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E-B Environment - Behaviour Proceedings Journal

AQoL2023Bali
https://www.amerabra.org

e-IPH e-International Publishing House Ltd., United Kingdom

07th Asia-Pacific International Conference on Quality of Life
Wina Holiday Villa, Kuta, Bali, Indonesia, 30 Sep – 02 Oct 2023

Heritage Conservation: Documentation of Rumah Tok Gajah, Kuala Berang, Terengganu

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Abstract
The originality of Malaysia's original culture and history will eventually disappear unless local heritage is preserved and recorded. Inadequate documentation may make it more difficult to preserve this heritage. Thus, data documentation and compilation are an alternative option. The objectives of this study are to identify the Malay architectural heritage and the uniqueness of traditional house of Rumah Tok Gajah. Data were gathered by on-site measurement, observation, visual analysis, and a detailed evaluation of the house's components. The output of this study is limited to two-dimensional drawing, manual sketches and also laser-cut models with frames has contributed for data documentation.

Keywords: Heritage; Conservation; Documentation; Malay Traditional House

DOI: https://doi.org/10.21834/e-bpj.v8i26.5149

1.0 Introduction
Rumah Tok Gajah in Kuala Berang, Terengganu, is an example of a legacy that may be and is recognised by the current generation. It requires appropriate attention as a Malay heritage that needs to be conserved and cared for in the greatest way possible. This research paper aims to analyse Rumah Tok Gajah, a type of traditional Malay architecture selected to illustrate a conservation and preservation effort through data documentation and compilation. Additionally, this research paper will investigate how Rumah Tok Gajah can be conserved and preserved by archiving all the drawings through digital and hand-drawn sketches and by creating a laser-cut model framed into certain sizes. The distinctiveness and effects of several elements in Rumah Tok Gajah will be analysed and documented. The definition of heritage is something of worth that is passed down from one generation to another, according to the 2005 National Heritage Act (Act 645) and the 2017 Heritage Building Conservation Guidelines (GPPBW). It discusses painting traditions, culture, locales, structures, archival materials, prints, and writing books and papers. Because cultural legacy has value from an aesthetic, archaeological, architectural, cultural, historical, scientific, social, spiritual, linguistic, or technological standpoint, it is a valuable asset. Thus, one of the various ethnic groups living in Malaysia, the Malays, are the owners of the traditional Malay house, a piece of

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DOI: https://doi.org/10.21834/e-bpj.v8i26.5149

architectural history that must be carefully preserved for the benefit of future generations. In Malaysia, both the governmental and commercial sectors are giving priority to the preservation of historic structures.

1.1 Research Objective

The objectives of this study are to identify the Malay architectural heritage and the uniqueness of the Malay traditional house of Rumah Tok Gajah (RTG). Preservation can be achieved by creating a laser-cut model framed and archiving all of the documented RTG digital and manual drawings. The morphology of RTG is also described in this research paper for documentation and further discussion of cultural heritage to pique interest and foster an appreciation of traditional Malay houses among younger generations.

2.0 Literature Review

The cultural heritage can be split into tangible and intangible categories. In general, everything that can be seen falls under the category of tangible cultural property, including mobile (such as coins and paintings) and immovable (such as structures and monuments) items that can be found on dry land and underwater (Abebe, A. H., & Gatisso, M. M., 2023; Abdul Aziz, N.A, et al., 2020). On the other hand, intangible cultural heritage deals with more subjective elements like tradition, dances, rituals and values of the legacy resources.

Traditional Malay houses feature aesthetic design values that were formerly a sign of the grandeur of the art that can be discovered in Malay villages. The Malay people's awareness of the tradition of the traditional Malay house must now be established so that it does not become restricted and destroyed by age. However, heritage is in danger due to the lack of experience and exercise, meticulous care, proper appreciation, and off-course community negligence. Heritage management is an essential and growing field with stewardship, conservation, recording, identifying and analysing from the point of public interest. Proper heritage management can generate economic activities, enhance aesthetics, increase surrounding land value, and transfer knowledge from generation to generation (Hasan, M. H., et al., 2022).

Traditional Malay houses included intricate architectural details such as decorative components that should be prioritised. Components of spatial symbol, functional purpose and memory place are part of heritage conservation. These three components demonstrate a sustainability cycle of historic houses and cultural memory, which can ensure the practical application of the heritage conservation approach (Zhou, W., et. al., 2022). As a result, the traditional Malay houses are a part of historic houses that are significant for the conservation strategy due to their abundance of decorative components.

Tuan Ahmad Tuan Abdullah, 64, of Kampung Pauh, Kuala Berang, also known as Pok Tun among the locals, is the 150-year-old owner of RTG. RTG is located in Warisan Pahlawan Resort, Kuala Berang, Terengganu (see Figure 1). At the Warisan Pahlawan Resort, guests have the opportunity to experience "*Kampung*" culture by lodging in their preferred traditional houses. This resort provides possibilities for guests to appreciate culture and heritage.

The house is named after Tok Gajah, an iconic Malay hero in the fight against British invaders. RTG is one of 16 traditional houses etched on a one-hectare land in Kampung Pauh, Kuala Berang, where all the houses created over the 17-year construction period are currently used as village inns. Pok Tun claims that before the house could be properly restored, he initially purchased several traditional houses sold by locals in Terengganu, including the RTG. Pok Tun has maintained ownership of various home collections due to his interest in traditional house designs with unique carvings. In essence, Pok Tun himself restored the RTG's carvings and structural elements.

(a) (b)

Fig. 1: (a) Main Façade of RTG in Warisan Pahlawan Resort ; (b) RTG in Warisan Pahlawan Resort compound.
(Source: Warisan Pahlawan Resort Website, 2021)

Typically, according to Tuan Ahmad or Pok Tun, all the traditional Malay houses he bought had solid construction but had been damaged on the roof part because of the use of "senggora" roofing tiles material. Pok Tun travelled to Kelantan to purchase the "senggora" roof tiles to maintain this traditional house's authenticity. Traditional Malay houses were often placed in accordance with traditional beliefs. Socio-culture is considered as the law within a society that dictates and forms the society's characters and way of living, collectively or individually (Ibrahim, I., et al., 2020). The architecture of the traditional Malay houses reflects the physical environment to portray the family and community manifestation of the cultures and behaviours (Azman, N.S., et al., 2022).

2.1 Conservation and the Importance

There are several distinct contexts in which the term "heritage building conservation" might be used. But what is conservation all about, and how can one contribute? Conservation of historical structures is, in general, a technological endeavour. Physical work was needed to preserve the heritage buildings' materials and structure. It is a process to stop deterioration, and the objective is to extend the lifespan of buildings. Due to misguided notions about conservation, the general public's perception of the preservation of local historic structures has remained relatively negative. Despite the fact that our country is now classified as a developed one, there is still a part of our heritage legacy that we must conserve and preserve. The existence of heritage buildings serves as a reminder of our roots and a teaching tool for the younger generation.

The Malay Traditional House embodies the design aesthetics initially viewed as a symbol of the glory of the Malay community's art of struggle. With references to the National Heritage Act of 2005 (Act 645) and the Guidelines for the Conservation of Heritage Buildings of 2017 (GPPBW), the conservation process involves guarding against the destruction or repair of a historically significant structure without careful planning and supervision. One method of extending the life of a building so that it can last for future generations is through preservation, which entails labour to maintain the original condition of a building and heritage site.

2.2 Uniqueness of a Cultural Heritage

Cultural heritage: includes tangible or intangible forms of cultural property, structure, or artefact and may include a heritage matter, object, item, artefact, formation structure, performance, dance, song, or music that is relevant to Malaysians' historical or contemporary way of life, on or in land or underwater cultural heritage of intangible form but excluding natural heritage (Heritage Act, 2005). Cultural heritage is considered an irreplaceable treasure of humanity, showcasing its achievements over generations. The need for cultural heritage identification and preservation is generally known, and experts are attempting to use all methods available to achieve this goal. Heritage building falls under tangible cultural heritage and can be defined as a building or groups of separate or connected buildings aged more than 100 years with a unique value of architecture, homogeneity or their place in the landscape and have outstanding universal value from the point of view of history, art or science (Heritage Act, 2005). Heritage building conservation in Malaysia has been initiated by both the government and the private sector. Heritage is the preservation of our past for the present and future generations.

Prior authors claimed that architectural sites, old and historical structures are evidence to a community's cultural identity and legacy that must be preserved (Hasan, M. H., et al., 2022). The concept of "appropriate updating" is central to heritage conservation, which holds that cultural assets should comprise components that enable societies to understand and modify their past, appreciate the present, and make initiatives for the future (Zhou, W., et al., 2022). People may relate to and learn about not just the lives of their forefathers but also the building advancements achieved in the past through recognising the attributes of architectural sites and historical structures.

2.3 Documentation of Cultural Heritage for RTG

The use of digital technology in data collection and item status recording could be highly significant. The application of digitalisation could overcome the limitation of data documentation by producing a comprehensive visual culture of images, interactive concepts and systematic findings (Zeng, Q., et al., 2023; Aburamadan, R., et al., 2021). Digital technologies have the potential to greatly simplify and speed up the documentation process while also providing a precise result and accurate output for establishing the conservation phase. The common features of documentation are namely, (1) *recording*, (2) *digital inventories*, (3) *management* and (4) *visualisation and presentation* (Haddad, N. A., et al., 2021; Khalil, A., et al., 2021). It is vital to remember that documentation involves various tasks such as surveying, testing, monitoring, and acquiring textual and other information.

Table 1. The Categorisation of Documentation Techniques

Category	Application
Image- based	Photogrammetry
	IR Cameras
Non-image based	Traditional
	Terrestrial Survey
	Laser Scanner
Combination Method	Photo-Laser scanner
	Structural-light

(Source: Hassani, F., 2015)

According to Hassani, F., (2015), under the category of *image-based*, photography is a fundamental tool for documenting cultural legacy at a particular point in time. These data must be produced and archived to meet future needs in the preservation and conservation process. The image serves as the foundation for data collecting of the targeted object in this category, and the coordinates are accessible after the processing phase. As the most important examples of image-based approaches, photogrammetry and infrared cameras are discussed here. Next, he also added for the *non-image-based category*, images are not the base of the surveying process, and the coordinates of the different points can be accessible directly using range-based tools. Furthermore, Hassani, F., (2015) highlighted that the *combination methods category* involved tools that are introduced in this section have the structure and characteristics of both previous categories, which means they take advantage of image-based methods with photogrammetry bases, as well as non-image-based techniques that survey the target by transmitting beam to the surface. To that end, these technologies attempt to compensate for the shortcomings and issues of two other categories.

3.0 Methodology

Several published literature and documents emphasise the importance of cultural heritage documentation (Hassani, 2015). Hassani (2015) also mentioned cultural legacy is threatened by various circumstances, including natural disasters, vandalism, urban development, and ageing, which, in a pragmatic view, cannot guarantee their eternality and must be preserved at all times. As a result, we must ensure that they are carefully documented so that, in the event of their loss, we may pass on the documentation and recording archives to future generations or, if necessary, use them for reconstruction purposes. Due to that, his study investigates the qualitative data which includes; (1) On-site field survey, (2) observation on visual and physical attribution, (3) sketches, digitalised drawings and laser cut. The physical measurement that has taken place in RTG involves conventional and digital methods to record data. On-site measurement includes collecting information on the physical characteristics of special elements, which is significant in traditional Malay houses.

3.1 On-Site Field Survey

A team of students aided in the measurement of the building elements. The main data was acquired through recorded measurements, technical illustrations, and photographic documentation of the spatial elements in RTG. The comprehensive and scaled drawings were essential for comprehending and scrutinising the various elements of the house.

3.2 Observation on Visual and Physical Data

The site and the building were subjected to observational assessment during the site visit. Within the framework of RTG, a sequence of site visits was conducted, concentrating on various house components such as the roof, walls, flooring, and secondary elements like doors, windows, columns, and balustrade designs. This observation process was sustained and involved a comparative analysis with the basic physical attribution of the traditional Terengganu house.

3.3 Verbal Data

The interview with the owner of the collector of the traditional houses provided some data on the house regarding the background, special characteristics and spaces of RTG. It is clear that the special element, characteristic and carvings' form was kept within specific bounds, and when combined with those shapes, it provided the impression of a particular kind of traditional house architecture.

3.4 Documentation via Digital, Manual Sketches and Laser Cut

Site drafting is characterised as a direct technique digital tool since it requires the user to pick information to be captured at the time of capture (Quintero, M. S., et al., 2007). According to Fai et al., (2011), existing heritage building documentation is a challenging task that often needs a hybrid approach to visualising heterogeneous resources such as survey data, CAD drawings, pictures, and 3D non-contact imaging data.-This research involves all three methods that are distinct in producing measure drawings. Digital documentation uses tools like CAD software, while product production uses the laser printer to achieve high precision and visualise the 2D drawings. Laser cutting utilises laser technology to create precise physical models or templates for better visualisation and prototyping. These methods have been used to provide the correct accuracy level and the intended purpose of the measure drawings.

4.0 Finding

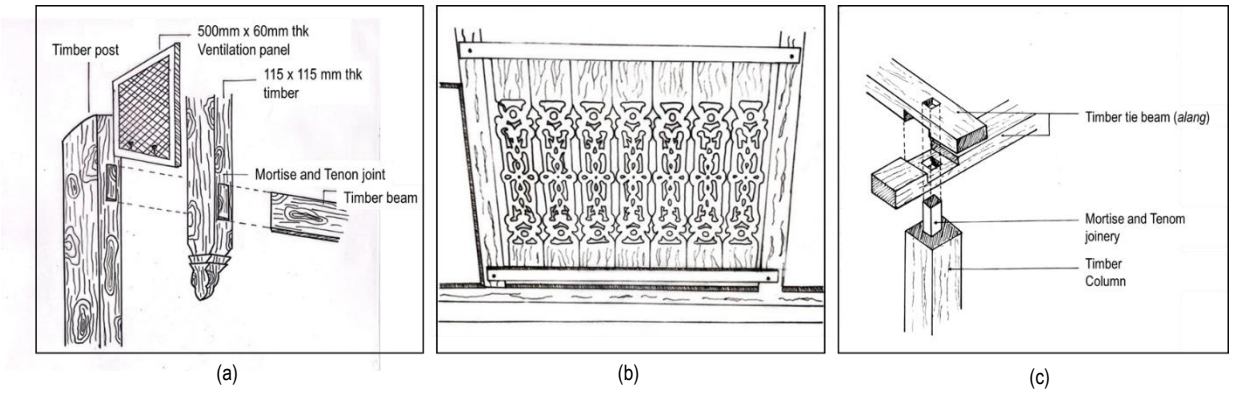
(a) (a) (b)

Fig. 2: (a) Existing photos of RTG that showed the roof design; (b) Existing photo of RTG roof plan ; (c) Laser-cut in frame of Roof Plan of RTG *(Source: Author, 2023)*

The documentation of cultural heritage conservation is needed for measuring and documenting a house, even in the absence of any existing drawings or records of the house's original state. This documentation is essential to understand the changes made to the house over time, particularly in the case of "*Rumah Terengganu*" and another house, where the extension of this house is believed to have been done by the owner. The need for documentation of cultural heritage conservation depends on the accessibility of reference resources. Limited archive of paper-based sketches or accurate references that can be discovered for RTG to be utilised as reference materials. Thus, the information was gathered through on-site measurement, observation, graphical analysis, and detailed examination of the house's parts. It can be embarked under the *combination method* category of documentation techniques, which involves both image- and non-image-based methods. Both image-based and non-image-based techniques for RTG documentation provide highly accurate references for 2D drawings that may be used to produce manual sketches, detailed technical drawings, and even laser-cut models with frames (see Figure 2).

RTG conservation via digital media platforms can be significantly enhanced by referring to visual reference materials such as manual sketch drawings, pictures, and on-site measurement drawings (see Figure 3). Considering traditional Malay houses included intricate architectural details such as decorative components, site inspection should be prioritised. Observation would be the most important function for keeping all RTG technical records anytime and wherever needed.

This study revealed the presence of aesthetic components that highlighted the distinctiveness of RTG. Most of RTG's carving and decorative elements can be categorised under non-structural elements. Four decorative components stand out in RTG attributable to their uniqueness namely, (1) *kekisi*, (2) *kepala pintu*, (3) *kepala tingkap*, and (4) decorative wall panels. RTG depicts the typical Malay timber house, which is typically adorned with intricate wood carvings depicting many motifs and philosophies on the exterior walls, above the doorways, or in the windows to promote appropriate ventilation in addition to aesthetic appeal.

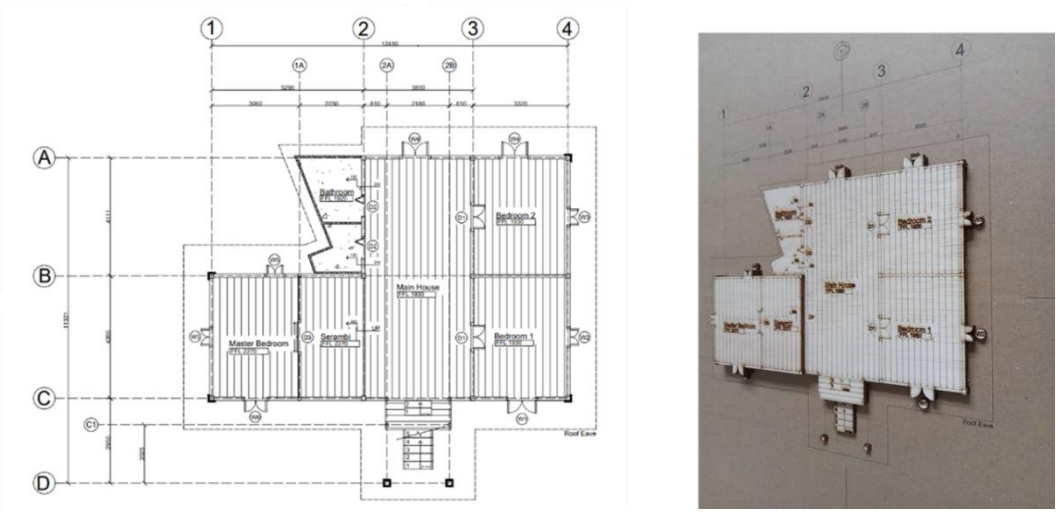


(a) (b) (c)

Fig. 3: (a) Manual sketch drawing of ventilation panel of RTG; (b) Manual sketch drawing of "*kekisi*" of RTG; (c) Manual sketch joinery for column and beam of RTG

(Source: Author, 2023)

4.1 Uniqueness of RTG



(a) (b)

Fig. 4: (a) 2D drawing of RTG Layout Plan ; (b) Laser- cut of RTG Layout Plan.

(Source: Author, 2023)

RTG featured a classic Malay traditional Terengganu house in form and plan. It is a wooden house built on high terraces about two meters off the ground and has walls made of wood or bamboo. In addition to meeting people's social, cultural, and economic needs, the Terengganu house reflects Malaysian culture's creative and aesthetic skills (Awawdeh, T., et al. 2019). RTG has six main areas, including the main house (*Rumah ibu*), the verandah (*serambi*), the master bedroom, and the bathroom (see Figure 4). The carved panels, which complement features of the house's general form, make the RTG design stand out clearly. Rashid, S., et al., (2021) highlighted that decorative elements are the non-structural components considered an additional component to the building that adds an aesthetical value.

In regard to the shapes of the railing panels, window head (*kepala tingkap*) and the doorhead (*kepala pintu*), it is clear that the carvings' form was kept within specific bounds, and when combined with those shapes, they provide the impression of a particular kind of traditional house architecture (see Figure 5 and Figure 6). Most timber houses in Terengganu and Kelantan have ventilation panels, which are the most common style of carvings. The majority of them are installed on top of doors, windows, and upper portions of walls in the form of ventilation panels (Kamarudin, Z., et al., 2010).

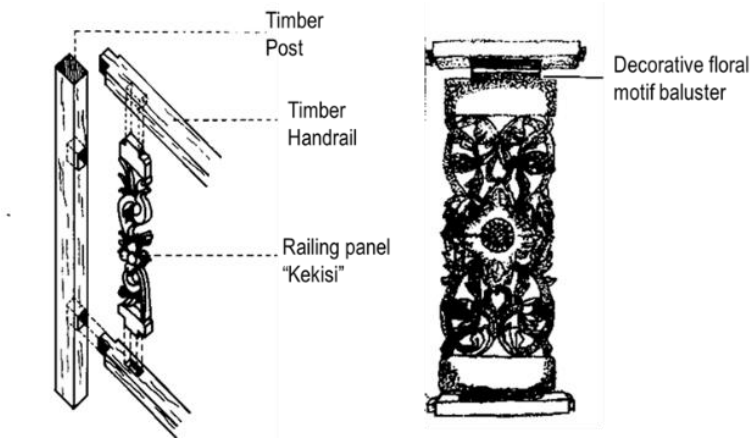


Fig. 5: Manual sketches of the decorative elements of RTG
(Source: Author, 2023)

(a) (b)

Fig. 6: (a) Digital drawing and existing photo of RTG railing panels; (b) Digital drawing and existing photo of RTG "kepala pintu".
(Source: Author, 2023)

4.2 Principles and Approach of Conserving RTG

Heritage conservation through accurate documentation is part of extending the life of heritage buildings. Several approaches to conserving heritage buildings include restoration, preservation, and reconstruction. However, for RTG, heritage conservation only entailed the documenting and recording phases. The documentation process of RTG starts with historical research about RTG via verbal data from the building owner and the local people. It is critical to gather all relevant evidence on the structure and/or location that is to be conserved. Since RTG lacks any previous drawings that may serve as reference materials, measured drawings are being made to show the inside and outside of a structure and the structural details. Additionally, it aids in highlighting any fault areas, such as cracks or missing components. The on-site field survey process involved going through the RTG building to obtain and record information based on observations also contributed to the documentation and recording phase (see Figure 7).

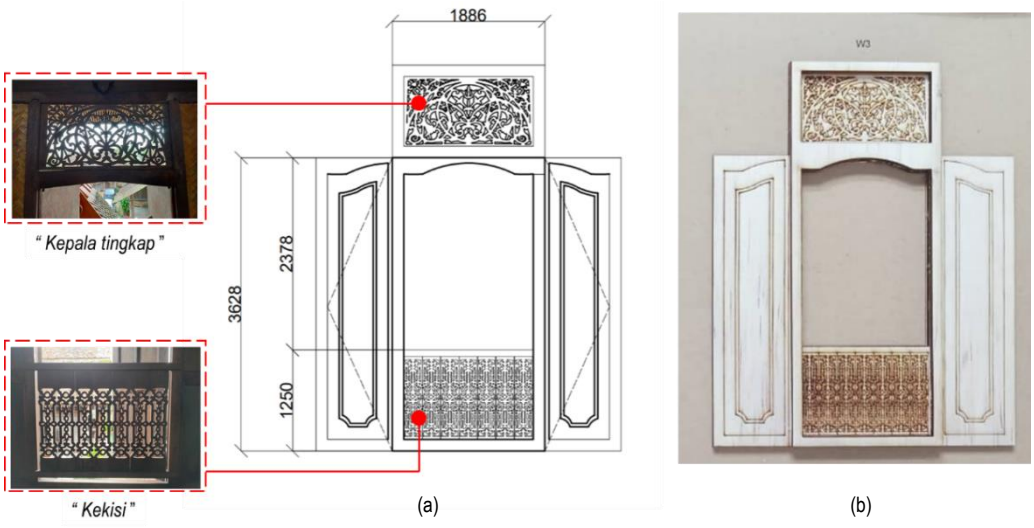


Fig. 7: (a) 2D drawing of RTG's window and existing photo of "*Kepala tingkap*" and "*Kekisi*" as reference; (b) Laser-cut of RTG's window *(Source: Author, 2023)*

4.3 Issues and Challenges

Heritage conservation, with the help of accurate documentation can have several advantages. Nevertheless, a few issues and challenges can be highlighted during this research. Firstly, RTG has no referenceable paper-based sketch, and architectural documentation is still absent. The measured drawings also included some inaccessible elements, such as roof structures. As a result, comparable investigations that are appropriate for the RTG roof type of Terengganu's "*Rumah Bujang Berserambi Berselasar*" are being carried out. Furthermore, the RTG ornamental sculptures are difficult to digitally reproduce because each wood carving has distinctive characteristics and beliefs.

5.0 Discussion

The tangible cultural heritage is the focus of this documentation. RTG represents the merging of architectural functionalism with aesthetics. Rashid, S., et al., (2021) highlighted that decorative elements are the non-structural components considered an additional component to the building that adds an aesthetical value. Proper documentation, including 2D measurement drawings, sketches, detail drawings of building components and laser-cut frames, can open up unlimited possibilities for cultural conservation activities. Conservation necessitates efficient resource management and a systematic approach to conservation efforts. RTG heritage documentation relies entirely on digital media platforms after going through the primary data phase, which includes data collection utilising cameras, measured drawings, and technical sketches. As can be identified on the digital media platform, the emphasis is on visual evidence for conceptualising the architecture in either 2D or 3D drawing. It has been highlighted that through digital media platforms, there is so much to offer, and it also creates endless possibilities for cultural conservation efforts (Zeng, Q., et al., 2023; Hamzah, N. R., et al., 2022; Aburamadan, R., et al., 2021).

The presence of the traditional house is considered to be due to a lack of sources of reference and documentation against the attempt to preserve the history of the traditional Malay House. Thus, Malay architectural heritage will be lost to time. The important thing that the Malay generation needs to be aware of today is the willingness to care for and preserve the interests of individual rights that must be implemented collaboratively within a community. RTG portrayed a classic Malay traditional Terengganu house in form and plan. It is a wooden house built on high terraces about two meters off the ground and has walls made of wood or bamboo. In addition to meeting people's social, cultural, and economic needs, the Terengganu house reflects Malaysian culture's creative and aesthetic skills (Awawdeh, T., et al., 2019).

5.1 Output of the Documentation through appropriate archive

The main output of this research was a two-dimensional drawing that served as the basis for documentation that documented all of the significant elements, structure, joineries, laser-cut model in the frame and uniqueness of RTG as part of the conservation effort via proper archives.

5.2 Documentation Strategy

It is important to compile and document all construction features, technical drawings, manual sketches, decorative elements of RTG and laser-cut models of RTG special features in the frame through digital media technologies. The measured drawing and on-site observation survey are carried out manually inside and outside the RTG building. According to the observations, data collecting was transferred into a digital platform, which resulted in detailed 2D technical drawings and contributed to producing a laser-cut RTG frame.

6.0 Conclusion & Recommendations

This study supplements the extensive research on Terengganu's traditional Malay houses. Consequently, the investigation into RTG in Kuala Berang will persist in its societal contribution, furnishing valuable insights into the architecture of the local community in Terengganu. It requires appropriate attention as a Malay heritage that needs to be conserved and cared for in the greatest way possible. All sectors should make more efforts to educate the public about heritage protection for the field's future development. The heritage building is an antique structure that chronicles the progress of humanity and gives significance to the history that occurs in our motherland. The awareness and concern of Malay people about the heritage of Malay Traditional Houses is now vital. Thus, the younger generations must know about it as evidence of their respect for the legacy of old traditions. It is also essential to consider the necessity of conserving and preserving an individual's or a group's inheritance rights. In order to increase awareness of the need to protect and hand down the heritage to future generations, it is essential to cultivate a passion and excitement for the riches of Malay history.

Acknowledgements

The Faculty of Engineering and Built Environment (FETBE), UCSI University, School of Architecture and Built Environment students and owner of Rumah Tok Gajah, Kuala Berang, Terengganu, Tuan Ahmad Bin Tuan Abdullah are gratefully acknowledged.

Paper Contribution to Related Field of Study

This research provides various contributions, with the findings assisting in a better understanding of how cultural heritage conservation can be accomplished using digital media platforms. Numerous revelations about the spatial attributes that enhance the uniqueness of Kuala Terengganu's traditional Malay houses have been unveiled by analysing the historical architectural landscape.

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