



A COMPARATIVE STUDY OF BYZANTIUM HAGIA SOPHIA AND MADURAI MEENAKSHI TEMPLE

¹Prof.Dr.D.Nagarathinam, ² M.Sivakumar, ³ & B.Ramesh Babu Maharajan

¹Principal, ²Assistant Prof. & Head, ³Assistant Professor

¹Department of Mechanical Engineering

^{2,3}Department of Civil Engineering

Theni Kammavar Sangam College of Technology, Theni-625 534, INDIA

Abstract: Byzantium was an ancient Greek city. Byzantium is now called Istanbul. It is the capital of Turkey. It is also called seven hills city. Hagia Sophia is the supreme work of Byzantine architecture. The city Madurai is the very old city of India, more than 2,500 years old. This paper describes the comparative study of Architectural beauty of Ancient city Byzantium's Hagia Sophia and the Ancient Madurai Meenakshi Temple.

Index Terms – Byzantium, Hagia Sophia, Madurai, Meenakshi Temple,

1. INTRODUCTION

1. I. Byzantium City

Byzantium was in the 5th and 6th century's center famous for architecture in Europe. It looks with extreme beauty such as golden mosaics and carved birds that pleasure an Emperor. The structure stands for complex accretion of myth, symbol, and history. Turkey in a kind of Gordian knot, confounding preservationists who want to save it from decay and restore its form glory. It is also symbolic of a heavenly place ⁽²⁾. Byzantium is now called Istanbul. It is the capital of Turkey. It is also called seven hills city. Istanbul has become a world heritage site since 1985 ⁽³⁾. It is a unique city founded in two continents, Europe and Asia. The city is divided by Bosphorus. The old city (Byzantium) was situated on the European side. The most imposing achievement of Byzantine architecture is the Church of Holy Wisdom or Hagia Sophia ^(4,5). It was constructed in a short span of five years (B.C.537–532).



Fig.1. Three Dimensional View of Hagia Sophia

Byzantium occupies one of the most beautiful and advantageous sites in the world. It was later renamed New Rome (Nova Roma). The city was rebuilt and reinaugurated as the new capital of the Roman Empire and subsequently renamed as Constantinople in 330 AD. Since the establishment of modern Turkey in 1923, the Turkish name of the city, Istanbul, has replaced the name Constantinople in 1930. **The city's largest church, the Hagia Sophia was converted into a mosque. Today it serves as a Museum of Constantinopolitan legacy.** Hagia Sophia was not destroyed by Emperor Constantine I and Emperor of Muslim for its fascinating beauty. **Fig .1.Three Dimensional View of Hagia Sophia.** The architecture was a mixture of Greek and Roman style. It has a large dome set on a square base instead of a vaulted roof ^(5, 6). **Fig.2. shows the hall elevation of the Hagia Sophia.** The walls were patched by marble with colored glass mosaics. Hagia Sophia structures placed an emphasis on decorative touches.

The central part of this third and final version of Hagia Sophia was designed as a rectangle 250 feet X 220 feet. The top dome was supported by four huge columns at the corners of the square and it was from 40 equally spaced ribs. At the dome's base, 40 windows were there creating the sensation that the dome actually floated over the church.



Fig. 2. Entrance Hall to Hagia Sophia. Source: Clausito's Foot Print

1. II. Introduction about Meenakshi Sundareswarar Temple

The original temple was built by Kulasekara Pandia in the 6th Century at first it was a temple of art and architectural elements ^(7, 8). Lord, Siva was worshiped there. At Madurai Lord, Shiva performed one of the **seven dances of Sandhya Tandava** by lifting left foot for the balance of creation whereas Lord, Shiva performed his dance of **Ananda Tandava** by lifting right leg at **Chidambaram** ⁽⁹⁾. In 1310 the temple was sacked by the infamous Muslim invader Malik Kafur. He and his soldiers in the 1310 and all the ancient elements were destroyed all the ancient elements completely and no sculptural element of the ancient temple remains today ⁽¹⁰⁾.

Meenakshi temple is situated on the southern bank of the Madurai Vaigai river which is the heart of the city of Madurai. The Meenakshi temple is dedicated to goddess Meenakshi, the consort of Lord Shiva. Madurai Meenakshi temple is the international tourist attraction as well as one of the most chief places of Hindu pilgrimage. Madurai Meenakshi temple is considered as **'The Athens of the East'**. The East Tower served as the main entrance to the Temple. Since then Sri Meenakshi, the goddess, gained importance.

2. The Tallest 170 feet South Gopuram

The temple has **14 gopurams** including two magnificent exquisite sculptures of Golden gopurams. The tallest south temple tower is 51.9 meters (170 ft) in height. **Fig.3. Shows the South Tower of Madurai Meenakshi Temple.**



Fig. 3. Madurai Meenakshi Amman Temple South Tower. Source: Wikipedia

3. Porthamarai Kulam: It is the sacred Pond with a Golden Lotus known as **Porthamarai Kulam** located inside the temple, a very holy site for devotees. and people have to go around the tank to enter the main shrine.

4. Doppler Effect

If we walk along the corridors, the pitch of the noise made by people come running from the opposite direction will be amplified by the Doppler Effect. The space noise (infrasound) from the **Pon Thamarai Kulam**, being a white noise will mask the background noise. We can talk to our friends or family with intelligibility. If there is rain, in the water in the tank the white noise effect is accentuated. All acoustic energy is degraded into some form of heat energy. If water is retained in **the Pon Thamarai Kulam** viscous attenuation of acoustic heat energy is possible. **Fig.4. shows the Photo Graphical View of Porthamarai Kulam.**

The **Pon Thamarai Kulam** is situated inside the temple to collect rainwater from the terrace and to get space noise to overcome the Doppler Shift and for viscous attenuation of acoustic heat energy. All statues are designed and fixed not as an accident.



Fig.4. A Photo Graphic View of Porthamarai Kulam. Source: Flickr.com

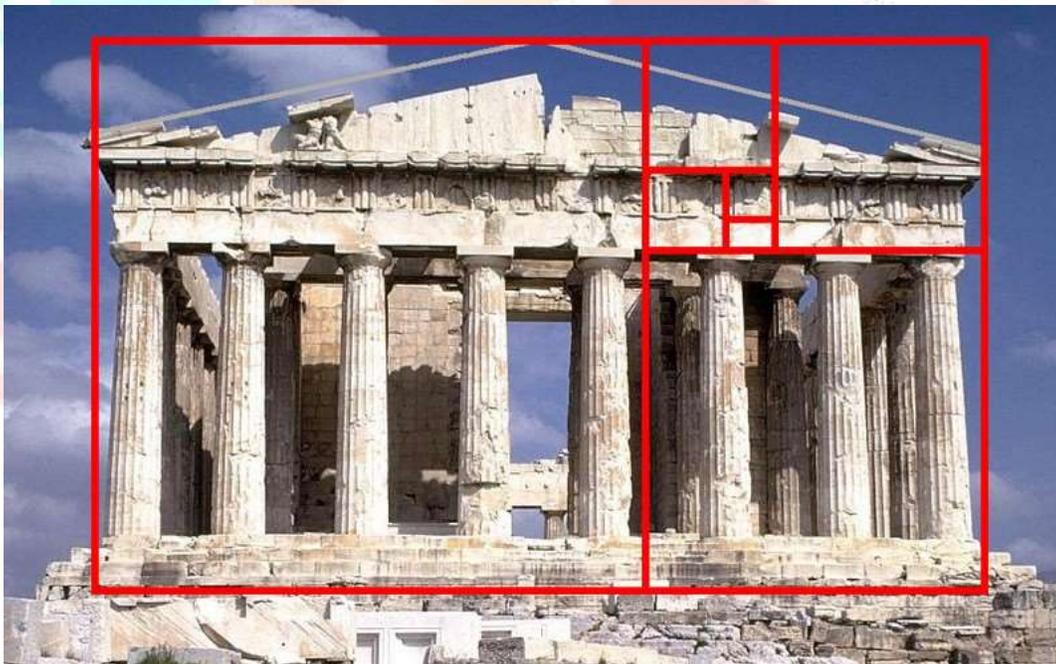


Fig.5. Fibonacci Spiral for Byzantium Construction.

5. Fibonacci Sequence:-

By definition, the first two numbers in the Fibonacci sequence are either 1 and 1, or 0 and 1, depending on the chosen starting point of the sequence, and each subsequent number is the sum of the previous two. Example: 0,1, 1, 2, 3, 5, 8, 13, 21, 34, 54...A Fibonacci Spiral approximates the golden spiral using quarter-circle arcs inscribed in squares of integer Fibonacci-number side, shown for square sizes. **Fig.5. shows how this Fibonacci Spiral profusely used in Byzantium construction.**



Fig. 6. Thousand pillars Mandapam at Madurai Meenakshi Temple. Source: Flickr.com

S.No	BYZANTINE HAGIA SOPHIA	MADURAI MEENAKSHI TEMPLE
1	It is located in Istanbul, Turkey.	It is located in Madurai, Tamil Nadu, India.
2	It is a symbol of Byzantine Architecture.	It is a symbol of Dravidian Architecture.
3	Hagia Sophia was decorated richly and artistically by Greek Architecture.	The Madurai temple was decorated so richly and artistically by Dravidian Architecture.
4	Natural disaster i.e. an earthquake caused severe damage throughout the striation in 1344 and various parts of the building collapsed.	Manmade disaster i.e. Muslim invader Malik Kafur caused heavy damage to the temple in A.D.1310 and all the ancient elements were destroyed completely
5	The Church Hagia Sophia is converted into a mosque in 1453.	It is a temple for Madurai Meenakshi and it is not converted.
6	The Hagia Sophia construction consists of mostly masonry.	The Madurai temple construction consists of mostly masonry.
7	It has a large dome at the Top of the Hagia Sophia.	It has a Flat roof surface at the Top of the temple building.

Table-1: A comparison of Byzantine Hagia Sophia and Madurai Meenakshi Temple

6. Thousand pillars Mandapam at Madurai Meenakshi Temple

At Madurai Meenakshi temple parallel walls or parallelism produces standing waves, which in turn creates echoes. Hence the statues on the pillars in any hall have random distribution to avoid symmetry and parallelism. All parts of the statues are proportioned to the **Golden Ratio 1.618** and the Fibonacci Spiral is profusely used in the statues. Fibonacci learned number theory from India and also through the Arabs.

During the 7th and the 8th centuries, the Mandapam have flat roofs usually covered with massive stone slabs. The Mandapam in the south Indian temple is often large in size. (hundred pillar mandapa, thousand-pillar mandapam. Pillars are all well ornamented and also, they display carvings of gods and goddesses. 1000 Pillars hall of Madurai Meenakshi Amman Temple (Fig.6.) was built which is

older than *Nellaiappar Temple*, Tirunelveli. This 1000 Kaal *Mandapam* which contains 985 (instead of 1000) carved pillars. It is also, maintained by the Archaeological Survey of India. Table -1 shows a comparison of **Byzantine Hagia Sophia and Madurai Meenakshi Temple**.

7.1. Askta Sakthi Mandapam

The visitors who enter the temple through the eastern gateway they first enter through the Askta Sakthi Mandapam.(Fig.7). The visitors are not entering through eastern gopuram. During the construction of eastern gopuram, the gopuram had collapsed and few workers died. So the visitors started avoiding to enter through this gopuram and they started entering through Askta Sakthi Mandapam. This Askta Sakthi Mandapam was built by Thirumalai Nayakar's wives **Rudrapathi Ammal and Tholimamai**. Askta Sakthi Mandapam is an impressive structure with a hemispherical ceiling. It is 14m long and 5.5m wide. There are bas-reliefs all over the place.

7.2. One School of Thought

It was built with the help of a **Roman (Italian)** Architect. But the citation was not there in history. But the people are believing that only Greek and Romans were good at this architect. (Refer above architectural view).

7.3. Another School of Thought

Thirumalai Nayakar Mahal was built with the help of a Roman Architect. Thirumalai Nayakar's wife Rudrapadi Ammal wanted to construct a hemispherical structure by seeing the Thirumalai Nayakar Mahal. Therefore this Askta Sakthi Mandapam was built by our architect in order to prove that we can also construct an arch-type of Mandapam that is the reason, this Askta Sakthi Mandapam was constructed by our Indian architect.



Fig. 7. Ashta Shakthi Mandapam for Eastern Entrance. Source: Flickr.com

8. Conclusion

Byzantium Hagia Sophia and Madurai Meenakshi Sundareswarar Temple are symbols for the beauty of art and architecture. Byzantine is the premier monument of civilization. These symbol stands for the immortal world of art and architecture. The Emperor of Christians and Muslims realized the beauty of art and architect with Esthetic and Aesthetic sense with spirituality in Byzantium Hagia Sophia which is a symbol for Greek Architecture and it was not demolished by anyone and the name has changed. Madurai Meenakshi is the symbol for Dravidian Architecture which was plundered and looted by Malik Kafur ⁽¹⁰⁾ in the later 14th Century. Also, he destroyed it, taking back with him all the temple treasures¹ and reconstructed by the Pandian king.

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