

Calculation of CFA

Principle

Podium CFA	Site area x site coverage
Total GFA	Site area x plot ratio

CFA : GFA

Residential (apartment)	1.15-1.25	(1.15)
Residential (house)	1.2-1.3	(1.25)
Office / Commercial	1.15-1.2	(1.2)
Hotel	1.3-1.4	(1.35)
Industrial	1.15-1.2	(1.2)
Government	1.15-1.25	
Refuge floor	1.03	

Unit

m : ft	3.28
m ² : ft ²	10.76
Steel	7843 kg/m ³

Other

Carpark	1 No. per 2 flats
Carpark (basement)	40-50m ² /No. incl. driveway & ramp
Carpark (open)	25 m ² /No. incl. driveway
Loading & unloading bay	150m ² (3 x standard carpark)
Clubhouse	<= 5% of GFA of residential portion
Refuge floor	One floor for residential building over 25 storeys
Hotel	FOH : Guest room : BOH = 15-20% : 50-60% : 25-30%
Office	9m ² / person

Major Rates Reference

	Assumption	Qty	Unit	Rate	Cost/CFA	Remarks
Site Investigation					50	
Site investigation						subject to number of boreholes and trial pits
Demolition and Hoarding					100	
Demolition		CFA	m2	1,000		including shoring
Site clearance		site area	m2	200		
Hoarding	2.5m high	perimeter of site; deduct length against adjoining building	m	8,000		include making good of adjoining building / affected area
Covered walkway			m	20,000		
Foundation and Basement	consider waterproof concrete				4,000	
ELS and site formation						
Excavation, disposal and backfill			m3	500		
Monitoring works		site area	m2	200		
Lateral support						
Pipe pile						
Pipe pile	CHS 273mm dia; 400mm c2c	depth = 2 times of excavation	m	3,000		
	813mm dia		m	10,500		
Lagging wall	12mm steel plate	depth = excavation	m2	2,500		
Grout curtain	required / not required	depth = pipe pile	m2	2,500		
Sheet pile						
Sheet pile	190kg/m2	depth = 2 times of excavation	kg	20		
Grout curtain	required / not required	depth = sheet pile	m2	2,500		
Diaphragm wall						
Disphragm wall	1m thick; 40m deep		m3	8,000		
Cavity wall	150mm thick	basement perimeter x basement depth	m2	500		
Structting and shoring	600kg/m2 on structting area	basement perimeter x basement depth	kg	20		
Dewatering			item	5%		allowance only
Raft foundation						
Excavation, disposal and backfill	open cut with working space 0.25m; 500mm thick + 1m below ground level		m3	500		
Raft footing	500mm thick 45D formwork: no formwork to bottom; 0.1m2/m2 raft area rebar: 200kg/m3	raft area = footprint area	m2	2,050		
Waterproof tanking		1m2/m2 raft area if not available	m2	500		
Binding layer	50mm thick		m3	1,400		
Miscellaneous	vapour barrier, hardcore, joints, openings for services, etc.		item	10%		allowance only
Bored pile foundation						
Bored pile	2.5m dia; 25m deep; no rock encountered	1m2 cross section for 250m2 CFA	m3	14,000		63,000/m
Bored pile	2.5m dia; 60m deep; no rock encountered	1m2 cross section for 250m2 CFA	m3	16,000		80,000/m
Socketd H pile	223kg/m; 25m deep; no rock encountered	1 no. for 100m2 CFA	m	10,000		
Mini pile	219mm dia; 25m deep; no rock encountered	1 no. for 50m2 CFA	m	8,000		
Substructure						
Excavation and disposal		depth = pile cap + basement + wearing slab / pile cap + assume 1.5m to group level	m3	500		
Binding layer			m2	125		
Pile cap		footprint area of tower + assumed small cap for podium				
Binding layer	75mm thick		m3	1,400		
Pile cap	2m thick; 300kg/m3		m3	5,500		
Basement						
Basement slab and beam	500mm thick; 280kg/m3	basment area	m2	2,500		
Reinforced screen wall	400mm thick; 300kg/m3		m2	2,900		
Wear slab	500mm thick	basment area	m2	600		on top of basement bottom slab w sub-soil drainage
Waterproofing to screen wall		depth incl. basement, wearing slab, pile cap	m2	500		
Waterproofing to slab		+30% for sides of pile cap	m2	500		
Dewatering			item	5%		Included in ELS

Major Rates Reference

	Assumption	Qty	Unit	Rate	Cost/CFA	Remarks
Superstructure						
Carcase						
Structure - concrete					5,400	
Concrete		0.55m3/m2 CFA	m3	1,600		suspended slab: 1500-200mm structural wall: 200mm column: beam, staircase
Formwork		2.5m2/m2 CFA	m2	500		
Rebar		general: 160-250kg/m3 column: 300kg/m3 beam: 250kg/m2 slab/stair: 120kg/m3 wall: 200kg/m3	kg	13		
Miscellaneous			item	5%		allowance only
Transfer plate to tower	3.5m thick; 400kg/m3		m2	21,000		
Mass fill concrete			m3	1,400		
Structure - steel						120% higher than concrete
Structural steel	steel ratio include connections	150-200 kg/m2 CFA	kg	40		
FRP coating to structural steel			item	20%		allowance only
Metal decking outside core		0.85 m2/m2 CFA	m2	1,000		
Concrete	slab 120mm thick; wall same as concrete design; beam replaced by steel; column 80% of concrete design;	0.36 m3/m2 CFA; including core walls, column casing, topping on metal decking	m3	1,600		
Formwork		1.25 m2/m2 CFA	m2	500		
Rebar		160kg/m3	kg	13		
Miscellaneous	sundries like water tanks, staircases, expansion jointe, etc.		item	5%		allowance only
Façade					5,800	
In-situ RC wall	150mm thick	<div> facade ratio = Residential 1.2m2/m2 office / hotel 0.4m2/m2 industrial 0.4m2/m2 window/curtain wall: external wall finish = 20% / 80% </div>	m2	1,600		
Precast RC wall	150mm thick		m2	3,600		
Glass wall			m2	10,000		
Curtain wall			m2	8,000		
Window			m2	5,000		
Louvre			m2	7,000		
Aluminium cladding			m2	6,000		
Performance test			item	40,000		allowance only
Architectural features			item	10%		allowance only
Corrugated metal roof	incl. extra cost for pitched roof, projection, gutters, etc.		m2	4,000		
Corrugated sheet wall panel system	incl. allowance for windows of minimal area		m2	3,000		
Internal non-structural wall		residential: 0.9-1m2/m2 CFA			200	
RC wall	100mm thick	deduct slab thickness 150mm 100kg/m3	m2	1,400		lift shaft, staircase, plant room, kitchen bedroom, bathroom
Block wall	100mm thick		m2	750		
Dry wall			m2	900		
Door and shutter		residential: 0.1 no./m2 CFA			900	
Single timber door			no	8,000		
Double timber door			no	12,000		
Single glass door			no	25,000		
Double glass door			no	35,000		
Balcony bi-folding door			m2	10,000		
Roller shutter	1h frf		m2	8,000		

Major Rates Reference

	Assumption	Qty	Unit	Rate	Cost/CFA	Remarks
Finishes						
External wall finishes					500	
Waterproof			m2	300		
Stone cladding	PC rate 2000/m2		m2	3,000		
External tile	PC rate 400/m2		m2	600		
External paint			m2	250		
Architectural features			item	10%		allowance only
Roof finishes		roof = building footprint			100	
Insultion			m2	300		
Waterproof			m2	300		
Tile w screed	PC rate 400/m2		m2	600		
Channel			item	100,000		allowance only
Skirting			item	10%		allowance only
Balcony finishes					150	
Waterproof			m2	300		
Tile w screed	PC rate 600/m2		m2	800		
Typhoon proof aluminium ceiling			m2	5,000		
Glass balustrade	1100mm high		m	9,000		
Metal railing	1100mm high		m	3,000		
Floor finishes		residential: 0.8m2/m2 CFA			800	
Waterproof			m2	300		
Tile w screed	PC rate 600/m2		m2	800		
Stone w screed	PC rate 2000/m2		m2	3,000		
Timber floor	PC rate 1200/m2		m2	2,000		
Vinyl / carpet	PC rate 300/m2		m2	600		
Raised floor system			m2	6,000		
Stone threshold			m	1,000		
Skirting			item	10%		allowance only
Internal wall finishes					2,500	
Waterproof		internal wall : floor ratio = residential 1m2/m2 office 0.5m2/m2 hotel 1.5m2/m2	m2	300		
Paint			m2	250		
Tile w screed	PC rate 600/m2		m2	800		
Stone w screed	PC rate 2000/m2		m2	3,000		
Stone window cill			m	1,000		
Wallpaper	PC rate 300/m2		m2	600		
Laminate / veneer			m2	1,400		
Glass	PC rate 500/m2		m2	1,400		
Ceiling finishes					600	
Open ceiling paint			m2	300		
Aluminium ceiling panel			m2	1,100		
Gypsum board ceiling w paint			m2	900		
Baffle ceiling w paint			m2	1,600		
Bulkhead and sides of beams			item	20%		allowance only
Lift finishes			Lift	100,000	20	allowance only
Fixtures and fittings					800	
Sanitary fittings	1 bathroom 1 kitchen		flat	30,000		
Cabinet						
Bathroom cabinet			set	40,000		
Kitchen cabinet	open kitchen		set	65,000		
	enclosed kitchen		set	35,000		
Shower partition	2.5x2.5m		set	18,000		
Toilet cubicle			set	12,000		
Steel and metal works		residential area	m2	500		
Décor, graphics and signage			item	200,000		allowance only

Major Rates Reference

	Assumption	Qty	Unit	Rate	Cost/CFA	Remarks
External and Landscaping Works					600	
Hard Landscape			m2	8,000		
Driveway and concrete paving			m2	1,000		
Stone pavement			m2	3,000		
Timber decking			m2	4,000		
Planter wall			m	4,000		
Fence wall			m2	12,000		
Vertical green wall			m2	4,000		
Soft Landscape			m2	4,000		
Outdoor swimming pool			m2	35,000		
Canopy			m2	40,000		
Footbridge			m	100,000		
Covered walkway			m2	25,000		
External lighting (façade & landscape)			item	5M		allowance only
Underground drainage		site area	m2	200		
Utilities deviation			item	0.5-2M		allowance only
E&M Services					8,000	consider MC attendance
Lift and Escalator						
Lift for low rise			no	1.2M		
Lift for high rise			no	2.2M		
Escalator			no	1.2M		
Electrical Installation		CFA	m2	3,200		residential
MVAC Installation		CFA	m2	2,400		residential
Fire Services Installation		CFA	m2	800		residential
Plumbing and Drainage Installation		CFA	m2	1,800		residential
Gas Installation			flat	40,000		residential
Filtration system for swimming pool			item	9M		250m2 pool
Building Maintenance Unit (BMU)			tower	500,000		
BWIC			item	5%		
Other						
Kitchen appliance			flat	50,000		
Concrete spalling repair (A&A)		CFA	m2	50		
Refuge floor			m2	12,000		
Clubhouse			m2	40,000		
BEAM Plus			item	2%		
Design and Build			item	5-10%		
Congested site			item	5%		
Preliminaries	might include in breakdown		item	12%	4,000	
Contingencies			item	10%	2,000	
Fluctuation					36,520	Apartment, high rise, high end