

Chapter 3

A Review and Comparative Study of Retrofit for the Energy Efficiency of Malaysian Heritage Buildings

Khairool Aizat Ahmad Jamal

 <https://orcid.org/0000-0003-4674-581X>

Taylor's University, Malaysia

Siti Norlizaiha Harun

 <https://orcid.org/0009-0004-5658-1155>

Universiti Teknologi MARA, Malaysia

Shahrul Yani Said

 <https://orcid.org/0000-0002-7727-5438>

Universiti Teknologi MARA, Malaysia

ABSTRACT

Historic buildings (HB) are invaluable embodiments of culture and identity. Retrofitting HB has become a strategic imperative in Malaysia, given their substantial presence of building stock, moreover these buildings grappled with contemporary challenges. Energy retrofit allows adaptation and reuse while prioritizing environmental sustainability. However, such notions are still in their infancy stage, hindered by the gap between understanding heritage preservation techniques and energy efficiency consideration. The lack of inclusive guidance is an obstacle, restricting widespread application of retrofit intervention in HB conservation. This chapter aims to identify current limitations of Malaysia's Conservation Guidelines (HBCG) through a comparative analysis with similar international guidelines. Findings reveal lack of interpretations for contemporary green issues, unlike the latter which allows broader interpretation. The paper suggests additional guidance for practitioners in navigating environmental challenges, emphasizing intangible considerations such as heritage values and identity.

INTRODUCTION

Historic Buildings (HB) stand as iconic representations of Malaysia's rich historical and cultural heritage, reflecting the nation's background and character and generate significant economic benefits through urban vibrancy (Besen, 2018). Hence, it is vital to adapt and preserve their values for future generations. Heritage building conservation is not new to the Malaysian built environment industry. According to Harun (2011), heritage buildings represent the values of tangible cultural heritage, which have their own uniqueness and characters that need to be preserved. There are several importance and contributions of historical buildings in Malaysia, including, among others, preserving the history and beliefs of a society, maintaining the importance of architectural and cultural aspects, psychological aspects, and values of historic buildings, providing an image and identity to the city, providing continuity and stability in the built environment, as interpretational elements and tourism image, and providing heritage education to the young generation (Harun, 2021). In current record by the Malaysian Heritage Department, more than 125 historic buildings that are gazetted as national heritage (Jabatan Warisan Negara, 2023), with many potential future submissions. Since the addition of Georgetown and Malacca to the UNESCO World Heritage List on July 7, 2008, there has been a surge in demand for heritage conservation projects in Malaysia. In a preliminary study, Syed Zainol et al. (1995) reported that there are more than 39,000 historic buildings identified in Malaysia that were built between 1800 and 1948 in 235 towns and cities within Malaysia. Ali et al. (2018) highlights the distribution of historical buildings in Malaysia and reveal that over 20,000 buildings can be considered heritage-significant and deserving of conservation and preservation. Within established cities such as Kuala Lumpur, Georgetown, and Ipoh combined, a total of over 7500 historic buildings of various categories are recorded within the core areas alone (Ipoh, 2020; Georgetown, 2021; KLCP, 2020).

Hence, this signifies that historic buildings represents a considerable portion of the Malaysian building stock, and immediate actions need to be provisioned to protect such heritage assets, prolonging their survival from various threats and challenges (Hasan et al., 2019). Unfortunately, such buildings faced many challenges of the 21st century, which has alarmed the global heritage-built practice to rethink its current processes (Khalaf, 2021). With many of these buildings facing threats of defects, negligence, deterioration, and loss of performance over time, crucial adaptation measures are needed to be in place to ensure the survival of historic buildings, especially in contemporary settings (Ali et al., 2018; Harun, 2011). The effects caused by climate change have drastically degraded the building energy performance (BEP) and thermal comfort in Malaysia (Campagna & Fiorito, 2022). Studies have indicated traditional historic buildings in contemporary settings generally recorded poor environmental performance with high projections of energy consumption, contributed a high amount of carbon dioxide (CO₂) emissions, and need appropriate measures to improve their environmental performance (Khalil et al., 2021; Tang, 2019; Yau & Hasbi, 2017). These effects are widely held due to various conditions faced, being under threats of deterioration, were predominantly built in a time where energy efficiency regulation was limited, not being built sustainably, the types of materials used, and having less consideration for maintenance (Yazdani et al., 2018; Fillipi, 2015; Jagarajan et al., 2015; MacDonald et al., 2009). However, historic buildings could potentially achieve much more energy and carbon reduction compared to new construction, as it would take new buildings many years to achieve optimum sustainability impact as compared to historic properties.

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