



DakshinaChitra



A GLIMPSE OF SOUTH INDIA



## *Conservation and Reconstruction of Timber Buildings*

*The DakshinaChitra Experience*

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Reconstruction of the houses at DakshinaChitra has taken place with an architect and by different traditional craftsmen teams, each from the region from which the house was removed. This article records the methods of the transplantation of the Kerala buildings, which are primarily timber constructions, but the principles used were applied to homes from the other regions.

### *Measured Drawings of Buildings*

The goal in dismantling a home is to be able to accurately reassemble it at the new site. The key is simply that all members should be numbered and the numbers noted in a drawing or numbered in such a way that one can easily find out which piece goes where. We followed the procedure below at DakshinaChitra while making the measured drawings.

- We cross checked all the measurements at the site itself (Unlike a measured drawing for documentation purposes, we knew we would not be able to cross-check once the building has been dismantled).

- We calibrated our tape with another tape to avoid differences between tapes, particularly the tapes we were going to use at the site for reconstruction.
- We photographed extensively before demolition as well as at various stages of demolition to minimize doubt regarding what goes where.
- We measured all details, despite having photographed extensively, for approximation is always an approximation.
- For details such as cornices, etc., we made a template before demolition and used it for reconstruction.
- In measuring each detail, we specified in the drawing, for example, which cornice we had measured and where that cornice was located.
- The levels of the various rooms of an old building are very confusing. We clearly marked levels in the drawings.
- When measuring the heights of the walls and parapets, we found that the floors of the building were not absolutely level. Old craftsmen were not bothered about the rectangularity and levels of the rooms.
- When the timber roofs were measured, we found that the distance between the masonry walls is not critical. What was more important was the distance between the wall plates.

The team was familiar with the basic techniques of construction which helped to avoid mistakes and confusion. For example, we dismantled each door to its individual pieces (10 to 12 pieces). Since no nails were involved it was easy for us to do so. Finally we had to assemble them again into a door at the site. We numbered each of the timber members of the door and recorded them in the drawing.

### *Method of Numbering*

We numbered the different pieces of the building before the demolition started and marked the same on the drawing. For example, we gave the number on the rafter as FRN8. What it means is that the member belongs to the first floor (F), R denotes the rafter, N denotes the north side and 8 denotes the number. So looking at the number, we know for each particular piece which floor it is located on, how it is used, and on which side it comes.

In the case of the wall plates and beams, the north or east direction was marked to locate the correct position of the timber member in the reconstructed building.

### *Demolition of the Buildings*

During demolition we numbered the pieces which had been inaccessible before. Another problem which cropped up was that what we saw as a single member, often ended up being two or three different members when dismantled. Because we were aware of the details of construction, the job was fairly simple. The method we adopted in DakshinaChitra was to have the head mason, the head carpenter and the architect at the demolition site supervising every stage of the demolition.

Some of the damaged pieces, especially timber pieces, broke into two or three and could not be used in the reconstruction. We gave numbers to these particular beams, for example, GMD2, which is a main beam in Room D in the Ground Floor. The fact that GMD2 was damaged beyond use was recorded in the drawing and in a log book so that we would not spend hours looking for this member.

During the demolition of the buildings, the critical dimensions were marked on a long timber piece (for long measurements, timber pieces have to be joined). This scale was used at the site for setting out the building in order to avoid any error in



the tape measurements. This is the traditional method of measuring and the craftsmen were more comfortable with this method of scaling the critical measurements.

### *Procedure Adopted for the Work at the New Location*

At DakshinaChitra we stacked the materials with the number showing and in the order in which they were required for reconstruction. A modern masonry foundation had been constructed and termite treatment applied at the foundation level.

One of the first tasks in cleaning the timber members was to transfer the number to another side which would not be seen. This was checked by two people, because any error in the numbering at this stage would have caused us a lot of problems and would be difficult to find out.

The timber was cleaned and sanded to remove the dirt and any paint or similar coating which had been applied over the years. No chemicals were used for cleaning. The paint was removed by using a burner and then scraping over it. If the timber had been affected by any termites, we made sure that insecticide was applied to the particular timber member alone.

We did not apply any timber preservative or protective coating for the timber members. Only the affected members were treated. It would have been very expensive to treat all the timber members with the preservative. What we decided was to treat the affected members and then check regularly for problems. We applied only a 'sealer' coat, so that even if the timber is attacked at a later date, we can apply any treatment needed.

There was no adjustment in reconstruction even though the rafters, beams, etc., could be interchanged. There was no

attempt to correct any mistake in the old buildings. Such mistakes can be seen in the new reconstructed buildings.

The policy adopted was to replace the old timber only when it was absolutely necessary from the structural point of view. The termite eaten pieces were stabilised, and used because they continued to serve the purpose they were intended for. Whenever we had to replace the old timber because they were beyond repair, we used old timber from other demolished buildings to repair the reconstructed structure.

In the case of some large timber beams which were badly damaged, we have inserted steel sections to carry the load and strengthen the beams. But none of these are visible externally anywhere in the buildings.

### *Craftsmanship*

One does not need very skilled craftsmen to transplant a building when compared with the skill required for making it. But while we were involved in the reconstruction, there were many problem areas where we did need to consult highly skilled carpenters. Traditional methods were used to solve the problem.

While we were doing the reconstruction, the comparatively young team of craftsmen, many of whom were from traditional carpenter families, consulted their fathers in areas where they needed help. We consulted older craftsmen on various topics which were required for the reconstruction. The skills have definitely come down over the years, but the craft is in danger of dying. If we are able to do new buildings using traditional building materials and techniques, it will thrive once again.

The traditional craftsmen use a different scale for the measurement of the roof and the buildings. It is known as *kole* (literally, pole) which is approximately 72 centimetres. The dimensions and the length of the



rafters, etc are calculated using this scale. We have used the same measurement system for the roof and other timber members. In the olden days, when the *kole* was used for the measurement of the roofs, it varied from building to building and place to place, because there were no standard measurements. One *kole* is equivalent to 24 *angulas*, and it varies from 71 to 75 centimetres from place to place.

The importance of the *kole* measurement is to know the slope of the roof. The craftsmen did not do the roof according to any degree slope or rise:span ratio. They had a different system of calculating the slope, which is the reduction from a 45 degree angle. So if a carpenter says that the roof is with a slope of 1 in 6, it means that 1/6<sup>th</sup> of the height is reduced compared with a 45 degree slope. For calculating the slope of the roof and to do the missing timber members, we had used the traditional system of calculation. For this we had to know the exact length of the *kole* which they had used in the old building. In the Calicut house, we could locate the *kole* which was put under the wall plate and in the other buildings, the traditional craftsmen had marked on the beams with a chisel the measurements they had used to construct the roof.

### *Economics of Transplantation*

In the transplantation of the buildings, we found that the cost of the reconstructed buildings with all the timber was more or less equal to that of a new building. That is because we were able to get the old buildings at a much lower price (roughly 25% of the cost of a new house at that time). These were buildings meant for demolition and had already come into the market. The people who buy these old buildings are the demolition contractors who sell the old timber to people who make doors, windows, almirahs and furniture from the “recycled” timber.

By transplanting these buildings, we have not only saved the buildings but also provided visitors to DakshinaChitra with a glimpse into the lifestyle of the people of Kerala and other regions of the South.