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ENVIRONMENTAL STANDARD READINGS FOR MANUSCRIPT ARTIFACTS IN DISPLAY CASE AT TERENGGANU STATE MUSEUM AND 'FIRST GALLERIA' TAIPING

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Abstract

Manuscript artifacts in a museum's display case will usually undergo a process of deterioration. This type of artifact is categorized into 'sensitive artifacts'. Due to the organic contents in these sensitive artifacts, extra supervision are required. Manuscript artifact easily react to the heat, humidity and Lux. Standard guidelines for temperature, humidity and Lux reading was introduced by an international agency, ICOM (International Council of Museum) to ensure the preservation of these categories of artifacts. This paperwork intended to discuss how far the implementation of the guidelines to Malaysian museums. The finding reveals that most of manuscript artifacts are contravened with the guideline.

Keywords: Museum, Gallery, Manuscript Artifact, Manuscript Preservation, Display Cases

1. Introduction

From the bibliographic data (2000), manuscript is a hand writing, typing script and curving, writing paper, scratched on stone, soil, paper and others. Dewan Bahasa and Pustaka (1979) defined that manuscript is a original transcript written by hand. But the oxford dictionary (1993) stress out that the meaning of manuscript is consider as old transcript. Normally, the age of manuscript at museum is over 100 years old. Artifact manuscript collection must be cared for in a manner so as to preserve them for the foreseeable future. Due to the organic contents in these sensitive artifacts, extra supervision are required. easily react to the heat, humidity and Lux.

1.1. ICOM Background

The International Council of Museums (ICOM) is the only international organisation representing museums and museum professionals. Since 1946, ICOM has assisted members of the museum community in their mission to preserve, conserve and share cultural heritage. ICOM also takes advice from institutional partners to achieve its objectives. ICOM is governed in an inclusive and hierarchical manner, on an international level. The organisation gathers almost 30,000 members and is made up of National Committees, which represent 137 countries and territories, and International Committees, which gather experts in museum specialties worldwide. The International Council of Museums works for society and its development. It is committed to ensuring the conservation and protection of cultural goods. ICOM sets standards for museums in design, management and collections organisation. The *ICOM Code of Ethics for Museums* is a reference in the global museum community. It establishes minimum standards for professional practices and achievements for museums and their employees. ICOM carries out its international missions thanks to international mandates in association with partners such as UNESCO, INTERPOL and the World Customs Organisation (WCO). ICOM's missions include, fighting the illicit traffic of cultural goods, risk management, culture and knowledge promotion and protection of tangible and intangible heritage.

1.2 Background of Museums in Malaysia

ICOM Definition of a Museum in 2001 as "A museum is a non-profit making, permanent institution, in the services of society and of its development, and open to the public, which acquires, conserves, researches, communicates and exhibits for the purposes of study, education and enjoyment, material evidence of man and his environment". Much of Malaysia's history and heritage are being preserved in the many museums around the country. The first museum in the country was built in Taiping, Perak in 1883. When later it was acknowledged there

was a need for a more comprehensive and organized collection to house the artefacts and treasures, Kuala Lumpur was chosen as the location of a new and larger museum. The Selangor Museum was built in 1888, then integrated with the Taiping Perak museum to become the Federated Malay States (FMS) Museum. Since Malaya, (which was then under the British colonial administration), the FMS Museum came under the administration of the Federated Malay States Museums Department. In 1945, as a result of bombing incidents, a considerable amount of artefacts were destroyed. Those that were salvaged were temporarily housed at the Taiping Museum. Currently there are about 101 museums in Peninsular Malaysia (2007).

1.3 Deterioration of Artefact Manuscript in Display Case at Malaysian Museum



Figure 1 : The handwritten religious book collection above suffer deterioration such as yellowish and brownish, blob and spot, faded, rotten and paper peel
Source : Norashikin Abdul Karim, (2006)

The serious problem was the deterioration of manuscript artefact in display showcases, found at the National Museum Kuala Lumpur prior to renovation in 2007. Figure 1 above shows the manuscript artefact deterioration sample at the National Museum. Artefacts deterioration occurs due to the neglect of the 6 environmental factors during the process of display in showcases. For example, the handwritten religious book collection above suffers deterioration such as yellowish and brownish, blob and spot, faded, rotten and paper peel.

This problem was also identified by Geoff Pickup in his report 2005. Manuscript artefact collection must be cared for in a manner so as to preserve them for the foreseeable future. The curator's duty is to control the display environment with continuous checking of showcase's reading (See figure 2 and figure 3 below).



Figure 2 : The curator measured Lux reading on manuscript wall display at Terengganu State Museum
Source : Norashikin Abdul Karim, (2006)

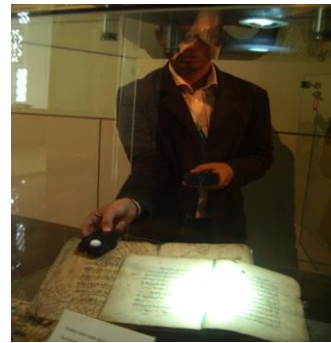


Figure 3 : The curator measured Lux reading on manuscript free standing display at National Museum Kuala Lumpur
Source : Norashikin Abdul Karim, (2006)

David Dean stipulates 3 environmental factors or 3 agents of deterioration of display artifacts (D. Dean, 1994, pp. 67-81) :

1. Temperature

A major part of display designing involves modifying and enclosing spaces. It should know the capabilities of the museum heating, ventilation, and air conditioning system (HVAC). Climate control is more difficult. A refrigerated air conditioner can help maintain proper temperature levels in both display and storage areas. Achieving temperature control means that relative humidity is more easily controllable. Temperature can be maintained and collections will remain more stable.

2. Relative Humidity (RH)

Relative humidity is a amount of water vapour and will hold at saturation at certain temperature. For the display case it has the higher temperature inside the case, the lower the relative humidity (RH).

3. Natural and Artificial Lighting

Light is a visible and invisible, energy and ingredient for all chemical and mechanical process of heat form of energy. Natural sunlight contains all frequencies of electromagnetic energy or radiation, the invisible that damages objects most. UV light and the visible light most harmful type of light for collections to energize and damage the molecules and chemical change causes skin cancer. The materials of sensitive to UV are hair, feathers, leather, silk, ivories, and dyes. Artificial light sources available for general illumination, fluorescent lighting produce the most ultraviolet rays can reduce damage with using the UV filter.

1.4 Controlling Relative Humidity in Display Showcases

Relative humidity (RH) is the ratio of water vapour in the air to the amount that it could hold if fully saturated, it is expressed as a percentage. Low levels of relative humidity imply dry conditions since the air is then capable of taking up moisture. High values are recorded when the air is already humid and unable to take up much more moisture, for example in humid or wet weather. RH is measured with a 'hygrometer' (Paine, 2006, p. 172). According to Paine (2006) again, organic materials are also susceptible to attack from mould/fungi if conditions are humid, over 65 per cent RH. Metallic objects can also be adversely affected by high levels of RH, which encourage corrosion. RH needs to be as low as possible for all metallic objects. Paine (2006) advises that museums should aim to have a constant RH all year round in display showcase. Ideally, it should not rise above 60 percent or fall below 40 per cent, and should be stabilized at 50-5 per cent for a mixed collection. In older buildings, where condensation can occur at this level, 45-50 per cent RH is an effective compromise. According to Tim Padfield, the relative humidity (RH) in museums holding a variety of materials is usually set at 50 or 55 percent (%). The reason for this standard is difficult to find because the values have been redefined so many times in the literature (Padfield, 1994, pp. 6-8).

1.5 Controlling Temperature in Display Showcases

Temperature is measured with a 'thermometer'. Temperature is an important factor in RH because the ability of air to hold water vapour increase with higher temperature and decrease with lower temperatures. Change in temperature in a display showcase area can therefore affect levels of RH. Changing temperature can also speed up the rate of biological/chemical deterioration (Paine, 2006, p. 173). According to Paine (2006), museum collections do not require high temperatures. A temperature of 18°C (+/-2°C) is an acceptable temperature for the display of a mixed collection. Beware of localized high temperatures created by heaters or spotlights. According to ICOM (2004), for several decades, the standard in humidity and temperature advice was simple, and rigid: aim to achieve 21°C with 50% RH, and very little fluctuation permitted. This standard grew out of a concern for paintings and furniture in Europe, and was indeed beneficial to those collections. Unfortunately, it was not at all beneficial to modern archival and paper materials, which needed cool and dry conditions for long life. (Michalski,2000) It was not beneficial to corroded metals, which needed dry conditions. It was unnecessarily stringent for many collections, such as paintings, wooden artifacts, parchment, which were at serious risk only from damp. Finally, as noted under sustainability, it was an expensive standard to implement at a building level (Stefan Michalski, ICOM, 2004a).

1.6 Controlling Light in Display Showcases

Light is another critical environmental factor. Natural sunlight is the most harmful form of energy for museum collections. It contains all frequencies of electromagnetic energy including heat and ultraviolet light. If sunlight is not necessary, it is best to keep it out of the galleries altogether. If it is required, collection objects such as textiles, paintings, drawings, woods, and such materials should not be placed in direct sunlight. Metal and some ceramics are not greatly impacted by sunlight, but it is best not to expose anything to direct sunshine (G. E. D. Dean, 1996, p. 119). Light can cause serious damage to museum collections and is one of the greatest threats to the long-term care of collections. Light is a form of energy and can cause colour fading as well as deterioration in the materials from which museum objects are made. All museum objects are to a greater or lesser extent affected by light, although metals and ceramics are not affected to the same extent as other materials. Some materials are extremely sensitive to light and every care needs to be taken to reduce their exposure levels. Special care should be taken to protect museum items made of more than one type of material. The intensity of light is measured by 'light meter' using units of measurements known as 'lux unit'. Recommended maximum levels of illumination range from 50-200 lux. The following levels should not be exceeded for the categories of material shown (Paine, 2006, pp. 169-170) : a) 200 lux – oil/tempera paintings, undyed leather, lacquer, wood, horn, bone and ivory, stone. b) 50 lux – costume, textiles, watercolour painting, tapestries, furniture, prints and drawings, postage stamps, manuscripts, ephemera, miniatures, wallpaper, dyed leather and most natural history and ethnographic items.

The lighting standard is, this is usually based on Garry Thomson's recommendation (in The Museum Environment), itself in agreement with earlier authorities, of 50 – 200 lux, according to material. This standard has prompted many an angry memorandum from conservators complaining about 70 lux in the costume collection. If this 70 lux comes from a tungsten lamp it does less damage than 10 lux from a blue sky. Here again the problem lies in the conservator's or architect's acceptance of the standard as a mere number, without understanding the underlying photochemistry (Padfield, 1994, pp. 7-8).

For many decades, the lighting standard in museums stated that textiles and works on paper should be illuminated at only 50 lux and paintings and other painted surfaces 150 lux. (Lux is the SI international unit of light intensity). For comparison, full sunlight can be up to 100,000 lux, indirect daylight 10,000 lux, bright spotlamps are 2000 lux, office lighting typically aims to provide 750 lux on the desk, and a candle held an arm's length away shines 1 lux on you (Stefan Michalski, ICOM, 2004a, p. 78).

ICOM (2004) stated that several complications arose. Older viewers cannot see details at 50 lux – the usually recommended lighting level for light-sensitive textiles, watercolours and manuscripts, while even young viewers cannot see complex or dark for no good reason. On the other hand, many others are so sensitive to light that continual illumination even as low as 50 lux will cause fading after many years of permanent display. The author has reviewed all the literature on visibility, as well as all the useful data on textile fading, and developed a general lighting guideline.

1.7 Good modelling of lighting design for display showcase

Diagram 1 and figure 4 show the "genius of Wedgwood" exhibition at the Victoria and Albert Museum, London displayed both pottery, that has no light level restrictions, and documents, which must be limited to 50 lux. Individually controlled light sources ensure that light levels are safe, and that there is an interesting and dramatic lighting balance, with good modelling of three dimensional objects, and clearly visible captions without glare. Lighting design, drawing and photograph by Sulton Vane Associates, Lighting Design, London (S.Simpson, 2003, p. 450).

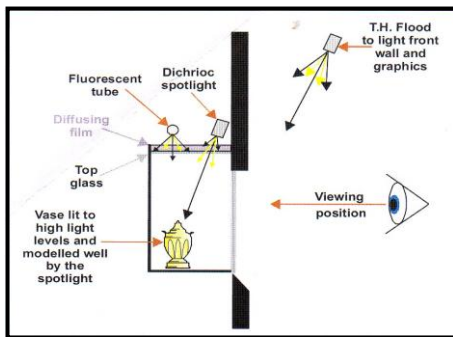


Diagram 1 : The diagram shows the good modeling of lighting design
Source : Robert S.Simpson, Lighting Control Technology and Applications.



Figure 4 : The plate shows the lighting photograph by Sulton vane Associates at the Victoria and Albert Museum, London
Source : Robert S.Simpson, Lighting Control Technology and Applications, (2003), p.450

2. Methodology

2.1 Case Study Method

Empirically, design research is generally based on case studies. A case study is in-depth study of the cases under consideration, and this depth has become another feature of the case study approach. French sociology clearly describes it as a monographic approach. Case studies employ various methods. These method includes the interviews, participant observation, and field studies, Jacques Hamel (1993 : 1).

There are currently about 126 museums in the Peninsular and East Malaysia. This study specifically observes the museums in Peninsular Malaysia that displayed the early artifacts manuscript and based on the famous museum and gallery. The following location had been taken as case studies:

- 1) Terengganu State Museum (The Largest Museum in Malaysia) -1977
- 2) 'First Galleria' Taiping (The Largest Private Gallery in Malaysia) - 2010

Both case studies chosen are highly significant for this research. The Terengganu State Museum is known for their expertise in traditional method of preserving the manuscript. On the other hand, the 'First Galleria' Taiping has no expertise in preserving the artefacts, however, this galleria possessed an outstanding manuscript collections during the British colonization in Taiping dated circa 1886.

2.1.1 Background of Manuscript Display at Terengganu State Museum

The arrival of Islam to Malay Peninsula, particularly in Terengganu has left various manuscripts of Islamic doctrine. The inscribed stone (*batu bersurat*) of Kuala Berang is an important evidence of the Islamic spreading and the beginning of *Jawi* (Arabic) lettering in Malay Archipelago. The artifact proves that Islam reached Terengganu in the early 14th century. The religion expansion has brought with them the growth of written manuscript. Some remnants of the *kitab*, transcripts and old documents are kept in the Terengganu Museum at present day. This has ascertain the Terengganu Museum being the chosen case study as it challenge the capability of the expertise in preserving the manuscript artifacts in terms of temperature, humidity and Lux reading. Figure 5 shows a manuscript freestanding display case in Terengganu State Museum.



Figure 5 : The plate shows the manuscript freestanding display case at Terengganu State Museum.
Source : Norashikin Abdul Karim, (2006)

2.1.2 Background of Manuscript Display at 'First Galleria' Taiping



Figure 6 : The plate shows the manuscript freestanding display case at First Galleria at Taiping
Source : Norashikin Abdul Karim, (2012)

The first galleria is the gateway to Taiping's 100 first and Taiping's thirty three first. The manuscript artefacts in this galleria consist of old books, documents, journals and maps during the establishment and rule of British in Taiping. Many of the early important manuscripts are placed in this galleria. For instance, the Perak Annual Report 1988, the First Revenue and Expenditure of Taiping Report 1885 and the 100 years old map of Taiping used by the Jack Fenner's tin mining industry. Moreover, there is an original collection of The Commissioner letter to Governor Sir Andrew Clarke dated on 23rd February 1874 found, besides so many other original manuscripts. However, the method of preserving and style of displaying the manuscript has not yet been plan. Furthermore, the responsible

expertise in manuscript recording, updating and displaying being the constraint of this gallery. Figure 6 shows a manuscript freestanding display case in First Galleria Taiping.

2.2 Methods of Measurement (Primary Data)

One method of measurement was involved in this particular research, it was on-site measurements of display case environmental performance of Light intensity (*Lux*), Relative Humidity (RH) and Temperature (°C). Therefore, all display cases at Terengganu State Museum and First Galleria Taiping were measured in detailed by the researcher. (See figure 7 and figure 8). Two types of display case design were considered during readings taken, namely 'Free Standing' display case and 'Wall Mounted' display case



Figure 7: The researcher was measured temperature and humidity reading on manuscript freestanding display case using Thermo-hygrometer at First Galleria Taiping

Source : Norashikin Abdul Karim, (2012)



Figure 8: The researcher was measured intensity of light (Lux) reading on manuscript wall display using LUX Meter at First Galleria Taiping

Source : Norashikin Abdul Karim, (2012)

3.0 Result

The following Table 1 below show the summary of readings taken for temperature (°C), relative humidity (RH) and intensity of light (Lux) for the measured manuscript artefacts at Terengganu State Museum and The First Galleria Taiping. The table also were indicated the source of light, type of ventilation and time surrounding during the readings taken. See detail at Appendix A (A.1 and A.2).

Museum /Gallery	Light Intensity (Lux)	Source of Light	ICOM (Lux)	Temperature (°C)	Ventilation	ICOM (°C)	Humidity (RH/%)	Time Surrounding	ICOM (RH/%)
Terengganu State Museum	20 - 400	Artificial Lighting	> 50<	26 - 27	Air-Con (close area)	24	63 - 67	10.00 am – 12.00 pm	< 70<
First Galleria Taiping	2 - 159	Natural Light	>50<	28 - 30	Natural (Electric Fan)	24	66 - 70	10.00 am – 12.00 pm	< 70<

Table 1: The summary of readings taken for temperature (°C), relative humidity (RH) and intensity of light (Lux) for the measured manuscript artefacts at Terengganu State Museum and The First Galleria Taiping.

Source : Norashikin Abdul Karim, (2012)

CONCLUSION

As a conclusion of this paper on environmental standard reading for manuscript artefacts in display cases, it can be concluded here that the Lux, temperature and relative humidity readings of display cases for manuscript artefacts at Terengganu State Museum and First Galleria Taiping were not seriously follow the ICOM readings guidelines. The finding reveals that 100% of Lux and temperature readings for manuscript artefacts in Terengganu State Museum and First Galleria Taiping are contravened with the guideline. Thus, it proves that both case studies do not comply with the proposed reading guideline by ICOM. To ensure that artifacts are properly conserved begins from

the interior spaces planning of the museum itself whereby temperature, humidity and total light intensity (lux) should be controlled to adhere to ICOM's standard. To ensure the display cases are in good condition. Consequently, the control of the interior environment (macro-environment) to the standard of ICOM will effect to the control of the case interior (micro-environment). Therefore, the design of display cases should consider the character and type of the artefact to be displayed especially for sensitive artefact like manuscript. The case display and preservation aspects like measuring the right temperature, relative humidity (RH) and light intensity (lux) according to the ICOM standard must be strictly adhere.

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<http://www.jmm.gov.my>

Appendix A.

A.1. Sample of data collection on Lux, Relative Humidity and Temperature of manuscript artefacts reading at First Galleria Taiping.

Lux, Relative Humidity and Temperature Reading of manuscript artifacts readings at First Galleria Taiping

Manuscript Name : <i>Table Case of Manuscript Display – 100 year of Map belonging to Jack Fenner</i>		Code No : FG/M/1912
		
Source of Light : <i>Natural Sun Light</i> Type of Ventilation : <i>Natural (Electric Fan)</i> Time Surrounding : <i>10.00 am – 12.00 am</i>		
<i>Display case / surrounding readings</i>	<i>ICOM</i>	<i>Artifact Deteriorations :</i>
Light Intensity (Lux) Reading : 158 Lux Temperature (°C) Reading : 30 °C Relative Humidity (RH) Reading : 67 %	< 50Lux 24°C < 70 %	*Map brownish & yellowish, rotten binder, . . .

A.2. Sample of data collection on Lux, Relative Humidity and Temperature of manuscript artefacts reading at Terengganu State Museum

Lux, Relative Humidity and Temperature Reading of manuscript artifacts readings at Terengganu State Museum

Manuscript Name : <i>Free standing Case of Manuscript Display – The handwritten religious book collection</i>		Code No : FG/M/1945
		
<p> Source of Light : <i>Artificial Lighting</i> Type of Ventilation : <i>Air-con (closed area)</i> Time Surrounding : <i>10.00 am – 12.00 am</i> </p>		
Display case / surrounding readings	ICOM	Artifact Deteriorations :
Light Intensity (Lux) Reading : a) 20 – b) 40 Lux Temperature (°C) Reading : 26 (in)-27(out) °C Relative Humidity (RH) Reading : 65(out)-67(in)%	< 50Lux 24°C <70 %	*Yellowish, spots & brittle, manuscript rot (cloth Moth)