PROJECT QUALITY PLAN

PROPOSED CONDOMINIUM HOUSING DEVELOPMENT COMPRISING OF 2 BLOCKS OF PART 25/30 & 1 BLOCK OF PART 26/30 STOREY FLATS (TOTAL 645 UNITS) WITH COMMUNAL FACILITIES & SWIMMING POOL ON LOT 2645 PT MK 10 BUKIT BATOK EAST AVE 2/5 (REGENT HEIGHTS CONDOMINIUM)

For

M/S BUKIT LANDMARK PROPERTIES PTE LTD

Copy No.	

Prepared By: Tay K L

Authorised By: Richard Teo

Date: 30 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	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	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	Not Used
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	1043-PQP File	30 May 1997
2	Tay Khoon Lee	30 May 1997

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
1/0	30 May 1997	Section 1 – 9	26	1st Issue
1/1	2 June 1998	2.3, 2.4, 3.2, 3.3, 3.4, 3.5, 3.6, 4.1, 4.3 & 5.1	11	3, 5, 6, 8, 9, 10, 11, 12, 13, 15 & 18
2	30 December 1998	Section 1 – 10	26	-
3	13 January 1999	Section 9	1	-

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Statistics of Development	
Site Area, m²	27034.00
Nett Floor Area, m²	67165.60
Gross Floor Area, m²	75691.40
Covered Carpark, m²	483
No. of Covered Carpark Lots	701
No. of Apartments/Houses	645
No. of Beds (for Hospitals)	-
No. of Guestroom (for Hotels)	-
No. of Blocks / No. of Storeys	3 Blocks of 30-Storeys
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1000)										
Services	EI	ACVI	LEI	FFAI	PSI	SPFI				
Estimate	-	-	-	-	-	-				
Awarded	5800	5090	3250	890	5900	450				

Total Project Construction Cost (S$ x1000)			
	Site Clearance	Piling Works	Main Contract
Estimate	-	-	-
Awarded	189	6130	105000

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

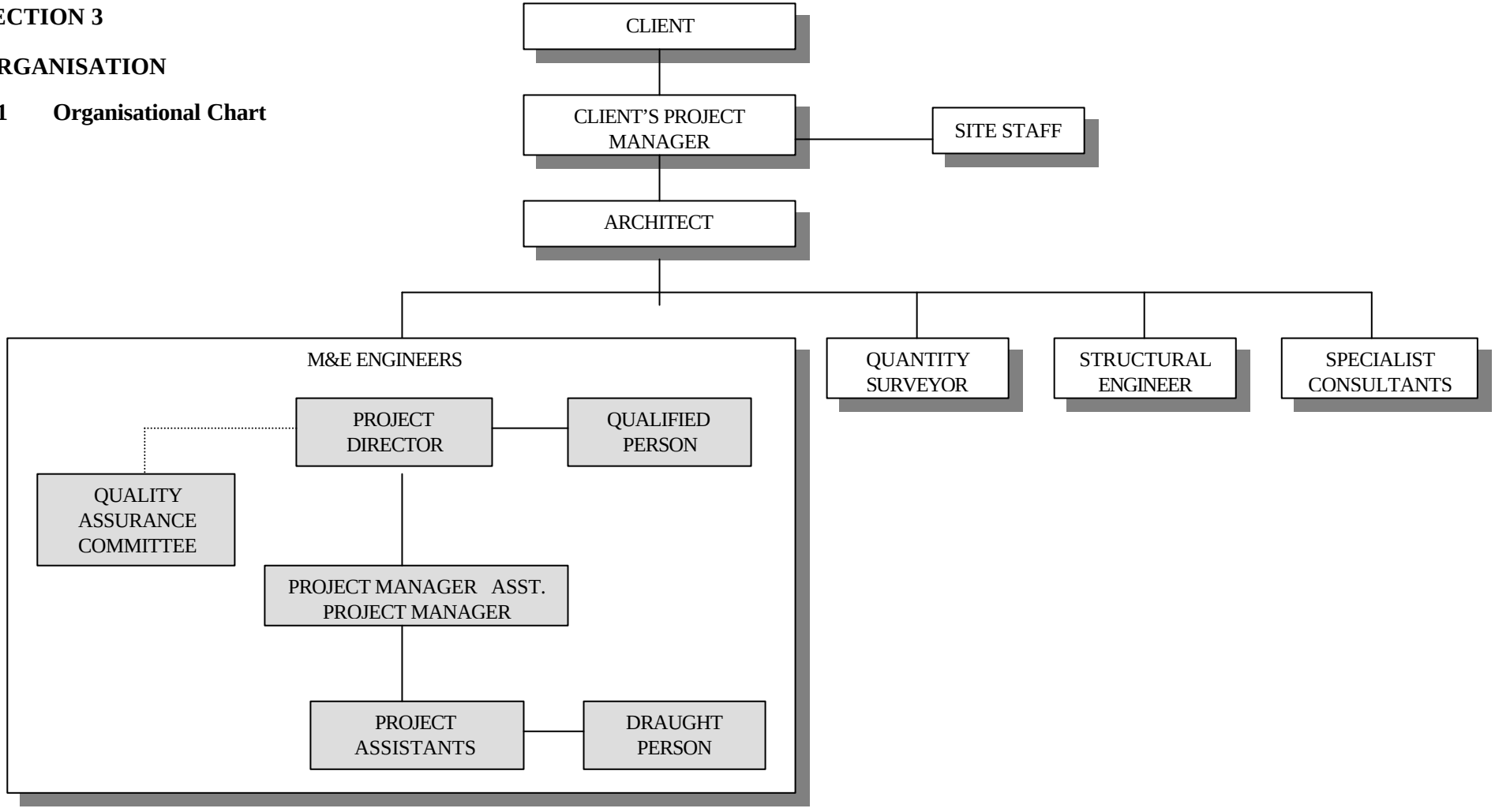
EJECTOR & DIVERTER		SUMP PUMP	✓	FUEL OIL TANK		LIFT	✓	PRESSURE VESSEL		HOISTS		FOAM	

(✓ *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
Qualified Person	Mechanical	Loh Chew Thong
	Electrical	Richard Teo
Project Manager		Tay K L
Assistant Project Manager		Loh F Y
Project Assistant (Mech)		Liaw S F
Project Assistant (Elect)		Loke S K
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		-

3.3 Client/Client's Representatives

Client:- Bukit Landmark Properties Pte Ltd

Address:- 14 Scotts Road
#06-00, 6th Storey, Far East Plaza
Singapore 228213

Tel:- 235 2411

Fax:- 235 3316

Client's Representatives:-

Name of Firm	Contact Person	Contact
Bukit Landmark Properties Pte Ltd	Name: Mr Thomas Ngai Position: Project Manager	Tel: 830 6397 (DID) Fax: 733 9071 Pager: - Handphone: - Email: -
Bukit Landmark Properties Pte Ltd	Name: Mr Faizal B. Ahmad Position: Resident Engineer	Tel: 569 4520 (Site) Fax: 566 8240 (Site) Pager: - Handphone: - Email: -
Bukit Landmark Properties Pte Ltd	Name: Mr Anthony Ng Position: M&E Clerk-of-Work	Tel: 569 4520 (Site) Fax: - Pager: - Handphone: - Email:

3.4 Other Consultants (Local)

Function / Name of Firm	Contact Person	Contact
Architect RDC Architects Pte Ltd	Name: Mr Mohan Shanmugan Position: Director	Tel: 338 1816 Fax: 336 3117 Pager: - Handphone: - Email: projects@rdca.com.sg
Quantity Surveyor Davis Langdon & Seah Singapore Pte Ltd	Name: Mr Telly Lui Position: Quantity Surveyor	Tel: 222 3888 Fax: 224 7089 Pager: - Handphone: - Email: -
Structural Engineer Tan Ee Ping (S) Pte Ltd	Name: Mr Choi Hon Kit Position: Engineer	Tel: 339 7277 Fax: 338 8362 Pager: - Handphone: - Email: -
Interior Designer Logan Designs Pte Ltd	Name: Mr Jonathan Lim Position: Designer	Tel: 222 2011 Fax: 221 6131 Pager: - Handphone: - Email: -
Lighting Consultant N.A.	Name: - Position: -	Tel: - Fax: - Pager: - Handphone: - Email: -
Acoustic Consultant N.A.	Name: - Position: -	Tel: - Fax: - Pager: - Handphone: - Email: -
Landscape Architect Sitetectonix Landscape Architect	Name: Ms Helen Yeo Smith Position: -	Tel: 324 6476 Fax: 324 6484 Pager: - Handphone: - Email: stx@pacific.net.sg

3.4 Other Consultants (Overseas)

NOT USED

3.5 Contractors/Sub-Contractors

Function / Name of Firm	Contract *	Contact Person	Contact
Main Contractor Neo Corporation	DC	Name: Mr B K Loh Position: Project Manager	Tel: 564 8047 Fax: 564 8964 Pager: - Handphone: - Email: -
Air Conditioning & Ventilation Installation Sub-Contractor Heng Electrical Engineering Pte Ltd	DSC	Name: Mr Philip Tan Position: Engineer	Tel: 452 3860 Fax: 452 2457 Pager: - Handphone: - Email: -
Plumbing & Sanitary Installation Sub-Contractor Zee Yee Electrical & Plumbing Pte Ltd	DSC	Name: Mr Charles Quek Position: Project Manager	Tel: 746 8302 Fax: 746 2537 Pager: - Handphone: - Email: -
Electrical Installation Sub-Contractor Sembawang Shipyard	NSC	Name: Mr Lau Poh Guan Position: Project Engineer	Tel: 750 8645 (DID) Fax: 750 8653 Pager: 9408 9602 Handphone: - Email: -
Lift & Escalator Installation Sub-Contractor Schindler Lifts (S) Pte Ltd	NSC	Name: Mr A Ganesh Position: Senior Project Engineer	Tel: 283 8611 Fax: 283 2212 Pager: 9307 9905 Handphone: - Email: -
Fire Fighting & Alarm Installation Sub-Contractor Bees Building Services Pte Ltd	NSC	Name: Mr William Wang Position: Director	Tel: 747 3438 Fax: 747 2118 Pager: - Handphone: - Email: -
Swimming Pool Filtration Plant Installation Sub-Contractor Chasetech Pte Ltd	NSC	Name: Mr Alex Tan Position: Engineer	Tel: 793 7818 Fax: 793 7816 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 Lim Yew Kiam	7313457
(b) Sub-Station	Mr Chin Yoke Fah	8318556
(c) Installation	Mr Wang Hee Weng	277 7043
(d) Meter Section	Mr Kok Ah Man	2777002
(e) Road Lighting	-	-
(f) Diversion	-	-
Telecom:		
(a) Planning/Line Plant	Mr Wong Yin Hong	8382861
(b) Installation	-	-
(c) Diversion	-	-
BCD:		
(a) Building Plan	-	-
FSB:		
(a) Building Plan	-	-
(b) M&E Section	Mr Tan Choon Leong (MV System)	838 6452
	Mr Vijayaratnam (Fire System)	838 6421
PUB (Water)		
(a) Water Conservation	Mr Mufid	731 3575
(b) Plumbing Plan	Mr Lau Kam Kok	731 3552
(c) Diversion	Mr Iqbal	467 0242
PowerGas:		
(a) Planning/Submission	-	-
(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

		1996			1997												1998												1999		
ID	TASK NAME	O	N	D	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
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	
Application for Electricity Supply	Power Supply Pte Ltd	-	6/9/95							22/9/95
Power Supply Substation	PowerGrid Pte Ltd	-	27/3/96	15/4/96	}	}				}
Main Single Line Diagram	Power Supply Pte Ltd	-	27/3/96	15/4/96	} 22/5/96	} 6/6/96	17/6/96			} 21/6/96
Consumer Switchroom Layout	PowerGrid Pte Ltd	-	27/3/96	15/4/96	}	}				}
Metering Layout	PowerGrid Pte Ltd	-	4/3/98	12/3/98	3/4/98					13/4/98
Sanitary Installation	ENV (Sewerage)	-	12/4/96	16/5/96	12/6/96					10/7/96
Domestic Water Supply	PUB (Water)	-	17/10/96	1/11/96	4/2/97	20/2/97	29/5/97	12/6/97	27/8/97	22/11/97
								20/9/97	24/10/97	
Gas Supply Installation	PowerGas Pte Ltd	-	-							
Air Conditioning & Ventilation Inst.	Fire Safety Bureau	-	9/10/98							12/10/98
Fire Fighting & Alarm Installation	Fire Safety Bureau	-	5/11/96	29/11/96	18/12/96	22/1/97	12/2/97			4/3/97
Telephone Installation	Telecom (Broadband)	-	20/1/97	28/2/97	2/6/96					30/6/97
	Telecom (TDCS)									
	Telecom (Domestic Operation)	2/9/97	6/11/97							13/11/97
Fuel Storage	Fire Safety Bureau									
	Pollution Control Department									

SECTION 4

PROGRAMME

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

Project Files to be initiated by PM as and when required

File Ref:		File Ref:		File Ref:	
-SM	✓	-SR	✓	-ET/MT	✓
-SC/SC(L)	✓	-QM		-MT	
-AI	✓	-EC/MC	✓	-DF	✓
-SQ	✓	-MC		-EOT	✓
-CO	✓	-PP	✓	-SF	✓
-ID	✓	-Q	✓	-VO	✓

Service Files to be initiated by PM as and when required

	Service										
File Ref:	ACVI	FFAI	PSI	EI	LI	SPFP					
-G	✓	✓	✓	✓	✓	✓					
-Q											
-RVO	✓	✓	✓	✓	✓	✓					
-PP	✓	✓	✓	✓	✓	✓					
-AI											
-VO											
-EI	✓	✓	✓	✓	✓	✓					
-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	Loke S K
- Lift & Escalator Installation	Loke S K
- 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
Other Drawings	
- Interior Design	Loke S K
- Landscape/Waterscape	Loke S K

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	* C	* C	
c.	Project Cost Estimate/Contract Cost	A	-	I	-	C	
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	A	-	C	-	C	
c.	Tender Evaluation Report	A	-	I	-	I	
d.	Design Report	A	-	A	-	-	
e.	Progress Report	I	-	I	-	-	
f.	Financial Report	I	-	I	-	C	
g.	Minutes of Meeting	I	-	I	-	-	
h.	Inspection Report	I	-	I	-	-	
i.	Testing & Comm. Report	I	-	I	-	-	
j.	O & M Manual	I	-	I	-	-	

* When issue also relates 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
-	-

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			
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~~

(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
A1	Documentation of Quality System Procedure
A2	Documentation of Project Quality Plan
A3	Administration Control
A4	Document Control
A6	Archive Control
A9	Feedback Reporting
B4	Design Change Control
B5	Drawing Control
C1	Construction Process Control
C2	Testing and Commissioning

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	I
Tender Report	I
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)*

1. Financial status to be issued to Quantity Surveyor monthly for compilation.

2. For changes of design, request for variation to be issued to Client before formalisation of the Architect Instruction.

3. No separate M&E technical meeting held monthly. Adhoc meetings are arranged when necessary. Technical issues were also discussed in the site meeting held weekly at the site.

SECTION 10

LIST OF SUB-JOB

10.1 List of Sub-Job Numbers

NOT USED