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AAK | PROMOTING EXCELLENCE IN THE BUILT ENVIRONMENT

# THE Architect

THE OFFICIAL MAGAZINE OF THE ARCHITECTS CHAPTER, ARCHITECTURAL ASSOCIATION OF KENYA

# EXCELLENCE IN ARCHITECTURE

PLUS: AAK ANNUAL CONVENTION 2017 • STATUS OF THE BUILT ENVIRONMENT • LIST OF MEMBERS

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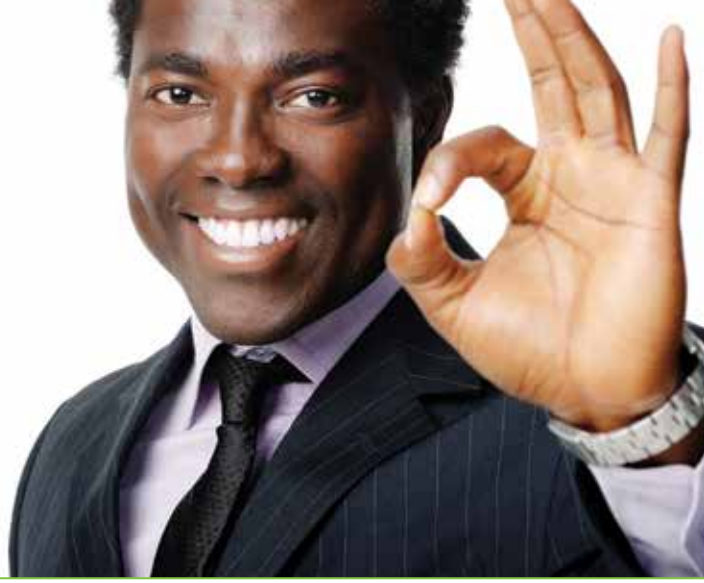

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# EXCELLENCE IN ARCHITECTURE

Last year marked an important year for the association and we celebrated AAK@50 all year long with great events for our members culminating in the Duracoat Awards of Excellence in Architecture 2017 where outstanding architects and architectural practices were feted for their contribution to architecture in Kenya and neighbouring countries. And what better way to start the year than to remain hot on the heels of excellence by documenting these awards as well as prescribing what excellence in architecture, regulation of practice and in education is all about.

As we are all aware practices across the various disciplines in the built industry were previously ran as apprentices. This ensured that the standards of practice were passed on from one generation to the next. This way, operations were slowly perfected and became standards that led towards excellence. However, today the trend has changed to take up the increase in the number of projects in the market, well, except for 2017 where elections set back our industry, and to accommodate the increasing number of young professionals joining the industry each year. In this scenario, we find that there is minimal continuity in firms and therefore the art of perfecting the trades is getting lost.

It is therefore imperative that we appreciate the value of excellence in our practices and find means and ways of passing these down to other generations. Recognition of excellent architecture inspires the next generation and ensures that we carry on the mantle of doing good for the society. In the long run, issues of collapse of buildings, poorly planned roads, flooding and such urban calamities will be a thing of the past.

As in all other issues, we invite you to read a word from our chairperson announcing what we have lined up for the chapter in 2018 as well as handpicked articles from our contributors and advertisers. We are also introducing a section for the governing council, where the President shall give an account on what the association is currently working on for our members and for the practice.

May we all aspire to be excellent in our practices.

"Excellence is an art won by training and habituation. We do not act rightly because we have virtue or excellence, but we rather have those because we have acted rightly. We are what we repeatedly do. Excellence, then, is not an act but a habit" *Aristotle*

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# 2018 YEAR OF ARCHITECTURAL EXCELLENCE

2017 marked the 50th Anniversary of the association and with it came lots of great achievements and firsts. There was of course the 50th anniversary Gala Dinner in May and the Nairobi Then and Now Exhibition, the CSR Run in July, the Standard Gauge Railway Station tour in September to mention but a few.

The industry took a hit following the election period but the current resurgence in 2018 is giving many lots of hope and optimism.

The culmination of the past year's calendar was the AAK Duracoat Awards of Excellence in Architecture which are held every two years and seek to recognize and celebrate projects that evoke excellence in the profession. The awards came at a good time, considering the International Union of Architects (UIA) Congress was held in Seoul, South Korea, in September and several AAK members had a chance to attend and interact with their contemporaries from around the globe.

The issue of excellence transcends several facets of the profession, with matters of environmental awareness, building regulation, contract review taking centre stage at the beginning of this year. We are tasked with not only improving the environment with our projects, but also protecting it for posterity and ensuring our projects appeal to sustainability ideals that have become almost mandatory to adhere to. Integrity cannot be left out in this debate, with the cases of buildings collapsing in the headlines.

It is my hope that Architects will rise to be the champions of the built environment and ensure a collaborative approach with their fellow built environment professionals such that excellence becomes the norm…a basic standard to maintain.

The Architects Chapter shall seek to spearhead this via several fora and project visits so as to demystify what is required of the industry. In the end, we should all leave this planet in a better state than we found it, one project at a time.

Here to a 2018 full of Architectural Excellence!

## AAK ARCHITECTS' CHAPTER CALENDAR OF EVENT

| | | |
|---|---|---|
| **February** 21st — CHAPTER ANNUAL GENERAL MEETING | **June** 25th-29th — AUA CONGRESS MAURITIUS | **August** 15th-18th — AAK ANNUAL CONVENTION |
| **April** 6th — CHAPTER GOLF TOURNAMENT | **July** 19th-20th — EAIA AGM/ COUNCIL MEETING KIGALI | **October** 1st — WORLD ARCHITECTURE DAY |
| **May** 4th-5th — KERICHO BuildTour | **July** 19th-20th — UIA BUREAU MEETING / BREAKFAST CPD NAIROBI | **October** 25th — CHAPTER BREAKFAST SEMINAR |

EMMA MILOYO president@aak.or.ke

# A WORD FROM THE PRESIDENT

The Architectural Association is now concluding commemoration of its 50th Anniversary. This has been a landmark occasion to celebrate 50 years of existence and that members of the Association grow it to be a formidable organization, remaining a leading Association of built environment professionals in the region. During this period, we developed a set of policy issues that the Government of Kenya has identified as part of the national priority agenda, especially on the affordable housing.

The Association also incorporated Corporate Social Responsibility as a way of contributing to the well-being of all. We organized a CSR Run on 1st July 2017 and whose proceeds were used to support the Anwa Junior Academy in Kibra as well as the AAK Bursary initiative in support of needy university students pursuing built environment programmes.

As an established and leading professional association in the industry, we are aware of the challenges that the industry has faced over the years. These challenges have disadvantaged the nation in many ways, including loss of lives and property as well as poorly planned cities, towns and neighborhoods. We have sustained advocacy in this regard and currently, a Built Environment Practitioners Bill has been presented and circulated to members. We will continue in this initiative to ensure the legislative process is properly completed.

*AAK team at Anwa Junior School*

*Members of the AAK College of Fellows and Governing Council at a meeting with members who were elected to national leadership positions*

Automation system has been an important factor in streamlining the process of obtaining permits. This process was conceptualized by this Association and implemented at the Nairobi City County, and thereafter expanded to Mombasa, Kisumu and Kiambu counties, all with the support of the International Finance Corporation.

As you are aware, The Building Code of Kenya has been in place as The Local Government (Adoptive By-Laws) (Building) Order 1968 vide Legal Notice No. 15. There has been effort, in the recent past, to develop the National Building Regulations. From the foregoing, the country lacks an official building code. The revision of the Building Code is currently ongoing and the Association has made noteworthy contribution to this. We have made a submission and appeared before the Parliamentary Committee on Lands. We are now working on a more detailed submission as requested by Parliament.

As you are aware, the Joint Building Council Ltd was established in 1980, as a partnership between the Architectural Association of Kenya and the Kenya Association of Building and Civil Engineering Contractors (KABCEC). The key objective of its establishment was To promote the consideration and discussion of all questions affecting the building industry including the trade of builders and contractors for the execution of public and private works, the practice of the professions of architect, surveyor and engineer, and all ancillary and allied trades and professions, and every branch of such trades or professions).

*AAK Executive Committee members issuing a cheque to students as the Association's support under the Bursary initiative*

a) Review the Structure of the Council – this has now been renamed to Joint Building and Construction and Council (JBCC) with a view to making it more inclusive.
b) Re-launch the Price Fluctuation list.

The Association also launched an electronic membership management system. With this system, we have discontinued manual issuance of Annual Membership Certificates and will be rolling out electronic membership application. This system will also make it easier for the public to authenticate annual membership certificate via the AAK membership portal – members.aak.or.ke.

To further streamline membership matters, AAK Governing Council has introduced new amendments to the By-Laws to replace termination with Suspension of membership on account of nonpayment of subscriptions.

The Association has continued to invest in strengthening the AAK Secretariat. During the year, we recruited Lina Jamwa as Membership and Communications Manager as well as Maureen Gikonyo as Research and Advocacy Manager.

The Association remains committed to excellence and superior services to our members ■

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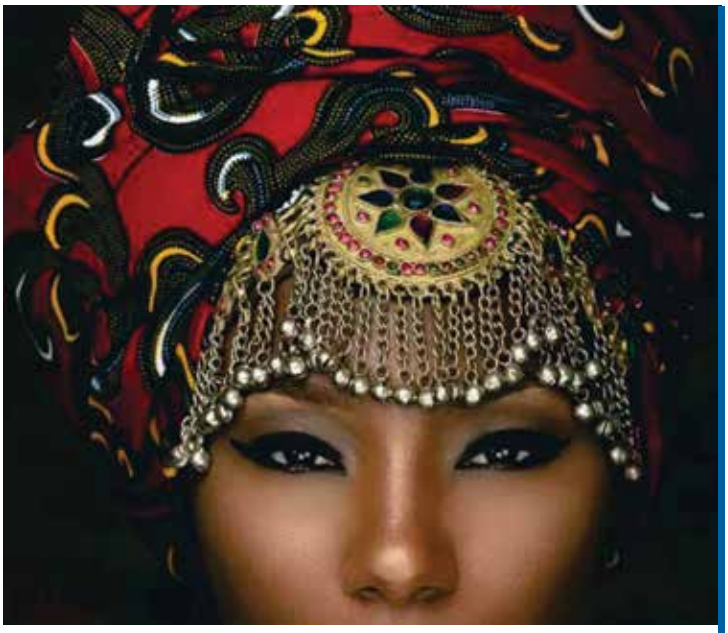

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# SPECIFICATIONS IN ROOFING: GETTING IT RIGHT THE FIRST TIME

Specifications. The one word that defines the route-map towards the transformation of an Architect's dream into reality. They define how to harness diverse interests – some aligned & some competing – on a project harmoniously. From aesthetics, to form, to function and adherence to standards. The project team uses them to talk to each other and to align their individual mandates into a coherent, living whole.

Clear, updated & well written specifications go to the heart of an Architect's professional responsibility on a project and when absent or indistinct, liability. Coupled with actual execution oversight, good specifications are often times the difference between great architecture and the rabbit hole that is failed projects, endless litigation, costs, professional embarrassment, revisions and variations.

The same applies when it comes to that common crowning glory of every building - the roof! Besides the roof's core functionality of protection from the elements, the roof is often a key design item that defines form & gives character to a building. The choice & application of the roofing solution must therefore be informed & deliberate; then meticulously applied as per specifications and best practice. Out of world-wide experiences, steel industry experts have defined the nine core parameters & considerations involved in defining & specifying a steel roofing solution as follows:-

| CORE PARAMETER | WHY? | DESIGN & MATERIAL IMPLICATIONS |
|---|---|---|
| PROJECT LOCATION (e.g. coastal /inland) | Corrosiveness & related conditions | Steel coating class & protection, design, warranties & periodic maintenance regime<br>*e.g. MRM's AZ150, Colourplus PVDF roofing in corrosive marine / industrial conditions* |
| SITE TERRAIN | Wind-loading & weather -tightness consideration, | Structural design, building orientation, form & roof slope, choice of profile, fasteners & method of installation.<br>*e.g. MRM's 0.6mm SAFLOK700 installed as using the High-Wind Load (HWL) system in severe wind zones* |
| SITE'S WIND ZONE | | |
| ROOF HEIGHT | | |
| PURLIN MATERIAL | Fastener performance & compatibility issues | Choice & application of fasteners<br>*e.g. MRM's Class4 FIXTITE fasteners in marine zones* |
| ROOFING PROFILE | Effective water shedding vs min. slope/ aesthetics | Choice of profile, slope & accessory design<br>*e.g. MRM's NEWLOK standing seam profile on 2° slope* |
| MATERIAL CHOICE | Load bearing attributes, thermal expansion, on-roof installations compatibility – e.g. solar | Choice of profile & design, fixing method of on-roof attachments, budget vs performance considerations<br>*e.g. Aluminium has 35% the carrying capacity of MRM's AZ-coated Steel & twice the thermal expansion.* |
| CHOICE OF GAUGE | | |
| FINISH (e.g. metallic colour) | Thermal & "cool" roof consideration/ aesthetics | Choice of finish, "green" design, allied items<br>*e.g. MRM's 0.5mm NEWLOK in Colorplus metallic Lilac Haze with a Solar Reflectance Index (SRI) of 75* |

This is apt demonstration that the roof has cross-cutting implications on the structural, environmental-soundness, aesthetics and even cultural-fit (i.e. design-language) performance of a building. In this regard, the Architect's role is therefore to meet each of these often non-aligned design challenges using specifications that yield a coherent whole. The best specifications should transcend generalities to encompass standards & applicable tests, design criteria & minimum performance including warranties & product identifiers. They may even define the installer's competence & support documentation thereof. They must guarantee results & clearly document deliverables.

Mabati Rolling Mills Ltd (MRM) continues to engage all industry players towards a culture of excellence in specifications in roofing & allied building solutions. Experiences gathered over the 12 African countries in which we operate as part of SAFAL Group, has enriched our product & service development to allow it respond to the most demanding challenges for roofing & allied building solutions.

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We are continuously engaging the industry to realize the immense possibilities of all these innovations through correct specifications. MRM remains an avowed optimist in the potential of our building industry and our collective ability to harness the best technologies world over to answer our local needs; roofing or otherwise. For the professionals, industry-updated, technically-correct, environment-respecting, heritage-relevant & contractually enforceable specifications should & must continue to be the epitome.

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# THE AAK-DURACOAT AWARDS OF EXCELLENCE IN ARCHITECTURE 2017

The Awards of excellence in architecture wound up in a colourful event held at the Villa Rosa Kempinsky on 5th December last year. The event, which also featured the awarding of the children's competition winners was specially held in celebration of the Association's 50th year anniversary and was combined together with the annual President's dinner.

## THE CHILDREN'S COMPETITION

In celebration of the 50 years of AAK, the Association held a children's design competition for children between seven (7) and twelve years old. The competition themed 'My future Home' required the children to give an impression, through artistic work, of how their future home would look like. A total of 52 submissions were received from children from schools within Nairobi County. The submissions ranged from hand drawings, mosaics to models.

The jury considered the aspects outlined below in their evaluation:

- Aesthetics
- Presentation Quality
- Understanding of the assignment
- Creativity in media exploration
- Futuristic elements
- Features in the home
- Consideration of the age of the child making the submission

### Winner

Seven year old Ali-Jamee Mohammed emerged winner in the competition. The jury found his entry to be very futuristic and had key sustainable design elements including solar heating and rain water harvesting. The submittal also used mixed media including paint, cardboard, toothpicks, aluminium and glitter pen in the artwork. Ali's entry scored highly in understanding the competition brief, designing a house for the future as well as creativity in media exploration.

### 1st Runner up

Nine year old Allan Mogoi Karioki came in second in the children's competition. Allan's submittal used mixed media including a paper collage, colored drawings, and details of the elements in the home. He also submitted a write up detailing the quality of the space and indicating he would use timber materials in construction of his house.

Allan submitted three different sheets for evaluation. Including a detailed drawing of his future vehicle, a collage and a color pictured of his future house. There was clear substantial effort in the work he submitted.

### 2nd Runner up

Leonel Ngatia was the second runner up. The six year old's submittal stood out as the only 3-dimensional artwork, which is a plus in architectural submissions. He used different materials within including fabric to indicate curtains and a stick to hold the structure up ■

*Ali-Jamee Mohammed receiving his trophy from Arch. Aidah Munano, the then Principal Secretary state department of Housing. Looking on are his parents, Mr and Mrs Mohammed.*

*Allan Mogoi Karioki receiving his medal from Arch. Aidah Munano*

*Leonel Ngatia after receiving his medal from Arch. Aidah Munano. Helping him is his mother and looking on are his aunt and father.*


*The winners of the children's competition. L-R: Leonel Ngatia, Ali-Jamee Mohamed and Allan Mogoi Karioki*

*Awardees receiving awards during the AAK-Duracoat Awards of Excellence in Architecture 2017*

# AWARDS OF EXCELLENCE IN ARCHITECTURE

The award scheme is aimed at recognizing excellence in architecture for projects designed, built and completed in Kenya or within East Africa by members of the Architectural Association of Kenya. The scheme is often held biannually and the jury in each year considers submissions and award projects based on the following criteria:

a. Design, Innovation and Creativity
b. Cost Effectiveness
c. Creative Use of Materials
d. Promotion of African Traditional Architecture
e. Sustainability
f. Socio-economic Impact to the Community
g. Professional Training
h. Professional Leadership
i. Eco-design
j. Land Use Planning
k. Response to the Urban Context

# JURY REPORT

## INTRODUCTION

This annual AAK award scheme is commendable. The competition is a great way of spurring design excellence and more architects should be encouraged to participate. The jury comprised of Arch. Jonathan Manning from South Africa, Arch. Christian Benamina from Rwanda and Arch. Dr. Susan N. Kibue from Kenya.

The jury assessed the submissions between Saturday, 2nd December 2017 and Monday, 4th of December 2017. The exhibition of the works was displayed at the Architecture, Design and Development (ADD) building at the University of Nairobi. The final awards were presented to members of the AAK and invited guests, at the Villa Rosa Kempinski in Nairobi at the AAK Awards of Excellence, and Presidents Dinner on the 5th of December 2017.

## ASSESSMENT PROCESS

The jurors were presented with 56 projects that were submitted by Architects who are members of the AAK. The evaluation criteria for the submissions issued to the jurors was based on 11 criteria. These were rationalised by the 2017 Jury down to 5 main criteria, details of which are listed below. The entries were vetted based on the submission requirements, leaving 28 eligible projects in total. The evaluation of the entries was based on 'Excellence in Design'. The jurors noted the high proportion of the submissions, totaling 50%, that were eliminated due to not meeting the requirements of the awards submission process. It was further noted that some of the submissions were seemingly not specifically prepared for the competition.

## ASSESSMENT CRITERIA USED

The following assessment criteria were applied:

- Design Innovation and Creativity (50%)
- Creative Use of Materials (10%)
- Contextual Appropriateness (20%)
- Sustainability (10%)
- Socio-Economic Impact to the Community (10%)

## THE AAK-DURACOAT AWARDS OF EXCELLENCE IN ARCHITECTURE 2017

**Best Residential Building Project**

14 submissions were received in this category of which 6 were deemed eligible.

## THE AWARDS OF EXCELLENCE 2017 JURY MEMBERS


*Christian Benimana, Rwanda Programs Director, The Mass Design Group*

*Jonathan Manning, Group Managing Director, Osmond Lange Architects + Planners, South Africa*

*Dr. Susan N. Kibue, Senior Lecturer, Jomo Kenyatta University of Agriculture and Technology*

- *1st Prize – Swahili Gem, submitted by Urko Sanchez Architects*
  Swahili Gem is an apartment building located close to the water's edge on Tudor Creek in Mombasa. The Jury was impressed by the building's successful integration of vernacular Swahili aesthetics and traditional building technology, its sensitive siting and scale, and the appropriateness of its response to climatic conditions. The quality of graphic presentation of the submission was also exemplary.

- *Honourable Mention – Munje Beach House, submitted by Gronlykke Studio*
  The beach house is located on a beachfront site on the South Coast. The jury commends the house's elegant interior design and thoughtful selection of materials.

**Best Commercial Project**
15 submissions were received in this category of which 4 were deemed eligible.

- *1st Prize – The Hub, Karen, submitted by Bowman Architects*
  The Hub is a new retail mall developed in the Southern Nairobi suburb of Karen. The jury enjoyed the scheme's departure from the run-of-the-mill strip mall typology towards an integrated sequence of internal retail spaces arranged around a central piazza and a series of covered colonnade walkways.

**Best Educational Institution Project**
7 submissions were received in this category of which 5 were deemed eligible.

- *1st Prize – Mara Girls Leadership School, submitted by Mellbye Architects & Ecospace Architects*
  Mara Girls Leadership School is a rural school located in Talek, Masai Mara. The building comprises an oval shaped courtyard enveloped by a covered walkway interfacing with internal classroom spaces. The jury appreciated the resourcefulness of the design, utilizing a limited palette of materials and simple construction technologies to create beautiful spaces.
- *2nd Prize – International School of Kenya Elementary School, submitted by Team 2 Architects*
  The Elementary School is sited on the campus of the private International School of Kenya on Kirawa Road in northern Nairobi. The school is arranged within a number of parallel wings interspersed by planted courtyards. The jury took pleasure in the beautifully designed external walkways and integral stained-glass artworks. They were also impressed by the restrained material palette as well as the passive cooling and ventilation measures.

- *Honourable Mention – USIU Students Centre, submitted by Beglin Woods*
  The new 4-storey Student Centre is located on the University's Kasarani Campus. The jury was impressed by the clarity of the planning of the floorplates and the integration of usable external spaces.

**Best Low Cost / Social Project**
5 submissions were received in this category of which 4 were deemed eligible.

- *1st Prize – SOS Children's Village, Djibouti, submitted by Urko Sanchez Architects*
  The SOS Children's Village is home to an NGO providing family-based care to abandoned, destitute or orphaned children. The scheme comprises a series of human-scaled buildings set along a network of narrow walkways. The architecture mimics the vernacular townscape grain and architectural vocabulary of the regional vernacular. The jury commends the sensitivity and appropriateness of the project's programmatic, climatic and formal response as well as the quality of the graphic presentation of the submission.

**Best Town Planning Project**
2 submissions were received in this category of which both were deemed eligible. No award was made in this category.

**Best Hospitality Industry Project**
7 submissions were received in this category of which 4 were deemed eligible. No award was made in this category.

**Best Cultural Building Project**
2 submissions were received in this category of which both were deemed ineligible. No award was made in this category.

**Best Health Centre/Hospital Project**
1 submission was received in this category which was deemed eligible. No award was made in this category.

**Best Landscaping Project**
2 submissions were received in this category of which 1 was deemed eligible. No award was made in this category.
**Best Building Restoration Project**
2 submissions were received in this category of which 1 was deemed eligible. No award was made in this category.

## RECOMMENDATIONS

The Jury of AAK Awards of Excellence in Architecture 2017 commends the AAK for adopting many of the recommendations made by the jury of the competition of the year 2016. However, based on the jury's understanding of what the competition seeks to promote, namely Excellency in Architecture, the Jury's experience assessing the entries and the results of the assessment, the Jury of AAK Awards of Excellence in Architecture 2017 hereby makes the following recommendations to board of AAK (The organizers of the competition):

1. The jury recommends to the board to allow submission of (i) projects located anywhere in the world built and completed by members of AAK within the last five years, and (ii) projects located in Kenya within the last five years built and completed by non-members of AAK but recommended/nominated by members of AAK.

2. On the submission categories, the Jury observed that the categories were numerous and overlapped in ways that in some cases created unfairness in evaluation. The jury recommends reducing and rationalizing the number of categories
3. With regard to the submission deadline, the jury was made aware that the deadline for submission was shifted a number of times. This situation creates confusion and unfairness. From a fairness point of view, in case the circumstances require that the deadline be extended the communication and procedures for resubmission should allow the already submitted entries to be resubmitted in line with the new deadline.
4. The jury strongly recommends implementing a submission graphic and layout format that needs to be strictly followed when entries are submitted. The benefit of this is that the jury will be able to assess the projects on an equal basis, and encourages entries to submit selected aspects that are only necessary and relevant to the categories and evaluation criteria in that particular category, rather than submitting drawings and graphics created for other purposes.
5. The jury recommends that the provided graphic layout format aligns with overarching evaluation criteria and that entrants be requested to submit materials highlighting the aspects of the projects that speaks to excellence in:
    a. Design Innovation and creativity.
    b. Creative use of materials,
    c. Contextual appropriateness,
    d. Environmental Sustainability,
    e. Socio-Economic Impact.
6. With regard to the evaluation criteria, the jury recommends that the submissions be pre-screened for compliance with submission criteria before the jury is convened to assess them, with future juries only assessing eligible submissions.

Last year's Awards attracted 54 entries from firm members of the Architectural Association of Kenya. Out of these, seven (7) were awarded under the categories outlined below:

| Category | Winner | 1st Runner up | 2nd Runner up | Notable mention |
|---|---|---|---|---|
| **Best residential Building Project** | Swahili Gem by Urko Sanchez Architects | | | Munje Beach House by Gronlykke Studio |
| **Best Commercial Building Project** | The Hub, Karen by Bowman Architects | | | |
| **Best Educational Institution Project** | Mara Girls Leadership School by Mellbye Architects & Ecospace Architects | International School of Kenya Elementary School by Team2 Architects | | USIU Students Centre by Beglin Woods |
| **Best Low Cost / Social Project (Residential, Healthcare, Educational)** | SOS Children's Village, Djibouti by Urko Sanches Architects | | | |

*The then PS of the State Department of Housing and Urban Development, Aidah Munano gives her speech during the Awards of Excellence and President's dinner*

*Some of the guests during the Awards of Excellence and President's Dinner last year*

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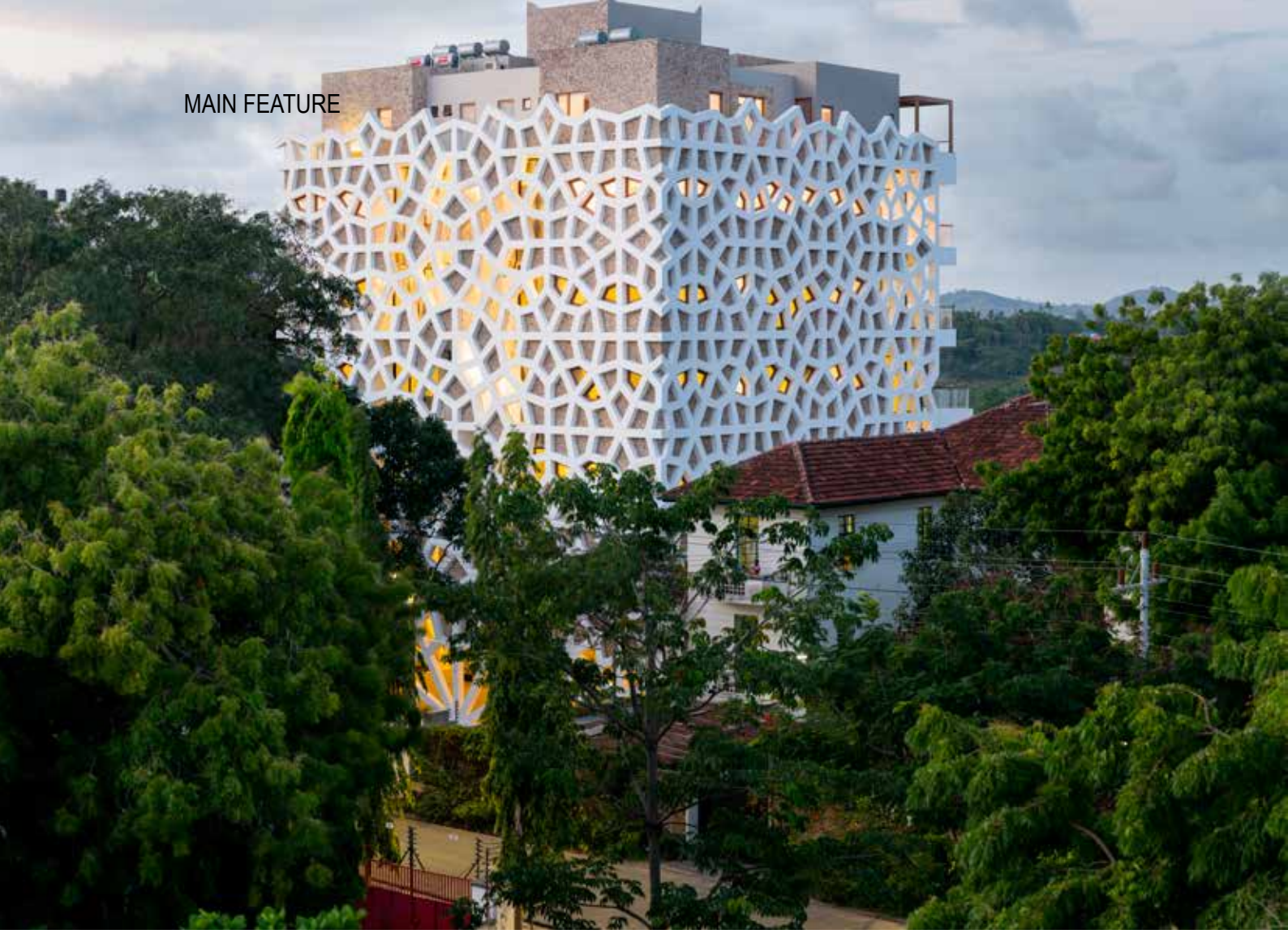

BEST RESIDENTIAL BUILDING PROJECT

# TUDOR APARTMENTS

## OVERVIEW

The project consists in 14 apartments in Tudor Creek, Mombasa-Kenya. Characterized by a moucharabiah structural shell, it is distinct with its search for privacy and optimized natural ventilation and light. With our vision, the apartments benefit from the experience of outdoor living, contact with nature and the integration of the surroundings into each private home.

## LOCATION / CONTEXT

Located on the east coast of Kenya, Mombasa is the second-largest city in the country. A multicultural and strategic centre known for trading and skilled craftsmen, it is characterized by a savanna tropical climate and a land crossed by creeks.

Tudor, our intervention zone, is situated on the creek´s waterfront, which is a privileged location north of Mombasa Island. With lush vegetation all around and a serene neighbourhood, the project naturally fits into this environment.

We worked closely with the client to create a building with minimal environmental impact, by adapting to the land's natural slope, and by using locally available materials and know-how.

## REQUIREMENTS / SITUATION CONSTRAINTS

- Maximize the scenery from within and outside the apartments, notably via terraces and balconies
- Environmentally friendly:
  - Naturally aerated spaces: passive cooling.
  - Well-lit spaces, a challenge, as light must come in without the sun heat.
  - Rainwater collection, driven by water scarcity.
  - Solar-heated water for energy saving.
  - Local, long lasting materials
- Ensure privacy regarding theproximity of the road, and that of theneighbours in the adjacent plots: a building of flats on one side, a private house on the other with a risk of major residential development. This was a drive for creating the filtering shell.

## PROPOSAL

Swahili Gem is a development that prides itself in its innovative architecture, showing its attachment to Mombasa's history by borrowing inspiration from the rich traditions of Swahili design. This development project is committed to harmonizing Mombasa's past, present and future.

The proposal is an intimate development of 14 apartments, all offering breath-taking panoramic views on the creek. We developed aniconic building, with innovation of architectural designs, highest standards of product finishes, luxurious, contemporary lifestyle, and respect for the natural and local heritage.

The plot's slope and its narrow shape guided our design to minimize the building's impact. The steep drop towards the creek, on the lower part of the plot, was saved with three distinct and unique patio houses, stepped one into the other. On top of filtering light, the patios allow ventilation via permeable wood lattices facing the water. They are accessible via lateral stairs that descend towards the creek, passing by an integrated gym at the bottom, and arriving to an infinity pool. A measured distance from the neighbours and the road give the building a well-weighted impact, for it to be present but not overwhelming in the scenery. This way, the apartments block, enveloped with its protective skin, rises facing the road, overlooking the creek, and topped with a penthouse.

## ENVIRONMENTAL FEATURES

- The development was careful to leave the mangroves and other trees intact on site.
- In addition, natural, passive ventilation was a guiding theme in the project design.
- In the apartments, cross ventilation is possible from the sea, through the shaded terraces, to the interiors, via the integrated wooden lattices and through the surrounding envelope.
- In the distinct bottom houses, the patios allow double ventilation: wood lattices allow air to circulate from the seaside through the interiors and to the patios; two superimposed lattices allow ventilation for both the house and the false ceiling, to avoid it transmitting heat from the sun on the top terraces. Moreover, vegetation is integrated in the patios and on the terraces, offering freshness and greenery.
- In the absence of sufficient connection to the sewage system, we integrated a bio-digester for treating used waters before releasing them into nature, that is to say, in the creek water. Furthermore, rainwater collection provides water for care for the garden.

## STRUCTURAL SKIN: CONTEMPORARY MUCHRABIAH

We designed the mucharabiah skin following a study of different traditional patterns. It serves for the privacy in relation to the surroundings, and for the filtered, natural light we wanted for the houses.

This skin wraps itself around the apartments block, leaving its Northern façade free, with balconies facing the sea and taking full advantage of the breath-taking scenery.

Moreover, the skin was rendered entirely structuralthanks to the engineering team. A novelty to Kenya, such structural skin was possible thanks to local and international engineers working hand by hand, and to the steel workers on-site who managed, by dedication and care, flawless bar bending work without access to any technology.

Spatially, this skin also redirects people's local tendency to put bars on their windows, becoming itself the border and the filter. Sometimes the direct limit of the internal house spaces, the shell is at other times a first filter of sunlight and heat, doubled by internal handcrafted wood-lattice shutters. In this way, light is generous and heat is broken down.

## CRAFTS, TECHNIQUES, TEAM WORK

In addition to white, plaster finishing, the project uses mtomo finish, a coral stone cladding technique original to Lamu that helps keep thermal capacity thanks to the porosity of the coral stone. Wood work was realised entirely thanks to outstanding hand carving by local artisans from Mombasa and Lamu. Furthermore, artisans produced in situ terrazzo for the flooring of the patio houses ■

NOTABLE MENTION

# MUNJE HOUSE

In 2014 I came across a 1 acre plot 5 km south of Msambweni Beach just after Munje village on the road to Funzi Island. It has a 100 meter wide sandy cove in a stretch of coral cliffs and it is where the local fishermen from Munje keep their dugouts, nets and cages. This is where the road ends; there are no neighbors, only the ruins of a mosque built by Arabs hundreds of years ago and a huge baobab tree even older than the mosque with one of its large branches shading an old tomb. Several indigenous trees and Doum palms cover the plot, which I methodically measured up for incorporation into the design.

A courtyard type house was built with small nooks and crannies to preserve the trees. The elegant long roof, large window panels and open plan pay homage to the Scandinavian houses of the sixties. Part of the house has a second floor with attractive views over the courtyard and the beach. All rooms have doors opening both out to the beach and in to the courtyard and are shaded by deep verandahs for cool indoor spaces.

Both the interior and the exterior of the house are in natural machine cut coral block walls and natural clay tile floors give it a flowing, surreal inside-out ambiance. This together with the swahili furniture and handmade brass lights and decor evoke a sense of timeless luxury and charm. The visually soothing sandy tone of the indigenous coral block walls have acoustic benefits as well, and together with the high ceilings and natural ventilation add to the overall indoor climate.

All work from the shell of the house, the plastered bordering and Swahili niches in beach sand and calcium, to the hardwood kitchens, wardrobes, windows, doors and the fluted courtyard columns were made by coastal craftsmen using local materials and to a commendable quality. The furniture, brassware and selected antiques are either from nearby Ukunda or Old Town in Mombasa.

The house has 3 sections around a communal courtyard with swimming pool, verandahs and lawns. Each section has its own master bedroom and one or more kids rooms so up to 3 families can stay and enjoy their holiday together and still have their privacy. The house has 5 double rooms and 5 single rooms and can accommodate up to 14 guests and a visiting cook. All bedrooms are self-contained.

The house has a pool bar, a home theatre and 4 informal dining areas: in the main kitchen, at the pool verandah, at the BBQ grille and pizza oven and on the verandah outside the annex kitchen ■

BEST COMMERCIAL BUILDING PROJECT

# THE HUB, KAREN

## BACKGROUND

The HUB Karen' is a mixed use complex set on a sprawling 20 acres in the heart of Karen, Nairobi's green suburb.

Karen, a low density residential suburb located approximately 14 km's due south west of the Nairobi City Centre, is recognized for its peaceful character, attractive natural environment, and diverse but harmonious population. The Client sought a community lifestyle centre, with a toned down residential feel architecture where people can shop, meet and engage, and ensure that the building did not appear imposed in its location.

The building works commenced on January 2014, and the Mall opened to the public on February 2016.

## DESCRIPTION

The project comprises of 32,500 sm of Gross lettable area and 1,100 no parking bays, 22,500 sm being retail anchored with supermarket, entertainment areas and fashion, 5,000 sm of small and medium size office space and 2,500 sm of medical and wellness. There are more than 20 food and beverage outlets all with outdoor terraces, to take advantage of Nairobi equatorial climate and landscaped open areas.

This is housed in six low key separate buildings linked by bridges around a focal point: A large open air piazza of 2,000 sm which hosts exhibition, performances, markets and events. This has brought value to the community, by bringing events to Karen. The open air complex and open air corridors maximizes on natural day light and ventilation, and also increasing visibility and security. A 4000sqm water body serves as a backdrop of the centre offering relaxing views for restaurants.

The building footprint is less than 25% of the total plot, while 50% of the land remains landscaped, with a large waterbody and walking trail.

The project responds to the gradual slope within the site by providing multi-level entry points, which has improved pedestrian accessibility and provided for an interplay of levels within the two main courtyards linked together with a grand staircase.

## GOING GREEN AND SUSTAINABILITY

The mall assumes an open plan that allows for passive ventilation which positively impacts the energy foot print in the building as well as the cost of maintenance since there is no mechanical ventilation required in the public spaces. Incorporation of openness also ensures that all the shops are well aerated, easily visible and accessible and naturally lit except


for aesthetic purposes by individual tenants. Additionally, the lighting arrangement is all LED coupled with motion sensors in the common areas. Solar panels have also been installed in the expansive roofs so as to complement supply from the national grid.

There is a complete water strategy in place, and to compliment the city council water supply (which was a major concern from the residents as there is already a lot of pressure on the existing water supply which is insufficient), a sewer treatment plant has been installed on site to treat the grey water. In that regard, 80% of all the water used in the mall is recycled. In addition, it was a mandatory requirement for all the food outlets in the mall to install dishwashing machines to save on water. Floor cleaning and gardening uses recycled water only. Taps and flashing systems in the washrooms are also sensor controlled.

All the waste from the complex is sorted out (bottle/ carton/ metal/ plastic/ organic) with an aim of recycling, and more important, a waste bank has been provided for the community within the premises, waste is collected and delivered to recyclers by the complex management.

## MATERIALS AND CONSTRUCTION

**Structure:** The project utilizes an RC frame construction, with RC columns and coffered slab construction. RC lift cores and stairs provide stiffening elements.

**Finishes:** The choice of materials used was guided by the design concept. Earthly materials and colours were utilized, for instance, stone cladding on the shop front fronts, arches, main stair cases; Timber cladding on parts of the walls and interior flooring; textured special effects finishing on the walls, brown wooden looking glass on the windows; stone tiles courtyards floors, and all were all inspired by the traditional concept that has strongly been developed across the entire design.

Typical of the Karen residential architecture, the complex takes the form of a grand suburban home with a minimal height comprising of two storeys, a pitched shingles roof, dormer windows on the top floor, earthy tones on the exterior finishes, large green spaces and airy common spaces.

## PROJECT SIGNIFICANCE AND IMPACT

The Hub Karen is an identifiable destination and offers a lot of variety for communities within Nairobi to meet, shop and engage, and is one of a kind in Nairobi.

Due to infrastructural challenges being experienced in Narobi, the project responded well, not to increase the problem but to help solve the problem, especially in Karen, which has originally been a residential area, therefore roads network not expanded for such developments. The Client undertook and upgraded into a dual carriage way the access from Karen to the complex, including a public transport stage and a separate entry/ exit and deliveries to reduce traffic congestion at entry/ exit points. This also included upgrades on drainage systems which had previously been neglected ■

BEST EDUCATIONAL INSTITUTION PROJECT

# MARA GIRLS LEADERSHIP SCHOOL TALEK, MAASAI MARA

*Main entrance with a feel of a 'fortress-like' entry*

## INTRODUCTION

The Mara Girls Leadership School is an initiative of Basecamp Foundation in Talek Town in Maasai Mara, Kenya that focuses on bright girl students with special talents that are moulded into leadership activities.

It provides a home away from home for the girls so that they can focus on school within the safety of the school. Here, they still carry out similar responsibilities as they would at home but with ample time for studies and leadership training. The school also encourages the students to learn about their culture, environment and conservation. The facilities to support that are built into the design of the school. The school is designed to accommodate only students in their last three years of Primary school i.e. classes 6,7 and 8.

## PROJECT DATA

The project was designed from October 2014. In January 2015 construction commenced and it was completed in December 2016 with the following facilities;

- 3No. Classrooms for 15 students each
- 6No. Dormitories for 8 students each
- Student Library
- Student Cafeteria
- Staff Offices
- Staff Quarters

*Use of Maasai bright sharp colours for the dry walkways as a vernacular design element*

*"Home away from Home" interior mimicking the Maasai lifestyle and culture of bright sharp colours*

*Inspiration - Traditional 'boma' with Maasai women*

*Detail - corner of conflict resolution*

## INSPIRATION NARRATIVE

As pastoralists of the savannah, Maasai have always lived in circular or oval 'bomas' (family villages) close to nature and wildlife as well as subject to the forces of harsh climate and weather.
The Mara Girls Leadership School (www.maragirlsleadershipkenya.org) has been designed in recognition of this traditional lifestyle, taking into consideration the living and learning conditions affected by heavy rains, strong winds, wet and dry season temperature fluctuations, intense penetrating sunshine and the risk of attack from wildlife or other imminent threats.

The key noticeable features of this project are found within the prominent connection and interaction between girls' boarding school and the traditional lifestyle and culture of surrounding community. That is to say, between vernacular design and architecture and the sense of place and people. Part of what we have chosen to refer to as the school's vernacular design and architecture school developed in relation to the project brief:

- The overall school facilities, including classrooms, administration, dormitories, dining/assembly, teachers housing are all kept within a traditional oval circumference. This required four independent sections to be designed and placed tight together. Thick building blocks where placed protruding from the base of the walls to mimic the feeling of a "safe fortress" – the traditional 'boma'.
- Colourful transparent sheets were used to create a "dry" walk-space providing access to all facilities also during the rainy season. The resulting bright red, green, blue and yellow shadows on the ground resembling the traditional sharp coloured clothing and beadworks in the Maasai tradition.
- A fireplace was included in the dining area to mimic the ever burning open indoor fire that is the centre of each of the huts making up the boma.

## SUSTAINABILITY ASPECTS

In relation to sustainability and improved socio-economical aspects the following illustrate some of the key features:

- The school features a 950m2 roof, which annually collects over 800m3 of clean water, which is an "overproduction" of water of approximately 35% or 275m3 that is available for public use during times of water shortage.
- A 9.2Kwh energy/power system based on solar panels and deep cycle batteries was designed for the school's lighting, Internet connection and computer charging requirements. The school effectively utilizes 4Kwh, which leaves the system an approximate 55% overcapacity that is available for other community activities.

**Other aspects include:**

- Wind protection
- Passive ventilation and Daylighting
- Green spaces
- School security/safety aspects

## LEADERSHIP ASPECTS

The Mara Girls Leadership School is an initiative that focuses on bright girl students with special talents that are molded into leadership activities. For that purpose the school has designed spaces where the students practice conflict resolution and contemplation & reflection, traits that are key abilities for young community leaders in the making ■

1ST RUNNER UP

# INTERNATIONAL SCHOOL OF KENYA ELEMENTARY SCHOOL

The proposed elementary school is part of a larger masterplan. The aim was to increase the number of students 'intake from 800 to 1200.The proposed school mainly comprises of classrooms from pre-kindergarten to kindergarten, grade 1,2,3,4 and 5.The ES campus has been divided accordingly into blocks from A to E. The blocks have been distributed to with courtyards between them in order to allow natural light and ventilation to move through all the blocks.

The blocks have also been carefully placed so as to save most of the existing trees on the site.

The blocks have been spread across the entire length of the north western to the southern side from block A to D and E respectively. The existing site falls on the southern side there by resulting in blocks D and E having an extra lower ground floor. The lower ground floors have been dedicated to multi-purpose rooms.

## FOLLOWING ARE THE FUNCTIONAL BREAKDOWNS OF THE BLOCKS:

Block A houses the prekindergarten classes on the ground floor accessed from a covered Corridor and opening out into a secluded play area dedicated for them .The remaining part of the ground floor is dedicated to administration and offices. The first floor is dedicated to special language and extra classrooms.

Block B, C & D house the kindergarden, Grade 1,2,3,4 &5 comprise of a square 1 storied block with 4 classrooms spread on all four corners with a common area in the middle, which acts as a break out space. This breakout space acts as an informal learning and interaction area. The common toilet and kitchen facilities are also accessed from this common area.

The central common area is lit with a skylight which brings in natural light into the common area both at the ground and first floor. Individual classrooms open out into an activity areas which are accessed via a sliding door. The activity areas are pavilions where a lot learning activities take place. They also act as an inside outside space for learning and teaching.

Block E is a smaller block adjacent to block D on the lower southern side and houses the laboratory on the ground floor and the staff resting area on the first floor.

The complex has been finished with maximum locally available materials and Craftsmanship like cladding timber and stained glass works.

The approach to the design has been done keeping mind the various aspects like light, color, the scale of the surroundings and the navigational path in the school which stimulate the minds of the developing children. The main elements like integrating day lighting with high-efficient artificial lighting, adequate acoustics and easy access to outdoor spaces has been adopted very well in the designs ■

NOTABLE MENTION

# USIU STUDENTS CENTRE BY BEGLIN WOODS

## BASIS OF DESIGN AND PROJECT OVERVIEW

**General**

USIU commissioned Beglin Woods Architects to provide full design and supervision services for the construction of a new Students Centre building at the USIU complex.

The site is located on a flat site, as part of the developing Master Plan of the complex. The land is adjacent to the New Library building and the New Science and Technology Building, also both designed by Beglin Woods. The Library was completed in 2008 and the Science and Technology building was completed in October 2014.

**1.2 Project Understanding and Goals**

The USIU project had to:

- Provide the required student facilities and activities
- Meet a construction budget, which includes certain fixed equipment.
- Provide Health Counseling and other Administrative services.
- Be ready for student occupation by mid 2016.

The land available for the project was studied in relation to the contour plans of the site and the existing buildings and site services. This ensures that the new building compliments and links into the existing facilities, rather than appear as a stand-alone new development. The land is adjacent to the New Science and Technology Building, also designed by Beglin Woods. The Library was completed in 2008, the Science and Technology building was completed in October 2014, and the Students Centre November 2016.

## ARCHITECTURAL DESIGN PRINCIPLES

**Design Overview**

Factors that have been considered in the Design development include the following.

Integration of new facilities within an existing older established institution.

- Maintenance of separate identities while sharing common facilities.
- Focus on the development of a working student community on the site.

The new facilities consist in total of more than 7,712 square metres (83,000 sf) gross plinth area including spaces for the health centre, the counseling centre, teaching kitchens, sports and gym facilities, and all the other student facilities.

Individual sections have been created for area/cost information, site analysis, and disciplined design issues. Preliminary concepts of building layouts, revised area requirements, systems design, building controls and security, have been developed into final approved design drawings.

The Proposed new facilities consist of:

- New Health Centre
- New Counseling Centre
- Meeting Rooms
- Offices
- Teaching kitchens and restaurant
- Coffee Shop
- Sport Facilities
- Gym
- Changing Rooms

Factors that have been considered in the Design development include the following.

- Integration of new facilities within an existing older established institution.
- Maintenance of separate identities while sharing common facilities.
- Focus on the development of a working student community on the site.

On completion, the USIU campus will have been renovated and expanded to accommodate the new facilities, which will be able to provide for up to 10,000 students, lecturers, scientists, technicians and administrative staff. Thereafter the USIU campus will continue expand its housing, academic and administrative venues to accommodate the planned population on site. For this long-range master plan, short and medium-term plans are being implemented. Certain facilities will be shared and others will be specific to individual programs.

The campus on completion will be an integrated working and residential University community, which reflects the shared interests of its member institutions while accommodating their individual objectives. The success to which this can be achieved depends on the skill and foresight of the work of the design team appointed to carry out this project.

The project is seen as a combination of highly technical work in upgrading and extending USIU and providing enhanced and extended common facilities to serve the present and future needs of USIU. The master plan, which has previously been developed by the architects, serves as a guide to all future developments on the complex.

USIU is establishing a world-class University Campus.

**Architectural Character**

The existing buildings, technically, socially and administratively, are of mixed natures, and we believe the Student Facility reflects a consistent Architectural Character. The principle characteristics are:

Flat roofs for services.

- Stone plinth walls with synthetic maintenance free render and solar glazing.
- Four story configurations around 2 courtyards.
- Quality Aluminum glazing sections
- High quality glazed solar control windows
- Open naturally ventilated offices where no air conditioning is needed
- Lush landscaping
- Lively ambience

The new Students Centre relates closely in architectural design to the existing new buildings both in terms of architectural style and exterior materials. Interiors reflect modern high tech, low maintenance and easily cleanable materials.

**Interior Specifications**

The finishes internally to floors, walls and ceilings required by the USIU facilities will be to a high specification allowing for ease of cleaning and maintenance.

*New Floor Finishes:* Floor finishes are specified as granite in entrance and lift lobbies, and imported ceramic tiles with epoxy grouting. Specialised sheet flooring was laid in all of the sports areas.

*Wall Finishes:* Walls are generally finished in silk washable paint finish.

*Ceiling Finishes:* Ceilings to all areas will be out of acoustic panels on steel grids under the concrete beams.

*Casework and furniture* for all areas will be coordinated with the furniture in the offices and social areas.

## EVALUATION CRITERIA

1. The land available for the project was studied in relation to the contour plans of the site and the existing buildings and site services. This ensures that the new building compliments and links into the existing facilities, rather than appear as a stand-alone new development. The mechanical, electrical and civil engineers have studied the site and produced their designs and specifications for the extended building services.
2. The quantity surveyor had an estimate, and the building completion came in at the estimated value.
3. Maintenance free materials are used throughout, with natural stone plinths, acrylic rendered walls, and high quality solar glazing throughout.
4. The complex was designed as a contemporary students union facility, with a stunning courtyards which will be planted with indigenous trees and shrubs.
5. Solar heating is installed for the hot water requirements in the kitchen areas. Photo voltaic panels are located on the roof areas to provide lighting for the common circulation areas. Proximity detectors control all the lighting. Solar glass is installed all the windows. Building orientation is North South to reduce exposure to solar to a minimum.
6. The Students Centre compliments the best University Campus in East Africa, and will be the hub for all Student activities.
7. The partner in charge studied in detail other Students Centre precedents before embarking on the concept design of this complex.
8. The Design and Construction Team was led by the partner in charge.
9. Eco Design is always part of the USIU client's brief.
10. The Masterplan of the USIU complex was initially prepared by ourselves in 2001. We are following this plan with every project we carry out for USIU ■

BEST LOWCOST/SOCIAL PROJECT

# SOS CHILDREN'S VILLAGE IN DJIBOUTI

## CONTEXT

We were approached by SOS Kinderdorf for a compound of 15 houses for children, to run their family-strengthening programmes, as they are an international NGO committed to caring for children, orphaned or in need, and to provide them with a permanent home and family. The project was to take place in Tadjourah, on the coast of Djibouti, in the horn of Africa, not far from where the hottest temperature ever was recorded. This very hot and dry climate will be a determining aspect in our design solution.

On the other hand, and as in many other places in Africa, there is a lack of regulations of constructions, which often leaves developers the freedom to build low quality, short-term rentable architectures, often leaving sustainability behind. For us, this freedom comes with great responsibility and it was the ideal context to design a high quality, low budget compound.

## DESIGN SCHEME

After extensive research on the place, we came to a few principal points and opted for a medina-based typology.

**Community and Traditions**

As traditionally nomads in the desert, the local residents' relationship with open space is essential and many activities take place there. Going against the contemporary flow of minimal open space, we made sure every house had one that was private enough for it to become an integral part of the home and of everyday life. Moreover, and much like a traditional medina, the houses all look inwards: the compound is a walled quarter, providing intimacy, and a sense of community and security, well-adapted to the social and environmental context.

**Ventilation and Thermal Comfort**

It is a traditional typology in hot climates. Its typical narrow streets and optimal orientations are a great solution for



passive and effective ventilation, to render the extreme climate habitable. We conducted a very detailedstudy for an optimal natural ventilation: by the orientation of alleys, the "ventilation corridors", and by the openings, big or small, in the surfaces of the houses. In critical points, and when it wasn't possible to have a free flow of air, we created tall ventilation shafts, which we called "wind catcher towers": they "catch" the wind and direct it into the room, hence keeping a refreshing air flow in the interior spaces. It was experimental and turned out quite efficient.

To optimize sun shading and cross-ventilation, both essential to make the climate viable, the houses follow the same scheme but are placed in relation to one another in a well-studied manner, sometimes becoming two superimposed houses, where roofs are terraces.

So typical of medinas, these optimal distancesare also a tool for keeping the privacy of each house: they participate in the clear definition between public and private spaces, which encourages residents to use the outdoors. Through a layout with optimal distances between houses, each open space becomes an integral part of the house, a private space with a strong relation between interior and exterior.

This permeability is further strengthened by an absence of systematic doors at every opening. With the climate and the low budget, closing all openings with doors wasn't necessary, as it rarely rains and the free flow of air is much needed; nor was it wanted: keeping large openings would allow an organic surveillance by the SOS mothers across the village, and strengthen the essential relationship of every house with its private, open space. This openness also puts children in an ideal position for free play.As such, large openings are sometimes half-closed with a moucharabieh, another traditional solution for ventilation and mild visibility. The only spaces that are completely impermeable are the bedrooms.

**Safety and Self-Sufficiency**

As it is a medina for children, and in the local cultural context, the narrow streets sometimes open up to become squares of different sizes, where communal activities take place and a sense of community can be built, a sense that is essential in the functioning of SOS children's villages. Those open spaces are also safe spaces for children to play, as cars are completely kept out of the project, with a few parking lots at one of the entrances. In this way, the project is a constant place of recreation, and interstitial spaces are suited for various activities.

Plants are introduced in the project: despite the aridity of the climate, encouraging residents to take proper care of them generates a network of communal greenery and, on the long run, those trees will grow to provide extra shade and cool down the spaces.

We also took advantage of the hot, sunny climate to power houses with solar energy: the project is equipped for self-sufficient,photovoltaic electricity production.

## MATERIALS

As we were working with a low budget, we use a reinforced concrete structure, precast cement blocks, and Cemcrete finish from a South African company. The pale, earthy tone finish is for reflecting a maximum of light and blending in the landscape.

Ultimately, the SOS Children's village is a shell to protect life, adaptable by the families who will inhabit it and bring it to life, with the colourful, vivid touch of their traditional clothing and furniture, to name a few. It is today a success on a social and architectural level and is often visited by the residents of the area.

## TEAMWORK

The construction of this project was possible thanks to an international team, which reflects the mixture of backgrounds in our practice. As we are based in Kenya but were working in Djibouti for this project, we collaborated with a number of parties, aside from the valuable client, SOS Kinderdorf:

Based in Kenya: Fritz Bachlechner, Austrian Project Manager; Estrella de Andrés, Spanish architect; Oliver Kabure, Kenyan engineer.

Based in Djibouti: Dji Fu, Chinese Contractor; John Andrews, Ugandan Architect; and all the Djiboutian who worked on site ■


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# USING 3D PRINTING TO HIGHLIGHT EXCELLENCE IN ARCHITECTURAL DESIGN

Kenya's architects are raising the bar with innovative new designs that are transforming the built environment. Designs and projects are often visualized with renders and cardboard/foam architectural models, but there is a new, innovative way to highlight excellence in architectural design: 3D printed models.

3D printing, also known as 'additive manufacturing' is a method of making almost any kind of object using a machine called a 3D printer. 3D printers most commonly print in plastics, but other types of printing with metal, ceramics, bio-tissue and even food is possible! Here in Kenya, 3D printing is available in plastics, and a number of individuals and companies are the technology to prototype new products, create final products like phone cases, key chains, spare parts and create architectural models.

## HOW 3D PRINTING WORKS

3D printing requires a digital 3D model in order to create the physical 3D object. Designers can create a 3D model in any 3D CAD software, such as SketchUp, ArchiCAD, Revit, AutoCAD, Rhino3D, etc. The model is then exported from the CAD software as an .stl or .obj file. This file is opened in 3D 'slicing' software – software that tells the 3D printer how to actually create the file. The operator of the printer then enters the requirements and adjusts the settings for the specific design to be printed. From there, the design is saved onto an SD card or USB key, or sent to the 3D printer directly via WIFI.

The 3D printer uses rolls of plastic, called filament, as the raw material. These plastic filaments are fed into a heated print head, which heats the plastic to high temperatures and extrudes the plastic in a fine thread. This fine thread of hot plastic is laid down on a glass print bed in the shape of the object. The plastic is cooled with fans and then another layer added on top of that, until the object is built up, layer-by-layer.

3D printing has actually been around for many years – it was invented in the 1980s! However it has only become accessible and popular in recent years when patents expired and 3D printers became more affordable. Today, desktop 3D printers range from $500 - $30,000, depending on the quality, features and size of the printer. Most printers print in a single colour, but dual-head printers are available that print in two colors or two materials. Painting is also possible, but requires a steady hand and high quality paint.

As for the plastic materials, a wide range of options is available. PLA is a bioplastic made from maize (or other plants) and is the easiest material to use and thus is the most commonly printed. ABS is the plastic used in Lego pieces, while PET is used to make disposable water bottles. Other advanced materials, such as hybrid plastics with carbon fibre, wood fibre, brass and copper, are available, as are industrial plastics such as PC, Nylon and PVA (water soluble). These now come in loads of colors as well, so anything really is possible!

## 3D PRINTING FOR ARCHITECTS

There are several applications of 3D printing for architects. The first is to 3D print the model to visualize the final design. 3D printed models are sturdier than traditional models and they allow for geometries, like overhangs and curves, which would otherwise be very difficult to create by hand. The model can also be printed to allow for interaction – roofs or entire floors can be removed in order to see inside the building, highlighting the floor plans and even furniture of each level.

Architects can also use 3D printers to print components throughout the design process. This can allow for testing and prototyping of a design, and to show the proposed design to the client during the design process. This can save time and numbers of iterations, as the client is better able to understand the idea with a physical model than with a render.

Single colour models show off the design elements very well, allowing the viewer to see the fine features. Completely white models are used by architects in Europe and the Americas to prototype their work as well as showcase their final design.

## GUIDELINES FOR ARCHITECTS

There are some specific things to consider when designing for 3D printing. Walls need to be a certain thickness and the model needs to be watertight. Please keep in mind:

1. Details need to be at least 0.2 mm thick (best at least 0.6 mm)
2. Ensure the model is watertight and not missing any surfaces
3. Eliminate any holes or gaps in the model
4. Do not export textured surfaces in the .stl file
5. Minimize the polygon count as much as possible
6. Ensure there is no floating geometry
7. All normals are facing outwards

Most desktop 3D printers have a print bed size of 20 cm, although larger printers are available. This means that larger models need to be split into several parts in order to be printed. This can be done during the design phase, or can be done afterwards during the preparation for 3D printing.

## CASE STUDY: SWAHILI GEM TUDOR APARTMENTS BY URKO SANCHEZ

This year's winner of Best Residential Project went to the Swahili Gem Tudor Apartments by Urko Sanchez. As a 3D printing service provider, we at Kuunda 3D worked with Urko Sanchez to print this model and displayed it at the AAK Annual Convention in Mombasa.

The CAD file was provided by Urko Sanchez Architects and was optimized for 3D printing by Kuunda 3D. This process resulted in 39 separate parts to print, which took over 300 printing hours (on multiple 3D printers it is about one week of printing). The pieces were assembled into a model of 70 cm by 30 cm by 50 cm. The material used was white PLA plastic, which resulted in a sturdy model that withstood shipping from Nairobi to Mombasa and back!

This model was used to showcase the developer's portfolio, highlight the architect's design and attract new buyers and clients. Models can even be used for teaching purposes – a physical model can more easily show how Swahili Gem was designed to make use of the breeze to cool the apartments.

## WINNER OF AAK AWARDS GETS 3D PRINTED MODEL

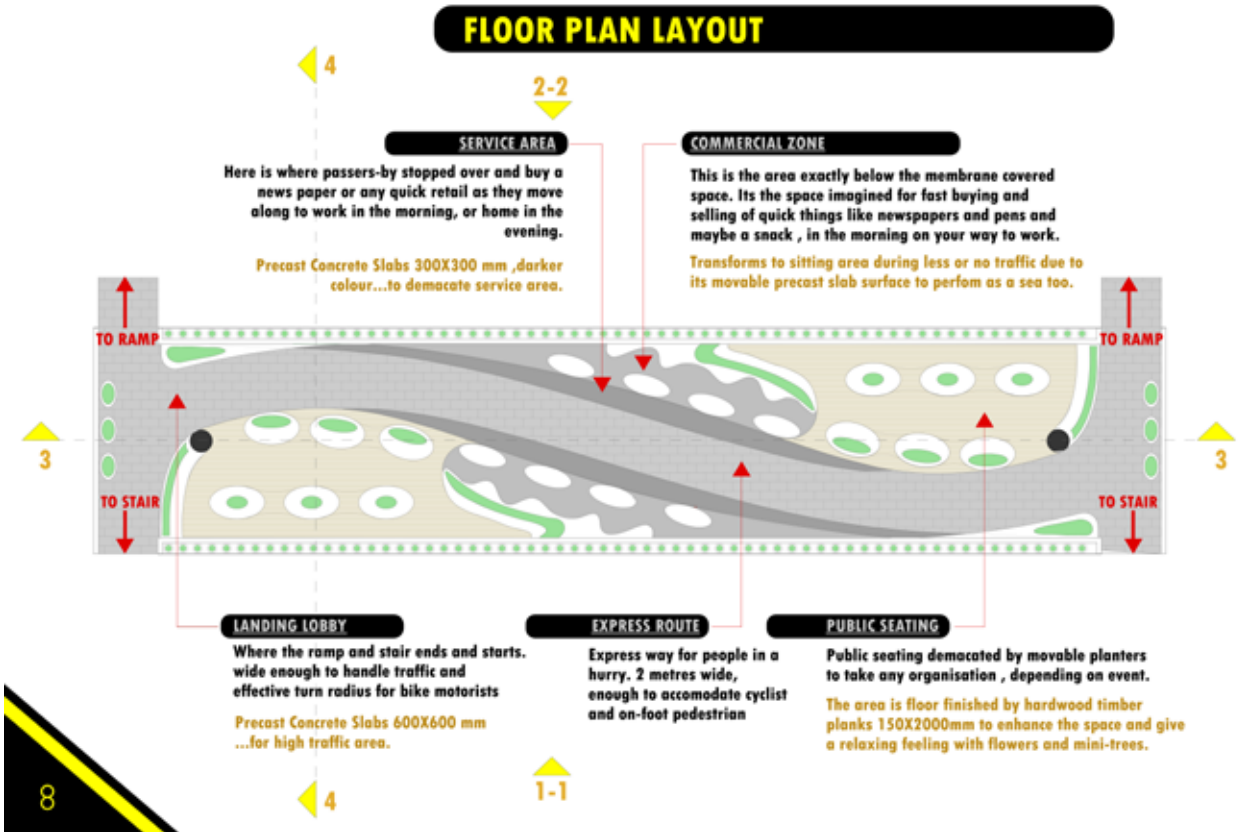
As part of AAK's commitment to giving back, they awarded the winner of the Best Low Cost/Social Project design an additional prize: a 3D printed model from Kuunda 3D. Urko Sanchez Architects took the prize for their SOS Children's Village design in Djibouti. This model will now be 3D printed, in much the same way as the Swahili Gem ■

**ABOUT THE AUTHOR**

**ELIZABETH ROGERS** is the founder of Kuunda 3D, a one-stop 3D printing company based in Nairobi and Dar es Salaam. Kuunda 3D sells 3D printers and materials, offers design and 3D printing services and provides training and after-sales services for 3D printing. http://kuunda3d.com | info@kuunda3d.com | 0797561349

ELTON BIRIR eltonbirir@gmail.com

# BRIDGING FUNCTIONS...BRINGING LIFE



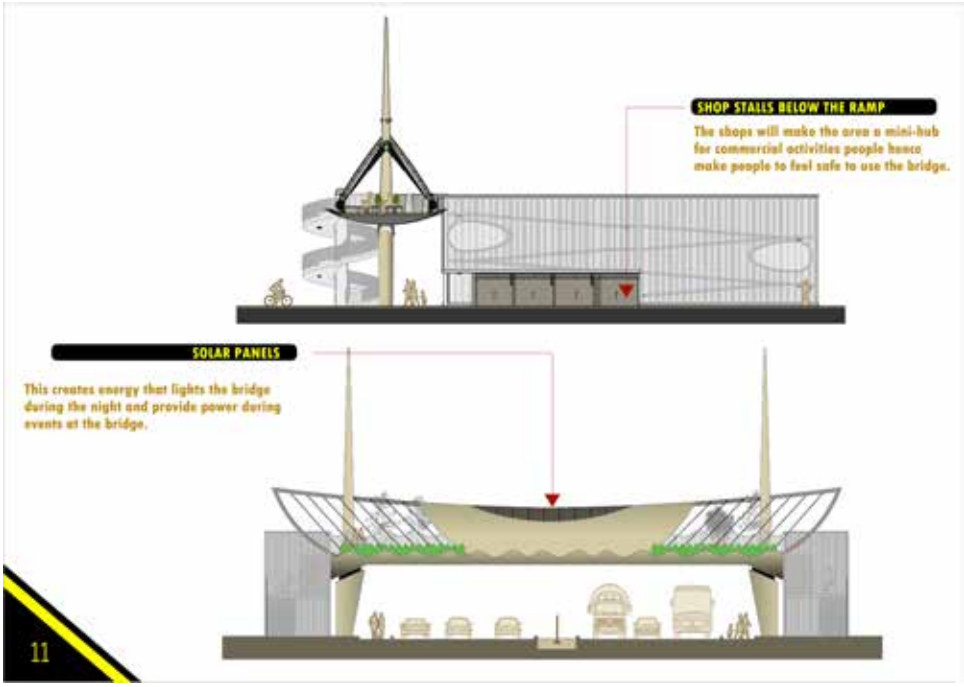

Pedestrian bridges have for a while now been considered a cross over tool for people to move from one side of a road to another. This has failed to function with time. People are less reluctant to use it, many preferring to just take the shorter route of gambling between how fast they can run seven lanes of superhighway and the high speed of oncoming vehicles. What a gamble.

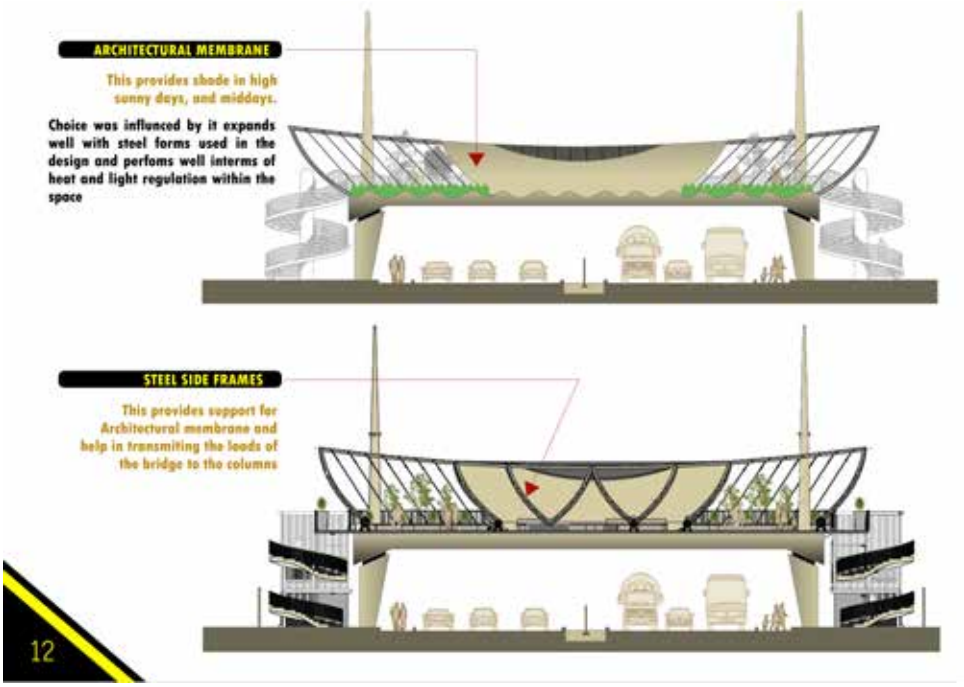
The pedestrian foot bridges are no longer used for crossing only, if they are used, but new functions have been experienced to come up in the recent times. Vendors have encroached those spaces as place for business, Street people are taking it over the night as place of rest, and more interestingly, the public are even staying up there and watching the vehicles passing below them and disappearing at the distance. All these functions had not been designed for in the initial designs of the bridges, hence becoming inconvenient to its primary function of crossing the road. All these challenges , including the aesthetics of the existing footbridges being wanting, to KURA in partnership with AAK to hold a competition to have a model that might help solve some of this issues ,with site being the footbridge at Mbagathi road.

My proposal was an approach that saw an opportunity of using these challenges as the basic element of the design. Instead of the infrastructure to just bridge two places, why not bridge functions that are happening in these places already, instead of trying to resist. The result was a bridge that had space for commercial activities, a place to relax and watch the vehicles with vegetation to give the place life and a better crossing experience unlike the traditional straight path.

The design is a flexible module that can accommodate different functions with demand. This can be events like board game tournaments, street fashion shows, concert events of less number of people among others.

Introduction of shop stalls below the ramps made sense as it would encourage people and commercial activities around




the bridge. This is because of the common nature of humans of feeling safe where there are other humans present. This will discourage the mugging reported on lonely footbridges.

The structural part of it is a proposal to use spaceframe light weight beam and steel cables suspension to help in the long cantilever of the design.

Material wise, apart from concrete columns and steel parts, an introduction of the corten steel clad is prominent. The choice of corten steel was made with the desire to show time, change of time and periods over the years. Corten steel has been seen to age gracefully by changing color from its primary red ochre to dark tones of grey sometimes. This helped reflect the nature of our society which is ever changing with time in every bit from culture to technology. The design hopes that a hundred years from when it is constructed, someone can see time essence in it and be able to deduce the age of it and life times it will have lived. It will be telling a story of the place.

These are just but a few of the forces that drove the design and it is my hope that it will serve the purpose accordingly, bridging functions of the society and bringing life to the place ■

**ABOUT THE AUTHOR**

**ELTON BIRIR** is an architecture student at Technical University of Kenya. He is also the winner of the Kenya Urban Roads Authority (KURA) Footbridge Students' competition 2017. Elton is a member of ASA-TUK Chapter and a student member of AAK

ETTA MADETE AND VIVA MUGAMBI

# ETTA MADETE AND VIVA MUGAMBI FROM THE UNIVERSITY OF NAIROBI WIN INTERNATIONAL STUDENT DESIGN COMPETITION


*Winners MS Etta Madete (Left) and Ms Viva Mugambi(Right)*
*Photocredits- Martin Gatobu-pixelratedstudios@gmail.com*

The College of Architecture and Engineering at the University of Nairobi closes a successful 2017 with students, Etta Madete and Viva Mugambi emerging winners of an international student design competition coming first out of 13 other applicants from across Africa.

The competition put forward by Sustainable Carbon Cycle Industries (SCCI, Bonn, Germany) called for proposals by various African Architectural Institutions to nominate students who submitted design proposals for a sustainable production facility that meets the cultural traditions of the country, follows sustainable design principles and has developmental potential. The winning proposal by Ms. Madete and Ms.Mugambi will be implemented in phases across different African countries the first being Tanzania.

"We would like to sincerely congratulate the winners of our Green Facility Design competition and also thank them for their innovative ideas that will drive our company forward. The expertise and dedication with Ms Madete and Ms Mugambis' proposal was outstanding and shows the high quality level of academic education that the University of Nairobi transfers." - Tobias Loewe (SCCI CEO) and Dominik Kagerer(SCCI COO).

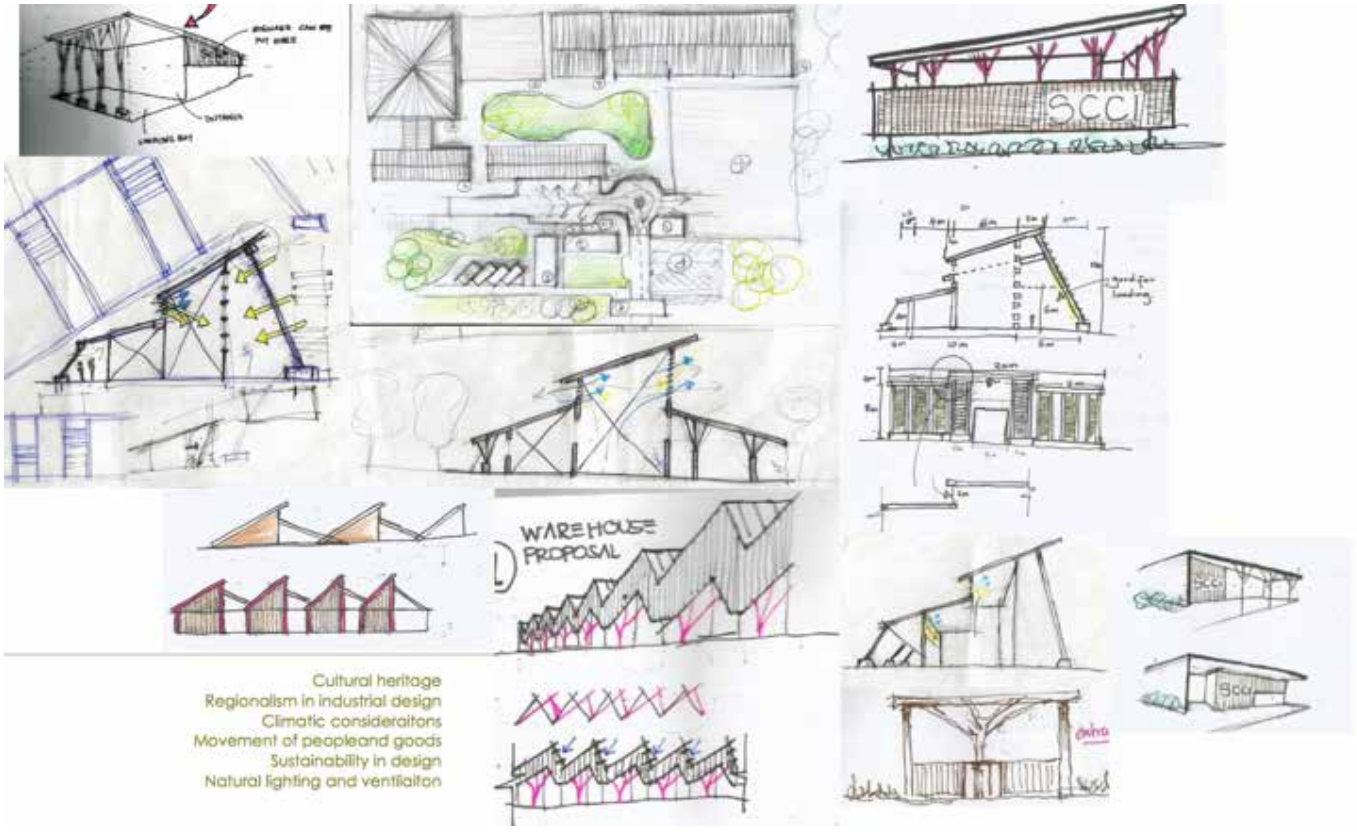
The winning design proposal incorporated sustainable design features such as rainwater harvesting, sun-shading, renewable energy sources, natural lighting, natural ventilation and the choice of locally available materials. Urban gardening under the permaculture scheme also featured in the design and will enable the facility and the staff to be self-sustaining. International student competitions are gateway opportunities for collaboration across countries and cultures to share and exchange ideas.

Etta Madete Graduated with a Bachelor of Architecture (First class Hons) in September 2017 and is currently a Graduate Architect working at Morphosis Ltd. as well as a part time lecturer at the University of Nairobi. Viva Mugambi is a fourth year Architecture student at the University of Nairobi.

The department of Architecture also celebrated in 2017 when architecture student, Asya Essajee Abdulatif, emerged as the University of Nairobi graduating class of 2017 Valedictorian. She is the 4th University of Nairobi Valedictorian in the last 11 years from the Department of Architecture and Building Science. We look forward to more growth and success in the coming years.

"The standard of the design and the level of performance provided by the architects equates to any international standard, if not even surpassing these." Tobias Loewe (SCCI CEO) and Dominik Kagerer (SCCI COO) ■

*Winners MS Etta Madete (Left) and Ms Viva Mugambi(Right) with University of Nairobi, Department of Architecture Chairman Musau Kimeu.*



*Delegates at the AAK Annual Convention 2017 held at the Pride Inn Beach Resort, Mombasa*

*Arch. David Mutiso listens to speakers at the Convention*


*AAK President Emma Miloyo speaks at the AAK Annual Convention 2017*


*QS. Moses Nyakiogora, Secretary National Building Inspectorate speaking at the AAK Annual Convention 2017*

*Arch. George Arabbu, Arch. Gad Opiyo of AAK with QS. George Omondi and Mwongera Rukaria of BORAQS have a chat during the break*

*AAK Members at a visit to Mabati Rolling Mills, Mariakani*

*Plascon Kenya Team at the AAK Annual Convention 2017*

*Scenes from the AAK Annual Convention - Gala Dinner*

*Scenes from the AAK Annual Convention - All-white cocktail*

# AAK ARCHITECTS' CHAPTER BREAKFAST CPD ON DESIGN FOR HEALTHCARE


*The Architects' Chapter chairperson, Wilson Mugambi, giving a speech during the breakfast CPD seminar*

*Participants during the breakfast CPD seminar*

*Participants during the breakfast CPD seminar*

*Panel discussion during the breakfast CPD seminar*

*Architects' Chapter chairperson Wilson Mugambi (L) during the breakfast CPD seminar*

*Architects' Chapter Treasurer John Mwaniki during the breakfast CPD Seminar*

AAK MEDIA communication@aak.or.ke

# STATUS OF THE BUILT ENVIRONMENT

AAK launched the Status of the Built Environment Report during the last quarter last year. The report highlighted key issues in the Kenyan Built environment among them being building permit approvals, highlights in the real estate, land investor and developer trends and infrastructure policy.

According to the report, the construction sector is a key driver of economic growth in Kenya as it contributes at least 7% of GDP. The construction sector recorded the biggest increase per share. The prime residential rents in Nairobi also declined over the first half of 2017 albeit a slower rate of -2.75% compared to -4.36% over the first half of 2016. The decline was resultant of an oversupply and corporate budget cuts by multinationals. It was also reported that the land prices within the Nairobi Metropolis, especially in the satellite towns such as Thika, Ruiru and Murang'a continued to be on an upward trend, backed by improved infrastructure and urban population growth ■


*Summary of the Status of the Built Environment Report that was launched in 2017 by AAK*

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# REVITALISATION OF OLD TOWN MOMBASA GATEWAY

## COMMUNITY DEVELOPMENT CENTRE

Mombasa Old Town is one of the most cosmopolitan centres along the entire coast of East Africa. It is an economically robust city with a diverse culture and laden with a rich 600 year history and heritage. Four cultural streams; the Arab, the Indian, European and the local African tradition and have converged to produce an exotic mixture of population and culture. As Mombasa grew in prominence to become the second largest city in the country, it was confronted with many of the problems urban centres in Africa faced post independence: a bustling population, emerging commerce and the need for better infrastructure, housing and institutional facilities. The traditional order and structure of the city could not adequately accommodate these new demands without causing a detriment in its urban fabric. This naturally resulted in an urban sprawl and in Mombasa's shift from Old town to a new urban area that could match its post- independence needs as a centre of commerce. This, inevitably, resulted in a change in the architectural style, lifestyle and domination of automobiles over pedestrians and modernity over cultural traditions robbing off the spaces in Old Town, their aesthetic features, special communal facilities and the physical characteristics that seem to attract the public in using these spaces.

The proposed site location is at the gateway of Mombasa Old Town, the confluence of Nkrumah road, Ndia Kuu and Mbarak Hinawy street. The site is partly occupied by the Fort Jesus Museum to the south, the Mombasa Club to the East, the Mazrui cemetery to the West and a mixed use urban neighbourhood to the North. The intersection of Ndia Kuu, Mbarak Hinawy road and Fort Jesus forms the true entrance to the Old Town.

The site is a confluence of political, social, religious and recreational activities. The proposal envisages the revitalizing of Old Town Mombasa Gateway and connectivity between the main island and the mainland area through the creation of a vibrant and sustainable urban space and infrastructure, conducive to a flourishing urban society. This is achieved through reinforcement of the visual image by conserving its inherent forms, space and activities, integration of the dynamics of the mixed uses provided by the structure of the area into a community development centre within the built-up areas, provision of sustainable public spaces, integration of the coastline into the design and promotion of local economic development.

## 'GATEWAY' - THE CONCEPT

Mombasa town is the 'Gateway' link acting as an access point into and out of the town. The design solution seeks to exploit this opportunity, using a concept that narrates the story of the cultural and architectural aspects of the community to be exhibited to the users of the urban spaces. As with all stories, the scheme provides a story-line that has a beginning, a median and an end. The Big Idea is to create a vibrant experiential curve highlighting these three parts within the confines of the site - from Nkrumah Road to the Waterfront or vice versa, thus creating a palindrome of design.

## DESIGN STRATEGIES

**Urban Design Strategy**

The urban design strategy involved the multidisciplinary skills of designing and arranging the physical elements based on Kevin Lynch's Image of the City, that make up the public realm; the part of the urban environment that people generally have access to. This was to contribute towards creating urban environments that entice people to live, work, play and visit.

It also relates the issue of contextuality and visual integrity of the historic environment. The preservation or urban and architectural heritage was seen as a driver of social, cultural and economic viability.

**Sustainable Design Strategy**

The orientation, shape and environmental systems of the open spaces were used to positively modify a range of hostile climates to create comfortable optimum conditions. As Mombasa is a hot and humid area, thermal comfort of both outdoor and indoor spaces is very important.

## SOCIO-CULTURAL DESIGN STRATEGY

**Appropriation of The Built Form**

These semi-public zones within the built forms like the barazas (stone benches) and the wikios (bridge rooms) are interesting points that create well-functioning transition spaces between the private and the public spaces. They also create social meeting points and add on to the unique character of the town. These spaces are, therefore, important to conserve and to provide architectural elements that would enrich the urban culture of the area.

**Accommodation of Religious Spaces**

The open spaces create platforms for both, religious and cultural activities to take place. Some spaces are directly linked to the social amenities; the mosques and the madrassas (Koranic schools). These spaces are designed to act as spill-out zones for the religious activities and also to host the annual religious festivals like Maulidi (celebration of the birth of Prophet Muhammad - May peace be upon him).

**Veil Appropriation**

The design takes into consideration the gender segregation of the Swahili people and the Islamic culture of the inhabitants. The design interprets the veil concept, a symbol most closely related to the Muslim woman into designs that encourage privacy within the interior spaces occupied by the woman. This example can be seen in the timber lattice work employed on the balconies and the wikios ■

### ABOUT THE AUTHOR

**ASYA ESSAJEE** is a holder of a Bachelor degree in Architectural Studies and Bachelor of Architecture from the University of Nairobi. She graduated top in her class with First Class honours and was the valedictorian of the 2017 graduating class. She is currently pursuing her Masters degree in Architecture at the University of Nairobi where she also doubles as a part-time tutorial fellow. During her undergraduate studies, Asya also enhanced her practical understanding and exposure of the discipline through working with a number of good practice/prominent architectural firms.

Asya is a highly motivated graduate architect with a key interest in Urban design. She is also keen on developing her passion for academic research as well as a mentor in the architectural discipline.

JIM GITONGA mukindajim@gmail.com

# CENTER FOR PARLIAMENTARY STUDIES

Center for Parliamentary Studies is a premier institution established under the Parliamentary Service Commission Legal Notice No. 95 of July 22, 2011. Construction of the Center is outlined in the Parliamentary Strategic Plan 2008-2018. Its main purpose is to offer training to county and national assembly staff in Kenya and the region on matters regarding governance, law making among other specialized functions. Through its affiliation with international parliamentary organizations, it will offer seminars and exchange programs among legislators and their staff. Moreover, it plays a vital diplomatic role.

**Project Location:**
Karen Shopping Center

**Main Focus:**
The project was based on building energy saving as a result of facade angle manipulation and shading techniques used. This was after study, analysis recommendations from my thesis which investigated the role played by facade form and shading elements in thermal regulation.

**The Thesis:**
'Potentiality of Façade Elements and Form in Thermal Regulation the Case of Nairobi City'

## ABSTRACT:

Nairobi has a cool, moderate climate. This was one of prime reasons for its location as a railway town. The climate provides an opportunity for passive designs with high energy saving potential. Despite this advantage, many buildings within the city's context are marked as high energy spenders in thermal cooling and artificial lighting. This is directly related to the building form, orientation and ineffective use of shading elements. The building form affects how the façade relates to the exterior environment. Within the tropics, the sun is the main environmental parameter that affects indoor thermal and visual comfort. The thesis employed parametric studies to test the effects of various façades forms and shading strategies. The effects were measured as resultant indoor temperatures and presented in comparison with desired human comfort range of 20-240C. Deviation from the comfort range was analysed inform of energy loads that would be required to achieve the thermal range. Comparisons exhibit the potential of each model in achieving indoor thermal quality. The parametric studies informed the case studies in which raw data was collected and analyzed. Conclusions show that there's a close correlation between building form, shading strategies used and resultant indoor thermal environment. The study showed that south and north glazed façades tilted at an angle of 750 form the ideal Nairobi region self-shading mechanism reducing

energy consumption by 27.7%. The egg-crate shading devices demonstrates as the most effective shading strategy with 37.3 % energy savings potential. Efficiency of this system is improved by using minimal connection points to the main building.

## INSPIRATION:

Planning layout is inspired by the Kenyan shield on the national flag. It's an emblem that shows strength, leadership and protection. This emphasized the importance and role to be payed by the legislative training center.

## ORGANIZATION:

Organization is through axis which form major circulation routes. Related services are placed with close proximity. Blocks are placed according to inter block relationships with most related being placed close to each other. Pedestrian circulation routes are designed to have minimal connection distances between different facilities, However, Longer routes are used in thoroughfares within the park to enjoy the landscaped views and allow social interaction.

The Building form, orientation, facade design, shading and material mix, are carefully designed to have minimal indoor solar heat admittance during hot seasons, enable positive gains during the cold season, allow free air circulation and other passive techniques. It also allows comfortable indoor lighting guided by CIBSE Indoor Lighting guidelines. Thermal design is in accordance to ASHRAE Standard 55-66, CIBSE Guide A Chapter 6 and ISO :7730 (2005). Combined strategies result to overall reduction of the buildings energy use.

## FACILITIES:

This institution combines the below listed facilities:

i. The Administration
ii. Training center
iii. Research and Information centers
iv. Meeting centers
v. Hospitality (hotel and meeting)

## CONSTRUCTION:

A mixed approach was used where modular and in situ construction methods are used. The central administration block used modular construction technology. Composed of an assembly of steel, precast walls and floor slabs. These materials after demolition can be reused easily. Its front façade consists of a low-emissivity glazing slanted at 750.

## THERMAL DESIGN:

The meeting center, comprising of a theater, e-meeting rooms, seminar rooms, restaurant and bouquet rooms was the main building analyzed for thermal and lighting design.

Thermal displacement ventilation is the key passive technique. The number of people in the building determine the resultant internal gains which serve as the main accelerator due to the difference in air densities creating a buoyancy force. Convection plumes are generated where stale warm air rises and expelled via roof and rear wall openings. Cool fresh air is consequently sucked in via under seat placed vents.

Due to the western solar exposure, the rare walls are 300mm thick. Thick walls have a higher thermal decrement factor. They also have members that serve as support for climbing plants. That create a pleasant microclimate through evapotranspiration and shading of the walls.

The administration building incorporates a 750-slant low-e façade with egg-crate shading devices which further reduces thermal admittance. Its noted that slanting the glazing to 750 reduces energy consumption by half as compared to an erect 900 glazed façade(thesis)

## LIGHTING STRATEGY:

The buildings are designed to have maximum use of daylight. The central admin building has limited width to allow ample light penetration. The auditorium uses natural lighting with rear walls specifically curved to inter reflect light from outside to inside with minimal heat admittance. The reflecting services are painted white. The hall also has curved glazed inlets on the sides. Due to the large depth, the roof is modified to admit lighting to the hall center. The effectiveness of these lighting strategies was tested through parametric light study analysis and proved to be successful ■

DUNCAN WAMUGI dunmugi@gmail.com


## THE PROJECT

Design of Technical and Vocational Training institute for the Deaf on the vacant site Owned by Deaf Aid Kenya

## PROJECT OBJECTIVES

There are over 600,000 deaf persons and 340,000 signers in Kenya (2009 census) and only 52 institutions dedicated for education of the Deaf. Of these institution only 3 are TVET schools (Source: Kenya association of Parents of the Deaf). The project aims at equipping skills to over 500 hearing impaired persons every year to reduce the level of deaf dependency.

Apparently, there are 3 deaf schools in Rift valley and non in the south rift.

The project is carried out in Isinya with the aim to enhance equity in distribution of similar infrastructure and capture the increasing sub-urban population of Kajiado County. The development also aims at exploring Deafspace Architectural Guidelines, spatial integration, spatial efficiency, and vertical integration, adhere to stipulated planning and zoning regulations and address issues relating to Design of learning institutions mean for the deaf.

## PROJECT COMPONENTS.

**Administration.**

1. Top Management
2. Teaching Staff
3. Student Union

**Resource Centre**

1. Library
2. ICT centre
3. Administrative Offices

**Theoretical teaching**

1. General theory- Normal classrooms
2. Subject theory- Special classrooms

**Practical teaching.**

1. Laboratories
2. Workshops

**Student Centre**

1. Canteen
2. Bookshop
3. clinic

**Sport Facilities**

## FACTORS CONSIDERED IN DESIGNING OF THE TECHNICAL &VOCATIONAL TRAINING INSTITUTE FOR THE DEAF

**1. Lighting**

The phenomenology of Deaf existence, joy and sense of dwelling inside the place are enhanced by the powerful connection with the outside environment that is realized when natural light is and evokes feelings of comfort and satisfaction with the visual environment for the deaf.

Since vision is the most developed of deaf senses, the design ensure visual comfort by controlling glare and ensuring appropriate patterns of contrast

**2. Acoustics**

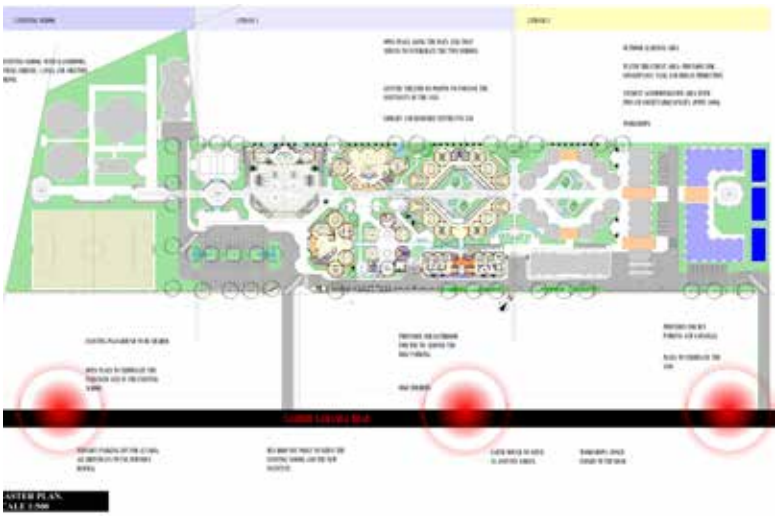
Architectural acoustics is defined as the science and engineering of achieving good sound levels in a space (Morfey Christopher 2001) and is concerned with speech intelligibility. Speech Intelligibility is greatly dictated by background noise levels and reverberation effects A lot of effort has been put up in this design especially in theatres, classrooms and work to suppress noise level below 34dBA that make this space liveable for the deaf.

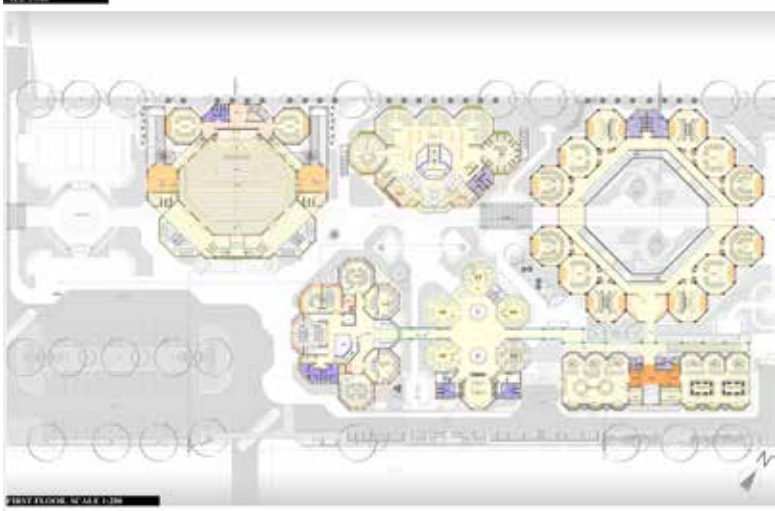
**3. Sensory reach**

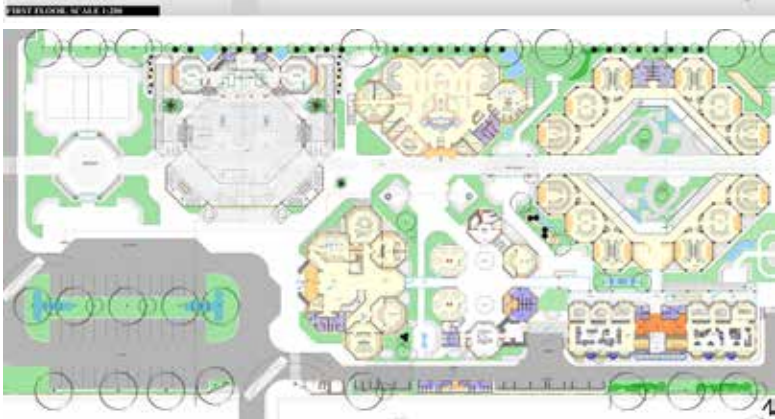
Deaf inhabit a sensory world that is different from that of the hearing. The deaf considers that Hearing impaired persons need to spatially orient themselves in a space and have visual awareness of the activities in their surroundings at the same time. The fact that, Deaf people are highly attuned to visual and tactile cues such as shadows and vibrations means they can read their surroundings environment and various activities in ways that hearing people do not. The Built environments is designed so as to provide visual and tactile reach in 360 degrees, extending Deaf people's awareness and making spatial orientation easier. For example, installing windows in walls that divide rooms or building such walls to waist-height to allow Deaf people to see what is happening in other areas.

**4. Mobility and proximity**

The design acknowledge the urgency to design circulation spaces that enable signers to maintain visual connection while maintaining direction. When walking and conversing at the same time, signers usually maintain a wide space between them in order to facilitate clear visual communication. If one signer moves towards the other, the other responds by moving away to maintain the signers distance. The design enable scanning the surroundings to check for hazards and to navigate, adjusting their path when necessary. Landscapes, buildings, pathways, and rooms are designed so that signers can move through space unimpeded







**5. Flexibility and adaptability of the spaces for Offices,**
**6. Facilities for disabled**
**7. Security as appertains to functional flow patterns**
**8. Sustainability of the project**
**9. Material and technology**

SWANYA ALLAN swanyavalencia@gmail.com

# ARCHITECTURE THAT RESPONDS TO CHANGE


## ABSTRACT

This project's goal is to create spaces that are adaptable to different changes in climatic and physical conditions be during daytime and night time as well in order to accommodate changing user needs. Change is a complex entity and therefore as an architect I wanted to create spaces and find solutions to problems that may arise due to change in physical or climatic changes in order to bring people together and create a comfortable and safe environment for occupancy to all at any time of the day or year. This project was also as a result of analysis and documentation of space qualities of tourism facilities and as well as tourism experiences in respect to quality of space and as a result establish relationship between space the changing physical parameters.


## PROBLEM BACKGROUND

Many tourist facilities in Kenya are 'asleep' in the sense that they only come to life during the day but during the night it is quite the opposite in that they become dormant and they are basically 'sleeping structures' whereby the main activity that goes on is sleeping because they are not designed to adapt to the transition between day and night. Tourism is becoming more diverse and hence there is need to evolve. More tourists are coming into the country and there is increased awareness and participation in local tourism making it necessary to harmonize the former and latter. To do this, it is necessary as architects to design facilities that can adapt to change in time every day which also brings about change in the needs of the users of the building. By doing this our facilities will be able to accommodate anyone from any part of the world due to building adaptability to the basic needs of any tourists in terms of their preferences during the day and night as well. This will also reduce buildings only being limited to use during the day leading to increased participation in tourism because of accessibility on a twenty-four-hour basis. In the long run our tourist facilities will be able to generate more revenue at night as well instead of being limited to accommodation strictly.

## PROBLEM STATEMENT

While tourism is considered as the main foreign exchange earner in the country, it is also being under-utilised as an industry and proper structures are not being actualized to cater for both local and foreign tourists as well as their changing demands. This necessitates the need to understand each of the tourist's needs across the board and design spaces that are viable for use by everyone at different times of the day and year. There is also a sense of monotony in the design




of space for tourists in Kenya mainly due to need to generate revenue but we need to do away with this perception that makes us build inadaptable buildings i.e. "sleeping architecture" i.e. structures that are only active during the day but go dark after sunset because of being used mainly for accommodation purposes at night.

Adaptable buildings can offer a variety of advantages due to their flexible nature. However, if buildings are poorly laid out and built, the very advantages that people seek can be rendered useless. In addition, the cumulative effects of improper tourist facility development can include: significant loss of international tourists, decreased popularity of local tourism and eventually loss of revenue generated by tourism in general. To achieve an entirely viable development of tourist facilities countrywide, it needs really innovative design approaches; concepts that harmonize with the natural environment: concepts that address the opportunities and the potential challenges in full and fulfil the users' requirements.

## PROJECT SIGNIFICANCE

Studies that lead to this project will analyze design fields, the ideas and structure of moving and flexible architectural elements for multi-purpose utilization of spaces. The peculiarity of some architectural spaces is about the fact that they can be useful for different applications. This may be a result of change, movement and displacement in the interior components of the building. Key words: Flexible space, Ambulatory architecture, Multi-purpose space, Multi-application space.

Using new technologies in buildings gives opportunity for innovation via flexibility of interior elements such as ceiling, the floor, walls, furniture etc. This flexibility allows for architectural space to be less and rigid.

## CONCLUSION

Buildings should be designed with adaptability in mind to anticipate the accelerating rhythm of change, and absorb its consequent effects. Adaptability plays a major role to improve the sustainable attributes of the building in order to keep harmony with the natural environment and lie within the new imperatives of sustainable development.

The above guidelines have shown that the building is a highly complex system which requires a systemic approach to achieve adaptability. It calls for a combination of many interrelated key factors: social, professional, economical, spatial, functional, technical, and structural as well as some aspects related the facade adaptability. A lack of consideration of one of these aspects may hinder the building adaptability ■

# LIST OF MEMBERS IN GOOD STANDING AS AT 30TH APRIL 2018

## FELLOW ARCHITECTS

| | |
|---|---|
| 804 | CAVANAGH J.A. |
| 2084 | GATHECHA W. |
| 889 | GITOHO J.N |
| 363 | KAPILA S. |
| 1563 | KARURI L.G. |
| 839 | KEBATHI S. |
| 595 | KIMATHI J. |
| 950 | KUNGU P. |
| 1014 | MAGUTU G.J. (PROF) |
| 1759 | MULYUNGI G.M. |
| 1040 | MUNGAI F.G. |
| 1758 | MUNYANYA M.K. |
| 931 | MUSYOKI N. |
| 5 | MUTISO D.M. |
| 729 | NJENDU K.J.G. |
| 741 | NDONG J.E.O. |
| 1322 | NGUNJIRI P.G. (PROF) |
| 640 | MUTISO R.G.M. (DR) |
| 1515 | SIKA P.O. |
| 636 | SIMU A.C.M. |
| 288 | WAWERU J.G. |
| 824 | GITHUNGURI G.N. |

## CORPORATE ARCHITECTS

| | |
|---|---|
| 2644 | ABDI A.M |
| 2202 | ABDULNASSIR A.M. |
| 1721 | ABONYO E.O. |
| 1505 | ABUNGE O.O |
| 1931 | ACHARYA T.S. |
| 2851 | AGUTU M.I.A |
| 1830 | AIZPUN F. |
| 2655 | ALI L.I |
| 3119 | ALOYO P. |
| 847 | ANDREWS T.J. |
| 2520 | ANJARWALLA S. |
| 475 | ARCHER J.H. |
| 1790 | ATKINS W.G. |
| 500 | BEGLIN D.W. |
| 670 | BHULLER M.S. |
| 2372 | BISHER F.A. |
| 1464 | CHANGILWA S.A. |
| 2415 | CHARFARE A.A. |
| 1996 | CHEBII K. |
| 2719 | CHIIRA M.J.M. |
| 54 | CHUDHA J.S. |
| 828 | DIANGA S.O. |
| 1189 | FERNANDES S. (MRS) |
| 2429 | GACHANJA J.K. |
| 2386 | GATAI H.M. |
| 3060 | GATHECHA N.N |
| 1269 | GATIMU D.N. |
| 1312 | GICHOHI J.N. |
| 1984 | GICHUKI G.R. |
| 1795 | GICHURI O.W.M |
| 1207 | GITHAIGA A.G. |
| 2548 | GITHATU F.G. |
| 2182 | GREMLEY A.J. |
| 1465 | GRONLKKE T. |
| 2155 | GUCHU J.K. |
| 800 | HANJARI G.B. (DR) |
| 748 | HAMEED SALMANN M.M |
| 3336 | HOFF J.H |
| 1746 | IKINU O.W. |
| 2778 | IMRAN S.W |
| 2409 | JASPAL SINGH |
| 3433 | KABIRU M.N. |
| 2749 | KABUTU J.W |
| 959 | KAFUNA J.K |
| 2667 | KIBOWEN R. TIMOTHY |
| 2080 | MAGAMBO J.K. |
| 1634 | KAHURA C.M. |
| 1065 | KAISI K. |
| 2679 | KAMAU I.R |
| 3895 | KANJA D.K |
| 1183 | KANYANGWESO J.O |
| 1341 | KARAGO J |
| 2647 | KARAMA Y.B |
| 944 | KARANJA W.M. |
| 2338 | KARIITHI J.K |
| 2807 | KARIUKI S.M. |
| 3676 | KARIUKI W. |
| 2737 | KARUGA V. |
| 1376 | KARUGO P.M. |
| 2468 | KASANGA S.M |
| 1557 | KATUA C.M. |
| 1311 | KHAN A.L. |
| 2716 | KIBISU L.L. |
| 2615 | KIBOWEN K.C |
| 2616 | KIBAARA I.M |
| 1176 | KIBWAGE J. |
| 2587 | KIGAI E.K. |
| 1326 | KIGONDU S. |
| 1888 | KIMANI A |
| 2085 | KIMANI D.K. |
| 888 | KIMANI J.W. |
| 2736 | KINYUA E.G |
| 2413 | KANYUA C.W |
| 1614 | KIPKETER J |
| 1629 | KIPSANG' TITUS |
| 1939 | KIRATHE E.M. |
| 2308 | KITHAKA J.M. |
| 749 | KITHAKYE D.I. |
| 1801 | KOECH M.K. |
| 2418 | KOMORA S. |
| 3304 | LAGAT D.K |
| 529 | LALL C.J.S. |
| 2445 | LATI FELIX |
| 1167 | LEE-SMITH D. (MS) |
| 948 | LIKU E.K. |
| 1560 | LORD M.A. |
| 702 | LUKWAGO J.M. |
| 2669 | MABONGA W.D |
| 1669 | MACHARIA J.N |
| 2333 | MACHARIA W.M |
| 1779 | MACHARIA S.M |
| 3213 | MAKAGUTU N.O |
| 1401 | MAINA J |
| 3397 | MANGO A.O |
| 1920 | MANKU G.S. |
| 3609 | MASIBILI F.N |
| 2116 | MATIVO J.K |
| 548 | MBINDA J.J.M |
| 1882 | MBICHA S. |
| 3096 | MBUGUA H.K |
| 891 | MBUGUA N. |
| 3147 | MBURU E.G |
| 2438 | MECCA J.P |
| 1230 | M'GITHAE B.N. |
| 2010 | MILIKAU E.S |
| 2512 | MILOYO E.K |
| 2097 | WAITITU L.M |
| 960 | MISIANI C.A.O |
| 1388 | MONG'ARE S.G |
| 1809 | MONARI A.O. |
| 542 | MRUTTU I.R. |
| 2738 | MRUTTU .O.S |
| 2240 | MUCHAI J.M. |
| 1765 | MUGO E.D.G |
| 3282 | MUIRURI I.N |
| 2872 | MUKUI M. |
| 2077 | MULI P |
| 1211 | MULI S.K. |
| 3430 | MUNALA G.K (Dr.) |
| 1293 | MUNGAI W. |
| 2593 | MUNGAU K.J.S.A. |
| 1415 | MURIUKI D.K |
| 2382 | MUSUNGA M. |
| 2421 | MUSUVA M.W. |
| 2501 | MUTAI E.K. |
| 1743 | MUTHUSI P.M. |
| 1703 | MUTUA J.A. |
| 2193 | MUTUA JACKSON |
| 3398 | MUTUA U.M |
| 2102 | MUTUKU M. |
| 1628 | MWACHARO M.S. |
| 2337 | MWANGI B.G. |
| 1219 | MWANGI L.M |
| 2123 | MWANGI S.G. |
| 2779 | MWANGI M.K |
| 2806 | MWATU O.K. |
| 1788 | MWAURA A.M. |
| 1926 | MWEU J.M. |
| 1922 | MWITI G. |

| | |
|---|---|
| 2320 | NAMULANDA D.M. |
| 648 | NANDHRA H.S |
| 2507 | NAICCA C.M. |
| 486 | NUGI KAMAWE |
| 4100 | NDEDA S R,J |
| 2424 | NDERITU P.A.M. |
| 2099 | NDETA B.S. |
| 3102 | NDEGE L.K |
| 1851 | NDUNGU C.N. |
| 1209 | NDUNGU D.K. |
| 2998 | NDUNG'U K.K |
| 793 | NGIBUINI S.N. |
| 1404 | NGUNJIRI F.K. |
| 2153 | NJENDU G.M. |
| 2534 | NJENGA D.K. |
| 2502 | NJERU P.M. |
| 2811 | NJERU J.M. |
| 3688 | NJERU B.G |
| 2454 | NJUGUNA B.M |
| 1435 | NJUE M.G. |
| 1631 | NUNGARI F.N. |
| 2774 | NYACHWA W.N |
| 2312 | NYAGAH A.G |
| 2500 | NYAGA C.W. |
| 2546 | NYAGA D.K. |
| 1853 | NYANDIEKA J. |
| 732 | NYANJA G.B. |
| 3444 | NYOLE F.C |
| 2451 | NYONGESA A.W |
| 4316 | NYORO E. GITAU |
| 933 | NZIOKA S.N. |
| 1850 | OBANYI D |
| 2748 | OBALA P.O |
| 2173 | OCHIENG V.M. |
| 1200 | OCHONG' D.O.W. |
| 1617 | ODHIAMBO A.T |
| 1760 | OGAI I.L.O. |
| 1188 | OGOLI M.D. |
| 1810 | OGUNDE O.O. |
| 2136 | OGWAPIT S. |
| 2518 | OJWANG' P.O. |
| 1846 | OKELLO J.F |
| 1406 | OKOTH T.O. |
| 1524 | OMORO A.B.O. |
| 3931 | ONWONG'A O. THOMAS |
| 2751 | OPIYO G.O |
| 2526 | OSIDIANA D.N. |
| 1890 | OUNDO S.W. |
| 1986 | OWENDE M.O. |
| 2319 | OYUGI A.O. |
| 2463 | PATEL K.M |
| 1280 | MUKESH PATEL |
| 657 | PATEL V.K.L. |
| 1734 | RAI J.N. |
| 2329 | RAJNOVIC P |
| 1813 | REHAL S.S. |
| 1313 | RUKWARO W.R. (PROF) |
| 2654 | SANCHEZ U. |
| 3098 | SEHMI J.S |
| 746 | SHAH S.Z. |
| 1566 | SHARMA N. (MRS) |
| 2876 | SIKHILA H.W |
| 1564 | SITUMA D.W. |
| 2164 | SUERO I.M. |
| 3851 | TURYAHABWE R |
| 275 | VAULKHARD T.G. |
| 1653 | VIRDEE A.S. |
| 2137 | WACHIRA P.N. |
| 1328 | WACHIRA S.K. MAJOR |
| 806 | WAGAIYU E.K. |
| 3283 | WAHOME C.N |
| 2537 | WAIHINYA C.N. |
| 2897 | WAMBUA P.K |
| 1118 | WAMWANGI J.M |
| 832 | WANYONYI J.S. |
| 2154 | WASILWA P.O |
| 2824 | WETUNGU C.M |
| 563 | WILL P.A. |
| 1078 | WOODS S.R |
| 3680 | DENNIS M. GITHAIGA |
| 3984 | SHAH ANVI |
| 2658 | OCHIENG' N. ONYANGO |
| 3158 | TARVINDER S. SEMBHI |
| 1621 | JOSEPH M. THITU |
| 3748 | MOSES GATHUA KIMANI |
| 3100 | PHILLIP O. G. KOTENG' |
| 3820 | PAUL KONES BHOYYO |
| 2747 | BRENDA MAIBA BHOYYO |
| 2935 | REX CASTRO OMONDI |
| 4164 | CYNTHIA N. KIMANI |
| 3686 | JOASH OBARE |
| 4006 | GEORGE R. TAGOMBA |
| 3459 | JOHN M. MWAZIGHE |
| 3873 | STEPHEN O. LUTTA |

## GRADUATE ARCHITECTS

| | |
|---|---|
| 2436 | AKALI.G.M |
| 4312 | BELINDA TUJU OTIENO |
| 4143 | BUKANIA N S |
| 3369 | VAN DER EERDEN J.F.M. |
| 3732 | ESMAIL F.I |
| 3899 | FEI Q |
| 4178 | GIKERA K.E |
| 4134 | GITARI W J |
| 4113 | GITHAIGA .G |
| 3451 | GITHINJI K.M |
| 4322 | HUSSEIN MEREMIYA |
| 3202 | ISOE D.M |
| 4182 | ITEBA A.M |
| 3303 | JACKSON M.M |
| 3962 | JALAKHAN ZAINAB |
| 4313 | JOHN T. THIAKUNU |
| 3250 | KAMUNYU |
| 4126 | KARUMA K A |
| 4101 | KIMANI MUCHIRI |
| 3422 | KAMAU G.K |
| 4133 | KAITESI F |
| 2385 | KEEGA J.K. |
| 1817 | KIARAHO D.N. |
| 4187 | KIMANI K.J |
| 3510 | KING'E V.N |
| 4179 | KIPROP A.H |
| 4131 | KIRUMA MUGO |
| 4190 | KOBIA |
| 4184 | KIPLAGAT K.R |
| 3153 | LATESTE M.O.W |
| 3129 | LENJO P.M |
| 4119 | LEITICH |
| 4112 | LECCHINI A M |
| 3897 | LIKU A.M |
| 3873 | LUTTA S.O |
| 4118 | MAGARE J K |
| 4188 | MAKANA .M.D |
| 2506 | MAKHULO S.D.M |
| 2310 | MALONZA J.M |
| 4117 | MATOLA M W |
| 1071 | MPUNGU P.J |
| 4122 | MUCHUGIA E K |
| 4130 | MUNG'ATA M F |
| 3940 | MOYO DENNIS |
| 3326 | MULANGO S.S |
| 1937 | MUNENE G.M. |
| 3139 | MUSANGI H.W |
| 4191 | MUTAHI G.G |
| 3947 | MUTHAMA BENDICT |
| 3474 | MUTONGA W.P |
| 3329 | MWAURA M M |
| 3438 | NASILA M.M |
| 4180 | NG'ANG'A P.G |
| 4129 | NGUMBAU M.V |
| 4128 | NJOROGE S K M |
| 4120 | NJERU E M |
| 4185 | NJERU W M |
| 4135 | NJUGUNA M C |
| 3836 | NYAKOIRO C.M |
| 3456 | NZUKI S.M |
| 4193 | ODHIAMBO O.B |
| 4192 | ODUOR N.H |
| 3448 | OLUGA P.S |
| 3999 | OMAR T.T. |
| 1886 | SITATI .T |
| 3458 | OBUTU M I |
| 4183 | ONDAKO |
| 4194 | OSORO T.C |
| 4189 | RIMO M.G |
| 3158 | SEMBHI T.S |
| 3984 | SHAH ANVI |
| 2663 | SHAH N.P |
| 2865 | THETHY J.S |
| 1749 | THIMANGU A. |
| 4116 | THUKU C K |
| 3898 | VIRDI G |
| 2656 | WAFULA A.M |
| 4114 | WAKONYO P D |
| 4102 | WAKHULE.S.K |
| 4186 | WAMBUI T.N. A |
| 4181 | WAMBUIN.K |

| | |
|---|---|
| 4197 | WAINAINA J.M |
| 3944 | WANYONYI ADDAH |
| 4198 | WEZHULI S.S |
| 4039 | BAHATI JUSTUS CALVIN |
| 4341 | CHARLES MUSYOKA AKAYI |
| 3465 | AJWANG' ROBERT OWINO |
| 3964 | MWANGI CAROLINE NJERI |
| 4342 | KIMATA R. WAMBUI |
| 4343 | KARIUKI BRIAN BABU |
| 4358 | MUNYI CYRUS MURAGE |
| 4360 | WILLIAM K.THURANIRA |
| 4361 | KENEDY MURIMI NDWIGA |
| 4363 | ERIC KISANG' PLAL |
| 4364 | IAN NDUNGU NJUGUNA |
| 4366 | DAVID WANGA WAUDO |
| 4367 | ALEX MWANGI MWAURA |
| 4368 | CHRISPINE M. NYAKUNDI |
| 4369 | WENDY W. WANDUNG'U |
| 3535 | ROBERT WERU MAINGI |
| 4370 | DANIEL L. MALECHE |
| 4261 | ISABEL M. NJOROGE |
| 4371 | KIZITO KURIA MWANGI |
| 4372 | FAITH F. MUREKEFU |
| 4373 | MICHAEL K. MBITHI |
| 4374 | JOHN K. KAHURA |
| 4375 | JOHN C. KARIUKI |
| 4376 | ERASTUS W. MWAI |
| 4377 | MICHAEL M. MATHENGE |
| 4378 | PATRICK G. MURITHI |
| 4379 | PASCAL MUSERA WANDA |
| 4380 | ANTHONY M. MUTISO |
| 4382 | MUHIA MOSES WAMBUI |
| 4383 | ANDREW M. WARURUA |
| 4384 | CHRISTINE N. MBAI |
| 4386 | AYARA AUSTINE OKONJI |
| 4387 | ANTONY T. A. OSUNDWA |
| 4388 | SAMMY AKEM NYABIBA |
| 4389 | KENNETH K. ROTICH |
| 4390 | FELIX OCHIENG' DATCHE |
| 4391 | VIOLA C. LANGAT |
| 4392 | KIVAYA CHEYE VICTOR |
| 4393 | DAVID NG'ANG'A NGURE |
| 4394 | IRENE N. MUSYOKA |
| 3454 | STEPHEN K. KIHUGA |
| 3481 | SAMUEL M. KARANJA |
| 4395 | NELSON M. KIHARA |

## LICENTIATE ARCHITECTS

| | |
|---|---|
| 2228 | BARASA I.B. |
| 2166 | DEYA E.O |
| 2184 | KAMAU J.N. |
| 3905 | KAWUNDI F.L.O. |
| 2343 | MABIA G.K. |
| 4091 | Manyinsa N.J |
| 2392 | MBURU G.K. |
| 2129 | MUCHEMI S.N. |
| 3363 | MURIANTHI N.N |
| 4033 | MUTUA M.J |
| 4012 | MUTUNE T.K |
| 2178 | NYANGWESO M.O. |
| 2637 | OKICH P.O |
| 4092 | ONGONG'A J.C |
| 3095 | OTIENO P.G.J |
| 2375 | SHISIA W.Y.A. |
| 4381 | DENNIS M. NYAGA |

## TECHNICIAN ARCHITECTS

| | |
|---|---|
| 3672 | AWITI C.O |
| 2311 | BOLO D.O. |
| 3253 | KABETHI J.N |
| 2309 | KINYANJUI MUNGAI |
| 2706 | KIOK T.M. |
| 3877 | MAINA G.G |
| 3750 | MISAO C.O |
| 2740 | MUNYORI S.N |
| 4049 | MWIWAWI |
| 3214 | NJOROGE A.M |
| 4050 | NYONGESA S.P |
| 3372 | OMUNJALU S.O. |
| 3961 | PARMALEK HENRY |
| 3854 | SAID F.S |
| 4359 | DICKSON B. KIMATHI |

## FELLOW QUANTITY SURVEYORS

| | |
|---|---|
| 740 | ALUVAALA A.I. |
| 418 | GICHUIRI O.M. |
| 1090 | KIMORO D.N. |
| 575 | LITIKU F.M. |
| 489 | MARJAN A.S. |
| 382 | MATHU K. |
| 577 | NJUGUNA D.M. |
| 488 | MBAYA J.S. |
| 578 | MURAGE S.K. |
| 668 | OGODA J.A.M. |
| 684 | OKETCH T.O. |

## CORPORATE QUANTITY SURVEYORS

| | |
|---|---|
| 2230 | ASURA E. |
| 876 | BACHIA F.K. |
| 802 | BUNEI R.K.C. |
| 20 | FENWICK H.R. |
| 490 | GAKUYA H.N. |
| 1741 | GICHUIRI J.W. |
| 2195 | GITONGA A.M. |
| 734 | GRANTHAM D.J. |
| 626 | HAJEE B.H. |
| 766 | HONGO J.V. |
| 1367 | HUSSEIN W.H. |
| 2724 | KAHURIA T.K. |
| 700 | KAMAU M.D. |
| 789 | KARIGUH R.M |
| 738 | KINYANJUI W. |
| 1100 | KITHINJI N.B. |
| 1902 | KIRUI D.K. |
| 2704 | KOBIA M.M |
| 771 | KOIGI G.K. |
| 1655 | KUNG'U J.N. |
| 1497 | KUSIENYA C.M |
| 426 | LEVITAN A. |
| 1872 | MANYUIRA T.G. |
| 1245 | MATHENGE J.M. |
| 770 | MAUNGU N. |
| 1699 | MBAYA F.R.N. |
| 1525 | MBUGUA L.G. |
| 1419 | MIRITI P.K. |
| 2643 | MOHAMUD M.A |
| 677 | MUAMBI H.K. |
| 1551 | MUCHINA J.N. |
| 1656 | MUCHUNGU P |
| 1732 | MUCHUNGU A. |
| 768 | MUGAKI P.N. |
| 3350 | MULONDO R.P |
| 1301 | MUNALA B. |
| 3142 | MUNYAKHO G.O |
| 866 | MUSYIMI J.M. |
| 2050 | MUTAI A.K. |
| 1834 | MUTAI N. (MS) |
| 836 | MUTISYA P.T. |
| 1055 | MWANGANGI J.M |
| 1125 | MWANGI C.M. |
| 721 | MWAURA C.J. |
| 687 | NAYAR K. |
| 2888 | NDULI M.N |
| 1099 | NDUNGU P.M. |
| 1479 | NGARUIYA W..G |
| 2889 | NGAYWA B.L |
| 3843 | NGORU E.M |
| 481 | NGUGI B.N. |
| 763 | NGUGI P.K. |
| 1024 | NGUYO D.M. |
| 2425 | NJUGUNA A.N. |
| 725 | NYAMBANE J.N. |
| 782 | OBAE S.G. |
| 1157 | ODHIAMBO E.O. |
| 854 | OKEROSI J.O. |
| 604 | OLUOCH J.M.O. |
| 1725 | OMUFIRA A.N. (Ms) |
| 485 | OORO M.A. |
| 2444 | OTIENO O.S. |
| 1641 | RUKWARO S.M. |
| 1671 | TOROITICH B.K. |
| 4326 | WAGUTHII J. MUCHOKI |
| 1241 | WAHOME .W .G |
| 898 | WAIREGI W. |
| 708 | WAITE S.G.K. |
| 1494 | WOSE L |
| 4336 | MALONZA SIMON SAILI |

## GRADUATE QUANTITY SURVEYORS

| | |
|---|---|
| 4125 | ADIKA O.B |
| 1786 | HERD S.N.C. |
| 3231 | KOIGI S.N.K |
| 4144 | KHAMASI A R |
| 1535 | NJOROGE L.K. |
| 4115 | OKOTH O.K |
| 3736 | WAWERU ALICE NDUTA |
| 3548 | NDERI KEVIN KAGIRI |

| | |
|---|---|
| 4355 | MUEMA ALEX MASAKU |
| 4356 | MWANGI ROSE NJERI |

**LICENTIATE QUANTITY SURVEYORS**

| | |
|---|---|
| 2725 | MASSAM B. |

**TECHNICIAN QUANTITY SURVEYORS**

| | |
|---|---|
| 1799 | ARIWI D.J.O. |

**FELLOW TOWN PLANNERS**

| | |
|---|---|
| 1069 | KIBINDA P.M. |
| 311 | NJAU G.J. |
| 422 | WANG'ONDU M.H.C. |
| 278 | OHAS J.M |

**CORPORATE TOWN PLANNERS**

| | |
|---|---|
| 3675 | ABUYA D.O |
| 2622 | GICHUKI D.K |
| 3407 | GITHINJI E.M |
| 2295 | KAUMBA A.A |
| 2207 | KIMANI M.W. |
| 2627 | KITONGA C.D |
| 2263 | KOMOLLO F.O |
| 2217 | MAINA J.M |
| 1354 | MAIRURA E.O. |
| 513 | MANASSEH J.M. (MRS) |
| 2944 | MANG'IRA P.C.K. (MRS) |
| 2623 | MARANGA H.N |
| 2829 | MATENDE R.O |
| 2487 | MUCHERU N.N |
| 2239 | OGUTU C.M |
| 2257 | MBURU E .W |
| 3103 | MUGENDI G.M |
| 1957 | MUSYOKA R.M. (MRS) |
| 1628 | MWACHARO M.S. |
| 2629 | MWANIKI M.A.R |
| 2165 | MWAURA A.M., |
| 2041 | MWAURA P.M. |
| 2213 | MWANIKI J.W |
| 1735 | MWANZIA A.M. |
| 2065 | NDEGWA E.N. |
| 2254 | NDUNGU K.K. |
| 3518 | NDUNG'U G.N |
| 2621 | NGARI S. |
| 3429 | NGIGI S.W (Mrs) |
| 1947 | NYABUTI J.A. |
| 2219 | NYIKA D. |
| 2225 | NYAROO .M.J |
| 2171 | OMONDI F.O. |
| 2229 | OMOLLO W.O. |
| 2450 | ONYANGO M.O |
| 2837 | OSEWE V.O |
| 2886 | MUKESH PATEL |
| 2248 | RITA J.N |
| 2560 | MUGO W.J |
| 2280 | WANJIRU N.W |

**GRADUATE TOWN PLANNERS**

| | |
|---|---|
| 2284 | CHELANGAT B.K |
| 3780 | MUCHIRI C.N |
| 3395 | NJOROGE N. BETH |
| 2255 | NJUGUNA B.M |
| 2275 | NYAMONGO |

**CORPORATE ENVIRONMENTAL DESIGN CONSULTANTS**

| | |
|---|---|
| 3177 | DAVID E.L |
| 2799 | MWEU J. M. |
| 2794 | KIMANI M.W |
| 2793 | MWANGI W.N |
| 2792 | NYIKA DAVID |

**FELLOW ENGINEERS**

| | |
|---|---|
| 1274 | GORO E.C. |
| 699 | HIRANI R.M. |
| 443 | KITOLOLO A.S. |
| 113 | MANGAT H.S. |
| 2601 | ODINGA R.A |
| 22 | PATEL I.B. |

**CORPORATE ENGINEERS**

| | |
|---|---|
| 2525 | ANYIKA W.M. |
| 564 | BHUNDIA B.B. |
| 361 | BOGA R.K. |
| 3561 | GITAU P.K |
| 2602 | GUMBO N. |
| 2731 | KAGONDU G.M. |
| 2313 | KHAN M.A. |
| 920 | KHANDIA M.A. |
| 2732 | KIMANI F.M |
| 2150 | LOVEDAY J.I.W. |
| 2151 | MACO'DAWA G.O. |
| 2100 | MSAFIRI A.S. |
| 2162 | MUTEA E.K. |
| 2733 | MWANIKI A.W |
| 2860 | NALYANA P.O |
| 2227 | NJENGA G.N. |
| 2054 | NJOROGE G.M. |
| 2859 | NYAWADE B.O |
| 2161 | NOORANI |
| 3612 | OTWANI J.A. |
| 2023 | MATALANGA N.W. O |
| 1305 | SHANKLA A. |
| 1455 | VARSANI R.M. |
| 2815 | WAIRAGU J.M. |

**GRADUATE ENGINEERS**

| | |
|---|---|
| 4056 | KEVIN ODONGO OKOTH |

**LICENTIATE ENGINEERS**

| | |
|---|---|
| 3896 | MAINA J.M |

**FELLOW LANDSCAPE ARCHITECTS**

| | |
|---|---|
| 1445 | NGUMMO R.M.K. |
| 1518 | MEHTA H.S. |
| 1454 | NGUNJIRI P.G. (PROF) |

**CORPORATE LANDSCAPE ARCHITECTS**

| | |
|---|---|
| 2817 | MURAGE D.G. |
| 2689 | OMOLE H. |
| 2757 | WANZA CAROLYNE |
| 2756 | OMONDI AMBROSE OFAFA |
| 2770 | ODHIAMBO L. PHOEBE |
| 2294 | MARWA SAMUEL MUGO |
| 2766 | KATUMPE J. SALAASH |
| 3182 | SYLVIA M. MUTUA |

**GRADUATE LANDSCAPE ARCHITECTS**

| | |
|---|---|
| 2916 | CHONGA O.C |
| 4323 | KWAMBOKA J. ONYONI |
| 4324 | MICHIRA VINCENT KABA |
| 2772 | OCHANDO S.O |
| 2770 | ODHIAMBO L.P |
| 3205 | OWUOR M.O |
| 2294 | MARWA S.M |
| 3191 | MOCHAMA E.M |
| 1948 | PATEL B.P. |
| 4349 | MURAGURI R. WAIRIMU |
| 4350 | MUTISYA MATHIAS LOKI |
| 4351 | VALASA GRACE SYOMBUA |
| 4352 | MWANIA ANNELINDA |
| 3191 | MOCHAMA EMMANUEL |
| 3421 | MATHUKU C. MWIKALI |
| 4353 | OTIENO J. NYAGWALLA |

**CORPORATE CONSTRUCTION PROJECT MANAGEMENT**

| | |
|---|---|
| 3617 | ABONYO E.O. |
| 2937 | ABUNGE O.O |
| 3611 | KANALO J.A. |
| 2940 | KINYUA E.G |
| 3912 | MATHU N. VINHUS |
| 2926 | MBINDA J.J.M |
| 3757 | MBUGUA L.M |
| 2930 | MOHAMMED K.M |
| 2941 | NDETA B.S |
| 3389 | NDULI M.K. |
| 3390 | NGAYWA B.L. |
| 2938 | OCHONG' D.O |
| 2939 | OGAI I.L.O |
| 3058 | OGUNDE O.O |
| 4234 | PAUL ODHIAMBO OKICH |
| 2923 | ORIKO D.O |
| 2919 | OUNDO S.W |
| 2942 | WAITITU L.M |
| 3112 | SEBORU M.A |
| 3815 | MASUDI W. MARCAN |

**GRADUATE CONSTRUCTION PROJECT MANAGEMENT**

| | |
|---|---|
| 4124 | KHAMILA |
| 4327 | KIAGE MOSES OBARE |
| 4329 | MWANIKI SIMON MUTUA |
| 4328 | MUTINDA P. MUTHOKA |
| 4195 | MWAURA N.S |
| 3637 | NGIGI P.N. |
| 4348 | ABDULFATAH ALI KASSIM |

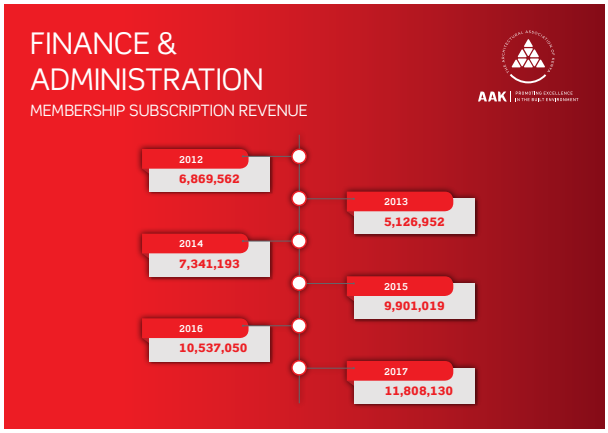
# LIST OF REGISTERED FIRMS IN GOOD STANDING

| | | |
|---|---|---|
| 1 | Tectonics International | Architect |
| 2 | Trioscape Planning Services Ltd | Architect |
| 3 | Oje Associates | Architect |
| 4 | Mariamu Maawy Architects & Interior Designs | Architect |
| 5 | Eco Plan Management Ltd | Planning |
| 7 | Dmj Architects | Architect |
| 8 | Symbion Kltd. | Architect |
| 9 | Kenmt Bill Engineers & Planners | Planning |
| 10 | Armstrong & Duncan | Q. Surveyor |
| 11 | Mathu And Gichuiri Associates Ltd | Q. Surveyor |
| 12 | Harold Fenwick & Associates | Q. Surveyor |
| 13 | Ooro & Sanya Associates Ltd | Q. Surveyor |
| 14 | Batiment Group Ltd | Architect |
| 16 | Africost Kenya Consulting Quantity Surveyors | Q. Surveyor |
| 17 | Triad Architects | Architect |
| 18 | Getso Consultants Limited | Q. Surveyor |
| 19 | Sk Archplans | Architect |
| 20 | Apt Design Solutions | Architect |
| 21 | Morphosis Limited | Architect |
| 22 | Tej Architects | Architect |
| 23 | Axis Architects | Architect |
| 24 | Davson And Ward | Q. Surveyor |
| 25 | Arprim Consultants | Architect |
| 26 | Tectura International Ltd | Architect |
| 28 | Synthesis Ltd | Architect |
| 29 | Aka Studio | Architect |
| 31 | Abbey Architect (K) Ltd | Architect |
| 32 | Adventis Inhouse Africa Limited | Architect |
| 33 | Align Architects | Architect |
| 35 | Architronic | Architect |
| 36 | Arch-Link International Ltd | Architect |
| 37 | Barker & Barton Kenya | Q. Surveyor |
| 40 | Consting Consult | Q. Surveyor |
| 41 | Construction Cost Consultancy Ltd | Q. Surveyor |
| 42 | Costwise Associates | Q. Surveyor |
| 43 | Frame Consultants Ltd | Engineer |
| 44 | Gakuya & Associates | Q. Surveyor |
| 45 | Githunguri & Partners | Architect |
| 46 | Images Architects | Architect |
| 48 | Laurez & Associates | Q. Surveyor |
| 49 | Linarch Consultants | Architect |
| 50 | Lins Consult | Architect |
| 51 | Muambi Associates | Q. Surveyor |
| 52 | North Wind Consulting Limited | Q. Surveyor |
| 53 | Otto Mruttu & Partners | Architect |
| 54 | Scope Design Systems | Architect |
| 55 | Skair Associates | Architect |
| 57 | U-Design Architects & Interior Designers | Architect |
| 58 | Uniconsult Engineering Consultants Ltd | Engineer |
| 59 | Bowman Associates | Architect |
| 60 | Gitutho Associates Consulting Architects | Architect |
| 61 | Jawkim Architects | Architect |
| 62 | Maestro Architects Ltd | Architect |
| 63 | Octa Architects Ltd | Architect |
| 65 | Waweru & Associates, Architects | Architect |
| 67 | Gitau Associates | Architect |
| 68 | Arplad Architects | Architect |
| 69 | Lexicon Plus Ion Limited | Architect |
| 70 | Miradi Consultants | Q. Surveyor |
| 71 | Aegis Development Solutions Ltd | Q. Surveyor |
| 72 | Shaque Associates Ltd | Q. Surveyor |
| 75 | Ultimate Design Ltd | Architect |
| 76 | Kanjumba Consultants Ltd | Q. Surveyor |
| 77 | Litiku Consultancy | Q. Surveyor |
| 79 | M & M Construction Consultants | Q. Surveyor |
| 80 | Interbill Consultants | Q. Surveyor |
| 81 | Mak Consultants | Q. Surveyor |
| 82 | Integrated Ymr Partnership | Q. Surveyor |
| 83 | Point Consultants | Q. Surveyor |
| 84 | Bunei, Maungu And Associates | Q. Surveyor |
| 85 | Aaki Consultants | Architect |
| 86 | Cadplan Architects Limited | Architect |
| 87 | Tecta Consultants | Architect |
| 88 | Paul K. Ngugi Associates | Q. Surveyor |
| 89 | Studio Infinity Architects | Architect |
| 90 | Radius Architects | Architect |
| 91 | Sketch Studio | Architect |
| 92 | Peter Thomas Associates Ltd | Architect |

| | | |
|---|---|---|
| 93 | Domus Architects | Architect |
| 94 | Miguna Consultants | Q. Surveyor |
| 96 | Masterbill Intergrated Projects | Q. Surveyor |
| 97 | Otieno & Kungu Associates | Architect |
| 98 | Makro Consultancy Ltd | Architect |
| 99 | Edon Consultants Int. Ltd | Architect |
| 100 | Archgrid Systems | Architect |
| 101 | Apex Systems Consulting Group | Engineer |
| 104 | Ngasi Consulting Engineers | Engineer |
| 105 | Feradon Associates Ltd | Engineer |
| 107 | Genesis Architects Limited | Architect |
| 108 | K & M Archplans | Architect |
| 109 | Archten Architects | Architect |
| 110 | Space And Systems | Architect |
| 111 | Atticspace | Architect |
| 112 | Intershelter Sullivan Architects | Architect |
| 113 | Arcs Africa | Architect |
| 114 | Log Associates | Engineer |
| 115 | Professional Consultants Ltd | Engineer |
| 117 | Nderitu Consultants | Q. Surveyor |
| 118 | Mutiso Menezes International | Architect |
| 119 | Planning Systems Services Ltd | Architect |
| 120 | Mruttu Salmann And Associates | Architect |
| 123 | Songa Ogoda & Associates | Q. Surveyor |
| 124 | Gem Archplans | Architect |
| 126 | Designworth Architects Ltd | Architect |
| 127 | Kenchuan Architects Limited | Architect |
| 128 | Inter Architects | Architect |
| 129 | Gachagua, Kahoro & Associates | Q. Surveyor |
| 130 | Dimensions Architects & Interior Designers Ltd | Architect |
| 131 | Murai Associates | Q. Surveyor |
| 132 | Achera & Partners Architects & Urban Designers | Architect |
| 133 | Ojwang O Costing Masters & Associates | Q. Surveyor |
| 134 | Blink Studio Limited | Architect |
| 135 | Archetype Architects | Architect |
| 136 | Baseline Architects Ltd | Architect |
| 137 | Mandhry Associates | Q. Surveyor |
| 138 | Premier Consultants | Q. Surveyor |
| 139 | Icon Concepts Ltd | Architect |
| 140 | Tarakibu Architects Limited | Architect |
| 141 | Gibb Architects | Architect |
| 142 | Sycum Solutions Co. Ltd | Architect |
| 143 | Quantech Consultancy | Q. Surveyor |
| 145 | Fairplan Systems Ltd | Architect |
| 146 | Jofrok Building Consultants | Architect |
| 147 | Quanti Bill Consults Company Ltd | Q. Surveyor |
| 148 | Geodev (K) Ltd | Planning |
| 150 | Heritage Associates Ltd | Architect |
| 151 | Waaki Associates | Architect |
| 152 | Whintto Architects (K) Ltd | Architect |
| 153 | Studio Partners | Architect |
| 154 | Archscan Associates Limited | Architect |
| 156 | E.d.g & Atelier | Architect |
| 157 | Innovative Planning & Design Consultants | Architect |
| 158 | Miwa Designs Ltd | Architect |
| 159 | Outsource Designs | Architect |
| 160 | Acrick Consultants Limited | |
| 161 | Tandem And Stark | Q. Surveyor |
| 162 | Bon - Arch Associates Ltd | Architect |
| 163 | Arcscene Architects (K) Ltd | Architect |
| 164 | Centreline Projects Consultants | Q. Surveyor |
| 165 | Gitutho Architects And Planners Ltd | Architect |
| 166 | Beglin Woods Architects Ltd | Architect |
| 167 | Urban Green Landscapes Ltd | L. Architect |
| 168 | Venture Architects Limited | Architect |
| 169 | Brickehaus Limited | Architect |
| 171 | Symbion Mombasa Ltd. | Architect |
| 172 | Archetypum Afrika | Architect |
| 173 | Tsavo Architects Limited | Architect |
| 174 | A.d Design Architects | Architect |
| 175 | Fhg Architecture (K)Ltd | Architect |
| 176 | Design Master Studio Limited | Architect |
| 177 | Design Source Limited | Architect |
| 178 | Trioscape Limited | Architect |
| 179 | Locus Studio Ltd | Architect |
| 180 | Team2 Architects | Architect |
| 181 | Boogertman And Partners Architects Ltd | Architect |
| 182 | Studio Verv Ltd | Architect |
| 183 | Mysticah Designs & Associates Lts | L. Architect |
| 184 | Edesign Studios Ltd | Architect |

# ADVOCACY AND COMMUNICATION




# CALENDAR OF EVENTS


# AAK ANNUAL CONVENTION 2018

## TOWARDS DIGNIFIED HOUSING FOR ALL

15TH - 18TH AUGUST 2018 • PRIDE INN PARADISE BEACH RESORT, MOMBASA

## 15th to 18th August 2018

PrideInn Paradise Beach Resort, Mombasa

- The Land Question
- Technology, Innovation & Research
- Wholesome housing
- Delivery

**Early Bird Registration Deadline 31st May 2018**


**Email: aak@aak.or.ke**
**Phone: 020 242 0806, 0721 691 337**
**Blue Violets Plaza, Kindaruma Road**
**6th Floor, Wing B, Room 605**


@archKE

LIPA NA M-PESA

Paybill Number

988567

Account Number

CONVENTION

Early Bird Registration (up to 31st May)- Ksh. 20,000
Regular Registration (1st June to 31st July) - Ksh. 25,000
Late Registration (1st August to 15th August) - Ksh. 30,000
First 20 Students & Graduates - Ksh. 20,000
Non-Members - Ksh. 40,000

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SCHELL


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**Mombasa:** Shimanzi, Makande Rd T: 0718 000 008, Nyali, Opp City Mall T: 0718 000 009