The American School of Kinshasa

Facility Improvement Plan - May 2010

Updated October 2016

CONTENTS

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In November 2015 David Croteau visited TASOK to see the completed building projects, discuss the current plans and discuss further next steps with campus development. During the visit David Croteau met with the Superintendent (Simon Gillespie), Finance and Facilities Manager (Kareen LaPlanche), Board Members (Mustafa Rawji and Amanda Opper), a group of students, a group of teachers (representing the different areas of the school and current users of the Forest Classrooms), TASOK's construction contractor (BatCongo) who was responsible for the building renovations to date, and a member of the original board (Inge Sthreshley) that was part of the 2010 Master Plan development.

Since 2010 the Forest Classroom prototype and renovations to the three middle school buildings has been completed. In addition the upper school library has been renovated to create a more open and central location for learning and collaboration on campus. Construction of a new elementary 4 classroom building is currently underway.

We recommended the following updates to the 2010 Master Plan,

Further education is needed by users to maximize the environmental features of the buildings. Including climate control, and water catchment. Teachers and students can benefit from the purpose of self-sustaining classrooms through an education program, collecting data on energy conservation, and establishing projects that fulfill the purpose and design of the prototype.

The completed prototype should be equipped with other features indicated in the 2010 Master Plan including exterior operable louvers on windows, solar panels to provide electricity for lights and computers, and energy consumption meters to track how students are using the building, to make improvements to their usage, to set goals, and to compare old and new classroom energy use.

The existing pods could be renovated with the same philosophy that guided renovation of the prototypical classrooms. The existing elementary classrooms could be replaced with the four-classroom design with outdoor covered space allowing teachers and students to connect more with the natural environment.

The Rotunda areas in the Middle and High School could become outdoor student centers for collaboration. Relocating the walkways along the buildings in Middle and High School would provide more open green spaces at the center of campus. The science building could be opened to create a walkway where lockers could be kept, along with lockers along covered areas of buildings.

The French room could be moved to the current Computer Lab to make way for a Digital Media Lab next to the art room. The Digital media space would be a flexible area and include concepts of technology, design technology, digital media, and robotics.

These recommendations are incorporated into this updated Master Plan dated October 2016. Updated Pages are indicated with "(October 2016)".

Executive Summary

Context
TASOK was founded in 1961 by missionaries who guided the original development with assistance from the American Embassy. Although the founding missionary group declined the U.S. Embassy's offer to build a school, the U.S. Embassy leased from the DRC government for 99 years the 42 acres of land that is now TASOK's campus. Construction of the high school was completed in 1967, followed by the elementary buildings in 1971 and middle school classrooms in 1989. At its largest TASOK accommodated some 650 students. However, in 1991 violent political unrest in Kinshasa led a major exodus of western expatriates and a dramatic decline in enrollment at TASOK. By 1995 enrollment at TASOK had shrunk to less than 50 students. Since then enrollment has grown sporadically at an average rate of about 20 students per year. Today TASOK enrolls around 300 students.

In the early days when the school first started, enrollment at TASOK consisted of U.S. Christian missionary families and State Department families. By the 1980's enrollment consisted of families of English speaking businessmen, Christian missionaries, local Indian businessmen, foreign diplomats, and the U.S. State Department. Today, enrollment includes Congolese, Indians, U.S. State Department families and expatriates from Asia and Europe here on business or affiliated with NGO's.

Purpose
Flansburgh Architects was retained to visit TASOK and conduct a facility audit of its existing campus. The purpose of this audit was to evaluate whether the existing facilities are meeting the immediate needs of TASOK and identify what changes would be required to accommodate a growth rate of approximately 20 students per year over the next 20 years. It was understood that any recommendations would be made in the context of the challenging social, economic and technical conditions that exist in the Democratic Republic of the Congo.

Process
Flansburgh Architects spent one intense week at TASOK to understand the culture of the campus and investigate the condition of its existing facilities. During the visit we met with administration, faculty, board members, parents, maintenance staff and every high school student through group meetings, classroom visits, one-on-one interviews and informal dinners. We gathered all available documentation showing the layout of the existing campus and with the assistance of Brian Trapp were able to locate and describe otherwise undocumented structures.

Goals
TASOK identified four major goals:
- Maintain and enhance TASOK's position as the premier English speaking K-12 school in the DRC.
- Strengthen TASOK's commitment to preserving the garden-like quality of its campus.
- Restore and revitalize outdated campus facilities to respond to the demands of a first world education in the 21st century.
- Identify incremental investments that accommodate short-term needs, support long-term goals and are flexible enough to meet an uncertain future.

Recommendations
- Renovate one typical middle school classroom building to become a new prototypical, climate responsive and self-sustaining classroom for the 21st century. This remade classroom building would be connected to an outdoor forest classroom dedicated to the study, care and preservation of the rain forest. As a prototype it would serve as an example of what could be achieved if every classroom building were renovated and would be an unmistakable guide for future improvements.
- Establish forest preservation zones where future development is prohibited and respect for the indigenous rain forest is encouraged.
- Consider alternative options to restore or replace the elementary school classroom "pods" to better respond to Congo's climate conditions and TASOK's current teaching pedagogy.
- Provide campus facilities for expatriate families, who's lives revolve around TASOK. These facilities could include a poolside family club, improvements to the CAC, fitness room and Parent Teacher Committee room.

Example of new science classroom, Seabury Hall, Hawaii.

Available space at TASOK
The approximate available net square footage at TASOK is 134,567 NSF for an enrollment of 300 students. The recommended net square footage for a typical American K-12 public school for 325 students is approximately 86,010 NSF. The recommended net square footage for an American K-12 public school is approximately 159,645. Therefore, TASOK is oversized for an enrollment of 325 students and undersized for an enrollment of 650 students.

Proposed space requirements for an enrollment at TASOK of 650 students (25 students/grade)
To accommodate an anticipated growth of 325 students over the next 10-20 years TASOK should construct 25,078 of additional net square footage. Of this additional space approximately 15,000 NSF is required for new faculty apartments. This would create 15 more faculty apartments so that 75% of faculty could live on campus. The remaining 25% would live off campus. Much of the existing academic square footage would be renovated and reorganized to accommodate the increasing enrollment. An additional 10,000 NSF would be required for new academic spaces including two additional elementary school classrooms, two additional middle school classrooms, two additional high school classrooms and a covered basketball court/outdoor gymnasium at the elementary school.

		ENROLLMENT 325 students			EXISTING ENROLLMENT			ENROLLMENT 650 students			
		QTY	SF	TOTAL	QTY	SF	TOTAL	QTY	SF	TOTAL	DIFF.
ELEMENTARY SCHOOL											
52	K	1	1,200	1,200	1	1,300	1,300	2	1,200	2,400	1,100
51	Gr 1	1	950	950	1	1,350	1,350	2	950	1,900	550
43	Gr 2	1	950	950	1	1,080	1,080	2	950	1,900	820
42	Gr 3	1	950	950	1	1,025	1,025	2	950	1,900	875
23	Gr 4	1	950	950	1	2,050	2,050	2	950	1,900	-150
22	Gr 5	1	950	950	1	2,052	2,052	2	950	1,900	-152
21	ES French	1	950	950	1	800	800	1	950	950	150
	History	0	950	0	0	950	0	2	950	1,900	1,900
				6,900			9,657			14,750	5,093
MIDDLE/HIGH SCHOOL											
MS9	MS English/History	1	950	950	1	960	960	2	950	1,900	940
HS3	MS Math	1	950	950	1	960	960	2	950	1,900	940
HS14	Science (incl. prep.)	1	950	950	1	3,050	3,050	1	1,200	1,200	-1,850
43	MS French	1	950	950	1	1,025	1,025	1	950	950	-75
HS5	HS History	1	950	950	1	960	960	2	950	1,900	940
HS4	HS English	1	950	950	1	960	960	2	950	1,900	940
HS2	HS Math	1	950	950	1	960	960	2	950	1,900	940
HS13	Science (incl. prep)	1	950	950	1	3,050	3,050	2	1,200	2,400	-650
HS11	HS French	1	950	950	1	960	960	1	950	950	-10
46	ESL	1	950	950	1	1,025	1,025	1	950	950	-75
	African/French	0	950	0	1	960	960	1	950	950	-10
				9,500			14,870			16,900	2,030
ARTS											
24	ES Art	0	1,000	0	1	1,000	1,000	1	1,000	1,000	0
	MS/HS Art	1	1,000	1,000	1	960	960	1	1,000	1,000	40
	MS/HS Art Storage	1	300	300	1	340	340	1	300	300	-40
	Musis	1	1,200	1,200	1	1,025	1,025	1	1,200	1,200	175
	Drama	0	1,200	0	1	960	960	1	1,200	1,200	240
	Band	0	1,500	0	1	960	960	1	1,500	1,500	540
	Small Ensemble	1	200	200	0	200	0	1	200	200	200
	Music Practice	2	75	150	0	75	0	2	75	150	150
	Instrument storage	0	200	0	1	340	340	1	200	200	-140
				2,850			5,585			6,750	1,165
TECHNOLOGY											
	Elementary Lab	0	1,000	0	1	1,000	1,000	1	1,000	1,000	0
	Storage/Worshop	0	300	0	1	1,025	1,025	1	300	300	-725
MS6	AV room	0	950	0	1	840	840	0	950	0	-840
	ES Tech Office	0	120	0	1	400	400	0	120	0	-400
HS1	MS/HS Lab	1	1,000	1,000	1	960	960	1	1,000	1,000	40
HS1a	MS/HS Tech Office	1	120	120	1	340	340	1	120	120	-220
				1,120			4,565			2,420	-2,145
LIBRARY											
	MS/HS Reading	1	1,250	1,250	1	1,275	1,275	1	1,250	1,250	-25
	MS/HS Stacks	1	2,500	2,500	1	2,500	2,500	1	2,500	2,500	0
	ES Reading	0	750	0	1	1,000	1,000	1	750	750	-250
	ES Stacks	0	1,000	0	1	1,600	1,600	1	1,000	1,000	-600
	ES Storage	0	250	0	1	500	500	1	250	250	-250
				3,750			6,875			5,750	-1,125
DINING											
44/45	ES Dining	1	2,250	2,250	1	2,320	2,320	1	4,500	4,500	2,180
	MS/HS Dining (outdoors	1	2,625	2,625	1	4,050	4,050	1	5,250	5,250	1,200
	Kitchen	1	1,600	1,600	1	450	450	1	2,000	2,000	1,550
				6,475			6,820			11,750	4,930

		ENROLLMENT 325 students			EXISTING ENROLLMENT			ENROLLMENT 650 students			
		QTY	SF	TOTAL	QTY	SF	TOTAL	QTY	SF	TOTAL	DIFF.
ADMINISTRATION											
	Reception	1	125	125	1	120	120	1	125	125	5
	Open Office	1	300	300	1	200	200	1	300	300	100
	Small Conf. Room	1	250	250	1	145	145	1	250	250	105
	Nurse Office	1	250	250	1	110	110	1	250	250	140
	Cot/Toilet	1	120	120	1	75	75	1	120	120	45
	Head's Office	1	375	375	1	260	260	1	375	375	115
	Principal Office	1	125	125	1	165	165	1	125	125	-40
	Office	1	125	125	1	145	145	1	125	125	-20
	Office	1	125	125	1	170	170	1	125	125	-45
	Office	1	125	125	1	175	175	1	125	125	-50
	Office	1	125	125	1	145	145	1	125	125	-20
	Office	0	125	0	1	145	145	1	125	125	-20
	Admin. Kitchenette	1	60	60	1	60	60	1	60	60	0
	Admin. Storage	1	110	110	1	65	65	1	110	110	45
	Admin. Storage	0	35	0	1	60	60	1	35	35	-25
MS3	Storage	1	400	400	1	960	960	1	400	400	-560
MS7	Faculty Lounge	1	300	300	1	840	840	1	450	450	-390
MS2	Large Conf. Room	0	500	0	1	840	840	1	500	500	-340
HS9	College Counseling	1	150	150	1	465	465	1	150	150	-315
MS5	PTC	0	500	0	1	960	960	1	500	500	-460
MS1a	Stuco Storage	0	200	0	1	340	340	1	200	200	-140
				3,065			6,445			4,575	-1,870
PHYSICAL EDUCATION											
33	ES PE	0	6,000	0	1	1,080	1,080	1	6,000	6,000	4,920
35	ES PE Activity Room	0	1,000	0	1	540	540	1	1,000	1,000	460
35a	ES PE Storage	0	150	0	1	540	540	1	150	150	-390
	ES Changing Rooms	0	500	0	1	665	665	2	500	1,000	335
	HS PE	1	10,000	10,000	1	8,000	8,000	1	8,000	8,000	0
	MS/HS Changing Room	1	1,000	1,000	1	1,560	1,560	1	1,000	1,000	-560
	MS/HS Changing Room	1	1,000	1,000	1	1,560	1,560	1	1,000	1,000	-560
	HS Storage	0	300	0	0	200	0	1	300	300	300
	Pool storage	1	250	250	1	240	240	1	250	250	10
	Fitness Room	1	900	900	1	840	840	1	900	900	60
	HS PE Office w/shower	1	250	250	0	250	0	1	250	250	250
				13,400			15,025			19,850	4,825
CULTURAL ARTS CENTER											
	CAC	1	3,000	3,000	1	3,400	3,400	1	3,000	3,000	-400
	Stage	1	1,600	1,600	1	2,600	2,600	1	1,600	1,600	-1,000
	Dressing rooms	2	300	600	1	2,600	2,600	2	300	600	-2,000
	Control Balcony	1	200	200	1	25	25	1	200	200	175
	Storage	0	400	0	0	0	0	1	400	400	400
				5,400			8,625			5,800	-2,825
RESIDENTIAL											
	One bedroom	10	1,000	10,000	10	1,000	10,000	15	1,000	15,000	5,000
	Two bedroom	11	1,000	11,000	11	1,000	11,000	15	1,000	15,000	4,000
	Three bedroom	9	1,000	9,000	9	1,000	9,000	15	1,000	15,000	6,000
				30,000			30,000			45,000	15,000
MAINTANENCE											
	Workshop	1	1,375	1,375	1	8,140	8,140	1	8,140	8,140	0
	General Storage	1	400	400	1	340	340	1	340	340	0
	Storage	0	1,375	0	1	500	500	1	500	500	0
	Workshop	0	400	0	1	4,070	4,070	1	4,070	4,070	0
				1,775			13,050			13,050	0
TOTAL NET SQUARE FOOTAGES				**86,010**			**134,567**			**159,645**	**25,078**

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Campus Open Space

KEY

- A — Service yard
- B — Residential yard
- C — Rain forest
- D — Iconic green
- E — Athletic field
- F — Forest classroom

Campus open space

Campus open spaces can be categorized as follows:

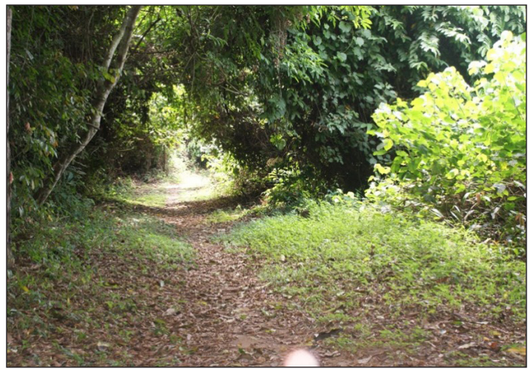
- Service yards
- Residential yards
- Rain forests
- Iconic green spaces
- Athletic fields and playgrounds
- And, a forest classroom

Each of these types of campus open spaces contributes to TASOK's unique character. The diagram above indicates where these areas are located. Future development should take care to preserve these essential areas.

0 100 200 300 FT

Scale 1:3000

Pedestrian Circulation



Pedestrian circulation

The pedestrian circulation is largely confined to covered walkways and further restricted by gravel filled drainage swales around buildings. Other campus paths include a perimeter walking path that encircles the campus along the wall, sidewalks around the pick-up/drop-off loop and unpaved roadways that connect the upper and lower faculty family apartments to the academic campus.

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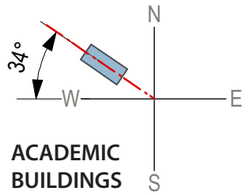
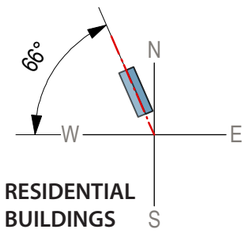
Building Orientation



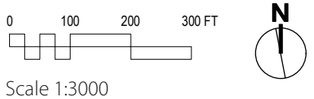
ACADEMIC BUILDINGS



RESIDENTIAL BUILDINGS

Building orientation

Academic buildings are oriented with their long axis in a northwest/southeast direction. The narrow width of the buildings is open to prevailing southwest to north-east breezes. The elementary school "pods" have a deep cross section and no ventilated attic that diminish the effectiveness of natural ventilation.



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Vehicular Circulation (Existing)

KEY

- Residential traffic
- MS / HS pick-up & drop-off
- ES pick-up & drop-off
- Service route

Vehicular Circulation/Campus Security

The existing pick-up and drop-off situation is congested, cumbersome and somewhat chaotic. There is insufficient stacking space for the simultaneous dismissal of the elementary, middle and high school. Students must cross traffic to walk to and from a parking area at the center of the drop-off/pick-up loop. Drivers park and wait on campus, raising security concerns. Access to the campus for pick-up and drop-off is through a single main gate, focusing all traffic to one location.

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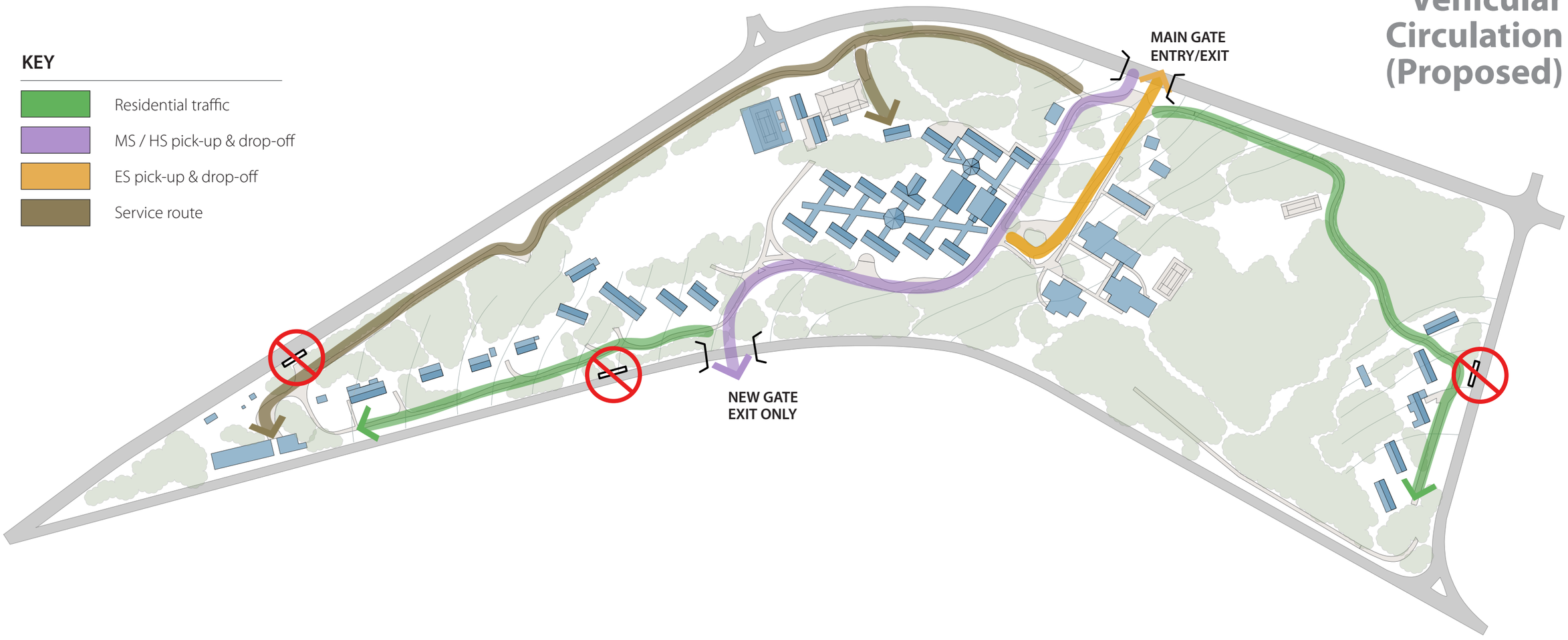
Vehicular Circulation (Proposed)



Vehicular Circulation/Campus Security

Four gates could be consolidated into two gates. A second gate just beyond the administration building could alleviate congestion, extend stacking space and simplify drop-off and pick-up. The reduction from four gates to two gates would also enhance campus security.

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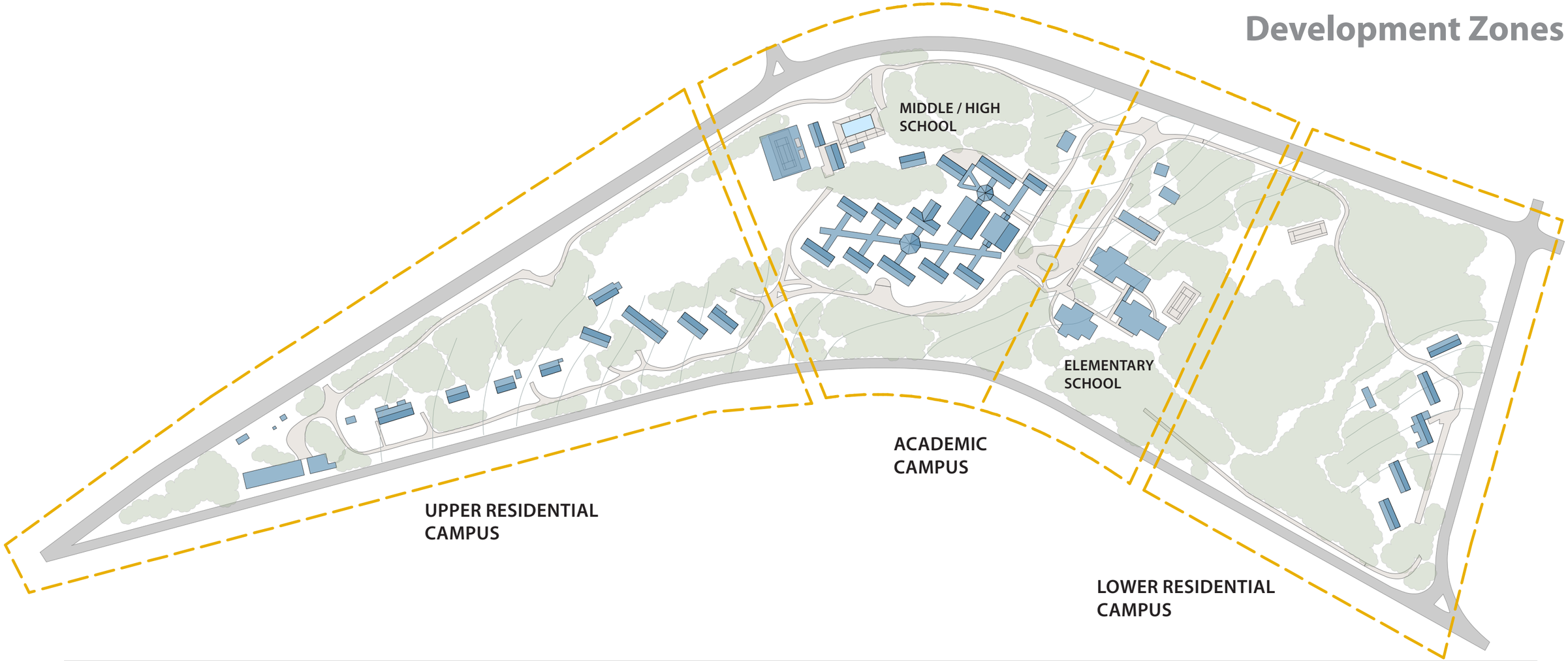
Development Zones



Campus Development Zones

The academic buildings and functions occupy the center section of the campus, with residential zones to each side. Future development should follow these established zones maintaining the natural separation between residential and school buildings. Elementary school facilities should remain separate and distinct from middle/high school facilities.

0 100 200 300 FT

Scale 1:3000

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Infrastructure

The campus infrastructure is outdated, unreliable, in disrepair or missing altogether.

WATER SERVICE
TASOK has installed dozens of elevated storage tanks to store water in the event the municipal water supply is disrupted. An effort to drill a well on the campus yielded a well that yields 1-1/2 gals/minute, a rate woefully insufficient to serve the campus. The campus uses an average of 14,000 gals/day.

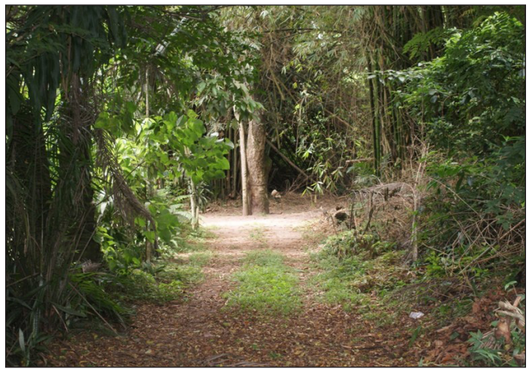
INTERNET
TASOK has installed a satellite dish to provide independent internet service. The school is in the process of installing its own fiber optic distribution system and local wireless hubs to better serve the needs of the campus.

ELECTRICAL SERVICE
The Upper campus has a 200 KVA generator and 250 KVA transformer. The Academic campus has a 250 KVA generator and a 400 KVA transformer. The Lower campus has a 125 KVA Generator and a 250 KVA transformer. Many electrical devices are not grounded, wires are exposed, circuits routes are unknown and wire connections are not in junction boxes. These conditions compromise safety, interrupt service and make maintenance and management of the system very difficult. Fluctuations in current can cause damage to electrical equipment. Electrical stabilizers are in country awaiting release by the Congolese government.

INTERCOM AND BELL SYSTEM
The intercom system and bell system are separate and antiquated. The school has implemented an acoustic whistle to notify children in an emergency. This method is insufficient to serve a 42-acre campus with 300 students and 30 faculty families.

FIRE PROTECTION
Buildings are not equipped with a fire sprinkler system and lack smoke detectors. A reliable water reservoir or municipal system is not available to suppress a potential fire.

Preservation Zones



Forest Preservation Zones

Students, faculty, parents and alumni universally cherish the lush landscape of TASOK's campus. The rain forest gives TASOK its identity, provides a pleasant learning environment, supports wildlife and invites exploration. It is inherently important to the character of the campus and must be preserved. This diagram indicates specific areas to be closed to development and preserved as rain forest permanently.

0 100 200 300 FT

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Scale 1:3000

Awareness

Forest preservation zones
TASOK should identify Forest Preservation Zones on campus that are kept off limits to future development. The diagram at left proposes outlines for these zones.

Forest Preservation Trust Fund (FPTF)
The perpetual preservation and maintenance of the rain forest will require expertise, labor, equipment and materials that may exceed the budget constraints at TASOK. A Forest Preservation Trust Fund (FPTF) could be established with a covenant that resources from the fund be used only to preserve, sustain and maintain the forest. Interest from the FPTF could be used to pay for the ongoing forest preservation effort.

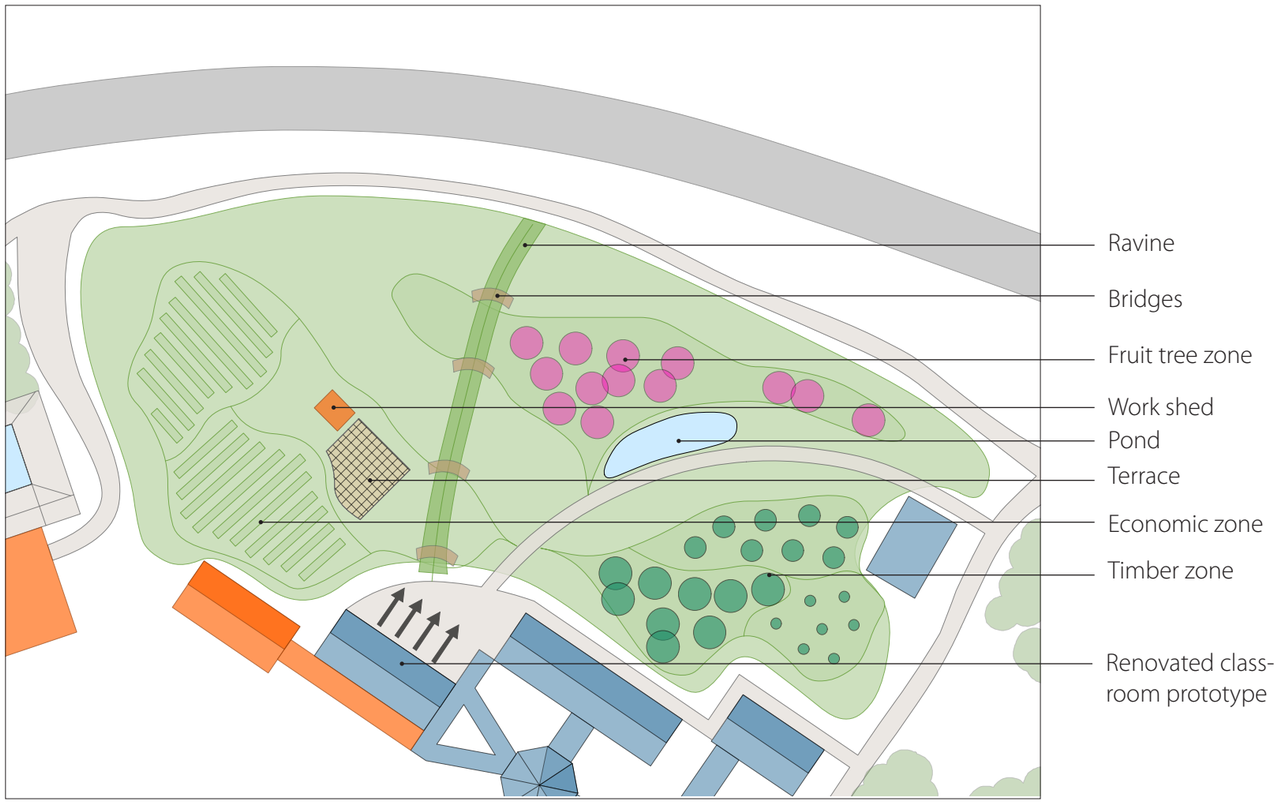
Campus Arborist
Successful programs often depend upon passionate leaders with the knowledge and expertise to achieve its goals. A dedicated Campus Arborist could focus attention on and care for the wide variety of flora on TASOK's campus. Without a knowledgeable advocate, existing trees will not thrive, depriving TASOK of a valuable amenity.

Tree removal and restoration program
As existing trees age, new trees should be planted to replace them. In this way TASOK will be assured of keeping a healthy stand of mature trees on campus. The promise of new trees can also help lessen the trauma of removing mature existing trees. The tree removal and restoration program could be administered by the Campus Arborist and funded by the Forest Preservation Trust Fund.

Curriculum integration
During our conversations with the students it was clear that they treasure the garden-like quality of TASOK's campus. They identify TASOK with its lush setting, a stark contrast to the surrounding areas of Kinshasa. Incorporating learning about indigenous plants and the rainforest ecosystem into TASOK's curriculum would distinguish TASOK from other schools in Kinshasa and strengthen the students' connection to their campus.

Campus wide awareness training
In collaboration with the Campus Arborist, teachers could integrate the study, care and replanting of campus flora as a unit in each Elementary School grade level with more detailed study as part of the science curriculum at the Middle School and High School grade levels.

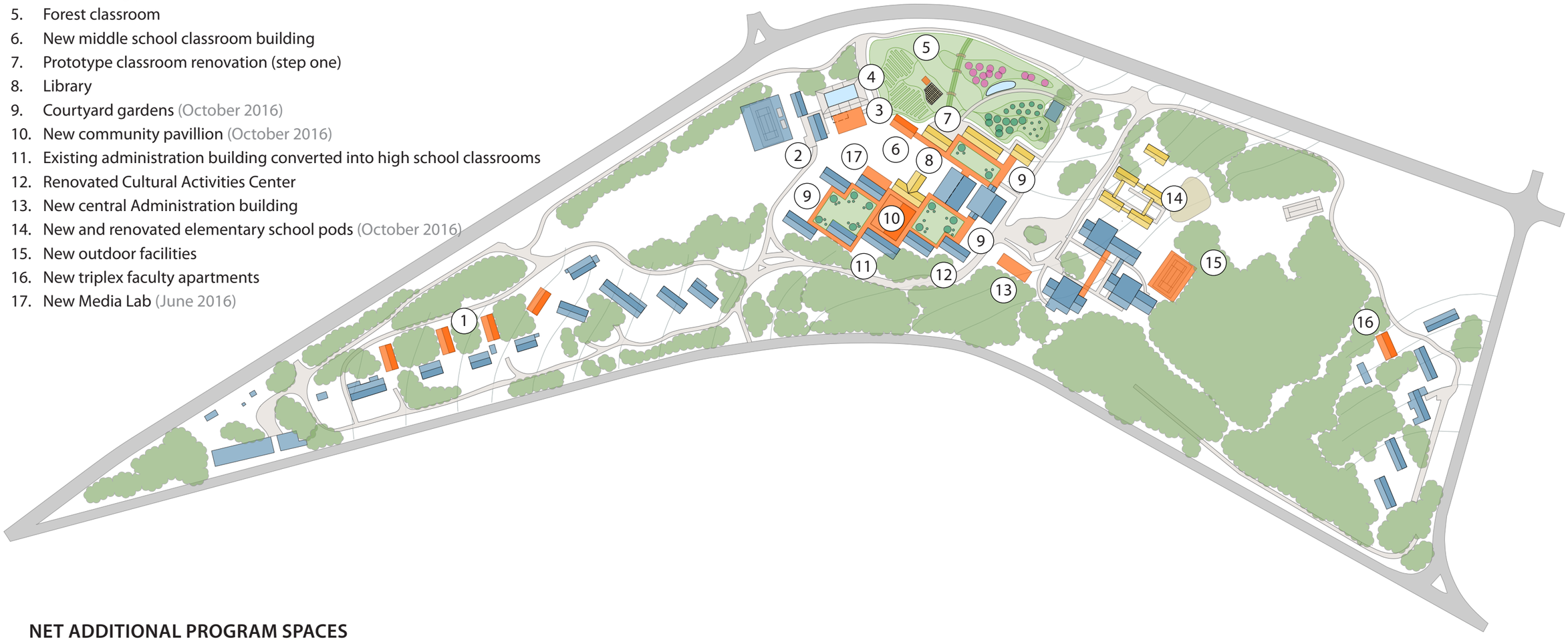
Forest classroom (see diagram below)
An outdoor classroom/reforestation project is already underway as a club activity. It includes construction of new pathways and trellises in addition to clearing and planting. A small nursery has been also established. This program could be incorporated into a project based science curriculum. An existing Middle School classroom could be converted to a science laboratory with a green house that opens onto the outdoor environment.



New Campus Facilities
(Updated October 2016)

FACILITY KEY

1. New triplex faculty apartments
2. Renovated changing rooms
3. New family club & dining commons
4. New wading pool
5. Forest classroom
6. New middle school classroom building
7. Prototype classroom renovation (step one)
8. Library
9. Courtyard gardens (October 2016)
10. New community pavillion (October 2016)
11. Existing administration building converted into high school classrooms
12. Renovated Cultural Activities Center
13. New central Administration building
14. New and renovated elementary school pods (October 2016)
15. New outdoor facilities
16. New triplex faculty apartments
17. New Media Lab (June 2016)



NET ADDITIONAL PROGRAM SPACES

Elementary school classrooms
Two Middle school classrooms
Two High School classrooms
Fifteen Faculty apartments
One New Community Pavillion (October 2016)
One New Media Lab (October 2016)

Key

- New Building
- Existing Building
- Completed Building

0 100 200 300 FT

Scale 1:3000

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PROPOSED RENOVATIONS AND NEW BUILDINGS

Cultural Activities Center
The existing CAC was originally designed as a multipurpose space. With the construction of a covered outdoor gymnasium at the elementary school, fitness room and existing covered gymnasium at the middle/high school the CAC can be re-dedicated to the arts. Renovations to the CAC would include: installation of fixed tired seating and side balconies; new control room; storage for rations below new tiered seating; ¾" plywood and ¼" masonite over existing stage floor; fire rated exterior safety doors; additional toilet rooms on either side of the existing entrance vestibules; reconfiguration of changing rooms to accommodate stage access to both sides of the stage; new acoustic ceiling panels and adjustable acoustic draperies; ventilation system with CO2 Sensors interlock; fire detection system; center speaker cluster and theatre rigging.

Changing Rooms
Recent renovations to the changing rooms are inconsistent with western standards. Renovations to changing rooms would include additional showers for elementary school students, appropriate showers and changing areas (each shower should be approximately 1M x 1M with an adjacent changing area of approximately 1M x 1M), appropriately designed lavatories separate from water closets, and appropriately sized water closet stalls measuring 1M x 1.5M, benches for changing, dedicated student lockers for PE uniforms, and tall lockers to accommodate street clothes for two classes.

Faculty Apartments
In general, accommodations in faculty apartments are acceptable. However, improvements to existing faculty apartments could include a second bathroom, larger kitchen and termite extermination and preventive measures.

Family Club, New Kitchen and Dining Commons
The campus is the center of family life for many who attend TASOK. Students tend to want to stay on campus until late in the day or visit campus on weekends. A family club, centered at the pool would support families and reinforce this sense of belonging. The existing kitchen and outdoor covered dining area would be removed and replaced with a new middle school classroom building. A new kitchen would be constructed along the southern edge of the pool and serve both the pool area and an enlarged outdoor dining area. The pool would be restored and a new PTC meeting room, faculty lounge, covered outdoor area and infant pool constructed to serve on campus and off-campus families.

Elementary School Pods
The existing elementary school "pods" were designed and constructed in the 1970's using an open plan concept. The broad building footprint, lack of a ventilated attic space and intermittent demising walls added over the years inhibit cross ventilation. The current teaching method is also not supported by the open plan concept. As they exist now the elementary "pods" do not respond to the Congolese climate or TASOK's educational goals. Three options were investigated to address these issues, as shown on the following pages.

New Administration Building
Increasing enrollment will require the addition of two High School Classrooms, and Forest Preservation Zones and other important campus open spaces will limit areas for development. A new Administration building located at the southern end of the drop-off loop would be centrally located between the elementary school, middle school and high school facilities and create an obvious destination for visitors to the campus. This would allow the existing administration building to be converted into high school classrooms appropriately located in the midst of other high school classrooms.

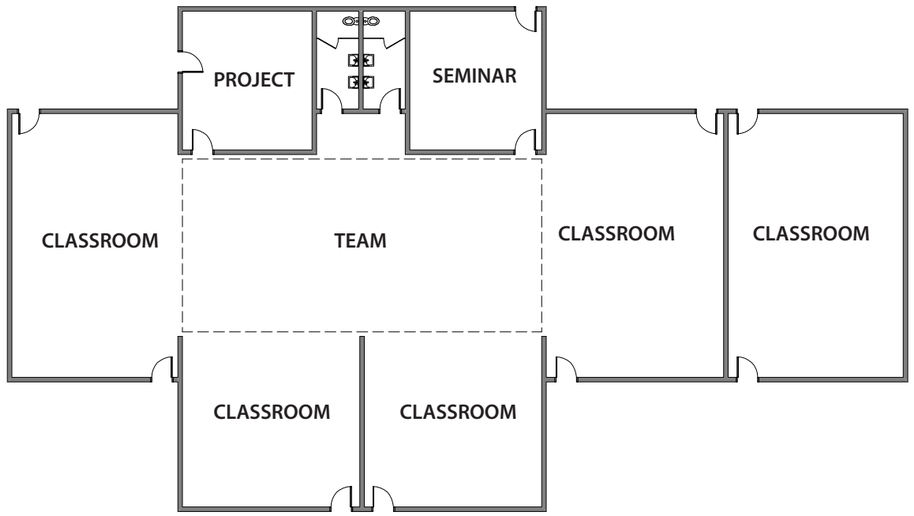
Classroom Renovations
(See the section entitled The First Step)

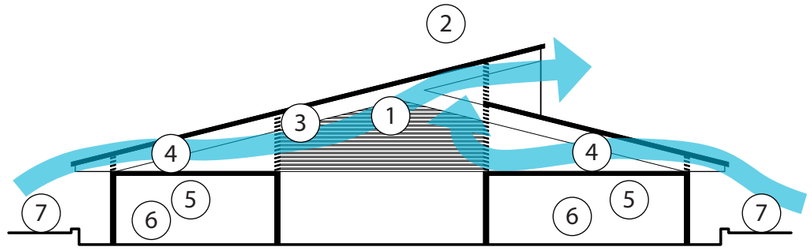
Library
TASOK currently has approximately 6,000 volumes in the elementary school library and 12,000 volumes in the high school library. One-third to one-half of the titles are out of date. Renovations to the high school library would include a "walk-in" computer lab for students, a soft seating area for reading and informal gathering, a display area for student exhibitions, announcements and display of new resources, and a reduced area for stacks (as more titles are provided electronically). The library could be more student centered with meeting spaces for student clubs. The library should move to an electronic collection, possibly using electronic reading devices, like Amazon's Kindle or Apple's iPad to supplement and ultimately replace its print collection. A digital library could improve student access to substantially more volumes than could be accommodated at TASOK.

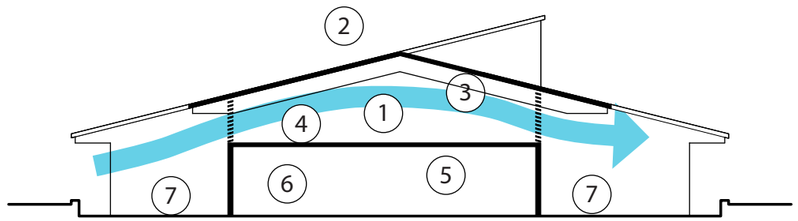
New Outdoor Facilities
New outdoor facilities would include a wading pool, tennis courts, forest classroom, and improved elementary school playgrounds.

Elementary School Pods: Options for the Future

(Updated October 2016)







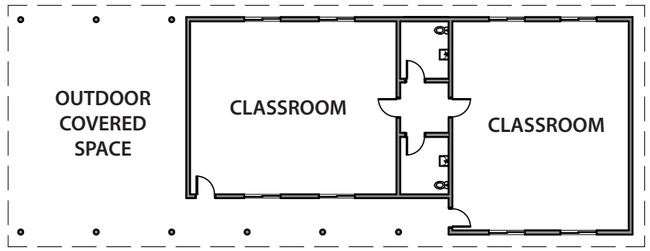
Restore the "Pods"

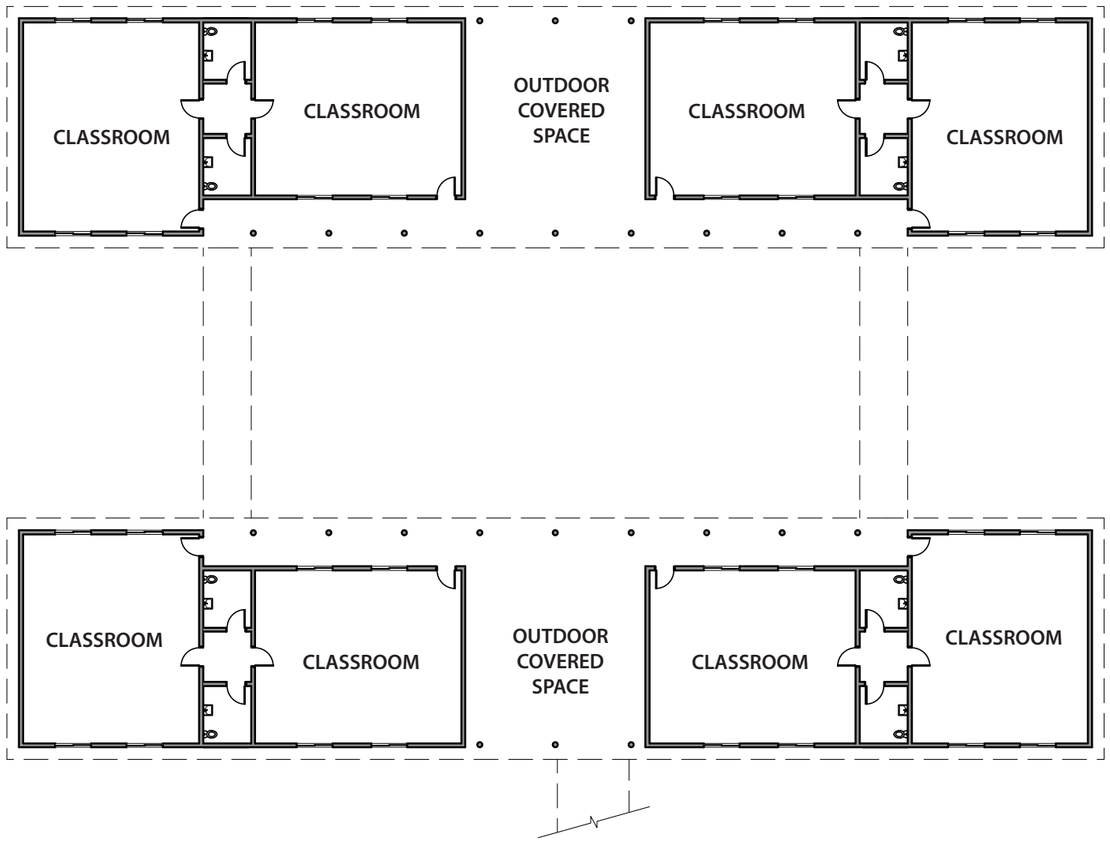
Restore the "pods" to the original open plan design concept. This approach would improve cross ventilation, provide more daylight and views to the center of the building, and encourage collaboration and team teaching among elementary school teachers. The buildings would function as originally intended.

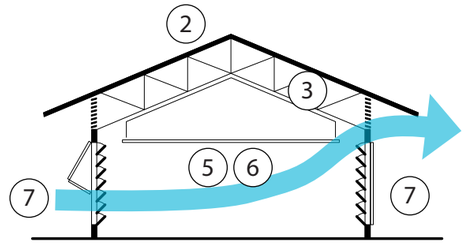
1. **Attic ventilation:** Provide ventilation at roof eaves and ridge to use the "stack" effect of rising hot air to induce a natural air flow through attic spaces thereby keeping them cooler.
2. **Thermally insulated metal roofing**: Replace the existing corrugated asbestos roofing with structural insulated metal roofing. The structural roofing can be attached directly to steel trusses in the same spans as the existing roofing, they can serve as a substrate for photo voltaic panels, the insulation will reduce heat gain in the attic, and the metal surface can be used to direct rainwater to a rainwater collection system.
3. **Steel roof trusses:** Replace existing wood trusses with new steel trusses. Wood trusses are combustible and susceptible to termites.
4. **Thermally insulated classroom ceiling**: Provide thermal insulation at the classroom ceiling to inhibit heat transmission from the attic space and retain cool air from the "split" system. The system could consist of fiberglass batts between 2x6 light gauge metal framing purlins spanning between trusses.
5. **Acoustical treatment:** Provide surface mounted fiberglass acoustic panels. The high humidity of the Congo causes mineral fiber acoustic ceiling tiles in a suspended grid to sag and ultimately fail.
6. **Direct/indirect lighting fixtures**: Provide pendent mounted direct/indirect high efficiency lighting fixtures that direct 50% of the light upward to be reflected off the ceiling and 50% downward for task lighting. This approach maximizes lighting distribution, provides more even light levels, reduces glare from lighting fixtures and creates a more appropriate lighting for an educational environment.
7. **Operable metal windows:** The existing windows are either a casement/fixed combination or jalousie. The casement/fixed combination has been retrofitted with a mylar film to maintain the integrity of the window in the event it is shattered. Unfortunately the film reduces light transmission and views to the outdoors. Install new aluminum windows with low-E laminated glass to reduce heat gain and provide clear safety glazing at all classrooms

Elementary Classrooms: Options for the Future

(Updated October 2016)







New Elementary Classrooms

Raze the existing elementary classrooms and build new classrooms that better reflect today's teaching methods, have a narrow building footprint and ventilated attic (like the proposed renovated classrooms described in the section entitled The First Step) to promote cross ventilation, provide natural day lighting and become self-sustaining. Outdoor covered areas could serve as group meeting areas and activity areas.

Prototype Classroom Renovations

(Updated October 2016)

STEP ONE COMPLETE

The suggested first step to envision the master plan was to renovate one Middle School Classroom building to become a prototypical, self-sustaining, classroom building for the 21st century.

This approach had the following benefits:

- The investment was small compared to the cost of the overall master plan. An incremental approach is more adaptable to the political uncertainties of the DRC. The renovated building is a tangible example of what would be possible if every classroom building were renovated. Experiencing what's possible first hand encourages people to provide support for the next classroom renovation.
- The prototype exhibits an expected level of workmanship and tested the viability of various building systems.
- As faculty and students use the building, new ideas can be incorporated into the next renovations.
- The first building includes a science classroom and green house connected to the outdoor classroom, emphasizing and solidifying TASOK's identification with the rain forest and environmental issues in general.
- The building is self-sustaining, thereby reducing water consumption and electrical consumption.
- It focuses resources on students. They are the first to benefit from a healthier, more educationally appropriate environment.
- The scope was small enough that the project could be completed with TASOK's own forces.

Prototype Classroom Renovations

ELECTRICAL USE CALCULATION

6.0 kwh/sf/yr x 2,400sf = 14,400 kwh/yr

14,400 kwh/yr x .82 = 11,800 watts (estimated wattage of photovoltaic array panels)

11,800 watts / 15 watts/sf = 800sf (estimated area of photovoltaic array panels)

WATER USE CALCULATION

1.5 gal/student x 50 students x 22days = 1,650 gal/month.

Annual rainwater collection = 4.458 ft/yr x 2,400sf x 7.48 gal/sf = 80,000 gal/yr.

The dry season lasts three months, therefore a storage tank should be equal to:

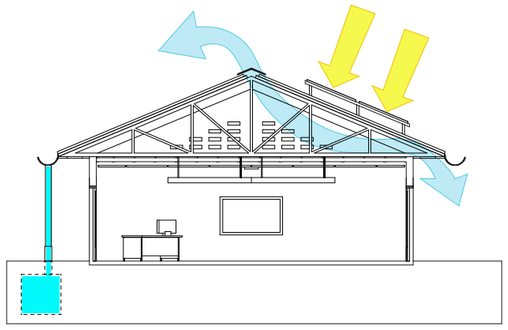
3 months x 1,650 gal/months = 4,950 gallons (say 5,000 gallons),
Cistern size 5,000 x .135cu.ft/gal = 675 cu.ft.

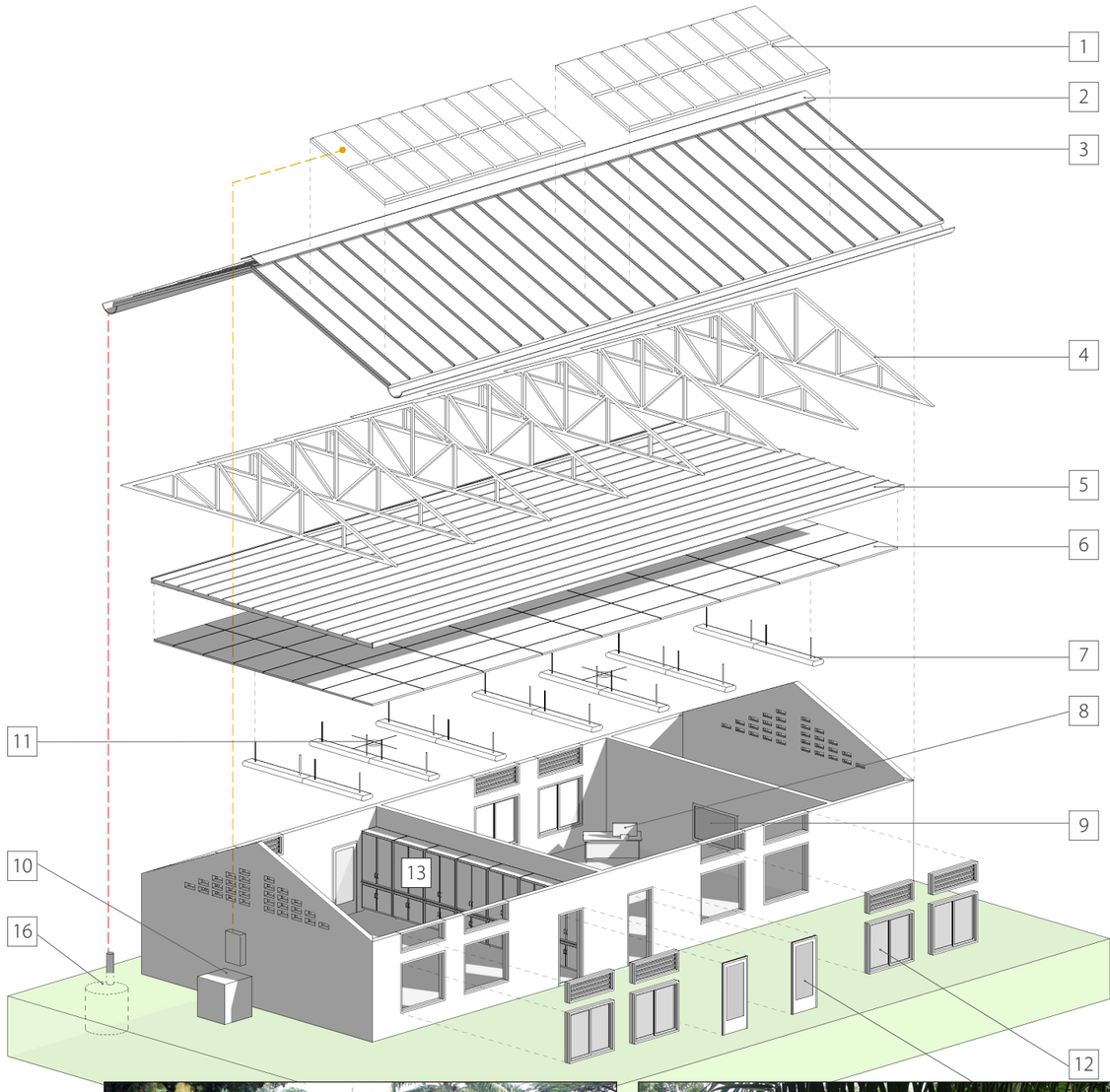
SECTION VIEW

Air movement cools the attic space.

Photovoltaic panels convert energy from the sun into electricity for the building.

Rainwater is collected from the roof and stored in underground cisterns.





1. **Photovoltaic panels**
2. **Attic ventilation:** Provide ventilation at roof eaves and ridge to use the "stack" effect of rising hot air to induce a natural air flow through attic spaces thereby keeping them cooler.
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8. **Wireless and hard wired connection**
9. **Digital projector**
10. **Split system**
11. **Carbon dioxide sensor**
12. **Operable metal windows:** The existing windows are either a casement/fixed combination or jalousie. The casement/fixed combination has been retrofitted with a mylar film to maintain the integrity of the window in the event it is shattered. Unfortunately the film reduces light transmission and views to the outdoors. Install new aluminum windows with low-E laminated glass to reduce heat gain and provide clear safety glazing at all classrooms
13. **Classroom storage:** Classrooms lack adequate closed and open storage for classroom supplies, educational materials and student projects.
14. **Furniture:** The existing furniture generally consists of chair/desk combinations. This type of furniture inhibits team work, makes roundtable discussions difficult, and limits layout options in the classroom. Replace chair/ desk combinations with loose chairs and rectangular two-person tables.
15. **Metal door with glass:** Existing doors are solid wood making them susceptible to termites, difficult to see colleagues as they approach from the other side and challenging to monitor classrooms from outside when doors are closed. Replace the existing doors with glass doors with aluminum rails and stiles.
16. **Rainwater collection system**

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Conclusion

TASOK is blessed with a beautiful campus that is well conceived. The elementary school is separated from the high school/middle school but close enough to create a cohesive sense of campus. Faculty apartments are remote enough from the academic campus to be private but still feel connected by walking paths through the forest. Much of the needed space to accommodate an increase in enrollment already exists but it is outdated and served by a failing infrastructure. The master plan contemplates an incremental re-birth of TASOK. It is an approach that could keep pace with increasing enrollment and be responsive to an uncertain future.

Acknowledgements

Flansburgh Architects acknowledges the invaluable contributions of everyone who attended the many meetings, interviews and informal gatherings during our visit. The conversations gave us a great sense of TASOK and life in the DRC. Thank you,

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Brian Trapp, Maintenance Manager
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TASOK Parent Teacher Committee
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