Green Vocational College
Masterplan

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LOCALWORKS
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Green Vocational College
Masterplan

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ORIGINATED BY	Felix Holland	Morgane Charron
	Principal Architect	Graduate Architect
CHECKED BY	Randi Karangizi	
	Graduate Architect	
REVIEWED BY	Moreen Katusiime	
	Senior Architect	
APPROVED BY	Felix Holland	
	Principal Architect	

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Executive summary

Localworks have been commissioned by Africa Rise and Education Development Initiative to prepare a Masterplan for their future Green Vocational College in Buwama.

Design brief
The core of your idea is to build a truly ecological vocational training school, using local materials, innovative appropriate technologies and passive design principles throughout; and to utilise the project as a learning opportunity for your teachers and students, in form of the school community becoming part of the practical construction process. The school already exists, however, its current premises need to be vacated by the end of the calendar year, onto a new piece of land in Buwama.

The college will have a total of 300 students, aged from 13 to 20. About 180 students (80 girls and 100 boys), and most teachers will live on site in boarding facilities. There will be workshops for hairdressing, tailoring, electrics, plumbing, automobile mechanics, motorcycle mechanics and carpentry. Workshops will be complemented by classrooms, an art & design studio and an IT lab.

The communal heart of the campus will be a multipurpose hall with adjoining kitchen. This covered external space can be used for dining, assemblies and performances, but it could also form part of the college's outreach programme, by making the facility available to the community at certain times.

At this early stage, we believe that the complete programme for the Green Vocational College translates into a gross external area of around 3,490m².

Masterplan
In the following pages, we shall present our proposed site masterplan which responds to :
- the school needs in terms of spaces and equipment;
- the time constraints that require the school to start operating in January 2024;
- the site conditions;
- the global consideration for eco and durable construction and technologies.

In addition, we will develop the way the site is organised and its relationship to the context; we will present schematic floorplans for each building as well as a phasing proposal.

Cost estimate
At this early stage, we believe that the total cost of developing all buildings and site infrastructure would be in the region of $3,115,000, out of which Phase 1 would be about $480,000.
This includes contractor's preliminaries, client contingency and VAT, but excludes statutory and professional design and supervision fees.

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Masterplan
Design brief

I dream of ...

... a school with a strong community outreach focusing on conservation and environmental action

... a universally accessible school in regards to people with physical impairments

... teaching spaces that enable learner-centered learning

... a school that recycles its own and the community's waste and teaches how to work with recycled materials

... a school that is attractive and comfortable to current and new students

... a school that incorporates local knowledge and cultural/ indigenous traditions

... a school in which every individual is a learner (students, teachers and community)

... a school that is intentionally green, both in its operations and in its teaching

... a model school that other schools can learn from

... a school that produces some of its own food based on permaculture principles and that promotes nutritional variety

... a time where students are co-builders of the school

... a school that is built (almost) entirely of regenerative materials

... a school that operates on a circular system (recycle, reuse, regenerate)

... a school where the different departments are spatially inter-connected

Project brief

As part of your original brief, you mentioned your main intention is the architecture and general atmosphere of the new school to encourage inspiration and innovation, but also to reconcile with nature.
It was also emphasized that time is an extremely important factor in the project as the school needs to be operating in January 2024, and the Masterplan should be taking this into consideration by having a realistic phasing proposal.

The college should cater for a total of 300 students, including 180 as boarding beneficiaries.
Aged 13 to 20, their needs should be at the heart of the design process, reflected in an inspiring, creative, sensual surrounding that encourages active learning and critical thinking; also providing for the necessary privacy and spaces for individual expression that is needed during this formative life period.
Teachers are also being given the opportunity to live in the premises thanks to 10 staff accommodation units.

The school intends to keep all 7 vocational departments (Tailoring and Knitting, Hairdressing, Motorbike Mechanics, Vehicle Mechanics, Construction, Plumbing and Electrics) and even to grow numbers for each of them to reach circa 30 students per course (currently around 15).
A new department should also find space in the school, that is Carpentry.
We would be keen to create highly functional spaces, especially for the workshops, that allow the school to develop over the years without being restricted by the structures.

The school requires other supporting spaces, such as 4 classrooms, IT lab, Library, Administration facilities, and a Multipurpose Hall.

Finally you are very interested in green or alternative technologies and especially for water and wastewater treatment, where you are considering the construction of a bio-digester and using semi-dry communal-flush toilets. Whilst being the most eco-friendly form of dealing with human waste, such a system also has the advantage of producing a potent fertiliser for a school garden and also producing gas that can be used for cooking. Compost toilets are an alternative option that you are also keen on exploring.
Other appropriate technology ideas include on-site bio-waste briquet-making, rainwater harvesting, bamboo production, solar power and more.

The brief was later refined, following a workshop we had in Mpigi late April and ‘work-in-progress’ meetings we had afterwards.
These interactions and the site visit of the existing school premises made us understand better the way the school functions. This translated into adjusting areas originally proposed for each department as well as the resources they need to access (water, etc).

Building programme

Based on the brief and our discussions during our 'work-in-progress' sessions, the following room programme was developed. In total, we had estimated the spatial requirements for Green Vocational College to be in the region of 3,490m² (gross external area including covered walkways). Phase 1 would represent about 1,680m² gross (48%).

Room programme	From brief							
Administration Block								
Reception/secretary/waiting	1	no.	x	15	m2	=	15	m2
Principal's office	1	no.	x	15	m2	=	15	m2
Offices	2	no.	x	10	m2	=	20	m2
Staff room	1	no.	x	25	m2	=	25	m2
Archive store + Power room	1	no.	x	10	m2	=	10	m2
Library	1	no.	x	15	m2	=	15	m2
Sick Bay	1	no.	x	10	m2	=	10	m2
Covered walkway	1	no.	x	40	m2	=	40	m2
Sub total: Administration Block						=	**150**	**m2**
Classroom Block(s)								
Classrooms (for 30 students)	4	no.	x	50	m2	=	200	m2
Art & Design studio	1	no.	x	60	m2	=	60	m2
Covered outdoor teaching space	1	no.	x	45	m2	=	45	m2
IT Lab (for 20 students)	1	no.	x	45	m2	=	45	m2
Covered walkway/circulation	1	no.	x	100	m2	=	100	m2
Sub total: Classroom Block(s)						=	**450**	**m2**
Workshops								
Hairdressing	1	no.	x	71	m2	=	71	m2
Tailoring + Knitting	1	no.	x	122	m2	=	122	m2
Electrics	1	no.	x	70	m2	=	70	m2
Plumbing	1	no.	x	70	m2	=	70	m2
Mechanics (cars + bikes)	1	no.	x	174	m2	=	174	m2
Construction (container + shade)	1	no.	x	230	m2	=	230	m2
Carpentry (container + shade)	1	no.	x	138	m2	=	138	m2
Sub total: Workshops						=	**875**	**m2**
Meditation/Prayer Room								
Circular meditation space	1	no.	x	30	m2	=	30	m2
Sub total: Meditation/Prayer Room						=	**30**	**m2**
Multipurpose Hall								
Hall for 200px (covered external)	1	no.	x	250	m2	=	250	m2
Store								
Sub total: Multipurpose Hall						=	**250**	**m2**
School Kitchen								
Cooking and preparation space	1	no.	x	45	m2	=	40	m2
Dishwashing area (covered external)	1	no.	x	15	m2	=	15	m2
Servery (covered external)	1	no.	x	20	m2	=	20	m2
Food store	1	no.	x	10	m2	=	10	m2
Firewood store	1	no.	x	10	m2	=	10	m2
Sub total: School Kitchen						=	**95**	**m2**

Room programme	From brief							
Student Accommodation, Boys (100px)								
Dormitories (24px)	4	no.	x	60	m2	=	240	m2
Dormitories extension (4px)								
Warden room	1	no.	x	30	m2	=	30	m2
Common area	1	no.	x	60	m2	=	60	m2
Stairs/Circulation								
Sub total: Student Accommodation, Boys						=	**330**	**m2**
Student Accommodation, Girls (80px)								
Dormitories (24px)	4	no.	x	60	m2	=	240	m2
Dormitories (16px)								
Dormitories extension (4px)								
Matron room	1	no.	x	30	m2	=	30	m2
Common area	1	no.	x	60	m2	=	60	m2
Sub total: Student Accommodation, Girls						=	**330**	**m2**
Teacher Accommodation (10px)								
Junior double units	4	no.	x	60	m2	=	240	m2
Senior double units	1	no.	x	90	m2	=	90	m2
Sub total: Teacher Accommodation						=	**330**	**m2**
Guest Bungalow (6px)								
Common room with kitchen	1	no.	x	35	m2	=	35	m2
Bedrooms	3	no.	x	14	m2	=	42	m2
Bathroom	1	no.	x	6	m2	=	6	m2
Veranda	1	no.	x	20	m2	=	20	m2
Sub total: Guest Bungalow						=	**103**	**m2**
Ancillary Buildings								
Guardhouse (single unit with two rooms)	1	no.	x	30	m2	=	30	m2
Tool store (near agricultural area)	1	no.	x	15	m2	=	15	m2
Canteen/Kiosk	1	no.	x	10	m2	=	10	m2
Sub total: Guardhouse						=	**55**	**m2**
Bio-Toilets								
Student & teacher toilet block (300px)	1	no.	x	45	m2	=	45	m2
Admin & Visitor toilet block (10px)	1	no.	x	20	m2	=	20	m2
TQs' toilet and shower block (10px)	1	no.	x	20	m2	=	20	m2
Boys' toilet and shower block (100px)	1	no.	x	45	m2	=	45	m2
Girls' toilet and shower block (80px)	1	no.	x	45	m2	=	45	m2
Sub total: Bio-toilets						=	**175**	**m2**
Sports grounds								
Large sports field (football)	1	no.						
Net-ball field	1	no.						
Basketball field								
Total net internal area							**3,173**	**m2**
Grossing factor							1.10	
Total gross external area							**3,490**	**m2**

nb : the green sections are what you intend to have operational in January 2024 (Phase 1)

Building programme - Workshops

The table here shows a refined programme for each of the 8 workshops, and the images illustrates current set-ups.

Workshops - Room programme						
Hairdressing						30 Students
Store	1	no.	x	5	m2	= 5 m2
Washing area	3	no.	x	2	m2	= 6 m2
Cutting/Styling	1	no.	x	60	m2	= 60 m2
Sub total:						**= 71 m2**
Tailoring and Knitting						30+10 Students
Fabric, wool and tool store	1	no.	x	10	m2	= 10 m2
Sewing area	1	no.	x	80	m2	= 80 m2
Kniting area	1	no.	x	20	m2	= 20 m2
Cutting/Ironing area	1	no.	x	12	m2	= 12 m2
Sub total:						**= 122 m2**
Electrics						30 Students
Work area	1	no.	x	60	m2	= 60 m2
Store	1	no.	x	10	m2	= 10 m2
Sub total:						**= 70 m2**
Plumbing						30 Students
Work area	1	no.	x	60	m2	= 60 m2
Store	1	no.	x	10	m2	= 10 m2
Sub total:						**= 70 m2**
Mechanics (cars+bikes)						30 Students
Workspace on cars (3x6m)	2	no.	x	18	m2	= 36 m2
Spare parts and tool store	1	no.	x	15	m2	= 15 m2
Paint cabin	1	no.	x	18	m2	= 18 m2
Workspace on bikes (2.5x4m)	2	no.	x	10	m2	= 20 m2
Work tables area	1	no.	x	15	m2	= 15 m2
Instructor office	2	no.	x	10	m2	= 20 m2
Circulation	1	no.	x	50	m2	= 50 m2
Sub total:						**= 174 m2**
Construction						30 Students
Workspace	1	no.	x	160	m2	= 160 m2
Circulation	1	no.	x	50	m2	= 50 m2
Instructor office	1	no.	x	10	m2	= 10 m2
Store	1	no.	x	10	m2	= 10 m2
External material storage						
Sub total:						**= 230 m2**
Carpentry						30 Students
Wood store / drying shelves	1	no.	x	12	m2	= 12 m2
Tools store	1	no.	x	6	m2	= 6 m2
Machines area	1	no.	x	30	m2	= 30 m2
Working area	30	no.	x	3	m2	= 90 m2
Sub total:						**= 138 m2**


Current Plumbing Department


Current Tailoring Department


Current Construction Department

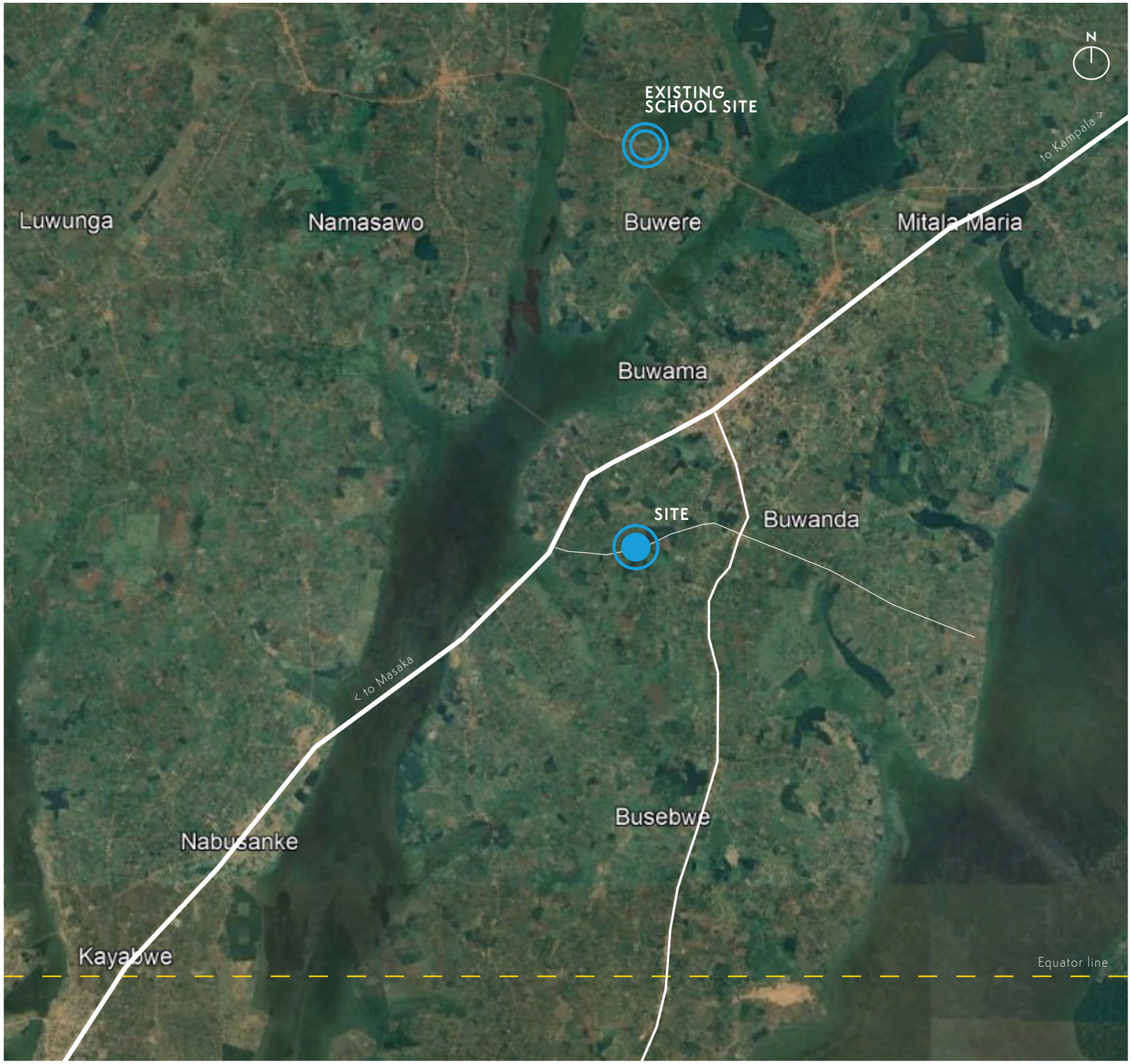
Masterplan

Existing conditions

Site location

Buwama village is located along Masaka road, approximately 70 km from Kampala.

In the southern outskirts of Buwama, near the Equator line, the site is a 5 minutes drive from the main road, and 15 minutes from the old school.

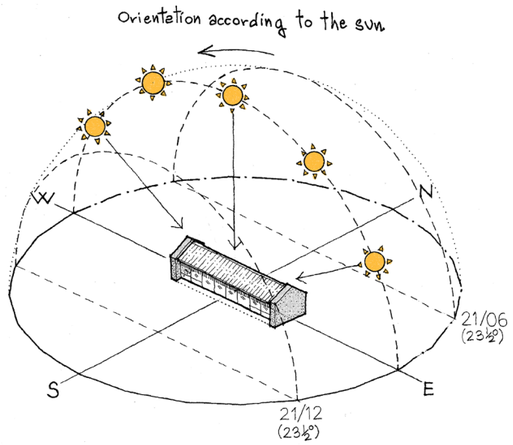


Climate data

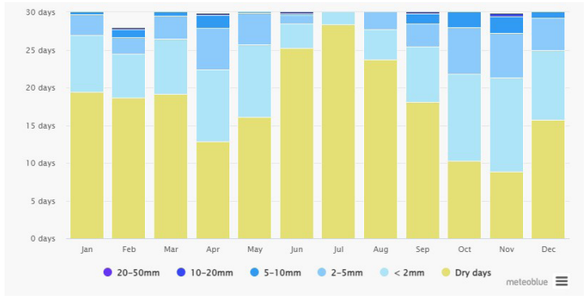
The site is located about 5km North of the Equator. Buildings on the equator are most comfortable when their sides facing east and west are as solid as possible to prevent the low but intense morning and evening sun from penetrating deep into the building; and their sides facing north and south as transparent as possible to maximise on natural daylight and airflow.

Powerful tropical rains and storm events, from unpredictable directions, are frequent, especially around October to December and April to May. Any large openings need to be effectively closeable and passive ventilation – which is absolutely essential to keep the indoor climate comfortable and allow for night-time cooling – needs to be positioned in such a way that the likelihood of direct rain ingress is minimised.

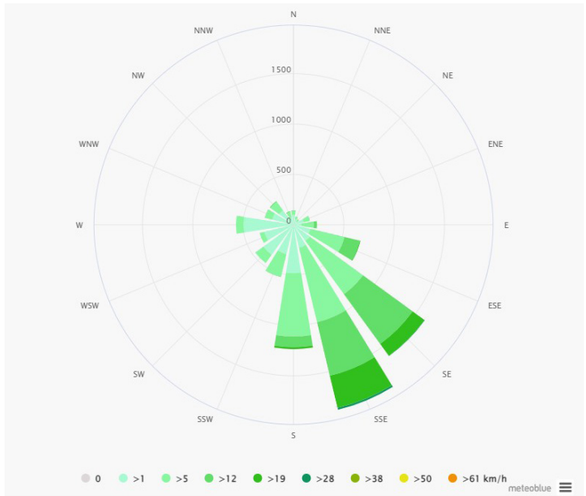
Buwama's general wind direction is determined by its location in relation to Lake Victoria, it comes from south-east. While wind speeds are generally low, the steady breeze can at times be experienced as uncomfortable. It would therefore be desirable for any openings of the building facing south-east to be closeable.



Ideal orientation of a building near the equator in relation to the sun



Average precipitation amounts (Source: Meteoblue)



Wind rose (Source: Meteoblue)

Site situation

The site is composed of 3 plots of land, respectively about 1.4, 1.1 and 3.1 acres. Two of them are separated by a mud road which also constitute the main access, and are boarded by community paths that should be kept.

It is located at proximity of a high voltage line, but distant enough to not be affected by it (noise, view, dangers).

The surroundings are rural with scattered residentials, a secondary school, a church and murrum quarry directly touching the site.

Environmental constraints

The main difficulty of this site is that it is fragmented due to the successive additions of pieces of land. We would recommend the creation of an element that would connect all of them together : a large path, a green axis or an alignment of buildings.

There are some existing structures on and around the site, and particularly a small church, which could create future nuisances (noise, crowd, parking...).

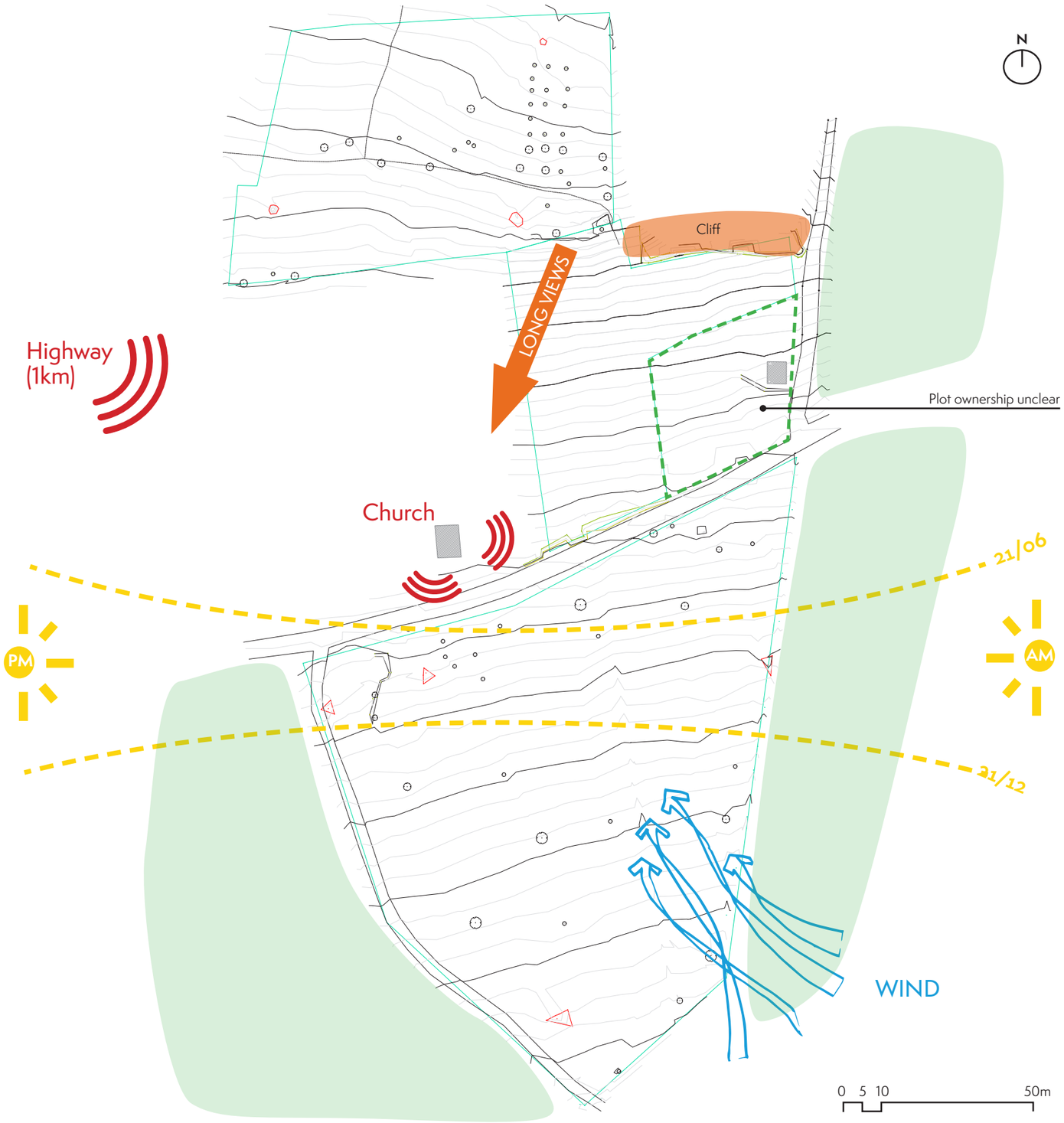
Neighboring church

Existing shed on site

Surrounded by forests, the eastern one being of great interest with lots of indigenous species, the lower site feels very protected and introverted, looking inwards, while the top site benefits from longer views across the valley.

Given the sloped nature of the site, the storm water strategy would need to ensure that it is well drained and buildings are kept free of below-ground water build-up.

Both in terms of sun and wind, these should be considered opportunities rather than constraints, for as long as the buildings are designed appropriately.



Noise

Existing buildings

Forest

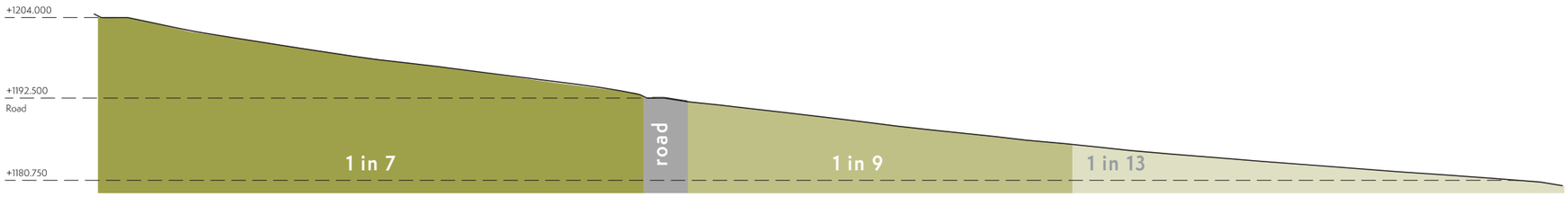
Site topography

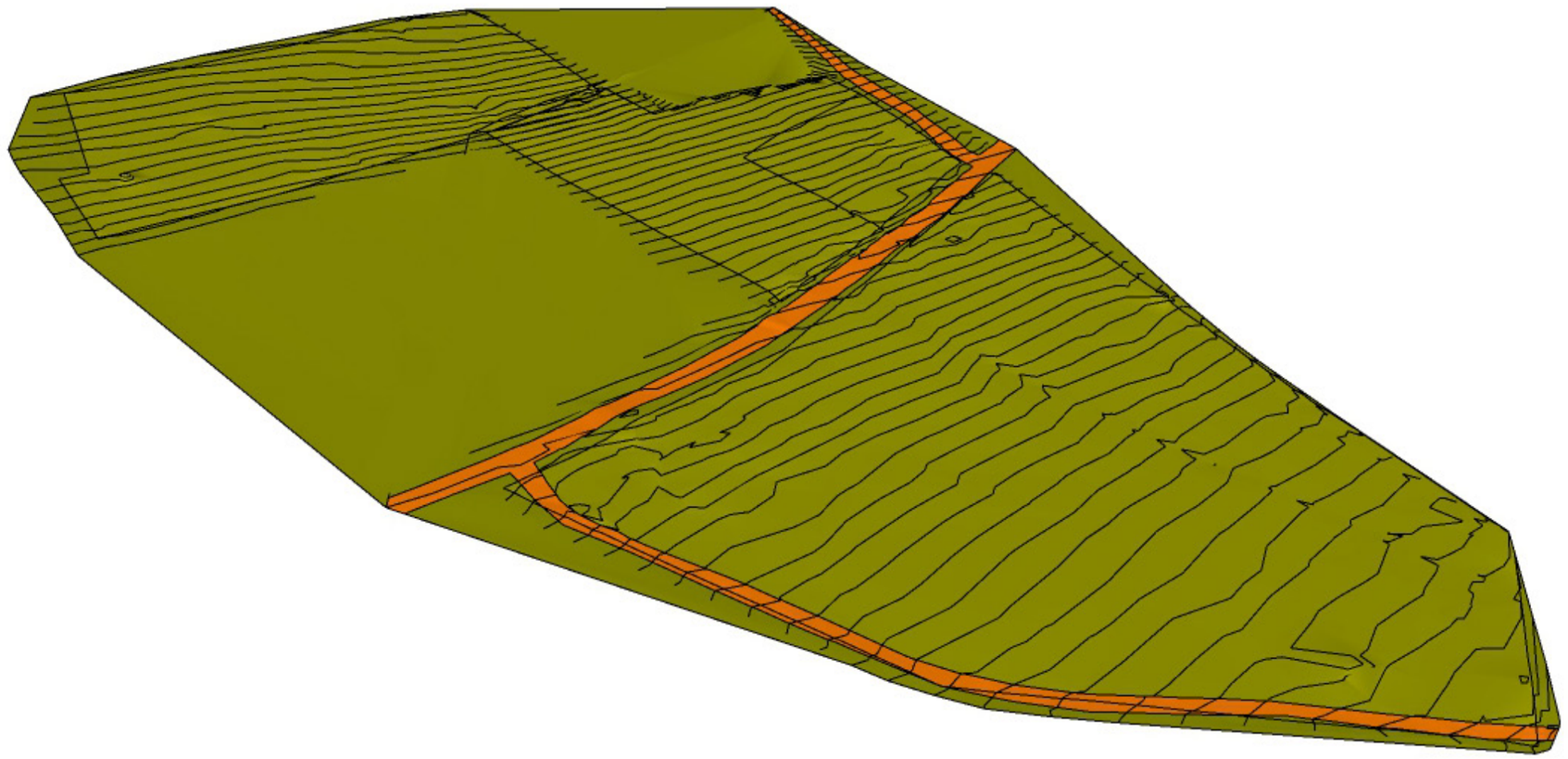
Sitting near the bottom of a valley, the site is located on its northern side and is gently sloping down towards South.

While the lowest part of the site slopes at a rate of 1 in 13, it gradually becomes steeper as we go up, with a slope of 1 in 9 below the road and 1 in 7 for the upper plot.

As a comparison, we usually recommend 1 in 20 slope for unassisted wheelchair, and 1 in 12 for assisted wheelchair. A typical carpark ramp is 1 in 8.

This means, that any ramped footpath would need to move in serpentines, or steps will be needed.





Trees

While the upper site is quite bare with no significant existing tree, the lower one has some variety of species, from fruit trees to ficus. These trees are still young and not very tall nor wide.

The design should cater for planting a large amount of new trees, ideally a mix of fast and slow growing types.

Site photos


Panoramic view at top of the site


Access road coming from the highway


Community path going down the valley


Murrum quarry

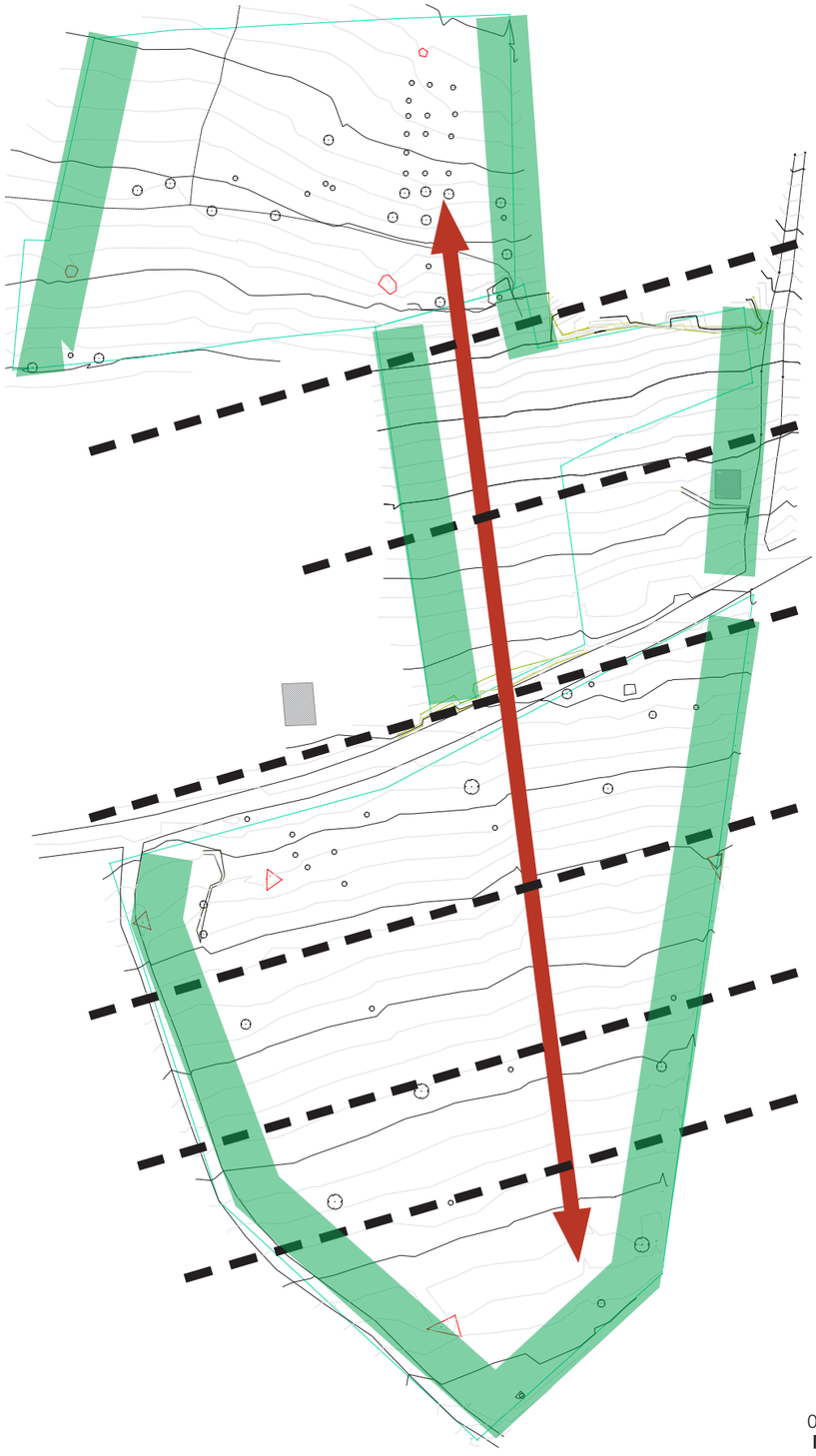
Masterplan
Site development plan

Site development plan

General intentions

We have developed the masterplan based on clear general intentions :

- dividing the site into strips, parallel to the topography contour lines; each strip would then host a function;
- creating a central spine linking all 3 plots; this might not be a perfectly straight axis as slopes might not always allow it;
- protecting the perimeter of the site with a wide biodiversity buffer (5-8m); this would help creating a separation with the outside, but also bring in more fauna and flora in a larger context, while providing solutions for storm water that would be sent to these zones for infiltration.

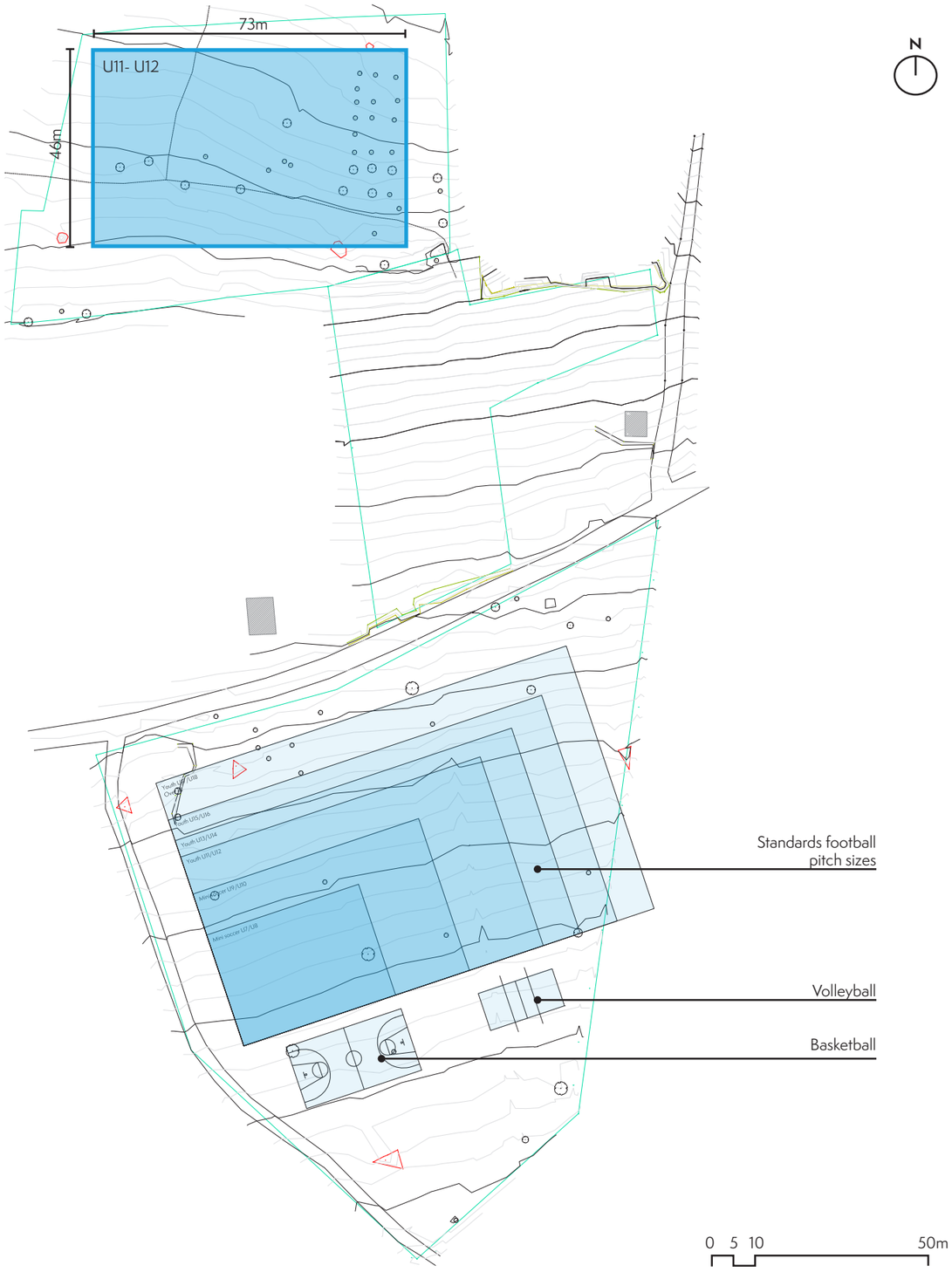


Sports

We conducted a feasibility study on pitches sizes that could fit on the original 2 plots, and the conclusion was that a larger football pitch (from U11 to over 18) would not be appropriate.

Our recommendation was to invest in an additional plot of land for that sole purpose, which you did at the top of site. However, it appears that given the shape, the slope direction and the level differences, only a small football pitch would work (U11).

Smaller sport facilities, such as basketball and volleyball, could however be easily implemented at the bottom of the site.



Site zoning

We are proposing to develop the masterplan based on the strips concept previously explained, with each of them hosting a function.

Right below the access road, we are suggesting to place the School Administration as well as the Classrooms.
The next stripe would be almost entirely dedicated to the School Workshops, only the Multipurpose Hall and Kitchen, in line with the Administration above, would come disrupt it to separate the noisy activities from the others.

The bottom of the site is suitable to host both sports and the school farm.

The student accommodations are proposed to the East, on either side of the road to clearly separate Boys and Girls.
Teachers and Guest accommodation would then sit higher up to be more separate from the school and to benefit of longer views.

Finally the large sports pitch is proposed at the very top of the site.

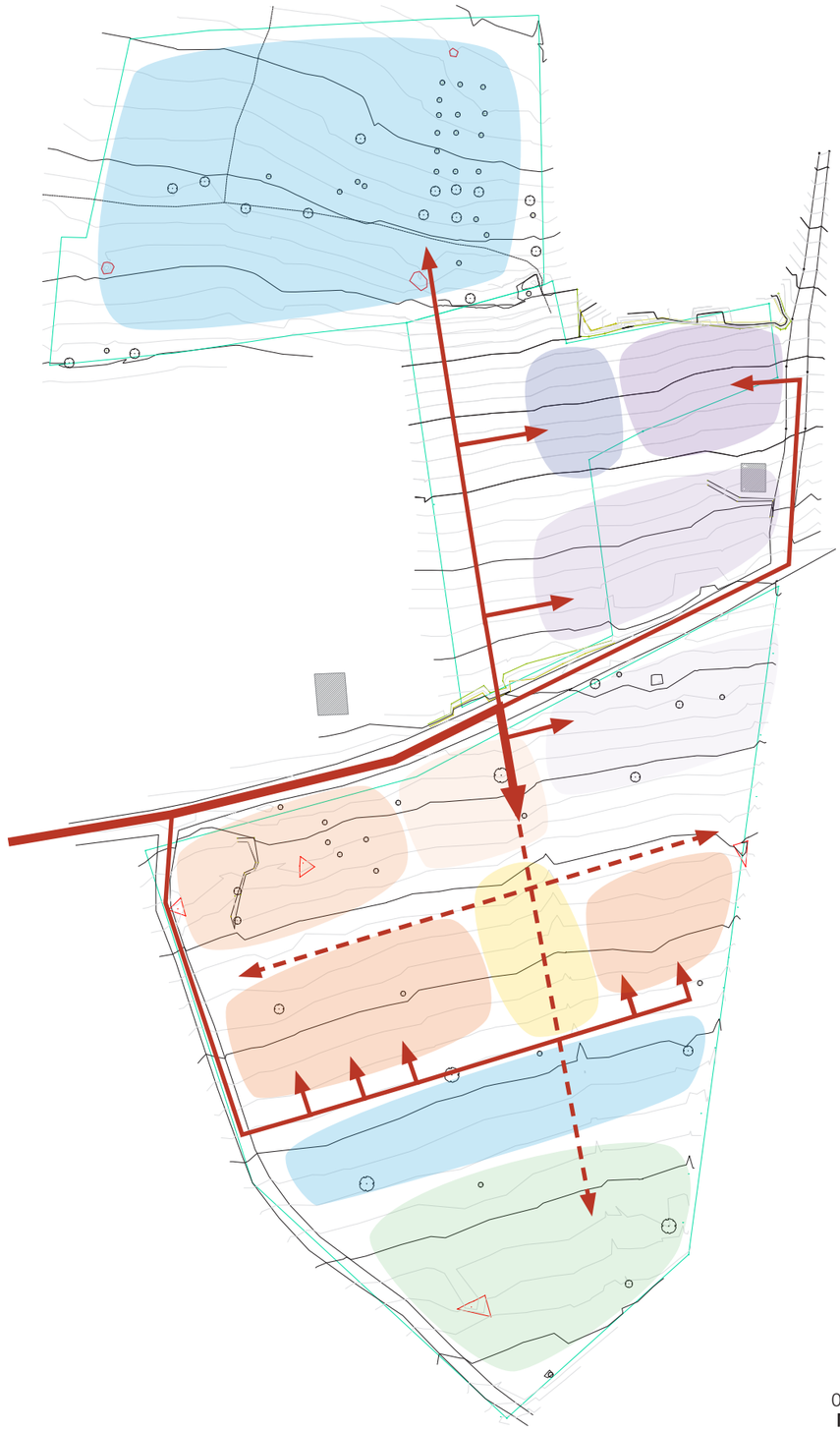
- School Administration
- School Classrooms
- School Workshops
- Multipurpose Hall
- Students accommodation (Girls)
- Students accommodation (Boys)
- Teachers accommodation
- Guests accommodation
- Farm
- Sports

Site access and circulation

Our proposal resides in accessing the school in its heart, where the Administration is, so one can easily control the in and out of the premises.
The users are invited to follow an internal axis, leading them straight to the bottom of the site, through the Hall and the lower Sports grounds.

A secondary entry is proposed on the Western side of the site, to assist with logistics needs (deliveries of materials, equipment, food, etc.).

Boarding facilities are also accessed near the Administration, while Teachers and Guests can reach their home, either through the footpath that leads all the way to the upper Sports pitch, or via the vehicular access on the Eastern route.



Approach from the main road

Proposed Masterplan

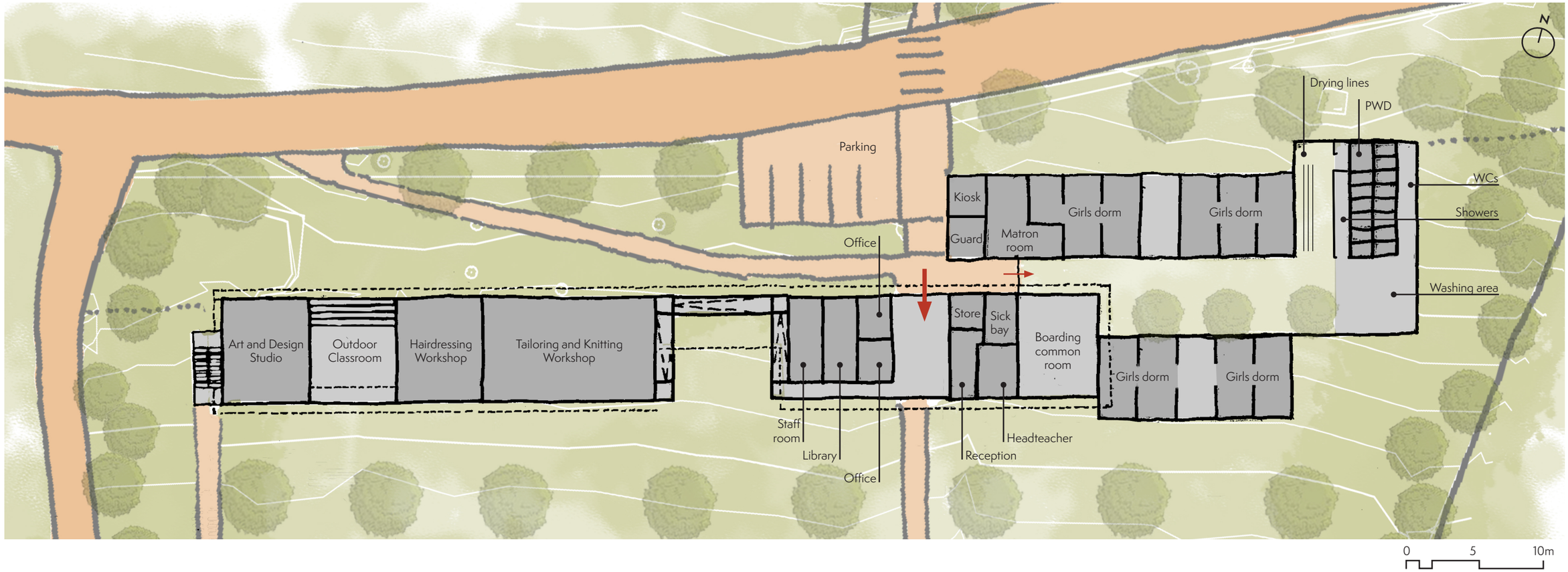
Based on our design intentions and principles described previously, the proposed Masterplan is shown to scale here with more detail.

While most buildings are oriented parallel to the contours and with a width of 8 to 10m, the workshops are positioned against the topography and are slightly wider (12m) to allow for larger free space looking at the landscape where they can expand.

The proposal keeps space for vegetation and unbuilt areas, like at the bottom where the farm is, or at the top where the sports pitch is. Other 'breathing strips' in between buildings are created, thanks to the double-storied teaching block which free up some ground space.

Bird-eye view

Site development plan



Floorplan diagram
Classrooms, Administration and Girls Boarding Accommodation - Ground Floor

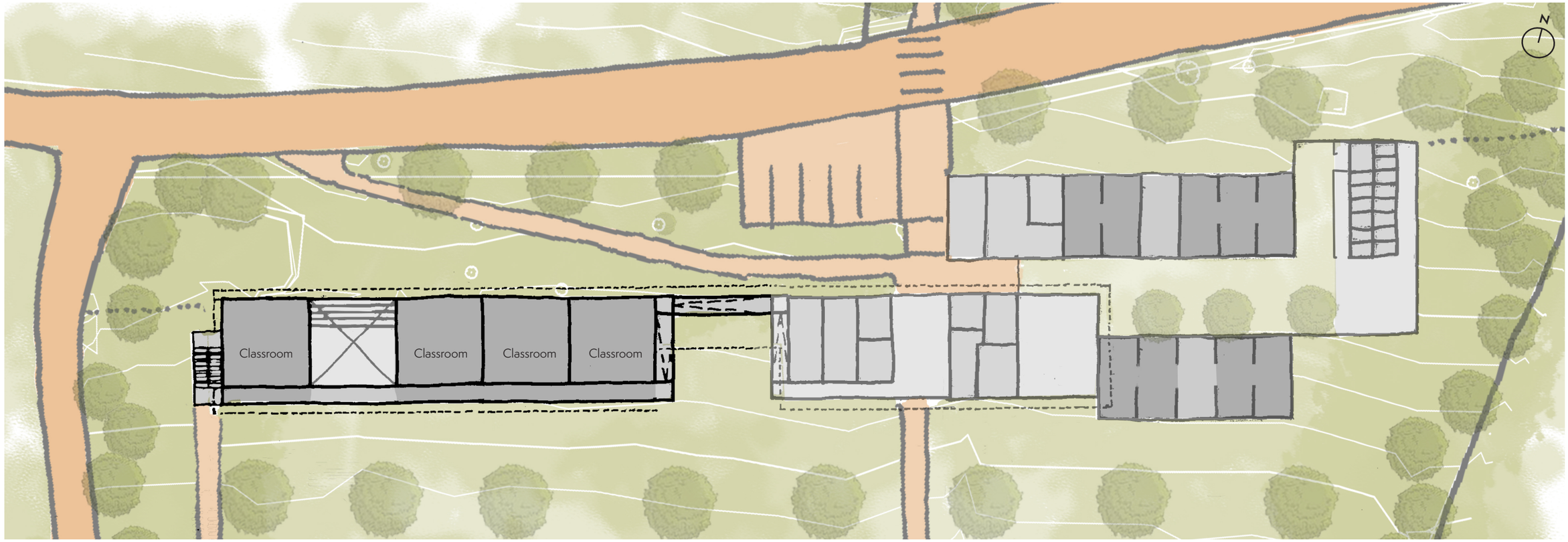
The parking, which caters for 5 cars, is located directly on the road, at a slightly higher level than the buildings. It is proposed to step down, or to use the ramp, to reach the Administration covered arrival where one would be welcomed at the reception. Offices, sick bay, staff room are hosted here as well as the Library which could eventually be opened to the local community.

Users can move to the 'classroom' type workshops, such as the Tailoring, Hairdressing and Arts departments. An outdoor classroom with small in-built amphitheatre benches lets the workshops expand when needed. It also suitable for small events or extra-curricular activities (theatre, music...).

On the other end of the Administration is the Girls boarding compound. The entrance is in front of the matron's room for better surveillance, and 4 dormitories are proposed in 2 blocks. Each dormitory accommodates about 24 students, though they are subdivided in cubicles of 4 with central circulation.

The common room is designed as a covered external space, with the roof being an extension of the Admin block. Bio-toilets and showers are located at the end of the compound with some covered space for washing and drying lines on the side.

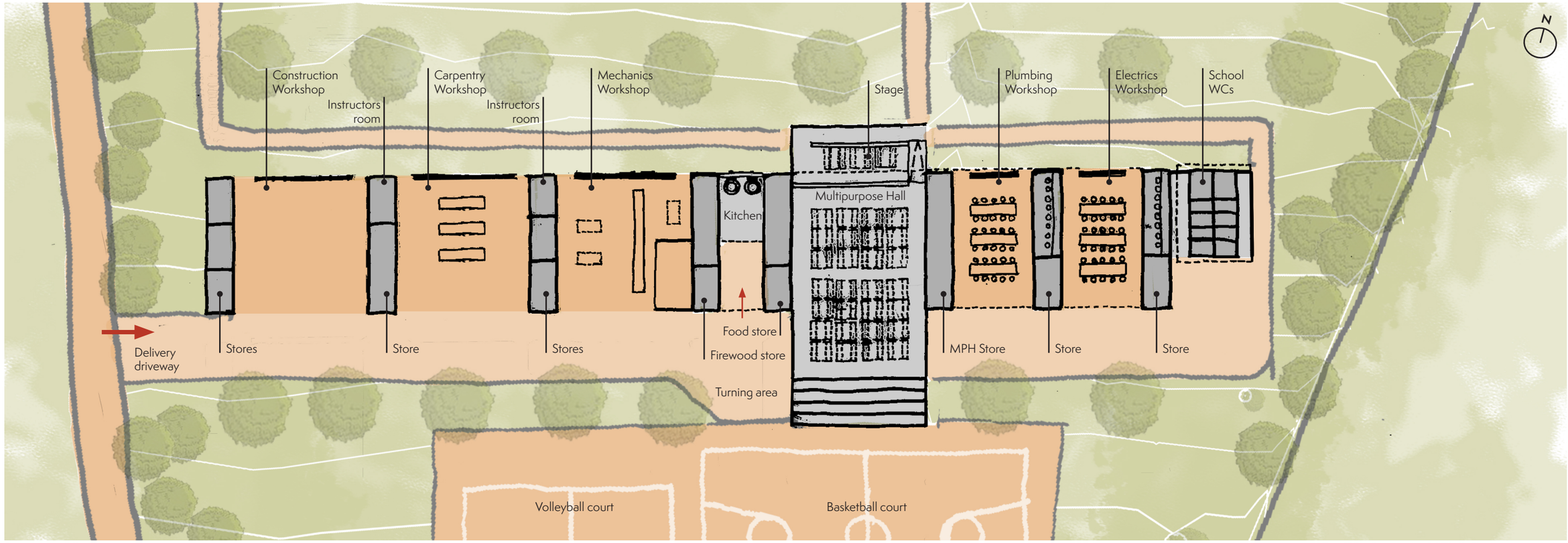
Site development plan



Floorplan diagram
Classrooms, Administration and Girls Boarding Accommodation - First Floor

The workshops building is proposed to be double storied, with all 4 classrooms on the upper floor. It is accessible via a ramp on the Admin side, or via a stair at the opposite end. A walkway, turning into a bridge, allows continuous circulation even above the double height outdoor classroom.

Site development plan



Floorplan diagram
Workshops and Multipurpose Hall

Slightly downhill are the rest of the workshops and the Multipurpose Hall, designed with the simple idea of containers and roofs in between.

We have proposed for the Hall to be central and in line with the Administration building to reinforce the main axis linking all 3 plots and generally all functions of the project. Its structure protrudes on both sides of the strip and is essentially a large empty space where the tables can be arranged according to user needs (dining, exams, assembly, etc.). It is fitted with an accessible stage, seating steps as you go towards the basketball court, and is boarded by 2 containers: one for storage, one to conceal the kitchen serving area.

The kitchen is developed as a courtyard, partially covered, with 2 containers for stores, preparation and servery.

The workshops are separated into 2 groups. The heavy duty works are towards west, such as Construction, Carpentry and Mechanics Departments, as these activities would regularly needs deliveries of materials or vehicle access, via the secondary entry created there. Towards East are the Plumbing and Electrical departments, proposed as large covered space with long working tables and store adjacent.

Generally, all these spaces are open and facing the landscape, though the ‘back’ side, looking up-hill is partially closed with stone wall.

The school bio-toilets are located at the end of that strip.

View out from the Mechanics Workshop

Floorplan diagram
Teachers, Guest and Boys Boarding Accommodation

Right above the road is the Boys boarding compound. Similar to the Girls one, it follows the same idea of 4 dormitories developed in 2 blocks, bio-toilets and showers on one end of the compound, common room and warden room by the entry.

The Teachers accommodation is proposed as 2 elongated buildings, 8 Junior units on the top side, 2 Senior units below, and shared bio-toilets (each of the unit has its own bucket shower).

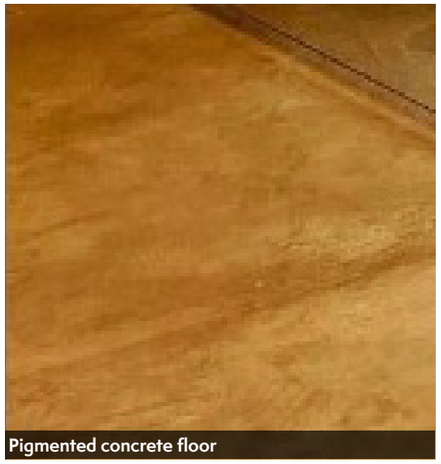
The Guest bungalow, to the left, is accessed through the covered veranda, with the common room directly adjacent and the 3 bedrooms in the other wing.

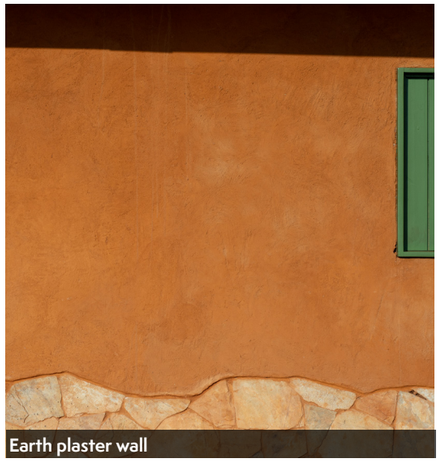
This set up forms a U-courtyard which could be planted or cultivated. Parking is located to the east of the building.

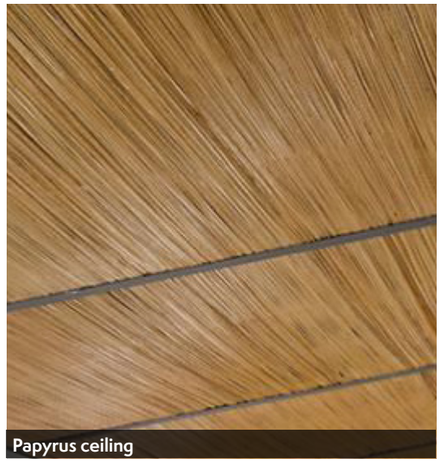
Material palette

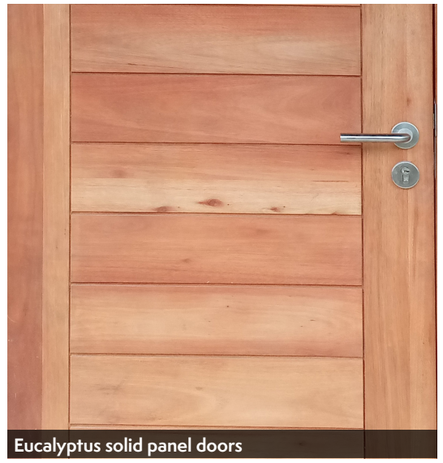
Our proposal relies on the use of natural and local materials with a long life span.

That would be translated into a earthy scheme, with earth plaster, pigmented concrete and murrum ground; there will be a very strong presences of bamboo, in the roof structure, covering and wall cladding as well.


Pigmented concrete floor

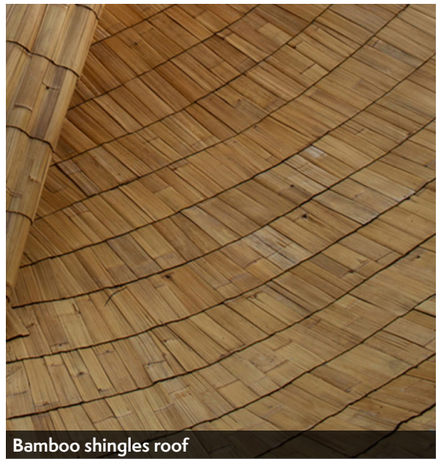

Earth plaster wall

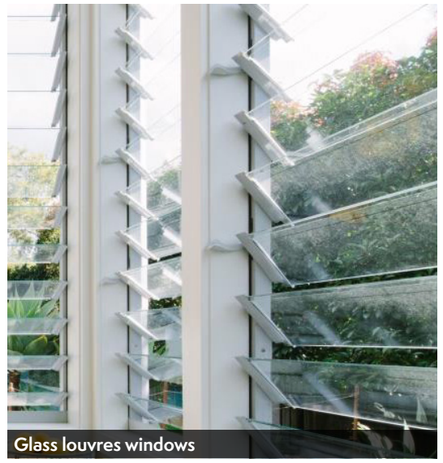

Papyrus ceiling


Eucalyptus solid panel doors

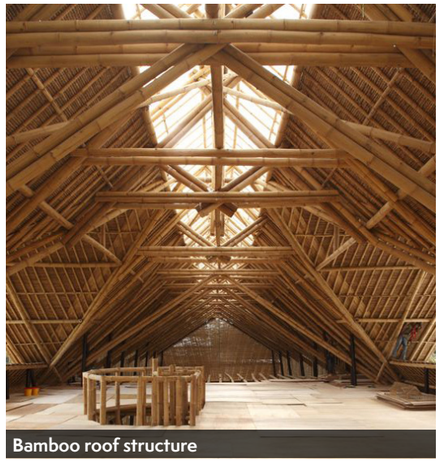

Stabilized murrum ground


Bamboo sticks wall cladding


Bamboo shingles roof


Glass louvres windows


Full-Graffiti containers


Bamboo roof structure

Architectural inspiration

Area schedule

In total, the masterplan proposes a combined gross external floor area of ca. 3,420m². The spreadsheet on this page breaks down the area per building, and also compares those with the pre-design brief.

Room programme	From brief	From design (gross)
Administration Block		
Reception/secretary/waiting	1 no. x 15 m2 = 15 m2	1 no. x 15 m2 = 15 m2
Principal's office	1 no. x 15 m2 = 15 m2	1 no. x 16 m2 = 16 m2
Offices	2 no. x 10 m2 = 20 m2	2 no. x 11 m2 = 22 m2
Staff room	1 no. x 25 m2 = 25 m2	1 no. x 23 m2 = 23 m2
Archive store + Power room	1 no. x 10 m2 = 10 m2	1 no. x 9 m2 = 9 m2
Library	1 no. x 15 m2 = 15 m2	1 no. x 23 m2 = 23 m2
Sick Bay	1 no. x 10 m2 = 10 m2	1 no. x 13 m2 = 13 m2
Covered walkway	1 no. x 40 m2 = 40 m2	1 no. x 59 m2 = 59 m2
Sub total: Administration Block	= 150 m2	= 179 m2
Classroom Block(s)		
Classrooms (for 30 students)	4 no. x 50 m2 = 200 m2	4 no. x 56 m2 = 224 m2
Art & Design studio	1 no. x 60 m2 = 60 m2	1 no. x 68 m2 = 68 m2
Covered outdoor teaching space	1 no. x 45 m2 = 45 m2	1 no. x 54 m2 = 54 m2
IT Lab (for 20 students)	1 no. x 45 m2 = 45 m2	1 no. x 45 m2 = 45 m2
Covered walkway/circulation	1 no. x 100 m2 = 100 m2	1 no. x 59 m2 = 59 m2
Sub total: Classroom Block(s)	= 450 m2	= 449 m2
Workshops		
Hairdressing	1 no. x 71 m2 = 71 m2	1 no. x 68 m2 = 68 m2
Tailoring + Knitting	1 no. x 122 m2 = 122 m2	1 no. x 135 m2 = 135 m2
Electrics	1 no. x 70 m2 = 70 m2	1 no. x 110 m2 = 110 m2
Plumbing	1 no. x 70 m2 = 70 m2	1 no. x 110 m2 = 110 m2
Mechanics (cars + bikes)	1 no. x 174 m2 = 174 m2	1 no. x 164 m2 = 164 m2
Construction (container + shade)	1 no. x 230 m2 = 230 m2	1 no. x 164 m2 = 164 m2
Carpentry (container + shade)	1 no. x 138 m2 = 138 m2	1 no. x 164 m2 = 164 m2
Sub total: Workshops	= 875 m2	= 915 m2
Meditation/Prayer Room		
Circular meditation space	1 no. x 30 m2 = 30 m2	1 no. x 30 m2 = 30 m2
Sub total: Meditation/Prayer Room	= 30 m2	= 30 m2
Multipurpose Hall		
Hall for 200px (covered external)	1 no. x 250 m2 = 250 m2	1 no. x 237 m2 = 237 m2
Store		1 no. x 27 m2 = 27 m2
Sub total: Multipurpose Hall	= 250 m2	= 264 m2
School Kitchen		
Cooking and preparation space	1 no. x 45 m2 = 40 m2	1 no. x 50 m2 = 40 m2
Dishwashing area (covered external)	1 no. x 15 m2 = 15 m2	1 no. x 16 m2 = 16 m2
Servery (covered external)	1 no. x 20 m2 = 20 m2	1 no. x 18 m2 = 18 m2
Food store	1 no. x 10 m2 = 10 m2	1 no. x 9.2 m2 = 9 m2
Firewood store	1 no. x 10 m2 = 10 m2	1 no. x 9.2 m2 = 9 m2
Sub total: School Kitchen	= 95 m2	= 93 m2

Room programme	From brief	From design
Student Accommodation, Boys (100px)		
Dormitories (24px)	4 no. x 60 m2 = 240 m2	4 no. x 72 m2 = 288 m2
Dormitories extension (4px)		1 no. x 14 m2 = 14 m2
Warden room	1 no. x 30 m2 = 30 m2	1 no. x 34 m2 = 34 m2
Common area	1 no. x 60 m2 = 60 m2	1 no. x 60 m2 = 60 m2
Stairs/Circulation		1 no. x 25 m2 = 25 m2
Sub total: Student Accommodation, Boys	= 330 m2	= 421 m2
Student Accommodation, Girls (80px)		
Dormitories (24px)	4 no. x 60 m2 = 240 m2	2 no. x 72 m2 = 144 m2
Dormitories (16px)		2 no. x 48 m2 = 96 m2
Dormitories extension (4px)		1 no. x 14 m2 = 14 m2
Matron room	1 no. x 30 m2 = 30 m2	1 no. x 34 m2 = 34 m2
Common area	1 no. x 60 m2 = 60 m2	1 no. x 60 m2 = 60 m2
Sub total: Student Accommodation, Girls	= 330 m2	= 349 m2
Teacher Accommodation (10px)		
Junior double units	4 no. x 60 m2 = 240 m2	4 no. x 60 m2 = 240 m2
Senior double units	1 no. x 90 m2 = 90 m2	1 no. x 100 m2 = 100 m2
Sub total: Teacher Accommodation	= 330 m2	= 340 m2
Guest Bungalow (6px)		
Common room with kitchen	1 no. x 35 m2 = 35 m2	1 no. x 35 m2 = 35 m2
Bedrooms	3 no. x 14 m2 = 42 m2	3 no. x 14 m2 = 42 m2
Bathroom	1 no. x 6 m2 = 6 m2	1 no. x 6 m2 = 6 m2
Veranda	1 no. x 20 m2 = 20 m2	1 no. x 20 m2 = 20 m2
Sub total: Guest Bungalow	= 103 m2	= 103 m2
Ancillary Buildings		
Guardhouse (single unit with two rooms)	1 no. x 30 m2 = 30 m2	1 no. x 14 m2 = 14 m2
Tool store (near agricultural area)	1 no. x 15 m2 = 15 m2	1 no. x 10 m2 = 10 m2
Canteen/Kiosk	1 no. x 10 m2 = 10 m2	1 no. x 9.6 m2 = 10 m2
Sub total: Guardhouse	= 55 m2	= 34 m2
Bio-Toilets		
Student & teacher toilet block (300px)	1 no. x 45 m2 = 45 m2	1 no. x 55 m2 = 55 m2
Admin & Visitor toilet block (10px)	1 no. x 20 m2 = 20 m2	
TQs' toilet and shower block (10px)	1 no. x 20 m2 = 20 m2	1 no. x 46 m2 = 46 m2
Boys' toilet and shower block (100px)	1 no. x 45 m2 = 45 m2	1 no. x 73 m2 = 73 m2
Girls' toilet and shower block (80px)	1 no. x 45 m2 = 45 m2	1 no. x 73 m2 = 73 m2
Sub total: Bio-toilets	= 175 m2	= 247 m2
Sports grounds		
Large sports field (football)	1 no.	
Net-ball field	1 no.	1 no.
Basketball field		1 no.
Total net internal area	3,173 m2	
Grossing factor	1.10	
Total gross external area	3,490 m2	3,423 m2

nb : the green sections are what you intend to have operational in January 2024 (Phase 1)

Phasing proposal

Phasing the Masterplan is a crucial and fundamental step of this project, as the school needs to be operating in less than 7 months.

We are proposing as follow:

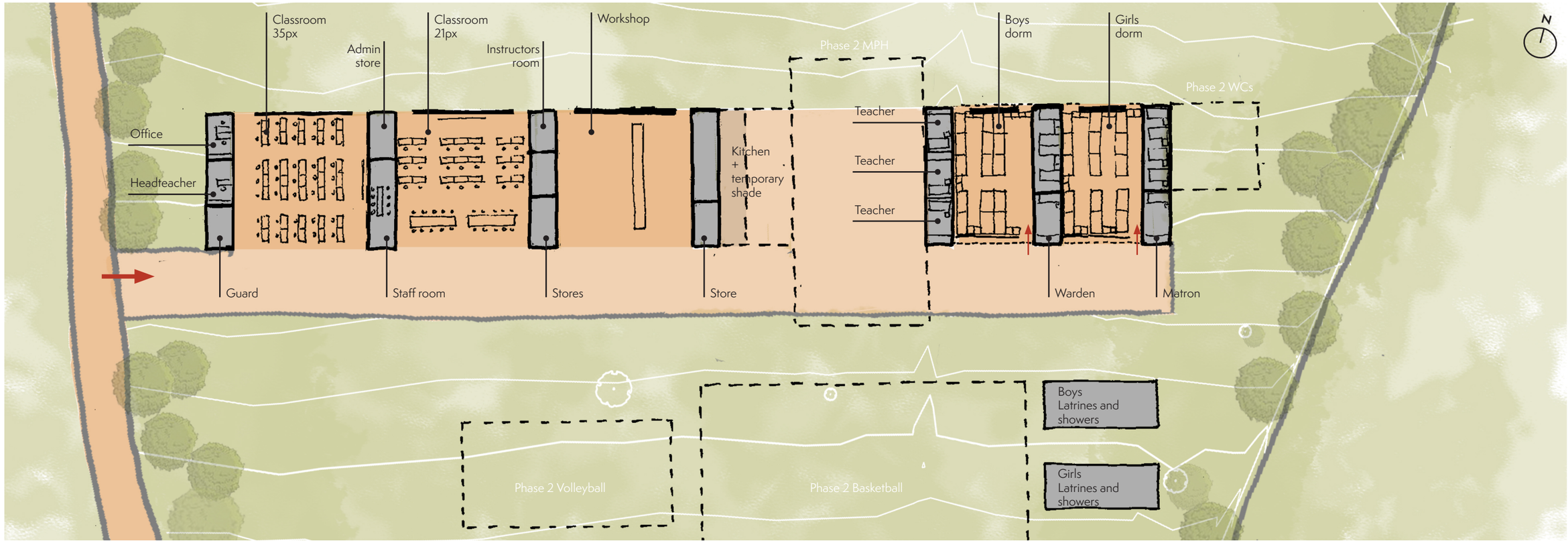
Phase 1
- Container Workshops
- Essential external works

Phase 2
- 2-storey Teaching block
- Administration block
- Half of each hostel block (i.e. one of two single-storey buildings, respectively) plus common room an supervisor's apartment
- Multi-purpose Hall with Kitchen
- Student toilets/bathrooms (the one near the workshops and each of those next to hostels)
- All other external works

Phase 3
- Teachers quarters
- Teacher toilets/bathrooms
- Guest accommodation
- The other half of each of the hostels
- Prayer room

Phase 1 Phase 2 Phase 3

Site development plan



Phasing proposal
Phase 1

For ease of construction and time efficiency, we are proposing to first build the containers strip.

While they will be workshops in the final stage, we have thought of a different organization for phase 1 so all functions can be temporarily fitted there.

That is :

- Offices
- Staff room
- Guard room
- 2 Classrooms
- 2 Shared workshops
- Kitchen
- 3 Teachers accommodation
- Boarding dormitories for about 40 girls and 40 boys
- Temporary latrines and showers


Temporary boarding example


Temporary boarding example

Phasing proposal
Phase 1

We estimate Phase 1 to represent a gross external floor area of ca. 840m² (25% of the total areas).

Room programme	From design		Phase 1	
Administration Block	(gross)			
Reception/secretary/waiting	1 no. x 15 m2 =	15 m2	1 no. x 9.4 m2 =	9 m2
Principal's office	1 no. x 16 m2 =	16 m2	1 no. x 9.4 m2 =	9 m2
Offices	2 no. x 11 m2 =	22 m2	1 no. x 9.4 m2 =	9 m2
Staff room	1 no. x 23 m2 =	23 m2	1 no. x 18 m2 =	18 m2
Archive store + Power room	1 no. x 9 m2 =	9 m2	1 no. x 9.4 m2 =	9 m2
Library	1 no. x 23 m2 =	23 m2		
Sick Bay	1 no. x 13 m2 =	13 m2		
Covered walkway	1 no. x 59 m2 =	59 m2		
Sub total: Administration Block	=	179 m2	=	47 m2
Classroom Block(s)				
Classrooms (for 30 students)	4 no. x 56 m2 =	224 m2	1 no. x 133 m2 =	133 m2
Art & Design studio	1 no. x 68 m2 =	68 m2		
Covered outdoor teaching space	1 no. x 54 m2 =	54 m2		
IT Lab (for 20 students)	1 no. x 45 m2 =	45 m2		
Covered walkway/circulation	1 no. x 59 m2 =	59 m2		
Sub total: Classroom Block(s)	=	449 m2	=	133 m2
Workshops				
Hairdressing	1 no. x 68 m2 =	68 m2		
Tailoring + Knitting	1 no. x 135 m2 =	135 m2	1 no. x 133 m2 =	133 m2
Electrics	1 no. x 110 m2 =	110 m2		
Plumbing	1 no. x 110 m2 =	110 m2		
Mechanics (cars + bikes)	1 no. x 164 m2 =	164 m2	1 no. x 164 m2 =	164 m2
Construction (container + shade)	1 no. x 164 m2 =	164 m2		
Carpentry (container + shade)	1 no. x 164 m2 =	164 m2		
Sub total: Workshops	=	915 m2	=	297 m2
Meditation/Prayer Room				
Circular meditation space	1 no. x 30 m2 =	30 m2		
Sub total: Meditation/Prayer Room	=	30 m2	=	0 m2
Multipurpose Hall				
Hall for 200px (covered external)	1 no. x 237 m2 =	237 m2		
Store	1 no. x 27 m2 =	27 m2		
Sub total: Multipurpose Hall	=	264 m2	=	0 m2
School Kitchen				
Cooking and preparation space	1 no. x 50 m2 =	40 m2	1 no. x 18 m2 =	40 m2
Dishwashing area (covered external)	1 no. x 16 m2 =	16 m2		
Servery (covered external)	1 no. x 18 m2 =	18 m2		
Food store	1 no. x 9.2 m2 =	9 m2	1 no. x 9.2 m2 =	9 m2
Firewood store	1 no. x 9.2 m2 =	9 m2		
Sub total: School Kitchen	=	93 m2	=	49 m2

Room programme	From design		Phase 1	
Student Accommodation, Boys (100px)				
Dormitories (24px)	4 no. x 72 m2 =	288 m2	1 no. x 100 m2 =	100 m2
Dormitories extension (4px)	1 no. x 14 m2 =	14 m2		
Warden room	1 no. x 34 m2 =	34 m2	1 no. x 10 m2 =	10 m2
Common area	1 no. x 60 m2 =	60 m2		
Stairs/Circulation	1 no. x 25 m2 =	25 m2		
Sub total: Student Accommodation, Boys	=	421 m2	=	110 m2
Student Accommodation, Girls (80px)				
Dormitories (24px)	2 no. x 72 m2 =	144 m2	1 no. x 100 m2 =	100 m2
Dormitories (16px)	2 no. x 48 m2 =	96 m2		
Dormitories extension (4px)	1 no. x 14 m2 =	14 m2		
Matron room	1 no. x 34 m2 =	34 m2	1 no. x 10 m2 =	10 m2
Common area	1 no. x 60 m2 =	60 m2		
Sub total: Student Accommodation, Girls	=	349 m2	=	110 m2
Teacher Accommodation (10px)				
Junior double units	4 no. x 60 m2 =	240 m2	3 no. x 9 m2 =	27 m2
Senior double units	1 no. x 100 m2 =	100 m2		
Sub total: Teacher Accommodation	=	340 m2	=	27 m2
Guest Bungalow (6px)				
Common room with kitchen	1 no. x 35 m2 =	35 m2		
Bedrooms	3 no. x 14 m2 =	42 m2		
Bathroom	1 no. x 6 m2 =	6 m2		
Veranda	1 no. x 20 m2 =	20 m2		
Sub total: Guest Bungalow	=	103 m2	=	0 m2
Ancillary Buildings				
Guardhouse (single unit with two rooms)	1 no. x 14 m2 =	14 m2	1 no. x 8.9 m2 =	9 m2
Tool store (near agricultural area)	1 no. x 10 m2 =	10 m2		
Canteen/Kiosk	1 no. x 9.6 m2 =	10 m2		
Sub total: Guardhouse	=	34 m2	=	9 m2
Bio-Toilets				
Student & teacher toilet block (300px)	1 no. x 55 m2 =	55 m2	1 no. x 55 m2 =	55 m2
Admin & Visitor toilet block (10px)				
TQs' toilet and shower block (10px)	1 no. x 46 m2 =	46 m2		
Boys' toilet and shower block (100px)	1 no. x 73 m2 =	73 m2		
Girls' toilet and shower block (80px)	1 no. x 73 m2 =	73 m2		
Sub total: Bio-toilets	=	247 m2	=	55 m2
Sports grounds				
Large sports field (football)				
Net-ball field	1 no.		1 no.	
Basketball field	1 no.		1 no.	
Total net internal area				
Grossing factor				
Total gross external area		3,423 m2		837 m2

nb : the green sections are what you intended to have operational in January 2024 (Phase 1)

Masterplan

Site Services Strategy

Security

We identify 3 types of security:

- No security - the zones on either sides of the road, but also the sports pitch and the path that leads to it, are not fenced and rather made public so the locals can also benefits from it. However we still suggest to plant along the boundaries to define the site;
- Light security - The teacher's courtyard as well as the School are proposed to have a green fence combined with chain link;
- Strong security - The 2 sensitive areas of the project are the boarding compounds where we suggest to use a solid wall fence.

Generally, to avoid redundancy and dead spaces, we are proposing for the buildings to be part of the security line, ie the fence is interrupted at the buildings rather than being continuous in front.

Strong security
Light security
Wall fence
Green fence + Chain link

Phase 1 Security

Wastewater

All bio-toilets have been strategically aligned so as to all feed into the same bio-digester, which produces both fertilizer for the farm, and bio-gas for the kitchen.

Rainwater harvesting

A large over ground steel tank is proposed at the bottom of the site to collect rainwater from all roofs.

That water along with the one from the water well is then pumped all the way to the top of the site, to gravity tanks sitting on a concrete slab.

Storm water strategy

We are proposing a succession of swales, parallel to the contours, to slow down storm water so it has a chance to infiltrate into the ground. Excess water is then sent to the sides where the heavily planted bio-diversity buffer is.

Note, it would also be essential that, on the northern side of the road, efficient drainage is to be created.

Masterplan
Landscape Strategy

Landscape Masterplan Principles

Green Vocational School Uganda

The Landscape Design

Today, we all have a responsibility to 'find space for nature'. Find a balanced co-existence is becoming increasingly important.

This ties in well with the overriding concept of developing and teaching based on a 'Green' and 'Vocational' Education.

Vocational
relating to an occupation or employment.
"vocational training"

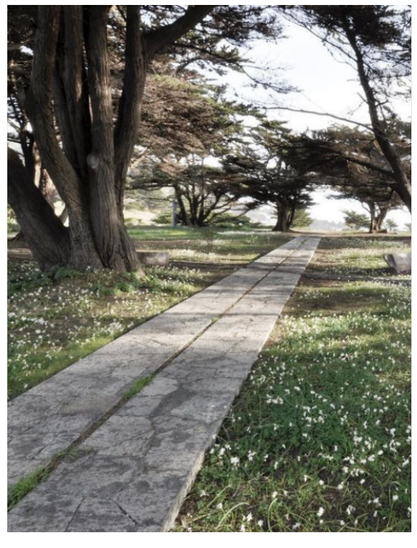
- (of education or training) directed at a particular occupation and its skills."specialised vocational courses such as fashion and catering have been popular among students"

The connectivity of a vocational education is driven by the sense of practicality. This overriding drive should and must be embraced in any landscape design.

The landscape design should be two things ; a celebration of a sense of place to help create a ecologically sensitive design well suited to a positive co-exhistence of human needs and those of the natural world, and a design drawn from and inspired by the surrounding landscape. A project born from the site itself.

Green Vocational school - new example for green and sensitive design.

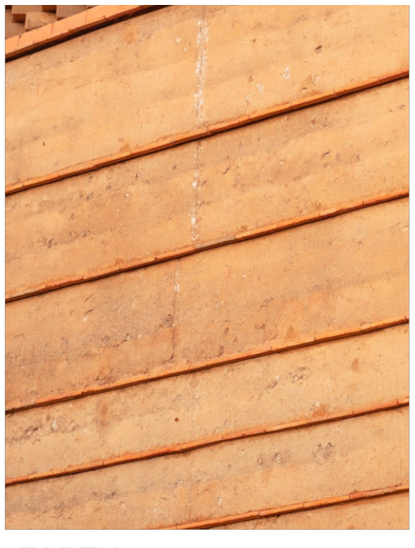
UPLAND FOREST



A DESIGN WHICH OFFERS AN IMMEDIATE INTRO TO

LOCAL STONE

GRASSLAND ECOLOGY WILDS AND FARMS



EARTH

A Balanced co-existence with the Natural World

A contemporary definition of the landscape as a safe haven for nature in an inviting and balanced communion with the human world.

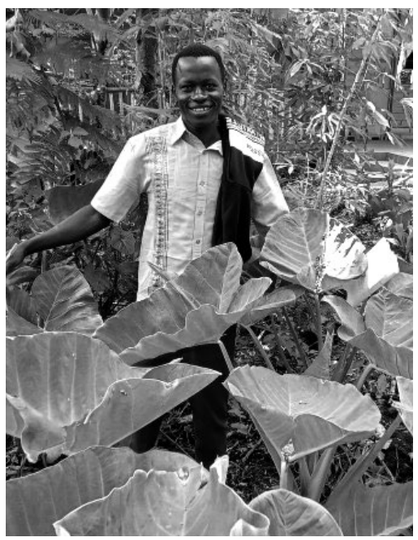
Key Design Drivers

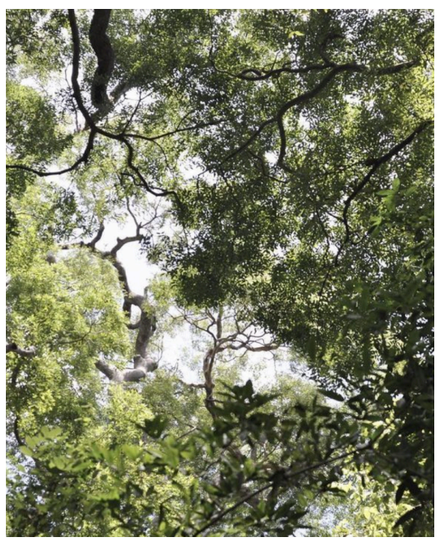
- Interactive areas closer to the centres of activity. This allows for more formalised and usable outdoor teaching and work spaces within nature.

- Planted and usable crop species for use within the vocational training. Ideas such as bamboo plantations and suitable timber would be key usable zones within the design. The idea of a school farm, to both teach and showcase sustainable farming practices would be key in this design driver.

- Looser natural areas spreading out with low impact activation elements such as paths and benches.

- Peripheral biodiversity buffers which allow for the protection of the site but also allows for a method to increase biodiversity on the site.

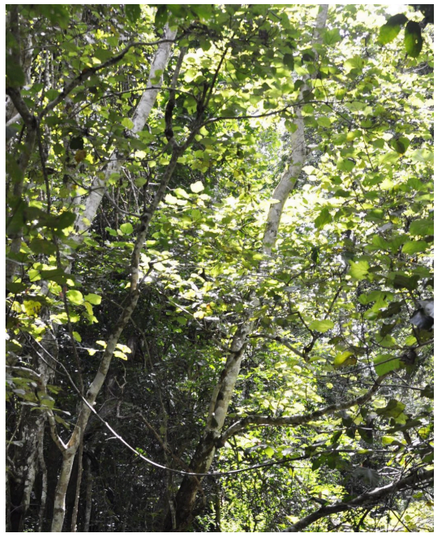
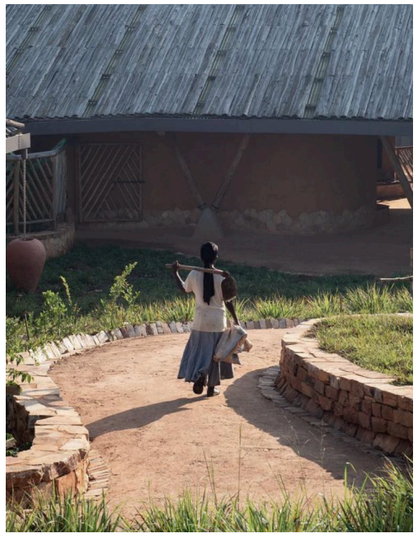
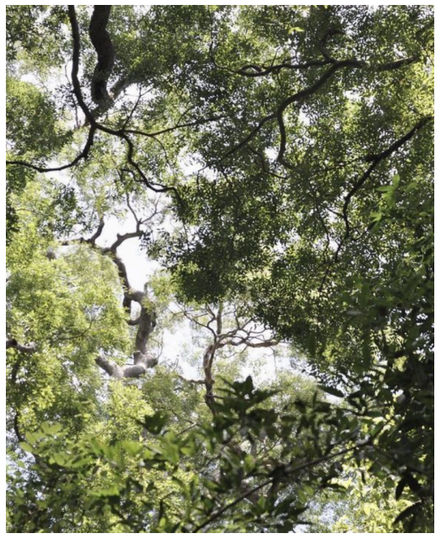
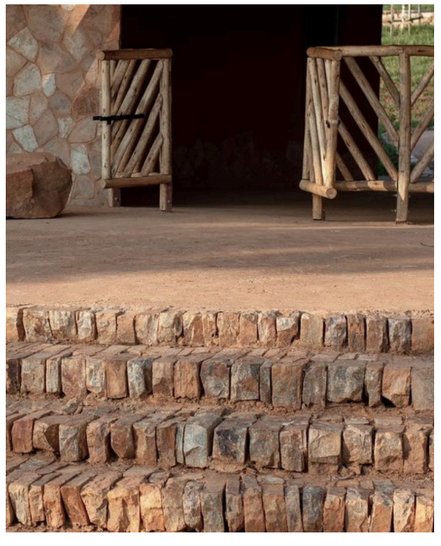




Sustainable Development standards as design drivers

The Landscape design will be aiming for viable solutions that balance the ecological and economical needs, while being equitable and bearable towards the larger social environment.

- Storm water management; infiltration and storing.
- Use of native plants.
- Local source of plant and hardscape materials.
- Selecting durable and sustainable materials.
- Supporting local interaction through landscape; larger impact; community outreach.

Masterplan
Budget estimate

PROPOSED CONSTRUCTION OF GREEN VALLEY VOCATIONAL COLLEGE, BUWAMA

PRELIMINARY BUDGET ESTIMATE – *Ver 1.0*

Date: 27th June 2023

Prepared by:

Dudley Kasibante and Partners Ltd,
2nd Floor, Carol House, Plot 40, Bombo Road,
P.O. Box 8963, Kampala.
Tel: +256 414 345025.
Email: dkp@dudleykasibante.co.ug.
Web: www.dudleykasibante.co.ug.

1.0 Introduction

1.1 This submission presents our Preliminary Elemental Budget Estimate for the Proposed Green Vocational School Buwama.

1.2 The project essentially comprises the following: -

a) Classrooms
b) Workshops
c) Prayer Room
d) Multi-purpose Hall;
e) School Kitchen;
f) Student, Teacher and Guest Accommodation;
g) Bio-toilets;
h) Ancillary Buildings including guardhouse, and canteen.
i) External works including

2.0 Phasing Plan

2.1 It is anticipated that the college will be developed in phases as indicated below:-

a) Phase 1 comprising the "Container Village" plus essential external works. This generally includes workshop space, temporary office space as well as teachers and student accommodation.
b) Phase 2 comprising the following:-
   i. 2-storey teaching block and Administration Block
   ii. Half of each of the boys and girls hostel blocks plus common room and matron's apartment;
   iii. Multi-purpose Hall with Kitchen;
   iv. Student toilets/bathrooms
   v. All external works
c) Phase 3 comprising the following:-
   i. Teachers quarters
   ii. Teacher toilets/bathrooms
   iii. Guest accommodation
   iv. The other half of each of the hostels
   v. Chapel

Proposed Construction of Green Vocational School Buwama
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3.0 Assumptions

3.1 Our preliminary budget estimate is based on the following assumptions:-

a) Currency
The estimate has been presented in Unites States Dollars. It is anticipated that the currency of the construction contract will be maintained as United States Dollars.
b) Foundations
For phase 1 buildings, concrete pad stones have been assumed. For Phases 2 and 3, foundations have been assumed to comprise a combination of concrete pad bases, hardcore filling, ground beams, concrete blinding and floor bed.
c) Structural Frame.
For Phase 2 buildings, the structural frame comprises concrete columns and beams as well as a composite suspended slab built from earth tiles vermiculite infill and 75mm thick concrete topping.
d) Walling and associated finishes.
For Phase 1 buildings, the structure is generally second-hand shipping containers. For Phases 2 and 3, walling on ground floor is generally compressed earth blockwork. For First Floor, walling is generally sawn softwood studwork with bamboo shingle cladding on the outside and earth plaster on the inside.
e) Roof Construction and Coverings
Provision has been made for treated bamboo scissor truss roof structure and bamboo shingles on bamboo strips and gauge 32 galvanized steel sheets. Galvanized steel gutters and uPVC downpipes have also been provided.
f) Windows and Doors
Allowance has been made for timber framed glass lourved windows as well as glazed mild steel doors.
g) Internal finishes
Internal floors generally comprise steel floated concrete floors. Internal ceiling finishes generally comprise Vaulted wattle-and-daub ceiling, suspended from trusses, on bamboo joists hanging perpendicular to trusses, finished with pigmented lime-earth coating.
h) External works.
The preliminary budget estimate assumes very limited external works generally comprising chainlink fencing, driveway and car park, football pitch, basketball and volleyball, footpaths, softscape including planting, stormwater drainage, site services like rainwater collection, water storage, biodigester, generator, mains connections for water and power etc.
i) Estimate Validity.
It is anticipated that the estimate will remain valid for a period of approximately six (6) months.

4.0 Methodology

4.1 This preliminary budget estimate has been based on global rates per square metre.

4.2 Pricing is based on current market prices as well as similar completed projects.

4.3 The estimate is presented in section 5.0 below.

5.0 Cost Plan Estimate

5.1 Presentation of the Estimate.

5.1.1 Table 1 below presents our summary estimate for Phase 1.

S/No.	Description	Amount (US$)
1	Phase 1 - Building Works	280,151
2	External Works	56,030
3	**Sub-total A**	**336,181**
4	Allow for Preliminaries @10%	33,618
	Sub-total B	**369,800**
5	Allow for Contingency @10%	36,980
	Sub-total C	**406,780**
6	Allow for VAT @18%	73,220
7	**Total Estimated Cost**	**480,000**

5.1.2 Table 2 below presents our summary estimate for Phase 2.

S/No.	Description	Amount (US$)
1	Phase 2 - Buildings	767,668
2	External Works and Drainage	618,938
3	**Sub-total A**	**1,386,605**
4	Allow for Preliminaries @10%	138,661
	Sub-total B	**1,525,266**
5	Allow for Contingency @10%	152,527
	Sub-total C	**1,677,793**
6	Allow for VAT @18%	302,003
7	**Total Estimated Cost**	**1,979,795**

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5.1.3 Table 3 below presents our summary estimate for Phase 3.

S/No.	Description	Amount (US$)
1	Phase 3 - Buildings	392,149
2	External Works and Drainage	66,000
3	**Sub-total A**	**458,149**
4	Allow for Preliminaries @10%	45,815
	Sub-total B	**503,964**
5	Allow for Contingency @10%	50,396
	Sub-total C	**554,361**
6	Allow for VAT @18%	99,785
7	**Total Estimated Cost**	**654,146**

5.1.4 The following items are **not** included in the estimate: -

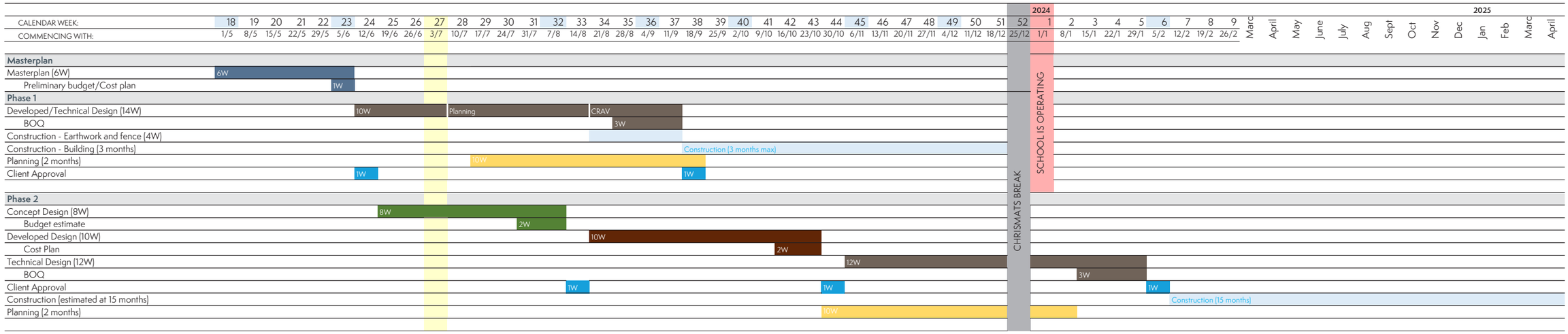
a) Equipment;
b) Furniture and loose fittings;
c) Professional fees;
d) Statutory fees;

Prepared by:

Sendikwanawa Wilson John,
Project Quantity Surveyor,
Dudley Kasibante and Partners

Masterplan
Program

23120 | Green Vocational School
Design & Build Programme
LOCALWORKS



Design & Build Program

The above program shows the planned works for both Phase 1 and Phase 2.

This document concludes the Masterplan stage, which considered the overall project in order to get the big picture.

From now on, we will be splitting the project into Phase 1 and Phase 2.

- Phase 1 needs to be fast-tracked with optimized time lines for the Design stages and with the Construction planned to be commencing on 21/08 with earthworks and fencing, while the rest would be starting around 18/09. The goal is for Phase 1 to be completed by January 2024.
- Phase 2 would follow standards design time lines and would be done in parallel to the construction of Phase 1. Construction of Phase 2 could be starting at the earliest in February 2024, to be confirmed. We estimate the construction period to last for about 15 months.

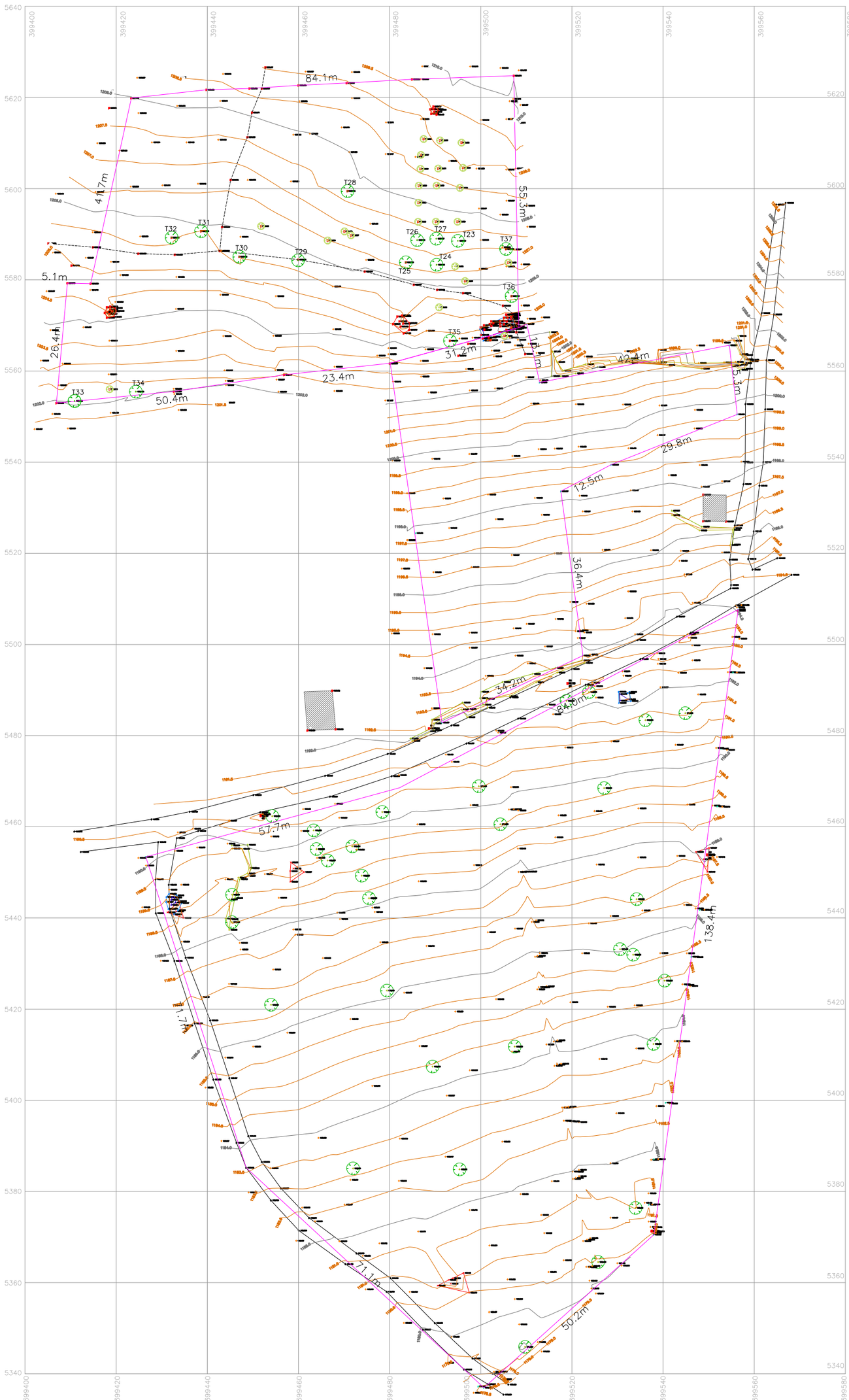
It is important to note that all of this program rely on fast client approvals, sufficient funding and on responsive Planning authorities.

Thank you.

Localworks
The Square, 10 Third Street
P.O. Box 12352
Kampala, Uganda

PHONE: +256-392-17 44 44
EMAIL: info@localworks.ug
WEB: www.localworks.ug

Appendix A
Topographic Survey



KEY

- Major Contour 2m interval
- Minor Contour 0.5m interval
- Road
- Boundary
- Building
- Tree
- Small Tree (Girth<0,1m)
- Emberkment bottom
- Emberkment top
- Ditch Bottom
- Ditch Top
- Ant hill
- Footpath

SURVEY UGANDA LIMITED
Plot 2 Veronica Road Kiwatule, Jane Nalunga Apartments
P.O BOX 11743, Kampala, Uganda
Tel: +256-703741850, +256772451829
Email: wanah.2000@gmail.com

DRAWING TITLE

TOPOGRAPHICAL SURVEY OF BUWAMA LAND

SURVEYED	N.J	SCALE	1:100
DRAWN	A.J	CHECKED	W.G
DATE	May, 2023	APPROVED	