Spaces and Places

"An amazing experience"

University Estates | 2016 - 2019

Inspiring excellence.
Transforming lives.

UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
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UFS

Spaces and Places

"An amazing experience"

University Estates | 2016 - 2019

Gordon B. Hinckley once said, "You can't build a great building on a weak foundation. You must have a solid foundation if you're going to have a strong superstructure." This metaphor is not only relevant for buildings and structures, but we believe it is also relevant for a student's education, the cohesion of a team, and the advancement of one's personal life.

Message from the Rector and Vice-Chancellor

Very often when people think of projects, it is expected that innovation is a purely design-oriented exercise, whereas innovation is also about institutional form, structures, and logic.

We have to accept that we cannot do everything, but rather demonstrate that we can do certain things well and build a portfolio of success over time. At the University of the Free State, spatial dimensions need to be rethought to suit institutional strategies and aspirations. This implies not only providing facilities to satisfy educational norms and standards, but perhaps, more importantly, to create an innovative, forward-looking 'learning landscape' nuanced for quality in things such as human-centredness, spatial configuration, site planning, landscaping, detail, and finishes.

Spaces and Places signifies our commitment to transforming our thinking and our approach to delivering infrastructure.

Rector and Vice-Chancellor
Prof Francis Petersen

Message from the Vice-Rector: Operations

It is with pride that I write this message. There is no need to reflect on our massive infrastructure development over the past few years, as this is covered extensively in this publication.

Everything we have done in the past two years reflects our 'one university three campuses' theme – the development of a strategy that has brought us closer to transforming the infrastructure on all campuses and creating a university that will be fit for purpose in the next century of its existence. In doing so, we have also ensured that we preserve the special character of our 115-year-old university. We will continue to build on the confidence and experience of our great achievements over the past three years. Already committed to environmental, social and governance matters, we are positive to further improve the use of spaces by delivering value-for-money infrastructure in future years, despite the difficult economic conditions ahead.

The small University Estates team must be congratulated on delivering projects on time and within budgets.

Vice-Rector: Operations
Prof Prakash Naidoo


UNIVERSITY ESTATES

Introduction

Frank Lloyd Wright said, "*A building is not just a place to be, but a way to be.*"

Our team at University Estates are specialists in the field of construction management, space management, maintenance and cleaning of buildings, infrastructure, and terrain services. That being said, our primary focus is to serve the UFS community. By supporting the core business of this great institution, we support the 'way to be' for all students, personnel, and visitors to our campuses.

This publication is a visual representation and celebration of our contributions over the past few years.

The successful amalgamation of Facilities Planning and Facilities Management under the collective name of University Estates initiated the vision of accommodating University Estates' personnel in one complex (instead of five separate buildings). This vision finally became a reality with the occupation of our new premises in January 2019.

We at University Estates are proud of our projects and properties and keep our focus on the broader principles of property management. Like all good buildings, we are also not only focused on the aesthetics, but on solid foundations that can stand the test of time for generations to come.

Property Manager: University Estates
Albie Louw

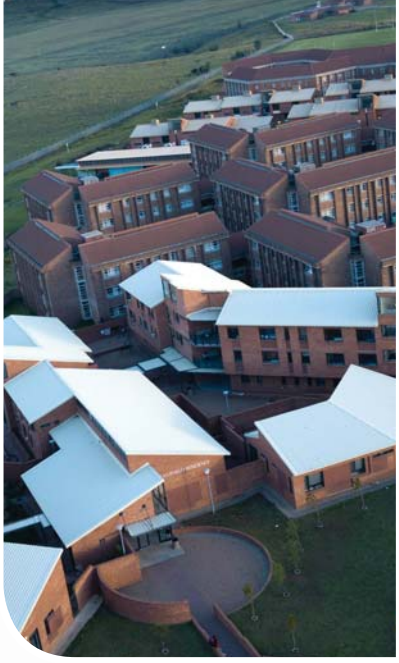

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Table of contents

31

67

75

South Campus

"The Project Management Office accounts for all infrastructure and construction projects done by University Estates. These projects range from new buildings, upgrading and renovation of existing spaces and infrastructure, as well as innovative spaces to advance the academic programme."

Project Manager | University Estates | Maureen Khati


UFS
UV
Welcome | Welkom
Rea o amohela

Campus entrance

A new entrance structure welcomes personnel, students, visitors, and the community to an educational experience.

Even though this structure is unique to the campus, it mirrors the entrances of both the UFS Bloemfontein and Qwaqwa Campuses.

Included in this development is an overhead canopy over the incoming and outgoing vehicle lanes. This space limits and regulates access to the campus, allowing more efficient access control on entering the campus.

Included are also offices for Protection Services and a reception area for visitors.

The design of the entrance complements the other buildings and establishes an unmistaken identity for the campus, enhancing the sense of arrival.

Included in the design is a lounge for students waiting for transport, and ablution facilities that also allow for accessibility for persons with disabilities. The structure also allows students to wait for their transport in an outdoor waterwise garden.

Student housing

The first student residence, Legae, was built to provide students with safe and secure accommodation on campus.

The need for on-campus accommodation has then outgrown the existing 270-bed residence. Two new residences with 252 and 260 beds, respectively, were developed.

These accommodate undergraduate students.

Liberty Residence was completed in 2018. This residence is comprised of double (119) and single rooms (10), a gazellie, general services, a reception

area, and space for cleaning personnel. This development also has a day residence situated in Block D and a manager's apartment.

In the most recently built residence, Toka, student housing is provided in the units, consisting of double (119) and single rooms (10), a gazellie, general services and reception area, space for the cleaning personnel, and apartments for the residence managers. The residence is also equipped with single-bedroom flats (12).

In both residences, every passage has an access-controlled entrance, ablution facilities, and kitchen. Each floor is equipped with a laundry room and storage space. The hot-water supply of the buildings is done through heat pumps. Residences are also connected to a greywater system, using water that is collected from bath, shower and bathroom basins. The water is used for water closet (WC) flushing and for irrigation purposes on the campus.

Sports facilities

Four multipurpose sports courts have been constructed where different sporting codes can be enjoyed, including basketball, tennis, and netball. This space is close to the entrance gate of the campus, with the ablution facilities nearby.


UFS UV

Student Representative Council offices

The former car entrance has become obsolete and has been converted into a structure for the Student Representative Council, accommodating 12 persons in an open-plan office space, as well as into dedicated enclosed offices. The space is also equipped with an ablution facility, a kitchen, and boardroom.

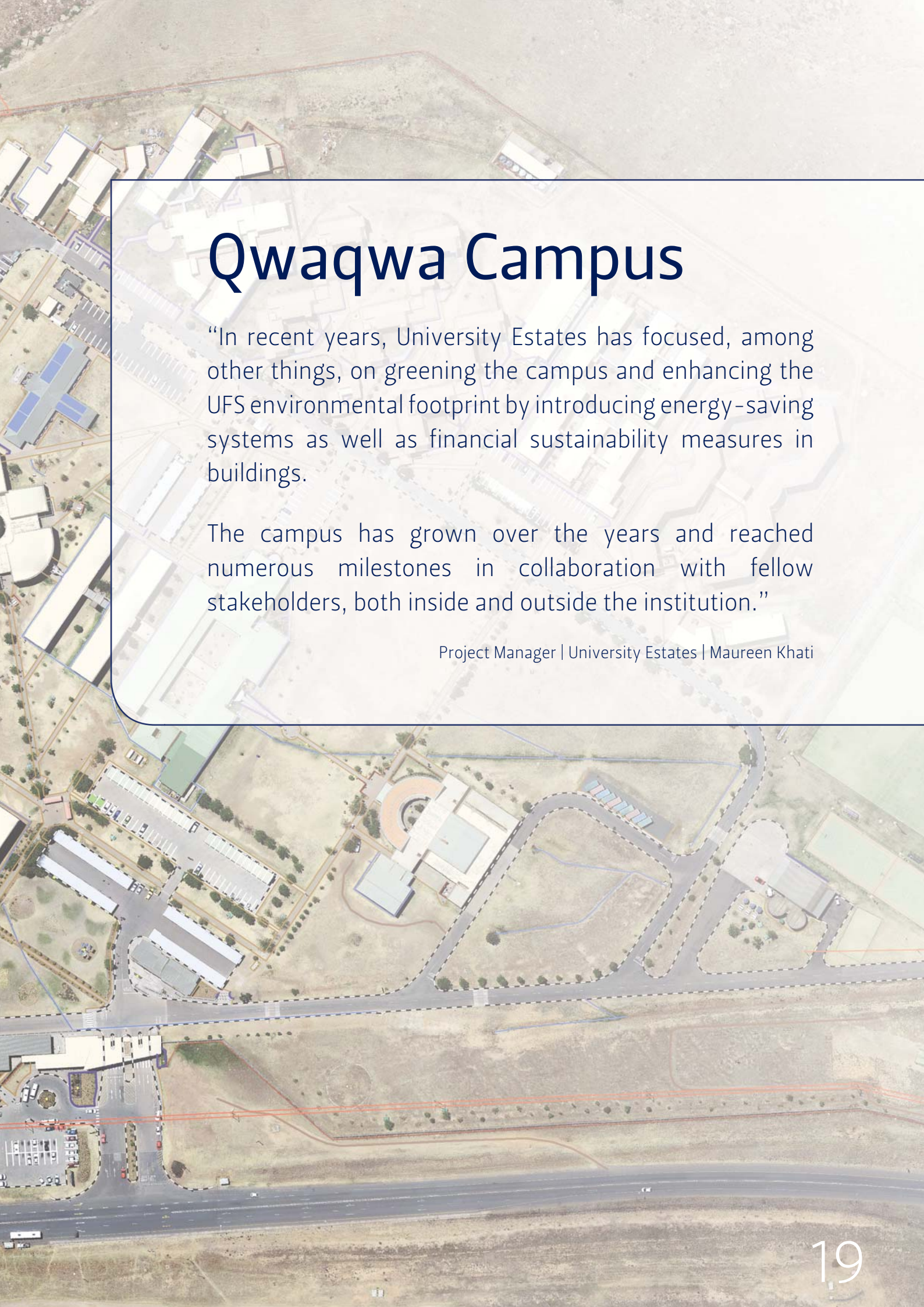
Chemistry laboratory

The Chemistry laboratory was developed as a result of a pressing need for more laboratory space within the curriculum.

Existing space was converted into a fully equipped laboratory to relieve the strain on the Bloemfontein Campus laboratories.

The project consisted of a 48-seat laboratory equipped with seven fume cupboards. The supporting facilities include a microscope store, a preparation room, a balancing room, and a chemical store. Safety features include an emergency shower. A specialised extraction system was installed to service the fume cupboards as well as the preparation room and the chemical store.

As it is expensive to construct new spaces, University Estates has ensured that the university gets the most from the renovation of this building, achieving the most efficient use of space.



Qwaqwa Campus

"In recent years, University Estates has focused, among other things, on greening the campus and enhancing the UFS environmental footprint by introducing energy-saving systems as well as financial sustainability measures in buildings.

The campus has grown over the years and reached numerous milestones in collaboration with fellow stakeholders, both inside and outside the institution."

Project Manager | University Estates | Maureen Khati

Afromontane Research Unit (ARU) Building

The proposed new research facility is comprised of specific research-driven spaces.

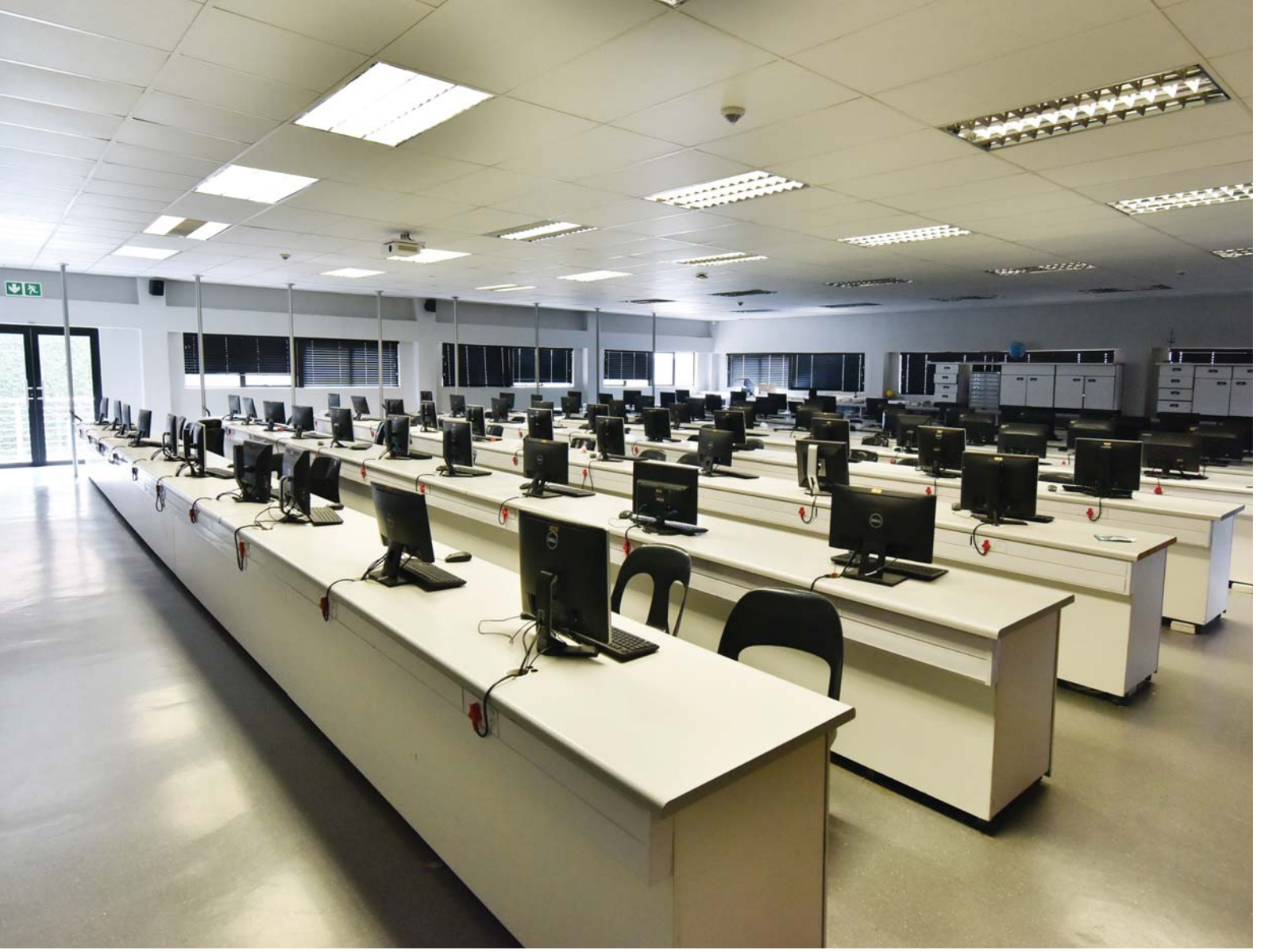
The design provides for three separate blocks, combined and accessed from a central circulation entrance area.

The research area is separated from a postgraduate study space and ablution block, which can be utilised by external users, while the functions in the research spaces continue uninterrupted.

The main research hub makes provision for state-of-the-art digital communication platforms in order to connect to satellite research stations. This sets the stage for lively research seminars/group discussions, while the main passage terminates at the informal lounge and kitchenette, with uninterrupted views of the Free State landscape.

The postgraduate study space with limited glazing creates a calm and isolated environment for individual study/research and is serviced by a coffee kitchenette.

Passive green-energy principles are incorporated into the design. North-oriented windows are minimal in size to control energy loss inside the building. Cavity walls from clay brick, as a natural building material, assist with releasing heat during winter to the internal spaces and isolated heat during the cold winter months.



Computer laboratory

A second computer laboratory was completed, addressing the dire need of students for computers for studying and research purposes, as well as for writing exams.

Two hundred computers are accommodated in two equal-sized spaces, with the administrative support services housed in a central service core.

Ablution facilities for this structure are accessible from outside the building for after-hour use.

The building was designed with minimum maintenance finishes to fit seamlessly into the established environment and pedestrian routes of the campus.

Electricity supply in this building is solar powered.

Tutorial venues

A building accommodating tutorial programmes was developed on the campus. In addressing the growing need for tutorial venues, different options were explored, one being prefabricated buildings.

Cost calculations were done to compare this proposal with a basic permanent structure from conventional building materials. A basic classroom design was used as the basis. In this comparison, a cost difference of less than R200/m^2 was found between the two options and therefore it was decided to construct the building as we have it today.

The uncomplicated building design and the use of finishes and materials prove to be a huge success.

24/7 Study space

A 400-seat study space that will be open 24 hours a day, seven days a week, is being developed next to the TK Mopeli Library.

The building, with multifunctional study spaces that make provision for studying and caucusing, is equipped with hard and soft seating.

Modular lecture space and assessment centre

Rapid expansion and growth in student numbers have established the need for a multifunctional lecture hall facility.

The objective of the design is to incorporate and respect the immediate context of the surrounding established buildings and pedestrian routes on this part of the campus. The use of a concrete column-and-beam frame structure design with brick infill panels is found on several buildings. The architects have designed a contemporary adaptation of this methodology. The building is arranged around a lofty, central corridor with all entrances to facilities set away from the main circulation to promote effective circulation between classes.

The ingress of natural light has been carefully designed for an airy feel inside the building. The design also complies with all the latest regulations regarding effective energy and resource management, including low electrical energy consumption, low water-usage fittings, a rainwater harvesting system, energy-absorbing glazing, and adequate roof insulation materials.

Three lecture halls, forming the main focus of the project, are designed to accommodate 600 students. These are divided into 300-, 60-, and 240-seat lecture halls. The latter can acoustically be divided into two spaces of 120 seats each.

The project will accommodate academic offices, boardrooms, a discussion space, and the required quantity of ablutions and supporting services for the facility as a whole. A new student service centre accommodating personnel from Student Academic Services and the Department of Finance also forms part of the project. All facilities are universally accessible. The project is scheduled for completion by May 2020.

Student housing

An additional student housing unit for undergraduate students has been developed. It will accommodate 148 students.

Student housing provided is comprised of double and single rooms, a gazellie, general services and reception area, facilities for the cleaning personnel, and an apartment for the residence manager. The unit is also equipped with one-bedroom quarters.

Each passage has an access-controlled entrance, shower facilities, and a kitchen.

Every floor is equipped with a laundry room and storage space.

In 2019, the Peter Mokaba Blocks A and B residences were renovated, including waterproofing and painting of all previously painted areas.


XEKE RESIDENCE

KovsieGear, Student Media

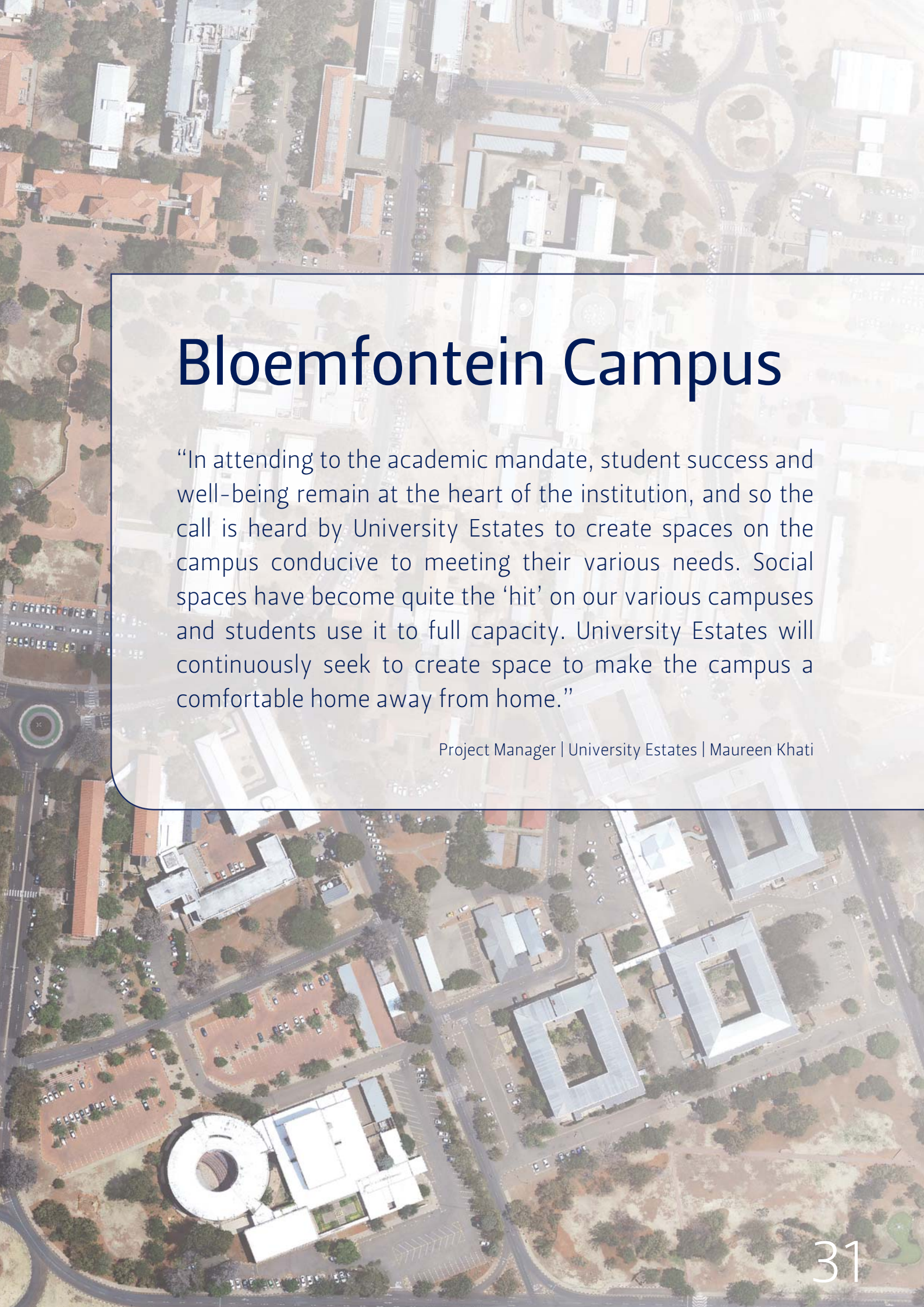
On display, just as one enters the gates of the campus, is a newly developed building that accommodates Student Media with the radio station, Q-lit, and the merchandise shop, KovsieGear.

Communication and Marketing opened the second KovsieGear store where they sell UFS merchandise and clothing to enhance the Qwaqwa Campus marketing brand. Q-lit, the campus radio station with world-class studios – a key medium to reach the campus community – is also situated in this building.

Protection Services

Protection Services, striving to provide a safe environment for personnel, students, and campus visitors, can now do so through visibility and accessibility, after moving from the Intsika Building to the new premises next to the campus entrance.

The building is comprised of a reception area, monitor room, holding cell, committee room, kitchen, ablution facilities, and offices. The project was completed on 2 December 2018.



Bloemfontein Campus

"In attending to the academic mandate, student success and well-being remain at the heart of the institution, and so the call is heard by University Estates to create spaces on the campus conducive to meeting their various needs. Social spaces have become quite the 'hit' on our various campuses and students use it to full capacity. University Estates will continuously seek to create space to make the campus a comfortable home away from home."

Project Manager | University Estates | Maureen Khati

University Estates Building

Both the departments of Facilities Planning and Facilities Management – previously accommodated in various buildings on the Bloemfontein Campus – are now housed in this renovated building.

The existing facilities buildings next to the previous Facilities Planning Building were identified as the site for the new building. Due to structural difficulties, the walls had to be demolished, but the existing footprint was kept as a reminder of the original structure.

The layout consists of 'clusters'. These clusters were grouped in different areas in the new building to provide the best working environment for the personnel. Open-plan offices, communal workspaces, and shared boardrooms form the basis of the layout.

It was important that the building portrays its function, and this was done in a cost-effective way with basic building materials – some re-utilised – with an innovative approach.

Green building principles were also applied in the construction of the building. This includes the harvesting of rainwater and wastewater from the air-conditioners, which will be used to water the gardens. Other eco-friendly principles such as waterless urinals, cold water in the kitchenettes and bathrooms, motion sensors in passages and ablutions, vinyl floor coverings, and the use of recycled building materials were also used. Solar panels placed at the entrance to the building also generate power for the reception area.

Council Chambers

In 2019, the Council Chambers received an upgrade, giving this (now) modern space a completely new look and feel.

Against the backdrop of the three UFS campuses, the space also includes natural as well as LED lights, furniture, and an exclusive round transparent glass table layout that define the venue.

Incorporated into this 50-seat upgrade is the implementation of state-of-the-art technology, including an acoustic panel and plasma screens that compare with the best in the world. The space also includes energy-efficient lighting and new heat-resistant windows to allow for more natural light.

To accommodate more people waiting for different meetings in an open, free-flowing space by using the area in a more efficient manner, existing vaults were utilised, allowing for a foyer, caucus room for pre-meeting and

other discussions, the expansion of the existing kitchen to create a better-suited service space, and a new gender-inclusive and accessible ablution facility.

The space also opens onto an outdoor patio that lets in natural air, with improved landscaping using succulent plants and indigenous trees.

This facility now also caters for persons with disabilities.

New laboratories

Francois Retief Human Genetics Laboratory

The upgrading of the existing laboratory was completed at the end of 2019.

Improvements have been made to the multifunctional laboratory for specialised human genetics work, and include a new kitchen, boardroom, and offices.

BSL3, specialised container laboratory

Independent, specialised laboratory work in the Faculty of Health Sciences will be accommodated through a new, state-of-the-art facility.

This structure, manufactured outside the country, will be shipped to South Africa and installed, ready for operation, in 2020.

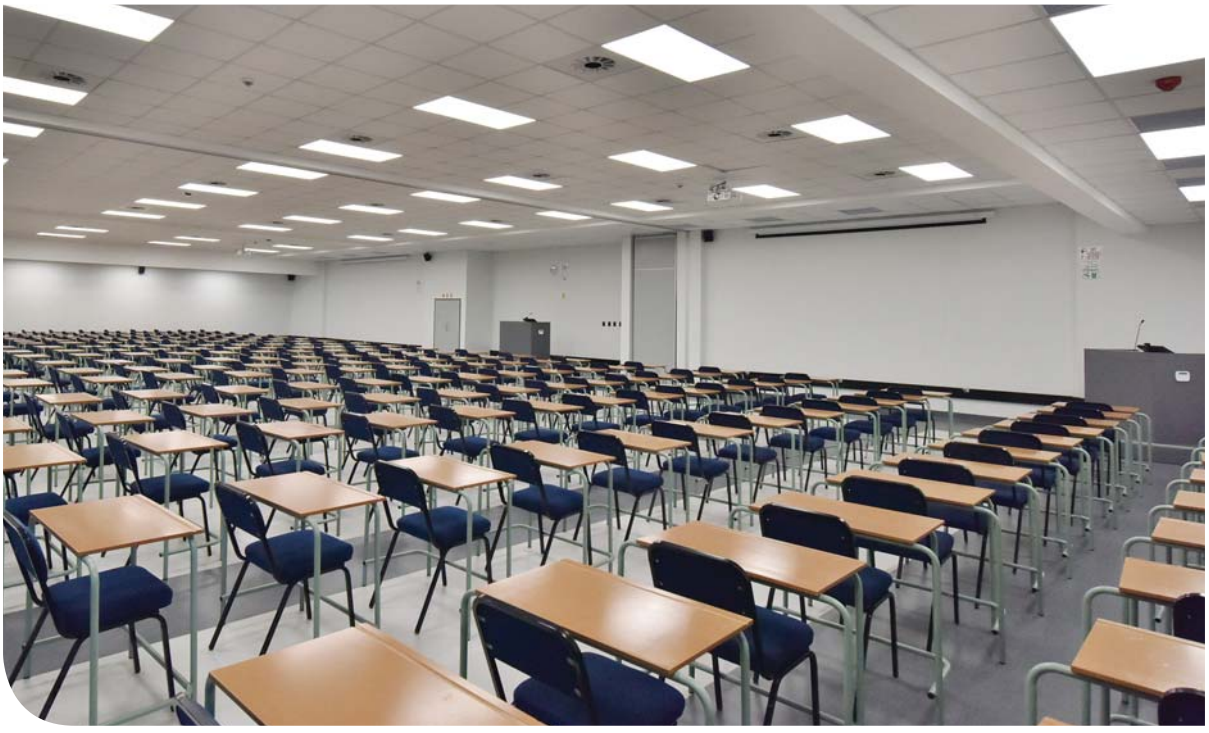
Refurbishment of sensory laboratory

The project was intended to relocate existing laboratories to alternative spaces in the Agriculture Building to create space for a new sensory laboratory as a later project. It included the demolition of two spaces, the application of new floor and wall finishes, and the installation of new laboratory equipment and cupboards.


BSL 3


BSL 3


JAMES MOROKA
JAMES MOROKA



Lecture and study spaces

Extension of the Muller Potgieter Building

An extension to the Muller Potgieter Building is comprised of a multipurpose lecturing space consisting of two floors, with a 250-seat lecture hall on each floor, as well as ablution facilities.

The hall on the first floor can be divided into two lecture rooms.

The design brief was to have a building that is energy and resource efficient, as well as environmentally responsible. A number of design, construction, and operational practices have been incorporated into the innovative construction of the Muller Potgieter Building, which significantly reduces or eliminates the negative impact of development on the environment as well as on occupants. This includes:

Energy efficiency:

- Motion-sensor lighting control
- Light-emitting diode (LED) and compact fluorescent lights (CFL)
- Low E-insulated glazing systems
- Wall-, floor-, and roof-isolating systems
- Solar energy
- Energy star-certified air-conditioning systems

Water conservation:

- Harvested rainwater
- Low-flow toilet fixtures and faucets
- Water-scarce plant selection

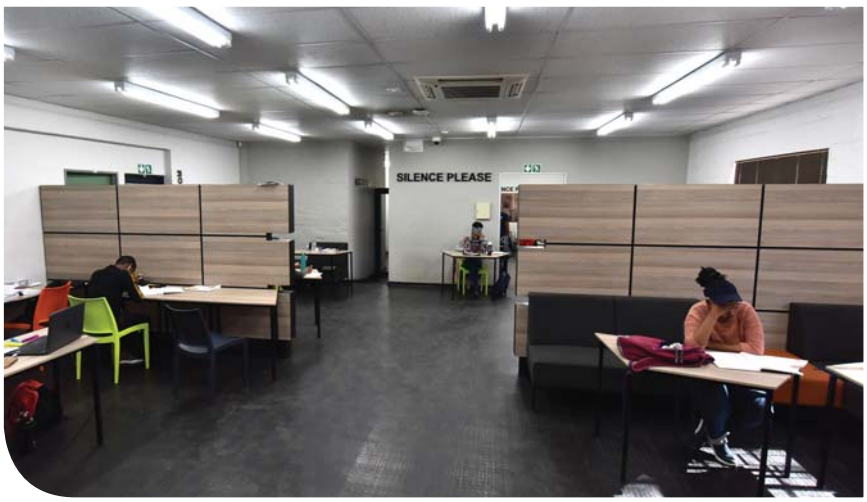
Material and resource conservation:

- Local resources and manufacturers

Environmental quality:

- Low-emitting Volatile Organic Compounds (VOC) materials
- Walk-off mats and entry points


24/7 STUDY


SILENCE PLEASE

24/7 Study space

The need for an overnight study facility, in addition to the existing facilities that the UFS provides, was recognised and the existing Facilities Management Block C was upgraded into a study space (open 24 hours a day, seven days a week), accommodating 80 students.

The space is especially effective during tests and examinations, as students can study for longer hours. The space also provides a more centralised venue on campus.

It is divided into different types of study areas to accommodate different types of learning. The space provides for informal studying (soft seating), semi-formal studying (discussion rooms), and formal studying (small and large study spaces with tables). The renovated space also accommodates a kitchenette for breaks during studying as well as a gender-inclusive, unisex ablution facility.

Modular lecturing space and assessment centre

This development next to the UFS Sasol Library was designed to be a multifunctional space with five discussion rooms, ablution facilities, and a computer laboratory tutorial venue that accommodates 864 computer stations. To maximise the use of this area, the 1 000-seat modular lecture space can also be converted into three similar venues.

Additional lecture spaces will provide room for persons with special needs. The room will be equipped with acoustic installations, accommodating 30 persons. All the spaces will be accessible to everyone, as universal access guidelines have been applied to the entire project.

Completion is scheduled for December 2020.

UFS Sasol Library

The five-year strategic planning of the UFS Sasol Library is currently unfolding with the second phase of this project on Level 4, the administrative level.

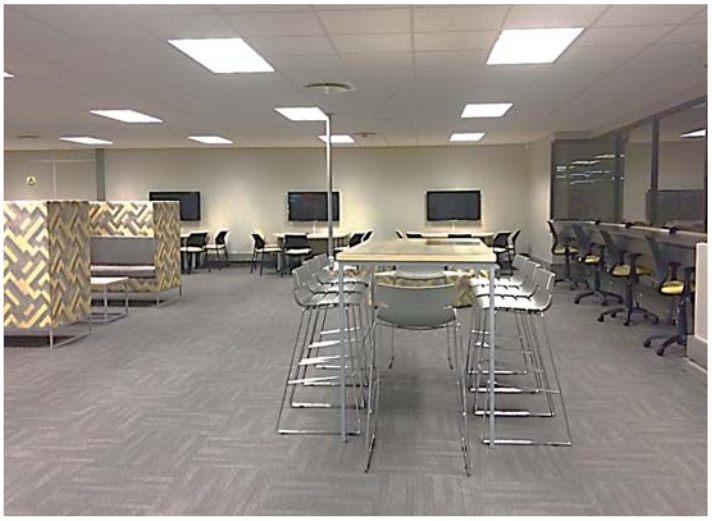
Phase 2, as part of the renovations to this level, provides for upgrades to the larger collaborative spaces, study spaces, and training facilities on this floor. State-of-the-art technology was also installed on this level, including plasma screens and smart boards.

This covers half of the area of Level 4, with the remaining area still occupied by the administration personnel of the library during the construction of phase 2.

During phase 3, the focus will be on the remaining area; the reorganisation of the personnel; optimising their offices and meeting spaces, as well as a personnel lounge in order to streamline productivity.

Part of phase 3 also includes work on Level 5, where the main lending stacks area is situated. In order to maximise the floor space, book stacks will be minimised and moved to the centre of the floor, opening a large study area along the glazed perimeter on this level.

On completion of all the planned stages, the entire air-conditioning system will be renewed as well.

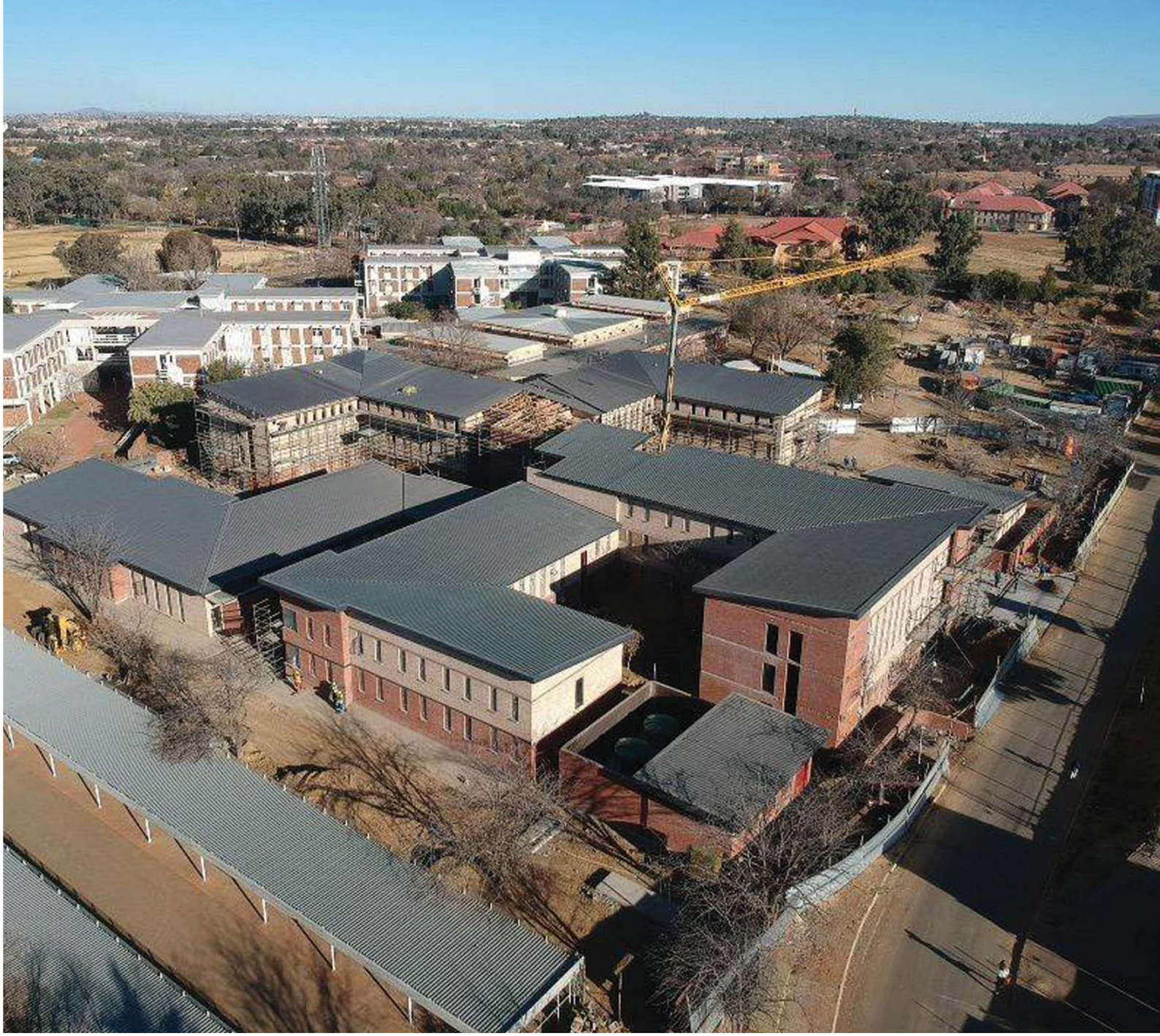


Student housing

Another new student housing unit for undergraduate students is being built on the Bloemfontein Campus. It is scheduled for completion in December 2019 in preparation for the first-term intake of students in 2020.

The project will make provision for 248 beds. It is designed to accommodate students in double rooms (Block A and B), double and single rooms – the latter on the second floor (Block C and D) — a gazellie and space for the cleaning personnel (Block E), single-bedroom apartments (Block D), and a manager's apartment (Block F). Each passage has an access-controlled entrance, ablution facilities, and a kitchen. Each floor is equipped with a laundry room and storage space.

The building is also equipped with a heat pump and refuse area, and will be connected to the greywater system.



Upgrading of residences

Major upgrades to bathrooms and kitchens took place — all during the limited recess period when students are not on campus to ensure students' studies are not disrupted by construction to the residences.

This includes a complete overhaul of the bathrooms, changing baths to showers, re-tiling, and the replacement of the sanitary fittings and the pipework. The project also included the installation of a two-pipe plumbing system, enabling these facilities to switch over to a greywater system.

Odeion revival

The Odeion is one of the first impressions of the university on entering the institution through the Main Gate and hosts various prestigious events on the Bloemfontein Campus.

The outside façade does not do justice to the jewel housed inside.

The scope of the work includes the foyer, preparation rooms, sound rooms, and upgraded ablution facilities. This promises a more inviting, visible and exciting structure with a contemporary look and feel.

To emphasise this new look, the existing entrance canopy and some of the exterior walls will be demolished to accommodate a new glass and aluminium façade framed by a new porte cochère, stretching from the renovated entrance, around the corner towards the existing courtyard.

Together with the updated exterior, the central interior will also be renovated to match the contemporary outside look. This will be achieved by wooden bulkheads, enlarged corridors, and new loose furniture, as well as new built-in furniture that creates different spaces from the entrance to the theatre doors.

Sport

Early in 2016, KovsieSport moved to their new offices in the Callie Human Centre.

Previous storage areas were redeployed as a state-of-the-art gymnasium, called KovsieFit. This commercial gymnasium is open to personnel, students, and the general public and includes a high-performance gymnasium for sports stars.

A flagship project that was completed in 2017, is the upgrading of the UFS long-jump facility at Pellies Park. The existing single run-up was designed and upgraded to a four-lane International Association of Athletics Federations (IFFA)-approved standard, synthetic run-up. The run-up now caters for long-jump as well as for triple-jump competitions. The total runway length has been extended to 65 m from end to end.

The existing astro hockey courts were resurfaced to supplement the already existing facility. A mini-practice field was added. Recently, floodlights to allow for media coverage have been added to both courts.

Various sports facilities were upgraded and improved. This includes general renovations to the soccer clubhouse, as well as the construction of a spectator deck, due to the level difference of the soccer fields and the floor level of the clubhouse.

The squash courts have been renovated, which include the replacement of all the floors. The renovated space, completed in 2019, aims to add value to both the on-campus as well as the external squash community.

1. Bloemfontein Campus.
2. Qwaqwa Campus.
3. South Campus.

Outdoor gymnasiums

Four outdoor gymnasiums have been installed on the three campuses.

The first outdoor gymnasium was set up in the area behind the Mabaleng Building on the Bloemfontein Campus. Due to its success, a second gymnasium was installed near Mooimeisiesfontein at the Main Gate.

On the Qwaqwa Campus, personnel and students can make use of the outdoor gymnasium in the area near the dining hall, and on the South Campus the gymnasium is situated in front of the new lecture hall building.

The gymnasium equipment is not only there to promote a healthy lifestyle; it makes exercise fun and is available to everyone at all times.

Outside learning and social spaces

Outside learning areas have been developed for students to socialise, study, and relax.

These group workspaces outside the classroom environment consist of concrete benches, roof structures, paving and electrical supply points for students to charge their cellphones and laptops. Outdoor recreation and informal collaboration spaces were also developed on the South Campus. Similar spaces are in the pipeline for the Qwaqwa Campus, with the estimated completion date at the end of February 2020.

1. South Campus.
2. Qwaqwa Campus.
3. Bloemfontein Campus.
4. Bloemfontein Campus.

Universal access

Situated on the three UFS campuses are several beautiful historic buildings that were unfortunately not designed or built with the needs of students with disabilities in mind.

Many changes have been made to the infrastructure to address the challenges that persons with disabilities face on all UFS campuses.

Special initiatives to aid visually impaired students were installed on the Bloemfontein Campus. One of these projects includes the installation of tactile paving. These specially textured paving blocks have features that can warn and provide directions to the visually impaired when using their canes. It allows them to, with orientation and mobility training, feel their way around when walking independently on campus and crossing the road. Tactile paving was positioned at strategic spaces on the campus, as identified by the Centre for Universal Access and Disability Support.

Adding to this initiative to improve mobility and accessibility, more entrances were built – focusing on installing ramps such as the structure at the Flippie Groenewoud Building – to make the premises accessible for people with disabilities.

Effective signage was also installed inside and outside buildings, and dedicated seating spaces were made available in lecture rooms for students with mobility impairments.

Lifts are used to make buildings more accessible for persons with disabilities, and were installed in the Agricultural Building. The lifts in the Flippie Groenewoud Building on the Bloemfontein Campus and the TK Mopeli Library on the Qwaqwa Campus will soon be upgraded. Voice announcement was introduced in the lifts that could accommodate it.

These projects were executed in order to add to a high-quality student experience for all students at the UFS.

Also included in the universal access initiative at the UFS are gender-inclusive toilets, an initiative from the Gender and Sexual Equity Office and the Unit for Institutional Change and Social Justice.

This initiative was implemented in support of non-discrimination against any group of people.

New buildings, student residences, and guest WC facilities around the campus were equipped with gender-inclusive bathrooms.


INCLUSIVE


Centre for
Sustainable
Agriculture,
Rural Development
and Extension
Centre for
Environmental
Management


Flippie
Groenewoud
Building
Blocks A & B

Naval Hill Planetarium

Astronomy enthusiasts now enjoy the sight of the stars from the newly established observation platform at the Naval Hill Planetarium.

The project includes a staircase to the platform for people to appreciate the view and to look at game in the surrounding reserve.

More developments at the planetarium include a multipurpose hall, ablution facilities, and offices. Added to this development on the grounds of the planetarium, is also a new landscaped entrance garden, complete with seating boulders to enjoy the Lamont Hussey telescope exhibit. University Estates also assisted with the installation of the telescope.

All walkways around the planetarium are connected in order to create a more effective circulation space.

The planetarium, established in the converted Lamont-Hussey Observatory, is a powerful tool for science communication and education. Thousands of people attend presentations here each year.

Boyden Observatory

At the Boyden Observatory, an astronomical research observatory and science education centre about twenty kilometres outside Bloemfontein, accommodation was retrofitted in the existing space to accommodate visiting academics. Roads and storm-water drainage were also addressed.


ENVIRONM
CENTR

Re-use of tunnels

Food insecurity is one of the many challenges experienced by less-privileged students across institutions of higher learning in South Africa.

The UFS also has students experiencing severe food insecurity. Previous research findings indicate that a great percentage of our students go through periods of hunger.

Two 300 m^2 tunnels were moved from the experimental farm to the Bloemfontein Campus and re-erected, and two water tanks with pumps were fitted. The tunnels are covered with netting, and 40 vegetable boxes were built.

Residence Committee members from all the on- and off-campus student communities for civic and social-responsibility portfolios and student associations will be trained. Training will be combined with the first planting of seedlings. Planting and training are expected to start early in January 2020.

Paradys experimental farm

Renovations were done at the Paradys experimental farm, which is mainly used for research and student training, as well as for the training of emerging farmers.

The project has reached practical completion in 2019, and includes the upgrading of the electrical infrastructure, security fence and infrastructure, and the complete renovation of the houses of most of the personnel.

A 120-kW solar installation was also installed, which is sufficient for all electrical needs during the daytime.

Upgrades and renovations

Power reticulation, sewer and water bulk services

The current infrastructure on all three UFS campuses was built with a smaller community in mind. This resulted in a need to increase and upgrade the sewer and water reticulation and bulk services. The first phase of this project was implemented on the Bloemfontein Campus. Based on the assessment report, upgrades to the system on the South and Qwaqwa Campuses were prioritised and will commence soon.

Simulation models were produced to evaluate the water and sewer systems on the respective campuses of the university. These models were calibrated with the measurements and physical system attributes observed in the field and obtained from record data.

The water network on the Bloemfontein Campus is supplied from various municipal connections disseminated across the campus. This configuration results in a challenging system to manage due to the varying permutations and supply combinations. The simulation models allowed for the imitation of numerous operational scenarios, ultimately allowing for the introduction of supply zones, which in turn assisted with distributing system pressures more evenly, irrespective of the configuration of supply points. The zoning therefore optimised system pressures and assisted with water-loss monitoring.

In the sewer system, as it became clear, there were bottlenecks. This information was used to prioritise refurbishment projects. The knowledge gained from the modelling also assisted in clarifying the increase in maintenance frequencies in certain areas and to put remedial measures in place.

George du Toit Building

Improvements were made to the offices at Human Resources, including paintwork and new carpets, as well as an upgrade to the bathrooms.

In the South wing of the George du Toit Building the existing office space was redeployed into open-plan offices, vaults to offices, etc. The occupants have almost doubled; the Human Resources offices on the second floor now accommodate 13 new workstations and 38 personnel, while the new offices in the basement of the building feature 25 workstations (all new).

Maintenance to roads

Roads on both the Bloemfontein and Qwaqwa Campuses were maintained. This includes the resealing and marking of the roads, contributing to preserving our infrastructure.

On both the campuses, roads of 49 600 m^2/8,26 km were resealed with new crumb rubber technology (NCRT) treated with 21 400 m^2 latex rubber, and sprayed with 28 300 m^2 bituminous emulsion.

Remarking of 27,6 km white, yellow and red lines, and 2 114 m^2 white and yellow lettering and symbols were completed as well.

Gown Store

The existing Gown Store could not accommodate the number of gowns and other accessories needed for graduations. The brief called for additional storage space and a new functional reception counter with enough covered queuing space, allowing students easier access and flow during graduations.

The renovated facility now accommodates mobile shelving, a kitchenette, and a large reception counter, with five stations for personnel to assist students with their graduation attire. The entrance creates a more visible and contemporary look and feel.

Space management

Excluding other capital projects, 4 180 m^2 of the existing UFS building space were redesigned to improve the utilisation of this very scarce resource.

Space Management in most instances also gets interlinked with the project planning and implementation phases to create suitable spaces for personnel and students.

Geographically referenced aerial mapping, detailed topographical mapping (with 0,5 m contours) and line mapping of all building footprints and roads commenced in September 2018 and have since been completed for all three campuses.

Strategic development planning

The three campuses extend over 522 Ha of land.

The overall intention of the UFS Strategic Development Plans (SDPs) is to guide and manage physical growth and to balance competing land-use demands, by putting in place a long-term, logical development path that will shape the spatial form and structure of the campuses. The proposed development path must be dynamic and adaptive, as well as reviewed from time to time to ensure that it remains relevant, realistic, and informed by changing events.

With the above taken into consideration, SDPs (see backdrop) pertaining

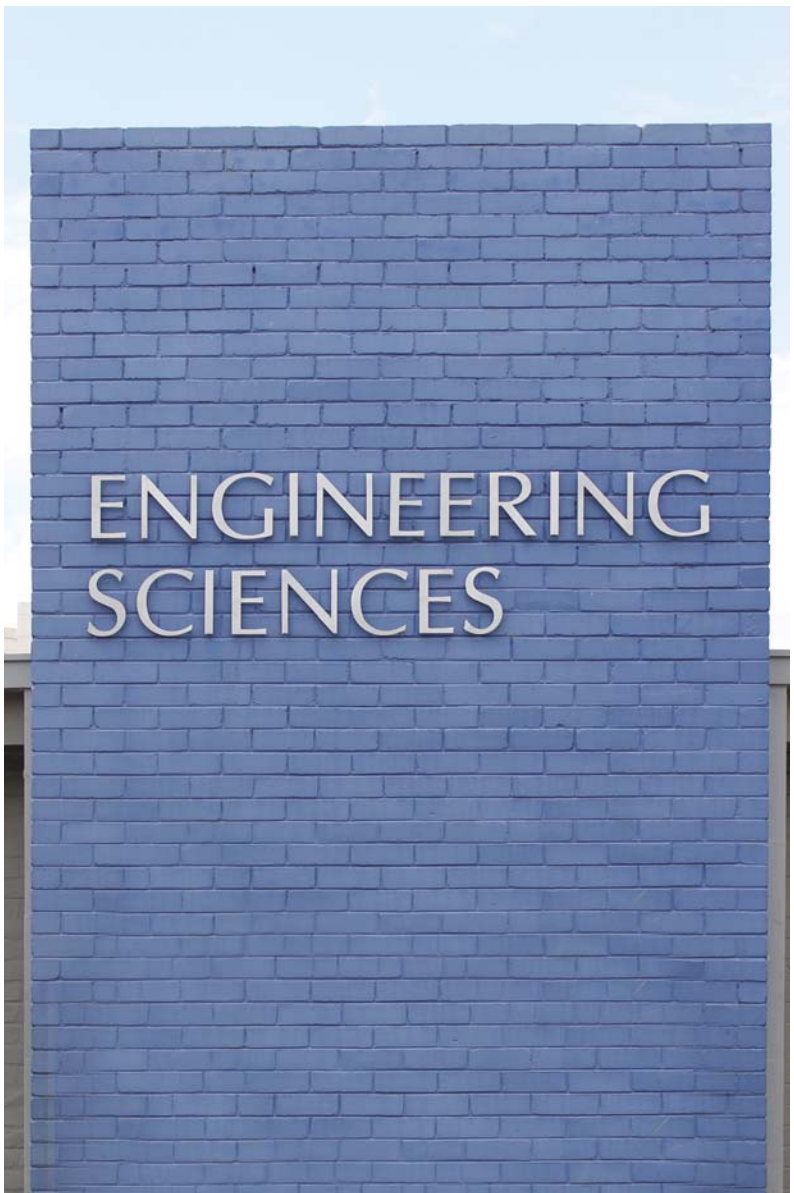
to the physical environment are updated annually for all three campuses and are utilised not only for internal planning, but also for reporting to the Department of Higher Education and Training.

This includes residential, academic, parking, road and pedestrian networks, active and passive open spaces, and research partnership land-use categories.

The property office not only manages the strategic planning pertaining to traffic and parking, such as Traffic Impact Assessments that are a municipal prerequisite before the approval of building plans for new developments. They are also responsible for the professional inputs related to layout designs for new or amended parking areas and the road networks on our campuses and our parking policies.

Signage

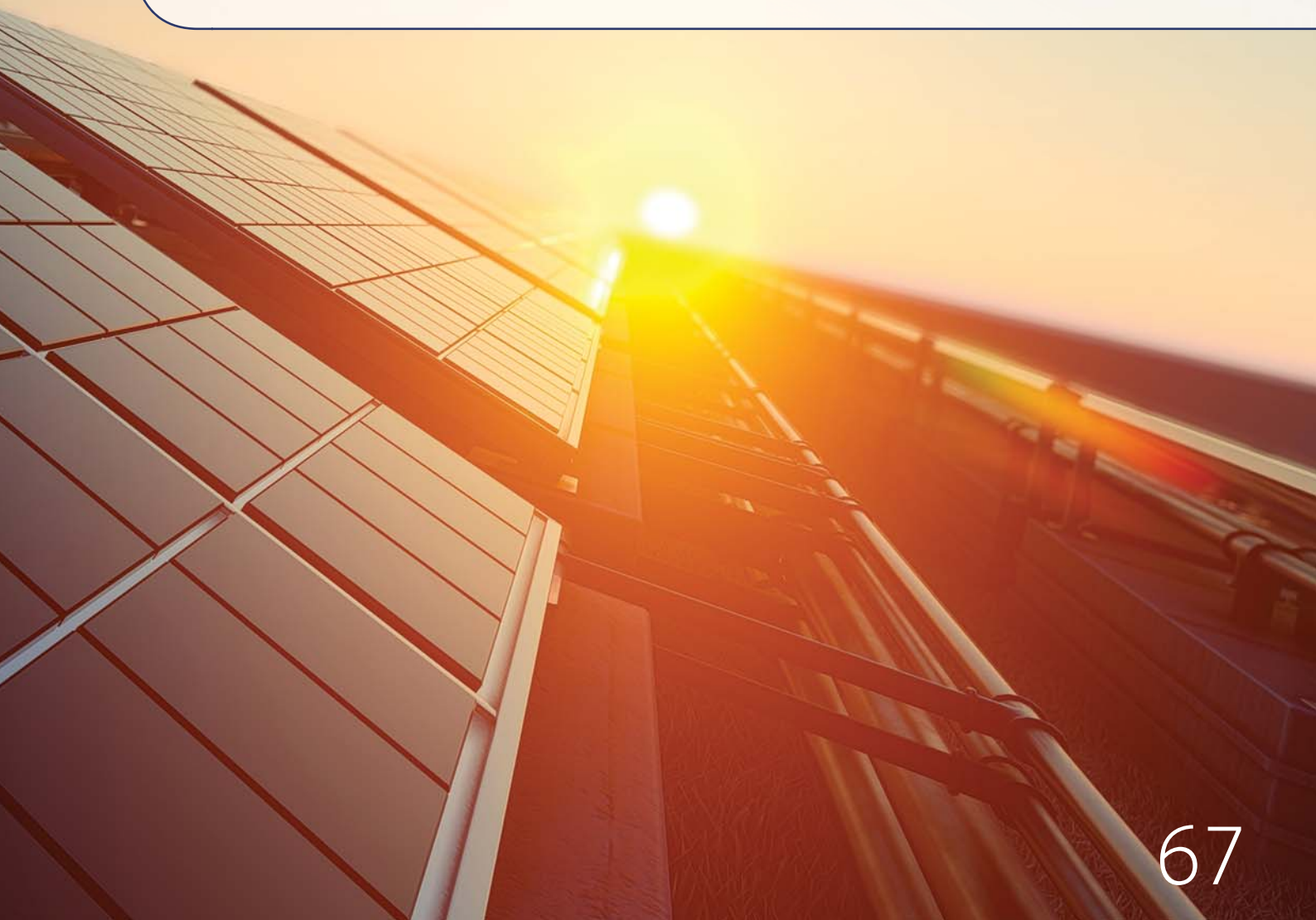
A total of 163 signage projects were completed on our campuses, ranging in scope from building names to the planning and installation of internal directional signage.



Energy efficiency and sustainability

"With energy efficiency and sustainability as a core value of University Estates, we set goals to drive energy efficiency and sustainability, ensure reliable electricity supply, and improve customer experience and service delivery."

Electrical Engineer | University Estates | Nicolaas Esterhuysen



Solar photovoltaics (Solar power)

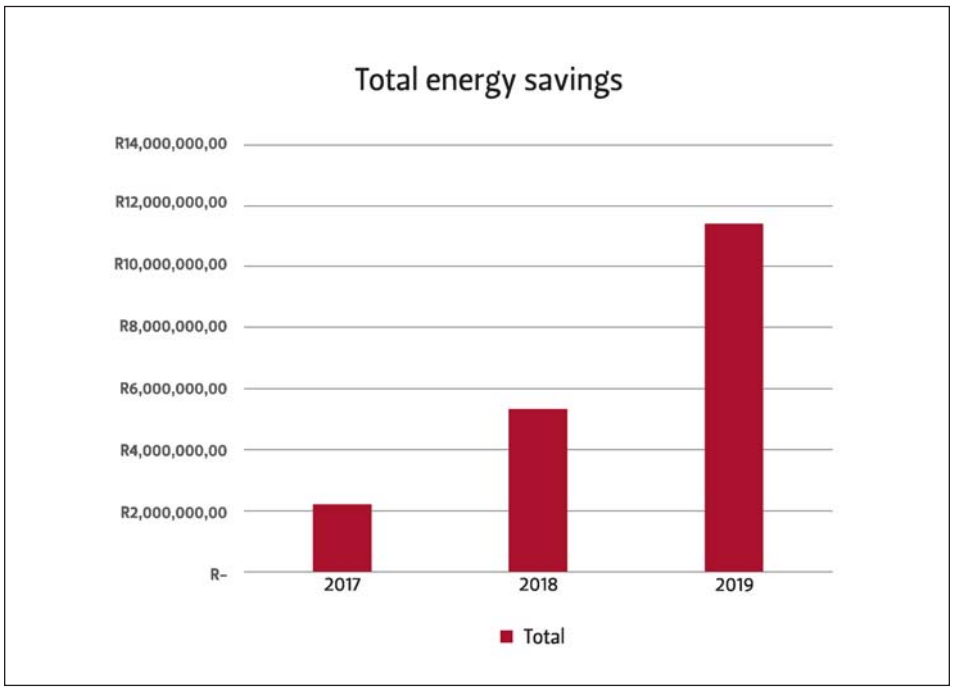
Solar plants were established on all three campuses as a response to our contribution towards sustainability and environmental impact reduction.

These solar facilities provide the daytime energy needs on their peak performance days of both the Qwaqwa and South Campus and about 10% of the Bloemfontein Campus.

The total electricity usage has decreased with 2,3% from 2013 to 2018 (despite various buildings and residences being added). A rise in electricity tariffs accounted for a 40% increase in cost. This was achieved not only through solar power alone, but included other initiatives such as movement sensors to switch lights off when areas are not occupied, changes to light-emitting diode (LED) lights, and demand limiting with our expanding Building Management System.

On the South Campus, 26 solar-driven LED streetlight poles with battery storage were installed in the Legae Residence's parking area.

Overall, the total solar generation footprint across the UFS campuses is 3 535 kWp.



Light-emitting diode (LED) retrofits

Traditional lighting fixtures are being retrofitted with LED lights in high-use areas such as lecture halls, area lighting, and event venues such as the Callie Human Centre.

Retrofitting of lights is a continuous process, prioritised according to the highest return on investment, such as streetlights. These lights are not only energy efficient with an increased lifespan, but are also 100% recyclable and can reduce the carbon footprint of the UFS significantly. All new installations are equipped with energy-efficient lighting, such as the floodlights of the mini-astro hockey field.

Heat pumps

The hot-water supply to existing residences is systematically being replaced with centralised heat-pump clusters, where possible, as funding becomes available.

Heat pumps are 30% less energy intensive than conventional electric geysers. There are three heat-pump clusters on the Bloemfontein Campus, and one on the Qwaqwa Campus. The heat-pump systems are designed to provide 60 litres of warm water per student per day. All new residences are equipped with heat pumps that are connected to the Building Management System to track water usage and to assist with proactive fault identification.

Reliable electricity supply

A decentralised approach was followed to install generators at strategic locations.

During a power interruption, the generator forms a microgrid and supplies power to the essential loads. Priority was given to academic venues and Information and Communication Technology (ICT) Services to allow the university to function during a power interruption. The emergency supply is constantly under review to gain the maximum usability from these assets.

Central air-conditioning systems

Other initiatives implemented for effective energy usage are the central air-conditioning systems. These systems were installed in the H van der Merwe Scholtz Hall on the Bloemfontein Campus and the Madiba Arena on the South Campus. The systems in both of these venues used for student activities are connected to the Building Management System whereby energy savings and venue control are realised.

1. Heat-pump cluster 1, Bloemfontein Campus.
2. Outdoor central air-conditioning unit, Bloemfontein Campus.
3. Heat pump and hot water storage, Bloemfontein Campus.

Greywater systems and water-saving initiatives

The environment-friendly approach to building infrastructural development is supported by initiatives to save not only electricity, but also water.

In response to the ongoing local drought conditions and water restrictions affecting the province in general, greywater systems were installed on all three campuses. The greywater system installed at the three residences on the South Campus collects a total of 90 000 kilolitres of water daily and saves the university approximately R80 000 per month. Greywater is gathered from baths, showers, and basins to be reused for WC flushing. Access water is used for irrigation purposes. All water undergoes a process of disinfection, aeration and filtration before redistribution. The greywater plant on the South Campus was recently automated into a set standard.

All new student residences on the Qwaqwa Campus will also be equipped with greywater systems.

On the Bloemfontein Campus, the piping at older residences has also been changed to a two-way system (to fit greywater tanks when funding becomes available) during renovations.

A greywater reservoir sump room on the Bloemfontein Campus, consisting of three clusters, collects water from ten residences. Water collected from this greywater system is used for irrigating some of the gardens as focus points.

Other water-saving initiatives include the installation of waterless urinals in administrative and academic buildings, water inhibitors to basin taps (reducing the volume of water per minute used to wash one's hands), pressure control systems (reducing the volume of water), and push-button systems instead of conventional taps. Since 2017, water has also been collected from gutters through rainwater harvesting and used for gardens. Additional rainwater tanks also help to keep plants alive thanks to an irrigation team watering plants.

Water storage tanks

Nineteen water storage tanks, varying in size from 5 000 to 20 000 litres each, with a total storage capacity of 265 kilolitres, were installed at various buildings on the Bloemfontein Campus.

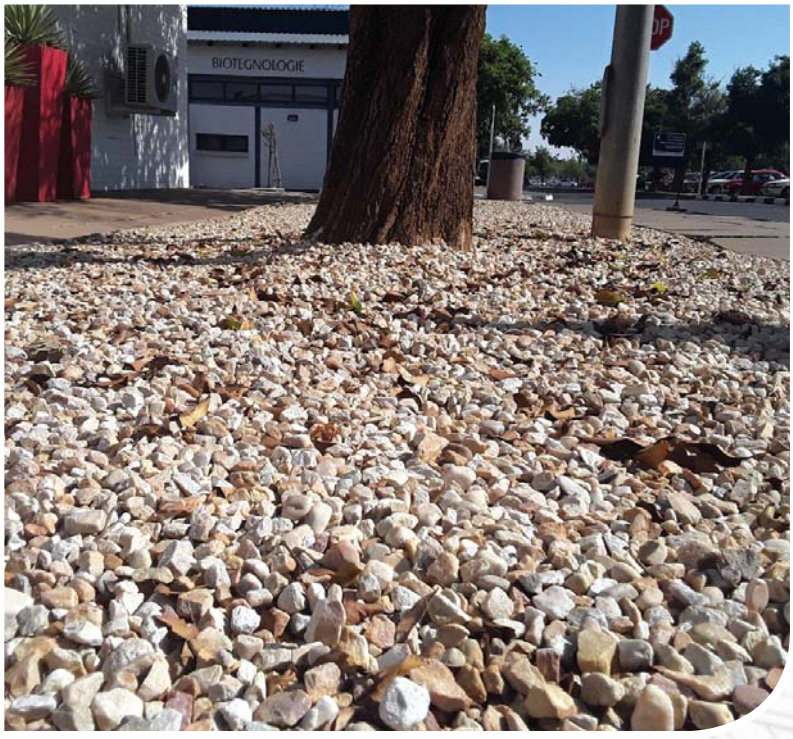
The purpose of the collection tanks is to harvest rainwater, which is used during periods when the campus does not have municipal water.

Water from the tanks is not intended for drinking, but for ablution purposes.

Access water can be used to water surrounding flowerbeds and gardens.


LIBERTY


JoJo


BIOTEGNOLOGIE

Waterwise initiatives

"With the ongoing drought in Southern Africa, we have to adapt to new norms and implement several initiatives to use water sparingly."

Waterwise initiatives

To prevent further loss of gardens and lawns (with irrigation not being possible) several waterwise gardens and greywater initiatives were rolled out in spaces on the campus.

It started with two highly visible areas – the traffic circles at the George du Toit and Francois Retief Buildings. Landscaping material such as artificial lawn, ornamental gravel, boulders, paving, and drought-resistant plants were used in these and other areas.

The gardens around the Biotechnology Building, Geography Building, Muller Potgieter Building, the pedestrian walkway in front of the Institute for Groundwater Studies and Engineering Sciences, as well as the Thakaneng Bridge were also upgraded to waterwise gardens.

A signature project for the Bloemfontein Campus includes the revitalisation of the Red Square. Modern urban landscaping techniques were used.

The redevelopment of this space also makes provision for celebrating the university's diversity by creating flexible social spaces that promote a community environment.

Personnel, students, and visitors will have a unique experience with the newly added seating, lighting, and landscapes to the core of the Bloemfontein Campus. Indigenous plants and trees create a low-maintenance garden that provides greenery and shade while promoting water conservation. This project is phased and phase 1 was completed in 2019.

More than 150 indigenous trees, more adaptable to local environmental conditions have also been planted. During National Arbor Month in September 2019, the first ten of 100 trees were planted by the Rectorate on the Bloemfontein Campus, assisted by the University Estates team. These trees are watered by hand with the limited borehole water available.

Fifty trees were planted on the Qwaqwa Campus.

With this initiative, the focus was on a greener sustainable environment. As a university we believe that sustainability is of great importance. The university as an educational, academic institution is investing in social and environmentally friendly spaces that will still be there for generations to come.

Extra smaller greywater units are also used for irrigation to keep some focus areas growing and in good condition. Four such units have been installed and are currently operational.

Last word ...

On entering any of our campuses, the change in landscape is evident. Where we were able to boast with our environment with luscious green lawns and gardens, times have changed. We needed to rethink, restrategise, and revisit our master planning.

First impressions are formed by the environment, of which buildings, gardens, and infrastructure form a major part. We value each building for its own unique personality defined by its own language, consisting of function, purpose, and sustainability. The amount of passion, hard work, and detailed planning that goes into all of our infrastructure is unknown to the visitor or passer-by, but is evident from the overall picture. We strive to leave a legacy behind to be admired and enjoyed by all future generations.

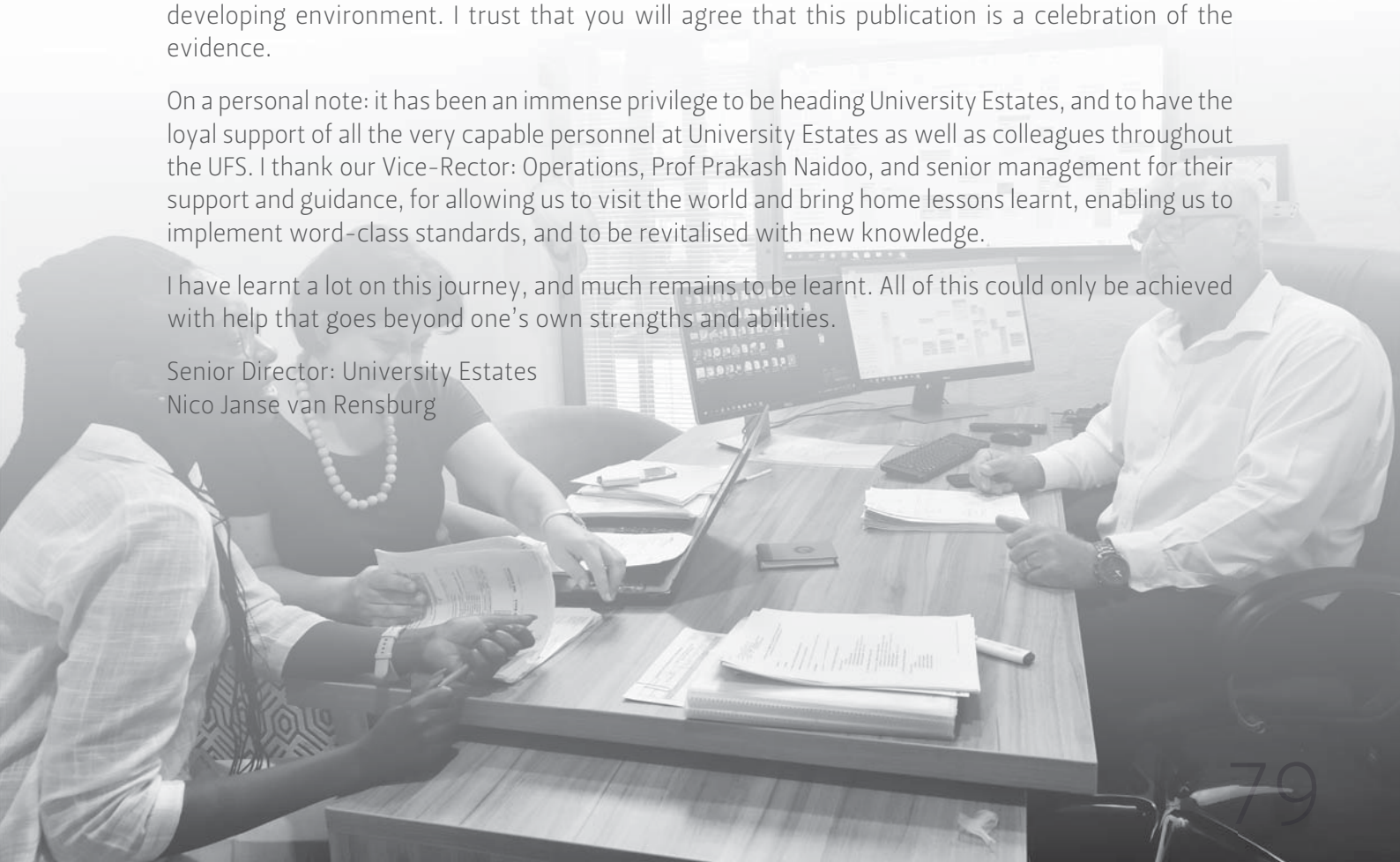
Faced with a dynamic environment, it remains an ongoing process to meet world-class standards and to deal with an ever-growing variety of challenges and demands. This includes accessibility, eco-friendliness and energy efficiency, involving established as well as emerging contractors and consultants, budgets, user expectations and the UFS goals, all transformed into building excellence. Our approach remains not only to construct buildings – our goal is much broader. We also build and develop our personnel, our contractors, and consultants through continuous mentoring and assistance. This ongoing process also involves the challenge of bringing together a wide variety of people, each with their own unique skills and creativity, in such a way that their work and study environments become a home away from home.

We have entered a new paradigm of adaptability and multifunctionality, rather than one of extensions and newly built spaces, rethinking existing spaces and how to use them in a dynamic, developing environment. I trust that you will agree that this publication is a celebration of the evidence.

On a personal note: it has been an immense privilege to be heading University Estates, and to have the loyal support of all the very capable personnel at University Estates as well as colleagues throughout the UFS. I thank our Vice-Rector: Operations, Prof Prakash Naidoo, and senior management for their support and guidance, for allowing us to visit the world and bring home lessons learnt, enabling us to implement word-class standards, and to be revitalised with new knowledge.

I have learnt a lot on this journey, and much remains to be learnt. All of this could only be achieved with help that goes beyond one's own strengths and abilities.

Senior Director: University Estates
Nico Janse van Rensburg



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May we shape the buildings and may every person leaving one of them look back on the visit and realise that they have been shaped in this place. As Winston Churchill rightly said, "We shape our buildings: Thereafter, they shape us."


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