BQSM CPD POINTS 8 APPLIED

RICS CREDIT HOURS 16 APPLIED

CIDB CCD POINTS 20 APPLIED

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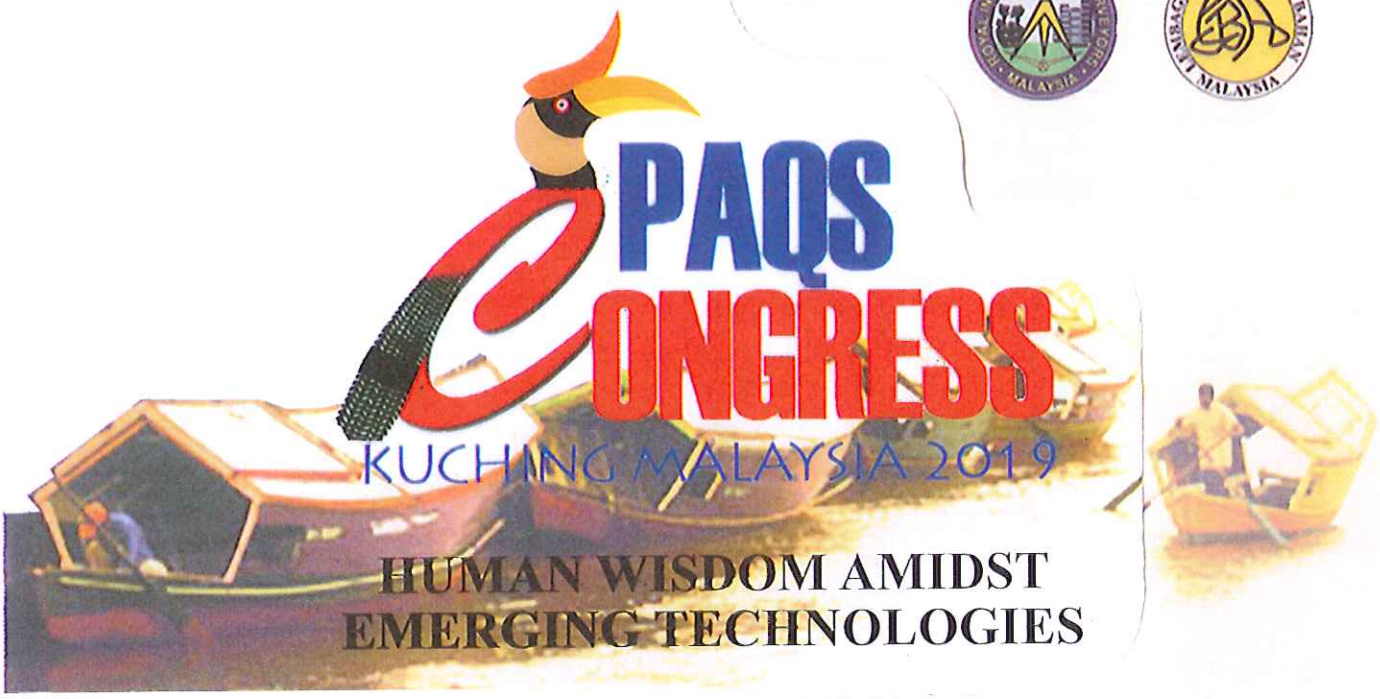

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QUANTITY SURVEYING ASPECTS IN COST MANAGEMENT OF CONSERVATION PROJECTS / BUILDING - WHAT END USER NEED FROM CONSULTANT QUANTITY SURVEYOR

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Keywords : Building conservation, Consultant Quantity Surveyors Challenges, GBI in conservation projects, tender and contract documentation, Malaysia.

Abstract

Being involved in various Building conservation and Cost Management consultancy service with Government and private sector, the writer wish to share the End user expectation from Consultant Quantity Surveyor such as approach in providing initial cost estimation, selecting the most viable option and tender procurement, format of documentation, selecting the right contractor and post contract cost management in order to accomplish the intended investment within the reasonable cost and getting the building with restored heritage element and fulfilling the Heritage management plan.

Further, the application of GBI (Green building index) in conservation projects will be explored in reference to completed and ongoing conservation project in Penang.

In view of the size, availability and various constraints faced in conservation projects the challenges faced by Consultant Quantity Surveying firm in providing cost management services, financial remuneration and resources will be shared.

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INTRODUCTION

Government and private sectors place greater emphasis on the conservation of heritage places as a result of the expending interest and appreciation in the events, declaration of particular enclaves as cultural heritage such as Penang and Melaka as UNESCO world Heritage site.

The initial involvement of the author was started when the Architect Lawrence Loh requires Consultant Quantity Surveyor service for Restoration of Suffolk House at Ayer Itam, Penang back in the year 2006.

Thereafter, the author had involved in various conservation building project for Government and private sector in Penang and Selangor.

PRINCIPAL OF BUILDING RESTORATION

To ensure the successful conservation work of heritage buildings is carried out; there are five (5) key principles that should be observed;

- Minimizing the Disruption
- Research and Laboratory Tests
- Documentation of Conservation / Restoration Works
- Applying the Suitable Methods and Techniques
- Effective Approach in Cost Estimation and Tender Procurement

In Heritage Building restoration process, we can't avoid theory and literature reviews. Certainly the understanding on basic principle of Building restoration is vital prior to enhance to next step of project procurement and post contract cost management.

INTENTION OF THIS ARTICLES

This paper presents the authors experience in cost management and tender procurement for conservation of Building works mainly in Penang and Selangor.

This articles does not give guidelines to the Quantity Surveyor on how to prepare the tender document and Bill of Quantities for conservation projects but how the format and approach in preliminary estimate, BQ preparation and Contract Documentation contributes greater assistance to end user to accomplish the intended investment within the reasonable cost and getting the building with original condition and features.

The author also wish to share the implementation of Green Building Incentive in conservation project by Penang State Government in particulars of the restoration of Kimberly Street Shophouse and Pusat transit gelandangan at C.Y. Choy Road which lead to GBI Building accredition.

This article will briefly explore the cost management process conducted by Author in the following completed and ongoing conservation project;

a. Restoration of 23 Love Lane Hotel, Penang PAM (Gold award winner – Heritage categories year 2013).
b. Restoration of Rumah Bugis for Muzium Shah Alam, Selangor.
c. Restoration of shophouse, Kimberly Street, Penang for Penang State Government.
d. Restoration of Sia Boey Market, Penang (Phase 1) for Penang State Government.
e. Restoration of Victoria Clock Tower for MPPP (Thinkcity).

CLIENTS EXPECTATION FROM A CONSULTANT QUANTITY SURVEYOR

Before we progress to the clients expectation, the Consultant Quantity Surveyor need to understand the type of client and their involved in Building restoration work.

Generally, there are two type of end user in Heritage building or conservation projects, namely, Government agency and Private sector end users. The manner and client requirement for both sector's is slightly difference in the method of tender procurement.

i. Category 1 : Government agencies

The nature of project shall mainly evolve in preserve and restore the national monument and heritage building for future generation reference, educational and non profit base.

Among the additional features foreseen in government related project tender documentation and procurement shall be as follow;

a) Emphasize on proper construction process and progress documentation for future references (e.g. : HABS1, HABS2, HABS3 as per "Garis Panduan Pemuliharaan Bangunan Warisan" by Jabatan Warisan Negara, Julai 2012).
b) Video recordings and records of Construction Methodology for academic reason.
c) Archeological Surveys and excavation.
d) Green Building Index compliance (Majlis Bandaraya Pulau Pinang)
e) Classification on the Category of Building (e.g. MP Pulau Pinang) as listed in the Figure No. 1 below.

Figure No. 1 : Category of Building classification (MPPP)

Nota : Kategori 1 : a) Bangunan yang mempunyai nilai kepentingan yang tinggi
b) Bangunan dan monumen yang diklasifikasikan sebagai purba dan diwartakan di bawah Akta Bendapurba 1976

Kategori 2 : Bangunan yang mempunyai kepentingan nilai sejarah dan seni binanya yang memerlukan segala usaha untuk mengekalkannya

Notes : Category 1 : a) Buildings of exceptional interest
b) Buildings and monuments declared as ancient and gazetted under the Antiquities Act 1976
Category 2 : Buildings of special interest which warrant every effort being made to preserve them

Sumber / *Source:*
Majlis Perbandaran Pulau Pinang / *Penang Municipal Council*

f) The tender Procurement method shall abide with Treasury guideline.
   i) For project less than RM 500k :-
      - Tatacara Perolehan Sebut Harga (Bil 5 - Tahun 2009 Kementerian Kewangan) shall be applied.
      - Registered with PKK / LPIPM Kelas F and CIDB under sub-head of B-03 (Pemulihan dan Pemuliharaan).

   ii) For project more than RM 500k
      - Tender Document shall be prepared according to Latest JKR guidelines and formats.
      - Open tender concept with limitation on tenderer or registered under Sub-head of B-03 (pemulihan dan pemulihaan).

ii. Category 2 : Private sector

Generally the private sector end user orientation shall evolve on Commercial value. In Penang Island Heritage enclave area, the end user tend to capitalize on the declaration of UNESCO world Heritage gazetted area for their personal gain and commercial purpose.

The End user's main objective is obtaining UNESCO Heritage branding for business and commercial premises (e.g. hotel, office etc).

This category of end user is less concern on process of restoration and documentation and more interested on end product and value for money invested.

The tender Procurement method shall be;

- Normally on selective tender basis.
- Few industry player in the market will be shortlisted for tenders.
- Use of PAM Contract to adminter the contract.
- Many round of tender clarification meeting with tenderer prior to the award.

The anticipated client's expectation (but not limited) from Consultant Quantity Surveyor (CQS) can be itemized as follows;

i. The CQS should able to provide **"Right Cost Estimate"** based on reasonable assumptions and options.

ii. Advising the client on most appropriate tender documentation format, content, supplement items to Standard preliminaries, adopting the relevant guidelines from governing bodies such as "Jabatan Warisan" requirement "GWTHi (if the project in Penang Island) and Local Authority.

iii. Assist in Appointment of Right Contractors by adopting suitable tender procurement system, which may include the "Pre Qualification" on qualified Heritage Building contractor.

iv. Minimizing the Variation Order.

v. Contract Document as "SOP" for the Project Implementation

vi. Project completed within the stipulated time period.

i. Right Cost Estimate

This expectation is common in all the building projects. However, the conservation refurbishment work was perceived by design professional to be inherently more risky than new-build project.

Hence, the approach to the preparation of "Right cost estimate" for conservation project need to be strategies and detailed based on information available. The practice of superficial method estimating may not be suitable.

The comparison of initial estimate for new and conservation building is tabulated in the below table.

Table No. 1 : Comparison of Intial estimate approach

METHOD OF ESTIMATION

NO	NEW BUILDING	CONSERVATION BUILDING
I	Unit rate basis (e.g cost/bed for hospital)	Method (I) & (II) may not be applicable
II	Superficial area (cost/m2) based on Historical cost data of similar building	
III	Approximate quantity estimate based on developed design brief	Method (III) is applicable : Approximate quantity estimate based on checklist prepared and observed on site & conservator's input.
IV		The estimated model may varied to option 1A, 1B, 1C (based on various uncertainties observed on site at initial site (e.g : replacement of timber board; 100% or 70% or 50% replacement
V		Stage estimate : For a sick building; Priority 1 : to cure the sick building (damage to root to prevent further water leakage) Priority 2 : Restoration of building Priority 3 : Finishes and fitments

The well known conservator in Penang, Dr Gywn Jenkin always equate the Heritage Building as a "sick old ladies". The approach to treat her should be gentle, careful and on systematic process starting with diagnostic of sickness, prepare the body system to accept the treatment and lastly the process of treatment.

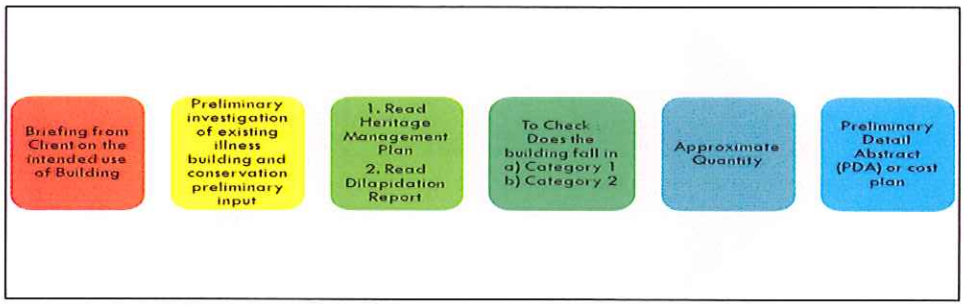
The "sick old ladies" fenomena is similar to the dilapidated building restoration process. There would be no single perfect estimate in conservation project. Each dilapidated building have their own sickness and defect to be rectified and restored.

In order to minimize the uncertainties in the estimate; generate various cost model (Option 1, 1B, 1C etc)

The category of cost model can be identified on;

a. Mild approach
b. Medium approach
c. Extreme approach

Figure No. 2 : Estimate process flow chart



Before "jump the gun" for submission of initial cost estimate to Client; please observe the following process;

a. Site visit (is a must and must).

b. Take as many photo as you can and probably we have to refer again and again to pick the dilapidated element in the building in addition report preparation by Conservator or Architect or Building Surveying.

c. Raise queries to the Architect / Engineer / Conservator during the site visit.

d. Read the Heritage Impact Assessment Report. This document shows in measured drawings, photography and the condition of site and is submitted during Building plan submission stage to Local Authority. This document describes new projects proposal and how it will impact on the heritage significance of the site and surrounding area.

Figure No. 3 : Heritage Impact Assessment

HERITAGE IMPACT ASSESSMENT OASIS HOTEL 23 LOVE LANE GEORGE TOWN

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1.04 DEFINITIONS

2 THE SITE
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2.02 DESCRIPTION OF THE SITE
2.03 BUILDING CONDITION

3 THE PROJECT
3.01 THE BRIEF
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5 MITIGATING MEASURES
5.01 CONDITIONS INVESTIGATION SURVEY
5.03 METHOD STATEMENT

6 CONSERVATION MANAGEMENT
6.1 CONSERVATION AND RESTORATION PROCESS
6.2 POST CONTRACT MANAGEMENT AND MAINTENANCE

Dr Ki/ BKS / HIA Submission Version . 2 - July 2009

e. Read the dilapidation Report. The Figure No. 4 shows the sample of report.

Figure No. 4 : Sample Dilapidation survey report

23 Love Lane

29th Sept 2008

CONDITION

CONSERVATION

18. ANGLO INDIAN BUNGALOW front view with porch

19. ANGLO INDIAN BUNGALOW side view showing damaged plasterwork from salt contamination, rising damp and poor maintenance

20. ANGLO INDIAN BUNGALOW rear view of roof originally terracotta v shaped tiles is now covered in corrugated asbestos sheeting

21. ANGLO- INDIAN BUNGALOW rear view the concrete external staircase is a later addition and has caused damage to the original fabric of the house

21 20 19 18

Love Lane

PHOTO LOCATION PLAN

9

anglo indian bungalow - exterior

dilapidation survey - architectural

f. Condition Investigation Survey

In order for the design team, Architect, Engineer, Quantity Surveyor to understand the condition of a heritage building; condition Investigation Survey is carried out. This is more detailed than dilapidation Report and not only examines the condition but also the areas of change required by the restoration work (refer Figure No. 5 and 6).

Figure No. 5 : Sample of Conditions Investigation Survey

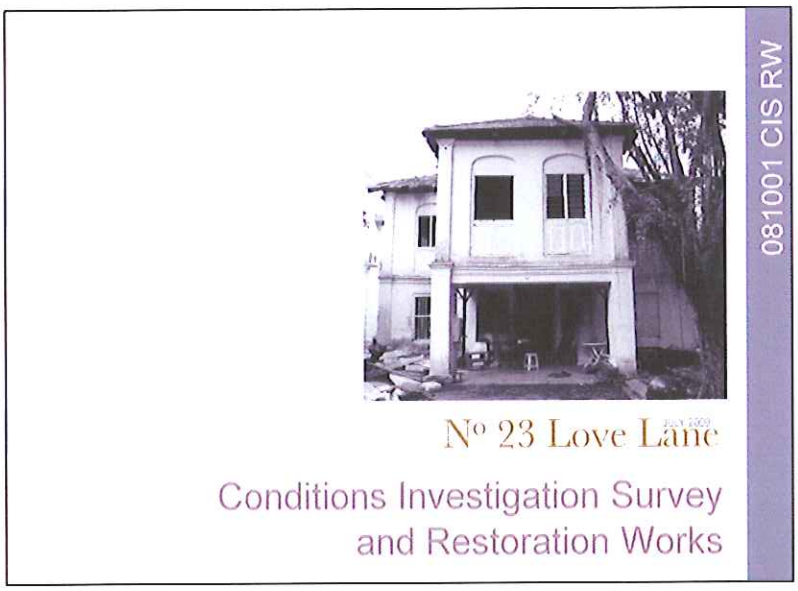
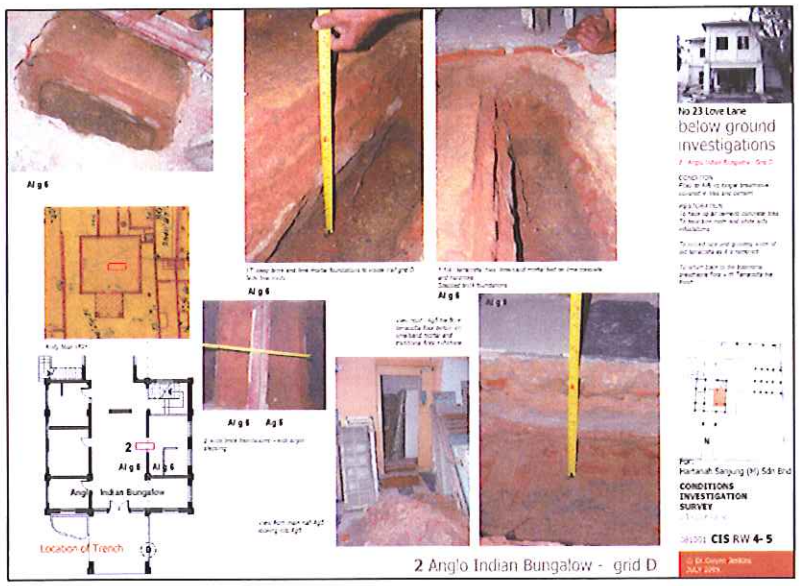


Figure No. 6 : Sample of conditions Investigation Survey – Below ground investigation



This document is also used as part of Tender Documentation to facilitate tenderer's pricing.

g. Propose optional restoration technique and cost estimates (e.g. Some of the dilapidated Building especially near to the seaside, may exposed to the salt effect and may requires salt treatment and rising Damp treatment). There are various method available such "Cocooning method" and "sacrificial method" to treat the salt in the Building wall with different construction cost range.

Figure No. 7 : Sample BQ for sacrificial method and cocooning method

	Description	Unit	Qty	Rate	Amount
	ELEMENT NO. 2 : EXTERNAL FACADE TREATMENT AND EXTERNAL WALL				
	EXTERNAL WALL				
	SALT DESALINATION AND RISING DAMP TREATMENT FOR EXISTING BRICKWALL (EXTERNALLY)				
	Note :				
	The scope of works for Salt treatment shall be as follow but not limited to followings;				
	i. Visit and study the site and problems				
	ii. Prepare solution with detailed method statement				
	iii. Implement proposal to achieve the followings ;				
	a) remove the salt including chlorides , sulphates and nitrats at all existing Building wall effected by salt (approximately 3.00m average high from ground floor level)				
	The tenderer shall suggest the specialist Contractor which intend to execute the above work with detail method statement for Architect/ Heritage Conservator assesment and approval.				
	HACKING EXISTING PLASTER				
	Hack, remove; cutting out the effected decomposed plastering work due to salt contamination.				
A	Surface of existing external brickwall at 3.00m high (Provisional)	m2	94		
	SALT DESALINATION (PROVISIONAL)				
B	Note : Ion chromatograph test was allowed in Bill No. 3.				
	Salt Desalination Treatment - Sacrificial weak lime method (Provisional)				
C	To supply and apply approved salt desalination treatment works including skilled labour and machineries to complete the said works.	m2	94		
	Salt Desalination Treatment - Cocooning Method(Provisional)				
D	To supply and apply approved salt desalination treatment works including skilled labour and machineries to complete the said works (m2).	Rate Only			
				To Collection RM	

h. Lastly, proceed with approximate quantity take off and produce various cost option based on the information collected and budget available in the Client's hand. Refer Figure No. 8 for the sample of cost model.

Figure No. 8 : Sample of various cost estimate appraisal with various degree of assumption.

COST APPRAISAL NO. 1

PROPOSED REFURBISHMENT/ CONSERVATION WORKS FOR QUEEN VICTORIA MEMORIAL CLOCK TOWER, GEORGETOWN, PENANG.

SUMMARY OF ELEMENT COSTS

Option 1 : Mild Approach (Must be executed element)
Option 2 : Medium Approach (must be executed element with higher conservative view)
Option 3 : Extreme approach (Total replacement of defect element and 'good to have' element)

		TOTAL COST ELEMENT (RM)					
REF.	ELEMENT	OPTION 1 - MILD APPROACH		OPTION 2 - MEDIUM APPROACH		OPTION 3 - EXTREME APPROACH	
1	**DEMOLITION AND SITE CLEARANCE**						
1A	Clearing Building of Fixtures, fittings and Plant live	2,500.00		2,500.00		2,500.00	
1B	Cleaning of Buildings and fungus treatment	3,000.00		3,000.00		3,000.00	
1D	Existing timber staircase to be removed (Dilap Pic 5.18)	1,000.00		1,000.00		1,000.00	
1F	Existing M&E services, air brackets, wires etc to be removed	2,000.00		2,000.00		2,000.00	
1G	Existing window to be removed (4 nos at 1st floor)	1,000.00		1,000.00		1,000.00	
	Group Element Total (1)	9,500.00		9,500.00		9,500.00	
2	**ANTI-TERMITE TREATMENT, TESTING & RISING DAMP TREATMENT**						
2A	Anti-termite treatment	3,000.00		3,000.00		3,000.00	
2B	Testing & Scientific Lab Test	5,000.00		5,000.00		5,000.00	
2C	Rising Damp Treatment	5,120.00		5,120.00		5,120.00	
	Group Element Total (2)	13,120.00		13,120.00		13,120.00	
3	**DOME AND PINNACLE**						
3A	Cleaning and remove shrubs, plant, etc	1,000.00		1,000.00		1,000.00	
3B	Dome Structure	3,500.00	Repair existing	7,000.00	Replace 50%	11,060.00	Replace 100%
3C	Dome Covering	11,000.00	Repair existing	11,000.00	Repair existing	25,300.00	Replace 100%
3D	Pinnacle	1,000.00	Make good	1,000.00	Make good	1,000.00	Make good
	Group Element Total (3)	16,500.00		20,000.00		38,360.00	
4	**ROOF AND PILLAR**						
4A	Appointment of structural Engineer to verify the structural condition	3,500.00		3,500.00		3,500.00	
4B	Roof Structure (Below Dome)	7,500.00	Repair Existing	10,000.00	Replace 50%	15,000.00	Replace 100%
4C	Additional Roof Support (I-Beam)	N/L		5,000.00	New I-Beam	5,000.00	New I beam
4D	Roof Covering (Below Dome)	7,600.00	Repair Existing	9,880.00	Replace 50%	15,200.00	Replace 100%
4E	Fascia board and ceiling replacement	2,000.00	Replace 100%	2,000.00	Replace 100%	2,000.00	Replace 100%
4F	Pillar (8 nos) & make good	4,000.00	Make Good	4,000.00	Make Good	4,000.00	Make Good
4G	Concrete Roof (2nd & 3rd Floor)	2,500.00	Make Good	2,500.00	Make Good	2,500.00	Make Good
	Group Element Total (4)	27,100.00		35,880.00		47,200.00	
5	**BELL AND CLOCK**						
5A	Appointment of Specialist to review and check the clock	2,000.00		2,000.00		2,000.00	
5B	Servicing Replacement the mechanism of clock	Excluded		Excluded		624,870.00	Mechanism replacement
5C	Replacement of broken glass at clock panel (Gambar 5.17)	5,000.00	Replace 100%	5,000.00	Replace 100%	5,000.00	Replace 100%
5D	Make good existing bell including replacement of steel A-Frame	10,000.00	Make Good	10,000.00	Make Good	10,000.00	Make Good
	Group Element Total (5)	17,000.00		17,000.00		641,870.00	
6	**TIMBER AND MILD STEEL STAIRCASE**						
6A	Replace existing damaged timber staircase	2,500.00		2,500.00		2,500.00	
6B	Repainting existing m.s staircase	1,000.00		1,000.00		1,000.00	
	Group Element Total (6)	3,500.00		3,500.00		3,500.00	
7	**TIMBER FLOOR AND JOIST**						
7A	Anti-rust treatment to existing I-beam support (Gambar 5.24)	2,000.00	Make Good	2,000.00	Make Good	2,000.00	Make Good
7B	Timber Floor and joist at 1st and 2nd floor (Gambar 5.25)	5,995.00	Replace 50%	11,990.00	Replace 100%	11,990.00	Replace 100%
	Group Element Total (7)	7,995.00		13,990.00		13,990.00	
8	**CONCRETE FLOOR**						
8A	Internal Floor including waterproofing and screeding (GF)	4,660.00		4,660.00		4,660.00	
8B	External Floor (1st Floor)	3,000.00		3,000.00		3,000.00	
8C	Balconies with waterproofing (1st Floor)	1,200.00		1,200.00		1,200.00	
	Group Element Total (8)	8,860.00		8,860.00		8,860.00	
9	**WALL, CEILING AND FAÇADE TREATMENT**						
9A	Wall Finishes	32,650.00	50% repair	45,240.00	70% repair	64,550.00	100% repair
9B	Ceiling Finishes (Teak oil on surface)	1,840.00	Make good	1,840.00	Make good	1,840.00	Make good
9C	Cornices/decorative works	3,000.00	Make good	3,000.00	Make good	3,000.00	Make good
	Group Element Total (9)	37,690.00		50,080.00		69,390.00	
10	**DOOR & WINDOW**						
10A	Window	9,600.00	100% Replacement	9,600.00	100% Replacement	9,600.00	100% Replacement
10B	Door (refurbish and repair)	2,500.00	Repair	2,500.00	Repair	2,500.00	Repair
	Group Element Total (10)	12,100.00		12,100.00		12,100.00	
11	**DECORATIVE ELEMENT**						
11A	Clean existing 'lion head' sculpture (7 nos)	2,030.00	Make good existing	2,030.00	Make good existing	2,030.00	Make good existing
11B	Make good/replace 'fish head' sculpture (8 nos)	2,000.00	Make good existing	4,800.00	Make Good & Replace	4,800.00	Make Good & Replace
11C	Moulding and decorative works	15,000.00	Make Good & Replace	15,000.00	Make Good & Replace	15,000.00	Make Good & Replace
	Group Element Total (11)	19,030.00		21,830.00		21,830.00	
12	**EXTERNAL WORKS & SIGNAGE**						
12A	Granite slab (reinstatement)	3,000.00		3,000.00		3,000.00	
12B	Granite staircase (making good)	1,000.00		1,000.00		1,000.00	
12C	Perimeter Low Wall (make good and re-paint)	3,000.00		3,000.00		3,000.00	
12D	Signage	1,000.00		1,000.00		1,000.00	
12E	Refurbishment 4 nos of Concrete Dome Sculpture (ground perimeter)	2,000.00		2,000.00		2,000.00	
	Group Element Total (12)	10,000.00		10,000.00		10,000.00	
13	**OPTIONAL WORKS**						
13A	Salt Desalination Works (sacrificial method)	N/L		10,200.00		10,200.00	
13B	Hard Landscape (reinstate existing water feature as per original design)	N/L		N/L		10,000.00	
13C	Soft Landscape	N/L		N/L		3,000.00	
13D	Cast iron Barricade Fencing	N/L		N/L		27,500.00	
	Group Element Total (13)	-		10,200.00		50,700.00	
	Total Item (1) - (13)	**182,395.00**		**227,060.00**		**940,420.00**	
14	PRELIMINARIES (Refer Breakdown)	65,700.00		65,700.00		71,700.00	
15	Contigencies (Allow 5% of cost)	12,404.75		14,638.00		50,606.00	
16	GST (6%)	15,629.99		18,443.68		63,763.56	
	TOTAL	**276,129.74**		**325,841.68**		**1,126,489.56**	

i. The assumption made in the estimates and degree of replacement of dilapidated element to be stated clearly for clients knowledge and information. In the sample below (Figure No. 9 and 10) the "Phasing estimate" can be generated based on client budget in hand and priority element to be execute first.

Figure No. 9 : Sample of Budget presentation to Employer.

PROPOSED REFURBISHMENT/ CONSERVATION WORKS FOR 5 1/2 UNITS OF DOUBLE STOREY SHOPHOUSES ATLOT NO. 94, 96, 98, 100, 102 & 102A AT KIMBERLY STREET, GEORGETOWN, PENANG.

OPTION 2A - PHASING ESTIMATE

DESCRIPTION	COMPLETE WORK	PHASE 1	PHASE 2
PRELIMINARIES AND GENERAL CONDITION *(STANDARD)*	165,000.00	112,200.00	52,800.00
PRELIMINARIES *(ADDITIONAL: CONSERVATOR, HABS 1,2 & 3 REPORT AND VIDEO RECORDING)*	130,000.00	90,000.00	40,000.00
DEMOLITION,SITE CLEARANCE, SHORING AND TREATMENT	234,180.00	234,180.00	-
STRUCTURAL WORKS	132,650.00	132,650.00	-
EXTERNAL FACADE TREATMENT AND INTERNAL WALL FINISHES	351,150.00	351,150.00	-
DOOR AND WINDOW	82,500.00	82,500.00	-
ROOF DRAINAGE AND COVERING	197,000.00	197,000.00	-
INTERNAL FINISHES	378,480.00	378,480.00	-
EXTERNAL FINISHES	24,150.00	24,150.00	-
STAIRS AND BALCONIES	117,000.00	117,000.00	-
SANITARY FITTINGS	20,000.00	20,000.00	-
ADDITIONAL ARCHITECTURAL WORKS (ALLOWANCE)	100,000.00	70,000.00	30,000.00
BUILDING SERVICES	315,000.00	315,000.00	-
EXTERNAL WORKS AND LANDSCAPING	94,500.00	-	94,500.00
PROVISIONAL SUM	100,000.00	-	100,000.00
CONTIGENCIES	100,000.00	70,000.00	30,000.00
	152,497.00	131,658.60	20,838.00
TOTAL	**2,694,107.00**	**2,325,968.60**	**368,138.00**

Based on the following assumption:
a. 70% of replacement of Timber roof trusses
b. 70% of replacement of Timber flooring
c. Salt desalination and treatment (70% of ground floor wall area)
d. 70% of replacement of Timber strip ceiling
e. 70% of lime concrete ground slab to be new

The following example of phasing estimate (Refer Figure No. 10); the overall cost estimate is RM 2.31 Million, however the budget available in the department's expenditure account for the particular year is only RM 1.00 Million. Therefore the phasing of conservation work was divided to various package to suit the department budget.

Figure No. 10 : Various stage of estimate according to needs.

PROJECT : CADANGAN KERJA-KERJA KONSERVASI DAN MENAIKTARAF BANGUNAN PEJABAT AGAMA ISLAM, KLANG.
BUILDING WORKS TOTAL GFA : 873 m2

A	CONSTRUCTION COST			PHASE		
	ELEMENT	COST / M2	AMOUNT (RM)	1	2	3
1	Preliminaries (Allow 10% of Contract Sum excluding	203.86	177,972.20	49,832.22	60,510.55	67,629.44
2	Dilipidation survey & Conditional Investigation Survey (CIS)	97.37	85,000.00	42,500.00	42,500.00	
3	Demolition & Site Clearance	85.91	75,000.00	75,000.00		
4	Anti-Termite Treatment	28.64	25,000.00	25,000.00		
5	Salt Desalination & Rising Damp Treatment (if required by conservator)	206.19	180,000.00	180,000.00		
6	Structural Works (Strengtening / Modification)	255.27	222,850.00	222,850.00		
7	External Façade Treatment & Internal Wall Finishes	252.00	220,000.00		220,000.00	
8	Door & Window	126.00	110,000.00	110,000.00		
9	Roof Drainage & Covering	80.18	70,000.00	70,000.00		
10	Internal Finishes	226.03	197,320.00		197,320.00	
11	Stairs & Balcony	45.82	40,000.00		35,000.00	
12	Sanitary Fittings	17.18	15,000.00		15,000.00	
13	Built-In Furniture & Fittings (Allowance)	229.10	200,000.00			200,000.00
14	Additional Architectural Works (Allowance)	114.55	100,000.00	8,000.00	42,000.00	
15	Building Services (Mechanical & Electrical)	321.59	280,750.00			280,750.00
16	External Works (Within Lot Boundary)	106.07	92,600.00			92,600.00
17	Internal Signages	34.36	30,000.00			30,000.00
18	Hard Landscape & Soft Landscape	57.27	50,000.00			50,000.00
19	External Works (Outside Lot Boundary)	57.27	50,000.00			
20	Contingencies (Allow 5% of Contract Sum)	112.12	97,884.75	29,365.43	36,217.36	32,301.97
	A. SUB-TOTAL (BUILDING COST)	2,656.79	2,319,376.95	812,547.64	648,547.91	753,281.40

Figure No. 11 : Sample of Report on Cost Estimate.

2.0 Approach to cost estimate

a. There would be no single perfect estimate in conservation project.
b. However, we could minimize the uncertainties in the estimate by generating various probabilities.
c. We had generated two (2) options to be presented for Clients for decision making; namely OPTION 1 & OPTION 2 as per tabled below;

3.0 Total Budgetary Construction Cost

ITEMS	ESTIMATED COST	REFERENCE	REMARKS
OPTION 1	RM 2,938,500.00	See Attachment A	- Based on 100% replacement of: a. Structural timber roof trusses b. Timber flooring c. Based on 100% ground floor wall Salt desalination & treatment d. Timber ceiling e. Lime concrete ground slab
OPTION 2	RM 2,694,500.00	See Attachment B	- Based on 70% replacement of: a. Structural timber roof trusses b. Timber flooring c. Based on 70% ground floor wall Salt desalination & treatment d. Timber ceiling e. Lime concrete ground slab

The clients shall be given with various options of estimate for their decision making (Refer Figure 11) . By its nature predicting the cost and extent of such alterations, renovations and repairs to existing buildings is risky and the client shall be made aware of these factors when reviewing the cost plan and Conservation Management Plan.

The Client to choose the option he comfortable with budget available. This scenario is well suited to Government sector projects whereby the yearly budget given to the certain project is spent wisely and priority to be given to the most urgent restoration and repair element of the building in order to prevent further damages (Please refer Figure No. 11).

ii. Advising the Client on the most appropriate tender documentation format and supplement attachment.

Preparation of Bill of Quantities is major part of the Tender documentation process and question also arise on what the format of BQ. Whether elemental cost breakdown method as per Standard Method of Measurement for Building work or "top down" format.

In my case, we had adopted "need basis" format. The approach to this format are as follows;

Need basis format

- Based on "sick building" treatment principle
- Start from most deteriorated element (priority on curing the chronic side of building) and followed by restoration and conservation of remaining building element.
- In order to prevent further damage to building, the priority shall be repairing the damaged/decayed building element which contribute to further building deterioration.
- If initial building indicates that the Roof Tiles/covering is not in order and window/opening of building is being vandalized; then the first element shall start from roof repair/temporary roofing and seal off the building opening.

Differences between New Building New Works and Building Conservation Works

BIL	NEW BUILDING WORK	BIL	BUILDING CONSERVATION WORK
1	Work Below Lowest Floor Finish	1	Site Cleaning
2	Frame and Upper Floor	2	Demolition
3	Roof Structure	3	Shoring and Treatment
4	Staircase Structure	4	Salt Desalination and Rising Damp Treatment
5	Roof Covering and Finishes	5	Structural Works
6	Staircase Finishes and Balustrade	6	External Façade Treatment, External and Internal wall
7	External Wall	7	Door and Window
8	Internal Wall and Partition	8	Roof Drainage and Covering
9	Doors, Ironmongeries and Windows	9	Internal Floor, Ceiling and Wall Finishes
10	Internal Wall, Floor and Ceiling Finishes	10	Stairs
11	External Finishes	11	Sanitary Fittings
12	Internal Plumbing and Sanitary	12	Builder's Work In Connection With Services
13	Sanitary Wares and Fittings	13	Ancillary Structure and Building.
14	Sundries	14	Plumbing Work and Sundries

In addition, the following "additional" information is suggested to be included in the tender document;

- Dilapidation Report
- Method Statement
- Dilapidation Survey
- Conservation Methodology
- Measured Drawing

Please refer Figure No. 12 for sample "content page" of Tender Document.

Figure No. 12 : Content of Tender Documentation

CADANGAN MEMBAIKPULIH (i) RUMAH PENGINAPAN 2 TINGKAT SEDIA ADA BANGUNAN 'ANNEX' 2 TINGKAT SEDIA ADA BANGUNAN 'ANNEX' 1 TINGKAT SEDIA ADA (ii) 2 UNIT RUMAH KEDAI 1 TINGKAT SEDIA ADA DENGAN 1 TINGKAT MEZZANINE NO 23, LOVE LANE, DI ATAS LOT 341, SEK 19, BANDAR GEORGETOWN, DAERAH TIMUR LAUT, PULAU PINANG

FOR

HARTANAH SANJUNG (M) SDN BHD

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VOLUME 2 OF 2

Conditional Investigation Survey

Dilapidation Report

In reference to the completed Restoration and Relocation of Rumah Bugis Tradisional Timber house from Kuala Selangor to Shah Alam, Selangor [2015] , Malaysia , the Bill of Quantities (BQ) format adopted was based on work flow method after consultation with the Conservator of the project .

The restoration and relocation of the "Rumah Bugis" have involved three main stages as follows ;

Stage 1 : Coding, Dismantling and Salvaging

i) Provide special codes for building structures and elements for reference.
ii) Dismantle the entire house and document the dismantling process in detail.
iii) Verify existing timber species and strength group.
iv) Identify timber condition.
v) Salvage any existing timber for reconstruction.
vi) Document the condition of the house through the Historical Architectural Building Survey (HABS).
vii) Conduct video documentation of work on site.

Stage 2 : Treatment, Transport and Relocation

i) Mark or label existing timber structures and elements for reference.
ii) Transport all dismantled building materials form the site to a sawmill in Kelang.
iii) Conduct timber treatment including repair, replacement and replication.
iv) Upgrade timber species and strength group.
v) Pack and store treated old and new timber.

vi) Transport the timber structures and elements from Kelang to Shah Alam.
vii) Document the treatment, transport and relocation process.

Stage 3 : Remeasuring, Reconstruction and Repainting

i) Identify a new site at museum grounds for reconstruction.
ii) Remeasure and peg the new site based on measured drawings.
iii) Store building materials on site.
iv) Reconstruct the house in its original form and design.
v) Prepare for additional electrical appliances.
vi) Repaint the house with the original type of paint and colour.
vii) Document the reconstruction process in the HABS and final reports.

Figure No. 13 : Original Condition at Kuala Selangor

Figure No. 14: After relocation at Shah Alam

iii. Assist in Appointment of Right Contractors

The selection and appointment of right contractor is vital in the conservation project and the following are the expected quality in the competent contractor;

a. Contractors that are capable and understand the conservation principles.
b. Clearly understood the BQ description prepared by QS and requirement by Conservator.
c. In private sector, regardless the size of project; qualified and experienced contractor shall be invited to participate on "selective tender" basis.
d. However, in government sector, ensure appropriate registration by Contractor in CIDB category and sub-head for conservation work (e.g. B03 – Pemulihan dan Pemuliharaan) is complied.

Among the practical issues faced during tenderer selection stage;

a. For government related procurement, one of main criteria is registration with CIDB under sub-head of "B03 – pemulihan dan pemuliharaan" which the primary intention to provide accreditation to the Employer that the contractor is possessed with relevant technical skill, management and understanding the scope of work under those registered sub-head.

   This requirement is compulsive basic criteria for the contractor to participate and purchase the tender document and attending site briefing.

However, sometime the practice of issuing "kebenaran khas" for specific sub-head for their contractor whom have "zero" experience in conservation work had allowed unexperienced contractor to participate in the tender exercise.

b. However, in private sector projects, there are few contractor generally monopolized the industry and controlling the construction activity of heritage / conservation project in the particular project territory. Usually the same set of Builder is seen to be major player in the industry.

iv. Minimizing the Variation Order

This factor is always the "wish list" of all Employer.

The Employer always wish, to ensure variation of works throughout contract period is minimum or zero.

Based on my experience, how best the QS had drafted the Bill of Quantities and implementation of necessary tender pre requisites; the Variation work in Building conservation project cannot be avoided. A good Quantity Surveyor may put his effort to minimize it by capturing the uncertainties in the Bill of Quantities, by allowing provisional quantity item or "unit rate" only. It is very helpful in the event any variation work initiated by designer / Employer.

Most of Variation work arise due to the following factor;

a. Employer change of mind during the construction stage. In Kimberly Street shop house restoration project, toward the end of contract duration Employer change the function use of the Building in order to allow "Craftsman" exhibition area which resulting extended completion period and additional cost.
b. Local Authority requirement (ie. each dilapidated Building have their own sickness and need to be rectified on "Ad hoc" basis (Case study : Love Lane Hotel; fire rated ceiling).

c. Unexperienced design Consultant with conservation project experience team in the project.

d. Unavailability of Material specification as stated in the Tender Drawing or Bill of Quantities during construction stage (Case study : Sia Boey Market restoration).

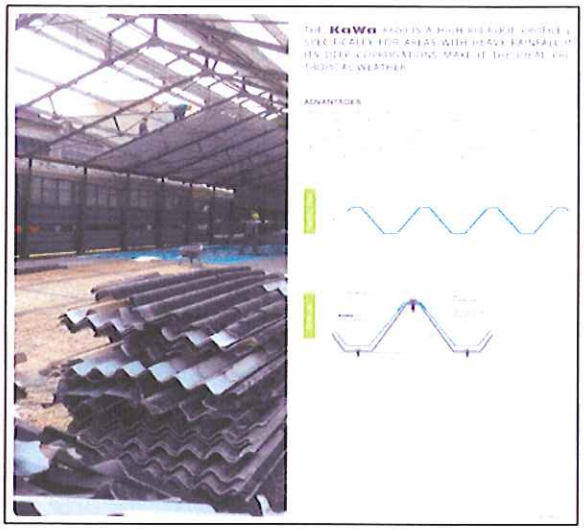
Case study : Sia Boey Market Restoration

In Sia Boey Market restoration project, the Architect specify the type of roof to be installed without consideration the suitability of the product to the building and availability of the material in the market.

It results variation work almost 100% of original tender priced roofing material in the Bill of Quantities. The increase is inevitable due to urgency of work and critical path of replacing the dismantled original roof material.

Figure No. 15 : Sia Boey Market Restoration, Penang

Figure No. 16 : The roof covering for Sia Boey Market



e. Interference of new team of construction project manager during Post contract stage. Sometime the client or state agencies may allow other state holder to interfere the management of construction work which resulting interference in the contractor; original program of work.

f. Local Heritage enthusiasts and social activities demand (In location such as Penang Island) . The external force such as NGO's may put restraint in progress of project. The newspaper news and reaction of Local politician may contribute the delay in the project execution.

v. Efficient Post Contract Administration.

The post contract administration commence upon the issuance of Letter of Award to the successful contractor and the Consultant Quantity Surveyor's immediate task is preparation of Contract Document.

While compiling the Contract Document, greater emphasize should be given to following matters;

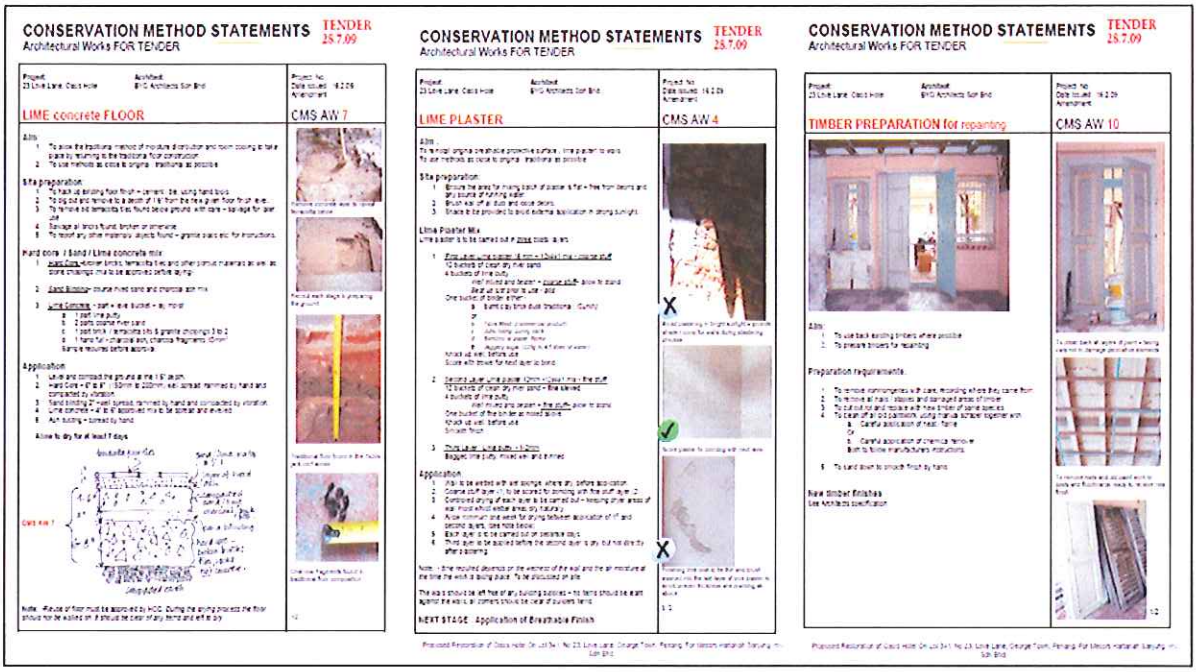
a) Rationalization of unit rates, whereby the priced quoted by the tenderer are reasonable and fit to the intended end product.

b) Contract Document as "SOP" to The Project Implementation.

   i) The Contract Document in conservation project should to be viewed as a tool for Architect, Clerk of Work and Employer's Representative to monitor, understand and supervise the conservation work carried out by contractor on site.

   ii) In lieu of Standard specification (as for normal Standard specification for Building work); the Contract Document shall be a single reference point on the methodology of conservation (Refer Figure No. 17), quality control, intended end product quality, indication on the constraints surrounding the projects and able to signal the contractor on potential risk foreseen in particular conservation projects.

Figure No. 17 : Conservation method statement



vi. Project Completed within the Stipulated Time Period

It is always nice to hear that Building to be completed within the stipulated time. However, in practical, I never seen any of conservation projects completed within the prescribed time period.

The reason for Extension of Time is majorly due to the following issues;

a) Failure of Design consultant to equip themselves with Local Authority requirement
b) Shallow input on existing site condition during design stage such as;

   i) BOMBA requirement for Fire rated ceiling for soffit of timber floor, whereby the Architect wish to adhere the original look with exposed timber floor grain finish.

   ii) Failure to investigate the stability of soil beneath the existing ground and floor slab.

   iii) Tendency of Design Consultant, especially structural Engineer providing "Standard detail drawing" without site visit and investigation.

   iv) Failure of M&E Engineer and Civil Engineer to investigate the relocation and diverting of existing services on site during design stage.

   v) Failure of Design Consultant to investigate the impact into adjoining Building.

   vi) Employer / Architect giving unrealistic completion period in the "Form of Tender".

   (E.g. Sia Boey Market Restoration should be completed within 4 months, however in actual fact with very experience and capable contractor the project take 8 months to complete).
   Hence, a Consultant Quantity Surveyor role is **not** only compiling and translate the design information to the Bill of Quantities, but more important is that the above said identified risk factor is efficiently discussed and resolved during the design and tender procurement stage.

ISSUE AND CHALLENGES FOR CONSULTANT QUANTITY SURVEYOR

The following are the anticipated issues and challenges faced by the writer since handling the conservation project for last 13 years;

i. Most of the Heritage Conservation project is on smaller scale (less than RM 10.00 million).

ii. Consultant Quantity Surveyor may hesitate to explore and embark in this field as compared to new construction project, which promising to bigger Contract Sum and related fee percentage.

iii. The scale of fees for QS service under Category 3 of Building work of Schedule of Fees (SOF) by Ministry of Finance is grossly under provided and not commencement with the effort been put by experienced Consultant Quantity Surveyor. The revision on scale of fee for conservation project need to be initiated. Based on MOF scale of Fees, Consultant Quantity Surveyor fee for project below RM 1,000,000 is more RM 21,000.00 for full service.

iv. Each heritage or dilapidated building have their own set of sickness and level of diagnosis by Conservator. The practice of applying the previous project format and historical cost data of previous conservation job may **not** workable and it's not "like for like" comparison method.

v. The time spent by Senior QS or Principal of the firm is proportionally high as compared to other new building project of same value. As was equate the heritage building as "sick old lady". More gentle attention from experience Quantity Surveying is required.

vi. The learning curve of Project Quantity Surveyor is high and while he or she completed a conservation job and learnt the knowledge; the continuation of similar job is still in question: (ie Surveyor been trained but **not** having an opportunity to implement in next opportunities). Delegation of any technical work to junior Quantity Surveyor may not resulting the expected output.

vii. On the matter of Procuring the experienced conservation Building Contractor; only a few Contractor involved and explored the conservation project market and tender price received may **not** be competitive as compared to other new Building project.

viii. The other design consultant appointed by Employer (Architect & Engineer) may **not** experience in Building Conservation technology and procedures. This may prompt the Heritage project experienced Quantity Surveyor end up spent more time and resources to educate Architect or Engineer in order for them to prepare appropriate design drawing related to conservation technique.

ix. Currently the Architect is still the leading consultant appointed by Employer to realize the Building Conservation project's and based on my personal experience since 13 years ago, I haven't came across my Building Surveyor involve in Building conservation project. As such "Building Surveyor" shall take lead role in design and project management ofn conservation project procurement.

x. Involvement of other stake holder during the Post contract stage of project. This was commonly happen in government related project and associated cultural value whereby the state regulating bodies, member of Parliament, member of legislative assembly may involve in the highly sensitive NGO and Building conservation enthusiasts. Usually those well known monuments and close to public interest building will be exposed with these issues.

GBI IMPLEMENTATION IN BUILDING CONSERVATION PROJECTS

The Penang state government has come out with policy of obtaining Green Building certification for conservation project that focuses on increasing the efficiency of resource use (energy, water and material). One of the pilot project initiated by Majlis Bandaraya Pulau Pinang is "Proposed Restoration of Shop Houses, Kimberly Street, Penang" whereby the Chief Minister of Penang himself have directly overseas the implementation of the project.

The GBI facilitator was appointed together with the design team during the tender procurement stage. The successful contractor shall comply all GBI requirement throughout the projects facilitate the GBI facilator (GBIF) provide input such as;

a. Submission of specified GBI accredited material for GBIF checking before selection.

b. Submit list of product installed that meet the credit requirements and their specification.

c. Submit Roof material and insulation specification with thermal conductivity value for GBIF checking.

d. Submit manufacture details of the installed fitting (fitting hydraulic report is required).

e. Submit information on the source or supplier, manufacture data sheets on percentage of recycle content material (pre-consumer and post consumer) and product cost.

f. Submission of MR6 Form A&B for construction waste management plan (on daily and monthly basis).

GBI IMPLEMENTATION IN KIMBERLY STREET SHOPHOUSE CONSERVATION PROJECTS

The "Kimberly Street Shophouse" project was chosen as pilot project for cooperation between Heritage council, MBPP and Green Building Index (GBI) to develop new tool for heritage Building criteria for NREB, Historic Building tool" (Refer Figure 18)

The main objective is to preserve on original heritage building design feature incorporation with;

i) Energy Efficiency
ii) Indoor Environmental Quality
iii) Sustainable site and Management
iv) Material and Resources
v) Water Efficiency
vi) Innovation

The following GBI element were incorporated in the contract in order to achieve the "Certified" GBI rating (50 to 65 points of score).

<u>Element 1 : Material Requirement</u>

i. EE1 Glazing – Proposed 6mm Grey Tinted Glass [U-value = 6.2 W/m2K or lower; SC = 0.55 or lower]

ii. EE1 Roof Insulation – Proposed 75mm thick Mineral Wool Insulation System [k-value = 0.03 W/mk or lower] underneath tiles roof.

iii. EQ3 Low VOC materials

- Low VOC paint and coating to walls OR no paint or coating used.
- Low VOC paint and coating to ceilings OR no paint or coating used.
- Low VOC carpet or interior flooring OR no carpet or interior flooring used.
- Low VOC adhesive and sealant OR no adhesive or sealant used.

iv. SC3 Integrated Pest Management, Erosion Control & Landscape Management

- Use of least toxic chemical pesticides, minimum use of chemicals and use only in targeted locations and only for targeted species. Conduct routine inspection and monitoring.
- Erosion and sedimentation control for ongoing landscape operations including measures that prevent erosion and sedimentation, prevent air pollution from dust or particulate matter and restore eroded areas.

v. SC6 Greenery & Roof

- Use roof material with SRI > 78 for low pitch roof (gradient < 2:12), OR SRI > 29 for steep pitch roof (gradient > 2:12) for > 75% of the roof surfaces.

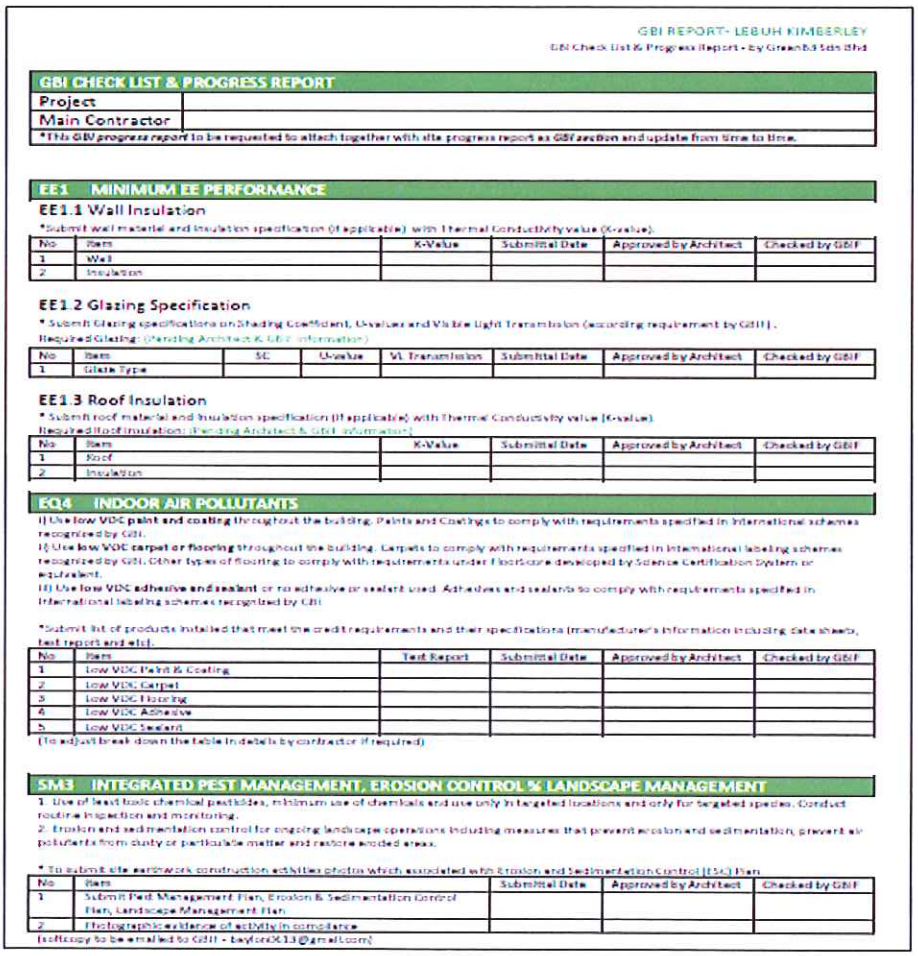
vi. MR6 Refrigerants & Clean Agents

- Use zero Ozone Depleting Potential (ODP) products : non-CFC and non-HCFC refrigerants ND clean agents.

vii. WE4 Water Efficient Fittings

- The use of water efficient water closets, wash hand basins or shower heads or systems which has the potential to reduce potable water consumption in the building. Water efficient fittings to reduce annual potable water consumption by > 50%.

Figure No. 18 : GBI check list and Progress Report



GBI REPORT- LEBUH KIMBERLEY

GBI Check List & Progress Report - by Greenbiz Sdn Bhd

GBI CHECK LIST & PROGRESS REPORT	
Project	
Main Contractor	

*This GBI progress report to be requested to attach together with site progress report as GBI section and update from time to time.

EE1 MINIMUM EE PERFORMANCE

EE1.1 Wall Insulation

*Submit wall material and insulation specification (if applicable) with Thermal Conductivity value (K-value).

No	Item	K-Value	Submittal Date	Approved by Architect	Checked by GBI
1	Wall				
2	Insulation				

EE1.2 Glazing Specification

* Submit Glazing specifications on Shading Coefficient, U-value and Visible Light Transmission (according requirement by GBI).

Required Glazing: (Pending Architect & GBI information)

No	Item	SC	U-value	VL Transmission	Submittal Date	Approved by Architect	Checked by GBI
1	Glass Type						

EE1.3 Roof Insulation

* Submit roof material and insulation specification (if applicable) with Thermal Conductivity value (K-value).

Required Roof Insulation: (Pending Architect & GBI information)

No	Item	K-Value	Submittal Date	Approved by Architect	Checked by GBI
1	Roof				
2	Insulation				

EQ4 INDOOR AIR POLLUTANTS

i) Use **low VOC paint and coating** throughout the building. Paints and Coatings to comply with requirements specified in International schemes recognized by GBI.

ii) Use **low VOC carpet or flooring** throughout the building. Carpets to comply with requirements specified in International labeling schemes recognized by GBI. Other types of flooring to comply with requirements under FloorScore developed by Science Certification System or equivalent.

iii) Use **low VOC adhesive and sealant** or no adhesive or sealant used. Adhesives and sealants to comply with requirements specified in International labeling schemes recognized by GBI

*Submit list of products installed that meet the credit requirements and their specifications (manufacturer's information including data sheets, test report and etc).

No	Item	Test Report	Submittal Date	Approved by Architect	Checked by GBI
1	Low VOC Paint & Coating				
2	Low VOC Carpet				
3	Low VOC Flooring				
4	Low VOC Adhesive				
5	Low VOC Sealant				

(To adjust break down the table in details by contractor if required)

SM3 INTEGRATED PEST MANAGEMENT, EROSION CONTROL & LANDSCAPE MANAGEMENT

1. Use of least toxic chemical pesticides, minimum use of chemicals and use only in targeted locations and only for targeted species. Conduct routine inspection and monitoring.
2. Erosion and sedimentation control for ongoing landscape operations including measures that prevent erosion and sedimentation, prevent air pollutants from dusty or particulate matter and restore eroded areas.

* To submit site earthwork construction activities photos which associated with Erosion and Sedimentation Control (ESC) Plan

No	Item	Submittal Date	Approved by Architect	Checked by GBI
1	Submit Pest Management Plan, Erosion & Sedimentation Control Plan, Landscape Management Plan			
2	Photographic evidence of activity in compliance			

(softcopy to be e-mailed to GBI - baylorX13@gmail.com)

Element 2 : On Site Practice and Procurement

i. SM3 Integrated Pest Management, Erosion Control & Landscape Management
   - Submit Pest Management Plan
   - Submit Erosion and Sedimentation Plan
   - Submit Landscape Management Plan
   - Submit Air Pollution control Management Plan

ii. MR2 Recycled Content Materials
   - To submit information on the source / suppliers, manufacturer's date sheet on percentage of recycle content materials (pre-consumer & post-consumer) and product cost.

iii. MR5 Storage & Collection of Recyclables
   - During construction, designate dedicated area where on-site sorting of waste materials can be stored in separate skips for collection to recycling facilities. The size of the storage space allocated should be adequate to store the recyclables waste volume generated by the construction.

iv. MR5.1 Construction Waste Management
   - Develop and implement a construction waste management plan that, as a minimum identifies the materials to be diverted from disposal regardless of whether the materials will be sorted on site or co-mingled. Quantify by measuring total truck loads of waste sent for disposal. Recycle and / or salvage > 75% volume / tonnage of non-hazardous construction debris.

v. WE1 : Rain Water Harvesting

vi. IN2 : Green Building Index Facilitation

The good cooperation and working attitude between GBIF, contractor and design consultant had successfully contribute the "GBI accreditation" for the landmark project in Penang (Restoration of Kimberly Street Shophouse).

CONCLUSIONS

This articles explore the clients needs from Consultant Quantity Surveyor in providing initial estimate, tender procurement and post contract management.

Currently the practice of Building conservation is not considered new. Many contractor's and consultants is actively involve in the Building conservation and heritage building refurbishment. The Consultant Surveyor (CQS) should equip themselves with relevant knowledge and skills . The ability to modify and adapt the existing Standard Method of Measurement and conventional method of estimating approach to suit the actual project need and dilapidated condition of building .

The inclusion of Green Building Index (GBI) in Building conservation process is another evidence that the Client is moving to another milestone which requires Consultant Quantity Surveyor to equip themselves with necessary knowledge and contract procurement management.

The government also need to recognize the service of Consultant Quantity Surveyor (CQS) in Refurbishment and restoration of Heritage Building by reviewing the Scale of fees which currently not commensurate with effort and service rendered.

The local university syllabus shall also incorporate the Building conservation tender procurement in their curriculum for Quantity surveying course . The same principle also applicable for tender procurement for adaptive use of building.

The current effort taken by RISM in publishing the new Standard Method of Measurement for Building conservation is timely and relevant to the industry.

REFERENCE

1. Heritage Impact Assessment Conditional Investigation Survey (CIS) for QASIS HOTEL [July 2009}, Love Lane, Georgetown by BYG Architecture Sdn Bhd and Dr. Gwynn Jenkins.

2. Contract Document [2019] for Restoration of Sia Boey Market, Penang by PDC.

3. Cost Appraisal No. 1 [Jan 2016] for Refurbishment Kimberly Street Shophouse, Georgetown, Penang by MBPP.

4. Green Building Index assessment criteria for NREB, Historic Building [2017].

5. Preparation of Tender for Building conservation work. Current Practice in Malaysia [2010], Q.y. Lee and Y.M. Lim.

6. Garis Panduan Pemuliharaan Bangunan Warisan, Jabatan Warisan Negara [Julai 2012].

7. ACCU Nora International correspondent Vol. 17 [2017]. The seventeenth Regular Report, Cultural Heritage Protection cooperation office, Asia Pacific Cultural Centre for UNESCO (ACCU) page 23, Restoration and Relocation of Rumah Bugis Traditional Timber House, Shah Alam, Malaysia.