PROJECT QUALITY PLAN

PROPOSED CONDOMINIUM HOUSING DEVELOPMENT AND ANCILLARY FACILITIES (TOTAL 340 UNITS) AT UPPER BUKIT TIMAH ROAD (THE HILLSIDE CONDOMINIUM)

For

M/S BUKITVILLE INVESTMENT PTE LTD

Copy No.	

Prepared By: Tay K L

Authorised By: Tan L S

Date: 28 December 1998

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	Not Used
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	Not Used

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	1018-PQP File	5 June 1997
2	Tay K L	5 June 1997

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
1/0	5 June 1997	Section 1 - Section 9	26	1st issue of PQP
2/0	2 October 1998	Section 1 – Section 9	26	2nd issue of PQP
3	28 December 1998	Section 1 - Section 10	26	3rd issue of PQP
4	2 March 1999	7	2	Pg. 21

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Statistics of Development	
Site Area, m²	Not Available
Nett Floor Area, m²	44,613
Gross Floor Area, m²	49,319
Covered Carpark, m²	9,926
No. of Covered Carpark Lots	345
No. of Apartments/Houses	340
No. of Beds (for Hospitals)	-
No. of Guestroom (for Hotels)	-
No. of Blocks / No. of Storeys	3 Blocks of 10 Storeys
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1000)										
Services	EI	ACVI	LEI	FFAI	PSI	SPFI	BS			
Estimate	5500	4200	3000	900	5450	300	500			
Awarded	5000	3164	2500	680	4328	*700	410			

Total Project Construction Cost (S$ x1000)			
	Site Clearance	Piling Works	Main Contract
Estimate	-	-	93000
Awarded	230	7399	109000

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

**Include water fetures equipment*

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

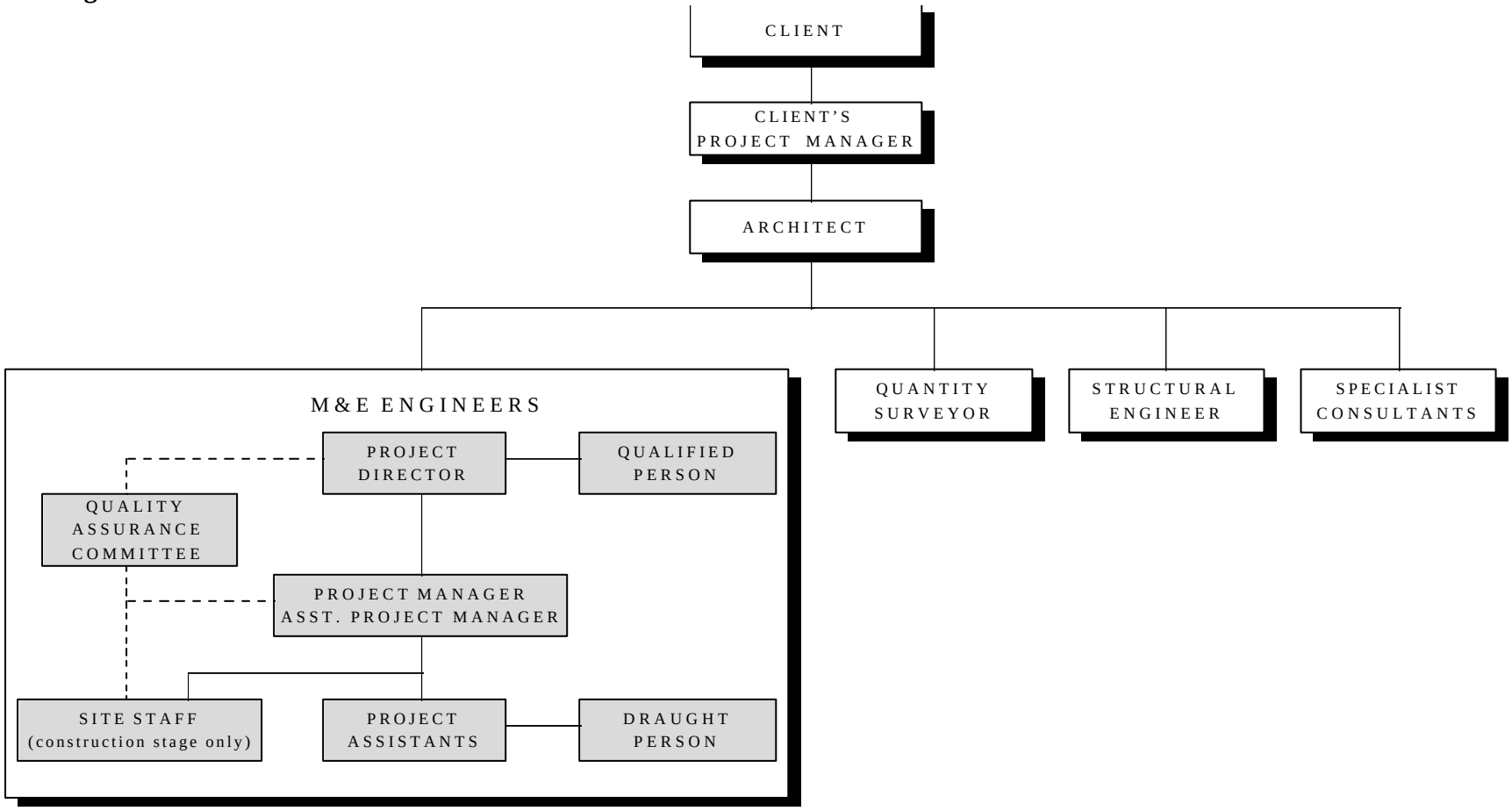
EJECTOR & DIVERTER		SUMP PUMP	✓	FUEL OIL TANK		LIFT	✓	PRESSURE VESSEL		HOISTS		FOAM	

(✓ *where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 Project Related Staff

TITLE		NAME
Project Director		Tan L S
Qualified Person	Mechanical	Loh C T
	Electrical	Tan L S
Project Manager		Tay K L
Assistant Project Manager		Fok Y C
Project Assistant (Mech)		Liaw S F
Project Assistant (Elect)		John Gui
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		-

3.3 Client/Client's Representatives

Client:- Bukitville Investment Pte Ltd

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

Tel:- 220 8411

Fax:- 225 0929

Client's Representative Related Staff:-

Name of Firm	Contact Person	Contact
Bukitville Investment Pte Ltd	Name: Tan Yop Poh Position: Project Manager	Tel: 220 8411 Fax: 225 0929 Pager: - Handphone: - E-mail: -
Bukitville Investment Pte Ltd	Name: Yeo Kuei Ping Position: Resident Engineer	Tel: 764 5530/764 6834 (Site) Fax: 764 9843 (Site) Pager: - Handphone: - E-mail: --
Bukitville Investment Pte Ltd	Name: Kenny Tan Position: M&E Clerk-of-Work	Tel: 764 5530/764 6834 (Site) Fax: 764 9843 (Site) Pager: - Handphone: - E-mail: -
-	Name: Position:	Tel: Fax: Pager: Handphone: E-mail:
-	Name: Position:	Tel: Fax: Pager: Handphone: Email:

3.4 Other Consultants (Local)

Function / Name of Firm	Contact Person	Contact
Architect RSP Architects Planners & Engineers Pte Ltd	Name: Mr Collin Chan Position: Architect	Tel: 737 7544 Fax: 733 9143 Pager: - Handphone: - Email: -
Quantity Surveyor LCH Quantity Surveying Consultant	Name: Ms Evelyn Ho Position: Quantity Surveyor	Tel: 222 2232 Fax: 227 2232 Pager: - Handphone: - Email: -
Structural Engineer HCE Engineering Partnership	Name: Ms Chua Lee Chen Position: Engineer	Tel: 337 5555 Fax: 337 2649 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:
Landscape Architects Site Concepts International Pte Ltd	Name: Mr Mark S Mahan Position: General Manager	Tel: 221 8826 Fax: 221 8937 Pager: - Handphone: - Email: -
_____ -	Name: Position:	Tel: Fax: 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 Woh Hup Pte Ltd	DC	Name: Mr Ng Yew Hung Position: Senior Project Manager	Tel: 892 1324 (Site) Fax: 764 9035 (Site) Pager: - Handphone: - Email:
Air Conditioning & Ventilation Installation Sub-Contractor O.Y.L. Sales & Service (S) Pte Ltd	NSC	Name: Mr Wong Soon Huey Position: Project Manager	Tel: 250 2966 Fax: 250 1807 Pager: 9217 6442 Handphone: Email
Plumbing & Sanitary Installation Sub-Contractor Poly Engineers Pte Ltd	NSC	Name: Mr Joseph Yeo Position: Project Manager	Tel: 292 5246 Fax: 296 0958 Pager: 9219 1772 Handphone: 97248556 E-mail: -
Electrical Installation Sub-Contractor Bintai Kindenko Pte Ltd	NSC	Name: Ms Seah Sye Mui Position: Vice President	Tel: 776 0330 Fax: 775 7227 Pager: - Handphone: - Email: -
Lift Installation Sub-Contractor Chevalier Singapore Holdings Ltd	NSC	Name: Mr Andrew Goh Position: Project Co-ordinator	Tel: 273 2266 Fax: 747 2988 Pager: 9594 1366 Handphone: - Email: -
Fire Fighting & Alarm Installation Sub-Contractor Sprinkler Engineering Pte Ltd	NSC	Name: Mr M P Thang Position: General Manager	Tel: 481 9255 Fax: 482 3643 Pager: 9404 3755 Handphone: - Email: -
Swimming Pool Filtration Plant Installation Sub-Contractor Venus Enterprises Pte Ltd	NSC	Name: Mr Noel Choo Position: Asst. Project Manager	Tel: 732 0011 Fax: 733 4342 Pager: 9518 3191 Handphone:9672 4420 E-mail: -
Security Installation Sub-Contractor Chubb (S) Pte Ltd	NSC	Name: Mr Kelvin Suen Position: Project Manager	Tel: 292 8421 Fax: 298 7310 Pager: 9415 5477 Handphone: - E-mail: -

** 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 Chin Yoke Fah	Tel: 831 8556 Fax: 831 8564
(c) Installation	Mr Tao Chong Meng	Tel: 277 7062 Fax: 277 7044
(d) Meter Section	Mr Tan Hoe Kiang	Tel: 733 1668
(e) Road Lighting	-	-
(f) Diversion	Mr Lim Yew Kiam/Mr Lee Soon Yong/ Mr Teo Poh Choon	Tel: 733 1668
Telecom:		
(a) Planning/Line Plant	Mr Lui Kwong Hing	Tel: 838 2853 Fax: 733 9895 Pager: 930 76789
(b) Domestic Telephone Operation Division	Mr Raymond Chong	Tel: 838 2583
(c) Diversion	-	-
BCD:		
(a) Building Plan	-	-
FSB:		
(a) Building Plan	-	-
(b) M&E Section	Mr Vijayaratnam (Fire System)	Tel: 833 6421
	Mr Rashi (Mechanical Ventilation System)	
PUB (Water)		
(a) Water Conservation	Mr Mufid	Tel: 731 3575
(b) Plumbing Plan	Mr Lau Kam Kok	Tel: 731 3552
(c) Diversion	-	-
PowerGas:		
(a) Planning/Submission	Mr Liew K B	Tel: 831 8662
(b) Installation/Inspection	-	-
(c) Diversion	-	-
ENV (Sewerage):		
(a) Building Plan	-	-
(b) M&E Section	Mr Chow Y M/Ms Gina Tan	Tel: 731 9630
(c) Diversion	-	-
ENV (Pollution Control)		
(a) Planning/Submission	-	-
(b) Inspection	-	-

SECTION 4

PROGRAMME

4.1 Overall Programme

		1998												1999												2000					
ID	TASK NAME	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
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

4.2 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	Comment	Resubmit	
Application for Electricity Supply	Power Supply Pte Ltd		5/4/95									5/5/95
Power Supply Substation	PowerGrid Pte Ltd		18/7/95	24/7/95	4/10/95	31/10/95	29/1/96	15/2/96	10/4/96	2/5/96	7/5/96	21/5/96
				6/11/96	15/11/96	4/12/96						18/12/96
Main Single Line Diagram	Power Supply Pte Ltd		21/8/96	13/9/96	16/9/96	30/9/96	01/10/96					13/12/96
Metering Layout	PowerGrid Pte Ltd		29/1/97	13/2/96	14/2/97							20/2/97
Sanitary Installation	ENV (Sewerage)		5/7/95	4/8/95	15/4/96	12/6/97	20/6/96	2/12/96	23/12/96			10/7/96 3/01/97
Domestic Water Supply	PUB (Water)		22/1/97	21/2/97	10/4/197	12/5/97	15/5/97					2/06/97
Gas Supply Installation	PowerGas Pte Ltd		31/12/96	23/1/97	18/3/97	-	-	-	-			9/4/97
Air Conditioning & Ventilation Inst	Fire Safety Bureau		9/6/97	27/6/97	25/7/97							8/8/97
Fire Fighting & Alarm Installation	Fire Safety Bureau		20/5/97	10/7/97	20/8/97							1/9/97
	Telecom (Broadband)		1/8/96	13/8/96	26/8/96	5/9/96	-	18/9/96	1/1096			4/1096
Telephone Installation	Telecom (TDCS)		-	-	-	-	-	-	-			-
	Telecom (Domestic Operation)		1/8/96	-	-	-	-	-	-			30/8/96
Fuel Storage	Fire Safety Bureau											
	Pollution Control Department											

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

NOT USED

SECTION 5

PROJECT RECORDS

5.1 List of Internal Files

Standard Files

File Ref: 1018		File Ref: 1018	
-CM	✓	-QSP	✓
-PC	✓	-BD	✓
-AE	✓	-CC	✓
-AM	✓	-GC	✓
-AA	✓	-CF	✓
-PQP	✓		

Project Files to be initiated by PM as and when required

File Ref: 1018		File Ref: 1018		File Ref: 1018	
-SM	✓	-SR	✓	-ET	-
-SC	✓	-QM		-MT	-
-SQ	✓	-EC	✓	-DF	-
-CO	✓	-PP	✓	-EOT/MC	✓
-AD	✓	-Q(M)/Q(E)	✓	-SF	✓

Service Files to be initiated by PM as and when required

	Service										
File Ref: 1018	ACVI	FFAI	PSI	EI	LI	SPFP	BS				
-G	✓	✓	✓	✓	✓	✓	✓				
-Q	-	-	-	-	-	-	-				
-RVO	✓	✓	✓	✓	-	-	✓	(In one File)			
-PP	-	-	✓	-	-	-	-				
-EI	✓	✓	✓	✓	✓	-	-	(In one File)			
-AI	✓	✓	✓	✓	-	-	-	(In one File)			
-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	Liaw S F
Incoming Architectural Sketches/Details	Liaw S F
Incoming Structural Drawings	Liaw S F
M&E Drawings	
- Electrical Installation	John Gui
- Lift Installation	John Gui
- Air Conditioning & Ventilation Installation	Liaw S F
- Fire Fighting & Alarm Installation	Liaw S F
- Plumbing & Sanitary Installation	Liaw S F
- Swimming Pool Filtration Installation	Liaw S F
- Building Security Installation	John Gui
Other Drawings	
- Landscape/Waterscape	John Gui

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

* When issues relate to the respective Consultant

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
- NA-	- NA -

8.2 List of Applicable Code of Practice and Regulations

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

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

Section	Title
A2	Documentation of Project Quality Plan
A3	Administration Control
A4	Document Control
A6	Archive Control
A9	Feedback Reporting
A10	Computer Control
B3	Design Control
B4	Design Change Control
B5	Drawing Control
B6	Specification Control
B7	Tender Process and Evaluation
C1	Contruction Process Control
C2	Testing and Commissioning
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	A
Pre-Qualification of Tenderers	A
Tender Documents	C
Tender Report	A
Payment Valuation for QS	For progress claim certification
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)*

Request for variation (RFV) to be issued to Client for approval before an instruction can be issued.

SECTION 10

LIST OF SUB-JOB

10.1 List of Sub-Job Numbers

NOT USED