Alpha
Engineering Consultant

PROJECT QUALITY PLAN

PROPOSED 5-STOREY LIGHT INDUSTRIAL FACTORY (PARCEL A2) (URA SALES PARCEL 495) ON LOT 5141V MK23 AT 1 KAKI BUKIT ROAD 1 (BEDOK PLANNING AREA) SINGAPORE

For

M/S EUNOS LINK TECHNOLOGY PARK LTD

Copy No.	1

Prepared By: Heng Chye Hing

Authorised By: Tan L S

Date: 2 November 2005

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
	Local Overseas – 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	Authority Submission Status for M&E Services (Amendment) – 2nd Submission

TABLE OF CONTENTS

SECTION	DESCRIPTION
5	**PROJECT RECORDS**
5.1	List of Internal Files
5.2	Filing of Drawings
6	**INTERFACING**
6.1	Method of Interface
6.2	Internal Design Interface
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 – 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 – Not Used
10	**LIST OF SUB-JOB**
10.1	List of Sub-Job Numbers

SECTION 1

QUALITY PLAN CONTROL AND DISTRIBUTION

1.1 List of Copy Holders

Copy No.	Copy Holder	Date of Issue
1	1097(2)-PQP	15 February 2001
2	Heng C H	15 February 2001

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
1	15 Feb 2001	Section 1 – 10	26	
2	2 Nov 2005	Section 1 – 10	26	

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Light Industrial Flatted Factories

Statistics of Development	
Site Area, m²	26,018
Nett Floor Area, m²	-
Gross Floor Area, m²	53,178
Covered Carpark, m²	14,965
No. of Covered Carpark Lots	643
No. of Apartments/Houses	-
No. of Beds (for Hospitals)	-
No. of Guestroom (for Hotels)	-
No. of Blocks / No. of Storeys	1 Block 5 Storeys
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)										
Services	EI	ACVI	LEI	FFAI	PSI	SPFI				
Estimate	6.0	3.2	4.34	3.0	3.5					
Awarded	3.68	1.0	0.775	1.4	1.07					

Total Project Construction Cost (S$ x1M)			
	Site Clearance	Piling Works	Main Contract
Estimate	-	-	-
Awarded	-	-	38.7

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

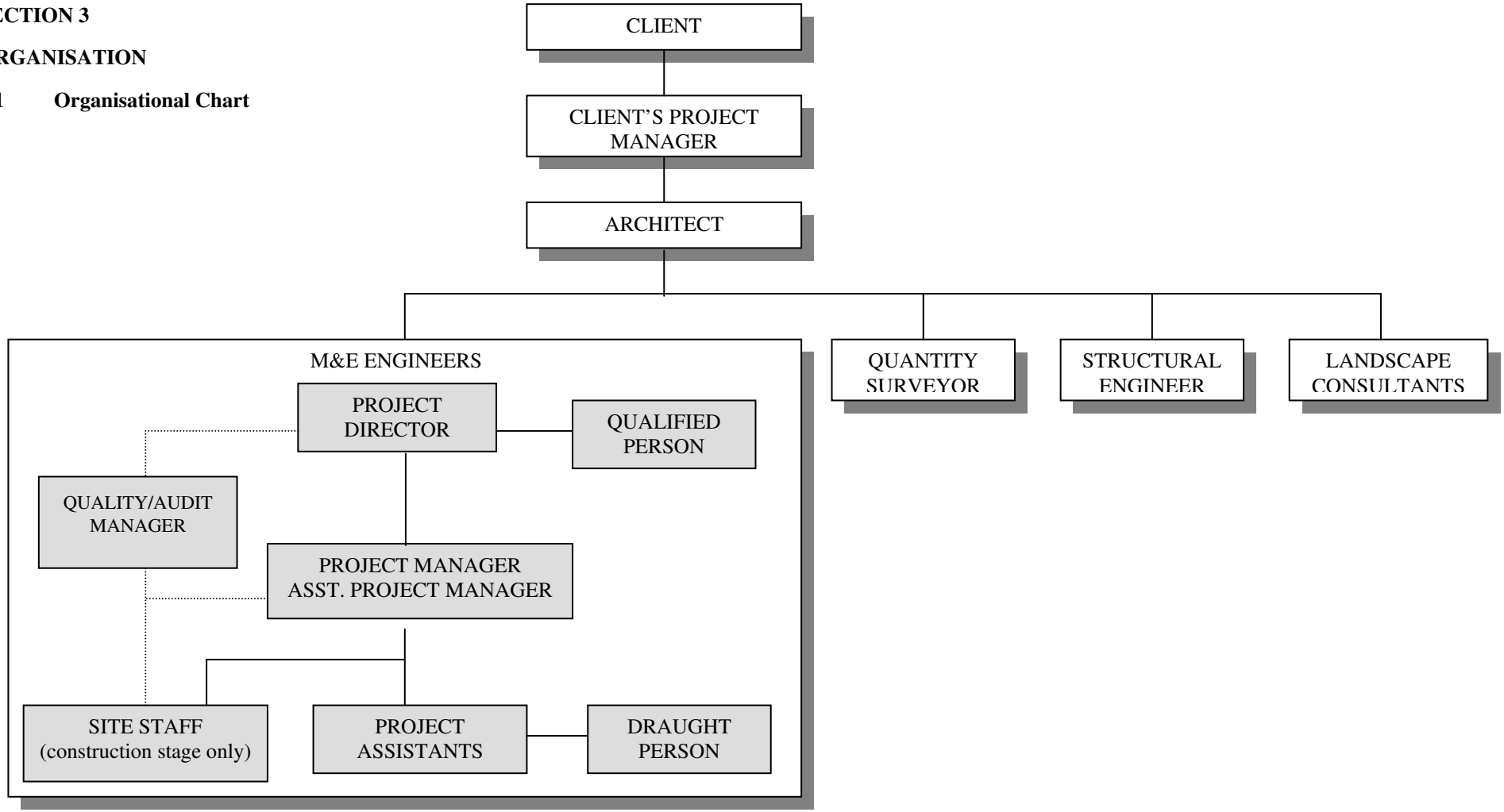
EJECTOR & DIVERTER		SUMP PUMP		FUEL OIL TANK		LIFT & ESCALATOR	✓	PRESSURE VESSEL		HOISTS		FOAM	

(✓*where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 AEC's Project Team Member

TITLE		NAME
Project Director		Tan L S
Qualified Person	Mechanical	Andrew Loh
	Electrical	Tan L S
Project Manager		Heng C H
Assistant Project Manager		Goh S H
Project Assistant (Mech)		Ang W L
Project Assistant (Elect)		Alvin Ong
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		Arrifin Bin Abdullah

3.3 Client/Client's Representatives

Client:- Eunos Link Technology Park Ltd

Address:- 14 Scotts Road #06-00
Far East Plaza
Singapore 228213

Tel:- 6235 2411

Fax:- 6733 9071

Client's Representatives:-

Name of Firm	Contact Person	Contact
Eunos Link Technology Park Ltd	Name: Mr Leo Cheung Position: Project Manager	Tel: 6235 2411 Fax: 6733 9071 Handphone: - Email: leo_cheung@fareast.com.sg
	Name: Position: -	Tel: Fax: Handphone: - Email: -
	Name: Position:	Tel: Fax: Handphone: Email:
	Name: Position:	Tel: Fax: Handphone: Email:
	Name: Position:	Tel: Fax: Handphone: Email:

3.4 **Other Consultants** (Local)

Function / Name of Firm	Contact Person	Contact
Architect RDC Architects Pte Ltd	Name: Ms Rita Soh Position: Project Director	Tel: 6278 8878 Fax: 6278 7727 Handphone: - Email: enterpriseone@rdca.com.sg
Quantity Surveyor KPK Quantity Surveyors	Name: M/s Ng C C/Phan Lay Eng Position: Quantity Surveyor	Tel: 536 3303 Fax: 536 2633 Handphone: Email: layeng@kpkqs.com.sg
Structural Engineer KTP Consultants Pte Ltd	Name: Mr Chua Kien Pin Position: -	Tel: 6273 5622 Fax: 6273 8454 Handphone: - Email: chuakp@ktp.com.sg
Landscape Consultant PDAA Design Pte Ltd	Name: Ms Yoly C Estomata Position: Director	Tel: 6297 8128 Fax: : 6297 5628 Handphone: - Email: pdaasing@pacific.net.sg
Lighting Consultant NA	Name: - Position: -	Tel: - Fax: - Pager: - Handphone: - Email: -
Acoustic Consultant NA	Name: - Position: -	Tel: - Fax: - Pager: - Handphone: - Email: -

3.4 **Other Consultants** (Overseas) - **NOT USED**

Function / Name of Firm	Contact Person	Contact
Architect	Name: Position:	Tel: Fax: Handphone: Email:
M&E Consultant	Name: Position:	Tel: Fax: Handphone: Email:
Quantity Surveyor	Name: Position:	Tel: Fax: Handphone: Email:
Structural Engineer	Name: Position:	Tel: Fax: Handphone: Email:
Interior Designer	Name: Position:	Tel: Fax: Handphone: Email:
Lighting Consultant	Name: Position:	Tel: Fax: Handphone: Email:
Acoustic Consultant	Name: Position:	Tel: Fax: Handphone: Email:
_____	Name: Position:	Tel: Fax: Handphone: Email:

3.5 Contractors/Sub-Contractors

Function / Name of Firm	Contract *	Contact Person	Contact
Main Contractor China Construction (South Pacific) Development Co Pte Ltd	DC	Name: Mr Frankie Chew Position: Project Manager	Tel: 6227 4537 / 6745 3823 Fax: 6227 5073 / 6745 8607 Handphone: - Email: kakibt@chinaconstruction.com.sg
Air Conditioning & Ventilation Installation Sub-Contractor Cycle Aire (S) Pte Ltd	NSC	Name: Mr Tan K T Position: Manager	Tel: 6744 3933 Fax:6744 8857 Handphone: - Email: cycle_aire@pacific.net.sg
Plumbing & Sanitary Installation Sub-Contractor Great Resources M&E Contractor Pte Ltd	DSC	Name: Mr Low B K Position: Project Manager	Tel: 6756 6123 Fax: 6756 6597 Handphone: - Email: -
Electrical Installation Sub-Contractor Great Resources M&E Contractor Pte Ltd	NSC	Name: Mr Seow Oon Tiong Position: Project Manager	Tel: 6756 6123 Fax: 6756 6597 Handphone: - Email: -
Lift & Escalator Installation Sub-Contractor Schindler Lifts (Singapore) Pte Ltd	NSC	Name: Mr Frankie Goh Position: Project Manager	Tel: 6748 8611 Fax: 6846 2212 Handphone: - Email: frankie_goh@sg.schindler.com
Fire Fighting & Alarm Installation Sub-Contractor Great Resources M&E Contractor Pte Ltd	NSC	Name: Mr Tan Wee Yick Position: Project Manager	Tel: 6756 6123 Fax: 6756 6597 Handphone: - Email: -
Swimming Pool Filtration Plant Installation Sub-Contractor		Name: Position:	Tel: Fax: Handphone: Email:
Carpark System Installation Sub-Contractor		Name: Position:	Tel: Fax: Handphone: Email:
_____		Name: Position:	Tel: Fax: 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
SP PowerGrid:		
(a) Sub-Station	Mr Francis Chang See Tong	6823 8555
(b) Diversion		
SP Services:		
(a) Customer Supply	Mr Lee Chi Meng	
(b) Installation		
(c) Meter Section		
(d) Road Lighting		
TFCC:		
(a) SCV	Mr Lee Him Buan	6848 5855
(b) SingTel		
(c) IDA		
BCA:		
(a) Building Plan		
FSSD:		
(a) Building Plan		
(b) M&E Plan	Mr Chong Wee Chung	6848 1466
PUB (Water Supply) Network Dept:		
(a) Water Conservation		
(b) Plumbing Plan	Mr Ng Guan Chai	6731 3209
(c) Diversion		
PUB Water Reclamation (Network) Dept:		
(a) Building Plan/CBPU	Mrs Alison Liew	6732 7733 / 6731 9663
(b) M&E Plan	Mrs Alison Liew	6732 7733 / 6731 9663
(c) Diversion		
CityGas Pte Ltd:		
(a) Planning/Submission	Mr Liew Khee Boon	6586 8888 / 6686 8846
(b) Installation/Inspection		
PowerGas Pte Ltd:		
(a) Diversion		
NEA (Pollution Control)		
(a) Planning/Submission	Mrs Alison Liew	6732 7733 / 6731 9663
(b) Inspection		

SECTION 4

PROGRAMME

4.1 Overall Programme

			2004												2005							2006							
ID	TASK NAME	MONTHS	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	June - Nov	D	J	F	M	A	M	J	J	A
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		N.A																										
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	SP Services Ltd									
Power Supply Substation	SP PowerGrid Ltd		21/5/04	31/5/04	17/6/04					25/6/04
Metering Layout	SP Services Ltd	N.A								
Sanitary Installation	PUB Water Reclamation (Network) Dept		28/10/04							1/11/04
Domestic Water Supply	PUB (Water Supply) Network Dept		11/10/04	25/10/04	29/11/04					3/1/05
Gas Supply Installation	City Gas Pte Ltd		29/10/04	8/11/04	29/11/04					10/12/04
Air Conditioning & Ventilation Inst.	FSSD		9/12/04							14/12/04
Fire Fighting & Alarm Installation	FSSD		28/12/04							30/12/04
Telephone Installation	TFCC		27/9/04							14/10/04
Broadband Co-axial Cable System (BCS)	Starhub Cable Vision		27/9/04							14/10/04
Fuel Storage	FSSD	N.A								
	NEA (Pollution Control)	N.A								

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	SP Services Ltd									
Power Supply Substation	SP PowerGrid Ltd									
Metering Layout	SP Services Ltd									
Sanitary Installation	PUB Water Reclamation (Network) Dept									
Domestic Water Supply	PUB (Water Supply) Network Dept		29/4/05							20/5/05
Gas Supply Installation	City Gas Pte Ltd		22/4/05	4/5/05	3/6/05					16/6/05
Air Conditioning & Ventilation Inst.	FSSD									
Fire Fighting & Alarm Installation	FSSD		5/8/05							23/8/05
Telephone Installation	TFCC									
Broadband Co-axial Cable System (BCS)	Starhub Cable Vision									
Fuel Storage	FSSD									
	NEA (Pollution Control)									

SECTION 5

PROJECT RECORDS

5.1 List of Internal Files

Standard Files

File Ref:		File Ref:	
- Owner	✓	- Architect	✓
- Authorities	✓	- Other Consultants	✓
- Contractors	✓	- CC	✓
- CF	✓	- PQP/QSP	✓

Project Files to be initiated by PM as and when required

File Ref: 1097(2)		File Ref:		File Ref:	
-601					

Files under the old Filing System

File Ref: 1097(2)		File Ref: 1097(2)		File Ref: 1097(2)		File Ref: 1097(2)		File Ref: 1097(2)	
-CM	✓	-CO/SR/SQ	✓	-VO	✓				
-PC	✓	-BD	✓	-EC/MC	✓				
-AE	✓	-GC	✓	-SC	✓				
-AM	✓	-PP	✓	-E/L-G	✓				
-AA	✓	-SM	✓	-A/F/P-G	✓				

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	Ang W L
Incoming Architectural Sketches/Details	Ang W L
Incoming Structural Drawings	Ang W L
M&E Drawings	
- Electrical Installation	Goh S H
- Lift & Escalator Installation	Goh S H
- Air Conditioning & Ventilation Installation	Ang W L
- Fire Fighting & Alarm Installation	Ang W L
- Plumbing & Sanitary Installation	Ang W L
- Swimming Pool & Filtration Installation	NA
Other Drawings	NA

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	HCH	GSH	**Before tender**	**Completed**
2.	Mechanical equipment essential load requirement	HCH	GSH		**Completed**
3.	Mechanical equipment control panel & isolator location	HCH	GSH		**Completed**
4.	LMR heat load	GSH	HCH		**Completed**
5.	Transformer room heat load	GSH	HCH		**Completed**

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

SECTION 7

WORK AUTHORISATION

Activity \ Authorised Signatories	PD	QP	PM	AE	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
AE : Assistant Engineer
SS : AEC Site Staff

SECTION 8

DESIGN INPUT & METHODOLOGY

8.1 List of Client's Standards, Reference Documents or Brief – NOT USED

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 & 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~~		

(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 Management System Procedures

Section	Title	✓ where applicable
M1	Preparation of Consultancy Offer	✓
M2	Project Commissioning and Service Agreement	✓
M3	Design Control	✓
M4	Design Change Control	✓
M5	Tender Process and Evaluation	✓
M6	Authority Submission	✓
M7	Construction Process Control	✓
M8	Testing and Commissioning	✓
S1	Document Control	✓
S2	Documentation of Quality Management System Procedure	✓
S3	Documentation of Project Quality Plan	✓
S4	Specification Control	✓
S5	Library Control	✓
S6	Archive Control	✓
S7	Filing Control	✓
S8	Drawing Control	✓
S9	Administration Control	✓
S10	Purchasing Control	
S11	Training Control	
S12	Computer Control	
Q1	Quality System Audit	
Q2	Feedback Reporting	
Q3	Clients Feedback	
Q4	Management Review	

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,C
M&E Cost Estimate Report	A,C
Pre-Qualification of Tenderers	-
Tender Documents	I
Tender Report	A,C
Payment Valuation for QS	C,I
Certificates of Supervision for TOP/CSC	I

** 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)*

* To be submitted within 7 days upon receipt of progress claim

SECTION 10

LIST OF SUB-JOB

10.1 List of Sub-Job Numbers

Sub Job No	Description	Allocation Details
601	Conversion of Factories at 5th storey to Food Processing Units	Manpower – HCH/AWL Manhour – To be progressively recorded in timesheet