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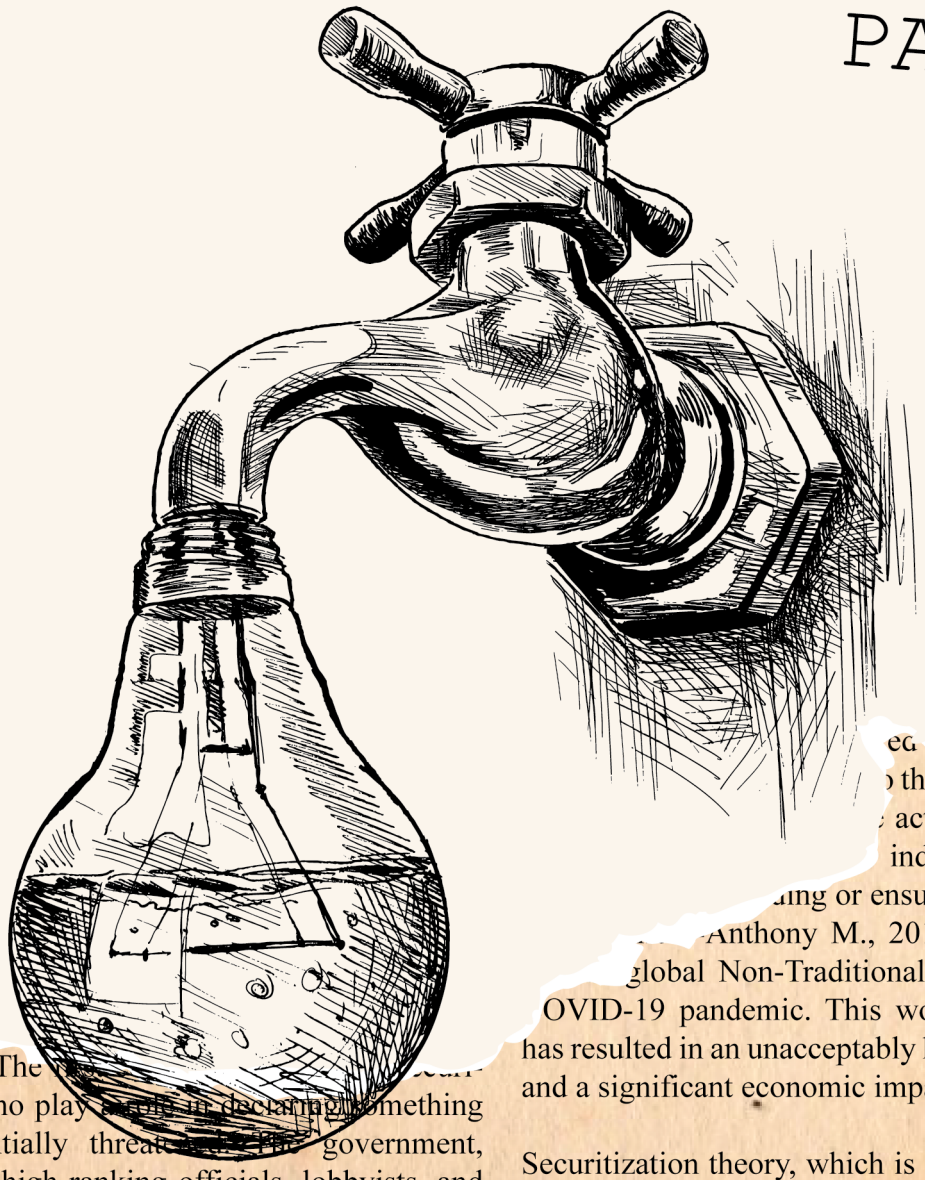

issue. The ... actors who play a role in declaring something that is existentially threat... government, represented by high-ranking officials, lobbyists, and even pressure from a group are all examples of securitizing actors. Next is the issue or threat that potentially brings harmful effects towards peace and stability of the country and lastly is the reference object or who needs the security. This is how actors assure the

...ed
...o that those mo...
... actors, political ...
... individuals can h...
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... Anthony M., 2018). One of the m...
...global Non-Traditional Security risks is the ...OVID-19 pandemic. This worldwide health crisis has resulted in an unacceptably high number of deaths and a significant economic impact.

Securitization theory, which is employed as a framework analysis, is the basic theory that underpins the analysis in this study. Securitization developed from Copenhagen School (COPRI – Copenhagen Peace Research Institute) of security studies pioneered by Barry Buzan, Ole Weaver and Jaap De Wilde (1998),

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SUSTAINABLE ART CONSTRUCTION

Use Of Waste Crush Clay Bricks As Aesthetic Interior And Exterior Art Construction Innovation

a chapter by

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Sustainable Art Construction: Use of Waste Crush Clay Bricks as Aesthetic Interior Art Construction Innovation

In accordance with the globally spread trend of sustainability, the modern 4R concept of waste management promotes: reducing waste at the source, reusing elements and their parts, recycling to produce raw materials, and recovering embodied energy. Discarded bricks from building demolition sites studied in this study could be reused, but they could also be crushed and used as an application in aesthetic interior art façade. This paper investigates the use of waste crushed clay brick material as an aesthetic interior art façade panels with a stone face that can be used in a ventilated façade system. It describes the production process of a pilot element and goes on to suggest details of the proposed elements of the art facade. The paper also shows various design possibilities for application as well as observed aspects of sustainability and cost-effectiveness relevant to the application of the proposed interior art façade panel. The research contributes to the current course of sustainability in the construction industry by proposing an example of forming a new prefabricated building element using recycled building demolition waste material. Green building, also known as sustainable construction, is concerned with the fiscal, societal, and environmental effect of constructing a useful structure. In other words, it demands planners and builders to use construction practices that will not harm the ecosystem in the long run. Sustainable structures are intended to be energy effective, healthful for the people who reside or work in them, and to decrease pollution and trash.

Sustainable art construction is an approach to creating art that minimizes environmental impact and promotes sustainability. This approach involves using materials and techniques that are ecofriendly, non-toxic, and responsibly sourced. Here are some principles of sustainable art construction:

1. Use of eco-friendly materials: Sustainable art construction involves the use of materials that are renewable, recyclable, or biodegradable. This includes materials such as recycled paper, natural fibers, and sustainably harvested wood.

2. Non-toxic materials: Artists can use non-toxic materials such as water-based paints and natural dyes to reduce exposure to harmful chemicals and reduce environmental impact.

3. Energy-efficient lighting: The use of energy-efficient lighting can reduce electricity consumption and carbon emissions.

4. Minimizing waste: Sustainable art construction involves minimizing waste through efficient use of materials and recycling of waste materials.

5. Reuse of materials: Artists can also use reclaimed and repurposed materials to create art.
This not only reduces waste but also adds a unique and creative element to the artwork.

6. Promoting environmental awareness: Sustainable art construction

can also be used as a tool to raise awareness about environmental issues and promote sustainability.

Sustainable art construction is defined as "meeting present needs without jeopardizing future generations' ability to meet their own needs". When it is not possible to apply one of the stated actions, only the worst option in terms of environmental protection remains – waste disposal at a landfill (Tijana Vojnovic Calic, Dragica Jevtic, Aleksandra Krstic-Furundzic). Sustainable design in architecture, among other things, is based on the reuse of building elements, the use of recycled materials, and the use of recyclable materials. The advantage of reuse and recycling is that it conserves energy that is embedded in a building element. Reuse and recycling also reduce the amount of waste material produced and the demand for limited landfill space, as well as the extraction of new natural resources and the negative impact of their exploitation (J. J. Kim and B. Rigdon). The construction sector is a large consumer of natural resources as well as a substantial producer of building construction and demolition waste (P. B. Cachim), which includes bricks and roof tiles. They could be cleaned and reused, but they could also be recycled as crushed aggregate and profitably used for drainage, as a road base, concrete aggregate, and so on. Because the use of energy during the manufacturing of clay goods is rather large, reuse and recycling of brick products should be approached with caution. Crushed clay brick aggregate could be used in decorative purposes, for landscaping, in the form of brick fines, chips and nuggets. Brick possesses natural and infinite pleasant colours of burnt clays. Its colour formation is achieved through a complicated physio-chemical reaction during the firing process. In contrast to the colour of the stained body, the brick color is permanent and will not fade during the weathering process. Different clay compositions, firing temperatures, or kiln atmospheres can lead to different colours. By proper control of these factors, bricks can be made to exhibit endless variety of natural and attractive colours. Bricks' natural colours combined with the extreme flexibility in applications produce aesthetic results which are always personal and everlasting. Several studies have been conducted to investigate the potential of using crushed clay brick as an alternative of enhancing the aesthetic value of a building. Poon and Chan investigated the possibility of using crushed clay brick as aggregates in sub-base materials. Akhtaruzzaman and Hasnat studied the use of crushed clay brick aggregate as a 100% replacement of coarse natural aggregate in concrete. From previous research, the main advantages of using waste crushed clay brick as alternative art of enhancing aesthetic value of a wall construction and being considered environmentally friendly approach. The main focus of the research is to present an additional information in the field of recycling waste crush clay brick in order to explore the possible uses of these recyclable materials in construction industry applying as an aesthetic art of interior and exterior façade.

Figure 1: Range size of waste crush clay brick (WCCB)

1. Application as landscape slope stabilization

In the section of the designed application of waste crush clay brick (WCCB) as landscape slope stabilization, two distinctive layers can be observed: a supporting base and a decorative face. The base is composed of fine aggregate as bedrock and WCCB is applied together using cement glue. WCCB connected with mortar were cleaned, dried, cracked, and separated; waste brick pieces accounted for 75% and waste mortar for 25%. As a filler for slope stabilization, particles of WCCB with a particle size range of 2.5 mm to 0.075 mm were substituted. WCCB can be used as a slope stabilization technique due to its high compressive strength, low permeability, and durability. The process involves placing the crushed clay brick on the slope and compacting it to create a stable foundation. This layer of crushed clay brick serves as a drainage layer, allowing water to flow through it and prevent soil erosion. The compacted layer also provides

stability to the slope by distributing the weight of the upper layers of soil evenly. This helps to prevent landslides and slope failure. The use of waste clay bricks in slope stabilization also has environmental benefits as it reduces the amount of waste going to landfills. Overall, using WCCB as slope stabilization is a cost-effective and sustainable solution that can help to prevent slope erosion and failure while also reducing waste.

Figure 2: Landscape slope stabilization application using waste crush clay brick (WCCB)

Figure 3: Application mixture between waste crush clay brick (WCCB) with cement glue

2. Application as aesthetic wall art façade

The designed application as an aesthetic wall art façade involves two distinctive layers mix which can be observed: a bonding base mix and a decorative face. The base is composed of cement mortar and waste crush clay brick laid on top. WCCB has poor strength and high hygroscopicity compared to natural aggregate because its surface is rough, porous, and covered with many corner angles and micro fissures generated by disintegration and compression. The character of rough surface and high hygroscopicity will form a microtubule or micropore system which reveals the beauty and make it aesthetically unique to apply as wall panel facade. When added to surface of any wall panel, it increases the compactness of the panel and also improving the interface structure, thereby enhancing the aesthetic value of the wall and strength. With porous honeycomb structure, larger specific surface area, and easily processed into fine particles or powder (Haili Cheng). WCCB can be used to create one-of-a-kind and inventive wall art surfaces. WCCB, with its natural hues, textures, and designs, can lend a primitive and organic feel to any structure façade or internal wall. Using WCCB as wall art displays has environmental advantages as well, as it allows for the repurposing of a refuse substance that would otherwise wind up in a dump. It can also be a lowcost method to add a distinctive and creative feature to a building's façade or internal wall. The use of WCCB as a wall art façade can provide an innovative, sustainable, and aesthetically appealing option for building design and adornment.

Figure 4: Application process of waste crush clay bricks on cement brick

Figure 5: View of waste crush clay brick aesthetic wall art facade

Figure 6: Side view section on timber wall panel façade applied by using WCCB

Crush clay brick provides superior thermal insulation compared to other construction

materials such as concrete. It may be perforated to increase their thermal insulation properties. In addition, the thermal mass and moisture that the clay brick has absorbed may aid to maintain a somewhat consistent temperature within the home. In other words, brick gently absorbs and releases heat, keeping the home cool during the day and warm at night.

3. Application as wall art plaque

WCCB are one of the sustainable materials which can be applied in art industry especially in making ornaments, plaque or merchandise. When involve in making a formal plaque, texture and colours are the important element in enhancing the aesthetic value of the plaque. Textures can have a significant impact on the appearance of a colour and also affect the overall feel of an in plaque making. Colours can play a significant role in the look and feel of a design. From subtle variation to stark contrasts can be achieved through colours. Also, the ability to break up large expanses of the crush clay brick can help alleviate the beauty. Colour range is another way to impact the look and feel of the aesthetic interior and exterior art construction. The range is the variation of colour within a production run. Sometimes a monochromatic look is desired and certain colours will not be a match.

Figure 7: Process application of waste crush clay bricks (WCCB) as wall art merchandise plaque

Figure 8: Wall art merchandise plaque made from waste crush clay brick (WCCB)

As a conclusion, sustainable art construction is a creative and responsible way to create art that not only looks beautiful but also contributes to a healthier planet. The recyclable usage of WCCB has attracted more and more attentions, the widening of its ways of recyclable usage has laid a solid foundation for improving its application value. But there are also some problems:

1. When serving as environmental absorption material, since the source and the particle status after cracking vary, the absorption effect of WCCB will be different. At present, most of the research content are physical absorption of WCCB, the relationship between chemical compound and absorption effect is still not commonly seen.

2. The new application technologies of WCCB currently are still not very mature, mostly in the stage of laboratory research without relevant industrial application experiments, let alone standardized, industrial production process, which is discordant with the discharge amount of WCCB both currently and in the future.

3. The evaluation on the economic and environmental benefits of recycle usage of WCCB is insufficient.

4. Since current policies regarding classified discharge of construction waste are insufficiently stringent, there are no obvious cost savings associated with recycling, cracking, and processing when compared to directly using natural sand or other admixtures, such as fly ash and mineral slag. However, these issues will be soon resolved with the help of governments and the unceasing efforts of scientific and technical workers.

References

Tijana Vojnovic Calic, Dragica Jevtic, Aleksandra Krstic-Furundzic (2017). The Use Of Recycled Crushed Clay Brick Aggregate For The Purpose Of Forming A Prefabricated Façade Panel. Facta Universitatis – Series Architecture and Civil Engineering Vol. 15. 59-72

J.J. Kim and B. Rigdon, Sustainable Architecture Module: Introduction to Sustainable Design, National Pollution Prevention Center for Higher Education, University Ave, Ann Arbor, 1998

P.B. Cachim, “Mechanical properties of brick aggregate concrete”, Construction and Building Materials vol. 23, pp. 1292-1297, 2009

Haili Cheng (2016). Reuse Research Progress on Waste Clay Brick. Procedia Environmental Sciences 31 (2016) 218-226

Ali A. Aliabdo, Abd-Elmoaty M. Abd-Elmoaty, Hani H. Hassan (2013). Utilization of Crushed Clay Brick in Concrete Industry. Alexandria Engineering Journal (2014) 53, 151-168

C.S. Poon, D. Chan (2006). Feasible use of recycled concrete aggregates and crushed clay brick as unbound road sub-base. Constr. Build. Mater. 20 (2006) 578-585

A. Akhtaruzzaman, A. Hasnat (1983). Properties of concrete using crushed brick as aggregate. Concr. Int. 5 (1983) 58-63

Ahmad, M. N. (2016). Falsafah seni ukiran kayu Melayu (Doctoral dissertation, Universiti Malaya).

Ahmad, S. H., Taib, M. Z. H. M., & Masri, M. H. (2012). Istana Besar Tengku Long: wall carving decoration and motifs influence the spatial social interaction at Surung Area. In The 9th Regional Symposium of the Malay Archipelago (pp. 1-14). Universiti Teknologi MARA (Perak).

Daud, N. I. M. K., Arbi, E., & Faisal, M. (2012). Pengaplikasian ukiran kayu melayu dalam seni bina di Malaysia. Journal of Design and Built Environment, 11, 1-14.

Hamdzun Haron, 2013. Akal rekaan pandai seni warisan Melayu. Selangor: Institut Alam dan Tamdun Melayu.

Haron, H., Yusof, N. A., Taha, M., & Mutalib, N. A. (2014). Motifs of nature in Malay traditional craft. Middle-East Journal of Scientific Research, 21(1), 169-180.

Hussin, H., Baba, Z., & Hassan, A. (2012). The philosophy in the creation of traditional Malay carving motifs in Peninsula Malaysia. Geografia, 8(7).

Kamarudin, Z., & Said, I. (2008). Composition of Malay woodcarving: case studies on two traditional timber houses. Jurnal Alam Bina, 2.

Keumala N. I. M. K., Arbi, E., & Faisal, M. (2012). The application of Malay wood carving on contemporary architecture in Malaysia. Journal of Design and Built Environment, 11(1).

Nasir, M. N. M., & Muhamad, A. (2018). Koleksi Bangau Perahu Di Jabatan Muzium Malaysia: Tema Dan Makna (The Collection of Bangau (Sail Guard) in Department of Museum Malaysia: A Study of Theme and Content). Asian Journal of Environment, History and Heritage, 2(1).

Noor, F., & Khoo, E. (2012). Spirit of wood: The art of Malay woodcarving. Tuttle Publishing.Perbadanan Kemajuan Kraf tangan Malaysia (2009) Ukiran kayu. Perbadanan Kemajuan Kraf tangan Malaysia, Kuala Lumpur.

Noorizal, R. & Norzehan A. (2009), Seni Kraf Kayu; Motif dan Teknik. Selangor: Institut Kraf Negara.

Norhaiza, M. (2009). Ukiran Kayu Warisan Melayu. Kayu Perbadanan Kemajuan Kraftangan Malaysia. Mantera Communication Sdn Bhd.

Othman Yatim (2000), ‘Mengukir Kegemilangan Lalu: Biografi Wan Su Othman, Penerima Anugerah Seni Negara 1997’.Kuala Lumpur:Kementerian Kebudayaan,Kesenian Dan Pelancongan.

Othman, J. & Ahmad Majid, N. H. (2017). Assessing Aesthetics Preferences of Malay Wood Carved Panels. Special issue Sci. Int. (Lahore), 29.

Said, I., & Ahmad Saifuddin, A. (2001). Timber Species in Malay Woodcarving. Publisher: Universiti Teknologi Malaysia, Johor, Malaysia.

Shaffee, N., & Said, I. (2013). Types of floral motifs and patterns of Malay woodcarving in Kelantan and Terengganu. Procedia-Social and Behavioral Sciences, 105, 466-475.

Shuaib, A. A., & Enoch, O. F. (2014). Integrating the Malay traditional design elements into contemporary design: An approach towards sustainable innovation. Procedia-Social and Behavioral Sciences, 129, 59-67.

Wahid, J., Abdullah, A., Saleh, B. K., & Awad, J. (2021, March). The Wood Carvings of Two Traditional Timber Mosques in Kelantan and Terengganu. In IOP Conference Series: Materials Science and Engineering (Vol. 1101, No. 1, p. 012026). IOP Publishing.

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