

ANCIENT BUDDHIST STŪPAS AND THE NATIVE TECHNOLOGY OF SRI LANKA

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Introduction

Stūpas are called “chaitiya”, “dagaba” and some time “saya” in Sri Lanka. Stūpas are monumental structures built to honour the Lord Buddha and the sacred relics. They are not tombs. Stūpas symbolize the supremacy of sacred relics of the Buddha and venerable Sanghas. According to the history of Stūpa, the oldest Stūpa in Sri Lanka was built by King Devanampiyatissa (250 – 210 BC) and it was named as ‘Thuparamaya’. With the passage of time more Stūpas were built by kings, and out of them the most notable ones are RuvanvaliSaya by king Dutugamunu (161 – 137 BC), Abayagiriya by king Walagamba (89- 77 BC) and Jetavana by king Mahasen (276- 303 AD). Meanwhile the Jethavana was the third tallest structure and largest brick structure in the world. The most venerated Stūpa in Sri Lanka is the RuwanveliSaya, because it enshrines the most amounts of corporal relics of the Buddha. However Thuparamaya, Tissamaharamaya, Mirisawati, Ruwanvali, Abayagiri, Jetavana, Kirivehara, and Rankoth vehera are also some of the most important ancient Stūpas in Sri Lanka.

Technology of ancient Stūpas in Sri Lanka

Solid structures of the ancient Stūpas in Sri Lanka are built mostly of burnt bricks. The structural form of the Sri Lankan Stūpa has changed from the original Indian form to a form of its own. The main components of a Sri Lankan Stūpas are the basal rings, dome, square chamber, spire, minaret and crystal. Dome is the biggest component of a Stūpa and it contains the relic

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chamber, either in the level of the basal rings at the bottom, or in the square chamber at the top. Several shapes have been used for the dome, described as the bell, bubble, paddy heap and lotus. The bell and bubble shapes are most common and the huge Stūpas like Abhayagiri and Jetawana are of the paddy heap shape. This shape is the most stable form from the structural point of view, as it produces no tension in the dome under self-weight. The ancient Sri Lankan builders have arrived at this shape, may be by trial and error, for the colossal Stūpas they built. According to the Mahawansa great care was taken in selecting the sites and laying the foundation. Most Stūpas are founded on rock and for others elaborate preparations of the foundations are made. Then butter clay is spread over the stones and bricks are laid over the clay. Then on top of these, rough cement and a network of iron is laid. Finally a sheet of copper and a sheet of silver are laid. This more or less gives a reformed concrete foundation with a damp seal.

Materials used in the construction

The main building block of a Stūpa is the burnt clay brick, and different sizes of bricks have been used in different component of the Stūpa. Dome, the most bulky component of the Stūpa, has an outer layer of high quality bricks of large size, and towards its inside brickbats as well as earth has been used in some Stūpas. The bricks are laid with a very thin mortar and the outside surface of the Stūpa has been protected from the elements with a thick plaster. Bricks are used for the foundations as well. Special precautions are taken for strict quality control.

Bricks

It is logical to assume that the bricks used in the construction of Stūpas were not burnt, but sun – dried bricks. These were later replaced with

high quality burnt bricks. Mahawansa in fact states that when Thuparama, the first Stūpa, was built, mud bricks were heaped over the sacred spot to form a Stūpa. The basal rings and the foundation below them, and the dome are the most voluminous parts of a Stūpa. For these parts the ancient Stūpa builders used large bricks which required both hands to handle, unlike modern bricks of much smaller dimensions. The size of these large bricks has reduced over time. The ones used in the third century BC are more than double the size of those used in the twelfth century AD. The bricks were very strong that the Stūpas stand strong since today. The brick work symbolizes stability, strength, and nobility. In ancient Stūpas brick bonding principal was strictly adhered to and no vertical joints generally meet. With the slurry like mortar the thickness of mortar is reduced to almost Zero, marking the loads transfer from one brick to another virtually by direct contact. The ancient brickwork and the brickwork used by the British in the nineteenth century are used in the renovations of Jetavana. It can be seen that five courses of ancient brickwork match four courses of the British era brickwork with thick mortar.

Plaster

The outer surface of the Stūpa brickwork is made water-proof by using a plaster layer; some of the Stūpas have several plaster, reaching an overall thicknesses of 9 to 10 inches. One of the best preserved examples is the Kirivehera at Polonnaruwa, built by king Parakramabahu in the twelfth Century AD. These plasters are like lime – concrete rather than normal stucco.

Conclusion

The skills of building Stūpas were originated and derived from Indians whereas later on the supports of Sri Lankan kings were contributed to introduce wonderful creations to the world by nourishing the cultural heritage of Sri Lanka.

Keywords: Stūpas, ancient, technology, Ruwanvelisaya, structures

Bibliography

- Desapriya, Buddhika. (2005) Sri lankawebuaddha Stūpa pratima Sahagruhanirmana, Warakapola: Ariyaprakasana.
- Hettiarachchi, P.P. Monuments and world heritage sites.
- Paranavithana, Senarath. (1972) Glimpses of ceylon past. Colombo: Lake house investment Ltd.
- Paranavithana, Senarath. (1972) Art of ancient sinhalese. Stūpa in Colombo: Lake house investment Ltd.
- Rahulahimi, Walpola (1993) History of Buddhist in Ceylon, Dehiwala: Buddhist cultural center.

