Alpha
Consulting Engineers Pte Ltd

PROJECT QUALITY PLAN

PROPOSED ERECTION OF 4-STOREY OFFICE BUILDING WITH BASEMENT CARPARK ON LOT 02915P, 03330K MK01 AT MARITIME SQUARE, HARBOURFRONT AVENUE (BUKIT MERAH)

For

MAPLETREE INVESTMENTS PTE LTD

Copy No.	1

Prepared By: Loh Fook Yuen

Authorised By: Choong Choon Guan

Date: 25 June 2009

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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	6038-PQP File	12 June 2008

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	12 June 2008	1 to 11	28	+1 pg (Section 4.1 Overall Programme
1	25 June 2009	1 to 11	28	

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Commercial/office redevelopment

Statistics of Development	
Site Area, m²	24,936
Nett Floor Area, m²	-
Gross Floor Area, m²	32,000
Covered Carpark, m²	-
No. of Covered Carpark Lots	160
No. of Apartments/Houses	NA
No. of Beds (for Hospitals)	NA
No. of Guestroom (for Hotels)	NA
No. of Blocks / No. of Storeys	2 / 5
No. of Phases	Demolition/Sub-Structure/Super Structure

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)								
Services	EI	ACVI	LEI	FFAI	PSI	SPFI	Cold Room	
Estimate	10.1	14.95	2.6	2.5	1.55	NA	NA	
Awarded	-	-	-	-	-	NA	NA	

Total Project Construction Cost (S$ x1K)			
	Site Clearance	Piling Works	Main Contract
Estimate	-	47,150	160,296
Awarded	49.5 (Demolition & Hoarding)	NA	NA

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	✓	COLD ROOM	
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

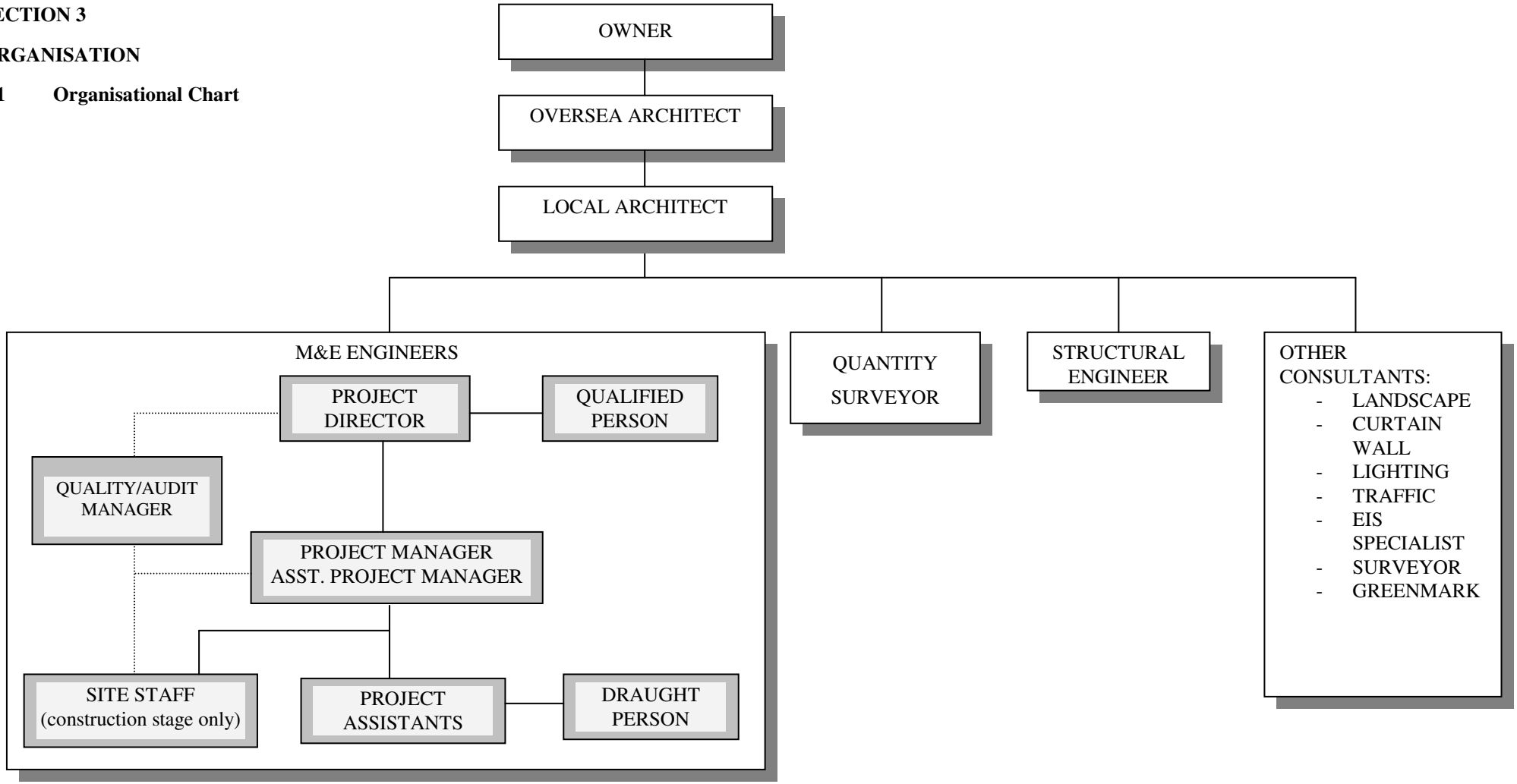
EJECTOR & DIVERTER	✓	SUMP PUMP	✓	FUEL OIL TANK	✓	LIFT & ESCALATOR	✓	PRESSURE VESSEL		HOISTS		FOAM	

(✓*where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 ACEPL's Project Team Member

TITLE		NAME
Project Director		Choong Choon Guan (CCG)
Qualified Person	Mechanical	Choong Choon Guan (CCG)
	Electrical	Tan Lai Siong (TLS)
Project Manager		Loh Fook Yuen (LFY)
Assistant Project Manager		Chong Lai Meng (CLM)
Project Assistant (Mech)		Tay Heng Chuan (THC)
Project Assistant (Elect)		Derek Ong (DO)/Charles Wong (CW)
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		-

3.3 Client/Client's Representatives

Client: Mapletree Investments Pte Ltd

Address: 460 Alexandra Road
#05-02/03
PSA Building (Annexe Block)
Singapore 119963

Tel: 6377 6111

Fax: 6273 2740

Name of Firm	Contact Person	Contact
Mapletree Investments Pte Ltd	Name: Mrs. Lee Pheck Yan Position: Senior Vice President (Development Management)	Tel: 6377 6110 Fax: - Handphone: - Email: pylee@mapletree.com.sg
	Name: Mr. Wong Sik Hong Position: Vice President (Development Management)	Tel: 6377 6290 Fax: - Handphone: 9177 3391 Email: wong.sikhong@mapletree.com.sg
	Name: Ms. Chong Kim Fung Position: Vice President (Asset Management)	Tel: 6377 6127 Fax: - Handphone: - Email: kfchong@mapletree.com.sg
	Name: Mr. Chin Kah Vuan Position: Project Manager	Tel: 6377 6550 Fax: - Handphone: - Email: kvchin@mapletree.com.sg
	Name: Position:	Tel: Fax: Handphone: Email:

3.4 **Other Consultants** (Local)

Function / Name of Company	Contact Person	Contact
Project Architect Architects 61 Pte Ltd	Name: Mr Tah Kong Han Position: Architect Name: Mr. Ibrahim Warda Position: Architect Name: Mr Hermanto Position: Asst. Architect	Tel: 6393 6877, Fax: 6732 5439 Hp: - Email: konghan@a61.com.sg Tel: 6393 6819, Fax: 6732 5439 Hp: 9477 6916 Email: ibrahim@a61.com.sg Tel: 6393 6867, Fax: 6732 5439 Hp: - Email:hermanto@a61.com.sg
Quantity Surveyor WT Partnership (S) Pte Ltd	Name: Ms. Jenny Chung Position: Associate	Tel: 6533 0822 Fax: 6533 2833 Handphone: - Email: jennychung@wtpartnership.com.sg
Structural Engineer HCE Engineers Partnership	Name: Mr Dennis Ong Chin Lock Position: Principal Name: Ms Sharron Ng Position: Project Director	Tel: 6337 5555 Fax: 6337 2649 Hp: 9674 9855 Email: dennis_ong@hce.com.sg Tel: 6337 5555 Fax: 6337 2649 Hp: 9823 9723 Email: sharron_ng@hce.com.sg
Landscape Architect PDAA Design Pte Ltd	Name: Mr. Joaquin Rodriguez Position: Designer	Tel: 6297 8128 Fax: 6297 5628 Handphone: - Email: joaquin@pdaadesign.com
Lighting Consultant BO Steiber Lighting Design	Name: Mr. Lars Lundqvist Position: Managing Director Name: Mr Pontus Position: Designer	Tel: 6224 6913 Fax: 62274170 Handphone: 9647 7591 (Mr Lars Lundqvist) Email: a47608@bsld.com.sg
Green Mark Consultant BSD Building System & Diagnostics	Name: Mr. Yong Ping Quen Position: Senior Engineer	Tel: 6560 0702 Fax: - Handphone: 9829 7399 Email: yongpq@bsd.com.sg
Fire Engineer	Name: Position:	Tel: Fax: Handphone: Email:
Façade Consultant Connell Wagner (Pte) Ltd	Name: Mr Yang Li Position: Associate Name: Ms Christina Cheong Position: Façade Engineer	Tel: 6256 6188 ext 206 Fax: 6251 7188 Hp: 9643 3110 Email: YangL@conwag.com Tel: 6256 6188 ext 246 Fax: 6251 7188 Hp: - Email: CheongC@conwag.com

3.4 **Other Consultants** (Overseas)

Function / Name of Company	Contact Person	Contact
Design Architect Ingenhoven Architekten	Name: Mr. Olaf Kluge Position: Lead Architect	Tel: +49 [0]211 30101 175 Fax: +49 [0]211 30101 31 Handphone: +49 [0]170 7119878 Email: Olaf.Kluge@ingenhovenarchitekten.eu
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:
Environmental Design Consultant DS-Plan	Name: Mr. Peter Moesle Position: Head of Department Green Building & Energy Design	Tel: +49 [0]711 687070 353 Fax: +49 [0]711 687070 368 Handphone: +49 [0]173 8724246 Email: peter.moesle@ds-plan.com
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 Company	Contract *	Contact Person	Contact
Main Contractor	-	Name: Position:	Tel: Fax: Handphone: Email:
Air Conditioning & Ventilation Installation Sub-Contractor	-	Name: Position:	Tel: Fax: Handphone: Email:
Plumbing & Sanitary Installation Sub-Contractor	-	Name: Position: -	Tel: Fax: Handphone: - Email:
Electrical Installation Sub-Contractor	-	Name: Position: -	Tel: Fax: Handphone: - Email:
Lift & Escalator Installation Sub-Contractor	-	Name: Position: -	Tel: Fax: Handphone: - Email:
Fire Fighting & Alarm Installation Sub-Contractor	-	Name: Position:	Tel: Fax: 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:
Demolition Contractor Ong Hoo Kim Construction Pte Ltd	DC	Name: Mr Ong Hoo Kim Position: Director	Tel: 6227 8753 Fax: 6382 3205 Handphone: 9737 4972 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 Chin Yoke Fah	6823 8556
(b) Diversion		
SP Services:		
(a) Customer Supply		
(b) Installation		
(c) Meter Section		
(d) Road Lighting		
TFCC:		
(a) SCV		
(b) SingTel		
(c) IDA		
BCA:		
(a) Building Plan	N.A.	
FSSD:		
(a) Building Plan		
(b) M&E Plan		
PUB (Water Supply) Network Dept:		
(a) Water Conservation		
(b) Plumbing Plan		
(c) Diversion		
PUB Water Reclamation (Network) Dept:		
(a) Building Plan/CBPU		
(b) M&E Plan		
(c) Diversion		
City Gas Pte Ltd:		
(a) Planning/Submission	N.A.	
(b) Installation/Inspection		
PowerGas Pte Ltd		
(a) Diversion	N.A.	
NEA (Pollution Control)		
(a) Planning/Submission	N.A.	
(b) Inspection		

SECTION 4

PROGRAMME

4.1 Overall Programme (Project on hold)

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.	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																									

SECTION 4

PROGRAMME

4.2 Authority Submission Status for M&E Services - 1st Submission

Service	Authority	Original Submission		Comments/Resubmission						Approval/
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	Clearance
Application for Electricity Supply	SP Services Ltd	27/2/08	17/2/08	-	-	-	-	-	-	20/3/08
Power Supply Substation	SP PowerGrid Ltd	2/6/08	5/6/08	26/6/08	24/7/08	18/8/08	5/9/08	-	-	19/9/08
Metering Layout	SP Services Ltd	End Aug 2008								
Sanitary Installation	PUB Water Reclamation (Network) Dept	Oct 2008								
Domestic Water Supply	PUB (Water Supply) Network Dept	Oct 2008								
Gas Supply Installation	City Gas Pte Ltd	Oct 2008								
Air Conditioning & Ventilation Inst.	FSSD	Nov 2008								
Fire Fighting & Alarm Installation	FSSD	Nov 2008								
Telephone Installation	TFCC	End Aug 2008								

SECTION 4

PROGRAMME

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

Service	Authority	Original Submission		Comments/Resubmission						Approval/
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	Clearance
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									
Gas Supply Installation	City Gas Pte Ltd									
Air Conditioning & Ventilation Inst.	FSSD									
Fire Fighting & Alarm Installation	FSSD									
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:		File Ref:		File Ref:	
- IC	✓				

(✓*where applicable*)

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	All project drawings in soft copy to be saved in server
Incoming Architectural Sketches/Details	
Incoming Structural Drawings	
M&E Drawings - Electrical Installation - Lift & Escalator Installation - Air Conditioning & Ventilation Installation - Fire Fighting & Alarm Installation - Plumbing & Sanitary Installation	
Other Drawings	
- Shop Drawing (Electrical)	DO
- Shop Drawing (Mechanical)	THC

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.	Electrical load of mechanical equipment	CLM	DO	Early July 2008	Completed
2.	Location of SCP	CLM	DO	End July 2008	Completed
3.	BMS Point Schedule	DO	CLM	End July 2008	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	Developer	Management Contractor	Architect	Structural Engineer
1.	**Letters/Fax:**				
a.	Project Design	A	A	C	C
b.	Project Administration	A	A	I	I
c.	Project Cost Estimate/Contract Cost	A	A	I	I
2.	**Drawings**				
a.	Outline Design Drgs.	A	A	C	C
b.	Sketch Design Drgs.	A	A	C	C
c.	Final Design Drgs.	A	A	C	C
d.	Shop Drawings	C	C	C	C
e.	As Built Drgs.	I	I	I	I
3.	**Other Document**				
a.	Specification	A	A	I	I
b.	Tender Document	A	A	I	I
c.	Tender Evaluation Report	A	A	I	I
d.	Design Report	A	A	C	C
e.	Progress Report	-	-	-	-
f.	Financial Report	-	-	-	-
g.	Minutes of Meeting	I	I	I	I
h.	Inspection Report	I	I	I	I
i.	Testing & Comm. Report	I	I	I	I
j.	O & M Manual	I	I	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 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
AE : Assistant Engineer
SS : ACEPL 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~~	
~~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

Institute of Plumbing's Plumbing Services Design Guide

8.4 List of Applicable Quality System Procedures

Alpha Consulting Engineers Pte Ltd'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 & Environmental 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	✓
QE1	Quality & Environmental System Audit	✓
QE2	Feedback Reporting	✓
QE3	Clients Feedback	✓
QE4	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 Consulting Engineers Pte Ltd	Lift traffic calculation	✓
Econdial	2.5	Merlin Gerlin	Design for low voltage network	
Hyena	4.00.1	ACADS-BSG	Fire Sprinkler & Hydrant Analysis	

(✓*where applicable*)

SECTION 9

ENVIRONMENTAL CONSIDERATIONS

9.1 Sustainable Design Features / Criteria

Item	Remarks
Green Mark criteria	Platinum
Green Design Features	PV cells, Thermal Energy Storage, Mechanical louver screen, sensor operated escalator, fluo-fitting with T5 & HF ballast, rain water recycling, high efficiency chiller system.

9.2 Site PPE Requirement

The necessary Personal Protective Equipment (detailed below) shall be provided by the main contractor / Company in accordance to the site EHS requirements prior to the site monitoring.

PPE	✓ where applicable
Safety Helmet	To be advised
Safety Shoes	To be advised
Eye Protection	To be advised
Ear Protection	To be advised
Safety Harness / Belt	To be advised
Others:	To be advised

9.3 Site Emergency Preparedness

Site staff shall comply with the site emergency preparedness and response procedure, established by the main contractor / owner, which shall include the following details.

Items	✓ where applicable
Evacuation Route	To be advised
Emergency Exit	To be advised
Assembly Point	To be advised
Emergency Contact List / Person	To be advised
Alarm system / methods	To be advised

SECTION 9

ENVIRONMENTAL CONSIDERATIONS

9.4 Reporting of Environmental Non-conformances

When encountering environmental non-conformances, Site Staff shall be responsible to feedback to the main contractor.

9.5 List of Applicable Environmental management system Procedures

Alpha Consulting Engineers Pte Ltd's Environmental Management System Procedures

Section	Title	✓ where applicable
E1	Aspect / Impact Identification, Risk Assessment & Risk Control	
E2	Identifying Legal & Other Requirements	✓
E3	Objectives, Targets & Programmes	✓
E4	Communication	✓
E5	Emergency Preparedness & Response	✓
E6	Monitoring & Measurement	
E7	Control of Air & Noise Pollution	
E8	Management of Wastes	

SECTION 10

CLIENT'S REQUIREMENTS

10.1 List of Output Required by Client:-

Item	* Remarks
M&E Design Report	A
M&E Cost Estimate Report	A
Pre-Qualification of Tenderers	A
Tender Documents	A
Tender Report	A
Payment Valuation for QS	NA
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.

10.2 Specific Procedures Required By Client *(If applicable)*

NOT USED

SECTION 11

LIST OF SUB-JOB

11.1 List of Sub-Job Numbers

Sub Job No	Description	Allocation Details
6038-601	New Bus Coach Shelter	CCG