Alpha
Consulting Engineers Pte Ltd

PROJECT QUALITY PLAN

BOTANIQUE @ BARTLEY

For

UOL DEVELOPMENT (BARTLEY) PTE LTD

Copy No.	1

Prepared By: Yip Yoke Fun

Authorised By: Loh Fook Yuen

Date: 16 December 2020

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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	6200 PQP	16 December 2020

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	1 July 2014	1 to 11	29	+ 1 pg (Section 9.1 – Sustainable Design Features)
1	30 September 2014	1 to 11	29	+ 1 pg (Section 9.1 – Sustainable Design Features)
2	29 January 2016	1 to 11	29	+ 39 pages (Section 4.1 – Overall Programme) + 1 pg (Section 9.1 – Sustainable Design Features)
3	20 January 2017	1 to 11	29	+ 39 pages (Section 4.1 – Overall Programme) + 1 pg (Section 9.1 – Sustainable Design Features)
4	5 July 2017	1 to 11	29	+ 26 pages (Section 4.1 – Overall Programme) + 1 pg (Section 9.1 – Sustainable Design Features)
5	16 October 2017	1 to 11	29	+ 26 pages (Section 4.1 – Overall Programme) + 1 pg (Section 9.1 – Sustainable Design Features)
6	29 April 2019	1 to 11	30	+ 1 pg (Section 9.1 – Sustainable Design Features)
7	29 October 2019	1 to 11	30	+ 1 pg (Section 9.1 – Sustainable Design Features)
8	16 December 2020	1 to 11	30	+ 1 pg (Section 9.1 – Sustainable Design Features)

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Statistics of Development	
Site Area, m²	20,077.60
Nett Floor Area, m²	-
Gross Floor Area, m²	61,839
Covered Carpark, m²	20,000
No. of Covered Carpark Lots	803
No. of Apartments/Houses	797
No. of Beds (for Hospitals)	NA
No. of Guestroom (for Hotels)	NA
No. of Blocks / No. of Storeys	9 Blocks/16-17 Storey
Green Mark Category	Gold Plus
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)										
Services	EI	ACVI	LEI	FFAI	PSI	SPFI				
Estimate	18	9	3.5	2	13	0.8				
Awarded	10.38	6.15	3.17	1.48	8.67	1.1				

Total Project Construction Cost (S$ x1M)			
	Site Clearance	Piling Works	Main Contract
Estimate	-	-	-
Awarded	Included	Included	171

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

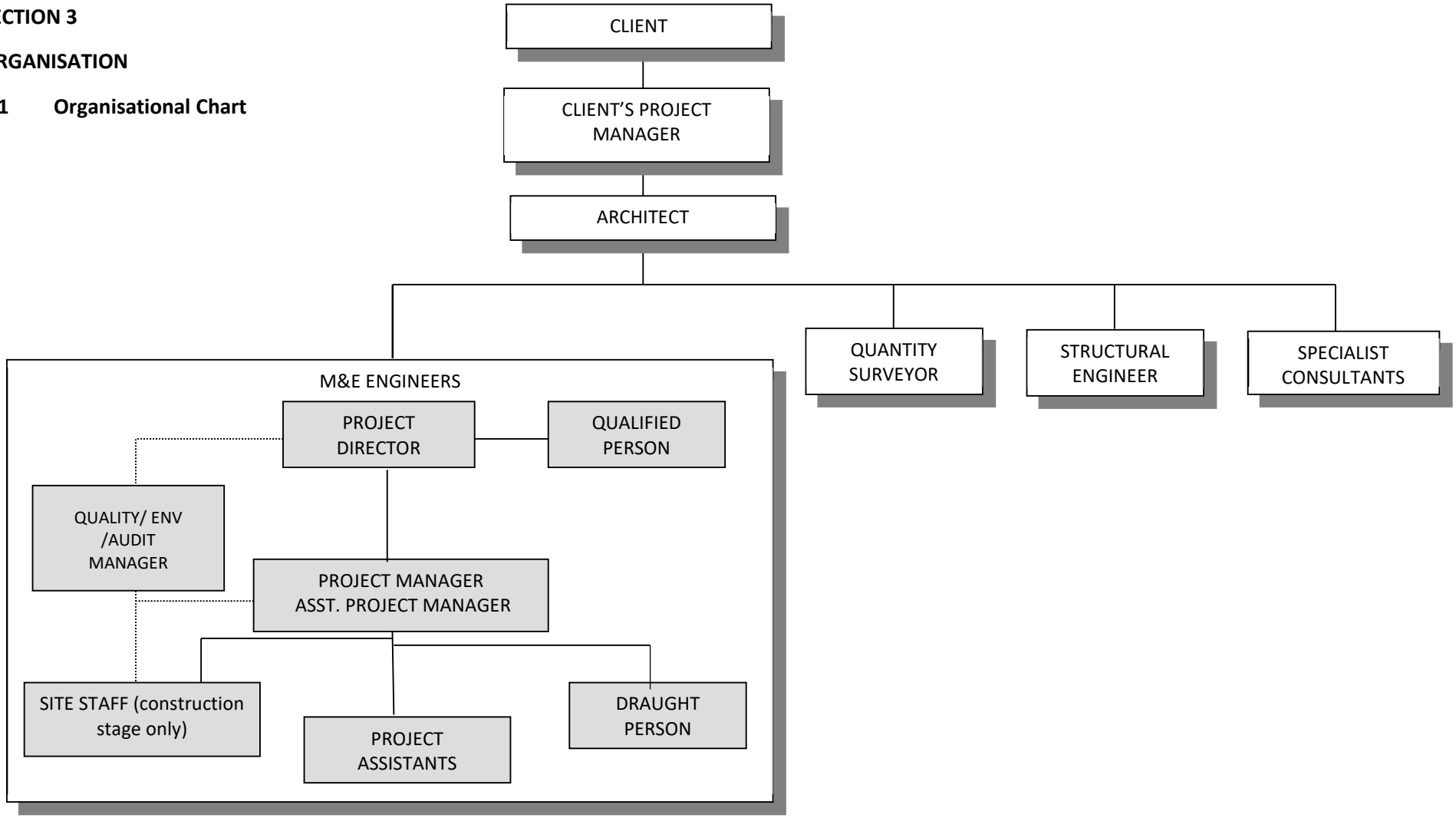
EJECTOR & DIVERTER	✓	SUMP PUMP	✓	FUEL OIL TANK		LIFT & ESCALATOR		PRESSURE VESSEL	✓	HOISTS		FOAM	

(✓*where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 ACEPL's Project Team Member

TITLE		NAME
Project Director		Loh Fook Yuen (LFY)
Qualified Person	Mechanical	Choong Choon Guan (CCG)
	Electrical	Loh Fook Yuen (LFY)
Project Manager		Yip Yoke Fun (YYF)
Assistant Project Manager		Lim Chai Hoon (LCY)
Project Assistant (Mech)		-
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:-	UOL Development (Bartley) Pte Ltd	Client:-	China Construction Realty Co Pte Ltd
Address:-	101 Thomson Road #33-00 United Square Singapore 307591	Address:-	182 Cecil Street #31-01 Frasers Tower Singapore 069547
Tel:-	6255 0233	Tel:-	62274537
Fax:-	6252 9822	Fax:-	62275073

Client's Representatives:-

Name of Company	Contact Person	Contact
UOL Development (Bartley) Pte Ltd	Name: Ms Swee Jenny Position: General Manager (Project Development)	Tel: 6255 0233 Fax: 6252 9822 Handphone: 94886136 Email: swee.jenny@uol.com.sg
China Construction Realty Co Pte Ltd	Name: Mr Yang Wen Hui Position: Managing Director	Tel: 62274537 Fax: 6227 5073 Handphone: 90283949 Email: YangWenHui@chinaconstruction.com.sg
	Name: Position:	Tel: Fax: Handphone: Email:
	Name: Position:	Tel: Fax: Handphone: Email:
	Name: Position:	Tel: Fax: Handphone: Email:

3.4 **Other Consultants** (Local)

Function / Name of Company	Contact Person	Contact
Architect ADDP Architects LLP	Name: Mr Markus Cheng Thiam Hann Position: Associate Partner	Tel: 6270 2153 Fax: 6325 4918 Handphone: 9742 2550 Email: uplrd@addp-doprojects.com
Quantity Surveyor Rider Levett Bucknall LLP	Name: Ms Lim Siew Huay Position: Senior Quantity Surveyor	Tel: 6339 1500 Fax: 6339 1521 Handphone: - Email: sh.lim@sg.rlb.com
Structural Engineer TEP Consultants Pte Ltd	Name: Mr Tan Jian Wei Position: Engineer	Tel: 6339 7277 Fax: 6338 8362 Handphone: 93800747 Email: t776_upperpl@tepc.com.sg
Interior Designer Index Design Pte Ltd	Name: Ms Serene Tan Position: ID Architect	Tel: 6220 1002/64169153 Fax:6334 7262 Handphone: 88180098 Email: serene@index.com.sg
Lighting Consultant	Name: Position:	Tel: Fax: Handphone: Email:
Acoustic Consultant	Name: Position:	Tel: Fax: Handphone: Email:
Landscape Architect Ecoplan Asia Pte Ltd	Name: Mr Thanapong (Gong) Position: Managing Director	Tel: 6235 3825 Fax: 6235 0825 Handphone: 9021 4341 Email: gong@ecoplanasia.com
_____	Name: Position:	Tel: Fax: Handphone: Email:

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

Function / Name of Company	Contact Person	Contact
Architect	Name: Position:	Tel: Fax: Handphone: Email:
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:
Interior Designer	Name: Position:	Tel: Fax: Handphone: Email:
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 China Construction Realty Co Pte Ltd	DC	Name: Mr Yang Wen Hui Position: Managing Director	Tel: 64432068 Fax: 6443 2069 Handphone: 90283949 Email: YangWenHui@chinaconstruction.com.sg
Air Conditioning & Ventilation Installation Sub-Contractor Natural Cool Air-Conditioning and Engineering Pte Ltd	DSC	Name: Mr Kester Xu Position: Asst. Manager	Tel: 6454 7667 Fax: 6454 5115 Handphone: 8571 6786 Email: kester.xu@naturalcool.com.sg
Plumbing & Sanitary Installation Sub-Contractor JinJin Engineering Pte Ltd	DSC	Name: Mr Lin Xiong Position: Project Director	Tel: 6749 6521 Fax:6396 3579 Handphone: - Email: th.jj.jv.botanique@gmail.com
Electrical Installation Sub-Contractor Great Resources M&E Contractor Pte Ltd	DSC	Name: Mr Jia Ying Hui Position: Project Manager	Tel: - Fax: - Handphone: 9068 9928 Email: jiayinghui99@gmail.com
Lift & Escalator Installation Sub-Contractor Mitsubishi Elevator (S) Pte Ltd	DSC	Name: Mr Eric Lee Position: Section Manager	Tel: 6436 2818 Fax: 6748 2292 Handphone: 9450 9680 Email: eric.lee@mesp.meap.com
Fire Fighting & Alarm Installation Sub-Contractor Jee Ann Fire Engineering Pte Ltd	DSC	Name: Mr Wu Jian Position: Director	Tel: 6483 3568 Fax: 6458 8502 Handphone: 9820 6509 Email: jeeannengrg@yahoo.com.sg
Swimming Pool Filtration Plant Installation Sub-Contractor Hydrotechs Mechanical and Electrically Service Pte Ltd	DSC	Name: Mr Lai Heng Tong Position: Managing Director	Tel: 6748 4779 Fax: 6748 8016 Handphone: 9026 1457 Email: project@hydrotech.com.sg
Carpark System Installation Sub-Contractor MHE-Demag (S) Pte Ltd	DSC	Name: Mr Dave Ng Position: Sales Engineer	Tel: 6305 3500 Fax: 6862 1933 Handphone: 9450 5810 Email: dave.ng@mhe.demag.com
_____		Name: Position:	Tel: Fax: 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
SP PowerGrid:		
(a) Sub-Station	Mr Abbas Mohd Supiah	6378 8557
(b) Diversion	Mr Azmi Hassan	9114 4531
SP Services:		
(a) Customer Supply		
(b) Installation		
(c) Meter Section		
(d) Road Lighting		
TFCC:		
(a) SCV	Mr Kevin Choo	9146 9432
(b) SingTel	Mr Lee Him Buan	9653 1397
(c) IDA	Mr Seah Koon Chye	6211 1751
BCA:		
(a) Building Plan	Ms Deva Lutchia	6804 4383
(b) Green Mark	Ms Ong Hui Wen	6325 5002
FSSD:		
(a) Building Plan	Mr Tan Yi Yang	6848 1729
(b) M&E Plan	Mr Daven Tan/Ms Ang Ai Hua Nancy	6848 1408/6848 1729
PUB (Water Supply) Network Dept:		
(a) Water Conservation		
(b) Plumbing Plan	Mr Ow Zhao Hui/Ms Neshitra Nair	6731 3934/6731 3552
(c) Diversion	Mr Loh Kai Yeong	9631 3523
(d) NEWater		
PUB Water Reclamation (Network) Dept:		
(a) Building Plan/CBPU	Mr David Lim/Mr Ashraf Pinto/Mr Samuel Lim	6731 9629/6708 6194/ 6885 2408
(b) M&E Plan		
(c) Diversion		
City Gas Pte Ltd:		
(a) Planning/Submission	Mr Liew Khee Boon	6578 7603
(b) Installation/Inspection	Mr Lim Teck Seng	9007 5727
PowerGas Pte Ltd		
(a) Diversion	Mr Abi Sufyan Bin Marsuni	6595 5106
NEA (Pollution Control)		
(a) Planning/Submission		
(b) Inspection		

SECTION 4

PROGRAMME

4.1 Overall Programme – NOT APPLICABLE

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	31 May 2014	31 Mar 2014							23 Apr 2014
Power Supply Substation	SP PowerGrid Ltd	31 Jul 2014	22 Aug 2014	8 Sep 2014	29 Dec 2014					17 Jan 2015
Metering Layout	SP Services Ltd	-								
Sanitary Installation	PUB Water Reclamation (Network) Dept	30 Apr 2016	7 Dec 2016							30 Dec 2016
Domestic Water Supply	PUB (Water Supply) Network Dept	15 Dec 2017	4 April 2018							11 June 2018
Gas Supply Installation	City Gas Pte Ltd	31 Mar 2015	7 Jan 2015	27 Jan 2015	22 Apr 2015	30 Apr 2015	12 May 2015			25 May 2015
Air Conditioning & Ventilation Inst.	FSSD	1 March 2018	10 April 2018							11 May 2018
Fire Fighting & Alarm Installation	FSSD	30 April 2018	5 July 2018							19 July 2018
Telephone Installation	TFCC	30 Dec 2014	19 Jan 2016							11 Feb 2016
Broadband Co-axial Cable System (BCS)	TFCC	30 Dec 2016	19 Jan 2016							11 Feb 2016

SECTION 4

PROGRAMME

4.3 Authority Submission Status for M&E Services (Amendments) – 2nd Submission

Service	Authority	Original Submission		Comments/Resubmission						Approval/
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	Clearance
Application for Electricity Supply	SP Services Ltd	N.A								
Power Supply Substation	SP PowerGrid Ltd	-	15 Aug 2015		7 Aug 2017					21 Aug 2017
Metering Layout	SP Services Ltd	N.A								
Sanitary Installation	PUB Water Reclamation (Network) Dept	N.A								
Domestic Water Supply	PUB (Water Supply) Network Dept	N.A								
Gas Supply Installation	City Gas Pte Ltd	4 Sept 2018	4 Sept 2018	18 Oct 2018	12 Nov 2018					19 Nov 2018
Air Conditioning & Ventilation Inst.	FSSD	3 Oct 2019	3 Oct 2019							10 Oct 2019
Fire Fighting & Alarm Installation	FSSD	15 Nov 2019	30 Sept 2020							7 Oct 2020
Telephone Installation	TFCC	N.A	24 Jul 2017							14 Aug 2017
Broadband Co-axial Cable System (BCS)	Starhub Cable Vision	N.A	24 Jul 2017							14 Aug 2017

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:	
MC/EC	✓				

(✓*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	Softcopy saved in the 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 - Swimming Pool & Filtration Installation	
Other Drawings - Landscape Drawings - FSSD Approval Building Plan	

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 APPLICABLE

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

*Note: Applicable only, if the client engaged a Project Manager.

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 APPLICABLE

ITEM	KEPT BY

8.2 List of Applicable Code of Practice and Regulations

Services	Title of Code of Practice/Standard
Electrical Wiring	SS CP 5 : 1998
Lightning Protection System	SS 555 : 2010
Air Conditioning & Ventilation Installation	SS 553 : 2009
Lift & Escalator Installation	SS 550 : 2009
Sprinkler System	SS CP 52 : 2004
Dry Riser System	SS 575 : 2012
Automatic Fire Alarm System	SS CP 10 : 2005
Sanitary System	Code of Practice on Sewerage & Sanitary Works
Plumbing System	SS CP 48 : 2005
Town Gas/LPG Supply System	SS CP 51 : 2004

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 Pre-Consultation and Waiver

S/N	Description	Date of Application	Date of Approval	Remarks
1	*Clause 7.6.4 in COPIF2013 Consultation Ref No. Waiver Ref. No. IDA.INTC.96.0701/SKC	8 January 2016	8 January 2016	-
2	*Clause 5.5.2 in Code of Practice on surface water drainage Consultation Ref No. PUB-DD-PCWVDRA Waiver Ref. No. CW/CAT8/14/069-S45249	15 May 2015	10 July 2015	
3	*Clause 2.3.3(c) in Fire Code which require clarification or waiver. Consultation Ref No.- Waiver Ref. Nos., WVR/03249/14, WVR/03250/14, WVR/03253/14 WVR/03266/14, WVR/03267/14, WVR/03268/14 & WVR/03270/14	16 September 2014 17 September 2014	2 October 2014	
4	*Clause 6.4.1(c) in Fire Code which require clarification or waiver. Consultation Ref No.- Waiver Ref. Nos. WVR/02233/14	2 July 2014	1 August 2014	
5	*Clause 4.3 in Fire Code which require clarification or waiver. Consultation Ref No.- Waiver Ref. Nos. A17/1/3/W4648 SUB2016067016	1 Sept 2016	8 Sept 2016	

S/N	Description	Date of Application	Date of Approval	Remarks
6	*Clause 6.4.3(b)(i) in Fire Code which require clarification or waiver. Consultation Ref No.- Waiver Ref. Nos. WVR/01200/17	4 May 2017	3 June 2017	
7	*To exempt the provision of the sprinkler protection directly above the domestic water transfer tank. Consultation Ref No.- Wavier Ref. WVR/01957/17	26 July 2017	31 August 2017	
8	*Clause 2.2.13(b)(i) in Fire Code which require clarification or waiver. Consultation Ref No.- Waiver Ref. Nos. WVR/02848/18	8 Nov 2018	4 Jan 2019	
8	*Clause 2.2.13(b)(i) in Fire Code which require clarification or waiver. Consultation Ref No.- Waiver Ref. Nos. WVR/00385/19	19 Feb 2019	21 March 2019	

*To fill in actual information

8.5 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	
S13	Non-Conformity & Corrective Action Procedures	✓
S14	Quality & Environmental Management System Audit	✓
S15	Feedback Reporting	✓
S16	Client's Feedback	✓
S17	Management Review	✓
S18	Risk Identification, Assessment & Control	✓

8.6 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	
Fault Level Calculation	-	Alpha Consulting Engineers Pte Ltd	Calculation of voltage drop and fault level	
Dialux	4.11	Freewave	Lighting design	✓
Lift Traffic	7.18	Elevate	Lift traffic calculation	✓
Fault Level Calculation	11.1.1	ETAP	Calculation of fault level and voltage drop	

(✓*where applicable*)

SECTION 9

ENVIRONMENTAL CONSIDERATIONS

9.1 Sustainable Design Features / Criteria

Item	Remarks
Green Mark criteria	Gold Plus RB Version 4.1
Green Design Features	Refer to attached list

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	✓
Safety Shoes	✓
Eye Protection	-
Ear Protection	-
Safety Harness / Belt	-
Others:	-

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	✓
Emergency Exit	✓
Assembly Point	✓
Emergency Contact List / Person	✓
Alarm system / methods	✓

List of green features

- LED Light at common areas
- Motion Sensor at staircase mid landing, refuse chute area & linkbridge to MSCP
- Cool paint on east & west walls
- 2 ticks shower mixer tap, basin mixer tap & bib tap and 3 ticks dual flush water closet
- Ferro-lite wall for internal partitions
- Low VOC paint on internal walls
- Utilize Pneumatic Waste Collection System (PWCS)
- Regenerative Lift
- Photo cell devices for 24 hours lighting circuit
- Ductless fan for basement ventilation
- Private meters to monitor water & electricity usage in common areas

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	NA
Tender Documents	A
Tender Report	A
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.

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

Not Applicable

SECTION 11

LIST OF SUB-JOB

11.1 List of Sub-Job Numbers – NOT APPLICABLE

Sub Job No	Description	Allocation Details