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THE 1ST INTERNATIONAL SYMPOSIUM
ON CULTURAL HERITAGE (ISyCH) 2021

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FOREWORD FROM DEAN OF FACULTY OF CREATIVE TECHNOLOGY AND HERITAGE

I am pleased that the 1st International Symposium on Cultural Heritage (ISyCH 2021) has been successfully organised and concluded. Through live and recorded sessions, the symposium managed to bring together international academics, experts, students and industry players together to share their research results and experiences in heritage studies. The event also saw the presentation of interesting papers and lively discussions. Hopefully it has been a fruitful, rewarding and long-lasting experience for all participants.

I would like to congratulate the organising committee for their hard work in reviewing all submitted papers and publishing the symposium's proceedings. I trust that these proceedings will be an excellent reference to stimulate further research in the areas of cultural heritage, locally and internationally.

We thank all authors, participants and strategic partners, namely the National Heritage Department, Universiti Malaysia Terengganu, Universiti Pendidikan Sultan Idris, Universiti Utara Malaysia, Mercubuana University (Indonesia) and Fatoni University (Thailand) for your contribution.

We look forward to seeing all of you again in the next ISyCH in 2022.

Dr. Hanisa Hassan
Dean, Faculty of Creative Technology and Heritage

FOREWORD FROM CHAIRMAN OF INTERNATIONAL SYMPOSIUM OF CULTURAL HERITAGE

The 1st International Symposium on Cultural Heritage (ISyCH 2021) was held at Universiti Malaysia Kelantan during a global pandemic. However, through technology we managed to organise this event and provided a platform for international scholars to share and discuss their research findings. This year's theme is "Cultural Heritage: The Foundation for Sustaining and Empowering of Communal Identity", a topic that is quickly gaining attention in both academic and industrial discussions. The challenges of globalisation and technological advancement, make the discourse on communal identities and engagement to heritage governance, participation and interpretation more relevant.

I would like to thank the organising committee for their tireless effort and dedication in making this symposium a success. To the editors, thank you for investing significant time and effort in reviewing the submitted papers and publishing these proceedings. Many thanks to our strategic partners for your support and participation in this symposium.

Finally, we hope to see you again in the 2nd ISyCH 2022.

Dr. Raja Iskandar bin Raja Halid
Chairman, ISyCH 2021

PREFACE

It is a great privilege for us to present the 'e-Proceedings of International Symposium of Cultural Heritage (ISyCH) 2021'. The theme for our first symposium is 'Cultural Heritage: The Foundation for Sustaining and Empowering of Communal Identity', which highlights the community as a key holder in sustaining cultural heritage and how the local heritage shapes the community's identity. ISyCH 2021 was held on October 18th, 2021, and was streamed online/virtually through Facebook Live.

ISyCH 2021 aims to provide a platform to discuss issues, challenges, opportunities, and research findings related to the notion of cultural heritage in Southeast Asia. The rapid development, modernisation and globalisation create new problems and questions on culture, tradition, and cultural heritage. Hence, there is a fundamental need for sharing brilliant ideas and stimulating good awareness from this important research field.

The support and participation from the researchers and presenters were overwhelming, and they truly exceeded our expectations. In this event, we have received a number of extended abstracts from both our strategic partners in Malaysia and overseas (Indonesia and Thailand). In total, we had 29 extended abstracts and two full papers, which clustered under overarching themes: language and literature, heritage conservation, customs and cultural heritage, and performing arts.

Again, we want to express our gratitude to everyone involved directly or indirectly in the ISyCH 2021, including keynote speakers, authors, reviewers, program committee and strategic partners.

We hope that you will find it as useful references and make for inspiring readings. We look forward to seeing all of you in the next year, ISyCH 2022.

Dr. Ainul Wahida Radzuan
Chief Editor

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A REVIEW ON MALAY VERNACULAR ARCHITECTURE VENTILATION DESIGN ELEMENTS EFFECTIVENESS AND ITS APPLICATION

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ABSTRACT

Thermal comfort and ventilation needs of the occupants have been achieved successfully with the perfect solution by means of Malay vernacular architecture design. Ventilation have always been a major design element that needs to be thoroughly planned especially in Malay vernacular architecture in order to provide thermal comfort to the occupants. Amongst the various factors that affects ventilation in Malay vernacular architecture are the availability of multiple windows and openings, the orientation of the building, roof design as well as a variety of floors that contributes to further enhance the thermal comfort of the occupants. Thus, modern development needs to incorporate the suitable elements and applications for ventilation based on the design solutions provided by the Malay vernacular architecture into their designs. A study on vernacular ventilation assists in reinstating the relevance of its application in providing the most efficient thermal comfort to the occupants. The main focus of this research paper is to identify the applications and optimization of ventilation in Malay vernacular architecture by means of conducting simulations and reviewing case studies as it could further assists designers in the future to provide modern developments that are more feasible in its design specifically on its thermal comfort. This research will provide adequate case studies and ethnographic observations to further enhance the understanding of Malay vernacular architecture ventilation elements in which the researcher would behave as a participant in this progressive study. This research is conducted to change future architects and designers approach in planning and designing more feasible ventilated contemporary buildings.

Keywords: application; feasible; Malay vernacular architecture; ventilation

1. INTRODUCTION

This paper aims to identify the interdependence relationship between the Malay vernacular and contemporary architecture ventilation design elements and its application to our natural climate. This identification process further strengthens the understanding of designers on how Malay carpenters were able to build and design vernacular architecture that accommodates and facilitates Malaysia's equatorial climate. In accordance with Hutchinson, (2002), 'the characterization of a house depicts a clear projection of a specified region' [1]. Critical factors of house designs are being reflected such as materials, climate, cultural background as well as economics [3]. Hence, reflection of occupant social background in the region, local materials usage, climatic factors consideration as well as thermal comfort requirements in a design of a house is the very definition of Malay vernacular architecture. This could be supported by a study done by Krisprantono (2005), in which he stated that the relationship between the practical knowledge and the theoretical notion that indulges the

physical and non-physical traits of a specific place or location is being pursued in vernacular architecture [2]. Thus, material limitation, topography and climate variations are amongst understanding which is linked with our human nature in terms of environmental adequate responses which are constantly being referred to as the physical character. While, social relationship, technology and traditions as well as history are referred to as the non-physical character. The relationship between society, mankind and the ecological environment symbolizes synergies in which the natural traditions are being expressed and emphasized by Krisprantono[2].

2. MATERIALS AND METHODS

The selected design simulation software for this research is the INSIGHT plugin from Revit Autodesk as it is deemed suitable and adequate in acquiring the objectives of the study, which is to formulate the settings to simulate relative humidity, rate of air flow and the temperature of the air. As of the natural ventilation, the software of MacroFlo is coordinated into the INSIGHT simulation, which is applied further to simulate the flow of air driven by pressure of the wind and forces of buoyancy through components of doors and window openings. The MacroFlo application is also integrated within Apache, which could also be used to simulate relative humidity together with temperature of the indoor air based on the setup weather design database. The table below shows the materials of the buildings being assigned to both of the Rumah Selangorku and both Malay vernacular house in INSIGHT software. The proper material for the building is vital to attain precise simulation readings. However, certain materials were not available for the design database setup such as regional materials which includes a gap timber floor, a bamboo thatched wall as well as an 'attap' roof usually made from palm leaves. Hence, the materials resemble the most to it were chosen for the simulation.

Table 1. Simulation of materials and their U-Values

Elements of Construction	Vernacular Malay House	The U – Value (W/m ² k)	Rumah Selangorku	U – Value (W/m ² k)
Roofing	Slope Roofing –			
Domestic	3.3770	Flat Roof Design	0.2500	
Ceiling	Joist - Timber			
Interior Ceiling	1.2580	100mm Reinforced – Concrete Ceiling	3.6840	
Exterior Wall	Timber Wall Framing	0.4490	Brick / Block Wall	0.4395
Interior Partition	Frame Partition With 1 In. Wood	1.1630	115mm Single – Leaf Brick	1.9710
Ground Floor	Un-Insulated Suspended Timber Floor	0.6280	Slab on grade Floor	0.1980
Door	Wooden Door	2.1945	Timber Flush – Panel Hollow – Core Door	2.3255

3. RESULTS AND DISCUSSION

The location and sizes of the openings are the major factors that allows air intake to flow in the building effectively. As per the tabulated data, the Malay vernacular house is able to register higher percentage reading of openings compared to the Rumah Selangorku building.

Table 2. Temperature of indoor air of case study

Thermal Variable	Statistics	Case 1: House of Tan Mas Mohar		Case 3: Rumah Selangorku (1 st Floor)		Case 4: Rumah Selangorku (11 th Floor)	
		Rumah Ibu	Serambi	Liv/ Din	Kit	Liv/ Din	Kit
Air Temperature	Space						
	Mean	25.1	25.1	26.8	25.4	26.8	25.4
	Max	29.5	30.5	29.0	28.6	29.5	29.0
	Min	23.4	23.3	24.2	23.7	24.1	23.6

Table 3. Approximate humidity of case study

Thermal Variable	Statistics	Case 1: House of Tan Mas Mohar		Case 3: Rumah Selangorku (1 st Floor)		Case 4: Rumah Selangorku (11 th Floor)	
		Rumah Ibu	Serambi	Liv/ Din	Kit	Liv/ Din	Kit
Relative Humidity (%)	Space						
	Mean	80.1	80.3	74.5	78.4	75.0	78.6
	Max	97.5	99.8	92.7	93.6	92.7	93.5
	Min	59.6	55.4	54.0	59.7	53.5	58.2

Table 5. External and Internal Ventilation of case study

Thermal Variable	Statistics	Case 1: House of Tan Mas Mohar		Case 3: Rumah Selangorku (1 st Floor)		Case 4: Rumah Selangorku (11 th Floor)	
		Rumah Ibu	Seram- bi	Liv/ Din	Kit	Liv/ Din	Kit
Macroflo Internal Vent. (l/s)	Space						
	Mean	110.9	64.1	132.5	112.0	142.8	110.6
	Max	960.5	1091.0	323.6	293.3	413.4	344.2
	Min	0.0	0.0	13.9	0.4	15.5	0.0

Thermal Variable	Statistics	Case 1: House of Tan Mas Mohar		Case 3: Rumah Selangorku (1 st Floor)		Case 4: Rumah Selangorku (11 th Floor)	
		Rumah Ibu	Seram-bi	Liv/ Din	Kit	Liv/ Din	Kit
Macroflo External Vent. (l/s)	Space						
	Mean	389.4	404.7	18.4	11.1	31.8	18.5
	Max	3288.2	3638.4	189.8	145.6	335.5	256.7
	Min	0.2	0.2	0.0	0.0	0.0	0.0

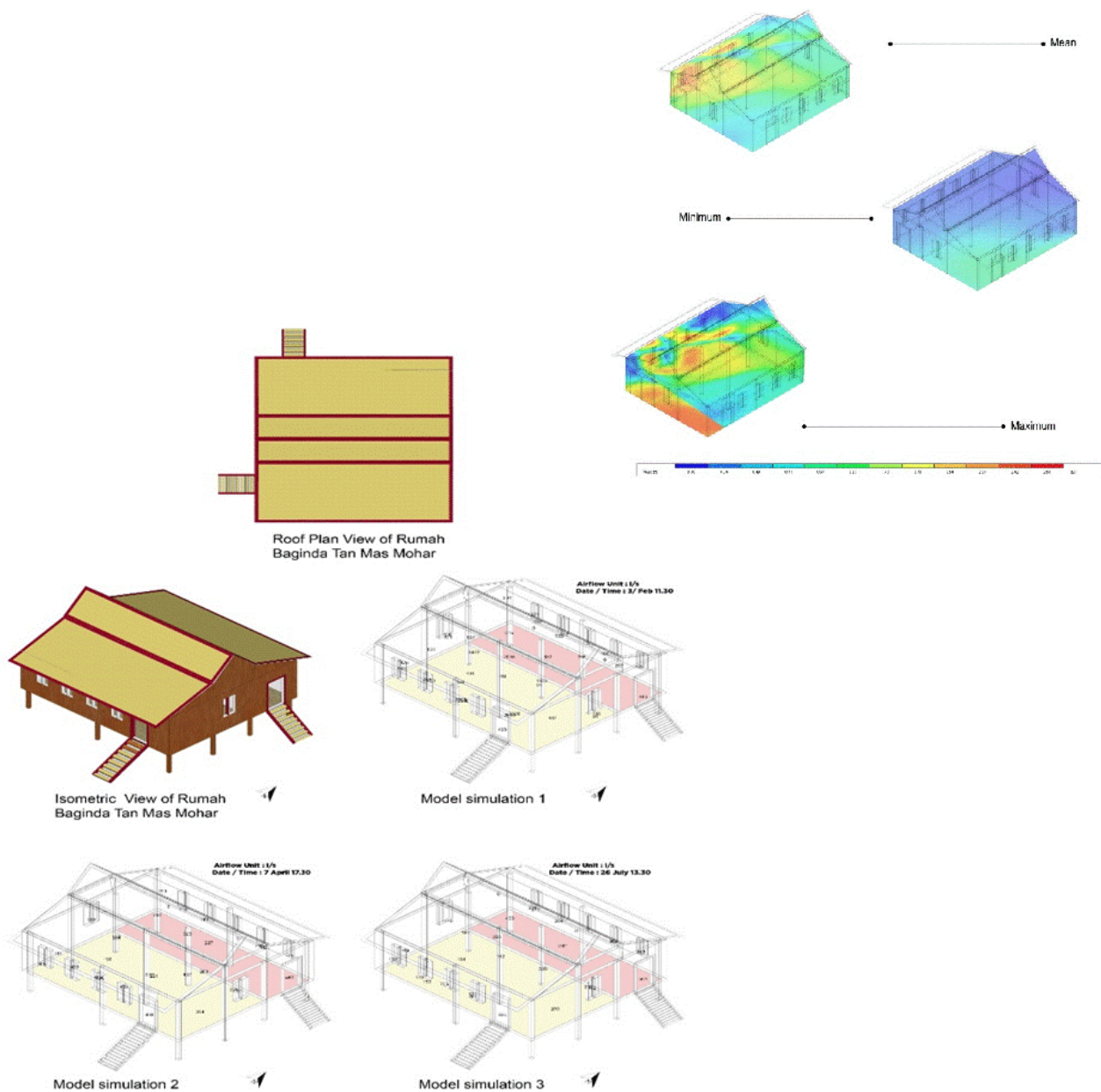


Figure 1. Heat and ventilation simulations of Rumah Baginda Tan Mas Mohar

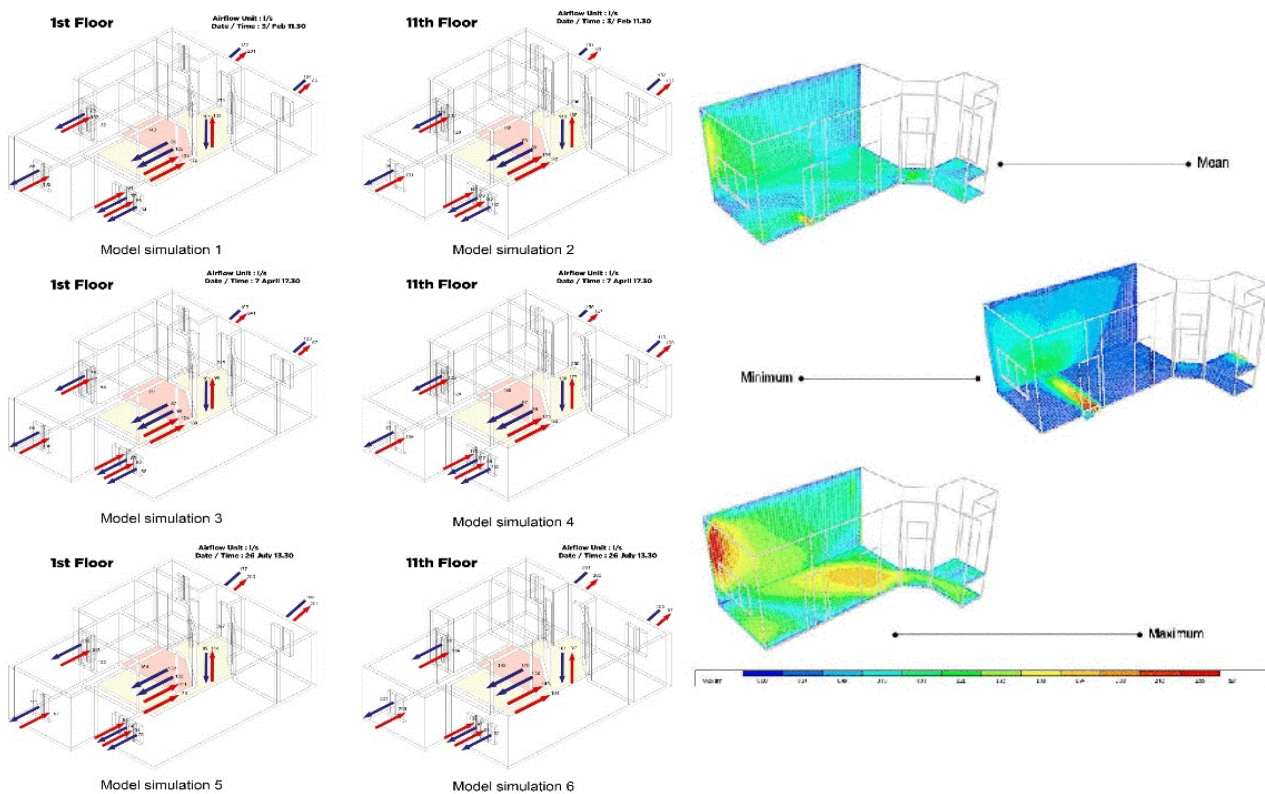


Figure 2. Heat and ventilation simulations of Rumah Selangorku 1st and 11th floor

4. CONCLUSION

In a nutshell, in the design of Malay vernacular and social projects developments there were several issues being discovered. As can be gathered from this study, the social projects uses materials such as bricks and concretes that have high capacity of thermal as compared to the Malay vernacular house which uses materials that readily gives out heat and helps cools the building. These materials used in the social projects can causes discomfort during night time as it has high heat capacity and usually stores a high amount of heat.

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