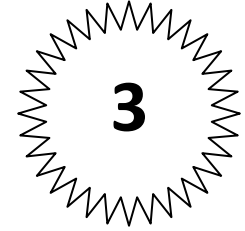


. MUSIC MARVELS IN ARCHITECTURE

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Abstract: Architecture being one of the classic fine arts disciplines has long had a close relationship with the art world. Architectural works are typically recognized as cultural icons and work of Art. Art is a medium of expression that can be interpreted in many ways while architecture is a mixture of Art, technology and structure. Musical terms like Rhythm, Texture, Harmon, Proportion and Articulation referred both in architecture and in Music. Repetition of elements in music is repetition of sounds and in architecture, it is repetition of openings and shapes. Architecture and Music are based on creativity and design principles. Music and Architecture when brought together by rhythm and proportions from which creativity and ideas are born. The stunning beauty and craftsmanship that is showcased on the stones in the form of musical pillars and musical steps in South India are Marvels of Ancient Indian Architectural fine arts, which are the base for later development in Music Architecture.

Keywords: Architecture, Music, Musical pillars, Musical steps, Indian temples, Musical notes.

Need for study: The creative beautiful Arts, Music and Architecture combines to form Musical Architecture which can construct new Musical Instruments and Music Auditorium with perfect acoustics. This study is to bring out the Music Marvels in Architecture.

Methodology used: Historical method to show the Indian musical steps of 12th century and Indian musical pillars of 7th century and comparative method with other Architectural structures of the world.

Introduction: Architecture is the Art and Science of designing and engineering large structures and buildings. Architecture is a fine art commonly known as the high arts. These fine arts have been regarded as the pinnacle of aesthetic value for a long time. Architectural works are perceived as cultural and political symbols and work of Art .India has a rich culture especially with highly appreciated temple architecture from early period. Most of the Art and architectural remains that survive from ancient and Medieval India are religious in Nature. The types of architectures established are not by Architects but by the society according to the needs. Society sets a goal and assigns to the architect the job of finding the means of achieving them. The history of Architecture is concerned more with religious building than with any other type The Arts reflects the society that creates them through their temple, sculptures, and buildings. Indians incorporated a fundamental principle of their culture.

Architecture: Architecture being one of the classic fine arts disciplines, has long had a close relationship with the art world. Architectural works are typically recognized as cultural icons and work of Art .Art is a medium of expression that can be interpreted in many ways while architecture is a mixture of Art, technology and structure. The key of architecture is both form and function.

Musical Architecture: Musical terms like Rhythm, Texture, Colour, Shapes Harmony, Proportion, Repetition and Articulation referred both in Architecture and in Music. Rhythm in music is patterns of sounds in relation to a beat. Repetition of elements in music is repetition of sounds and in architecture is repetition openings and shapes and Structural bays establish regular or irregular rhythm in architecture.

Music Theory of Architecture : Architecture and Music are based on creativity and design principles such as rhythm , colour , shape proportion , harmony , unity , repetition , and others . They share art relationship through performance and visual techniques to create alternative innovative design proposal. Structure or form in music referred to the arrangement and order of the parts or sections of the music. The structure of a piece of music is a predetermined order. In Architecture the fundamental structure is fixed and the arrangement of parts or sections that are improvisation or innovation are added.



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Music and Architectural relations: Music and Architecture are creative art forms. When Architecture and music are brought together by rhythm and combinations they will create new ideas and new inventions . The modern architectural buildings and new musical tunes are the consequences of the above.

Musical steps in Indian Architecture: Singing Steps – Darasuram – Tamil Nadu

Singing Steps - Musical steps: The Airavateshvara Temple built by Rajaraja – II in 12 th Century at Darasuram near Kumbakonam , Tanjore district , Tamil Nadu , India features with brilliant achievements of the Chola Architecture which belongs to Dravidian Architecture .The musical steps is



one of the wonders of Chola Dynasty who did that a thousand years ago. This temple has **singing steps** made up of stones that produce 7 swaras on tapping. Very Interesting fact about this temple is the Agra mandapa (spacious front portion of the temple) has attached to square Porch of 7 meters (23 feet)side. It has ornated carved steps that go east and west. Each step emits different tone of the musical scale. One can hear 7 swaras (notes) at different points. It is astonishing that it is produced by intricately carved balustrade steps .This shows the musical knowledge of the Indian Architect who

had constructed the steps. The notes are emitted according to the nature of the stone (length, width , height , density , air columns and so on) This step shows extraordinary mastery of Indian Architects on various musical notes and various material which could produce such musical sounds . It is one of the highest form of Science in Rock melting technology and Architecture.

Musical Steps in Croatia : It is a Music Organ which is an architectural sound art object . It is a experimental musical instrument which produce music by Sea waves. Located in Zadar Croatia this sea organ was designed by architect Nikola Basic. From a distance it looks like a set of stairs on the seafront. But a closer analysis, it divulge seven steps each act like 7 chords. This steps when hit by the sea waves produce a harmony of sound. The Sea organ looks like series of marble steps which underneath hide 35 organ pipes catch the sounds of waves entering and escaping the hallowed out holes producing a unique soundtrack .

Musical steps - Sea Organ - Zadar, Croatia .



The sounds played is the result of the different lengths and sizes of the organ pipes and the music is powered by the energy of the sea with the waves of high tide and low tide. The organ sits along 230 feet of the Adriatic coastline. Each step contain five pipes that are installed into the cement and produce completely different chords. Narrow channels connect them all so as waves crash into the steps the water pushes air through the pipes and creates a unique sound. They are called **Singing Steps**. There is no repetition because the

sea is ever changing, so every sound the organ makes is unique.

London Festival of Architecture – 2016 : Xylophone like pavilion built for London festival of Architecture The architecture studio pH+ has created a pavilion in Greenwich that can be played like a giant musical instrument built in a Peninsula square for that year’s festival. The Pavilion features walls covered in Copper pipes, allowing the building to function as a huge Xylophone. The Xylophone like structure frame a pathway that forms the Pavilion Perimeter. Children are invited to pick up small mallets at the entrance allowing them to make music by striking the wall.



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London Festival of Architecture



Musical Tree - England



Architectural music Tree: This is an incredible bit of architecture and a magnificent musical instrument .It is 3 – meter- tall wind powered musical sculpture made of galvanized steel pipes. Located in Burney England which was completed in 2006 to create music through nature by Wind. This was designed by Architects Mike Tonkin and Anna Liu. The main structure is made up of bent steel pipes constructed in the shape of a Tree. When the steel pipes hit by the wind create a Harmony of sounds covering number of Octaves. Recycled telegraphic lines were used for constructing this musical Tree. This is called **Singing and Ringing Tree**. Due to the varying length and narrow slits on specific pipes the music tree produces wonderful musical notes.

Musical pillars:

The musical notes that erupt from the musical pillars of many temples are also a highly commendable effort of Architects of India from a very early time. One of the Iconic work of these ancient temples are Musical pillars. They are the architectural structures, speak wonders about that period's exceptional Crafts man ship. Music and architecture are the products of a common cultural milieu.

Musical Pillars in South India:

Tamil Nadu ; The Temples with Musical Pillars are seen all over Tamil Nadu , Andra Pradesh , Karnataka and Kerala. Tamil Nadu dominates all the states in numbers.

- 1) Nellaiappar Temple in Tirunelveli,
- 2) Meenakshi Amman Temple in Madurai,
- 3) Thaanaumaal Ayan Temple in Suchindram,
- 4) Alwar Thirunagari Temple in Tirunelveli
- 5) Shembajarama Nallur Temple in Tirunelveli.
- 6) Airaavatheswarar Temple in Dhaarasuram,
- 7) Thaadikombu Temple in Dindukkal.
- 8) Kalakkaadu in Tirunelveli.
- 9) Courtaalam near Tenkasi
- 10) Varadaraajar Temple in Kanchipuram.
- 11) Alagar Koil in Madurai
- 12) Thirumayam Temple in Pudukottai .

Andhra Pradesh:

- 1) Venkateswara Temple - Tirupath
- 2) Veerabhadra Temple - Lepakshi

Karantaka :

- 1) Vittala Temple - Hampi



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Kerala:

1) Padmanabaswamy Temple - Tiruvananthapuram

Structure of Musical Pillars: Musical Pillars are a group of stone pillars. They produce melodic musical notes when tapped. These pillars are not so excessively burdensome or costly. Musical Pillars are firm, very narrow in shape. They are made out of a single block of stone. They are usually arranged in groups around a central pillar which is attached to the roof of the temple. Usually these pillars are 3 to 7 feet long and are of circular cross sections. Some pillars are also square, rectangular, octagonal, polygonal in cross sections. Most of these Pillars are plain without any carvings.

1. Musical Pillars of Nellaiappar temple :



Musical Pillars of this temple belongs to 7th Century. It is the earliest Musical Pillar found in South India. It was built in the period of Pandiya King Nindraser Nedumaaran. Each Pillar is carved out of a single Rock or Stone. It has a central strong Pillar around it 48 small cylindrical tubes are surrounded. The architecture here is of such high standards and caliber that a cluster of 48 pillars were carved from a Single stone. There are 161 Pillars in total which make the Musical Sounds.

Madurai.

2 Musical Pillars of Meenakshi Amman Temple -



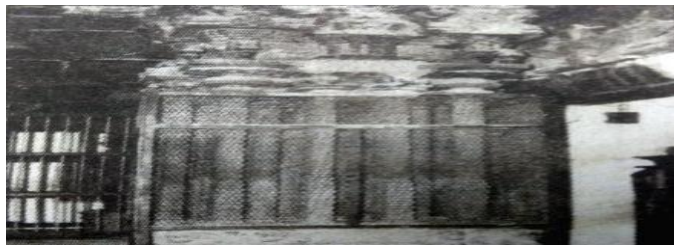
There are 5 Musical Pillars seen in Meenakshi Amman Temple, Madurai. They are Monoliths, It has large Central Pillar which is surrounded by 22 small Pillars. These small Pillars are cylindrical in shape. The upper and lower portions of the pillars are square in shape and the middle Musical Pillars are Circular and cylindrical type.

3. Musical Pillars of Suchindram temple :

This temple is built by Chera King Marthanda Kulasekara Perumal of 1410. There are 4 Musical Pillars carved out of a single stone which stands 18 feet (5.5 m) in height. In northern side there is a Musical Pillar with a strong Central Pillar surrounded by 24 Pillars. In southern side there is a Musical pillar with a central Pillar surrounded by 35 Pillars. The shape of

each Pillar is octagonal at the top which is attached to the ceiling and square at the bottom attached to the floor.

Musical Pillars of Suchindram temple



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4) Alwarthirunagari Temple :

Stone Naagaswaram : Other than Musical Pillars blowing stone musical Instrument seen in Alwarthirunagari Temple which is called Stone Nagaswaram, a wind Instrument. The stone Nagaswaram is shorter version of present day Nagaswaram. The middle part of the body is made up of Stone. We can play with this Nadaswaram even today. Same type of Stone Nagaswaram is seen in Kumbeshwarar Temple of Kumbakonam.

5. Shenbagarama Nallur temple : It is a Vishnu Temple present in Nanguneri District of Tamil Nadu. These blowing pillars have a cylindrical shape with conical bore in the center which is about 1 foot long. This pillar has a hole about 1 inch in Diameter in one side and slightly smaller hole on the other side. When we blow through the big hole we can hear conch like sound and while on the smaller hole Ekkaalam (a temple instrument) like sound.

Architectural Acoustics :

Architectural acoustics involves designing a building to control how sound waves reverberate off its interior in such a way as to maximize clarity, amplifying sound in areas where it is appropriate to do so and reducing noise levels where doing so is beneficial.

International Center for Music – Poland



The International Center for Music: RMJM Arta Tiran designed the center. His aim is to find a best design in Zelazowa Wola , Poland . The centers concept design is based on creation from nothing. “The creation from Nothingness “ is the school of thought of Chopin’s .The structure of the building is divided into three layers. These three layers act as time, varying compositions and recreate the intervals of music .

Music Park Auditorium Rome



Music Park Auditorium Renzo Piano: This music Park is located in Rome. This Park consists of three music boxes of different capacities and features. The symphony concerts are held at main auditorium. To achieve optimum acoustic conditions huge cushions, moving seat tops and wall hangings are used. Huge cushions are hanged out from the ceiling to break the sound. The medium and small halls have mechanical systems which will allow to move the moving seat tops, and stages. This will give a great versatility to adapt to the requirements

of musicians.

Conclusion: The above different examples shows how architects interprets music in their architectural work .The impact of music is seen in Architecture in many works. Architecture is not just an Art, the Architects are trying to convey their feelings through a constructions. Therefore it is essential for anyone to approach things not as architects but also as Artists of different category. The musical notes that



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erupted from the musical pillars and steps are a highly commendable work of Architects of India from a very early time. One of the Iconic work of these ancient temples are Musical pillars and musical steps. They are the architectural structures speak wonders about that period's exceptional Crafts man ship. Music and architecture are the products of a common cultural milieu. The stunning beauty and craftsmanship that is showcased on the stones in the form of musical pillars and musical steps are Marvels of Ancient Indian Architectural fine arts which are the basic structures for later new innovations in Music Architecture.

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