PROJECT QUALITY PLAN

PROPOSED EXECUTIVE CONDOMINIUM HOUSING DEVELOPMENT COMPRISING 9 BLOCKS OF RESIDENTIAL FLATS (ONE PT 12/13-STOREY, ONE PT 13/14-STOREY, ONE 14-STOREY, FIVE PTS 14/15-STOREY, ONE PT 11/14/15-STOREY TOTAL: 696 UNITS), A SINGLE STOREY CARPARK BUILDING WITH 2 BASEMENT & COMMUNAL FACILITY ON LOTS 3396 (RESURVEYED LOT), MK 13 AT WOODLANDS DRIVE 72/WOODLANDS AVENUE 7 (WOODSVALE)

For

M/S WOODSVALE LAND PTE LTD

Copy No.	

Prepared By: Philip Tey/Lee W C

Authorised By: Richard Teo

Date: 14 April 2000

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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	1154-PQP File	8 July 1998
2	Philip Tey	8 July 1998

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
1/0	8 July 1998	Section 1 - 10	27	1st Issue
2/0	2 December 1998	Section 1 – 10	27	2nd Issue
3	30 December 1998	Section 1 – 10	26	-
4	14 April 2000	Section 1 – 10	26	-

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Statistics of Development	
Site Area, m²	34,000
Nett Floor Area, m²	95,200
Gross Floor Area, m²	376.44
Covered Carpark, m²	14,150
No. of Covered Carpark Lots	348
No. of Apartments/Houses	696
No. of Beds (for Hospitals)	-
No. of Guestroom (for Hotels)	-
No. of Blocks / No. of Storeys	13 Blocks/ 11 to 15 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	-	-	-	-	-	-				
Awarded	10.76	7.18	3.7	1.38	9.73	0.19				

Total Project Construction Cost (S$ x1M)			
	Site Clearance	Piling Works	Main Contract
Estimate	-	-	-
Awarded	-	-	146

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*)

* Mechanical services submissions as prepared by the Contractor.

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

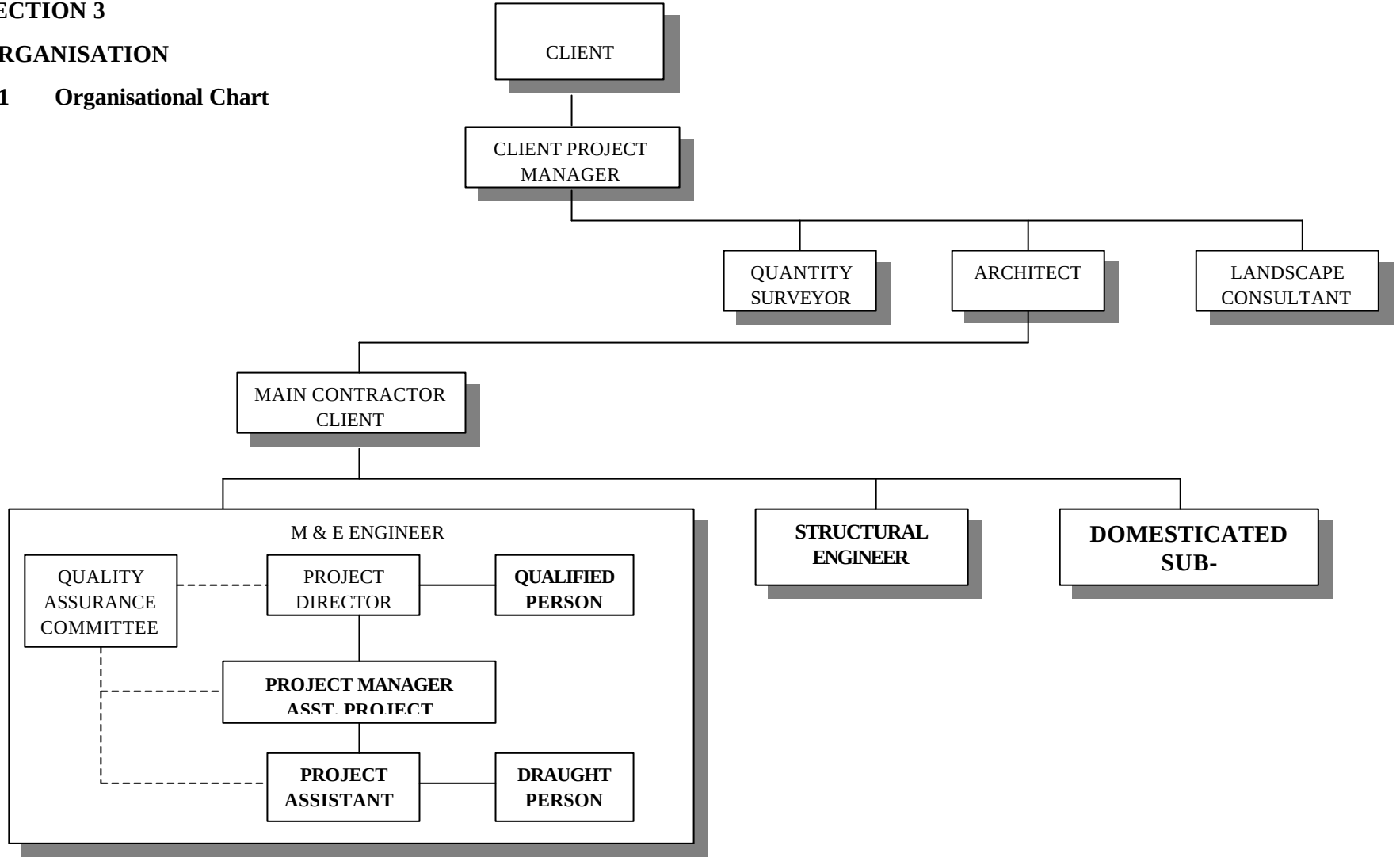
EJECTOR & DIVERTER		SUMP PUMP	✓	FUEL OIL TANK		LIFT & ESCALATOR	✓	PRESSURE VESSEL		HOISTS		FOAM	

(✓ *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	Andrew Loh
	Electrical	Richard Teo
Project Manager		Philip Tey
Assistant Project Manager		Lee Wee Chong
Project Assistant (Mech)		Swee Tong Hua
Project Assistant (Elect)		Chiam Bon Yeak
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		-

3.3 Developer's/Client's Representatives

Developer:-	Woodsvale Land Pte Ltd	Client:-	Nakano Singapore (Pte) Ltd
Address:-	95 South Bridge Road #03-01 Pidemco Centre Singapore 058717	Address:-	1 Coleman Street #06-02 The Adelphi Singapore 179803
Tel:-	539 7825	Tel:-	365 7610 (Site)
Fax:-	539 7647	Fax:-	365 6685 (Site)

Developer's Representatives:-

Name of Firm	Contact Person	Contact
Woodsvale Land Pte Ltd	Name: Mr Lee Yew Kwung Position: Project Manager	Tel: 539 7823 Fax: 539 7669 Pager: - Handphone: - Email: -
Woodsvale Land Pte Ltd	Name: Mr Chew Kheng Foo Position: Resident Engineer	Tel: 365 2530 Fax: 368 9196 Pager: - Handphone: - Email: -
Woodsvale Land Pte Ltd	Name: Mr Tan Khoon Tee Position: Clerk-of-Work	Tel: 365 2530 Fax: 368 9196 Pager: - Handphone: - Email: -
Woodsvale Land Pte Ltd	Name: Mr Desmond Tan/Mr Sam Ong Position: Clerk-of-Work (M&E)	Tel: 365 2530 Fax: 368 9196 Pager: - Handphone: - Email: -
Woodsvale Land Pte Ltd	Name: Mr Ng Wee Meng Position: Clerk-of-Work	Tel: 365 2530 Fax: 368 9196 Pager: - Handphone: - Email: -
Woodsvale Land Pte Ltd	Name: Mr John Tan Position: Clerk-of-Work	Tel: 365 2530 Fax: 368 9196 Pager: - Handphone: - Email: -

Client's Representatives (Cont'd):-

Nakano Singapore (Pte) Ltd	Name: Mr S Hattori Position: Project Manager	Tel: 365 7610 Fax: 365 6685 Pager: - Handphone: - Email: -
Nakano Singapore (Pte) Ltd	Name: Mr Ling Hea Inn Position: Construction Manager	Tel: 365 7610 Fax: 365 6685 Pager: - Handphone: - Email: -
Nakano Singapore (Pte) Ltd	Name: Mr Jason Quek Position: M&E Co-ordinator	Tel: 365 7610 Fax: 365 6685 Pager: - Handphone: - Email: -

3.4 Other Consultants (Local)

Function / Name of Firm	Contact Person	Contact
Architect Consortium 168 Architects Pte Ltd	Name: Mr Tan Chit Phee Position: Architectural Manager	Tel: 334 4887 Fax: 334 2627 Pager: - Handphone: - Email: -
Quantity Surveyor Davis Langdon & Seah	Name: Mr Ho Kong Mo Position: Quantity Surveyor	Tel: 222 3888 Fax: 224 7089 Pager: - Handphone: - Email: -
Structural Engineer P&T Consultants Pte Ltd	Name: Mr Leong Wai Mun Ms Cheng Li Xiang Position: Structural Engineer	Tel: 532 5529 Fax: 534 5496 Pager: - Handphone: - Email: -
Interior Designer Tow Francis Pte Ltd	Name: Mr Thomas Tow Position: Interior Designer	Tel: 227 2771 Fax: 227 3317 Pager: - Handphone: - Email: -

3.4 Other Consultants (Local) (Cont'd)

Function / Name of Firm	Contact Person	Contact
Lighting Consultant -	Name: - Position: -	Tel: - Fax: - Pager: - Handphone: - Email: -
Acoustic Consultant -	Name: - Position: -	Tel: - Fax: - Pager: - Handphone: - Email: -
Landscape Consultant Belt Collins International Pte Ltd	Name: Ms Debra Wright Position: Landscape Architect	Tel: 223 8133 Fax: 222 9602 Pager: - Handphone: - Email: bci@beltcollins .com.sg

3.4 Other Consultants (Overseas) - NOT USED

3.5 Contractors/Sub-Contractors

Function / Name of Firm	Contract *	Contact Person	Contact
Main Contractor Nakano (S) Pte Ltd	DC	Name: Mr S Hattori Position: Project Manager	Tel: 296 9388/365 6559 Fax: 296 1554/365 6685 Pager: - Handphone: - Email: limmengteck@post1.com
Air Conditioning & Ventilation Installation Sub-Contractor Dai-Dan Co (S) Pte Ltd	DSC	Name: Mr Kek Yong Teck Position: Senior Project Manager	Tel: 368 1095 Fax: 368 8165 Pager: 9606 2612 Handphone: - Email: -
Plumbing & Sanitary Installation Sub-Contractor Dai-Dan Co (S) Pte Ltd	DSC	Name: Mr Kek Yong Teck Position: Senior Project Manager	Tel: 368 1095 Fax: 368 8165 Pager: 9606 2612 Handphone: - Email: -
Electrical Installation Sub-Contractor Dai-Dan Co (S) Pte Ltd	DSC	Name: Mr Kek Yong Teck Position: Senior Project Manager	Tel: 221 8488/368 1095 Fax: 225 0544/368 8165 Pager: 9606 2612 Handphone: - Email: -
Lift & Escalator Installation Sub-Contractor Fujitec Singapore Ltd	DSC	Name: Mr Tong Tuch Weng Position: Project Co-ordinator	Tel: 241 6222 Fax: 444 7626 Pager: 9527 0985 Handphone: - Email: -
Fire Fighting & Alarm Installation Sub-Contractor Dai-Dan Co (S) Pte Ltd	DSC	Name: Mr Kek Yong Teck Position: Senior Project Manager	Tel: 368 1095 Fax: 368 8165 Pager: 9606 2612 Handphone: - Email: -
Swimming Pool Filtration Plant Installation Sub-Contractor Dai-Dan Co (S) Pte Ltd	DSC	Name: Mr Kek Yong Teck Position: Senior Project Manager	Tel: 368 1095 Fax: 368 8165 Pager: 9606 2612 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 Lee Chi Ming	Tel: 831 8281/Fax: 831 8239
(b) Sub-Station	Mr Francis Chan See Tong	Tel: 831 8555/Fax: 831 8564
(c) Installation	Mr Wang Hee Weng	Tel: 277 7043
(d) Meter Section	Mr Kong Kum Meng	Tel: 277 7056
(e) Road Lighting	-	-
(f) Diversion	-	-
Telecom:		
(a) Planning/Line Plant	Mr Lee Chong Beng	Tel: 838 2509/Fax: 733 9895
(b) Installation	Mr Lee Chong Beng	Tel: 838 2509/Fax: 733 9895
(c) Diversion	-	-
BCD:		
(a) Building Plan	Mr Chua Toke Seng	Tel: 731 9632/Fax: 731 9725
FSB:		
(a) Building Plan	Mr Tan Choon Leng	Tel: 838 6452/Fax: 838 6427
(b) M&E Section	Mr Chan Hong Meng	Tel: 838 6402/Fax: 838 6427
PUB (Water)		
(a) Water Conservation	M/s David Loh/Mufid	Tel: 731 3575/Fax: 731 3023
(b) Plumbing Plan	Mr Ng Guan Chai	Tel: 731 3598/Fax: 731 3023
(c) Diversion	-	-
PowerGas:		
(a) Planning/Submission	Mr Liew Khee Boon	Tel: 831 8662/Fax: 831 8699
(b) Installation/Inspection	Mr Zulkiflee	Tel: 831 8693
(c) Diversion	-	-
ENV (Sewerage):		
(a) Building Plan	Mr Seah K T	Tel: 731 9156
(b) M&E Section	-	-
(c) Diversion	-	-
ENV (Pollution Control)		
(a) Planning/Submission	-	-
(b) Inspection	-	-

SECTION 4

PROGRAMME

4.1 Overall Programme

			1977												1998											
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.	Conceptual/Schematic 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																									

* *Completion – 30 June 2000*
\+ *TOP – 15 July 2000*

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	-	01/09/97	09/09/97						09/09/97
Power Supply Substation	PowerGrid Pte Ltd	-	17/11/97	24/11/97	17/12/97	02/01/98				13/05/98
Main Single Line Diagram	Power Supply Pte Ltd	01/07/98	20/07/98	23/07/98	11/08/98					21/08/98
Consumer Switchroom Layout	PowerGrid Pte Ltd									N.A.
Metering Layout	PowerGrid Pte Ltd	-	02/09/98							10/09/98
Sanitary Installation	ENV (Sewerage)	10/12/97	10/12/97	17/01/98	27/04/98					23/09/98
Domestic Water Supply	PUB (Water)	02/03/98	02/03/98	04/04/98	07/07/98					24/08/98
Gas Supply Installation	PowerGas Pte Ltd	31/03/98	31/03/98	13/04/98	05/06/98					11/06/98
Air Conditioning & Ventilation Inst.	Fire Safety Bureau	19/06/98	31/07/98							20/08/98
Fire Fighting & Alarm Installation	Fire Safety Bureau	12/06/98	09/06/98							03/07/98
Telephone Installation	Telecom (Broadband)	15/11/97	11/11/97	22/11/97	28/11/97					21/01/98
	Telecom (Domestic Operation)	09/09/98	09/09/98	23/09/98	23/09/98					01/10/98

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	10/03/98	10/03/98	16/03/98	01/04/98					13/05/98
Main Single Line Diagram	Power Supply Pte Ltd		11/8/98							21/8/98
Consumer Switchroom Layout	PowerGrid Pte Ltd		N.A.							N.A.
Metering Layout	PowerGrid Pte Ltd		2/9/98							10/9/98
Sanitary Installation	ENV (Sewerage)		23/4/98							23/9/98
Domestic Water Supply	PUB (Water)		13/8/98							24/8/98
Gas Supply Installation	PowerGas Pte Ltd	-	1/6/98							11/6/98
Air Conditioning & Ventilation Inst.	Building Control Division		N.A.							N.A.
	Fire Safety Bureau		31/7/98							20/8/98
Fire Fighting & Alarm Installation	Fire Safety Bureau		9/6/98							3/7/98
Telephone Installation	Telecom (Broadband)		11/11/97							21/1/98
	Telecom (Domestic Operation)		9/9/98							1/10/98
Fuel Storage	Fire Safety Bureau		N.A.							N.A.
	Pollution Control Department		N.A.							N.A.
Cable Ready System	SCV		12/3/98	21/5/98	26/5/98					11/11/98

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			
-SF	✓	-C3	✓		

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	Swee Tong Hua
Incoming Architectural Sketches/Details	Swee Tong Hua
Incoming Structural Drawings	Chiam Bon Yeak
M&E Drawings	
- Electrical Installation	Chiam Bon Yeak
- Lift & Escalator Installation	Chiam Bon Yeak
- Air Conditioning & Ventilation Installation	Swee Tong Hua
- Fire Fighting & Alarm Installation	Swee Tong Hua
- Plumbing & Sanitary Installation	Swee Tong Hua
- Swimming Pool & Filtration Installation	Swee Tong Hua
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

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

ITEM	KEPT BY
M&E Design Brief	STH
Architect's Drawings	STH

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			
Sprinkler System	~~BS~~	SS	~~NFPA~~	~~AS~~	~~LPC~~
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 Supply System	~~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 System Procedures

Section	Title
A1	Documentation of Quality System Procedure
A2	Documentation of Project Quality Plan
A3	Administration Control
A4	Document Control
A6	Archive 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
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	-
M&E Cost Estimate Report	-
Pre-Qualification of Tenderers	-
Tender Documents	-
Tender Report	-
Payment Valuation for QS	-
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)*

SECTION 10

LIST OF SUB-JOB

10.1 List of Sub-Job Numbers

NOT USED