PROJECT QUALITY PLAN

PROPOSED LANDED HOUSING DEVELOPMENT AT SEMBAWANG ROAD/ANDREWS AVENUE

For

M/S SEMBAWANG ESTATES PTE LTD

Copy No.	

Prepared By: Lee Kok Sweet

Authorised By: Loh Chew Thong

Date: 6 June 1997

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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	Loh Chew Thong	(LCT)	6 June 1997
2	Richard Teo	(RT)	6 June 1997
3	Lee Kok Sweet	(LKS)	6 June 1997
4	Alan Lau	(LTC)	6 June 1997

1.2 Revision Record

Version	Date of Issue	Section Reference	Page(s)	Remarks
1/0	6 June 1997			1st Issue

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Size of Development	
Site Area, m²	20,188
Nett Floor Area, m² *	-
Gross Floor Area, m²	15,814
Covered Carpark, m²	-
Total Built-up Area m²	-
No. of Covered Carpark Lots	-
No. of Apartments/Houses	67
No. of Guest Room	-
No. of Storeys	3-Storey Terrace/Semi-Terrace
No. of Phases	-

*** Excludes Covered Carpark**

2.2 Cost Plans

M&E Services Cost Plan (S$ x 1M)									
Services	EI	ACVI	LEI	FFAI	PSI	SPFI			
Estimate	1.4	0.8	-	-	1.7	-			
Awarded									

Total Project Construction Cost (S$ x1M)				
	Site Clearance	Piling	Sub-Structure *	Super-Structure *
Estimate	3.56	1.72	1.85	21.57
Awarded				

Site Clearance shall include earth work, soil improvement, service diversion and termination.

**Include provision for M&E Services*

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							
DATA COMM.									
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	

2.4 Work Packages

2.4.1 M&E Services Sub-Contract

SERVICES	TYPE*
Electrical Installation	NSC
Lift & Escalator Installation	-
PABX Installation	-
Telelift Installation	-
Security Installation	-
Fire Fighting & Alarm Installation	-
Air Conditioning & Ventilation Installation	NSC
Plumbing & Sanitary Installation	DSC
Building Automation System	-
Swimming Pool Filtration Plant	-

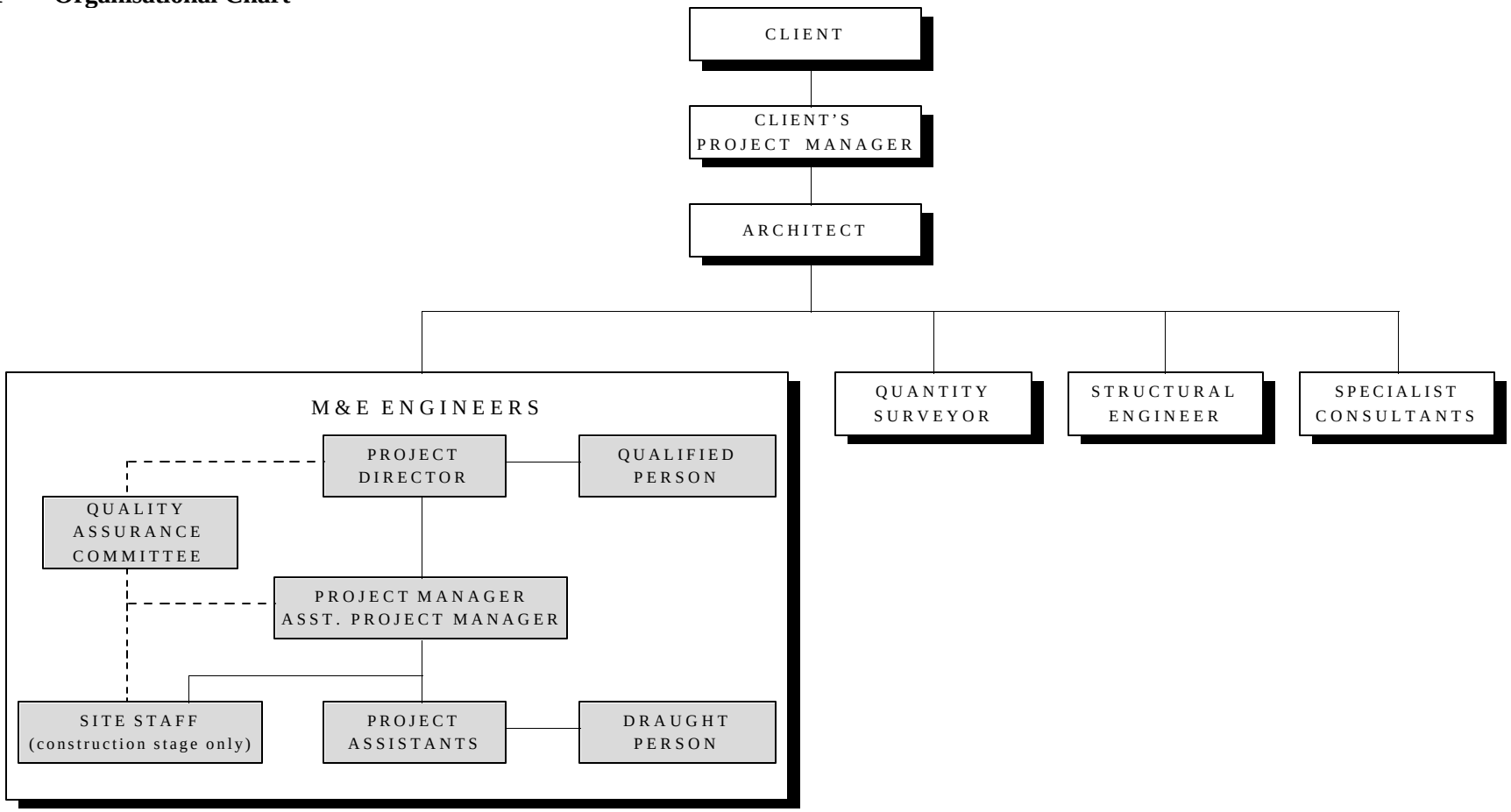
**NSC: Nominated Sub-Contract* **DC: Direct Contract*

*DSC: Domesticated Sub-Contract *NS: Nominated Supplier

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 Project Related Staff

TITLE		NAME	
Project Director		Loh Chew Thong	(LCT)
Qualified Person	Mechanical	Loh Chew Thong	(LCT)
	Electrical	Richard Teo	(RT)
Project Manager		Lee Kok Sweet	(LKS)
Assistant Project Manager		Alan Lau	(LTC)
Project Assistant (Mech)		Serene Teh	(ST)
Project Assistant (Elect)		Tan King Suan	(TKS)
Draughtsperson			
Resident Engineer			
Assistant Resident Engineer			
Clerk-of-Work (M&E)			

3.3 Client/Client's Representatives

Client:- Sembawang Estates Pte Ltd

Address:- 65 Chulia Street
#49-05 OCBC Centre
Singapore 049513

Tel:- 536 1836

Fax:- 536 1858

Client's Representative Related Staff:-

NAME	POSITION	DID/TEL NO.	REMARKS
Mr Ng Chee Seng	General Manager	As Above	-
Mr Rick Wu	Assistant Project Manager	As Above	-

3.4 Other Consultants (Local)

Function / Name of Firm	Contact Person and Position	Telephone/ Fax/Pager Nos.
Architect RDC Architects Pte Ltd	Mr Kenneth Loh	Tel: 338 1816 Fax: 336 3177
Quantity Surveyor W T Partnership	Mr David Lim	Tel: 533 0822 Fax: 533 2833
Structural Engineer Chan Chee Wah Consultants	Mrs Lim L H	Tel : 469 4188 Fax : 469 4189
Interior Designer		
Lighting Consultant		
Acoustic Consultant		
Client's Project Manager		
Design Architect		
Landscape Consultant		

3.5 Contractors/Sub-Contractors

Function / Name of Firm	* Type	Contact Person and Position	Telephone/Fax/Pager Nos.
1. Main Contractor			
2. Air Conditioning & Ventilation Installation Sub-Contractor			
3. Plumbing & Sanitary Installation Sub-Contractor			
4. Electrical Installation Sub-Contractor			
5. Lift & Escalator Installation Sub-Contractor			
6. Fire Fighting & Alarm Installation Sub-Contractor			
7. Swimming Pool Filtration Plant Installation Sub-Contractor			

** 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 No:/Fax No:
PowerGrid/Power Supply:		
(a) Customer Supply	Mr Lim Jit Meng	Tel: 831 8552
(b) Sub-Station	Mr Francis Chang	Tel: 831 8555
(c) Installation		
(d) Meter Section		
(e) Road Lighting		
(f) Diversion		
Telecom:		
(a) Planning/Line Plant	Mr Chin Yong How	Tel: 838 2845
(b) Installation		
(c) Diversion		
BCD:	N.A.	
(a) Building Plan		
(b) Air-Cond & Vent Plan		
FSB:	N.A.	
(a) Building Plan		
(b) M&E Section		
PUB (Water)		
(a) Water Conservation		
(b) Plumbing Plan		
(c) Diversion		
PowerGas:	N.A.	
(a) Planning/Submission		
(b) Installation/Inspection		
(c) Diversion		
ENV (Sewerage):		
(a) Building Plan		
(b) M&E Section		
(c) Diversion		
ENV (Pollution Control)		
(a) Planning/Submission		
(b) Inspection		

SECTION 4

PROGRAMME

4.1 Authority Submission Status for M&E Services (Main Building)

Service	Authority	Original Submission		Comments/Resubmission						Approval/ Clearance
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	
Application for Electricity Supply	Power Supply Pte Ltd									16/1/97
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)									
Domestic Water Supply	PUB (Water)									
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)									-
	Telecom (Domestic Operation)									
Fuel Storage	Fire Safety Bureau									-
	Pollution Control Department									-

SECTION 4

PROGRAMME

4.2 Work Progress - Design and Tender Stage

M&E Services

	SERVICES		EI	ACVI	LEI	FFAI	PSI	SPFI	
1.	Number of Drawings								
2.	Preliminary Design Completed	25%							
		50%							
		75%							
		100%							
3.	Detailed Design Completed	25%							
		50%							
		75%							
		100%							
4.	Tender Document Completed	25%							
		50%							
		75%							
		100%							
5.	TENDER								
	Tender Date								
	Tender Evaluation Report								
	Tender Award								

SECTION 5

PROJECT RECORDS

5.1 List of Internal Files

Standard Files

File Ref: 1096		File Ref: 1096	
-CM	✓	-QSP	✓
-PC	✓	-BD	✓
-PUB/TAS	✓	-CC	✓
-BCD/FSB/ENV	✓	-GC	✓
-PQP	✓	-CF	✓

Project Files to be initiated by PM as and when required

File Ref: 1096		File Ref: 1096		File Ref: 1096	
-SM		-SR		-ET	
-SC		-QM		-MT	
-AI		-EC		-DF	
-SQ		-MC		-EOT	
-CO		-P			

Service Files to be initiated by PM as and when required

	Service										
File Ref: 1096	ACVI	FFAI	PSI	EI	LI	SPFP					
-G	✓		✓	✓							
-Q											
-VO											
-P											
-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	Lee Kok Sweet
Incoming Architectural Sketches/Details	Service File
Incoming Structural Drawings	Lee Kok Sweet
M&E Drawings	
- Electrical Installation	
- Lift & Escalator Installation	
- Air Conditioning & Ventilation Installation	
- Fire Fighting & Alarm Installation	
- Plumbing & Sanitary Installation	
Other Drawings	
- Swimming Pool Filtration Plant Installation	

INTERFACING

6.1 Method of Interface

Description	Method of Interface
Client's Review & Approval	
Interface With External Design Teams	
Interface Between Internal Design Teams	

SECTION 6

INTERFACING

6.2 Internal Design Interface

Item No.	Description*	Required From	Required By	Date Required	Remarks

** 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	-	A/C	C/I	I	
b.	Project Administration	C/I	-	A/C/I	C/I	C/I	
c.	Project Cost Estimate/Contract Cost)	A/C	-	I	I	C/I	
2.	**Drawings**						
a.	Outline Design Drgs.	C/I	-	C	C/I	-	
b.	Sketch Design Drgs.	C/I	-	C	C/I	-	
c.	Final Design Drgs.	A	-	A	I	I	
d.	Shop Drawings	-	-	A/C	C	-	
e.	As Built Drgs.	I	-	-	-	-	
3.	**Other Document**						
a.	Specification	I	-	I	-	-	
b.	Tender Document	I	-	I	-	-	
c.	Tender Evaluation Report	A	-	I	-	-	
d.	Design Report	A/C	-	C	-	-	
e.	Progress Report		-				
f.	Financial Report		-				
g.	Minutes of Meeting		-				
h.	Inspection Report		-				
i.	Testing & Comm. Report		-				
j.	O & M Manual		-				

SECTION 7

WORK AUTHORISATION

Activity \ Authorised Signatories	PD	QP	PM	Site Staff
Checklists	✓			
Client Correspondence/Fax	✓		✓	
Other Consultants Correspondence/Fax			✓	
Contractor's Drawing. Review			✓	
Contractor's Technical Submittals			✓	
Contract Correspondence	✓		✓	
Contract Payment Certificates			✓	
Final Account Certificates				
Site Instruction/Direction			✓	
Architect Instruction/Direction			✓	
Site Progress Reports				
Design Drawing. Approval				
Design Drawing. Checking				
Local Authority Correspondence/Submission		✓		

* *Tick where authorised.*

Key to abbreviations:-

PD : Project Director

QP : Qualified Person

PM : Project Manager/Assistant Project Manager

SS : (Designated) Site Staff

SECTION 8

DESIGN INPUT & METHODOLOGY

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

ITEM	KEPT BY

8.2 List of Applicable Code of Practice and Regulations

Electrical Wiring	BS	SS	IEE	~~NFPA~~	
Lightning Protection System	~~BS~~	SS			
Emergency Voice Communication System	~~BS~~	~~SS~~	~~NFPA~~		
Air Conditioning & Ventilation Installation	~~BS~~	~~AS~~	~~NFPA~~	SS	~~MS~~
Lift & Escalator Installation	~~BS~~	~~SS~~			
Sprinkler System	~~BS~~	~~SS~~	~~NFPA~~	~~AS~~	~~LPC~~
Wet Riser System	~~BS~~	~~SS~~	~~NFPA~~	~~AS~~	~~MS~~
Automatic Fire Alarm System	~~BS~~	~~SS~~	~~NFPA~~	~~AS~~	~~MS~~
Sanitary System	~~BS~~	SS	~~NFPA~~	~~AS~~	~~MS~~
Plumbing System	~~BS~~	SS	~~NFPA~~	~~AS~~	~~MS~~
Town Gas/~~LPG Supply System~~	~~BS~~	~~SS~~	~~NFPA~~	~~AS~~	
Boiler and Steam Supply System	~~ASME~~	~~BS~~	~~AS~~		
Mechanical Smoke Control System	~~BS~~	~~NFPA~~	~~AS~~		

SECTION 8

DESIGN INPUT & METHODOLOGY

8.3 List of Design Guide or Handbook Used

Carrier's Handbook of Air Conditioning System Design

ASHRAE Handbooks

Institute of Plumbing's Plumbing Services Design Guide

8.4 List of Applicable Quality System Procedures

Alpha Engineering Consultant's Quality System Procedures

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
Hyena	4.00.1	ACADS-BSG	Fire Sprinkler & Hydrant Analysis
AutoHan	-	Hong Kong Productivity Council	Chinese character Input System
Fault Level Calculation	-	Alpha Engineering	Calculation of voltage drop and fault level

SECTION 9

CLIENT'S REQUIREMENTS

9.1 Specific Documents/Reports Required by Client:-

Item	Date Submitted	* Remarks
M&E Design Report		
Preliminary Tender Documents		
Tender Report		
Progress Report		
Payment Valuation for QS		
O&M Manuals		
As-Built Drawings		

* *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)*