Cost Centres for Restoration Work: A Case Study of Town Hall in George Town, Penang

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Abstract

Purpose: The purpose of this paper is to identify the cost centres of conservation works for Town Hall in George Town. Design/methodology/approach: The case study approach is one of the most commonly used research designs in qualitative research. The case study method is adopted in this research to enable in-depth and detail probing of the cost centres from the total costs of conservation works and also to understand the reasons for the high costs in certain work items for the chosen building. Findings: Generally, the major costs found in building conservation works are for restoration works and upgrading or improvement of M&E services to the building. This paper discusses the findings from the case study of one of the selected buildings in George Town. Further studies on the various costs under restoration works revealed that roof, ceiling, decorative elements, internal wall and columns finishes, door, ironmongeries and windows, external finishes and plumbing and sanitary installation are the major cost centres for restoration works. The paper then further discusses the reasons for the above findings. Originality/value: This study attempts to identify the cost centres of conservation works for a historical building in George Town. Understanding the cost centres will enable a better cost estimation for similar works in the future.

Keywords: building conservation works, cost centres, George Town, restoration works, cost studies

1. Introduction

Building conservation generally involves the renovation of old structures, which could bring them back to fulfilling their original functions by contemporary standards or adapt them to new uses. According to Ahmad (1998), historical buildings are preserved and conserved for various reasons, namely retention of historical values and development and also to promote tourism. The state of Penang is well known for the heritage character of its capital city, George Town. Compared to the fast industrializing and urbanizing landscape of Penang State, the old city still retains its charms and historical ambience. The Penang Island Municipal Council (MPPP) has adopted a heritage conservation policy for Georgetown and on 7th July 2008, UNESCO has listed Melaka and George Town as Joint Historic Cities of the Straits of Melaka to the World Heritage List. According to the document submitted to UNESCO, the nominated property in the Historic City of George Town covers 109.38 hectares and consists of the historic inner city on the north-east cape of Penang Island. There are more than 1,700 historic buildings within the core zone aligned on four main streets of Pengkalan Weld, Lebuh Pantai, Jalan Masjid Kapitan Keling and Lorong Love besides other perpendicular streets of Jalan Tun Syed Barakbah, Lebuh Light, Lebuh Bishop, Lebuh Gereja, Lebuh China, Lebuh Pasar, Lebuh Chulia, Lebuh Armenian and Lebuh Archeh.

Due to the listing, more property owners are starting to have an interest in restoring their property to take advantage of the city new status, causing an increase in restoration works. As such the demand for professionals such as conservation architect, quantity surveyors, building surveyors has also increase. However, the education and training of a quantity surveyor has always focussed on new building works. Due to the lack of experience in this area, many quantity surveyors are not familiar with the pricing for building conservation works. Unlike new building works where there are cost data to refer to, anecdotal evidence suggests that there is very limited cost data that quantity surveyors can refer to for historical building conservation work. Experience in new building works has shown that cost data plays an important role in the construction industry as it is an important source of reference for construction cost to both the quantity surveyor and the contractor. As such, the objective of this study is to define and identify cost centres for building conservation works to provide a guide for quantity surveyors in estimating such works in the future.

2. Cost centres of building conservation works

It is important to start out this paper with a clear definition of the terms ‘cost centre’, ‘building conservation’ and ‘historical building’. According to Ashworth (1988), ‘cost centre’ is defined as items of cost importance identified within a building project. In old buildings, the demolition and structural costs are minimal and the major factors that determine the overall cost of a project lie in the architectural and mechanical work (Fitch, 1992). Frequently, costs for mechanical and electrical work are high due to the complex nature of the systems installed. This element of the work is likely to remain an expensive item because historical buildings do not lend themselves to the installation of the quantity of ductwork and chases normally associated with mechanical and electrical equipment. Feilden (1994) recognises that, whilst the general renewal of building engineering services gives ‘life’

to these historic structures, their installation also causes acute technical and artistic problems. Fidler (1987) fears that old buildings are under threat from adaptive use, because it is often difficult to reconcile the technical requirements with the principles of conservation.

According to Lee (2006), Building Restoration Works and Mechanical and Electrical Works are the two major cost centres that need to be considered when preparing costs for all restoration projects. He also divided the restoration works into two elements called major and minor elements. Major elements are considered as important elements that must be priced and taken into account during the preparation of the estimate for restoration works. These major elements include roof and rainwater goods, floor structure and finishes, wall and column finishes and ceiling structure and finishes. The minor elements only appear on certain circumstances or can be interpreted as uncommon building trades or activities.

Ahmad (1998) has defined 'building conservation' as the practice of keeping historical buildings intact. The term 'historical buildings' usually refers to old building that has historical and architectural value. The scopes of works for conservation works to historical building are different from new building works. There are some special scopes of works that is specifically for conservation works. These special scopes include the preparation of the dilapidation survey report and from this report, repair methods and techniques can be identified. All building defects, methods and techniques will be recorded systematically by using the Historical Architectural Building Survey (HABS) documentation method. Scientific studies and laboratory tests will also be carried out before the completion of building conservation works.

3. Methodology

The main aim of this paper is to obtain an indication of which elements form the cost centres for building conservation works. In order to have an in-depth study of the cost centres, the research methodology chosen is case study. The case study research represents one of the most commonly research design in qualitative research. The sampling method used in this research is selective rather than based on random sampling. The authors acknowledge that the core criticism of case study research is that the results can not be generalised to a population (Woodside and Wilson, 2003). Below are the criteria used to select the sampling for this study:

- The building must be a historical building.
- The building must be within George Town area.
- It must have complete bill of quantities in the tender document.
- No study has been conducted on the building before.

From a survey of all conservation works in George Town, fifteen projects are short-listed and upon closer examination, Town Hall is chosen as the case study as it fulfils all criteria. The other projects are rejected because some have been studied by other researcher while some does not have sufficient information for case study or the information is too old. As part of the data collection, the contract document for this project was reviewed to obtain the relevant information. Other than secondary data, interviews were also carried out with the consultants who have been involved in this project. In order to determine the cost centres, the study applied the Pareto principle which is also commonly known as the 80-20 rule. The Pareto principle states that, for many events, roughly 80% of the effects come from 20% of the causes (John, 1997). Based on this principle, the study will define cost centre as those elements that contribute to 80% of the total cost.

4. Case study project

4.1 Introduction

Many heritage buildings in George Town, Penang have exceptionally survived the decades amidst intense development pressure and rapid urbanization. Some of them have been gazetted under the Malaysian Antiquities Act 1976, a condition that provides these buildings some protection and encourages their preservation. One such example is the Town Hall, a British colonial building located at The Esplanade in George Town, Penang. This distinctive building is considered by many local and foreign tourists as one of the notable heritage buildings in Penang. In February 2003, the Penang Municipal Council had granted a sum of RM4.17 million for the restoration of the Town Hall. A team of consultants including architect, engineers, quantity surveyor and conservation consultant were duly appointed to take on the restoration project, which was completed in August 2004.

Figure 1: During restoration

Figure 2: After restoration

(http://www.hbp.usm.my/conservation/SeminarPaper/TownHall.htm)

4.2 Historical background

The Town Hall, Penang's oldest Municipal Building was built around 1879 and is categorised as Grade 1 heritage building which means that it must be maintained in its original design. A building of British Palladian architecture, with classical arches, columns, pilasters, quoins, ornamental elements on roof parapet and balustrades, the Town Hall stands on Lot No. 70, Section 19, Georgetown, North-East District, Penang. With a land area of 70,711 square feet, the Town Hall is situated along Jalan Padang Kota Lama or formerly known as the Esplanade Road. On 1st January 1879, Lt. Governor Sir Archibald Edward Harbord Anson laid down the foundation stone of the Town hall and it was declared open by Governor Sir Federick Weld of the Straits Settlement in 1880. It was formerly the social venue for the town's elite, namely the European community. Hence, the Chinese called it 'Ang Mor Kong Kuan' or 'The European Club'.

The Town Hall had been the focus of social live and civic pride. It had within its building an assembly hall with a stage as well as a ballroom with adjoining supper rooms. In the past, the Town Hall had functioned as a venue for Council meetings, Council elections, public speeches, balls, dramas and amateur concerts. For instance in 1891, the English Evening Service of the Wesley Church was held here while the "Bangsawan Wayang Kulit"(shadow play show) had performed in 1903. In addition, a group of Filipino musicians called the "Manila Band" had performed in this Town Hall regularly from 1890-1954. Apart from administrative and social functions, the Town Hall housed the Penang Library for more than 20 years and a private college (Kolej Damansara Utama) for 8 years. Due to its immense historical and architectural values, the building was gazetted on 29th July 1982 under the Antiquities Act 1976.

The Town Hall has a balcony that overlooks the Esplanade. In the olden days, the elite used to gather on the balconies of the Municipal Council buildings to view the processions and games held below. Through the years, the Town Hall has undergone five extensive expansions in 1890, 1903, 1938, 1958 and 1991 to accommodate the increasing demand for internal space and now comprises a front portico, an assembly hall, a ballroom with adjoining supper rooms, a stage, office rooms and a library. The Town Hall was also used for the filming of the movie "Anna and the King" in 1999. In the year 2003, archaeological excavations unearthed a small tunnel with a 96cm opening underneath the building. Artefacts' discovered in the tunnel included broken pieces of pottery, Chinese roof tiles, bricks, glasses, porcelain, coins and even nails.

4.3 Elemental cost breakdown

The total cost incurred for restoring Town Hall is RM4,157,063.20. The costs for conservation works can be divided into four sections which consist of preliminaries, prime cost and provisional sums, building restoration works, and mechanical and electrical works. From the Table 1 below, it shows that building restoration works and mechanical and electrical works are the two major items which have the highest cost. This is similar to the literature review which also proved that building restoration works and mechanical and electrical works are the major cost centres.

Table 1: Elemental Cost Breakdown

Schedule No.	*Item*	*Amount (RM)*	*Percentage (%)*
1	*Preliminaries*	*352,150.00*	*9*
2	*Prime Cost and Provisional Sums*	*598,900.00*	*14*
3	*Building Restoration Works*	*1,584,793.20*	*38*
4	*Mechanical and Electrical Works*	*1,621,220.00*	*39*
	TOTAL	*4,157,063.20*	*100*

4.3.1 Preliminaries

Table 2 below shows the major cost items for preliminaries. The elements are arranged in descending order according to the cost of the element. The highest cost item is contractor's superintendence item. This item include provision of on and off site management supervision including site agent and all necessary clerical and supporting personnel. This item also includes the allowance for a qualified and approved conservationist to assist contractor in supervision and other related matters to the conservationist works. The conservationist shall be engaged full time and based at site throughout the duration of the works.

The second highest cost item is safeguarding of the works. This item includes safeguarding the works, materials and plant against damage and theft including all necessary watching and adequate lighting. The contractor is also responsible for the safety of all materials, fixed and unfixed of his own, other sub-contractors and suppliers. This item also includes the cost for the employment of sufficient uniformed security guards for round the clock duties for the full duration of the contract. The equipment for supervision of the works includes computer, software, scanner, printer, camera, video camera and photocopy machine. The plant item includes provision of all necessary proper and modern mechanical and non-mechanical plant, vehicles, machineries, tools and whatever else devices that may be required for the proper and efficient execution and completion of the works.

Table 2: Major Cost Items for Preliminaries

No.	*Item*	*Amount (RM)*
1	*Contractor's Superintendence*	*100,000.00*
2	*Safeguarding the Works*	*50,000.00*
3	*Equipments for Supervision of the Works*	*25,000.00*
4	*Plant*	*25,000.00*
5	*Consultant's Site Office*	*16,000.00*
6	*Temporary Buildings*	*12,500.00*
7	*Performance Bond*	*12,000.00*
8	*Construction Industry Development Board Act 1994*	*11,000.00*
9	*Contractor's Workmen Accommodation*	*10,000.00*
10	*Scaffolding*	*10,000.00*
11	*Setting Out*	*10,000.00*
12	*Temporary Electricity Supply*	*10,000.00*

4.3.2 Prime cost and provisional sums

Table 3 below shows the cost breakdown for prime cost and provisional sums. From the breakdown below, it shows that contingency sum is found to be the highest cost item. Contingency sum is a sum allocate for unforeseen works. Under the requirement by the Museum and Antiquity Department of Malaysia, conservation work should involve a systematic method of recording and documentation based on the HABS. The HABS involved three major stages; before, during and after restoration works. Five copies of documentation for each stage must be prepared and according to the interviewee the minimum fee for prepare one copies of HABS report is RM10,000.00. Hence, total documentation fee for a building is RM150,000.00.

Table 3: Cost Breakdown for Prime Cost and Provisional Sums

No.	*Item*	*Amount (RM)*
	Prime Cost Sums	
1	*Motorised Blinds*	*153,500.00*
2	*Curtain*	*42,800.00*
3	*Sky Lift*	*32,600.00*
	Provisional Sums	
4	*Support for Backdrop*	*20,000.00*
5	*Restoration Work Documentation*	*150,000.00*
6	*Contingency Sum*	*200,000.00*
	Total	*598,900.00*

4.3.3 Building restoration works

Table 4 below shows the elemental cost breakdown for building restoration works. The elements are arranged in descending order according to the cost of the element. The major cost item are roof; ceiling; decorative elements; internal wall and column finishes; doors, ironmongeries and windows; external finishes; and plumbing and sanitary installation.

The item contributing to the highest cost for the restoration of roof element is roof covering. Type of roof tile used in this building is second hand Chinese roof tile and new “Peranakan” V profile clay roof tiles. The second highest cost for roof restoration is the temporary roof item. The third highest cost for roof restoration is the timber roof trusses item. These roof defects are one of the common building defects that occur in this country. There are some reasons why roof covering form the major cost. The damaged or missing roof tiles are unavailable in the current market and to specially manufacture it will incur extra cost. Besides that, some of the restoration works may require skilled artisan or skilled labourer from overseas. These factors must be taken into consideration when pricing for the conservation works.

For the ceiling element, the item contributing to the highest cost is restoration of existing timber board ceiling. It takes up 53% of the total cost of restoration for this element. This is because almost 80% of the ceiling finish is timber board ceiling finish. For the restoration of decorative element, the highest cost element is restoration of mouldings and decorative flowers. It takes up 40% of the total cost of restoration for this element. This is because most of the plaster mouldings on the walls and columns are in a poor state. The decorative flowers which situated along the front parapet wall and on the ceiling of the hall are also in a bad condition. Besides that, a set of carved timber decorative flower design proscenium arch which was built on the stage have been badly affected by termite infestation. Urgent attention is needed to save this structure.

All the walls of the case study building are masonry except for openings that have been closed with plywood to create an enclosure or partitions. The item contributing to the highest cost for the restoration of this element is the restoration of existing wall finishes. It takes up 76% of the total cost of restoration for this element. The installation of new hardwood panel door cost the highest cost for the restoration of doors, ironmongeries and windows element. There are a total of 87 numbers of new hardwood panel doors that are needed to be installed in this case study building. The hardwood panel doors have either one-door or two-door leaves of various sizes.

The item contributing to the highest cost for the restoration of external finishes element is the restoration of existing external wall. This is because external wall covers a big portion of the building. For the restoration of plumbing and sanitary installation, the sanitary appliances elements form the highest cost. This is because almost all the sanitary appliances need to be change. The sanitary appliances included water closet, vanity basin, urinal, basin tap, bidet spray set, toilet roll holder, soap dispenser, floor strainer, hand dryer, jumbo roll holder, guard rail and mirror.

Table 4: Cost Breakdown for Building Restoration Works

No.	*Item*	*Amount (RM)*
1	*Roof*	*499,765.35*
2	*Ceiling*	*175,070.20*
3	*Decorative Elements*	*154,264.00*
4	*Internal Wall and Columns Finishes*	*148,723.30*
6	*Doors, Ironmongeries and Windows*	*134,371.90*
6	*External Finishes*	*96,769.75*
7	*Plumbing and Sanitary Installation*	*82,140.00*
8	*Floor*	*55,772.40*
9	*Floor Finishes*	*49,724.40*
10	*Damp Proofing Works*	*43,500.00*
11	*Wall and Columns*	*36,415.90*
12	*Ramp and Corridor*	*28,472.60*
13	*Staircases and Balustrade*	*27,000.00*
14	*Demolition Works*	*20,303.40*
15	*Anti Termite Treatment*	*16,000.00*
16	*External Works*	*10,500.00*
17	*Scientific Testing and Analysis*	*5,500.00*
18	*Archaeological Excavation*	*500.00*
	Total	*1,584,793.20*

4.3.4 Mechanical and electrical works

This element forms the highest cost for building restoration works. The total cost for this element is RM1,621,220.00. The item under mechanical and electrical works can be divided into three items which are electrical and telephone; air conditioning; and plumbing. Costs for mechanical and electrical works are high due to the complex nature of the system installed.

For the electrical and telephone item, all existing electrical wiring must be completely removed with minimum damage. Works include installation of new telephone and electrical wiring, switches, power sockets and lighting points with minimum damage to existing wall. Also to provide for centrally located switchboards, concealed conduits for electrical and telephone wiring. All power/telephone points are to be located at floor skirting level.

For air conditioning item, all air conditioning are ceiling mounted type. Besides that, all existing internal plumbing and toilet fittings are removed and new system installed.

5. Conclusion

Historical building is one of the largest assets in George Town. Since George Town has been listed into World Heritage List, much of the conservation works will be done on the historical buildings. By knowing the major costs of conserving a building, a quantity surveyor would be able to focus on the critical items and ensure that the costs for items specific to conservation works are included in the estimate or tender. As such, this study attempts to identify the cost centres of conservation works for a historical building. Its aim is to obtain an indication of which elements form the cost centres for building conservation works. It is hopes that the findings may be use as a baseline reference for future conservation projects.

As such, the cost centres derived from this case study consists of roof, ceiling, decorative elements, internal wall and columns finishes, door, ironmongeries and windows, external finishes and plumbing and sanitary installation. Besides that, the mechanical and electrical works is also important it constitute a cost centre for building restoration works. By understanding the major cost centres in building conservation works, a quantity surveyor would be able to provide a better estimate of the cost as the major elements are given careful consideration.

References

Ahmad, A.G. (1994:1), "Building maintenance", *Paper presented at Bengkel Menangani Masalah Pemuliharaan Bangunan Lama di Malaysia*, 19th-22nd December 1994, Kota Ngah Ibrahim, Taiping, Perak.

Ahmad, A.G. (1994:2), "Why buildings decay", *Paper presented at E&O Hotel, Penang*, 11th December 1994, Penang, Penang Heritage Trust.

Ahmad, A.G. (1994:3), "Conservation of British colonial building in Malaysia", *Buletin Perumahan, Bangunan & Perancangan*, vol. 7, no. 1, p. 42-52

Ahmad, A.G. (1998), "Colour in building conservation", *Paper presented at Seminar on Colour for Sale*, 20th June 1998, Penang, University Science Malaysia.

Ahmad, A.G. (2004), "The dilapidation survey report", *Majalah Akitek*, vol. 16, no. 1, First Quarter 2004, p. 19-21.

Ahmad, A.G. (2009), Professor Abdul Ghafar's Biodata (available online http://www.hbp.usm.my/conservation/biodata.htm [Accessed on 20th July 2009]).

Ashworth, A. (1988), *Cost studies of buildings*, Singapore: Longman Singapore Publishers (Pte) Ltd.

Bridger, C. (1996), "Investigation into the refurbishment characteristic encountered when integrating modern building services to historic buildings", *Proceeding published by COBRA 1996: The*

Construction and Building research Conference of the Royal Institution of Chartered Surveyor, Oxford Brookes University.

Chaudhary, C.M. (1991), *Research methodology*, RBSA: Jaipur.

Feilden, B.M. (1994), *Conservation of historic building*, UK: Butterworth.

Ferry, D.J., Brandon, P.S. and Ferry, J.D. (1991), *Cost planning of buildings*, Oxford: Blackwell Science.

Fidler, J. (1987), "The architectural impact of electrical, mechanical and ventilating systems on historic buildings", *Unpublished report to Research Awards Panel of the Architects Registration Council of the United Kingdom*.

Fitch, J.M. (1992), *Historic preservation-curatorial management of the built world*, Charlottesville: The University Press of Virginia.

John, R.F. (1997), "Pareto's Principle - The 80-20 Rule", (available online http://management.about.com/cs/generalmanagement/a/Pareto081202.htm [accessed on 20th July 2009]).

Kamal, K.S.; Ab. Wahab, L.; Ahmad, A.G.; Abd Karim, S.B. (2007), "Understanding the common building defects in Malaysia historic buildings", *Proceeding of the International Conference on Built Environment in Developing Countries*, 3rd - 4th December 2007, Universiti Sains Malaysia.

Lee, K.S. (2006), "Cost estimate in conservation of historical building", *Degree Dissertation*, Universiti Sains Malaysia.

Naoum, S.G. (1998), *Dissertation research and writing for construction students*, Oxford: Butterworth-Heinemann.

Tye, T. (2008), "Site visit report: 57 Macalister Road", Penang Heritage Trust, (available online http://www.pht.org.my/57-macalister-road.htm [accessed on 20th July 2009]).

UNESCO (2008), "Melaka and George Town, historic cities of the straits of Malacca", (available online http://whc.unesco.org/en/list/1223 [accessed on 20th July 2009]).

Woodside, A.G. and Wilson, E.J. (2003), "Case study research methods for theory building", *Journal of Business and Industrial Marketing*, Vol. 18 Nos. 6-7, pp. 493-508

Zikmund and William, G. (1997), *Business research methods*, Fort Worth: Dryden Press.