PROJECT QUALITY PLAN

THE MAKENA

For

M/S HONG LEONG HOLDINGS LTD

Copy No.	

Prepared By: TKL/YYF

Authorised By: LCT

Date: 4 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, Andrew	(LCT)	4 June 1997
2	Tan Lai Siong	(LST)	4 June 1997
3	Tay Khoon Lee	(TKL)	4 June 1997
4	Lee Kok Sweet	(LKS)	4 June 1997

1.2 Revision Record

Version	Date of Issue	Section Reference	Page(s)	Remarks
1/0	4 June 1997			1st Issue

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Size of Development	
Site Area, m²	35210.20
Nett Floor Area, m² *	76892.582
Gross Floor Area, m²	82892.582
Covered Carpark, m²	6000
Total Built-up Area m²	97212.841
No. of Covered Carpark Lots	504
No. of Apartments/Houses	504
No. of Guest Room	NA
No. of Storeys	2 Block of 29 Storey, 2 Block of 17 Storey & 1 Block of 20 Storey
No. of Phases	1

*** Excludes Covered Carpark**

2.2 Cost Plans

M&E Services Cost Plan (S$ x 1M)									
Services	EI	ACVI	LEI	FFAI	PSI	SPFI	BSI		
Estimate	-	-	-	-	-	-	-		
Awarded	5.55	5.05	2.30	0.92233	6.82	0.2716	0.5973		

Total Project Construction Cost (S$ x1M)				
	Site Clearance	Piling	Sub-Structure *	Super-Structure *
Estimate	-	-	-	-
Awarded	-	5.8735	-	5,873,537.57

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	NSC
PABX Installation	-
Telelift Installation	-
Security Installation	NSC
Fire Fighting & Alarm Installation	NSC
Air Conditioning & Ventilation Installation	NSC
Plumbing & Sanitary Installation	NSC
Building Automation System	NSC
Swimming Pool Filtration Plant	NSC

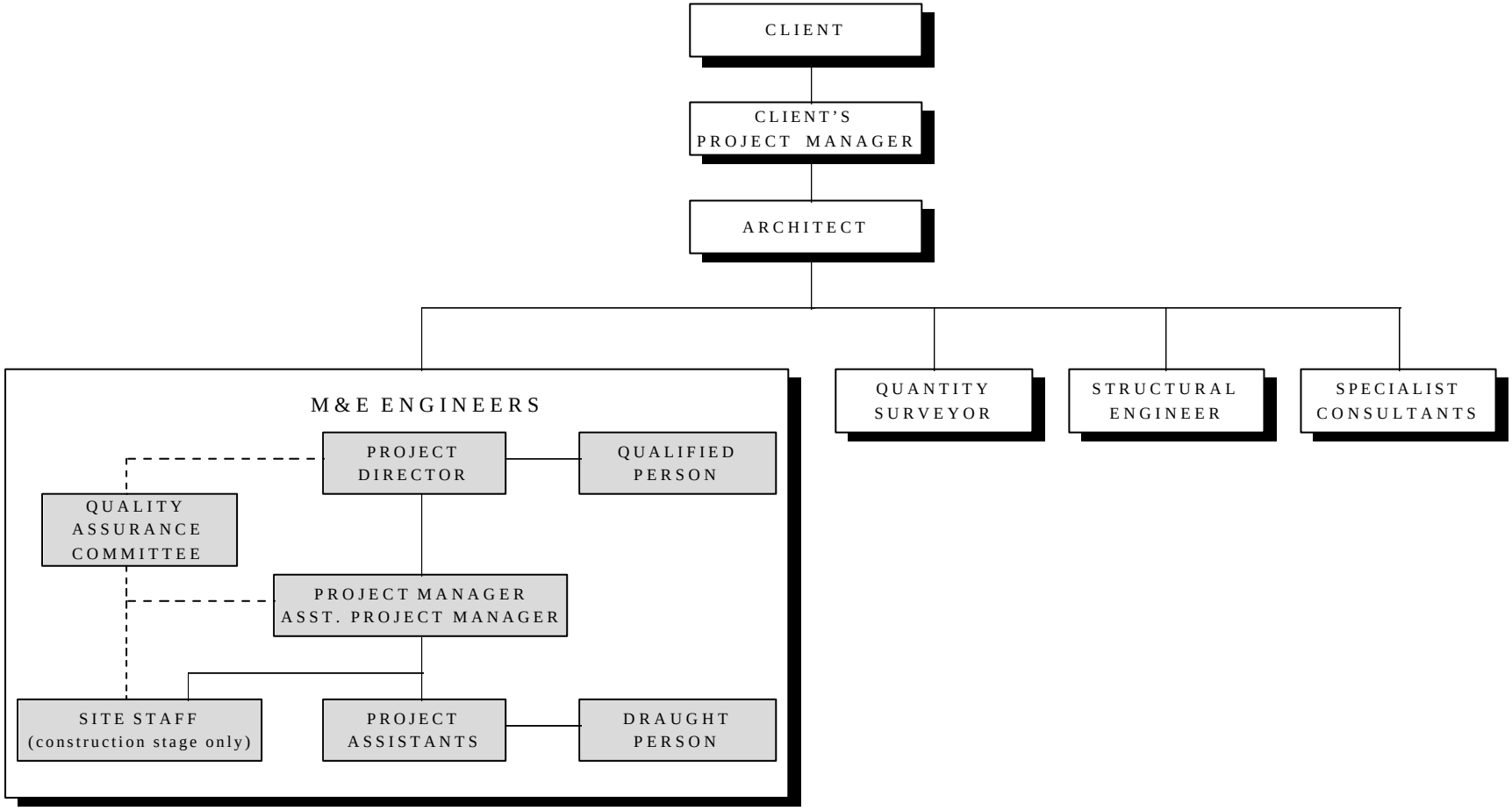
**NSC: Nominated Sub-Contract* **DC: Direct Contract*

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

SECTION 3

ORGANISATION

3.1 Organisational Chart


CLIENT
CLIENT'S PROJECT MANAGER
ARCHITECT
QUANTITY SURVEYOR
STRUCTURAL ENGINEER
SPECIALIST CONSULTANTS
M&E ENGINEERS
PROJECT DIRECTOR
QUALIFIED PERSON
QUALITY ASSURANCE COMMITTEE
PROJECT MANAGER ASST. PROJECT MANAGER
SITE STAFF (construction stage only)
PROJECT ASSISTANTS
DRAUGHT PERSON

SECTION 3

ORGANISATION

3.2 Project Related Staff

TITLE		NAME
Project Director		Loh Chew Thong (LCT)
Qualified Person	Mechanical	Loh Chew Thong (LCT)
	Electrical	Tan Lai Siong (TLS)
Project Manager		Tay Khoon Lee (TKL)
Assistant Project Manager		Lee Kok Sweet (LKS)
Project Assistant (Mech)		Yip Yoke Fun (YYF)
Project Assistant (Elect)		Tan King Suan (TKS)
Draughtsperson		-
Resident Engineer		Goh C T (GCT)
Assistant Resident Engineer		-
Clerk-of-Work (M&E)		Ong B S (OBS) Lee H K (LHK)

3.3 Client/Client's Representatives

Client:- Hong Leong Holdings Ltd

Address:- 16 Raffles Quay
#25-01
Hong Leong Building
Singapore 048581

Tel:- 220 9911

Fax:- 225 0929

Client's Representative Related Staff:-

NAME	POSITION	DID/TEL NO.	REMARKS
Loke K Y	Project Manager	220 9911	

3.4 Other Consultants (Local)

Function / Name of Firm	Contact Person and Position	Telephone/ Fax/Pager Nos.
Architect James Yip & Partners	Mr C N Suneeth (Architect)	Tel: 227 6822 Fax: 227 6322
Quantity Surveyor Davis Langdon & Seah	Mr Wong S M (SQS) Ms Christine Lim (QS)	Tel: 222 3888 Fax: 224 7089
Structural Engineer KTP Consultants	Mr Cheah K H (Senior Engineer)	Tel : 273 5622 Fax : 273 8454
Interior Designer		
Lighting Consultant		
Acoustic Consultant		
Client's Project Manager		
Other Specialist		

3.5 Contractors/Sub-Contractors

Function / Name of Firm	* Type	Contact Person and Position	Telephone/Fax/Pager Nos.
1. Main Contractor Hyundai Engineering & Construction Co Ltd		Mr Oh J H (Senior Project Manager) Mr Ross Smith (Project Mananger)	Tel: 346 8401 Fax: 346 8284
2. Air Conditioning & Ventilation Installation Sub-Contractor O.Y.L. Sales & Service (Singapore) Pte Ltd	NSC	Mr Chua C S (Project Engineer) Mr Francis Quek (Project Supervisor)	Tel: 250 2966 Fax: 250 1807
3. Plumbing & Sanitary Installation Sub-Contractor Poly Engineers Pte Ltd	NSC	Mr Chua C C (Managing Director) Mr Tan S G (Project Manager)	Tel: 292 5246 Fax: 296 0958
4. Electrical Installation Sub-Contractor Hitachi Plant Engineering & Construction Co Ltd	NSC	Mr P W Chan (Senior Manager)	Tel: 279 0588 Fax: 224 8358
5. Lift & Escalator Installation Sub-Contractor Chevalier Singapore Holdings Ltd	NSC	Mr S C Tan (Senior Manager)	Tel: 273 2266 Fax: 747 2988
6. Fire Fighting & Alarm Installation Sub-Contractor Sprinkler Engineering Pte Ltd	NSC	Mr Too J C (Project Supervisor)	Tel: 481 9255 Fax: 482 3643
7. Swimming Pool Filtration Plant Installation Sub-Contractor Team Design Architects	NSC	Mr Johnson Tan (Managing Director)	Tel: 288 7533 Fax: 280 8792
8. Carpark System Installation Sub-Contractor -		-	-
9. Building Security System Philips Security (S) Pte Ltd	NSC	Mr Paul Shin (Project Engineer)	Tel: 350 2597 Fax: 356 2040

** 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	Ms Chua Gek Noi	2409232 / 2409225
(b) Sub-Station	Ms Chua Gek Noi	2409232 / 2409225
(c) Installation	Mr Koh Tian Seng	7331668
(d) Meter Section	Mr Tan Hoe Kiang	7331668
(e) Road Lighting		
(f) Diversion		
Telecom:		
(a) Planning/Line Plant	Mr Lee Him Buan	8382847
(b) Installation	Mr Raymond Chong	8382583
(c) Diversion		
BCD:		
(a) Building Plan		
(b) Air-Cond & Vent Plan	Cheong Yee Chek	3258633 / 3258671
FSB:		
(a) Building Plan		
(b) M&E Section	Mr Vijayan	8386421 / 8386427
PUB (Water)		
(a) Water Conservation	Mr Ramahad Singh	7313977
(b) Plumbing Plan	Ms Wong Wai Cheng	7313544 / 7313023
(c) Diversion		
PowerGas:		
(a) Planning/Submission	Mr Tan Kah Hock/Mr Lim Hock Ann	8318680
(b) Installation/Inspection	Mr Lim Teck Seng	8318693 / 8318692
(c) Diversion		
ENV (Sewerage):		
(a) Building Plan		
(b) M&E Section	Mr Chow Y M	7319630 / 7319725
(c) Diversion		
ENV (Pollution Control)		
(a) Planning/Submission		
(b) Inspection		

SECTION 4

PROGRAMME

4.1 Overall Programme

			1996											1997										
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																									>

SECTION 4

PROGRAMME

4.3 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									25/6/91
Power Supply Substation	PowerGrid Pte Ltd									10/12/93
Main Single Line Diagram	Power Supply Pte Ltd									7/10/95
Consumer Switchroom Layout	PowerGrid Pte Ltd									28/2/94
Metering Layout	PowerGrid Pte Ltd									20/3/97
Sanitary Installation	ENV (Sewerage)									4/6/94
Domestic Water Supply	PUB (Water)									12/9/96
Gas Supply Installation	PowerGas Pte Ltd									31/8/95
Air Conditioning & Ventilation Inst.	Building Control Division									30/3/96
	Fire Safety Bureau									9/1/95
Fire Fighting & Alarm Installation	Fire Safety Bureau									21/12/94
	Telecom (Broadband)									28/1/94
Telephone Installation	Telecom (TDCS)									-
	Telecom (Domestic Operation)									20/10/94
Fuel Storage	Fire Safety Bureau									-
	Pollution Control Department									-

SECTION 4

PROGRAMME

4.4 Authority Submission Status for M&E Services (Amendments)

Service	Authority	Original Submission		Comments/Resubmission						Approval/ Clearance
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	
Application for Electricity Supply	Power Supply Pte Ltd									
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

4.5 Work Progress - Design and Tender Stage

M&E Services

	SERVICES		EI	ACVI	LEI	FFAI	PSI	SPFI	BSI
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		1/8/95	8/1/96	10/4/96	8/12/95	5/5/95	24/7/96	27/3/96

SECTION 5

PROJECT RECORDS

5.1 List of Internal Files

Standard Files

File Ref: 1016		File Ref: 1016	
-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: 1016		File Ref: 1016		File Ref: 1016	
-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: 1016	ACVI	FFAI	PSI	EI	LI	SPFP	BSI				
-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	Yip Yoke Fun
Incoming Architectural Sketches/Details	Yip Yoke Fun
Incoming Structural Drawings	Yip Yoke Fun
M&E Drawings	
- Electrical Installation	Lee Kok Sweet / Tan King Suan
- Lift & Escalator Installation	Lee Kok Sweet / Tan King Suan
- Air Conditioning & Ventilation Installation	Yip Yoke Fun
- Fire Fighting & Alarm Installation	Yip Yoke Fun
- Plumbing & Sanitary Installation	Yip Yoke Fun
Other Drawings	
- Swimming Pool Filtration Plant Installation	Yip Yoke Fun

INTERFACING

6.1 Method of Interface

Description	Method of Interface
Client's Review & Approval	1. Brief Design Report 2. Discussion in Client/Consultant Meeting
Interface With External Design Teams	1. Communication via faxes and letters. 2. Discussion in Client/Consultant Meeting & Technical Meeting.
Interface Between Internal Design Teams	1. Memo or circulation of design information. 2. Adhoc Meeting..

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

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
N.A.	N.A.

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 Required	* Remarks
M&E Design Report		A
Preliminary Tender Documents		A
Tender Report		A
Progress Report		A
Payment Valuation for QS		Re
O&M Manuals		Re
As-Built Drawings		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)*

SECTION 10

LIST OF SUB-JOB

10.1 List of Sub-Job Numbers

Sub Job No	Description	Allocation Details