PROJECT QUALITY PLAN

COMPACT METAL WAREHOUSE FACTORY & OFFICE AT TUAS

For

M/S COMPACT METAL INDUSTRIES LTD

Copy No.	

Prepared By: Wong T C

Authorised By: Tan L S

Date: 28 December 1998

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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	1141-PQP File	13 June 1997
2	Alan Lau	13 June 1997

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
1/0	13 June 1997	Section 1 to Section 10	25	1st Issue
2/0	1 October 1998	Section 1 to Section 9	25	2nd Issue
3	28 December 1998	Section 1 to Section 10	26	3rd Issue

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Warehouse, Factory & Office

Statistics of Development	
Site Area, m²	17,000
Nett Floor Area, m²	-
Gross Floor Area, m²	21,667
Covered Carpark, m²	-
No. of Covered Carpark Lots	-
No. of Apartments/Houses	-
No. of Beds (for Hospitals)	-
No. of Guestroom (for Hotels)	-
No. of Blocks / No. of Storeys	4 Storeys
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)										
Services	EI	ACVI	LEI	FFAI	PSI	BSSI				
Estimate	3	1.3	0.14	1.2	0.3	0.15				
Awarded	1.966	1.63	0.094	0.68	0.58	0.06				

Total Project Construction Cost (S$ x1M)			
	Site Clearance	Piling Works	Main Contract
Estimate	-	2.7	26.00
Awarded	-	1.45	21.76

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.									
UNDERFLOOR TRUNKING	✓								

(✓ *where applicable*)

2.3.3 Submission to Relevant Authorities by Others

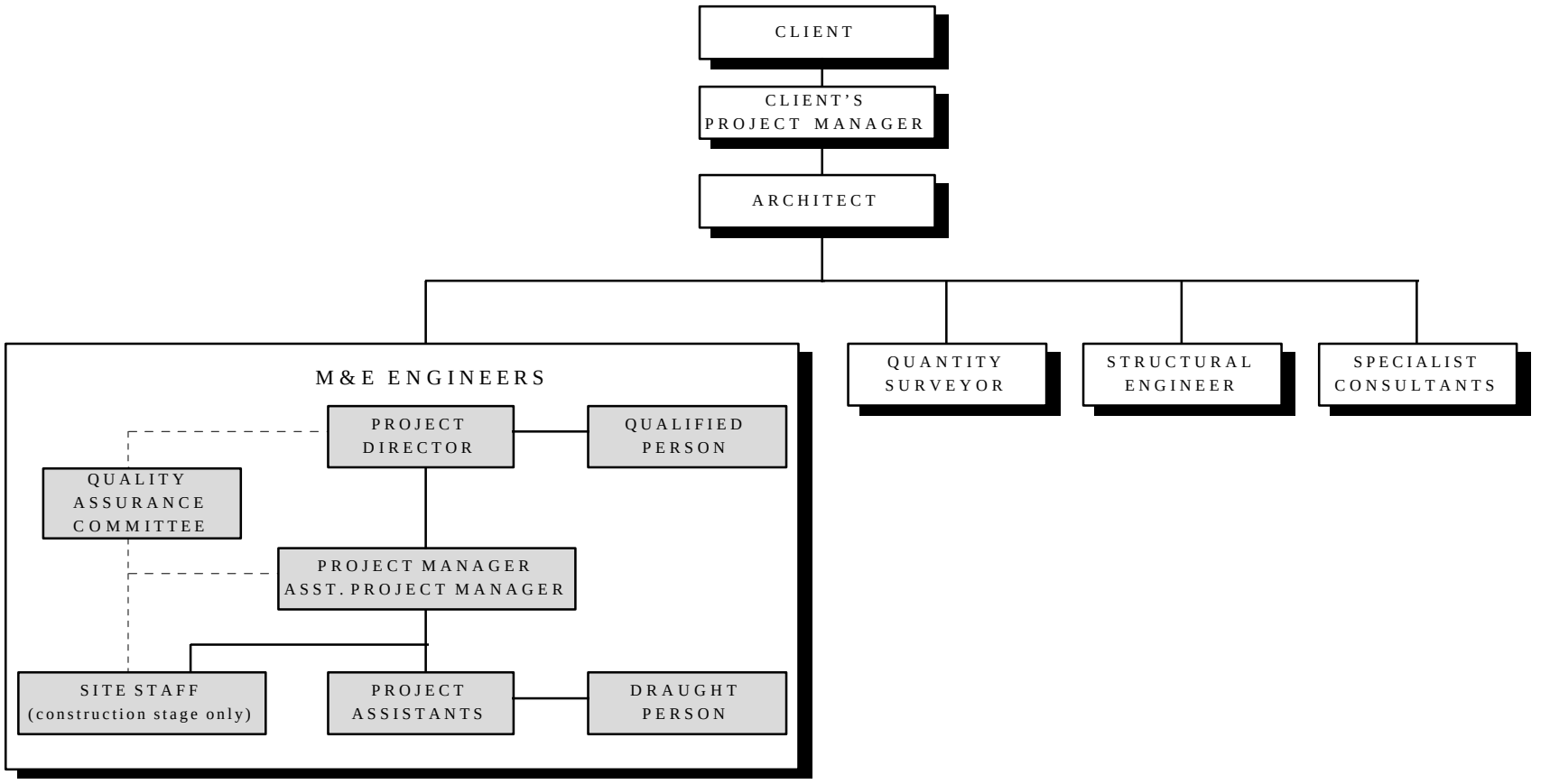
EJECTOR & DIVERTER		SUMP PUMP	✓	FUEL OIL TANK		LIFT & ESCALATOR		PRESSURE VESSEL		HOISTS		FOAM	

(✓ *where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 AEC's Project Team Member

TITLE		NAME
Project Director		Tan Lai Siong
Qualified Person	Mechanical	Andrew Loh
	Electrical	Tan Lai Siong
Project Manager		Alan Lau
Assistant Project Manager		Wong Tack Chow
Project Assistant (Mech)		Serene Teh Bee Kin
Project Assistant (Elect)		-
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		-

3.3 Client/Client's Representatives

Client:- COMPACT METAL INDUSTRIES LTD

Address:- 1 Gul Drive Jurong Town
Singapore 629454

Tel:- 861 2130

Fax:- 861 2953

Client's Representatives:-

Name of Firm	Contact Person	Contact
Compact Metal Industries Ltd	Name: Mr K T Tan Position: Director	Tel: 861 2130 Fax: 861 2953 Pager: - Handphone: - Email: -
Compact Metal Industries Ltd	Name: Mr Alex Tan Position: GP Dev. Manager	Tel: 861 2130 Fax: 861 2953 Pager: - Handphone: - Email: -
Compact Metal Industries Ltd	Name: Mr Kenny Goh Position: Production Manager	Tel: 861 2130 Fax: 861 2953 Pager: - Handphone: - Email: -
Archi Engineering	Name: Mr Andrew Quek Position: Production Manager	Tel: 861 9600 Fax: 861 9608 Pager: - Handphone: - Email: -
Integrate Pte Ltd	Name: Mr Raymond Foo Position: Production Manager	Tel: 861 1666 Fax: 862 1400 Pager: - Handphone: - Email: -

3.4 Other Consultants (Local)

Function / Name of Firm	Contact Person	Contact
Architect Architects Team 3 Pte	Name: Mr Kok Siew Hoong Position: Director Name: Mr Roger Ting Position: Associate Name: Mr Milind Dighe Position: Project Architect	Tel: 466 8867 Fax: 466 7810 Fax: 467 7475 (Milind Dighe) Pager: - Handphone: - Email: Archt3@signet.com.sg
Quantity Surveyor Barton Associates Pte Ltd	Name: Mr Julian Collins Position: Managing Director Name: Miss Josephine Tan Position: Quantity Surveyor	Tel: 298 5833 Fax: 294 1609 Pager: - Handphone: - Email: barton@singnet.com.sg
Structural Engineer Oscar Faber Consultants Pte Ltd	Name: Mr Lee Tuck Chong Position: Director Name: Mr Cheng Ying Position: Engineer	Tel: 336 7277 Fax: 338 1076 Pager: - Handphone: - Email: -
Interior Designer Space Partnership Pte Ltd	Name: Ms Andrea Wong Position: Senior Project Director Name: Mr Hakim Position: Designer	Tel: 221 7700 Fax: 336 3005 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 (Overseas)

NOT USED

3.5 Contractors/Sub-Contractors

Function / Name of Firm	Contract *	Contact Person	Contact
Main Contractor Tong Hup Seng Enterprises	Bill of Quantities	Name: Mr Kevin Ang Position: Director Name: Mr Fong Kum Yeo Position: M&E Engineer	Tel: 863 2989 Fax: 863 1214 Pager: - Handphone: - Email: -
Air Conditioning & Ventilation Installation Sub-Contractor GDS Engineering Pte Ltd	NSC	Name: Mr Yeo Aik Teck Position: Director Name: Mr Zhou Hong Bin Position: Engineer	Tel: 289 1624 Fax: 287 8430 Pager: - Handphone: - Email: -
Plumbing & Sanitary Installation Sub-Contractor New Union Jack	DSC	Name: Mr Michael Tan Position: Director	Tel: 569 7393 Fax: 569 8683 Pager: - Handphone: - Email: -
Electrical Installation Sub-Contractor Emac Pte Ltd	NSC	Name:MrLow Kwang Liang Position: Executive Director Name: Mr Lim Kim Position: Engrg Assistant	Tel: 348 7270 Fax: 348 7505 Pager: - Handphone: - Email: -
Lift & Escalator Installation Sub-Contractor LG Industrial Systems	NSC	Name: Mr Daniel Goh Position: Project Engineer	Tel: 323 7361 Fax: 323 7362 Pager: - Handphone: - Email: -
Fire Fighting & Alarm Installation Sub-Contractor Deluge Fire Protection (SEA) Pte Ltd	NSC	Name: Mr Albert Lam Position: Project Manager Name: Mr Gary Tan Position: Project Engineer	Tel: 862 3688 Fax: 862 3600 Pager: - Handphone: - Email: -
Swimming Pool Filtration Plant Installation Sub-Contractor -		Name: Position:	Tel: Fax: Pager: Handphone: Email:
Carpark System Installation Sub-Contractor -		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 No:/Fax No:
PowerGrid/Power Supply:		
(a) Customer Supply	Mr Lee Chi Ming	Tel: 8318281 Fax: 8318239
(b) Sub-Station	Mr Chin Yoke Fah	Tel: 8318556 Fax: 8318564
(c) Installation	Mr Loh Park Woon	Tel: 27777063 Fax: 2777944
(d) Meter Section	-	-
(e) Road Lighting	-	-
(f) Diversion	-	-
Telecom:		
(a) Planning/Line Plant	Mr Ong Boon Tat	Tel: 8382158 Fax: 7339895
(b) Installation	-	-
(c) Diversion	-	-
BCD:		
(a) Building Plan	-	-
FSB:		
(a) Building Plan	-	-
(b) M&E Section	ACMV – Ms Nancy Ang Ai Hua	Tel: 8386455 Fax: 8386427
	FFAI – Mr Han Fook Kuang	Tel: 8386396 Fax: 8386427
PUB (Water)		
(a) Water Conservation	Mr Ong Meng Phong	Tel: 7313558 Fax: 7313023
(b) Plumbing Plan	-	-
(c) Diversion	-	-
PowerGas:		
(a) Planning/Submission	-	-
(b) Installation/Inspection	-	-
(c) Diversion	-	-
ENV (Sewerage):		
(a) Building Plan	-	-
(b) M&E Section	Mr Tan Eng Sang	Tel: 7319680 Fax: 7319680
(c) Diversion	-	-
ENV (Pollution Control)		
(a) Planning/Submission	-	-
(b) Inspection	-	-

SECTION 4

PROGRAMME

4.1 Overall Programme

		1997		1998												1999											
ID	TASK NAME	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
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.	Construction Period																										
11.	TOP																										
12.	CSC																										

Remarks:
1. The main contract commences on 26 December 1998.
2. TOP is expected in March 1998.

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	-	19/5/97							
Power Supply Substation	PowerGrid Pte Ltd	-	18/7/97	1/8/97	8/9/97	-	11/11/97			14/11/97
Main Single Line Diagram	Power Supply Pte Ltd	-	16/4/98	10/6/98	25/6/98					30/6/98
Sanitary Installation	ENV (Sewerage)	By Architect								
Domestic Water Supply	PUB (Water)	By Licensed Plumber								
Air Conditioning & Ventilation Inst.	Building Control Division	-								
	Fire Safety Bureau	-	21/8/98							1/9/98
Fire Fighting & Alarm Installation	Fire Safety Bureau	-	4/9/98							
	Telecom (Broadband)	-	25/9/97	17/11/97	5/12/97					15/12/97
Telephone Installation	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

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									

← Not Applicable →

SECTION 5

PROJECT RECORDS

5.1 List of Internal Files

Standard Files

File Ref: 1141		File Ref: 1141	
-CM	✓	-QSP	✓
-PC	✓	-BD	✓
-AE	✓	-CC	✓
-AM	✓	-GC	✓
-PQP	✓	-CF	✓

Project Files to be initiated by PM as and when required

File Ref: 1141		File Ref: 1141		File Ref: 1141	
-SM	✓	-SR	✓	-ET	
-SC	✓	-QM		-MT	
-AI	✓	-EC/MC	✓	-DF	
-SQ	✓	-PP	✓	-EOT	
-CO	✓	-VO	✓		

Service Files to be initiated by PM as and when required

	Service										
File Ref:	ACVI	FFAI	PSI	EI	LI						
-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	Alan Lau
Incoming Architectural Sketches/Details	Alan Lau
Incoming Structural Drawings	Alan Lau
M&E Drawings	
- Electrical Installation	Wong Tack Chow
- Lift & Escalator Installation	Wong Tack Chow
- Air Conditioning & Ventilation Installation	Alan Lau
- Fire Fighting & Alarm Installation	Alan Lau
- Plumbing & Sanitary Installation	Alan Lau
- Swimming Pool & Filtration Installation	-
Other Drawings	-

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.	Location and power requirements for FCU & CU	LTC	WTC	1/12/97	Given on 10/12/97
2.	Location and power requirements for SCP	LTC	WTC	5/12/97	Given on 10/12/97

** 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	C	-	C	C	C	
b.	Project Administration	C	-	C	C	C	
c.	Project Cost Estimate/Contract Cost	A	-	I	I	I	
2.	**Drawings**						
a.	Outline Design Drgs.	-	-	C	C	-	
b.	Sketch Design Drgs.	I	-	C	C	-	
c.	Final Design Drgs.	I	-	I	I	-	
d.	Shop Drawings	I	-	A	A	-	
e.	As Built Drgs.	C	-	C	-	-	
3.	**Other Document**						
a.	Specification	C	-	C	-	C	
b.	Tender Document	C	-	C	-	C	
c.	Tender Evaluation Report	C	-	C	-	-	
d.	Design Report	A	-	A	-	-	
e.	Progress Report	I	-	I	-	I	
f.	Financial Report	C	-	I	-	I	
g.	Minutes of Meeting	I	-	I	-	-	
h.	Inspection Report	I	-	I	-	-	
i.	Testing & Comm. Report	I	-	I	-	-	
j.	O & M Manual	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 & 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 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	No Specified Requirement
M&E Cost Estimate Report	No Specified Requirement
Pre-Qualification of Tenderers	No Specified Requirement
Tender Documents	No Specified Requirement
Tender Report	No Specified Requirement
Payment Valuation for QS	No Specified Requirement
Certificates of Supervision for TOP/CSC	No Specified Requirement

** 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)*

SECTION 10

LIST OF SUB-JOB

10.1 List of Sub-Job Numbers

NOT USED