



Reviewing and Identifying the Green Criteria in Relation to the Building Cost: Project Management

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ABSTRACT

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To determine the similarities and differences categories of the assessments between the Malaysian green assessment tool for residential building with other countries, six (6) green assessments from six (6) different countries had been chosen; the United State (US) to represent the American region, the United Kingdom (UK) to represent Europe, Japan to represent Asia and Australia. Singapore was chosen as it is very close to the location of the case study, Malaysia. Each of the countries represents different climate condition except for Singapore and Malaysia which experience the same climate. This paper will show a comparison of each selected green assessment tool under Management/Project Management criterion. The objective is to find out the potential benchmarks which can be applied in developing a cost model prediction tool for the Malaysian green home.

Keywords:

Green assessment, green criteria, building cost, management/project management

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1. Introduction

When the awareness of sustainable development has increased in the construction industry, it led to the implementation of an energy rating guideline. In the latter half of the 1980s, the construction industry started to move toward sustainability. Various techniques to evaluate the environmental performance of the building had been introduced. The first green building assessment was introduced in the UK in 1990 is the Building Research Establishment Environmental Assessment Method (BREEAM). Since then, several countries have developed their own green or environmentally friendly building programs [1]. Some of the programs include the Leadership in Energy and Environmental Design (LEED) of the USA, GreenGlobe from Canada launched in 2002 [2], the Comprehensive Assessment System for Building Environmental Efficiency (CASBEE) of Japan, and the Green Star of Australia [3]. In Singapore, in the building sector, one of the efforts to promote sustainable development is an implementation of the Green Marks (GMS) [4]. In Malaysia, the Green

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Building Index (GBI) was introduced in 2009 to assist the building industry in demonstrating sustainable development [5].

Almost all environmental assessment methods have been designed to suit with a specific territory [6] or to meet with the local purposes and are not fully applicable to all regions [7]. They depend on the climatic conditions, geographical characteristics, the potential for renewable energy gain, resource consumption (such as water and energy), construction materials and techniques used, building stocks, government policy and regulation, appreciation of historic value, population growth and public awareness.

2. Literature Review

Site management and project management are part of the important factors to be considered when enhancing the project value. As it can oversee a variety of resources, including labour, equipment, materials and profit. Generally, in every stage of any development or construction process, there is a correlation to the buildings' cost. It will comprise i) preliminaries cost, ii) sub-structure cost, iii) super-structure cost, iv) mechanical and electrical services, v) external works, vi) site development, vii) furniture and equipment, viii) consultants' fees and ix) contingency cost. When the quantity surveyors do the pricing to the development cost, the cost itself does not only involve the materials cost, but also the method of implementations.

Accordingly, to discover which of the green criteria those involve direct cost or indirect cost of the building elements, the arrangements were made based on the RIBA Plan of Work because it organizes the process of briefing, designing, constructing, maintaining, operating and using building projects into a number of key stages.

3. Results and Discussion

The summary of the green assessment under Management/Project Management which has been arranged according to the RIBA Plan of Work 2013 [8] is shown in Table 1.

Table 1

Summary of green assessment under Management/ Project Management

MANAGEMENT / PROJECT MANAGEMENT							
RIBA PLAN OF WORKS 2013		GREEN ASSESSMENT					
		LEED	BREEAM	CASBEE	GREEN STAR	GREEN MARK	GBI
STAGE 0	STRATEGIC DEFINITION						
STAGE 1	PREPARATION AND BRIEF				MAN-1		SM 7 SM 8
STAGE 2	CONCEPT DESIGN						
STAGE 3	DEVELOPED DESIGN				MAN-16		
STAGE 4	TECHNICAL DESIGN						
STAGE 5	CONSTRUCTION		MAN 2 MAN 3 MAN 4		MAN-4 MAN-6 MAN-7	LH 3-3	SM 5 SM 6

STAGE 6	HANDOVER AND CLOSEOUT						
STAGE 7	IN USE		MAN 1		MAN-2 MAN-3 MAN-5	LH 3-4	SM9

The codes in Table 1 above indicate the green assessment as below:

CODES	GREEN ASSESSMENTS
MAN 1	Home User Guide
MAN 2	Considerate Constructors
MAN 3	Construction Site Impacts
MAN 4	Security
MAN-1	Green Star Accredited Professional
MAN-2	Commissioning Clauses
MAN-3	Building Tuning
MAN-4	Independent Commissioning Agent
MAN-5	Building Users' Guide
MAN-6	Environmental Management
MAN-7	Waste Management
MAN-16	Metering
LH 3-3	Environmental Management Practice
LH 3-4	Stormwater Management
SM 5	Construction System and Site Management
SM 6	Stormwater Management
SM 7	Redevelopment of Existing Sites and Brownfield Redevelopment
SM 8	Avoiding Environmentally Sensitive Areas
SM 9	Building User Manual

Sources: [9-14]

After reviewing all the above green assessment indicated in Table 1, the finding shows that, only MAN 4, LH 3-3 and GBI: SM5 related to the building cost. The rest are not directly related to the building cost.

Accordingly, BREEAM: MAN 4 – Security, points will be awarded when the security for external doors and windows achieve for at least a minimum standard as per required. It aims to encourage the burglary resistance of building components, strong-points, and security enclosures. So, there is a necessity to select the secured materials for doors and windows which provide enhanced security against the unauthorized forced entry for at least. Nonetheless, during the design stage, the designer should encounter the site layout, general arrangement for external lighting, car-parking, planting, footpaths, communal areas, doors and windows, electrical or similar, where the location and details of all security measures are shown, including features such as external lighting, door/window locks etc. All those criteria are necessary to encourage the design of developments where people feel safe and secure; where crime and disorder, or the fear of crime, does not undermine the quality of life or community cohesion.

Security and safety are very important in creating a green community. This statement can be referred to ODPM [15] in which they stated that “safety and security are essential to success the aim for sustainable communities. As they are not the only places with well-designed, attractive environments to live and work in, but they are also places where freedom from crime, and from the

fear of crime; as to improve the quality of life. Sustainable communities are communities which are economical, socially and environmentally, and respect the needs of the future generations”.

Green Mark: LH 3-3 – Environmental Management Practice involves the method of managing resources on the site. It can affect construction cost indirectly. As for an example; in the build-up rate calculation of the sawn timber formwork, recycling of the formworks can reduce the material used on-site. It is not only can help to reduce the resources but also can be economical and return an extra profit to the builders or contractors.

GBI: SM5 – Construction System and Site Management, by means of its objective are to encourage the usage of IBS as to reduce on-site construction material wastage and construction wastage to landfill sites. The IBS can replace the traditional formwork (made of timber) in order to reduce on-site construction material wastage and construction wastage to landfill sites. It is also encouraging to reduce the polluting effects of construction and also from workers during construction. Points are given by controlling pollution from waste and rubbish from workers, create and implement a Site Amenities Plan for all construction workers associated with the project. The IBS can be economical, especially for housing development (either terrace houses or apartments) because the design is normally repeated, and the patterns are the same or similar.

Other green assessments which do not involve a direct cost to the building development (but involves the project development cost) and shall be considered are GBI: SM7 – Redevelopment of Existing Sites and Brownfield Redevelopment and GBI: SM8 – Avoiding Environmentally Sensitive Areas. These two assessments are very important because they will discourage the development in environmentally sensitive areas, encourage re-development of the existing sites, reward rehabilitation of Brownfield site and development in the rehabilitated sites and help to reduce the environmental impact by disallowing any development on prime agriculture land. As define by the Town and Country Planning Act, land that is specifically identified as habitat for any species threatened or endangered lists, within 30 meters of any wetlands as defined by the Structure Plan of the area or within setback distances from wetlands prescribed in state or local regulations, as defined by local or state rule or law, whichever is more stringent, previously undeveloped land that is within 15 meters of a water body, defined as seas, lakes, rivers, streams and tributaries which support or could support fish, recreation or industrial use, land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner and land which is classified as Class IV (steeper than 30 degrees).

4. Conclusions

Those above criteria will be considered and becoming the options for the building elements to be included in the proposed cost modelling prediction tool. Those above criteria will be considered and becoming the options for the building elements to be included in the proposed cost modelling prediction tool.

Green Assessments	Building Elements
BREEAM: MAN 4 – Security	- Doors and Windows – secured materials for doors and windows - Ironmongeries – door and window locks - Internal Electrical Services - point for external lighting
Green Mark: LH 3-3 – Environmental Management Practice	Managing resources on the site Encourage 3R – reuse, recycle and reduce of the materials on-site

GBI: SM5 – Construction System and Site Management	Sub-structure and Super-structure - use IBS as to reduce on-site construction material wastage and construction wastage to landfill sites
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