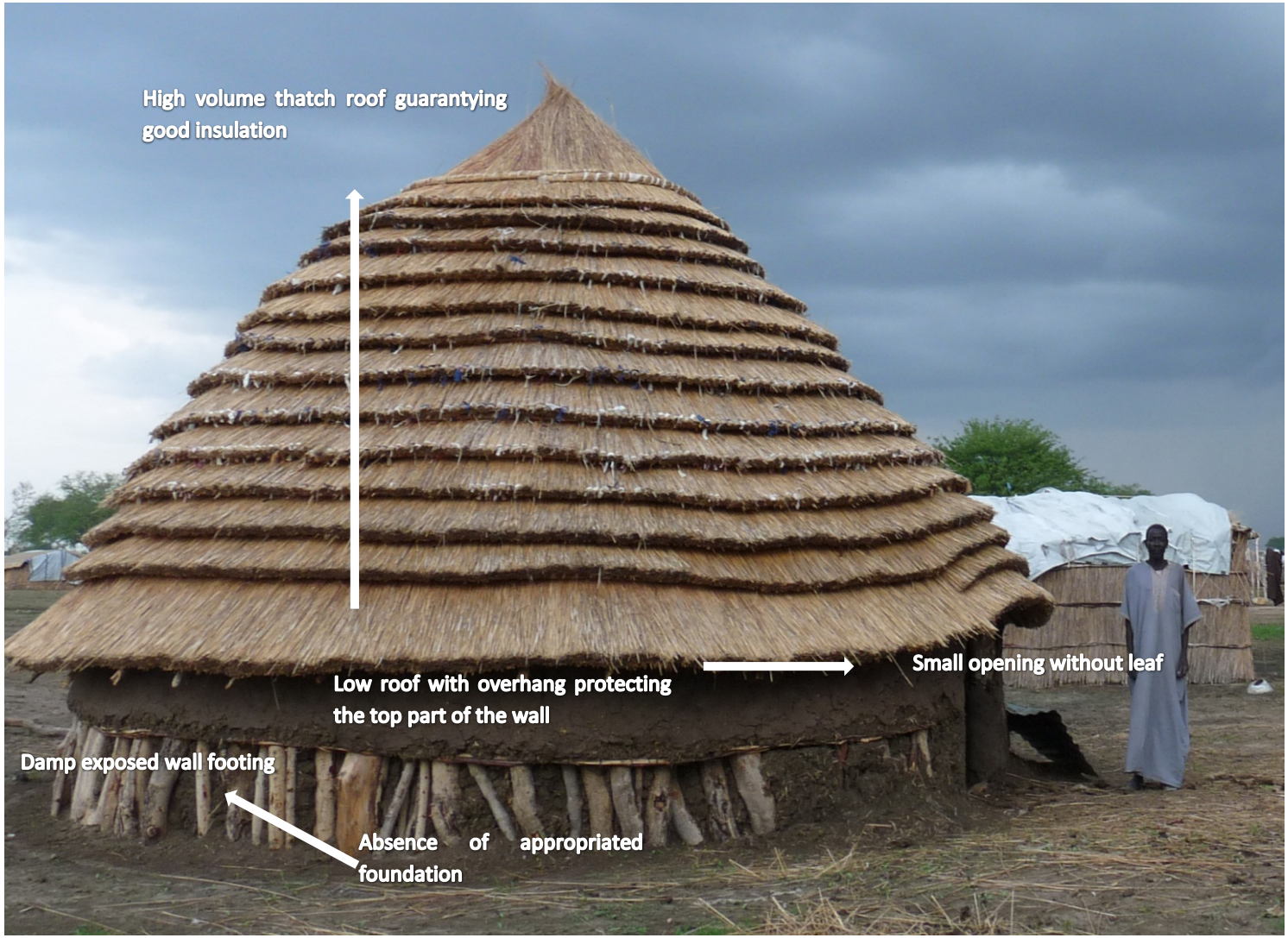


TECHNICAL WORKING GROUP ON CONSOLIDATION OF EMERGENCY SHELTER

Shelter's elements, materials and joint reviewed:

- General structure, vertical elements, general dimensions
- Roof structure, trusses and framing.
- Bracing.
- Tying/pegging.
- Structure's ground fixing. Termites' problems.
- Plastic sheeting fixing.
- Ground floor treatment. Pallets, sans backfilling, sand bags etc.
- Details, other

SUMMARY OF THE POINT TO BE REVIEWED

	Scenario 1. Self Help	Scenario 2. Self Help + technical assistances	Scenario 3. Construction team
Responsibility for design and construction	Beneficiaries, Various designs	Beneficiaries, primary. Technical assistance advising + demonstration pilot shelters	NGO, contractors, fixed design.
Timeline for construction (800 shelters)	3 to 4 weeks	3 to 5 weeks. 160 -250 shelters per week.	8 weeks minimum 100 shelters max per weeks
Quality	Various but usually very low	Low to medium according willingness of beneficiaries to received advises	High to very high
Materials **(on top of what was previously distributed)**	Re use of existing materials A top up kit (2 extra bamboo bundles, 30 extra ropes, 1 extra plastic sheet, 100 2.5" nails, pegs)	Re use of existing materials A top up kit (2 extra bamboo bundles, 30 m extra ropes, 1 extra plastic sheet, 100 2.5" nails, pegs). Light adaptation feasible according technical assistances using referral.	Basic E shelter from pipeline (2 plastic sheet, 6 poles, 2 bamboo bundles, 30 m ropes, pegs) A top up kit (3 extra bamboo bundles, 30 extra ropes, 1 extra plastic sheet, 100 2.5" nails).
Tools	Not provided up to the beneficiaries	Set of basic tools temporary available with technical advisors	Fully equipped tools, possibility to prepared elements in a mini workshop. (Splitting bamboo etc.)
Team	IOM site planer	IOM site planner. 2 teams of 4 technical supervisor (skilled labor) Team manager	IOM site planner 10 teams of 4 labors each. 2 team managers.
Cost		25 000 SSP labors 8 000 SSP tools 32 000 SSP to 35 000 SSP + 800 top up kit	126 000 SSP labors (minimum) 8 000 SSP tools 134 000 to 140 000 SSP minimum + 800 E shelter kit + 800 top up kit

BOR PoC example, august 2014

STRATEGY VERSUS DESIGN

Average family size in South Sudan (to be adapted according the case) : 6.3 equivalent to 22 m2

…. Whatever the cultural aspect of the permanent dwelling tukul dissociated functions (kitchen, bathing, sleeping) and structure are usually less than 16 m2.

Wall structure, NRC Minkaman, 2014

Door Frame reinforced, CRS design 2014

Questions:

- Upper horizontal frame rigidity ?
- Durability of bamboo as primary structural elements?
- Adopting 16 m2 as minimum standards
- Minimum height of the structure ?

GENERAL STRUCTURE, VERTICAL ELEMENTS, GENERAL DIMENSIONS

Scissor trusses, CRS design 2014

Curved grass, Concern design 2014

Curved grass, NRC design 2014

Double pitch, NRC design 2014

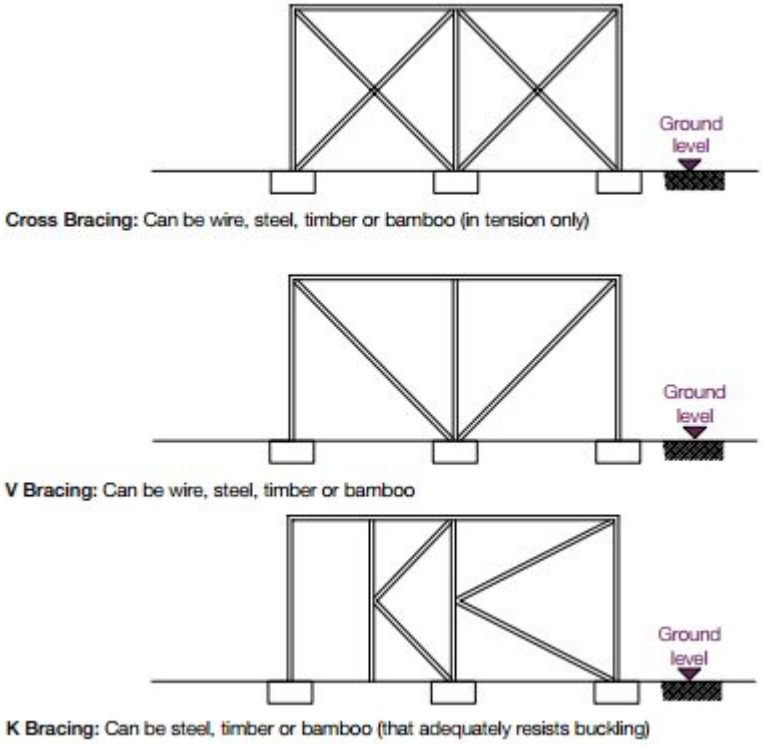
Single pitch, NRC design 2014

Curved bamboo, NRC design 2014

ROOF STRUCTURE, TRUSSES AND FRAMING

Bracing the structure increase its resistance

- Reinforced connection between pole and beam
- Wall angle bracing (vertical frame)
- Wall full X bracing (vertical frame)
- Roof full bracing (horizontal upper frame)



BRACING THE STRUCTURE

Pegging/Tying, Concern design 2014

Wall base & fixing, NRC design 2014

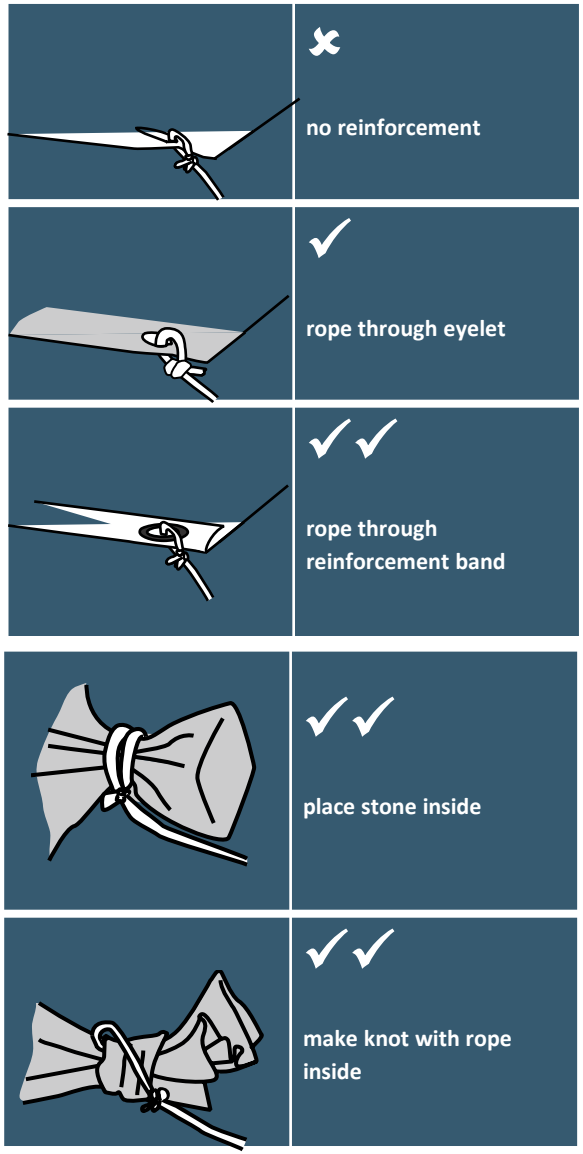
TYING / PEGGING / FIXING / WALL BASE

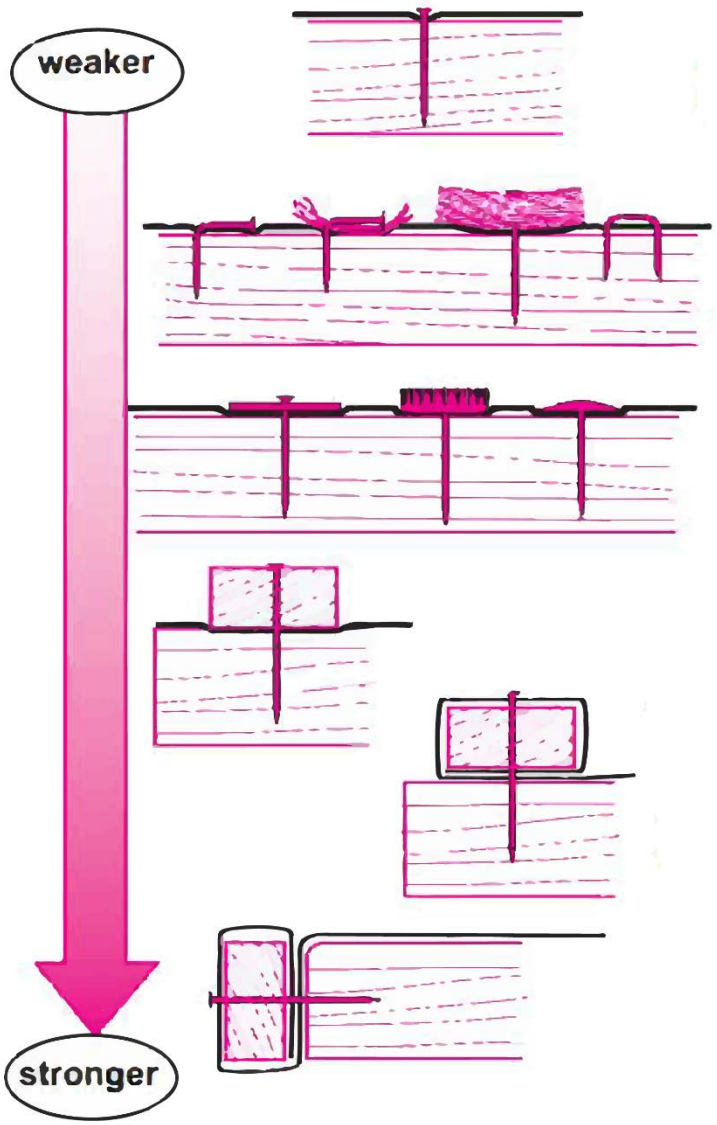
Digging hole, CRS design 2014

Termites:

- Burn oil not well performing
- Chemical

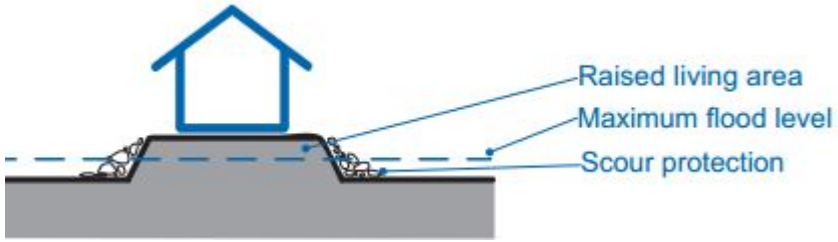
STRUCTURE'S GROUND FIXING. TERMITES' PROBLEMS





PLASTIC SHEETING FIXATION

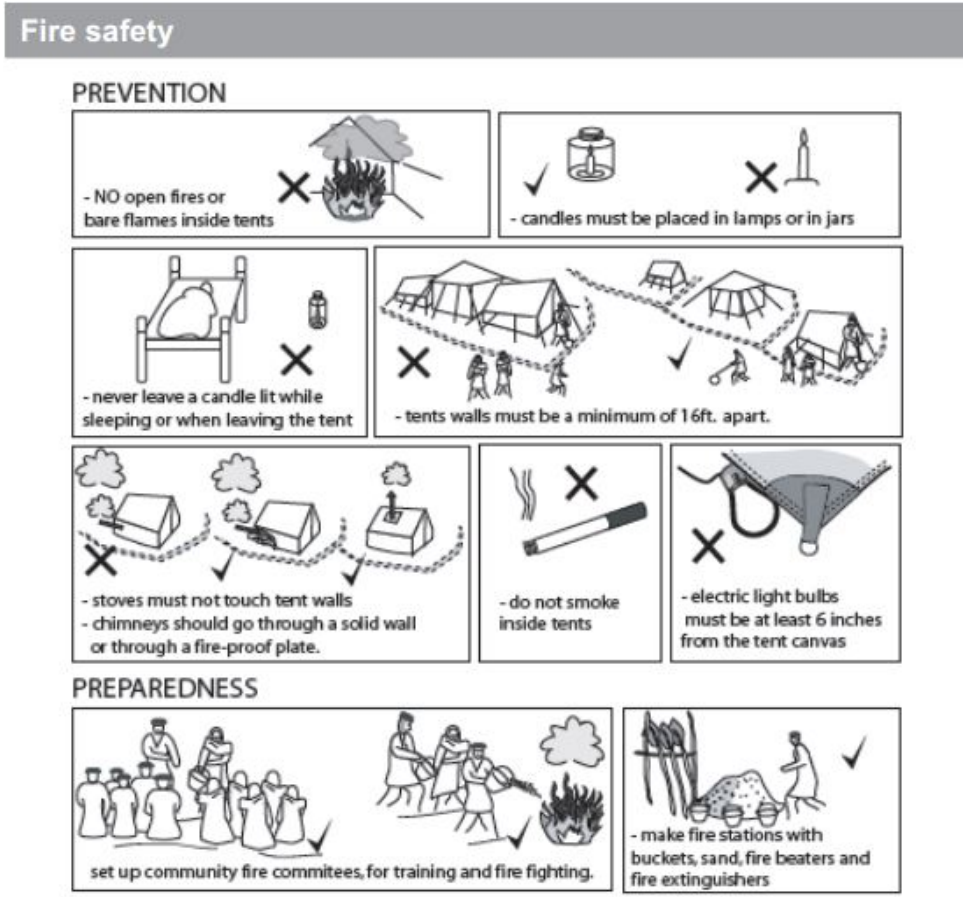
Sand backfilling , Concern design 2014



GROUND FLOOR TREATMENT. PALLETS, SANS BACKFILLING, SAND BAGS ETC.

Repairing small hole using glue and plastic sheeting patches.

Fire prevention



DETAILS, OTHER