Alpha
Engineering Consultant

PROJECT QUALITY PLAN

PROPOSED ERECTION OF A BLOCK OF 10-STOREY SINGLE-USER, SINGLE OCCUPIER INDUSTRIAL BUILDING WITH 1 LEVEL BASEMENT CARPARK ON LOT NO. 8683W PT MK 24 AT KALLANG SECTOR (GEYLANG PLANNING AREA)

For

M/S ASCENDAS LAND (SINGAPORE) PTE LTD

Copy No.	1

Prepared By: R. Vijay

Authorised By: Richard Teo

Date: 24 September 2003

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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	1365 PQP File	24 September 2003
2	R. Vijay	24 September 2003

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	24 September 2003	1 to 10	26	

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Commercial/ Office Development

Statistics of Development	
Site Area, m²	10,946
Nett Floor Area, m²	36,444.00
Gross Floor Area, m²	27,364.00
Covered Carpark, m²	6,259.00
No. of Covered Carpark Lots	246
No. of Apartments/Houses	-
No. of Beds (for Hospitals)	-
No. of Guestroom (for Hotels)	-
No. of Blocks / No. of Storeys	2 Blocks of 12-storey including Basement and Roof
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)										
Services	EI	ACVI	LEI	FFAI	PSI	IB				
Estimate	3.32	3.97	1.00	1.00	0.841	0.597				
Awarded	2.55	3.331	0.97	0.849	0.899	0.596				

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

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

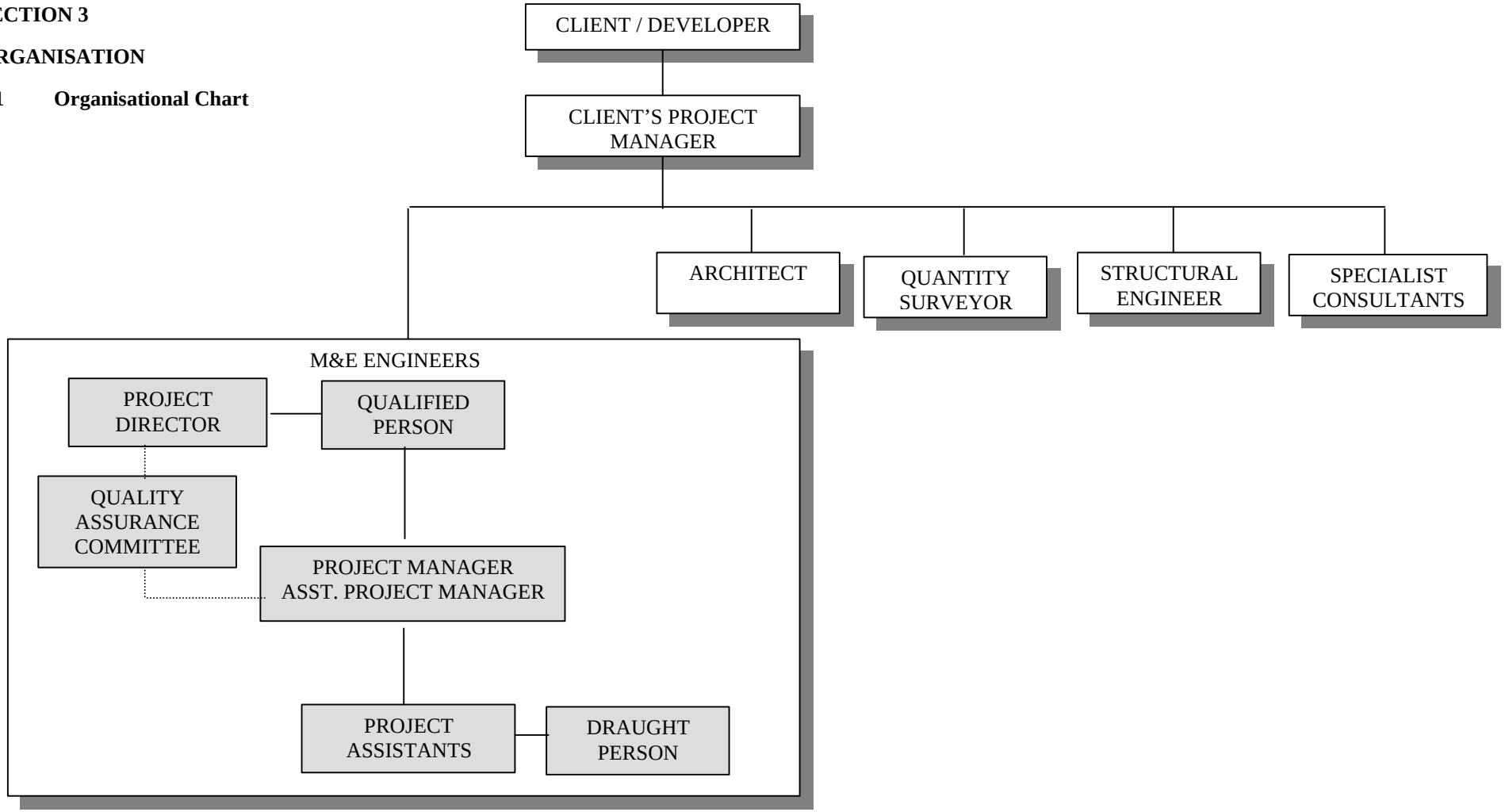
EJECTOR & DIVERTER		SUMP PUMP		FUEL OIL TANK		LIFT & ESCALATOR	✓	PRESSURE VESSEL		HOISTS		FOAM	

(✓ *where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 AEC's Project Team Member

TITLE		NAME
Project Director		Richard Teo (RT)
Qualified Person	Mechanical	Loh Chew Thong (LCT)
	Electrical	Loh Fook Yuen (LFY)
Project Manager		R. Vijay (VJ)
Assistant Project Manager		Loh Fook Yuen (LFY)
Project Assistant (Mech)		Rachelle Ooi (RO)
Project Assistant (Elect)		Derek Ong (DO)
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		-

3.3 Client/Client's Representatives

Client:- Bovis Lend Lease Pte Ltd

Address:- 510 Thomson Road #06-01, SLF Building, Singapore 298135

Tel:- 6258 8777

Fax:- 6259 6677

Client's Representatives:-

Name of Firm	Contact Person	Contact
Ascendas Services Pte Ltd	Name: Mr Yew Kok Chee Position: Project Manager	Tel: 6774 9198 Fax: 6777 8962 Pager: - Handphone: 9684 3243 Email: kokchee.yew@ascendas.com
	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 (Local)

Function / Name of Firm	Contact Person	Contact
Architect Architects 61 Pte Ltd	Name: Mr Ashvinkumar Position: Director (Projects)	Tel: 6433 9119 Fax: 6732 5439 Pager: - Handphone: - Email: ashvin@a61.com.sg
Quantity Surveyor NA	Name: - Position: -	Tel: - Fax: - Pager: - Handphone: - Email: -
Structural Engineer Worley Pte Ltd	Name: Mr Pierre Belcour Position: Senior Engineer	Tel: 6735 8444 Fax: 6735 7444 Pager: - Handphone: - Email: pierre.belcour@worley.com.au
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:
_____	Name: Position:	Tel: Fax: Pager: Handphone: Email:
_____	Name: Position:	Tel: Fax: Pager: Handphone: Email:

3.4 **Other Consultants** (Infineon's Consultants)

Function / Name of Firm	Contact Person	Contact
Architect TEC PMC Inc.	Name: Mr Martin Atzinger Position: Architect	Tel: +1 323 933800 Fax: +1 323 9388900 Pager: - Handphone: - Email: atzinger@tecarchitecture.com
M&E Consultant Siemens Pte. Ltd. (Industrial Building Consultants)	Name: Dennis Yeoh Position: Senior Quantity Surveyor	Tel: 6740 7276 Fax: 6740 7270 Pager: - Handphone: - Email: dennis.yeoh@siemens.com
Quantity Surveyor	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Structural Engineer	Name: Position:	Tel: Fax: 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:
_____	Name: Position:	Tel: Fax: Pager: Handphone: Email:

3.5 Contractors/Sub-Contractors

Function / Name of Firm	Contract *	Contact Person	Contact
Project Manager Bovis Lend Lease Pte Ltd		Name: Mr Fong See Chet Position: S. Project Manager	Tel: 6258 8777 Fax: 6259 6677 Pager: - Handphone: 9662 2433 Email: see-chet.fong@ap.bovislendlease.com
Air Conditioning & Ventilation Installation Sub-Contractor GDS Engineering Pte Ltd	NSC	Name: Mr K Venkatesan Position: Project Manager	Tel: 6285 8112 Fax: 6287 8430 Pager: - Handphone: - Email: kimgds@qala.com.sg
Plumbing & Sanitary Installation Sub-Contractor Kim Technology & Systems Pte Ltd	NSC	Name: Mr Desmond Foo Position: S. Project Manager	Tel: 6289 1624 Fax: 6287 8430 Pager: - Handphone: 9450 4312 Email: kimsan@kimgds.com.sg
Electrical Installation Sub-Contractor Nylect Engineering Pte Ltd	NSC	Name: Mr Simon Tan Position: Operations Manager	Tel: 6759 6888 Fax: 6759 6988 Pager: - Handphone: 9782 8487 Email: simon.tan@nylect.com
Lift & Escalator Installation Sub-Contractor Fujitec (Singapore) Pte Ltd	NSC	Name: Mr Andy Lai Position: Project Executive	Tel: 6241 6222 Fax: 6444 7626 Pager: 9609 0201 Handphone: 9838 0716 Email: pjf@fujitecsg.com
Fire Fighting & Alarm Installation Sub-Contractor Deluge Fire Protection (SEA) Pte Ltd	NSC	Name: Mr Louis Soon Position: Project Manager	Tel: 6862 3688 Fax: 6862 3600 Pager: - Handphone: - Email: louis@deluge.com.sg
Building Management Systems & Control Installation Sub-Contractor Johnson Controls Pte Ltd	NSC	Name: Mr Daniel Ng Position: Project Engineer	Tel: 6740 6774 Fax: 6743 4420 Pager: 9556 8827 Handphone: - Email: daniel.wl.ng@jci.com
Carpark System Installation Sub-Contractor NA		Name: - Position: -	Tel: - Fax: - Pager: - Handphone: - Email: -
_____		Name: Position:	Tel: Fax: 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 Rick Lim	6823 8008/ 6823 8289
(b) Sub-Station	Mr Francis Chang	6823 8555/ 6823 8564
(c) Installation		
(d) Meter Section		
(e) Road Lighting		
(f) Diversion	Mr P Sivanadam	6290 9155/ 6290 9124
Telecom:		
(a) Planning/Line Plant	Mr Chiam Choong Juke	6211 1830/ 6211 2116
(b) Installation		
(c) Diversion		
BCD:		
(a) Building Plan		
FSSD:		
(a) Building Plan		
(b) M&E Section	Cpt. Han	6848 1467
PUB (Water)		
(a) Water Conservation		
(b) Plumbing Plan		
(c) Diversion		
PUB (NEWater)	Mr Kuang Kim Yaw	6731 3515
PowerGas:		
(a) Planning/Submission		
(b) Installation/Inspection		
(c) Diversion		
ENV (Sewerage):		
(a) Building Plan		
(b) M&E Section		
(c) Diversion		
ENV (Pollution Control)		
(a) Planning/Submission		
(b) Inspection		

SECTION 4

PROGRAMME

4.1 Overall Programme

			2003												2004											
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.	Sub-Structure Construction Period																									
5.	Super-Structure Construction Period																									
6.	TOP																									
7.	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 Pte Ltd	27/05/03	27/05/03	-	-	-	-	-	-	01/06/03
Power Supply Substation	PowerGrid Ltd	20/06/03	11/06/03	19/06/03	24/06/03	-	-	-	-	01/07/03
Consumer Switchroom Layout	PowerGrid Ltd									
Metering Layout	PowerGrid Ltd	31/10/03								
Sanitary Installation	ENV (Sewerage)	3/10/03								
Domestic Water Supply	PUB (Water)	22/09/03	22/09/03							
Gas Supply Installation	City Gas Pte Ltd	NA	NA	NA	NA	NA	NA	NA	NA	NA
Air Conditioning & Ventilation Inst.	FSSD	3/10/03								
Fire Fighting & Alarm Installation	FSSD	3/10/03								
Telephone Installation	TFCC (MDF room)	16/08/03	16/08/03							
	TFCC- SCV (CDR room)	16/08/03	16/08/03							

SECTION 4

PROGRAMME

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

Service	Authority	Original Submission		Comments/Resubmission						Approval/ Clearance
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	
Application for Electricity Supply	SP Services Pte Ltd									
Power Supply Substation	PowerGrid Ltd									
Consumer Switchroom Layout	PowerGrid Ltd									
Metering Layout	PowerGrid Ltd									
Sanitary Installation	ENV (Sewerage)									
Domestic Water Supply	PUB (Water)									
Gas Supply Installation	City Gas Pte Ltd									
Air Conditioning & Ventilation Inst.	FSSD									
Fire Fighting & Alarm Installation	FSSD									
Telephone Installation	TFCC (MDF room)									
	TFCC- SCV (CDR room)									

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	
-SC		-QM		-MT	
-AI		-EC/MC	✓	-DF	
-SQ		-MC		-EOT	
-CO		-PP			

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	Derek Ong
Incoming Architectural Sketches/Details	Derek Ong
Incoming Structural Drawings	Derek Ong
M&E Drawings	
- Electrical Installation	Derek Ong
- Lift & Escalator Installation	Derek Ong
- Air Conditioning & Ventilation Installation	Rachelle Ooi
- Fire Fighting & Alarm Installation	Rachelle Ooi
- Plumbing & Sanitary Installation	Rachelle Ooi
- Building Management System Installation	Rachelle Ooi
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

Item No.	Description*	Required From	Required By	Date Required	Remarks

** 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	-	-	-	
b.	Project Administration	-	A	-	-	-	
c.	Project Cost Estimate/Contract Cost	-	A	-	-	-	
2.	**Drawings**						
a.	Outline Design Drgs.	-	A	C	C	-	
b.	Sketch Design Drgs.	-	A	C	C	-	
c.	Final Design Drgs.	-	A	C	C	-	
d.	Shop Drawings	-	A	I	I	-	
e.	As Built Drgs.	-	I	I	I	-	
3.	**Other Document**						
a.	Specification	-	A	-	-	-	
b.	Tender Document	-	A	-	-	-	
c.	Tender Evaluation Report	-	A	-	-	-	
d.	Design Report	-	A	-	-	-	
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	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 Questionnaires			✓	
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 – 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~~
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~~
Town Gas/LPG Supply System	BS	SS	NFPA	~~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
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	4.0	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	
Ecodial	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	NA
M&E Cost Estimate Report	NA
Pre-Qualification of Tenderers	NA
Tender Documents	A
Tender Report	A
Payment Valuation for QS	NA
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)* – **NOT USED**

SECTION 10

LIST OF SUB-JOB

10.1 List of Sub-Job Numbers – NOT USED

Sub Job No	Description	Allocation Details