Malawi Shelter Cluster
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Coordinating Humanitarian Shelter

Malawi Shelter Cluster
Technical Working Group
for
Promoting Safer Building Practices
in Malawi

a collaboration with the Global Shelter Cluster Working Group on "Promoting Safer Building Practices" and partners of the GCRF research project

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MALAWI RED CROSS SOCIETY

Agenda:

1. Introduction and recap of last meetings findings and conclusions

2. better and feasible solutions for walls, colums, beams,
- analysis of solutions proposed in the safer house construction guidance
- experiences and potential solutions from the field

3. How to rate and select the alternative Solutions identified
- proposed matrix

5. AOB, suggestions for way forward

OXFORD BROOKES UNIVERSITY · Habitat for Humanity · care · GCRF · CRS CATHOLIC RELIEF SERVICES · Episcopal Conference of Malawi · CRAterre

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- # Identified weaknesses and failure mechanisms:

	House element (categorg) (these elements should be used as guideline, use only the relevant ones or add other not mentioned; delete what is not applicable)	Description of element (as observed)	Failure mechanism (if not built well)	Strength of the Element (if built well)	Element Importance ranking[1]	Possible solution	Solution ranking[2]	Comment	Possible solution	Solution ranking[2]	Comment	Are EIC material already available?
1	Foundation(DPM, Plinth wall, plastering with water dehydrating agent)	**Most houses do not have the foundations and few which have they make it shallow and others they just make a header course and start wall construction**	The building lacks stability as it stands on a top soil which is not stable and well compacted and. This also exposes the superstructure wall to running water risking the wall to soaking	The house with foundation stands firm on a stable ground making it stronger against running water	8	provide a compacted embarkment around the wall	12	can be done by owner	construct a deep and raised foundation	11	The action needs more bricks but the purpose it serves is very essential	
2	Structure (column, beam, load bearing walls, lintel, wallplate,etc.)	**Most of the houses do not have wall plates fixed this affects the even distribution of roofing load to the bricks on the superstructure walls**	In case of failure of a brick/block point loaded with the roofing wall the failure is not controlled as it passes to the next brick with extra force	Roofing load is evenly distributed to bricks	8	Insert the plated by lifting the roof and tie it to the wall with tie wire or ropes of relatively high tensile strength	10	Lifting the roof may need more man power	Fix wall plates and tie them to the wall with a galvanized tie wire	11	Cost for purchasing galvanized tie wire may e hard for the villagers to manage	
3	Structure (column, beam, load bearing walls, lintel, wallplate,etc.)	**Most houses use timber pole posts and they are usually not treated for termites.**	Timber post poles are attacked by **termites** hence weakened and fail to support the roofing.	Posts help to support the roof	8	Treat timber posts for termites and have regular checks if attacked by termites	10	Termicides might not be affordable	If possible consider constructing masonry columns	10	Exposure to rains may damage the column if done by adobe bricks and mud mortar	
4	Structure (column, beam, load bearing walls, lintel, wallplate,etc.)	**Usually they use thin timber poles for lintels where there are no door frames and where there are door frames they don't put lintels. Mostly not treated and not strong**	Small timber easily eaten by **termites** and are not strong enough to support the roofing load, they break resulting into a roofing failure.	The bricks load effect on top of door opening is taken care by the lintel	8	Insert strong poles, lintel, with a proper thickness	10	The insertion process may cause a structural failure to the wall	Fix the lintel to bear the brick load	12	Its relatively easy to afford	
5	Roof structure and strap	Quality of the thatch is also an issue as most thatched houses they use the grass with a lot of debris hence decomposes faster than expected. some don't tie the thatched grass making it prone to wind	The roof doesn't get off the water quickly hence getting into the grass casing decomposition.	Clean grass makes the roof to have a long life since there are no decomposing	8	At least clean the grass that will be on top	11	Marrying the two can be a challenge sometimes	Clean the grass before using it for thatch	11	(applies only for thatch roof) A lot of grass will be needed to satisfy the need	
6	**Foundation(DPM, Plinth wall, plastering with water dehydrating agent)**	**Plinth wall with a compacted space protects the foundation wall from getting wet.**	**A well compacted volume of filled material between foundation and plinth wall blocks the running water to soak the foundation wall**	**A dry foundation is stronger to bear the superstructure loading effect.**	7	Construct a plinth wall around the foundation to avoid water getting closer to the foundation and where the foundation is low consider an	11	Providing an embarkments is the easiest thing that only needs man power	Raise the foundation and construct a plinth wall around it	10	Molding of bricks for the plinth wall demands an extra labour	
7	**Structure (column, beam, load bearing walls, lintel, wallplate,etc.)**	**Some houses have a one-brick thick load bearings walls**	**The wall is overloaded with the roofing risking human life and property damage due to structural failure**	**A thick wall support the load better and provides much comfort inside the**	7	provide supporting posts to take the roofing load	10	It depend with the availability of poles in the area	Construct a double-brick thick wall or use the bricks of a good thickness	10	The shelter consumes more bricks and mortar to construct double-brick thick wall	
8	**Foundation(DPM, Plinth wall, plastering with water dehydrating agent)**	**Damp proof membrane protects the wall from the capillary action**	**Incase of the foundation getting wet the moisture is blocked to get into the superstructure wall**	**The wall is kept dry all the time making it strong**	7	Construct a plinth wall to avoid water getting closer to the foundation and drain water away from the structure quickly	11	The suggested solution can reduce the magnitude of the effect	sensitize the importance of putting a membrane/plastic sheet before starting construction of the superstructure wall	9	The cost attached to it may not be affordable to everyone	

Wall starting on a header course on the ground

Side Gable CGI covered (burnt brick) Design – lintel failing due to heavy brick loading and lengthy span

Missing wall plate for even distribution of load on the wall

- **Identified key audiences:**
  - affected communities/vulnerable communities at high risk
  - local builders
  - housing officers, VCDCs, Community Development Officers and other community mobilizers to best reach those communities with safer construction guidance

  There was common understanding that the that the key messages to disseminate need to be adapted to the different contexts and the respective hazards, local building cultures, available materials etc

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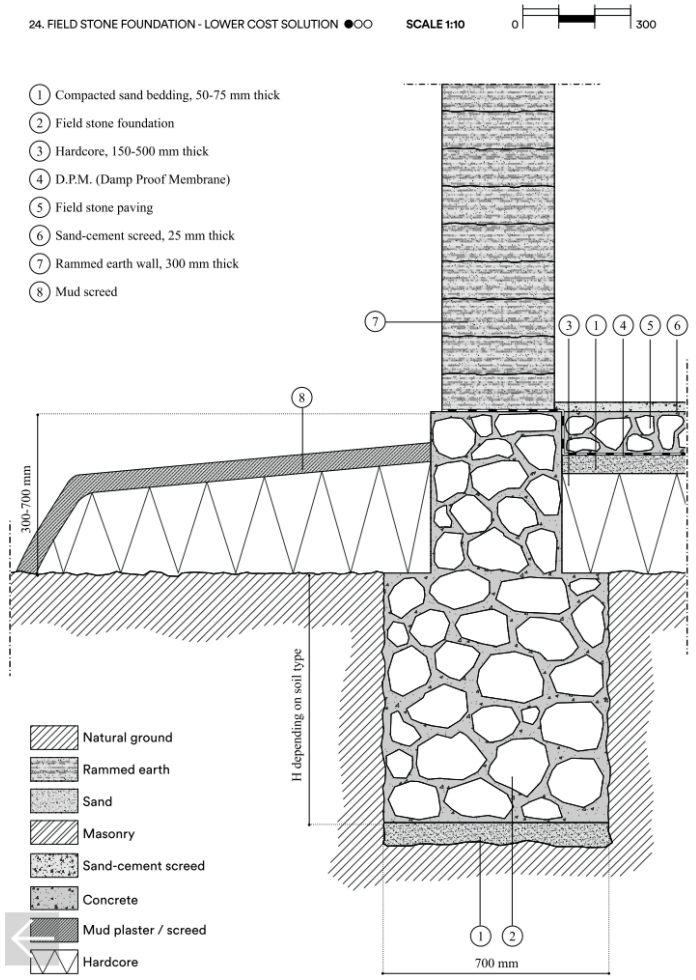
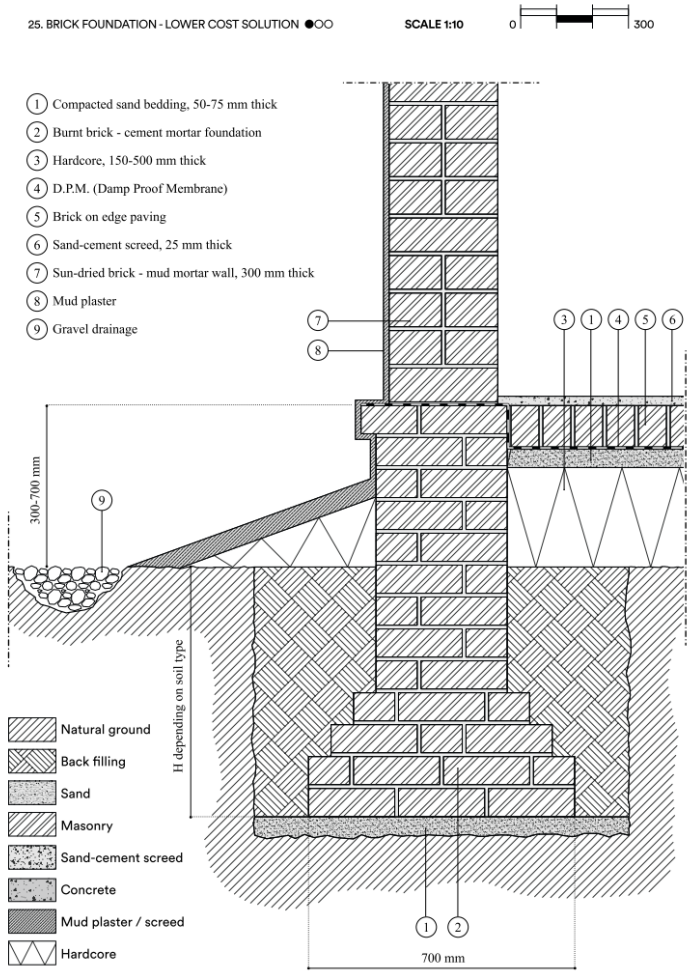
Foundation solutions from safer housing guidance:

- Rubble (field stone) masonry
- Burnt brick with cement mortar





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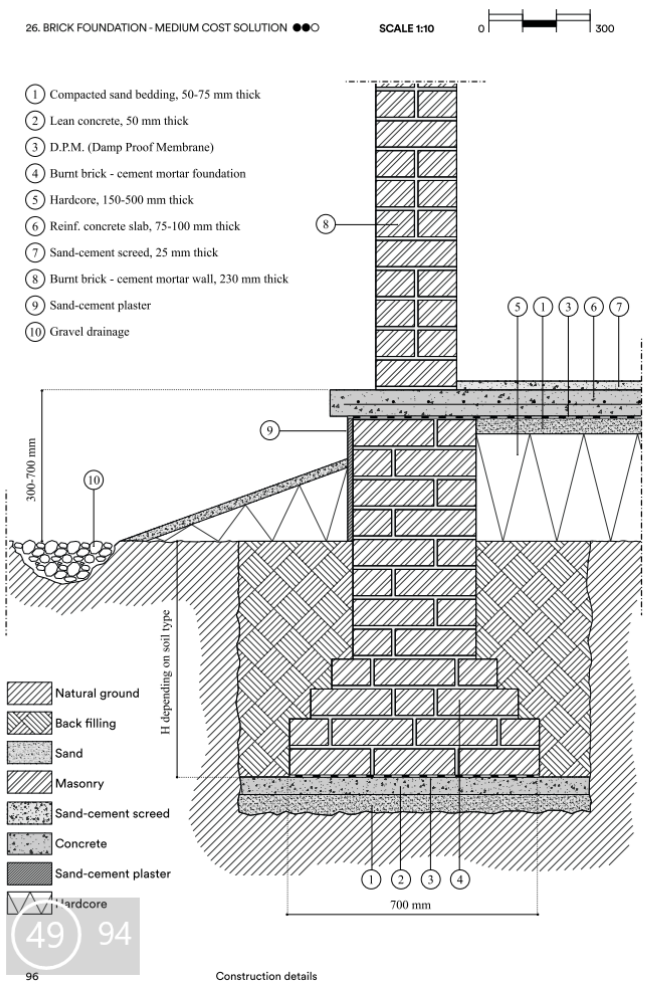
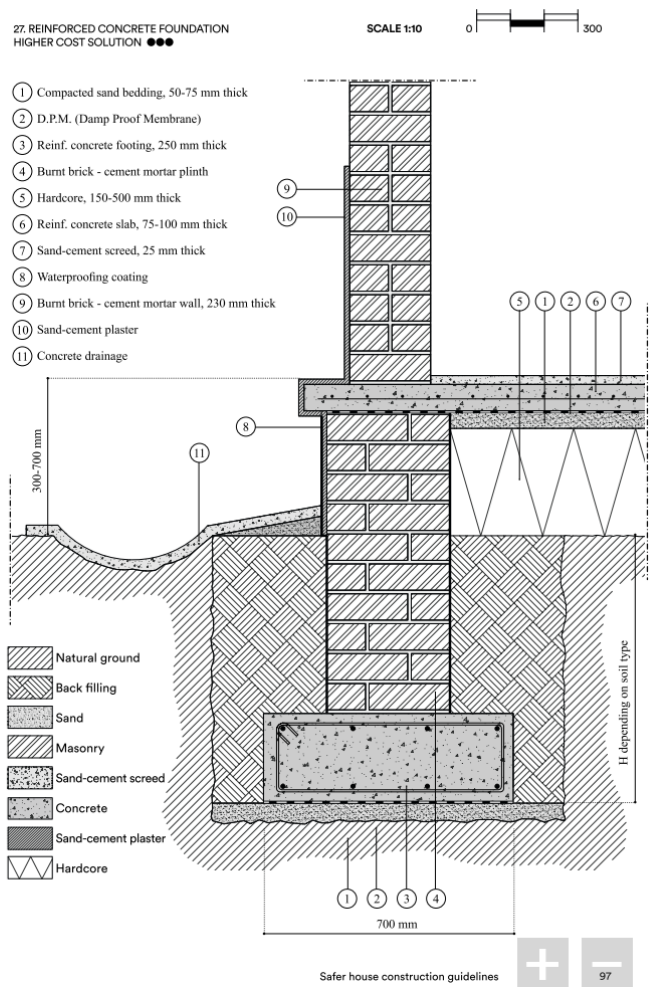
Foundation solutions from safer housing guidance:

- Burnt brick – cement mortar with concrete slab floor
- Reinforced concrete with burnt brick and concrete slab





- Examples from field experience (CRS/Cadecom)
- Further examples from Malawi local building practices (CRAterre)