O.R. TAMBO HOMESTEAD

STRUCTURAL IMPACT ASSESSMENT REPORT OF EXISTING STRUCTURES

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1. O. R. TAMBO DWELLING - GENERAL

We carried out an inspection of the homestead where the late Mister O. R. Tambo resided after his return from exile when visiting his natal home at Nkantolo. We report here on the original condition of the structures on site. This report is focused on the two roomed dwelling where he resided.

This report looks at specifics of the two roomed structure and states the various alternatives which will be followed to achieve a sound structure.

The possible categories looked at were, as bulleted below, in order of importance, but with the understanding that the structure required some attention.

- The structure was only in need of general repairs, and it was generally in good condition.
- The structure requires parts to be removed and re-built, such as the roof.
- The structure requires major portions to be removed and re-built.

The intention of this report was to provide proposed interventions and to outline the methods and materials to be used during the restoration work being carried out.

It is understood that the two roomed unit, known as the O. R. Tambo dwelling, will be restored, with its' original shape and form. This will be regardless of the 'out of square' original construction. The intention is to deliver a restored structure which will withstand time and act as an informer of heritage.

The report below starts with the original status of the O. R. Tambo dwelling and then goes on to make recommendations and finally deals with specifics, methods and materials.

2. REPORT

TWO ROOMED RECTANGULAR BUILDING.

This, the detached unit where the late Mr. Tambo lived when visiting Nkantolo was the main focus of our attention during our visit to asses the homestead, and also during our structural impact assessment. This building comprises two rooms. The external walls to this unit were built leaning outwards, which has resulted in cracking at various points around the unit. The fascia boards were all rotten or non existent. The roof sheets were in a poor state and were held down by blocks and stones to prevent them from flying off. The general condition of this unit was poor.

This view, the front elevation, clearly shows that the roof timber has rotted. The window and door frames are in poor condition. The walls have cracks above the windows and door. There are also indications of rising damp. The top part of the wall on the right hand side is leaning to the right. The walls are of concrete blocks as can be seen in the exposed portions.

This photograph shows the left hand side of the front elevation. The wall on the left is leaning towards the left and has resulted in the formation of the crack in the front wall.

This photograph shows the right hand side of the front elevation. The right side wall is leaning outwards such that it has caused a tension crack in the front wall.

This is the left side elevation. The back wall leaning outwards can be clearly seen.

This is the right side elevation. Once again the back wall leaning outwards is clear. The façade shows signs of being touched up recently, so there are no obvious cracks, but we expect them to appear due to the leaning wall. Note also the condition of the roof. The sheets will need to be replaced.

The two photographs above show the whole back wall. The left and right walls are leaning outwards in each case. The back wall itself has two full height cracks, from the ground to the roofline. One is by the change in height of the wall, which is reflected at the front wall above the doorway and the other is just right of the blue drum.

This collage simply highlights the fact that all the walls have cracks in them and that these need to be addressed.

Given the above scenario, together with the fact that the structure is a heritage building, we have to consider the best way forward. The main intention would be to preserve the building in its' present form but without the cracks and poor material. Based on the age of the structure, the materials used in this structure are all available and of the same type. The replacement of some parts or the whole structure will not have any major impact in terms of materiality, but will improve structural stability.

The roof system definitely requires replacement. This means removal of all sheets, purlins and rafters. Replace the system with new rafters and purlins designed to present day codes of practice, but to use similar lines as were used in the original. The sheets should be replaced with the same profile. There should be no ceiling as there never was one. The fascia boards were also of timber and should be replaced. All the timber should be termite proofed and the external portions painted to the Architect's specification.

All rotted timber should be replaced, such as the door frame.

The walls need to be reinforced as they are not straight, in order to avoid or significantly reduce continuous cracking taking place. The back wall appeared to be the worst case, so the plaster will have to be removed to expose the blocks and the problems within. A solution will be to "stitch" the wall using reinforcement in the mortar joints. It will also be necessary to replace damaged blocks to ensure stability. In a similar way all the other walls where there are cracks, will be exposed and repaired, maintaining the existing shape of the wall, be it straight, at a slant or curved. The top three courses will have

reinforcement placed all around the building to minimise any future cracks occurring. The one risk which must be taken into account when construction work starts, is the condition of the existing foundations, and provide solutions as necessary. We will have to check for adequate strip footings. We also believe that there was no damp proof course placed in the original structure, this will have to be rectified. Other problems will arise during the construction phase due to latent defects, which will be dealt with as they arise.

The internal floors and plasterwork generally will have to be tested and confirmed as being durable. If not we will have to strip parts of these elements and rebuild them.

3. O. R. TAMBO DWELLING - RESTORATION

The following measures will be taken to restore the two roomed unit to its original status.

FOUNDATIONS

The base area which has been partially exposed by erosion, will first be checked all around to determine its' integrity. All damaged sections will be noted and exposed for the Engineer to make a determination.

All necessary repairs will be carried out with the use of materials which have already been used on the building as well as the use of reinforcing steel.

The present foundation is shallow and of mass concrete. After confirmation of its integrity, the perimeter will be filled with soil from the immediate vicinity. It will be placed all around and lightly compacted, with a slope of 1% away from the walls. The area behind will have a grass channel to allow storm water to flow to both sides and flush towards the front and carry on flowing down towards the lower side of the homestead.

FLOORS

In order to show how the floors were originally, the existing floors will only be repaired where necessary.

The floor was of concrete with a screed over. The screed over will be chipped back where damaged and replaced with a fresh screed. The mix quantities will be 1 part cement to 4 parts building sand, with a steel float finish. The thickness will be dependent on what was originally used, but we would prefer a minimum of 30mm to be applied.

WALLS

The walls in this case exhibit the most stress and therefore require attention all around in order to strengthen and maintain stability.

Each crack will be exposed to the underlying block wall. The condition of the blocks will be assessed first, replacing any that are damaged. An angle grinder will then be used to cut into the mortar joints. The joints will then be washed clean. The next step will be to place 10mm high yield steel reinforcement into the joint together with fresh mortar. The mortar mix will be 1 part cement to 4 parts sand. The bars will extend 500mm minimum each side of the crack. This method is commonly called “stitching”. This procedure will be carried out both externally and internally, but at different times so as to allow curing time for each side. Doing this to both sides at one time will weaken the structure, so it will not be accepted generally except where a block is being replaced. Finally plaster over with the standard plaster mix. This process will be repeated for all the cracks which are visible already.

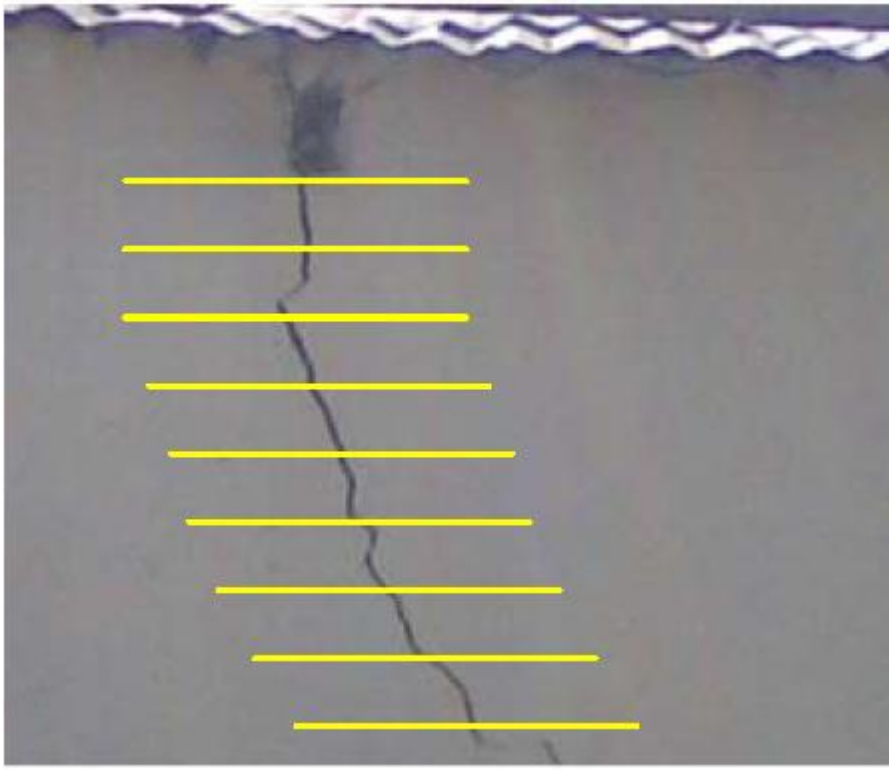
The next stage will be to tie the upper portion of the walls all around to form a “ring beam” effect. This will be achieved by cutting into three consecutive mortar lines all around the building at the same height, near the eaves. Place the 10mm reinforcing bars in each mortar line, all around the building. Fix in with fresh mortar and finally plaster over with the standard plaster mix.

This exercise will require 6 No. x 10metres x Y10 reinforcing bars for the top ties and will also require 55 No. x 1metre x Y10 reinforcing bars for the general stitching work.

ROOF

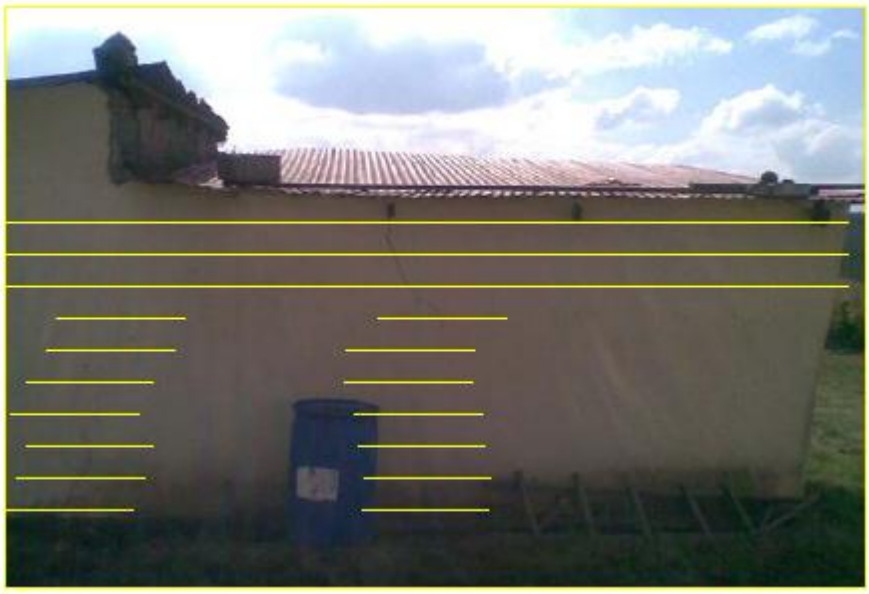
The roof is made up of two sections. Both sections will be removed to expose the rafters. The condition of the rafters will be checked and any rotten or damaged rafters will be replaced. This also applies to the fascia board which is clearly rotten. After the rafters have been placed, at a pitch which complies with the roof sheet manufacturers’ recommendation, the roof sheets will be replaced, again after checking and replacing any rusted and damaged sheets. The side laps will also be sealed to prevent any rainwater seepage.

The materials used here will be 152x38mm V6 pine rafters, with 76x38 V6 pine purlins. The sheeting will be corrugated type with the colour to Architect’s specification.



The photograph above shows typically how “stitching” will be carried out, using one metre long lengths of 10mm diameter high yield steel reinforcing bars.

The photograph below shows the typical “stitching” together with the tying up of the eaves all around using 10mm high yield reinforcing bars.



4. CONCLUSION

The restoration done in this way will stabilise the O. R. Tambo dwelling and ensure that it stands as a heritage structure for the foreseeable future.

The surrounding ground area will be finished with some landscaping to avoid any further erosion and exposure of the foundation. This will entail reshaping of the ground but finishing will still be the natural grass that is present already.