with a minority of students in residences and the rest left to arrange their own accommodation. The two new universities underline the positive aspects of students living on or close to campus in 'living-learning communities'. These communities are seen as enhancing integration and orientation, promoting students' intellectual, cultural and social development, and improving retention and academic success.

The Department of Higher Education and Training committed both new universities to large proportions of campus based student residences. Campus residences will accommodate up to 80% of Sol Plaatje University students, and 60% of the students of the University of Mpumalanga. Providing student housing for high numbers constitutes a large portion of the infrastructure spend and is an important component of the overall campus. Creating a sense of community and belonging, a home away from home and an environment that uplifts the human spirit is integral for providing an environment conducive to cross collaboration with other students and researchers from different sciences and levels of study. With this in mind, student residences were designed to be more than dormitories, becoming places of mixed use by including seminar and teaching spaces, study areas and even entertainment zones. (Fig. 10.5)

The residences are arranged as several smaller buildings clustered around varying central courtyards and gardens, which is an ideal configuration to encourage their residents to informal gathering and meeting. The courtyards are quiet and partly shaded outdoor spaces that serve as a transition between individual apartment units and the broader campus. Moving away from traditionally planned faceless corridor dormitories, students are instead clustered into smaller groups around shared amenities to ensure their greater sense of cohesion. (Fig. 10.6)



Fig 10.5: Residences at the University of Mpumalanga.



Fig 10.6: Residences are arranged as several smaller buildings clustered around varying central courtyards and gardens at the University of Mpumalanga.

10.5 STUDENT AND STAFF MOBILITY

Most South African university campuses are dominated by private vehicular movement and parking zones. Not only does this detract negatively from the quality of the campus environment, but it also drains valuable resources from the academic programme. Planning for a more balanced movement network entails a fundamental shift of focus onto non-motorised transport and the pedestrian. In the case of Sol Plaatje University, cars are pushed to the periphery, allowing the campus to be car free, and to make way for pedestrians and cyclists. In mandating a non-motorised campus, the university has introduced a very successful cycling programme, and students and staff receive a university branded bicycle to commute to and from campus. (Fig. 10.7)

Universal access is a further component of the inclusive university design, and aims to produce buildings and environments that are inherently accessible to people with disabilities.

Equity of access demands that all have equal access to all facilities and amenities on campuses. The principles of Universal Access have been used from the onset of the planning and design process to promote human equity and dignity. This includes ensuring that all renovated and newly constructed buildings are free of potential environmental barriers and consistently follow accessibility standards throughout the campuses. By ensuring ease of access to the university campus, the shared spaces and facilities support independent living and full participation in all aspects of university life, ultimately reinforcing the inclusion and integration of diverse members of society.



Fig 10.7: Students and staff receive a university branded bicycle to commute to and from campus at the Sol Plaatje University.

10.6 COLLABORATION AND EXCHANGE OF IDEAS

In the past architects designed campus buildings to meet the needs of specific faculty programmes. It was assumed that the programmes would never change and buildings were constructed accordingly; solid and often inflexible. But no more. At both universities, flexible and resilient building design is the point of departure.

The new universities are imagined as campuses populated with spaces that create a culture of 24/7 learning. The rise of the generation that embraces social media and connectivity means that learning spaces must no longer operate as mono-functional spaces with limited usage after lecture hours. All the spaces and buildings from residences to resource centres function as environments that support collaboration, with flexibility for restructuring depending on academic needs. Where in the past pedagogy has normally been constrained

by the physical structure of space, this flexible approach allows new teaching models that are varied and encourage sharing of resources and the uniting of disciplines in vibrant cross-fertilising venues. Academic spaces are planned as robust places able to accommodate change over time. (Fig. 10.8)

Over the course of eight years the Department of Higher Education and Training has supported the development of infrastructure expansion at South African universities. A large variety of buildings have been developed, all showcasing best practice in accommodating greater numbers of students, lecture venues, laboratories and support amenities. These examples were hugely beneficial to the design and planning of the new universities and were used as precedents in guiding the development of the new buildings and facilities. In addition, some of the research done by the architects was incorporated into a book on South African university buildings, project managed by the NUPMT and titled “*Woza Sizokwakha – Building Higher Education*”.

The best practice identified, together with the aim to create resilient structures that can accommodate a greater mix of academic spaces has supported the development of new architectural typologies, which stand in contradiction to traditional single use academic buildings. In the first phase, multi-purpose buildings were constructed to accommodate the developmental nature of the two universities’ respective academic programmes. These included libraries, residences, multi-purpose teaching venues, offices and student support, all of which were completed in time for the 2016 academic year.

Subsequently, the improved understanding of the academic programmes that both universities are pursuing, and their increased confidence and sense of respective identity now requires the development of more specialised academic buildings. These buildings constitute the next phase of construction, and include research laboratories, teaching kitchens for new hospitality and tourism programmes, specialised teacher education amenities and computer science laboratories, much of which was scheduled for completion in 2017. (Fig. 10.9)



Fig 10.8: Academic Teaching and office building as part of the first phase of completed buildings at the University of Mpumalanga



Fig 10.9: Academic Building as part of the first phase of completed buildings at the Sol Plaatje University

10.7 ENVIRONMENTAL SUSTAINABILITY

The development of the new universities offers an opportunity to showcase best practice in environmentally sustainable architecture and infrastructure development. In order to realise healthy and comfortable buildings, strategies founded in a response to local conditions are a necessity. Information on local climate, wind, sun exposure and temperatures for the two

respective areas were fundamental to the design of buildings, infrastructure and outdoor environments.

The universities have been developed on the basis of a comprehensive environmental strategy encompassing transport, health, energy, water, and waste to bolster their ambitious socio-economic target. This design philosophy is captured in a Sustainability Charter,^[10-6] establishing the university's stance on environmental performance by mandating the ideals of the Sustainability Master Plan.^{[10-7]. [10-8]} The development of both the overall campuses, and their buildings eliminates negative environmental impact by adopting a sensitive design approach. A focus on rainwater harvesting, grey water application, renewable energy, air purification, energy conservation, eGain forecasting and the integration of proven building and infrastructure design are all principles employed to improve the habitable and natural environment.

Deliberate placement, form and orientation of buildings with respect to local conditions provides for favourable micro-climates in all spaces. The latest research in bio-climatology was applied to the architecture, greatly reducing the need for heating and cooling in the buildings. Passive strategies, utilising locally attuned responses to the distinct environmental conditions found in Kimberley and Nelspruit were key in creating self-sufficient and low energy solutions. The same sensitivity was fundamental during the design of the landscaping and public spaces. Here the focus was on designs where only indigenous trees are planted, water runoffs are contained and reused, and local materials applied to attractive public spaces.

10.8 ICONIC NATURE AND IDENTITY

As the first new universities to be developed since 1994, the architectural language strives to be representative of our democracy, expressing an understanding of its sense of place. Whilst both universities are designed to be of their place and of a distinct African appeal, the architecture is further underpinned by "dignified utility", that is both essential and economical. This sees the emergence of an architecture that is being of, and recognisable as part of South Africa. (Fig.10.10 below)

To ensure that both campuses have meaning, the architecture is bound in the human experience of the environment, and not a mere manifestation as artefact. The quality of space created by holistic campus design is instead focused on atmosphere, joy, surprise and wonder. The campus environment expresses the interplay of textures and colour, the shifting mood of light through the day, of smell and sound. It is about designing sensual space that invokes interactive emotion. These facets are all closely related to and chosen from their respective direct contexts. It follows that a distinct African appeal emerges - simple, straightforward and honest use of materials; bold articulation of forms, subservient to and respectful of the natural environment; a gentle composition of colour, texture and patterns woven into fabrics and bricks that allow the passage of light, direct the breeze, create silence and finally, protect. Out of this emerges an architecture which makes the University of Mpumalanga and Sol Plaatje University unique and distinct.

Design has been developed with optimism, an injunction to be effective but with planned expansion predicated on budgets provided by a developing economy. Bearing in mind that universities are built for the ages, they also seek to celebrate the achievements and critically assess the impact of the multiple and diverse projects which have been transforming and

augmenting the higher education landscape. Inside all these new university buildings, sitting in the lecture theatres, working in the laboratories, populating the residences, utilising the libraries, IT and recreational facilities, are South Africa's next generation of professionals, artisans, managers, technicians, academics and researchers. Both universities are forging ahead with their expansion and physical capacity, continuing to target their aim to be centres of academic excellence, innovation and relevance - engaged within their settings.



Fig 10.10: Auditorium and Library building within the Science Block at the University of Mpumalanga

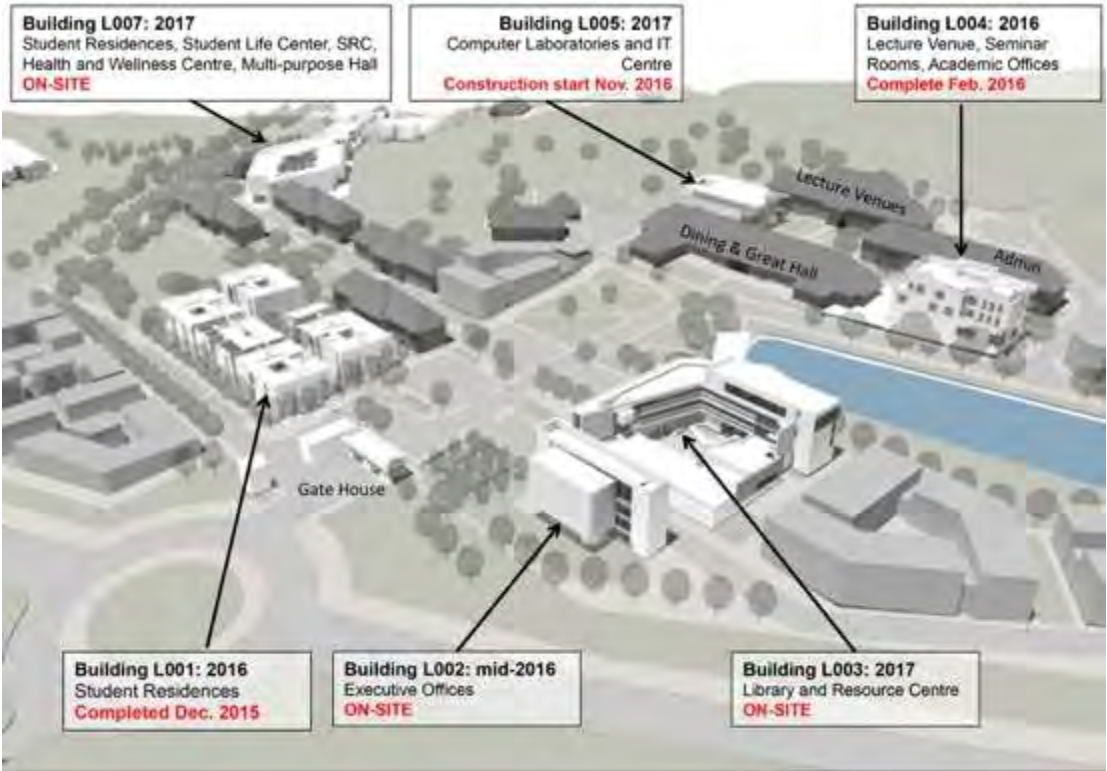


Fig 10.11: Impression of the first two phases of buildings to be completed at the University of Mpumalanga



Fig.10.12 Impression of the first two phases of buildings to be completed at the Sol Plaatje University

Reference Documents

- 10-1 List of service providers
- 10-2 Architectural briefing session presentations to both UMP and SPU architects
- 10-3 Architectural Guidelines Document for SPU and UMP
- 10-4 Example of a Building Specific Briefs for SPU and UMP
- 10-5 Example of an Accommodation Schedule attached to each project brief
- 10-6 Sustainability charter for SPU and UMP
- 10-7 SPU Sustainability master plan
- 10-8 UMP Sustainability master plan