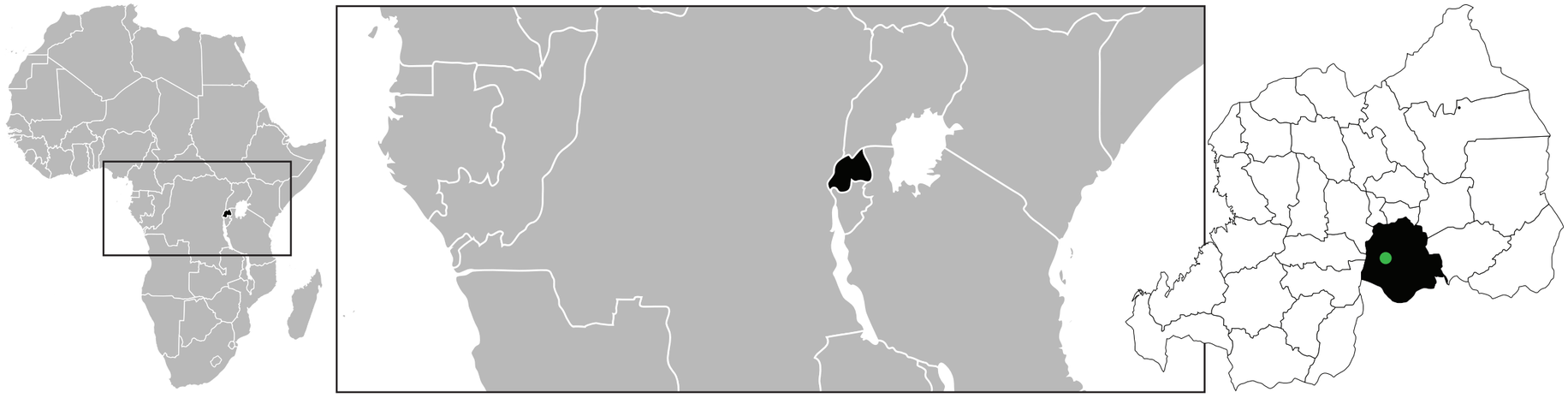


Nibakure Children's Village School

Bryan May
ARCH 593 Master's Project
Professor Susan Conger-Austin
Spring 2010

Feb 26, 2008

Site Location	SE corner	2°10'05.73"S	30°04'54.58"E
	Corner #5	2°10'05.9"S	30°04'54.6"E
	Corner #4	2°10'07.1"S	30°04'52.1"E
	Corner #3	2°10'05.2"S	30°04'43.4"E
	Corner #2	2°10'03.7"S	30°04'45.1"E
	Corner #1	2°09'55.3"S	30°04'47.8"E
Power Line Road Crossing		2°09'56.1"S	30°05'49.4"E
Turn From Main Road	Kilometer Marker 29.33	2°09'56.6"S	30°06'12.0"E

NYAMATA

NCV

Corner #1

Corner #2

Corner #3

Corner #5

SE Corner

Corner #4

Power Line Road Crossing

Turn from Main Road

Table of Contents

Project Description

Design a master plan and school to provide orphaned children in Nyamata, Rwanda with the education necessary to become a part of the globalized world. The village and school will grow in phases, beginning with a group of 15 students and gradually expanding to a total of 150 children. Given Rwanda's recent history, nothing is more crucial than instilling in these children a profound sense of trust and safety by weaving together communities which are situated in their culture, place, and traditions. Materials for the buildings will be pulled directly from the site. Local labor and materials are essential to the construction of the school in order to reduce costs and to further connect the buildings to their site. Using local materials also minimizes the ecological impact of the project.

Case Statement

My project is being developed because of the need to care for the many orphaned children of Rwanda. Over the course of 100 days, approximately 800,000-1,000,000 people (Tutsi and Hutu moderates) were killed by the Hutu regime, leaving countless children without homes and shattering the already fragile economy. Today, these children are experiencing for the first time a globalized society and economy, and they must be prepared for the rapid changes globalization will inevitably bring to their country. This school is not only for the children who became orphans as a result of the Rwanda Genocide of 1994, but also their children. Due to the psychological trauma endured by the survivors, young parents are abondoning their children at an alarming rate, thus perpetuating the harmful mental effects of the past.

In the years since the genocide, Rwanda has struggled to rebuild, and politically it remains under one party rule. However, there are signs of hope. The economy is strengthening as trade ties have been established with China and parts of Europe with Belgium leading the way. The government hopes to transform the country from an agricultural society into a "knowledge-based" economy. The government has stretched fiber optic cables from border to border anticipating a technological boom in the years to come, but electricity is still uncommon. The site for the school embodies this typical dilemma; there is fiber optic cable, but no electricity.

The children of Rwanda will be those who rebuild the country, and to do so they need a strong foundation, one which may begin in this very school.

Process Explanation

To develop my project I spoke with members of the NCV (Nibakure Children's Village) Board of Directors who is currently in the process of planning and funding the development of the village. With their passion and experience, I have been able to gain a better understanding of the educational experience these children need in order to lead Rwanda out of its recent, tumultuous history. In order to accomplish this goal, I will exhaustively research the social and political history of Rwanda as well as the role and importance of education to the rebuilding process. One of the most important parts of the project is the ability of the design to expand and change over time. As the number of students increases over time, the NCV will fund new additions to the school. When the school first opens, there will only be a few homes for the orphans and a primary school for the youngest children. In the coming years, the board will continue to expand the school to accomodate the children as they grow.

One of my primary interests is the connection between neurology and education. Physical spaces can have a strong impact on their inhabitants at the neural level. Recent fMRI research has revealed startling connection between physical environments and their users. For example, certain colors stimulate specific neural pathways, light and dark stimulates the production of serotonin and melatonin, and sound can alter one's perception of space. By taking advantage of recent research into this realm, I will create an immersive educational experience by engaging all the senses through the physical building itself. In order to design for brain-based learning, as the concept is often called, I plan on researching not only the architectural implications of the built world, but also the architecture, dynamism, and most importantly, the myelination of the brain itself.

With technology on the rise, there will be a focus on technology in and out of the classroom. After speaking with the architect on the Board of Directors, I know that the Board is trying to expose children to computers so that they will be better suited to enter professions in the fields of Information Technology (IT). The challenge here will be broad; children in rural Rwanda do not grow up with computers, email, and cell phones so introducing such a fundamental technological change will have far-reaching implications on the local culture and society.

Goal Statement

Key goals my solution will satisfy include creating a school which will support children by developing skills for success in a changing world and to cultivate aspirations for a safer, globalized Rwanda.

Guiding Principles

Community
Students with an understanding of community and collaboration will have the skills they need to succeed in life, but more importantly, a school which nurtures a tightly-knit community will forge relationships that will last far beyond the years spent in the classroom. The school's design must reflect a sense of community and foster these relationships.

Learning
The physical building will stimulate all of the senses in order to create an immersive educational experience by taking advantage of recent developments in neurology and fMRI scanning.

Accountability
Children passing through the doors of the school must learn to be self-reliant and self-confident. In order to instill these qualities within students, the design must simultaneously promote individuality and leadership.

Technology
Embracing computers and technology is one of the stated goals of those involved in the project. However, technology must not conflict with or subtract from the community; rather, the two should exist and work in tandem.

Flexibility/Dynamism
The school must be dynamic; it will need to be able to respond to changes in enrollment, curriculum, culture, student needs, and emerging technology. The building must be able to respond to these needs.

Neurology
Taking advantages of the latest studies in neurology and learning, spaces will create the most beneficial and immerseive brain-based learning environments possible to give students every concevable advantage.

Empathy
The emotional effects of genocide are complex and will never be fully understood by someone who has not gone through such hardship and trauma. Growing up in a world torn to its very roots by hatred and violence, the children of Rwanda must be given an opportunity to develop a sense of empathy that was markedly absent from those who have forever scarred the country's history.

Tradition
Take pride in local traditions, customs, and forms and exploit them to their fullest. There is value in providing technology and contemporary solutions to problems, but one should never completely abandon history and traditional methods.

Reconciliation
The reality of history bears heavily on the social, cultural, and political conscience of Rwanda, and reconciliation is crucial to bringing the country to the world stage. The design of the school, therefore, must be able to reconcile education with reality. These guiding principles must not be treated as if they are mutually exclusive; when reconciled into a design, these principles will speak volumes about the past, present, and future of Rwanda and its orphans.

Stakeholders

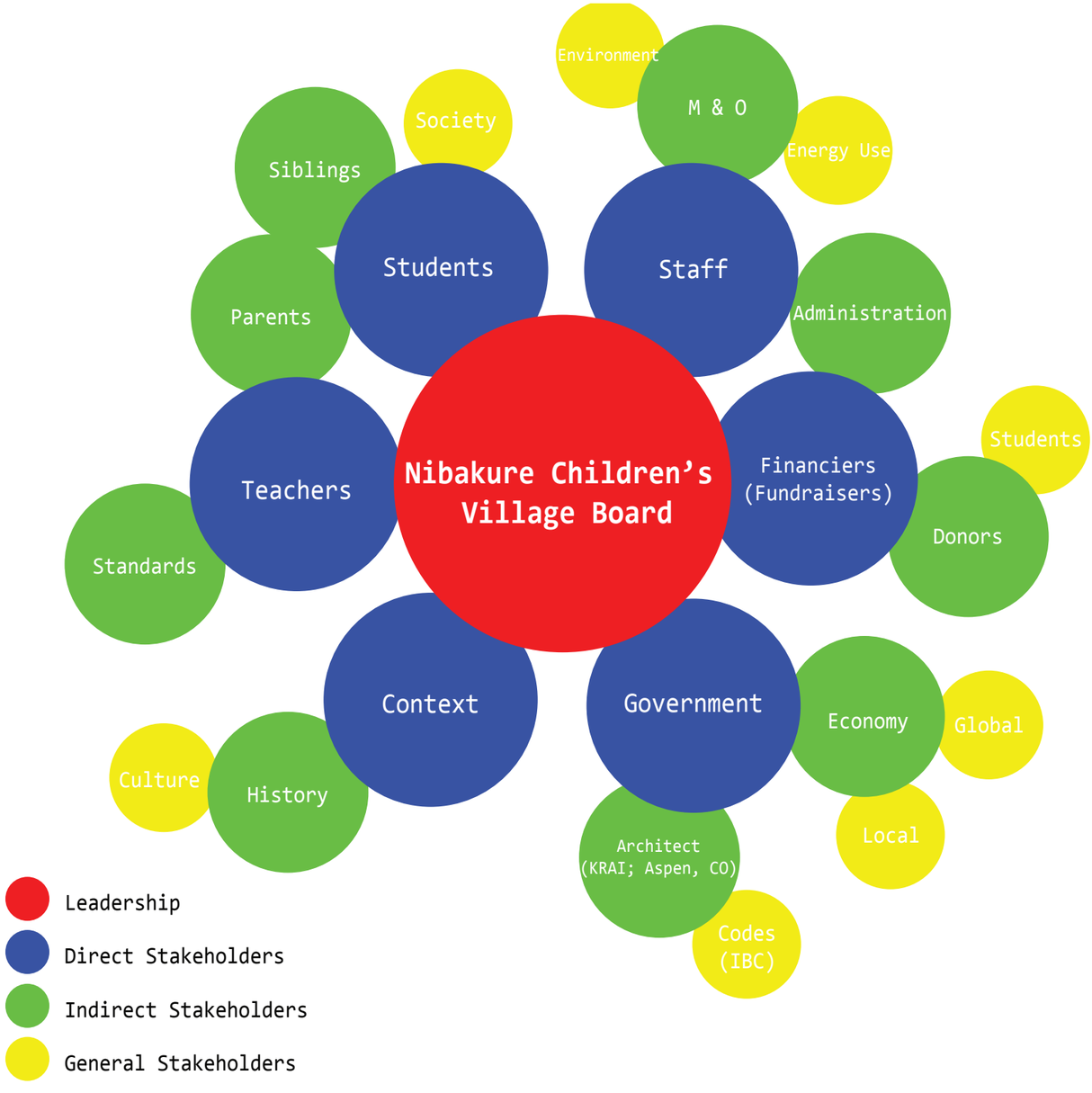
Current leadership comes in the form of the Nibakure Children's Village Board of Directors, which is located in Hudson, Wisconsin. The Executive Director of the board is Floriane Robins-Brown. NCV is a registered nonprofit in both in the US and Rwanda and consists of 12 board members. The Rwandan government donated twenty three acres of land for the project. In reality, the Rwandan government will play a large, although somewhat silent, role in the development of this project. Not only did the govenrment donate the land, but KRAI will need to follow design standards and some guidelines for schools set forth by the government and the local building department.

The current architect is Kim Raymond Architects, Inc. out of Aspen, Colorado. KRAI is working pro bono while funds are raised for future phases of construction and architectural services. There is also a local architect of record, Straton Uwizeyimana of Archus, in Kigali, Rwanda (the capital city, located about 20 miles north of Nyamata) who handles the project on a day-to-day basis.To date, KRAI has completed a master plan and designed three homes. Construction is now underway on these three homes, and the scope of phase II is currently under negotiation. Options include the design of a primary school or adding more homes. The NCV Board is leaning toward the residential option.

This project will extend far beyond its own borders. In this village, children will help heal the scars of history and develop Rwanda into a player in the global economy.

NCV Board Members

Floriane Robins-Brown: Executive Director, CEO, and founder of Nibakure Children's Village
John Liethen: Board Chair
Kristen Ainsworth: Board Treasurer
Linda Edwards: Board Vice Chair
Claudia Kaul: Board Secretary
Wendy Finch-McCusker: Board Chaplain
Linda Henderson: Director
Paul Musherure: Director
Clet Niyikiza: Director
Kim Raymond: Director and Architect
Regan Waller: Director
Drew Wierda: Director
Linda Garrett-Johnson: NCV Consultant



Program: Quantitative Analysis

Room ID	Space	Qty	Net S.F.	Total Net S.F.	# Teachers	# Students	Capacity	Notes
1.00	**WITHIN EACH LEARNING "POD"**							
1.01	Studio	1	600	600	1	15	15	Whiteboard, projection, cubbies, collaborative area
1.02	Storage Closet	1	30	30				
1.03	Teacher's Office	1	80	80				Teachers will come from the Government
1.04	Storage Closet	1	15	15				
TOTAL	12 PODS (4 Primary, 4 Secondary, 4 Vocational)	12		7380			180	
2.00	**COMMUNAL LEARNING AREAS**							
2.01	Library	1	1000	1000				
2.02	Library Storage	1	300	300				AV Equipment
2.03	Office	2	120	240				Librarian's Office
2.04	Computer Lab	2	500	1000				Projection, whiteboard, smartboard
2.05	Gallery and Exhibit Space	1	500	500				
2.06	Art Classroom	1	525	525	1	15		
2.07	Art Storage	1	60	60				
2.08	Music Classroom	1	525	525	1	15		
2.09	Bathroom	2	400	800				
3.00	**PERFORMANCE AND SOCIAL SPACES**							
3.01	Auditorium	1	200	200				
3.02	Exterior Community Spaces	1	5000	5000				
4.00	**PHYSICAL EDUCATION**							*FUTURE PHASE*
4.01	Athletic Fields	1	5000	5000				1 Soccer Field, 2 Basketball Courts (in first phase)
5.00	**FOOD SERVICES**							
5.01	Cafeteria	1	2000	2000				
5.02	Kitchen	1	500	500				
5.03	Food Serving Area	1	60	60				
5.04	Food Storage	1	200	200				
6.00	**HEALTH SERVICES**							*FUTURE PHASE*
6.01	Infirmary Rooms	4	80	320				
6.02	"Recovery" Room	1	200	200				
6.03	Office	3	150	450				Main office and two staff offices
6.04	Storage	2	100	200				
7.00	**ADMINISTRATION**							
7.01	Head of School Office	1	100	100				
7.02	Administration Space	1	200	200				
7.03	Administrative Storage	2	50	100				
7.04	Meeting Room	2	150	300				
7.05	School Store	1	150	150				Raises money for school; staffed by students as a learning opportunity
7.06	Store Storage	1	100	100				
8.00	**BUILDING SUPPORT**							
8.01	Mechanical							N/A: NATURAL VENTILATION ONLY
8.02	Server Room	1	200	200				Incorporate into Computer Lab
8.03	Maintenance/Custodial	3	50	150				Utility Shed
8.04	Storage	2	100	200				Utility Shed
8.05	Power Generation	1	400	400				Utility Shed
	NET AREA TOTAL (SF)			29,085				
	GROSS AREA ESTIMATE (SF)			33,448				

Studio

Listen
Converse
Read
Write
Empathize

Learn

Social Learning

Play
Perform
Create
Exhibit
Gather

Learn

Nourishment

Eat
Drink
Replenish
Gather
Converse

Learn

Heal

Heal
Rest
Relax
Rejuvenate
Prepare

Learn

Administer

Lead
Manage
Direct
Generate
Fund

Learn

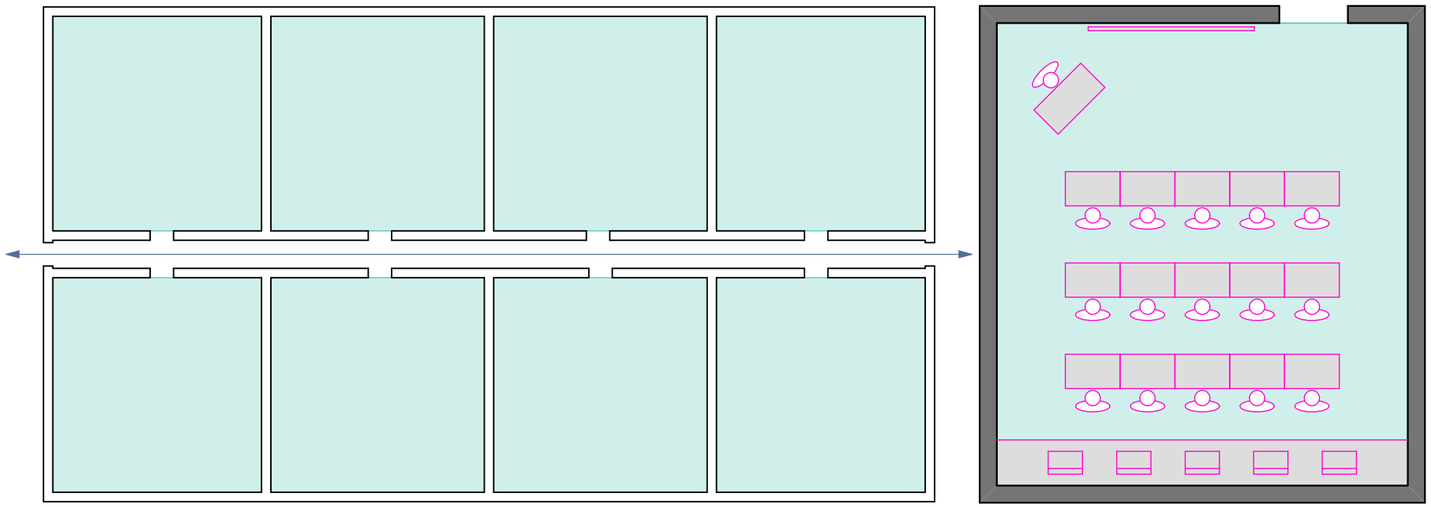
Nature

Eat
Play
Converse
Empathize
Grow

Learn

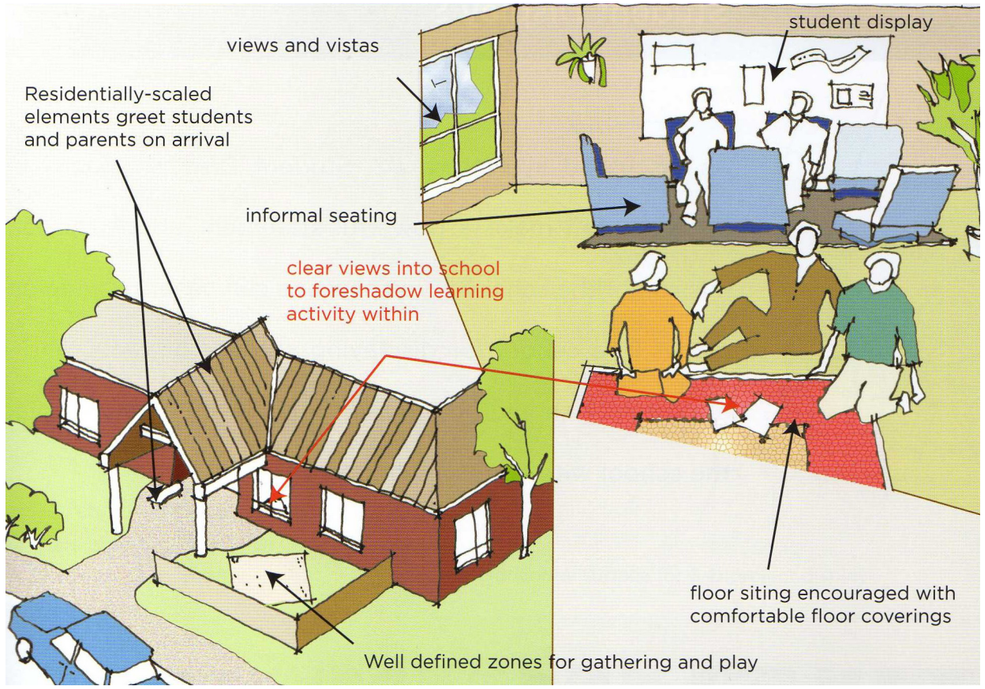
Note: The program and design will grow incrementally as the number of students increases. The school will start with 15 students and a primary school. Eventually, when needed, a secondary school will be built. Therefore, the program and the design must allow for gradual, phased growth.

Program: Studio Spaces

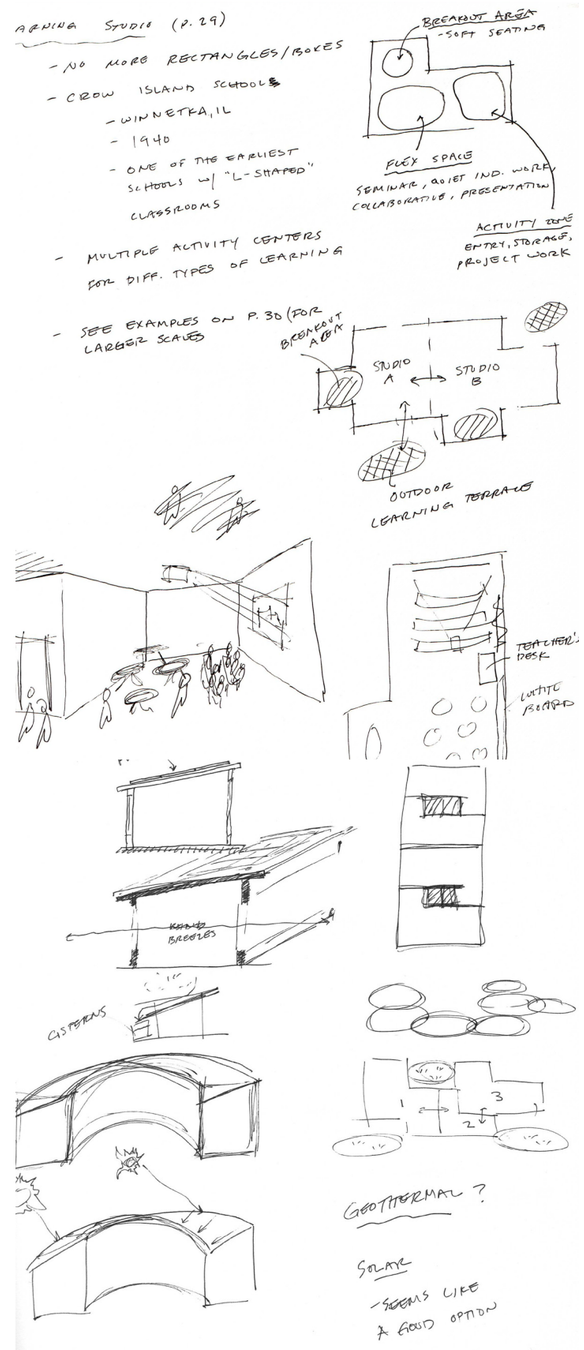


Education is not an assembly line. It is time to move beyond the Ford model. This model provides a static, passive learning spaces. Everyone experiences the same space regardless of age or subject.

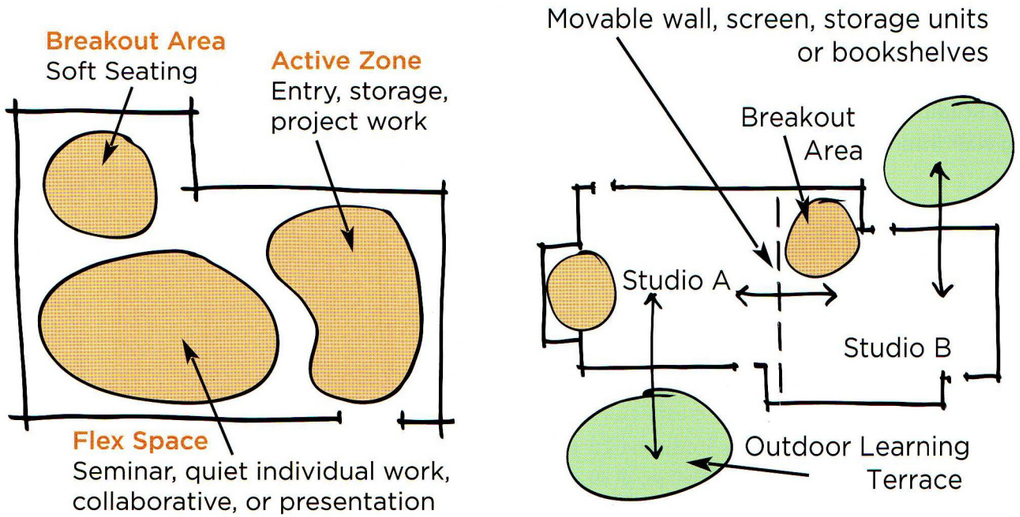
Standard input = Standard output



Increasingly, designers are making schools feel more and more like homes to make schools feel more welcoming and reduce stress students can feel in a classroom atmosphere.

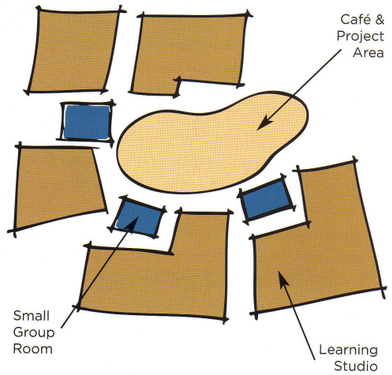


Dynamic, flexible spaces yield collaborative environments with muiltiple activity centers for different types of learning; this is the basic concept of the studio space. Goodbye, Ford. Welcome, adaptability.



"Studios" defy traditional connotations conjured up by the term "classroom." Studios provide dynamic, flexible spaces that combine several fundamental functions to satisfy all learning types. There are spaces for individual work, group projects, discussion, and lectures.

A residential-scaled space in Mesolan Ala-Asteen, an elementary school in Finland. Here, small groups of students can gather to talk, study, or even eat.



Studio-based Small Learning Community (SLC)

The Djidi Djidi Aboriginal School in Picton, Australia (shown below) is a studio-based small learning community (SLC). The SLC provides students with a sense of belonging by reinforcing the concept of community; spaces remain transparent, encourage group work, foster discussion, and forge relationships between students. The key aspect of this design relies on small groups of students where all of the students will know each other. An SLC will work best for small school, which is why it is a valuable resource for this project.

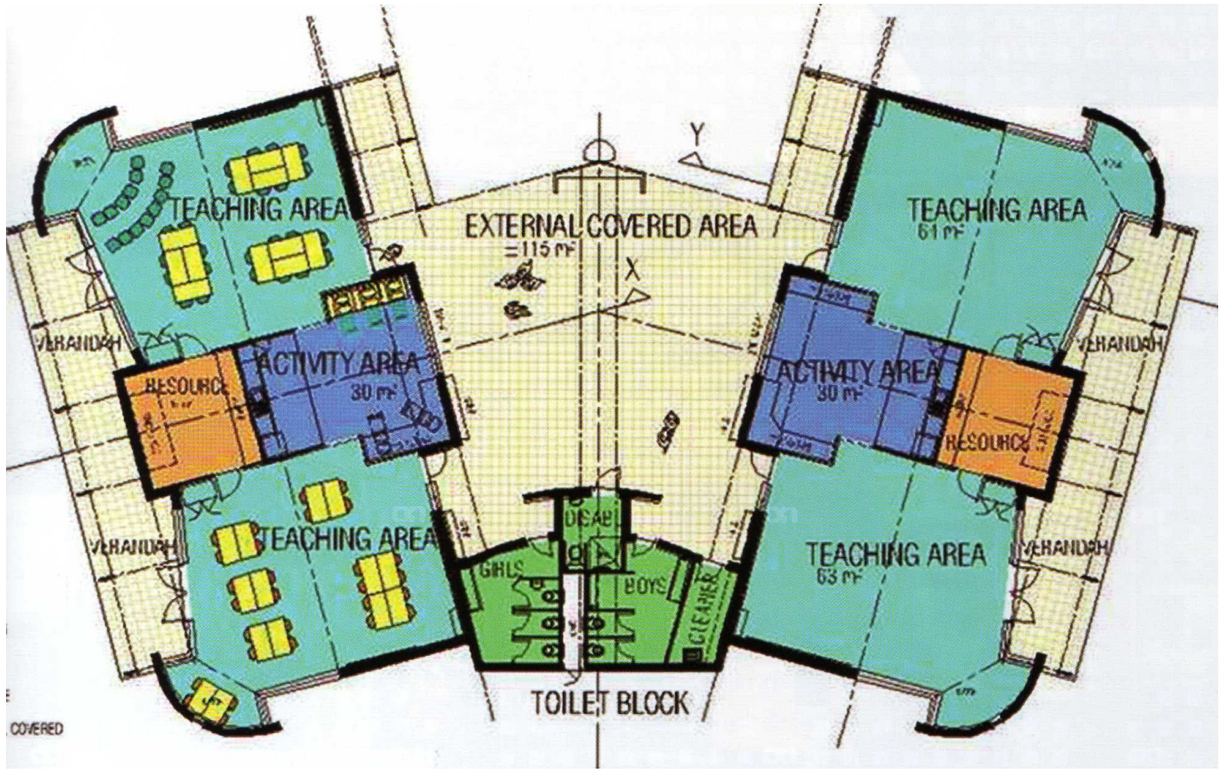


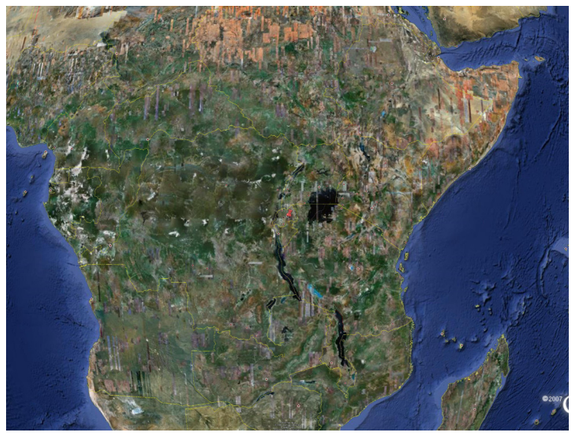
Image credits: *The Language of School Design*

Site

The site is located in Nyamata, Rwanda. Located in the Bugesera District, Nyamata saw some of the most tragic events of the genocide. Situated about 40 km south of Kigali, the capital city, Nyamata is seeing steady growth and may become the site of the country's next international airport. This District has been undergoing drastic transformations since the end of the genocide and continues to grow.

Site Location	SE corner	2°10'05.73"S	30°04'54.58"E
	Corner #5	2°10'05.9"S	30°04'54.6"E
	Corner #4	2°10'07.1"S	30°04'52.1"E
	Corner #3	2°10'05.2"S	30°04'43.4"E
	Corner #2	2°10'03.7"S	30°04'45.1"E
	Corner #1	2°09'55.3"S	30°04'47.8"E

Power Line Road Crossing		2°09'56.1"S	30°05'49.4"E
Turn From Main Road	Kilometer Marker 29.33	2°09'56.6"S	30°06'12.0"E



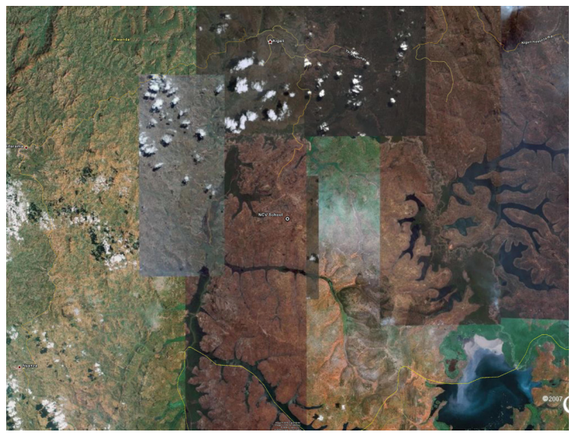








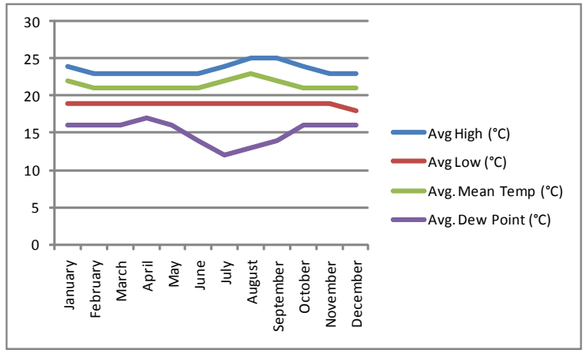


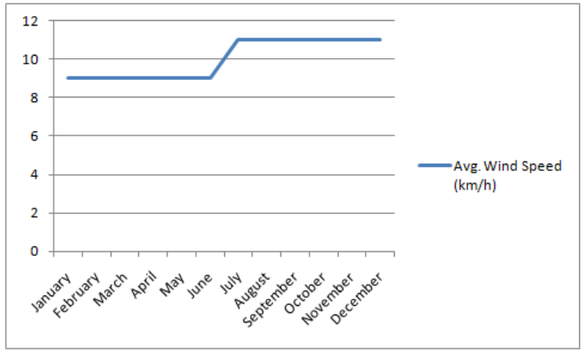


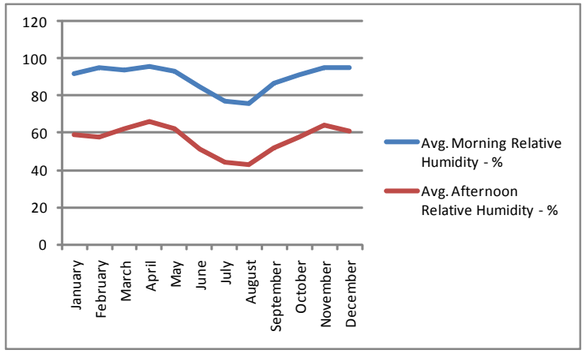

Image credits: Kim Raymond (Kim Raymond Architects, Inc.)

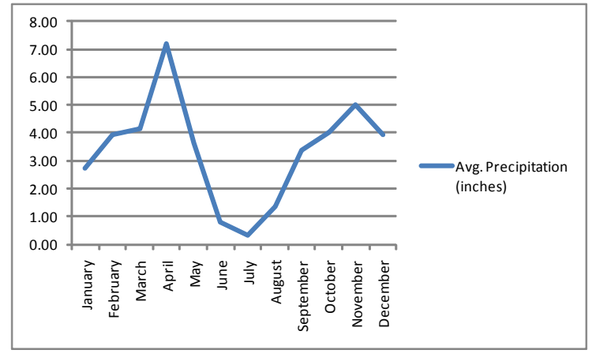
Climate Data

(With the exception of the sun chart, all data has been consolidated and reformatted into charts and graphs by Bryan May)









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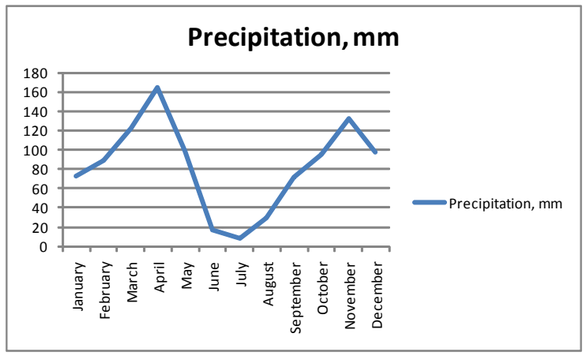
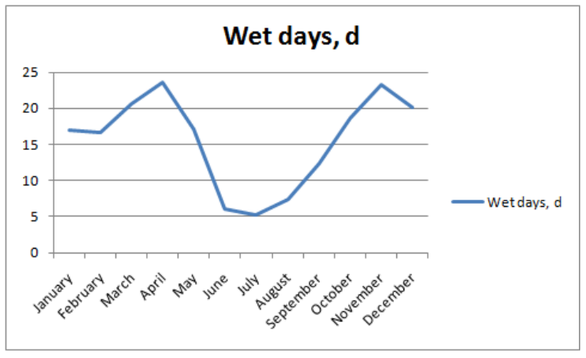
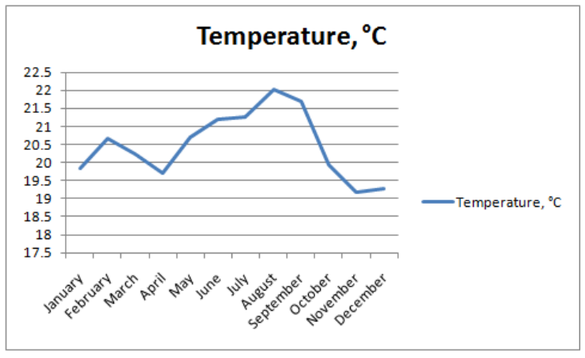
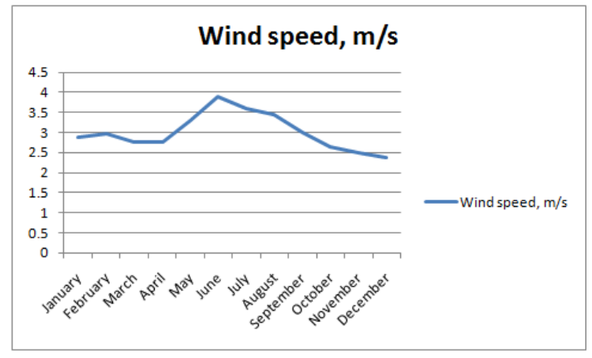
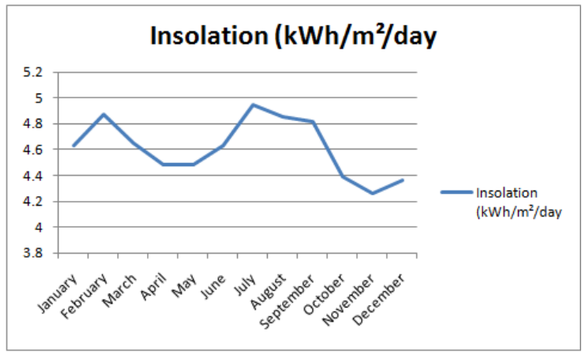


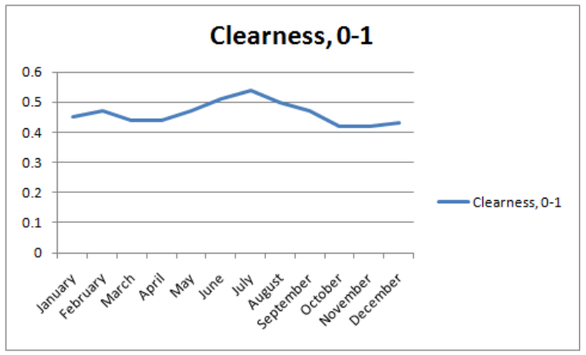






Source: http://www.gaisma.com/en/location/rwamagana.html





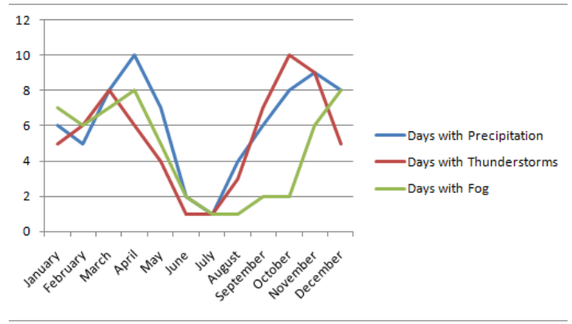
Source: http://www.usc.edu/dept/architecture/mbs/tools/vrsolar/frameset.html

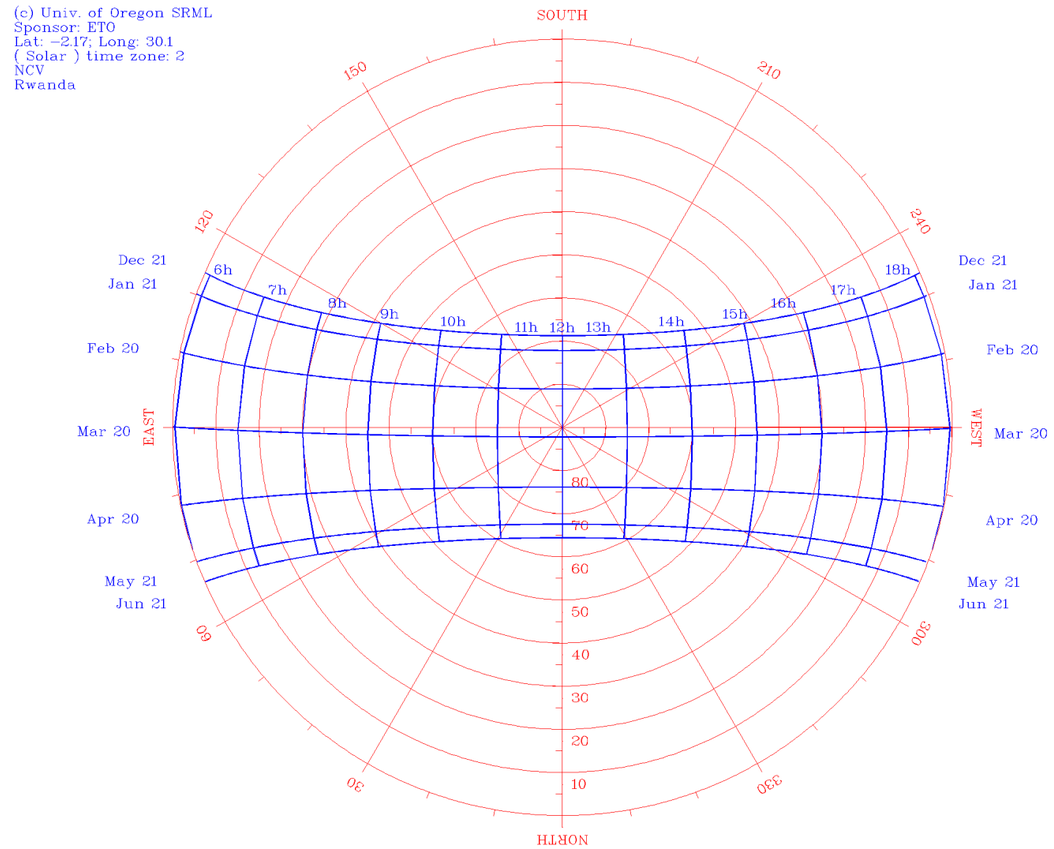
Summary Annual Tables
for 2.165722 degrees South latitude

	21-Jun *Winter Solstice* declination 23.45 degrees		21-Mar / 21-Sept *Equinox* declination 0 degrees		21-Dec *Summer Solstice* declination -23.45 degrees	
hours (hour angle)	**Altitude**	**Azimuth**	**Altitude**	**Azimuth**	**Altitude**	**Azimuth**
6 *(90)*	-0.86	66.56	0	90	0.86	113.44
8 *(60)*	26.32	62.42	29.98	88.75	28.26	115.58
10 *(30)*	51.16	47	59.93	86.26	54	128.71
12 *(0)*	64.38	0	87.83	0	68.72	0
14 *(-30)*	51.16	-47	59.93	-86.26	54	-128.71
16 *(-60)*	26.32	-62.42	29.98	-88.75	28.26	-115.58
18 *(-90)*	-0.86	-66.56	0	-90	0.86	-113.44
20 *(-120)*	-28.26	-64.42	-29.98	-91.25	-26.32	-117.58

	Days with Precipitation	Days with Thunderstorms	Days with Fog	Days with Snow	Days with Lows Below Freezing	Days above 90 F (32.2 C)
January	6	5	7	0	0	0
February	5	6	6	0	0	0
March	8	8	7	0	0	0
April	10	6	8	0	0	0
May	7	4	5	0	0	0
June	2	1	2	0	0	0
July	1	1	1	0	0	0
August	4	3	1	0	0	0
September	6	7	2	0	0	0
October	8	10	2	0	0	0
November	9	9	6	0	0	0
December	8	5	8	0	0	0

Source: http://www.usc.edu/dept/architecture/mbs/tools/vrsolar/frameset.html





Source: http://solardat.uoregon.edu/PolarSunChartProgram.html

	January	February	March	April	May	June	July	August	September	October	November	December
Insolation (kWh/m²/day	4.63	4.87	4.65	4.48	4.48	4.63	4.95	4.85	4.82	4.39	4.26	4.36
Clearness, 0-1	0.45	0.47	0.44	0.44	0.47	0.51	0.54	0.5	0.47	0.42	0.42	0.43
Temperature, °C	19.84	20.67	20.23	19.72	20.69	21.19	21.25	22.03	21.69	19.95	19.19	19.26
Wind speed, m/s	2.87	2.97	2.75	2.77	3.31	3.89	3.6	3.44	2.99	2.65	2.5	2.37
Precipitation, mm	73	89	123	165	99	17	8	29	72	95	132	97
Wet days, d	17	16.7	20.7	23.6	17.2	6	5.3	7.4	12.3	18.6	23.3	20.2

Source: http://solardat.uoregon.edu/PolarSunChartProgram.html

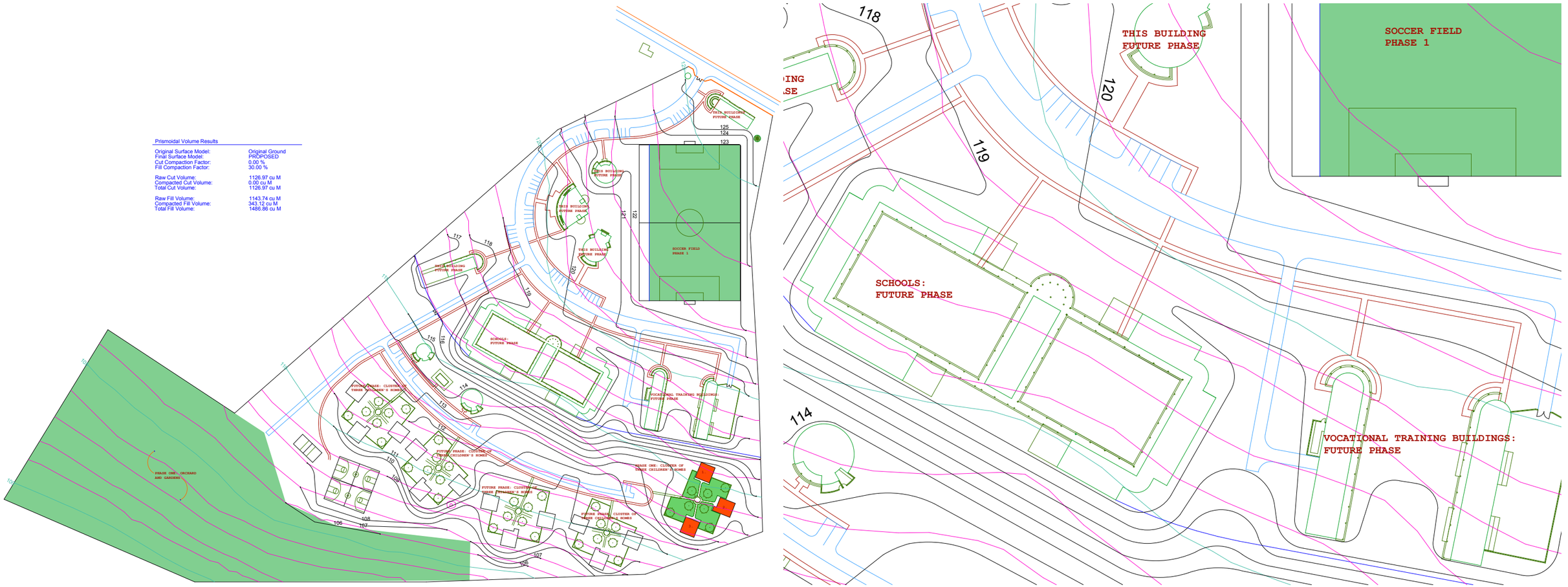
	Avg. Wind Speed (km/h)	Avg. Wind Direction
January	9	E
February	9	E
March	9	E
April	9	S
May	9	S
June	9	S
July	11	S
August	11	S
September	11	E
October	11	E
November	11	E
December	11	E

	Record High	Record Low	Record Wind Speed (km/h)
January	32	12	39
February	30	11	50
March	31	14	30
April	33	14	72
May	32	14	76
June	31	11	72
July	32	13	72
August	32	12	94
September	31	12	54
October	31	14	37
November	31	14	72
December	31	12	85

Original Site Plan

Prismoidal Volume Results

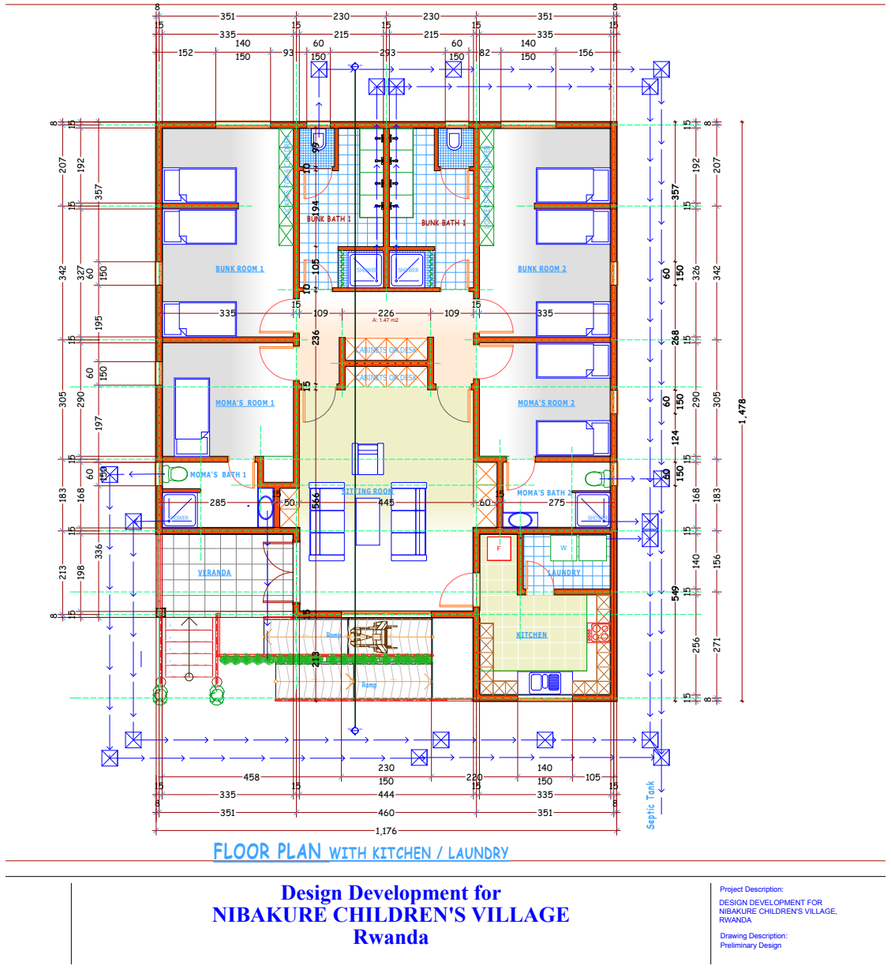
Original Surface Model:	Original Ground
Final Surface Model:	PROPOSED
Cut Compaction Factor:	0.00 %
Fill Compaction Factor:	30.00 %
Raw Cut Volume:	1126.97 cu M
Compacted Cut Volume:	0.00 cu M
Total Cut Volume:	1126.97 cu M
Raw Fill Volume:	1143.74 cu M
Compacted Fill Volume:	343.12 cu M
Total Fill Volume:	1486.86 cu M

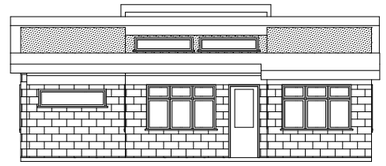


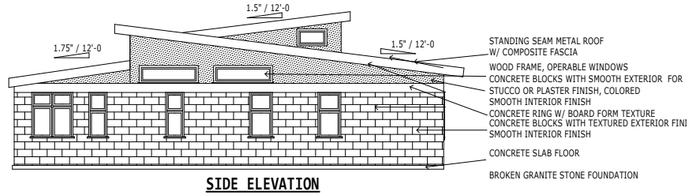
These plans were provided by Kim Raymond Architects, Inc. but drawn by a unnamed architect in Minneapolis, MN. The plan, which relies heavily upon vehicular traffic and the soccer field as form-giving devices, lacks a sense of locality, tradition, and pedestrian access. The plan for the school is static and its very presence is monolithic. I have chosen to redesign a portion of this master plan to create more dynamic spaces which are tied closely to their place.

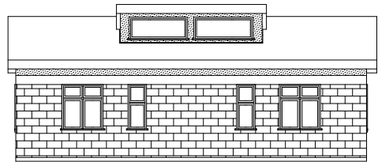
Homes: Currently Under Construction

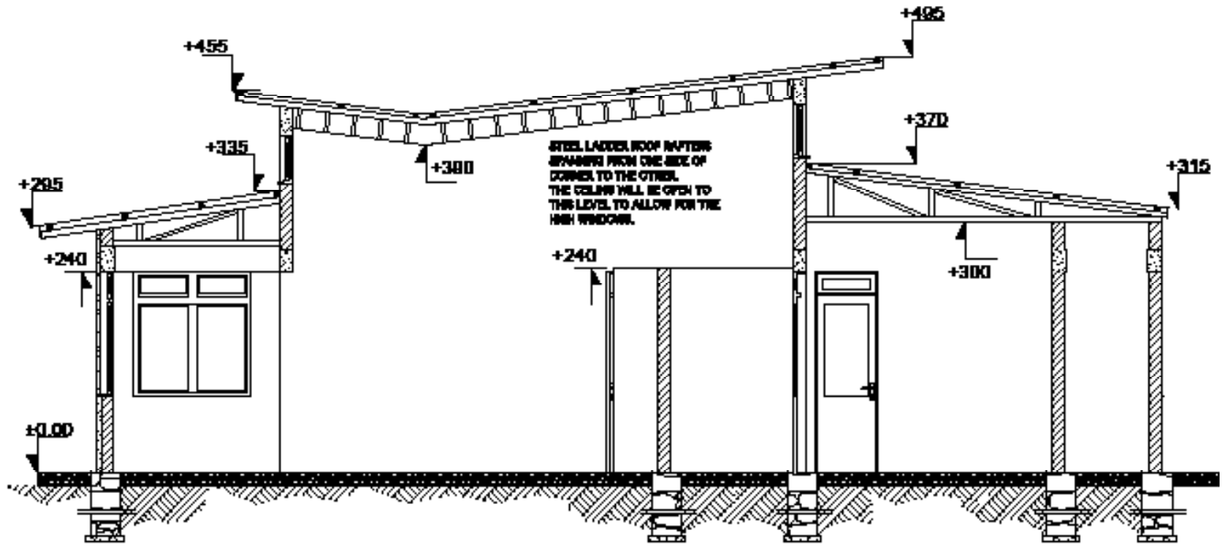
Three homes are currently under construction.











Credit: Kim Raymond Architects, Inc.

Homes: Renderings




Homes: Foundation




Homes: Construction




Credit: Straton Uwizeyimana and Kim Raymond Architects, Inc.

Credit: Straton Uwizeyimana

Credit: Straton Uwizeyimana and Kim Raymond Architects, Inc.

Precedents



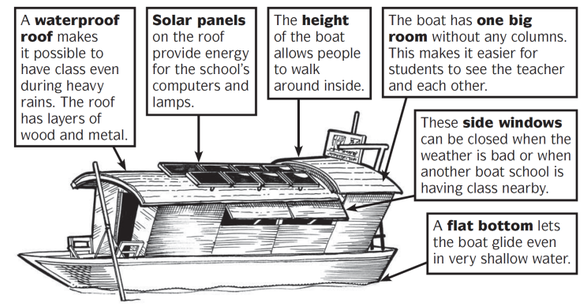

Bukomero Primary School

In 2008 the Rwandan government announced that English would replace French as one of the official languages of Rwanda, alongside Kinyarwanda, in an effort to become a part of the global economy. Soon thereafter, the government decreed that all classes must be held in English. With the de facto "official" languages of education having been French and Kinyarwanda for so many years, teachers themselves speak are struggling to learn English in order to teach their classes.

The Bukomero Primary School was renovated and reopened in 2008. In the summer of 2009, GlobalPeaceExchange (GPE) volunteers taught English classes for primary and secondary school children and teachers. The government typically teaches such classes, but rarely do schools in rural areas actually receive this attention. Rural schools also lack resources (such as English dictionaries, textbooks, and audio) to make the transition into an English-speaking world, so the GPE raised funds to renovate the existing library.

Like NCV, the Bukomero Primary School wanted to establish connections to the newly developed communications infrastructure. In order to improve IT resources and connectivity, GPE added electricity to the buildings and installed new computers.

Images (clockwise from top left): Primary School building, Computer Center, Library (before), and Library (after)
Image and Information Source: http://www.globalpeaceexchange.org/projects/rwanda/



Nauka (Boat) School
Bangladesh

Bangladesh faces a future unlike that of any other country in the world; a one meter rise in sea levels could result in a loss of up to 20% of its land area and 30 million environmental refugees. Current predictions suggest this will happen by 2050, if not much sooner. A majority of the country lies less than ten meters above sea level. To make matters worse, monsoons regularly cause the Ganges and the Bramaputra (Asia's two largest rivers) to flood their banks. For children in the area, this used to mean they would be unable to go to school. During the monsoon season, schools can be closed for months, but not anymore. Architect Mohammed Rezwan grew up in Bangladesh and was subjected to closing schools. After architecture school, Rezwan turned his attention to helping Bangladesh and its children survive the climate crisis. In 1998, with a few friends he launched an NGO which would eventually give birth to its first *Nauka* (Boat) School in 2002. Since than, 90 Boat Schools have been built.

The solar-powered boats, acting as both a bus and a school, are built entirely of locally sourced materials and take advantage of a flat bottom and shallow draft, allowing them to float in shallow streams and even over flooded land. The cane exterior blends in with the rural landscape. With waterproof roofs and operable windows, the interior space remains dry and well ventilated, allowing for school in even the most harsh conditions. Children are picked up at home, taught lessons along the rivers, and dropped back off at the end of the day. A simple metal truss supports the roof and leaves the interior space completely open for tables, desks, chairs, computers, book storage, and up to 35 children and adults. Each boat holds three classes per day as it travels through the country. Classes are held for children up to the fourth grade and cover the Bengali alphabet, how to identify local fishes and birds, and hwo to harves clean water in an area prone to waterborne diseases.

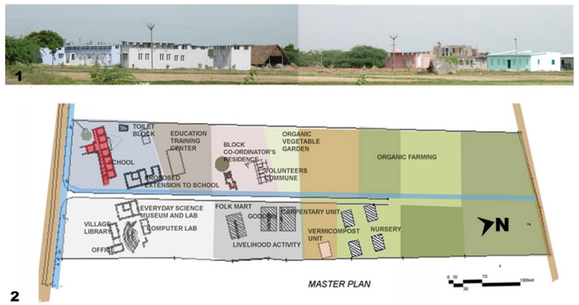
Sources: http://www.washingtonpost.com/wp-dyn/content/article/2007/09/26/AR2007092602582.html
http://www.irinnews.org/Report.aspx?ReportId=81044
http://www.pbs.org/newshour/bb/environment/jan-juneo8/bangladesh_03-28.html
Time for Kids. VOL. 15, NO. 9. NOVEMBER 6, 2009.
http://www.timeforkids.com/TFK/kids/news/story/0,28277,1932891,00.html (video)

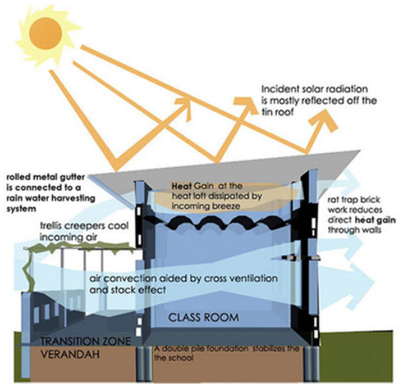
Image credits: Jaspreet Kindra/IRIN (top), Abir Abdullah/The Washington Post (bottom left), *Time for Kids* (bottom right)

Schools for the Children of the World
Africa

Never underestimate functional spaces and the power of simplicity, traditional building methods, and raw materials.

Photo Credits: Chuck Newman, AIA (President, Schools for the Children of the World)
Images provided by Amy Yurko (Secretary, Schools for the Children of the World)





Eureka School: AID India
Tamilnadu, India

More than 98% of the children in the state of Tamilnadu attend primary school; however, less than half of those are sufficiently literate in Tamil, the local language. The traditional classroom atmosphere characterized by an authoritative teacher forcing memorization instead of constructive learning methodologies which take advantage of different learning styles. The Eureka School serves as an alternative. In addition to incorporating activity-based learning methodologies, DesignShare states the following design goals for the school's atmosphere:

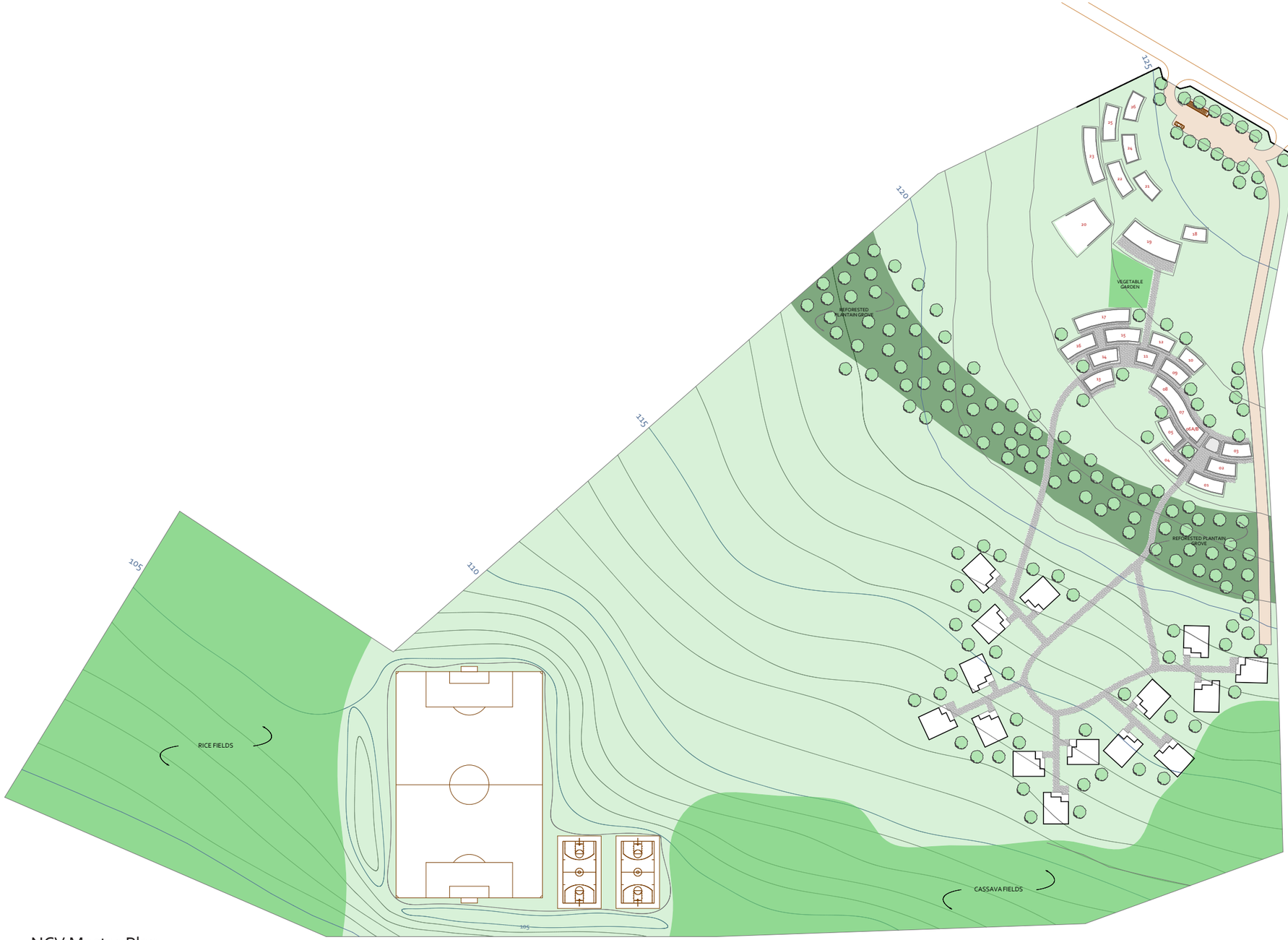
1.Freedom: The school should have a free atmosphere and the attempt is to make children enjoy, not fear, the school.
2.Confidence building: At a young age, what children most need is confidence. Giving children respect as individuals, showcasing their work and building up their confidence will be part of the school culture – even in small things.
3.Exploration Oriented: The school will build on children's innate curiosity and desire to explore – learning will structured around projects that they can do and present. (DesignShare)

Effective school design does not always have a large price tag. The Eureka School was built for a total cost of $48,597 ($9/sf^2), with a large portion of those savings coming from the roof design (see more at the website listed below). Materials are locally sourced and therefore contain very low levels of embodied energy, an important aspect of sustainable design. Other sustainable elements include a tin roof, which reflects most of the direct solar radiation, overhangs to reduce solar gain, and gutters connected to the roof to collect rain water. The design also takes advantage of natural ventilation and the natural stratification of warm air (stack effect).

The school won a Merit Award in 2007 from DesignShare.

Sources: http://www.designshare.com/index.php/projects/eureka-school-archestudio-aid-india/intro
Image Credits: DesignShare

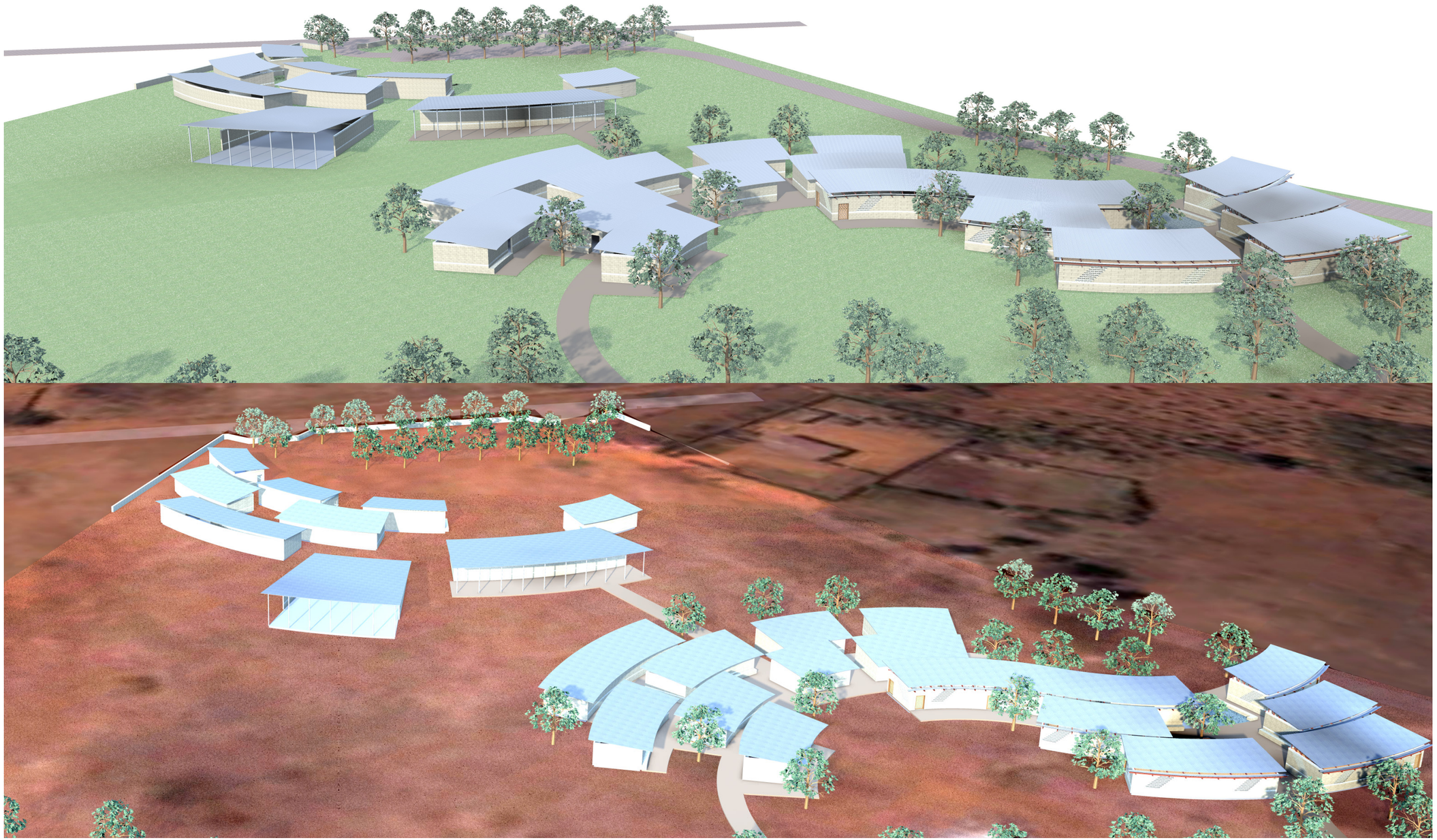
Proposed Site Plan



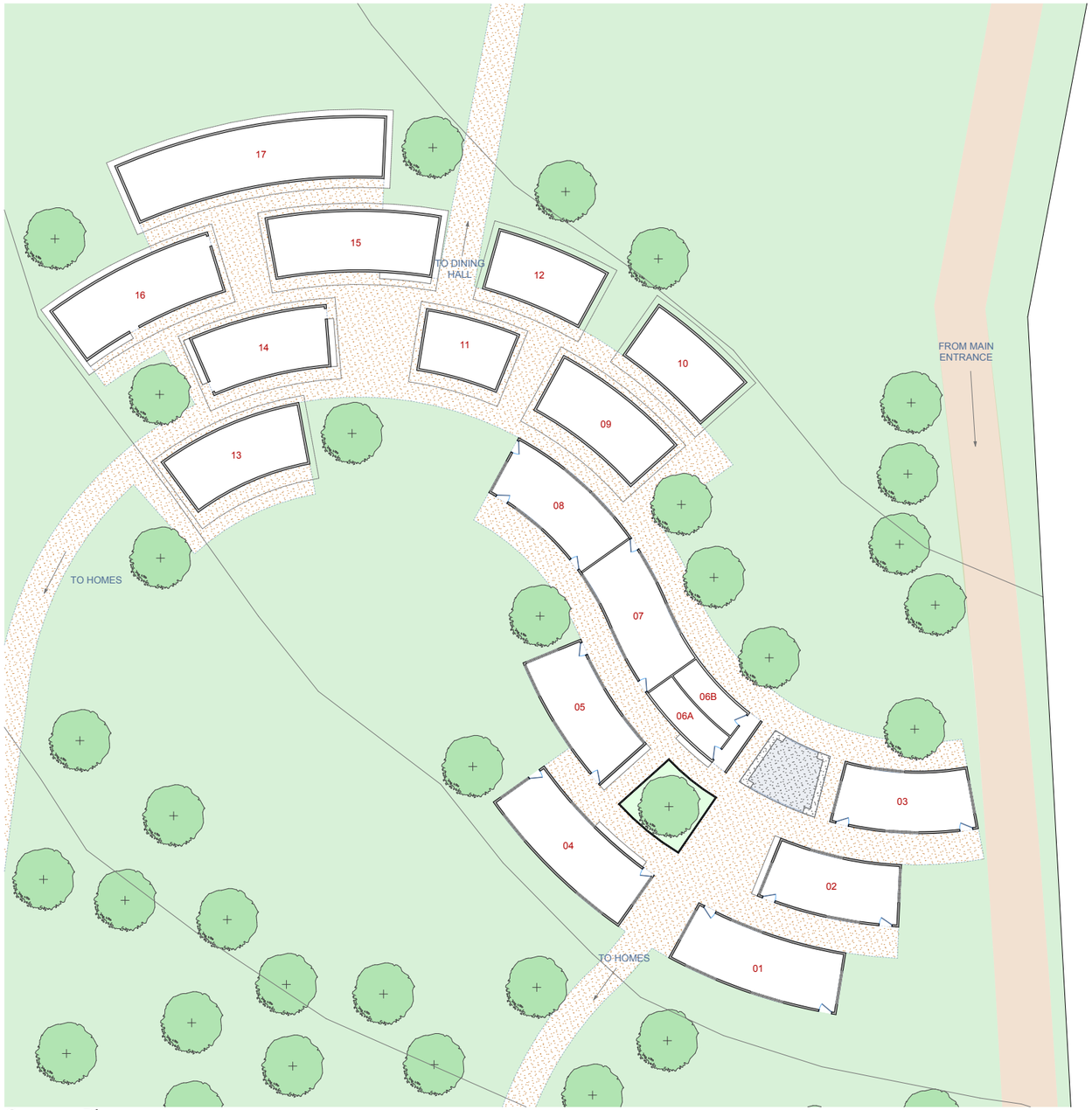
NCV Master Plan

Scale: 1:2000

Site Rendering

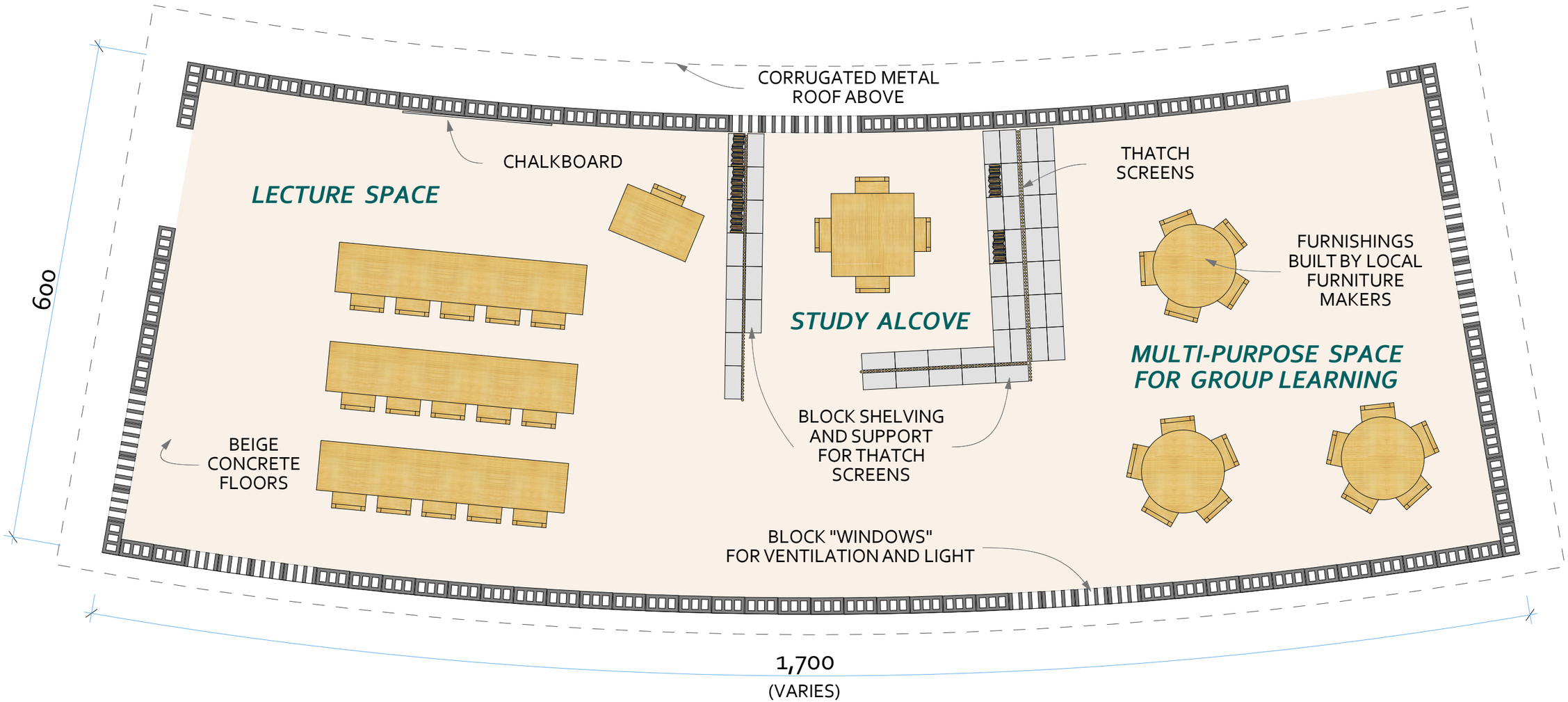


Proposed Campus Plan



Campus Plan

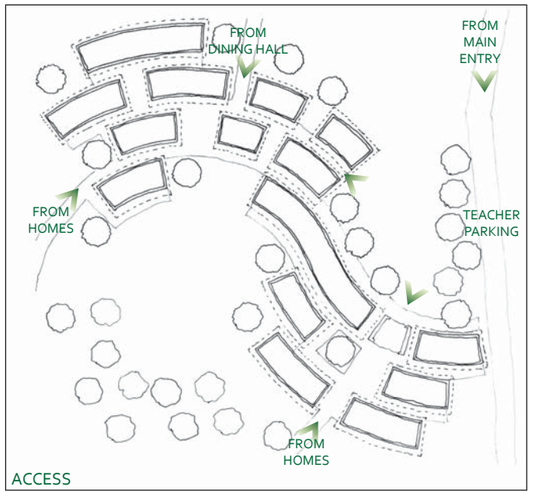
Scale: 1:500

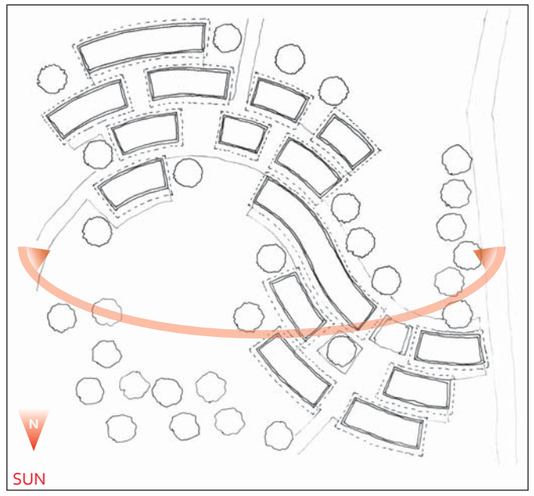


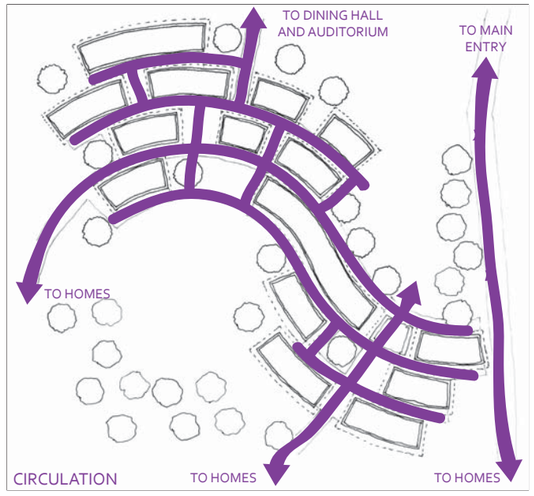
Studio Plan (typical)

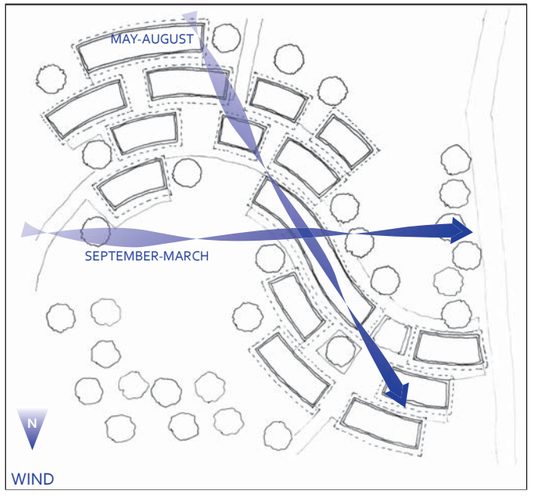
Scale: 1:200

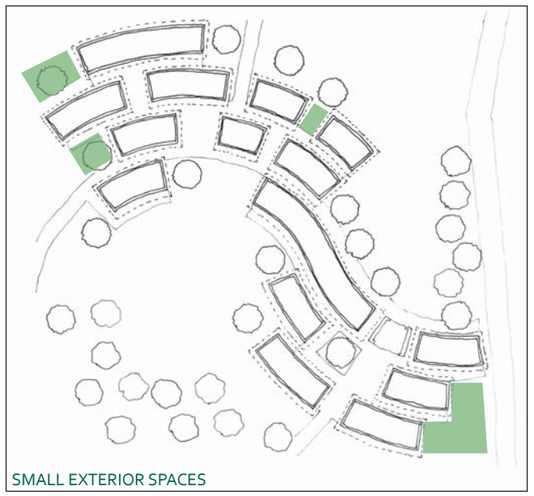
Campus Diagrams

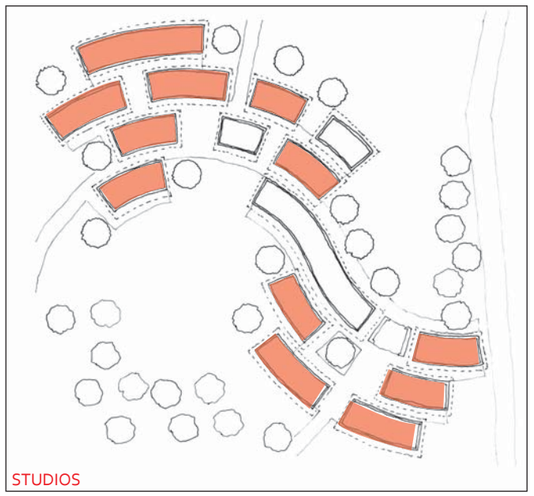


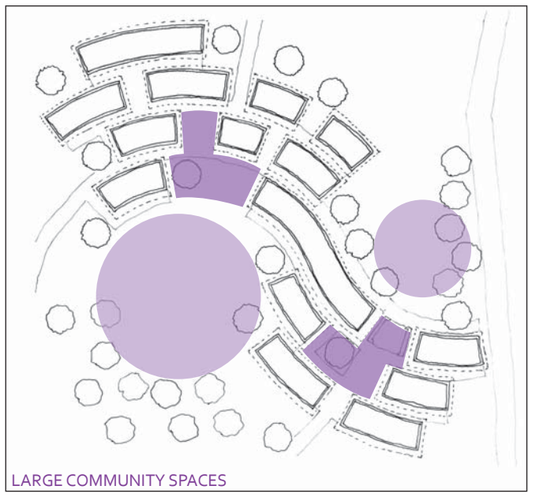


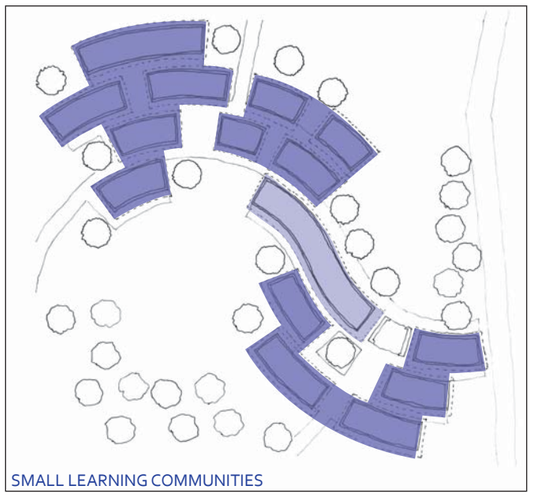


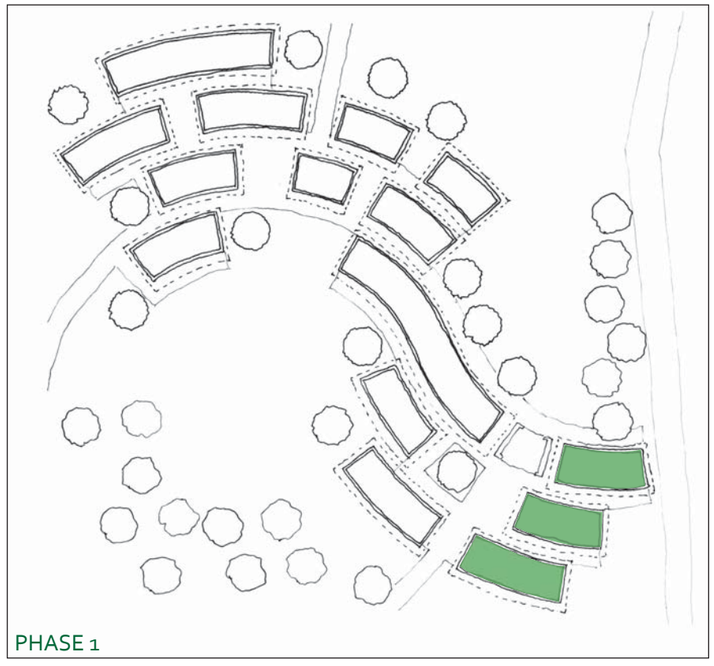




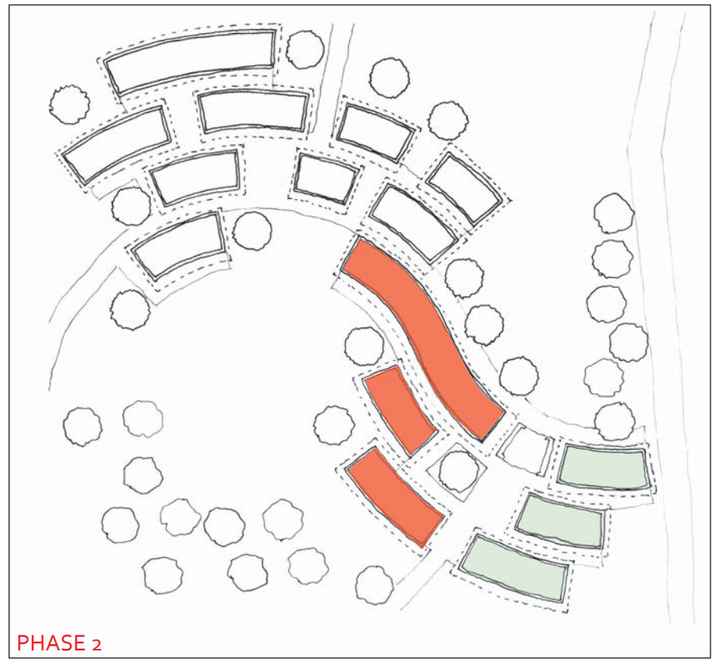




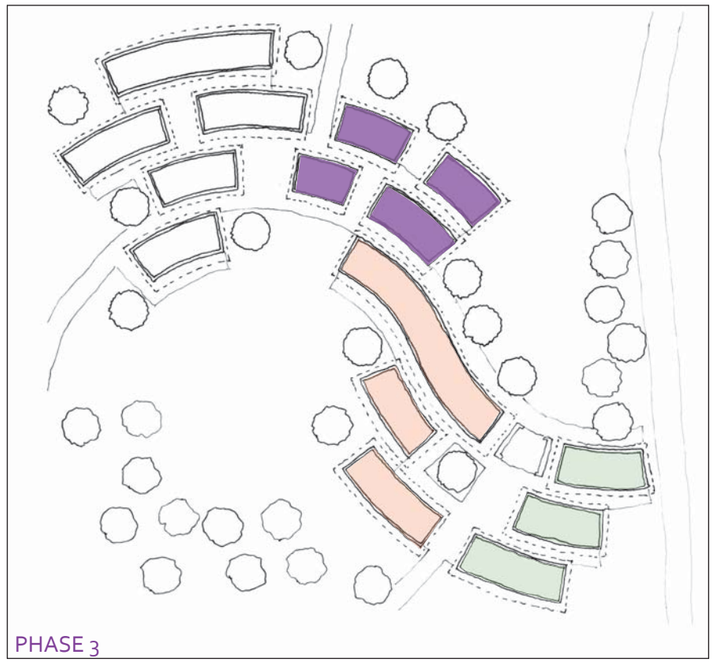




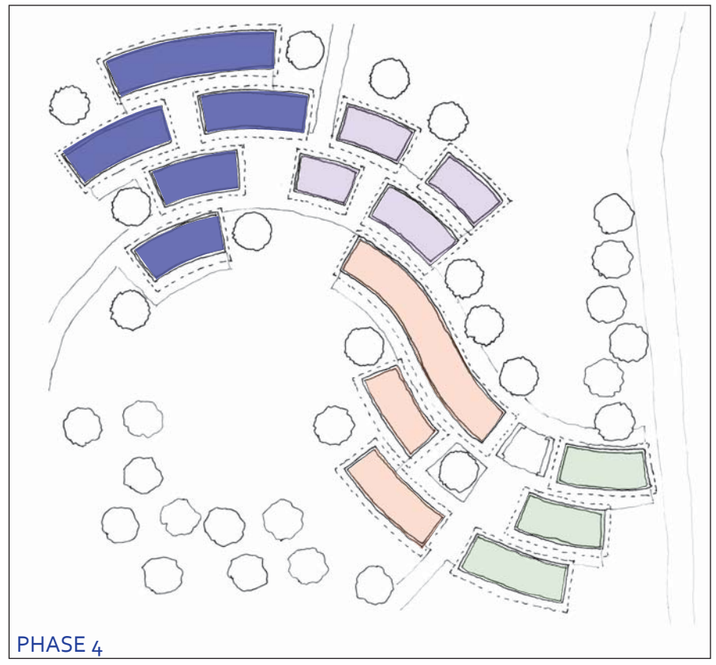
PHASE 1



PHASE 2



PHASE 3



PHASE 4

Courtyard Renderings

The sand-colored studios give way to light-colored gravel walkways. Block benches against the studios give the students a place to gather in the shade between classes, and a tree provides the children with a place to gather and learn from one another. At the primary school's entrance exists a small recessed area which fills with 2 centimeters of water after the brief, heavy storms which strike during the rainy season. The pool would dry quickly, allowing for a beautiful, transitory moment of reflection.

"If you think in terms of a school building, it began possibly with a man under a tree who did not know he was a teacher, talking to a few who did not know they were students, and you realize that the institution of school came from such beginnings..."

Louis Kahn

Materials and Construction

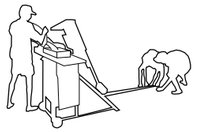
GATHER RUBBLE FOR FOUNDATIONS

GATHER THATCH FOR SCREENS AND CEILING

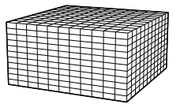
SAND

EARTH

CEMENT



LOCAL LABOR AND BLOCK PRESS



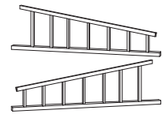
CONCRETE BLOCKS MADE ON SITE

THATCH WOVEN ON SITE

THATCH PANELS

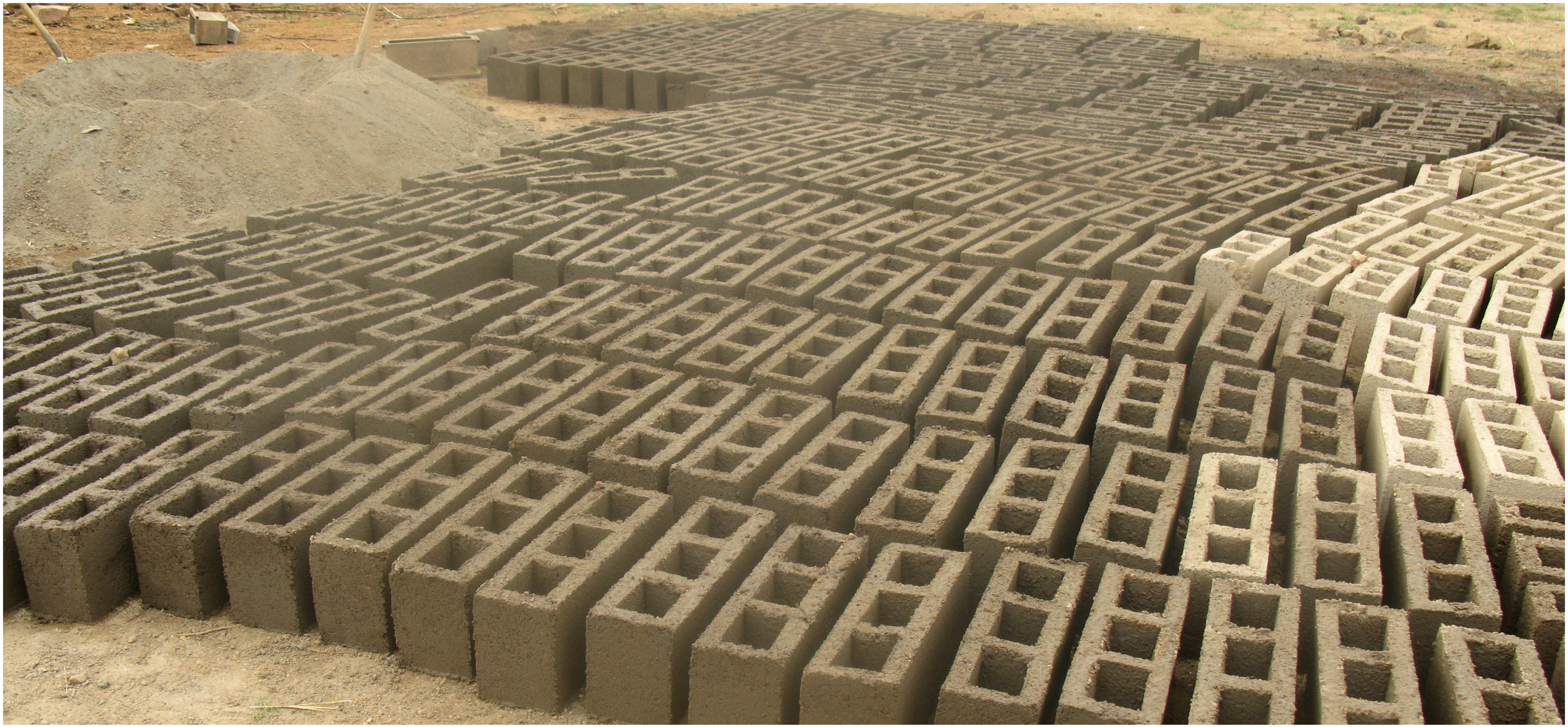
TRANSPORTATION

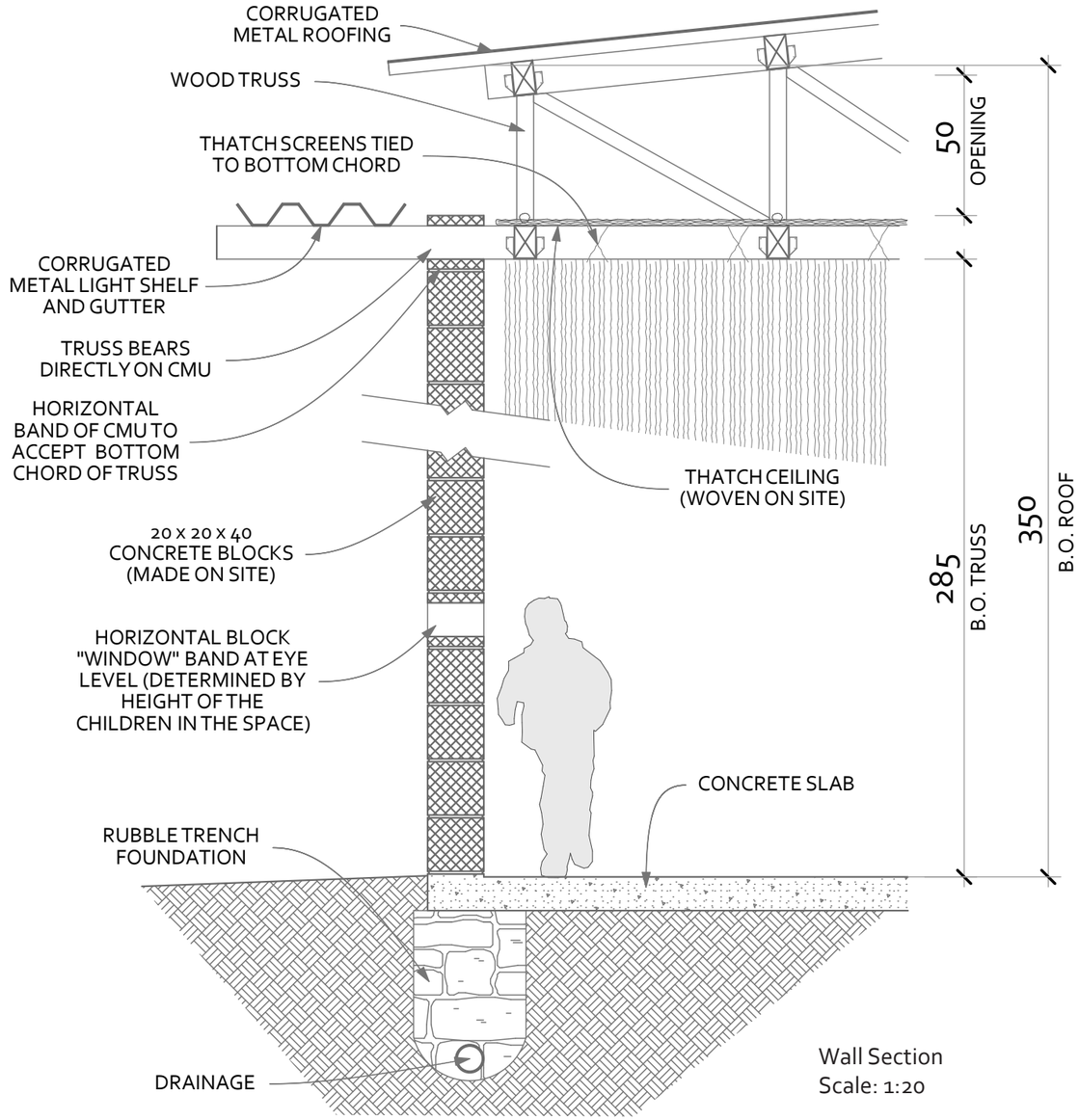
TIMBER BEAMS AND COLUMNS



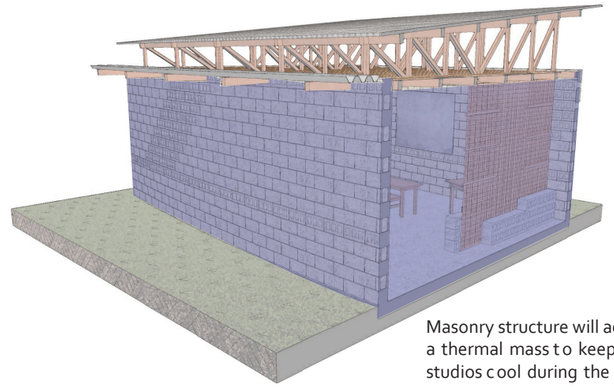
ROOF TRUSSES

CORRUGATED METAL ROOFING

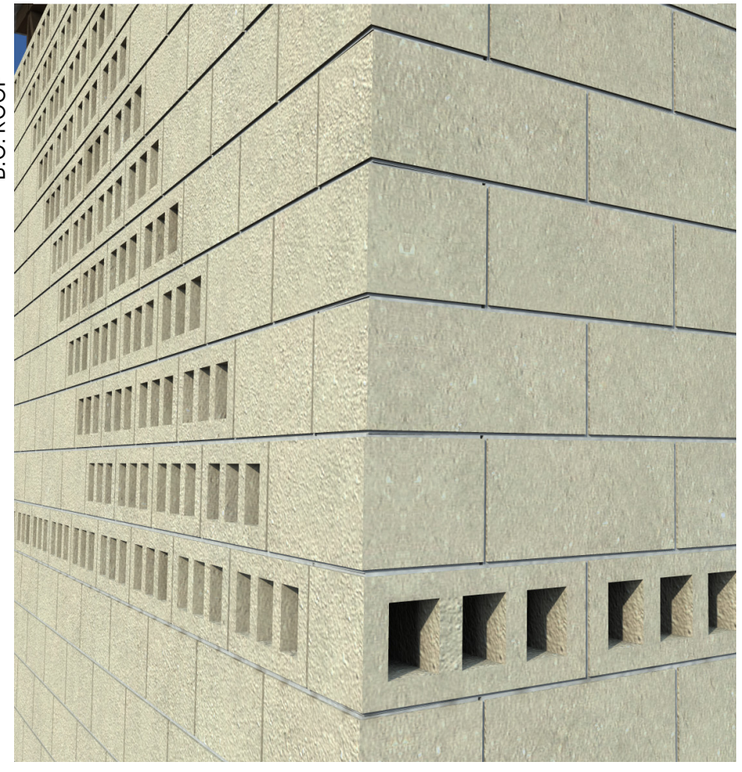




Wall Section
Scale: 1:20

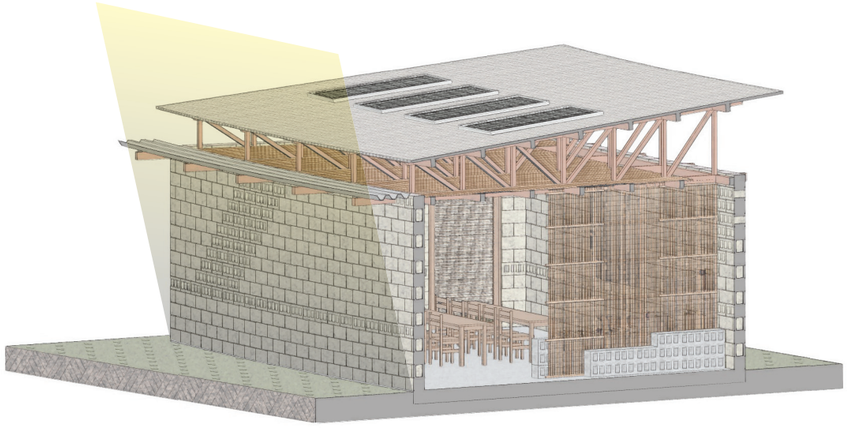


Masonry structure will act as a thermal mass to keep the studios cool during the day.



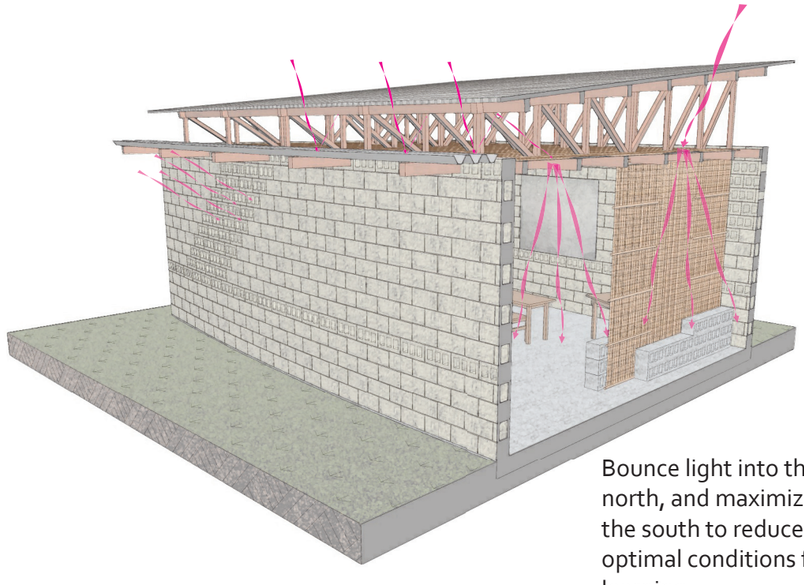
Interior Renderings: Light

When students arrive for their first day of class, the studio is empty. One of the first tasks a class will need to accomplish is the design and construction of their own studio. Spaces be configured to accomodate specific programs.



Shade morning and early afternoon sunlight to reduce heat gain during the school day.

Buildings that require electricity (computer lab, administration, dining hall), benefit from the addition of PV panels. The roofs are angled to maximize efficiency.



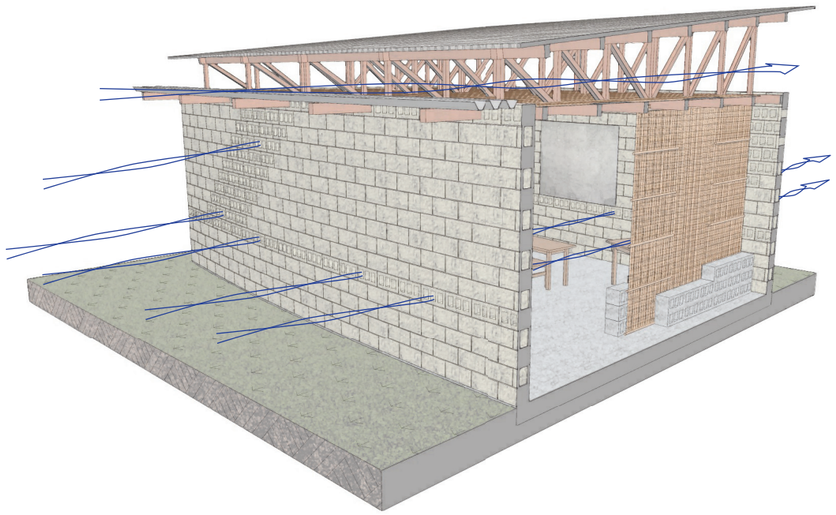
Bounce light into the space from the north, and maximize diffuse light from the south to reduce glare and maintain optimal conditions for reading and learning.

The horizontal band of block at eye level brings in light and allows the children to view the site from their own vantage point. It also provides a benchmark against which the children can measure their own development. The height of the lower horizontal band will be determined by the height of the students in the studio; the secondary and vocational schools would have a higher band to match the eye level of taller children. Over the course of their education, students will be able to measure their physical growth by identifying the CMU course through which they can see outside. The larger block openings will remain constant, always providing the children with a sense of growth and progress.

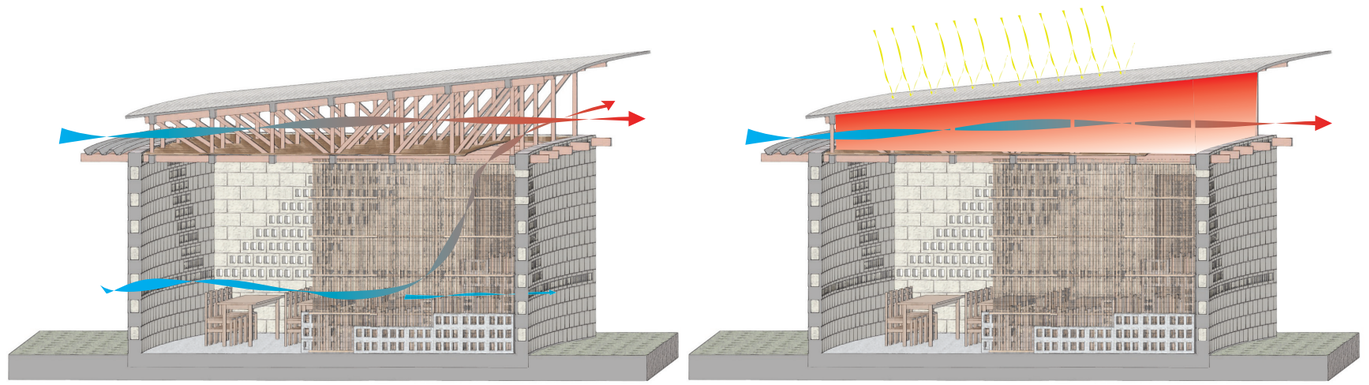
Interior Renderings: Light

Thatch screens, woven from fallen branches found on the site, divide the space into separate study areas and class spaces. The panels are tied to the trusses and beams above and supported between blocks at their base. The blocks double as book shelves and storage racks for the children's items. Each space is easily configured and reconfigured to accomodate various learning needs.

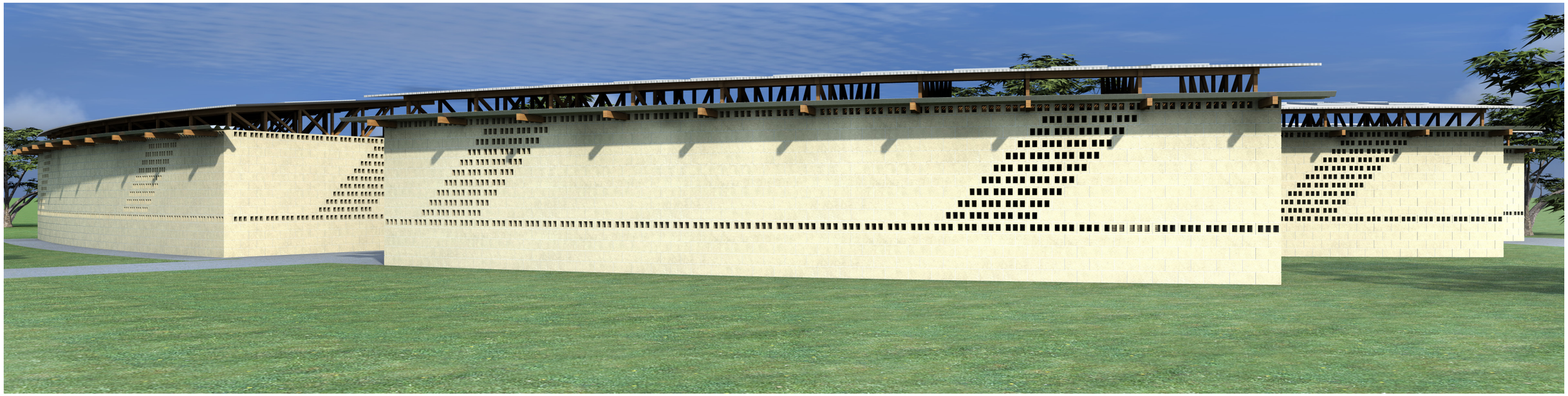
Cross Ventilation



Natural Stratification of Air and Stack Ventilation



The block pattern is inspired by Rwandan basket weaving. A recognizable and traditional motif, this pattern symbolizes two friends walking along a path, stopping to chat with others, and then continuing on their way. It is a symbol of friendship and community commonly used in the weaving of Rwandan Peace Baskets.



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