

Improvement of the Architecture of *Jethvana* temple premises from the initial state to the developed period

D.T. Mendis¹, C.R Withanachchi²

Preface

The Anuradhapura *Jethavanarma Stupa*, considered as a gigantic monument in the world and the large scaled monastery are considered as a creation of king *Mahasena* who was a great tank builder, in 276 – 303 A.D. (Mw 37:1-50). Archaeological researches by the Central Cultural Fund are launched over a period of approximately 30 years from the 1980th decade upto now, under the UNESCO – Sri Lanka cultural triangle programme. In order to examine that, these premises in which the temple is built belonged to which cultural literary style before it was built. Through the material culture, found by those research dates; this report submits a story about the build environment of the same ground from the *pre-Jethavana* period to built *Jethavana* period.

Pre – *Jethavana* build environment

According to the literary sources, there are facts that the *pre – Jethavana* build environment has started through several matters. According to the *Mahawamsa* a mid-Historic *wansakata* in which the Sri Lanka history is recorded, structure of this land in the *pre – Jethavana* period can be discussed in two parts. As,

- I. The time, before establishment of Buddhism.
- II. The time, after establishment of Buddhism.

When investigate the facts of the time before Buddhism established, it seems spreads up to a distance of about 4 – 5 B.C. According to the *Mahavamsa*, Anuradhapura becomes developed up to a city, by king *Pandukabhya*. When planning the city by him, it seems the gate villages were put up in the four directions of the city (Mw 10:88). By “*Antharapana*” of *Deepawansa* and by “*Nigama*”, “*Nigamastana*” of stone inscriptions, (Dw .IX) It is clear that there gate villages develop in to the markets with the economic development (Ez. Vol. III: No.17). If any such village was put up towards 4 – 5 BC, the most suitable place in the south of the city was arranged in the *Jethavana* temple premises. Placement of basic water facilities form the *Kadamba Nadee (Malwatu Oya)* and moisture soil, good for Agriculture from it’s valley gives a great support for that. How ever the ideas about there gate villages could be obtained through the facts about the *Kumbalgame*, develops near or inside this

¹Central Cultural Fund,² Senior Lecturer in Archaeology and Heritage Management, Department of Archaeology and Heritage Management Rajarata University of Sri Lanka, chandana.withanachchi@gmail.com

land (Ratnayake 1982: 6 - 7) and the *Welangama*, offered to the *Jethvana* temple (Ez. Vol. II) according to the *Etaweeragollewa* stone inscription of king *Dappula V*.

Like this, it seems that any village condition develops relating *pre – Jethavana* period of pre – Buddhist time and it is mentioned in the *Wansakatha* that this land where the temple was put up had been as an orchard – *Nandana uyana* (Mw. 15 : 1 - 9). It is mentioned that the Arhat *Mahendra thero* – son of *Asoka* - A great emperor of India had preached *Dhamma* for the public over seven days in this orchard. Due to these conditions, it is proved that this temple land had been civilized before the temple was constructed there. By the excavations from the top crust to the bed rock for getting the archaeological facts except the sources, through the Microlithic stone implements, it is proved that this land had been civilized in the pre – historic mid – stone period. It is clearly shown the finding of these stone implements from the Reddish Brown Earth as well as inner city of Anuradhapura and how ever after these settlements, human activities with developed civilizations are found in the latter period (Mendis 2003/2004 : 8 - 14).

The facts, about the first builds of the build environment in the *pre – Jethavana* period are found, by the excavation results named JSMP 2001/2002, JSWMP 2003/2004, JBOP 2005/2006 done in the *Jethavana* temple premises (Mendis 2003/ 2004 : 8 - 15). Geometrical primary builds reported from a Brown and Dark Brown soil horizon, are important about the architecture of the *pre – Jethavanaya*. These primary builds constructed up to the depth of about 1 – 2.5 meters from the top layer is made of burnt bricks. This technique is very simple such as cutting the trenches first and then filling up them by pressing well. The masonry technique is fantastic and the wall making methods was layer by layer of bricks. When filling the trench the bricks were placed in flat and narrow side system. The top hollow layer was filled with white sand. Out of this construction the left behind part is only about two or there brick layers over the ground level by now. There fore, it has been difficult to do a complete study on this (Mendis 2001, 2002, 2003, 2004, 2005, 2006)

The post holes left near by the ground bund proves that the ancient people have used scaffolds when raising up brick bunds for *pre – Jethavana* constructions. Through the above mentioned constructions that are considered as the placements of the architectural events of *pre – Jethavana* build environment, finding of physical cultural factors such as Black and red ware, Red ware, Black ware, *Laxmi* coins, *Swasthika* coins, Carnelian, Agget, Amateste, Rabaha and Quartz is also high lighted. Dr Shiran Deraniyagala points out (Deraniyagala 1992:712) that the physical cultural facts with these characters found at Anuradhapura inner city which is faced to the scientific time decisions, are belonged to the Mid – Early Historic period (Mid – Early Historic 250 BC – 100 AC). And also Dr Hema Ratnayake (Ratnayake 1993:66) who has made the bricks found from the excavations of south compound of *Jethavana stupa* in the 90th decade, in to TL dating has said that the bricks of that building were belonged to the 250 B.C. There fore by building factors, time factors and other physical and cultural factors prove that, these primary builds of rectangular or square shapes with geometrical shapes were built in this land in the *pre – Jethavana* period in the Early Historic time.

And also the ovens used for melting metals and related architectural creations found from the temple site are reported similarly to the above layers. According to that, these architectural creations make evident about some primary village level and techniques in the *pre – Jethavana* premises those evidences clear that primary architectural products were present in this land before building this temple.



Surface plan of *Jethavana Vihara*

Pre – Jethvana Build Environment

The architectural creations present on the ground of *Jethavanarama* temple can be considered as they are belonged to the temple architectural things. According to the temple sources, these temple relating Architectural creations had been mixed in to the environment in the period of 3 – 11 A.D (Mw. P. 37 - 38). Mainly the Architectural creations belong to the temple can be grouped in to two.

1. Religious Buildings
2. Non Religious buildings

Religious Buildings

- I. Stupa
- II. Chapter House
- III. Image House
- IV. Boo Shrine
- V. Damma Sala

Non Religious Buildings

- I. Residential House
- II. Toilets
- III. Well and pond
- IV. Refectory
- V. Hot Bath room

Prof Senaka Bandaranayake and Dr Roland Silva point out that above mentioned temple parts which are created systematically based on the Stupa, represent *Maha vihara* designs (Bandaranayake 1974; Silva 1998).

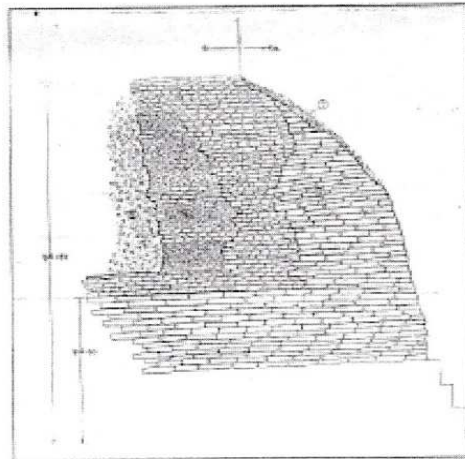
The Architectural builds of *Jethvana* temple, designed following Maha vihara system, are created using mainly following materials.

- I. Bricks and stones creations.
- II. Bricks stone and wooden creations.

Jethavana stupa and *Gedige Patimagara* can be shown as a creation, made of stones and bricks and *Boo* shrine, chapter house, *Damma Sala*, Assembly hall, Refectory, *Panchavasa* and other buildings can be introduced as Bricks, stones and wooden creations.

***Jethavana Stupa* and it's building technique**

The present *Jethavana Stupa*, seen at a height of 232 feet over the base stone slab is built in a square slab of 180«180 meters. The *Jethavana stupa*, covering an area of 11 acres including the sand – compound, could be understand that it had been as a gigantic building in the height of 400 feet when it was built in the beginning (Ratnayake 1998 : 330 - 340). This large stupa, which was built before 1600 years is still alive facing different harassments because of the highest technical skills of Architecture and Engineering of the ancient technicians of Sri Lanka. The present researches and other sources fix that the present all the inside parts of the *Jethavana stupa* in the fist period.



Ancient foundation of *Hathares Kotuwa*

According to *Mahawamsa*, king *Mahasena*, crowned in the period of 276 – 303 A.D. in Sri Lanka has constructed first, the *Jethavana stupa* and monastery complex (Mw. 37 : 32 - 34). When studying the technology, used for building old stupas in Sri Lanka, the archaeological study on *Jethavana stupa* is greater. For the recognizing of the building technology of *Jethavana stupa*, by the archaeological excavations in four types have fixed that it's foundation starts from the depth of about 25 feet from present stone slab – level. At present, it is estimated that the perimeter of the foundation of *Jethavana stupa* is 320 meters. It is started from the mother rock in the shape of circular.

The old masonry technique had been used for the *Jethavana stupa* is very attractive. Materials like bricks and clay have been used to build the stupa from the mother rock, in a system to tolerate the pressure. The layer started from the mother rock to strengthen the foundation, is constructed using the

bricks in good condition and in the size of 60 « 20 « 05 cm and 40 « 20 « 05 cm. Testing have fixed that the average P.S.I (pressure tolerance) of an old stupa brick is more than 600 pounds per one square inch. These types of bricks have been used to build the bund following up the method of layer by layer minimizing the breadth of brick holes. The breadth of the holes is limited to 2 mm and the boundary material is butter clay and it seems sticky like an ointment. When making the bund it is clearly seen the bricks are kept in flat and narrow method (Mendis 1998; Maithripala 1993). In the *Mahawamsa*, a description about building of *Mahaseya* by king *Duttagamini* is very similar to the technology of building *Jethavana stupa*.

“Samanerawarayan visin genena latha palingu gal ae matha athiroo nisa, palingu atla mattehi gal athiraweeya. Sema tanhi metiyen katayuttehi mavateena nam mettama wiya. Marendra themey rasa jalayen misrakala givulu meliyamin”

Like wise, it is mentioned that clay and gums have been used in the building technology (Mw. 29: 1 - 12). This statement is important because the materials used to join the bricks in brick works by ancient technicians takes a similarity with the archeological evidence and other sources.

Similarly the build of *Jethavana stupa* started from its mother rock has been connected to a one bund itself up to round outside bunds and the body. This type can not be seen with *Ruwanweliseya* and *Abhayagiri stupa* and it seems that their out side round bunds have been built after finishing of the body.



While starting it self the ancestors followed up the suitable technical methods for the body of *Jethavana stupa*. From the stone slab, while constructing the body of stupa in the height of 137 ft, they have followed the brick work technology to be proper for the height. They have used bricks, half bricks and brick pieces when coming from out layer inwards the body gradually (Gamlath 1997: 01). The specialty of this is, it is not built like making the square frame as a cube and putting up core bunds to it like cart wheel spokes and filling the holes with soil, similarly to the *Thopawewa*, *Daksina stupa* and a small *dagoba* of *Sigiriya* as Paranawithana has said (Paranawithana 1962: 25 - 37). Here, it is very important that they have constructed it, fixing very small brick pieces soil and bricks as a single layer (Mendis: 2000).

The factors have been found so as to identify clearly the Architectural evidences in the body of *Jethavana dagoba* because of the excavations of the large holes made due to removing out the bricks

of old body from the East and West and the excavations done in the foundation of north western frame of it (Gamlath 1997 ; Mendis 2000). According to that the builds of the body of *Dagoba* are comprised with 5 primary technical and house construction layers.

- I. Plastering of lime mixture.
- II. Permanent top brick layer.
- III. Inner layer with half bricks.
- IV. Layer with small brick pieces.
- V. Inner layer with small brick pieces and soil.

The old technicians have used lime mixture plastering to complete the body. In the *Jethavana stupa*, this lime plaster is left, over several places. It is special that even this plaster is done in several layers.

At the top is the layer, only with lime painted, introduced as white washing. Under that a second layer is of about ½ - 1 inch. It is not so strong but becomes strong after connecting with the first. The third layer is very thick. For making this, sand, lime and quarts in different size have been included. It is made so as to fix with brick layers (Gamlath 1997: 02).

Under the lime plaster is the bund made of finest bricks. This is stronger. After this as a space, half bricks and as last space small brick pieces and lowest that very small pieces and soil are used. While thinking about this technique it comes to mind that they would have used this method to stop the direct pressure coming from top of this, made like a solid.

The square frame of the *Jethavana stupa* is built on the body wall, 2.5 meters inside from the body surface. The length of it's one side is 90 meters and it is occupied on a lank more than 22 perches. When making the foundation of square frame, the technique used by ancient technician is the method of making out pointed wall. It is very important that this war built from the first layer an inside brick point.

Even the stone slab of the *Jethavana stupa* is built in a technically special method. It is built raised up 3 meters from the top ground level then. The lowest area of about 1.5 meters is comprised with 3 layers of bricks of different mixtures.

- I. The lowest layer made by mixing large brick pieces and white clay.
- II. Built by mixing brick pieces and clay.
- III. Built by only small brick pieces.

Like this, when building the next ½ meters layer after the first layer of 1.5 meters, clay on the three brick layers and sand on the clay layer has been placed. Similarly, on the layer, made of sand, again a clay layer and on that, 3 brick layers and then the stone slab have been created.

Review

When considering this situation, it is specially shown that in building each parts of the *Jethavana stupa*, very special technical methods have been implemented. For construction of Brick stone and wooden creations – specially the Chapter house, Refectory and Residential house etc, using of stone

Improvement of the Architecture of Jethavana temple premises from the initial state to the developed period

foundations and brick walls and for roofs and upstairs wooden posts can be shown. These temples, in the built *Jethavana* period were improved on the incorporation of the different kings, according to the written sources. All these sources prove that the architecture of the *Jethavana* temple has been started in the *Pre – Jethavana* period and more developed in the built *Jethavana* period. According to that it can be decided that for this development, the understanding of the land through the civilization relating this place in the Pre – Buddhist era could have been most helpful.

Acknowledgement

First of all, I am grateful for constructive comments and thoughtful insights from Professor Dr. S Senavirathne and Mr Pemasinghe Bandaranayeke for valuable comments and technical support.

References

English

Deraniyagala S.U.1992 **The Prehistory of Sri Lanka Part II**, Departement of Archaeology Survey, Government of Sri Lanka

Rathnayake H. 1984 **First Archaeological Excavation and Research Report**, Central Cultural Fund, Colombo

Rathnayake H. 1993 Jetavana Stupa and Monastery Complex, 64 – 85, **The Cultural Traingle**, Unesco Published

Wickramasinghe D. M. D. Z; H. W. Codrington 1928 – 33 **Epigraphia Zeylanica Vol. III**, Archaeology Survey of Ceylon, London

Wickramasinghe D. M. D. Z1912 **Epigraphia Zeylanica Vol. II**, Archaeology Survey of Ceylon, London

Sinhala

ගමලන් ධනංජය 2001 ජේතවන ස්තූප හතරැස් කොටුවේ ඉදිකිරීම් තාක්ෂණික ක්‍රම. 42 - 50, වැළිපිල පුරාවිද්‍යා සඟරාව 5 වන කලාපය, ඒකාබද්ධ පුරාවිද්‍යා උපාධිධාරී සංගමය, මධ්‍යම සංස්කෘතික අරමුදල

ගමලන් ධනංජය 1997, ජේතවන ස්තූප ගර්භයේ ඉදිකිරීම් තාක්ෂණික ක්‍රම. 1-8 සංස්කෘතික පුරාණ 2 වෙළුම, 8 කලාපය, මධ්‍යම සංස්කෘතික අරමුදල

දීපවංසය 1959 සංස්කරණය, කිරිඇල්ලේ ඥාණවිමල හිමි, ඇම්.ඩී. ගුණසේන සමාගම. කොළඹ

පරණවිතාන සෙනරත්, 1962 ලංකාවේ ස්තූපය, පරිවර්තනය, ඇල්. ප්‍රේමතිලක, සංඛ ප්‍රින්ට් ඇන්ඩ් පබ්ලිෂර්ස්, මීගමුව

මහාවංසය 1912 සංස්කරණය, ශ්‍රී සුමංගල හික්කඩුවේ, දොන් අන්ද්‍රීස් ද සිල්වා බටුවන්තුඩාවේ, රජයේ මුද්‍රණාලය, කොළඹ

මැන්දිස් තුසිත, 2003 ඉතිහාසයෙන් සැඟවුණු ප්‍රාග් ජේතවන අවධිය, 8 - 14 වැළිපිල පුරාවිද්‍යා සඟරාව, 6 වන කලාපය, ඒකාබද්ධ පුරාවිද්‍යා උපාධිධාරී සංගමය, මධ්‍යම සංස්කෘතික අරමුදල

එම J.S.D. 2000 කැණීම් වාර්තාව, ජේතවන ව්‍යාපෘතිය (අප්‍රකාශිතයි)

එම J.S.M.P. 2001, 2002 කැණීම් වාර්තාව, ජේතවන ව්‍යාපෘතිය (අප්‍රකාශිතයි)

එම J.S.W.M.P. 2003, 2004 කැණීම් වාර්තාව, ජේතවන ව්‍යාපෘතිය (අප්‍රකාශිතයි)

එම J.B.O.P 2005 කැණීම් වාර්තාව, ජේතවන ව්‍යාපෘතිය(අප්‍රකාශිතයි)

රත්නායක හේම, 1998 ජේතවන ස්තූපය හා ආරාම සංකීර්ණය, 330 - 340, අපේ සංස්කෘතික උරුමය, සංස්කෘතික හා ආගමික කටයුතු අමාත්‍යාංශය, මධ්‍යම සංස්කෘතික අරමුදල

රාජපක්ෂ අරුණ J.S.P. 2000 කැණීම් වාර්තාව, ජේතවන ව්‍යාපෘතිය(අප්‍රකාශිතයි)

සිල්වා රෝලන්ඩ්, 1998 අනුරාධපුර නගරය සහ නදාශ්‍රිත ආගමික සිද්ධස්ථාන වල වාස්තු විද්‍යාත්මක ලක්ෂණ, 295 - 310, අපේ සංස්කෘතික උරුමය, සංස්කෘතික හා ආගමික කටයුතු අමාත්‍යාංශය මධ්‍යම සංස්කෘතික අරමුදල