PROJECT QUALITY PLAN

PROPOSED EXECUTIVE CONDOMINIUM HOUSING DEVELOPMENT COMPRISING 4 BLOCKS OF 17-STOREY BUILDING (464 APARTMENTS UNITS AND 32 MAISONNETTE UNITS) WITH BASEMENT CARPARK AND ANCILLARY FACILITIES ON LOT 4095 PT MK 22 AT HOUGANG AVE 7/ UPPER SERANGOON ROAD (THE FLORIDA)

For

M/S CAIRNS GARDEN DEVELOPMENT PTE LTD

Copy No.	

Prepared By: Joyce Lam

Authorised By: Richard Teo

Date: 19 September 2000

TABLE OF CONTENTS

SECTION	DESCRIPTION
-	**TITLE PAGE**
-	**TABLE OF CONTENTS**
1	**QUALITY PLAN CONTROL AND DISTRIBUTION**
1.1	List of Copy Holders
1.2	Revision Record
2	**PROJECT INFORMATION**
2.1	Project Description
2.2	Project Cost
2.3	Scope of Works
3	**ORGANISATION**
3.1	Organisation Chart
3.2	AEC's Project Team Member
3.3	Client/Client's Representative
3.4	Other Consultants
3.5	Contractor/Sub-Contractors
3.6	Authorities
4	**PROGRAMME**
4.1	Overall Programme
4.2	Authority Submission Status for M&E Services – 1st Submission
4.3	Authority Submission Status for M&E Services (Amendment) – 2nd Submission

TABLE OF CONTENTS

SECTION	DESCRIPTION
5	**PROJECT RECORDS**
5.1	List of Internal File
5.2	Filing of Drawings
6	**INTERFACING**
6.1	Method of Interface
6.2	Not Used
6.3	Circulation of Documents to External Parties
7	**WORK AUTHORISATION**
8	**DESIGN INPUT AND METHODOLOGY**
8.1	List of Client's Standards, Reference Documents or Brief
8.2	List of Applicable Code of Practice and Regulations
8.3	List of Design Guide or Handbook Used
8.4	List of Applicable Quality System Procedures
8.5	List of Software Used for Design/Analysis
9	**CLIENT'S REQUIREMENTS**
9.1	List of Output Required by Client
9.2	Specific Procedures Required by Client
10	**LIST OF SUB-JOB**
10.1	Not Used

SECTION 1

QUALITY PLAN CONTROL AND DISTRIBUTION

1.1 List of Copy Holders

Copy No.	Copy Holder	Date of Issue
1	1163-PQP File	8 July 1998
2	Joyce Lam	8 July 1998

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
1/0	8 July 1998	Section 1 – 8	26	1st Issue
2	31 December 1998	Section 1 – 10	26	-
3	19 September 2000	Section 1.2, 3.2 – 3.4, 5.1 – 5.2, 6.1, 8.1	8	-

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Statistics of Development	
Site Area, m²	22,366
Nett Floor Area, m²	84,789
Gross Floor Area, m²	67,098
Covered Carpark, m²	-
No. of Covered Carpark Lots	522
No. of Apartments/Houses	496
No. of Beds (for Hospitals)	-
No. of Guestroom (for Hotels)	-
No. of Blocks / No. of Storeys	17
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)										
Services	EI	ACVI	LEI	FFAI	PSI	SPFI				
Estimate	-	-	-	-	-	-				
Awarded	4.53	3.27	2.11	0.27	5.46	0.275				

Total Project Construction Cost (S$ x1M)			
	Site Clearance	Piling Works	Main Contract
Estimate	-	-	-
Awarded	Included in MC		92.6

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

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.									
FLUSHFLOOR TRUNKING									

(✓ *where applicable*)

2.3.3 Submission to Relevant Authorities by Others

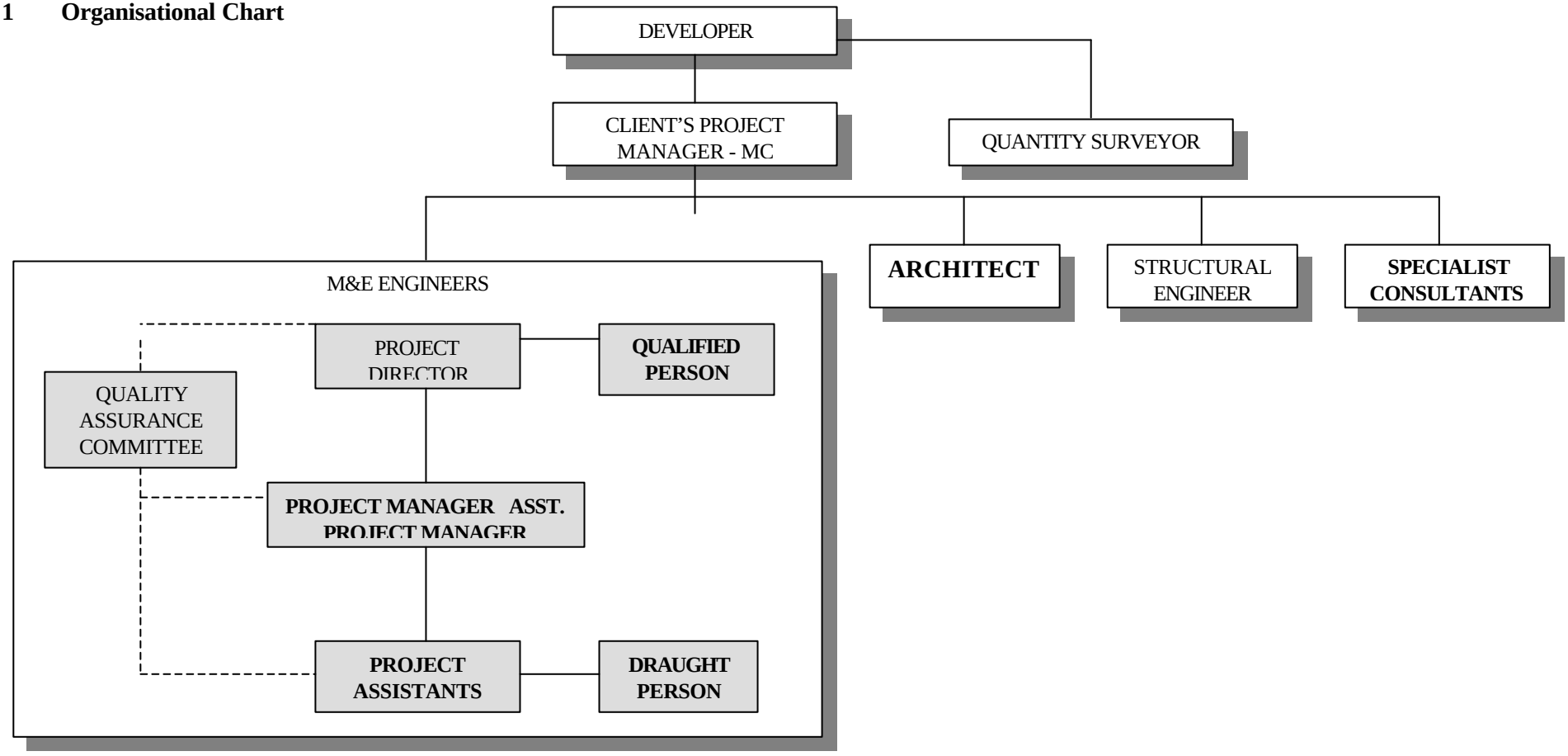
EJECTOR & DIVERTER		SUMP PUMP	✓	FUEL OIL TANK		LIFT	✓	PRESSURE VESSEL		HOISTS		FOA M	

(✓ *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
Qualified Person	Mechanical	Andrew Loh
	Electrical	Richard Teo
Project Manager		Joyce Lam
Assistant Project Manager		Choong C G
Project Assistant (Mech)		Heng C H
Project Assistant (Elect)		Chiam B Y
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		-

3.3 Developer's/Client's Representatives

Developer:-	Cairns Garden Development Ltd	Client:-	Hytech Builders Pte Ltd
Address:-	36 Robinson Road #02-01 City House Singapore 068877	Address:-	Blk 165 Bukit Merah Central #05-3685 Singapore 150165
Tel:-	221 2266	Tel:-	272 0802
Fax:-	222 2993	Fax:-	273 6569

Developer's/Client's Representatives:-

Name of Firm	Contact Person	Contact
Cairns Garden Development Ltd	Name: Mr Ho Han Position: Project Manager	Tel: 221 2266 Fax: 223 2746 Pager: - Handphone: - Email: -
Cairns Garden Development Ltd	Name: Mr Gan Eng Hin Position: Resident Engineer (C&S)	Tel: 386 6443 Fax: 386 6964 Pager: 9259 1727 Handphone: - Email: -
Cairns Garden Development Ltd	Name: Mr Vincent Sim Position: Clerk-of-Works (C&S)	Tel: 386 6443 Fax: 386 6964 Pager: 9558 0326 Handphone: - Email: -
Hytech Builders Pte Ltd	Name: Mr Ng Cheng Huat Position: Director	Tel: 272 0802 Fax: 273 6569 Pager: - Handphone: - Email: -
Hytech Builders Pte Ltd	Name: Mr Koh Teng Hua Position: Project Manager	Tel: 272 0802 Fax: 273 6569 Pager: - Handphone: - Email: -

3.4 Other Consultants (Local)

Function / Name of Firm	Contact Person	Contact
Architect Architect Vista	Name: Mr Wong Hong Fong Position: Architect	Tel: 348 7337 Fax: 348 2516 Pager: - Handphone: - Email: -
Quantity Surveyor Davis Langdon & Seah (S) Pte Ltd	Name: Mr Chan Cheow Pheng Position: Cost Research Manager	Tel: 222 3888 Fax: 224 7089 Pager: - Handphone: - Email: -
Structural Engineer Engineers Partnership	Name: Mr Lee Mow Woo Position: Chartered Engineer	Tel: 220 0752 Fax: 224 2073 Pager: - Handphone: - Email: -
Interior Designer Whyte-By-Design	Name: Mr Patrick Cheong/Ms Liza Clarins Position: Designer Manager	Tel: 275 1060 Fax: 275 0320 Pager: - Handphone: - Email: -
Lighting Consultant -	Name: - Position: -	Tel: - Fax: - Pager: - Handphone: - Email: -
Acoustic Consultant -	Name: - Position: -	Tel: - Fax: - Pager: - Handphone: - Email: -
Landscape Architect Site Concept International	Name: Mr Mark S Mahan Position: General Manager	Tel: 221 8826 Fax: 221 8937 Pager: - Handphone: - Email: -

3.4 Other Consultants (Overseas)

NOT USED

3.5 Contractors/Sub-Contractors

Function / Name of Firm	Contract *	Contact Person	Contact
Main Contractor Hytech Builders Pte Ltd	MC	Name: Mr Koh Teng Hua Position: Project Manager	Tel: 386 6007 Fax: 386 6310 Pager: 9300 1837 Handphone: - Email: -
Air Conditioning & Ventilation Installation Sub-Contractor Fettle Engineering Co (S) Pte Ltd	DSC	Name: Mr Jaime B L Position: Project Engineer	Tel: 278 7666 Fax: 278 7555 Pager: 9578 9940 Handphone: - Email: fettle@pacific net.sg
Plumbing & Sanitary Installation Sub-Contractor Lian Tat Plumbing Installation	DSC	Name: Mr Chan Ah Sun Position: Plumber	Tel: 745 310 Fax: 745 3101 Pager: 9407 7826 Handphone: - Email: -
Electrical Installation Sub-Contractor LSK Engineering (S) Pte Ltd	DSC	Name: Mr Y P Tan Position: Project Manager	Tel: 553 3955 Fax: 553 3966 Pager: - Handphone: - Email: -
Lift & Escalator Installation Sub-Contractor Kone Elevator Pte Ltd	DSC	Name: Mr Tham Wing Seng Position: Project Engineer	Tel: 258 5622/351 0213 (DID) Fax: 258 8734 Pager:9593 6232 Handphone: - Email: -
Fire Fighting & Alarm Installation Sub-Contractor Fire-Guard Engineering Pte Ltd	DSC	Name: Mr T S Lim Position: Project Engineer	Tel: 744 2142 Fax: 744 2406 Pager: 9304 2331 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	-	-
(b) Sub-Station	Mr Francis Chan See Tong	831 8555/831 8564
(c) Installation	Mr Kelvin Koh	277 7032/277 7044
(d) Meter Section	Mr Kong Kum Meng	277 7056/277 7088
(e) Road Lighting	-	-
(f) Diversion	-	-
Telecom:		
(a) Planning/Line Plant	Mr Ng Kok Yong	838 2838/733 9895
(b) Installation	Mr Ng Kok Yong	838 2838/733 9895
(c) Diversion	-	-
BCD:		
(a) Building Plan	-	-
FSB:		
(a) Building Plan	-	-
(b) M&E Section	Mr Ng Ah Hiap	838 6390/838 6427
PUB (Water)		
(a) Water Conservation	Mr David Loh/Mr Basheer	731 3518/731 3575/ 731 3023
(b) Plumbing Plan	Mr Ng Guan Chai	731 3598
(c) Diversion	Mr Kuang Kim Yaw	731 3544/731 3023
PowerGas:		
(a) Planning/Submission	Mr Liew Khee Boon	731 8662/831 8699
(b) Installation/Inspection	Mr Md Zulkeiflee	831 8693
(c) Diversion	-	-
ENV (Sewerage):		
(a) Building Plan	-	-
(b) M&E Section	Mr David Lim	731 9629/731 9725
(c) Diversion	-	-
ENV (Pollution Control)		
(a) Planning/Submission	Mr Cheam Tow Pang	731 9681/731 9725
(b) Inspection	-	-

SECTION 4

PROGRAMME

4.1 Overall Programme

			1998												1999											
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																									

** Phase 1 – 31 October 1999*
Phase 2 – 1 February 2000

*** Phase 1 – 30 November 1999*
Phase 2 – 31 January 2000

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 Pte Ltd	-	11.11.97							18.11.97
Power Supply Substation	PowerGrid Pte Ltd	20.12.97	23.12.97	2.1.98	16.1.98					28.4.98
Main Single Line Diagram	Power Supply Pte Ltd	-	3.8.98							17.8.98
Consumer Switchroom Layout	PowerGrid Pte Ltd									
Metering Layout	PowerGrid Pte Ltd									
Sanitary Installation	ENV (Sewerage)	-	13.1.98	23.1.98	30.3.98	20.4.98	28.4.98			
Domestic Water Supply	PUB (Water)	-	12.5.98	21.7.98	26.8.98	9.10.98	22.10.98			27.11.98
Gas Supply Installation	PowerGas Pte Ltd	-	5.6.98							11.6.98
Air Conditioning & Ventilation Inst.	Fire Safety Bureau		19.8.98							25.8.98
Fire Fighting & Alarm Installation	Fire Safety Bureau	-	22.5.98							3.6.98
Telephone Installation	Telecom (Broadband)	-	18.12.97							22.5.98
	Telecom (TDCS)									5.1.98
	Telecom (Domestic Operation)	-	10.12.98							
Fuel Storage	Fire Safety Bureau									
	Pollution Control Department									

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									
Power Supply Substation	PowerGrid Pte Ltd	-	8.12.98							16.12.98
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	-	7.9.98							18.9.98
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 5

PROJECT RECORDS

5.1 List of Internal Files

Standard Files

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

Project Files to be initiated by PM as and when required

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

Service Files to be initiated by PM as and when required

	Service										
File Ref:	ACVI	FFAI	PSI	EI	LI	SPFP					
-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	Chiam B Y
Incoming Architectural Sketches/Details	Chiam B Y
Incoming Structural Drawings	Chiam B Y
M&E Drawings	
- Electrical Installation	Chiam B Y
- Lift & Escalator Installation	Chiam B Y
- Air Conditioning & Ventilation Installation	Heng C H
- Fire Fighting & Alarm Installation	Heng C H
- Plumbing & Sanitary Installation	Heng C H
- Swimming Pool & Filtration Installation	
Other Drawings	

SECTION 6

INTERFACING

6.1 Method of Interface

Description	Method of Interface	
Client's Review & Approval	M&E Design Report	
	Pre-planned meeting at fixed intervals	✓
	Telefax, letter and telephone	✓
	Email	
Interface With External Design Teams	M&E Design Report	
	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*)

SECTION 6

INTERFACING

6.2 Internal Design Interface

NOT USED

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	-	-	-	-	-	
b.	Project Administration	-	I	I	I	-	
c.	Project Cost Estimate/Contract Cost	-	-	-	-	-	
2.	**Drawings**						
a.	Outline Design Drgs.	-	C	C	-	-	
b.	Sketch Design Drgs.	-	C	C	C	-	
c.	Final Design Drgs.	-	C	C	C	-	
d.	Shop Drawings	-	C	C	C	-	
e.	As Built Drgs.	-	-	-	-	-	
3.	**Other Document**						
a.	Specification	-	C	-	-	-	
b.	Tender Document	-	C	-	-	-	
c.	Tender Evaluation Report	-	-	-	-	-	
d.	Design Report	-	-	-	-	-	
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	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				
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

SECTION 8

DESIGN INPUT & METHODOLOGY

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

ITEM	KEPT BY
Design brief/Architects plans	Chiam B Y

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~~	

(Delete where necessary)

SECTION 8

DESIGN INPUT & METHODOLOGY

8.3 List of Design Guide or Handbook Used

Carrier's Handbook of Air Conditioning System Design

Institute of Plumbing's Plumbing Services Design Guide

8.4 List of Applicable Quality System Procedures

Alpha Engineering Consultant's Quality System Procedures

Section	Title
A1	Documentation of Quality System Procedure
A2	Documentation of Project Quality Plan
A3	Administration Control
A4	Document Control
A6	Archive Control
A9	Feedback Reporting
A10	Computer Control
B1	Preparation of Consultancy Offer
B2	Project Commission and Service Agreement
B3	Design Control
B4	Design Change Control
B5	Drawing Control
B6	Specification Control
D1	Quality System Audit

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	
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	A
M&E Cost Estimate Report	-
Pre-Qualification of Tenderers	-
Tender Documents	-
Tender Report	-
Payment Valuation for QS	-
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)*

SECTION 10

LIST OF SUB-JOB

10.1 List of Sub-Job Numbers

NOT USED