Alpha
Engineering Consultant

PROJECT QUALITY PLAN

PROPOSED AMARANDA GARDENS CONDOMINIUM AT SERANGOON AVENUE 3

For

M/S SHERWOOD DEVELOPMENT PTE LTD

Copy No.	

Prepared By: Loh Fook Yuen

Authorised By: Richard Teo

Date: 22 August 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	1339-PQP	22 August 2003
2	Loh Fook Yuen	22 August 2003

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	22 August 2003	1 to 10	26	

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Statistics of Development	
Site Area, m²	11,182.10
Nett Floor Area, m²	
Gross Floor Area, m²	23,482.329
Covered Carpark, m²	6,858.78
No. of Covered Carpark Lots	208
No. of Apartments/Houses	189
No. of Beds (for Hospitals)	-
No. of Guestroom (for Hotels)	-
No. of Blocks / No. of Storeys	3 Blocks of 17-Storey
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)										
Services	EI	ACVI	LEI	FFAI	PSI	SPFI				
Estimate	-	-	-	-	-	-				
Awarded	1.72	1.22	0.582	0.22	1.467	0.133				

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

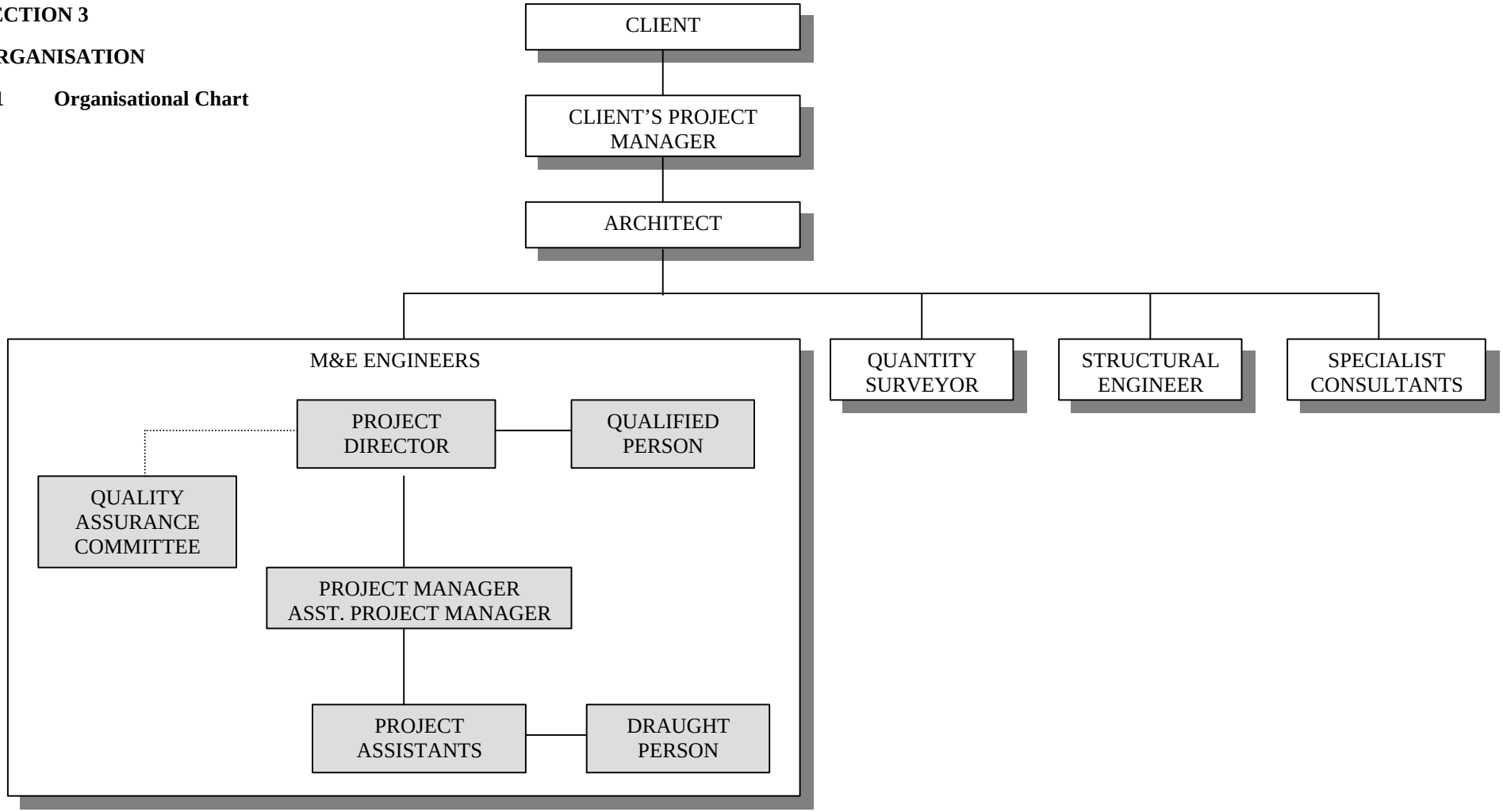
EJECTOR & DIVERTER	✓	SUMP PUMP	✓	FUEL OIL TANK		LIFT & ESCALATOR		PRESSURE VESSEL		HOISTS		FOAM	

(✓ *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
Qualified Person	Mechanical	Loh Chew Thong
	Electrical	Richard Teo
Project Manager		Loh F Y
Assistant Project Manager		Tay W C
Project Assistant (Mech)		Yip Y F
Project Assistant (Elect)		Lim C H
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		-

3.3 Client/Client's Representatives

Client: Sherwood Development Pte Ltd

Address: 230 Victoria Street #14-01/10
Bugis Junction Towers
Singapore 188024

Tel: 6338 8111

Fax: 6337 7206

Client's Representatives:-

Name of Firm	Contact Person	Contact
Sherwood Development Pte Ltd	Name: Mr Thomas Lo Position: Project Manager	Tel: 6338 8111 Fax: 6337 7206 Pager: - Handphone: - Email: tlo@kepland.com.sg
M&E Quality Inspector	Name: Mr Anthony Cheng Position: QA/QC	Tel: 6285 0817 Fax: 6285 6192 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 Design Link Architects	Name: Mr Chong Nan Hing Position: Architect	Tel: 6221 2355 Fax: 6221 1242 Pager: - Handphone: - Email: designlink@dla.com.sg
Quantity Surveyor KPK Quantity Surveyors	Name: Ms Chan Sow Wai Position: Quantity Surveyor	Tel: 6536 3303 Fax: 6536 2633 Pager: - Handphone: - Email: kpkqs@singnet.com.sg
Structural Engineer KTP Consultants Pte Ltd	Name: Mr Jonathan Ang Position: Associate Director	Tel: 6273 5622 Fax: 6273 8454 Pager: - Handphone: - Email: jonathan@ktp.com.sg
Interior Designer NA	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Lighting Consultant NA	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Acoustic Consultant NA	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Landscape Architect PDAA Design Pte Ltd	Name: Ms Yoly Estrada Position: Director	Tel: 6297 8128 Fax: 6297 5628 Pager: - Handphone: - Email: pdaasing@pacific.net.sg
Design Consultant Smallwood, Reynolds, Stewart, Stewart & Associates Pte Ltd	Name: Mr Tan Tee Hung Position: Associate Director	Tel: 6835 4355 Fax: 6835 4322 Pager: - Handphone: - Email: small@srss.com.sg

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

Function / Name of Firm	Contact Person	Contact
Architect	Name: Position:	Tel: Fax: Pager: Handphone: Email:
M&E Consultant	Name: Position:	Tel: Fax: Pager: Handphone: Email:
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
Main Contractor Poh Lian Construction Pte Ltd		Name: Mr David Foong Position: Project Manager	Tel: 6285 0817 Fax: 6285 6192 Pager: - Handphone: 9737 6578 Email: davidfoong@pohlian.com.sg
Air Conditioning & Ventilation Installation Sub-Contractor Leong Hum Engineering Pte Ltd		Name: Ms Mary Leong Position: Director	Tel: 6296 8473 Fax: 6296 0213 Pager: - Handphone: - Email: ihepl@starhub.net.sg
Plumbing & Sanitary Installation Sub-Contractor Santa Trading Pte Ltd		Name: Mr Koo Yam Fah Position: S. Project Manager	Tel: 6382 3018 Fax: 6382 2347 Pager: - Handphone: 9665 2916 Email:
Electrical Installation Sub-Contractor Link Electrical Pte Ltd		Name: Mr Peter Cheng Position: Director	Tel: 6745 1126 Fax: 6745 1165 Pager: - Handphone: - Email: linkepl@yahoo.com.sg
Lift & Escalator Installation Sub-Contractor Hitachi Asia Ltd		Name: Mr Victor Sia Position: Deputy General Manager	Tel: 6416 1711 Fax: 6561 0991 Pager: - Handphone: - Email: -
Fire Fighting & Alarm Installation Sub-Contractor Sprinkler Engineering Pte Ltd		Name: Mr Thang M P Position: General Manager	Tel: 6453 1488 Fax: 6453 7656 Pager: - Handphone: - Email: spkeng@singnet.com.sg
Swimming Pool Filtration Plant Installation Sub-Contractor Aqua Works & Engineering Pte Ltd		Name: Mr Lee Chin Ngee Position: Project Engineer	Tel: 6588 2033 Fax: 6588 2022 Pager: - Handphone: - Email: cnlee@acro.com.sg
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 Francis Chang	6823 8555
(b) Sub-Station	Mr Gan Hwee Tiong	6240 9222
(c) Installation		
(d) Meter Section		
(e) Road Lighting		
(f) Diversion		
Telecom:		
(a) Planning/Line Plant	Mr Barry Tan	6848 5798
(b) Installation		
(c) Diversion		
BCD:		
(a) Building Plan		
FSB:		
(a) Building Plan		
(b) M&E Section	Mr Kwan Lian Sian	6848 1455
PUB (Water)		
(a) Water Conservation	M/s Tham Tuck Kuan/Basheer	6731 3978
(b) Plumbing Plan	Mr Lim Chee Leong	6731 3695
(c) Diversion		
PowerGas:		
(a) Planning/Submission	Mr Liew K B	6586 8846
(b) Installation/Inspection	M/s Soo Cheong Kuay/Misnal B Pagi	6586 8876
(c) Diversion	Mr Banny Koh	6751 8111
ENV (Sewerage):		
(a) Building Plan	Mr Han Kit Juan	6732 7733
(b) M&E Section		
(c) Diversion		
ENV (Pollution Control)		
(a) Planning/Submission		
(b) Inspection		

SECTION 4

PROGRAMME

4.1 Overall Programme

			2002												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	J	F	M	A	M	J	J
1.	Site take-over and setting up																																
2.	Structural Drawing & Approval																																
3.	M&E Submission & Shop Drawing																																
4.	Sub-Structure Construction Period																																
5.	Super-Structure Construction Period																																
6.	TOP																																
7.	CSC																																
8.																																	
9.																																	
10.																																	
11.																																	
12.																																	
13.																																	

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	PowerGrid Ltd		6/8/02		15/8/02		24/9/02		21/8/03	
Consumer Switchroom Layout	PowerGrid Ltd									
Metering Layout	PowerGrid Ltd									
Sanitary Installation	PUB (Sewerage)	8/9/02	23/9/02							30/9/02
Domestic Water Supply	PUB (Water)	8/9/02	23/9/02							9/1/03
Gas Supply Installation	City Gas Pte Ltd	28/6/02	16/7/02							15/11/02
Air Conditioning & Ventilation Inst.	FSSD	13/9/02	23/9/02							21/9/02
Fire Fighting & Alarm Installation	FSSD	13/9/02	22/11/02							23/11/02
Telephone Installation	IDA (TFCC)	28/6/02	15/7/02							

*** submitted by Done Consultant**

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 Ltd									
Power Supply Substation	PowerGrid Ltd									
Consumer Switchroom Layout	PowerGrid Ltd									
Metering Layout	PowerGrid Ltd									
Sanitary Installation	PUB (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	IDA (TFCC)									

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	✓	-VO	✓

Project Files to be initiated by PM as and when required

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

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	Yip Y F
Incoming Architectural Sketches/Details	Yip Y F
Incoming Structural Drawings	Yip Y F
M&E Drawings	
- Electrical Installation	Lim C H
- Lift Installation	Lim C H
- Air Conditioning & Ventilation Installation	Yip Y F
- Fire Fighting & Alarm Installation	Yip Y F
- Plumbing & Sanitary Installation	Yip Y F
- Swimming Pool & Filtration Installation	Yip Y F
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	A			
b.	Sketch Design Drgs.		A	A			
c.	Final Design Drgs.		A	A			
d.	Shop Drawings			A			
e.	As Built Drgs.			A			
3.	**Other Document**						
a.	Specification						
b.	Tender Document						
c.	Tender Evaluation Report		A				
d.	Design Report		A				
e.	Progress Report			A		A	
f.	Financial Report			A		A	
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 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 - 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			
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 Management System Procedures

Section	Title
M6	Authority Submission
M7	Construction Process Control
M8	Testing and Commissioning

8.5 List of Software Used For Design/Analysis – NOT USED

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	NA
M&E Cost Estimate Report	NA
Pre-Qualification of Tenderers	NA
Tender Documents	NA
Tender Report	NA
Payment Valuation for QS	A
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