



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



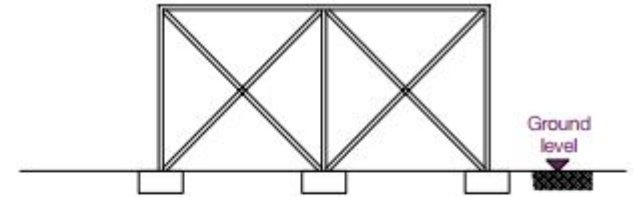
Curved bamboo, NRC design 2014

ROOF STRUCTURE, TRUSSES AND FRAMING

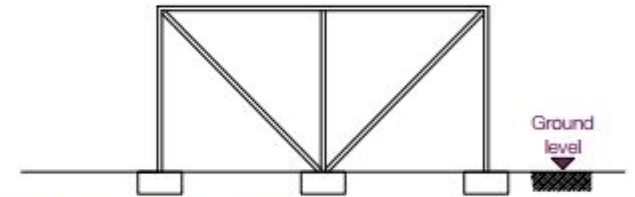
Bracing the structure increase its resistance



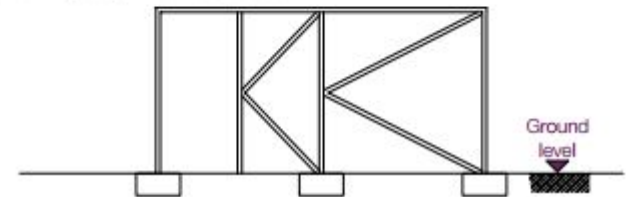
- Reinforced connection between pole and beam
- Wall angle bracing (vertical frame)
- Wall full X bracing (vertical frame)
- Roof full bracing (horizontal upper frame)



Cross Bracing: Can be wire, steel, timber or bamboo (in tension only)



V Bracing: Can be wire, steel, timber or bamboo



K Bracing: Can be steel, timber or bamboo (that adequately resists buckling)

BRACING THE STRUCTURE



Pegging/Tying, Concern design 2014



Wall base & fixing, NRC design 2014

TYING/PEGGING/FIXING/WALL BASE


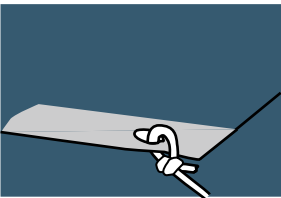


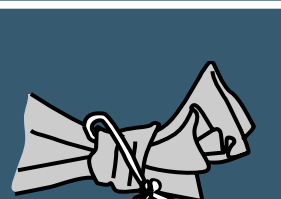


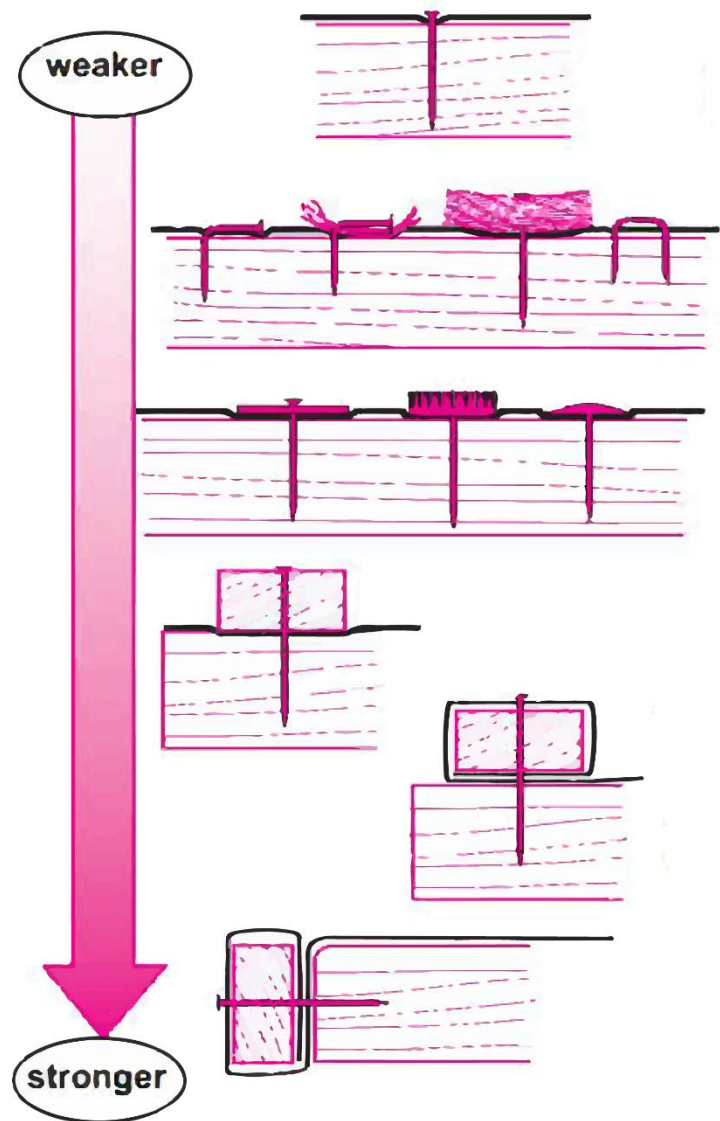
Digging hole, CRS design 2014

Termites:

- Burn oil not well performing
- Chemical

STRUCTURE'S GROUND FIXING. TERMITES' PROBLEMS

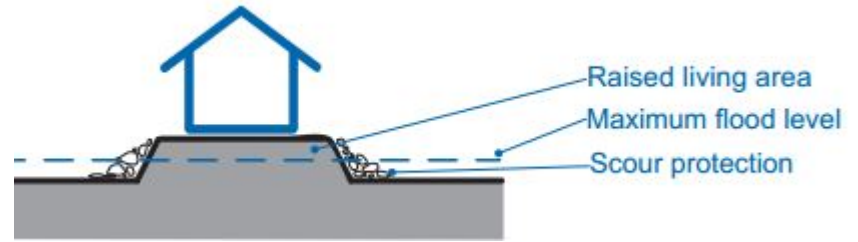
	✘ no reinforcement
	✓ rope through eyelet
	✓ ✓ rope through reinforcement band
	✓ ✓ place stone inside
	✓ ✓ make knot with rope inside



PLASTIC SHEETING FIXATION



Sand backfilling , Concern design 2014






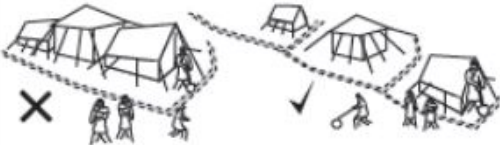



GROUND FLOOR TREATMENT. PALLETS, SANDS BACKFILLING, SAND BAGS ETC.

Repairing small hole using glue and plastic sheeting patches.

Fire prevention

Fire safety

PREVENTION

 <p>- NO open fires or bare flames inside tents</p>	 <p>- candles must be placed in lamps or in jars</p>	
 <p>- never leave a candle lit while sleeping or when leaving the tent</p>	 <p>- tents walls must be a minimum of 16ft. apart.</p>	
 <p>- stoves must not touch tent walls - chimneys should go through a solid wall or through a fire-proof plate.</p>	 <p>- do not smoke inside tents</p>	 <p>- electric light bulbs must be at least 6 inches from the tent canvas</p>

PREPAREDNESS

 <p>set up community fire committees, for training and fire fighting.</p>	 <p>- make fire stations with buckets, sand, fire beaters and fire extinguishers</p>
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DETAILS, OTHER