## Add one level of carpark basement (2024 D1Q1a)

THE HONG KONG INSTITUTE OF SURVEYORS QUANTITY SURVEYING DIVISION ASSESSMENT OF PROFESSIONAL COMPETENCE FINAL ASSESSMENT – 5<sup>th</sup> & 6<sup>th</sup> SEPTEMBER 2024 PRACTICE PROBLEMS NOTES TO ASSESSORS



# Question No. 1 – Scheme Design Cost Study (Cont'd) NOTES TO ASSESSORS

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

	1	Quantity	Unit	Rate	<u>Amount</u>
Basement CFA = 60 x 30m = 1800m2				(HK\$)	(HK\$)
				-	
Piling and substructure, structural frame and slabs,		7			
architectural and building services				<u> </u>	
Piling and substructure		1,800	m2	3,000	5,400,000
pile caps changes at this early stage. Assume the			ucuro-		
		4 000		6 000	10 800 000
	<u> </u>	1,800	m2		10,800,000
Heavier than those in superstructure				more than \$1	uperstructure
Architectural		1.800	m2	3,000	5,400,000
Cheaper than those in superstructure					
Ruilding services		1,800	m2	3,000	5,400,000
Cheaper than those in superstructure.  Main plant may be moved to the basement. Assume no significant cost difference to the overall in this respect.					
				Subtotal (A)	27,000,000
Basement Enclosure		. 1			
Sheet piling					
Perimeter = (50+30)m x 2 + m x 8 (allow m)				-	
Depth = say becoment storey height 4m + can					
2 5m + hasement wearing slab 0.5m = 7m x 2 =					
14m		2,632	m2	2,700	7,106,400
		304 800	ka	18	7,106,400
Assume 300kg/m2 x 188m x /m =	1	394,000	<u>. N</u> 9		
Excavation and cart away					
(60+2) x (30+2) x 4.5m =		. 8,928	m3	500	4,464,000
Grout curtain					
Assume same area as sheet piling	Ļ	2,632	m2	2,500	6,580,000
Dewatering					
	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.  Structural frame and slab Heavier than those in superstructure  Architectural Cheaper than those in superstructure  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.  Basement Enclosure  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  Steel strutting Assume 300kg/m2 x 188m x 7m =  Excavation and cart away (60+2) x (30+2) x 4.5m =  Grout curtain	Piling and substructure, structural frame and slabs, architectural and building services  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.  Structural frame and slab Heavier than those in superstructure  Architectural Cheaper than those in superstructure.  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.  Basement Enclosure  Sheet piling Assume grade FSP-III i.e. 150kg/m2 Perimeter = (60+30)m × 2 + 1m × 8 (allow 1m spacing from basement wall) = 188m Depth = say basement storey height 4m + cap 2.5m + basement wearing slab 0.5m = 7m × 2 = 14m  Steel strutting Assume 300kg/m2 × 188m × 7m =  Excavation and cart away (60+2) × (30+2) × 4.5m =  Grout curtain	Basement CFA = 60 x 30m = 1800m2  Piling and substructure, structural frame and slabs, architectural and building services  Piling and substructure	Basement CFA = 60 x 30m = 1800m2  Piling and substructure, structural frame and slabs, architectural and building services  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.  Structural frame and slab Heavier than those in superstructure  Architectural Cheaper than those in superstructure  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.  Basement Enclosure  Sheet pilling 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  Steel strutting Assume 300kg/m2 x 188m x 7m = 394,800 kg  Excavation and cart away (60+2) x (30+2) x 4.5m = 8,928 m3  Grout curtain	Basement CFA = 60 x 30m = 1800m2  Piling and substructure, structural frame and slabs, architectural and building services  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.  Structural frame and slab Heavier than those in superstructure  Architectural Cheaper than those in superstructure  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.  Basement Enclosure  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  Steel strutting Assume 300kg/m2 x 188m x 7m = 394,800 kg 18  Excavation and cart away (60+2) x (30+2) x 4.5m = 8,928 m3 500

THE HONG KONG INSTITUTE OF SURVEYORS QUANTITY SURVEYING DIVISION ASSESSMENT OF PROFESSIONAL COMPETENCE FINAL ASSESSMENT – 5th & 6th SEPTEMBER 2024 PRACTICE PROBLEMS NOTES TO ASSESSORS



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

#### **NOTES TO ASSESSORS**

#### A. <u>Estimated cost of additional basement (Cont'd)</u>

		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		İ		
	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 building line	300	m2	800	240,000
9.	Wearing slab				
	Concrete, say 45D, 1800m2 x 0.5m thick =	900	1	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				
D,	Contingencies	10	0/		0.000.704
	Contingencies	10	%		6,992,764
			Tota	l of A to D	76,920,400
			, , , (4	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]