



**St. Francis University of Health and Allied Sciences**  
**Student Residence & Campus Master Plan**  
Project Report | Project ZA-0010 | Ifakara, Tanzania

Prepared by EMI South Africa  
December, 2018





designing a world of hope

*EMI's Vision:*

People restored by God and the world restored through design.

*EMI's Mission:*

To develop people, design structures, and construct facilities which serve communities and the Church.

EMI is a non-profit international Christian design organization that mobilizes architects, engineers, land surveyors and construction managers as volunteers using their skills to serve the least reached peoples in the world. Our multidisciplinary teams collaborate with our local client ministries to design culturally-appropriate facilities that are sustainable, affordable and transformational. Our projects include hospitals, schools, orphanages, ministry centres, WASH projects and many other types that enable our Christian ministry partners to fulfill their calling and transform their communities. Together we are designing a world of hope.

### 3.1 Master Plan

The commitment SFUCHAS has made to raising up doctors and healthcare professionals in rural Tanzania ought to be reflected in the architectural planning and design of their future facilities. SFUCHAS is a forward thinking, community oriented organization looking to make a positive impact on the Morogoro Region of Tanzania. Therefore the goal of this project is to capture that vision in a master plan for campus development. Every building, every road, and every open space should be an inspirational area that will challenge students to dream of the possibilities ahead and to invest in the future of healthcare within Tanzania.

With these things in mind, this master plan considered three key components as the catalysts for inspiration on the new campus; a grand entry boulevard; two nodes or hubs of campus activity; and integrated green spaces for reflection

and connection. These areas will become the heart and lungs of the campus bringing life to an otherwise empty collection of buildings and landscape.

Other concepts that the master plan should give consideration to include: secondary access (especially pedestrian and cycles); vehicular and pedestrian circulation on site; building and campus services; storm water drainage and flood mitigation; and coordinated aesthetics. Each component considered alone can yield one well-thought solution, while sacrificing the functionality or appearance of another. Considered as a whole, these concepts create the backbone of a deliberate plan for campus development.

Finally, the master plan seeks to define different parts of the site throughout phased development, creating a framework

for future growth. Rather than mixing uses throughout the site, specific areas have been designated for residential, learning, healing, and community.

To accomplish the design, the EMI project team took an integrated design approach to throughout the process, including University staff in layout and review sessions. Over several meetings with staff, we had the opportunity to discuss immediate needs and challenges as well as future goals for the new campus. This communication process was key to gathering the necessary information about housing, class sizes, faculties, and long term goals needed to make the design of the master plan a success.



Campus View looking Southeast

## Programming Requirements

To achieve the goals set out by the client, an architectural program was developed to identify the particular needs of the growing campus. The team started by comparing the number of various health professionals within Tanzania to the average number of health professionals in various parts of the developed world.

As evidenced in **Table 3.1**, the need for further training of medical, nursing and dental professionals in Tanzania is imperative to the continued growth and development of the country as a whole. The limited number of health professionals that currently exist within Tanzania leaves large gaps within the care system – forcing people to travel long distances for care, or go without care altogether. Future population increases will only widen the gap between the need and ability to meet this need with current medical professionals.

It is with this data in mind that SFUCHAS intends to expand its offerings and become a leader within the medical education community in Tanzania. Within the next 5-10 years, SFUCHAS expects to expand the existing School of Medicine Faculty and programs offered by the Institute of Allied Health Sciences as well as implement the following new faculties:

- Faculty of Dentistry
- Faculty of Nursing
- Faculty of Pharmaceutical Sciences
- Faculty of Social Sciences

**Table 3.1: Medical Professionals per 10,000 people in Canada, USA, UK, Denmark, and Tanzania**

Medical Profession	Canada	USA	UK	Denmark	Tanzania
Physicians per 10,000 people	25.39	25.68	28.25	36.55	0.22
Nursing and Midwifery per 10,000 people	98.42	98.84	84.21	170.14	4.16
Dentistry per 10,000 people	12.53	16.39	5.35	7.52	0.20
Pharmaceutical per 10,000 people	8.80	8.87	8.68	5.07	0.35
Laboratory Health Workers per 10,000 people	5.42	23.01	34.40	-	0.50

**Table 3.2: Student Statistics per Faculty**

Faculties	Annual Intake	Number of Years	Total Pre-grad Population	Total Post-grad Population	Total Student Numbers
School of Medicine	450	5	2,250	230	2,480
School of Dentistry	150	5	750	80	830
Nursing	150	4	600	60	660
Pharmaceutical Sciences	150	4	600	60	660
Social Sciences	150	3	450	50	500
Institute of Allied Health Sciences	600	1.75	1,050	0	1,050
<b>Total</b>	<b>1,650</b>		<b>5,700</b>	<b>480</b>	<b>6,180</b>

Table 3.3: Building Program for Campus Master Plan

Building Program	Range/ Factor/ Percentage	Units	Total	Number of Buildings	Footprint	Number of Floors
Teaching facilities	2.5	m <sup>2</sup> per student	12,480 m <sup>2</sup>	5	4,160 m <sup>2</sup>	2 - 3
Administration and support	40%	% of teaching faculty	4,990 m <sup>2</sup>	3	2,500 m <sup>2</sup>	2
Residences	33.3%	% of student population	29,750 m <sup>2</sup>	10	7,440 m <sup>2</sup>	3 - 4
Teaching Hospital	400	Beds	16,000 m <sup>2</sup>	1	5,330 m <sup>2</sup>	2 - 3
Dental Clinic	100	Patients	500 m <sup>2</sup>	1	250 m <sup>2</sup>	2
Conference Facilities	1000	Delegates	2,100 m <sup>2</sup>	1	2,100 m <sup>2</sup>	1 - 2
Simulation Centre	60	Students	1,000 m <sup>2</sup>	1	500 m <sup>2</sup>	2
Research hub	60	Researchers	1,000 m <sup>2</sup>	1	500 m <sup>2</sup>	2
Staff housing (academic)	80	m <sup>2</sup> per house	4,000 m <sup>2</sup>	50	2,000 m <sup>2</sup>	1 - 2
<b>Total</b>			<b>71,820 m<sup>2</sup></b>	<b>73</b>	<b>24,780 m<sup>2</sup></b>	

For each of these new faculties, the anticipated student enrolment and the number of years spent within the program were assessed to determine the addition to the student population. Combining the students in the new faculties with the students within the growing School of Medicine serves as the baseline student population the proposed campus is expected to accommodate. **Table 3.2** graphically represents the student population per faculty.

Since the Institute of Allied Health Sciences programs will continue to be housed on the existing campus, the student population for the proposed campus is 4,650 pre-graduate students and 480 post-graduate students, or 5,130 total students.

A building program for the campus considering the proposed faculties and student numbers was carefully created and summarised in **Table 3.3**.

## Existing Site vs. Proposed Site

The following plans illustrate the existing site development to the proposed development. The few items shown on the existing site plan represent housing units and trees that will need to be removed or planned around as construction occurs. The proposed site plan incorporates all of the building program items identified in the planning exercises as well as site service items such as water, wastewater and electrical services.

The remainder of this section will explain design rationale for the proposed layout and specific design features of the site.



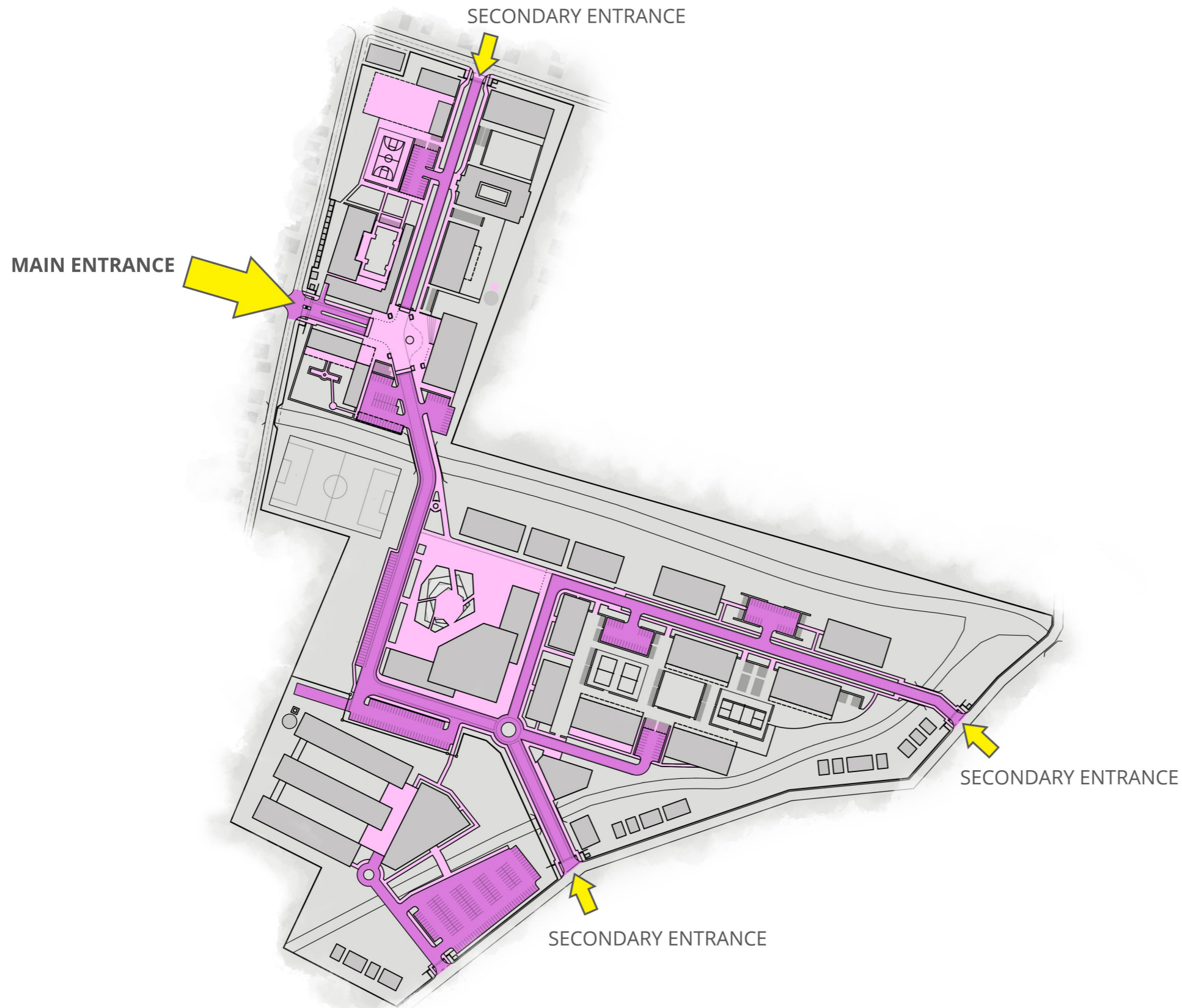
Existing Site Layout



### Legend

- A - Honey Processing Centre
- B1 - Canteen
- B2 - Canteen & Multi-Purpose Space
- C1-3 - Student Residences
- D - School Of Dentistry
- E - Research Centre & Library
- F1 - Administration Building
- F2 - Administration Building
- G - President's Courtyard
- H - Kiosks
- I - School Of Social Sciences
- J - School Of Nursing
- K - School Of Pharmacology
- L1 - School Of Medicine
- L2 - School Of Medicine
- M - Canteen
- N - Conference Centre
- O - Simulation Lab
- P - Teaching Hospital
- Q - Staff Residence
- R - Future Expansions





## Access and Circulation

The design includes four access points to the site which were determined by considering the context surrounding the site. The campus is located in the middle of a residential area with the north and west edges of the site fronting high density suburbs and the southeast edge of the site fronting less dense suburbs. Additionally, the tarmac road and main commercial zone in town is located west & northwest of the site – easily accessible from the proposed main entrance on the west side.

This western entry utilizes the current entry onto the site and will become the primary access point for all university staff, students and visitors. This entrance is bounded by the Administration and School of Dentistry buildings leading to one of the two main community nodes on campus, directly in front of the Research Centre & Library. This access point connects the University to the Ifakara main road at the Simba petrol station, making it an ideal choice for staff, students, and visitors to easily access the site from town.

A secondary access point connects the campus to the main road on the north side of the site providing ease of access to the northern residential zone which includes student residence buildings, cafeteria and canteen.

The south and southeast boundary will have two access points – one that links up with the main entry, creating the most direct route through campus, and the other that will be a controlled entry point for the southern residential zone. Additional pedestrian/bike entry points can be introduced to the site along the Greenbelt to reduce walking distances for staff and students. These additional entry points would be uncontrolled entrances.

Primary circulation consideration on site has been given to pedestrians, with lots of paths and open plazas for movement around campus. Formal and informal landscaped paths connecting the

entry points, residences, administration blocks, teaching facilities, community and recreational spaces are provided to designate the preferred pedestrian routes. Vehicular traffic is a secondary consideration to pedestrian traffic, and therefore several traffic slowing features are included in the design to decrease average speeds on the main road between the two primary entry points. The desired intent is to discourage unnecessary traffic flow through the campus while promoting travel by pedestrians and cyclists.

To aid in the movement of cyclists, bicycle accommodations have been incorporated throughout the proposed campus with designated bike lanes on the main route, ample space for bike parking and wider roads to accommodate both cycle and vehicular traffic.

## Layout

The overall layout of the site features different pockets creating definition between dwelling, teaching, administrating, healing, and recreation spaces. The plan to the right graphically illustrates the buildings that make up each of these spaces.

Student residence buildings occupy two zones along the northern and southern extremities of the site. This placement allows for students to easily access campus facilities while also maintaining privacy from the busiest parts of the campus.

Small shops for the community are proposed along the west boundary of the site, accessible from the public roadway.

Recreational and green spaces are interspersed between all buildings on the site but especially along the 'Greenbelt'. The Greenbelt is an area of the site dedicated to water drainage and preservation of nature in the fully developed site (more explanation of the Greenbelt can be found **Section 04 Landscape Design**).

The teaching hospital will be located on the southern portion of the site, adjacent to a public roadway, creating a reliable connection for public and ambulance access.



### Legend

- Dwelling
- Teaching
- Administration
- Healing

## Nodes

If the access points to the site were to be connected with lines, the intersection of these pathways would give a good indication of where the highest density of people and movement is directed, and therefore where the main nodes of community interaction should be located.

These nodes will become the heart of the site where the surrounding buildings bring life and definition to the campus. They will be where the hub of activity is located and thus the focal points of the campus.

There are two main nodes on the site, one each north and south of the Greenbelt. These nodes are designed as places of public gatherings, to inspire social interactions and allow for efficient pedestrian movement. For these reasons they will be highlighted with raised plazas, inspirational buildings and plenty of resting/gathering areas.

### *Research Centre Node*

The northern node will be fed by the main entrance and defined by a square plaza between the School of Dentistry, Administration Building and the Research Centre & Library. The plaza will be dominated by the architecture of Research Centre & Library, designed to inspire learning, inspire dedication and to inspire hope.



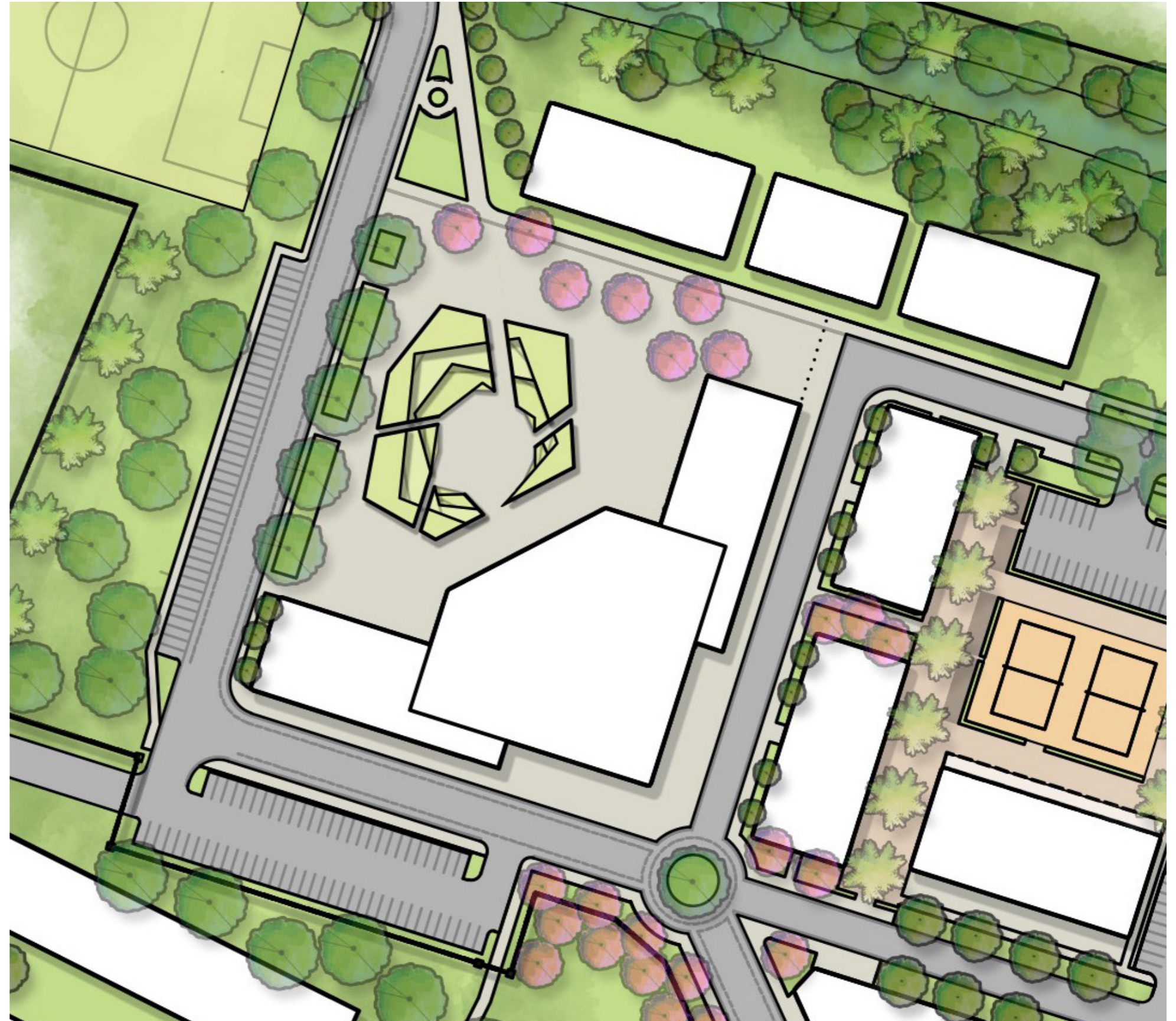
Research Centre Node



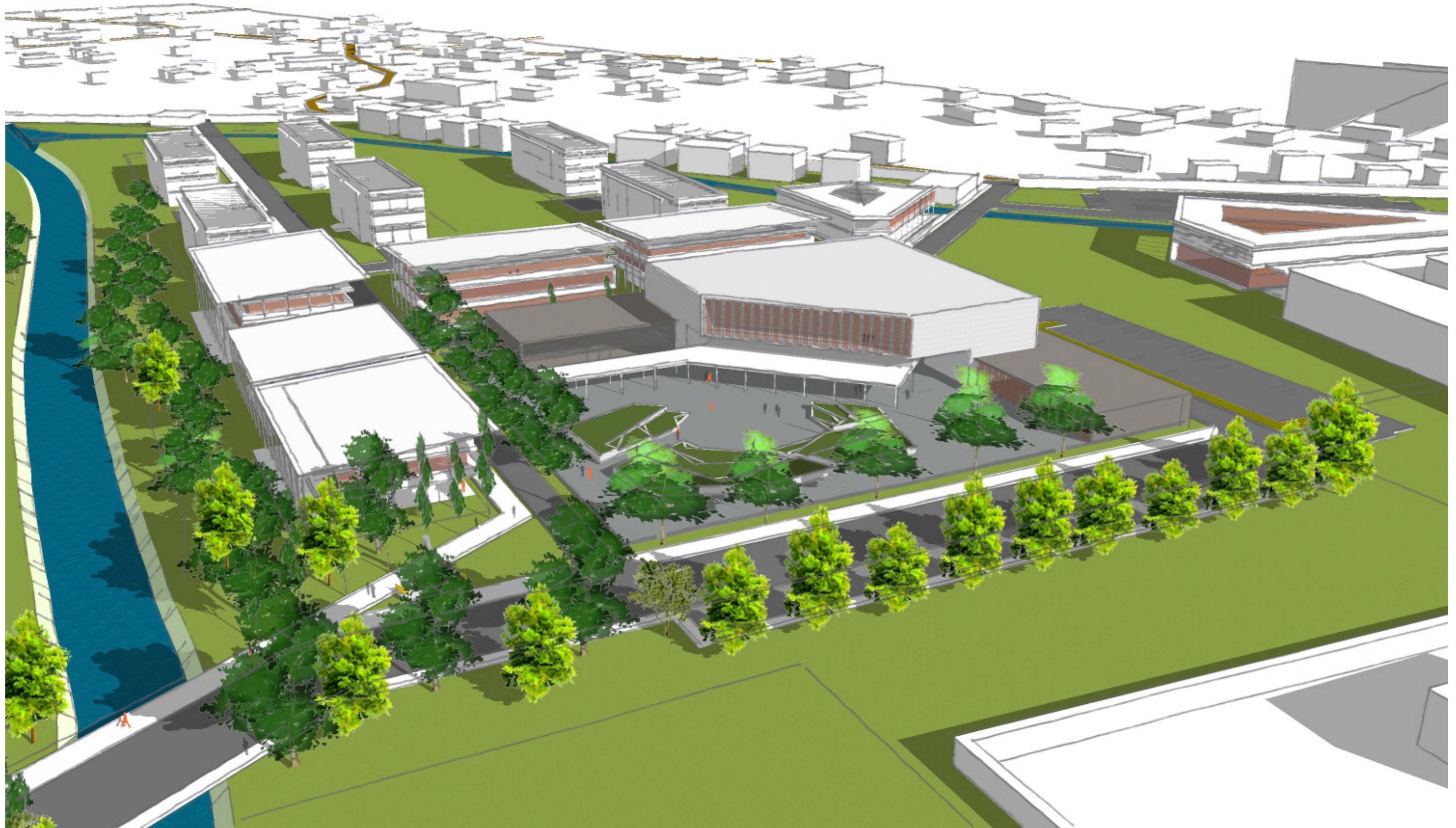
Research Centre Node

### *Conference Centre Node*

The southern node will be surrounded by the communal buildings (Conference Centre and Dining Hall) and the teaching facilities. It will be dominated by two features, the architecture of the Conference Centre and also the natural amphitheatre created as the centre piece of the plaza. This node will provide a variety of areas for staff and students to meet, have lunch outside, study together and enjoy the campus.



Conference Centre Node



Conference Centre Node

### Site Design Elements



Central Fountain



Amphitheater



Statue and Seating Area

## Phasing

Since the overall master plan is concentrated on understanding how the fully developed campus will look and work, it's important to take a step back and consider the steps needed to move from an empty piece of land to the envisioned finished campus. EMI proposes dividing the development into 5 phases encompassing several buildings into each phase. The buildings within each phase may be spread out over a 3-5 year period, but will still be considered as one phase of development for the purposes of this discussion.

### *Phase 1*

The first phase is primarily concerned with addressing the immediate need for student housing and expanding faculties by establishing buildings such as three (3) Student Residences and a School of Dentistry. Phase 1 will also install the infrastructure (walls, roads, guarded gates, water supply, electrical distribution) needed for everything north of the Greenbelt to be developed in a complete and safe manner. Upgrade of the drainage channel into the Greenbelt is also proposed for early in Phase 1 as these will be the most important changes to help with site drainage during rainy season.





### *Phase 2*

The second phase will round out the development of the northern portion of the site with construction of the Administration Buildings, the Research Centre & Library, and a Cafeteria & Canteen for student life.



### *Phase 3*

The third phase will extend the campus to the southern zone with construction of all the roads, water, wastewater and electrical infrastructure as well as construction of four (4) new Teaching facilities, a Simulation Lab Building, six (6) more Student Residence buildings, and several staff housing options.



### *Phase 4*

The fourth phase will add a major outreach component for the University in the form of a Conference Centre and convention space. The facility will also include a kitchen and dining facility that can be used by both students and conference attendees and an outdoor public space that will become a focal hub of campus activity.



### *Phase 5*

The fifth phase will develop a Teaching Hospital for the campus. This is envisioned to be a 400-bed facility with state-of-the-art training facilities and layout for resident medical and nursing students. The hospital will also require installation of a second bore hole and water tower storage unit.



### 3.2 Site Development Plan

#### Design Vision

The immediate needs for SFUCHAS include providing safe and adequate accommodations for their growing student base, creating space to expand their School of Medicine faculty to include a School of Dentistry, and consolidating their administrative staff into one location. Fulfilling these needs will require the majority of the northern portion of the new site and therefore has been used to define construction goals for Phases 1 & 2.

Collectively this northern development area becomes known as the Site Development Plan (SDP) area. The EMI team spent extra time considering the details of this development area to create a well-coordinated and detailed plan. The design strategies as applied to the SDP area have been carried through to the rest of the site to provide a uniform look and feel for the master plan, but there is still a lot of room for modifications and refinement to the southern zone of the campus.



SDP Central Plaza

#### Legend

- A - Honey Processing Centre
- B1 - Canteen
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- F1 - Administration Building
- G - President's Courtyard





Campus View looking North



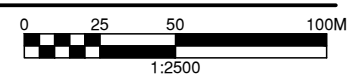
**BUILDING KEY**

- A - HONEY PROCESSING CENTRE
- B1 - CANTEEN
- B2 - CANTEEN & MULTI-PURPOSE SPACE
- C1-9 - STUDENT RESIDENCES
- D - SCHOOL OF DENTISTRY
- E - RESEARCH CENTRE & LIBRARY
- F1 - ADMINISTRATION BUILDING
- F2 - ADMINISTRATION BUILDING
- G - PRESIDENT'S COURTYARD
- H - KIOSKS
- I - SCHOOL OF SOCIAL SCIENCES
- J - SCHOOL OF NURSING
- K - SCHOOL OF PHARMACOLOGY
- L1 - SCHOOL OF MEDICINE
- L2 - SCHOOL OF MEDICINE
- M - CANTEEN
- N - CONFERENCE CENTRE
- O - SIMULATION LAB
- P - TEACHING HOSPITAL
- Q - STAFF RESIDENCE
- R - FUTURE EXPANSIONS

**LEGEND**

- SITE BOUNDARY
- BOUNDARY WALL
- - - - - OUTLINE OF ROOF ABOVE
- x - x - x - EXISTING CONCRETE MASONRY FENCE
- - - - - CHANNEL CENTERLINE
- - - - - FLOODPLAIN LINE
- Public Roads
- Internal Roads and Parking
- Paths and Hard Surfaces
- Recreational Courts
- Recreational Field
- Soft Landscape General
- Water Feature and Chanel
- Bridge with Culverts

**1 PROPOSED SITE PLAN**  
1:2500



**SFUCHAS CAMPUS MASTER PLAN**  
**IFAKARA, TANZANIA**  
**CAMPUS MASTER PLAN**  
**PROPOSED SITE PLAN**

**CONCEPTUAL DRAWINGS NOT FOR CONSTRUCTION**  
LOCAL REGULATIONS MAY REQUIRE DRAWINGS TO BE FINALIZED BY AN ARCHITECT/ENGINEER LICENSED TO PRACTICE IN COUNTRY

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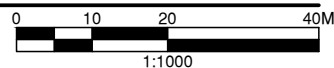
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- Recreational Field
- Soft Landscape General
- Water Feature and Chanel
- Bridge with Culverts

**1 SPD PROPOSED PLAN**  
1:1000



**SFUCHAS CAMPUS MASTER PLAN**  
**IFAKARA, TANZANIA**  
**SITE DEVELOPMENT**  
**SPD PROPOSED PLAN**

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