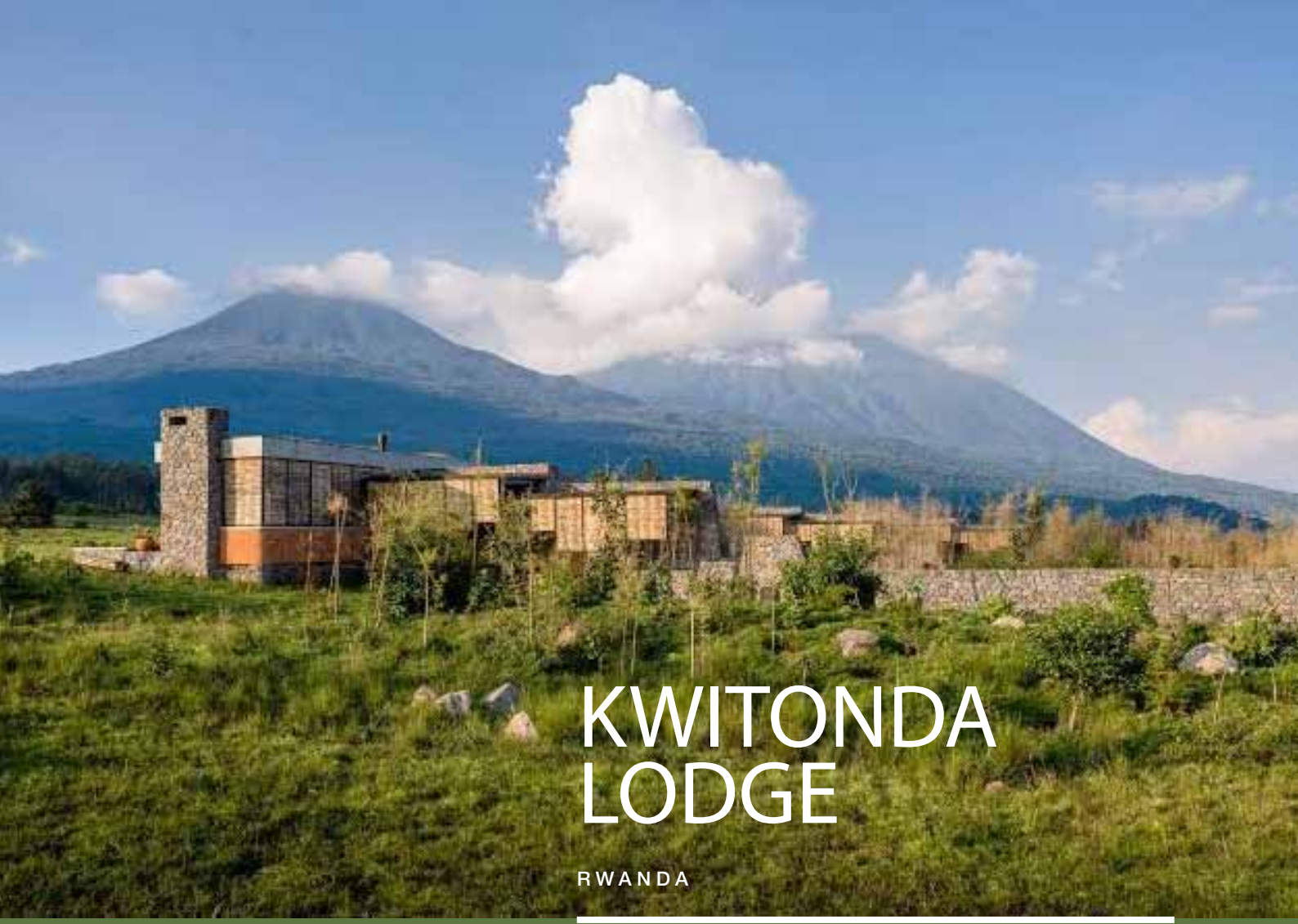


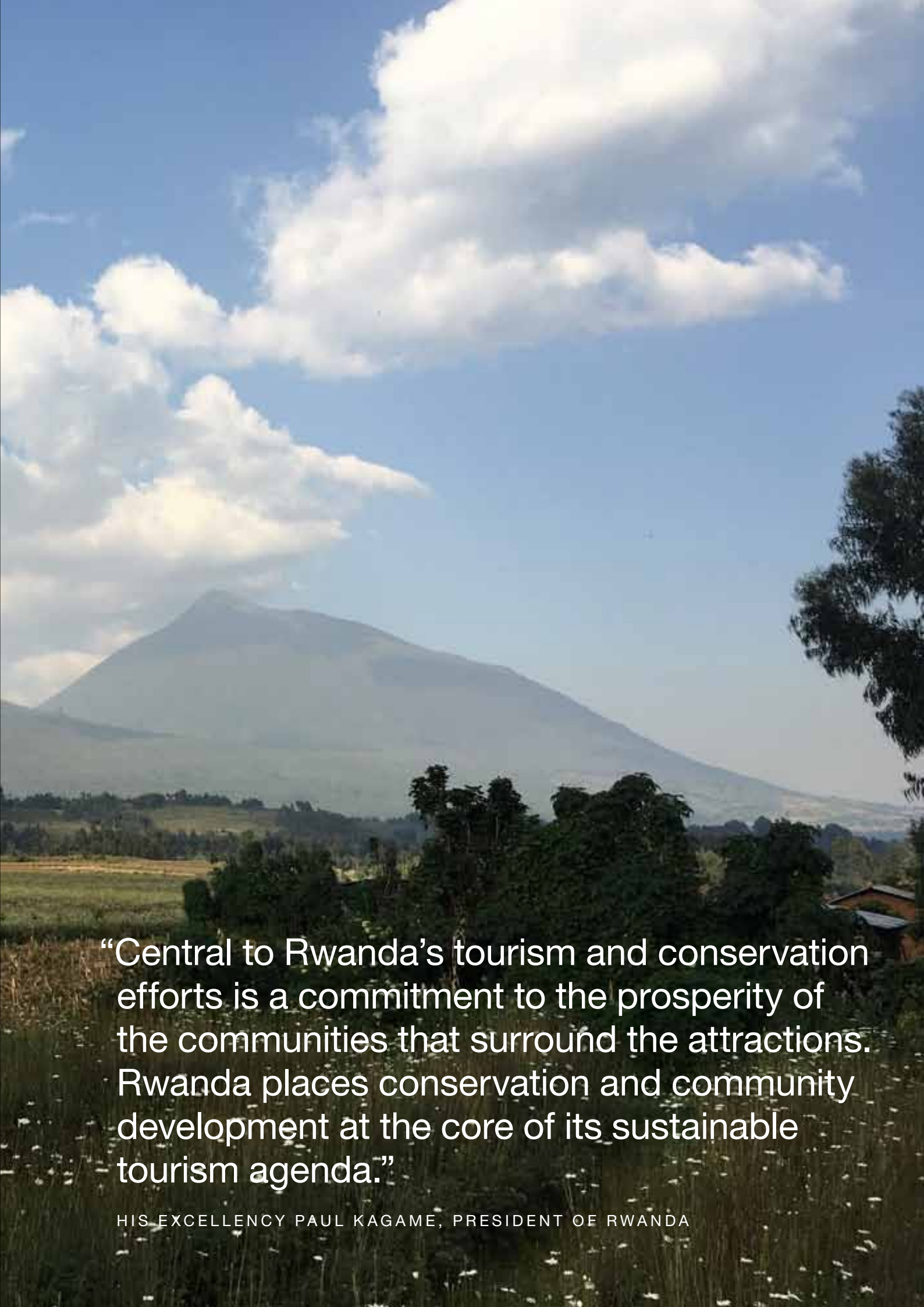
KWITONDA LODGE

RWANDA

DESIGN & DELIVERY SUSTAINABILITY REPORT

25TH MARCH 2020

MILTON



"Central to Rwanda's tourism and conservation efforts is a commitment to the prosperity of the communities that surround the attractions. Rwanda places conservation and community development at the core of its sustainable tourism agenda."

HIS EXCELLENCY PAUL KAGAME, PRESIDENT OF RWANDA

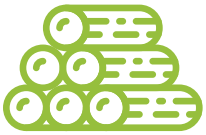
CONTENTS

1 EXECUTIVE SUMMARY

GLOBAL STATISTICS

>700 construction workers received One Planet and Sustainability training

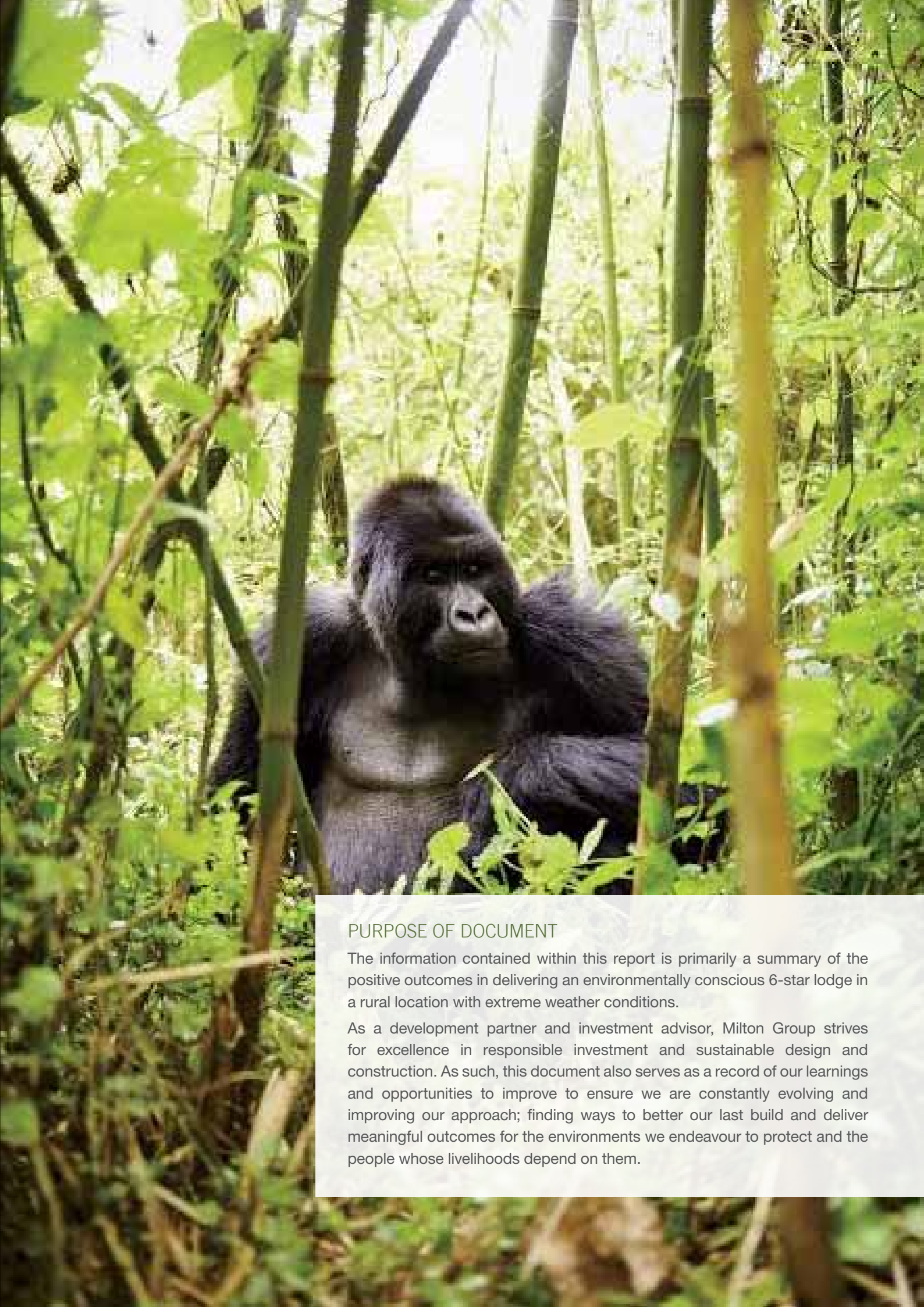
Close to $2 million spent in local community on wages, materials and logistics



70% of building material weight locally sourced

43.56% estimated energy saving through sustainable design

250,000 trees and shrubs planted in Phase 1 of reforestation process



PURPOSE OF DOCUMENT

The information contained within this report is primarily a summary of the positive outcomes in delivering an environmentally conscious 6-star lodge in a rural location with extreme weather conditions.

As a development partner and investment advisor, Milton Group strives for excellence in responsible investment and sustainable design and construction. As such, this document also serves as a record of our learnings and opportunities to improve to ensure we are constantly evolving and improving our approach; finding ways to better our last build and deliver meaningful outcomes for the environments we endeavour to protect and the people whose livelihoods depend on them.

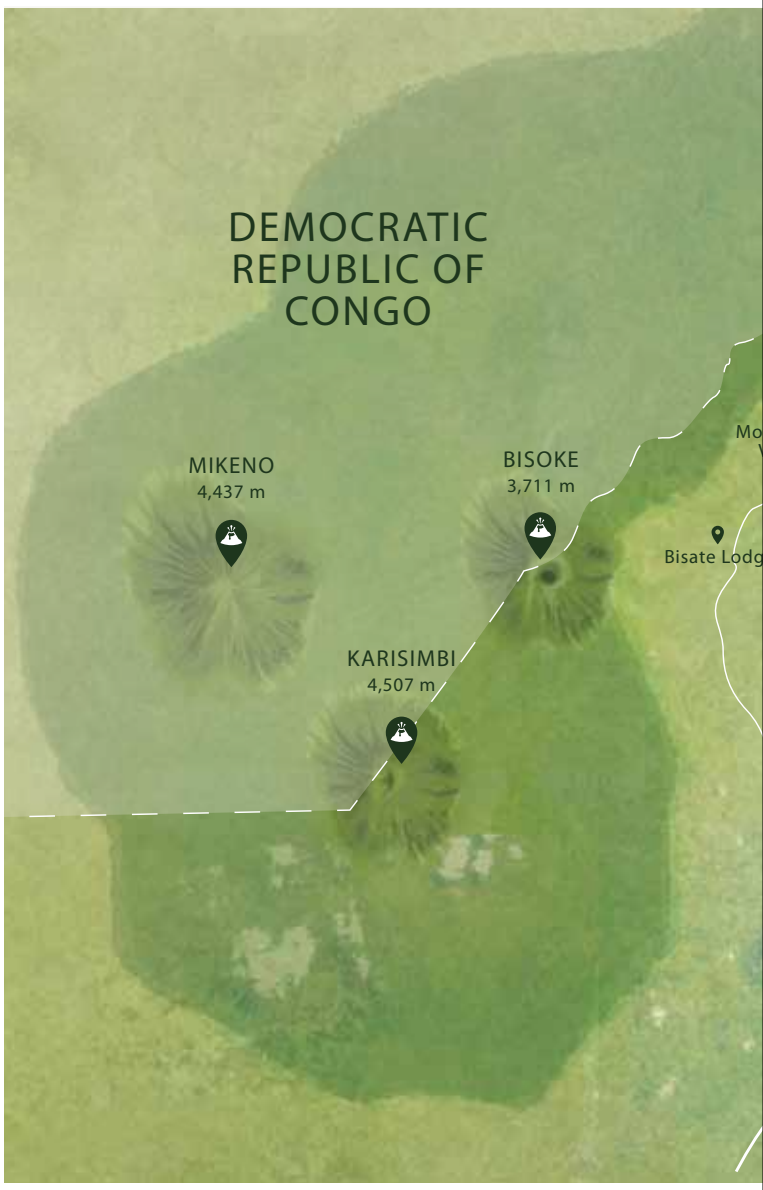
2 PROJECT CONTEXT & INCEPTION

THE VOLCANOES NATIONAL PARK AND MOUNTAIN GORILLAS

Volcanoes National Park is situated in the northwest of Rwanda, and borders Virunga National Park in the Democratic Republic of Congo and Mgahinga Gorilla National Park in Uganda.

Home to five volcanoes and covered in rainforest and alpine bamboo forests, it is best known as the natural habitat for the critically endangered mountain gorilla. Over time, habitat encroachment, as a result of the growing human population and political instability, has pushed these species to a precarious state.

Through a government-led initiative to welcome ecotourism partnerships and investments into the country, Rwanda is working to change the trend in gorilla population decline. Impact investment and sustainable tourism has become the cornerstone for a new era of conservation in the country; safeguarding the future of the mountain gorilla while at the same time helping to grow the country's economy.




UGANDA
SABYINYO
3,645 m
GAHINGA
3,474 m
MUHAVURA
4,127 m
Kidaho
Butaro
Volcanoes National Park
Sabyinyo Silverback Lodge
Volcanoes National Park Headquarters
SINGITA KWITONDA
Kinigi
Lake Burera
RWANDA
Ruhengeri
Musanze
Lake Ruhondo
Mukingo
Nyakinama
N
2 km
5 km
Singita Kwitonda
Europe
USA
East Africa
Kigali
RWANDA
South Africa

Impact investment and sustainable tourism has become the cornerstone of a new era of conservation; safeguarding the future of the mountain gorilla.

2 PROJECT CONTEXT & INCEPTION

A BENCHMARK FOR RESPONSIBLE DEVELOPMENT

The Singita Kwitonda project was born from the personal invitation of His Excellency Paul Kagame, President of Rwanda. Singita, as a hospitality brand, and the investment group behind Kwitonda Lodge, are African leaders in responsible tourism that achieve positive environmental and social outcomes. This reputation has offered the lodge the unique position of being the only project currently located within the 800m buffer zone surrounding the national park. The buffer zone was established to:

- reduce the level of conflict between humans and wildlife living in close proximity
- increase the amount of natural habitat available to the park's endangered primates and other fauna
- create a multi-use zone that can help support local community socio-economic uplift.

As such, the team was granted this privilege with the understanding that the project serves as a benchmark for sustainable tourism operations within this zone through a commitment to:

- an ongoing partnership with the community
- the full rehabilitation and reforestation of the land holdings, with the vision to one day extend the national park boundary and gorilla habitat
- the transfer of skills and knowledge in the management of a high-end lodge operation in a sensitive environment.

Graham Ledger & President Kagame at the ground-breaking ceremony in December 2016

Paul Milton welcomes President Kagame at the opening of Kwitonda Lodge in August 2019

The drive up to the Volcanoes National Park Headquarters through Kinigi Village

The Sculpture Garden at the Volcanoes National Park Headquarters

3 APPROACH TO SUSTAINABLE DEVELOPMENT

MILTON GROUP

Our primary goal is to deliver real social and environmental outcomes through the creation of sustainable business models that focus on tourism and real estate.

We have a global track record working for globally renowned family offices, government agencies and national parks in some of the world's most pristine and iconic natural environments.

By integrating market-relevant asset management solutions with a holistic approach to planning and sustainable development, we are able to unlock value and deliver quantifiable social, environmental and economic returns.

SINGITA

With a legacy of 25 years of conservation, Singita has successfully implemented a sustainable tourism model that preserves vast areas of iconic African wilderness.

Starting with one lodge in the Sabi Sand Game Reserve in South Africa, and expanding into Tanzania, Zimbabwe, Mozambique and now Rwanda, Singita's model of using unforgettable safari experiences to support its conservation and community development efforts makes the company a leader in the conservation tourism field.

Its inspirational 100-year vision includes an expansion strategy that will see Singita spreading its reach further into Africa, broadening its efforts in continuing to safeguard vulnerable sites and species. Integral to this work are Singita's strategic partnerships – relationships with donors, investors and individuals, which further the agenda of protecting Africa's most pristine areas.

- Health and Happiness
- Equity and Local Economy
- Culture and Community
- ~~Land and Nature~~
- Sustainable Water
- Local and Sustainable Food
- Travel and Transport
- Materials and Products
- Zero Waste
- Carbon Energy

One Planet Principles

ONE PLANET LIVING® – A HOLISTIC APPROACH TO A SUSTAINABLE COMMUNITY

The design, development and operation of Singita Kwitonda aimed to reduce its environmental footprint by taking a holistic approach to sustainability.

The development team, led by Milton Group, and Singita, as the hospitality management company, adopted the internationally recognised One Planet Living® framework. Developed by Bioregional UK, the framework uses 10 sustainability principles that provide a clear and actionable approach to creating, implementing and monitoring the performance of a sustainability community and has been applied to the full project lifespan.

As the appointed developer of Singita Kwitonda lodge, Milton Group's goal was to deliver an internationally recognised 6-star tourism product that promoted community partnerships, restored the natural functions of the land and reduced the overall operational footprint by adhering to internationally recognised One Planet framework.

Through buildings that respond to the local climate, the design maximises passive heating and cooling, and reduces energy and water consumption.

A typical guest suite

3 APPROACH TO SUSTAINABLE DEVELOPMENT

SUSTAINABLE DESIGN AT KWITONDA LODGE

A specialist consultant team with extensive experience in sustainable design applied the One Planet principles to reduce the environmental impact of the built environment.

Through buildings that respond to the local climate, the design maximises passive heating and cooling, and reduces energy and water consumption.

By promoting the use of locally available materials, the design aesthetic inspired by traditional Rwandan architecture and a large percentage of the construction spend stayed within the local community. Responsibly sourced and rapidly renewable construction materials has ensured that the overall environmental footprint of the development has been reduced.

Two digital modelling tools were used to test the efficiency of the built environment at the design stage.

1. Thermal Modelling

A digital thermal modelling exercise was conducted at the design stage to achieve an energy-sustainable building through an iterative process of building shell optimisation.

By simulating the real on-site climatic conditions, the team was able to integrate a number of passive design solutions to capture solar energy in the cooler months and repel solar energy in the hotter months.

The core objectives were to:

- promote the use of passive heating through solar gain
- promote cooling through passive ventilation
- reduce the building's dependency on mechanical equipment (such as air conditioning, lights, solar electricity generation) and thereby reduce capital costs and ongoing operational costs.

The ultimate goal was to identify the number of days per year where the buildings were outside an acceptable climate set point of 21 to 24-degrees.

2. Edge Model

EDGE (Excellence in Design for Greater Efficiencies) is an online platform, a green building standard and a certification system for more than 160 countries. The EDGE application helps to determine the most cost-effective options for designing green within a local climate context.

It uses a locally established construction benchmark as a comparative tool to determine the rate of improved efficiency for a proposed new construction.

An EDGE model was developed for the project at the design stage to assess its overall energy and water performance.

3 APPROACH TO SUSTAINABLE DEVELOPMENT

ONE PLANET CONSTRUCTION MANAGEMENT PLAN

Using the 10 One Planet principles, a sustainable construction management plan was designed to minimise negative environmental and social impacts of the construction process.

The plan focused on key areas such as:

- protecting the natural environment from construction disturbance through careful construction staging, erosion control, water management and habitat protection
- identifying responsible material supply chains
- reducing waste and promoting its adaptive reuse within the local community
- monitoring the consumption of natural resources such as power and water
- ensuring the fair and equitable employment of local workers and a safe working environment
- raising awareness locally about environmental challenges and opportunities.

PRINCIPLE	ITEM	NOTES / DESCRIPTION
ZERO CARBON	Grid connected	100% hydro supplying local grid.
	Diesel generators	Keep well maintained for improved efficiency and record deisel consumption.
	Energy efficient construction lights	No working at night.
	Energy efficient lights in site offices and workshops	Install throughout.
	Turn off office equipment	End of each day.
	Monitoring	Generator usage.
		Electrical consumption zonal metering of consumption; office, equipment etc…
ZERO WASTE	On site recycle station to sort waste	Sorting: plastics, paper and cardboard, metals, food waste, construction waste.
	Construction waste re use strategies	Identify ways to re-use construction materials on-site and/or in the local community.
	Training construction workers on recycling and waste	Training of all worker (casuals and permanent) on the waste sorting program. Identify ways to encourage creative ideas for waste reuse.
	Monitoring	Weigh all waste by category and determine amount recycled.
SUSTAINABLE TRANSPORT	Consolidate worker transport to and from site	Currently 1 tarnsport trip for workers per day. Workers stay on site for lunch.
	In-house construction vehicle logistics	Consolidate, use return journey for waste.
	Supply vehicle logistics	Identify ways to consolidate external supply vehicle traffic. Offer incentives to suppliers to take away waste on empty trucks.
	Consultant travel & transport	Reduce the requirement for multiple consultant visits. Plan and consolidate on-site tasks. Consultants to stay longer and come less frequently.
	Monitoring	Log books to track mileage, travel purpose and fuel consumption.

PRINCIPLE	ITEM	NOTES / DESCRIPTION
SUSTAINABLE MATERIALS	Maximise use of local materials and green alternatives throughout construction	Identify local or green alternatives without reducing quality.
	Monitoring	Contractors to track quantities of key materials and distance transported to site.
	Supplier training	Speak to suppliers about intent and encourage supply of sustainable materials and rehabilitation of ground extracted materials such as sand and aggregates.
	Harvest on-site timber	Collect any timbers that could be used as construction material on site such as eucalyptus trees.
	Harvest on-site stone	Harvest and stockpile any loose surface stones for re-use as edging or walls.
	Harvest on-site boulders	Harvest and stockpile any large boulders for re-use in the landscape.
	Temporary materials - e.g. shuttering	Ensure stored carefully for reuse.
	Green office supplies	Recycled paper, green cleaning products etc..
LOCAL AND SUSTAINABLE FOOD	Encourage healthier choices on site for construction workers	Workers eat daily on site. Ensure food waste is separated and reused in local community.
	Encourage healthier choices on site for construction management team	
SUSTAINABLE WATER	Harvest Rainwater and re-use on-site	Harvest water off roofs of site offices, workshops and canteen. Store in holding tanks and define applications for reuse.
	Protect hazardous materials storage zone to prevent water contamination	Use secure containers with earth bunding around. Correct contaminated soils with reagents.
	Toilet facilities	Ensure proper and safe wastewater mangement.
	Training & signage	Training on daily ways to reduce water consumption. Signage reminding workers to turn taps off, when to use rainwater etc..
	Monitoring with water meters	Use data to determine ways to reduce consumption on future sites.
LAND USE AND WILDLIFE	Fence off site not to be affect by construction	Chain wire fencing to reduce construction spilling into adjacent landscape
	Erosions & sediment control	Silt fences to be installed to protect watercourses Erosion and sediment control measures to be installed around material storage zones. Inspect after each storm event.
	Temporary drainage	Install temporary / permanent drains and catchment areas to site and along access roads.
	Tree protection	Fence off specimen trees to be protected.
	Define clear site operations and staging zones	For material setdown, vehicle turnaround, parking, waste storage, stockpiling, recycling etc…
	Construction paths	Define clear construction pedestrian and vehicle paths between construction zones.
	No food scraps to be left available for scavengers	No feeding wildlife.
	Reduce construction noise pollution	Maintain equipment in proper working order and install mufflers where necessary.
	Construction driver training	Set speed limits and load restrictions.
	No blasting	No use of explosives.
	Invasive species	Ensure topsoil and plant stock is not carrying invasive species.
	Revegetate disturbed areas	Revegetate any areas affected by construction (intentionally or accidentally) during construction.
	Quarry rehabilitation	Ensure murram pits and quarries are rehabilitated by local suppliers.
	Road maintenance	Ensure roads affected by increased traffic are being maintained.
	Education & training	Simple do's and don'ts on site.

3 APPROACH TO SUSTAINABLE DEVELOPMENT

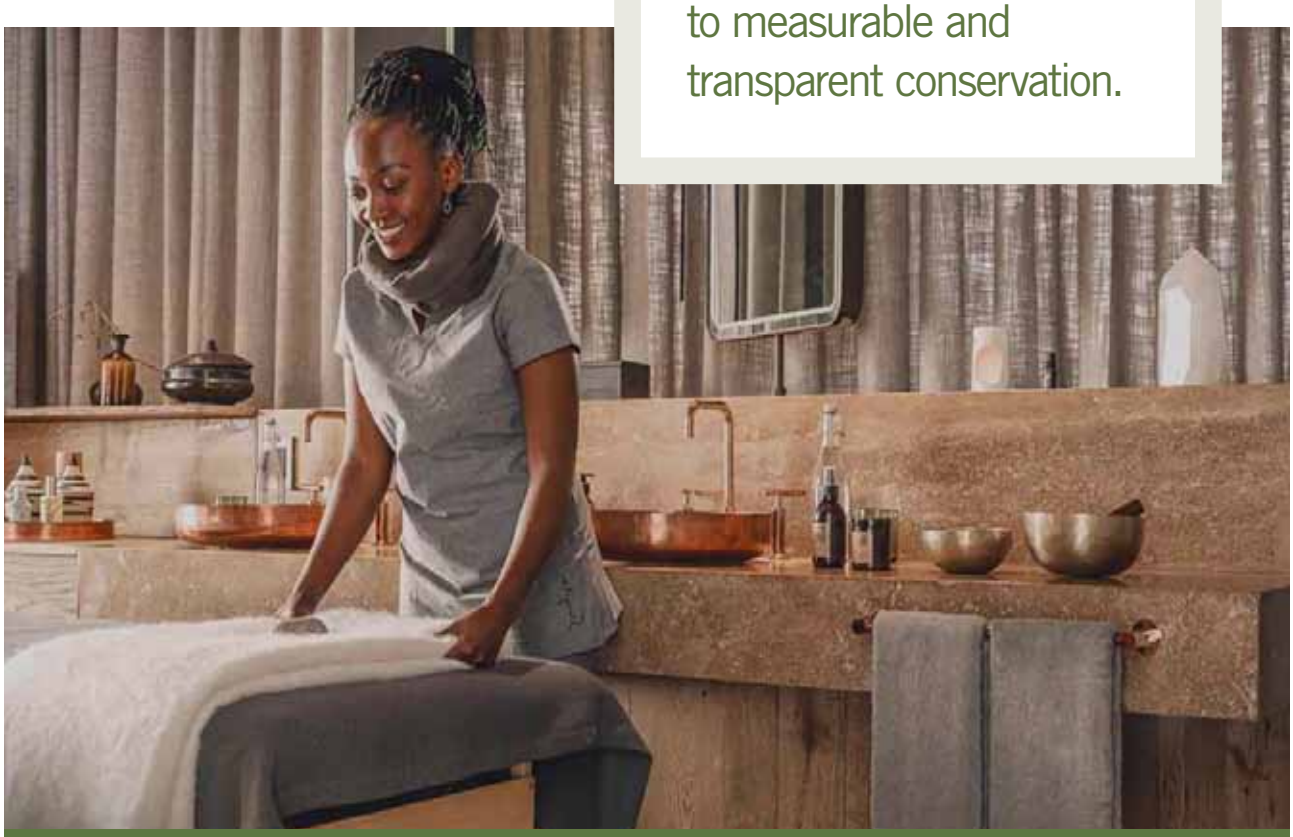
PRINCIPLE	ITEM	NOTES / DESCRIPTION
CULTURE AND COMMUNITY	Provide sustainability training and induction to all workers	Define easy, locally relevant way.
	Environmental education	Educate communities about why the project is going ahead and what sustainability measures are being practiced.
	Photographic record of project	Take images throughout project. Consider installing a giro-camera for timelapse images.
EQUITY AND LOCAL ECONOMY	Training	One Planet training for all workers.
	Local produce for site workers	Buy locally for worker meals.
	Employment	Maximise local employment opportunities in construction and logistics.
	On-job skills training	Ensure contractor has mechanisms in place to train workers in formalised apprenticeship approach.
	Wages	Prompt payment & fair wages.
	Local business	Where possible seek ways to buy locally and/or potential for start up businesses.
	Gender equality	Provide female only facilities and seek ways to expand female employment opportunities.
HEALTH AND HAPPINESS	On-site safety	Adhere to national standards: warning signs, warning tapes and barriers will be used onsite to warn workers and the public of ongoing construction works and dangerous areas. HSE induction courses to be conducted with all workers on commencement of the project and further regular safety training sessions to be done before the start of all construction operations.
	First aid kit	Clearly visible and accessible. Dedicated first aid room.
	Safety equipment	Provide necessary construction safety equipment such as safety boots, helmets, gloves, and reflective jackets during all times while at work.
	No smoking	No smoking on site.
	Health check ups & awareness	Can we extend health check up program to all workers?
	Staff satisfaction	Engagement: Suggestions opportunities, competitions etc.
	Monitoring	Safety. Engagement survey. Repeat throughout process to track improvements and employee satisfaction.

SUSTAINABLE OPERATIONS

Through a partnership with Bioregional UK that commenced 2012, Singita has committed to real and measurable sustainability practices across its portfolio of properties.

Singita will use this experience to create a context-sensitive approach to the management of a sustainable tourism community. A set of baselines and targets covering areas such as water, energy, waste management, supply chain integrity and employee health and happiness will be measured to track and quantify performance.

Being a partner in One Planet Living means that as a recognized example of One Planet Living principles, Singita Kwitonda Lodge will be subject to ongoing external performance audits and monitoring of its practices as part of its commitment to measurable and transparent conservation.



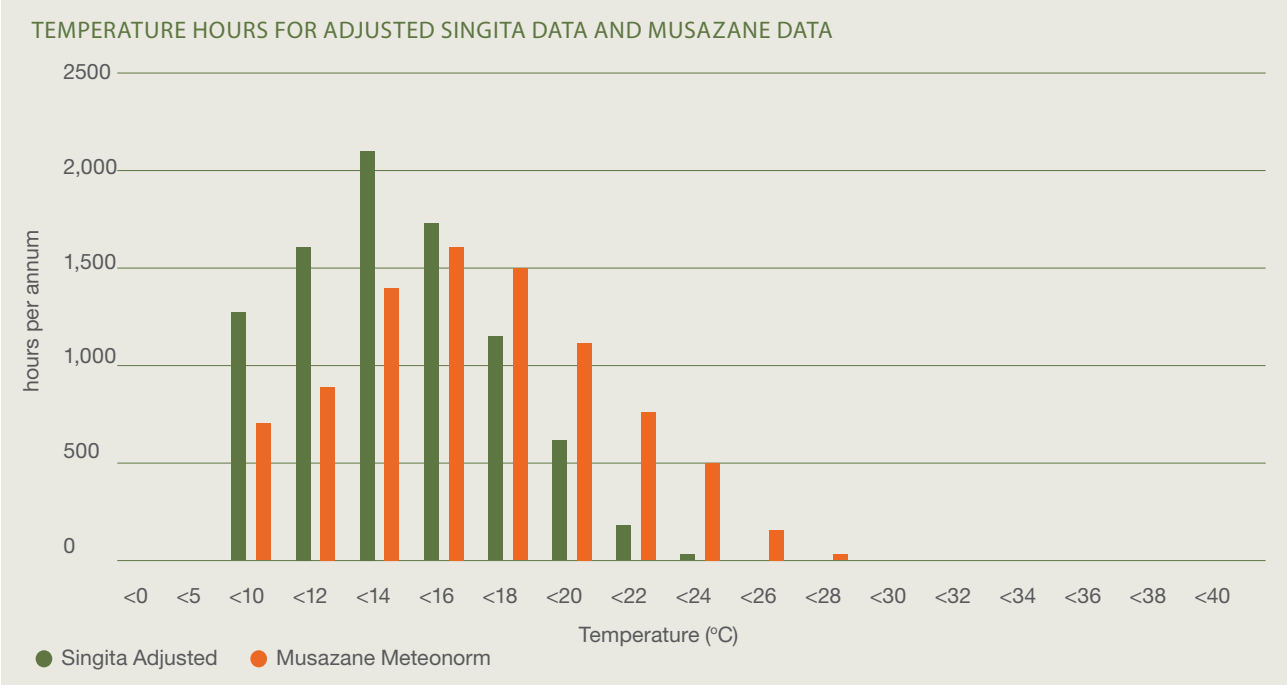
Sustainable operations at the Singita Kwitonda Lodge

4 CLIMATE & DESIGN ASSUMPTIONS

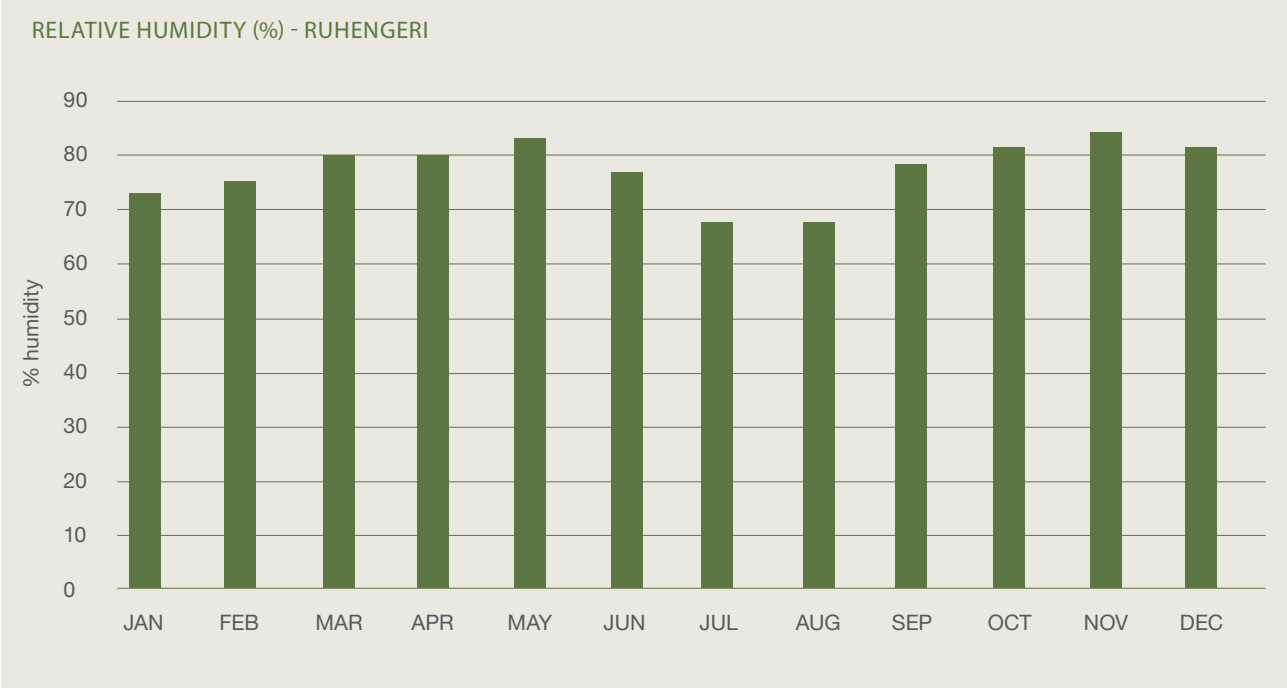
CLIMATE

Meteonorm weather data was used and adjusted according to the nearest measured data to the project site - a Kinigi weather station located 3 km from the site, which has recorded data intermittently over the past 7 years. The monthly maximum temperatures ranged between 19.3-23.2˚C and the monthly minimum temperatures ranged between 5.1-7.8˚C. Elements software was used to adjust Meteonorm data based on the dry-bulb temperatures measured at Kinigi. The relative humidity was kept constant during the adjustment.

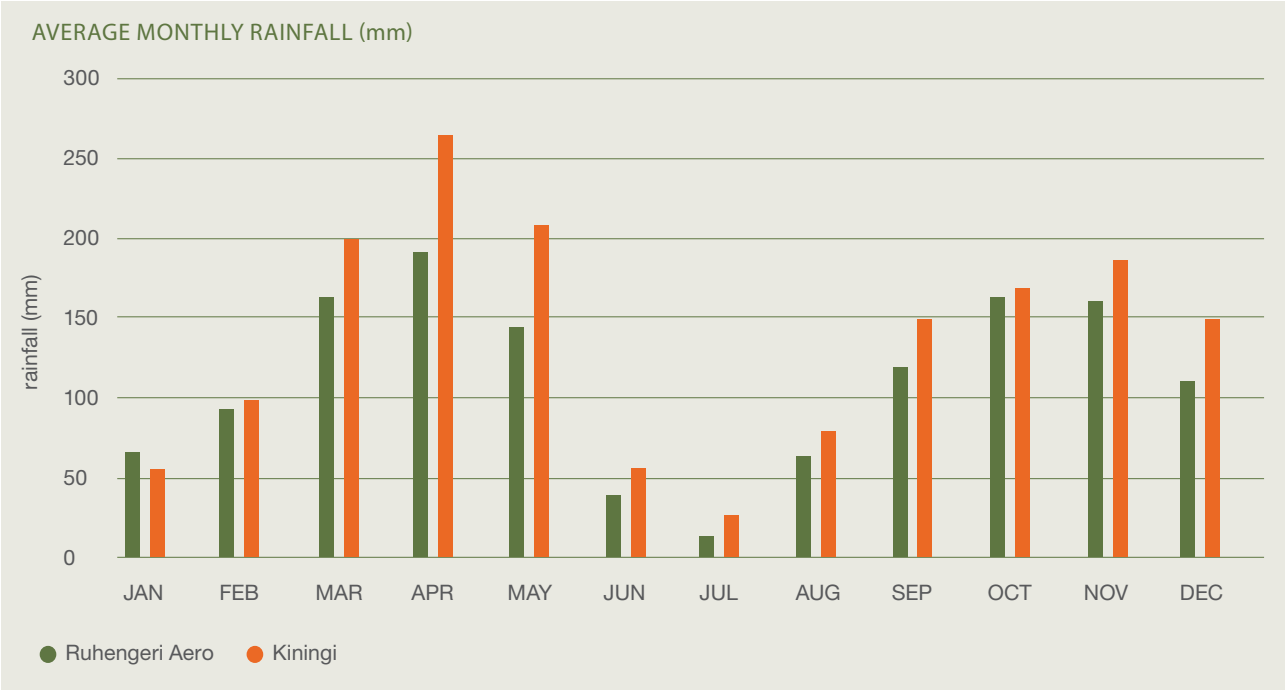
Temperature



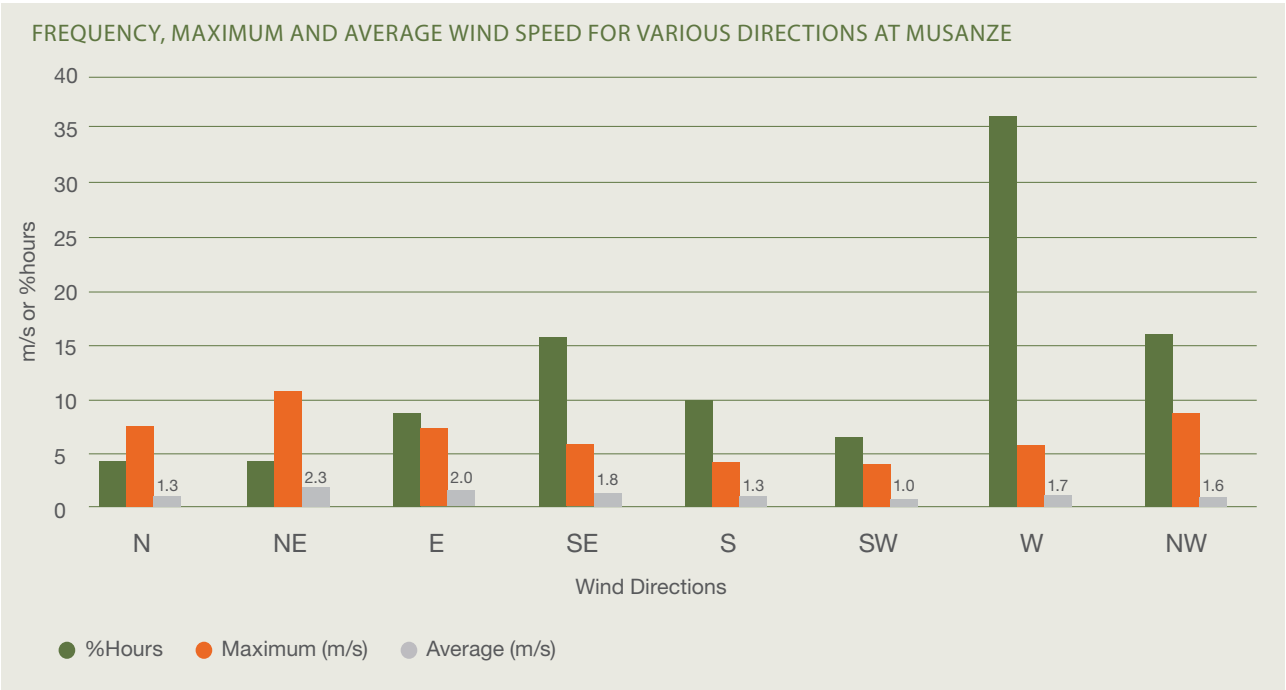
Humidity



Rainfall



Wind



4 CLIMATE & DESIGN ASSUMPTIONS

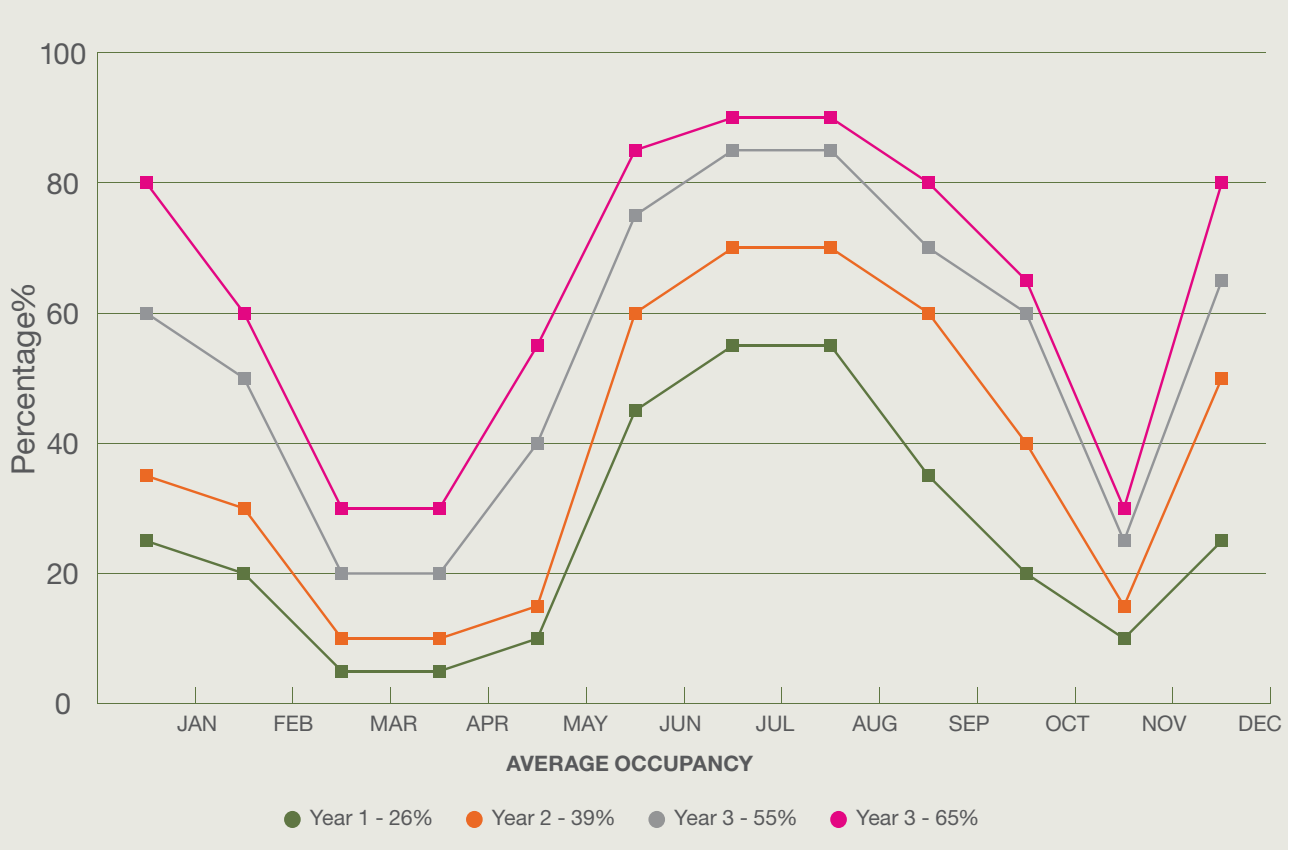
DESIGN ASSUMPTIONS

The following high-level design assumptions were used at the commencment of the design. It is important to note that these statistics were subject to change as a result of design and investment variables and decisions taken as part of any normal construction process.

INTERNAL BUILT AREAS	
Main Lodge	664 m2
Guest Suites	83 m2 per unit
Villa	516.3 m2
Service Core	314 m2
Staff Accommodation	599.2 m2

OCCUPANCY RATES ASSUMPTIONS	
Average occupancy rate at stable state	65% guest + 4% staff inspections
Average Villa occupancy rate at stable state	50%

PROJECT POPULATION	
Total guest population	18
Owner / Villa Population	8
Total staff population on site	52
Total estimated staff population with accommodation on-site	24
Total estimated staff population on duty in Main Lodge (FoH & BoH)	
Day shift	approximately 25
Night shift	approximately 13
Total staff population on duty in Service Core & BoH Areas	approximately 15



Eastern entry to the Main Lodge in typical Kinigi weather conditions

5 SUSTAINABLE DESIGN & CONSTRUCTION

5.1 ZERO CARBON

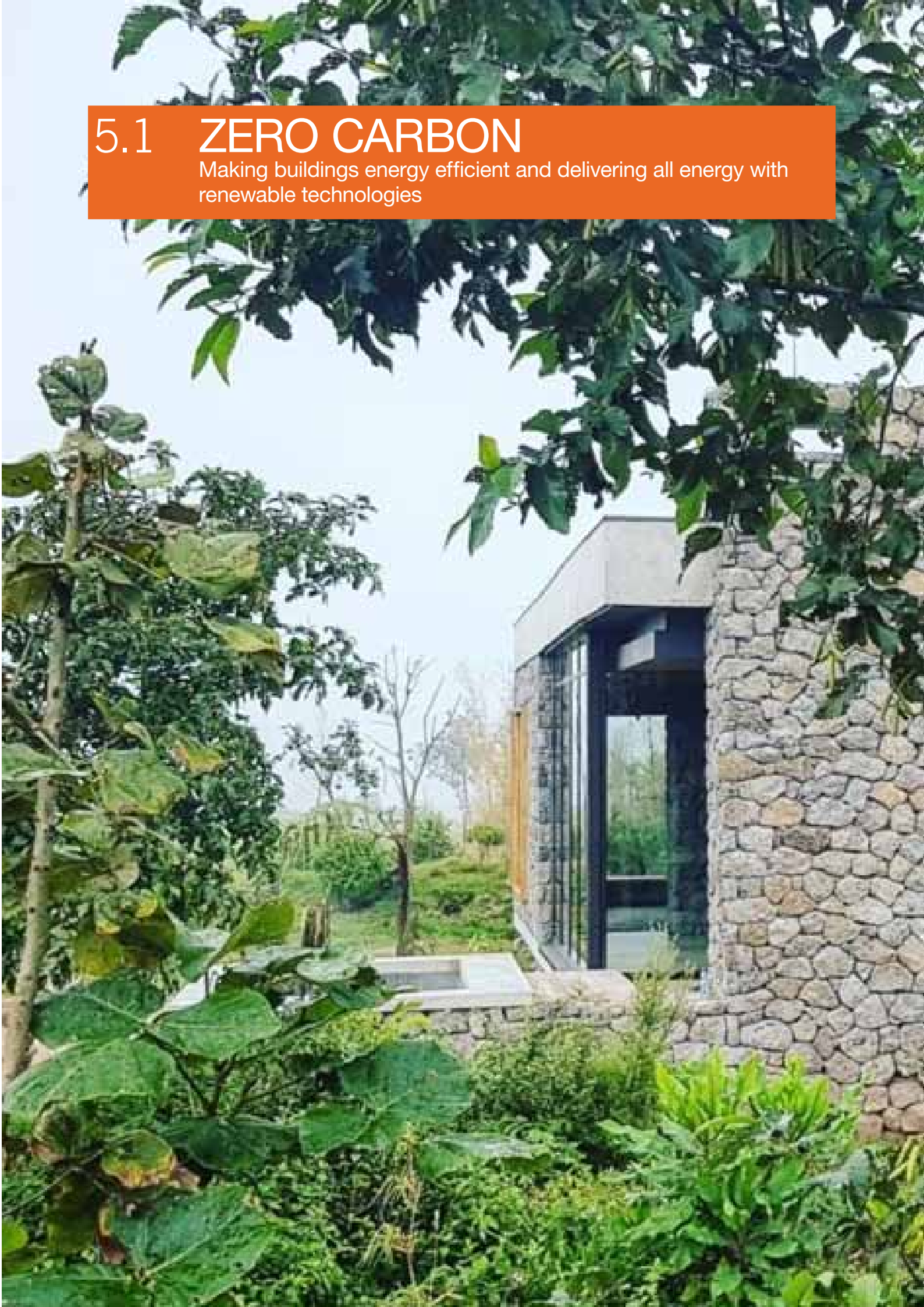
Making buildings energy efficient and delivering all energy with renewable technologies

POSITIVE OUTCOMES

- 43.56% project energy saving (projected using EDGE).
- No mecahnical cooling.
- Space heating delivered through radiant underfloor heating.
- Space and water heating powered by hybrid solar thermal and air source heat pump system.
- 100% LED lighting to interiors.
- 100% LED landscape lighting.

OPPORTUNITIES

- Reduce embodied carbon footprint and natural resource extraction impact through reduction in use of concrete.
- Offset embodied carbon footprint of development through purchase of conventional offset schemes or investing in off-site solar farm.



5.1 ZERO CARBON

Making buildings energy efficient and delivering all energy with renewable technologies

EMBODIED CARBON

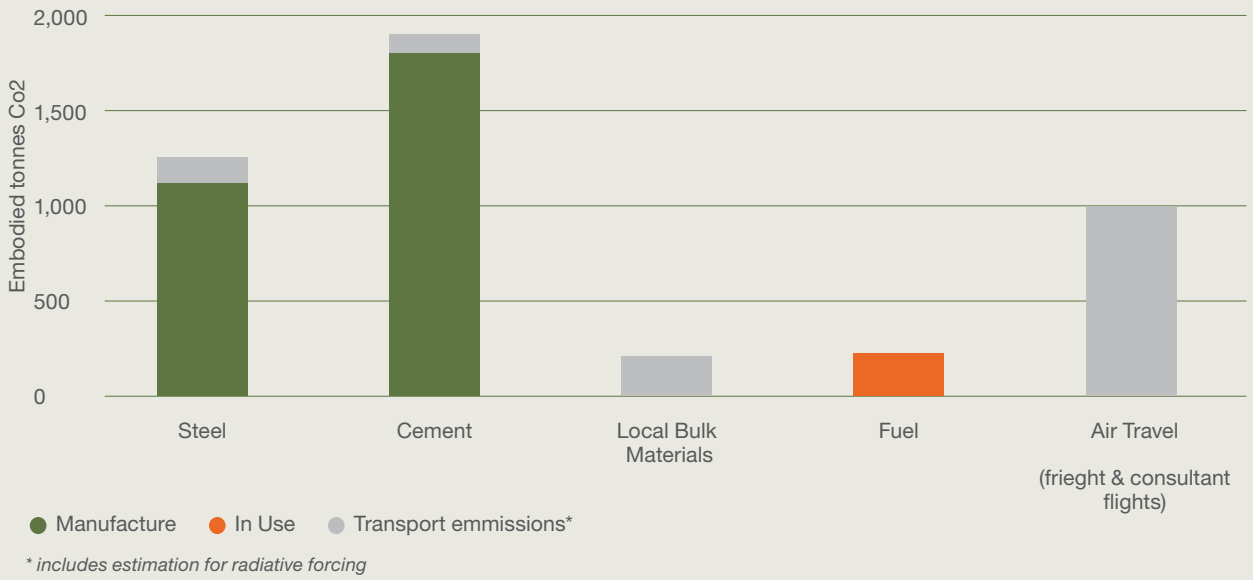
The total embodied or up-front carbon emissions are approximately 4,600 tonnes CO2eq. This was based on the most recent estimates of embodied carbon of construction materials from the Circular Economy Institute and the University of Bath.

This is a minimum estimate base and only includes the major construction materials. No fittings or finishings were included.

An analysis revealed:

- the steel and cement accounted for about 70% of the embodied carbon
- over 43,000 tonnes of materials were transported to site
- transporting the materials to site required around 150kL of fuel, costing more than $200,000
- air freight of materials and consultant travel accounted for over 20% of the project's embodied carbon.

BREAKDOWN OF EMBODIED CO2 EQ — 4,600 TONNES



** includes estimation for radiative forcing*

5.1 ZERO CARBON

Making buildings energy efficient and delivering all energy with renewable technologies

BUILDING SHELL

Steel & Concrete

The harsh and wet environment led the team toward a design that relied heavily on concrete. However, the design team employed several strategies to reduce the extent of concrete, including:

- a steel frame structure that utilised local materials as wall infills
- permanent aluminium decking on the floor slabs, roof slabs and external boardwalks to reduce the overall concrete slab thickness
- polished concrete finishes were limited to a feature treatment only.

Despite the above strategies, the built form can still be considered as relatively 'heavyweight' with steel and cement accounting for approximately 70% of the project's total embodied.

Further opportunities to reduce the overall weight and mass of the buildings could have been explored, including:

- reducing the building mass on the northern / volcano-facing façade
- a lighter entrance canopy structure
- reducing the extent of concrete supported green roofs, for example over the covered terraces
- selecting a lighter structural detail for outdoor terraces, for example raised timber decks
- reducing height and extent of external stone screen walls through alternative materials and focusing on soft landscape treatments earlier in the project
- reducing external concrete through selecting a different boardwalk material.

Core building shell construction; steel frame and concrete slab roof

with permanent shuttering

5.1 ZERO CARBON

Making buildings energy efficient and delivering all energy with renewable technologies

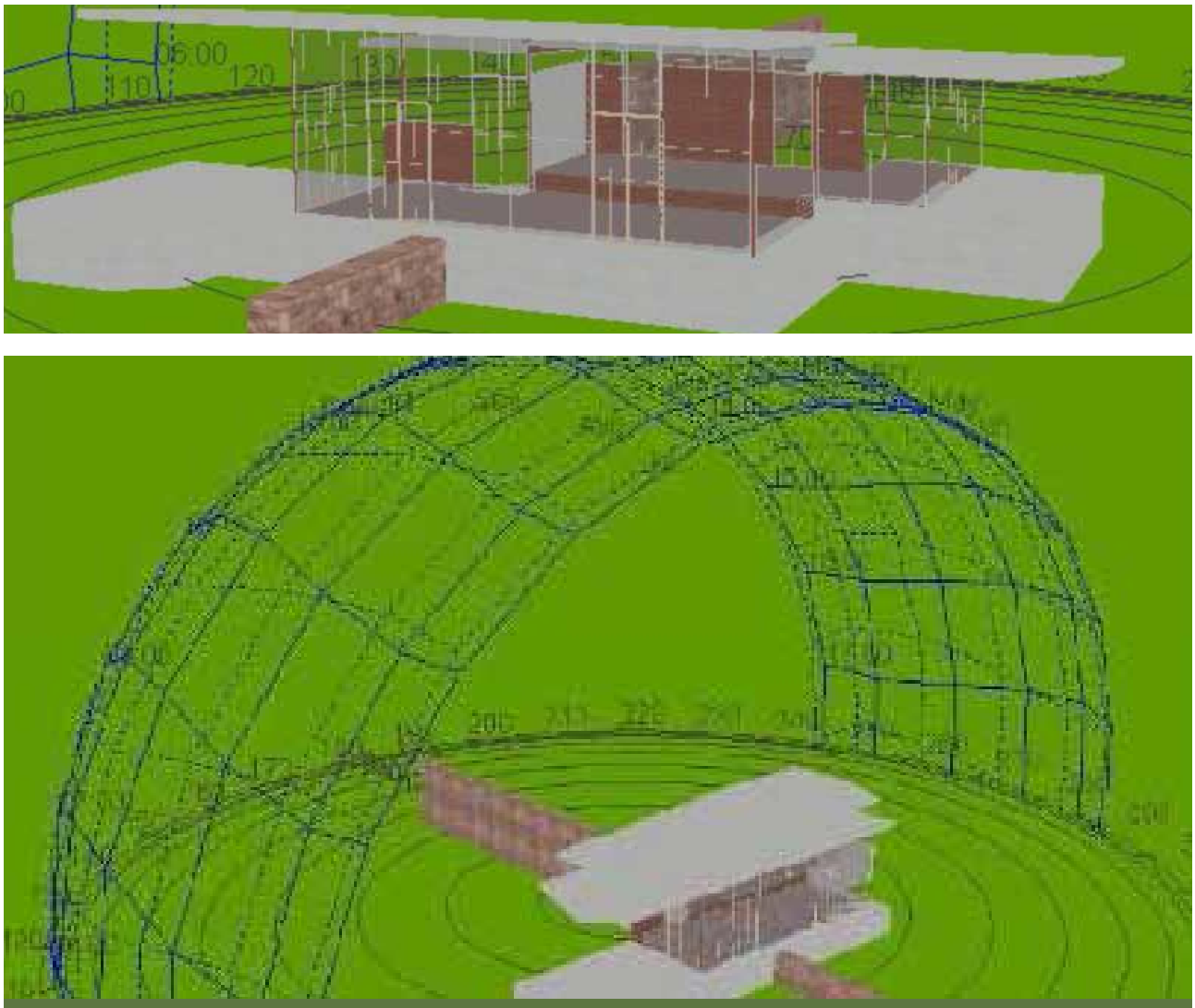
Thermal modelling

During the planning phase, digital software played an important role in the design process and was used to study the local climate and the performance of the proposed buildings within it.

The results were used to inform design decisions in an iterative process, with a core objective of regulating building temperatures by promoting passive heating and cooling.

Key design decisions included:

- glazing specification
- extent of glazing and shading strategies on exposed facades
- insulation profiles and locations
- extent and type of heating required
- mechanically-assisted passive cooling systems.



Thermal Modelling

Windows

- clear Low E Double glazing was used throughout the lodge front of house areas
- thermally broken aluminium frames or wooden frames were used in heated areas to reduce heat loss caused by thermal bridging and minimise internal condensation.

Frame	Composite timber frame including all required seals etc.	Composite aluminum/timber window	Thermally broken aluminum frame
Outer Frame	Outer face accoya timber	Similar to VELFAC system	Similar to VELFAC system
Inner Frame	Inner face FSC rated timber	As above	As above
Glazing	Sealed double glazing units made in Kenya	Sealed double glazing units made in Kenya	Sealed double glazing units made in Kenya

Main Lodge double glazing units during installation

Green Roof, Thermal Mass & Insulation

Thermal mass elements were incorporated into the design to store heat when not needed and release when additional heat is welcome.

The primary thermal massing element is a concrete roof slab. The profile consists of an 80mm rigid foam insulation board applied to the outside face and an exposed concrete face on the inside. This was also combined with a vegetated roof garden for approximately 80% of the roof area.

Envelope Leakage

All dissimilar materials junctions and concrete slab penetrations were comprehensively sealed to reduce building envelope leakage, including:

- junctions between window and door frames and masonry walls were packed with timber fillets and filled with polyurethane sealant
- all floor and roof slab penetrations were sealed with mortar and builder's foam.

5.1 ZERO CARBON

Making buildings energy efficient and delivering all energy with renewable technologies

ENERGY

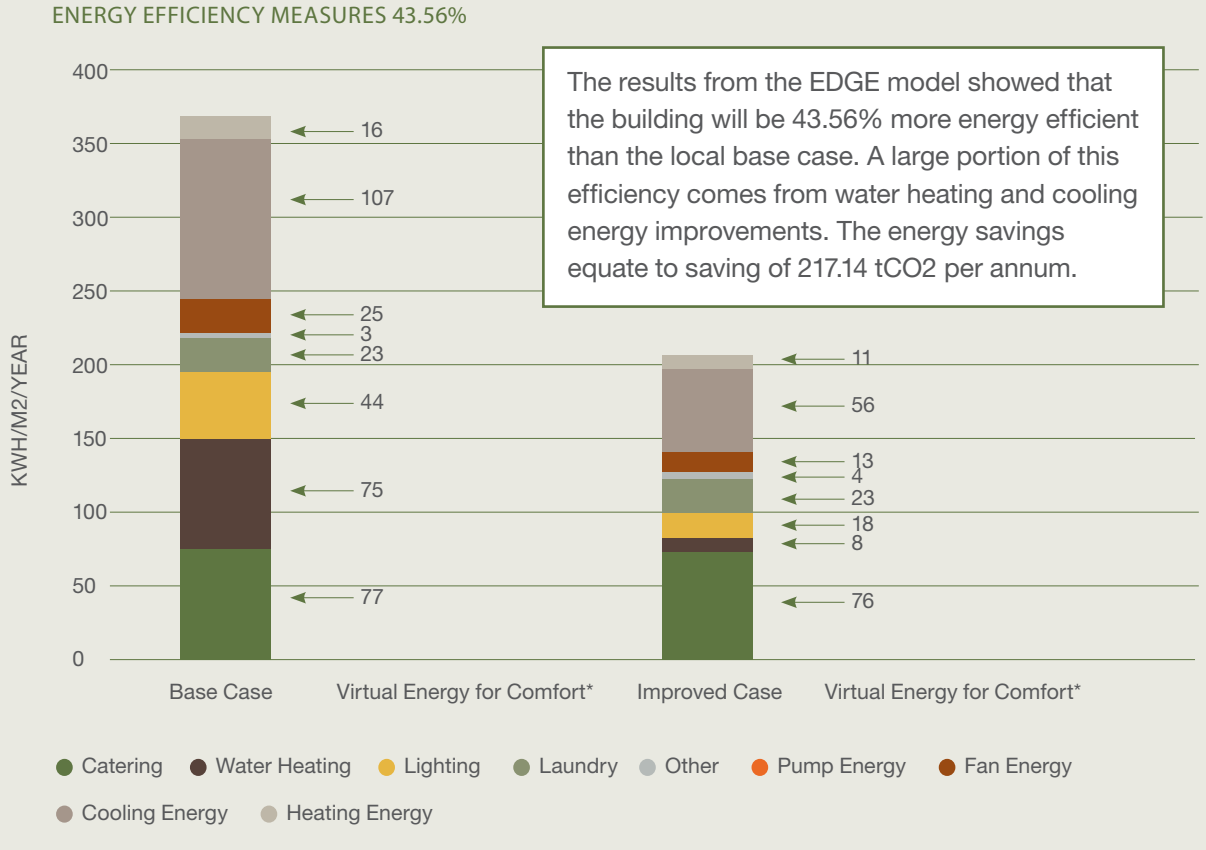
The project's regional grid supply is made up of 100% hyrdo generated power:

- Ntaruka Hydro Dam in the Northern Province supplies 9MW.
- Mukungwa Hydro Dam also in the Northern Province supplies 12 MW.

As such, the power strategy was not to be off-grid, but to reduce consumption through a high performing building shell combined with efficient equipment, fixtures and fittings.

Peak occupancy daily power demand by development zone and consumption types were calculated.

PEAK OCCUPANCY POWER DEMANDS	
Guest Lodge	
Total daily estimate load	1409 kW
Approximate instantaneous peak load	92.84 kW
Main Lodge	
Total daily estimate load	818 kW
Approximate instantaneous peak load	111.41 kW
Staff Accommodation	
Total daily estimate load	689 kW
Approximate instantaneous peak load	92.75 kW
Ancillary Buildings	
Total daily estimate load	100 kW
Approximate instantaneous peak load	29.82 kW
Site and Common Landscape	
Total daily estimate load	476 kW
Approximate instantaneous peak load	20.33 kW



Heating

The thermal modelling exercise resulted in the recommendation of a hybrid solar thermal and assisted air source heat pump system.

The system was designed to distribute heating demands to:

- underfloor heating
- domestic hot water
- pool heating with a dedicated heat pump.

Underfloor heating systems in guest areas have 60 W/m2 heating loads. This type of system uses a combination of radiant (floor surface temperature) and convective heating to improve thermal comfort. A backup electrical element in a storage tank ensures redundancy.

Desired pool temperature of 35-degrees is met via a dedicated air source heat pump.

Clean burning LPG fireplaces have been installed to all internal areas to reduce consumption of wood fuel.

Cooling

As a result of the thermal modelling process, an assisted natural ventilation and cooling system was designed that included:

- ducted / forced air ventilation system that draws in cool fresh air to ventilate and cool spaces while eliminating the need for air conditioners. The system allows easy retrofitting of air conditioning units for heating or cooling if identified as necessary after operations have stabilised
- split ductable units that can provide both cooling and ventilation were installed to the villa massage room, media room and gym as well as the Main Lodge wine cellar and pastry kitchen. Only the ventilation function was turned on at commissioning phase, with the cooling option only activated if required
- ceiling fans throughout the spaces aid internal air movement.

As a result of a building thermal modelling process, a mechanically assisted natural ventilation and cooling system was installed in lieu of traditional air conditioning.

5.1 ZERO CARBON

Making buildings energy efficient and delivering all energy with renewable technologies

Interior Lighting

- 100% of interior downlights are 7w LED dimmable bulbs with a high performance power factor of >0.8
- ENERGY STAR rated light fixtures throughout interior
- all ceiling fans are ENERGY STAR
- the harvesting of natural light was promoted throughout the design to reduce the need for daytime lighting.

Exterior Lighting

- 100% LED lighting
- extent of exterior lighting reduced especially in staff and back of house areas
- exterior lighting on timers to reduce electricity consumption between 12am and 6am.

Equipment & Appliances

- all appliances selected to be efficient ENERGY STAR (or similar)
- rated appliances including A++ refrigerators, dishwashers, clothes washers etc.

Monitoring

A comprehensive power metering system was designed to track the ongoing consumption patterns of the operations.

The system splits the development into the following zones:

- entire site
- back-up generator
- main Lodge
- guest suites 1 to 3
- guest suites 4 to 8
- staff accommodation and Canteen
- service yard
- fire services
- wastewater treatment facilities.

DELIVERY & CONSTRUCTION MANAGEMENT

Mains power supply was delivered to the project site 18 months later than agreed with the local municipality. As a result, the construction process was forced to be over reliant on diesel generators to deliver the project.

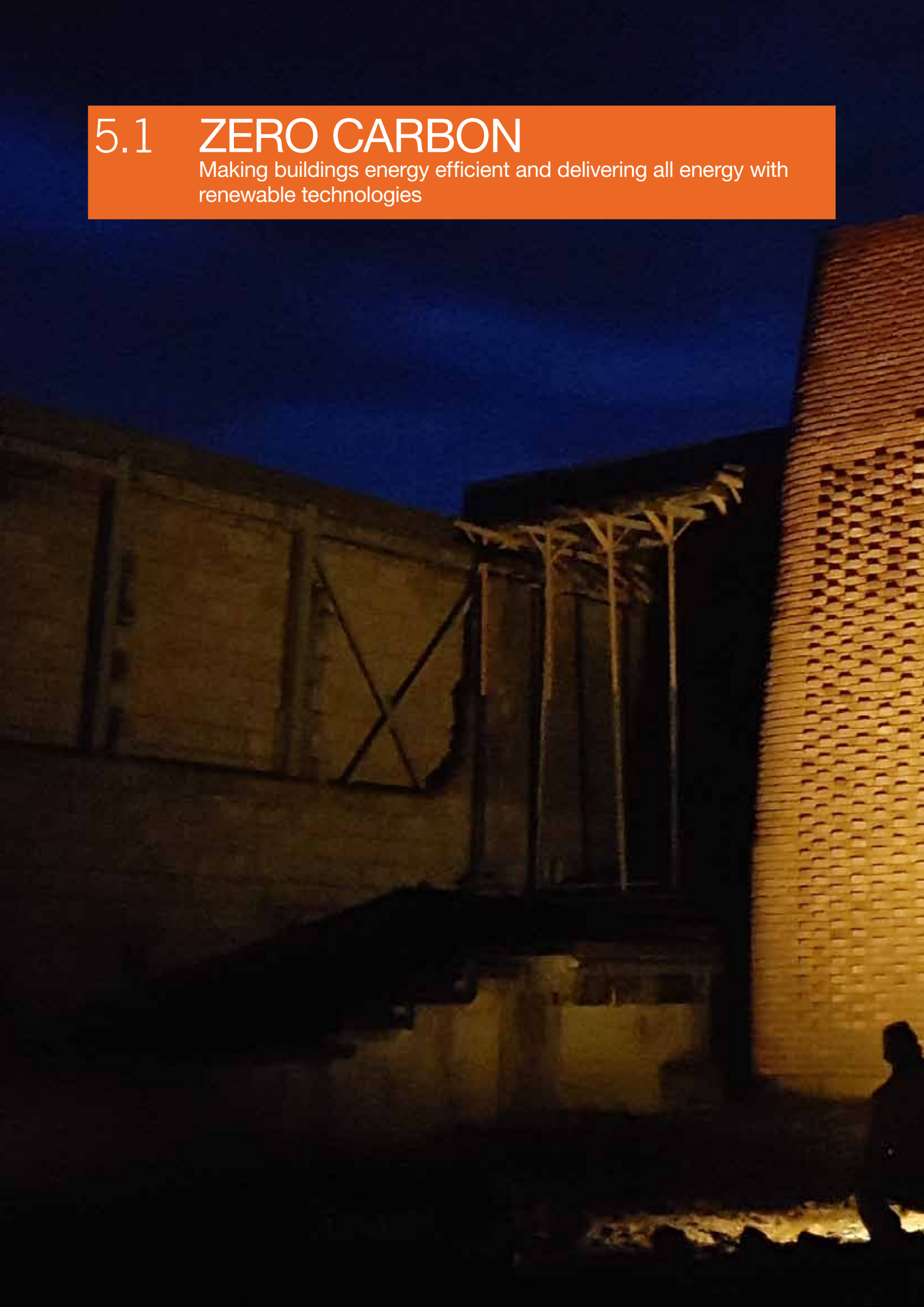
In response, the construction team employed a number of strategies to reduce diesel consumption, that included:

- a full-time mechanic was employed to maintain generator efficiency and ensure responsible usage
- fuel consumption was strictly monitored to detect irresponsible usage and deter theft
- a strict logistics schedule that ensured delivery and cart away vehicles carried optimum loads
- no night work was permitted
- energy efficient (solar) lighting was used at site office
- all office equipment was turned off at the end of each day.

All site machinery and vehicles were regularly maintained to reduce diesel consumption

5.1 ZERO CARBON

Making buildings energy efficient and delivering all energy with renewable technologies



100% LED lighting used in the landscape design

External LED ligting tests

5.2 ZERO WASTE

Reducing waste, reusing where possible, and ultimately sending zero waste to landfill

POSITIVE OUTCOMES

- Approximately 12 tonnes of waste generated during the construction of close to 6,000m2 of gross built area.
- All waste sorted and weighed before leaving site.
- The creative reuse of waste materials in the local community promoted throughout the build.
- Use of permanent shuttering to reduce timber formwork waste.

OPPORTUNITIES

- Strategies to reduce quantity of waste ending in landfill should be defined earlier in the project in conjunction with local waste management service providers.
- Better data management to track percentage recycled.
- Steel was the largest component at 3.5 tonnes - identify ways to reduce reliance on steel at design phase.

5.2 ZERO WASTE

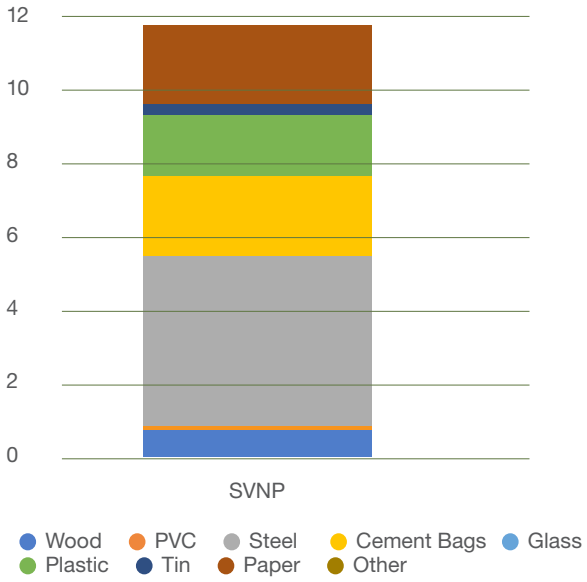
Reducing waste, reusing where possible, and ultimately sending zero waste to landfill

DESIGN STRATEGIES

- a prefabricated steel framing system was used to reduce on-site waste generation
- permanent shuttering was used for the majority of concrete slabs to reduce the depth of the slabs and the requirement for excessive shuttering during construction.

A prefabricated steel frame was used to reduce on-site waste

TOTAL WASTE (EXCLUDING FOOD) - TONNES



DELIVERY & CONSTRUCTION MANAGEMENT

Waste Reduction & Onsite Reuse

- the site was divided into 5 zones, to be kept clean, with 5 people appointed as permanent waste collectors
- clean building rubble and stone offcuts were used to backfill landscape terraces and under landscape mounding
- steel bending and cutting schedules were used project-wide, with off cuts used for temporary works and reinforcement framing
- timber for formwork was recycled and reused onsite where possible
- all formwork nails were straightened and reused
- at completion, formwork was cleaned and retained by contractor to be reused on future projects

Plastic reduction

- single use plastic bottles were discouraged throughout the construction process
- 2 water dispensers were located in the meeting room and staff room to supply the management and consultant team
- the food supplier delivered water in bulk with each lunch deliver to supply worker teams.

Off-site Waste Recycling

All waste was sorted by type throughout construction process; glass, plastics, metals, timber and food. However, during the construction process it was identified there was limited local infrastructure in place for waste management

Informal practices were put in place to minimise the amount of waste directed to landfill, including:

- off-cuts of timber and plywood were used in the kiln process for the production of local clay bricks
- any formwork off-cuts were collected and given to the surrounding villagers for firewood and/or for use in small domestic construction and repair projects
- steel waste was sold to a local company for reuse
- cement bags were reused as carry bags by local retail stores
- paint cans were reused within the local community to carry water or produce
- food waste was collected and distributed to local piggeries.

OPERATIONAL WASTE PLANNING

Through this process, the team has put together a comprehensive waste management plan to handle the ongoing operational waste, including; organic waste, paper, glass, metals, plastics, E-waste and sanitary waste.

To promote better waste management locally, the operations team plan to expand this waste manage plan to include local third-party service providers and other lodges and businesses within the region.

Onsite waste was carefully sorted for reuse, donation to communities or for sale to local small business

5.2 ZERO WASTE

Reducing waste, reusing where possible, and ultimately sending zero waste to landfill

INTERNAL STATISTICS

Waste data was gathered to a high level of detail; however the accuracy of some months is uncertain.

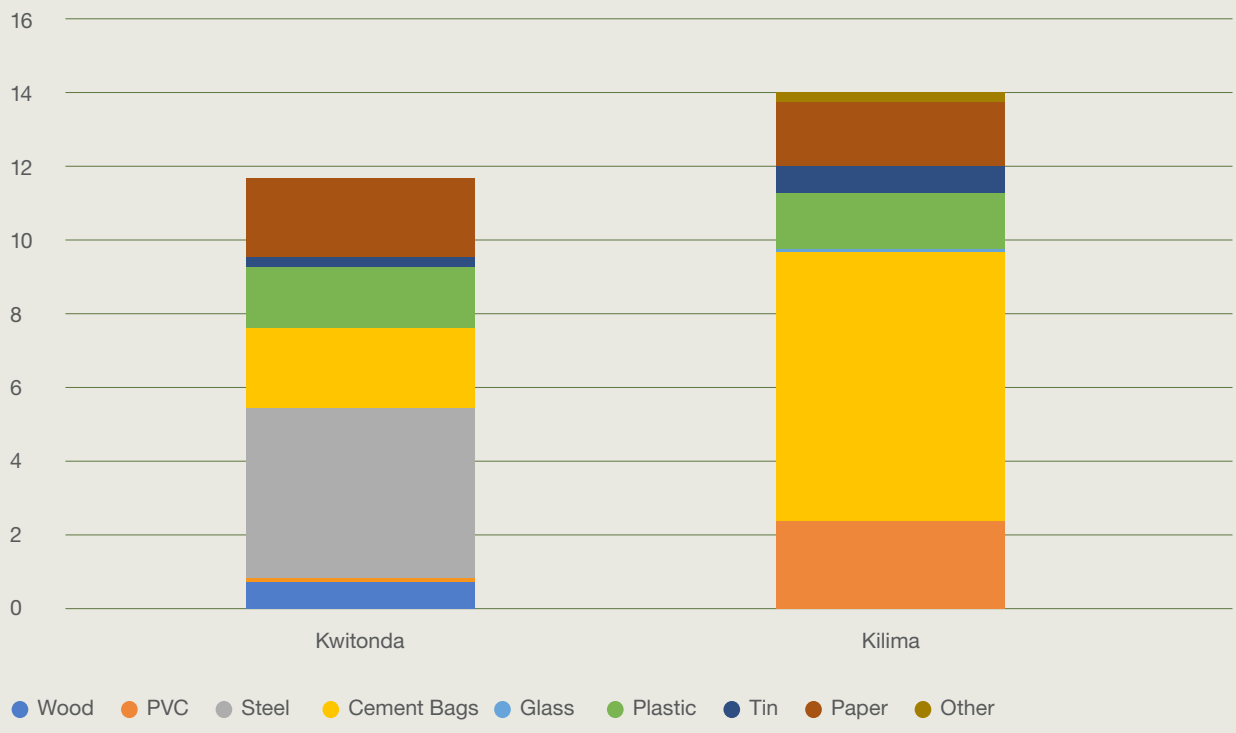
When compared to the waste generated at Kilima Lodge at Grumeti, the following summarises the waste generated per square metre of built area:

Project	Built Area (m2)	Waste (tonnes)	Waste per m2 (kg)
Kilima	1,000	14	14
Kwitonda	6,000	12	2

Kwitonda lodge generated approximately 7 times less waste per m2 than Kilima Lodge.

Using the LEED for Homes Reference Guide 2009, the project would have scored within the top percentile for ‘Reduced Construction Waste’.

TOTAL WASTE (EXCLUDING FOOD) COMPARING KWITONDA TO KILIMA LODGE - TONNES



INTERNAL RECOMMENDATIONS

With the exception of a few months where the quality of data is uncertain, the collection of data for total waste generated was detailed and managed well.

The tracking of waste diverted away from landfill was not managed to a high level of detail.

Could be better facilitated on future projects by:

- Working with contractor and local waste management providers in the planning phase to ensure waste recycling and landfill diversion avenues are clearly identified.
- Using digital technology as a tool to track waste.
- Instilling a culture of monthly reporting on waste.
- Working with local logistics service providers such as consultant accommodation to promote better waste management.

5.3 SUSTAINABLE WATER

Using water efficiently in buildings, farming and manufacturing. Designing to avoid local issues such as flooding, drought and water course pollution

POSITIVE OUTCOMES

- Natural hydrological functions rehabilitated.
- EDGE 81.80% water saving.
- 90% of wastewater is treated for reuse in nursery.
- Approximately 92% of the development parcel is permeable.
- 1:100 storm event design capacity.

OPPORTUNITIES

- Increase design capacity of rainwater harvesting.

5.3 SUSTAINABLE WATER

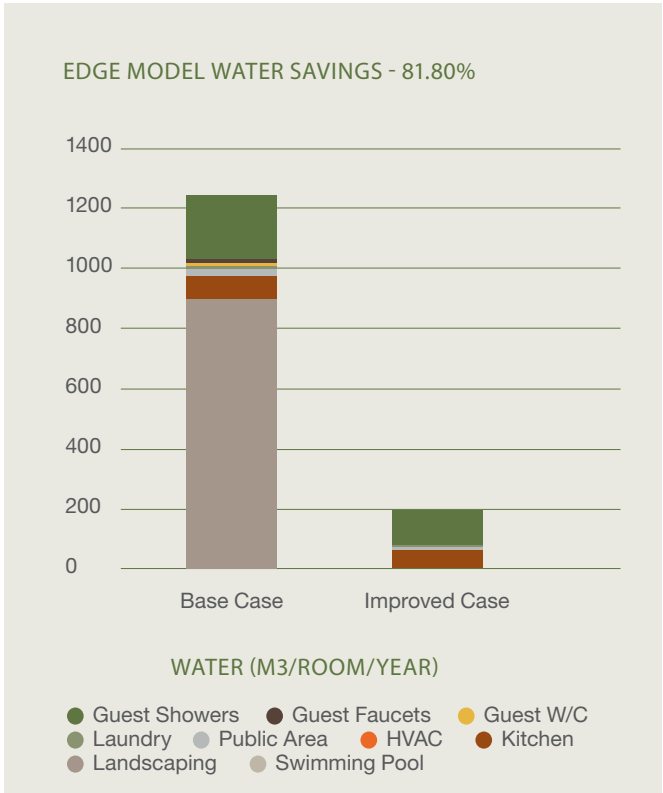
Using water efficiently in buildings, farming and manufacturing. Designing to avoid local issues such as flooding, drought and water course pollution

DESIGN STRATEGIES & BUILT ENVIRONMENT

Given the high rainfall environment the core focus of the water strategy was restoring the site's natural hydrological functions and ensuring the project did not adversely affect water quality through construction contamination or sedimentation.

Despite this, the project also took a responsible position on water consumption; aiming to reduce the population's overall consumption through efficient equipment and reusing wastewater for irrigation needs.

The results from the EDGE model shows the project is 81.80% more water efficient than the base case building. The majority of this saving comes from water efficient landscaping installations that are supplied exclusively with recycled black water.



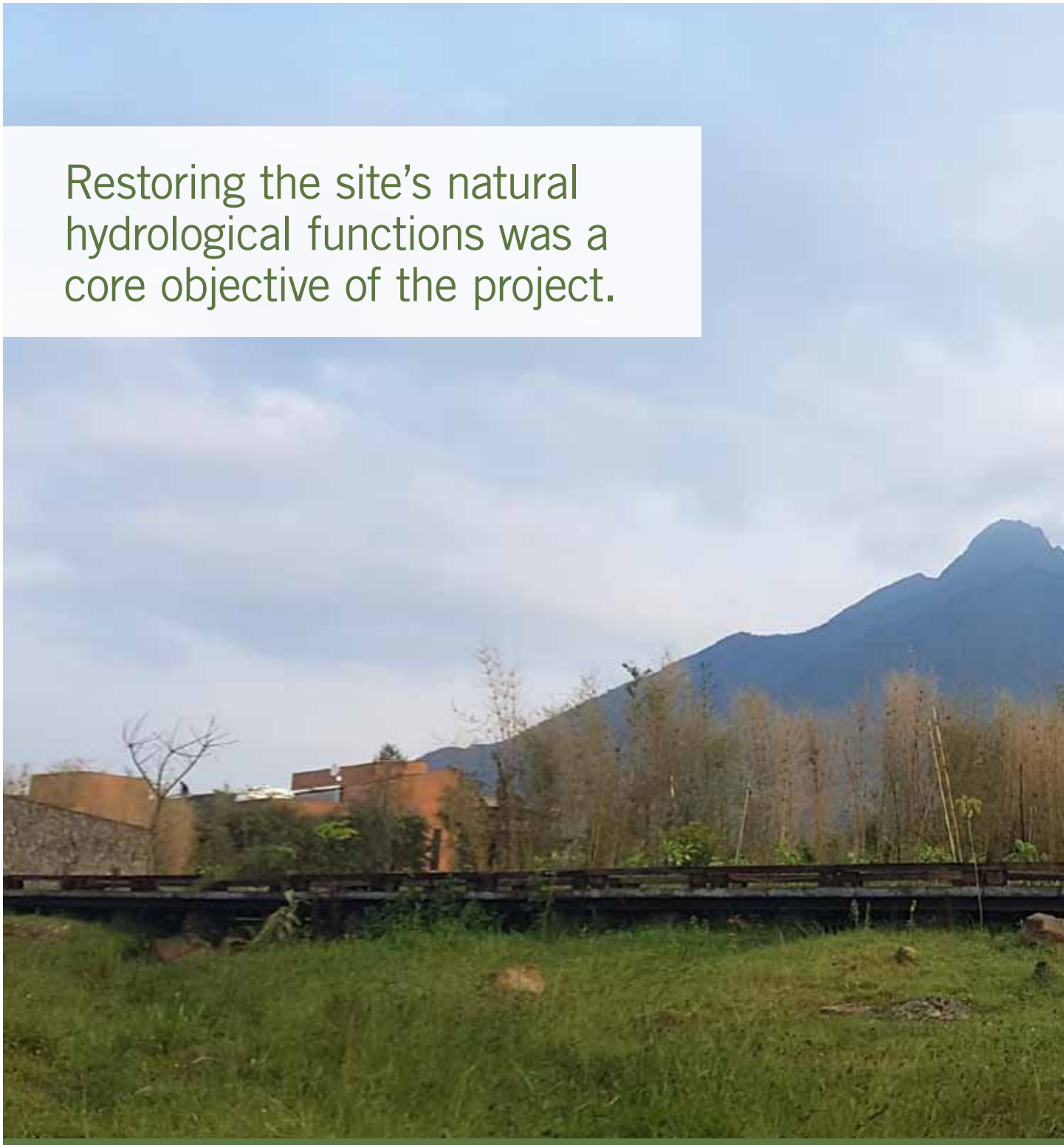
Permanent on-site plant nursery irrigation needs are met with

100% recycled water

5.3 SUSTAINABLE WATER

Using water efficiently in buildings, farming and manufacturing. Designing to avoid local issues such as flooding, drought and water course pollution

Restoring the site's natural hydrological functions was a core objective of the project.



Golf cart paths elevated to all natural hydrological functions to continue below

Site Hydrology & Surface Water Management

The project site had been denuded by historic agriculture activity which included the heavy manipulation of surface water movement through agricultural furrows. As part of the commitment to rehabilitate this piece of land, understanding and restoring the hydrological functions was critical.

The first stage of this process was a hydrological survey and digital storm event modelling exercise to understand the site's geology, subsequent water movements and impact of the proposed development. The team used this information to reshape the land, removing agriculture furrows and reinforcing the primary and secondary watercourses.

Once this baseline structure was established, further design interventions were used to reduce the impact of the built structures and encourage the natural establishment of riparian habitats, including:

- raising all built structures off the ground on an elevated concrete and steel pier system
- raising all road and pathway circulation networks to avoid inundation
- strategic positioning of culverts and fjords as identified by the digital storm event model
- elevating 40% of the guest boardwalk to allow seasonal flood events to continue below
- a network of detention basins to slow water moving through the site and create habitat for riparian and aquatic species
- vegetated roofs were installed to approximately 70% of the roof area, slowing the movement of water from roof surfaces back into the landscape
- a detailed swale system was designed to divert water away from built structures and into watercourses
- permeable surfaces in the landscape design where promoted where possible to slow runoff. Approximately 92% of the landscape is permeable.

5.3 SUSTAINABLE WATER

Using water efficiently in buildings, farming and manufacturing. Designing to avoid local issues such as flooding, drought and water course pollution

Wastewater Treatment and Reuse

3 packaged wastewater treatment plants (WWTP) were installed to treat sewerage to levels safe enough to discharge.

The treatment plants service:

WWTP1	Dedicated to Kataza House (villa)	1,000 L/day
WWTP2	Guest Suites 1 to 3	630 L/day
WWTP3	Remainder of the development	20,000 L/day

Treated water from WWTP3 is reused on site for irrigation within the plant nursery.

Indoor water use

Medium to high efficiency showers heads, taps and toilets were installed to the follow flow capacities:

Fixture	Flow or Flush Rate	Efficiency Rating
Basin Mixer Taps:	Average 4.5L/min	High
Showers Heads:	Average 9L/min	Medium
Toilets:	< 3/6 L/flush	High

Vivreau water purifying systems have been installed throughout the project to treat the municipal supply and reduce the need for bottled water.

Laundry equipment was specified with the following considerations:

- minimising litres of water per load or kg
- reducing kWh of electrical energy per load or kg
- utilises the water from the last rinse cycle for the next load's pre-rinse
- using heat recovery
- using heat pump based dryer rather than resistive element
- washing machine able to take and mix hot water from efficient central plant.

Outdoor Water Use

- no permanent irrigation systems were designed for general building landscapes and revegetation zones
- strategic hosecock points were installed for as-needed manual irrigation of lawn and feature landscape areas
- plant nursery is supplied by 100% recycled treated blackwater.

Monitoring

A comprehensive water metering system was installed to track the ongoing consumption patterns of the operations:

- a utility water meter has been installed for the main supply provided by WASAC
- dedicated water meters are installed at each storage tank
- sub-meters have been installed at each building
- additional meters have been installed at high use areas like the kitchen, laundry and plant nursery.

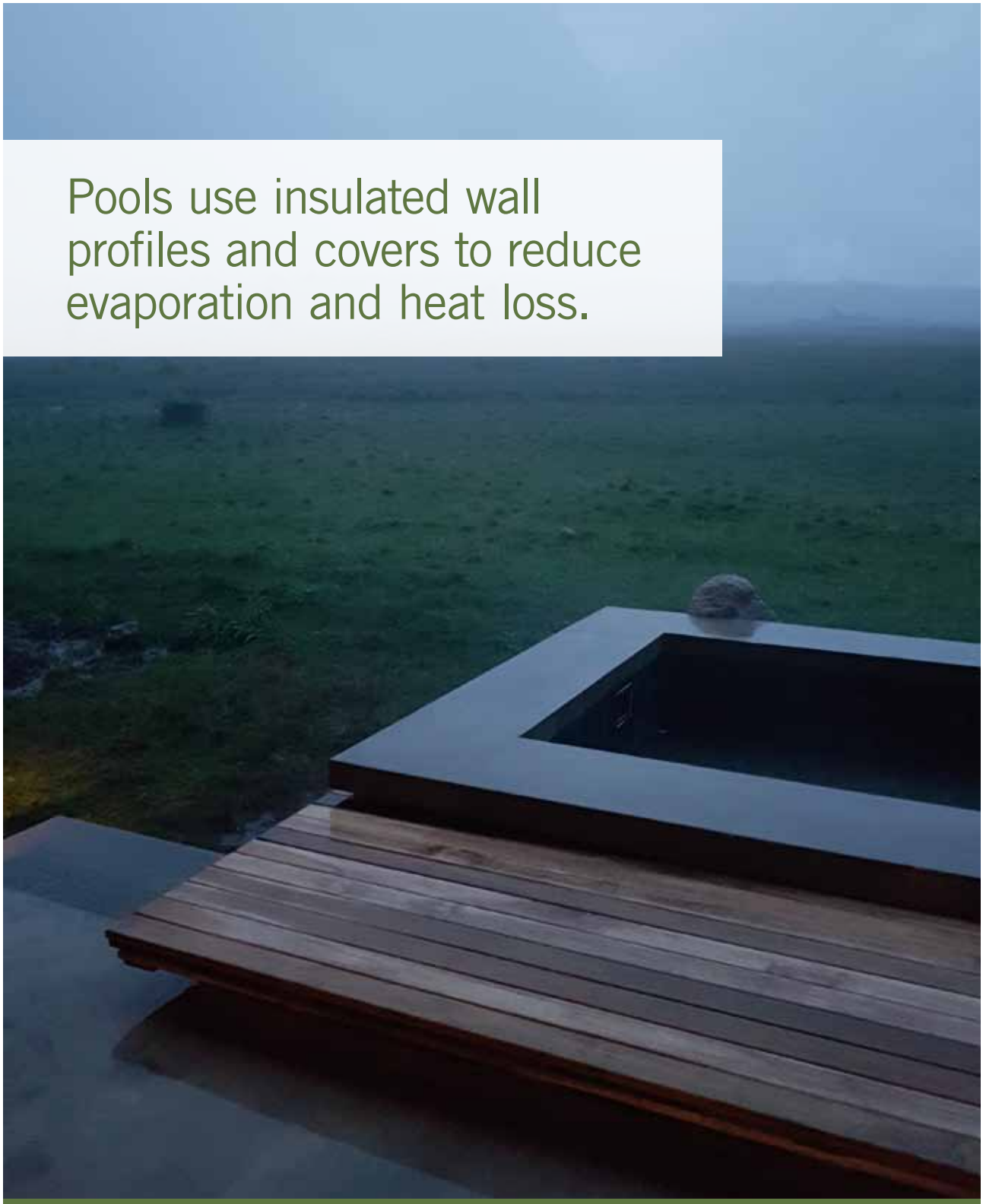
Water metering

Potable water reservoir at installation

5.3 SUSTAINABLE WATER

Using water efficiently in buildings, farming and manufacturing. Designing to avoid local issues such as flooding, drought and water course pollution

Pools use insulated wall profiles and covers to reduce evaporation and heat loss.



Heated pool at Guest Suite

Pools

- the guest suite pools' heating is done via a heat exchanger supplied from the domestic hot water cylinder and heat pump booster
- pools have insulated walls to reduce heat loss
- removable covers have been provided installed to reduce evaporation losses and retain heat
- top up system is not automatic in order to detect leaks straight away
- energy efficient pumps were installed
- cartridge filters requiring no back-washing were installed.

DELIVERY & CONSTRUCTION MANAGEMENT

Water supply

- 95% of construction water was forest / spring water stored in 3 x 20,000 litre tanks.

Water reduction

- 3 x 10,000 tanks were installed to collect water from office and workshop roofs for reuse in construction work and cleaning
- due to the high rainfall, steel drums were distributed throughout the site to capture rainwater for construction use
- all staff were inducted on principles of sustainable water consumption at work and at home, including; switching off water taps, rainwater collection and protecting watercourses
- hoses and supply lines were regularly checked for leaks
- all planting was coordinated with the high rainfall seasons to reduce irrigation requirement.

Watercourse protection

- clear demarcation of watercourses reduced encroachment of construction activity
- daily cleaning of work areas reduced risk of contamination
- generator and hazardous materials were kept away from watercourses and protected to avoid contamination.

5.3 SUSTAINABLE WATER

Using water efficiently in buildings, farming and manufacturing. Designing to avoid local issues such as flooding, drought and water course pollution

Rehabilitation of existing water courses to restore habit and prevent erosion

5.4 SUSTAINABLE MATERIALS

Using sustainable and healthy products, such as those with low embodied energy, sourced locally, made from renewable or waste resources

POSITIVE OUTCOMES

- 70% of materials sourced from within 50km of site.
- 850,000 bricks handmade locally.
- 100% of timber used on millwork was FSC certified.
- 100% of interior flooring timbers FSC certified.
- 100% of timbers used in landscape design were FSC certified or recycled from site.
- 100% of formwork timber responsibly grown.

OPPORTUNITIES

- Reduce amount of concrete in design.
- Ensure contractor works with local suppliers to responsibly extract and natural resources.
- Review impact of local materials before fixing design and construction methodology.
- Ensure contractor follows up with local suppliers to rehabilitate quarries.

5.4 SUSTAINABLE MATERIALS

Using sustainable and healthy products, such as those with low embodied energy, sourced locally, made from renewable or waste resources

DESIGN STRATEGIES

Local materials

The design team took inspiration from the surrounding landscape and architectural vernacular when selecting the materials palette. The result was a palette that was predominantly sourced from the surrounding community, ensuring:

- the architectural aesthetic is locally relevant
- the embodied energy to deliver materials to the site was reduced
- significant construction investment stayed in the local economy.

Renewable Materials

Given the abundance of bamboo regionally, the design team worked to incorporate it into the design, predominantly using it for screens and weaved panels which make up the suspended ceiling.

Screens made from rapidly renewable eucalyptus lath were also used for the entrance way canopies and screening around outdoor living areas.

FSC & responsibly grown timber

The specification of non-toxic and sustainable grown materials was also a priority, including:

- FSC timber was used for all flooring
- FSC timber was used for approximately 70% of the interior cabinetry
- FSC timber was used for all external boardwalk sleepers and kickers.

Non-toxic materials

- all paints were bitumen-based and non-toxic
- low-VoC adhesives were promoted in the off-site fabrication and on-site construction process.

USE OF FSC TIMBER FOR INTERIOR FIT OUT

Area	Timber		Adhesives
Cabinet doors, panels, and open cases	FSC	MDF	Titebond water based glue
Cabinet veneers	FSC	Oak veneer	Kleibert PPR 871 hot press glue
Cabinet edging, counter surfaces	FSC	Oak solid	PUR 501 glue
Vanities	FSC	Spruce	PUR 501 glue
Window linings	FSC	Oak	PUR 501 glue
Doors	FSC	Accoya, Oak	Balcotan glue
Timber Flooring	FSC	Oak	
Cabinet internal cases	Not FSC	Melamine faced chipboard	Urea Formaldehyde glue

Local sourced and manufactured materials

5.4 SUSTAINABLE MATERIALS

Using sustainable and healthy products, such as those with low embodied energy, sourced locally, made from renewable or waste resources

DELIVERY & CONSTRUCTION MANAGEMENT

Local building materials

- 70% of materials came from within 50km of the site
- local materials formed 90% of the core building shell and included: sand, aggregate, volcanic stone, murram and clay bricks
- local suppliers were visited to educate them about sustainable extraction processes and safe working conditions. However, a greater success rate of signed supplier agreements, could have been achieved with only 2 No. agreements signed for stones and aggregate.

Reuse & recycling of site materials

- all indigenous plants within the area of construction disturbance were harvested and stored in the plant nursery for reuse
- timber from the removal of the introduced eucalypt species prevalent on-site was reused in the construction of the plant nursery shade structures
- all site rock was harvested and reused from dry stone walls.

Interior furnishings

- 61% of items sourced in Africa
- 26% of items manufactured by an artist, artisan or community project
- 29% of the items had materials with environmental certification e.g. FSC for timber
- 71% of items were made predominantly (>50%) from natural materials
- 68% of products have am anticipated lifespan of >10 years.

Indigenous plants and trees were harvested and reused in the landscape.

A large ‘Flame Tree’ is transplanted to become a feature at the Main Lodge western entrance

5.4 SUSTAINABLE MATERIALS

Using sustainable and healthy products, such as those with low embodied energy, sourced locally, made from renewable or waste resources

Workers laying locally made clay bricks at Kataza House


TSUKASA LINE

5.5 SUSTAINABLE TRANSPORT

Reducing the need to travel, and encouraging low and zero carbon modes of transport to reduce emissions

POSITIVE OUTCOMES

- All guest circulation networks have been designed to promote walking.
- Wet weather transport is delivered via electric golf carts.

OPPORTUNITIES

- Where possible, reduce consultant team air travel.
- Commit to air travel offset program.
- Reduce reliance on air freight for materials.

5.5 SUSTAINABLE TRANSPORT

Reducing the need to travel, and encouraging low and zero carbon modes of transport to reduce emissions

DELIVERY & CONSTRUCTION MANAGEMENT

Construction transport

- majority of local workers walked to and from site each day
- management staff, sub-contractors and consultants car-pooled to reduce trips
- small 'tuk tuk' motorbikes were used on-site during the final FF&E fitout and operator handover
- delivery pickup trucks utilised return trips to transport waste or materials back down the mountain to reduce fuel consumption
- responsible and safe driving was promoted through:
    - Speed control signposts
    - Monitoring vehicle logbooks
    - Monthly vehicle servicing.

Signage used to slow traffic

'Tuk Tuks' used during final fit out

Bicycles used as primary means of transport

Consultant Air Travel

A number of strategies were indentified to reduce the footprint of the air travel asscociated with the international consultant team required to deliver a project of this caliber, including:

- using Kigali-based architects and engineers
- promoting Skype and digital conferencing in lieu of face to face meetings
- reducing the number of short stays on site to maximise the benefit of face to face time with the contractor, particularly for consultants requiring long-haul travel
- appointing a full time Clerk of Works to live in Musanze and represent the investor's interests.

Consultant and construction team air travel accounted for approximately 3% of the project's total emmissions.

Air & Sea Freight

The project relied heavily on air and sea freight for the following reasons:

- local availability of specialist construction materials
- reliability and security of land freight when crossing muiltiple international borders
- reliability of local suppliers and artisans in delivering required materials on time.

AIR FREIGHT	
Airfreight Load #1	61 tonnes
Airfreight Load #2	62 tonnes
Airfreight Load #3	75 tonnes
Other Miscellaneous Airfreight	13 tonnes
Total Air Freight	**211 tonnes**

SEA FREIGHT	
14 x 40' containers: - 1 from UK - 1 from Romania - 1 from China - 11 from South Africa	Average 50m3 per container
Total Sea Freight	**Total of 700 m3**

Interior furnishing leaving Cape Town enroute to Kigali

5.5 SUSTAINABLE TRANSPORT

Reducing the need to travel, and encouraging low and zero carbon modes of transport to reduce emissions

Interior furnishings arrive in Kigali

5.6 EQUITY & LOCAL ECONOMY

Creating bioregional economies that support equity and diverse local employment and international fair trade

POSITIVE OUTCOMES

- >700 local construction jobs created.
- Construction workforce 30% female.
- Estimated $820,000 spent in the local community through wages alone.
- Estimated $1.15 million spent in the local community on materials and support services.
- 850,000 handmade bricks sourced locally.

OPPORTUNITIES

- Opportunities for traineeship programs within design and project management teams.
- Structure accounting systems to more easily track local spend.
- Manufacture more interior products and furnishings locally or regionally.

5.6 EQUITY & LOCAL ECONOMY

Creating bioregional economies that support equity and diverse local employment and international fair trade

DESIGN STRATEGIES

The design promoted the use of local materials to ensure a large contribution to the local economy.

DELIVERY & CONSTRUCTION MANAGEMENT

Employment

- 90% of the construction workforce were locally employed
- gender equality was a target, with woman constituting 30% of the workforce
- the construction team ensured fair and equitable payment for all workers, meeting the national wage average plus performance bonuses
- estimated that up to 95 construction workers will retain an ongoing role with the contractor
- regular meetings were conducted with the Rwandan Social Security Board to ensure ongoing compliance with national requirements.

Land Expropriation

In conjunction with the District Officer, a fair and transparent procedure was followed throughout the land purchasing process and further land expropriation for the entry road. The process required fair land valuation and compensation for loss of crops or livelihood.

An ongoing and open dialogue was maintained with all community stakeholders throughout the construction process to ensure all compensation obligations were met and unforeseen variations to these were handled appropriately.

Skills Transfer

Skills transfer was a priority with successes that included:

- construction teams learning through on the job training and internship roles provided by the contractor
- an increase in computer literacy, with some employees joining the team as porters and progressing to store managers or office assistants.

E.S.REMERA-MBOGO
PO .BOX: 1668 KIGALI
TEL: 0788872066
0788556056
remerambogoee@yahoo.com

WDA
WORKFORCE DEVELOPMENT AUTHORITY - WDA
P. O. BOX 2707 Kigali
Tel: (+250) 255113365
E-mail: info@wda.gov.rw
Website: www.wda.gov.rw

RECOMMANDATION LETTER FOR INTERNSHIP.

To: SEVAMI BROTHERS & CO LTD, SINGETTA KWITONDO LODGE PROJECT

Dear Sir,

I have honor to introduce to you, Mr/Miss INGABIRE Olive

Student in E.S.REMERA-MBOGO in Level 3(Masonry) Option He/She is currently supposed to do internship, as it is required for Trainees who study professional courses to do internship in order to put the theoretical concepts learnt during class session into practice and improve his/her skills.

I Wish to request you support him/her to enable successfully making theory into practice during the 30 days that can start from 22/08/2018 to 21/09/2018

Thank you in Advance for your cooperation.

Yours Sincerely,

Approved for Internship

Done at Cyimbili 03/08/2018

School Manager

Mr HIZIMANA S. Seth

Internship programs

Women constituted 30% of the construction workforce.

A female employee in the plant nursery

5.6 EQUITY & LOCAL ECONOMY

Creating bioregional economies that support equity and diverse local employment and international fair trade

Support Businesses

Local businesses were engaged to supply materials and the support construction process, including:

- the supply of sand, aggregate, stone, clay bricks, bamboo weaves and plant stock. Numerous small suppliers were set up to meet the project needs
- 100% of delivery and porter jobs were local, transporting materials and consultants to site
- all food was supplied from a local restaurant, feeding >300 workers per day
- a Kigali-based pot manufacturer was used to hand make custom pots in lieu of importing specilaist pots from South Africa
- the team worked closely with local artisans to design and supply ceiling panels weaved from bamboo.

Pots hand crafted in Kigali

Local aggregate quarry

Locally made pots and eucalyptus weave panels being installed at Main Lodge

5.7 LOCAL & SUSTAINABLE FOOD

Supporting sustainable and humane farming, promoting access to healthy, low impact, local, seasonal and organic diets and reducing food waste

POSITIVE OUTCOMES

- Food for construction workers was primarily plant-based, grown and procured locally.
- Permanent herb and vegetable gardens were installed in the nursery for the ongoing supply specialist goods to the lodge.

OPPORTUNITIES

No further opportunities were identified.

A variety of fresh produce was available through the local markets

All food for construction workers was primarily plant-based, grown and procured locally.

5.7 LOCAL & SUSTAINABLE FOOD

Supporting sustainable and humane farming, promoting access to healthy, low impact, local, seasonal and organic diets and reducing food waste

Potatoes grown locally constituted a large portion of construction workers' meals

DESIGN STRATEGIES

- an area within the onsite nursery was dedicated to growing specialist vegetables and herbs to supply the lodge
- no pesticides or herbicides are used on site.

DELIVERY & CONSTRUCTION MANAGEMENT

- all food for construction workers was grown and procured locally
- workers participated in proposing the daily menu based on traditional local diets.

Local markets were the source of construction worker food supply

5.8 LAND USE & WILDLIFE

Protecting and restoring biodiversity and creating new natural habitats through good land use and integration into the built environment

POSITIVE OUTCOMES

- 100% native plant species.
- 250,000 plants used in the reforestation program were procured locally.
- Permanent nursery set up on-site for duration of construction program and into operations.
- 100,000m3 of earth moved to restore historic hydrological functions.
- Manicured lawn areas restricted to 200m2 around the Main Lodge.
- 1No. Gorilla incursion onsite.
- 2No. elephant incursions onsite.
- 2No. Illegal forest activities detected and reported.

OPPORTUNITIES

- Commence reforestation process sooner to reduce the reliance on built structures for privacy.

5.8 LAND USE & WILDLIFE

Protecting and restoring biodiversity and creating new natural habitats through good land use and integration into the built environment

A total of 100,000m3 of earth was moved to reinstate the natural hydrological functions of the land.

Earth Shaping reinforced historic watercourses and helped to provide privacy for Guest Suites

DESIGN STRATEGIES

On-site land rehabilitation program

Privileged to be within the 800m national park buffer zone, the development set out to rehabilitate a piece of land that had been denuded and scarred by historical agricultural practices; reinstating the biological functions and restoring the critically endangered Afro-montane forest.

The first stage of this process was a hydrological survey to understand the site's geology and subsequent water movements. The team used this information to reshape the land, removing agriculture furrows and reinforcing the primary and secondary watercourses.

The second stage was reforestation. Accompanied by expert local botanists and ecologists, Singita's conservation team undertook field trips into the adjacent national park to understand the land's natural state. They identified key forest and riparian species that were subsequently sourced locally and planted in the first phase of the reforestation program that included 250,000 plants and covered approximately 18Ha of land.

A permanent on-site plant nursery has been set up to continue propagating plants to carry on the reforestation of the entire 76Ha land parcel – returning the phenomenal biodiversity of the Albertine Rift to this precious piece of land and ultimately becoming new gorilla habitat in line with the Rwandan Development Boards's long-term vison to expand the national park boundaries.

5.8 LAND USE & WILDLIFE

Protecting and restoring biodiversity and creating new natural habitats through good land use and integration into the built environment

DELIVERY & CONSTRUCTION MANAGEMENT

Site Protection Strategy

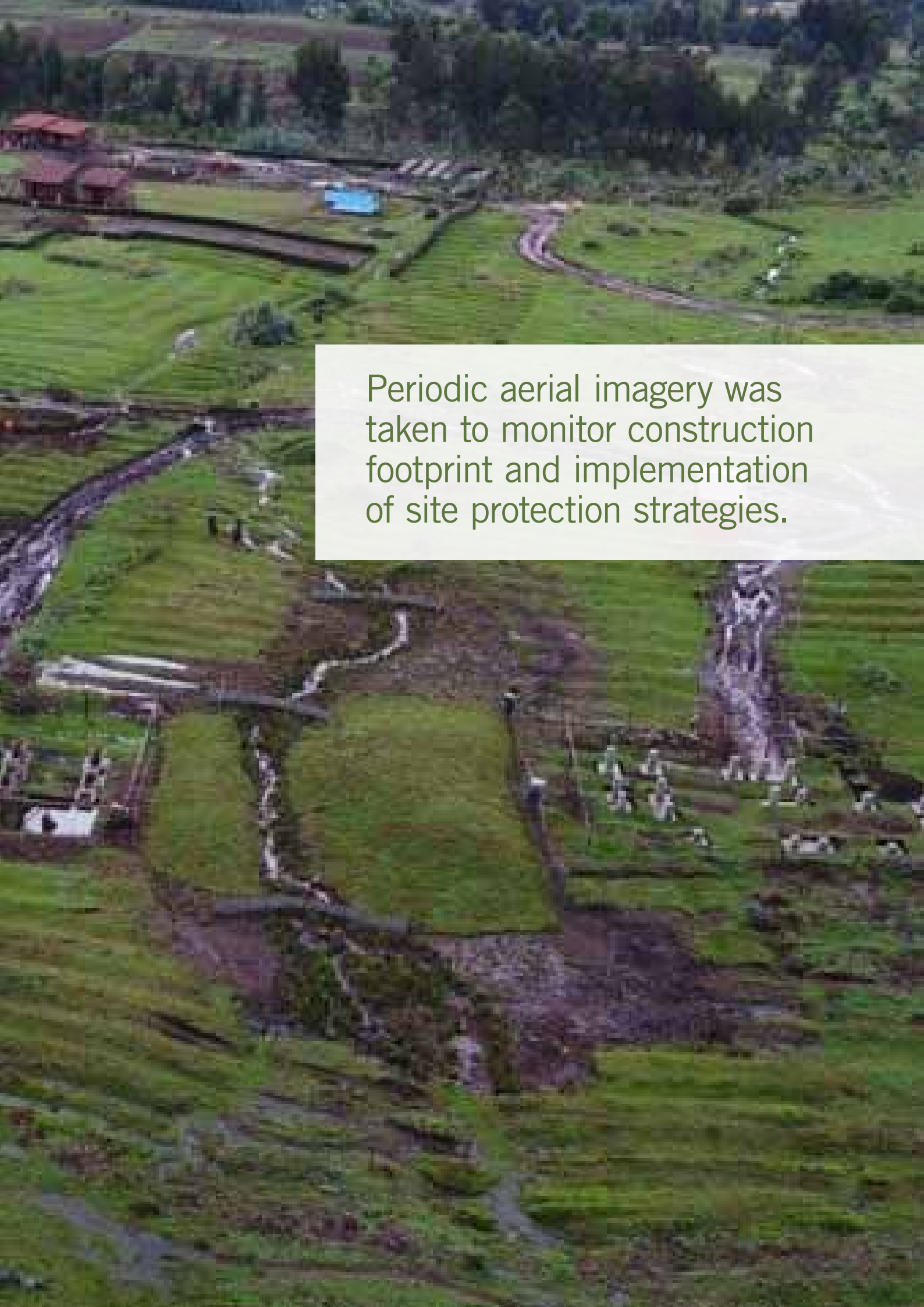
A comprehensive Site Protection Plan was designed prior to construction identifying strategies that included:

- all indigenous trees and shrubs to remain were taped off for protection
- building construction zones and construction pathways were taped off to prevent construction activities encroaching on protected areas
- erosion control measures were put in place to control silt movement offsite
- site staging zones including; vehicle parking, waste storage, materials storage and concrete mixing areas were clearly delineated inside the office compound
- concrete batching areas were set up away from vulnerable watercourses
- procedures were written and closely adhered to for the storage and handling of hazardous materials
- workspaces were cleaned on a daily basis
- 'Do's and Don'ts' signage was installed throughout the site, reminding workers to keep the site clean, wear safety equipment and not interfere with wild animals
- periodic aerial imagery was taken to monitor disturbance zones.

The Site Protection Plan clearly set out material storage and construction

staging areas

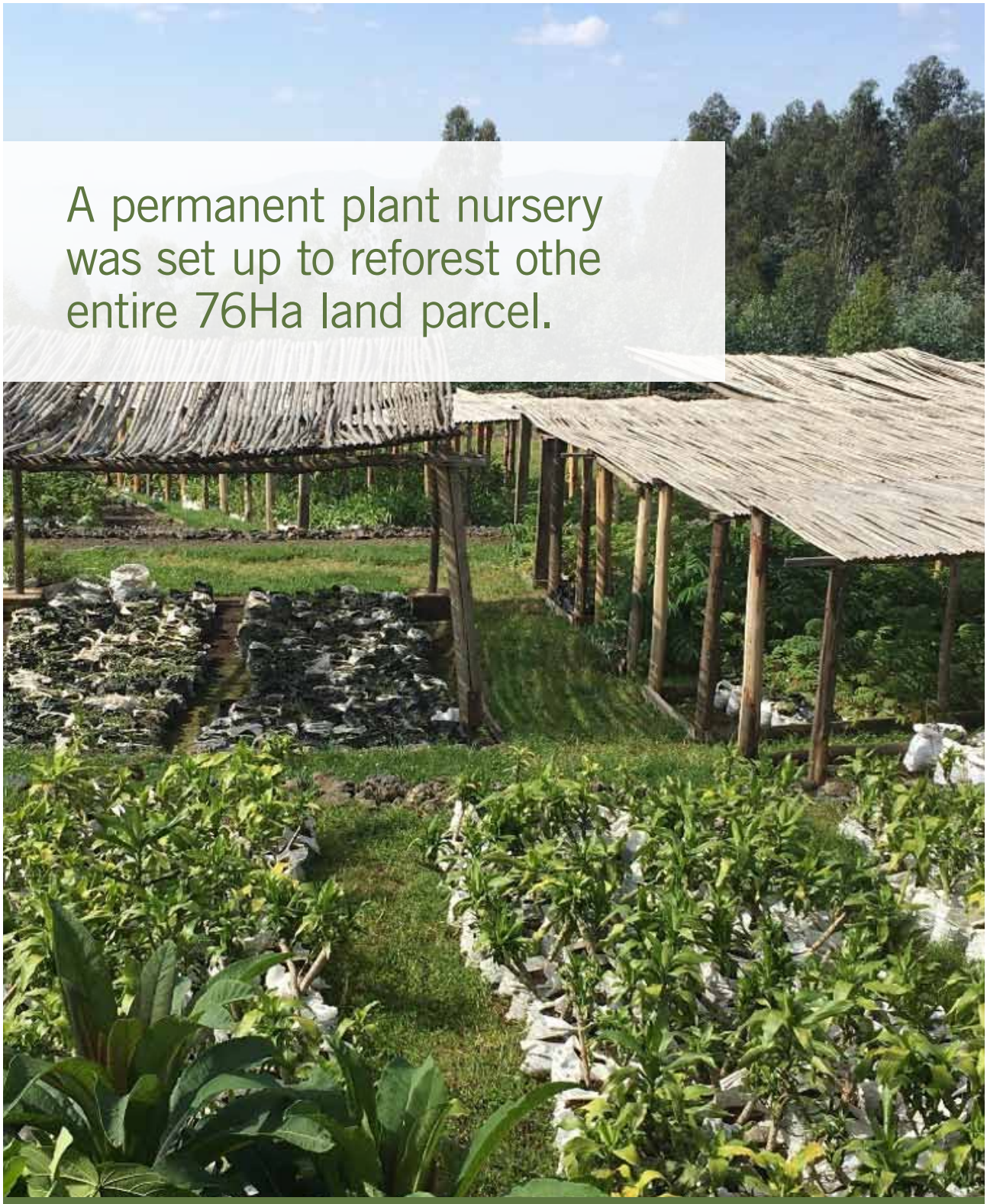
Aerial photo showing the strict control of the construction footprint and the protection of watercourses



Periodic aerial imagery was taken to monitor construction footprint and implementation of site protection strategies.

5.8 LAND USE & WILDLIFE

Protecting and restoring biodiversity and creating new natural habitats through good land use and integration into the built environment



The plant nursery was home to 250,000 plants during the construction process

Land

- plant suppliers were educated about monitoring their materials to reduce the importation of alien and invasive plant species into the national park
- nursery stock was subject to regular weeding with any alien species removed immediately
- Environmental Officer conducted regular inspections of the 7 watercourses for signs of littering and pollution.

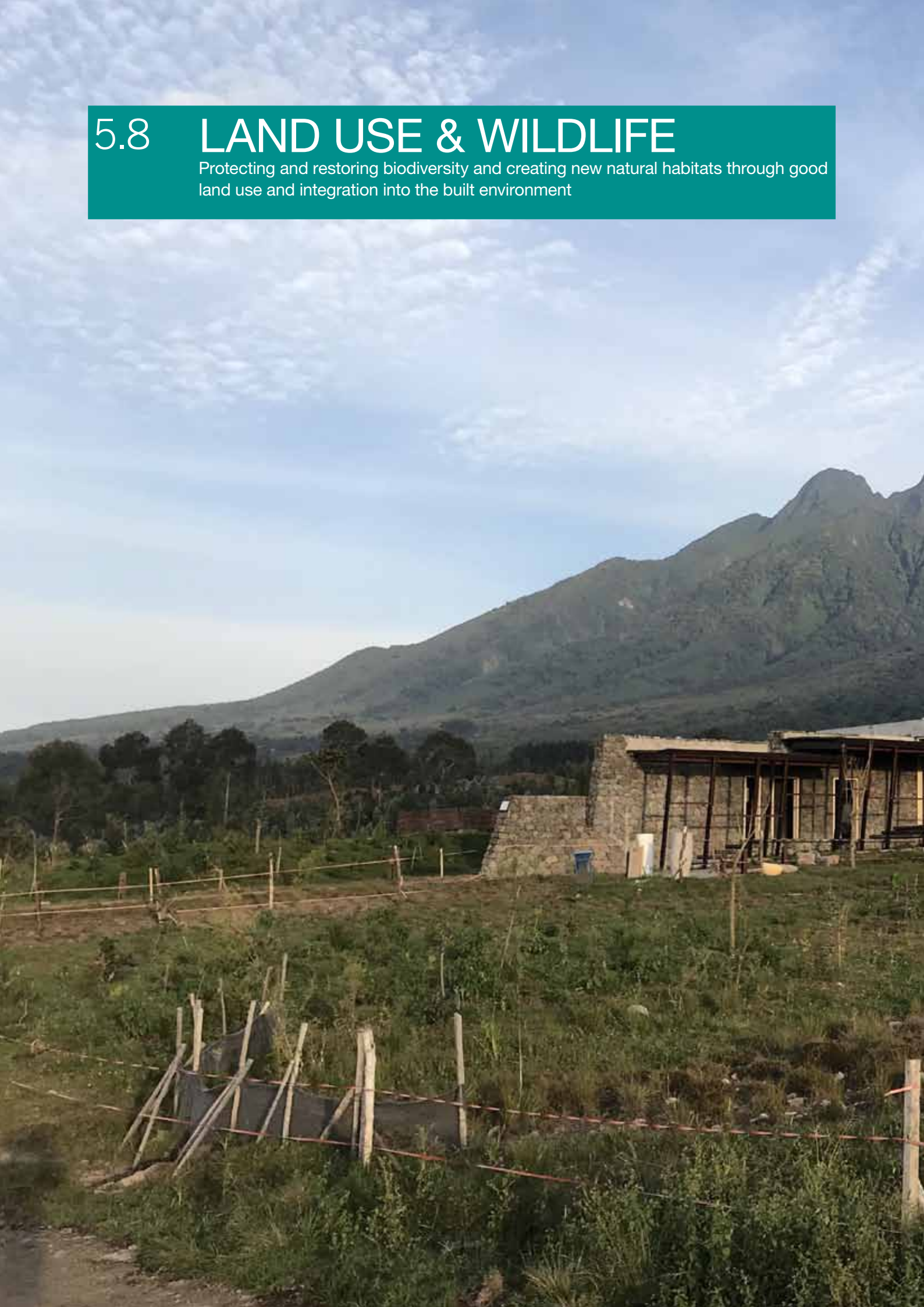
Wildlife

- 3 camera traps were set up at the national park boundary to monitor any wildlife incursions at night. The cameras detected the frequent incursion of large herbivores that included elephants and buffalos and one instance of a gorilla troop. Other instances included bushbucks, jackals.
- all food was consumed within the staff canteen designated areas, with all leftover food removed from site to deter scavengers and other wildlife
- cleaners ensured staff canteen areas were kept clean on a daily basis
- workers were educated on the value and importance of wildlife protection
- camera traps recorded illegal forest incursions and information was shared with park management.

Image of a gorilla captured on a camera trap located at the park boundary

5.8 LAND USE & WILDLIFE

Protecting and restoring biodiversity and creating new natural habitats through good land use and integration into the built environment



Work zones and construction paths were clearly delineated on site to prevent encroachment into protected areas.

Construction paths were clearly delineated throughout the full term of the construction

5.9 CULTURE & COMMUNITY

Respecting and reviving local identity, wisdom and culture; encouraging the involvement of people in shaping their community and creating a new culture of sustainability

POSITIVE OUTCOMES

- 100 desks made from timber packing crates were given to the local school.
- 600 construction workers were given One Planet and sustainability inductions.

OPPORTUNITIES

- Source a greater number of interior furnings locally to better reflect local culture and encourage development of artisan skills.

5.9 CULTURE & COMMUNITY

Respecting and reviving local identity, wisdom and culture; encouraging the involvement of people in shaping their community and creating a new culture of sustainability

DESIGN STRATEGIES

To allow the project team to navigate the cultural and political landscape with sensitivity, a number of key positions in the design and management team were filled by Rwanda personel, including:

- Head Project Manager
- Community & Environmental Officer.

DELIVERY & CONSTRUCTION MANAGEMENT

Training

- all workers received formal inductions on:
  - the importance of the environment to the project
  - One Planet principles; encouraging them to adhere to them both at work and at home.
- workers also attended daily 'toolbox meetings' and weekly environmental meetings to discuss environmental issues, general housekeeping, health, safety and employee concerns.

Workers receiving One Planet induction

100 desks made from reused packing crates are donated to the local school

Community support & engagement

- regular community consultation meetings were organised in conjunction with the local authorities to discuss any concerns and conflicts created by the project
- representatives from the development and management company attended local cultural and community events that included:
  - land donation event for park expansion by African Wildlife Foundation; December 2017
  - selection of community projects to be funded by tourism revenue sharing: Dec 2017, Nov 2018
  - Conversation on Conservation and baby gorilla naming ceremony during Kwitizina week: September 2018
  - Genocide Remembrance: April 2018 & April 2019
  - stakeholders' meeting, invited by park management, to discuss park biodiversity threats and role of partners in sustainable conservation: June 2019
  - community meeting, invited by local government, to discuss the role of community in conserving the park, community tourism and the role of community in protecting the developed projects around Volcanoes National Park: July 2019
- cases of theft and misbehaviour were minimal and were handled collaboratively with the community leaders
- 100 desks were given to G/S Kabara school, made from recycled timber packing palettes.

The management and investment team participated and collaborated in locally and nationally important cultural events.

Gorilla Naming Ceremony with Paul Milton and Luke Bailes in attendance

5.9 CULTURE & COMMUNITY

Respecting and reviving local identity, wisdom and culture; encouraging the involvement of people in shaping their community and creating a new culture of sustainability

A community consultation meeting

5.10 HEALTH & HAPPINESS

Encouraging active, sociable, meaningful lives to promote good health and wellbeing

POSITIVE OUTCOMES

- Personel protetcive equipment (PPE) issued to all workers.
- All workers given safety inductions.
- 6No. inquiries requiring further medical attention.
- 0No. deaths.
- No smoking permitted on site.

OPPORTUNITIES

- Ensure local suppliers are following health and safety protocols including the issue of PPE where necessary.

5.10 HEALTH & HAPPINESS

Encouraging active, sociable, meaningful lives to promote good health and wellbeing

DESIGN STRATEGIES

The health and happiness of building occupants was considered during the design stage, including:

- promoting natural ventilation and ensuring a minimum of 6 air changes per hour
- using Low VoC paints and adhesives to imporve air quality
- designing a common area landscape system that encourages walking and endeavours to educate guests on the local environment and their role within it.

DELIVERY & CONSTRUCTION MANAGEMENT

Safety

- risk assessment and management plans were written and followed
- a site health and safety guidebook was written and reinforced onsite with messaging and signposts
- personal Protective Equipment (PPE) were made available for any dangerous activities; ear and noise mufflers, helmets, boots, reflective jackets, gloves etc
- a first aid room was installed onsite. HSE in charge trained in first aid principles, with a local nurse hired to work in first aid room
- an injury logbook was kept throughout the project.
- the community was consulted to ensure children playing near construction work on the entry road kept a safe distance.

Health, Religion & Social Support

- small short-term loans were provided to construction workers by the contractor
- smoking was prohibited
- dining and toilet facilities were kept clean with dedicated staff
- freedom to worship was practiced for a multitude of faiths that included; Hindu, Christian and 7th Day Adventists.

No smoking signage

RWANDA RED CROSS
PUBLIC INTEREST ORGANISM
AUXILIARY OF PUBLIC AUTHORITIES
P.O BOX 425 KIGALI-RWANDA
TEL/FAX (+250)255 105260
E-mail: rrc@rwandaredcross.org
Web site: www.rwandaredcross.org

STANDARD FIRST AID CERTIFICATE N° [illegible] FA

Rwanda Red Cross certifies that NTAKARAKORWA DANA GUIDO has successfully completed Standard First Aid training organized at KIGALI

March 15, 2018 — Issue date
March 15, 2020 — Renewal date

Content of the training

1. First aid principles
2. Emergency removal, recovery position and transport of casualty
3. Respiratory emergencies
4. Bleeding & Shock
5. Stroke& Heart attack
6. Unconsciousness
7. Cardio-Pulmonary Resuscitation (CPR)
8. Traumatism of the skin (Wounds, Burns)
9. Traumatism of bones and joints
10. Moving &transportation
11. Fever
12. Food poisoning
13. First Aid kit management

Jeanne MUKESHIMANA, Training coordinator
Dr. Pascal KAYIRANGA, Head of First Aid Service
Apollinaire KARAMAGA, Secretary General of Rwanda Red Cross

A worker is treated in the on-site first aid room

Workers receive a safety briefing about the use of PPE

5.10 HEALTH & HAPPINESS

Encouraging active, sociable, meaningful lives to promote good health and wellbeing

6 FINISHED PRODUCT

Looking east from Guest Suite 3 toward the Main Lodge

On the 1st August 2019, the Singita Kwitonda Lodge was formally opened to the public by President Kagame.

The project was delivered on time, within a 24-month construction program, at a capital cost of approximately USD $25 million.

Main Lodge courtyard and fire pit

THE MAIN LODGE

Main Lodge Bar

Main Lodge Bar and Lounge

Main Lodge Dining Room

Western entry to the Main Lodge

THE GUEST SUITES

Guest Suite Bathroom

Guest Suite Bedroom

Guest Suite Lounge & Outdoor Terrace

Guest Suite 4

KATAZA HOUSE

Kataza House Dining Room

Kataza House Lounge

Kataza House Lounge and artworks

7 CONSULTANT TEAM

Milton Group LLC

DEVELOPMENT MANAGEMENT

Seyani Brothers Ltd, Rwanda

CONSTRUCTION

Singita International Ltd

LODGE MANAGEMENT, PROCUREMENT AND LOGISTICS

Aurecon-ECCON

LAND SURVEYOR

Earth System Africa

HYDROLOGIST

Rincent BTP

GEOTECHNICAL

TRPalmer

MASTER PLAN AND LANDSCAPE

Ecolution and One Planet

SUSTAINABILITY CONSULTANT

GAPP

CONCEPT ARCHITECT

FBW, Rwanda

ARCHITECT OF RECORD

Webb Uronu

QUANTITY SURVEYOR

FBW, Rwanda

STRUCTURAL & CIVIL ENGINEER

Cecile&Boyd

INTERIOR FURNISHINGS

HK Interiors

INTERIOR DESIGN

Fidele Ruzigan, Rwanda

EIA

“I acknowledge Milton Group, who led the construction of this beautiful facility working with a team of Rwandan and international consultants.

Congratulations on a job well done… it has exceeded my expectations”

HIS EXCELLENCY PAUL KAGAME, PRESIDENT OF RWANDA

MILTON