

FOSTERING QS CAPACITY IN
VALUE MANAGEMENT
AND
TECHNICAL AUDITING

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VALUE MANAGEMENT (VM) / VALUE ENGINEERING (VE)

1. Attend the first Value Engineering talk held in Singapore in conjunction with Inaugural PAQS Congress, way back in 1997, before Asian financial crisis and the second one in Kuala Lumpur in conjunction with 3rd PAQS Congress (1999).

DEFINITION

2. Definition by Mr. Lawrence Miles (The founder of Value Engineering) as philosophy implemented by the use of specific techniques, a body of knowledge, and a group of learned skills.
3. Value Engineering (VE) definition by 'Dell'/Sola AJ (1982) as a creative, organized approach whose objective is to optimize cost and/or performance of a facility or system
4. Other definition – Kelly and Male (1991) as an oriented effort to attain optimum value in product, system or service by providing necessary functions at the lowest cost.
5. Australia's Department of Defense, Reference book DRB 37 – The systematic effort directed at identifying the functions of system, equipments, facilities, procedures and supplies for the purpose of achieving the essential functions at the lowest cost consistent with the needed purpose, performance, reliability and maintainability.

HISTORY & PURPOSE

6. The concept was first conceived in 1942 for use in the manufacturing industry by Lawrence D Miles of General Electric Company, emerging as a result of components and material shortage in the manufacturing sector during World War Two.
7. The technique provides a systematic evaluation of a project's design and implementation to obtain the most value from every dollar of cost.
8. VM/VE aims at optimizing the overall value of a project to the client.
9. VM/VE entails a careful analysis of each function served or provided with a view to eliminate or modify anything that adds to the project cost without specifically serving any function.
10. Apart from initial cost, cost of operation, maintenance and replacement (life cycle cost) are also examined.
11. Often being regarded as a cost reduction exercise, the pre-requisite is always the value of project to client is not compromised.
12. Evaluation/ Appraisal may come up with recommendation to enhance value by increasing costs justifiably or changing the schedule of implementation.

CHARACTERISTICS

13. Kelly and Male (1991) characterized value management by
 - a) Systems oriented – uses formal job plan to identify and remove unnecessary cost
 - b) A multi-disciplinary team approach – teams of experienced designers (Architect, Civil & Structural Engineer, Mechanical & Electrical Engineer) estimators, quantity surveyors and value management consultants
 - c) Life cycle oriented – examines total costs of owning and operating a facility
 - d) A proven management technique
 - e) Functions oriented – relates function required to value received

14. Common VE HEARD or encountered in practise so far
 - a) Material substitution (use lower grade materials, from better material to common materials)
 - b) Reduction of circulation and/ or non-functional area

- c) Floor to floor height reduction
- d) Omit scope of work (strictly speaking, not part of VE)
- e) Design changes
- d) Change of method of construction

15. The Pondering Questions ?

Why VM/VE take so long to penetrate the building industries especially in Sabah context.

16. Possible Explanations

- a) Most people heard of it from some where, some how
- b) Most people only experienced limited experience of VE/VM in application
- c) The Client (Developer) don't know or have little knowledge about it or never heard of it
- d) The resistance from designers (Architect, C&S and M&E)

APPLICATION

17. VM/VE implement in 2 stages :
 - a) design stage
 - b) construction stage

18. PARETO'S LAW
The majority (say 80%) of value lies in a minority (say 20%) of items.

19. Application of VM/VE in Design stage
 - a) Feasibility / Schematic design stage
 - b) Design development stage
 - c) Working drawing stage

20. Optimum savings if applied in early stage.

FEASIBILITY / SCHEMATIC DESIGN STAGE

21. Documents required for VM during feasibility stage are
 - a) Development plan
 - b) Schematic layout plan
 - c) Existing topographical and cadastral survey
 - d) Soil investigation report
 - e) Planning approval letter
 - f) Copy of letter of approval from various government department, agencies, statutory bodies, services providers.
 - g) Copy of land title
 - h) Copy of S&P Agreement

22. Feasibility / Schematic Design Stage
 - a) Sample of Feasibility Study, e.g. (SAMPLE 'A')
 - b) Sample of Feasibility Study with VM/VE, e.g. (SAMPLE 'B')

- ESTIMATED COST OF CONSTRUCTION

Description		Estimated Amount
A	<u>Cost of Construction</u>	
1.	Preliminaries	880,160.00
2.	Piling Works (Allowance 60' FR Penetration R.C. Piles)	885,000.00
3.	Building Works	
3.1	<u>2 Storey Detached Units</u>	
a)	2 - Storey Detached (GFA = 387 MS)	1,981,440.00
3.2	<u>3 Storey Link Units</u>	
a)	3 - Storey Link Unit (GFA = 298 MS)	8,135,400.00
4.	Plumbing & Electrical Works	
a)	Detached House	398,000.00
b)	Link House	1,105,000.00
5.	<u>External Works & Services (Allowance)</u>	
a)	Site Preparation & Secondary Earthworks	150,000.00
b)	Road & Pavement	780,000.00
c)	Surface Water Drainage	600,000.00
d)	Soil Drainage & STP	520,000.00
e)	Water Reticulation	200,000.00
f)	Turfing	120,000.00
g)	Landscaping Works	60,000.00
h)	SESB Building	110,000.00
i)	Retaining Wall	500,000.00
j)	External M & E	
i)	External Telephone Infrastruction	100,000.00
ii)	External Street & Compound Lighting	30,000.00
6.	Contingencies	900,000.00
7.	Capital Contribution to	
a)	SESB	900,000.00
b)	Telekom	40,000.00
c)	JBA	70,000.00
TOTAL COST OF CONSTRUCTION		18,465,000.00

- FEASIBILITY STUDY

Description		Estimated Amount
1.	<u>SECTION I - ESTIMATED TOTAL DEVELOPMENT COST (TDC)</u>	
a)	Land Conversion Premium & Subdivision	240,000.00
b)	Soil Investigation & Survey	50,000.00
c)	Cost of Construction	18,465,000.00
d)	Professional Fees	1,384,875.00
e)	6% Service Tax on (d)	83,400.00
f)	Administration, Promotion & Marketing	845,500.00
g)	Miscellaneous Expenses	50,000.00
h)	Reimbursable expenses, Site Supervision, etc	300,000.00
i)	Financing Charges	856,811.00
j)	Land Cost (6.87Acres)	1,320,414.00
		say,
	SECTION I - ESTIMATED TOTAL DEVELOPMENT COST (TDC) *	23,596,000.00
2.	<u>SECTION II - RETURN FROM SALES (GDV)</u>	
2.1	<u>2 -Storey Detached</u>	
2.1.1	2 -Storey Detached Unit	
a)	Type 1 (GFA @ 387 MS)	6,000,000.00
b)	Exceeds Land	201.6 MS @ RM 435.00 87,696.00
2.1.2	Detached Lot (7 No.)	
a)	Lot 31	853 MS @ RM 538.00 458,914.00
b)	Lot 32	827 MS @ RM 538.00 444,926.00
c)	Lot 33	1049 MS @ RM 538.00 564,362.00
d)	Lot 34	822 MS @ RM 538.00 442,236.00
e)	Lot 35	1107 MS @ RM 538.00 595,566.00
f)	Lot 36	817 MS @ RM 538.00 439,546.00
g)	Lot 37	843 MS @ RM 538.00 453,534.00
		C/F
		9,486,780.00

Description		Estimated Amount
		B/F
		9,486,780.00
2.	<u>SECTION II - RETURN FROM SALES (GDV) - Cont'd</u>	
2.2	3 -Storey Link House	
a)	Type 3 (GFA @ 298 MS)	17,680,000.00
b)	Excess Land 2330 MS @ RM 435.00	1,013,550.00
	SECTION II - RETURN FROM SALES (GDV)	28,180,330.00
3.	<u>SECTION III - ESTIMATED RETURNS</u>	
a)	Estimated Profit Before Tax (EPBT)	4,584,330.00
b)	Rate of Return : EPBT / GDV	16.27%
c)	Rate of Return : EPBT / TDC	19.43%

PRELIMINARY FEASIBILITY STUDY (OPTION 1 & OPTION 2)

DESCRIPTION		OPTION 1 (130 Units)	OPTION 2 (152 Units)	VARIANCE OPTION 1 & 2
		GFA= 45,581 MS AMOUNT (RM)	GFA= 49,356 MS AMOUNT (RM)	
A	<u>Cost of Construction</u>			
1.	Preliminaries	4,250,700.00	4,568,200.00	317,500.00
2.	<u>Piling Works</u>			
a)	14-Storey Condominium with 3 Levels Basement Carparks (Allowance 80' FR Bored Piles)	9,800,000.00	-	800,000.00
a1)	16-Storey Condominium with 3 Levels Basement Carparks (Allowance 80' FR Bored Piles)	-	10,600,000.00	
3.	<u>Building Works</u>			
a)	14-Storey Condominium GFA = 28,663 MS	31,529,300.00	-	2,087,800.00
a1)	15-Storey Condominium GFA = 30,561 MS	-	33,617,100.00	
b)	Podium & Facilities GFA = 1,972 MS	3,944,000.00	3,944,000.00	-
c)	3-Storey Basement Carpark (294 No.) GFA = 8,432 MS	5,059,200.00	5,059,200.00	-
d)	5-Storey Town House GFA = 6,514 MS	7,816,800.00	7,816,800.00	-
4.	Plumbing, Mechanical & Electrical Works (Allowance)	11,000,000.00	12,000,000.00	1,000,000.00
5.	<u>External Works & Services (Allowance)</u>			
a)	Site Preparation & Earthworks (3.15 acres)	300,000.00	300,000.00	-
b)	Road & Carpark	600,000.00	600,000.00	-
c)	Surface Water Drainage & Culverts	900,000.00	900,000.00	-
d)	Soil Drainage	300,000.00	300,000.00	-
e)	Water Reticulation	200,000.00	200,000.00	-
f)	Turfing	60,000.00	60,000.00	-
g)	Landscaping Works	100,000.00	100,000.00	-
h)	Fencing & Gates (Condo)	230,000.00	230,000.00	-

DESCRIPTION			OPTION 1 (130 Units)	OPTION 2 (152 Units)	VARIANCE OPTION 1 & 2	
			GFA= 45,581 MS AMOUNT (RM)	GFA= 49,356 MS AMOUNT (RM)		
i)	Sewerage Treatment Plant (800 PE)		500,000.00	-	100,000.00	
i1)	Sewerage Treatment Plant (950 PE)		-	600,000.00		
j)	Walkway		90,000.00	90,000.00	-	
k)	SESB Building, Bin Centre		1,000,000.00	1,000,000.00	-	
l)	Retaining wall		2,800,000.00	2,800,000.00	-	
m)	External M & E (Street light, telephone & LV)		1,400,000.00	1,450,000.00	50,000.00	
n)	60,000 Gallon Elevated Water Tank		400,000.00	-	60,000.00	
n1)	70,000 Gallon Elevated Water Tank		-	460,000.00		
o)	30,000 Gallon Balancing Tank & Pump House (Allowance)		120,000.00	-	20,000.00	
o1)	35,000 Gallon Balancing Tank & Pump House (Allowance)		-	140,000.00		
6.	<u>Contributions to Local Authorities</u>					
		<u>Option 1</u>	<u>Option 2</u>			
a)	SESB	2,000,000.00	2,200,000.00	2,500,000.00	2,800,000.00	300,000.00
b)	Telekom	300,000.00	350,000.00			
c)	JBA	200,000.00	250,000.00			
7.	<u>Off-Site Works (Allowance)</u>					
a)	Upgrading of Roads & Drains		500,000.00	500,000.00	-	
8	Contingencies		4,000,000.00	4,000,000.00	-	
TOTAL COST OF CONSTRUCTION			RM 89,400,000.00	94,135,300.00	4,735,300.00	
COST PER GFA			1,961.34	1,907.27	(54.07)	

PRELIMINARY FEASIBILITY STUDY (OPTION 1 & OPTION 2)

DESCRIPTION	OPTION 1	OPTION 2	VARIANCE OPTION 1 & 2
	ESTIMATED AMOUNT	ESTIMATED AMOUNT	
1. Section I - Estimated Total Development Cost			
a) Land Conversion Premium & Subdivision (Allowance)	3,600,000.00	3,930,000.00	330,000.00
b) Soil Investigation & Survey	100,000.00	100,000.00	-
c) Cost of Construction	89,400,000.00	94,135,300.00	4,735,300.00
d) Professional Fees	5,364,000.00	5,790,000.00	426,000.00
e) 6% Service Tax on (d) say,	321,900.00	347,400.00	25,500.00
f) Administration, Promotion & Marketing	2,736,400.00	3,080,000.00	343,600.00
g) Miscellaneous Expenses (Allowance) (EIA Report, MASMA Report, TIA Study)	500,000.00	500,000.00	-
h) Reimbursable Expenses, Site Supervision, etc	1,788,000.00	1,930,000.00	142,000.00
i) Financing Charges	4,199,700.00	4,532,600.00	332,900.00
j) Land Cost say,	5,490,000.00	5,490,000.00	-
ESTIMATED TOTAL DEVELOPMENT COST (TDC)	113,500,000.00	119,835,300.00	6,335,300.00
2. Section II - Return From Sales (GDV) [Option 1 & Option 2]	137,870,000.00	163,685,000.00	25,815,000.00
2.1 5-Storey Town House (17 Units)			
a) Lower Townhouse (NSA = 226 MS)	10,220,000.00	10,220,000.00	-
b) Mid Townhouse (NSA = 224 MS)	8,700,000.00	8,700,000.00	-
c) Upper Townhouse (NSA = 351 MS)	2,270,000.00	2,270,000.00	-
d) Townhouse Penthouse (NSA = 292 MS)	5,700,000.00	5,700,000.00	-
2.2 14-Storey Condominium (Option 1 & Option 2)			
NEW TYPE (NSA= 136 MS)		22,540,000.00	22,540,000.00
a) 1 Bed + Studio Suite (NSA= 59 MS)	4,900,000.00	-	-
a1) 1 Bed + Studio Suite (NSA= 59 MS)	-	4,900,000.00	-
b) 2 Bed + Study Suite (NSA= 105 MS)	7,500,000.00	-	(2,500,000.00)
b1) 2 Bed + Study Suite (NSA= 105 MS)	-	5,000,000.00	-
c) 3 Bed + Maid Suite (NSA= 189 MS)	24,640,000.00	-	6,720,000.00
c1) 3 Bed + Maid Suite (NSA= 189 MS)	-	31,360,000.00	-
d) 2 Bed + Study Dual Key (NSA= 108 MS)	7,040,000.00	-	1,920,000.00
d1) Retaining wall	-	8,960,000.00	-

DESCRIPTION	OPTION 1	OPTION 2	VARIANCE OPTION 1 & 2
	ESTIMATED AMOUNT	ESTIMATED AMOUNT	
e) 3 Bed Dual Key (NSA= 145 MS)	12,040,000.00	-	-
e1) 3 Bed Dual Key (NSA= 145 MS)	-	12,040,000.00	
f) 3 Bed + Maid Dual Key (NSA= 191 MS)	12,540,000.00	-	3,420,000.00
f1) 3 Bed + Maid Dual Key (NSA= 191 MS)	-	15,960,000.00	
g) 3 Bed + Maid Duplex (NSA= 160 MS)	15,200,000.00	6,650,000.00	(8,550,000.00)
h) 3 Bed + Maid Duplex Suite (NSA= 190 MS)	9,040,000.00	11,130,000.00	2,090,000.00
i) Penthouse Corner (NSA = 384 MS)	18,080,000.00	4,540,000.00	(13,540,000.00)
j) Penthouse Centre (NSA = 393 MS)		4,660,000.00	4,660,000.00
k) ADDITIONAL 0.3M CORRIDOR (141 MS)		8,355,000.00	8,355,000.00
l) CAR PARK		700,000.00	700,000.00
3. Section III - Estimated Returns			
a) Estimated Profit Before Tax (EPBT)	24,370,000.00	43,849,700.00	19,479,700.00
b) Rate of return : EPBT / GDV	17.68%	26.79%	9.11%
c) Rate of return : EPBT / TDC	21.47%	36.59%	15.12%
4. Land Area (Acres)	3.15	3.15	-
5. Density	41.27	50.50	9.23
6. Townhouse/ Lift = 17/4	4.25	4.25	-
7. Condo / Lift = 113/6 (Option 1)	18.83	-	-
7a. Condo / Lift = 135/6 (Option 2)	-	22.50	-
8. Nett Saleable Area (NSA)	21,630 MS	24,522 MS	2,892 MS
9. Efficiencies (NSA / GFA)	47.45%	49.68%	2.23%
10. Efficiencies (NSA / GFA - Carpark)	58.22%	59.92%	1.70%
11. By Law Carpark Requirement (Option 1)	163.00	-	-
11a. By Law Carpark Requirement (Option 2)	-	190.00	-
12. Covered carpark provided	294.00	294.00	-
13. Carpark/ Condo unit	2.26	1.93	(0.33)

Developer's Equation

- c) Basic Feasibility Study (FS) : Total Development Cost + Profit = Gross Development Value (GDV), or
- d) Land + Building + Finance & Marketing + Profit = GDV
 - i) Land
 - a) Land cost
 - b) Conversion premium if any
 - c) Sub-division & strata premium
 - d) Legal fees & stamp duty
 - e) Survey fees
 - ii) Building
 - a) Preliminaries
 - b) Piling
 - c) Building works
 - d) Lot external works
 - e) External works

- f) Off-site works
 - g) Capital contribution cost
 - h) Contingencies
 - i) Consultant fees
 - j) 6% government services tax
 - k) Reimbursable expenses & site supervision
-
- iii) Finance & Marketing
 - a) Financing charges
 - b) Administration & marketing
-
- iv) Developer's Profit
 - a) Return on investment
-
- v) Gross Development Value
 - a) Market comparison to establish sales values
 - b) Income method to establish the income producing property i.e. Hotel, carpark, cinema, stadium
 - c) Cost method where the above non applicable

23. Estimated weightage in terms of GDV for housing Development in urban, sub-urban and rural area.

		URBAN	SUB-URBAN	RURAL
	YEAR	2009-2012	2011-2013	2007-2010
	TYPE	2-Storey & 3-Storey Terrace House	2-Storey Terrace & Semi-Detached	2-Storey Terrace House
1.	Land	10%	16%	3%
2.	Building	63%	60%	71%
3.	Finance & Marketing	7%	4%	6%
4.	Profit	20%	20%	20%
5.	GDV	100%	100%	100%
6.	Implementation	Developer-Contractor	Land as Contra	Developer-Contractor

24. The major items apart from profit is Land & Building

25. Land

Values of Land is normally based on market comparison basis on the assumption of highest and best use and free of encumbrance subject to the following limiting conditions

a) For specific purpose

b) Excludes any deleterious or hazardous materials present

c) Exclude contamination of land

d) Any cash crops

e) Exclude any structural defects

26. Market Value is the estimated amount for which a property/ Land should exchange on the date of valuation between a willing buyer and a willing seller in an arm's length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without compulsion.

27. Encumbrance – a liability upon an estate such as a mortgage, a claim, caveat, conversion etc.

28. Do VM/VE by determining
- a) Work out the Gross Floor Area (differ from Construction floor area)
 - b) Work out the Nett Saleable Area
 - c) The plot ratio (correlate to highest uses), i.e. (GFA/Land area or NSA/Land area) (plot ratio allowed by “Planning Department”)
 - d) The efficiency of land use (actual lot sizes over land area)
 - e) Carpark provision - for any provision over and above carpark by-law requirements
 - f) Work out efficiency of multi-storey carpark
 - g) Work out efficiency of design/ layout.

$$\frac{\text{Actual car park sizes x no. of carpark}}{\text{GFA for carpark floor}}$$

- h) Work out density ratio (correlate to density allowable by DBKK etc)
- i) Units/ Lift Ratio if applicable
- j) Work out the development efficiency
- k) Water table level (decide basement versus elevated carpark etc)

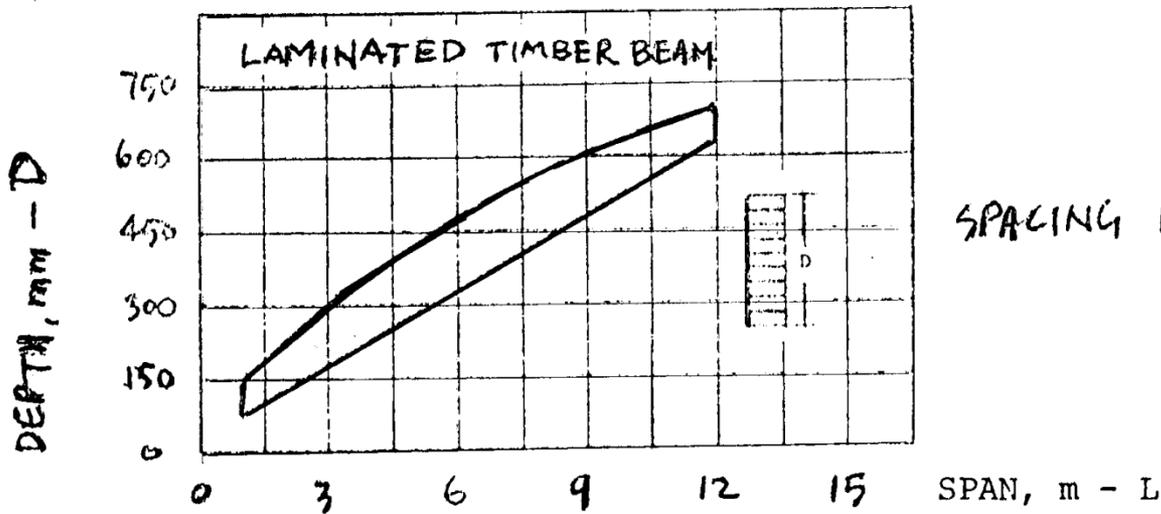
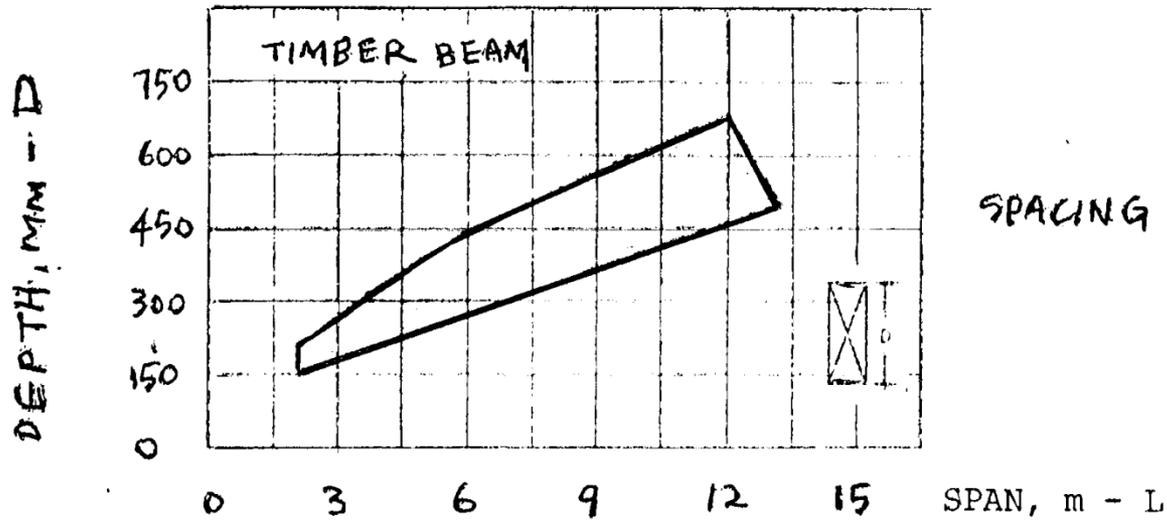
DESIGN DEVELOPMENT STAGE

29. VM/VE Basic Requirement
 - a) understand basic structural framing concepts
 - b) Understand basic M&E concepts
 - c) Understand basic Architectural concepts

30. Sample of quick reference for various structural system (SAMPLE C)

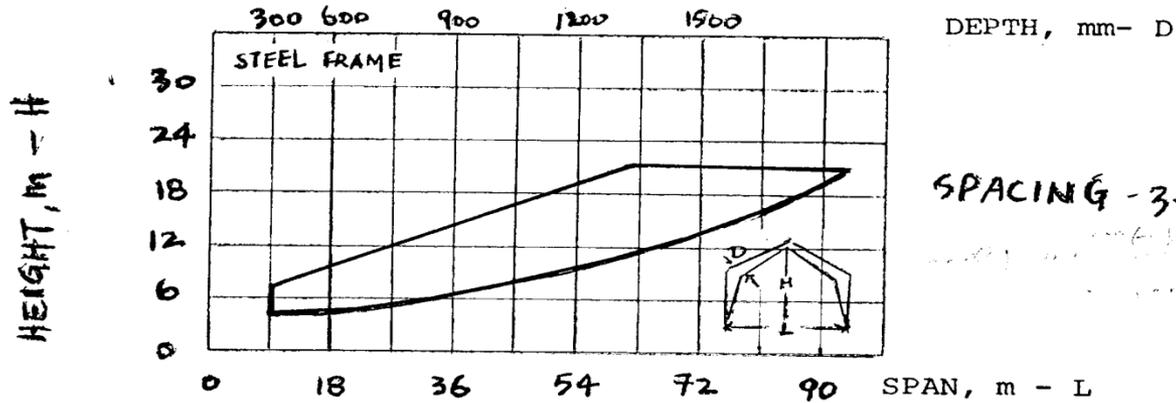
SAMPLE 'C'

TIMBER BEAMS

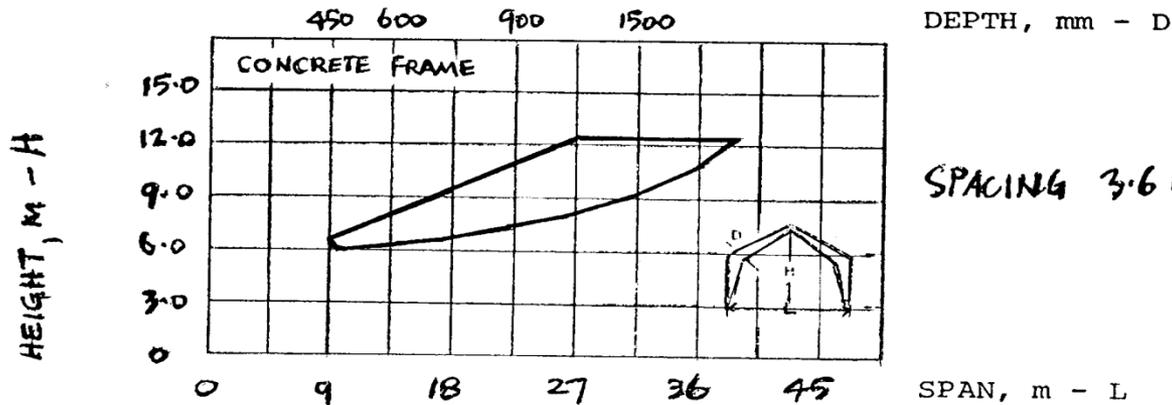


SAMPLE 'C'

FRAMES

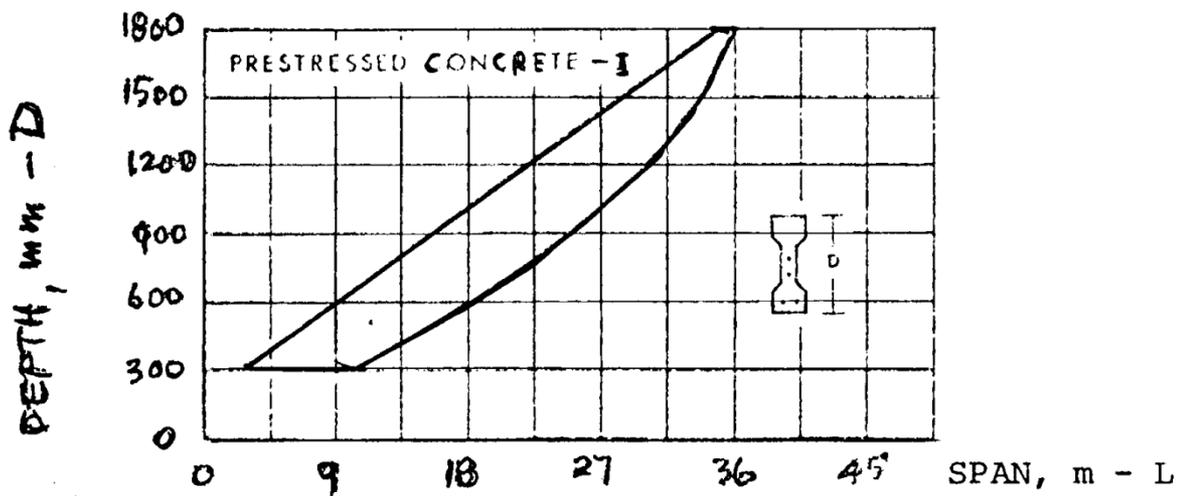
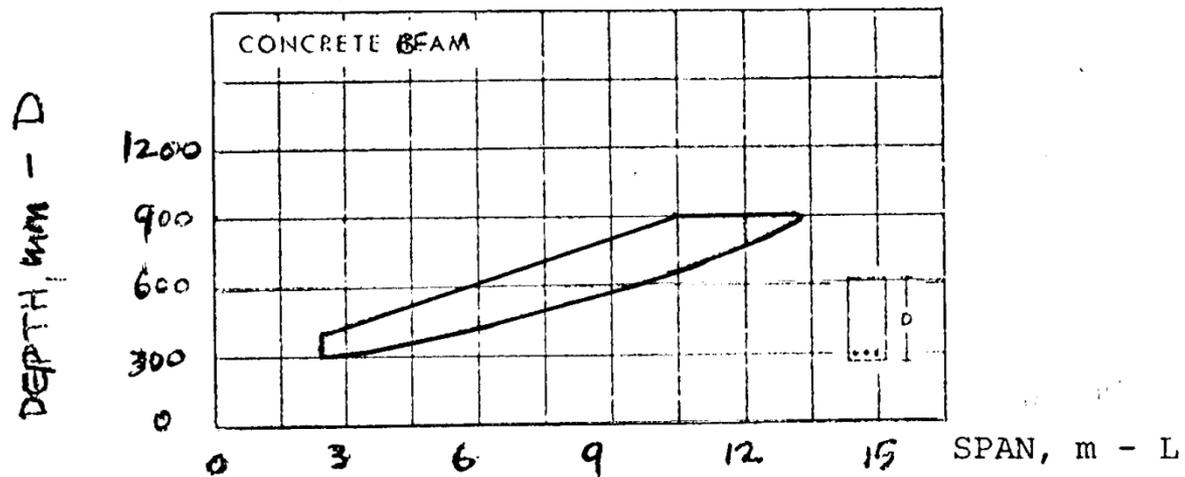


SPACING - 3.6 m - 7.2 m



SPACING 3.6 m - 7.2 m

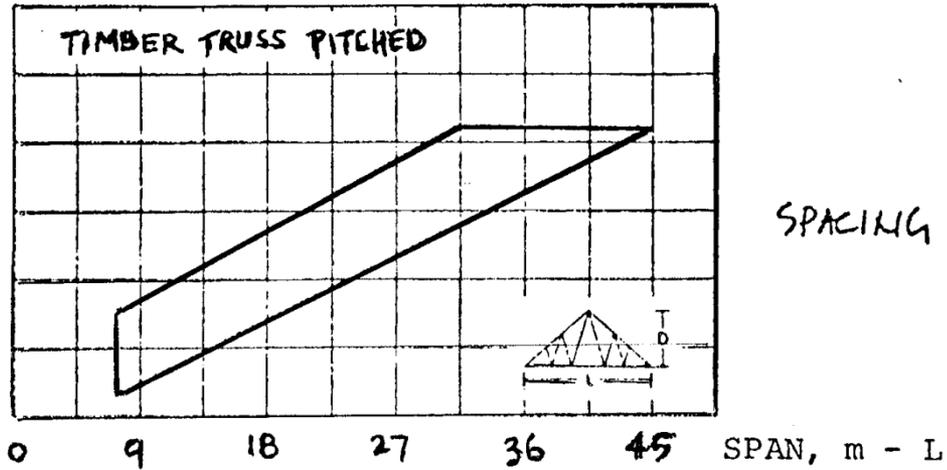
REINFORCED AND PRESTRESSED CONCRETE BEAMS



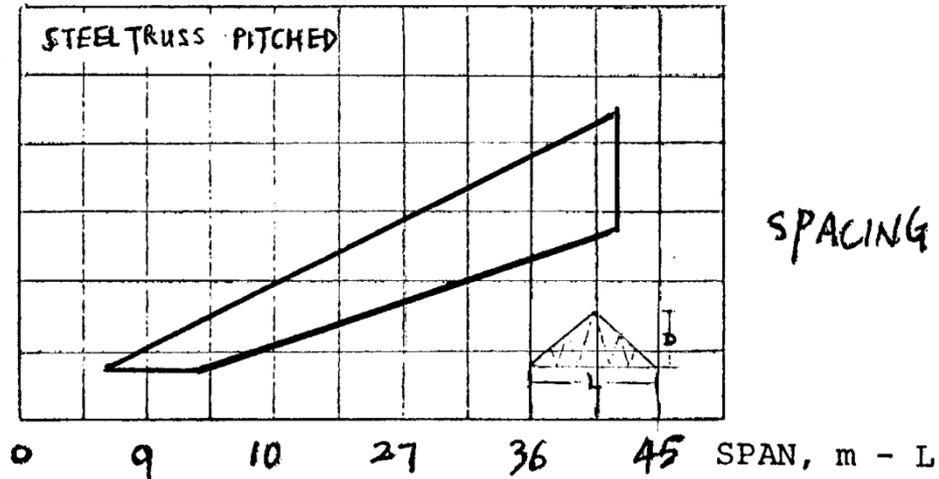
SAMPLE 'C'

TRUSSES

DEPTH, m - D

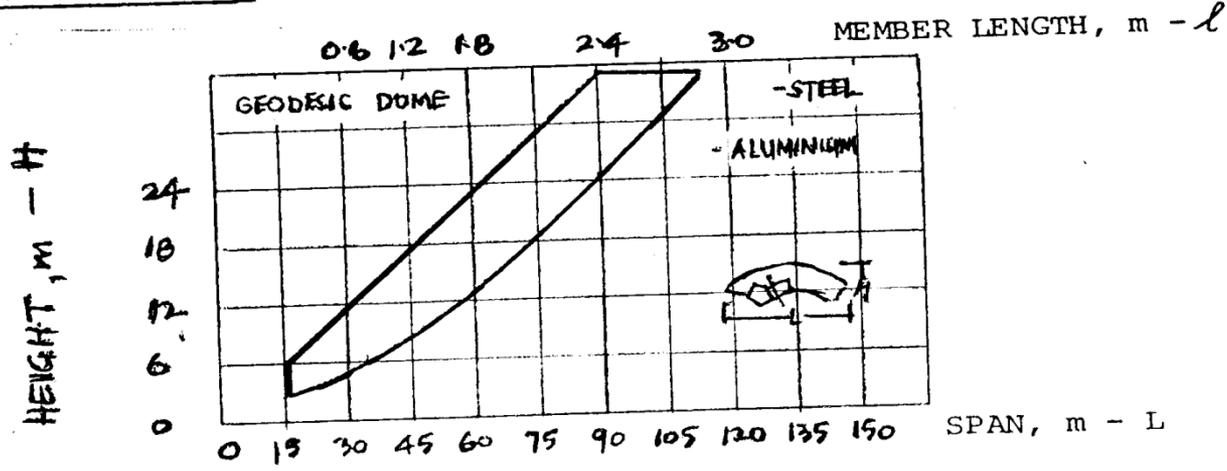


DEPTH, m - D

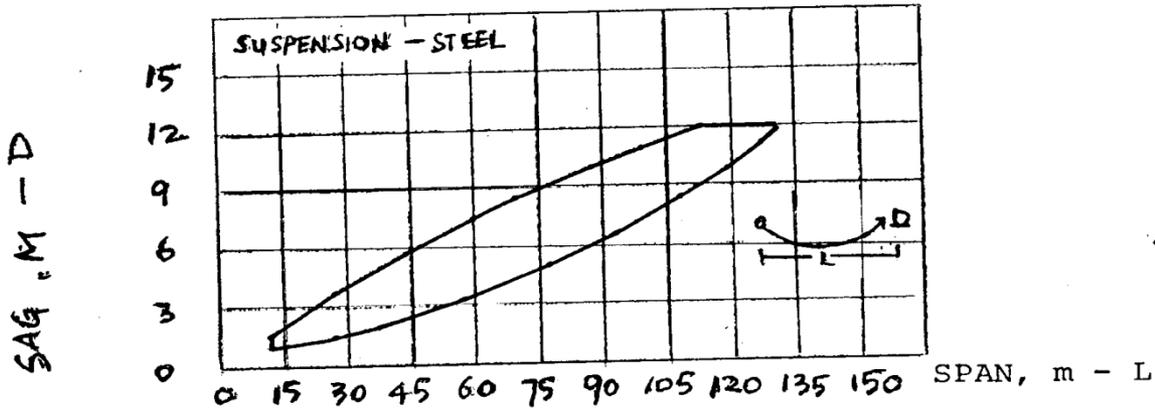


GEODESIC DOME

SAMPLE 'C'



SUSPENSION STRUCTURE



31. Work out the best optimum structural framing (high rise) by determining
- a) Piling working load/ GFA (potential saving of about 5% to 10%)
 - b) Structural framing (potential saving about 5% to 25%)
 - c) Structural system (conventional beam slab, flat slab, prestressed, shear wall, transfer beam, etc)
 - d) The interfacing for M&E major equipment & tanks (water & fire fighting) upon structural system

e) Civil Works

- i) Formation levels (single level vs split levels vs staging levels)
- ii) Drains [direction of flow, wider drains vs deeper drains, drain & cover & walkway (3 in 1 solution), grating vs concrete box cover]
- iii) Sewer reticulation (direction of flow)
- iv) Water reticulation (check hydrant position & radius or distance covered)
- v) Street light (check position or distance covered)
- vi) Retaining walls (comparison of rubble, gabion, reinforced concrete, Nehemiah, contiguous bored piles)

- f) Architectural Finishes
 - i) Walls & partitions (brick wall, shear walls, gypsum or light weight, IBS system)
 - ii) Wall & floor finishes (brand, model, etc)
 - iii) Ceiling finishes (type, brand, model)
 - iv) Doors (type, brand, model)
 - v) Lockset (type, brand, model)
 - vi) Windows (curtain wall, shop front, panel sizes, aluminium, sections)
 - vii) Sanitary fittings (type, brand, model)

TECHNICAL AUDITING

32. Definition From Dictionary
 - a) Technical – of or pertaining to the mechanical arts; of or pertaining to any particular art, science, business etc, strict interpretation within a specified field
 - b) Audit – to examine officially and pronounce as to the accuracy of (accounts)
33. Technical auditing – to examine officially and pronounce as to the accuracy of technical task/ matters in construction industry
34. Audit is not
 - a) Re-do the technical matters the same way as the original proponents
 - b) Perform the technical task/ matters as a second opinion

35. If QS want to call themselves Construction Cost Accountants, then it is appropriate that QS can perform the Audit role on technical matters concerning the construction industry.
36. Technical auditing is a new field and additional services that QS can best performed in view of their technical, financial, legal and management skill.
37. The technical auditing so far that I have carried out during the last 5 years are
 - a) Audit the EOT granted by the Consultant in respond to the relevant causes or events as submitted by the Contractor
 - b) Verifying the accuracy of the development cost and cash flow presented which are reasonable and adequate for the completion of the project within the stipulated construction time frame (SAMPLE 'D')

CORRELATION BETWEEN CONSTRUCTION SEQUENCE AND S & P'S PAYMENT SCHEDULE

ITEM	DESCRIPTION	2012		2013				2014		
		JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL
1.0	Work Schedule									
a)	Piling Works (1/7/12 -30/9/12)	←→								
b)	Foundatin Works (1/8/12 - 15/11/12)	←→	→							
c)	Ground Floor Beam & Slab (1/9/12-15/12/12)		←→							
d)	First Floor Beam & Slab (15/10/12-15/1/13)		←→	→						
e)	Roof Beam (16/11/12- 31/1/13)		←→	→						
f)	Wall & Partition (8/12/12-15/5/13)			←→	→					
g)	Door & Window Frame (16/2/13-21/5/13)			←→	→					
h)	Brickwall, Column & Beams Plastering (16/3/13-31/5/13)			←→	→					
i)	Roofing (22/4/13-15/7/13)				←→	→				
j)	Ceiling (8/6/13-31/8/13)				←→	→				
k)	Door & Window Panels (8/6/13 - 31/8/13)				←→	→				
l)	Electrical Wiring (15/2/13- 21/8/13)			←→	→					
m)	Plumbing (16/7/12-31/10/12)					←→	→			
n)	Sanitary Fittings (22/6/13-31/8/13)					←→	→			
o)	Floor & Wall Finishes (22/7/13-7/11/13)					←→	→			
p)	Painting (1/10/13-7/1/14)						←→	→		

CORRELATION BETWEEN CONSTRUCTION SEQUENCE AND S & P'S PAYMENT SCHEDULE

ITEM	DESCRIPTION	2012		2013				2014		
		JUL	OCT	JAN	APR	JUL	OCT	JAN	APR	JUL
q)	Lot External Works (1/9/13-31/1/14)					←	→			
r)	Road, Drain & Sewerage (1/9/13-7/3/14)					←	→			
s)	Water Main & SESB (15/10/13-21/2/14)						←	→		
t)	Occupation Certificate (15/2/14-31/3/14)							←	→	
2.0	S & P PAYMENT SCHEDULE									
2.1	Execution of Agreement	50%	15%		15%	10%	10%			
2.2 a)	Foundatin Works (16/11/12)					←	→			
b)	The R.C. Framework (1/2/13)					←	→			
c)	Walls with Doors & Window Frame in position (22/5/13)					←	→			
d)	Roofing & Internal Plastering (16/7/13)					←	→			
e)	Electrical Wiring & Plumbing (without fitting) (22/8/13)					←	→			
f)	Roads, Drains & Sewerage Works (8/3/14)							←	→	
g)	C.P.C. & O.C. duly comply with (1/4/14)							←	→	
h)	Written confirmation of subdivision of Land by Authorities (1/7/14)									←
i)	Vacant Possession (1/7/14)									←

- c) Verifying the construction cost estimate and construction schedule are reasonable and sufficient for the completion of the proposed project (The Land owner exchange land for the units plus cash consideration)

- d) Audit the Awarded project as to the reasonableness of their cost of construction. (SAMPLE 'E' & SAMPLE 'F')

COMPARISON OF KEY AREA

ITEM	DESCRIPTION	DEVELOPER/ EMPLOYER	CONSULTANT	REMARKS
1.0	DRAWINGS USED :	Building Plan No. :	Approved Building Plan No.:	
2.0	BUILT-UP AREA			
2.1	<u>Condominium</u>			
a)	Type A	2,266 FS (210.6 MS)	212.4 MS	- Shortfall 1.8 MS
b)	Type B	1,669 FS (155.1 MS)	147.5 MS	- Excess 7.6 MS
c)	Type C	965 FS (89.7 MS)	85.3 MS	- Excess 4.4 MS
d)	Type F	1,931 FS (179.5 MS)	145.9 MS	- Excess 33.6 MS
e)	Penthouse D	4,395 FS (408.5 MS)	411.1 MS	- Shortfall 2.6 MS
f)	Penthouse E	6,443 FS (598.8 MS)	586.8 MS	- Excess 12 MS
2.2	<u>Commercial Retails</u>			
a)	Basement 1	43,353 FS (4,029.09 MS)	3,507.33 MS	- Excess 521.76 MS
b)	Ground Floor	26,603 FS (2,472.40 MS)	2,254.33 MS	- Excess 218.07 MS
c)	1st Floor	26,411 FS (2,454.55 MS)	2,734.67 MS	- Excess 280.12 MS
2.3	<u>Carpark</u>			
a)	L2 - L6 Balance Lots	105	101	- Excess 4
b)	Basement 1	79	79	
c)	Basement 2	146	146	
3.0	GROSS FLOOR AREA	139,984 MS	143,048.3 MS	- Shortfall 3,064.30 MS

VERIFICATION ON COST OF CONSTRUCTION

ITEM	DESCRIPTION	GFA = 1,507,628 FS DEVELOPER / EMPLOYER		ELEMENT WEIGHTAGE (%)	REMARKS
		ESTIMATED COST	RM/ GFA		
1.0	<u>Piling Works</u> - Sheet pile, spun piles & bored piles	44,500,000.00	29.52	17.39	1.0 Following major significant items not captured :- a) Selected wall cladding b) Fire rated roller shutter c) Full height glass wall d) M&E equipment plinth e) Toilet cubicle partition f) Pebble wash finish g) Tempered glass railing proprietary system h) Mail box i) Children playground equipment j) Paver blocks k) Off site improvement works 2.0 Cost per FS for item 2(a) low for high rise structure with 2 basement & transfer plate/ beam facing sea. 3.0 Following major items unit rates on the low sides :- a) Granite wall finish b) Floor hardener c) Timber decking d) Waterproofing e) Glass roof canopy f) Toilet door g) Toilet sliding door 4.0 Following major items unit rates on the high sides :- a) Aluminium louvres
2.0	<u>Building Works</u>				
a)	R.C. Works + Basement 1 & 2	96,200,000.00	63.81	37.59	
b)	Roof Covering, Rain Water Goods	2,400,000.00	1.59	0.94	
c)	Door & Windows	12,500,000.00	8.29	4.89	
d)	Wall Partition & Finishes	21,000,000.00	13.93	8.21	
e)	Floor Finishes	14,100,000.00	9.35	5.51	
f)	Ceiling Finishes	5,950,000.00	3.95	2.33	
g)	Handrailing	5,400,000.00	3.58	2.11	
h)	Sanitary Wares & Fittings	8,250,000.00	5.47	3.22	
	SUB-TOTAL (2.0)	165,800,000.00	109.97	64.80	
3.0	<u>Mechanical & Electrical</u>				
a)	Electrical Services	26,638,900.00	17.67	10.41	
b)	Mechanical Services	18,946,400.00	12.57	7.40	
	SUB-TOTAL (3.0)	45,585,300.00	30.24	17.81	
GRAND TOTAL (1.0 + 2.0 + 3.0)		255,885,300.00	169.73	100	

38. List of Documents/ Drawings required for construction and audit purpose
- a) Approved Development plans
 - b) Approved Building plans
 - c) Tender drawings for Architectural, C&S and M&E
 - d) Priced BQ contract documents
 - e) Soil investigation report
 - f) Topographical& cadastral survey
 - g) Copy of budgetary estimate & cost plan
 - h) Copy of letter of approval from various government departments, agencies, statutory bodies, services provider (i.e. SESB, JBA, Telekom)
 - i) copy of Letter of Award
 - j) Copy of S&P agreement
 - k) Any other relevant documents/ drawings
39. Audit Works Components
- a) Gross Floor Area (GFA)
 - b) Nett Saleable Area (NSA)
 - c) Steel bar ratio for various concrete elements (SAMPLE 'G')

Analysis of steel bar ratio for Various structural concrete elements (Density of steel: 7850 kg/m³)

Description	Phase 1 (A)		Phase 1 (B)		Phase 2	
	Corner (10 Units)	Intermediate (50 Units)	Corner (14 Units)	Intermediate (79 Units)	Corner (20 Units)	Intermediate (81 Units)
1 GFA (ms)	1,833.00	7,338.00	2,566.00	11,595.00	3,928.00	12,763.00
2 Substructure						
2.1 Pad Foundtaion						
a) G25 Concrete (m ³)	12.00	13.00	12.00	13.00	12.00	13.00
b) Reinforcement (KG)	981.00	1,003.00	981.00	1,003.00	981.00	1,003.00
c) Steel Ratio (%)	1.04	0.98	1.04	0.98	1.04	0.98
2.2 Pile Caps						
a) G25 Concrete (m ³)	3.00	2.00	3.00	2.00	3.00	2.00
b) Reinforcement (KG)	358.00	256.00	358.00	256.00	358.00	256.00
c) Steel Ratio (%)	1.52	1.63	1.52	1.63	1.52	1.63
2.3 Column Stumps						
a) G25 Concrete (m ³)	1.00	1.00	1.00	1.00	1.00	1.00
b) Reinforcement (KG)	221.00	151.00	221.00	151.00	221.00	151.00
c) Steel Ratio (%)	2.82	1.92	2.82	1.92	2.82	1.92
2.4 Ground beam						
a) G25 Concrete (m ³)	6.00	5.00	6.00	5.00	6.00	5.00
b) Reinforcement (KG)	1,277.00	1,117.00	1,277.00	1,117.00	1,277.00	1,117.00
c) Steel Ratio (%)	2.71	2.85	2.71	2.85	2.71	2.85
2.5 Ground Slab						
a) G25 Concrete (m ³)	14.00	12.00	14.00	12.00	14.00	12.00
b) Reinforcement (KG)	1,002.00	878.00	1,002.00	878.00	1,002.00	878.00
c) Steel Ratio (%)	0.91	0.93	0.91	0.93	0.91	0.93
2.6 Apron Slab						
a) G25 Concrete (m ³)	3.00	1.00	3.00	1.00	3.00	1.00
b) Reinforcement (KG)	196.00	58.00	196.00	58.00	196.00	58.00
c) Steel Ratio (%)	0.83	0.74	0.83	0.74	0.83	0.74
3 Frame						
3.1 Columns and stiffener						
a) G25 Concrete (m ³)	3.20	2.10	3.20	2.10	3.20	2.10
b) Reinforcement (KG)	468.00	252.00	468.00	252.00	468.00	252.00
c) Steel Ratio (%)	1.86	1.53	1.86	1.53	1.86	1.53
3.2 Floor beam						
a) G25 Concrete (m ³)	4.00	4.00	4.00	4.00	4.00	4.00
b) Reinforcement (KG)	1,226.00	1,029.00	1,226.00	1,029.00	1,226.00	1,029.00
c) Steel Ratio (%)	3.90	3.28	3.90	3.28	3.90	3.28
3.3 Roof beam						
a) G25 Concrete (m ³)	2.00	2.00	2.00	2.00	2.00	2.00
b) Reinforcement (KG)	201.00	172.00	201.00	172.00	201.00	172.00
c) Steel Ratio (%)	1.28	1.10	1.28	1.10	1.28	1.10

Description		Phase 1 (A)		Phase 1 (B)		Phase 2	
		Corner (10 Units)	Intermediate (50 Units)	Corner (14 Units)	Intermediate (79 Units)	Corner (20 Units)	Intermediate (81 Units)
4	Upper Floor						
4.1	Floor slab						
a)	G25 Concrete (m ³)	8.00	7.00	8.00	7.00	8.00	7.00
b)	Reinforcement (KG)	608.00	495.00	608.00	495.00	608.00	495.00
c)	Steel Ratio (%)	0.97	0.90	0.97	0.90	0.97	0.90
4.2	Flat roof						
a)	G25 Concrete (m ³)	3.00	1.00	3.00	1.00	3.00	1.00
b)	Reinforcement (KG)	395.00	128.00	395.00	128.00	395.00	128.00
c)	Steel Ratio (%)	1.68	1.63	1.68	1.63	1.68	1.63
4.3	Cill						
a)	G25 Concrete (m ³)	1.00	0.40	1.00	0.40	1.00	0.40
b)	Reinforcement (KG)	94.00	55.00	94.00	55.00	94.00	55.00
c)	Steel Ratio (%)	1.20	1.75	1.20	1.75	1.20	1.75
4.4	Hood						
a)	G25 Concrete (m ³)	1.00	0.30	1.00	0.30	1.00	0.30
b)	Reinforcement (KG)	134.00	47.00	134.00	47.00	134.00	47.00
c)	Steel Ratio (%)	1.71	2.00	1.71	2.00	1.71	2.00
4.5	Gutter						
a)	G25 Concrete (m ³)	0.70	0.60	0.70	0.60	0.70	0.60
b)	Reinforcement (KG)	154.00	117.00	154.00	117.00	154.00	117.00
c)	Steel Ratio (%)	2.80	2.48	2.80	2.48	2.80	2.48
5	Staircase						
a)	G25 Concrete (m ³)	1.00	1.00	1.00	1.00	1.00	1.00
b)	Reinforcement (KG)	105.00	105.00	105.00	105.00	105.00	105.00
c)	Steel Ratio (%)	1.34	1.34	1.34	1.34	1.34	1.34
6	Total						
a)	G25 Concrete (m ³)	62.90	52.40	62.90	52.40	62.90	52.40
b)	Reinforcement (KG)	7,420.00	5,863.00	7,420.00	5,863.00	7,420.00	5,863.00
c)	Steel Ratio (%)	1.50	1.43	1.50	1.43	1.50	1.43

d) Cost per GFA & per element (SAMPLE 'H' & SAMPLE 'I')

SAMPLE 'H'

SUMMARY OF ELEMENT COSTS										
		GROSS FLOOR AREA : 1,833.00 m ²				GROSS FLOOR AREA : 7,338.00 m ²				
		DOUBLE STOREY TERRACE - CORNER (10 UNITS)				DOUBLE STOREY TERRACE - INTERMEDIATE (50 UNITS)				
BUILDING WORKS		Total cost of element (RM)	Cost per m ² GFA (RM)	Element unit quantity	Element unit rate (RM)	Total cost of element (RM)	Cost per m ² GFA (RM)	Element unit quantity	Element unit rate (RM)	
<u>1. Substructure</u>										
A	Work Below Lowest Floor Finish									
	a) R.C. Foudation	71,096.84	38.79	150.00 m3	473.98	355,401.72	48.43	750.00 m3	473.87	
	b) Column stump	14,814.70	8.08	10.00 m3	1,481.47	54,248.50	7.39	50.00 m3	1,084.97	
	c) Ground beam	95,475.20	52.09	64.00 m3	1,491.80	403,462.50	54.98	265.00 m3	1,522.50	
	d) Ground slab	99,809.20	54.45	160.00 m3	623.81	431,412.00	58.79	700.00 m3	616.30	
	e) Apron slab	20,882.00	11.39	34.00 m3	614.18	33,091.50	4.51	56.00 m3	590.92	
	Group Element Total :	302,077.94	164.80			1,277,616.22	174.11			
<u>2. Superstructure</u>										
B	Frame									
	a) Column	41,886.60	22.85	30.00 m3	1,396.22	122,359.50	16.67	100.00 m3	1,223.60	
	b) R.C. Stiffener (1st floor to roof level)	3,652.40	1.99	2.00 m3	1,826.20	10,343.50	1.41	5.00 m3	2,068.70	
	c) Floor beam (1st floor level)	82,468.80	44.99	40.00 m3	2,061.72	351,956.50	47.96	200.00 m3	1,759.78	
	d) Roof beam	27,961.90	15.25	20.00 m3	1,398.10	119,297.00	16.26	100.00 m3	1,192.97	
C	Upper Floors									
	a) Floor slab	68,987.60	37.64	80.00 m3	862.35	287,764.50	39.22	350.00 m3	822.18	
	b) Flat roof	35,358.00	19.29	30.00 m3	1,178.60	60,615.50	8.26	50.00 m3	1,212.31	
	c) R.C. Cill	9,843.10	5.37	10.00 m3	984.31	23,200.00	3.16	20.00 m3	1,160.00	
	d) R.C. Hood	11,679.20	6.37	10.00 m3	1,167.92	20,261.00	2.76	15.00 m3	1,350.73	
	e) R.C. Gutter beam	9,271.10	5.06	5.00 m3	1,854.22	36,549.50	4.98	20.00 m3	1,827.48	
	f) R.C. Gutter slab	2,647.40	1.44	2.00 m3	1,323.70	12,674.50	1.73	10.00 m3	1,267.45	
D	Stairs									
	a) Stair structure	12,459.90	6.80	68.30 m2	182.43	62,295.50	8.49	341.50 m2	182.42	
	b) Stair finishes and handrailing	36,063.00	19.67	68.30 m2	528.01	180,315.00	24.57	341.50 m2	528.01	
E	Roof									
	a) Roof structure	91,360.00	49.84	1,360.00 m2	67.18	379,350.00	51.70	5,150.00 m2	73.66	
	b) Roof covering	132,070.00	72.05	1,360.00 m2	97.11	581,450.00	79.24	5,150.00 m2	112.90	
	c) Rainwater goods	660.00	0.36	30.00 m	22.00	3,300.00	0.45	150.00 m	22.00	
F	Externall Walls	53,155.00	29.00	1,130.00 m2	47.04	147,900.00	20.16	2,700.00 m2	54.78	
G	Internal Walls & Partitions	62,465.00	34.08	1,210.00 m2	51.62	441,825.00	60.21	7,450.00 m2	59.31	
H	Doors	60,180.00	32.83	267.60 m2	224.89	258,100.00	35.17	1,149.00 m2	224.63	
I	Windows	52,040.00	28.39	222.75 m2	233.63	193,050.00	26.31	731.25 m2	264.00	
	Group Element Total :	794,209.00	433.28			3,292,607.00	448.71			

SUMMARY OF ELEMENT COSTS									
		GROSS FLOOR AREA : 1,833.00 m2				GROSS FLOOR AREA : 7,338.00 m2			
		DOUBLE STOREY TERRACE - CORNER (10 UNITS)				DOUBLE STOREY TERRACE - INTERMEDIATE (50 UNITS)			
BUILDING WORKS		Total cost of element (RM)	Cost per m2 GFA (RM)	Element unit quantity	Element unit rate (RM)	Total cost of element (RM)	Cost per m2 GFA (RM)	Element unit quantity	Element unit rate (RM)
	<u>3. Finishes</u>								
A	Internal Wall Finishes	126,863.00	69.21	4,260.00 m2	29.78	596,985.00	81.36	19,750.00 m2	30.23
B	Internal Floor Finishes	113,019.20	61.66	1,270.00 m2	88.99	454,318.50	61.91	5,150.00 m2	88.22
C	Internal Ceiling Finishes	44,238.00	24.13	1,360.00 m2	32.53	179,900.00	24.52	5,500.00 m2	32.71
D	External Finishes	126,029.80	68.76	3,980.00 m2	31.67	371,374.00	50.61	11,750.00 m2	31.61
	Group Element Total :	410,150.00	223.76			1,602,577.50	218.39		
	<u>4. Services</u>								
	Sanitary Appliances	37,040.00	20.21	100.00 No.	370.40	185,200.00	25.24	500.00 No.	370.40
	Group Element Total :	37,040.00	20.21			185,200.00	25.24		
	TOTAL (less Contingencies)	1,543,476.94	842.05			6,358,000.72	866.45		

VERIFICATION ON COST OF CONSTRUCTION

ITEM	DESCRIPTION	GFA= 3,928 MS		ELEMENT WEIGH- TAGE (%)	GFA= 12,763 MS		ELEMENT WEIGH- TAGE (%)	REMARKS
		DOUBLE STOREY TERRACE - CORNER			DOUBLE STOREY TERRACE - INTERMEDIATE			
		ESTIMATED COST	RM/ GFA		ESTIMATED COST	RM/ GFA		
1.0	<u>Preliminaries & General Conditions</u>	253,335.68	64.49	6.56%	821,748.32	64.39	6.39%	
	SUB-TOTAL (1.0)	253,335.68	64.49	6.56%	821,748.32	64.39	6.39%	
2.0	<u>Piling Works</u>							
a)	150mm x 150mm P.c. R.C. Piling 18m penetration	2,947.89	0.75	0.08%	9,562.11	0.75	0.07%	
b)	R.C. Foundation	122,371.51	31.15	3.17%	421,873.16	33.05	3.28%	
	SUB-TOTAL (2.0)	125,319.40	31.90	3.25%	431,435.27	33.80	3.36%	
3.0	<u>Building Works</u>							
a)	R.C. Sub-Structure	23,098.11	5.88	0.60%	18,444.29	1.45	0.14%	
b)	R.C. Frame Works	15,596.97	3.97	0.40%	12,079.13	0.95	0.09%	
c)	R.C. Upper Floor and Suspended Slab	13,778.64	3.51	0.36%	8,821.30	0.69	0.07%	
d)	Staircase Structure	1,245.99	0.32	0.03%	1,245.99	0.10	0.01%	
e)	Roof	22,409.00	5.70	0.58%	19,282.00	1.51	0.15%	
f)	External and Internal Wall	11,562.00	2.94	0.30%	11,794.50	0.92	0.09%	
g)	Doors	6,018.00	1.53	0.16%	5,162.00	0.40	0.04%	
h)	Windows	5,204.00	1.32	0.13%	3,861.00	0.30	0.03%	
i)	Floor Finishes	12,904.32	3.29	0.33%	10,006.37	0.78	0.08%	
j)	Wall Finishes	19,046.88	4.85	0.49%	15,287.18	1.20	0.12%	
k)	Ceiling Finishes	9,063.80	2.31	0.23%	6,758.00	0.53	0.05%	
l)	Staircase Finishes	3,036.30	0.77	0.08%	3,036.30	0.24	0.02%	
m)	Handrailing	570.00	0.15	0.01%	570.00	0.04	0.00%	
n)	Sanitary Appliances and Fixtures	3,704.00	0.94	0.10%	3,704.00	0.29	0.03%	
	Sub-total	147,238.01	37.48	3.81%	120,052.06	9.41	0.93%	
	Times Factor (Unit)	20.00			81.00			
	SUB-TOTAL (3.0)	2,944,760.20	749.68	76.29%	9,724,216.86	761.91	75.63%	
4.0	<u>Works Within Lot Boundary</u>	238,350.00	60.68	6.17%	726,772.50	56.94	5.65%	
	SUB-TOTAL (4.0)	238,350.00	60.68	6.17%	726,772.50	56.94	5.65%	
5.0	<u>Internal Mechanical & Electrical</u>							
a)	Internal Wiring Installation	136,900.00	34.85	3.55%	569,025.00	44.58	4.43%	
b)	Internal Cold Water & Sanitary	67,000.00	17.06	1.74%	279,450.00	21.90	2.17%	
	SUB-TOTAL (5.0)	203,900.00	51.91	5.28%	848,475.00	66.48	6.60%	
6.0	<u>Provisional Sum for Contingencies</u>	94,257.08	24.00	2.44%	305,742.92	23.96	2.38%	
	SUB-TOTAL (6.0)	94,257.08	24.00	2.44%	305,742.92	23.96	2.38%	
GRAND TOTAL(1.0+2.0+3.0+4.0+5.0+6.0)		3,859,922.36	982.67	100%	12,858,390.87	1,007.47	100%	

e) Weightage of elements component (SAMPLE 'J' & SAMPLE 'K')

SAMPLE 'J'

EXTERNAL WORKS

SUMMARY OF ELEMENT COSTS							
		Site area:			11.25	Acre	
		Total cost of element (RM)	Element weightage (%)	Cost per Acre (RM)	Element unit quantity	Element unit rate (RM)	
A	Road	1,230,964.00	43.11	109,419.02	9,656.00 m ²	127.48	
B	Surface water drainage	760,499.00	26.64	67,599.91	1,890.00 m	402.38	
C	Water Reticulation System	585,644.50	20.51	52,057.29	1,332.00 m	439.67	
D	Fencing	278,044.00	9.74	24,715.02	174.00 m	1,597.95	
Group Element Total :		2,855,151.50	100.00	253,791.24			

- Analysis of Cost Breakdown Based on Preliminary Cost Estimate

DESCRIPTION	PHASE 1			PHASE 2			PHASE 3		
	AMOUNT	RM/ MS	Element weightage (%)	AMOUNT	RM/ MS	Element weightage (%)	AMOUNT	RM/ MS	Element weightage (%)
1 Preliminaries	2,073,300.00	88.86	6.27	1,137,200.00	68.14	4.91	2,082,800.00	74.72	5.22
2 Piling Works	929,400.00	39.84	2.81	285,100.00	17.08	1.23	1,947,500.00	69.87	4.88
3 <u>Building Works</u>	20,004,900.00	857.44	60.49	13,225,700.00	792.43	57.05	25,958,600.00	931.28	65.08
a) Extra Balcony (2,172.7 m)	-	-	-	1,013,800.00	60.74	4.37	-	-	-
4 Lot External Works	1,443,500.00	61.87	4.37	965,100.00	57.83	4.16	-	-	-
5 <u>Mechanical & Electrical</u>	3,181,300.00	136.36		2,027,500.00	121.48		3,483,300.00	124.97	
a) Internal M&E	1,596,000.00	68.41	4.83	1,126,500.00	67.50	4.86	1,910,300.00	68.53	4.79
b) External M&E	1,585,300.00	67.95	4.79	901,000.00	53.98	3.89	1,573,000.00	56.43	3.94
6 <u>External Works</u>	4,124,100.00	176.76		3,597,300.00	215.54		4,811,600.00	172.62	
a) Site Preparation & Earthworks	896,000.00	38.40	2.71	522,000.00	31.28	2.25	896,000.00	32.14	2.25
b) Road	1,231,000.00	52.76	3.72	575,200.00	34.46	2.48	1,140,100.00	40.90	2.86
c) Surface Water Drainage & Ponds	933,500.00	40.01	2.82	1,660,600.00	99.50	7.16	1,098,600.00	39.41	2.75
d) Soil Drainage	585,600.00	25.10	1.77	386,600.00	23.16	1.67	423,500.00	15.19	1.06
e) Water Reticulation	278,000.00	11.92	0.84	182,900.00	10.96	0.79	983,400.00	35.28	2.47
f) Landscaping Works	200,000.00	8.57	0.60	200,000.00	11.98	0.86	200,000.00	7.18	0.50
g) Ancillary Buildings	-	-	-	70,000.00	4.19	0.30	70,000.00	2.51	0.18
7 Contribution (SESB, Telekom)	275,700.00	11.82	0.83	182,700.00	10.95	0.79	307,300.00	11.02	0.77
8 Provisional Sums	710,000.00	30.43	2.15	518,000.00	31.04	2.23	900,100.00	32.29	2.26
9 Contingencies	327,000.00	14.02	0.99	230,000.00	13.78	0.99	395,000.00	14.17	0.99
TOTAL	33,069,200.00	1,417.39	100.00	23,182,400.00	1,389.00	100.00	39,886,200.00	1,430.95	100.00
10 GFA (MS)	23,331	-	-	16,690	-	-	27,874	-	-
11 Cost per Unit	216,138.56	-	-	229,528.71	-	-	233,252.63	-	-

- f) Analysis of cost elements into stage of construction works as per S&P payment schedule (SAMPLE 'L')
- g) Any major or significant items overlook/ missed out that are required by relevant approving authorities.

SAMPLE 'L'

Second Schedule - Payment Schedule

	Stages of Construction Work	Estimated Cost (RM)			
		Double Storey Terrace - Corner	Percentage (%)	Double Storey Terrace -	Percentage (%)
(A)	Upon execution of this Agreement including booking fee, if any				
(B)	On completion of foundation works of the Property (10%)	304,064.36	14.23	1,281,074.80	16.06
(C)	On completion of reinforced concrete framework of the Property (15%)	293,756.10	13.75	1,045,021.50	13.10
(D)	On completion of brick walls of the Property with doors and window frames in position (15%)	227,840.00	10.67	1,040,875.00	13.05
(E)	On completion of roofing and internal plastering of the Property (15%)	391,815.00	18.34	1,739,375.00	21.80
(F)	On completion of the electrical wiring and plumbing (without fittings) of the Property (10%)	54,300.00	2.54	279,800.00	3.51
(G)	The sewerage works serving the Property (5%)	11,150.00	0.52	87,750.00	1.10
(H)	The drains serving the Property (5%)	16,500.00	0.77	20,900.00	0.26
(I)	The roads serving the Property (5%)	26,300.00	1.23	114,500.00	1.44
(J)	Upon the issuance of a certificate by the Developer's architect certifying that the construction of the Property has been duly completed in accordance with the relevant legislations, by-laws and rules, and that all conditions imposed by the Appropriate Authority, in respect of the issuance of the Occupation Certificate has been duly complied with (2.5%)	725,869.34	33.98	1,939,072.56	24.31
(K)	Within twenty-one (21) working days after receipt by the Purchaser of the written confirmation of the Developer's submission to and acceptance by the Appropriate Authority of the application for subdivision of the project land together with the as-built survey plan (2.5%)				
(L)	On the date the Purchaser takes vacant possession (5%)	84,690.00	3.96	429,150.00	5.38
TOTAL		2,136,284.80	100.00	7,977,518.86	100.00

= THANK YOU =