



PURPOSE CASE
BUILT STUDY

Life Sciences Building

South Africa's University of the Western Cape designed a new facility to improve its scientific research—and create a physical landmark suitable for a world-class institution.

Executive Summary

Organization

University of the Western Cape

Location

Cape Town, South Africa

Construction Type

New construction

Opening Date

2010

Project Area

28,000 square meters (301,390 square feet)

Project Cost

ZAR341 million

The Atlantic Philanthropies Investment

ZAR229.2 million (\$16.7 million)



In 1959, South Africa's apartheid government founded the University of the Western Cape (UWC) as part of its separate and unequal system to prepare "coloured" students for low- and mid-level positions in schools and civil service. During that time, the government underfunded UWC and prohibited it from teaching many subjects. The poor state of campus science facilities, constructed in the 1970s, limited the University's research outputs in particular.

Even before the fall of apartheid and establishment of a democratic government in 1994, UWC sought to overcome oppressive ideologies and racial inequality. In a new era of South Africa's development, campus leaders aimed to transform the University's reputation into that of a world-class academic institution while continuing to serve students from historically disadvantaged groups.

In 2006, UWC set out to increase the volume and quality of scientific research through a capital project that would house its life sciences departments. With investment and design support from The Atlantic Philanthropies, UWC opened the Life Sciences Building in 2010—introducing an iconic landmark on campus and signaling the University's intended leadership in this arena.

The Life Sciences Building is two structures connected by an atrium: the two-story Learning Centre with a green roof, and an impressive six-story laboratory facility visible from a highly-trafficked thoroughfare leading to Cape Town. The building provides access A nature reserve surrounds the building and provides flora and fauna for research.

UWC science departments—biosciences, anatomy, biotechnology, and bioinformatics—have flourished since the Life Sciences Building opened. High-quality laboratory, instructional, and gathering spaces

have enhanced collaboration between faculty and students, supported an increase in research capacity, and conveyed prestige. The building has helped the University attract increased investment in the sciences, and UWC is now recognized nationally and internationally for its excellence in research—including receiving top rankings by the South African National Research Foundation and *Times Higher Education*. According to students and staff, the Life Sciences Building has succeeded in changing perceptions of the school and has spurred renewed pride and confidence on campus. The building has also been lauded as a symbol of hope and a demonstration of what is possible in South Africa.

This case study is based on research conducted by MASS Design Group between July and August 2015. Funded by The Atlantic Philanthropies, this case illustrates how a capital project can address historic legacies of inequality and dramatically transform an organization's reputation to enhance morale and attract funding. It also demonstrates how capital project teams can learn from the successes and failures of other relevant buildings as they conduct their planning.

Purpose Built Series

Capital projects often bring lasting benefits to nonprofit organizations and the people they serve. Given this opportunity, foundations grant more than \$3 billion annually to construct or improve buildings in the United States alone.ⁱ Each capital project affects an organization's ability to achieve its mission—signaling its values, shaping interaction with its constituents, influencing its work processes and culture, and creating new financial realities. While many projects succeed in fulfilling their purpose, others fall short of their potential. In most instances, organizations fail to capture and share lessons learned that can improve practice.

To help funders and their nonprofit partners make the most of capital projects, The Atlantic Philanthropies and the S. D. Bechtel, Jr. Foundation commissioned *Purpose Built*—a multi-faceted study by MASS Design Group, a nonprofit architecture and research firm. In 2015 and 2016, MASS conducted interviews, reviewed literature, and examined a diverse set of completed projects around the world; each project was supported by one of the above funders.

The study generated a set of core principles as well as tools for those considering or conducting capital projects:



Introducing the Purpose Built Series is an overview of the study and its core principles.



Making Capital Projects Work more fully describes the *Purpose Built* principles, illustrating each with examples.



Planning for Impact is a practical, comprehensive tool for those initiating capital projects.



Charting Capital Results is a step-by-step guide for those evaluating completed projects.



Purpose Built Case Studies report on 15 projects to illustrate a range of intents, approaches, and outcomes.

See the full *Purpose Built* series online at www.massdesigngroup.org/purposebuilt.

ⁱ Foundation Center, *Foundation Maps* data based on grants made in the United States, 2006-2015.

“This kind of building has made it an attractive option to be here . . . not only because of the reputation but also because of the environment in which we work.”

**—Professor,
University of the
Western Cape**



Above. Nursing students attend a practical lecture in an anatomy lab. **Cover.** The Learning Centre’s green roof and natural landscaping contrasts with the regimented design of the six-story laboratory facility (partially visible at right).

Introduction

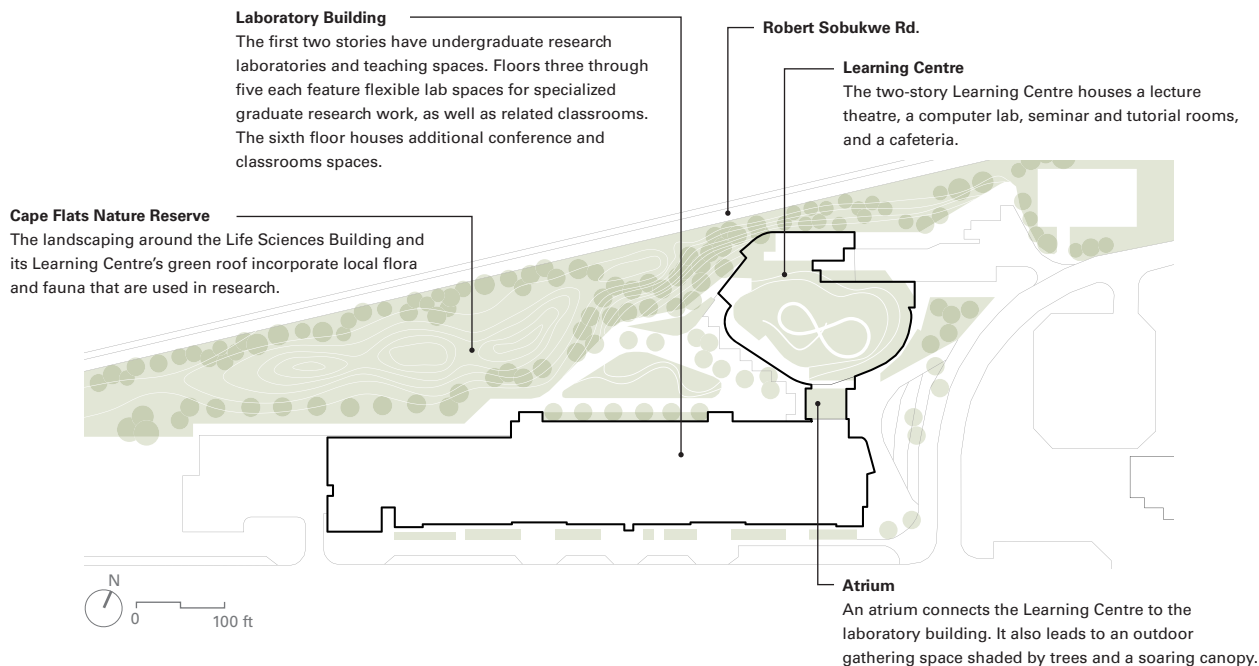
The South African government established the University of the Western Cape (UWC) in 1959—placing it in an isolated rural area on the outskirts of Cape Town—to educate the nation’s “coloureds,” a multicultural racial classification enforced under the apartheid system. For decades, UWC was disadvantaged compared to South African universities serving non-coloured (mostly white) students. The government underfunded UWC and prohibited it from teaching many subjects, including math and science, beyond a rudimentary level. UWC students only received training appropriate for lower- to mid-level positions in schools and civil service.

In the face of the constraints placed upon it, the University became an ideological hub in the struggle against oppression and discrimination, and played a distinctive role in helping to build a more equitable and inclusive South African society. In UWC’s early years, many students and faculty were politically active in the struggle against apartheid.¹ According to Institutional Planner Larry Pokpas, the University refused to implement government policies stating that only people designated as coloured could attend, opening its doors to students of all racial backgrounds. In 1982, the University adopted a formal mission statement that “rejected the apartheid

ideology on which it was established.”² UWC was the site where South Africa’s new Constitution was drafted; it also produced many of Nelson Mandela’s cabinet members when he became President in 1994.

The University faced serious challenges including financial and organizational struggles, even after apartheid ended. UWC fell into bankruptcy in the late 1990s, and the government proposed that it merge with another university. However, UWC successfully argued against this merger to preserve its inspiring legacy of resistance. Under the guidance of its then new rector, Professor Brian O’Connell, the University emerged from bankruptcy in 2002 with its independence intact but with few resources and damaged self-confidence.

The University needed a revamped mission for a new era. Its well-regarded reputation as a place where students and staff actively opposed harmful ideologies was not enough to sustain the University. UWC needed to define academic and social undertakings that would make it a center of excellence in a new historical context. With O’Connell’s leadership, UWC adopted a new mission in the early 2000s: UWC would transform itself from a low-ranking university into a world-class research institution, while simultaneously serving students from South Africa’s historically oppressed communities.



Above. A site plan depicts the Life Sciences Building in relation to a major thoroughfare and the northern portion of the Cape Flats Nature Reserve.

FACING BARRIERS TO LIFE SCIENCES RESEARCH

A strategic priority for the University was to improve its scientific research. Under the apartheid government, scientific research jobs, funding, and learning opportunities were restricted to white South Africans. While non-whites technically had access to participate in scientific fields at a higher level, the governmental application process was cumbersome and approved only on a case-by-case basis.

Facilities for the biosciences, anatomy, biotechnology, and bioinformatics departments were erected in the 1970s using prefabricated buildings—standard, mass-produced designs requiring minimal assembly on-site. Intended to be temporary, these woefully inadequate structures were deteriorating in the early 2000s; in the words of one professor, they were “far past their expiration date.”

The buildings held laboratories that were small, fragmented, and poorly equipped. Closet-sized offices and a lack of meeting rooms hampered research collaborations. Insufficient space for storing materials and prepping for wet labs made conducting complex and time-sensitive procedures or experiments challenging. This research environment kept faculty and students from producing the volume and quality of outputs that they were capable of generating, and made it very difficult for the University to attract high-caliber faculty and students.

OVERCOMING APARTHEID ERA STIGMAS

Placed by the apartheid government on the outskirts of Cape Town in an isolated rural area, UWC's physical infrastructure reinforced the perception that it was a “bush college”—provincial, poor, and irrelevant. A low-quality, under-resourced campus could not deliver the best education to its predominantly non-white student population, perpetuating an antiquated and bigoted ideology that declared coloured students were second rate. Campus leaders felt that the physical conditions of the University epitomized both the memory and practice of discrimination.



Above. Undergraduate students conduct research in the new laboratory facilities.

Project Mission

Faced with limited resources, University leaders initially conceived of a new building to replace the existing, dilapidated science facilities on campus. As the project process evolved, and with support from The Atlantic Philanthropies, UWC expanded its project mission to include the creation of a powerful design that could fuel the transformation of the University and serve as a physical landmark suitable for a world-class institution. This vision would improve the volume and quality of scientific research by attracting new students, recruiting new faculty talent, and supporting higher quality research. It would also proclaim—in a bold, concrete way—the capabilities of historically oppressed communities.

Process

COLLABORATING WITH A LIKE-MINDED PARTNER

The Atlantic Philanthropies became involved after its board visited UWC in 2005. Though armed with few resources and emerging from a lengthy era in which science education was lacking for coloured students, UWC researchers were conducting impressive work, notably leading Africa's groundwater data collection and analysis.³ When Charles E. “Chuck” Feeney, Atlantic's founding chairman, met with O'Connell, he was impressed with the rector's contagious energy and passionate vision for transforming the institution into a leading South African university. UWC's initial plan was to address existing facilities that were not structurally sound by adding a cluster of



Above. An image from a video clip in which Professor Brian O'Connell explains the evolution of the Life Sciences Building mission.

low-rise buildings on the south side of campus for scientific research. O'Connell knew that this plan would not fulfill the intent for a transformed University where the life sciences could flourish, and Feeney recognized an opportunity to improve this approach. Their meeting led to Atlantic's commitment to help build the Life Sciences Building—a structure to house all UWC's life science departments in a single, iconic location.⁴

To amplify this investment, Atlantic advised UWC to approach the federal government for additional funding. O'Connell met with the Minister of Education, and the Department of Education agreed to match Atlantic's grant—ending its 15-year moratorium on spending for higher education infrastructure. The new government went on to provide ZAR16.9 billion (\$881 million), as of 2014, to other universities across the country.⁵ Atlantic's investment also encouraged others, including the Ford Foundation and W.K. Kellogg Foundation, to help UWC achieve its fundraising target.

SELECTING A SITE THAT WOULD GET ATTENTION

University leaders decided to locate the Life Sciences Building on an undeveloped plot on the west side of campus, immediately adjacent to a major thoroughfare leading to Cape Town. This decision ran counter to plans for UWC campus development that co-located science departments on the south side of campus. However, a high visibility site was important to the University's aim to declare its presence and capability to local and national audiences.

LEARNING FROM OTHERS TO ENVISION NEW POSSIBILITIES

Atlantic supported UWC with funding and introductions to learn from others who had created leading-edge research spaces. University leaders gleaned inspiration and noted innovations through this experience—leading to improvements in the design for the Life Sciences Building.

Most notably, Atlantic funded a group from UWC (including the rector, the dean of sciences, the deputy vice chancellor, and a representative from the operations department) to visit Queensland University of Technology (QUT) in Brisbane, Australia. QUT was also an Atlantic grantee and had completed a project similar to the one being planned in South Africa. The UWC visitors met with QUT's project team and architects. The trip helped evolve UWC's vision for the design of its building. One team member recalled:

Their suggestion to “go to Brisbane and see what we're building there,” [was] sheer brilliance. It opened our eyes to what was possible. We were pretty . . . parochial about what we were doing before—we were not aware of what the rest of the world had moved in to. [It was] a real eye-opener.



Above. Individual department labs are located adjacent to shared work areas, designed to foster collaboration among professors, graduate students, and postdoctoral researchers.

Once UWC selected dhk Architects to lead the project design, Atlantic funded a return trip to Brisbane followed by visits to science buildings in Singapore, the United States, and the United Kingdom. These experiences introduced the project team to best practices for designing research facilities, including creating space for collaboration and flexibility. For example, the UWC team would apply a principle learned during the visits to precedent projects to standardize the floor plan for each laboratory while allowing for customization that included supporting specific storage and equipment needs. This approach allowed each lab to “wax and wane,” taking up more or less space as research projects and funding changed.

ENGAGING USERS TO IMPROVE LABORATORY SPACES

In addition to researching precedents, UWC also used stakeholder involvement to inform its design. Professor Jan van Bever Donker took on the role of the project team’s “super user,” with the responsibility of soliciting and aggregating information from all of the life sciences labs and sharing this data with the architects. For the duration of the project, van Bever Donker dedicated a full day each week to holding a series of one-hour meetings with each department to discuss and receive feedback on the design of the labs. From these meetings, specific equipment and related space needs were identified for each lab.

DESIGNING A LANDMARK RESEARCH FACILITY

The project design brief stated the intent to create an iconic and landmark building that would announce the University’s relevance in the scientific field. In the words of one faculty member, “If we wanted to be a world-class university, we needed to look and act and walk like a world-class university.” High-quality interior finishes and building systems would improve the experience of faculty and students. A stunning visual presence would announce the University’s relevance as a scientific research institution.

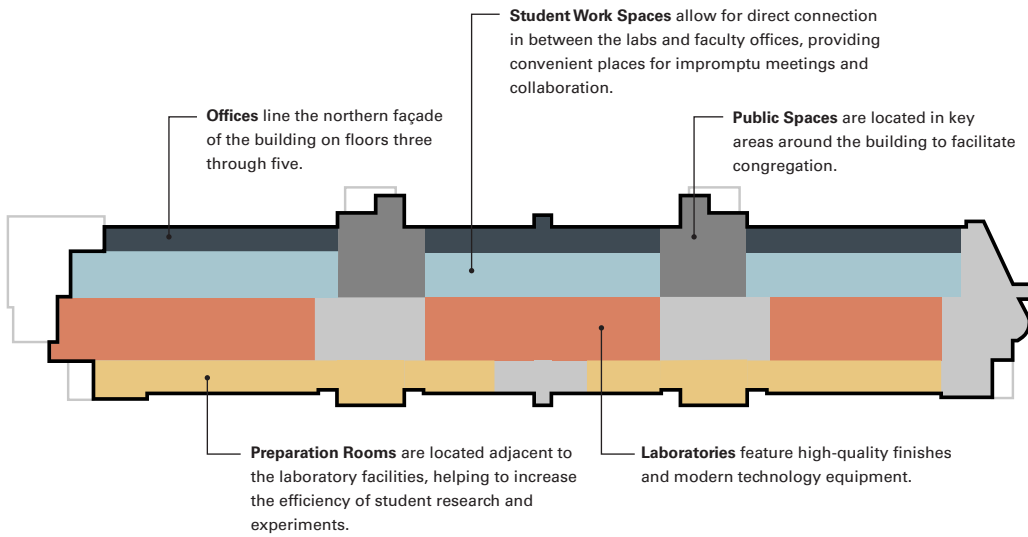
The design featured a six-story laboratory building with two floors to hold general labs and classrooms for undergraduates, and three floors dedicated to more specialized research labs, classrooms, offices, and workspaces. To encourage cross-disciplinary collaboration on these upper floors, the design included faculty offices lining the north wall, with labs and support rooms to the south, and student and researcher desks in between. Glass partitions separating these areas and informal meeting rooms between the labs would improve visibility and foster interaction among professors, graduate students, and postdoctoral researchers.

To offset the rigid and imposing aesthetic of this six-story laboratory facility, the team designed a two-story Learning Centre with a meandering roof and natural landscaping. This space would house a lecture hall, computer lab, seminar rooms, and a cafeteria to bring members of the larger University community to the Life Sciences Building.

These two major structures, totaling 28,000 square meters, would be connected by an atrium that would also serve as a pedestrian entry to the nearby nature reserve. Given this proximity, the Life Sciences Building would incorporate green building strategies. The initial plan included an expansive “green wave” that undulated up from ground level, reaching the top of the six-story roof. To contain costs, architects scaled back to highlight a green roof atop the Learning Centre. This roof and other environmental features would demonstrate the University’s local relevance. The building would later be acknowledged for its commitment to sustainability, helping UWC win the African Green Campus Initiative’s award in 2012 and 2014.

Impact

Through its high visibility and design excellence, as well as its contribution to improvements in research quality and output, the Life Sciences Building has become a landmark on UWC’s campus.



Above. The layout of the third to fifth floor building plan creates opportunities for faculty, students, and researchers to work together efficiently.

Left. Undergraduate labs on the second floor.

A NEW LEVEL OF RESEARCH OUTPUTS AND RECOGNITION

Since moving into the Life Sciences Building, two executive staff members interviewed agreed that “The University’s research output has shown a steep, steady increase.” The sciences are now the “flagship faculty of the University,” accounting for only 14 percent of its faculties, but 38 percent of its total output of PhDs. Faculty and students in the biotechnology department produce approximately 25 to 30 peer-reviewed research publications per year in international journals.⁶

A standardized laboratory design with built-in flexibility supports changing research foci. UWC researchers stated that the ability to reconfigure laboratory space with minimal cost and inconvenience allows them to adapt to new scientific needs and opportunities as they arise.

The building has improved collaboration among professors, post-doctoral fellows, and graduate students. Users find that the design promotes “better communication and collaboration” within lab teams, and that the shared open spaces between labs “encourage people to meet and chat.” According to one professor, the building is helping UWC “transition . . . from working in silos towards working in [a] network,” and that, as a result, “interdepartmental engagement is growing.”

Design and construction quality set this structure apart. A faculty member noted that the Life Sciences Building is “a facility [where everything opens and closes,] which most African universities in particular cannot afford.” As a professor running one of UWC’s labs said, “This kind of building has made it an attractive option to be here . . . We have attracted foreign scientists to our institute, not only

because of the reputation but also because of the environment in which we work.”

The strength of research outputs has brought new attention as well as national and international resources. As one staff member described, the University has been able to “leverage the facilities” to tap into additional funding and secure better partnerships. For example, the UWC science faculty has been rewarded five South African Research Initiative Chairs—prestigious research positions worth ZAR2.5 million annually.⁷ In addition, the quality of the UWC facilities led to its selection as host of the conference of the African Society of Bioinformatics in 2013, which brought 90 researchers from 12 African countries to campus.

Since moving into the Life Sciences Building, UWC has risen dramatically in national and international rankings. Today, the South African National Research Foundation ranks UWC first in research impact in biology and biochemistry, molecular biology and genetics, and physics. In July 2015, the *Times Higher Education* placed UWC as seventh on the African continent and fifth in the country (rankings are based on research citation scores).⁸ One University leader commented on the recognition, saying, “What has happened in this university in the last 10 years has been phenomenal. It’s actually been called ‘the miracle of the Western Cape.’”

AN ICONIC STATEMENT OF COMMITMENT TO SCIENCE

The Life Sciences Building is a highly recognizable structure that stands an impressive six stories tall and is visible from the main road leading past the UWC campus into Cape Town. Following its completion, a new Chemistry Building was constructed nearby. Though substantially different in their respective interiors, the scale and façade of these structures are similar. Together, these buildings compose a strong presence on campus that demonstrates the University’s value and attention to the sciences.

The Life Sciences Building has received national and international press attention and awards for its design excellence. South Africa’s *Architect & Builder* covered it in 2010, calling it “a cutting-edge institutional research laboratory designed to be an iconic embodiment of social and environmental scientific research in Africa.”⁹ An article published in the *West Cape News* shortly after its opening announced, “New UWC Science Center Symbol of What is Possible in Africa,” commending the University for overcoming the legacies of “a second-rate ‘bush college.’”¹⁰ In addition, the building received a top South African award for architecture—the Corobrik SAIA Award—receiving praise as “set[ting] a benchmark for institutional buildings” in sustainability.¹¹ Although some members of the project team had argued against moving the life sciences departments from the south side of campus to the west, the site selection has successfully increased the facility’s visibility to the larger community. Some staff



Above. Students attend class in the lecture hall at the Learning Centre.

remain concerned that the cost of moving other science faculties to collocate all programs on the west side of campus will be prohibitively expensive.

A CONCRETE SYMBOL OF TRANSFORMATION, CONFIDENCE, AND ABILITY

The Life Sciences Building helped the University proclaim the capabilities of the community it represents. Just emerging from bankruptcy in the 2000s—with a small campus, limited resources, and low ranking among South African universities—UWC, in the words of one professor, “would often feel small or embarrassed of what we had,” especially when compared to historically white universities. Following this project’s completion, students, faculty, and staff members “go past and see this big building and feel pride” at its scale and quality, according to one staff member. In the words of another staff member, “[The Life Sciences Building] marks the rebirth of UWC . . . Ever since this building, our entire language, our entire perception of ourselves . . . is in a completely different league. . . . It is something that we are proud of.”

The Life Sciences Building has “differentiated the University and placed it in a research-intensive space” for the first time in its history. There is a sense across the University that, with this building, UWC has “broken through the stigma of apartheid.” According to most people interviewed at UWC—many of whom are part of South Africa’s coloured community—the success in the wake of the new building indicates what is possible for the ethnic groups and universities that the apartheid government oppressed. As one faculty member said, “Historically disadvantaged universities have

had a difficult time achieving new things, and yet, having one of them standing out here being so successful, says that they can [be successful] also.”

As another faculty member stated, UWC was originally “designed for a set of people who thought of themselves as something less.” One person described how the building fostered a new mindset, “it said, ‘we’ve arrived.’ And not in a field we’re supposed to be good at—but in science.” The building has made a statement of equality, “because it says we’re not less, we are equal,” and “it says it emphatically and in concrete terms.”

Conclusion

The University of the Western Cape’s Life Sciences Building is a capital project that went well beyond meeting its organization’s immediate facility needs. Through visionary leadership, productive partnership, and thoughtful implementation, the Life Sciences Building is achieving impact for its users, its larger campus community, and its nation. This project demonstrates the value of an iconic building tailored to occupant needs and planned to accommodate future growth and change. The University’s scientific research capacity has increased dramatically in this new facility. The success of this project contributed to additional campus development and a renewed sense of pride in the University and among its many stakeholder groups—demonstrating the full potential of a previously underfunded academic center and of young people whose educational opportunities were curtailed under apartheid.

Videos

For additional information on this case study, see the following videos available at www.massdesigngroup.org/purposebuilt:

Evolution of the Mission

Changing Perceptions Through Research



Above. The six-story laboratory building at the edge of campus overlooks part of the Cape Flats Nature Reserve and is easily viewed from a major Cape Town thoroughfare.

Lessons from the Life Sciences Building

Envision greater possibilities for impact, and invest in design excellence.

A building design reflects the rights and hopes of its constituents: When UWC leaders set out to replace their dilapidated science facilities, they saw the opportunity to challenge external perceptions of a historically underfunded and oppressed “coloured” university and student body. In addition to designing and constructing a space to support high-quality research, the Life Sciences Building would serve as an icon in South Africa—and send a message to the world. A six-story laboratory building rises out of the landscape to announce the University’s presence in its surrounding community. A green roof on the adjacent Learning Centre as well as access to a nature reserve situates the facility within its environmental context. The design approach went well beyond functional needs to convey that this long-disregarded university had “arrived”—a message that carried deep significance for an institution of higher learning that stands for the rights and future of historically oppressed populations.

Connect with partners to scale outcomes.

Site visits provide ideas and inspiration: With support from The Atlantic Philanthropies, the project team toured relevant projects in several countries—including multiple visits to the Queensland University of Technology (QUT) in Australia. From these visits, along with an intentional process of engaging future users of the building to understand their needs, the team was able to create a design brief that prioritized collaboration, flexibility, and quality. This brief helped convey and establish a common vision of what the design should achieve.

The site visits were very significant to the final project approach. The University’s original vision involved a series of smaller buildings, each housing its own department, and hidden on the south side of campus. For UWC’s leadership and its entire design team, touring other projects led to a better and more ambitious design. As one project team member stated, in recalling the visit to QUT:

Their suggestion to go to Brisbane and see what we’re building there [was] sheer brilliance. It opened our eyes to what was possible. We were pretty . . . parochial about what we were doing before—we were not aware of what the rest of the world had moved in to. [It was] a real eye-opener.

Lessons from the Life Sciences Building

Define donor support as more than construction funding.

A bold investment creates confidence, attracts support: The Atlantic Philanthropies' investment in former UWC Rector Brian O'Connell's dream for a Life Sciences Building inspired confidence among those within the University as well as outside funders. Atlantic was UWC's first and largest investor in the Life Sciences Building; this investment came at a critical juncture as UWC was emerging from bankruptcy. The commitment of a significant funder to the mission and future of the organization was embraced as a sign that "someone believed in us," and helped energize the University community with a renewed sense of its own potential.

UWC also used Atlantic's investment to secure commitments from other funders. The University leveraged Atlantic's matching grant to gain support from the South Africa Department of Education, which had not invested in university infrastructure in 15 years. Atlantic's investment set the stage for involvement of the Ford Foundation, the W.K. Kellogg Foundation, and others whose contributions were crucial to UWC in reaching its fundraising goal.

End Notes

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Image Credits

p. 4 Courtesy of Gideon Mendel/Magnum Foundation. "Students in Anatomy Lab."

p. 5 Courtesy of Gideon Mendel/Magnum Foundation. "Students Conduct Research."

p. 9 Courtesy of Gideon Mendel/Magnum Foundation. "Class in Lecture Hall."

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