Add one level of carpark basement (2024 D1Q1a)

Question No. 1 – Scheme Design Cost Study (Cont'd)

NOTES TO ASSESSORS

A. Estimated cost of additional basement (Cont'd)

		Quantity	Unit	Rate (HK$)	Amount (HK$)
	Basement CFA = 60 x 30m = 1800m2				
A.	Piling and substructure, structural frame and slabs, architectural and building services				
1.	Piling and substructure It is difficult to assess how design of piling and and pile caps changes at this early stage. Assume the cost increase on pro-rata basis of CFA.	1,800	m2	3,000	5,400,000
2.	Structural frame and slab Heavier than those in superstructure	1,800	m2	6,000 more than superstructure	10,800,000
3.	Architectural Cheaper than those in superstructure	1,800	m2	3,000	5,400,000
4.	Building services Cheaper than those in superstructure. Main plant may be moved to the basement. Assume no significant cost difference to the overall in this respect.	1,800	m2	3,000	5,400,000
				Subtotal (A)	27,000,000
B.	Basement Enclosure				
1.	Sheet piling Assume grade FSP-III i.e. 150kg/m2 Perimeter = (60+30)m x 2 + 1m x 8 (allow 1m spacing from basement wall) = 188m Depth = say basement storey height 4m + cap 2.5m + basement wearing slab 0.5m = 7m x 2 = 14m	2,632	m2	2,700	7,106,400
2.	Steel strutting Assume 300kg/m2 x 188m x 7m =	394,800	kg	18	7,106,400
3.	Excavation and cart away (60+2) x (30+2) x 4.5m =	8,928	m3	500	4,464,000
4.	Grout curtain Assume same area as sheet piling	2,632	m2	2,500	6,580,000
5.	Dewatering Allow 5% of item 1 to 4 above		Sum		1,262,840

Question No. 1 – Scheme Design Cost Study (Cont'd)

NOTES TO ASSESSORS

A. Estimated cost of additional basement (Cont'd)

			Quantity	Unit	Rate (HK$)	Amount (HK$)
6.	Reinforced concrete screen wall					
	Concrete, say 45D, (60+30)m x 2 x 4m high x 0.5m thick =		360	m3	1,600	576,000
	Formwork, (60+30) x 2 x 2 x 4m =		1,440	m2	600	864,000
	Reinforcement, 360m3 x say 250kg/m3 =		90,000	kg	11.0	990,000
7.	Cavity block wall along screen wall					
	Assume 100mm thick; (60+30)m x 2 x 4m high		720	m2	600	432,000
8.	Waterproofing					
	Waterproofing to screen wall		720	m2	500	360,000
	Waterproofing to soffit of basement slab		1,800	m2	500	900,000
	Waterproofing (and insulation) to basement top slab outside buildng line		300	m2	800	240,000
9.	Wearing slab					
	Concrete, say 45D, 1800m2 x 0.5m thick =		900	m3	1,600	1,440,000
	Reinforcement, say 150kg/m3 =		135,000	kg	11.0	1,485,000
					Subtotal (B)	33,806,640
C.	Preliminaries					
	Preliminaries		15	%		9,120,996
D.	Contingencies					
	Contingencies		10	%		6,992,764
					Total of A to D	76,920,400
					say	76,920,000

Full marks criteria: Where different format is adopted, Candidates should provide a summary of their estimates, including breakdowns, assumptions, and exclusions. While it is acceptable for the estimated amounts to differ from the example provided above, significant deviations without proper justification should be marked down.

[8 marks]