PROJECT QUALITY PLAN

KIM CHUAN TELECOMMUNICATION COMPLEX
AT 38 KIM CHUAN ROAD

For

M/S SINGAPORE TELECOMMUNICATIONS LIMITED

Copy No.	

Prepared By: Chong Lai Meng

Authorised By: Richard Teo

Date: 23 November 2001

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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	1241- PQP File	14 March 2000
2	CLM	14 March 2000

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	14 March 2000	1 to 10	26	
1	14 September 2000	2.2, 3.2, 3.5 – 3.6, 4.2 & 10.1	7	
2	23 November 2001	1 to 10	26	

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Telecommunication Complex

Statistics of Development	
Site Area, m²	14,182.4
Nett Floor Area, m²	27,671
Gross Floor Area, m²	35,456
Covered Carpark, m²	
No. of Covered Carpark Lots	189
No. of Apartments/Houses	-
No. of Beds (for Hospitals)	-
No. of Guestroom (for Hotels)	-
No. of Blocks / No. of Storeys	1 / 10
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)										
Services	EI	ACVI	LI	FFAI	PSI	GI	UPSI	API	PA	
Estimate	6.100	8.600	0.850	3.600	0.750	2.550	2.550	0.400	0.600	
Awarded	4.248	8.308	0.620	2.518	0.876	3.140	2.393	0.45	0.89	

Total Project Construction Cost (S$ x1M)			
	Site Clearance	Piling Works	Main Contract
Estimate			
Awarded	0.15	1.866	59.3

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	✓	GENERATOR	✓
SECURITY	✓	BST CARPARK EXH	✓	DRY RISER	✓	LPG GAS		UPS	✓
TELELIFT		HEATING				MEDICAL GAS		AUTO PAGING	✓
DATA COMM.								SECURITY	✓
FLUSHFLOOR TRUNKING								PUBLIC ADDRESS	✓

(✓ *where applicable*)

2.3.3 Submission to Relevant Authorities by Others

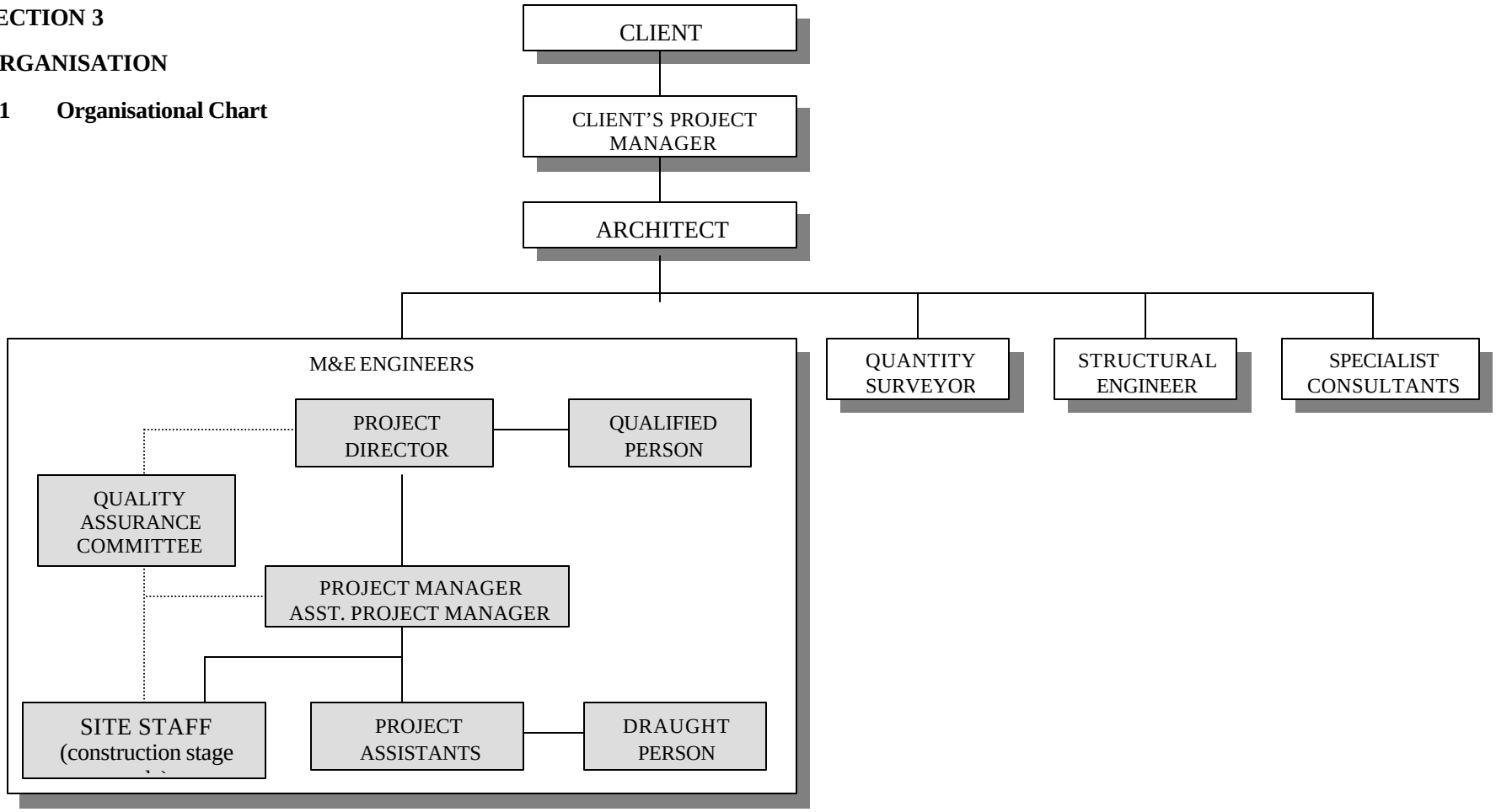
EJECTOR & DIVERTER		SUMP PUMP		FUEL OIL TANK	✓	LIFT & ESCALATOR		PRESSURE VESSEL		HOISTS		FOAM	

(✓ *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	Andrew Loh
	Electrical	Richard Teo
Project Manager		Chong Lai Meng
Assistant Project Manager		Goh Soon Huat
Project Assistant (Mech)		Sam Chong
Project Assistant (Elect)		Desmond Yeo
Draughtsperson		Common Pool
Construction Manager cum Resident Engineer		Gan Chiew Meng
Assistant Resident Engineer (M&E)		Samuel Tan
Clerk-of-Work (M&E)		-

3.3 Client/Client's Representatives

Client:- Singapore Telecommunications Limited

Address:- 375 Tanjong Katong Road #08-00
Katong Telecommunication Complex
Singapore 437132

Tel:- 346 3770

Fax:- 447 4552

Client's Representatives:

Name of Firm	Contact Person	Contact
Singapore Telecommunications Limited	Name: Ms Tan Ee Hua Position: Director	Tel: 346 3805 Fax: 440 1989 Pager: - Handphone: - Email: taneh@singtel.com.sg
Singapore Telecommunications Limited	Name: Mr Edward Lee Position: Senior Manager	Tel: 346 3770 Fax: 447 4552 Pager: - Handphone: 9661 6216 Email: edwardlee@singtel.com.sg
Singapore Telecommunications Limited	Name: Mr Lew Yew Meow Position: Senior Manager	Tel: 346 3768 Fax: 447 4552 Pager: 9302 5087 Handphone: 9628 8576 Email: lymw@singtel.com.sg
Singapore Telecommunications Limited	Name: Ms Tay Siew Lan Position: Project Assistant	Tel: 346 3771 Fax: 447 4552 Pager: - Handphone: 9628 7723 Email: taysl@singtel.com.sg
Singapore Telecommunications Limited	Name: Mr Sunny Khoo Position: Clerk Of Works	Tel: 2896205 Fax: 2898034 Pager: - Handphone: 96288523 Email: -
Failsafe Corporation Singapore Pte Ltd	Name: Mr Keith Ang Position: Vice President Name: Mr Ong Chin Seng Position: Project Manager Name: Mr Mark Sham Position: Senior Project Engineer	Tel: 216 7712 Fax: 216 7711 Pager: - Handphone: - Email: -

3.4 Other Consultants (Local)

Function / Name of Firm	Contact Person	Contact
Architect	Name: Mr Terry Tay Position: Director Name: Mr Goh Kee Siong Position: Associate	Tel: 467 2233 Fax: 466 7810 Pager: - Handphone: 9655 2616 Email: terrytay@at3.com.sg
Quantity Surveyor	Name: Mr Eward Tang Position: Director Name: Ms Hyacinth Tan Position: Associate	Tel: 536 3303 Fax: 536 2633 Pager: - Handphone: - Email: edwardtang@kpkqs.com.sg
Structural Engineer	Name: Dr See Lin Ming Position: Associate Director	Tel: 273 5255 / 377 9531 (DID) Fax: 274 0788 Pager: 94125384 Handphone: - Email: slm@meinhardt.com.sg
_____	Name: Position:	Tel: Fax: Pager: Handphone: Email:
_____	Name: Position:	Tel: Fax: Pager: Handphone: Email:
_____	Name: Position:	Tel: Fax: Pager: Handphone: Email:
_____	Name: Position:	Tel: Fax: 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
Demolition Contractor Kong Tong Construction Pte Ltd	DC	Name: I K Raj Position: Project Manager	Tel: 4874646 Fax: 4874440 Pager: - Handphone: - Email: -
Piling Contractor Sum Cheong Piling (S) Pte Ltd	DC	Name: Mr S K Chan Position: Project Manager	Tel: 861 1033 Fax: 861 0915 Pager: - Handphone: - Email: -
Main Contractor Greatearth Construction Pte Ltd	MC	Name: Mr Cheng Heng Wei Position: Deputy General Manager Name: Mr Tay Chan Kok Position: Project manager	Tel: 348 3438 Fax: 348 6238 Pager: - Handphone: 96579783 Email: -
Air Conditioning & Ventilation Installation Sub-Contractor Dai-Dan Co Ltd	NSC	Name: Mr K Miyanaga Position: General Manager Name: Mr Tan C K Position: Project Manager	Tel: 221 8488 Fax: 225 0544 / 220 2510 Pager: - Handphone: 96799856 Email: miyanaga@daidansin.com.sg
Plumbing & Sanitary Installation Sub-Contractor Lee Ann Electrical & Plumbing Pte Ltd	DSC	Name: Mr Ng Thiam Hoe Position: Managing Director Name: Mr Francis Low Position: Project Manager	Tel: 455 9339 Fax: 455 9242 / 455 9256 Pager: 9502 2753 Handphone: 9679 0180 Email: -
Electrical Installation Sub-Contractor Hitachi Plant Engineering & Construction Co Ltd	NSC	Name: Mr Chan Peng Woo Position: Section Manager	Tel: 275 4111 Fax: 275 4222 Pager: 9506 6600 Handphone: 9662 6340 Email: -
Lift Installation Sub-Contractor Schindler Lifts (S) Pte Ltd	NSC	Name: Mr Ivan Ho Position: Project Manager	Tel: 748 8611 Fax: 846 2212 Pager: Nil Handphone: 9633 2726 Email: -
Fire Fighting & Alarm Installation Sub-Contractor Deluge Fire Protection (SEA) Pte Ltd	NSC	Name: Mr Nelson Lee Position: Manager	Tel: 862 3688 / 862 3866 Fax: 862 3600 Pager: 9606 7671 Handphone: - Email: -
Generator Installation Sub-Contractor Hee's Engineering & Equipment Co Pte Ltd	NSC	Name: Mr Cheng Tai Foon Position: Managing Director Name: Mr Koh Guan Chua Position: Project Manager	Tel: 291 9166 Fax: 292 2732 Pager: - Handphone: 96791935 Email: -
Uninterruptible Power Supply Installation Sub-Contractor Socomec Sicon (Far East) Pte Ltd	NSC	Name: Mr James Tan Position: General Manager	Tel: 554 0900 Fax: 458 7377 Pager: - Handphone: 9624 5415 Email: james-tan@socomecsicon.com.sg
Security & Public Address Systems Installation Sub-Contractor ADC Technologies International Pte Ltd	NSC	Name: Mr William Sim Position: Operations Direction Name: Mr Tan Lip Boon Position: Project Engineer	Tel: 743 8088 Fax: 746 5935 Pager: - Handphone: 9007 2752 Email: -
Auto Paging Installation Sub-Contractor ADC Technologies International Pte Ltd	NSC	Name: Mr William Sim Position: Operations Direction Name: Mr Tan Lip Boon Position: Project Engineer	Tel: 743 8088 Fax: 746 5935 Pager: - Handphone: 9007 2752 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	Ms Ho Yin Shan	823 8551 / 823 8564
(b) Sub-Station	Mr Francis Chang See Tong	831 8555 / 831 8564
(c) Installation	-	
(d) Meter Section	Mr Tan Hoe Kiang	733 1668
(e) Road Lighting	-	
(f) Diversion	-	
Telecom:		
(a) Planning/Line Plant	Ms Dianne Low	825 6326 / 9859 0294
(b) Installation	-	
(c) Diversion	-	
BCD:		
(a) Building Plan	-	
FSB:		
(a) Building Plan	-	
(b) M&E Section	Lim Hock Beng	8386416/8386427
PUB (Water)		
(a) Water Conservation	Wong Meng Kin/Chang Meng Haur	7313977/7313023
(b) Plumbing Plan	Willy Lim/Ng Guan Chai	7313598/7313023
(c) Diversion	-	
PowerGas:		
(a) Planning/Submission	Wong Bon Fah	8318682
(b) Installation/Inspection	-	
(c) Diversion	-	
ENV (Sewerage):		
(a) Building Plan	-	
(b) M&E Section	Yong Wei Hin	7319622/7319725
(c) Diversion	-	
ENV (Pollution Control)		
(a) Planning/Submission	-	
(b) Inspection	-	

SECTION 4

PROGRAMME

4.1 Overall Programme

			2000												2001											
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

4.2 Authority Submission Status for M&E Services - 1st Submission

Service	Authority	Original Submission		Comments/Resubmission						Approval/
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	Clearance
Application for Electricity Supply	Power Supply Pte Ltd	Dec 99	9/12/99							24/12/99
Power Supply Substation	PowerGrid Pte Ltd	Jan 00	12/1/00	17/1/00	8/3/00	14/3/00	27/3/00	4/4/00	28/4/00	8/5/00
Main Single Line Diagram Consumer Switchroom Layout	Power Supply Pte Ltd PowerGrid Pte Ltd	June 00	5/6/00							14/6/00
Metering Layout	PowerGrid Pte Ltd	Aug 00	21/8/00							1/9/00
Sanitary Installation	ENV (Sewerage)	April 00	5/4/00							7/4/00
Domestic Water Supply	PUB (Water)	May 00	24/5/00	5/7/00	28/8/00	29/9/00	1/11/00	17/11/00	7/12/00	20/1/01
Gas Supply Installation	PowerGas Pte Ltd	Sept 00	7/9/00							31/10/00
Air Conditioning & Ventilation Inst.	Fire Safety Bureau (ACMV)	July 00	12/7/00							15/7/00
Fire Fighting & Alarm Installation	Fire Safety Bureau (FFAI)	July 00	30/6/00							1/7/00
Telephone Installation	Telecom (Broadband)	Jan 00	3/1/00	26/1/00	30/3/00	12/5/00	5/6/00			26/6/00
	Telecom (TDCS)									
	Telecom (Domestic Operation)									
Fuel Storage	Fire Safety Bureau									
	Pollution Control Department									

SECTION 4

PROGRAMME

4.3 Authority Submission Status for M&E Services (Amendments) - 2nd Submission – NOT APPLICABLE

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 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	✓	-BD[SG]	✓
-VO	✓	-BD(PH II)	✓

Project Files to be initiated by PM as and when required

File Ref:		File Ref:		File Ref:	
-SM	✓	-SR	✓	-ET/MT	✓
-SC	✓	-QM		-EMC	✓
-AI	✓	-EC/MC	✓	-DF	
-SQ	✓	-MC		-EOT	✓
-CO	✓	-PP	✓	-601	✓

Service Files to be initiated by PM as and when required

	Service										
File Ref:	ACVI	FFAI	PSI	EI	LI	PG	U	C	AP		
-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	Sam Chong
Incoming Architectural Sketches/Details	Sam Chong
Incoming Structural Drawings	Sam Chong
M&E Drawings	
- Electrical Installation	Desmond Yeo
- Lift Installation	Desmond Yeo
- Air Conditioning & Ventilation Installation	Sam Chong
- Fire Fighting & Alarm Installation	Sam Chong
- Plumbing & Sanitary Installation	Sam Chong
- Generator Installation	Desmond Yeo
- Security & Public Address Systems Installation	Desmond Yeo
- Uninterruptible Power Supply Installation	Desmond Yeo
- Auto Paging Installation	Sam Chong
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

Item No.	Description*	Required From	Required By	Date Required	Remarks
1.	Mechanical equipment power requirement	CLM	GSH		
2.	Mechanical equipment essential load requirement	CLM	GSH		
3.	Mechanical equipment control panel & isolator location	CLM	GSH		
4.	Lift motor room heat load	GSH	CLM		

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

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			
Emergency Voice Communication System	~~BS~~	SS	~~NFPA~~		
Air Conditioning & Ventilation Installation	~~BS~~	~~AS~~	~~NFPA~~	SS	~~MS~~
Lift Installation	~~BS~~	SS			
Sprinkler System	~~BS~~	SS	~~NFPA~~	~~AS~~	~~LPC~~
Dry 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~~
Mechanical Smoke Control System	BS	~~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
A1	Documentation of Quality System Procedure
A2	Documentation of Project Quality Plan
A3	Administration Control
A4	Document Control
A5	Library Control
A6	Archive Control
A7	Purchasing Control
A8	Training 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
B7	Tender Process and Evaluation
C1	Construction 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	A
Tender Report	A
Payment Valuation for QS	I
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)*

9.2.1 Prequalification of M&E Tenderers.

9.2.2

SECTION 10

LIST OF SUB-JOB

10.1 List of Sub-Job Numbers

Sub Job No	Description	Allocation Details
601	Enhanced Redundancy and Fitting out works	