



RESEARCH ON THE NEED FOR A STANDARDIZED INSTALLATION GUIDELINE FOR ATHANGUDI TILES

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Abstract

Athangudi tiles, originating from the Chettinad region of Tamil Nadu specifically the Town of Athangudi, represent an architectural heritage, craftsmanship of the Chettinad Style made using locally available lateritic soil, and natural oxide to provide the colors for the tiles, hence made using the region natural resources and sun-dried (not kiln-fired), making them eco-conscious, and their intricate patterns created by detailed stencil work and interlocking techniques, reflect their communal identity and craftsmanship. These tiles are significant to the artisan community who are following the traditional techniques passed down through generations and depend on these tiles for their livelihood, similarly the tiles are also a significant part of the Chettiar community being a key part of Chettinad architecture. However, in modern construction, they face major performance challenges, being handcrafted tiles they are prone to Human error. Problems such as cracking, unevenness, hollow-sounding floors etc are frequently reported when traditional techniques are not applied properly, therefore proving it requires skilled labours. Furthermore, modern contractors often lack the level of skill required for the installation of these tiles that are critical to achieve the aesthetic appeal of Athangudi tiles. The existing national and international standards of BIS and ISO, primarily address ceramic, vitrified, or granite/ marble flooring systems and fail to accommodate the nature of these heritage tiles.



This research aims to develop a standardized installation guideline for Athangudi tiles by combining traditional craftsmanship with contemporary construction practices. This research focuses on the tile installation techniques so that the traditional practice of making of the tile by artisan community can still be maintained without being disrupted, instead serving as a guideline for laying of the artisan made tiles through a detailed review of literature regarding athangudi tiles, analysis of artisan methods for the installation of tiles, and comparative analysis of existing flooring standards of Marble/ Granite, the study identifies the crucial parameters influencing installation quality. The expected outcome of the study are step-by-step guidelines that can serve as a reference material for architects, interior designers, and masons emphasizing key procedures to be followed for the proper installation of Athangudi Tiles. By systemizing the tile installation and handling processes, this research seeks to spread works of these artisan communities through awareness methods for the masons to learn the laying technique through workshops, exhibitions, entrepreneurial centre.

1. INTRODUCTION

1.1 Background and Context

Athangudi tiles are a traditional artisan made flooring material from the Chettinad region of Tamil Nadu specifically the Town of Karaikudi, Sivagangai District. The Tiles are known for their intricate patterns made with Stencil work, vibrant colors from Natural oxides, and for bring eco-friendly sun-dried products. Made using locally available lateritic soil, sand, cement, and natural oxides (coloring material), they reflect the region's vernacular identity and. The craft has been practiced by specific artisan communities where the knowledge has been passed on for generations, forming an essential part of their cultural heritage, and being one of key mark of Chettinad architecture and local livelihood.

1.2 Research problem statement

These heritage flooring tiles from Tamil Nadu are specifically pursued for their eco- friendliness, traditional look and cultural significance to specific communities like the Chettiar Community. However, due to the lack of standardized installation techniques and lack of skilled labour, these tiles often face issues such as cracking, unevenness, and water damage if not done properly by Athangudi professionals. The existing BIS and ISO standards for flooring account for Granite, Marble, Industry available ceramic tiles etc., which doesn't account for the handcrafted properties of Athangudi tiles. This result in market decline like the accessibility of the tile shrinks



significantly when we move out the state of Tamil Nadu due to lack skilled labour leading to the shrinking artisan community due to less inflow of work, and eventual risk of this heritage craft disappearing.

1.3 Aim and Objectives

Aim

To develop standardized installation guidelines for Athangudi tiles by documenting traditional practices and addressing performance failures such as cracking, unevenness, and water damage caused by the lack of standardized methods and the need for skilled labor, thereby improving durability, adoption, and cultural preservation.

Objectives

1. To document traditional installation practices followed by Athangudi artisans.
2. To analyze common performance failures arising from improper installation techniques.
3. To compare Athangudi tile requirements with existing BIS and ISO standards for granite and marble flooring.
4. To develop a comprehensive standardized guideline for installation that balances traditional craftsmanship with modern building practices.

1.4 Scope and Limitations

The study focuses on developing standardized installation guidelines for Athangudi tiles. It delves into research about documentation of traditional artisan tile making and installation techniques, identifying the various failures that occur due lack of skilled labour, and comparing the traditional installation technique with existing flooring ISO and BIS standards for marble and granite. The research emphasizes standardizing installation practices rather than the artisan based manufacturing process of the tiles, ensuring the preservation of generational old craftsmanship while allowing for a wider market. The study is specifically limited to Athangudi tiles produced in the Karaikudi region of Tamil Nadu due to the detail research about the same therefore does not extend to other types of handmade or industrial tiles.



1.5 Research Questions

1. What are the critical factors affecting Athangudi tile performance during and after installation?
2. How do traditional installation methods differ from modern tile-laying practices?
3. Which steps are essential for improving durability, strength, and water resistance and finishing of Athangudi tiles?
4. How can standardization improve market adoption and heritage preservation?

Chapter 2: Literature Review

2.1. Overview

- **Origin, Heritage, and Cultural Significance**

“It is named after the village “Athangudi” in the Sivagangai district of Chettinad, Tamil Nadu, where they were originally made. The Chettiar community traded extensively initially and used imported materials to build their palaces and mansions. After realising the expenses of the repairs of these sourced materials, the community set up a cottage industry to make the tiles with local materials and the tile-making craft was born.” (Totade, S., 2025), hence the wealthy Chettiar merchants, who were extensive traders who travelling across Southeast Asia and Europe, they set up a small scale industry in the village of Athangudi (Sivagangai district) to produce these Athangudi tiles

“By the 1920s, these tiles had become a signature element of Chettinad homes, celebrated for their durability, vibrant patterns, and cooling properties suited to the region’s climate.” (Pradhan, S., 2025), becoming a valued part of Chettinad architecture being a significant part of the Chettiar community

“The tile manufacturing has been practiced in Athangudi for nearly four generations tracing back its origin to the 18th Century. For more than 100 years, their predecessors in Athangudi have been producing handcrafted colorful tiles that come in a variety of colors and patterns and are made through a unique process that ;e44employs local soil and glass plates.” (Ramanathan et al., 2024), this showcases that Athagudi tiles are a heritage craft with their knowledge being passed on for generations & generations



- **Material & Manufacturing process**

“Riverine sand particles dominate the grain size, followed by silt and clay. Quartz is a major mineral associated with 45 other minerals found in the soil samples. The chemical composition of the soil is mainly made of silicate” (Ramanathan, R., & Dhakshinamoorthi, J., 2023). “Athangudi tiles are made using local materials such as sand, cement, and synthetic oxides.” “The synthetic oxides are used to create various colours” (Times of India, 2024), Athangudi tiles are made of locally available riverine sand/ laterite soil, cement, and synthetic oxide which give color to the tiles

“An 8-step-process is what makes the traditional Chettiar palace tiles durable. This begins with placing a piece of glass, shaped according to the tile size on a metal frame, and a stencil placed over this. The colours and cement are mixed separately, and scooped onto each section of the stencil. The metal frame is removed carefully, while the colours spread out evenly. To keep this in place, a thin layer of sand is sprinkled over and the stencil is removed. Over this comes a layer of cement, which is also levelled and pressed for an even finish. After the frame is removed, the tiles are dried for a day, and cured in water for 8-12 days. The cured tiles are sun-dried and shaped for a smooth finish.”

(Sekar, M., 2025), these are key 8 step which are thoroughly followed for the manufacture these handmade Athangudi tiles.

- **Traditional Installation Methods**

Traditional Installation Methods - “The laying process of the Athangudi Tile is a time consuming, practiced technique. In order to achieve the precision in the tile arrangement with seamless joints as seen in traditional Athangudi tile flooring, skilled labour is of paramount importance. The tiles are laid on a bed of 30mm thick cement mortar. Traditionally, the base mortar was prepared with lime, this keeps the Athangudi flooring much cooler than any other conventional tiling method. In recent times owing to time constraints in modern building practices, materials like cement mortar are preferred for the base bed as its drying and setting time is far lesser than that of lime mortar.” (Ramanathan et al., 2024), this explains the traditional installation technique of Athagudi tiles, it requires:

1. Sub-base preparation i.e. 30 mm-thick mortar bed.



2. Tile placement i.e. Tiles are laid directly on the fresh mortar, pressed gently with a thin iron plate to achieve good contact.
3. Levelling & alignment i.e. level each tile individually ensuring seamless joints,
4. Curing i.e. After the full floor is laid, the mortar is allowed to set and the tiles are kept damp for several days (often by spraying water) to cure.
5. Finishing touches – Once cured, excess mortar is scraped off, joints are cleaned, and the surface may be lightly rubbed with coconut oil or a soft cloth to bring out the natural gloss.

Need for Skilled Labour

“Even laying the tiles requires expert masons because the sides of the tiles are not polished evenly. Masons from Karaikudi are said to be the best in laying out the tiles in an even manner” (Gangopadhyay, 2022), “Even the laying of the tiles calls for great precision and should ideally be done by a mason trained in the art of laying Athangudi tiles to ensure properly levelled surfaces.” (GoodHomes, 2022). These instances prove that the technique of installing these Athangudi tiles require extensive knowledge about the process need for Skilled Labour.

2.2. Performance Issues due to lack of skilled Labour

“The low income of the craftsmen is one of the important reasons why Athangudi tile manufacturing failed to attract more people to learn this very old art form”

“The shortage of labour has led to a considerable reduction of tile manufacturing. Manufacturers across Athangudi hesitate to take on large volumes of orders due to the shortage of skilled labour.

The main reason for the decline in skilled craftsmen is a low income. Migration of the natives to other better paying jobs is a prominent threat that poses this industry.” (Ramanathan et al., 2024)

“It shows some cracks on surface of tiles after setting and hardening process.” (Anand et al., 2019)

These points prove that the skilled labour required for the installation of Athangudi tiles is declining due migration of other better paying jobs, posing a threat to this heritage industry. Due to the lack of skilled labour, there are few performance issues that occur -



- Cracking and durability issues - “It shows some cracks on surface of tiles after setting and hardening process.” (Anand et al., 2019), this proves that these traditional tiles tend to develop surface cracks over time, especially when subjected to rapid drying, or if the curing process is rushed or the mortar bed is not kept damp long enough or if the tile itself is not soaked to the appropriate time required to achieve the perfect finish of the final product, proving the lack of skilled labour and improper knowledge of the installation technique of these heritage handmade tiles.

2.3. Standards

Comparing the standards of Marble & Granite with Athagudi tile based on thickness and properties, we can assume the standards of Granite & Marble for a clean finish Athangudi Flooring.

In this research I have used BIS standards for Granite & Marble to be guide for Athangudi Tiles

“The slabs shall be rectangular or square and of specified dimensions, the tolerance on length and breadth shall be + 2 mm and on thickness + 1 mm.” (Bureau of Indian Standards, 1995). We can use these standards maintain proper measurement of the thickness of these handmade tiles, ensuring a smooth flooring finish.

“Allowed dimensions – Preferred tile sizes are 60 × 60 cm, 50 × 50 cm, 40 × 40 cm,

30 × 30 cm, 20 × 20 cm and 10 × 10 cm, each typically 10 mm thick; other dimensions may be supplied by agreement.” (Bureau of Indian Standards, 1969)

For the installation process we can also refer the Granite & Marble standards but being heritage tiles, these require their specific installation technique, but Marble and Granite Technique can be a stepping stone for learning Athangudi tiles installation

2.4 Research Gap

Although existing literature discusses the heritage value, manufacturing process, and decline of skilled labour in Athangudi tile production, there is a significant lack of research on standardized installation procedures. Current BIS and ISO standards focus on granite, marble, or industrial ceramic tiles and do not address these tiles, being handmade heritage craft these tiles have unique, porous, and variable characteristics of Athangudi tiles.



Chapter 3: Research Methodology

3.1 Research design

This study follows a qualitative and exploratory research design. Since Athangudi tiles are a heritage material with undocumented practices, an exploratory approach helps in understanding community knowledge, on-site behaviours, and performance failures. The research also uses a comparative framework, analysing traditional installation practices against BIS and ISO standards for granite and marble.

3.2 Data collection methods

Primary Data

Structured questionnaire distributed to architects, interior designers, tile installers, and contractors (responses analysed in Chapter 4).

Secondary Data

1. Review of published research papers
2. Athangudi Tiles related articles, reports, and design documentation
3. BIS standards for natural stone flooring like Marble and Granite

3.3 Tools

- Questionnaire survey to measure awareness, challenges, and training needs using Google form.
- Comparative standards analysis (BIS & ISO).
- Content analysis of artisan processes from literature.

3.4 Sampling & Participants

- Architects



- Interior designers
- Tile contractors
- Masons familiar with Athangudi installation

3.5 Ethical considerations

- Cultural sensitivity was maintained by respecting artisan community knowledge and avoiding any exploitation or misrepresentation of their traditional craft.

Chapter 4: User Analysis

4.1 Section A: General Awareness

The responses indicate high general awareness about Athangudi tiles among the surveyed group. Most respondents answered “Yes” to knowing about Athangudi tiles and their traditional process. A smaller portion indicated “Somewhat” aware, showing partial knowledge, while none selected “No.” In terms of experience, many had worked with Athangudi tiles occasionally, and several respondents had worked with them frequently, especially architects and designers. Only a few reported never having worked with them. Therefore the questionnaire reached the hands of experts and amateurs on the field of Design

4.2 Section B: Installation Process Knowledge

There is a strong consensus that specialized knowledge or training is essential for Athangudi tile installation.

- Critical steps identified across responses, the most frequently selected critical steps were:
 1. Mortar bed preparation and thickness
 2. Tile soaking before installation
 3. Proper curing time
- **Awareness of official guidelines**



Most respondents selected “No” or “Not sure”. This shows that no formal guidelines are known or accessible, confirming the need for developing standardized instructions. This showcases the key research gap responsible for this research

4.3 Section C: Challenges & Failures

- The responses reveal several recurring issues observed after installation, Uneven joints and thickness variation were among the most frequent.

- **Main causes identified, Respondents consistently pointed to:**

1. Lack of skilled labor (most selected)
2. Poor installation technique

- **Most respondents rated the difficulty as 4 or 5 (very difficult).**

This confirms a severe shortage of skilled installers capable of handling this heritage tile.

4.4 Section D: Comparative Insights

- Experience with other flooring - Most respondents has experience with modern flooring systems such as granite, marble, ceramic, etc.

- Comparison with modern tile installation, majority responded that Athangudi tile installation is - Much harder or Slightly harder than modern tiles.

4.5 Section E: Standardization Needs

- Need for step-by-step guidelines - A strong majority selected “Yes.” Professionals clearly want a formal standard to reduce installation failures.

- **Preferred format for guidelines**

Choices: Digital manual (PDF), Printed manual, Workshop / training sessions, Video tutorial (less frequent), Poster-based picture presentation (rare)

Workshops and manuals were especially popular being the top choice for the standardization



guideline format.

- **Leading of the standardization**

The choices were - Government organizations, Independent NGOs / craft preservation groups, Architects / Interior designers, Local artisans.

The highest choice being Government organizations. Respondents expect official involvement but also recognize the importance of community-led preservation.

Chapter 5: CONCLUSION

This research identifies a clear need for standardized installation guidelines for Athangudi tiles, as the absence of proper training and documentation results in frequent performance failures such as cracking, uneven joints, hollow-sounding floors, and water damage. The findings confirm that installation success heavily depends on skilled labour, particularly artisans from the Athangudi region, whose traditional knowledge is currently undocumented and at risk of being lost. Thus, the research concludes that developing a standardized yet culturally sensitive installation guideline is essential for preserving the craft, improving performance outcomes, empowering artisans, and integrating Athangudi tiles more effectively into modern construction practices.

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