Alpha
Engineering Consultant

PROJECT QUALITY PLAN

PROPOSED LANDED HOUSING DEVELOPMENT COMPRISING 76 UNITS OF 3-STOREY TERRACE HOUSES & 4 UNITS OF SHOW-HOUSES ON LOTS 884, 2013, 2015, 2017, 2019, 2021 & 2051 MK19 AT SEMBAWANG RD/JALAN ULU SELETAR (PHASE 6A, 7A & 7B)

For

M/S KALLANG DEVELOPMENT (PTE) LTD

Copy No.	1

Prepared By: Soh Kai Yea

Authorised By: Richard Teo

Date: 1 September 2003

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SECTION 1

QUALITY PLAN CONTROL AND DISTRIBUTION

1.1 List of Copy Holders

Copy No.	Copy Holder	Date of Issue
1	1272-PQP File	20 December 2000
2	Soh Kai Yea	20 December 2000

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	20 December 2000	1 to 10	26	
1	1 September 2003	1 to 10	33	

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Statistics of Development	
Site Area, m²	20,000 (Phase 6A,7A & 7B)
Nett Floor Area, m²	N.A
Gross Floor Area, m²	21,576.96 (excl carporch GFA)
Covered Carpark, m²	N.A
No. of Covered Carpark Lots	N.A
No. of Apartments/Houses	80 units for Phase 6A, 7A and 7B
No. of Beds (for Hospitals)	N.A
No. of Guestroom (for Hotels)	N.A
No. of Blocks / No. of Storeys	9 blocks / 3 storeys
No. of Phases	Total 15 Phases, Phase 1 to 5 completed by others Current Phase 6A, 7A & 7B

2.2 Project Cost

M&E Services Cost Plan (S$ x 1K) – 4 Units Show Houses										
Services	EI	ACVI	LEI	FFAI	PSI	SPFI	Auto Gate			
Estimate	-	-	-	-	-	-	-			
Awarded	65	60	-	-	82	-	-			

Total Project Construction Cost (S$ x1M)			
	Site Clearance	Piling Works	Main Contract
Estimate	-	-	-
Awarded	N.A	-	1.46

M&E Services Cost Plan (S$ x 1M) – 76 Units								
Services	EI	ACVI	LEI	FFAI	PSI	SPFI	Auto Gate	Street Lighting
Estimate	2.5	1.2	-	-	2.3	-	-	-
Awarded	1.89	0.67	-	-	1.64	0.0037	0.072	0.040

Total Project Construction Cost (S$ x1M)			
	Site Clearance	Piling Works	Main Contract
Estimate	-	-	-
Awarded	-	0.41	24.6

2.3 Scope of Works

2.3.1 Scope of Consultancy Services

Conceptual/Schematic Design	✓
Detailed Design	✓
Tender Documentation	✓
Tender Evaluation	✓
Contract Supervision	✓
M&E Costing	✓
Submissions to Authority	✓

(✓ *where applicable*)

2.3.2 Scope of M&E Services

ELECTRICAL	✓	AIR CONDITIONING	✓	SPRINKLER		SANITARY	✓	SWIMMING POOL	✓
LIFT		MECHANICAL VENTILATION	✓	FIRE ALARM		COLD WATER	✓	STEAM BOILER	
ESCALATOR		MECHANICAL SMOKE EXTRACT		HOSEREEL		HOT WATER	✓	FUEL STORAGE	
PABX		COMPUTER A/C		WET RISER		TOWN GAS			
SECURITY		BST CARPARK EXH		DRY RISER		LPG GAS			
TELELIFT		HEATING				MEDICAL GAS			
DATA COMM.		AUTO GATE CONTROL	✓						
FLUSHFLOOR TRUNKING									

(✓ *where applicable*)

2.3.3 Submission to Relevant Authorities by Others

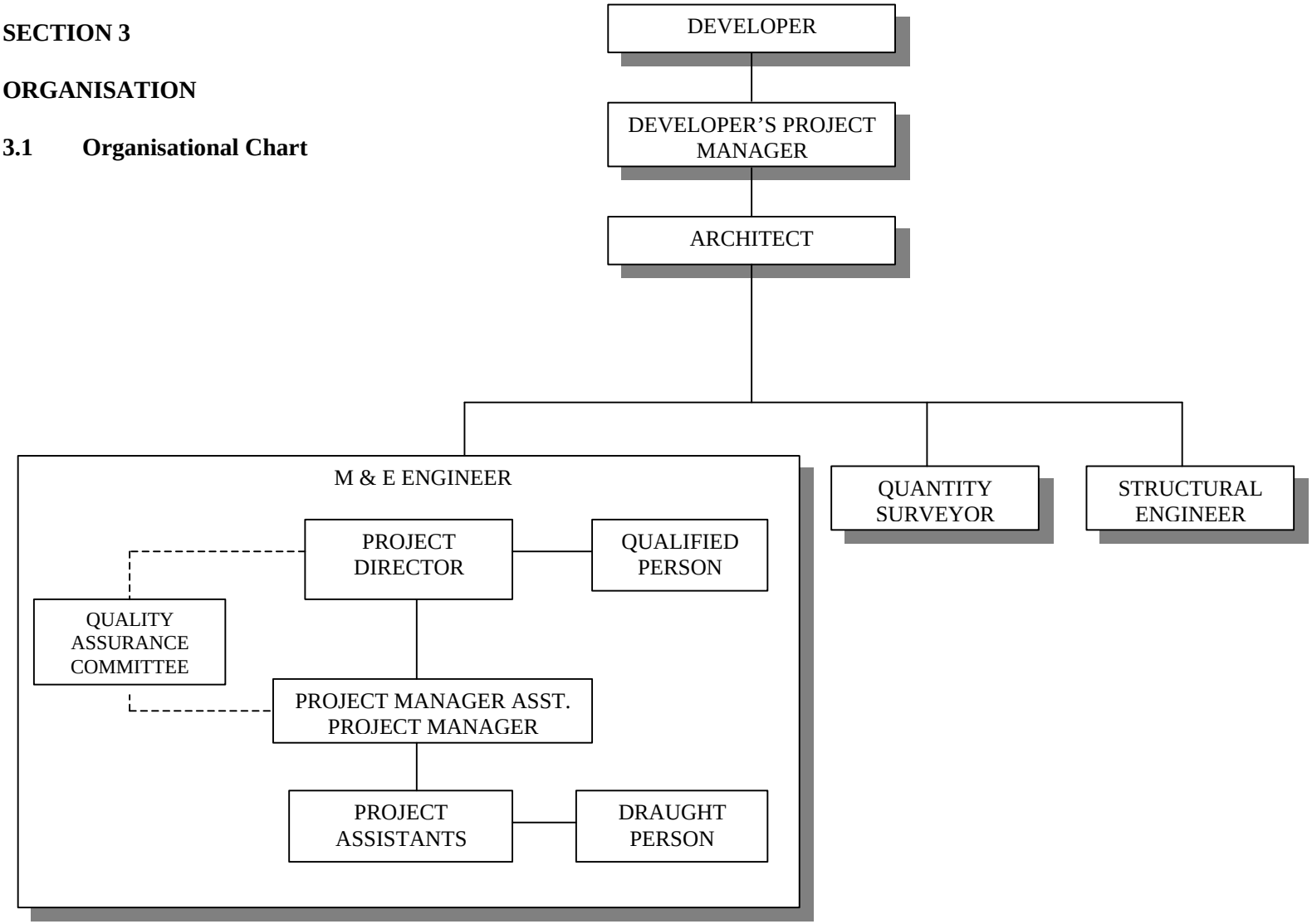
EJECTOR & DIVERTER		SUMP PUMP		FUEL OIL TANK		LIFT & ESCALATOR		PRESSURE VESSEL		HOISTS		FOAM	

(✓ *where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 AEC's Project Team Member

TITLE		NAME
Project Director		Richard Teo (RT)
Qualified Person	Mechanical	Andrew Loh (LCT)
	Electrical	Richard Teo (RT)
Project Manager		Soh Kai Yea (SKY)
Assistant Project Manager		Alan Lau (LTC)
Project Assistant (Mech)		Serene Teh (ST)
Project Assistant (Elect)		Jade Bai Yu Chen (JB)
Draughtsperson		Common Pool
Resident Engineer		Jason Chua (Civil & Architectural)
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		Mr Koh C H (seconded from Client) Mr Rashid (seconded from Client)

3.3 Client/Client's Representatives

Client: Kallang Development (Pte) Ltd

Address: 65 Chulia Street #45-01
OCBC Centre
Singapore 049513

Tel: 6538 2372

Fax: 6535 5217

Client's Representatives: Areca Property Management Pte Ltd acted as Project Manager for Kallang Development (Pte) Ltd

Name of Firm	Contact Person	Contact
Areca Property Management Pte Ltd	Name: Ms Quek Chay Hoon Position: Project Manager	Tel: 6538 2372 Fax: 6535 5217 Pager: - Handphone: 9853 5318 Email: CHQuek@singapore-e.com.sg
Areca Property Management Pte Ltd	Name: Ms Ann Awyong Position: Personal Assistant to PM	Tel: 6236 0201 Fax: 6535 55217 Pager: - Handphone: - Email: AnnAwyong@singapore-.com.sg
	Name: Position:	Tel: Fax: Pager: Handphone: Email:
	Name: Position:	Tel: Fax: Pager: Handphone: Email:
	Name: Position:	Tel: Fax: Pager: Handphone: Email:

3.4 **Other Consultants** (Local)

Function / Name of Firm	Contact Person	Contact
Architect ADDP Architects Pte Ltd	Name: Mr Tang Kok Thye Position: Architect	Tel: 6220 2153 Fax: 6325 4918 Pager: - Handphone: 9667 5360 Email: tangkokthye@addp-do.com.sg
	Name: Ms Janice Ha Position: Architect	Tel: 6220 2153 Fax: 6325 4918 Pager: - Handphone: - Email: Janice@addp-do.com.sg
Quantity Surveyor Northcroft Lim Consultants Pte Ltd	Name: Mr James Loo Position: Director	Tel: 6220 7188 Fax: 6222 0868 Pager: - Handphone: - Email: jloo@northcroft.com.sg
Structural Engineer DE Consultants (S) Pte Ltd	Name: Mr Tan Siang Jick Position: Director	Tel: 6227 3900 Fax: 6227 2909 Pager: - Handphone: - Email: deconsult@pacific.net.sg
Interior Designer	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Lighting Consultant	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Acoustic Consultant	Name: Position:	Tel: Fax: Pager: Handphone: Email:
_____	Name: Position:	Tel: Fax: Pager: Handphone: Email:

3.4 **Other Consultants** (Overseas) – **Not Used**

Function / Name of Firm	Contact Person	Contact
Architect	Name: Position:	Tel: Fax: Pager: Handphone: Email:
M&E Consultant	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Quantity Surveyor	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Structural Engineer	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Interior Designer	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Lighting Consultant	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Acoustic Consultant	Name: Position:	Tel: Fax: Pager: Handphone: Email:
_____	Name: Position:	Tel: Fax: Pager: Handphone: Email:

3.5 Contractors/Sub-Contractors (4 Units Show Houses)

Function / Name of Firm	Contract *	Contact Person	Contact
Main Contractor Keong Hong Construction Pte Ltd		Name: Mr Ling A T Position: Project Manager	Tel: 6564 1479 Fax: 6566 2784 Pager: - Handphone: 9637 0158 Email: khc1428@pacific.net.sg
Air Conditioning & Ventilation Installation Sub-Contractor Cosy M & E Singapore Pte Ltd	DSC	Name: Mr Eric Kan Position: Project Manager	Tel: 6741 1228 / 6741 1338 Fax: 6741 2401 Pager: - Handphone: - Email: -
Plumbing & Sanitary Installation Sub-Contractor OSK Engineering Pte Ltd	DSC	Name: Mr Tan YK Position: Project Manager	Tel: 6759 8888 Fax: 6758 1370 Pager: - Handphone: 9638 6173 Email: oskpl@singnet.com.sg
Electrical Installation Sub-Contractor Hee's Engineering & Equipment Co. Pte Ltd	DSC	Name: Mr Edwin Ng Position: Project Manager	Tel: 6291 9166 Fax: 6292 2732 Pager: - Handphone: - Email: hees1@singnet.com.sg
Lift & Escalator Installation Sub-Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:
Fire Fighting & Alarm Installation Sub-Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:
Swimming Pool Filtration Plant Installation Sub-Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:
Carpark System Installation Sub-Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:
_____		Name: Position:	Tel: Fax: Pager: Handphone: Email:

** Type of Contract*
- *NSC (Nominated Sub-Contract)*
- *DSC (Domesticated Sub-Contract)*
- *DC (Direct Contract)*
- *NS (Nominated Supplier)*

3.5 Contractors/Sub-Contractors (76 Units)

Function / Name of Firm	Contract *	Contact Person	Contact
Main Contractor Keong Hong Construction Pte Ltd		Name: Mr Ling A T Position: Project Manager	Tel: 6564 1479 Fax: 6566 2784 Pager: - Handphone: 9637 0158 Email: khc1428@pacific.net.sg
Air Conditioning & Ventilation Installation Sub-Contractor Leong Hum Engineering Pte Ltd	NSC	Name: Mr Prasad Position: Project Manager	Tel: 6296 8473 Fax: 6296 0213 Pager: - Handphone: - Email: lhepl@starhub.net.sg
Plumbing & Sanitary Installation Sub-Contractor OSK Engineering Pte Ltd	NSC	Name: Mr Tan YK Position: Project Manager	Tel: 6759 8888 Fax: 6758 1370 Pager: - Handphone: 9638 6173 Email: oskpl@singnet.com.sg
Electrical Installation Sub-Contractor Ho Hup Electrical Engineering Pte Ltd	NSC	Name: Mr Sim K S Position: Deputy General Manager	Tel: 6255 0022 Fax: 6253 3369 Pager: - Handphone: - Email: hohupee@singnet.com.sg
Swimming Pool Filtration Plant Installation Sub-Contractor Clean & Clear Pool Service	NSC	Name: Mr Tee Beng Hock Position: Project Manager	Tel : 6289 3526 Fax: 6289 6271 Pager: - Handphone: 9663 6078 Email: ccpsvc@singnet.com.sg
Autogate Control System LAM International Corporation Pte Ltd	NSC	Name: Mr Dan Ng Position: Project Manager	Tel: 6382 2822 Fax: 6382 3912 Pager: - Handphone: - Email: -
Street Light Installation Ngee Cheong Contractors Pte Ltd	DC	Name: Mr David Sung Position: Project Manager	Tel: 6293 6830 Fax: 6293 9095 Pager: - Handphone: 9679 8108 Email: nccpl@singnet.com.sg
_____		Name: Position:	Tel: Fax: Pager: Handphone: Email:

** Type of Contract*
- *NSC (Nominated Sub-Contract)*
- *DSC (Domesticated Sub-Contract)*
- *DC (Direct Contract)*
- *NS (Nominated Supplier)*

3.6 Authorities

Authorities/Department	Contact Person	Tel/Fax Nos./E-mail
PowerGrid/Power Supply:		
(a) Customer Supply	Mr Rick Lim	Tel: 6823 8008
(b) Sub-Station	Mr Francis Chang	Tel: 6823 8555
(c) Installation	-	
(d) Meter Section	Mr Kong K M	Tel: 6277 7056
(e) LV Reticulation	M/s Tony Yeo/Joseph Samy	Tel: 6823 8552 / 6240 9268
(f) Diversion	-	-
Telecom:	TFCC/2064	
(a) Planning/Line Plant	Ms Jane Peh (StarHub)	Tel: 6825 6366
(b) Installation	Mr Chin Y H (SingTel)	Tel: 6848 5615
(c) Diversion	-	-
BCD:		
(a) Building Plan	Mr Tan Cheong Ee	Tel: 6325 8638
FSSD:		
(a) Building Plan	-	-
(b) M&E Section	-	-
PUB (Water)		
(a) Water Conservation		
(b) Plumbing Plan	Mr Pratheipa Rajendram	Tel: 67313 553
(c) Diversion	-	-
PowerGas:		
(a) Planning/Submission	Mr Michael Wong	Tel: 6823 8681
(b) Installation/Inspection		
(c) Diversion	Mr Ng Koh Pek	Tel: 6823 8641
ENV (Sewerage):		
(a) Building Plan	M/s Tan K H/Lam TC	Tel: 6732 7733
(b) M&E Section	-	-
(c) Diversion	-	-
ENV (Pollution Control)	-	-
(a) Planning/Submission	-	-
(b) Inspection		
LTA	-	-
(a) Public Lighting	Ms Thong	Tel: 6332 6356
SCV	Mr Kelvin Choo	Tel: 6825 6377

SECTION 4

PROGRAMME

4.1 Overall Programme – (Refer to attached)

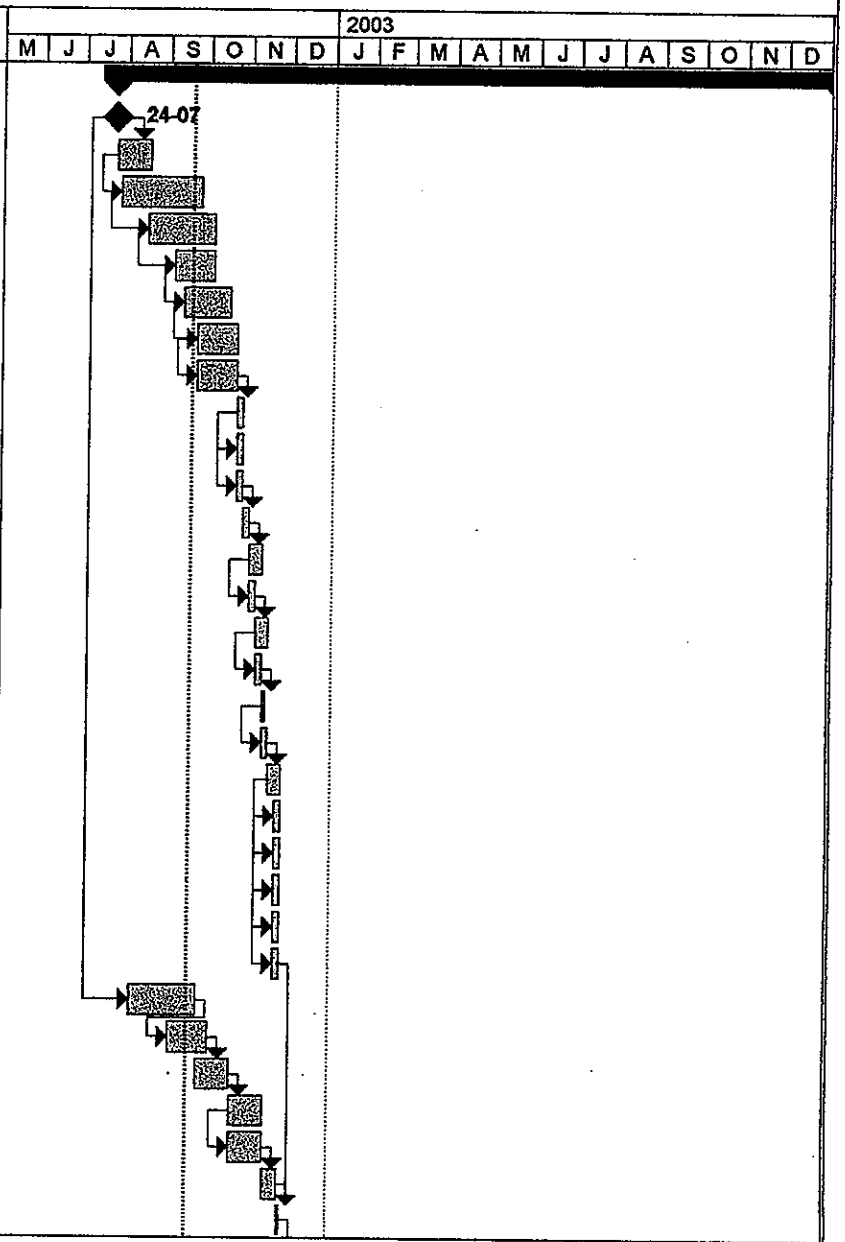
ID	TASK NAME	MONTHS	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1.	Preliminary Planning																									
2.	Planning Submission																									
3.	Detail Design																									
4.	BP Submission																									
5.	BP Submission (Amendments)																									
6.	Tender Period for Piling																									
7.	Tender Period for Sub-Structure																									
8.	Tender Period for Super-Structure																									
9.	Piling Period																									
10.	Sub-Structure Construction Period																									
11.	Super-Structure Construction Period																									
12.	TOP																									
13.	CSC																									

PROPOSED CONVENTIONAL HOUSING DEVELOPMENT
SPRINGSIDE 6A, 7A & 7B MASTER PROGRAMME REV-2

KEONG HONG CONSTRUCTION

19/09/02

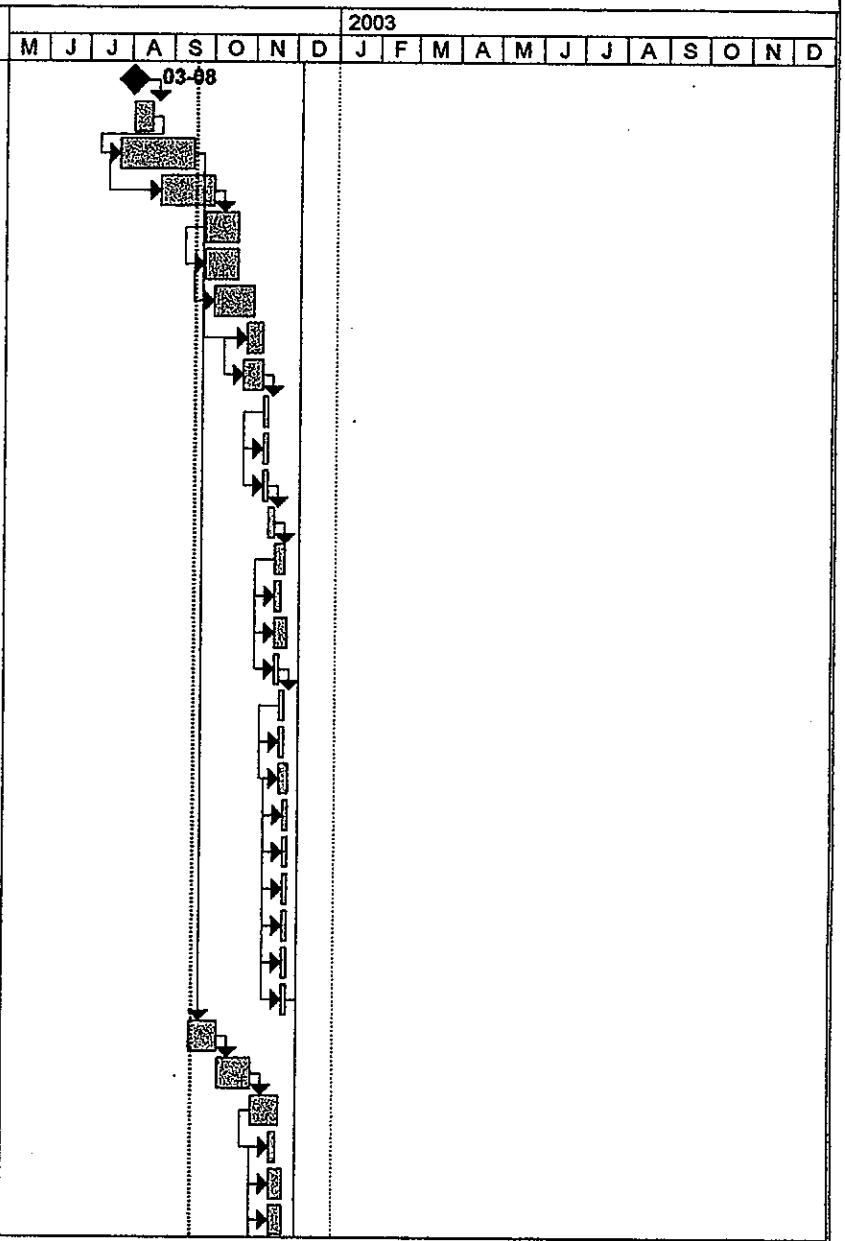
ID	Task Name	Duration	Start	Finish	Predecessors
1	**Mockup Units**	**532 days**	**24-07-02**	**06-01-04**	
2	**TB, TB1 Mockup**	0 days	24-07-02	24-07-02	
3	Brickwork	25 days	24-07-02	17-08-02	2
4	Door, Window Frame, Concealed M&E	60 days	27-07-02	24-09-02	3SS+3 days
5	Internal Plastering, Wall Screeding	50 days	16-08-02	04-10-02	4SS+20 days
6	Wet Area Waterproofing, Screeding	30 days	05-09-02	04-10-02	5SS+20 days
7	Long Bath, Wall & Floor Tiling	35 days	12-09-02	16-10-02	6SS+7 days
8	Kitchen Cabinet Carcass, Top	30 days	22-09-02	21-10-02	7SS+10 days
9	False Ceiling	30 days	22-09-02	21-10-02	8SS
10	Painting Base Coat	5 days	22-10-02	26-10-02	9
11	Vanity Top, Sanitary Wares	5 days	22-10-02	26-10-02	10SS
12	Marble Area Waterproof, Screeding	5 days	22-10-02	26-10-02	11SS
13	Timber Floor, Staircase Screeding	5 days	27-10-02	31-10-02	12
14	Window Glazing	10 days	01-11-02	10-11-02	13
15	Marble Flooring	5 days	01-11-02	05-11-02	14SS
16	Parquet Floor, Staircase, Wardrobe	10 days	06-11-02	15-11-02	15
17	Staircase Handrail	5 days	06-11-02	10-11-02	16SS
18	Marble Polishing & Protection	3 days	11-11-02	13-11-02	17
19	Internal Painting	5 days	11-11-02	15-11-02	18SS
20	Door, Ironmongery	10 days	16-11-02	25-11-02	19
21	Shower Screen	5 days	21-11-02	25-11-02	20SS+5 days
22	Kitchen Cabinet, Wardrobe Doors	5 days	21-11-02	25-11-02	21SS
23	Cooker Hob	5 days	21-11-02	25-11-02	22SS
24	Electrical Faceplate, Fancoil	5 days	21-11-02	25-11-02	23SS
25	Fixture & Fitting	5 days	21-11-02	25-11-02	24SS
26	Timber Roof, Roof Tiles	50 days	07-08-02	25-09-02	2SS+14 days
27	External Waterproofing, Screeding	30 days	05-09-02	04-10-02	26FS-21 days
28	External Plastering	25 days	26-09-02	20-10-02	27FS-9 days
29	External Spray Texture & Painting	25 days	21-10-02	14-11-02	28
30	Car porch roof, canopy	25 days	21-10-02	14-11-02	29SS
31	Tiling at Porch and Yard	11 days	15-11-02	25-11-02	30
32	Completion of TB,TB1	2 days	26-11-02	27-11-02	31;25



PROPOSED CONVENTIONAL HOUSING DEVELOPMENT
SPRINGSIDE 6A, 7A & 7B MASTER PROGRAMME REV-2

KEONG HONG CONSTRUCTION

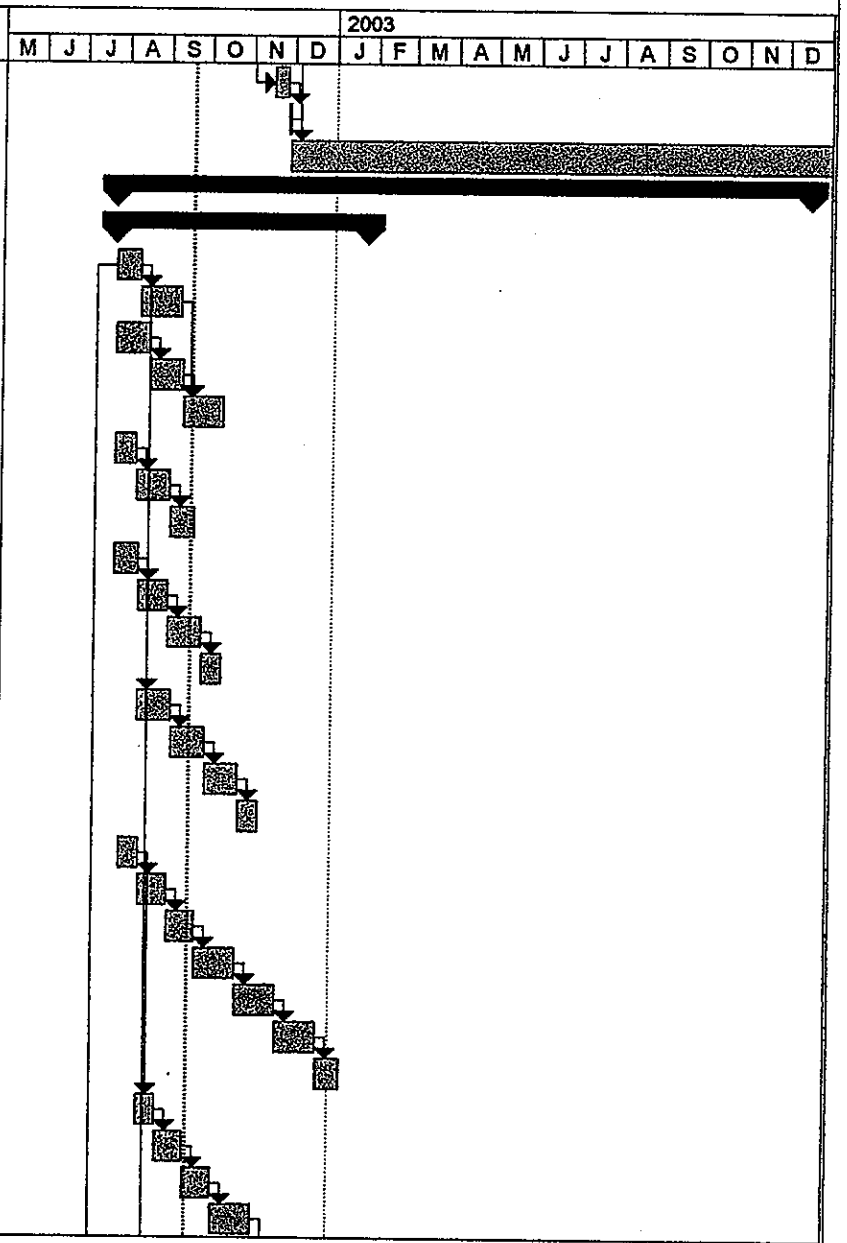
ID	Task Name	Duration	Start	Finish	Predecessors
33	**TD, TD1 Mockup**	0 days	03-08-02	03-08-02	
34	Upper Roof Structure	14 days	03-08-02	16-08-02	33
35	Brickwork	55 days	24-07-02	16-09-02	34FS-24 days
36	Door, Window Frame, Concealed M&E	40 days	23-08-02	01-10-02	35SS+30 days
37	Internal Plastering, Wall Screeding	25 days	25-09-02	19-10-02	36FS-7 days
38	Wet Area Waterproofing, Screeding	25 days	25-09-02	19-10-02	37SS
39	Long Bath, Wall & Floor Tiling	30 days	02-10-02	31-10-02	38SS+7 days
40	Kitchen Cabinet Carcass, Top	12 days	27-10-02	07-11-02	39SS+25 days
41	False Ceiling	15 days	24-10-02	07-11-02	40SS-3 days
42	Painting Base Coat	4 days	08-11-02	11-11-02	41
43	Vanity Top, Sanitary Wares	4 days	08-11-02	11-11-02	42SS
44	Marble Area Waterproof, Screeding	4 days	08-11-02	11-11-02	43SS
45	Timber Floor, Staircase Screeding	5 days	12-11-02	16-11-02	44
46	Window Glazing	8 days	17-11-02	24-11-02	45
47	Marble Flooring	5 days	17-11-02	21-11-02	46SS
48	Parquet Floor, Staircase, Wardrobe	10 days	17-11-02	26-11-02	47SS
49	Staircase Handrail	4 days	17-11-02	20-11-02	48SS
50	Marble Polishing & Protection	4 days	21-11-02	24-11-02	49
51	Internal Painting	4 days	21-11-02	24-11-02	50SS
52	Door, Ironmongery	7 days	21-11-02	27-11-02	51SS
53	Shower Screen	4 days	24-11-02	27-11-02	52SS+3 days
54	Fancoil	4 days	24-11-02	27-11-02	53SS
55	Kitchen Cabinet, Wardrobe Doors	4 days	24-11-02	27-11-02	54SS
56	Cooker Hob	4 days	24-11-02	27-11-02	55SS
57	Electrical Faceplate	4 days	24-11-02	27-11-02	56SS
58	Fixture & Fitting	4 days	24-11-02	27-11-02	57SS
59	External Waterproofing, Screeding	21 days	17-09-02	07-10-02	35
60	External Plastering	25 days	08-10-02	01-11-02	59
61	External Spray Texture & Painting	21 days	02-11-02	22-11-02	60
62	Sky Light	5 days	16-11-02	20-11-02	61SS+14 days
63	Boundry Wall, Fencing Sample	10 days	16-11-02	25-11-02	62SS
64	Meter Compartment	10 days	16-11-02	25-11-02	63SS



PROPOSED CONVENTIONAL HOUSING DEVELOPMENT
SPRINGSIDE 6A, 7A & 7B MASTER PROGRAMME REV-2

KEONG HONG CONSTRUCTION

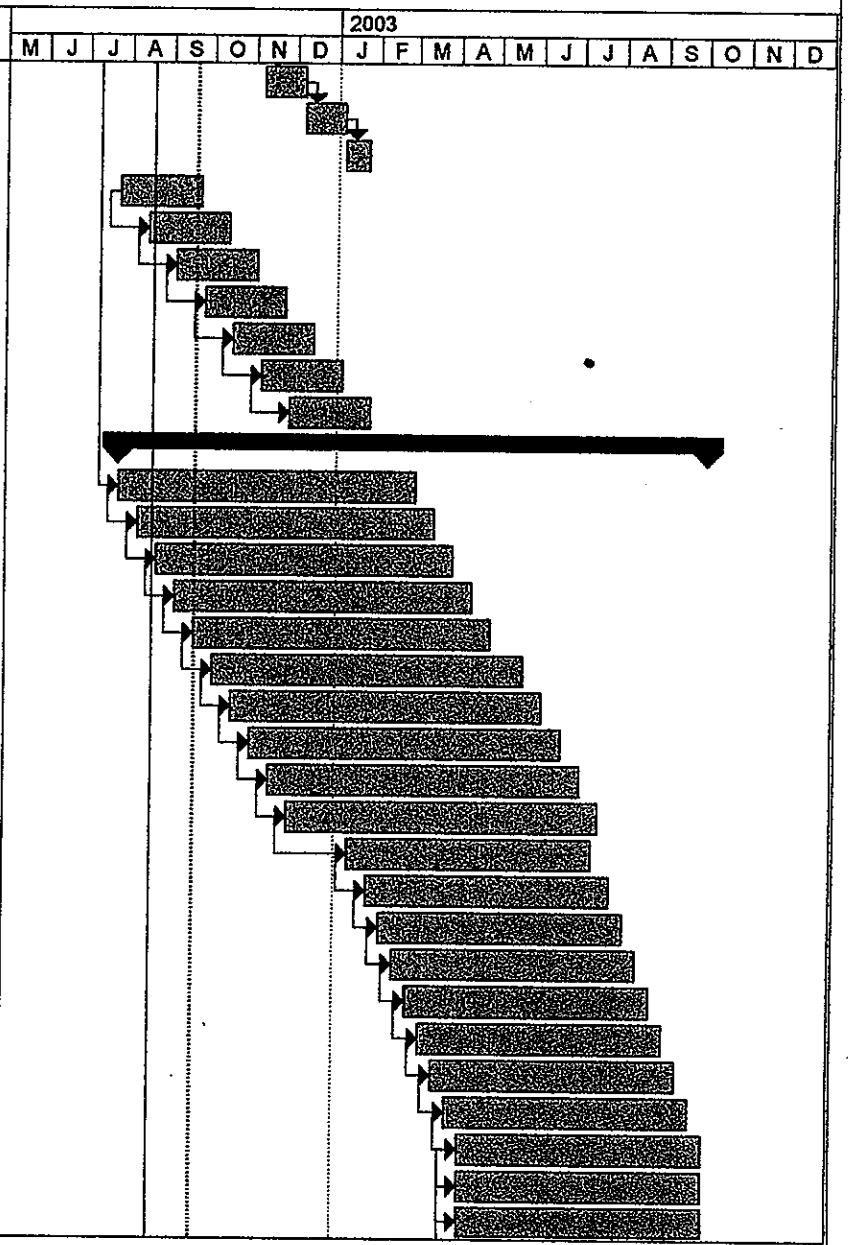
ID	Task Name	Duration	Start	Finish	Predecessors
65	Tiling at Porch and Yard	10 days	16-11-02	25-11-02	64SS
66	Fencing, Gate	2 days	26-11-02	27-11-02	65
67	**Completion of Mockup**	405 days	28-11-02	06-01-04	58;66;32
68	**Conventional Houses**	**512 days**	**24-07-02**	**17-12-03**	
69	**Conventional Houses Structure**	**186 days**	**24-07-02**	**25-01-03**	
70	Plot 139-143 -Timber Roof	18 days	24-07-02	10-08-02	
71	Plot 144-153 -Timber Roof	30 days	11-08-02	09-09-02	70
72	Plot 154-161 - 3rd Sty Slab	25 days	24-07-02	17-08-02	
73	Roof Structure	25 days	18-08-02	11-09-02	72
74	Timber Roof, Roof Tiles	30 days	12-09-02	11-10-02	71;73
75	Plot 202-210 - 3rd Sty Slab	16 days	24-07-02	08-08-02	
76	Roof Structure	25 days	09-08-02	02-09-02	75
77	Upper Roof Structure	18 days	03-09-02	20-09-02	76
78	Plot 192-201 - 2nd Sty Slab	18 days	24-07-02	10-08-02	
79	3rd Sty Slab	22 days	11-08-02	01-09-02	78
80	Roof Structure	25 days	02-09-02	26-09-02	79
81	Upper Roof Structure	15 days	27-09-02	11-10-02	80
82	Plot 191-188 -2nd Sty Slab	25 days	11-08-02	04-09-02	78
83	3rd Sty Slab	25 days	05-09-02	29-09-02	82
84	Roof Structure	25 days	30-09-02	24-10-02	83
85	Upper Roof Structure	15 days	25-10-02	08-11-02	84
86	Plot 477-182 Pilecap	15 days	29-07-02	12-08-02	
87	Groundbeam	21 days	13-08-02	02-09-02	86
88	1st Sty Slab	21 days	03-09-02	23-09-02	87
89	2nd Sty Slab	30 days	24-09-02	23-10-02	88
90	3rd Sty Slab	30 days	24-10-02	22-11-02	89
91	Roof Structure	30 days	23-11-02	22-12-02	90
92	Upper Roof Structure	18 days	23-12-02	09-01-03	91
93	Plot 181-172 -Pilecap	14 days	13-08-02	26-08-02	86
94	Groundbeam	21 days	27-08-02	16-09-02	93
95	1st Sty Slab	21 days	17-09-02	07-10-02	94
96	2nd Sty Slab	30 days	08-10-02	06-11-02	95



PROPOSED CONVENTIONAL HOUSING DEVELOPMENT
SPRINGSIDE 6A, 7A & 7B MASTER PROGRAMME REV-2

KEONG HONG CONSTRUCTION

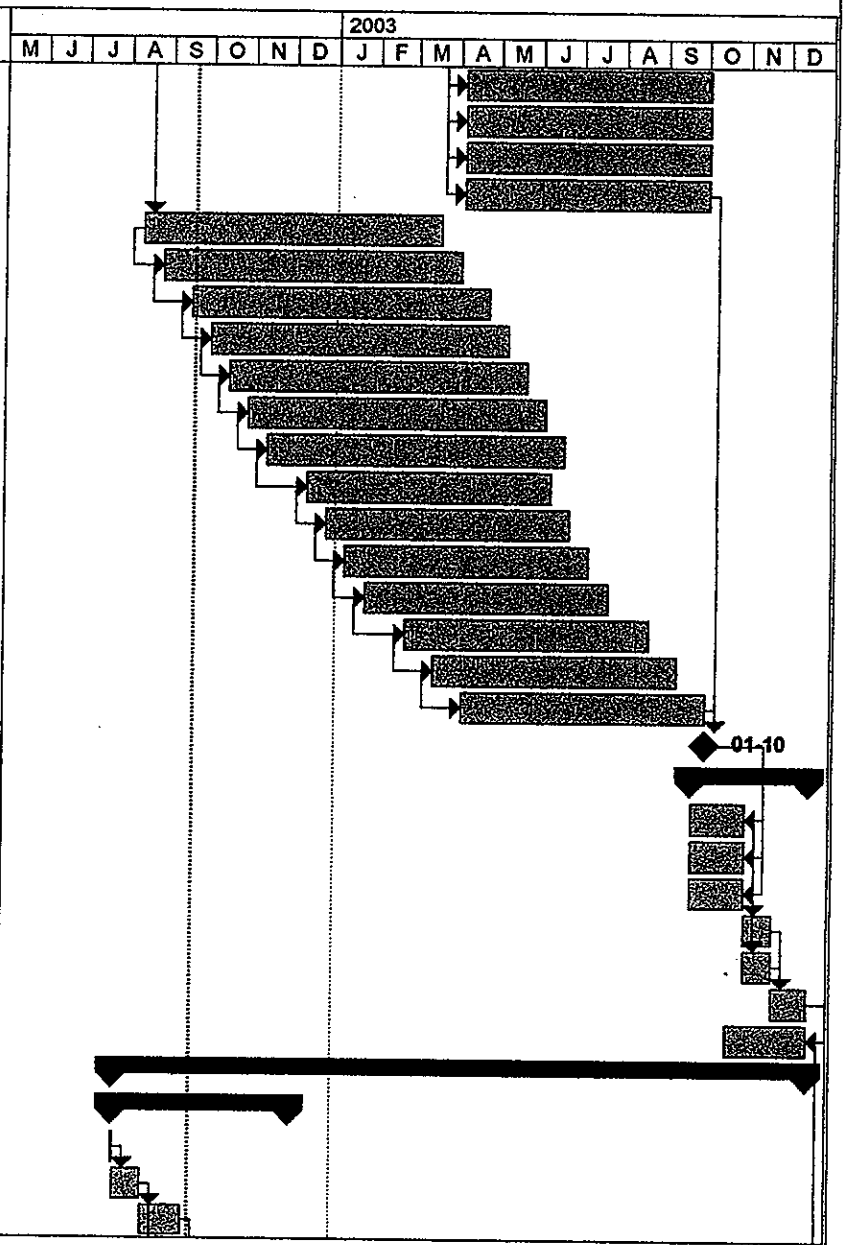
ID	Task Name	Duration	Start	Finish	Predecessors
97	3rd Sty Slab	30 days	07-11-02	06-12-02	96
98	Roof Structure	30 days	07-12-02	05-01-03	97
99	Upper Roof Structure	18 days	06-01-03	23-01-03	98
100	Plot 162-171 -Pilecap	60 days	24-07-02	21-09-02	
101	Groundbeam	60 days	14-08-02	12-10-02	100SS+21 days
102	1st Sty Slab	60 days	04-09-02	02-11-02	101SS+21 days
103	2nd Sty Slab	60 days	25-09-02	23-11-02	102SS+21 days
104	3rd Sty Slab	60 days	16-10-02	14-12-02	103SS+21 days
105	Roof Structure	60 days	06-11-02	04-01-03	104SS+21 days
106	Upper Roof Structure	60 days	27-11-02	25-01-03	105SS+21 days
107	**Conventional Houses Archi and M&E**	**435 days**	**24-07-02**	**01-10-03**	
108	Brickwork	220 days	24-07-02	28-02-03	70SS
109	Door, Window Frame, Concealed M&E	220 days	07-08-02	14-03-03	108SS+14 days
110	Internal Plastering, Wall Screeding	220 days	21-08-02	28-03-03	109SS+14 days
111	Wet Area Waterproofing, Screeding	220 days	04-09-02	11-04-03	110SS+14 days
112	False Ceiling	220 days	18-09-02	25-04-03	111SS+14 days
113	Painting Base Coat	230 days	02-10-02	19-05-03	112SS+14 days
114	Vanity Top Support, Longbath	230 days	16-10-02	02-06-03	113SS+14 days
115	Wall & Floor Tiling	230 days	30-10-02	16-06-03	114SS+14 days
116	Mable Area Waterproofing, Screeding	230 days	13-11-02	30-06-03	115SS+14 days
117	TimberFloor, Staircase Screeding	230 days	27-11-02	14-07-03	116SS+14 days
118	Kitchen Cabinet Carcass, Top	180 days	11-01-03	09-07-03	117SS+45 days
119	Vanity Top, Sanitary Wares	180 days	25-01-03	23-07-03	118SS+14 days
120	Window Glazing	180 days	04-02-03	02-08-03	119SS+10 days
121	Marble Flooring	180 days	14-02-03	12-08-03	120SS+10 days
122	Parquet Floor, Staircase, Wardrobe	180 days	24-02-03	22-08-03	121SS+10 days
123	Staircase Railing	180 days	06-03-03	01-09-03	122SS+10 days
124	Marble Polishing & Protection	180 days	16-03-03	11-09-03	123SS+10 days
125	Internal Painting	180 days	26-03-03	21-09-03	124SS+10 days
126	Door, Ironmongery	180 days	05-04-03	01-10-03	125SS+10 days
127	Electrical DB, Sanitary Fitting	180 days	05-04-03	01-10-03	126SS
128	Shower Screen	180 days	05-04-03	01-10-03	127SS



PROPOSED CONVENTIONAL HOUSING DEVELOPMENT
SPRINGSIDE 6A, 7A & 7B MASTER PROGRAMME REV-2

KEONG HONG CONSTRUCTION

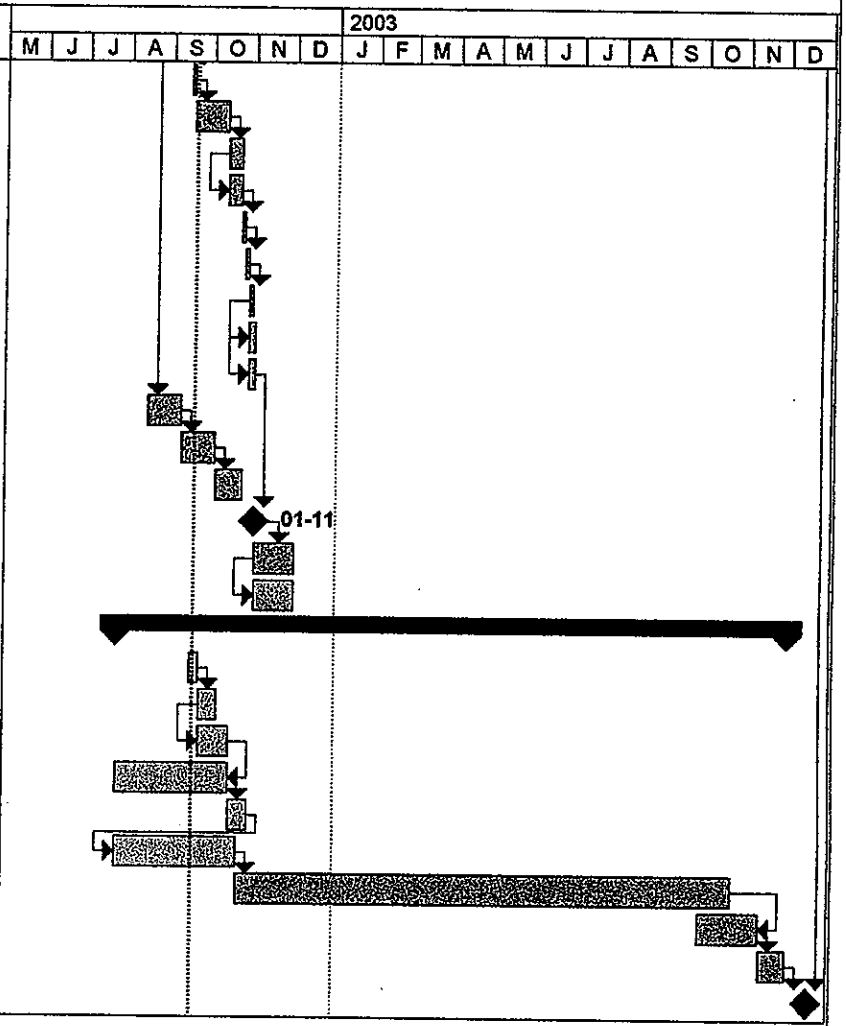
ID	Task Name	Duration	Start	Finish	Predecessors
129	Fancoil	180 days	05-04-03	01-10-03	128SS
130	Kitchen Cabinet, Wardrobe Doors	180 days	05-04-03	01-10-03	129SS
131	Cooker Hood & Hob	180 days	05-04-03	01-10-03	130SS
132	Electrical Faceplate	180 days	05-04-03	01-10-03	131SS
133	External Waterproofing	220 days	11-08-02	18-03-03	70
134	External Plastering	220 days	26-08-02	02-04-03	133SS+15 days
135	External Texture & Paint High Level	220 days	16-09-02	23-04-03	134SS+21 days
136	Apron, Driveway, Housedrain	220 days	30-09-02	07-05-03	135SS+14 days
137	Boundry Wall, Fencing Structure	220 days	14-10-02	21-05-03	136SS+14 days
138	Meter Compartment	220 days	28-10-02	04-06-03	137SS+14 days
139	Fencing Work	220 days	11-11-02	18-06-03	138SS+14 days
140	Aircon Compresser	180 days	11-12-02	08-06-03	139SS+30 days
141	Lighting Protection, Earth Pit	180 days	25-12-02	22-06-03	140SS+14 days
142	Tiling at Porch and Yard	180 days	08-01-03	06-07-03	141SS+14 days
143	Fencing, Gate	180 days	23-01-03	21-07-03	142SS+15 days
144	Skylight & Gate	180 days	22-02-03	20-08-03	143SS+30 days
145	External Texture & Paint Low Level	180 days	15-03-03	10-09-03	144SS+21 days
146	Turfing, Drain Grating	180 days	05-04-03	01-10-03	145SS+21 days
147	Completion of Archi Work	0 days	01-10-03	01-10-03	146;132
148	**Testing & Commissioning, QC**	**87 days**	**22-09-03**	**17-12-03**	
149	ENV Inspection & Clearance	40 days	22-09-03	31-10-03	147FF+30 days
150	PUB Inspection & Clearance	40 days	22-09-03	31-10-03	147FF+30 days
151	Power Grid Inspection & Clearance	40 days	22-09-03	31-10-03	147FF+30 days
152	Architectural RI Inspection	21 days	01-11-03	21-11-03	149;150;151
153	M&E RI Inspection	21 days	01-11-03	21-11-03	149;150;151
154	BCA Inspection,TOP	26 days	22-11-03	17-12-03	152;153
155	QC , Testing & Commission, Handover	60 days	19-10-03	17-12-03	154FF
156	**External Work & ESS**	**512 days**	**24-07-02**	**17-12-03**	
157	**Electrical Sub-Ststion**	**131 days**	**24-07-02**	**01-12-02**	
158	Switch Room Slab	1 day	24-07-02	24-07-02	
159	Roof Slab	21 days	25-07-02	14-08-02	158
160	Brickwall, Glass Block, PC Vent	30 days	15-08-02	13-09-02	159



PROPOSED CONVENTIONAL HOUSING DEVELOPMENT
SPRINGSIDE 6A, 7A & 7B MASTER PROGRAMME REV-2

KEONG HONG CONSTRUCTION

ID	Task Name	Duration	Start	Finish	Predecessors
161	Door Frames	3 days	14-09-02	16-09-02	160
162	Internal & External Plaster	25 days	17-09-02	11-10-02	161
163	Roofing Waterproofing	10 days	12-10-02	21-10-02	162
164	Metal Work	10 days	12-10-02	21-10-02	163SS
165	Painting	3 days	22-10-02	24-10-02	164
166	Floor Screeding	3 days	25-10-02	27-10-02	165
167	Aluminum Doors	3 days	28-10-02	30-10-02	166
168	Exposed Electrical Services	5 days	28-10-02	01-11-02	167SS
169	Misc Arch Work	5 days	28-10-02	01-11-02	168SS
170	Drain, Apron, Driveway	25 days	15-08-02	08-09-02	159
171	Boundry Wall & Fencing	25 days	09-09-02	03-10-02	170
172	External Finishes	20 days	04-10-02	23-10-02	171
173	Completion of ESS	0 days	01-11-02	01-11-02	169
174	Taking Over by Power Grid	30 days	02-11-02	01-12-02	173
175	HT Cable Pipe by Power Grid	30 days	02-11-02	01-12-02	174SS
176	**External Work & M&E Recticulation**	**496 days**	**24-07-02**	**01-12-03**	
177	Minor Sewer Manhole 1	7 days	16-09-02	22-09-02	
178	Manhole 1C	14 days	23-09-02	06-10-02	177
179	Manhole 4 & balance line	23 days	23-09-02	15-10-02	178SS
180	Drain & Culvert- SS Avenue	84 days	24-07-02	15-10-02	179FF
181	- SS Place	14 days	16-10-02	29-10-02	180
182	- SS Walk	90 days	24-07-02	21-10-02	181FS-98 days
183	**Completion of External Work**	365 days	22-10-02	21-10-03	182
184	Commissioning of External Services	45 days	28-09-03	11-11-03	183FF+21 days
185	External Work QC Inspection	20 days	12-11-03	01-12-03	184
186	**Overall Completion of SPRINGSIDE 6&7**	0 days	17-12-03	17-12-03	155;185



SECTION 4

PROGRAMME

4.2 Authority Submission Status for M&E Services - 1st Submission

Service	Authority	Original Submission		Comments/Resubmission						Approval/ Clearance
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	
Application for Electricity Supply	Power Supply Ltd	-	* 10/07/96							29/07/96
Power Supply Substation	PowerGrid Ltd	-	21/12/01	03/01/02	12/04/02	09/04/02	18/04/02			25/04/02
Main Single Line Diagram	Power Supply Ltd	30/09/03								
Consumer Switchroom Layout	PowerGrid Ltd	-	-							
Metering Layout	PowerGrid Ltd	-	25/03/03	04/04/03	09/06/03					19/06/02
Sanitary Installation	ENV (Sewerage)	-	16/06/03							18/06/03
Gas Supply Installation	PowerGas Pte Ltd	-	-							-
Air Conditioning & Ventilation Inst.	Building Control Division	-	-							-
Fire Fighting & Alarm Installation	Fire Safety Bureau	-	-							-
Telephone Installation	TFCC	-	* 10/10/97							4/11/97
	Telecom (TDCS)	-	-							
	Telecom (Domestic Operation)	-	-							
Fuel Storage	Fire Safety Bureau	-	-							
	Pollution Control Department	-	-							
Street Lighting	LTA	-	03/09/03	17/09/03						-
Broadband Coaxial Cable	SCV	-	16/08/01							8/11/01
LT Reticulation	PowerGrid Ltd	-	18/11/02							20/11/02

***** Submission by Previous Consultant

SECTION 4

PROGRAMME

4.3 Authority Submission Status for M&E Services (Amendments) - 2nd Submission

Service	Authority	Original Submission		Comments/Resubmission						Approval/ Clearance
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	
Application for Electricity Supply	Power Supply Pte Ltd	-	9/04/03							7/5/03
Power Supply Substation	PowerGrid Pte Ltd									
Main Single Line Diagram	Power Supply Pte Ltd									
Consumer Switchroom Layout	PowerGrid Pte Ltd									
Metering Layout	PowerGrid Pte Ltd									
Sanitary Installation	ENV (Sewerage)									
Gas Supply Installation	PowerGas Pte Ltd									
Air Conditioning & Ventilation Inst.	Building Control Division									
	Fire Safety Bureau									
Fire Fighting & Alarm Installation	Fire Safety Bureau									
	Telecom (Broadband)									
Telephone Installation	Telecom (TDCS)	-	23/07/01							20/08/01
	Telecom (Domestic Operation)									
Fuel Storage	Fire Safety Bureau									
	Pollution Control Department									

SECTION 5

PROJECT RECORDS

5.1 List of Internal Files

Standard Files

File Ref:		File Ref:	
-CM	✓	-BD	✓
-PC	✓	-CC	✓
-AE	✓	-CF	✓
-AM	✓	-GC	✓
-AA	✓	-PQP	✓

Project Files to be initiated by PM as and when required

File Ref:		File Ref:		File Ref:	
-SM	✓	-SR	✓	-EOT	✓
-SC	✓	-EC/MC	✓		
-AI/AD	✓	-PP	✓		
-SQ	✓	-ET/MT	✓		
-CO	✓	-DF	✓		

Service Files to be initiated by PM as and when required

	Service										
File Ref:	ACVI	FFAI	PSI	EI	LI	SPFP	AG	-			
-G	✓		✓	✓			✓				
-Q											
-VO								✓			
-PP											
-AI											
-AD											
-CF			✓	✓							

SECTION 5

PROJECT RECORDS

5.2 Filing of Drawings

The following team members shall take charge of filing of drawings, stamping "SUPERSEDED" drawings, etc.

Description	Team Member
Incoming Architectural Floor Plans (Latest Set)	SKY
Incoming Architectural Sketches/Details (Latest Set)	SKY
Incoming Structural Drawings (Latest Set)	SKY
M&E Drawings	
- Electrical Installation	SKY
- Lift & Escalator Installation	-
- Air Conditioning & Ventilation Installation	LTC
- Fire Fighting & Alarm Installation	-
- Plumbing & Sanitary Installation	LTC
- Swimming Pool Filtration & Plant Installation	LTC
- Autogate Control System	SKY
Other Drawings	

Note: All superseded hard copies of drawings (with soft copies in server) are discarded.

SECTION 6

INTERFACING

6.1 Method of Interface

Description	Method of Interface	
Client's Review & Approval	M&E Design Report	N.A
	Pre-planned meeting at fixed intervals	✓
	Telefax, letter and telephone	✓
	Email	✓
Interface With External Design Teams	M&E Design Report	N.A
	Pre-planned meeting at fixed intervals	✓
	Telefax, letter and telephone	✓
	Email	✓
Interface Between Internal Design Teams	Telephone	✓
	Email	✓
	Internal Project Team Meeting	✓
	Circulation of Information	✓

(✓ *where applicable*)

Note: M&E Design report not required by Client

SECTION 6

INTERFACING

6.2 Internal Design Interface

Item No.	Description*	Required From	Required By	Date Required	Remarks
1.	Air Conditioning Equipment Electrical Loading	LTC	SKY	-	Completed

** Information required by INTERNAL DESIGN TEAM MEMBERS*

SECTION 6

INTERFACING

6.3 Circulation of Documents to External Parties

	Code: A - Approval Required C - For Comments I - For Information Only	Client/ Client Rep.	Client's Project Manager	Architect	Structural Engineer	Quantity Surveyor	
1.	**Letters/Fax:**						
a.	Project Design	A	-	C	I	I	
b.	Project Administration	A	-	I	I	I	
c.	Project Cost Estimate/Contract Cost	A	-	I	I	I	
2.	**Drawings**						
a.	Outline Design Drgs.	A	-	C	C	I	
b.	Sketch Design Drgs.	A	-	C	C	I	
c.	Final Design Drgs.	A	-	C	I	I	
d.	Shop Drawings	C	-	C	C	I	
e.	As Built Drgs.	I	-	I	I	I	
3.	**Other Document**						
a.	Specification	A	-	I	I	I	
b.	Tender Document	A	-	I	I	I	
c.	Tender Evaluation Report	A	-	I	I	I	
d.	Design Report	N.A	-	NA	NA	NA	
e.	Progress Report	I	-	I	I	I	
f.	Financial Report	A	-	I	I	I	
g.	Minutes of Meeting	I	-	I	I	I	
h.	Inspection Report	I	-	I	I	I	
i.	Testing & Comm. Report	I	-	I	I	I	
j.	O & M Manual	I	-	I	I	I	

SECTION 7

WORK AUTHORISATION

Activity \ Authorised Signatories	PD	QP	PM	SS
General Correspondences with Client			✓ *	
General Correspondences with Other Consultants			✓ *	
M&E Cost Estimate Report	✓			
M&E Design Report	✓		✓	
Check Prints			✓	
Tender Drawing Approval			✓	
Tender Specification Approval			✓	
List of Tenderers	✓		✓	
Tender Questionaires			✓	
Tender Reports	✓			
Draft Letter of Award	N.A	N.A	N.A	N.A
Review of Contractor's Shop Drawing			✓ *	
Review of Contractor's Technical Submittal			✓ *	
Review of Contractor's Sample Submittal			✓ *	
Contractor's Request for Deviation	✓	✓	✓	
Progress Payment Valuation Form	✓		✓	
Final Account Valuation	✓		✓	
Draft Variation Order			✓	
Engineer/Architect's Instruction/Direction			✓	
Site Instruction/Direction			✓	✓
Correspondence/Submission to Authorities		✓		

(✓ *where authorised*)

Key to abbreviations:-

PD : Project Director
QP : Qualified Person
PM : Project Manager/Assistant Project Manager
SS : AEC Site Staff

* Denotes Activities which could be authorized by Project Assistants (M&E)

SECTION 8

DESIGN INPUT & METHODOLOGY

8.1 List of Client's Standards, Reference Documents or Brief

ITEM	KEPT BY
Sales Brochure	SKY
N.A	N.A

8.2 List of Applicable Code of Practice and Regulations

Electrical Installation	~~BS~~	SS	IEE	~~NFPA~~	
Lightning Protection System	BS	SS			
Air Conditioning & Ventilation Installation	BS	~~AS~~	~~NFPA~~	SS	~~MS~~
Sanitary System	BS	SS	~~NFPA~~	~~AS~~	~~MS~~
Plumbing System	BS	SS	~~NFPA~~	~~AS~~	~~MS~~

(Delete where necessary)

SECTION 8

DESIGN INPUT & METHODOLOGY

8.3 List of Design Guide or Handbook Used

Trane Air Conditioning Manual

Carrier's System Piping Design Part 3

ASHRAE Handbooks

8.4 List of Applicable Quality System Procedures

Alpha Engineering Consultant's Quality Management System Procedures

Section	Title
M1	Preparation of Consultancy Offer
M2	Project Commissioning and Service Agreement
M3	Design Control
M4	Design Change Control
M5	Tender Process and Evaluation
M6	Authority Submission
M7	Construction Process Control
M8	Testing and Commissioning
S1	Document Control
S2	Documentation of Quality Management System Procedure
S3	Documentation of Project Quality Plan
S4	Specification Control
S5	Library Control
S6	Archive Control
S7	Filing Control
S8	Drawing Control
S9	Administration Control
S10	Purchasing Control
S11	Training Control
S12	Computer Control
Q1	Quality System Audit
Q2	Feedback Reporting
Q3	Clients Feedback
Q4	Management Review

8.5 List of Software Used For Design/Analysis

DESCRIPTION/ PACKAGE NAME	VERSION	SUPPLIER/ SOURCE	PURPOSE	
Calculux	2.30	Philips	Lighting design	✓
Cophos	3.31	Zumtobel	Lighting design	
Carrier E20-II	3.21	Carrier	Programme for determination of heat load, duct size and its losses, etc.	✓
Gensize 2	2.1	Onan	Generator sizing	
Lift Traffic	-	Alpha Engineering	Lift traffic calculation	
Econdial	2.5	Merlin Gerlin	Design for low voltage network	
Fault Level Calculation	-	Alpha Engineering	Calculation of voltage drop and fault level	

(✓ *where applicable*)

SECTION 9

CLIENT'S REQUIREMENTS

9.1 List of Output Required by Client:-

Item	* Remarks
M&E Design Report	N.A
M&E Cost Estimate Report	A
Pre-Qualification of Tenderers	A
Tender Documents	A
Tender Report	A
Payment Valuation for QS	I
Certificates of Supervision for TOP/CSC	Re

** Remarks*

A: for approval C: for comment I: for Information Re: for record

Other purposes and for action: please specify.

9.2 Specific Procedures Required By Client *(If applicable)*

1. Consultants to forward Progress Payment Valuation to QS with 7 days from Contractor's claim submission.

SECTION 10

LIST OF SUB-JOB

10.1 List of Sub-Job Numbers

Sub Job No	Description	Allocation Details
1272-601	Purchaser's Request for 41 SS Walk	
1272-602	Purchaser's Request for 53 SS Link	
1272-603	Purchaser's Request for 1 SS Walk	
1272-604	Purchaser's Request for 17 SS Walk	
1272-605	Access to Mosque	
1272-606	Streetlighting Liaison work for Phase 1 to 5	
1272-607	Optional Air-conditioning Units by Purchasers	