

**Question No. 1 – Cost Estimate**

NOTES TO ASSESSORS

Attachment A

Upgrading the podium façade by replacing all existing wall tiles (approximate façade area 1,000 m²)

Take down existing wall tiles
(1000m² less glass area say 30%)
[The PQS should verify the quantity before any reply to the Owner]

Prepare surface to receive new tiles including applying waterproofing and screeding

Supply and install new wall tiles (Supply only \$300/m²)

Scaffolding and protection

Preliminaries (15%)

Contingencies (10%)

Qty	Unit	Rate	HK\$	
700	m ²	100	70,000	✓
700	m ²	350	245,000	✓
700	m ²	550	385,000	✓
1000	m ²	300	300,000	✓
			150,000	✓
			115,000	✓
Total		HK\$	1,265,000	✓

round Say HK\$ 1,300,000 ✓

arithmetical check

assumption, exclusion, items for clarification

Items for clarification should include:

- Wall tile specification
- Survey on existing substrate condition may be required to estimate the extent of preparation work
- Extent of scaffolding and protection

A list of assumptions, exclusions and items for clarification is required.

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NOTES TO ASSESSORS

Attachment B

Upgrading the interior of all existing 150 no. apartment units

	Past Project (Base) HK\$	Studio HK\$	1-Bedroom HK\$	2-Bedroom HK\$
Doors				
Studio	\$20,000 less one bedroom door say \$5,000 = \$15,000	20,000	15,000	20,000
2-bedroom	\$20,000 add two doors say \$5,000 x 2 no. = \$30,000			30,000
Partitions				
Assume no change to layout and no new partition is required. Allow for making good under "Additional Items" below	20,000	-	-	-
Floor finishes - Bedroom, living room				
Studio	\$40,000 x 24m ² / 52m ² = \$18,461	40,000	18,500	40,000
2-bedroom	\$40,000 x 77m ² / 52m ² = \$59,231			59,200
Floor finishes - Bathroom				
Studio	Same as 1-bedroom	10,000	10,000	10,000
2-bedroom	\$10,000 x 2			20,000
Wall finishes - Bedroom, living room				
Studio	\$30,000 / 2	30,000	15,000	30,000
2-bedroom	\$30,000 x 3/2			45,000
Wall finishes - Bathroom				
Studio	Same as 1-bedroom	30,000	30,000	30,000
2-bedroom	\$30,000 x 2			60,000

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Attachment B

Upgrading the interior of all existing 150 no. apartment units

	Past Project (Base) HK\$	Studio HK\$	1-Bedroom HK\$	2-Bedroom HK\$
<u>Ceiling finishes - Bedroom, living room</u>	25,000	11,500	25,000	37,000
Studio \$25,000 x 24m ² / 52m ² = \$11,538				
2-bedroom \$25,000 x 77m ² / 52m ² = \$37,019				
<u>Ceiling finishes - Bathroom</u>	5,000	5,000	5,000	10,000
Studio Same as 1-bedroom				
2-bedroom \$5,000 x 2				
<u>Kitchen cabinet</u>	25,000	25,000	25,000	25,000
Studio Same as 1-bedroom				
2-bedroom Same as 1-bedroom				
<u>Furniture</u>	60,000	35,000	60,000	85,000
Studio Base \$60,000, omit 1 sofa set, omit 1 TV cabinet, smaller dining table, less chairs, say less \$25,000 overall = \$35,000				
2-bedroom Base \$60,000, add 2nd bedroom (allow 1 King bed, 2 bedside tables, 1 wardrobe, 1 TV cabinet), say add \$25,000 overall = \$85,000				
<u>Sanitary fittings</u>	30,000	30,000	30,000	60,000
Studio Same as 1-bedroom				
2-bedroom \$30,000 x 2				

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Attachment B

Upgrading the interior of all existing 150 no. apartment units

	Past Project (Base) HK\$	Studio HK\$	1-Bedroom HK\$	2-Bedroom HK\$
<u>Lighting fittings</u>	20,000	10,000	20,000	30,000
Studio \$20,000 / 2				
2-bedroom \$20,000 x 3 / 2				
<u>AV equipment</u>	30,000	15,000	30,000	45,000
Studio \$30,000 / 2				
2-bedroom \$30,000 x 3 / 2				
<u>Miscellaneous e.g. curtains, signage, decoration, etc.</u>	20,000	10,000	20,000	30,000
Studio \$20,000 / 2				
2-bedroom \$20,000 x 3 / 2				
<u>Additional Items</u>				
Allow for demolition and making good		5,000	10,000	15,000
<u>Preliminaries</u>	37,000	35,300	53,300	82,700
Base \$37,000 (approx. 10%, allow 15% here due to works in live building i.e. more protection, restriction of working hours)				
Allow for adjustment for price fluctuation say average 8% per year (overall 26%)		70,300	106,200	164,800
Allow for premium by negotiation with one contractor instead of competitive tendering (say 10%)		34,100	51,500	79,900
<u>Contingencies (5%)</u>		18,700	28,300	43,900
HK\$/unit	402,000	393,400	594,300	922,500
Say HK\$/unit		393,000	594,000	923,000
X		100	40	10
Total HK\$	39,300,000	23,760,000	9,230,000	
Total (Studio, 1-bedroom + 2-bedroom)				HK\$ 72,290,000

Question No. 1 – Cost Estimate (Cont'd)

NOTES TO ASSESSORS

Optional VE Item – Adopting Windows / Glazed Screen instead of Curtain Walling

Base Scheme (per floor):

Length of curtain wall = 63.4m

Area of curtain wall = 63.4m x 3.3m = 209.22m²

Cost of curtain wall = 209.22m² x \$9,000/m² = **\$1,882,980**

Alternative Scheme (per floor):

Area of curtain wall replaced by:

(assume 700mm deep beam along building perimeter)

Length of glazed screen with sliding door at balconies = 2.5m x 8 flats = 20m

Length of window = (63.4m – 20m) = 43.4m

- Area of glazed screen with sliding door at balconies = 20m x (3.3m – beam 0.7m) = 52m²
- Area of window = 43.4m x 1.5m high = 65.1m²
- Area of external RC wall (150mm thick) = 43.4m x (3.3m – beam 0.7m – window 1.5m) = 47.74m²
- Area of ceramic tiles = 209.22m² – glazed screen 52m² – window 65.1m² = 92.12m²

Cost of glazed screen with sliding door = 52m² x \$6,000/m² = \$312,000

Cost of window = 65.1m² x \$4,500/m² = \$292,950

Cost of external RC wall (150mm thick) with paint to surface facing interior = 47.74m² x \$1,800/m² = \$85,932

Cost of ceramic tiles = 92.12m² x \$800/m² = \$73,696

Total cost = **\$764,578**

Estimated cost saving for adopting window / glazed screen = **\$1,882,980 - \$764,578 = \$1,118,402 per floor**

Total estimated cost saving = \$1,118,402 per floor x 20 floors x 1.15 for preliminaries x 1.1 for contingencies = **\$28,295,571, say \$28M**

Candidates' answer covering 80% of the points above should have full mark.

[12 marks]

VE item check (2017 D1Q2)

- change of sow (base, finish of double faces, joint) (builder & MEP & BWIC)
- arithmetical error
- rate
- quantity

Question No. 2 – Value Engineering

NOTES TO ASSESSORS

Objective

The objective of this question is to test Candidates' ability to carry out cost studies of specific design changes. To come up with a more realistic estimate, Candidates should list the points already clarified with or subject to clarification by the design consultants and/or the Client. Candidates should demonstrate sanity check on the quantities and rates in the assistant's backup calculations by giving their own estimate with clear build-up.

VE No. 1 – Structural reinforced concrete columns

Candidates should address the following after reviewing the assistant's backup calculation:

- Formwork – Apart from the unit rates, the quantity of formwork will change. Candidates should check the quantity for round columns and estimate the quantity for square columns.
- Concrete – Similar to formwork, the volume of concrete will change as well. Candidates should show the adjustment of the volume of concrete.
- Reinforcement – The reinforcement designs of round columns and square columns are different. **The structural engineer should advise** on the difference. At scheme design stage, it is acceptable to apply the same reinforcement ratio.
- Finishes to columns – The quantity and unit rate will change. The rates for circular wall finishes (like cladding / tiles) should be higher than those for flat wall finishes.

Cost implication of other building elements e.g. concrete shoulders of different mixes, floor finishes, ceiling finishes, building services can be considered relatively insignificant.

VE No. 2 – Atrium glass skylight

Candidates should address the following after reviewing the assistant's backup calculation:

- The unit rate for skylight with structural frame is approximately HK\$15,000/m². This is considered reasonable for a typical glass skylight.
- In addition to the omission of glass skylight, **interfacing details such as curbs and joints between the glass skylight and adjacent structure** and finishes could also be omitted.



Question No. 2 – Value Engineering (Cont'd)

NOTES TO ASSESSORS

VE No. 2 – Atrium glass skylight (Cont'd)

- The unit rate for the green roof is too low. The **structure supporting the green roof** is apparently missing. It can be reinforced concrete or steel. Candidates should add back the cost of the structure based on his assumption.
- **Waterproofing, insulation, roof finishes, and ceiling finishes** should be added back.
- Candidates should state the **green roof system (soil and plant)** and associated **irrigation system** and review the rate.

Bonus

Bonus marks for Candidates who have considered **design changes to lighting and building services installation.**

VE No. 3 – Western restaurant on G/F

The relocation of 300m² dining area from indoor to outdoor can only mean a change of use, not necessarily a reduction of the CFA. A change of use without reduction of the CFA would not save a lot and there would be extra cost to provide the dining area outdoor. It is therefore not appropriate to report any cost saving without further descriptions of the actual changes, as evidenced by records of clarification with the design consultants and the client. Candidates should demonstrate that they have considered (but not necessarily adopting) the following possible scope changes in the answer:

- Reduction or not of CFA, stating the **new use if CFA is not to be reduced.**
- Reduction of extent or standard of **interior finishes** to indoor dining area.
- Reduction of extent or standard of **M&E provisions** to indoor dining area.
- Addition of **canopy, umbrellas or similar covering outdoor dining area.**
- Upgrading of indoor furniture to **outdoor weatherproof furniture.**
- Downgrading of the outdoor furniture to simpler style.
- **Revision of external area to accommodate outdoor dining.**
- Addition of **outdoor lighting.**
- Addition of **outdoor ventilation and heating.**



Question No. 2 – Value Engineering (Cont'd)

NOTES TO ASSESSORS

VE No. 3 – Western restaurant on G/F (Cont'd)

Bonus

- Bonus marks to Candidates who have considered modification of façade design to allow for more open access between indoor and outdoor.

VE No. 4 – Back-of-house (BOH) false ceiling

Candidates should address the following after reviewing the assistant's backup calculation:

- Arithmetical error in the assistant's calculation of the omission is found. $300\text{m}^2 \times \text{HK\$}800/\text{m}^2 = \text{HK\$}240,000$ not $\text{HK\$}24,000$.
- Typically, with false ceiling, fire sprinklers are installed at the soffit of false ceiling and inside ceiling void. With the omission of the false ceiling, ceiling void fire sprinklers and associated pipework, fittings etc. should also be omitted.
- Similar to the above, ceiling void smoke detectors and associated wiring, control etc. should be omitted.
- Wall finishes to the exposed ceiling void should be added back.
- Painting to building services at the exposed ceiling void might be required.
- Plastering and painting to concrete ceilings and beams should be added back. The area on plan plus 10 to 20% addition for sides of beams would be a reasonable assumption. Having said that plastering may be ignored to reduce cost.
- The type of lighting fittings and fixing method will change.

Bonus

If air conditioning is provided at BOH area, its loading will increase due to the omission of false ceiling.



Question No. 2 – Value Engineering (Cont'd)

NOTES TO ASSESSORS

VE No. 5 – Transformers

Candidates should address the following after reviewing the assistant's backup calculation:

- The transformer itself is supplied and installed by the electricity supply company. However, a service charge is normally paid by the client to the electricity supply company, and could be reduced.
- Reduction in the costs of main switchboard and rising mains.
- Possible reduction of CFA due to the reduction in size of the transformer room, or a change of use. Similar to VE No. 3 (Western restaurant on G/F), Candidates should record the queries raised with the design consultants about the changes.
- Reduction of associated builder's works e.g. cable trench, ventilation, louvre, lighting etc. in the transformer room.

Corresponding changes to preliminaries and contingencies

Preliminaries and contingencies are usually allowed for simply as percentage mark-ups on the basic costs when preparing the Scheme Design cost estimate. With every change in the basic costs, the preliminaries and contingencies should in theory also be changed arithmetically. In reality, the preliminaries should not change so responsive to the change in the basic costs, especially when the change is small. It is therefore acceptable to include or exclude the corresponding changes to preliminaries and contingencies at every cost study. In case of exclusion, it should be so stated to signify that it is not forgotten.

Candidates' answers covering 80% of the points above should have full mark.

[16 marks]