THE ARCHITECTURAL ASSOCIATION OF KENYA

AAK | PROMOTING EXCELLENCE IN THE BUILT ENVIRONMENT

COVID-19 RAPID RESPONSE

PROPOSED GUIDELINES ON PLANNING AND DESIGN OF COVID-19 QUARANTINE AND TREATMENT CENTRES, AND LONG TERM INFRASTRUCTURAL INTERVENTIONS FOR THE KENYAN CONTEXT.

2020

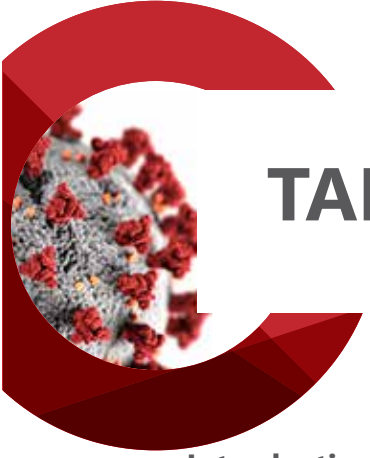
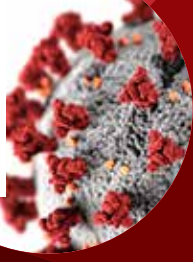


TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION



Introduction

Established in 1967, AAK is Kenya's leading Built and Natural Environment's professional association, incorporating Architects, Quantity Surveyors, Town Planners, Engineers, Landscape Architects, Environmental Design Consultants and Construction Project Managers. As an umbrella association, we bring together professionals in National and County Governments, the Private Sector and Academia. We also act as a link between professionals and stakeholders in the construction industry including policy makers, manufacturers, real estate developers, financial institutions, among others.

With the pandemic accelerating, its far reaching consequences continue to spread and catastrophically impact the interdependent global socio-economic sector. Given the scale and urgency of the pandemic, the way forward is to address it through collaborative efforts across all sectors: government, private sector and the civil society.

Towards this, it is only prudent that built environment professionals and consultants participate in this overall social responsibility as a means of responding to the crisis. AAK has therefore galvanized and put together a technical advisory committee to give advice on repurposing and/or constructing quick and safe care and treatment centers for COVID-19.

This has culminated in the production of this document; in which healthcare providers have also given their input. Our thanks to Kenya Healthcare Federation for their support and guidance.

Additionally, since it is evident that our urban spaces are not planned for social distancing, we intend to prepare long term urban management guidelines in the event there arises a similar pandemic in the future.

The objective of this document is to provide quick and innovative infrastructure guidelines to public and private health care sector players in response to Covid-19.

It is advisable that in implementation that registered professionals are engaged and the AAK membership stands ready to be engaged on design and supervision of the works. At the back of this publication we have also published contacts of our firm members available to provide this assistance when engaged.

In all the proposed solutions, we must insist that where possible, LOCAL SOLUTIONS and PRODUCTS be used.

BUY KENYA, BUILD KENYA

Mugure Njendu,
AAK President

PARTICIPATING VOLUNTEER PROFESSIONALS

Florence Nyole
Benjamin Nyawade
Patience Mulondo
Ham Wesonga
Charity Nyaga
Brenda Nyawara
Yasir Brek
Dennis Mukuba

Musembi Mumo
Manmit Jabbal
Francis Mbaya
Eric Kigada
Stephen Lutta
Susan Kabue
Dominic Cox
Raymond Muli
Judith Onyoni
P.V Osiago

Ambrose Ofafa
Mumbua Musyimi
Alfred Aluvaala
Cyrus Mbisi
Lorraine Odhiambo
Stephen Nyagaya
Stanley Maina
John Mwaniki
Olivia Otieno
David Njenga
Joel Oyuga
Susan Makhulo
Patrick Juma
Benson Githinji
Juliet Rita
Alex Nyaga
Gideon Olawo
Jasper Onyango
Baraka Mwau
Nathan Mutunga
Mugure Njendu

AAK COVID-19 RAPID RESPONSE LEADERSHIP TEAM

MUGURE NJENDU
AAK President
Architect, Urban Planner

WILSON MUGAMBI
AAK Vice-President
Architect

FLORENCE NYOLE
Chair- AAK Covid 19 Rapid Response Team
Team Lead, Group 1
Chairperson- Architects' Chapter
Architect

MUSEMBI MUMO
Team Lead-Group 2
Architect

AMBROSE OFAFA
Team Lead- Group 3
Landscape Architect

JOHN MWANIKI
Team Lead-Group 4
Architect
Assistant Hon. Secretary AAK

JULIET RITA
Team Lead- Group 5
Town Planner
Chair-Town Planners Chapter AAK

AAK COVID-19 RAPID RESPONSE EDITORIAL TEAM

PATRICIA K.BAARIU
Editor, BuildPress Magazine
Corporate Member and Council Member, Landscape Architects' Chapter

JAMES ODONGO
AAK Advocacy and Partnerships Officer

ASHLEY MWANGI
Graduate Architect
Creative Designer

CHRISTINE MWAURA
AAK Membership and Communications Officer

AAK COVID-19 RAPID RESPONSE DESIGN TEAM

VIOLETTE RIUNGU-MUCHIRI

Brand Builder,
Terracotta Moon

DIANA MACHOKA

Creative Designer,
Terracotta Moon

COLLABORATIVE KENYA HEALTHCARE FEDERATION COVID-19 RESPONSE TEAM

Kenya Healthcare Federation

KHF Chair

Amit Thakker

KHF Vice Chair

Elizabeth Wala

KHF CEO

Anastasia Nyalita

Supply chain

Vinod Guptan

ICT and mobile health

Torooti Mwirigi

Health reg, qual, stds

Millicent Olulo

Healthcare financing

Njoki Fernandes

Pnrship, coms, resources

Anne Musava

Human resources for health

Ken Auma

Board Director

Faith Muigai

INTERVENTIONS

1. Immediate design input on retrofitting of existing hospitals and schools required for Covid-19 Patients

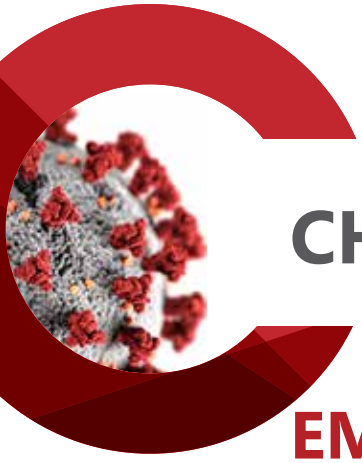
2. Innovative Design Solutions - container conversion, retrofitting of facilities, isolation units

3. Urban Scale solutions - mapping out identified facilities, urban parks and fields from city, neighbourhood, county level

4. Public Health solutions on sanitization, provision of water, emergency accesses etc.

5. Post Covid-19 strategies: longterm interventions and regulations, policies, legislation, guidelines on urban management

@ArchKE @arch_ke @arch_ke
Email: covidtaskforce@aak.or.ke Phone: 020 242 0806, 0721 691 337



CHAPTER 2:

EMERGENCY RESPONSE AT NATIONAL LEVEL

Task Force 1

Contributors to this Publication

Florence Nyole– Team Lead
Ham Wesonga
Charity Nyaga
Yasir Brek
Peter Ng'anga
Caleb Mutali
Robinson Manguro
Dennis Mukuba
Brenda Nyawara
Wangeci Kamau
Daina Murugi

Patience Mulondo
Mary Theresa

Benjamin Nyawade
Kevin Ndeti
Eng. Limo
Eng. Serem

Nashon Okowa

Editorial Contribution

Patricia Baariu
Mugure Njendu

Compilation and Co-ordination

James Odongo
Ashley Mwangi
Christine Mwaura

2.1 PLANNING CONSIDERATIONS FOR SETTING UP OF QUARANTINE FACILITIES FOR COVID-19 IN KENYA

BACKGROUND INFORMATION ON COVID-19

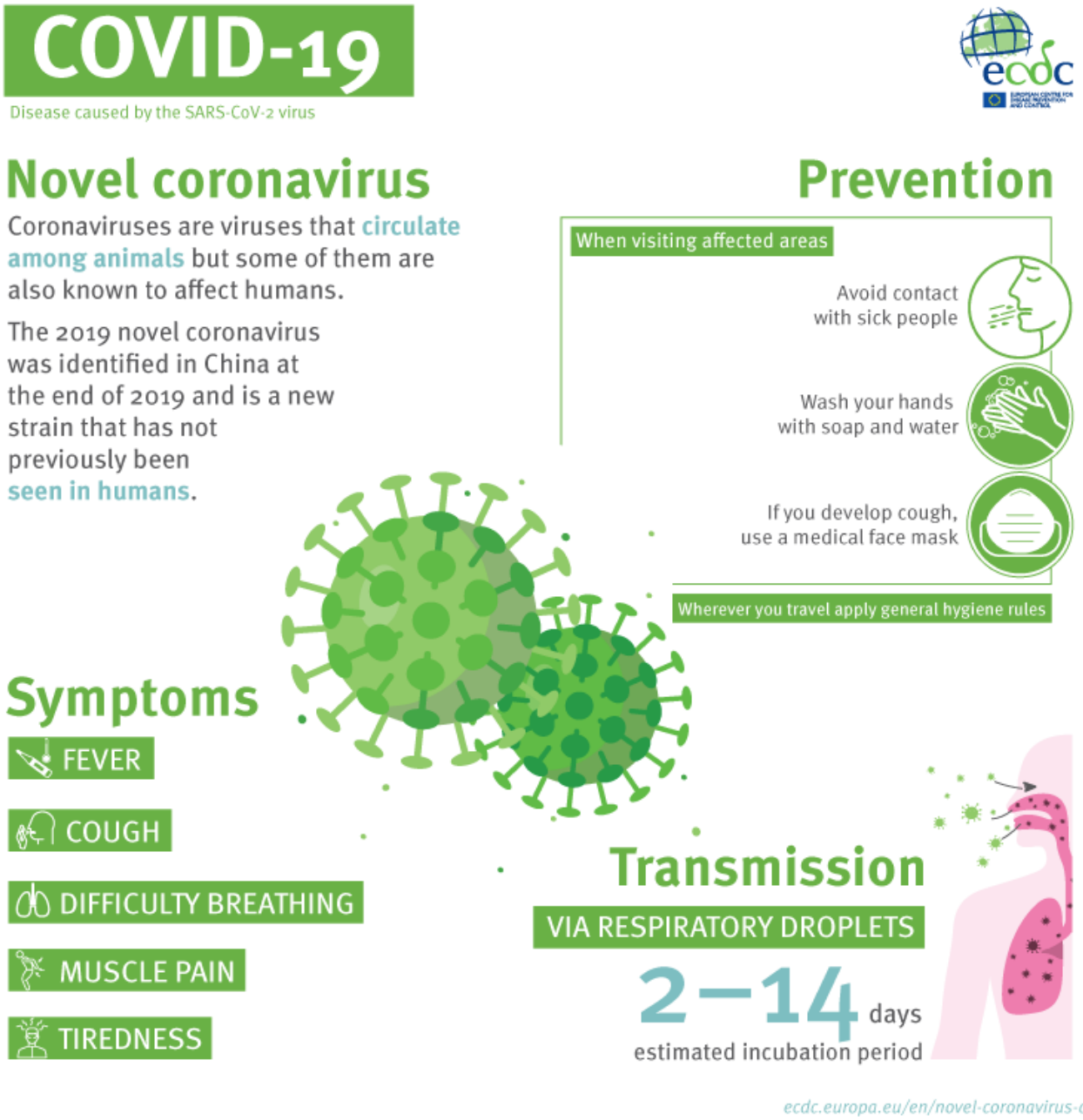


Figure 1: Basic information about the COVID-19 virus, symptoms, prevention and its transmission.

Quarantine

According to the Centers for Disease Control and Prevention (CDC), quarantine is the "separation and restriction of movement of persons, who, while not yet ill, have been exposed to an infectious agent and therefore may become infectious." Quarantine is effective in preventing the spread of a contagious illness and can be carried out voluntarily or ordered by government public health authorities.

Persons are usually quarantined in their homes, but they may also be quarantined in identified facilities. Quarantine can be applied to either an individual or a group of persons who are exposed at a large public gathering or during international travel or through exposure to a contact with confirmed to have contracted COVID-19. It can also be extended to the wider population or geographic level basis.

For instance, the closure of Nairobi Metropolitan area restricting movement into and out of the area is a geographical quarantine while the holding of persons in identified facilities for a period of time can be termed as population quarantine.

Figure 2: Chart on Impact of Mass Quarantine in China

Image Source: Neplaya Times

DEFINITION OF TERMS

Self-quarantine

According to the Aga Khan University Hospital, this means separating yourself from others when you are having no symptoms, but have been exposed and are at risk as is required by the government for 14 days after travel.

During this period, one watches out for COVID-19 symptoms and if mild, continue keeping away from others until 3 days after recovery. If one becomes severely ill, they should call emergency number 719 or if they need to go to the hospital immediately, they must notify the staff at the Accident and Emergency and take necessary precautions to protect oneself and others by wearing a mask.

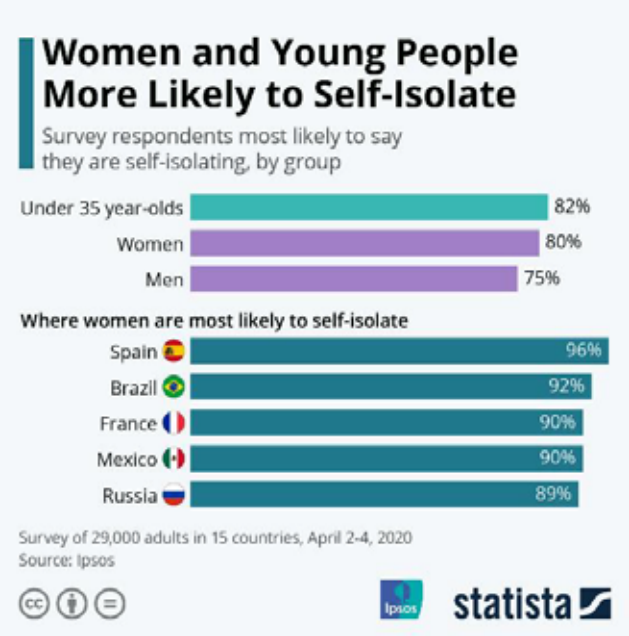


Figure 3: Self Isolation by group and location

Isolation

Isolation is different from quarantine, though many people wrongly use the terms interchangeably. Isolation, as defined by the CDC, applies to people who have a specific infectious illness. Their movements are restricted and they are separated from individuals who are healthy (or at least not symptomatic yet). Someone in isolation may be cared for at home, in hospitals, or at another healthcare facility. Though almost always voluntary, isolation can be mandated by the national or county government in order to protect the public from disease.

Isolation
Image source: newshub.co.nz

WHY QUARANTINE?

According to the World Health Organization, the recommended duration of quarantine for COVID-19 is up to 14 days from the time of exposure. The purpose of quarantine during the outbreak is:

- To reduce transmission by separating contacts of COVID-19 patients from the rest of the population, especially non-travelling persons in the population.
- To monitor the contacts for development of signs and symptoms of COVID-19
- To better segregate suspected COVID-19 cases as early as possible in order to reduce exposure to the virus.

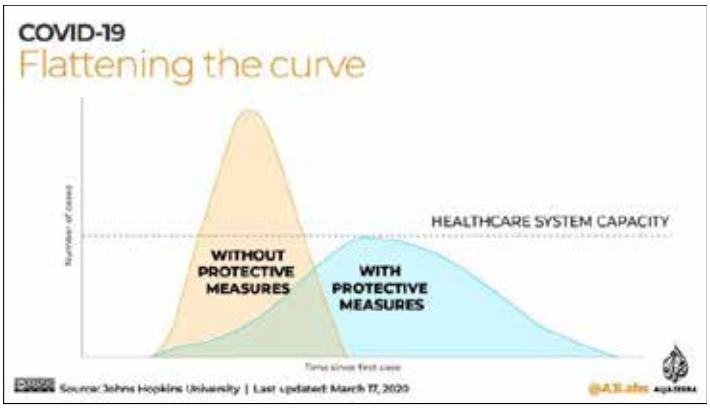


Figure 4: Illustration on Flattening the Curve

IDENTIFICATION OF A SUITABLE SITE FOR QUARANTINE

1. A secure location and requisite accommodation with safe and adequate space for quarantine of necessary number of individuals.
2. If possible, sites should be on the outskirts of cities to avoid unnecessary interaction with the public when delivering services to and from the facilities.
3. Staff needed to sustain, enforce, and provide services to quarantined individuals. Staff should be able to easily access quarantine centers.
4. Supplies needed to sustain quarantine should be easily delivered on need basis. Food, water and sanitation are among the basics supplies for quarantine.
5. Medical and mental health needs of the quarantined population should be met. Both physical and emotional support may be needed.
6. Special needs of the quarantined population (e.g., children, pregnant women, people with disabilities, and differing cultures and religions) should be considered.
7. Support organizations need to be available on site to assist in managing quarantine. These may include law enforcement, security guards and ambulance services, if need be.
8. Financial needs for managing quarantine are extensive and should be considered.
9. Address legal needs for managing quarantine (e.g. due process protections for quarantined population.)
10. Address media and public information issues as well as communication going in and out of quarantine facilities.

SPACE CONSIDERATIONS FOR A QUARANTINE SITE

1. ACCOMMODATION

According to the Federal Emergency Management Agency (FEMA) guidance for an emergency event of less than 36 hours duration is at least 1SQM per person while for longer periods then the space can double or triple that. Therefore, it is recommended that a quarantine facility should offer at least 3 SQM of space per person for personal space at a quarantine site exclusive of space required for eating, recreation, offices or ancillary services.

- An option of isolated ensuite rooms with washroom facilities
- A dormitory setup with a maximum of 5 -10 beds per room or zone separated from one another by a curtain or wall with each bed separated by a minimum of 1metre from all sides
- Washroom Facilities

Location

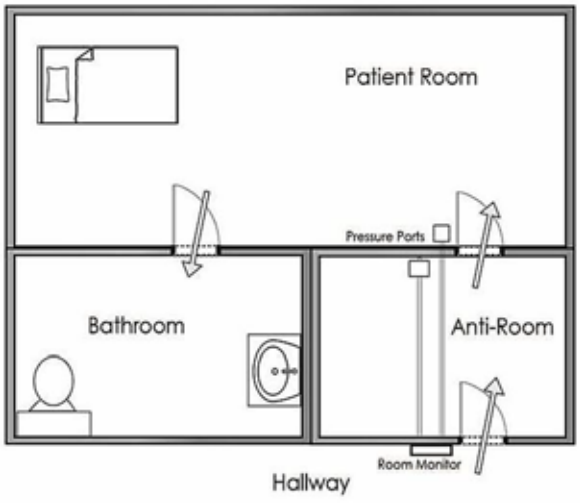
When selecting a site;

- It should preferably be placed in the outskirts of an urban or densely populated area to achieve isolation.
- It can be a hotel, a student hostel or an unused building within a health facility or a less than busy healthcare facility.
- It should be located away from the crowded and populated areas
- It should be well protected and secured preferably by assigned security personnel preferably from government.
- It should have access to a tertiary hospital facility having critical care and isolation facility.

Parking and Access considerations

- There should be sufficient parking space to allow for evacuation by ambulances and other emergency vehicles.
- Ease of access for delivery of food, medical and other supplies
- It should be universally accessible.

Airborne Infection Isolation Room



Space requirements for the facility:

The spatial program should include;

- Central administrative offices for the entire facility
- Logistics areas for processing entry and exit
- Designate examination room for testing or monitoring
- Laundry facilities which could be on or off the site

- Holding area for contaminated waste
- Wash room/Bathroom/Toilet for the staff

Social support and Recreational areas

- These could be used for television or radio, reading and indoor gaming. However, social distancing must be observed

Basic infrastructure and functional requirements:

The facility should have the following;

1. Sanitation

The sanitary needs of a group of people under quarantine must be addressed. Unless the quarantine is of very short duration, (e.g., less than 24 hours), both toilets and showers have to be provided. At least 5 shower cubicles and 5 WC toilets are recommended per 100 occupants.

In the case where the building or facility does not have enough sanitation facilities to cater for the numbers being accommodated, portable showers and cubicles can be erected with proper drainage and cleaning. One toilet for the physically challenged should also be erected. Depending on the facility being used, portable sinks might also need to be provided.

Also, for a quarantine of up to two weeks, provisions must include laundry service. Given the circumstances under which COVID-19 spreads, an off-site service may not be feasible. As an alternative, a washing area or several washer/dryer units could be installed in a designated area.

2. Power Source

If the building does not have adequate primary and backup power, generators and fuel supplies have to be available to keep the facility operational for the duration of the quarantine. Power requirements will be substantial and will involve more than back-up emergency power to keep exit lights illuminated.

3. Lighting

The building must have adequate lighting for daytime and nighttime use. Depending on how the building is used normally, sufficient lighting may already be in place, although it may not provide adequate task light or allow for lower lighting levels during the evening.

4. Communications

Quarantine planners will need to ensure that the site can be set up with communications links (telephone lines, internet, television, public address system) either through pre-established infrastructure or via wireless capability. Radios, batteries, and power outlets for cell phone recharging will be needed.

5. Heating, Ventilation, and Air Conditioning

A quarantine area must have sufficient heating, ventilation, and air conditioning (HVAC) systems to keep people reasonably comfortable.

This is more than just for convenience: the old, the very young, and people with particular medical conditions are less tolerant of temperature extremes than the rest of the population. Portable HVAC units may have to be brought into the quarantine site, and ventilation will have to be evaluated by an HVAC expert.

2. SUPPLIES

Food

These are crucial to the operation of a quarantine facility and there should be a plan to include provisions to store a supply of basic foods or to acquire them quickly, for the first 24–48 hours of the quarantine. After that point, if necessary, a food supply system should be in place to provide for needs of the people in quarantine.

There may be persons who have diabetes or other related blood sugar disorders or who are on medication that require to be taken with food. Also, some may have babies or small children with them. It is much harder for babies and small children to ward off hunger. Space for carbohydrate-rich snacks, baby formula, and canned or packaged food could be provided at the site. It is not necessary to have accommodations for preparing hot meals as long as they can be purchased for delivery from a supplier. Paper plates, cups, and napkins and plastic utensils can be used. Can and bottle openers should be available as well.

Water

The people in quarantine require lots of water as it is recommended that one keeps hydrated during the COVID_19 outbreak. In case the facility does not have potable running water, then alternative supplies must be provided such as bottled water brought in by a public or private supplier or stored on site.

At least 2 litres of water per day per person may be necessary. If the temperature in the building is warmer than comfortable, then more water may be needed. Other beverages can be provided to supplement water.

Clothing and Personal Items

Depending on the circumstances under which persons under quarantine arrived at the facility, persons may not have access to clothing and personal items or might not have appropriate clothing for the weather. Some quarantined individuals may be able to make arrangements for clothing and personal items to be sent to them by family or friends, while others may need to have these provided. Volunteer organizations have or can quickly obtain donations of clothes to fill the gap.

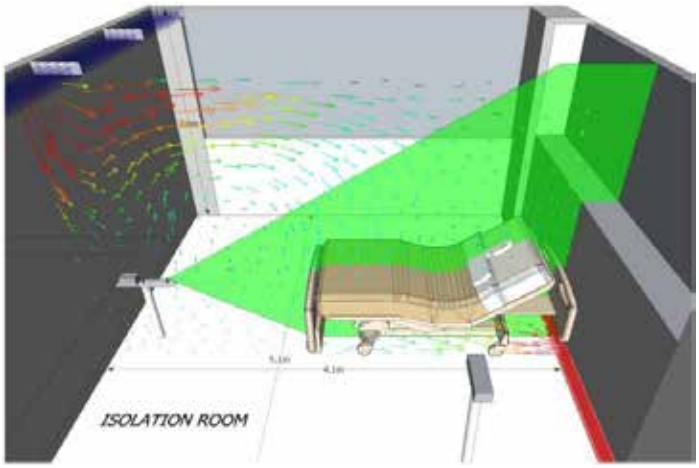


Figure 6: Artificial Ventilation in an Isolation Room
Source:https://www.researchgate.net/figure/The-isolation-room-is-fitted-with-the-downward-ventilation-systems-The-design-is-to_fig1_233915604

Bedding and Other Supplies

A projected list of supplies and equipment, according to the US Federal Emergency Management Agency (FEMA) and Red Cross guidelines, should include the following:

1. Bedding—a cot, blanket, pillow and sheets for each person with a spare one as well.
2. Emergency equipment such as flashlights, fire extinguishers, tool kits etc.
3. First-aid supplies including tape, safety pins, latex gloves, scissors, antiseptics, antibiotics, smelling salts, splints, thermometers, blood pressure gauges, variety of bandages, towels, and ointments.
4. Sanitary supplies—toilet paper, paper towels, personal hygiene items, chlorine bleach, disinfectants, trash cans, and plastic bags.
5. Infant and children supplies—disposable diapers, powders and ointments, moistened towels, pacifiers, toys, and blankets.
6. Social and recreational needs—age-appropriate games, toys, books, and magazines.

A quarantine area should have portable partitions to allow family groups to stay together and to allow at least some privacy for sleeping and changing clothes. In addition, partitions will be needed to establish recreational and office space.

First aid supplies needed

RISK ASSESSMENT OF THE QUARANTINE FACILITY

Assessing the risk levels enables the management to determine how likely it is that someone in the Quarantine facility will become infected with COVID-19 as a result of movements and activities performed within the facility. Risk assessment basically identifies the biohazard risk precaution levels along with associated activities. The risk level refers to how likely it is that someone in the Quarantine facility will become infected with the virus as a result of procedures performed within the facility.

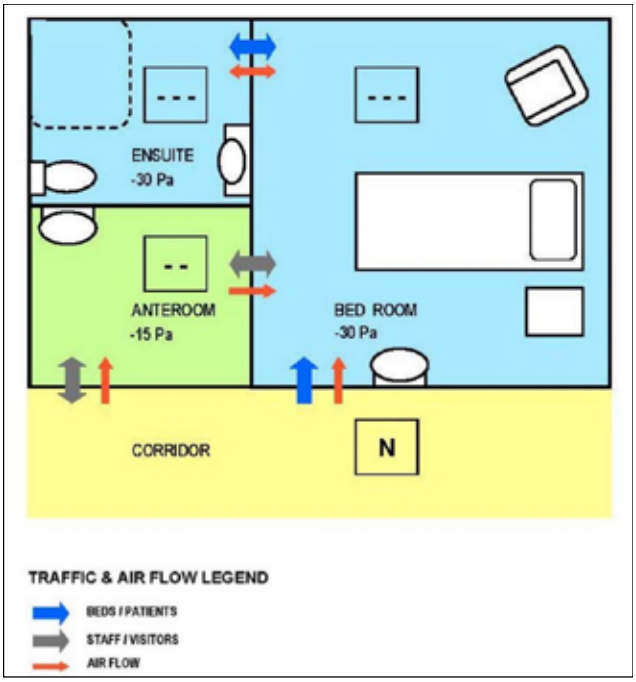


Figure 7: Typical Negative Pressure Isolation Room with Anteroom & Suite
Source:http://healthfacilityguidelines.com/ViewPDF/ViewIndexPDF/iHFG_part_d_isolation_rooms

Areas can be segregated and labeled according to the table below

Low risk areas	Have less direct contact with evacuee suspects such as control room, nursing station and areas of kitchen where food is cooked.
Moderate risk areas:	- Areas where infectious aerosols are generated from areas where the suspected cases were inhabiting such as in their bed linen, pillows and clothes - Low concentration of infectious particles - Contaminated surfaces near the quarantine zones.
High risk areas	- Direct dealing of suspected cases under Medical examination room, sample collection areas with high concentration of infectious particles while coughing, sneezing, gag reflex during sample collection - Toilet and bathroom areas, dining areas, areas of bio-waste collections, segregation and disposal.

Based on risk assessment, areas should be earmarked and infection prevention control measures to be applied as per MOH guidelines. *Annexed

STANDARD OPERATING PROCEDURES FOR QUARANTINE FACILITIES

1. Monitoring health of contacts

During the quarantine period, contacts should be monitored at least daily for fever and respiratory symptoms. To ensure smooth operations in the quarantine facility, the Standard Operating Procedures (SOPs) need to be applied for;

1. Daily monitoring surveillance using the daily reporting format
2. Fever triage and isolation procedures
3. Case and contact monitoring and response
4. Transfers of suspected or symptomatic cases to designated hospitals
5. Movement of health personnel and support staff into and out of the facility
6. Communication procedures to all parties
7. Procedural Standard Operating Procedures for;

- Persons under quarantine
- Medical personnel assigned to the facility
- Support Staff at Facility
- Security personnel assigned to facility

It is important that functional flow is maintained to reduce/minimize the interactions between quarantined persons, healthcare professionals and the facility staff to ensure transmission of disease is prevented and controlled.

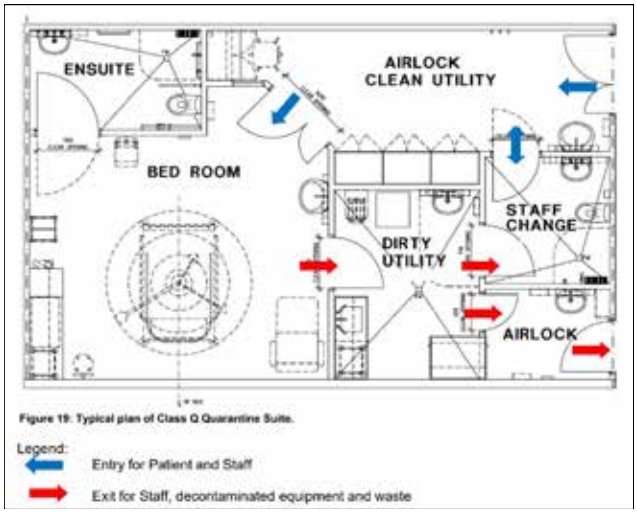


Figure 9: Typical plan of a Quarantine Suite
Source: http://healthfacilityguidelines.com/ViewPDF/ViewIndexPDF/iHFG_part_d_isolation_rooms

2. Human Resource Deployment

Since the quarantine facility cannot run itself, services must be provided even though staff will potentially expose themselves to contamination as well. For the purposes of planning, this document assumes that measures will be identified and implemented that minimize the risk of exposure for individuals providing these services such as through the use of personal protective equipment, inoculations and/or prophylactic treatment, and/or strategies for avoiding person-to-person contact.

In the quarantine facility the following staff need to be deployed to ensure routine examination and relevant clinical care of the quarantined people;

1. Chief Medical officer - In-charge /nodal officer for overall coordination and supervision of the quarantine center.
2. General Practice medical doctors,

4. Para-medics for emergency evacuation.
5. Pharmacist
6. Public health specialist for monitoring public health aspects of the facility
7. Clinical microbiologist for sample collection, packaging and infection prevention & control practices.
8. Housekeeping staff

3. Services

Security
Security is an essential service and law enforcement personnel are likely to be required. Again, consideration must be given to exposure of security personnel.

Securing Entry and Exit Points
To prevent and control infection within the facility, strategic efforts need to be put in place such as;

1. **Control room/ante room** where entry and exit of all persons is monitored.
2. **Proper training or awareness creation** on the SOPs within the facility.
3. **A well informed and trained security personnel** to check personnel at the main entrance gate of the area and a 24hour registration system for entries and exits
4. **Designated medical personnel** checking proper PPE wear especially from the main entrance of the facility and around the different areas within the facility.
5. **International biohazard warning** symbol and sign to be displayed on the doors of the rooms where suspected cases are staying, Bio medical waste (BMW) management areas, samples of higher risk groups are handled.
6. **Systematic authorization and assignment** of all personnel to designated work areas to access the quarantine areas.
7. **Closed doors** as much as possible preferably under observation of a guard

4. Medical Evaluation and Services

Nurses and doctors may be needed to assess quarantined individuals for symptoms of COVID-19 as well as to provide evaluation and Treatment of pre-existing or newly occurring conditions.

Part of the initial assessment process will be to screen the population for existing medical conditions. For example, some people may have chronic conditions that require medical treatment on an ongoing basis (e.g., dialysis every 48 to 72 hours or a continuous supply of supplemental oxygen).

Likewise, some people may have daily or frequent medication needs, and may require refill of medications to last for the expected duration of the quarantine period. Further some medication may require refrigeration or room temperature storage and if subjected to extreme temperatures the medicine may need to be replaced.

A quarantine plan must have provisions for replacing, storing and dispensing prescription medication and other medical treatment unrelated to the disease. Injuries and illness that could occur or develop during quarantine must be treated. First aid kits should be part of the inventory of supplies.

In addition, one Automatic External Defibrillator (AED) per 100 people should be available in the quarantine facilities and arrangements should be made in advance with local medical facilities for referring people subject to quarantine in the event that more extensive medical treatment is necessary.

In the event that there are suspected cases of the COVID-19 outbreak that necessitated the quarantine in the initial case, treatment plans and the staff needed to implement them are needed. Isolation areas within the quarantine area may be necessary.

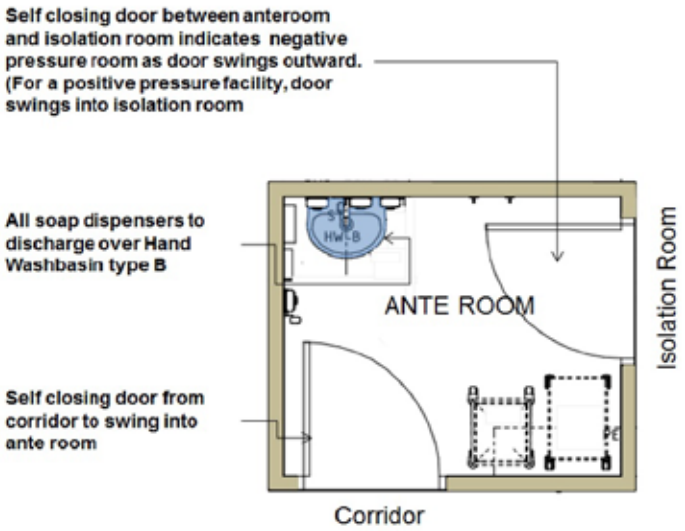


Figure 10: Typical Ante Room Floor Plan
Source: http://healthfacilityguidelines.com/ViewPDF/ViewIndexPDF/iHFG_part_d_isolation_rooms

2. Mental Health

While the majority of the population in quarantine will adjust to the situation, there may be individuals that do not.

There may be individuals with pre-existing mental health issues who require additional care. Part of the medical considerations for a quarantine plan must include provisions for mental health services and the wellbeing of the people in virtual lockdown. Counseling should be provided and resources made available after the people are released from quarantine. Mental health issues may overlap with medication needs and become part of the needs to acquire and store medications on site.

3. Special Needs

Language and Cultural Needs
Language barrier will cause communication difficulties within the facility and as such the services of interpreters may be required. Quarantined individuals or with multi-lingual skills may be of assistance in providing interpretation. If no locally-based interpreter is available it may be possible to provide interpreters by phone (note: even on-site interpreters will not be able to have direct contact with the quarantined individuals unless they themselves are quarantined). Embassy contact information should be provided to foreign nationals in quarantine, if any.

Dietary Restrictions
Whether based on cultural practices, religious beliefs, or health concerns, some people may require special food. For example, several cultures and religions do not eat pork products. When acquiring pre-packaged meals for the quarantine area, a chicken meal and a vegetarian meal should be two of the choices. After the dietary needs of the population are known, a variety of foods can be ordered.

Religious Needs
As with cultural differences, religious needs have to be addressed in a quarantine plan. An area(s) should be designated as "quiet or meditation" zone(s). Certain faiths may ask for religious books such as a Bible or Quran. Pastors or chaplains or other spiritual leaders may offer or request to be admitted to the area to minister to the needs of the members of their faith.

Media Management
A quarantine facility is likely to attract extensive media coverage. The challenges for staff at the facility include handling media inquiries and requests for interviews, managing (or restricting) access for media on site.

It is important during any emergency to convey complex information clearly and simply. However, it should be anticipated that quarantined individuals may contact the media directly via cell phone or e-mail, or be willing to provide interviews to the media without going through any official communications plan. Providing quarantined individuals with access to the same information that is going out to the media will help to address this issue.

4. Training

Training is the most important and critical part to ensure that all activities takes place as per established protocols and SOPs.
This is carried out to health care professionals and other relevant staff at the initial stage as below;

- Training of medical officers on SOPs would include daily examination, movements in the facility, infection prevention control measures and use of PPE kit etc.
- Training of clinicians, laboratory technicians and medics needs to be undertaken on appropriate sample collection and triple layer packaging with cold chain maintenance.
- Paramedical staff i.e., staff nurses; medics, pharmacist etc. need to be trained on SOPs to be followed at Quarantine centers and use of PPE kit.
- Staff undertaking the work in Laundry, Mess/Canteen, security and other related staff i.e., drivers, general duty staff etc. needs to be trained on use of mask, gloves, cleaning and disinfection procedures and use of PPE kit, etc.

Refresher training or regular direction to all the above staff needs to be provided as on need basis. During the quarantine period as and when new staff are posted, it needs to be ensured that he/she received proper training before undertaking the work. It is to emphasized that all activities/procedures must be done under strict monitoring/observations of trained specialists.

Training of medica staff is important and critical

ESTABLISHMENT OF INFECTION PREVENTION CONTROL (IPC) MEASURES

Infection Prevention Control measures should be undertaken as per the risk assessment that was previously proposed, with respect to probability of infection from possibly infected quarantine people to health care, other staff and surrounding areas. A special map of the facility needs to be prepared. This map should outline the details of movement of health care and other personnel around the quarantine area and in the building. It needs to be ensured that movement of health care staff and other personnel is as per the designed map to prevent and control infections.

Separate fence needs to be raised around the building to prevent entry of animals especially dogs, monkeys and even birds if possible. Well informed and trained security personnel needs to be deployed all around the building on 24*7 rotation basis to monitor the facility and to avoid entry of un- desired persons/ animals and even birds for eating any food remains/droppings inside the area.

To ensure that all health care personnel use PPE as per guidelines, they need to be properly trained and assisted during wearing of PPE. Separate areas to be earmarked for PPE Donning and Doffing. Compliance for same to be ensured by nodal officer.

Separate well informed and trained nursing officers need to be stationed at the building to regulate the movement of the staffs entering the facility. He/ She should be assigned the duty that every person entering the facility enters in the register of all the details on time of name, designation entry/exit.

Nursing officer to ensure that all the persons are labeled while entering the building so that they can be identified by security staff. At the entrance, two door entries may be ensured to avoid mixing of quarantine people with health care staff.

It is to be ensured that all the quarantine facility is decontaminated daily (refer to infection prevention control guidelines) with disinfectants (freshly prepared 1% hypochlorite, detergent solution) including surface mopping of all the floor, bathrooms, toilets facility, under side of beds, other related items placed in the rooms of quarantine people.

A separate cubicle for people developing mild symptoms for temporary observation (transit room) may be considered so that it will lead to an early isolation of any symptomatic person and to prevent transmission to other cluster of groups.

Lodging, Catering, Laundry and other related activities

Disposable and pre-packed food to be served to quarantined people. All the quarantined people to be kept on separate beds with distance of 1-2 meters with no bed facing opposite to each other. All Beds should have disposable bed sheets that should be changed on a daily basis. Personal toiletries/ towel/ blanket/ pillow with covers/electric kettle, room heater and water dispenser may be provided to each person depending on availability.

A separate room needs to be assigned to perform laundry services for cleaning of all the clothes and other washing related activities.

Before laundering, all the washable items needs to be placed in 1% hypochlorite up to 30 minutes and later washed in detergent solution.

Biomedical waste (BMW) management

To ensure that biomedical waste management in the facility takes place as per standard guidelines, separate yellow, red /black bags, foot operating dustbins needs to be kept at each floor and outside the facility. It is to strictly ensure that Doffing takes place in the designated area with all the PPE kit including mask, gloves properly placed in yellow bags. All the health care workers collecting the possible infectious material such as food items, PPE kits from yellow bags should also wear PPE and follow the IPC measures. Designated place to be earmarked outside the building for collection of yellow and black bags. It should be collected at least twice daily by biomedical waste management vehicle/any other local established practice.

Site of collection of biomedical waste should be regularly disinfected with freshly prepared 1% hypochlorite solution. All officials concerned with the administration and all other health care workers including medical, paramedical, nursing officers, other paramedical staff and waste handlers, attendants & Sanitation attendants needs to be well oriented to requirements of handling and management of general and biomedical waste generated at the facility. Steps in the management of biomedical waste include generation, accumulation, handling, storage, treatment, transport and disposal as mentioned in the SOP needs to be followed. Continuous training, monitoring & supervision to monitor the implementation to be done on daily basis to manage compliance related issues.

All the generated waste from Quarantine facility to be treated as isolation waste and its disinfection /treatment was strictly monitored by specialists in the health authorities.

Logistics Management

All materials to be used in quarantine facility i.e. PE, medical equipment i.e. Thermal thermometer, Stethoscope, BP machine etc., office logistic, sample collection and packaging material, etc. to be purchased in advance.

Performa needs to be prepared for daily consumption of PPE, triple layer mask, gloves, etc. and monitored by logistic team on daily basis.

Sample collection and packaging

For baseline testing, Samples (Nasopharyngeal swab and throat swabs) for COVID-19 need to be collected from all quarantined people & sent with triple layer packaging maintained in cold chain (2-8oC) to designated laboratory.

Safe collection & handling of specimens in the Quarantine camp needs to be performed in identified locations as per the SOP. Specimen containers generally used are viral transport medium (VTM vials containing 3 ml medium) with falcon tubes (50 ml) as secondary layer of Triple layer packaging system.

Containers needs to be correctly labeled to facilitate proper identification. Specimen request or specification forms to be placed in separate waterproof zip pouch envelopes with locking facility and pasted on the outside walls of the sample transport containers (Performa annexure). Just before the end of the 14 days quarantine period, resampling of nasopharyngeal swabs needs to be done.

Discharge of quarantine people from Quarantine Facility

The quarantined people need to be discharged at the end of 14 days of incubation period provided samples are negative on resampling. Instructions should be provided to self-monitor their health at their home (home quarantine) for the next 14 days and immediately report to the emergency response teams in their areas in case of development of symptoms suggestive of COVID-19.

Written instructions should be handed over to them individually. The County Surveillance Units, when established to be provided with contact details of the quarantine people to conduct active surveillance for the next 14 days.

Terminal Disinfection and decontamination procedures

Quarantine facility terminal disinfection procedures to be performed as per guidelines. Cleaning/ decontamination to be performed using the proper personal protective equipment (PPE) and adopting three bucket system as prescribed in the SOP (at attached annexure).

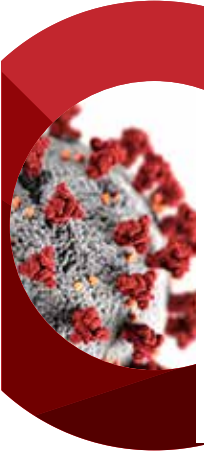
Spraying of 1% sodium hypochlorite working solution (dilution 1:4 from an initial concentration of 4%) to be done on all the surfaces (protecting electrical points/ appliances). This is to be followed by cleaning with a neutral detergent that is used for removing the traces formed by hypochlorite solution. While cleaning, windows need to be opened in order to protect the health of cleaning personnel.

All frequently touched areas, such as all accessible surfaces of walls and windows, the toilet bowl and bathroom surfaces needs to be carefully cleaned. All textiles (e.g. pillow linens, curtains, etc.) should be first treated with 1% hypochlorite spray and then, packed and sent to get washed in laundry using a hot-water cycle (90°C) and adding laundry detergent. 1% hypochlorite solution should also sprayed in the PPE doffing area and discard area twice a day on daily basis. Mattresses / pillows after spraying with 1% hypochlorite should be allowed to get dry (both sides) in bright sunlight for up to 3 hours each.

Clean-Up and Disinfection (Post-Quarantine)

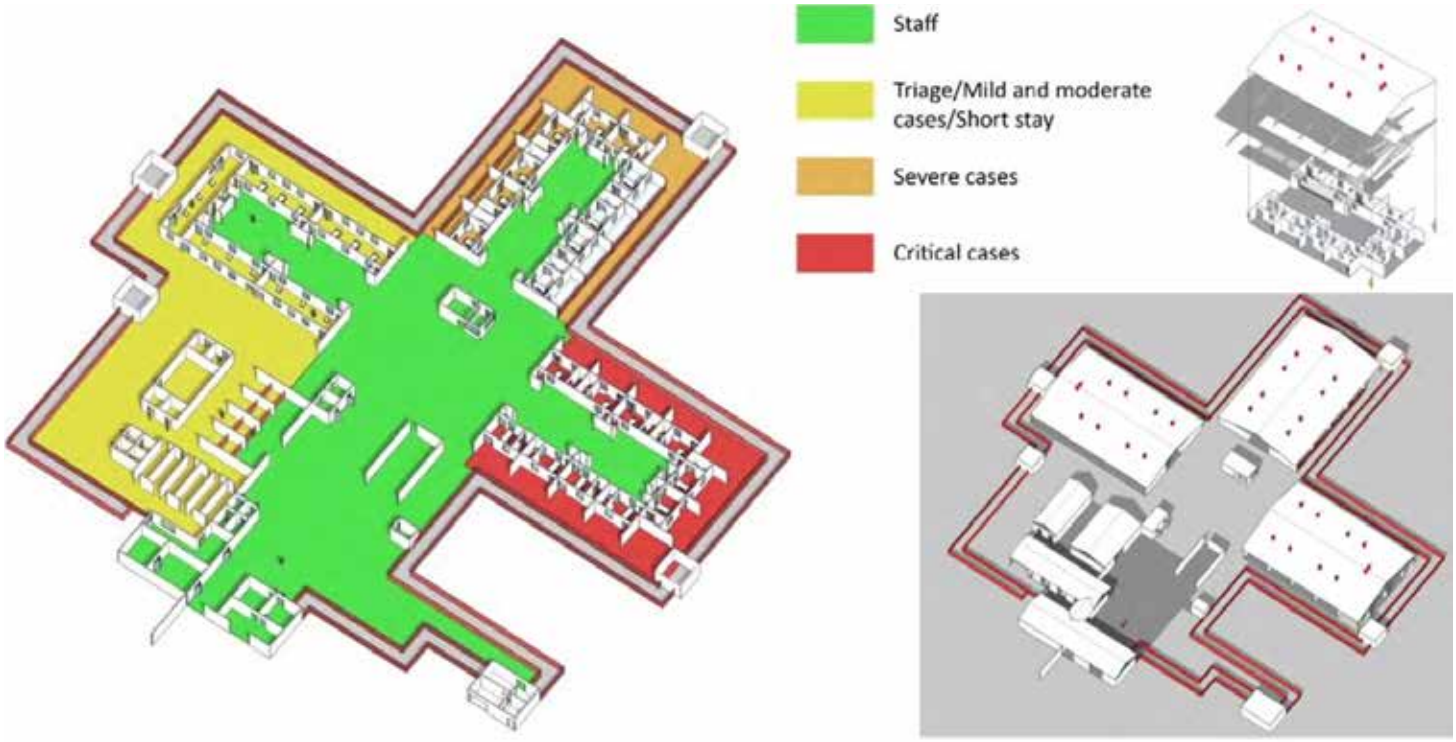
Before the area that is used for quarantine is returned to other service or left in a stand-by mode for future use as a quarantine facility, it must be cleaned sufficiently to ensure that there is no risk of further contagion from the items or materials left behind. Plans should be made for specialized cleaning/disinfection by individuals trained in the use of appropriate personal protection equipment (PPE) for the quarantinable disease and universal precautions for dealing with materials potentially contaminated by blood and feces.

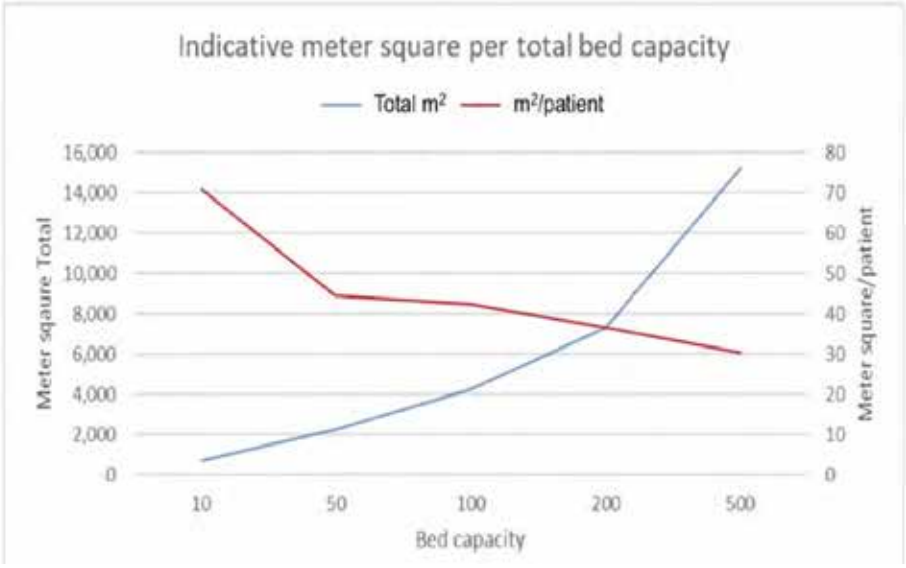
If the quarantine facility serves another purpose (e.g., food service), more stringent clean-up standards may be applicable.



2.2 DESIGN CONSIDERATIONS/PRINCIPLES OF ALL SEVERE ACUTE RESPIRATORY INFECTION (SARI) TREATMENT CENTRES (IN RELATION TO COVID-19)

Derived from World Health Organization standards (www.who.int)





These measures are indicative and based on architectural standards and previous field experiences with other infectious diseases.

- As close as possible to the outbreak epicentre;
    - Next to existing health facilities (to allow an integrated approach and ease the referral of suspect case);

    And/or

    - New place chosen according to specific strategic reasons (space, community acceptance, accessibility, etc.)

Construction field requirements:
- Enough space (future extensions) and accessible water source;
- Soil conditions: waste water infiltration, rain water evacuation, stability, etc.;
- Take into account prevailing winds for the control of smoke and odours.

Accesses and flows

Space allocation (mixed areas and restricted areas)

Proximity between areas

Dimensions and distances

Ventilation and light

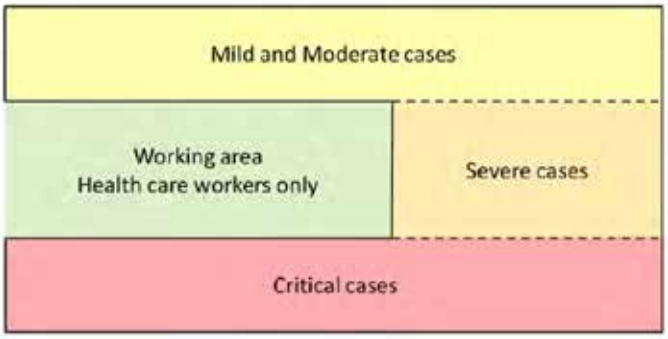
Materials

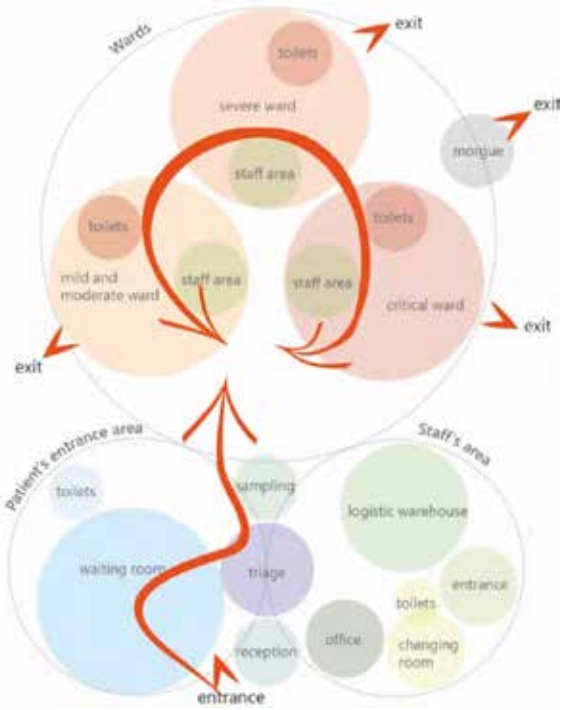
Essential elements:

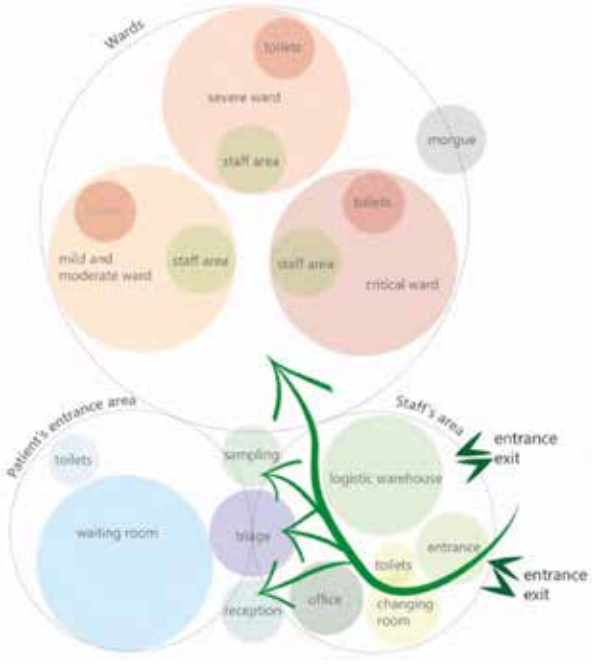
- Patient's entrance area: reception, waiting room, patient's toilet and triage, sampling.
- Staff's area: entrance, changing room, staff's toilet, office, logistic area.
- Ward: Mild/moderate, severe and critical wards

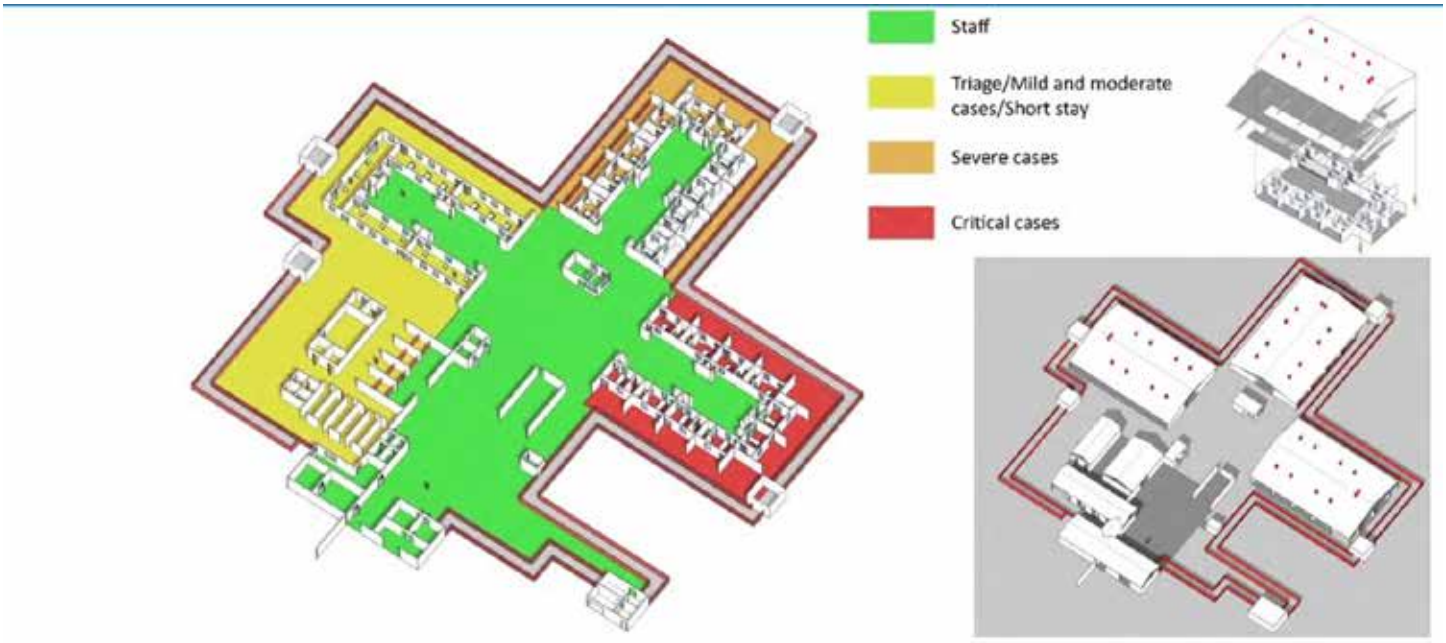
- ✓ Medical care should be provided as soon as possible, even prior to laboratory confirmation, in order to avoid medical conditions worsening.
- ✓ The different levels of risk, represented by patients with specific medical conditions, such as severe cases which might need an aerosol generating procedure [aspiration, intubation, bronchoscopy, etc.].
- ✓ Ensure a clear demarcation and separation from patient and staff areas in order to reduce the risk for HCW and allow a rational use of PPE.

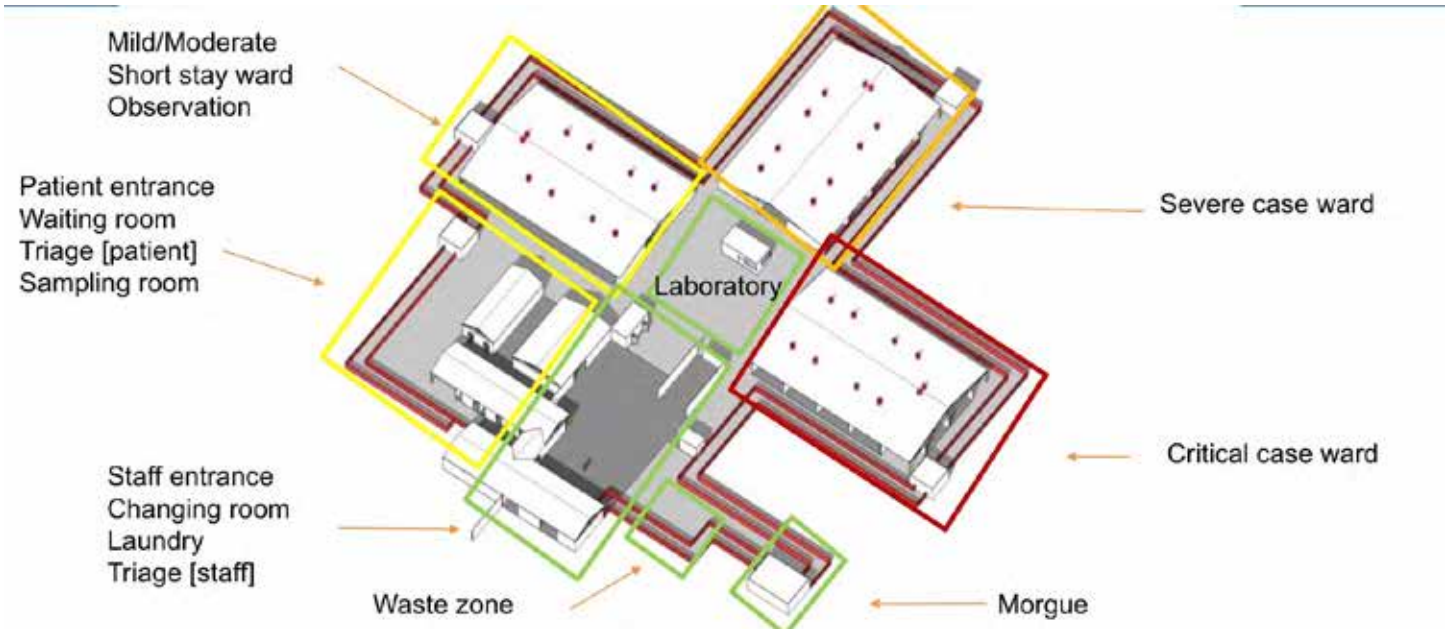
Based on the **clinical definition** of patients with SARI, suspected of COVID-19, the clinical syndromes associated with COVID-19 infection and related medical conditions: mild, moderate and severe illness [including critical patients].








Staff
Triage/Mild and moderate cases/Short stay
Severe cases
Critical cases

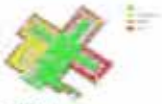

Mild/Moderate
Short stay ward
Observation
Patient entrance
Waiting room
Triage [patient]
Sampling room
Staff entrance
Changing room
Laundry
Triage [staff]
Waste zone
Laboratory
Severe case ward
Critical case ward
Morgue

Short stay ward
Mild/Moderate cases
Ward: Spatial separation
Ventilation: Natural ventilation

Severe cases
Ward or individual self-contained room
Ventilation: Ventilation at least 160 l/s/patient

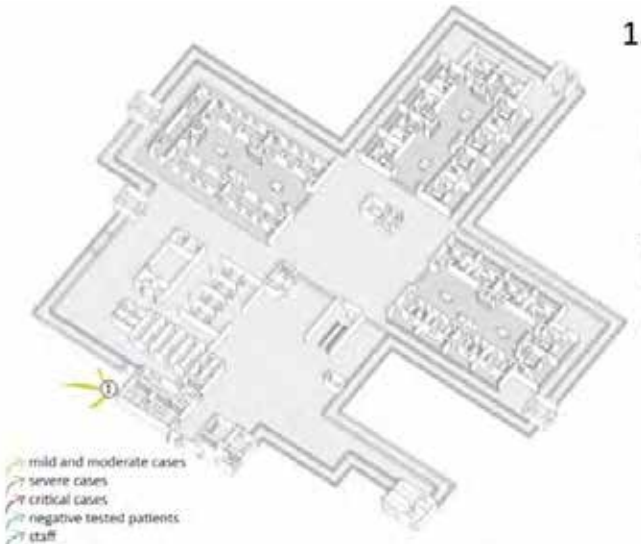
Critical cases
Individual self-contained room
Ventilation: Ventilation at least 160 l/s/patient

Short stay ward
Mild/Moderate cases
- ❑ Uncomplicated illness
- ✓ E.g. Isolation /community facility
- ➢ Droplet & Contact precautions

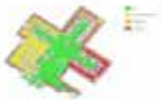


Severe case ward
- ❑ Severe pneumonia
- ✓ E.g. Oxygen
- ➢ Airborne & Contact precautions

Critical case ward
- ❑ Acute Respiratory Distress Syndrome [ARDS]
- ❑ Sepsis
- ❑ Septic shock
- ✓ E.g. Patient ventilation
- ➢ Airborne & Contact precautions

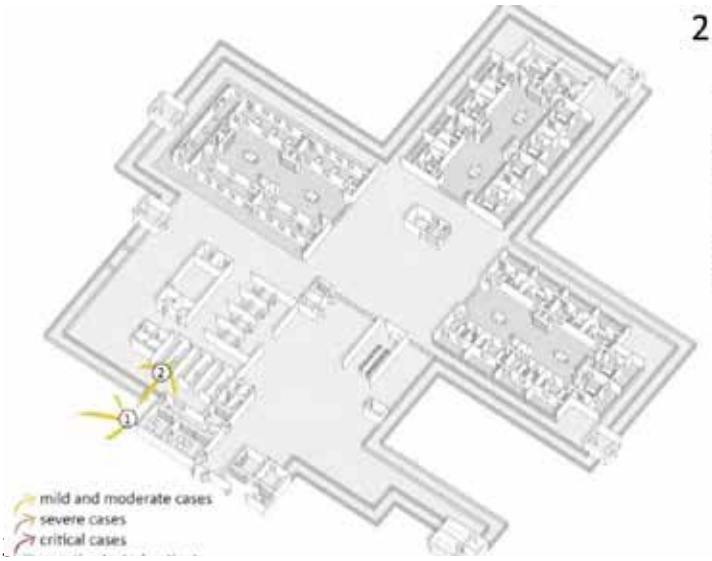


1. Patient entry



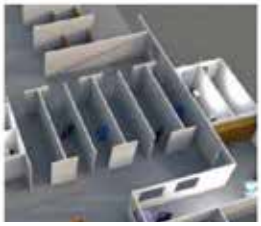
NOTE: Patients have already been triaged in another medical facility and are referred to the SARI treatment center.

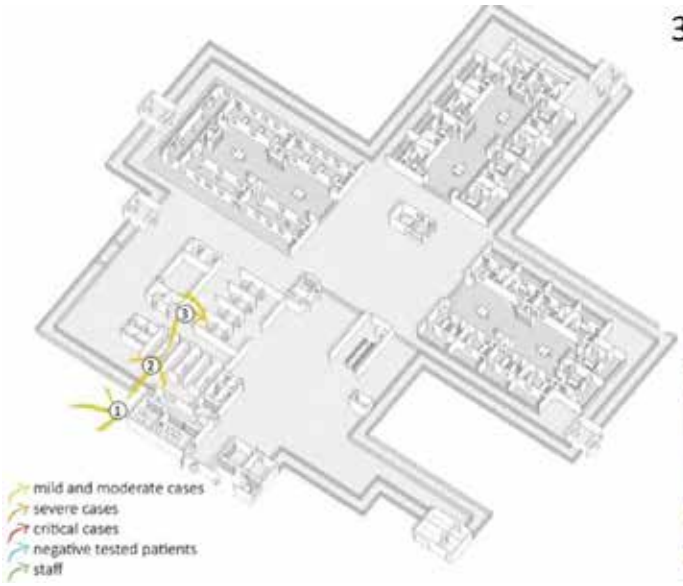
At this point, all patients:
- receive a mask;
- wash their hands; and
- are directed to a dedicated individual booth in the waiting room.



2. Waiting room

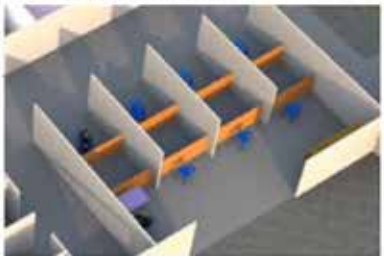
The waiting room is composed of different individual booths with separated entrances and exits. This facility is completely open [no doors] to allow a proper natural ventilation and is equipped with dedicated toilets.

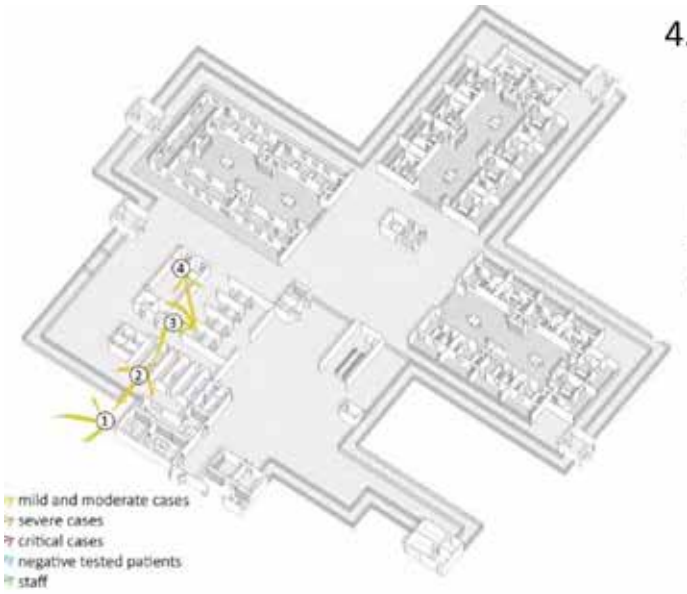




3. Triage

Patients are investigated in an individual triage booth. A one (1) meter distance fence [1.2 meter high] separates patients from staff. This facility is completely open [no doors] to allow a proper natural ventilation and is equipped with dedicated toilets.

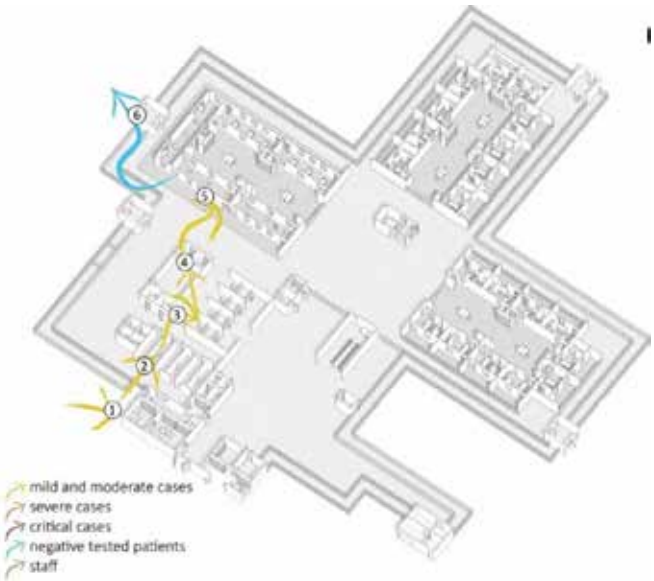


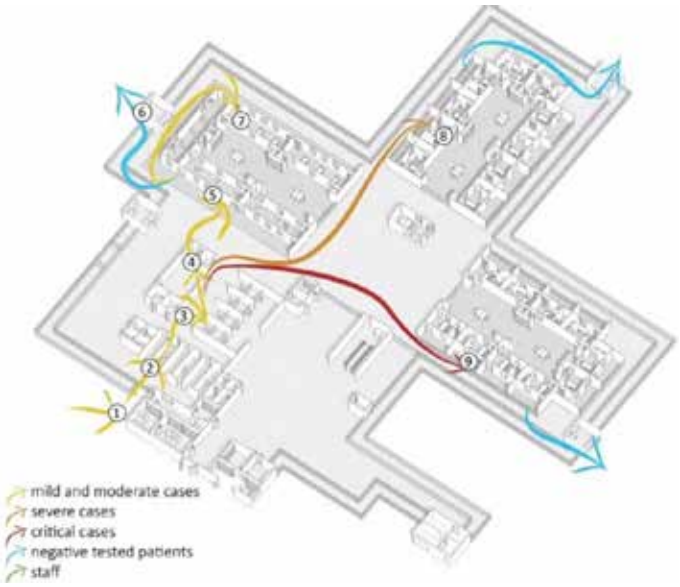


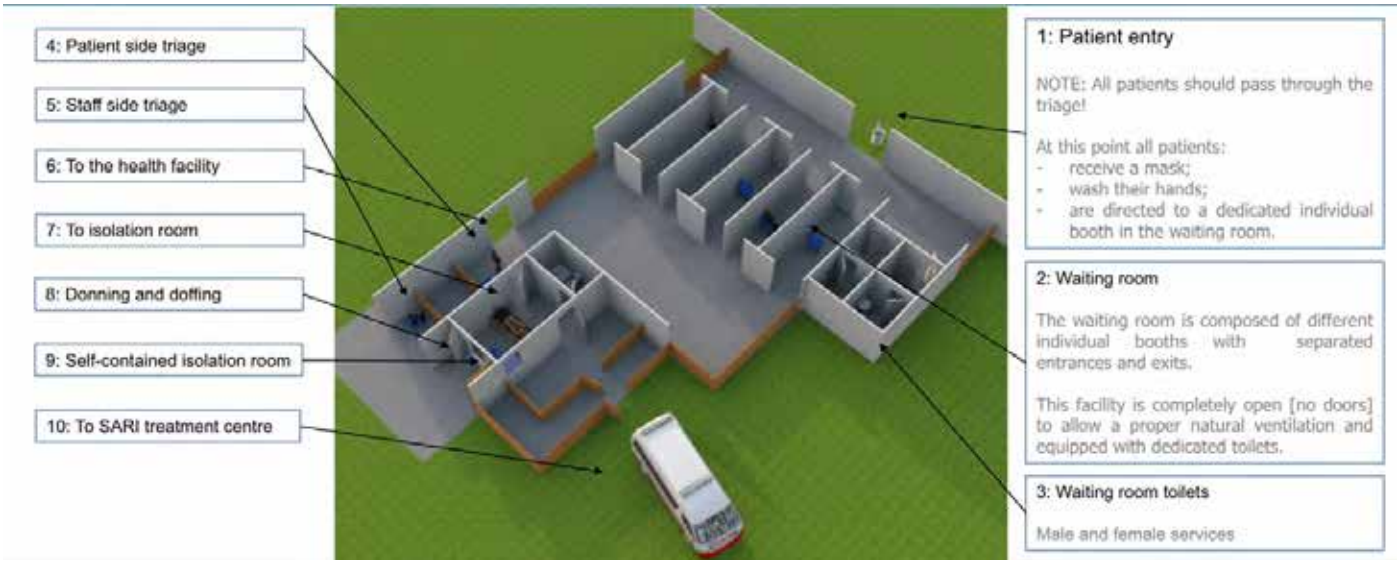
4. Sampling

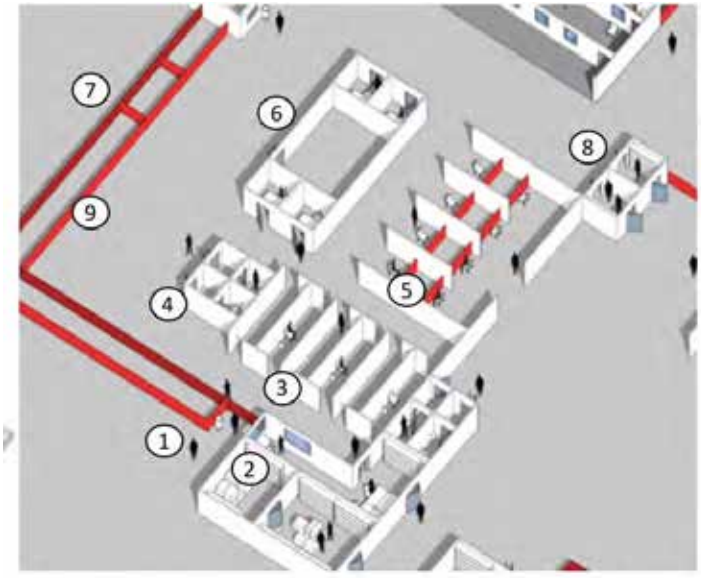
The sampling room has four (4) individual booths with natural or hybrid ventilation.

NOTE: Not all of the patients have been tested, this is according to medical decision.

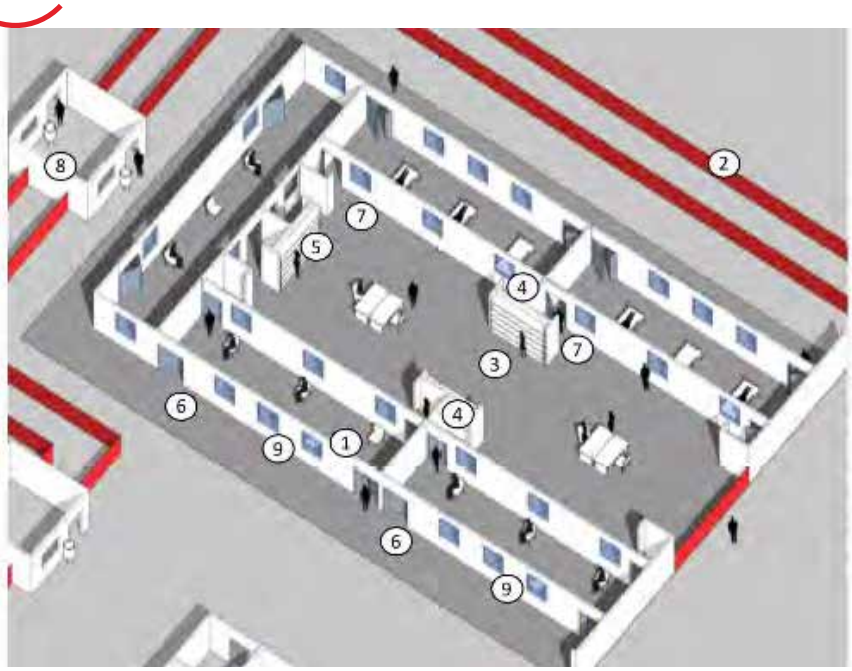




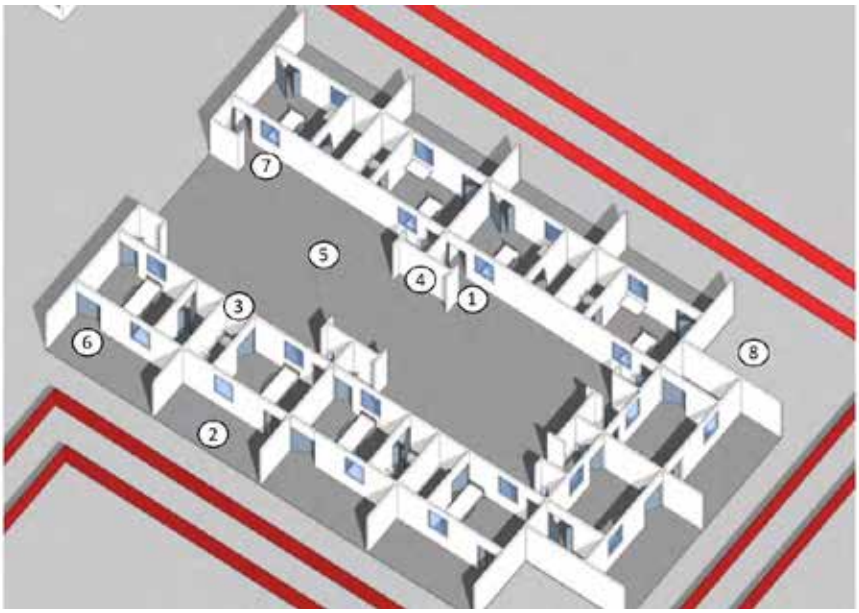




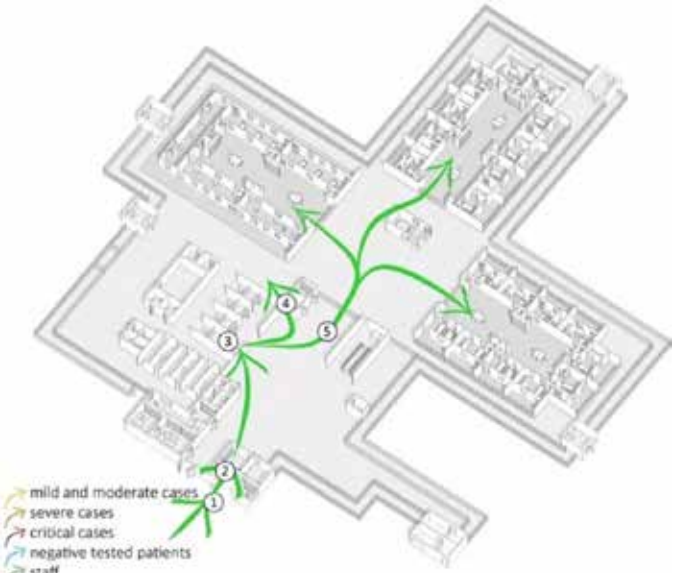
1. Patient entry
2. Reception/screening
3. Waiting room
4. Patient toilets
5. Triage
6. Sampling rooms
7. Ambulance entrance
8. Donning/doffing
9. Single barrier [1.2 meter high] is to identify the centre area*

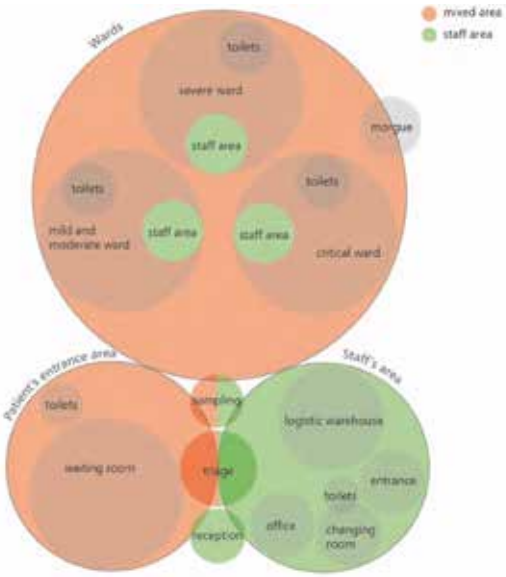


1. Patients [2 m distance*]
2. Single barrier [1.2 meter high] is to identify the centre area. Double fence with 1 meter distance can be used to help visitors to respect the spatial distance while visiting patients [not mandatory]
3. Working area [Staff only]
4. Doffing space
5. Shelf for PPE
6. Patient entrance
7. Staff entrance only
8. Discharge room
9. Windows for natural ventilation



1. Individual doffing [one per room]
2. Self-contained room with individual terrace
3. Individual toilet/shower
4. Shelf for PPE
5. Working area [Staff only]
6. Patient entrance
7. Staff entrance only
8. Space for cleaning and disinfection of items.

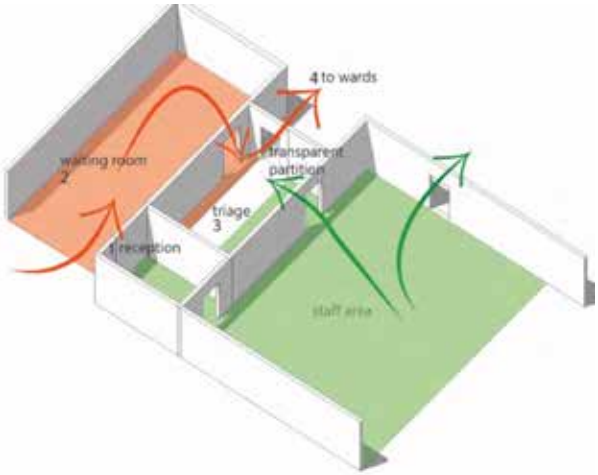




Some areas need to be in proximity:

Some spaces have to be close to each other with a determined spatial arrangement in order to ensure a proper flow, both for patients and staff.

A clear example is the patient's entrance complex composed of the reception, waiting room, and triage [patient's and staff's side].

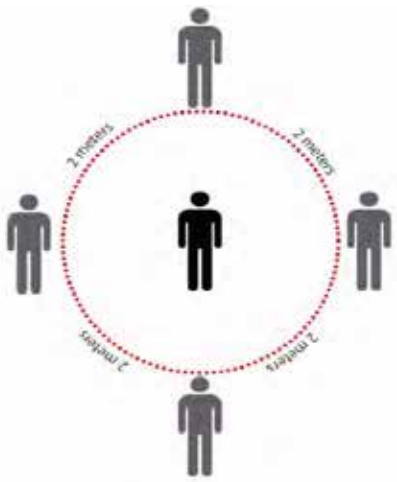


Spatial separation

Some spaces, such as the waiting room, screening, triage and mild/moderate wards, should be spacious enough to ensure two (2) meters* of spatial separation in between patients.

This distance can be enforced with the use of screens and transparent surfaces.

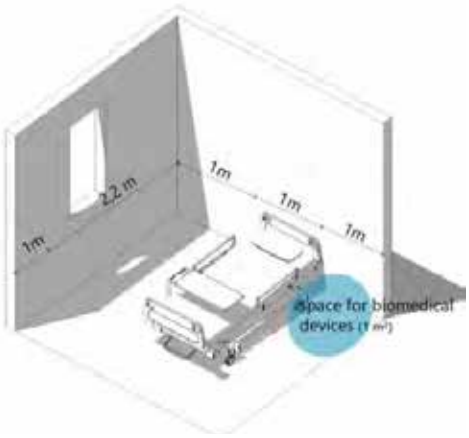
Two (2) meters of distance is also recommended in between suspected cases in case of a cohorting approach.



Severe and critical ward rooms

Self-contained rooms for severe and critical patients should be spacious enough to contain all the needed biomedical devices and for medical staff to stay at the bedside without issue.

Recommended surface is at least 9.6 square meters (m^2).

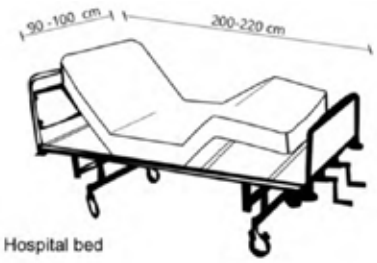


Doors, corridors and elevator dimensions

Severe and critical cases may need to be transported to their respective wards with a hospital bed.

Once possible locations for critical and severe wards have been identified, check the pathways heading to these areas to see if they are accessible with a hospital bed.

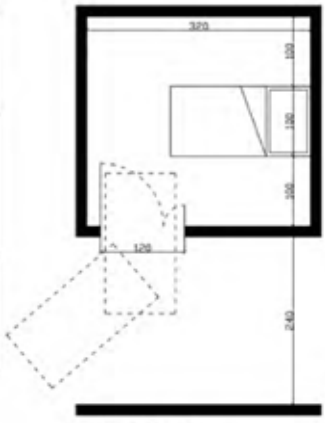
If pathways are not wide enough, check if the areas are accessible with stretchers.

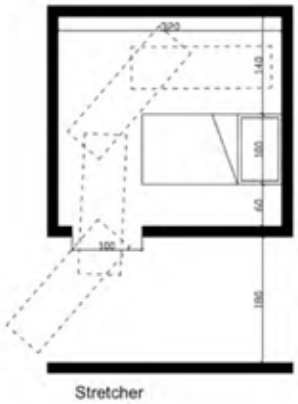


Hospital bed

Stretcher

	Elevators and hoists	Corridors	Doors
Minimum dimensions for hospital bed	240 cm x 140 cm	240 cm	120 cm
Minimum dimensions for stretchers	240 cm x 100 cm	180 cm	100 cm


Hospital bed


Stretcher

The purpose of ventilation is to provide healthy air for breathing by both diluting the pollutants originating in the building and removing the pollutants from it.

Building ventilation has three basic elements:

- ✓ Ventilation rate — the amount of outdoor air that is provided into the space, and the quality of the outdoor air;
- ✓ Airflow direction — the overall airflow direction in a building, which should be from clean zones to dirty zones; and
- ✓ Air distribution or airflow pattern — the external air should be delivered to each part of the space in an efficient manner and the airborne pollutants generated in each part of the space should also be removed in an efficient manner.

Natural ventilation

Natural forces (e.g. winds) drive outdoor air through the building openings such as windows, doors, solar chimneys, wind towers and trickle ventilators.

Mechanical ventilation

Mechanical fans drive mechanical ventilation. Fans can either be installed directly in windows or walls, or installed in air ducts for supplying air into, or exhausting air from, a room.

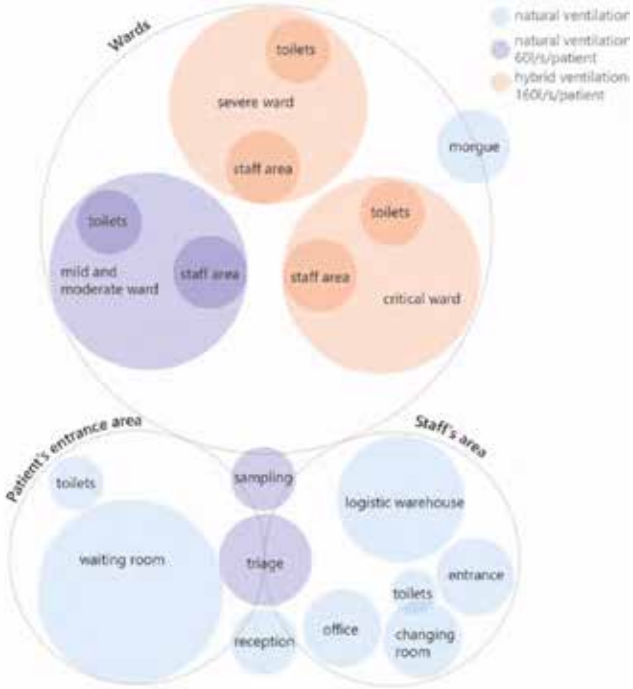
Hybrid ventilation

Hybrid (mixed-mode) ventilation relies on natural driving forces to provide the desired (design) flow rate. It uses mechanical ventilation when the natural ventilation flow rate is too low.

Two different types of ventilation are required

- Natural ventilation should be assured for the waiting room, triage, mild and moderate wards, staff working area with a minimum flow rate of 60 l/s/patient.

- Hybrid ventilation should be assured for severe and critical wards. A top-down airflow moving from clean to dirty zones with a minimum flow rate of 160 l/s/patient.



Some buildings, especially high density index facilities such as sports halls, health care facilities, offices and schools, may already have mechanical ventilation.

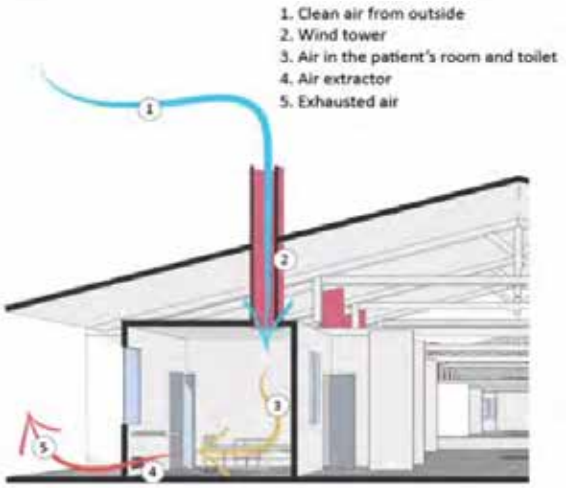
If already available, assess the flow rate, flow direction and how the exhausted air is treated or diluted.

The decision whether to use mechanical or natural ventilation for infection control should be based on needs, the availability of the resources and the cost of the system to provide the best control to counteract the risks.

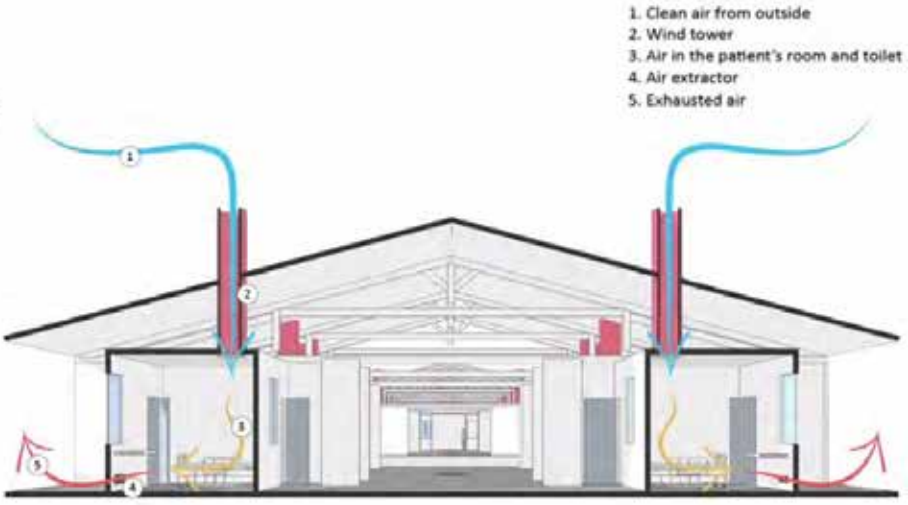
Area or service	Proposed ventilation system	Proposed exhausted air treatment
Staff area	Natural ventilation	Dilution
Triage	Natural ventilation	Dilution
Waiting room	Natural ventilation	Dilution
Sampling room	Natural ventilation	Dilution
	Hybrid ventilation	HEPA filter
Mild and Moderate cases ward	Natural ventilation	Dilution
Severe and critical cases ward	Hybrid ventilation	Dilution
	Mechanical ventilation	HEPA filter
Waste zone	Natural ventilation	Dilution
Morgue	Natural ventilation	Dilution

Top-down ventilation (fan-assisted stack plus a wind tower)

The air extractor will easily allow for control of the ventilation rate, meeting the ACH standard required and assuring a constant unidirectional top-down airflow.



In warm climate countries, due to temperature and pressure, the airflow will naturally move the opposite direction.
For the this reason, it is essential that air extractor is turned on whenever the room is occupied.



Air from the room can be exhausted directly to the outdoors where the droplet nuclei will be diluted in the outdoor air. It's essential to exhaust air away from air-intake vents, persons, and animals.

If for structural reasons dilution is not possible, exhausted air should passed through a special high efficiency particulate air (HEPA) filter that removes most (99.97%) of the droplet nuclei.

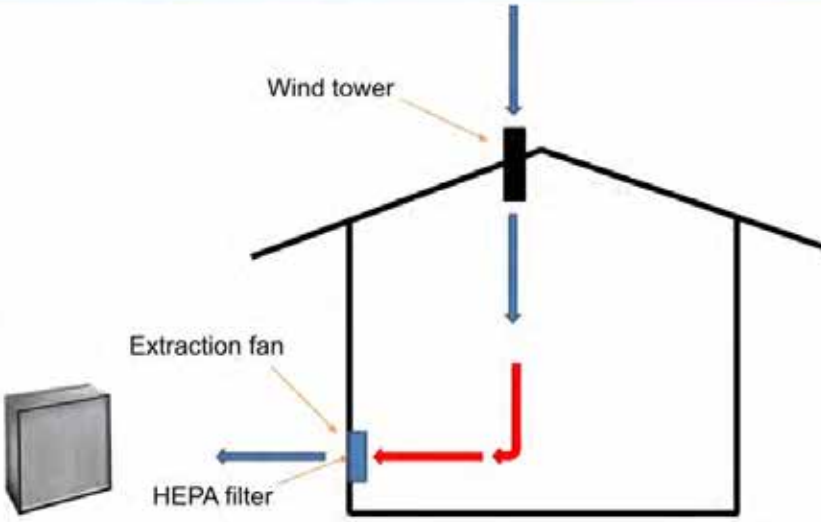
DILUTION IS THE RECOMMENDED SYSTEM

However, if not possible

HEPA FILTERS OR PORTABLE HEPA SYSTEMS ARE ADVISED

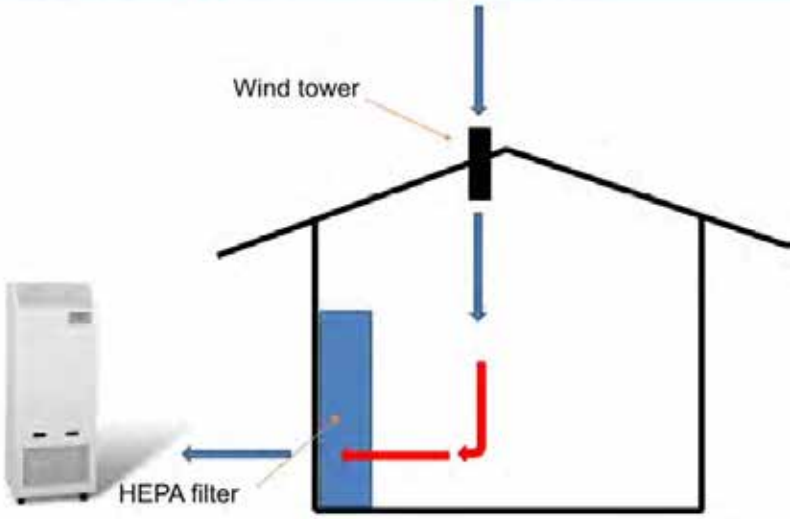
Exhausted air treatment - HEPA

HEPA is a type of pleated mechanical air filter. It is an acronym for "high efficiency particulate air [filter]". This type of air filter can theoretically remove at least 99.97% of dust, pollen, mold, bacteria, and any airborne particles with a size of 0.3 microns (µm).



Exhausted air treatment – portable HEPA

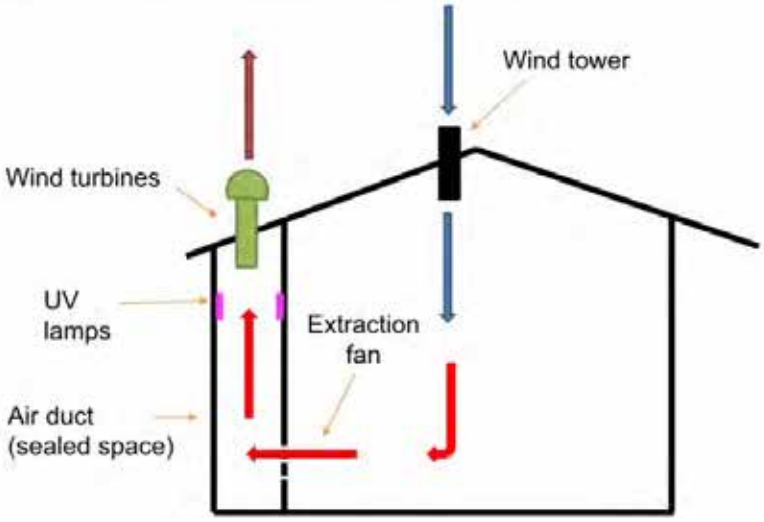
In order to simplify the installation, reducing the construction time and assuring proper air treatment, facilities may benefit from the use of a portable HEPA filter unit equipped with the proper fittings/ducting to exhaust air from a selected room to create the required ventilation flow rate and exhausted air treatment as well.



Exhausted air treatment - Ultraviolet Germicidal Irradiation (UVGI)

UVGI is electromagnetic radiation that can destroy the ability of microorganisms to reproduce by causing photochemical changes in nucleic acids.

UVGI is not recommended as stand-alone system but only as complementary to HEPA filtration in case of air recirculation.



The recommended characteristics for finishes and furniture are:

- Cleanable (material easy cleanable and resistant to repeated cleaning)
- Easy to maintain and repair (Select materials that are durable and/or easy to repair)
- Resistant to microbial growth (Select metals and hard plastics)
- Nonporous (Avoid porous plastics, such as polypropylene, in patient care area)
- Seamless (Avoid upholstered furniture in patient care areas).

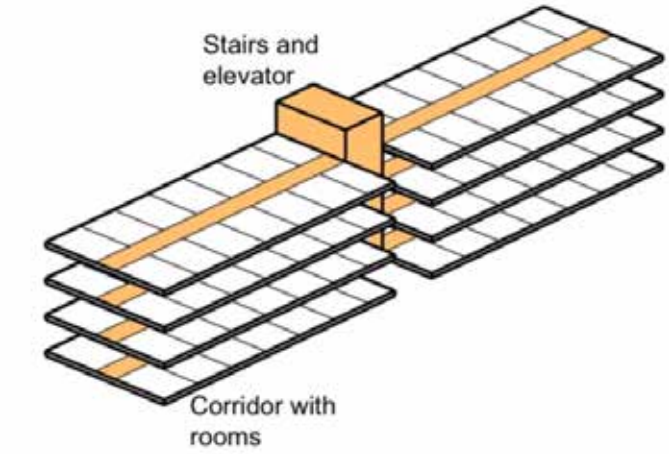
- Use physical barriers to reduce exposure to the virus, such as glass or plastic windows. This approach can be implemented in areas of the healthcare setting where patients will first present, such as triage areas, the registration desk at the emergency department or at the pharmacy window where medication is collected.

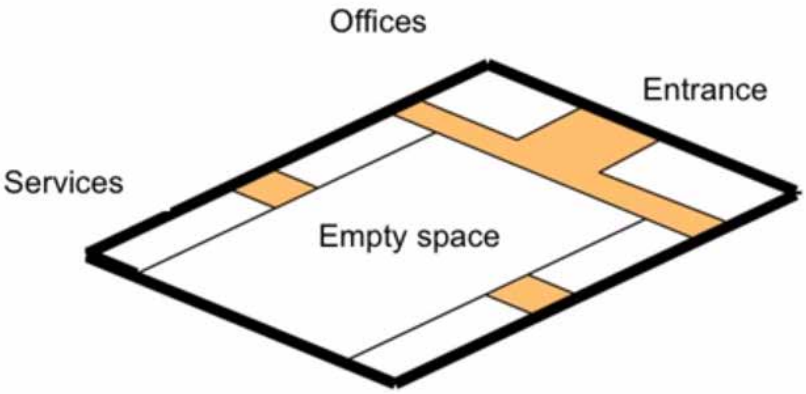
- Restrict healthcare workers from entering the rooms of SARI patients if they are not involved in direct care. Consider bundling activities to minimize the number of times a room is entered (e.g., check vital signs during medication administration or have food delivered by healthcare workers while they are performing other care) and plan which activities will be performed at the bedside.
- Visual contact with patient without need of PPE
- Biomedical devices placed on the staff side:
  - Monitor,
  - Oxygen,
  - IV, etc.
- Flexible and uniform technical plateau for all rooms as biomedical devices can be moved
- ''Humanized'' care
- Reduction of entries in the patient's area:
  - **Reduction of PPE consumption**

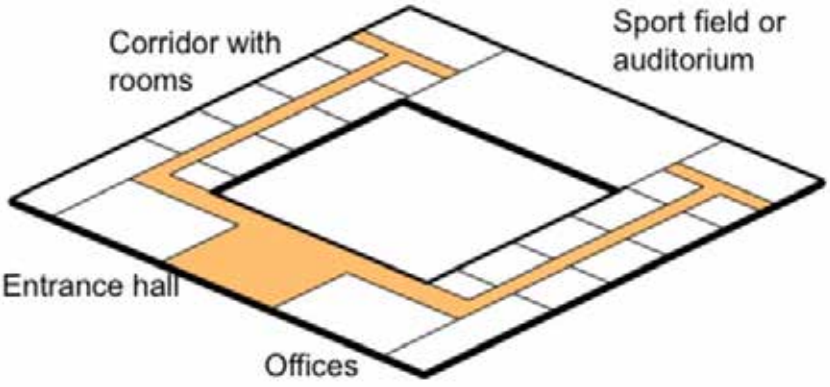


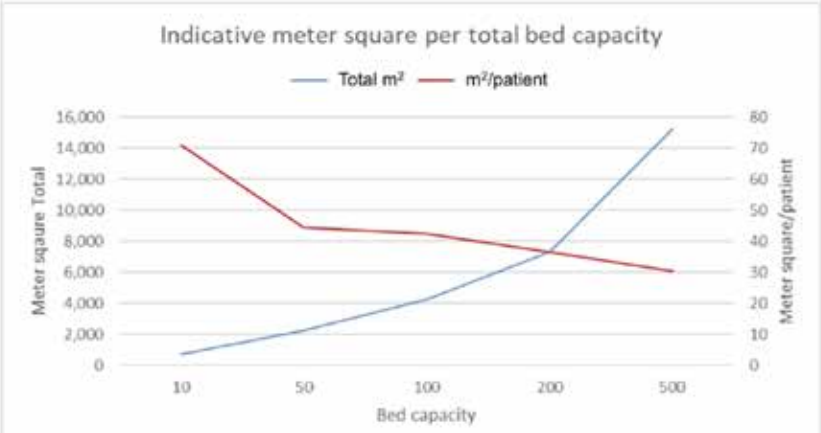
HOW TO SELECT AN EXISTING BUILLDING TO REPURPOSE AS A SARI TREATMENT CENTRE (IN RELATION TO COVID-19)

Derived from World Health Organization standards (www.who.int)









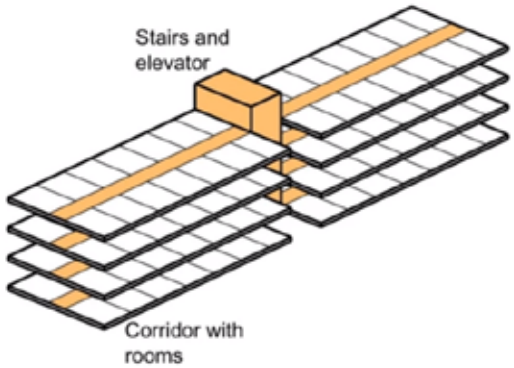
These measures are indicative and based on architectural standards and previous field experiences with other infectious diseases.

- As close as possible to the outbreak epicentre;
    - Next to existing health facilities (to allow an integrated approach and ease the referral of suspect case);

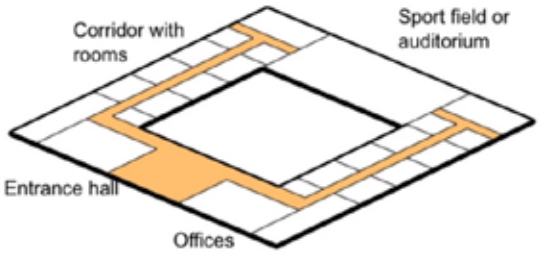
    And/or

    - New place chosen according to specific strategic reasons (space, community acceptance, accessibility, etc.)

Construction field requirements:
- Enough space (future extensions) and accessible water source;
- Soil conditions: waste water infiltration, rain water evacuation, stability, etc.;
- Take into account prevailing winds for the control of smoke and odours.

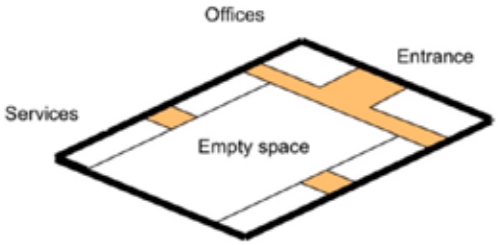


Buildings with a vertical distribution (accommodation facilities such as hotels, students accommodations, schools, offices, etc.)



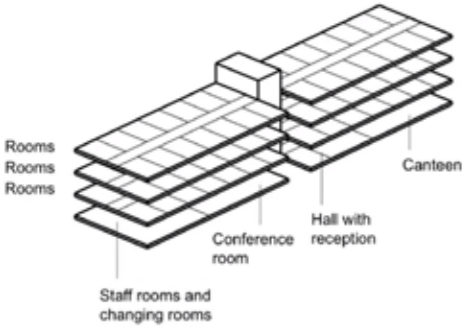
Buildings with horizontal distribution (schools, offices, etc.)

- Big open spaces (such as sport halls, trade fair pavilions, polyvalent buildings, etc.)



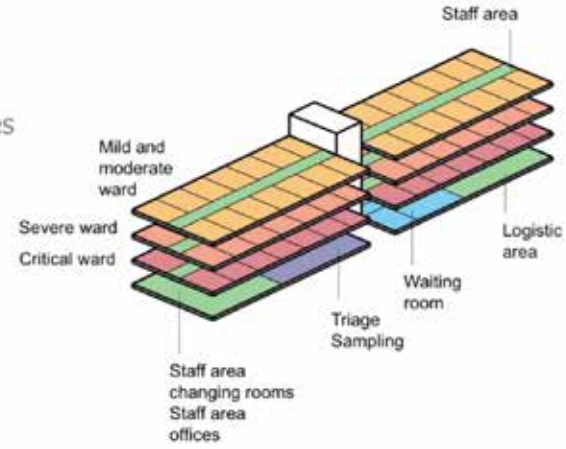
Hotel example

- Hall
- Canteen
- Conference room
- Staff zone
- First floor rooms
- Second floor rooms



Hotel example

- Hall
- Canteen
- Conference room
- Staff zone
- First floor rooms
- Second floor rooms
- Third floor rooms
- Reception, waiting room
- Staff area, warehouse, offices
- Triage, sampling
- Staff changing room
- Critical ward
- Severe ward
- Mild and moderate ward

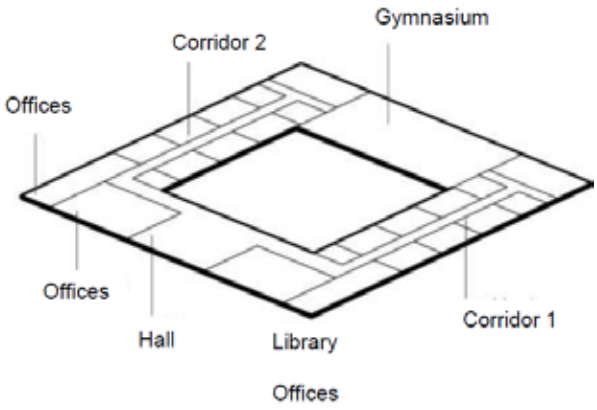


Horizontal distribution buildings, such as residential complex, offices or schools, usually are characterized by a central hall, offices nearby and one or more corridors.

Usually corridors start from the hall.

They could also host big areas [open space] such as gymnasium or conference rooms, libraries, etc.

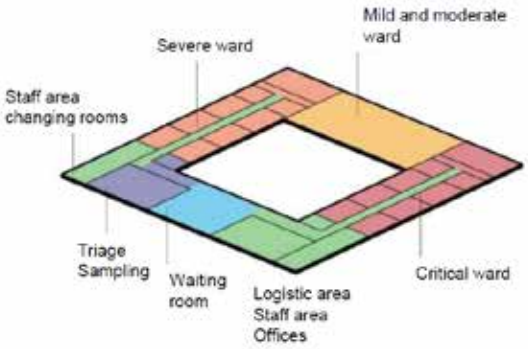
- Hall
- Offices
- Corridor 1
- Corridor 2
- Gymnasium
- Library



School example

- Hall
- Offices
- Corridor 1
- Corridor 2
- Gymnasium
- Library

- Waiting room, reception
- Offices, triage, sampling
- Critical ward
- Severe ward
- Mild and moderate ward
- Staff area, logistic warehouse

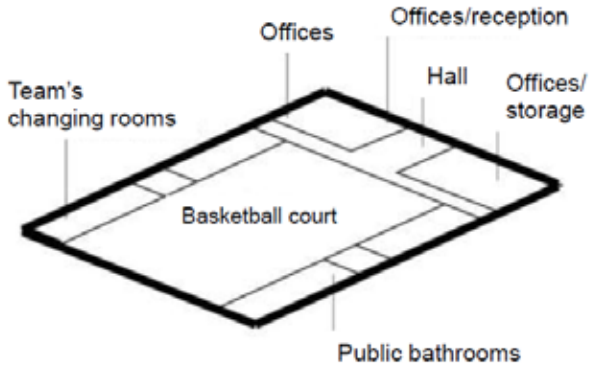


This includes fair trade pavilions and sports halls such as basketball and volley courts. Usually present wide halls, offices, public bathrooms and big open and empty space such as the playfield.

Due to their layout, open space buildings could be easily adapted to temporarily isolate patients with a cohorting approach such as community facilities

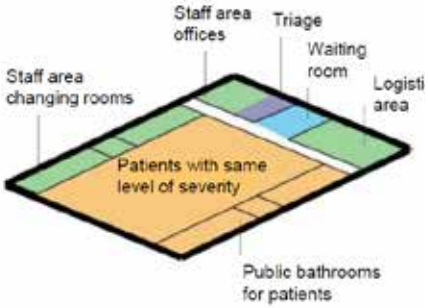
Big fair trade pavilions, due to their dimensions, are able to host the whole STC.

- Big hall
- Offices
- Team's changing room
- Public bathroom
- Basketball court



Basketball court example for cohorting approach

- Big hall
- Offices
- Team's changing room
- Public bathroom
- Basketball court
- Waiting room, reception
- Offices, logistic warehouse
- Staff changing room
- Patient's bathroom
- Patients with same level of severity or corhoting



The building to be repurposed has been identified

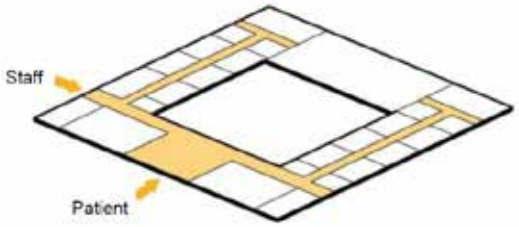
Necessary prerequisites to start the design process:

- Be sure to have all the technical drawings, plans of the existing building.
- Be sure to have plans and technical specifications for:
  - Ventilation,
  - Plumbing,
  - Electrical systems.

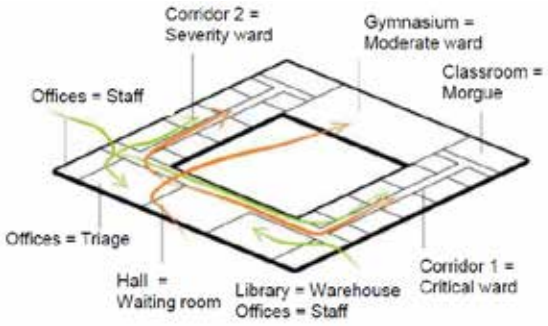
Design phases:

- Identify existing accesses and building distribution system. Try to find out two different main accesses: one for patients and one for staff, as shown in this presentation.
- Considering dimensions, proximity and flows, try to assign STC areas to existing areas.
- Check if electrical, ventilation and plumbing systems and waste management are appropriate for STC.
- Check if emergency pathways and doors are correct also according to the new layout.
- Decide which kinds of interventions you need to adapt the existing buildings to STC requirements.

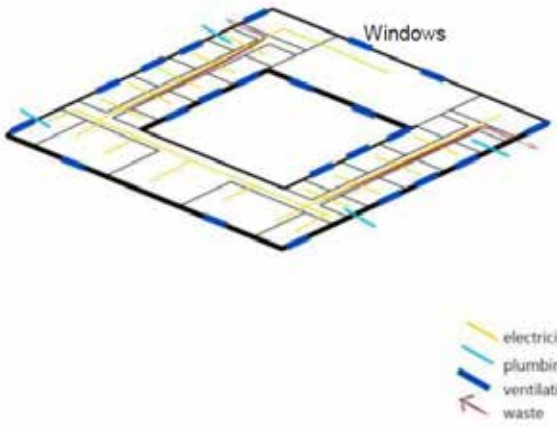
Identify existing accesses and building distribution system. Try to find out two different main accesses: one for patients and one for staff, as shown in this presentation.



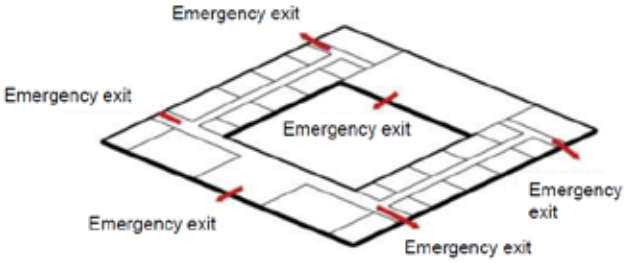
Considering dimensions, proximity and flows, try to assign specific COVID-19 areas to existing areas.

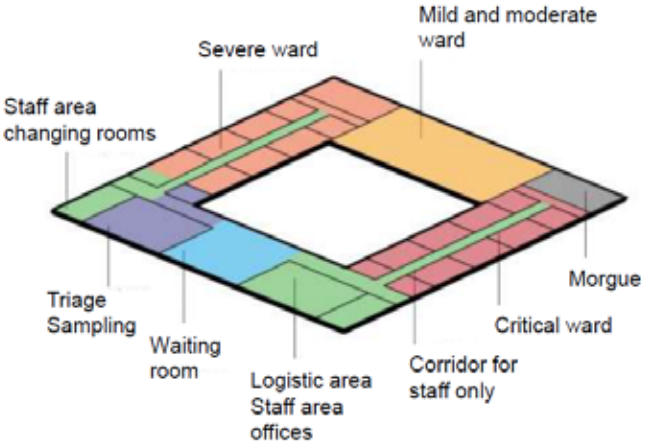


Check if electrical, ventilation, plumbing systems and waste management are appropriate for the repurposing.



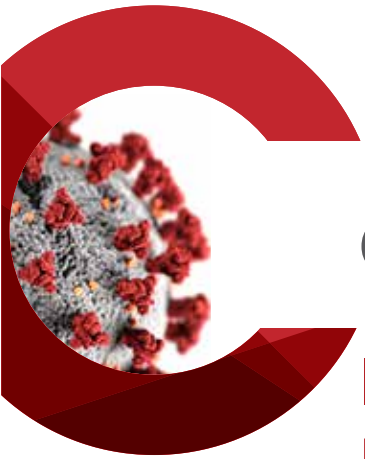
Check if emergency pathways and doors are still accessit
according to the new layout.





References:

1. WHO, Severe Acute Respiratory Infections Treatment Centre, Practical manual to set up and manage a SARI treatment centre and a SARI screening facility in health care facilities, March 2020, https://www.who.int/publications-detail/severe-acute-respiratory-infections-treatment-centre



CHAPTER 3:

INNOVATIVE DESIGN SOLUTIONS AT BUILDING SCALE

Task Force

Contributors to this Publication

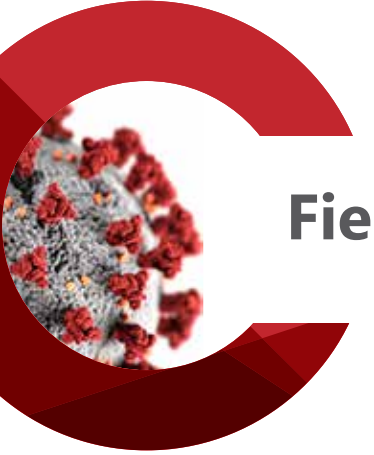
Musembi Mumo – Team Lead
Manmit Jabbal
Benjamin Nyawade
Judith Onyoni
Francis Mbaya
Eric Kigada
Stephen Lutta
Susan Kibue
Dominic Cox
Raymond Muli

Editorial Contribution

Patricia Baariu
Mugure Njendu
Florence Nyole

Compilation and Co-ordination

James Odongo
Ashley Mwangi



Field Hospitals: Tents

INTRODUCTION:

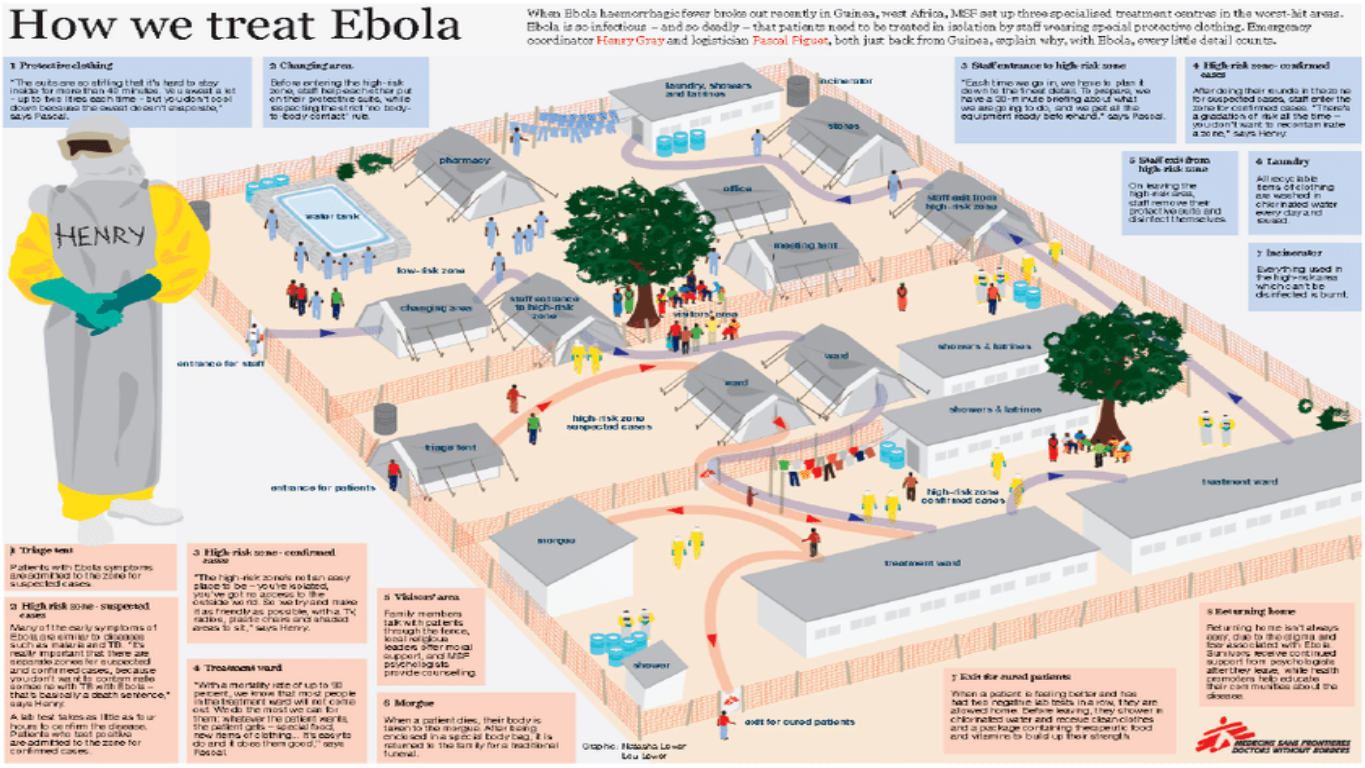
Field Hospitals have been the mainstay of military operations and are an effective and quick way of shoring up medical capabilities out of station, camp or area of jurisdiction, usually during war.

They can also used as a temporary measure to assuage emergency situations like epidemics and pandemics, primarily to act as mass screening areas and isolation centres away from the normal public medical facilities, either for reasons of avoiding infections of patients with unrelated cases but also to contain Contagion within a specific area.

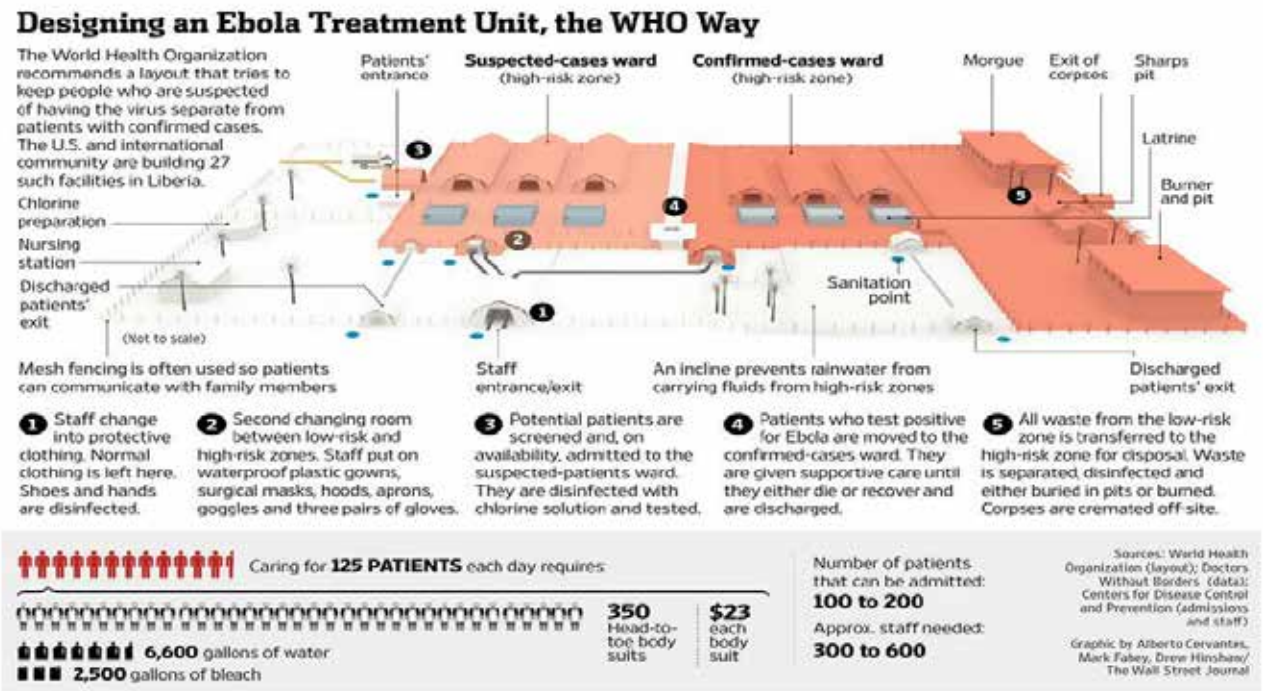
In Africa similar facilities have been used in the fight against The Ebola virus effectively in Countries like Sierra Leone, The DRC and others. They are quick to build, can be secured so that movements within the centre is monitored and critical care given as a fast and first response especially in hard to reach areas.

In the wake of the COVID-19 pandemic, the AAK team is set to use field hospitals, primarily for the following reasons:

1. Quick installations to act as County Covid-19 coordination centres.
2. Far flung areas with no medical facility with capacity to uptake the COVID-19 related cases.
3. Extensions to already existing facilities that may be overwhelmed by case numbers.
4. Mass testing and Quarantine Centres in the counties, especially suited to Public school settings to shore up medical capacity during the emergency.
5. Temporary Mortuary facilities for casualties.
6. Isolation areas for confirmed cases, primarily to host patients who may face stigma/cause panic when in normal hospital setting

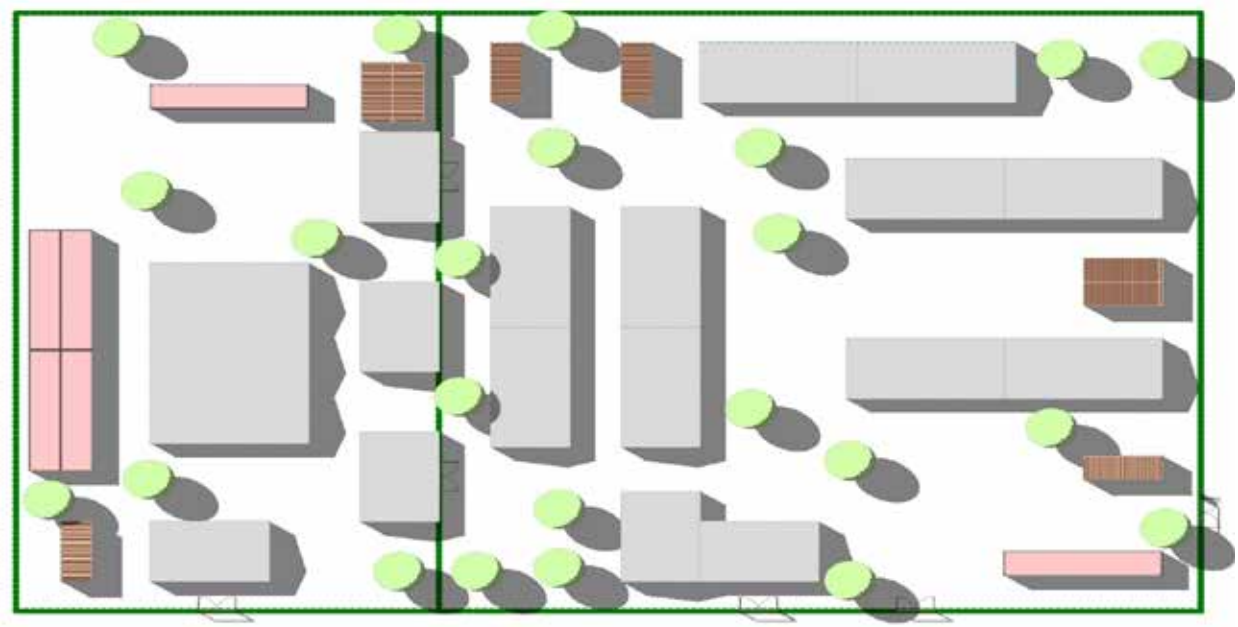


MSF field hospital for Ebola treatment- www.researchgate.net

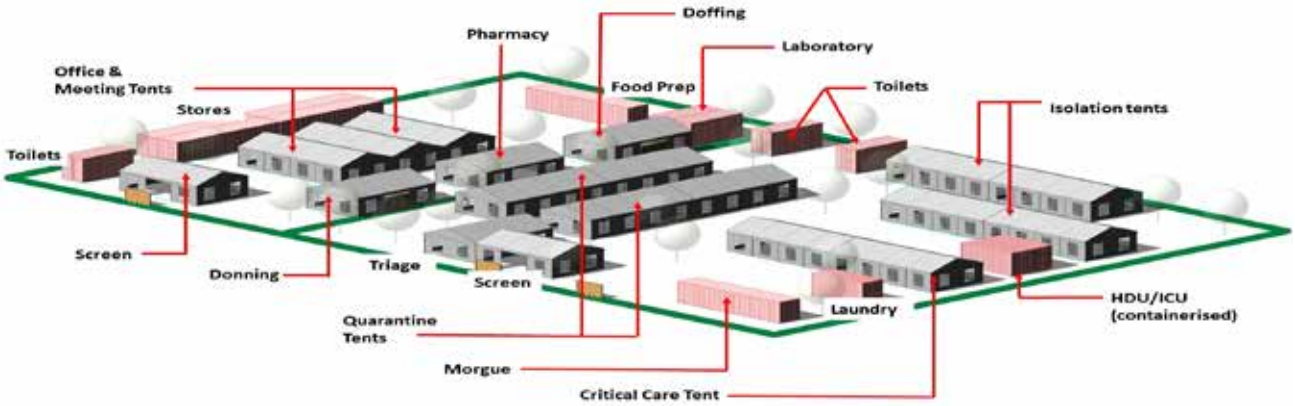


WHO field hospital layout for Ebola treatment centre - www.researchgate.net

SITE PLANNING



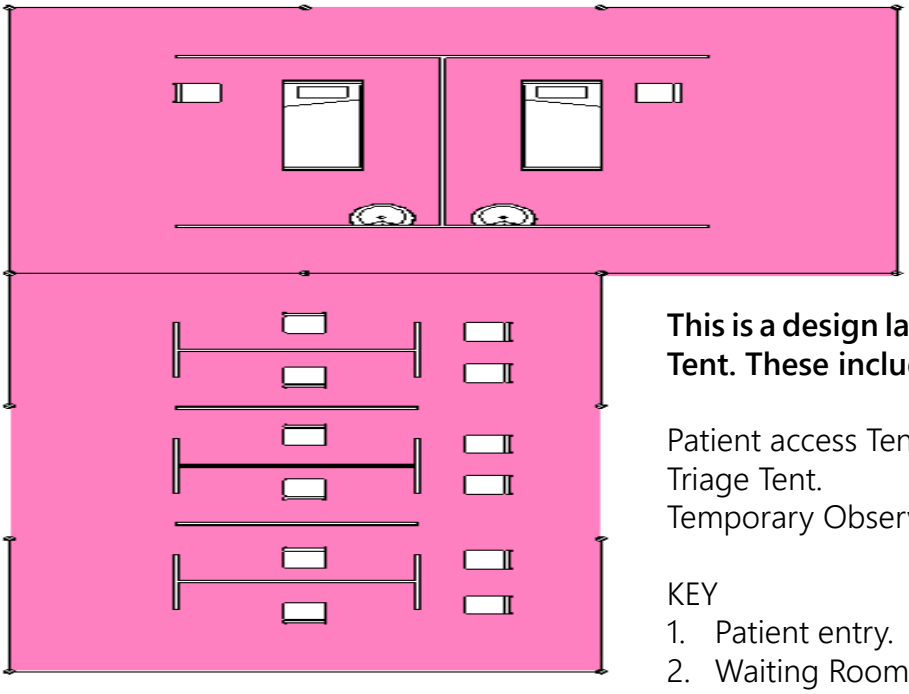
A draft layout of the facilities that are envisioned to be in the field hospital.



SECURITY INSTALLATIONS AND ACCESS POINTS:

Staff access points

There shall be several controlled access point into the field hospital. Critical and High risk areas like the treatment wards may be cordoned off with security wire within the general secure facility in which the field hospital is set up, in this instance most likely a school or stadium setting. Separate Access for Patients and health workers as well as a separate exit point for any recovered cases. The security workers may also be housed within the tents manning the access points, with a small armoury, usually within a vehicle.



This is a design layout for a typical Screening Tent. These include :

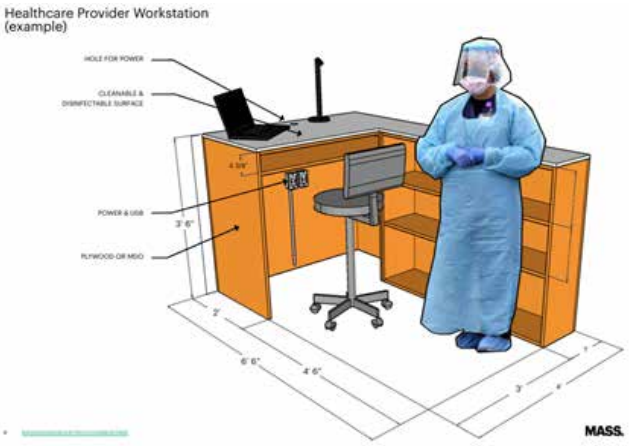
Patient access Tent.
Triage Tent.
Temporary Observation Tent/Waiting Area

KEY
1. Patient entry.
2. Waiting Room and initial screening
3. Triage
4. Suspected Cases to Quarantine
5. Negative Case to Health facility

HEALTH WORKERS' TENTS

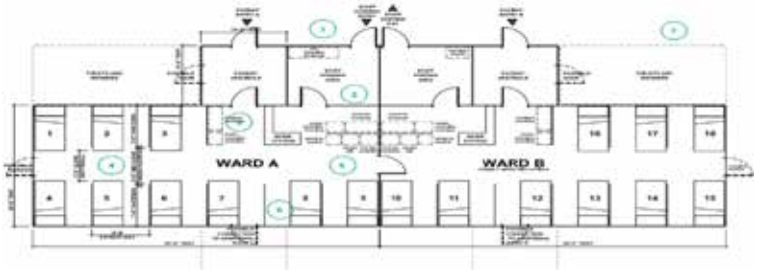
These may be divided into the following:

- Health workers and staff access screening tents
- Offices and Meeting Tent
- Staff Entry and Exit Tents to the High risk Zone/ Treatment Wards(Donning and Doffing)



HEALTH WORKERS' TENTS

Below is the design layout for a typical Quarantine Tent. Depending on the size of the tent it may have multiple additional facilities. The basic layout is a ward for quarantined persons who may have had contact with confirmed cases and includes toilets, and access to an external recreation area/park.

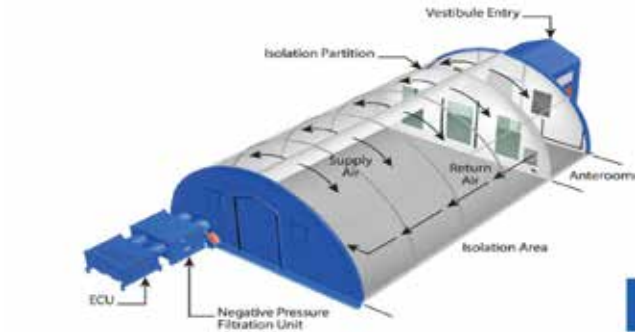


Sequence

1. Create separate entrances for health care providers and patients. This helps prevent close contact between patients and providers not wearing Personal Protective Equipment (PPE), both inside and outside the tent.
2. Providers should enter directly into a donning vestibule or room, where they can put on their PPE before interacting with patients. (Re-donning supplies within the tent allow PPE to be refreshed.)
3. Use a work surface of simple materials such as medium density overlay (MDO), plastic laminate, or draped plywood to provide a cleanable and disinfectable buffer between a provider and an ambulatory patient at key locations. The previous slide shows one example of a simple site-built workstation.

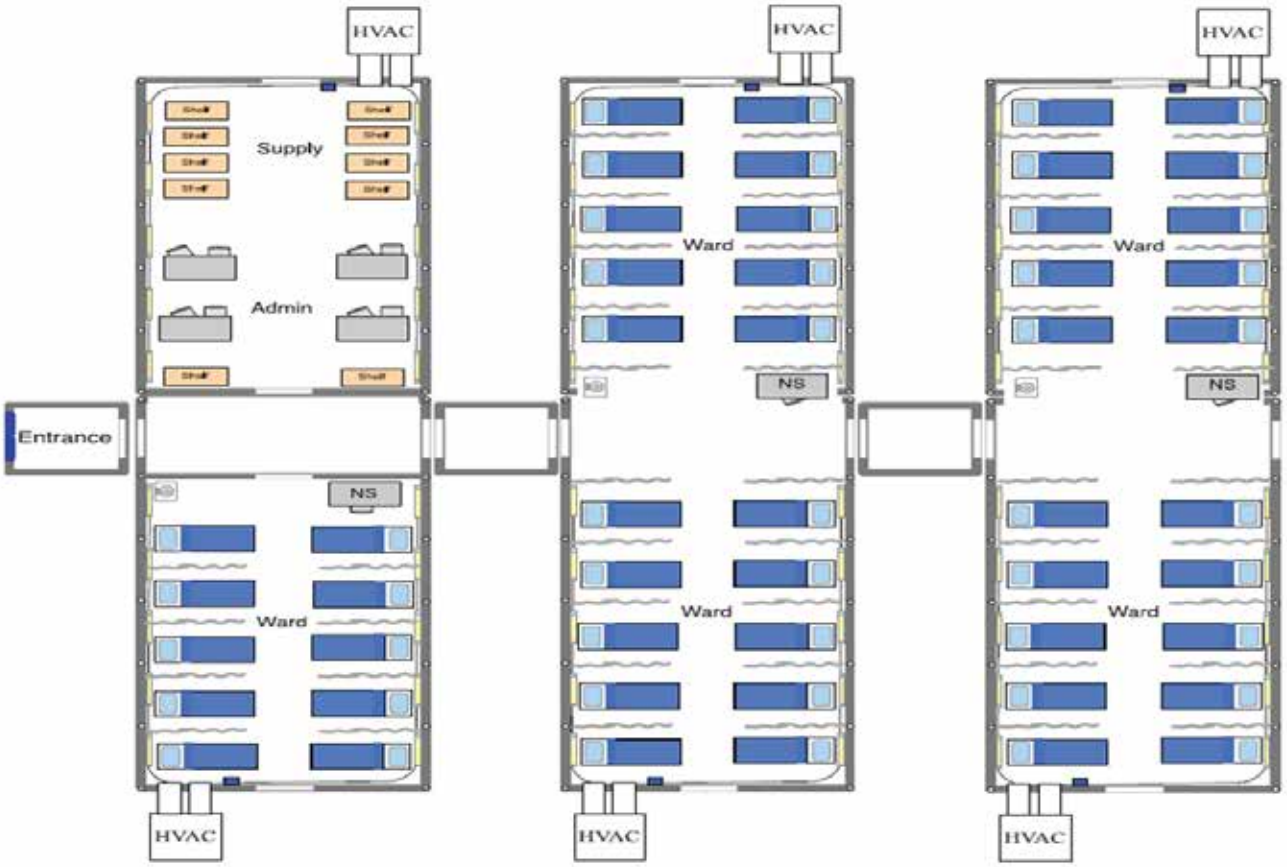
4. Since tents come in fixed dimensions, it can be difficult to achieve plan arrangements that facilitate social distancing, but it is crucial. When possible, strive for larger aisle dimensions than the 6′ between partitions and 5′ between beds shown here.
5. Centralizing clinical staff spaces (e.g., workstations, storage, and donning and doffing areas) will make clinical work more efficient and limit uncontrolled interaction between providers and patients.
6. Separation of beds by a partition or tensioned vinyl screen of 8′ high can help limit cross-contamination between patients and guide the flow of contaminated air.
7. A stand-alone 10′ x 10′ conditioned tent (not shown) can serve as a staff break area.

Depending on the size of the tent it may have multiple additional facilities. The basic layout includes separated rooms for persons who may have been confirmed positive for the virus. It includes personalised toilets, and emergency monitoring equipment and a sampling facility to regularly pick bloodwork and other samples as may be necessary.



Critical at this stage is to ensure these tents can be pressure controlled to have negative pressure and contain airborne spread of the virus.

ISOLATION TENTS



50 Bed Isolation Tent Ward with negative pressure by Alaska Structures Inc.

CRITICAL CARE/ TREATMENT TENTS

Below is design layout for a typical Critical care Tent or preparation centre. Depending on the size of the tent it may have multiple additional facilities. The basic layout includes separated rooms for persons who may have been confirmed positive for the virus. It includes personalised toilets, and medical infrastructure like oxygen and ventilators. Additional capacity to the tents may be the containerised HDUs/ICUs as the cases progress from recently confirmed cases to critical care need. A sampling facility to regularly pick bloodwork and other samples may also be necessary.

Necessary Equipment for Critical Care and Monitoring. Here, provision of Oxygen, Medical gas and Ventilators is critical in order to increase the chances of survival.

Depending on the size of the tent it may have multiple additional facilities.

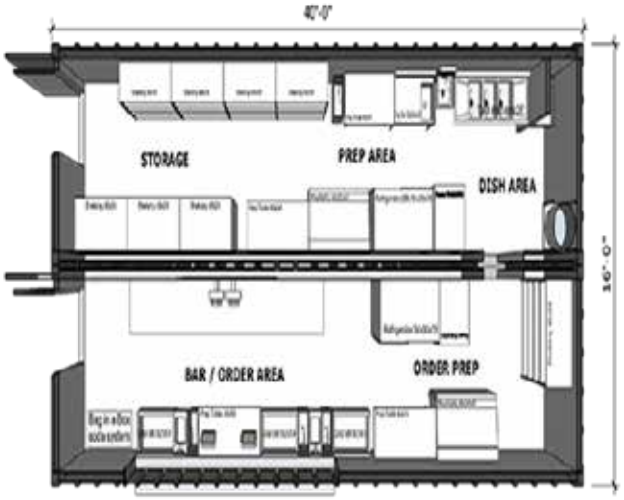
MORGUE/ OTHER WASTE MANAGEMENT FACILITY

Containerised body stowage

A stark reality is that COVID-19 has varying degrees of mortality depending on case management and capacity of the medical facilities in incident areas. Upto 3% of cases in Kenya currently end up in fatalities, which also must be handled in a specific manner as per the recently published government regulations.(citation needed) The Field hospital MUST have a holding centre, If near a much larger medical facility, but in the majority of instances in far flung areas, a morgue is required. Since the government directive is for disposal of corpses within 48 hours, the morgue may be sized as triple the 3rd percentile of the capacity of the facility, which number may be changed as suitable. Containerised extensions may prove more effective for this purpose than tents.

Mobile Medical Incinerator
Incineration of Medical Waster may also be incorporated within the area assigned to act as Morgue.

FOOD PREPARATION FACILITIES



These are the areas where food is safely prepared for patients in the treatment wards as well as staff in the facility. Considering the food and sanitation requirements, and the probability for elongated use of the facility, containerised solutions may be the best solution. Various companies produce these locally.

DESIGN AND CONSTRUCTION CONSIDERATIONS

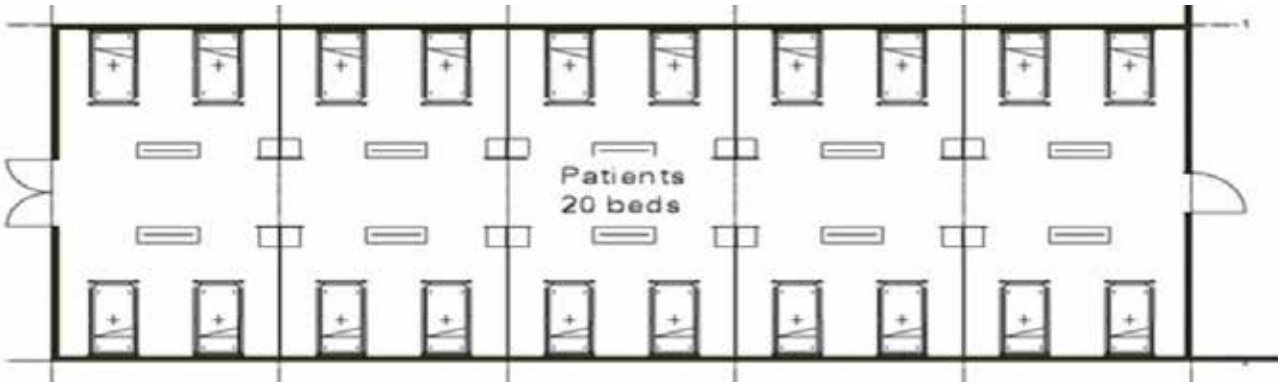
The following are the major considerations for the design of the field hospitals

1. Multiple controlled access points.
2. Restricted access to the treatment wards/ high risk areas/critical care areas.
3. Just as patients must be triaged to prioritize those most in need of care; spaces must be triaged to protect healthy people from getting sick—including healthcare workers and people with non-confirmed cases. Sequence the flows of people to limit unnecessary overlaps. Make sure to separate clean and dirty entrances, ensure proper donning and doffing areas for PPE, and consider how people and materials will be moving through the space.
4. Adequate ventilation within the tented facilities and between the various sections. Despite the WHO not confirming COVID 19 as an airborne contagion, precautions to be taken to ensure in case it develops to that situation, further infections within the facility are thwarted.
5. The Field hospital in this case is also a security installation. Design input from the security apparatus in the context region to be sought during preparations for commencement of work on site.
6. Information Centres or coordination centres to be included where accurate data on the status of the facility can be relayed to the authorities.
7. Temporary shelters are, in practice, never temporary. Infrastructure to be provided should be temporary but whose lifeline may be extended. In the majority of cases the facility may end up being in use for an extended period.

Thus the boreholes, localised sewage treatment, water and power reticulation to be provided with an extended use in mind.

8. Design is for infection control, thus the specifications to consider the life cycle of the virus and the fact that surface transmission is a huge part of conveyance of the same. Porous materials like wood, cardboard, fibres, cotton, and leather seem to be a less stable material for the COVID-19 virus, which lasts only 24 hours on these surfaces. We need to take special care to routinely clean non-porous surfaces like Stainless steel, Plastics and composites as the virus lives longer on these. Therefore we need to rethink material selection and treatment of surfaces even for facilities that shall be retrofitted.
9. Design should be for people, and not just against pathogens. Well-intentioned spaces may actually fail if they clash with how people will actually use them. The cultural preferences need to be considered and all natural human behaviours anticipated. The use of signs and graphics to guide the users on the safety standards and protocols used in the field hospital will be critical.
10. Tent clinics might offer the following to promote patient dignity, comfort and security: A legible, obvious ventilation strategy that clearly demonstrates environmental safety, Individual lockable storage for valuables, electronics, and medications, WIFI, power, and USB charging ports at patient beds, partitions between beds for privacy and contagion control and TV screens.

TENT DETAILS AND SIZES



Typical Tent sizes at 10m x 25m

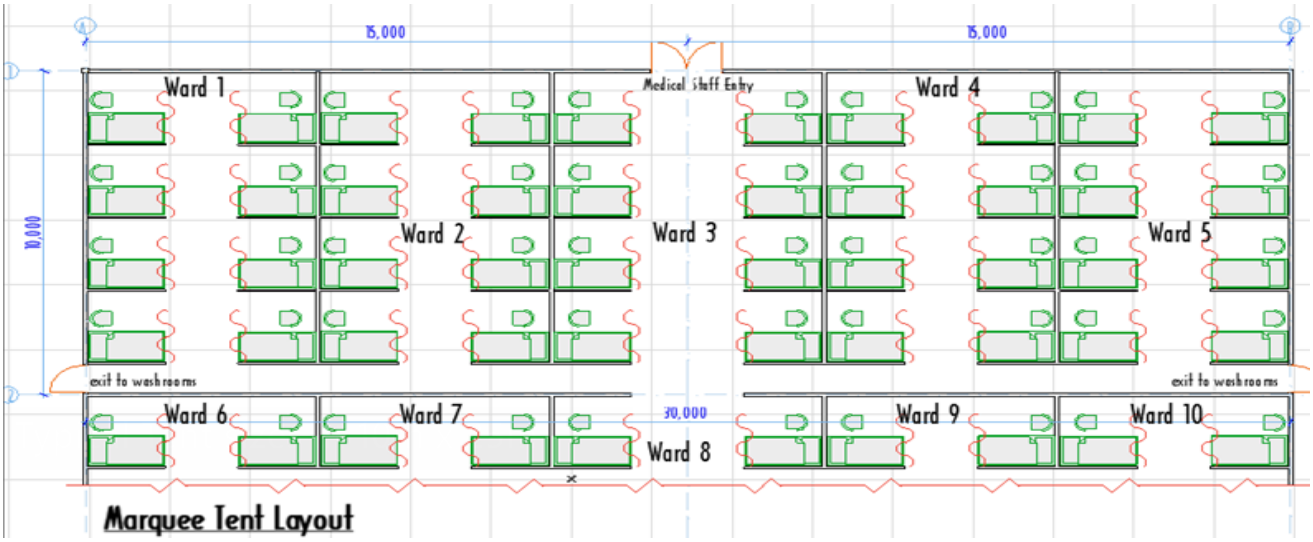
Depending on the overall size of the facility tents may be sized or shaped differently. Tent choice must take into account design considerations as stated previously.

Tent to be high enough for appropriate ventilation. The material specified to consider the context area's weather as this may have an effect on the internal thermal comfort and air character/humidity.

Depending on the overall size of the facility tents may be sized or shaped differently. Tent choice must take into account design considerations as stated previously.

Locally available Tents can be sourced from Events Managers Association of Kenya (EMAK) members countrywide

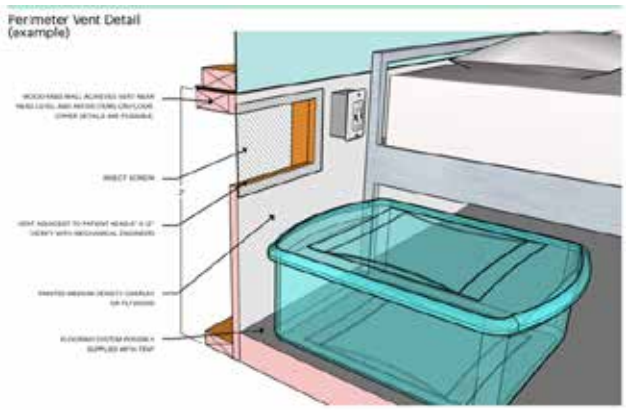
TENT DETAILS AND SIZES



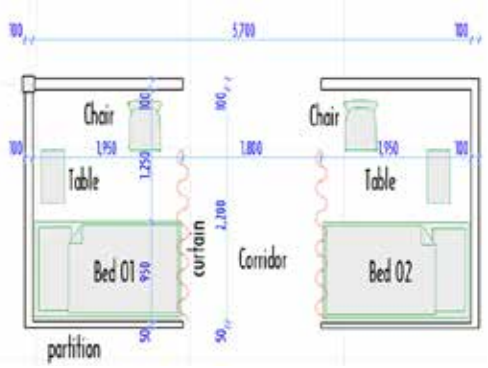
Marquee Tent sizes range from:
80m x 30m, 80m x 20m, 80m x 15m, 60m x 30m, 60m x 12m

Draft Tent Layout is on a 30m wide tent frame with wards set out in 10m sections.
Smaller tents to be utilised for:

- Staff Changing
- Triage
- Washrooms
- The Tent is split into ward rooms of 8 PAX.
- Each 10m section can accommodate 40 PAX in 5 wards.
- Largest Tent can accommodate 320 PAX



Ventilation considerations, separation of the different patients, provision of space for equipment and appropriate distancing of personnel attending to the patients will have room spacing at minimum 2.5 meters by 2 meters. The Partition between beds must be minimum 2 meters tall.



SITE IDENTIFICATION CRITERIA

Field Hospital Criteria:

An ideal site to set up a field hospital should have the following characteristics:

- Proximity to existing Hospital (Max 2KM) or Proximity to large population area that has a high incidence of COVID-19
- Secured Area (eg. Fenced Football Field)
- Flat Surface (Min 50mtrs x 100 mtrs)
- Utilities available (Water & Power supply)
- Washroom facilities (that can be upgraded)

Examples:

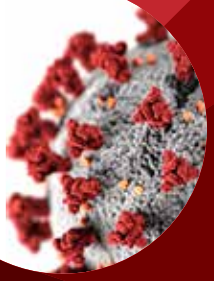
- Within the proximity of KNH & Nairobi Hospital
- Schools eg. Upperhill Secondary School
- Parking Silos eg. Britam Towers Silo Parking
- Playing Fields eg. Public Service Club
- Hotels eg. Crowne Plaza & Radisson Blue – use the conference halls as ICU and the rooms as ward beds.
- Within the proximity of Kibera (High Population area)
- Stadiums eg. Jamhuri Park
- Schools eg. Kibera Olympic

References and Precedents

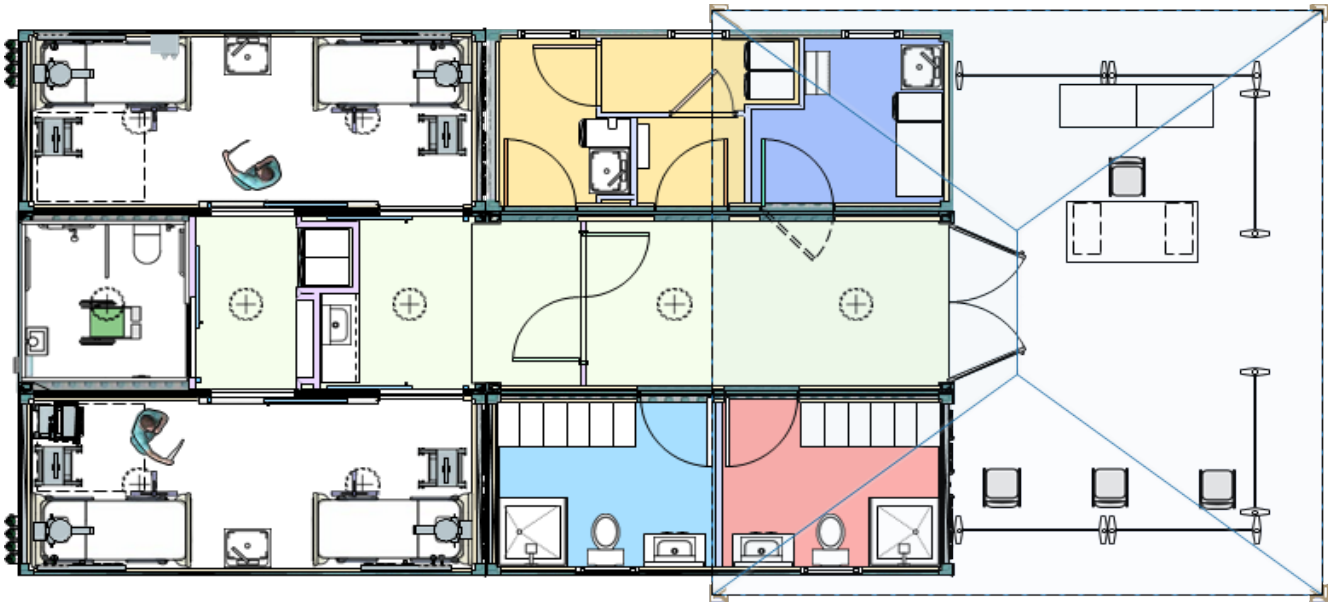
1. Design of Field hospitals . www.researchgate.net
2. The Role of Architecture in Fighting COVID-19 Designing Spaces for Infection Control- MASS design Group
3. The Role of Architecture in Fighting COVID-19 Guidelines for Limiting Contagion in COVID-19 Tent Clinics- MASS design Group
4. Negative Pressure Isolation Rooms & Treatment Facilities by BlueMed Response Sytems by Alaska Structures Inc.
5. Interim Solution For Quarantine Tents And Treatment Stations by HTS tentiQ GmbH

Field Hospitals to adhere to the MOH directives in plan & layout
http://www.health.go.ke/wp-content/uploads/2020/04/Kenya-IPC_Considerations_For-Health-Care-Settings-1.pdf
Ministry of Health adopted WHO recommendations on how to deal with COVID-19

3.2
Field Hospitals: Containers

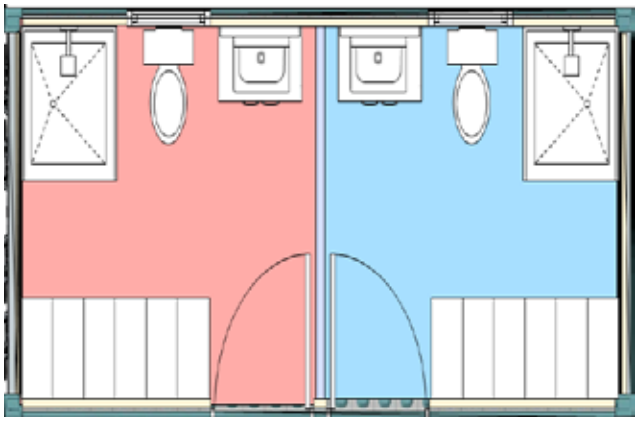


OVERALL FACILITY, HDU, CHANGING, DON-DOFF, RECEIPT



CHANGING FACILITY

- **HDU Facility: Side View**



- **Changing facility**

- **Proposed Longitudinal Section 20' Container**

- **Changing facility**

- **Rear perspective view three 20' containers**

FOUNDATIONS FOR CONTAINERS

Mainly four types of foundations:

Pier Foundations
Pile Foundations
Slab or Raft Foundations -
Strip Foundations

Pier Foundation

- Most commonly used foundations. Normally 500x500x500mm but this is mainly on good soil.
- Where the facility is installed in a paved parking lot, masonry stones may be used to elevate the containers

Pile Foundation

These are mainly used in very weak soil conditions. Piles (cylindrical solid steel tubes) are hammered into the ground through the soft soil until the piles reach more suitable load-bearing ground.

Slab/ Raft

A slab foundation is a popular choice when the ground is soft and requires an equal weight distribution. However, it is more time-consuming and more expensive to build than a pier foundation.

Strip Foundation

A strip foundation (also known as a trench foundation) is somewhat of a combination of the previously mentioned pier and slab foundation. The strip foundation, shown here, is simply a strip of concrete which is laid to support the containers. The concrete strip is normally 300-600mm wide and 1200mm deep.

HVAC Requirements

- All containerised HDU units will have their own HVAC system (with HEPA filter(s)
- Own UPS system that will sustain critical loads for 5min (enough for the changeover)
- Logistics of importing HEPA filters and UV ventilation systems to be discussed.

Power Requirements

- Where possible, rely mainly on the grid but backed up by a generator and a UPS for critical machines
- Generator and UPS to be sized up as per requirement of number of HDU units.
- Logistics of fueling generator to be discussed.
- Power board to be designed as per requirements.

Water Requirements

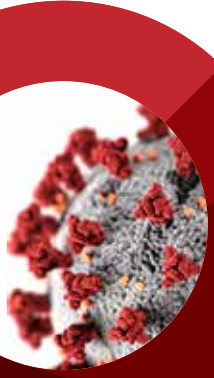
- Where possible, rely mainly on council water.
- Consider centralized water treatment. As this would be by HDU and not ICU facilities, this could be by way of a simple filtration system, not necessarily a Reverse Osmosis (RO) plant.
- A bore hole may be sunk where water is not available.

Sewer Requirements

- Where possible, connect to Council sewer line but new manholes may be required.
- Where not available, a Bio digester would be preferred as compared to a normal septic tank.

3.3 FIELD HOSPITAL HUTS

IDEA BASED ON WW1 & WW2 FIELD HUTS



INTRODUCTION:

FORWARD ACTION

The imperative is operational capacity ASAP. Lockdown affords some little time to prepare. Kenya is probably two to three weeks behind the European and USA trajectories.

Social factors are determining the success of their strategies to buy time, but the death toll is already beyond normal means of coping. Refrigerated trucks are deployed to serve as mortuaries in London. Mortality data is limited, the true number will be far higher. The full gravity of the contagion unfolds, while the economic damage is foreseeable. Stimulating SMEs wherever possible, mitigates the vanishing loss of businesses and workforce. The exit strategy must also be in sight, without which, consequences could be compounded and protracted.

QUESTIONS OF BALANCE

The deployment of boarding schools as treatment facilities might have drawbacks since in order to return adults to work, children must be returned to school first.

Moreover, cultural diversity criteria may also occasion reverberations, if parents are uncomfortable returning their children to schools which could have become mortuaries and graveyards.

FUTURE INFRASTRUCTURE

The advantage of a hut over a tent is that the hut has asset and service value post-emergency. Across the world, Covid19 has exposed the egregious stance of 'rentier' financiers towards capital investment in social infrastructure , particularly since the 2008 crash, preferring the fast returns of retail developments and other speculative bubbles.

In the UK since 2010, half the bed capacity in public hospitals was stripped out, deep cuts hit services, while staff salaries flat-lined. Much of the annual health budget is still wasted on servicing crippling repayments to PFI corporations, leaving nothing in the pot for capital spend on repairs and building maintenance, much of which was caused by the defective work of PFI consortiums in the first place.

The late, great, Dr. Magana Njoroge Mungai, among numerous others, continually called for major upgrades to Kenya's health infrastructure. Efforts to achieve that digitally will not fix decades of dilapidation in district hospitals, and may prove a costly, tendentious distraction from the real needs on the ground.

Emergency health infrastructure interventions made now should therefore be astutely mindful of their serviceability, and asset value, post-pandemic. The bereaved whose family members will pay the ultimate price now, may then see that the impetus to deliver effective welfare for future generations is real. David Mutiso cogently, and rather presciently, highlighted the acute need to address these problems at the AAK's 2019 conference ' '.

COVID -19 will not be the last pandemic the world has to face.

BRIEF:

Early in April the Architectural Association of Kenya, in collaboration with the Kenya Healthcare Federation, called on Architects and designers to work up ideas for repurposing and/or constructing quick and safe, care and treatment centres for COVID-19.

"Provide innovative design solutions such as container conversion, retrofitting of facilities, quick provision of isolation units using readily available materials to increase capacity"

This call comes as others across the globe initiate similar responses to meet the impending crisis: the UK's Building Design Partnership designed and constructed a 500 bed 'Nightingale' hospital facility by fitting out the 'Excel' exhibition centre in London; the Association of Ethiopian Architects published a design guide, and many others are galvanised to action

BACKGROUND & PRECEDENT 1914 - 1945

WARTIME NECESSITY

Countless thousands of temporary hut structures were designed and promptly built, often by women, to meet wartime emergencies.

Among these were Tarrant's Portable Hut, Nissen's Hospital Hut, the Iris Hut, the Quonset Hut, the Romney Hut and Best & Clifford's Transportable Types A & B Huts.

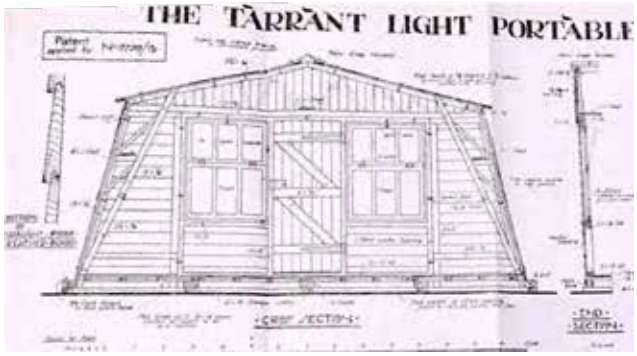
Many of these survived decades beyond their intended use, and became assets vital to the post-war housing crisis

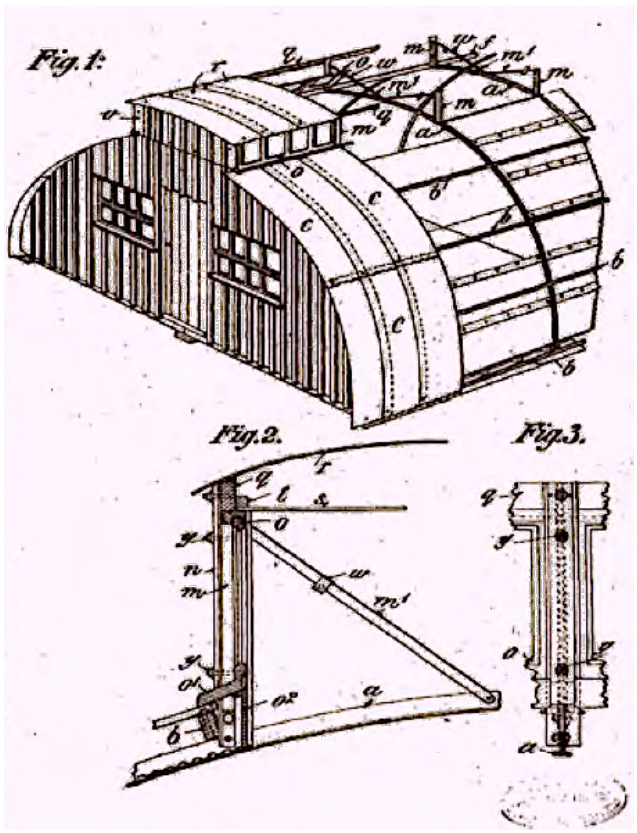
MARTIAL DELIVERY

Crucial to success was the speed of construction.

These well designed structures could bear directly on compacted earth footings. The Transportable Type B could top out in 10 hours with six builders.

This alacrity promoted a virtuous circle of positive hope and encouragement to the collective effort. Delivery was manifestly opportune

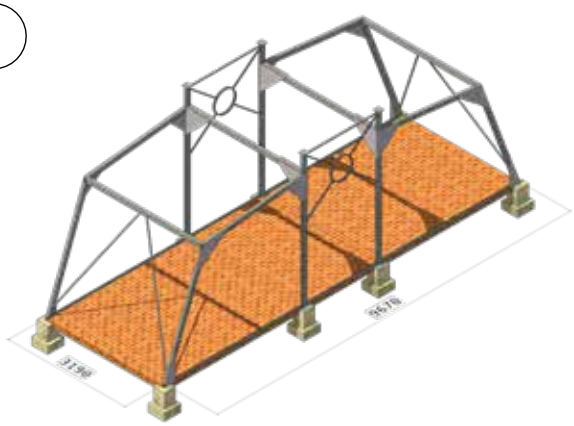




STRUCTURAL CONCEPT

STRUCTURAL MODULE

A hybrid of Nissen's hospital hut and Clifford & Best's Type B portable. A hollow section steel frame module is configured trigonometrically to meet the minimum clinical space requirements and allows standard corrugated iron cladding sheet 3m long, to work

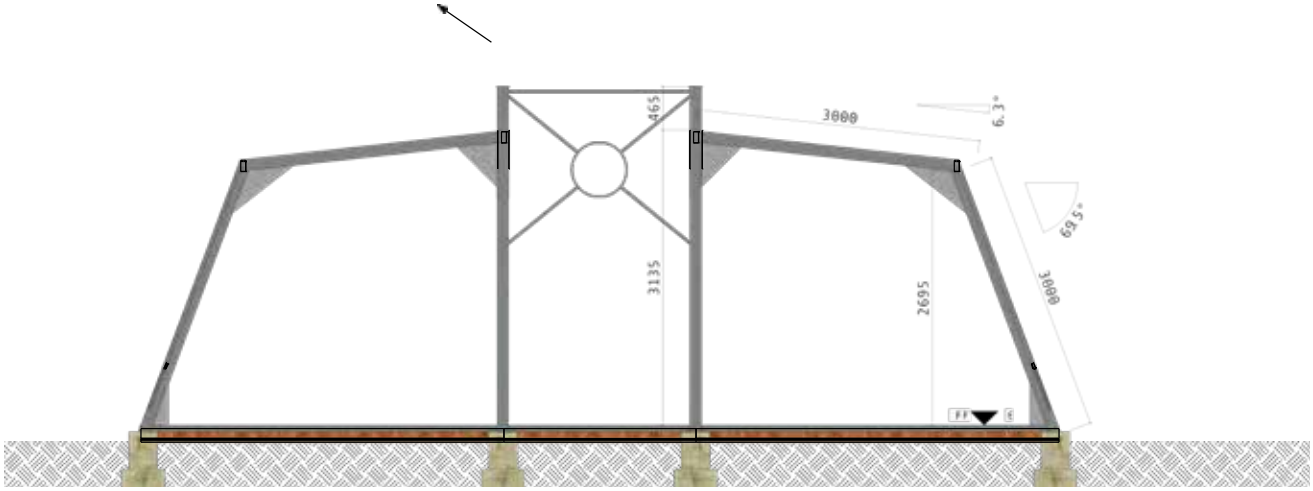


FABRICATION

The frame can be made up by local fundis. Screwed assembly on site. Structural members can be varied to suit what is readily available - CHS, SHS. Connections are made in the brace plates with self-tapping screws

FLOOR

Eliminating any concrete slab, this build-up cuts cost, construction time, and uses locally fired brick.

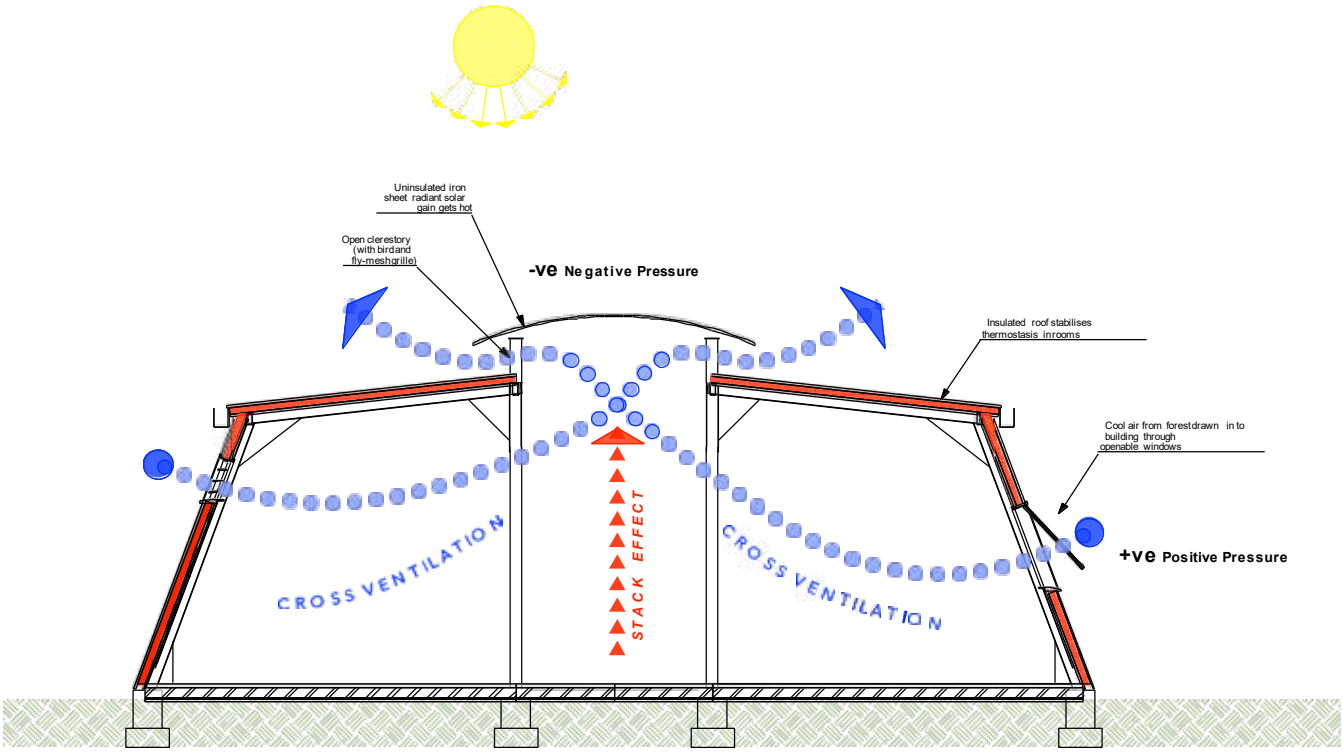


VENTILATION

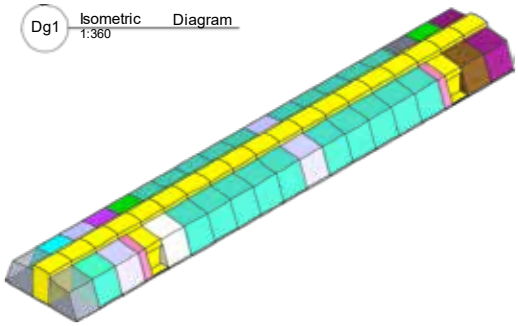
STRATEGY:
AEA guide March 2020

In the illustration below, we make the case for passive cooling where possible, by percipient site selection.

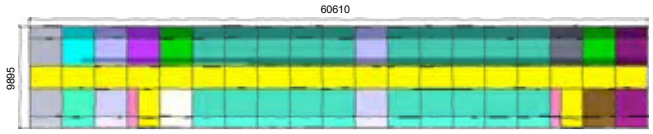
The principles of natural ventilation are sound. Hassan Fathy's seminal book on the subject merits a revisit.



SINGLE MODULAR RANGE TYPE VI



Dg1 Isometric Diagram
1:360

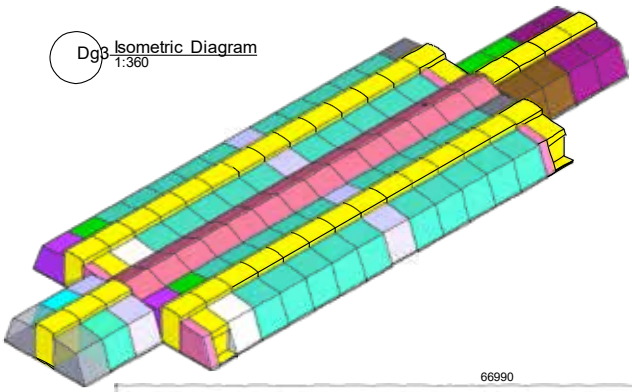


Dg2 Top Plan Diagram
1:360

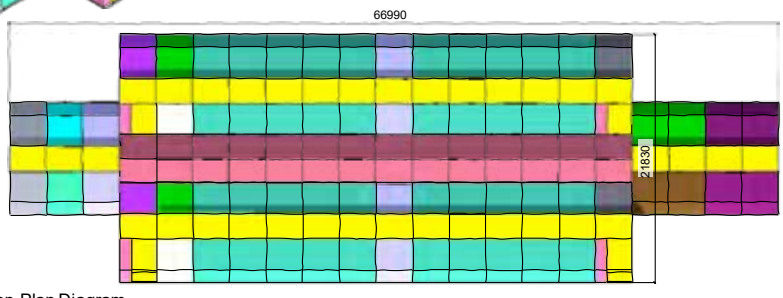
0 5 10 15 20 25 M

Clinical Circulation
Service Circulation
Office Reception
DON/DOFF
Clean Utility Dirty Utility
Doctors/Family Room
ICU Bed Washrooms Staff Rest
Room
Mortuary Cadaver Treatment
Controlled Waste Room
Switches/Cupboard
MEP & Medical Plant

TWIN MODULAR RANGE TYPE V2



Dg3 Isometric Diagram
1:360



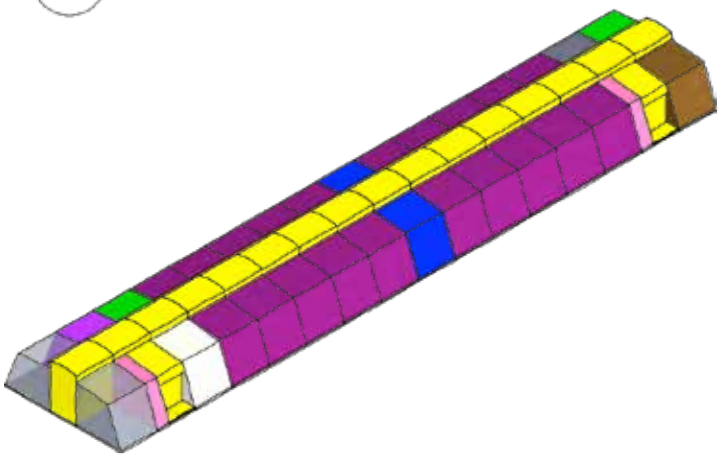
Dg4 Top Plan Diagram
1:360

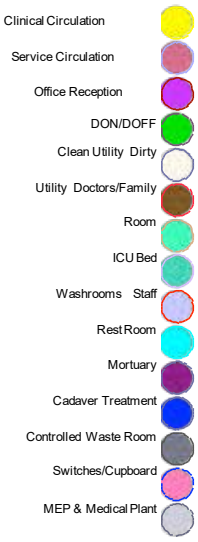
0 5 10 15 20 25 M

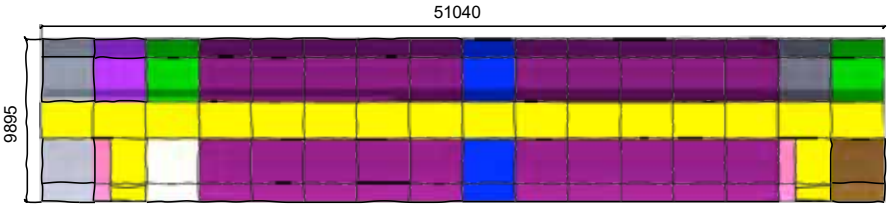
Clinical Circulation
Service Circulation
Office Reception
DON/DOFF
Clean Utility Dirty
Utility Doctors/Family
Room
ICU Bed
Washrooms Staff
Rest Room
Mortuary
Cadaver Treatment
Controlled Waste Room
Switches/Cupboard
MEP & Medical Plant

SINGLE MODULAR RANGE TYPE V3

Dg5 Isometric Diagram
1:360

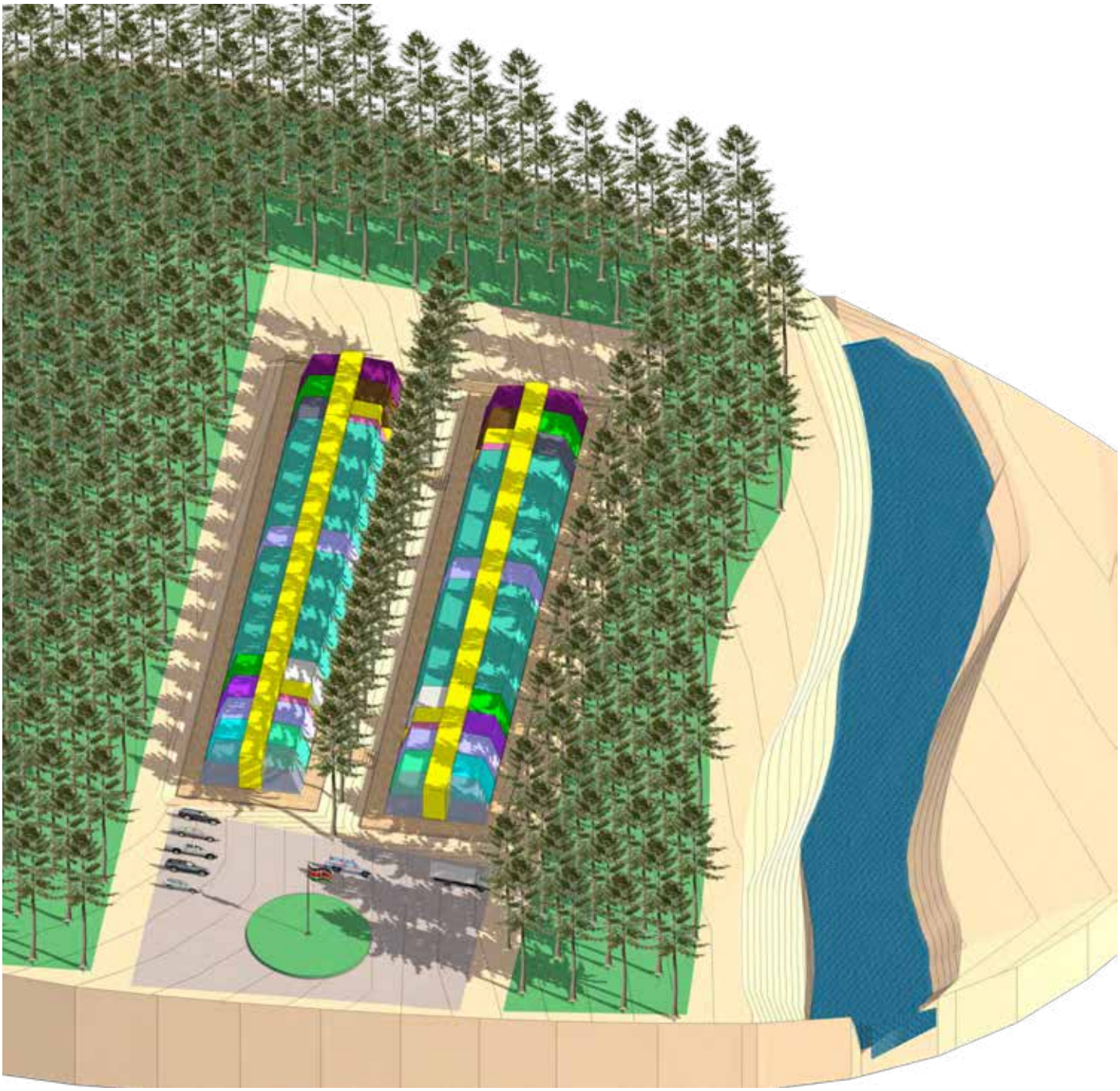




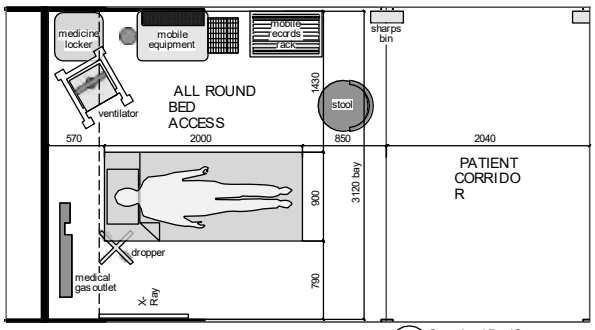


Dg6 Top Plan Diagram
1:360

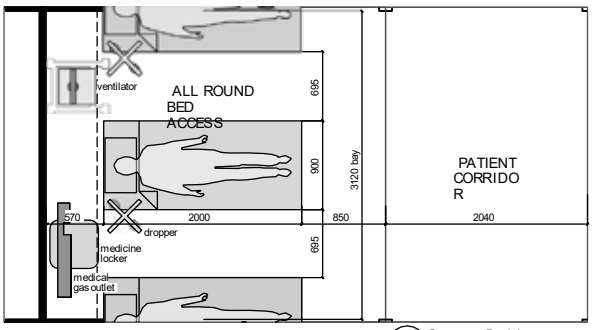
SITE & TOPOGRAPHY



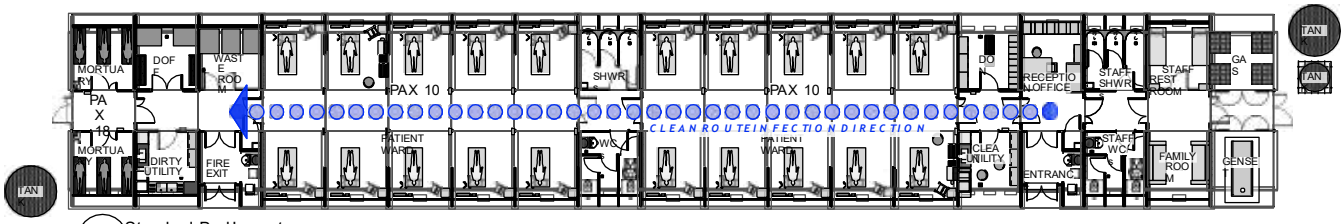
LAYOUT PLANS



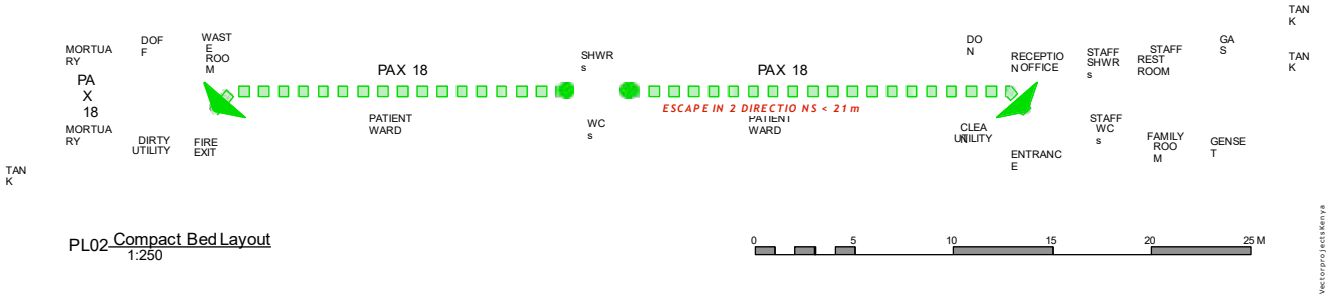
PL03 Standard BedSpace
1:50



PL04 Compact Bed Layout
1:50



PL01 Standard Bed Layout
1:250



PL02 Compact Bed Layout
1:250

ELEVATIONS

EVS South Elevation
1:250

EVN North Elevation
1:250

EVW West Elevation
1:250

EVE East Elevation
1:250

SANITARY SERVICES

A crucial factor impacting both cost and speed is foul waste drainage, particularly in black cotton soil terrain.

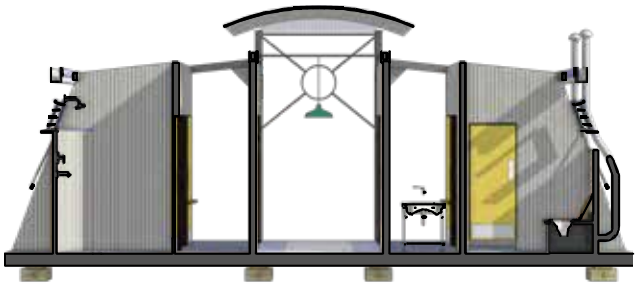
The Kenya Forest Service at The Nairobi Arboretum recently adopted the ecological alternative to the flush toilet - the composting loo illustrated here. Any difficulties procuring a proprietary product during the lockdown are readily overcome since, the principle of a woven fabric bag in a ventilated loo box is straightforward. It reduces cost, reduces water demand, eliminates sewerage, reduces plumbing pipework, and crucially, saves construction time.

RAINWATER HARVESTING

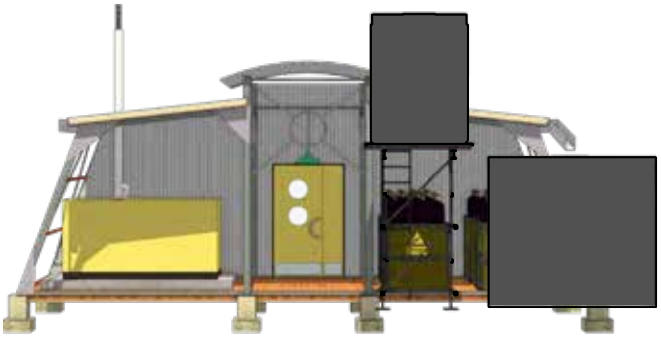
Calculations for water demand must account for the significant reduction that composting eco-loos bestow (9000 L /person/year).

Deep capacious gutters are provided to collect rainwater from the extensive dual pitch roof. These should be made up locally in pressed metal, since it is vital to promote economic activity during the lockdown, maintaining SMEs operability wherever practically possible.

Nominally 20, 000 litres storage capacity is indicated, with a smaller header tank on its stand adjacent to the M & E caged bay, terminating one end of the range.

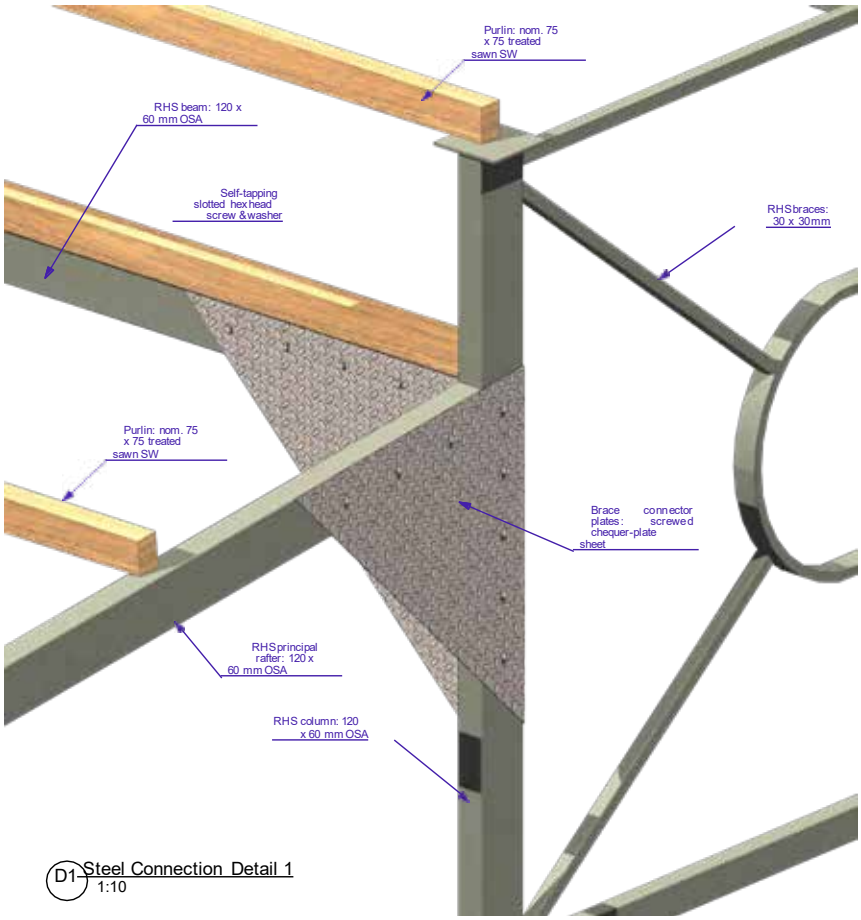


3d02 Washroom Perspective Section
1:100



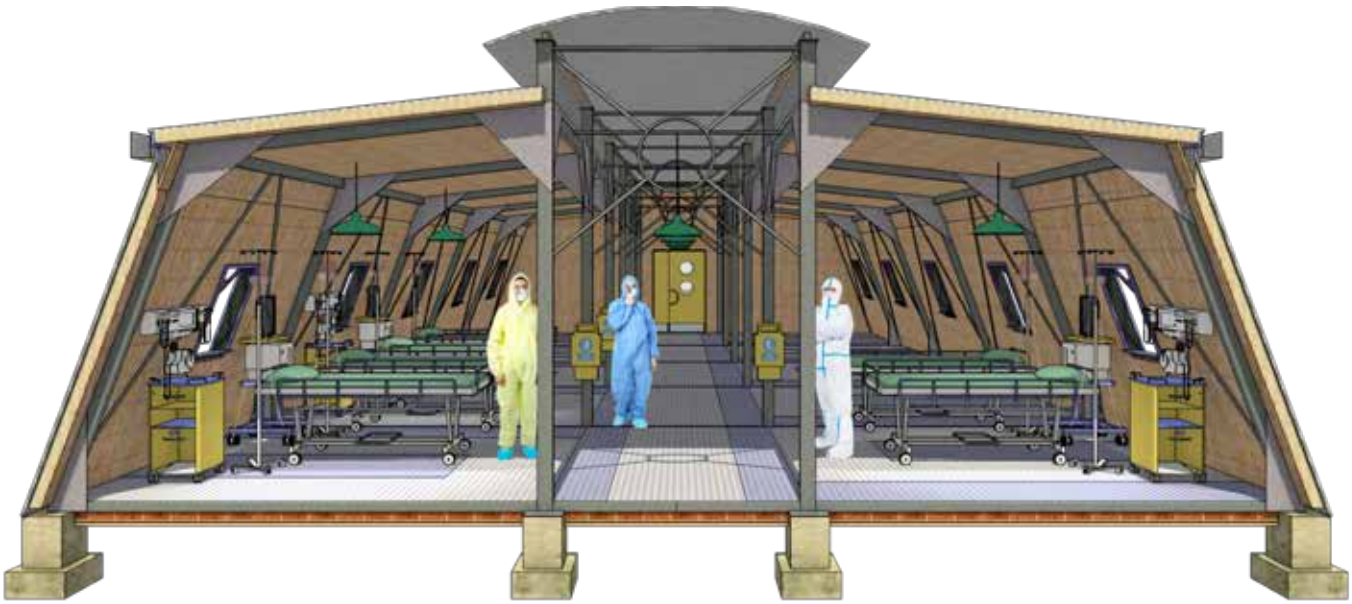
3d03 Water Tank & MEP Plant Perspective Section
1:100

TECHNICAL DRAWING



D1 Steel Connection Detail 1
1:10

INTERIOR PERSPECTIVE



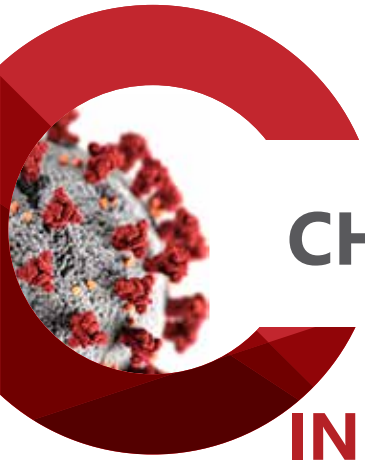
NOTES:

References:

1. Karey L. Draper, Wartime Huts: The Development, Typology and Identification of Temporary Military Buildings in Britain 1914-1945, Faculty of Architecture, University of Cambridge, UK, 2017

We are indebted to Dr Karey Draper for making her doctoral thesis available online:

Faculty of Architecture
Wolfson College University of Cambridge
2017



CHAPTER 4:

INNOVATIVE SOLUTIONS AT URBAN SCALE

Task Force 3

TASK: INNOVATIVE DESIGN SOLUTIONS AT URBAN SCALE:

Target Outcomes:

Carry out a COVID-19 risk assessment on the following facilities

Propose emergency response solutions at urban scale

Propose long term interventions/adaptions of the facilities to COVID-19 and any other future outbreaks of infectious diseases.

Contributors to this Publication

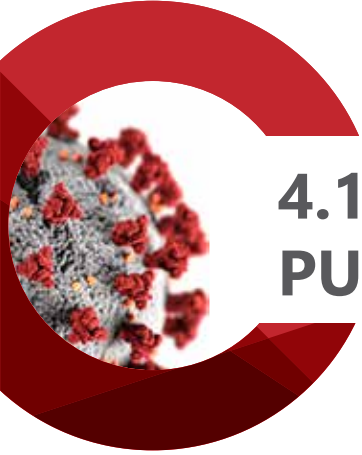
Ambrose Ofafa– Team Lead
Mumbua Musyimi
Douglas Ochong
Lorraine Odhiambo
Alfred Aluvaala
Cyrus Mbisi

Editorial Contribution

Patricia Baariu
Mugure Njendu
Florence Nyole

Compilation and Co-ordination

James Odongo
Ashley Mwangi



4.1 DEALING WITH COVID-19 IN PUBLIC SPACES

A public space refers to an area or place that is open and accessible to all peoples, regardless of gender, race, ethnicity, age or socio-economic level. These are public gathering spaces such as plazas, urban squares, parks, parking lots, sports fields, play grounds, as well as connecting spaces, such as sidewalks and streets (UNESCO).

It is worth noting that Pandemics are inherently "anti-urban" and "undermine our most basic ideas about community and, in particular, urban life." The COVID-19 pandemic seems to prey on the interconnectedness of our world, and our cities (and their public spaces) are no exception.

The COVID-19 pandemic has brought to the forefront various urban function – spatial problems within the public space. These include:

- **Inadequate medical facilities**

There is an insufficient number of medical facilities, uneven distribution, low capacity, and lack of resources to equip these facilities.

- **High urban population density**

COVID-19 is more likely to spread in cities with high population densities, as it is more difficult to control population movements and cut off the virus transmission route. Other urban systems will face greater pressure if the necessary movement restrictions and/or lockdowns are implemented.

- **Street Congestion**

Streets also have for years been a vital part of the public realm. The growing prevalence of the automobile has squeezed out the street uses for pedestrians and bicycle users.

Reclaiming streets as places for people can strengthen cities in a variety of ways – economically, environmentally, as well as socially.

- **Insufficient public open spaces**

This is mainly reflected in the uneven distribution of large open spaces, the small number of small open spaces, and the small scale in urban areas. During the pandemic such spaces can serve as a temporary testing centers, storage and patient receiving spots. Insufficient open space also means that the overall scale of the city's treatment is reduced, and the potential for coping with risks is relatively reduced.

- **Weak public awareness of the pandemic**

The lack of public awareness leads to loss of early response opportunities. Without proper guidance by the public sector and the media, the public's tolerance for the crisis is likely to become very low, leading to increased social panic and possibly riots.

- **Public health among the vulnerable groups**

The homeless in Kenya are among the vulnerable groups who are affected during this time of curfew and restricted movement in and out of the city. It is nearly impossible for homeless people to maintain social distance as well as observe hygiene due to lack of access to water/sanitation facilities.

- **Inadequate Planning for Public Spaces**

All over the world, sprawl development is allowed to spread without any plan for public space. Sometimes, developers create "public" space that is actually private —

- **Dilapidated existing public spaces**

For the public spaces that do exist, there is a laxity in maintenance by the County Governments whereby lawns and planting are not regularly maintained; there is inadequate park furniture such as benches, drinking fountains and are havens for street families. All these make the public parks unattractive places for people to visit and spend time and they do not feel safe to go into such places.

- **Inadequate Public Spaces That Bring People Together**

The best public spaces bring together people from all walks of life and all income groups. Where public space is absent, inadequate, poorly designed, or privatized, the city becomes increasingly segregated. Lines are drawn based on religion, ethnicity, and economic status. The presence of multiple types of people ensures that no one group dominates, and that the space is safe and welcoming for all, including women and youth.

- **Lack of Community Participation during the design process**

Public spaces are not only matters for planners, designers, and bureaucrats to decide. It is as a result of full public participation in the creation of public spaces that truly great places come into being. Building a city is an organic process, not a simple recipe or a one-size-fits-all pattern. Local customs must always be considered and honored. Maintenance costs must remain within reason for the community involved.

Short term Interventions

1. Heightened hygiene protocols:

By increasing the frequency and thoroughness of cleaning regimens in public spaces particularly those of high touch surfaces like doors, handles and furniture. Provision of hand washing stations and hand disinfection materials, e.g. sanitization booths in Mombasa which the public can walk through.

Public worker disinfecting park furniture

The disinfecting booth at the Island side of the Likoni ferry

2. Pedestrianization of streets.
Some streets in Kenya may need to be retrofitted calling for the pedestrianization of some streets to promote social distancing during COVID-19. Having open street day routes, where some streets are closed off to cars and opened to pedestrians and cyclists to give people alternatives to community public transport systems.

In New York for example, Mayor de Blasio has urged New Yorkers to "bike or walk" if they can. Cities as diverse as Berlin and Bogotá are using tactical urbanism to take road space from cars overnight and give it to people on foot and on bicycles to keep key workers moving—safely—during lockdown.

Temporarily protected bicycle lane on Müllerstraße, Berlin.

Joel Carlos Borges Street in São Paulo was transformed overnight to enhance road safety, including allocating greater space for pedestrians

3. Transforming Public Spaces
Public spaces such as parks, Parking Lots, Sports fields and Stadia can be set up as testing and treatment centers, storage facilities to help supplement hospitals overwhelmed with patients battling the Coronavirus.

For example a New York Christian humanitarian aid organization has set up a field hospital in Central Park, NY; Aga Khan University Hospital in Nairobi has set up a field hospital at the Gymkhana Club in Parklands, Machakos County has set up a field hospital at the Kenyatta Stadium.

The field hospital in Central Park is barricaded on one of the park's famous lawns

Machakos County Government opens COVID-19 mass testing and isolation facility at the Kenyatta Stadium which will accommodate up to 400 patients

4. Public awareness and education:
Public spaces that remain open for use are prime opportunities to educated users about the importance of social distancing and hygiene. Creating signage and posters that give helpful information that encourages users to practice social distancing, wash their hands frequently and effectively, stay at home when sick, and avoid public spitting, etc.

5. Designate public spaces for use as homeless shelters:
Homeless persons are among the vulnerable groups that have been greatly affected with curfew and movement restrictions during the COVID-19 pandemic. There is therefore need to convert public spaces such as public parks, vacant parking lots, stadiums, to house the homeless. They can be confined to white painted rectangles, barrier tapes or tents spaced 6-feet apart to ensure social distancing.

An example is South Africa where they have set up temporary shelters for homeless persons in parks, stadiums and freeways and are also giving them food and access to sanitation facilities.

Las Vegas put up temporary shelter in a parking lot and marked spaces for social distancing

A coronavirus isolation and quarantine complex for homeless people in Las Vegas parking lot

Homeless shelter tents set up under an elevated freeway in Capetown, South Africa. The site also has waterpoints and chemical toilets.

`6. Creation of healing gardens in the Hospitals

Public spaces that remain open for use are More than 100 years ago during the Spanish flu pandemic, doctors discovered that patients with severe flu who were looked after outdoors recovered faster than those treated indoors. A combination of fresh air and sunlight seemed to have prevented reinfection and death among patients and infection among medical staff. Creation of gardens designated to the COVID-19 patients in hospitals can go a long way in promoting their physical and mental well being.

Healing and Therapeutic gardens offer a space for patients to uplift their physical and mental well-being

7. Public transportation systems

As people avoid crowds and movement is restricted, cities are reporting public transit ridership has taken a sharp downturn. Design changes need to be adopted in bus stations at the waiting bays and seating areas to prevent the spread of infectious diseases.

Long term Interventions

1. Reclaiming and/or Creating neighbourhood parks

With the increase in urbanization and the subsequent building of high-rise developments, there is less and less space for the public for relaxation and recreation. The situation gets worse if the houses have poor ventilation and/or lighting. There is need to map out residential estates/ flats in order to create open public spaces where residents can access.

The city of Bogotá undertook a project to reclaim underutilized areas of the city and convert them into spaces for people.
The first space to be converted was a surface parking lot located in the neighborhood of Chapinero at the intersection between Calle 80 and Carrera 9.

2. Management and Maintenance of existing Public spaces

Exisiting parks need to be revitalized and managed to allow citizens of all walks of life to visit freely and safely. There is need to design for anti-theft furniture that is less prone to vandalism, public awareness to educate users on the benefits of the parks, maintain high levels of hygiene and maintain the facilities. Nairobi River, Uhuru Park and Central Park are a good place to start. Good will is required from the County Governments to enforce this.

3. Reclaiming existing cities to include public spaces such as parks, plazas, recreation areas, etc.

Southbridge Redevelopment Plan — Chicago
Redevelopment plans take an existing park and a proposed recreation field and merges both into a single open space

Wuhan Waterfront — Wuhan, China
This project will reconnect the city of Wuhan with the Yangtze River as part of a plan to spark the revitalization of the city's two most important areas.

5. Designate public spaces for use as homeless shelters:

Homeless persons are among the vulnerable groups that have been greatly affected with curfew and movement restrictions during the COVID-19 pandemic. There is therefore need to convert public spaces such as public parks, vacant parking lots, stadiums, to house the homeless. They can be confined to white painted rectangles, barrier tapes or tents spaced 6-feet apart to ensure social distancing.

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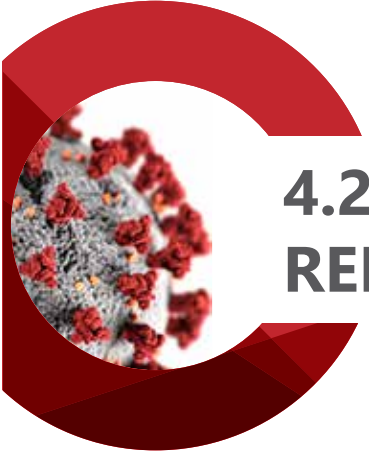


4.2 COVID-19 RESPONSE BY RELIGIOUS INSTITUTIONS

Background

Religious Institutions in Kenya would be documented as follows:

- Building affiliation i.e. Christian, Muslim, Hindu etc.
- Building size and location
- In depth documentation of the quality of the space

The information above will then assist in facility specific risk assessment and proposal of adaptive measures.
What is presented below are general measures:

Churches as places of congregation pose a unique risk in the spread of any infectious diseases since they bring together groups of people for both social and religious rituals and ceremonies.

However they also present an opportunity for collective action as they bring together large populations and are in possession of many facilities that can be adapted for housing and healthcare.

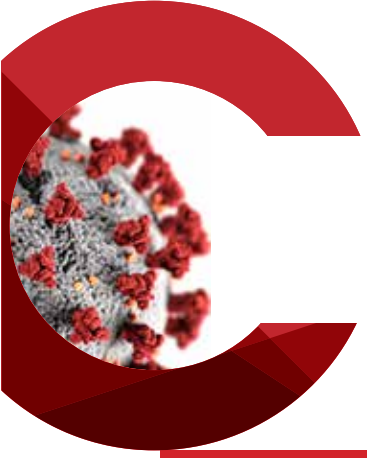
References:

https://cruxnow.com/church-in-europe/2020/03/across-europe-churches-offer-empty-facilities-to-help-fight-covid-19/
https://oxfamblogs.org/fp2p/religion-and-covid-19-four-lessons-from-the-ebola-experience/?utm_source=feedburner&utm_medium=feed&utm_A+Duncan+Green%29

1. Heightened hygiene protocols:
By increasing the frequency and thoroughness of cleaning regimens in public spaces particularly those of high touch surfaces like doors, handles and furniture. Provision of hand washing stations and hand disinfection materials, e.g. sanitization booths in Mombasa which the public can walk through.

Source : https://commons.wikimedia.org/wiki/File:Holy_Ghost_Roman_Catholic_church_in_Mombasa.JPG

a. Risks		
Risk area	Emergency response solution	Long term intervention
1. Congregation of large numbers of people	Suspend these	-
2. Large spaces	Suspend use of shared facilities	-
3. Open grounds	Suspend use	-
b. Opportunities		
Opportunity area	Emergency response solution	Long term intervention
1. Congregation of large numbers of people	Can be used as an avenue for offering connection and care	-Inter-consultation between medical and religious experts, understand the different and vital roles that religious organisations play in community, and how these can be harnessed in a medical emergency situation. -Develop guidelines for social interaction (funerals, weddings etc.) in times of pandemics
2. Large spaces	Can be converted immediately into health care facilities, quarantine centres, medical equipment and supplies storage or accommodation as needed	Ensure the necessary facilities are inbuilt into these structures to allow for easy and quick reconfiguration e.g plumbing, power points, structure etc.
3. Open grounds	Can be adapted into mobilisation centres of care for food distribution, communication centres etc.	Inbuild the necessary infrastructure to allow conversion of these spaces



CORONA VIRUS RISK ASSESSMENT AND INTERVENTIONS IN HIGH-DENSITY URBAN AREAS

INTRODUCTION

- High-density areas and informal settlements in Kenya pose a high threat to the COVID-19 spread.
- Nairobi and Mombasa are amongst the high-density urban areas facing the threat of the virus.
- High-density Settlements in Nairobi that have so far have confirmed cases include Kawangware, Pipeline, Ngara, Eastleigh, Tassia, Donholm, Madaraka, and Githurai estates.
- Other areas include Buruburu, Parklands, Mlolongo, Utawala and Kilimani areas

Already Existing Challenges

- High dependency on daily income
- Poor housing (shack/Shanties)
- Overcrowding/congestion
- Limited access to water
- Limited health facilities
- Poor sanitation
- Lack of hygiene
- Limited Savings

Exposure to the Virus

- Low access to virus detection (screening and diagnosis)
- Increase in chances of pre-existing conditions e.g. pneumonia, bilharzia.
- Increase in physical contacts
- No social distancing
- Cannot stay at home

Provision of running water/water tanks

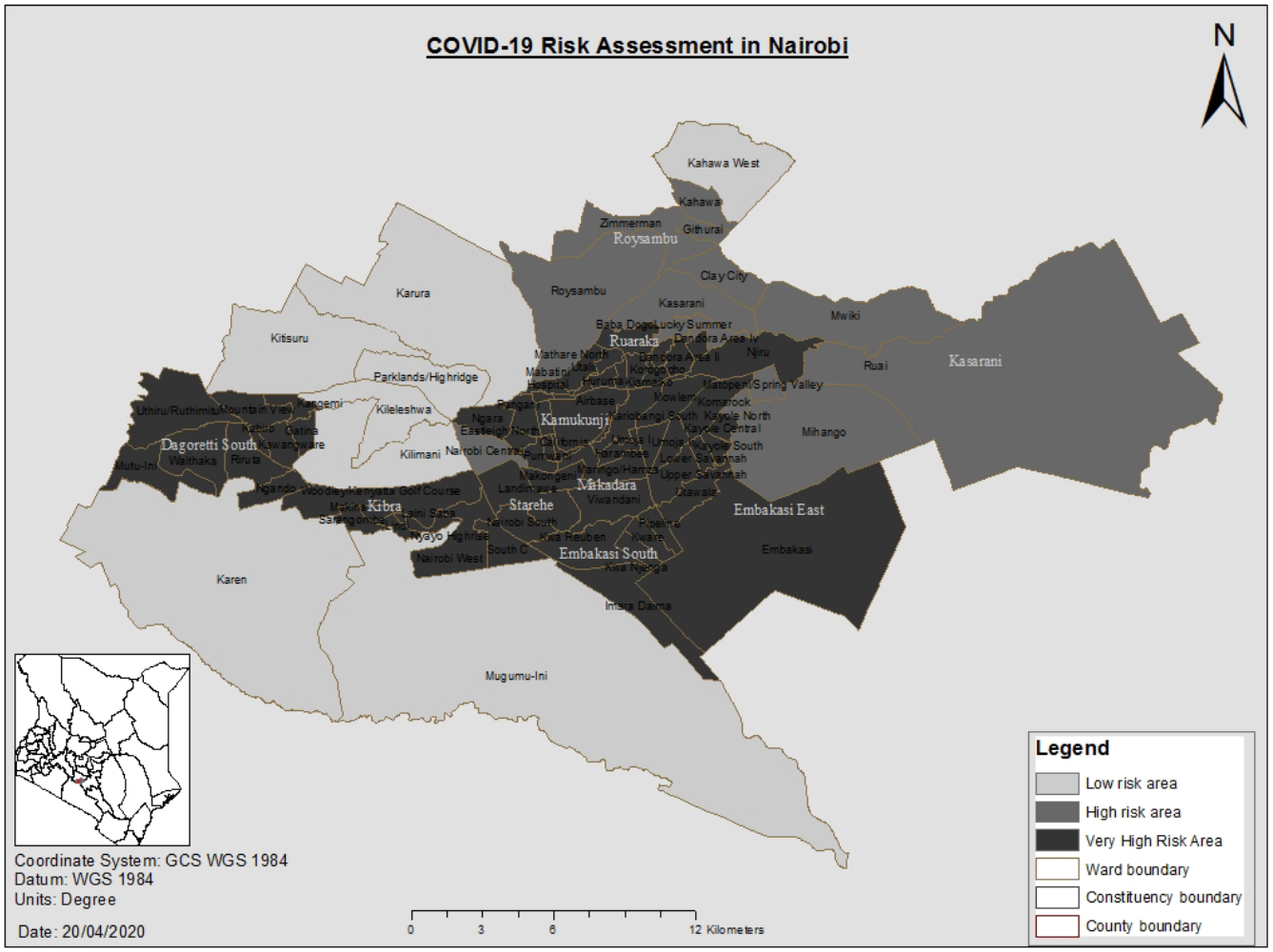
Basic street layout design/opening dead-ends

Mapping health facilities against population

Installation of screening centers

Access to low interest loans

NAIROBI COUNTY WARDS MAP: HIGH-RISK ASSESSMENT



	Population density (per Sq. Km)	Household size
Nairobi	6,247	2.9
Mombasa	5,495	3.1

Emergency Response actions

Disinfection of shared facilities

Installation of mobile clinics

Coordination of solid waste management

Long-term Interventions	Actors
Infrastructure Improvement Plan	National government, county government
Precinct Urban Spatial Plan	County government/planning schools, Associations
Slum Upgrading strategies	National government
Disaster Risk Management	National government, Slum dwellers
Community loans/Micro-loans	CBOs, NGOs, Investment groups/*Chamas*

URBAN PUBLIC TRANSPORT

Our assessment looks at the urban bus termini with the case of Nairobi City.
Bus termini are major concentration areas that risk spreading corona virus

These are places where passengers board, alight or wait for vehicles(matatus)

The Challenges and Risks

- Overcrowding of people at the terminus
- No physical distance between passengers in the vehicles
- Poor ventilation inside matatus
- Lack of running water
- Poor solid waste management
- Disorganized and unplanned
- Over-reliance on public transport
- Narrow lanes i.e. bus lanes, walkways, cycle tracks. te management

The assessment covers the following termini:

- Ngara Fig Tree station
- Fire Station Koja Station
- Muthurwa Bus termini
- GPO Bus termini
- Gikomba Bus Station
- OTC station
- Odeion Station
- Bus Station
- Githurai-45
- Railway Station
- Afya Centre

These stations lack the basic physical infrastructure to reduce the spread of COVID-19

CASE STUDIES

Bogota, Colombia:
Opening 76Km to reduce crowding in public transport.
(Car-lanes converted to bike-lanes)
Blocked entry of non-residents

New York:
Increase in cycling.
Converting on-street parking spaces near restaurants to temporary loading zones.
Social distancing

Emergency Response

- Working from home - #stayhome
- Provision of running water and hand-washing soaps or waterless sanitizers
- Social distancing in the bus waiting lanes
- Proper solid-waste management
- Cleaning (steam cleaning, disinfections) of stations and workplaces to minimize surface contamination (fomites)
- Control heating, ventilation, and air conditioning
- Mass testing and screening
- Cough etiquette
- Wearing PPEs such as masks, gloves etc
- Opening/increasing bike lanes and walkways

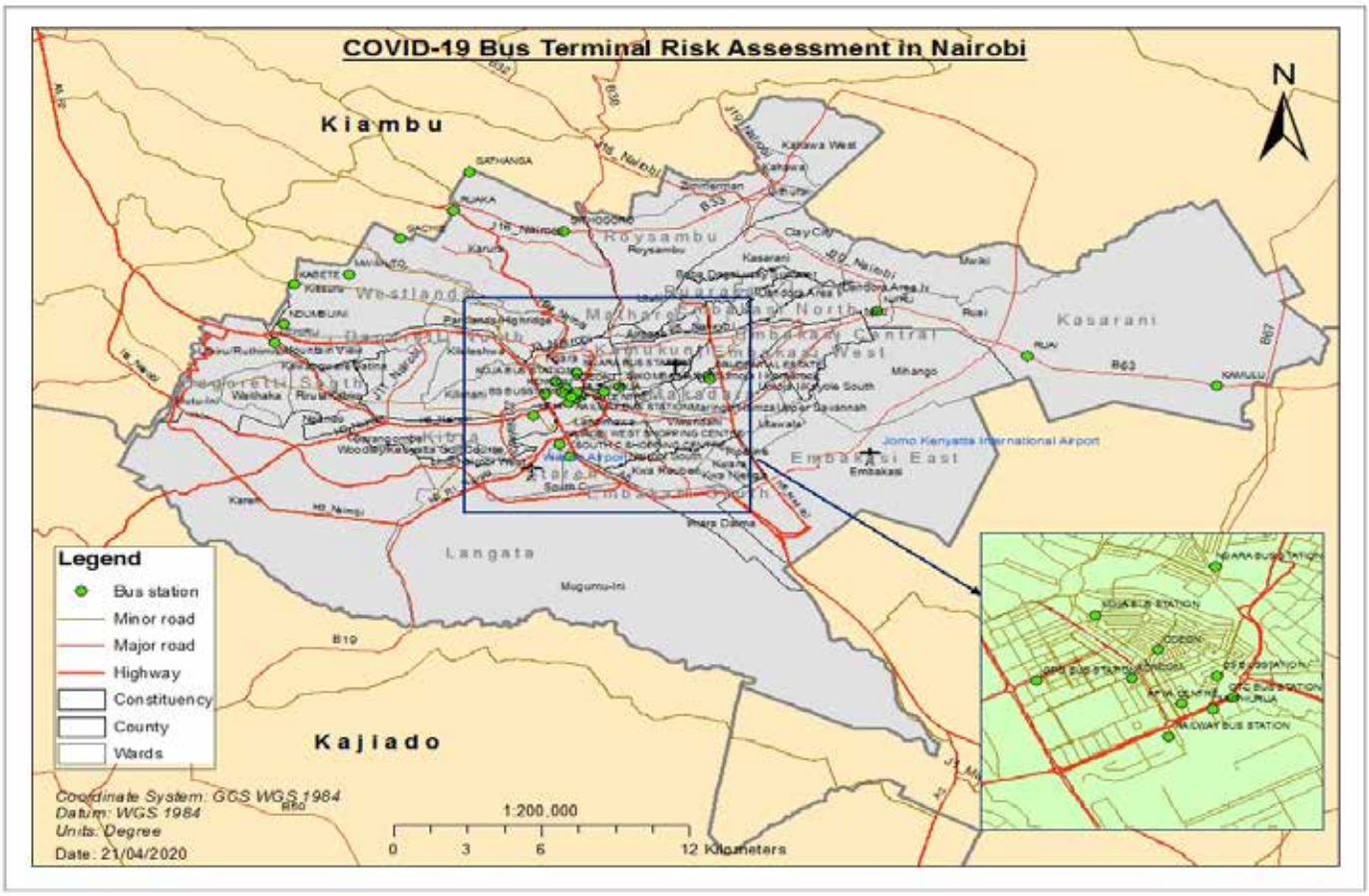
Long-term Interventions

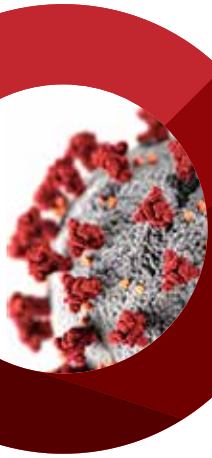
- Provision of basic infrastructure such as running water, solid waste management through long-term transportation plans
- Regular disinfection of the stations
- Implementation of the Nairobi's BRT plan
- Implementation of Nairobi's NMT plan

Actors

- The National government
- NAMSIP/KISIP
- The county government of Nairobi
- MoH, WHO
- Matatu Owners Association

NAIROBI TRANSPORT MAP





CHAPTER 5:

INNOVATIVE SOLUTIONS AT REGIONAL/COUNTY LEVEL

Task Force 4

OBJECTIVES

- Identify and map out available facilities at regional level
- Provide indicative deficiency in capacity.
- Identify, propose and design for alternative locations that can be easily converted into hospitals such as urban parks, stadia, open fields from neighborhood to urban, regional and up to national level up to regional level, counties etc
- Work with counties to collate information on capacity and indicate deficiency.

Task Force 4

Contributors to this Publication

John Mwaniki– Team Lead
Joel Oyuga
David Njenga
Juliet Rita
Olivia Otieno
Susan Makhulo
Patrick Juma
Benson Githinji
Ambrose Ofafa

Editorial Contribution

Patricia Baariu
Mugure Njendu
Florence Nyole

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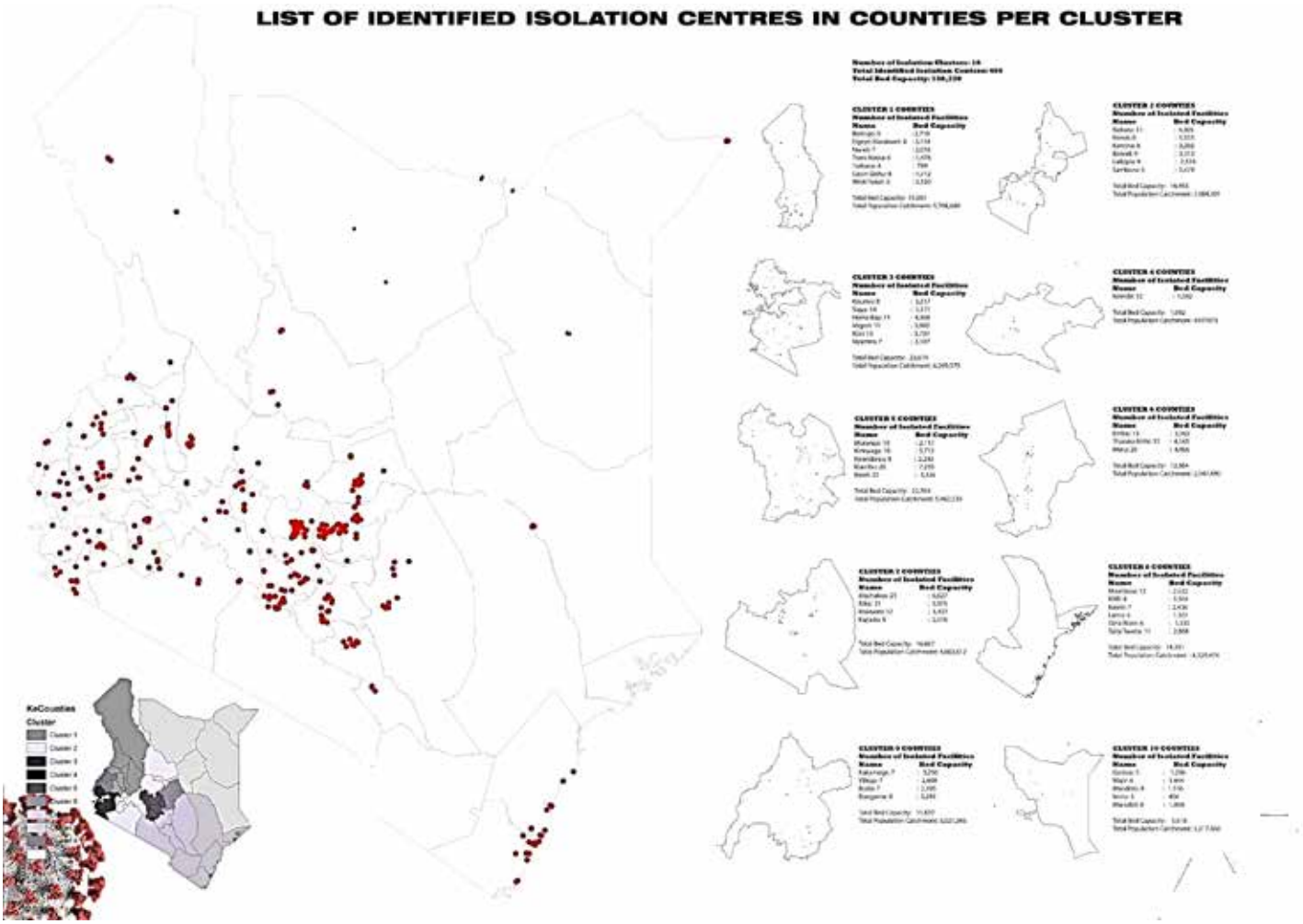
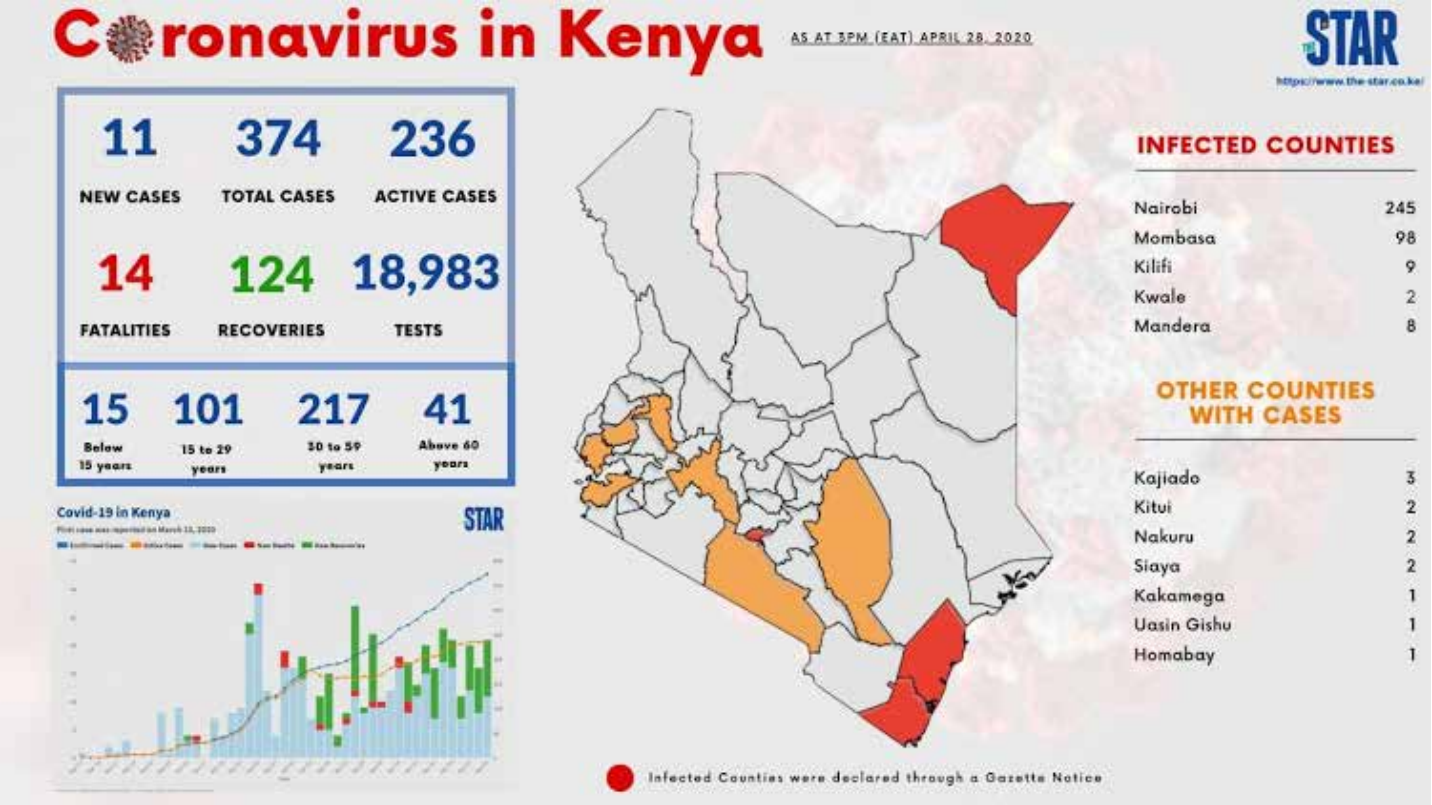

LIST OF IDENTIFIED ISOLATION CENTRES IN COUNTIES PER CLUSTER
KeCounties
Cluster


Coronavirus in Kenya
AS AT 3PM (EAT) APRIL 28, 2020
STAR
https://www.the-star.co.ke/
11
NEW CASES
374
TOTAL CASES
236
ACTIVE CASES
14
FATALITIES
124
RECOVERIES
18,983
TESTS
15
Below 15 years
101
15 to 29 years
217
30 to 59 years
41
Above 60 years
Covid-19 in Kenya
STAR
INFECTED COUNTIES
Nairobi 245
Mombasa 98
Kilifi 9
Kwale 2
Mandera 8
OTHER COUNTIES WITH CASES
Kajiado 3
Kitui 2
Nakuru 2
Siaya 2
Kakamega 1
Uasin Gishu 1
Homabay 1
Infected Counties were declared through a Gazette Notice

KENYA MEDICAL PRACTITIONERS AND DENTISTS COUNCIL
LIST OF IDENTIFIED ISOLATION CENTRES IN COUNTIES PER CLUSTER

CLUSTER NO	COUNTY	NATIONAL NO.	COUNTY NO.	NAME	SUB COUNTY	DESCRIPTION	CAPACITY
CLUSTER 1 (NORTH RIFT REGION)	UASIN GISHU	1	1.	KMTC		ISOLATION CENTRE	100
		2	2.	MOI MEDICAL SCHOOL		ISOLATION CENTRE	
		3	3.	UNIVERSITY OF ELDORET		ISOLATION CENTRE	
		4	4.	ELDORET POLYTECHNIC		ISOLATION CENTRE	
		5	5.	MOI GIRLS ELDORET	AINABKOI	ISOLATION CENTRE	470
		6	6.	HILL SCHOOL	KESSES	ISOLATION CENTRE	336
		7	7.	AIC CHEBISAAS	MOIBEN	ISOLATION CENTRE	336
		8	8.	PAUL BOIT	TURBO	ISOLATION CENTRE	470
						UASIN GISHU COUNTY TOTAL:	**1,712**
	TRANS NZOIA	9	1.	KMTC		ISOLATION CENTRE	
		10	2.	KITALE SCHOOL-SECONDARY	TRANS NZOIA WEST	ISOLATION CENTRE	269
		11	3.	ST JOSEPH'S GIRLS	TRANS NZOIA WEST	ISOLATION CENTRE	403
		12	4.	ST JOSEPH'S BOYS KITALE	TRANS NZOIA WEST	ISOLATION CENTRE	806
						TRANS NZOIA COUNTY TOTAL:	**1,478**
	WEST POKOT	13	1.	KMTC KAPENGURIA		ISOLATION CENTRE	126
		14	2	CHESTA		ISOLATION CENTRE	450
		15	3	CHEWOYET	WEST POKOT	ISOLATION CENTRE	605
		16	4	KAPENGURIA BOYS HIGH SCHOOL	WEST POKOT	ISOLATION CENTRE	605
		17	5	NASOKOL GIRLS SEC. SCHOOL	WEST POKOT	ISOLATION CENTRE	672
		18	6	TARTAR GIRLS	WEST POKOT	ISOLATION CENTRE	672
						WEST POKOT COUNTY TOTAL:	**3,130**
	BARINGO COUNTY	19	1.	BARINGO TTC		ISOLATION CENTRE	360
		20	2.	KMTC		ISOLATION CENTRE	100
		21	3.	KENYA SCHOOL OF GOVERNMENT		ISOLATION CENTRE	100
		22	4.	KABARNET HIGH SCH.	BARINGO CENTRAL	ISOLATION CENTRE	470
		23	5.	KAPROPITA GIRLS HIGH	BARINGO CENTRAL	ISOLATION CENTRE	403
		24	6.	KITURO HIGH SCHOOL	BARINGO CENTRAL	ISOLATION CENTRE	336
		25	7.	PEMWAI GIRLS' SEC SCH	BARINGO CENTRAL	ISOLATION CENTRE	336
		26	8.	BARINGO HIGH	KOIBATEK	ISOLATION CENTRE	336
		27	9.	ELDAMA RAVINE GIRLS	KOIBATEK	ISOLATION CENTRE	269
						BARINGO COUNTY TOTAL:	**2,710**
	NANDI COUNTY	28	1.	KMTC		ISOLATION CENTRE	
		29	2.	KOITALEL K. SAMUEL UNIVERSITY		ISOLATION CENTRE	
		30	3.	MOSORIOT TTC		ISOLATION CENTRE	540
		31	4.	KAPSABET BOYS	CHESUMEI	ISOLATION CENTRE	605
		32	5.	KAPSABET GIRLS HIGH SCHOOL	NANDI CENTRAL	ISOLATION CENTRE	403
		33	6.	SAMOEI BOYS	NANDI EAST	ISOLATION CENTRE	336
		34	7.	OUR LADY OF PEACE	NANDI EAST	ISOLATION CENTRE	134
						NANDI COUNTY TOTAL:	**2,018**
	TURKANA COUNTY	35	1.	LODWAR HIGH	TURKANA CENTRAL	ISOLATION CENTRE	336
		36	2.	OUR LADYS' GIRLS	TURKANA WEST	ISOLATION CENTRE	134
		37	3.	KAKUMA BOYS	TURKANA WEST	ISOLATION CENTRE	189
		38	4	Bishop Mahon	TURKANA WEST	ISOLATION CENTRE	140
						TURKANA COUNTY TOTAL:	**799**
	ELGEYO MARAKWET	39	1.	KMTC		ISOLATION CENTRE	100
		40	2.	TAMBACH TTC		ISOLATION CENTRE	500
		41	3.	ST.PATRICK ITEN	KEIYO	ISOLATION CENTRE	605
		42	4.	SINGORE GIRLS	KEIYO	ISOLATION CENTRE	538
		43	5.	TAMBACH BOYS	KEIYO	ISOLATION CENTRE	403
		44	6.	AIC KESSUP GIRLS	KEIYO	ISOLATION CENTRE	269
		45	7.	MOI KAPSOWAR GIRLS	MARAKWET WEST	ISOLATION CENTRE	336
		46	8.	CHEBARA BOYS	MARAKWET WEST	ISOLATION CENTRE	403
						ELGEYO MARAKWET COUNTY TOTAL:	**3,154**

CLUSTER NO	COUNTY	NATIONAL NO.	COUNTY NO.	NAME	SUB COUNTY	DESCRIPTION	CAPACITY
						CLUSTER 1 (NORTH RIFT REGION) TOTAL:	15,001
CLUSTER 1 (SOUTH RIFT REGION)	NAKURU COUNTY	48	1.	EGERTON UNIVERISTY		ISOLATION CENTRE	
		49	2.	UTUMISHI	GILGIL	ISOLATION CENTRE	403
		50	3.	KOELEL BOYS	GILGIL	ISOLATION CENTRE	610
		51	4.	NAIVASHA GIRLS SEC	NAIVASHA	ISOLATION CENTRE	336
		52	5.	NAIVASHA HIGH SCHOOL	NAIVASHA	ISOLATION CENTRE	336
		53	6.	LAKE NAIVASHA GIRLS SEC	NAIVASHA	ISOLATION CENTRE	336
		54	7.	NAKURU BOYS	NAKURU	ISOLATION CENTRE	403
		55	8.	NAKURU GIRLS	NAKURU	ISOLATION CENTRE	336
		56	9.	MOI FORCES LANET	NAKURU NORTH	ISOLATION CENTRE	470
		57	10.	JOMO KENYATTA BOYS	NAKURU NORTH	ISOLATION CENTRE	672
		58	11.	JOMO KENYATTA GIRLS	NAKURU NORTH	ISOLATION CENTRE	403
						NAKURU COUNTY TOTAL:	4,305
	NAROK COUNTY	59	1.	MASAI MARA UNIVERISTY		ISOLATION CENTRE	
		60	2	Narok TTC		ISOLATION CENTRE	455
		61	3	SUSWA GIRLS	NAROK EAST	ISOLATION CENTRE	252
		62	4	OLOLULUNG'A BOYS	NAROK SOUTH	ISOLATION CENTRE	403
		63	5	OLOMIRAN BOYS HIGH	NAROK WEST	ISOLATION CENTRE	336
		64	6	SEKANANI GIRLS	NAROK WEST	ISOLATION CENTRE	189
						NAROK COUNTY TOTAL:	1,635
	KERICHO COUNTY	65	1.	TENGECHA BOYS	BURETI	ISOLATION CENTRE	403
		66	2	Kericho TTC		ISOLATION CENTRE	380
		67	3	LITEIN HIGH	BURETI	ISOLATION CENTRE	403
		68	4	AIC LITEIN GIRLS	BURETI	ISOLATION CENTRE	336
		69	5	KERICHO HIGH	KERICHO	ISOLATION CENTRE	403
		70	6	MOI TEA GIRLS	KERICHO	ISOLATION CENTRE	269
		71	7	KABIANGA BOYS	BELGUT	ISOLATION CENTRE	605
		72	8	KIPSIGIS GIRLS	KERICHO	ISOLATION CENTRE	403
						KERICHO COUNTY TOTAL:	3,202
	BOMET COUNTY	73	1.	TENWEK HIGH	BOMET	ISOLATION CENTRE	470
		74	2.	LONGISA BOYS HIGH SCHOOL	BOMET EAST	ISOLATION CENTRE	470
		75	3.	MULOT BOYS	BOMET EAST	ISOLATION CENTRE	252
		76	4.	KONGOTIK .G	BOMET EAST	ISOLATION CENTRE	189
		77	5.	SIGOR HIGH	CHEPALUNGU	ISOLATION CENTRE	252
		78	6.	KAPLONG GIRLS	SOTIK	ISOLATION CENTRE	403
		79	7.	KAPLONG BOYS	SOTIK	ISOLATION CENTRE	403
		80	8.	CHEBILAT BOYS	SOTIK	ISOLATION CENTRE	538
		81	9.	NDANAI GIRLS	SOTIK	ISOLATION CENTRE	336
						BOMET COUNTY TOTAL:	3,313
	LAIKIPIA COUNTY	82	1.	KMTC		ISOLATION CENTRE	100
		83	2.	LAIKIPIA UNIVERISTY		ISOLATION CENTRE	
		84	3.	NANYUKI HIGH SCHOOL	LAIKIPIA EAST	ISOLATION CENTRE	470
		85	4.	ST. JUDE NTURUKUMA GIRLS SCH	LAIKIPIA EAST	ISOLATION CENTRE	202
		86	5.	ST LOISE NANYUKI GIRLS	LAIKIPIA EAST	ISOLATION CENTRE	202
		87	6.	G.G. RUMURUTI BOYS	LAIKIPIA WEST	ISOLATION CENTRE	336
		88	7.	NJONJO GIRLS	NYAHURURU	ISOLATION CENTRE	470
		89	8.	GATERO GIRLS	NYAHURURU	ISOLATION CENTRE	470
		90	9.	MWENJE BOYS	NYAHURURU	ISOLATION CENTRE	269
						LAIKIPIA COUNTY TOTAL:	2,519
	SAMBURU COUNTY	91	1.	MARALAL HIGH	SAMBURU CENTRAL	ISOLATION CENTRE	336
		92	2.	KISIMA GIRLS	SAMBURU CENTRAL	ISOLATION CENTRE	336
		93	3.	AIC MOI GIRLS	SAMBURU CENTRAL	ISOLATION CENTRE	336
		94	4.	BARAGOI BOYS SEC	SAMBURU NORTH	ISOLATION CENTRE	202
		95	5.	BARAGOI GIRLS SECONDARY	SAMBURU NORTH	ISOLATION CENTRE	269
						SAMBURU COUNTY TOTAL:	1,479
						CLUSTER 2 (SOUTH RIFT REGION) TOTAL:	16,453
CLUSTER 3 (NYANZA REGION)	KISUMU COUNTY	96	1.	MASENO UNIVERITY - YALA CAMPUS		ISOLATION CENTRE	
		97	2.	KMTC - KISUMU		ISOLATION CENTRE	
		98	3.	KISUMU POLYTECHNIC		ISOLATION CENTRE	500
		99	4.	TOM MBOYA COLLEGE		ISOLATION CENTRE	500
		100	5.	KISUMU GIRLS	KISUMU CENTRAL	ISOLATION CENTRE	470
		101	6.	KISUMU BOYS' HIGH SCHOOL	KISUMU CENTRAL	ISOLATION CENTRE	605
		102	7.	MASENO SCHOOL	KISUMU WEST	ISOLATION CENTRE	672
		103	8.	CHULAIMBO SEC SCHOOL	KISUMU WEST	ISOLATION CENTRE	470
						KISUMU COUNTY TOTAL:	3,217
	SIAYA COUNTY	104	1.	BONDO UNIVERSITY		ISOLATION CENTRE	
		105	2.	BONDO TTC		ISOLATION CENTRE	350
		106	3.	Ugenya TTC		ISOLATION CENTRE	320
		107	4.	SIAYA AGRICLTURAL INSTITUTE		ISOLATION CENTRE	100
		108	5.	KMTC - SIAYA		ISOLATION CENTRE	50
		109	6.	KMTC - BONDO		ISOLATION CENTRE	50
		110	7.	MARANDA HIGH SCHOOL	BONDO	ISOLATION CENTRE	739
		111	8.	NYAMIRA GIRLS SEC. SCHOOL	BONDO	ISOLATION CENTRE	538
		112	9.	USENGE HIGH SCHOOL	BONDO	ISOLATION CENTRE	470
		113	10.	ST MARY'S SCHOOL YALA	GEM	ISOLATION CENTRE	605
		114	11.	CHIANDA HIGH SCHOOL	RARIEDA	ISOLATION CENTRE	403
		115	12	RAMBA BOYS SEC. SCHOOL	RARIEDA	ISOLATION CENTRE	605
		116	13	NG'IYA GIRLS HIGH SCHOOL	SIAYA	ISOLATION CENTRE	605
		117	14	RANG'ALA BOYS SEC. SCHOOL	UGUNJA	ISOLATION CENTRE	336
						SIAYA COUNTY TOTAL:	5,171
	HOMA BAY COUNTY	118	1.	KMTC - HOMA BAY		ISOLATION CENTRE	100
		119	2.	ASUMBI TTC		ISOLATION CENTRE	370
		120	3.	ICIPE		ISOLATION CENTRE	
		121	4.	AGOROSERV		ISOLATION CENTRE	
		122	5.	HOMA BAY HIGH	HOMA BAY	ISOLATION CENTRE	672
		123	6.	OGANDE GIRLS' HIGH SCHOOL	HOMA BAY	ISOLATION CENTRE	538
		124	7.	ASUMBI GIRLS	HOMABAY	ISOLATION CENTRE	672
		125	8.	MBITA HIGH	MBITA	ISOLATION CENTRE	605

CLUSTER NO	COUNTY	NATIONAL NO.	COUNTY NO.	NAME	SUB COUNTY	DESCRIPTION	CAPACITY
CLUSTER 3 (NYANZA REGION)		126	9.	RATANG'A BOYS SECONDARY SCHOOL	NDHIWA	ISOLATION CENTRE	336
		127	10.	ST AUGASTINE MIROGI BOYS	NDHIWA	ISOLATION CENTRE	403
		128	11.	AGORO SARE HIGH SCHOOL	RACHUONYO SOUTH	ISOLATION CENTRE	672
						HOMA BAY COUNTY TOTAL:	4,368
	MIGORI	129	1.	KMTC - MIGORI		ISOLATION CENTRE	
		130	2.	MIGORI TTC		ISOLATION CENTRE	300
		131	3.	MOI GIRLS NYABOHANSE SEC SCHOOL	KURIA WEST	ISOLATION CENTRE	336
		132	4.	ST MARY'S MABERA GIRLS	MABERA	ISOLATION CENTRE	470
		133	5.	KADIKA GIRLS' SECONDARY SCHOOL	MIGORI	ISOLATION CENTRE	605
		134	6.	NYABISAWA GIRLS SEC	MIGORI	ISOLATION CENTRE	672
		135	7.	AGENGA SECONDARY	NYATIKE	ISOLATION CENTRE	168
		136	8.	MOI NYATIKE HIGH	NYATIKE	ISOLATION CENTRE	189
		137	9.	ST MICHAEL NYANDEMA	NYATIKE	ISOLATION CENTRE	126
		138	10.	KANGA	RONGO	ISOLATION CENTRE	538
		139	11.	ST JOSEPH'S RAPOGI SECONDARY SCHOOL	URIRI	ISOLATION CENTRE	538
						MIGORI COUNTY TOTAL:	3,942
	KISII	140	1.	KMTC - KISII		ISOLATION CENTRE	100
		141	2.	Kenyenya TTC		ISOLATION CENTRE	340
		142	3.	KISII UNIVERISTY		ISOLATION CENTRE	
		143	4.	KISII SCHOOL	KISII CENTRAL	ISOLATION CENTRE	672
		144	5.	NYANCHWA BOYS	KISII CENTRAL	ISOLATION CENTRE	202
		145	6.	KERERI GIRLS	KISII CENTRAL	ISOLATION CENTRE	605
		146	7.	NYANCHWA GIRLS	KISII CENTRAL	ISOLATION CENTRE	202
		147	8.	ITIERIO BOYS	KISII SOUTH	ISOLATION CENTRE	403
		148	9	NYABURURU	KITUTU CENTRAL	ISOLATION CENTRE	672
		149	10	CARDINAL OTUNGA	KITUTU CENTRAL	ISOLATION CENTRE	538
						KISII COUNTY TOTAL:	3,734
	NYAMIRA	150	1	Borabu TTC		ISOLATION CENTRE	380
		151	2	KMTC - NYAMIRA		ISOLATION CENTRE	50
		152	3	NYANSIONGO HIGH SCHOOL	BORABU	ISOLATION CENTRE	470
		153	4	MANGA GIRLS HIGH	BORABU	ISOLATION CENTRE	189
		154	5	NYAMBARIA HIGH	MANGA	ISOLATION CENTRE	605
		155	6	ST. PAUL'S GEKANO BOYS HIGH	MANGA	ISOLATION CENTRE	403
		156	7	SIRONGA GIRLS SEC	NYAMIRA	ISOLATION CENTRE	470
						NYAMIRA COUNTY TOTAL:	2,187
						CLUSTER 3 (NYANZA REGION) TOTAL:	22,619
CLUSTER 4 (NAIROBI REGION)	NAIROBI COUNTY	157	1.	UON MEDICAL SCHOOL		ISOLATION CENTRE	
		158	2.	KMTC		ISOLATION CENTRE	
		159	3.	UON MAIN CAMPUS		ISOLATION CENTRE	
		160	4.	UON PARKLANDS CAMPUS		ISOLATION CENTRE	
		161	5.	MULTIMEDIA UNIVERSITY		ISOLATION CENTRE	
		162	6.	KENYA INSTITUTE OF MASS COMMUNICATION		ISOLATION CENTRE	
		163	7.	NYAYO STADIUM		ISOLATION CENTRE	
		164	8.	KENYATTA UNIVERSITY		ISOLATION CENTRE	
		165	9.	JKUAT		ISOLATION CENTRE	
		166	10.	UPPER HILL SECONDARY SCHOOL	KIBRA	ISOLATION CENTRE	538
		167	11.	LANGATA BOYS	LANGATA	ISOLATION CENTRE	504
		168	12.	COOPERATIVE UNIVERSITY		ISOLATION CENTRE	
						CLUSTER 4(NAIROBI REGION) TOTAL:	1,042
CLUSTER 5 (CENTRAL REGION)	MURANGA COUNTY	169	1.	MURANGA TTC		ISOLATION CENTRE	450
		170	2.	KMTC		ISOLATION CENTRE	
		171	3.	MURANGA UNIVERISTY OF ADVANCED TECHNOLOGY		ISOLATION CENTRE	
		172	4.	MURANGA UNIVERISTY		ISOLATION CENTRE	
		173	5.	GATURA GIRLS	GATANGA	ISOLATION CENTRE	252
		174	6.	GITHUMU HIGH SCHOOL	KANDARA	ISOLATION CENTRE	470
		175	7.	MUGOIRI GIRLS HIGH	KAHURO	ISOLATION CENTRE	252
		176	8.	MUMBI GIRLS	MURANG'A EAST	ISOLATION CENTRE	189
		177	9.	MURANGA HIGH	MURANGA EAST	ISOLATION CENTRE	252
		178	10.	NJIIRI SCHOOL	KIGUMO	ISOLATION CENTRE	252
						MURANGA COUNTY TOTAL:	2,117
	KIRINYAGA COUNTY	179	1.	KARATINA UNIVERISTY		ISOLATION CENTRE	
		180	2.	KERUGOYA BOYS HIGH SCHOOL	KIRINYAGA CENTRAL	ISOLATION CENTRE	336
		181	3.	KERUGOYA GIRLS HIGH SCHOOL	KIRINYAGA CENTRAL	ISOLATION CENTRE	336
		182	4.	KAMUIRU SEC	KIRINYAGA CENTRAL	ISOLATION CENTRE	336
		183	5.	NGARU GIRLS	KIRINYAGA CENTRAL	ISOLATION CENTRE	403
		184	6.	MUTIRA GIRLS SECONDARY SCHOOL	KIRINYAGA CENTRAL	ISOLATION CENTRE	336
		185	7.	KIRANJA SEC.	KIRINYAGA CENTRAL	ISOLATION CENTRE	189
		186	8.	KARIA SEC	KIRINYAGA CENTRAL	ISOLATION CENTRE	189
		187	9.	KAGUMO GIRLS SEC	KIRINYAGA CENTRAL	ISOLATION CENTRE	252
		188	10.	NJEGA BOYS	KIRINYAGA CENTRAL	ISOLATION CENTRE	378
		189	11.	KABARE GIRLS SEC	KIRINYAGA EAST	ISOLATION CENTRE	336
		190	12.	MUGUMO GIRLS	KIRINYAGA EAST	ISOLATION CENTRE	336
		191	13.	KIANYAGA HIGH SCHOOL	KIRINYAGA EAST	ISOLATION CENTRE	403
		192	14.	KARUMANDI BOYS	KIRINYAGA EAST	ISOLATION CENTRE	336
		193	15.	ST BAKHITA KIBURIA GIRLS	KIRINYAGA EAST	ISOLATION CENTRE	269
		194	16.	NGIRIAMBU GIRLS SECONDARY	KIRINYAGA EAST	ISOLATION CENTRE	403
		195	17.	KIAMUTUGU BOYS	KIRINYAGA EAST	ISOLATION CENTRE	336
		196	18.	BARICHO BOYS	KIRINYAGA WEST	ISOLATION CENTRE	538
						KIRINYAGA COUNTY TOTAL:	5,712
	NYANDARUA COUNTY	197	1.	KMTC		ISOLATION CENTRE	100
		198	2.	NYANDARUA INSTITUTE OF SCIENCE & TECHNOLOGY		ISOLATION CENTRE	
		199	3.	NJABINI BOYS HIGH SCHOOL	KINANGOP	ISOLATION CENTRE	336
		200	4.	NYANDARUA HIGH SCHOOL	NYANDARUA CENTRAL	ISOLATION CENTRE	336
		201	5.	KALOU	NYANDARUA CENTRAL	ISOLATION CENTRE	126
		202	6.	NDARAGWA GIRLS	NYANDARUA NORTH	ISOLATION CENTRE	269
		203	7.	KARIIMA GIRLS SECONDARY	NYANDARUA SOUTH	ISOLATION CENTRE	538
		204	8.	NDURURUMO MIXED	NYANDARUA SOUTH	ISOLATION CENTRE	538
						NYANDARUA COUNTY TOTAL:	2,243

CLUSTER NO	COUNTY	NATIONAL NO.	COUNTY NO.	NAME	SUB COUNTY	DESCRIPTION	CAPACITY
CLUSTER 5 (CENTRAL REGION)	KIAMBU COUNTY	205	1.	KMTC 1		ISOLATION CENTRE	100
		206	2.	KMTC 2		ISOLATION CENTRE	100
		207	3.	KMTC 3		ISOLATION CENTRE	100
		208	4.	THOGOTO TTC		ISOLATION CENTRE	600
		209	5.	KIAMBU INSTITUTE OF SCIENCE AND TECH		ISOLATION CENTRE	
		210	6.	ALLIANCE GIRLS	KIKUYU	ISOLATION CENTRE	538
		211	7.	ALLIANCE HIGH	KIKUYU	ISOLATION CENTRE	538
		212	8.	CHANIA BOYS' HIGH	THIKA WEST	ISOLATION CENTRE	403
		213	9.	KIJABE BOYS HIGH SCHOOL	LARI	ISOLATION CENTRE	403
		214	10.	KIJABE GIRLS HIGH SCHOOL	LARI	ISOLATION CENTRE	403
		215	11.	KIKUYU BOYS	KIKUYU	ISOLATION CENTRE	189
		216	12.	LIMURU GIRLS	LIMURU	ISOLATION CENTRE	470
		217	13.	LORETO GIRLS HIGH	KIAMBU	ISOLATION CENTRE	538
		218	14.	LORETO LIMURU	LIMURU	ISOLATION CENTRE	403
		219	15.	MANGU HIGH	JUJA	ISOLATION CENTRE	538
		220	16.	MARY HILL GIRLS	THIKA WEST	ISOLATION CENTRE	538
		221	17.	MARY LEAKEY GIRLS'	KABETE	ISOLATION CENTRE	269
		222	18.	MOI GIRLS KAMANGU	KIKUYU	ISOLATION CENTRE	252
		223	19.	ST.FRANCIS GIRLS (MANG'U)	GATUNDU NORTH	ISOLATION CENTRE	403
		224	20.	THIKA HIGH SCHOOL	THIKA WEST	ISOLATION CENTRE	470
						KIAMBU COUNTY TOTAL:	7,255
	NYERI COUNTY	225	1.	DEDAN KIMATHI UNIVERISTY		ISOLATION CENTRE	
		226	2.	KARATINA UNIVERISTY		ISOLATION CENTRE	
		227	3.	KMTC NYERI		ISOLATION CENTRE	100
		228	4.	NYERI POLYTECHNIC		ISOLATION CENTRE	
		229	5.	KAMWENJA TTC		ISOLATION CENTRE	326
		230	6.	KAGUMO TTC		ISOLATION CENTRE	
		231	7.	WAMBUGU FARMERS TRAINING INSTITUTE		ISOLATION CENTRE	
		232	8.	TUMUTUMU GIRLS	MATHIRA WEST	ISOLATION CENTRE	403
		233	9.	MUKURWEINI BOYS	MUKURWEINI	ISOLATION CENTRE	269
		234	10.	KAHETI BOYS	MUKURWEINI	ISOLATION CENTRE	336
		235	11.	KAGUMO BOYS HIGH	NYERI CENTRAL	ISOLATION CENTRE	470
		236	12.	NYERI HIGH	NYERI CENTRAL	ISOLATION CENTRE	403
		237	13.	GIAKANJA BOYS	NYERI CENTRAL	ISOLATION CENTRE	403
		238	14.	MURUGURU GIRLS SEC	NYERI CENTRAL	ISOLATION CENTRE	403
		239	15.	MUTHUAINI SEC	NYERI CENTRAL	ISOLATION CENTRE	189
		240	16.	GACHIKA SEC	NYERI CENTRAL	ISOLATION CENTRE	252
		241	17.	KARIMA BOYS' HIGH SCHOOL	NYERI SOUTH	ISOLATION CENTRE	336
		242	18.	CHINGA GIRLS HIGH SCHOOL	NYERI SOUTH	ISOLATION CENTRE	269
		243	19.	KENYATTA HIGH SCHOOL [MAHIGA	NYERI SOUTH	ISOLATION CENTRE	269
		244	20.	CHINGA BOYS HIGH SCHOOL	NYERI SOUTH	ISOLATION CENTRE	269
		245	21.	OTHAYA BOYS HIGH SCHOOL	NYERI SOUTH	ISOLATION CENTRE	403
		246	22.	OTHAYA GIRLS SECONDARY SCHOOL	NYERI SOUTH	ISOLATION CENTRE	336
						NYERI COUNTY TOTAL:	5,436
						CLUSTER 5(CENTRAL REGION) TOTAL:	22,763
CLUSTER 6 (UPPER EASTER REGION)	EMBU COUNTY	247	1.	KMTC		ISOLATION CENTRE	100
		248	2.	KIGARI TTC		ISOLATION CENTRE	550
		249	3.	KENYA SCHOOL OF GOVERNMENT		ISOLATION CENTRE	100
		250	4.	NGUVIU BOYS	EMBU NORTH	ISOLATION CENTRE	269
		251	5.	NGUVIU GIRLS 7	EMBU NORTH	ISOLATION CENTRE	269
		252	6.	KANGARU SCHOOL	EMBU WEST	ISOLATION CENTRE	538
		253	7.	KIRIMARI BOYS SEC SCHOOL	EMBU WEST	ISOLATION CENTRE	269
		254	8.	ST PAUL'S HIGH SCHOOL KEVOTE	EMBU WEST	ISOLATION CENTRE	336
		255	9.	ST TERESA'S GIRLS' - KITHIMU	EMBU WEST	ISOLATION CENTRE	202
		256	10.	ST.JOSEPH'S SEC SCHOOL-MTETU	EMBU WEST	ISOLATION CENTRE	189
		257	11.	SIAKAGO GIRLS	MBEERE NORTH	ISOLATION CENTRE	336
		258	12.	SIAKAGO BOYS HIGH SCHOOL	MBEERE NORTH	ISOLATION CENTRE	336
		259	13.	KANGARU GIRLS SCHOOL	EMBU WEST	ISOLATION CENTRE	269
						EMBU COUNTY TOTAL:	3,763
	THARAKA NITHI COUNTY	260	1.	CHUKA UNIVERISTY		ISOLATION CENTRE	
		261	2.	CHOGORIA GIRLS H. SCH.	MAARA	ISOLATION CENTRE	470
		262	3.	OLOM GIRLS [MAGUNDU]	MAARA	ISOLATION CENTRE	403
		263	4.	CHOGORIA BOYS	MAARA	ISOLATION CENTRE	403
		264	5.	IKUU BOYS	MERU SOUTH	ISOLATION CENTRE	336
		265	6.	CHUKA BOYS	MERU SOUTH	ISOLATION CENTRE	470
		266	7.	CHUKA GIRLS	MERU SOUTH	ISOLATION CENTRE	336
		267	8.	KARAMUGI GIRLS	MERU SOUTH	ISOLATION CENTRE	269
		268	9.	IKAWA	MERU SOUTH	ISOLATION CENTRE	403
		269	10.	MUKUUNI HIGH	MERU SOUTH	ISOLATION CENTRE	269
		270	11.	IKUU GIRLS	MERU SOUTH	ISOLATION CENTRE	336
		271	12.	NJURI HIGH	MERU SOUTH	ISOLATION CENTRE	470
						THARAKA NITHI COUNTY TOTAL:	4,165
	MERU COUNTY	272	1.	MERU POLYTECHNIC		ISOLATION CENTRE	
		273	2.	Meru TTC		ISOLATION CENTRE	500
		274	3.	KENYA METHODIST UNIVERISTY		ISOLATION CENTRE	
		275	4.	MERU UNIVERISTY		ISOLATION CENTRE	
		276	5.	IGOJI TTC		ISOLATION CENTRE	680
		277	6.	MERU TECHNICAL INSTITUTE		ISOLATION CENTRE	
		278	7.	KMTC		ISOLATION CENTRE	
		279	8.	GIKUMENE GIRLS	IMENTI NORTH	ISOLATION CENTRE	269
		280	9.	KAAGA BOYS	IMENTI NORTH	ISOLATION CENTRE	336
		281	10.	KAAGA GIRLS HIGH	IMENTI NORTH	ISOLATION CENTRE	336
		282	11.	KANYAKINE HIGH	IMENTI SOUTH	ISOLATION CENTRE	336
		283	12.	KIRIGE HIGH	IMENTI NORTH	ISOLATION CENTRE	189
		284	13.	MULATHANKARI GIRLS	IMENTI NORTH	ISOLATION CENTRE	189
		285	14.	MUNITHU GIRLS	IMENTI NORTH	ISOLATION CENTRE	189
		286	15.	NKABUNE GIRLS	IMENTI NORTH	ISOLATION CENTRE	126
		287	16.	NKUBU HIGH	IMENTI SOUTH	ISOLATION CENTRE	470

CLUSTER NO	COUNTY	NATIONAL NO.	COUNTY NO.	NAME	SUB COUNTY	DESCRIPTION	CAPACITY
		288	17.	NTHIMBIRI SEC	IMENTI NORTH	ISOLATION CENTRE	252
		289	18.	ST MARYS GIRLS-IGOJI	IMENTI SOUTH	ISOLATION CENTRE	269
		290	19.	THUURA SEC	IMENTI NORTH	ISOLATION CENTRE	189
		291	20.	URUKU GIRLS	IMENTI SOUTH	ISOLATION CENTRE	126
						MERU COUNTY TOTAL:	4,456
						CLUSTER 6 (UPPER EASTERN REGION) TOTAL:	12,384
CLUSTER 7 (LOWER EASTER REGION)	MACHAKOS COUNTY	292	1.	KMTC MAANZONI		ISOLATION CENTRE	100
		293	2.	Kilimambogo TTC		ISOLATION CENTRE	400
		294	3.	KMTC		ISOLATION CENTRE	100
		295	4.	MACHAKOS TTC		ISOLATION CENTRE	550
		296	5.	MACHAKOS UNIVERISTY		ISOLATION CENTRE	
		297	6.	KANGUNDO HIGH SCHOOL	KANGUNDO	ISOLATION CENTRE	403
		298	7.	KATHIANI BOYS H. SCHOOL	KATHIANI	ISOLATION CENTRE	336
		299	8.	KATHIANI GIRLS SEC. SCHOOL	KATHIANI	ISOLATION CENTRE	336
		300	9.	KYANGULI MEMORIAL SCH..	MACHAKOS	ISOLATION CENTRE	315
		301	10.	MATUNGULU BOYS	KANGUNDO	ISOLATION CENTRE	315
		302	11.	MATUNGULU GIRLS	MATUNGULU	ISOLATION CENTRE	336
		303	12.	MISYANI GIRLS' SECONDARY SCHOOL	KANGUNDO	ISOLATION CENTRE	269
		304	13.	MITABONI ABC G.	KATHIANI	ISOLATION CENTRE	189
		305	14.	MITABONI BOYS HIGH SCH.	KATHIANI	ISOLATION CENTRE	189
		306	15.	MUMBUNI BOYS	MACHAKOS	ISOLATION CENTRE	470
		307	16.	MUMBUNI GIRLS	MACHAKOS	ISOLATION CENTRE	202
		308	17.	MUVUTI BOYS	MACHAKOS	ISOLATION CENTRE	504
		309	18.	TALA BOYS	MATUNGULU	ISOLATION CENTRE	336
		310	19.	TALA GIRLS	MATUNGULU	ISOLATION CENTRE	336
		311	20.	MACHAKOS BOYS	MACHAKOS	ISOLATION CENTRE	538
		312	21	MACHAKOS GIRLS	MACHAKOS	ISOLATION CENTRE	403
						MACHAKOS COUNTY TOTAL:	6,627
	KITUI COUNTY	313	1.	KMTC KITUI		ISOLATION CENTRE	100
		314	2.	KMTC MWINGI		ISOLATION CENTRE	100
		315	3.	KITUI TTC		ISOLATION CENTRE	485
		316	4.	SOUTH EASTERN UNIVERSITY		ISOLATION CENTRE	
		317	5.	JKUAT UNIVERSITY		ISOLATION CENTRE	
		318	6.	KITUI HIGH	KITUI CENTRAL	ISOLATION CENTRE	336
		319	7.	ST CHARLES LWANGA SCHOOL	KITUI CENTRAL	ISOLATION CENTRE	269
		320	8.	ST. ANGELA'S GIRLS SECONDARY SCHOOL	KITUI CENTRAL	ISOLATION CENTRE	269
		321	9.	ST THOMAS AQUINAS KALAWA	KITUI CENTRAL	ISOLATION CENTRE	269
		322	10.	ST URSULA GIRLS' SEC -TUNGUTU	KITUI CENTRAL	ISOLATION CENTRE	269
		323	11.	ST.MONICA GIRLS MULUTU SEC	KITUI CENTRAL	ISOLATION CENTRE	202
		324	12.	TIVA SECONDARY SCHOOL	KITUI CENTRAL	ISOLATION CENTRE	126
		325	13.	IVAINI SECONDARY SCHOOL	KITUI CENTRAL	ISOLATION CENTRE	126
		326	14.	ST MARY'S SEC - MIAMBANI	KITUI CENTRAL	ISOLATION CENTRE	189
		327	15.	MWINGI SECONDARY SCHOOL	MWINGI CENTRAL	ISOLATION CENTRE	269
		328	16.	YAMBYU GIRLS	MWINGI CENTRAL	ISOLATION CENTRE	134
		329	17.	WAITA MIXED	MWINGI CENTRAL	ISOLATION CENTRE	202
		330	18.	KAELA SEC SCHOOL	MWINGI CENTRAL	ISOLATION CENTRE	126
		331	19.	ENZIU SEC SCH	MWINGI CENTRAL	ISOLATION CENTRE	126
		332	20.	KIIO SEC SCH	MWINGI CENTRAL	ISOLATION CENTRE	189
		333	21.	MBONDONI SEC SCH	MWINGI CENTRAL	ISOLATION CENTRE	189
						KITUI COUNTY TOTAL:	3,975
	MAKUENI COUNTY	334	1.	KMTC MAKUENI		ISOLATION CENTRE	100
		335	2.	KMTC MAKINDU		ISOLATION CENTRE	100
		336	3.	MAKINDU HIGH	MAKINDU	ISOLATION CENTRE	403
		337	4.	MOI GIRLS KIBWEZI	MAKINDU	ISOLATION CENTRE	403
		338	5.	MAKUENI BOYS HIGH SCHOOL	MAKUENI	ISOLATION CENTRE	538
		339	6.	MAKUENI GIRLS HIGH SCHOOL	MAKUENI	ISOLATION CENTRE	336
		340	7.	MWAANI GIRLS SEC SCHOOL	MAKUENI	ISOLATION CENTRE	470
		341	8.	MWAANI BOYS' SECONDARY SCHOOL	MAKUENI	ISOLATION CENTRE	269
		342	9.	KAUMONI BOYS SECONDARY SCHOOL	MAKUENI	ISOLATION CENTRE	269
		343	10.	ST. LAWRENCE'S NZIU GIRLS	MAKUENI	ISOLATION CENTRE	189
		344	11.	ST JOHNS MALIVANI SEC SCHOOL	MAKUENI	ISOLATION CENTRE	98
		345	12.	UKIA GIRLS' SEC SCHOOL	MAKUENI	ISOLATION CENTRE	252
						MAKUENI COUNTY TOTAL:	3,427
	KAJIADO COUNTY	346	1.	OLOOLAISER HIGH	KAJIADO NORTH	ISOLATION CENTRE	403
		347	2.	NAKEEL BOYS	KAJIADO NORTH	ISOLATION CENTRE	336
		348	3.	OLOITOKITOK BOYS	LOITOKTOK	ISOLATION CENTRE	470
		349	4.	MASHUURU	MASHUURU	ISOLATION CENTRE	189
		350	5.	SUSWA GIRLS	NAROK EAST	ISOLATION CENTRE	252
		351	6.	OLOLULUNG'A BOYS	NAROK SOUTH	ISOLATION CENTRE	403
		352	7.	OLOMIRAN BOYS HIGH	NAROK WEST	ISOLATION CENTRE	336
		353	8.	SEKANANI GIRLS	NAROK WEST	ISOLATION CENTRE	189
						KAJIADO COUNTY TOTAL:	2,578
						CLUSTER 7 (LOWER EASTERN REGION) TOTAL:	16,607
CLUSTER 8 (COAST REGION)	MOMBASA COUNTY	354	1.	KMTC PORT REITZ		ISOLATION CENTRE	100
		355	2.	KMTC		ISOLATION CENTRE	100
		356	3.	BANDARI COLLEGE		ISOLATION CENTRE	
		357	4.	KENYA SCHOOL OF GOVERNMENT		ISOLATION CENTRE	132
		358	5.	SHANZU TTC		ISOLATION CENTRE	450
		359	6.	MOMBASA BEACH HOTEL		ISOLATION CENTRE	152
		360	7.	NORTH COAST HOTEL		ISOLATION CENTRE	
		361	8.	TECHNICAL INSTITUTE		ISOLATION CENTRE	
		362	9.	SHIMO LA TEWA	KISAUNI	ISOLATION CENTRE	538
		363	10.	MAMA NGINA GIRLS	MOMBASA	ISOLATION CENTRE	269
		364	11.	MAZERAS HIGH (KWALE COUNTY)	SAMBURU	ISOLATION CENTRE	403
		365	12.	MAZERAS GIRLS (KWALE COUNTY)	SAMBURU	ISOLATION CENTRE	378
						MOMBASA COUNTY TOTAL:	2,522
		366	1.	KMTC - KILIFI		ISOLATION CENTRE	100
		367	2.	PWANI UNIVERISTY		ISOLATION CENTRE	1,200

CLUSTER NO	COUNTY	NATIONAL NO.	COUNTY NO.	NAME	SUB COUNTY	DESCRIPTION	CAPACITY
CLUSTER 8 (COAST REGION)	KILIFI COUNTY	368	3.	NGALA MEMORIAL		ISOLATION CENTRE	605
		369	4.	BAHARI GIRLS		ISOLATION CENTRE	336
		370	5.	ST THOMAS GIRLS MEMORIAL		ISOLATION CENTRE	336
		371	6.	MALINDI HIGH		ISOLATION CENTRE	315
		372	7.	RIBE BOYS		ISOLATION CENTRE	269
		373	8.	RIBE GIRLS		ISOLATION CENTRE	403
						KILIFI COUNTY TOTAL:	3,564
	KWALE COUNTY	374	1.	KENYA SCHOOL OF GOVERNMENT MATUGA		ISOLATION CENTRE	172
		375	2.	KWALE HIGH	KWALE	ISOLATION CENTRE	605
		376	3.	WAA BOYS	KWALE	ISOLATION CENTRE	336
		377	4.	WAA GIRLS	KWALE	ISOLATION CENTRE	336
		378	5.	KAYA TIWI	KWALE	ISOLATION CENTRE	315
		379	6.	MSAMBWENI BOYS' SEC	MSAMBWENI	ISOLATION CENTRE	269
		380	7.	KINGWEDE GIRLS' SEC	MSAMBWENI	ISOLATION CENTRE	403
						KWALE COUNTY TOTAL:	2,436
	LAMU COUNTY	381	1.	KMTC		ISOLATION CENTRE	50
		382	2.	LAMU BOYS SEC	LAMU CENTRAL	ISOLATION CENTRE	202
		383	3.	LAMU GIRLS	LAMU WEST	ISOLATION CENTRE	269
		384	4.	MPEKETONI SEC	LAMU WEST	ISOLATION CENTRE	336
		385	5.	FAZA SEC	LAMU WEST	ISOLATION CENTRE	252
		386	6.	WITU SEC	LAMU WEST	ISOLATION CENTRE	252
						LAMU COUNTY TOTAL:	1,361
	TANA RIVER COUNTY	387	1.	Ngao Girls Sec. School		ISOLATION CENTRE	269
		388	2	Galana TTC		ISOLATION CENTRE	200
		389	3	Hola Boys Sec .School		ISOLATION CENTRE	269
		390	4	Galole Model Sec		ISOLATION CENTRE	189
		391	5	TARASAA HIGH		ISOLATION CENTRE	202
		392	6	KIPINI SEC		ISOLATION CENTRE	202
						TANA RIVER COUNTY TOTAL:	1,330
	TAITA TAVETA COUNTY	393	1.	KMTC VOI		ISOLATION CENTRE	100
		394	2.	KMTC TAVETA		ISOLATION CENTRE	100
		395	3.	TAITA TAVETA UNIVERSITY		ISOLATION CENTRE	
		396	4.	KENYATTA HIGH	MWATATE	ISOLATION CENTRE	403
		397	5.	VOI BOYS SEC	VOI	ISOLATION CENTRE	470
		398	6.	MWAKITAWA GIRLS	VOI	ISOLATION CENTRE	403
		399	7.	MOI HIGH SCHOOL-KASIGAU	VOI	ISOLATION CENTRE	202
		400	8.	ELDORO GIRLS	TAVETA	ISOLATION CENTRE	336
		401	9.	TIMBILA SEC	TAVETA	ISOLATION CENTRE	403
		402	10.	BISHOP NJENGA	TAVETA	ISOLATION CENTRE	269
		403	11.	MAHOO GIRLS	TAVETA	ISOLATION CENTRE	202
						TAITA TAVETA COUNTY TOTAL:	2,888
						CLUSTER 8 (COAST REGION) TOTAL:	14,101
CLUSTER 9 (WESTERN REGION)	KAKAMEGA COUNTY	404	1.	MASINDE MULIRO UNIVERSITY		ISOLATION CENTRE	
		405	2.	Eregi TTC		ISOLATION CENTRE	500
		406	3.	MUKUMU GIRLS	BUTERE	ISOLATION CENTRE	605
		407	4.	BUTERE GIRLS	BUTERE	ISOLATION CENTRE	605
		408	5.	KAKAMEGA HIGH	KAKAMEGA CENTRAL	ISOLATION CENTRE	605
		409	6.	BISHOP SULUMETI GIRLS	KAKAMEGA CENTRAL	ISOLATION CENTRE	336
		410	7	ST. IGNATIUS MUKUMU B.H.	KAKAMEGA EAST	ISOLATION CENTRE	605
						KAKAMEGA COUNTY TOTAL:	3,256
	VIHIGA COUNTY	411	1.	KAIMOSI TTC		ISOLATION CENTRE	550
		412	2.	BUNYORE TTC		ISOLATION CENTRE	200
		413	3.	KAIMOSI TECHNICAL		ISOLATION CENTRE	
		414	4.	KAIMOSI BOYS HIGH SCH	HAMISI	ISOLATION CENTRE	403
		415	5.	CHAVAKALI	SABATIA	ISOLATION CENTRE	672
		416	6.	MOI VOKOLI GIRLS	SABATIA	ISOLATION CENTRE	403
		417	7.	MBALE BOYS	SABATIA	ISOLATION CENTRE	470
						VIHIGA COUNTY TOTAL:	2,698
	BUSIA COUNTY	418	1.	BUSIA AGRICULTURAL INSTITUTE		ISOLATION CENTRE	100
		419	2.	ALUPE UNIVERISTY		ISOLATION CENTRE	
		420	3.	SIGALAME HIGH SCHOOL	SAMIA	ISOLATION CENTRE	538
		421	4.	SA KOLANYA GIRLS SECONDARY SCHOOL	TESO NORTH	ISOLATION CENTRE	470
		422	5.	S.A. KOLANYA BOYS	TESO NORTH	ISOLATION CENTRE	538
		423	6.	BISHOP SULUMETI GIRLS	TESO NORTH	ISOLATION CENTRE	336
		424	7.	ST MONICA CHAKOL GIRLS' HIGH SCHOOL	TESO SOUTH	ISOLATION CENTRE	403
						BUSIA COUNTY TOTAL:	2,385
	BUNGOMA COUNTY	425	1.	KMTC BUNGOMA		ISOLATION CENTRE	
		426	2.	WEBUYE HEALTH CENTRE		ISOLATION CENTRE	
		427	3.	ST. CECILIA GIRLS MISIKHU	BUNGOMA EAST	ISOLATION CENTRE	605
		428	4.	BUNGOMA HIGH SCHOOL	BUNGOMA SOUTH	ISOLATION CENTRE	403
		429	5.	FRIENDS SCHOOL KAMUSINGA	KIMILILI	ISOLATION CENTRE	605
		430	6.	CHESAMISI BOYS' HIGH SCHOOL	KIMILILI	ISOLATION CENTRE	672
		431	7.	LUGULU GIRLS	WEBUYE WEST	ISOLATION CENTRE	605
		432	8.	FRIENDS SCHOOL BOKOLI	WEBUYE WEST	ISOLATION CENTRE	403
						BUNGOMA COUNTY TOTAL:	3,293
						CLUSTER 9 (WESTERN REGION) TOTAL:	11,632
CLUSTER 10 (N. EASTERN REGION)	GARISSA COUNTY	433	1.	KMTC		ISOLATION CENTRE	100
		434	2.	GARISSA UNIVERISTY		ISOLATION CENTRE	
		435	3.	GARISSA TTC		ISOLATION CENTRE	300
		436	4.	GARISSA HIGH	GARISSA	ISOLATION CENTRE	403
		437	5.	NEP GIRLS	GARISSA	ISOLATION CENTRE	403
						GARISSA COUNTY TOTAL:	1,206
	WAJIR COUNTY	438	1.	KMTC		ISOLATION CENTRE	100
		439	2.	WAJIR HIGH SCH	WAJIR EAST	ISOLATION CENTRE	403
		440	3.	WAJIR GIRLS	WAJIR EAST	ISOLATION CENTRE	336
		441	4.	SABUNLEY SEC	WAJIR EAST	ISOLATION CENTRE	269

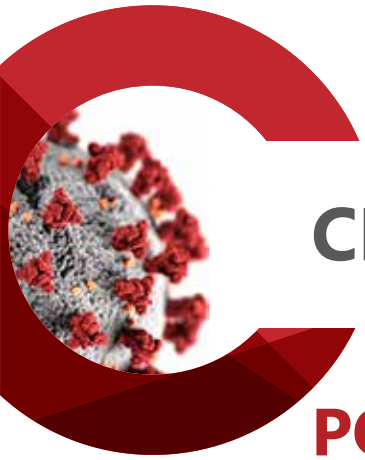
CLUSTER NO	COUNTY	NATIONAL NO.	COUNTY NO.	NAME	SUB COUNTY	DESCRIPTION	CAPACITY
CLUSTER 10 (NORTH EASTERN REGION)		442	5.	BUTE BOYS	WAJIR NORTH	ISOLATION CENTRE	202
		443	6.	BUTE GIRLS	WAJIR NORTH	ISOLATION CENTRE	134
						WAJIR COUNTY TOTAL:	1,444
	MANDERA COUNTY	444	1.	KMTC		ISOLATION CENTRE	
		445	2.	MANDERA TTC		ISOLATION CENTRE	250
		446	3.	MANDERA BOYS SEC SCH	MANDERA EAST	ISOLATION CENTRE	403
		447	4.	MOI GIRLS MANDERA SEC SCH	MANDERA EAST	ISOLATION CENTRE	336
		448	5.	HARERI MIXED	MANDERA EAST	ISOLATION CENTRE	189
		449	6.	KHALALIO BOYS	MANDERA EAST	ISOLATION CENTRE	126
		450	7.	KHALALIO GIRLS	MANDERA EAST	ISOLATION CENTRE	126
		451	8.	NEBOI BOYS	MANDERA EAST	ISOLATION CENTRE	126
						MANDERA COUNTY TOTAL:	1,556
	ISIOLO COUNTY	453	1.	KMTC		ISOLATION CENTRE	
		454	2.	ISIOLO GIRLS	ISIOLO	ISOLATION CENTRE	202
		455	3.	ISIOLO BOYS	ISIOLO	ISOLATION CENTRE	202
						ISIOLO COUNTY TOTAL:	404
	MARSABIT COUNTY	456	1.	CHALBI BOYS	CHALBI	ISOLATION CENTRE	134
		457	2.	MOI GIRLS MARSABIT	MARSABIT	ISOLATION CENTRE	269
		458	3.	MARSABIT BOYS	MARSABIT	ISOLATION CENTRE	202
		459	4.	MOYALE BOYS SEC.	MOYALE	ISOLATION CENTRE	269
		460	5.	MOYALE GIRLS	MOYALE	ISOLATION CENTRE	134
						MARSABIT COUNTY TOTAL:	1,008
						CLUSTER 10 (NORTH EASTERN REGION) TOTAL:	5,618

NATIONAL TOTAL:	138,220

Summary	
Isolation Centers	460
Number of Beds	138,220

DR. EVA W. NJENGA
CHAIR -KENYA MEDICAL PRACTITIONERS AND DENTISTS COUNCIL &
HEAD- NATIONAL CO-ORDINATION CENTRES FOR ISOLATION AND QUARANTINE FACILITIES

01 May 2020



CHAPTER 6:

POLICY AND LONG TERM POST-COVID SOLUTIONS

Task Force 5

Post COVID-19 strategies looking at making some of the interventions long-term alongside regulations, policy, legislation, guidelines on urban management.

Task Force 5

Contributors to this Publication

Plan. Juliet Rita– Team Lead
Arch. Alex Nyaga
Arch. Gideon Olawo
Plan. Jasper Onyango
Plan. Baraka Mwau
Plan. Nathan Mutunga

Editorial Contribution

Patricia Baariu
Mugure Njendu
Florence Nyole

Compilation and Co-ordination

James Odongo
Ashley Mwangi

SHORT TERM INTERVENTIONS

Procurement in COVID-19 Pandemic and Disaster Periods

For the Government, Procurement of all its services and goods are entirely governed by The Public Procurement and Disposal Act Cap 412C. The Act as it stands now requires review to capture emergencies, pandemics and other disasters that may require swift procurement processes and reactions with the aid of professional bodies like AAK.

As a means of transparently procuring services, the Act has worked. However, from AAK there are improvements that need to be incorporated to make it better for future use. The following areas need to be amended:-

1. Representation of professionals at the County Government levels
2. Introduce under section 73, a new clause (d).. there is an emergency in the form of floods, landslides, collapsed building, disease pandemics and other related natural disasters.
3. Part B , Section 74, add a new clause 2c. That requires very little time to see other providers, add d.. to seek to procure through sermons of professional bodies

LONG TERM INTERVENTIONS

1. Housing and Settlements

The COVID-19 Pandemic has once again illuminated the need to provide housing that meets the minimum public health requirements for habitation. It has equally brought to light the need to immediately look into our Building Code and Planning standards to ensure safer and comfortable social housing within cities and enhance access to infrastructural services.

It has become evident that in some of our settlements both formal and informal social distancing is a far fetched dream as the habitable rooms are small and occupied by a significant number of people. We need to rethink of our urban occupancy densities and think of entrenching this in the City's By-laws. The National Government efforts for street address system will be very crucial as each person will be located with where they stay.

Accessibility of settlements in urban areas is another issue in Kenya. The work and habitation areas are in most cases 40 to 60 minutes away for the average Kenyan by motorized means of transport. The COVID-19 pandemic has shown the need for more investment in non motorized transport as well as the need for mixed use development that brings jobs closer to the settlements.

The pandemic will shift the thinking of providing quality open spaces within living areas to enhance quality of life. With closure of health and fitness centers residents have taken to the streets to exercise.

Source : https://nairobinews.nation.co.ke/news

2. Urban Resilience

COVID-19 has made us think of our urban areas as places that not only drive the economy of the country but as centres that are most vulnerable to pandemics. We also have to take cognizance of the vulnerability of the rural population who rely on the city for their inputs and markets for their produce. The dynamics of these supply chains have greatly been affected by the pandemic.

Post COVID-19 we have to relook into the Public Health Act, implement it, review where we need to strengthen the law so as to tighten our response to future pandemics. The planning law and city's regulations on development control will need to be or the Government, Procurement of all its re-examined to ensure that post COVID-19 we change tactic to facilitate future development of more resilient urban areas in Kenya.

Critical infrastructure such as water, health care, electricity and even that which we didn't categorize as critical such as internet is an area that we are lagging behind as a country and need to immediately rethink our infrastructure investment to ensure the welfare of every Kenyan.

Critical Infrastructure
Source: https://www.howwemadeitinafrica.com/improved-electricity-supply

Adoption of online businesses is key in moving our urban economy forward and keeping our businesses afloat. Open air markets and even malls and wholesale markets and areas such as Gikomba and Eastleigh need an overhaul to ensure that going forward they are not the seedbeds of contagion.

Gikomba Market: open air markets need an overhaul
Source: https://hivisasa.com/posts/why-gikomba-businesses-are-efficient

Adoption of online businesses

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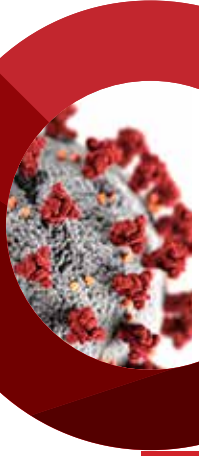

Appendix 2: AAK Firm Members to Engage For Design and Supervision of These Centres

Member No.	Chapter	Name	Email Address
F00005	TOWN PLANNERS	TECO PLAN MANAGEMENT LTD	ecoplanmanagement@gmail.com
F00007	ARCHITECTS	DMJ ARCHITECTSS	dmj@daginternational.com
F00008	ARCHITECTS	SYMBION KLTD.	symbionkenya@symbion-int.com
F00011	QUANTITY SURVEYORS	MGA CONSULTANTS LTD	info@mgaconsult.com
F00012	QUANTITY SURVEYORS	HAROLD FENWICK & ASSOCIATES	fenwick@fenwick.co.ke
F00013	QUANTITY SURVEYORS	OORO & SANYA ASSOCIATES LTD	oorosanya@gmail.com
F00014	ARCHITECTS	BATIMENT GROUP LTD	info@batiment.co.ke
F00016	QUANTITY SURVEYORS	AFRICOST LIMITED	info@africostlimited.co.ke
F00017	ARCHITECTS	TRIAD ARCHITECTSS	info@triad.co.ke
F00018	QUANTITY SURVEYORS	GETSO CONSULTANTS LIMITED	info@getso.co.ke
F00019	ARCHITECTS	SK ARCHPLANS	sk@skarchplans.co.ke
F00020	ARCHITECTS	APT DESIGN SOLUTIONS	ben@aptdesignsolutions.com
F00021	ARCHITECTS	MORPHOSIS LIMITED	info@morphosis.co.ke
F00022	ARCHITECTS	TEJ ARCHITECTSS	info@tej.co.ke
F00023	ARCHITECTS	AXIS ARCHITECTSS	info@axis.co.ke
F00024	QUANTITY SURVEYORS	DAVSON AND WARD	davard@africaonline.co.ke
F00025	ARCHITECTS	ARPRIM CONSULTANTS	info@arprimconsultants.com
F00026	ARCHITECTS	TECTURA INTERNATIONAL LTD	info@tectura-int.co.ke
F00029	ARCHITECTS	AKA STUDIO	info@akastudio.co.ke
F00032	ARCHITECTS	AIA ARCHITECTS LIMITED	info@adventis-africa.com
F00037	QUANTITY SURVEYORS	BARKER & BARTON KENYA	info@bbk.co.ke
F00041	QUANTITY SURVEYORS	CONSTRUCTION COST CONSULTANCY	ccc@tpo.co.ke
F00042	QUANTITY SURVEYORS	COSTWISE ASSOCIATES	COSTWISE@COSTWISE.CO.KE
F00043	ENGINEERS	FRAME CONSULTANTS LTD	info@frameconsultants.com
F00044	QUANTITY SURVEYORS	GAKUYA & ASSOCIATES	hngakuya@gmail.com
F00051	QUANTITY SURVEYORS	MUAMBI ASSOCIATES	muambi@swiftkenya.com
F00053	ARCHITECTS	OTTO MRUTTU & PARTNERS	otto.mruttu@ottomruttu.com

Member No.	Chapter	Name	Email Address
F00054	TARCHITECTS	SCOPE DESIGN SYSTEMS LIMITED	scopedesignsystems@gmail.com
F00055	ARCHITECTS	SKAIR ASSOCIATES	info@skairassociateskenya.com
F00057	ARCHITECTS	U-DESIGN ARCHITECTS	admin@udesign.co.ke
F00058	ENGINEERS	UNICONSULT ENGINEERSING	uniconsult.ecl@gmail.com
F00059	ARCHITECTS	BOWMAN ASSOCIATES	bowmanassociates01@gmail.com
F00061	ARCHITECTS	JAWKIM CONSULTING ARCHITECTS LLP	info@jawkimarchitects.com
F00062	ARCHITECTS	MAESTRO ARCHITECTS LTD	info@maestroarchitects.co.ke
F00068	ARCHITECTS	ARPLAD ARCHITECTS	info@arplad.com
F00069	ARCHITECTS	LEXICON PLUS ION LIMITED	info@lexicondesigns.co.ke
F00071	QUANTITY SURVEYORS	AEGIS DEVELOPMENT SOLUTIONS LTD	aegis@aegisdevelopment.co.ke
F00072	QUANTITY SURVEYORS	SHAQUE ASSOCIATES LTD	info@shaqueassociates.com
F00075	ARCHITECTS	ULTIMATE DESIGN LTD	info@tms-cgroup.com
F00079	QUANTITY SURVEYORS	M & M CONSTRUCTION	info@m-mconsultants.com
F00081	QUANTITY SURVEYORS	MAK CONSULTANTS	info@makconsultants.co.ke
F00082	QUANTITY SURVEYORS	INTEGRATED YMR PARTNERSHIP	info@ymr.co.ke
F00084	QUANTITY SURVEYORS	BUNEI, MAUNGU AND ASSOCIATES	buneimaungu@yahoo.com
F00085	ARCHITECTS	AAKI CONSULTANTS	info@aaki.co.ke
F00089	ARCHITECTS	STUDIO INFINITY LLP	lydia@studioinfinity.net
F00091	ARCHITECTS	SKETCH STUDIO	jaspal@sketch.co.ke
F00096	QUANTITY SURVEYORS	MASTERBILL INTERGRATED PROJECTS	info@miprojects.co.ke
F00104	ENGINEERS	NGASI CONSULTING ENGINEERSS	info@ngasi.org
F00105	ENGINEERS	FERADON ASSOCIATES LTD	consult@feradon.com
F00108	ARCHITECTS	K & M ARCHPLANS	consult@kmarchplans.com
F00110	ARCHITECTS	SPACE AND SYSTEMS	spaceandsystems@gmail.com
F00118	ARCHITECTS	MUTISO MENEZES INTERNATIONAL	mmi@mmiarch.com
F00123	QUANTITY SURVEYORS	SONGA OGODA & ASSOCIATES	info@songaogoda.co.ke
F00130	ARCHITECTS	DIMENSIONS ARCHITECTS	info@dimensionsarchitects.com
F00132	ARCHITECTS	ACHERA & PARTNERS ARCHITECTS	acheraarch@gmail.com
F00134	ARCHITECTS	BLINK STUDIO LIMITED	info@blinkstudio.co.ke
F00136	ARCHITECTS	BASELINE ARCHITECTS LTD	info@bslkenya.co.ke

Member No.	Chapter	Name	Email Address
F00137	TQUANTITY SURVEYORS	MANDHRY ASSOCIATES	info@mandhryassociates.com
F00141	ARCHITECTS	GIBB ARCHITECTS	gibb@gibbinternational.com
F00142	ARCHITECTS	SYCUM SOLUTIONS CO. LTD	admin@sycumsolutions.co.ke
F00143	QUANTITY SURVEYORS	QUANTECH CONSULTANCY	info@quantech.co.ke
F00147	QUANTITY SURVEYORS	QUANTI BILL CONSULTS COMPANY	quantibillconsult@gmail.com
F00148	TOWN PLANNERS	GEODEV (K) LTD	goedevkenya@yahoo.com
F00150	ARCHITECTS	HERITAGE ASSOCIATES LTD	studio@heritageassociates.co.ke
F00152	ARCHITECTS	WHINTTO ARCHITECTS (K) LTD	info@whinttogroup.co.ke
F00156	ARCHITECTS	E.D.G & ATELIER	info@edgatelier.com
F00161	QUANTITY SURVEYORS	TANDEM AND STARK	info@tandemandstark.net
F00163	ARCHITECTS	ARCSCENE ARCHITECTSS (K) LTD	arc@arcscene.com
F00165	ARCHITECTS	GAPL KENYA	info@gaplkenya.com
F00166	ARCHITECTS	BEGLIN WOODS ARCHITECTSS LTD	kimani@beglinwoods.com
F00167	LANDSCAPE ARCHITECTS	URBAN GREEN LANDSCAPES LTD	info@urbangreen.co.ke
F00171	ARCHITECTS	SYMBION MOMBASA LTD.	symbionmombasa@symbion-int.com
F00176	ARCHITECTS	DESIGN MASTER STUDIO LIMITED	kavisi@designmastersstudio.co.ke
F00177	ARCHITECTS	DESIGN SOURCE LIMITED	info@designsource.co.ke
F00178	ARCHITECTS	TRIOSCAPE LIMITED	trioscapeltd@gmail.com
F00179	ARCHITECTS	LOCUS STUDIO LTD	nrb@locustudio.co.ke
F00180	ARCHITECTS	TEAM 2 ARCHITECTSS	deepak@team2architects.co.ke
F00181	ARCHITECTS	BOOGERTMAN AND PARTNERS	mail@boogertman.co.ke
F00185	ARCHITECTS	PHAROS ARCHITECTS K LTD	info@pharosarchitects.com
F00186	LANDSCAPE ARCHITECTS	LANDMARK DESIGNS LTD	info@landmarkdesignsltd.com
F00189	ARCHITECTS	MASTERBUILD LIMITED	info@masterbuild.co.ke
F00190	QUANTITY SURVEYORS	KEMSAL CONSULTANTS LTD	oliviasally83@gmail.com
F00191	ARCHITECTS	MASTA D-SIGNS LTD	mastadesigns@ymail.com

Email: covidtaskforce@aak.or.ke
Phone: 020 242 0806, 0721 691 337

@ArchKE @arch_ke @arch_ke

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