Categorization of security as per the RAG (Red Amber Grey) Framework

I. Proposed Layered and Scalable Construction Security Measures

Risk determination of construction-associated risks is a function of threat assessment, vulnerability assessment and asset impact assessment. Mitigations of construction-associated risks play a crucial role in preventing attacks. This requires the usage of natural security strategies and environmental psychology. This includes:

a. Securing the Base Transmitter Station through physical designs - See proposed architectural drawings Annex C

b. Sense of ownership – A comprehensive stakeholder engagement with the community,

c. Natural surveillance provides high visibility on intruders, and natural layered access controls using the natural environment and landscape as barriers and camouflaging of the BTSs designs with the environment.

d. BTS security is in-depth and layered.

When providing security in layers and in-depth, one starts from the outmost to the inside and then to the protected assets inside the BTS facility. The BTS themselves require additional compartments and 'bankers' to enhance protection.

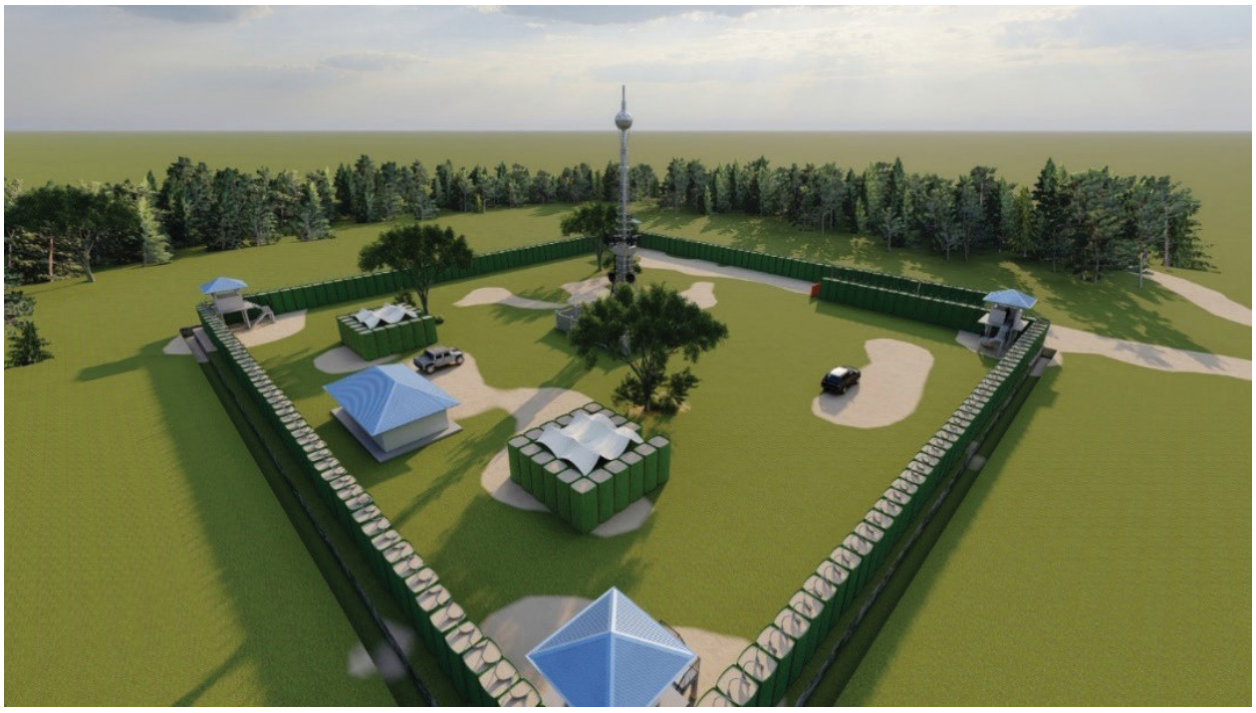

Figure1: Pictorial impression of a typical proposed new site in Red Zone

a. 1st layer of protection: These areas surround the BTS camp and beyond. Any shrubs within a 100–300-meter radius should be cleared to remove obstructions. In this area, the first layer of monitoring and surveillance must be installed, covering all arcs of ingress, and linked to the command center. Strategic lighting is vital in this security layer for a better view of criminal activities. Security personnel operating on this layer are responsible for active patrols and reporting any suspicious activities by intruders. When writing about any sightings of intruders, the report should include Numbers, Dress, Direction, Weapons and Activities. This layer contains:

- Bush clearance
- Floodlights
- Chain link fence
- Motion sensors
- Active patrols

b. 2nd Layer of Protection: Barriers on access to the BTS sites and perimeter fences should be installed. Barriers prevent unauthorized vehicular entry into the sites. This will also prevent any risk of Vehicle-Bourne Improvised Explosive Devices (VBIEDs) and significantly reduce the blast effects. Guidance on what to consider when constructing the anti-ram barriers includes.

- Cover all vehicular approaches,
- Natural barriers,
- Proper siting of the access points,
- The adjacent property uses and occupants, if any,
- Impact speed and angle of impact,
- Future site development.

Consider alternatives such as hardened furniture at entrances, concealment, erecting retaining walls, integrating walls with plants for concealment and camouflaging, and using natural boulders. The walls and fences should be opaque and must satisfy height requirements.

This second layer of protection includes a security post fully manned by security personnel. Armed attackers will target it. It should therefore be structurally hardened

against direct fires and bomb blasts. Walls should have more surveillance systems (step or motion detectors). Active patrols are to be maintained within and around the perimeter walls. Therefore, this layer contains the following.

- Open trench
- Hesco barrier or Berm wall
- Concertina wire
- Boom Gate
- Swing Gate
- Jersey barrier
- Guard towers
- CCTV cameras
- Control room to monitor CCTV and communicate with towers

c. 3rd Layer of Protection: This includes protection within the BTS facility. This consists of enhanced monitoring and surveillance to visually identify people and access to the critical assets within the BTS station. Construction materials and techniques should include reinforced concrete, steel, and blast-resistant entrances (windows and doors). Access to essential assets and spaces within the BTS station, such as generators and batteries, should be placed in compartments with restricted access.

For Red Zones, Intrusion Detection Sensors and alarm systems should be considered. These systems can sense unauthorized access and trigger alerts through the detection monitoring system for response actions. Some examples are Video Content Analysis (VCA) (detects movements on video signals from CCTV cameras) and Intrusion Detection

System (IDS) (uses electromagnetism to lock the entries and triggers an alarm if entry is forced).

ICT asset owners, Security agencies, Service providers, County Government and Community Leaders are to jointly determine the criticality (RED, AMBER, or GREY) of the BTS locations. This is to be used to determine the protection level required and all identified threats, risk levels and impact, as well as on the ability and capacity of security agencies to provide security, response, and recovery support. This layer therefore contains:

- Armoured gates
- Blast wall (reinforced concrete wall)
- Enhanced access and controls
- CCTV

BTS layered protective security, therefore, includes the provision of all or most of the following.

- Controlled access to the sites.
- Ant-ram barriers.
- Anti-climb perimeter walls.
- Anti-blast walls, windows, and doors.
- Integrated technology monitoring and surveillance.
- Active patrols dominate the environment.
- Incorporating security plans and design of BTS/Fi considerations ab-initio.

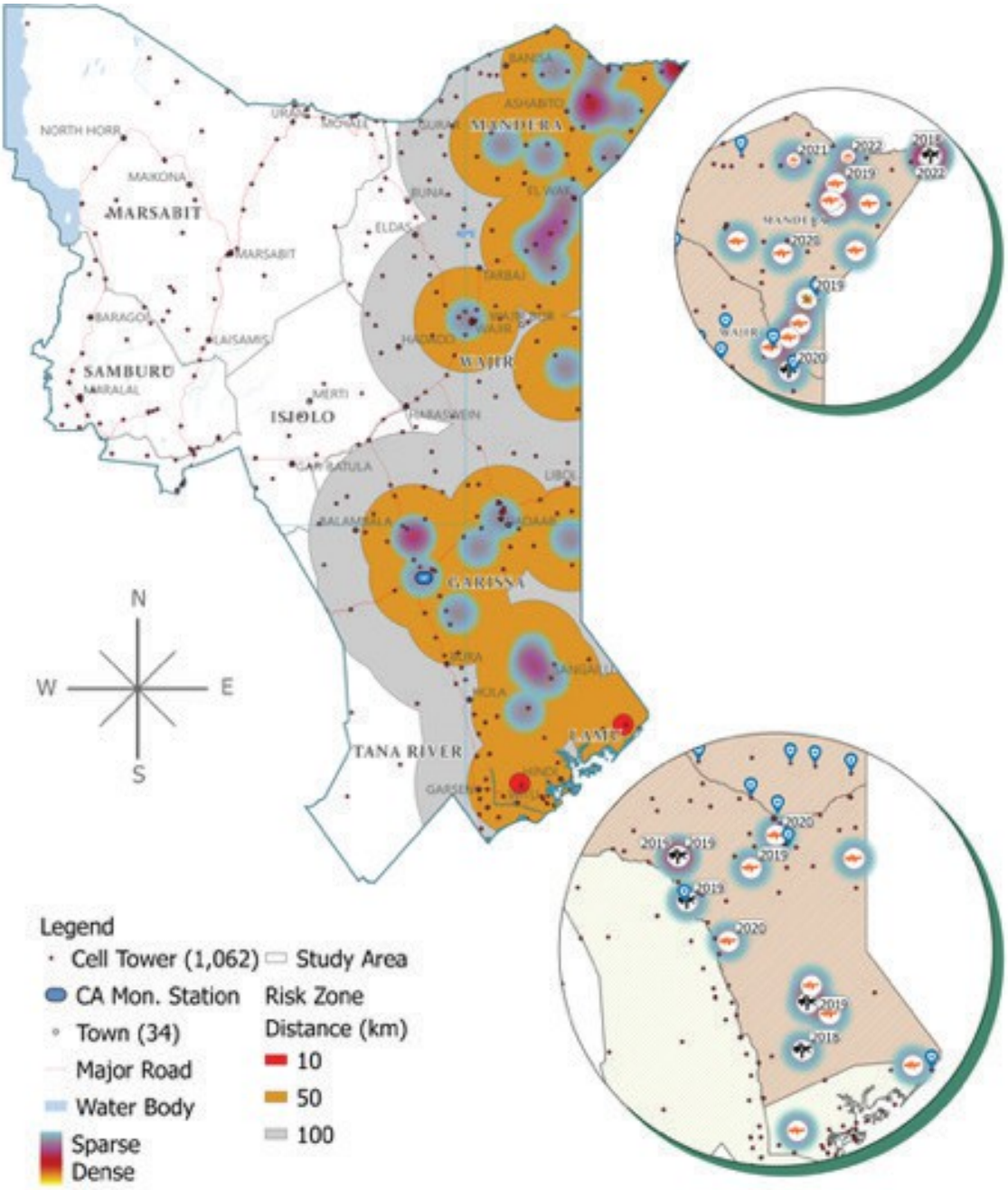

Figure 1:Region Cluster Map-Red, Amber and Grey Zones

II. Red Zones

High-risk areas (Mandera, Garissa, Wajir and Lamu), especially those close to the Somalia border or been previously attacked and damaged or attempts to attack have been made or is within a radius of 10km of the BTS attack incidents. BTSs in Red zones will either be relocated into a security camp or be provided with maximum and enhanced security

features. The proposed physical security measures will be strong enough to challenge the aggressor. The upgrade will include the following:

- Minimum camp size 5 acres.
- Bush clearance greater than the radius of 300m of the entire area.
- Chain link as screening fence on the outer perimeter
- Trench excavation as an inner fence.
- Hesco or berm wall next to the trench to protect the entrance and conceal the site.
- Concertina wire, boom barrier, jersey barriers, watch towers and flood lights.
- Renovate the existing security camps hosting the BTS
- New BTS sites will be constructed using a reinforced concrete wall with an armored steel door. For those already constructed to be reinforced using HESCO wall all round.
- Provision of other welfare and social amenities needs to the security team that is protecting the BTS.

III. Amber Zones

Amber zones represent those BTS in moderate risk areas such as those in towns and those near towns – 5-10km radius. These sites will have similar facilities to those in red zones but downgraded in volume but with a possibility of retrofitting or upgrading if the threat levels increase. The site should provide enough space to deploy security personnel if required. The minimum space size of the compounds to locate such BTSs is suggested to be 3 acres.

IV. Grey Zones

Usually, BTS located in peaceful locations such as those in Samburu, parts of Isiolo, Tana River and Marsabit counties. These sites have a provision for upgrading protective security features if the threat levels metamorphosis. The day-to-day security provision could be delegated to guards. This, therefore, means that the minimum size of space for constructing the BTS should be capped at 0.25 acres.

V. Requirement

Table 1: shows the security installations requirement for the sites as per the RAG framework for compliance. See Annex C for architectural drawings.

Table 1:Security enhancements for sites as per RAG framework

S/No	Description of required protection security upgrades	Red Zone		Amber Zone		Grey Zone
		BTS Inside Security Camps	BTS Outside Security Camps with Not Enough Space	BTS Inside Security Camps	BTS Outside Security Camps with Not Enough Space	
1	Bush Clearance	Yes	Yes	Yes	Yes	-
2	Flood lights -solar powered motion triggered	Yes	Yes	Yes	Yes	-
3	Chain link fence with razor wire on top	Yes	-	Yes	-	-
4	Open Trench- 2mx1.5m wide	Yes	-	Yes	-	-
5	BERM Wall with concertina wire fence- Triple concertina fences	Yes	-	Yes	-	-
6	Boom gate	Yes	-	Yes	-	-
7	Swing gate	Yes	-	Yes	-	-
8	Jersey barrier	Yes	-	Yes	-	-
9	Guard watch Towers	Yes	Yes	Yes	Yes	-
10	CCTVs and sensors	Yes	Yes	Yes	Yes	-
11	Control room for communications (container, solar powered)	Yes	-	Yes	-	-
12	BTS Facility wall - HESCO all round with razor wire and for internal compartments.	Yes	Yes	Yes	Yes	-
13	Access & Controls to the BTS facility	Yes	Yes	Yes	Yes	-
15	Camp structures for security agencies protecting the facility	Yes	-	Yes	-	-
16	Security firing positions with overhead protection	Yes	-	Yes	-	-
17	Quick Impact Project for the community	Yes	Yes	Yes	Yes	Yes