DEVELOPING QUALITY ASSESSMENT ELEMENTS FOR SHRUB PLANTING WORKS

BY

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ABSTRACT

This research focuses on the quality of shrub planting works. It aims to develop assessment elements for shrub plating works. The objectives of this study are, i) to identify the status of soft-scape quality management in relation to shrub planting works in Malaysia, ii) to develop element of assessment for shrub planting works, and iii) to establish weighted soft-scape quality assessment elements for shrub planting works in Malaysia. The data was collected using mixed-method approached. There are four stages in collecting data, which are, i) research framework and background study, ii) developing initial list of planting assessment elements; iii) conducting survey among 258 landscape architects listed in ILAM Directory, and iv) analyzing and producing a set of critical success factor for shrub planting works. The analysis is divided into three parts. i) The analysis on the general commonness of the socio-demographic of respondents based on different duration of work experience, gender, occupation and status of ILAM members, ii) The mean comparison on the Critical Success Factors (CSF) of the elements of assessment, iii) To analyze Contribution Weightage for elements of assessment. There are nine elements of assessment for shrub planting works which are i) Overall height, ii) Leaves, iii) Flower, iv) canes, v) Soil Mixture, vi) Planting hole, vii) Root ball size, viii) Mulching and ix) finishing and treatment. The findings reveal that leaves, canes and overall height are the elements ranked as the three most critical for the success of shrub planting work. Meanwhile, planting hole, soil mixture and mulching are among the three lowest ranked for the success of shrub planting work. Finally, it is hoped that the findings would help to facilitate the process of establishing the quality assessment tool for landscape work. Besides, the findings can be a reference in the process of improvement on the quality documents for landscape work in Malaysia as a whole.

خلاصة البحث

يركز هذا البحث على جودة أعمال زراعة الشجيرات، وهو يهدف إلى تطوير عناصر التقييم لأعمال طلاء الشجيرات. من أهداف هذه الدراسة هي: (1) تحديد حالة إدارة جودة اللينة الناعمة فيما يتعلق بأعمال زراعة الشجيرات في ماليزيا ، (2) تطوير عنصر التقييم لأعمال زراعة الشجيرات، و (3) إنشاء عناصر تقييم للجودة المرنة ذات المقاس الناعم لأعمال زراعة الشجيرات في ماليزيا. لقد تم جمع البيانات باستخدام طريقة مختلطة. وهناك أربع مراحل في جمع البيانات، وهي: (1) إطار البحث ودراسة الخلفية ، (2) وضع قائمة أولية بعناصر تقييم الزراعة ؛ ج) إجراء مسح بين 258 من مهندسي المناظر الطبيعية المدرجة في دليل ILAM ، و 4) تحليل وإنتاج مجموعة من عوامل النجاح الحاسمة لأعمال زراعة الأشجار. ينقسم التحليل إلى ثلاثة أجزاء. (1) تحليل القواسم العامة للديمغرافية والاجتماعية للمستجيبين بناءً على مدة مختلفة من الخبرة العملية والجنس والمهنة وحالة أعضاء ILAM ، (2) المقارنة المقارنة بين عوامل النجاح الحرجة (CSF) لعناصر التقييم ، (3) تحليل "وزن المساهمة" لعناصر التقييم. وهناك تسعة عناصر لتقييم أعمال زراعة الشجيرات وهي: (1) الارتفاع الكلي، (2) الأوراق، (3) الزهرة، (4) العصي، (5) خليط التربة، (6) ثقب الزراعة، (7) حجم كرة الجذر، (8) المهاد، و(9) التشطيب والعلاج. تكشف النتائج أن الأوراق والعصا والارتفاع الكلي هي العناصر التي تم تصنيفها على أنها العناصر الثلاثة الأكثر أهمية لنجاح أعمال زراعة الأشجار. وفي الوقت نفسه، تعد فتحة الزراعة ومزيج التربة والغطس من بين أدنى ثلاث درجات لنجاح أعمال زراعة الأشجار. أخيرًا، من المأمول أن تساعد النتائج في تسهيل عملية إنشاء أداة تقييم الجودة للعمل المناظر الطبيعية. علاوة على ذلك، يمكن أن تكون النتائج مرجعًا في عملية التحسين على جودة المستندات لعمل المناظر الطبيعية في ماليزيا ككل.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Science (Built Environment)

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DECLARATION

I hereby declare that this thesis is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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The Most difficult challenge I have encountered during the production of this thesis is to confine the context of the study while critically and precisely address significant issues derived from within the context of the study. Hopefully, this thesis give a good read for readers, students, academicians and especially researchers of related research concerns.

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LIST OF ABBREVIATIONS

ALAM	Angkatan Landskap Malaysia
ANSI	American National Standard Institute
ASCE	American Society of Civil Engineers
BPR	Business Process Re-engineering
BSI	British Standard Institute
CCC	Certificate of Completion and Compliance
CI	Continuous Improvement
CIS	Construction Industry Standard
CIDB	Construction Industry Development Board
CPMM	Construction Productivity Measurement Model
CPPMM	Construction Project Performance Measurement Model
CSF	Critical Success Factor
CQM	Construction Quality Management
CWF	Contribution Weightage Formula
ILAM	Institute Landscape Architect Malaysia
IPI	Integrated Performance Index
ISO	International Standard Organization
KPI	Key Performance Indicator
MPC	Malaysia Professional Centre
NLA	Nursery Landscape Association
NLD	National Landscape Department
NLG	National Landscape Guideline
PMM	Performance Measurement Model
PQMM	Project Quality Measurement Model
PQP	Project Quality Plan
PVMM	Project Viability Measurement Model
PWD	Public Work Department

QAS	Quality Assessment System
QLASSIC	Quality System in Construction
QMS	Quality Measurement System
SILARA	Malaysia Landscape Industry Association
SIRIM	Standard and Industrial Research Institute of Malaysia
SPSS	Statistical Packaging for Social Science

CHAPTER ONE

INTRODUCTION

1.1 RESEARCH BACKGROUND

Nowadays, landscape development in Malaysia has go through a major change as to accomplish the vision towards 'The Beautiful Garden Nation' by the year 2020. According to the National Landscape Policy (2011) "*The Beautiful Garden Nation is a country where its physical development is balanced with a well-managed green, beautiful and clean environment*". Moreover, it is also completed with unique outdoor spaces that provide special quality and reflect identity of Malaysia. Abdullah (2003) stated that this vision, "*has boosted rapidly the landscape growth all through the country that can be observed in Putrajaya, Cyberjaya and KLCC*". In order to accomplish the vision of Malaysia Beautiful Garden Nation by 2020, little attention is given to the quality aspect of the soft-scape material and works (Roziya, 2009). The quality of implementation related to landscape project is always an issues that require proper attention.

One method to evaluate workmanship of a construction work, which is Quality Assessment System in Construction (QLASSIC) had been established by the government of Malaysia through Construction Industry Development Board (CIDB) in 2006. QLASSIC has successfully recorded an improvement in construction activities according to the increase of QLASSIC scoring (Mukhtar, 2009). It clearly shows that QLASSIC is a tool that improves the quality of construction. QLASSIC is a method or system to evaluate and measure the quality of workmanship of a construction work based on the relevant approved standard. CIDB (2013) stated that QLASSIC assists the

quality of workmanship between construction projects to be objectively compared through a scoring system. There are five objectives of the establishment of QLASSIC, which are:

i. To benchmark the quality of workmanship of the construction industry.
ii. To establish a standard quality assessment system on quality of workmanship of construction work.
iii. To assess the quality of workmanship of a construction project based on the relevant approved standard.
iv. To be used as a criterion to evaluate the performance of contractors based on quality of workmanship.
v. To compile data for statistical analysis.

According to the increment on scoring mark for the project that undergo the process of QLASSIC assessment, it illustrated that QLASSIC enhances construction work quality at certain degrees (Sani, 2015). The necessity of improving landscape work through assessment system parallel with QLASSIC actually initiated the research. The intention of the study is to develop quality assessment elements for shrub planting works and as a part of fulfilling the need to create a set of reliable weighted soft-scape element to be used as a reference to improving quality control document in Malaysia.

1.2 PROBLEM STATEMENT

The Malaysia government's vision toward 'The Most Beautiful Garden Nation' by the year 2020 has boosted rapidly the landscape development during the whole of the country. Nevertheless, Malaysia Construction Industry Development Board (CIDB, 2000) reported, these vast and hasty developments have led to a damaging compromise in quality. Currently, no specific quality standard provided to control and monitor the quality of soft-scape elements and planting work.

Landscape project is a form of construction that combine of inert element with the living plants, or it is usually known as the hard-scape and the soft-scape, within the environment. In the building industry practice, the quality of the hard-scape is specific and codified. Whereas, for soft-scape elements and works the quality is a wide range of subjectivity. So, there is a need to developing quality assessment element for soft-scape planting work as it is an important document in determine the quality aspect of the landscape development in Malaysia.

Sani (2015) states that based on a survey conducted in the year 2010, the findings of the study indicated that there is a need to scrutiny the landscape work process as the result has revealed that the level conformance to specification is generally considered as low. Moreover, most of the respondents revealed that the quality of the soft-scape construction work in Malaysia have not fulfilled the specification requirement. The finding reported that 80% of respondents concluded that more than 50% of landscape project that they involved undergone rectification work after completion (Sani, 2015). If the project fail to satisfy the specification requirement, it must undergo rectification work after completion.

Many researchers have been highlighted on the subjects of managing construction quality (Abdul Rahman 2010; Mohamed et al, 2006). However, most of the researches were conduct as a whole. It is important to conduct a research in a narrower scope which focusing on the area of implementation in the construction work. The result of the study would help to guide QLASSIC in addressing assessment and can be a reference in the process of improving the quality management for landscape work in Malaysia. Since QLASSIC only fulfils a certain area of construction that is not included landscape work, the same effort to establish another version of QLASSIC to cater the area of landscape work.

In landscape field, soft-scape can be divided into six soft-scape types which are tree, shrub, palm, ground cover, grass and climber. In the previous study done by Sani (2015), on developing quality assessment elements for tree planting works, this study only cater for tree planting works. Developing a weighted element for all types of soft-scape in landscape work is necessary to fulfil the requirement of QLASSIC for soft-scape construction quality assessment. Therefore, the intention of this study is to developing quality assessment element for shrub planting works.

1.3 RESEARCH AIM

The aim of this research is to develop quality assessment elements for shrub planting works and as a part of fulfilling the need to create a set of reliable weighted soft-scape element to be used as a reference to improving quality control document in Malaysia.

1.4 RESEARCH QUESTION

In this research, there are issues and question that structure the study of developing assessment elements for shrub planting works. The research focuses on the following research questions:

1- What documents of shrub planting works quality control are available in Malaysia?

2- What are shrub planting works assessment elements?

3- What is the Critical Success Factors (CSF) level of every shrubs planting works elements?

1.5 RESEARCH OBJECTIVE

The research objectives are:

1- To identify the status of soft-scape quality management in relation to shrub planting works in Malaysia.

2- To develop element of assessment for shrub planting works

3- To establish weighted soft-scape quality assessment elements for shrub planting works in Malaysia.

1.6 RESEARCH METHODOLOGY

Table 1.1 shows the research methodology flow. It begins with the study of the quality management in relation to planting works in Malaysia. Related secondary data were referred from selected government agencies. Survey were conducted with the respondent that at least have basic knowledge of landscape field as to collect comments and issues related to quality management in relation to planting works in Malaysia.

Table 1.1: Research Methodology Flow

STAGE	OBJECTIVES	APPROACHES	REMARKS
1	To identify the status of soft-scape quality management in relation to planting works in Malaysia.	Literature review	• Definition of Quality in Construction • QLASSIC reviewed • List of initial assessment shrub planting work elements.
2	To develop element of assessment for shrub planting works.	Literature review Survey	• List of assessment shrub planting work elements. • Weighted Assessment Element Established
3	To establish weighted soft-scape quality assessment elements for shrub planting works in Malaysia.	Contribution Weightage Formula	• Reliable List • Assessment Element Established

In the beginnings of this research, National Landscape Department (NLD) and Construction Industry Development Body (CIDB) was visited by the researcher to gather relevant document of the research. The research concentrated on the status of

legal document relevant to quality assessment element for planting work and information related to quality in landscape construction in Malaysia.

Then, the research continued with producing the initial list of shrub elements for assessment by referring data from NLD, Canadian Nursery Landscape Association (Canadian NLA) and America Nursery Landscape Association (America NLA). At this stage, all the data referred from this three agencies will be compared to discover similarity and differences of the content.

To achieve the second objective, which is to develop element of assessment for shrub planting works, it was done through questionnaire survey. The respondent are among Landscape Architecture that register under Institute Landscape Architect Malaysia (ILAM). The respondents were divided into two group, which are ILAM corporate member of ILAM (ICM) and non-ILAM corporate member (NICM). The opinion depend on Critical success factors (CSF) of assessment elements from these two groups were used to form the reliable weighted element of assessment that can be used in landscape quality assessment tools and as a remark for related quality control documents.

Statistical Package for Social Science (SPSS) version 24 was used to analyse the data for questionnaire survey. A detail explanation on method of analysis will be explained in Chapter 3 (Research Methodology).

Finally, synthesis on the findings was conducted and the conclusion of the research was made. Then, the recommendations are proposed based on the conclusion of the research.

1.7 SIGNIFICANCE OF THE RESEARCH

This research is significant to landscape management, landscape industry in Malaysia and other countries. It will prepare the foundation for upgrading of landscape construction and landscape industry. Through detail assessment on construction process and material. It can determine the quality of landscape construction, David (2007) stated that conforming to requirement also mean conforming to design and specification which can be measured from customer's satisfaction, both from the customer's and producer's point of view. Moreover, quality can be referred as compliance and conformance with specification (Woodward, 1997).

The landscape industry necessities to have constant quality improvement that includes many aspects. This research is aimed to develop quality assessment elements for shrub planting works to be applied in construction quality assessment tool in order to measure the level of quality achievement in landscape projects. Besides, the finding also can be used as a reference in facilitate the needs of relevant quality control documents.

This research will provide landscape industry players a proper references and guideline for their practice. Furthermore, this research will benefit other countries that have problem and issues related to quality standard of overall landscape. This research can be the basis for further development of quality standard for landscape industry in total.

1.8 RESEARCH SCOPE AND LIMITATION

1.8.1 Research Scope

Since Malaysia has yet to establish national landscape standard as a reference, this research focused on establishing landscape construction quality assessment element for shrub planting works to be used as quality assessment tools. The scope of the research begin from review of the literature pertaining to the subject of overall issues on landscape quality in Malaysia. Then, the study was narrowed down to more precise topic interrelated to the establishment of landscape construction quality assessment elements. Landscape construction specification was one of the essential aspects that taken into consideration. Landscape construction specification offers the initial set of assessment element as a foundation of establishment of the final reliable set of landscape construction assessment element for shrub planting works.

The initial list of assessment element for shrub planting works were produce based on data referred from three government agencies which are NLD, Canadian NLA and America NLA. The data gained from this three agencies will be analysed through comparison method to discover similarity and differences of the content.

During the course of this research, the researcher distributed survey question in the process of developing quality assessment element for shrub planting works. Landscape Architects have been chosen as respondents of the survey. Moreover, landscape Architect is a qualified person in landscape industry in Malaysia. They are equipped with significant knowledge on landscape architecture as a whole. It clearly shows that landscape Architects are the most appropriate respondent to generalize the result of the research.