Alpha
Consulting Engineers Pte Ltd

PROJECT QUALITY PLAN

ONE AMBER AT AMBER GARDENS

For

BRENDALE PTE LTD

Copy No.	1

Prepared By: Lim Chai Hoon

Authorised By: Loh Fook Yuen

Date: 9 July 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	1427-PQP	6 February 2006

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	6 February 2006	1 to 10	26	
1	6 August 2006	1 to 10	26	+ 13 pgs (Sect 4.1 – Overall Programme)
2	6 February 2007	1 to 10	26	+ 15 pgs (Sect 4.1 – Overall Programme)
3	2 June 2008	1 to 11	28	+ 15 pgs (Sect 4.1 – Overall Programme)
4	9 July 2009	1 to 11	28	+ 1 pgs (Sect 4.1 – Overall Programme)

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Statistics of Development	
Site Area, m²	23,160.70
Nett Floor Area, m²	-
Gross Floor Area, m²	64,849.96 (plot ratio 2.8)
Covered Carpark, m²	
No. of Covered Carpark Lots	563
No. of Apartments/Houses	562
No. of Beds (for Hospitals)	-
No. of Guestroom (for Hotels)	-
No. of Blocks / No. of Storeys	4 blocks of 23 storey
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)							
Services	EI	ACVI	LI	FFAI	PSI	SPFI	
Estimate	6.2	5.0	1.9	1.2	5.8	0.5	
Awarded	5.565	4.885	1.556	0.583	4.341	0.169	

Total Project Construction Cost (S$ x1M)			
	Site Clearance	Piling Works	Main Contract
Estimate	-	11.5	115
Awarded	-	-	105.397

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

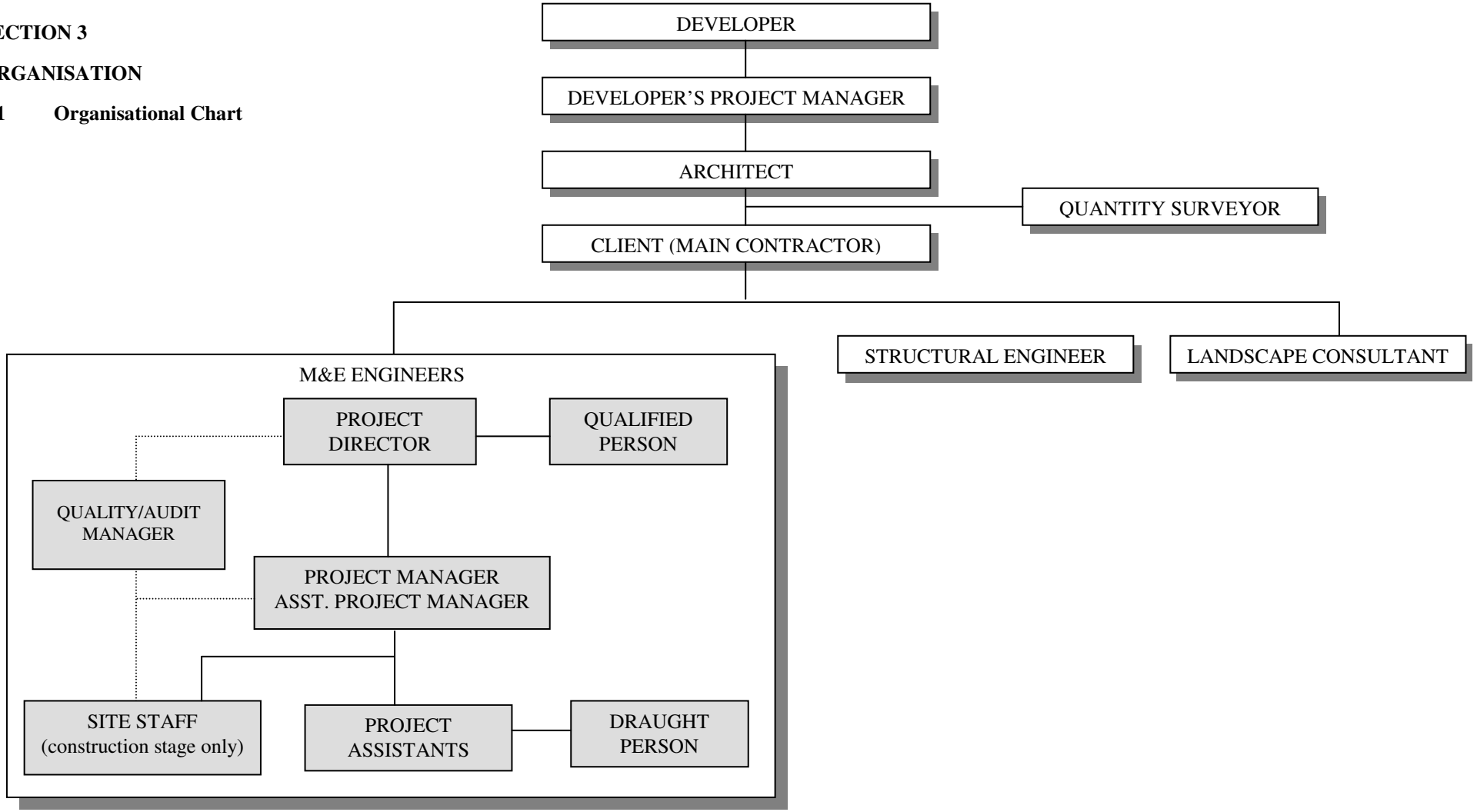
EJECTOR & DIVERTER	✓	SUMP PUMP	✓	FUEL OIL TANK		LIFT & ESCALATOR	✓	BST + Carpark System (using mini-jet fans)	✓	HOISTS		FOAM	

(✓*where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 ACEPL's Project Team Member

TITLE		NAME
Project Director		Richard Teo (RT)
Qualified Person	Mechanical	Loh Chew Thong (LCT)
	Electrical	Loh Fook Yuen (LFY)
Project Manager		Loh Fook Yuen (LFY)
Assistant Project Manager		Chong Lai Meng (CLM)
Project Assistant (Mech)		-
Project Assistant (Elect)		Lim Chai Hoon (LCY)
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		Ho Tuck Seng / Lim Pang Hui / Alvin Tan

3.3 Client/Client's Representatives

Developer:	Brendale Pte Ltd	Client:	China Construction (South Pacific) Development Co Pte Ltd
Address:	No. 5 Shenton Way #02-16 UIC Building Singapore 068808	Address:	10 Hoe Chiang Road #27-02 Keppel Towers Singapore 089315
Tel:	6220 1352	Tel:	6227 4537
Fax:	6226 3424	Fax:	6227 5073

Client's Representatives:

Name of Firm	Contact Person	Contact
Brendale Pte Ltd No. 5 Shenton Way #02-16 UIC Building Singapore 068808	Name: Mr Aldrin Tai Position: Project Manager	Tel: 6220 1352 Fax: 6226 3424 Handphone: 9696 5001 Email: aldrintai@singland.com.sg
UOL Project Management Services Pte Ltd 101 Thomson Road #33-00 United Square Singapore 307591	Name: Mr Lim Ching Kang Position: Project Manager	Tel: 6255 0233 Fax: 6252 9822 Handphone: - Email: lim.chingkang@uol.com.sg
China Construction (South Pacific) Development Co Pte Ltd 10 Hoe Chiang Road #27-02 Keppel Towers Singapore 089315	Name: Mr Yuan Kai Position: Project Director	Tel: 6372 1490 Fax: 6227 5073 Handphone: 9792 6836 Email: oneamber@chinaconstruction.com.sg
China Construction (South Pacific) Development Co Pte Ltd 10 Hoe Chiang Road #27-02 Keppel Towers Singapore 089315	Name: Mr Yang Dian Jun Position: M&E Engineer	Tel: 6342 1201 Fax: 6342 1202 Handphone: 9851 5002 Email: oneamber@chinaconstruction.com.sg

3.4 **Other Consultants** (Local)

Function / Name of Firm	Contact Person	Contact
Architect P&T Consultants Pte Ltd 24 Raffles Place #23-00 Clifford Centre Singapore 048621	Name: Mr Kelvin Ngin Position: Architect	Tel: 6535 2011 Fax: 6535 1283 Handphone: 9633 4469/9845 0451 Email: ngincs@ptcon.com.sg
Quantity Surveyor KPK Quantity Surveyors 865 Mountbatten Road #07-01 Katong Shopping Centre Singapore 437844	Name: Ms Phan Lay Eng Position: Senior QS	Tel: 6239 7317 Fax: 6536 2633 Handphone: 9366 8715 Email: layeng@kpkqs.com.sg
Interior Designer KKS International (S) Pte Ltd 50 Market Street #10-05 Golden Shoe Car Park Singapore 048940	Name: Ms Hidemi Kanda/Mr Alex Pagaduan Position: Interior Designer	Tel: 6534 0800 Fax: 6534 0600 Handphone: 9832 5049 Email: kks77321@singnet.com.sg
Structural Engineer TEP Consultants Pte Ltd 190 Middle Road #16-08 Fortune Centre Singapore 188979	Name: Mr Pok Ming Wee Position: Director	Tel: 6339 7277 Fax: 6338 8362 Handphone: 9689 5595 Email: pok_ming_wee@tepc.com.sg
Landscape Consultant Sitetectonix Pte Ltd 22 Cross Street #02-52/53/54 China Square Central Singapore 048421	Name: Mr Sherman / Wan Shyrell Position: Landscape Architect	Tel: 6327 4452 Fax: 6327 8042 Handphone: - Email: shermanstave@sitetectonix.com / wanshyrell@sitetectonix.com
Lighting Consultant NA	Name: Position:	Tel: Fax: Handphone: Email:
Acoustic Consultant NA	Name: Position:	Tel: Fax: Handphone: Email:
_____	Name: Position:	Tel: Fax: Handphone: Email:

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

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 Firm	Contract *	Contact Person	Contact
Main Contractor China Construction (South Pacific) Development Co Pte Ltd	D&B Contractor	Name: Mr Edwin Lim Position: Project Manager	Tel: 6342 1201 Fax: 6342 1202 Handphone: - Email: EdwinLim@chinaconstruction.com.sg
Air Conditioning & Ventilation Installation Sub-Contractor Great Resources M&E Contractor Pte Ltd	DSC	Name: Mr Sun Jia Ji Position: Asst Project Manager	Tel: 6756 6123 Fax: 6756 6597 Handphone: 9383 9797/8157 5997 Email: jiaji_sun@yahoo.com
Plumbing & Sanitary Installation Sub-Contractor Great Resources M&E Contractor Pte Ltd	DSC	Name: Mr Yang Zhong Yuan Position: Project Manager	Tel: 6756 6123 Fax: 6756 6597 Handphone: 9182 6154 Email: jackzhyu@yahoo.com.sg
Electrical Installation Sub-Contractor Great Resources M&E Contractor Pte Ltd	DSC	Name: Mr Chen Xu Position: Project Manager	Tel: 6756 6123 Fax: 6756 6597 Handphone: 9479 4686 Email: chenxu@chinaconstruction.com.sg
Lift & Escalator Installation Sub-Contractor Schindler Lift (S) Pte Ltd	DSC	Name: Mr Cosmas Position: Project Manager	Tel: 6854 7888 Fax: 6846 2212 Handphone: Email: Cosmas.Kossim@sg.schindler.com
Fire Fighting & Alarm Installation Sub-Contractor Great Resources M&E Contractor Pte Ltd	DSC	Name: Mr Lin Wu Position: Asst. Project Manager	Tel: 6756 6123 Fax: 6756 6597 Handphone: 9755 2161 Email: engrg@chinaconstruction.com.sg
Swimming Pool Filtration Plant Installation Sub-Contractor Aquatech Products & Services Pte Ltd	DSC	Name: Mr Peter Liew Position: Asst Project Manager	Tel: 6842 1188 Fax: 6842 0168 Handphone: 9008 7189 Email: aquatech@singnet.com.sg
Carpark System Installation Sub-Contractor MJ Airtech Asia Pacific	DSC	Name: Mr James Ong Position: Project Manager	Tel: 6481 1192 Fax: 6481 1102 Handphone: 9455 0717 Email: mjairtech@gmail.com

** 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:	Mr Francis Chang	6823 8555
(a) Sub-Station		
(b) Diversion		
SP Services:		
(a) Customer Supply	Mr Rick Lim	6823 8008
(b) Installation		
(c) Meter Section		
(d) Road Lighting		
TFCC:		
(a) SCV	Ms Jane Peh	6825 6366
(b) SingTel	Mr Lee Him Buan	6342 5933
(c) IDA	Mr Tan Huay San	6211 1870
BCA:		
(a) Building Plan		
FSSD:		
(a) Building Plan		
(b) M&E Plan	Mr Ding Tuen Cheng	6848 1415
PUB (Water Supply) Network Dept:		
(a) Water Conservation		
(b) Plumbing Plan	Ms Cheng Kia Yin	6731 3683
(c) Diversion		
PUB Water Reclamation (Network) Dept:		
(a) Building Plan/CBPU	Mr Philip Tan	6731 9653
(b) M&E Plan		
(c) Diversion		
City Gas Pte Ltd:		
(a) Planning/Submission	Mr Liew K B	6586 8846
(b) Installation/Inspection	Mr Lim Teck Seng	6586 8872 / 9007 5727
PowerGas Pte Ltd		
(a) Diversion	Mr Yeo Lian Peng / Mr Tan Lih Hong	9270 7972 / 6751 8131
NEA (Pollution Control)		
(a) Planning/Submission		
(b) Inspection		

SECTION 4

PROGRAMME

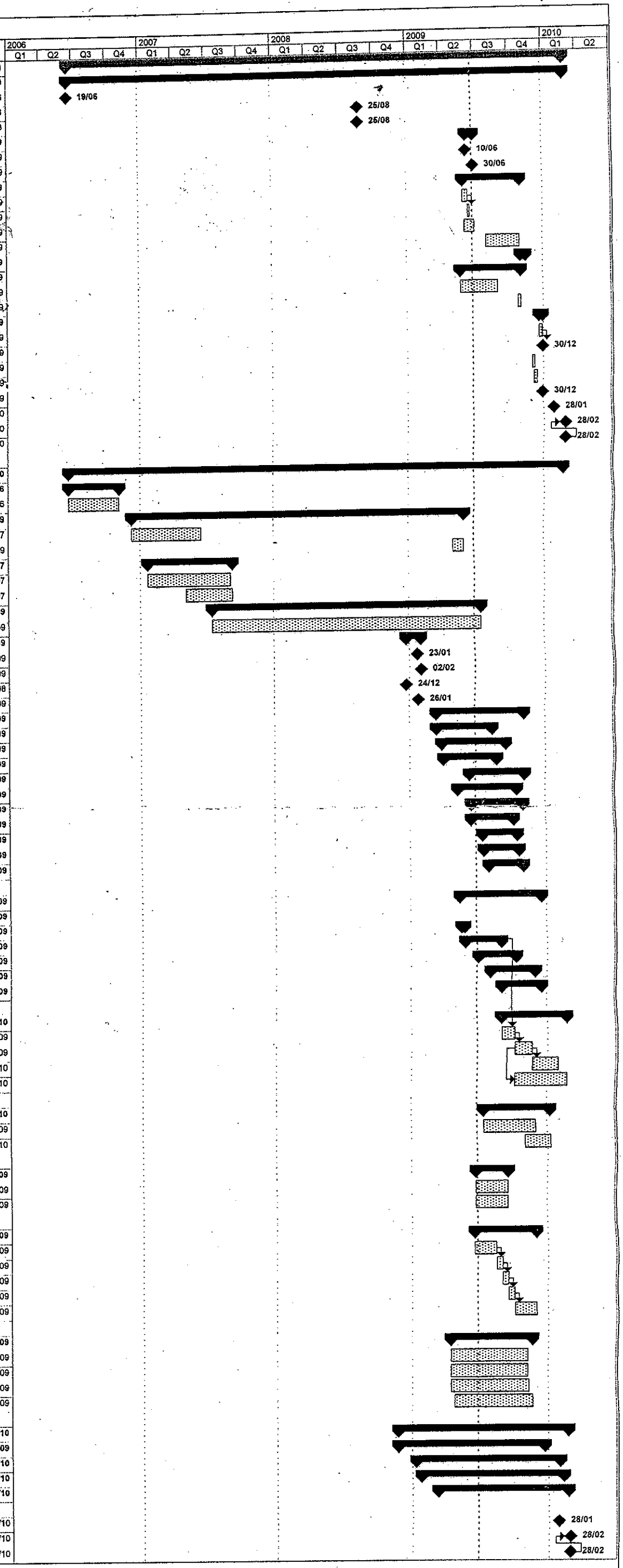
4.1 Overall Programme (refer to attached master programme)

			2005		2006												2007											
ID	TASK NAME	MONTHS	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	4																										
2.	Planning Submission	4																										
3.	Detail Design	4																										
4.	BP Submission	2																										
5.	BP Submission (Amendments)	-																										
6.	Tender Period for Piling	-																										
7.	Tender Period for Sub-Structure	-																										
8.	Tender Period for Super-Structure	-																										
9.	Piling Period	8																										
10.	Sub-Structure Construction Period	7																										

			2007						2008												2009					
ID	TASK NAME	MONTHS	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
11.	Super-Structure Construction Period	18																								
12.	TOP	3																								
13.	CSC																									

Revised Master Program - 6 for OneAmber Project

ID	Task Name	Duration	Start	Finish
0	**Master Program**	**1159 days**	**19/06/06**	**28/02/10**
1	**1 Project Milestones**	**1159 days**	**19/06/06**	**28/02/10**
2	1.1 Commencement date	0 days	19/06/06	19/06/06
3	**1.2 Substation**	**0 days**	**25/08/08**	**25/08/08**
4	1.2.1 handing over to SP services	0 days	25/08/08	25/08/08
5	**1.3 MDF & CDR**	**17 days**	**10/06/09**	**30/06/09**
6	1.3.1 handing over of MDF & CDR room	0 days	10/06/09	10/06/09
7	1.3.2 SCV inspection handover	0 days	30/06/09	30/06/09
8	**1.4 Electrical**	**133 days**	**01/06/09**	**31/10/09**
9	1.4.1 installation of switch board in LV switch room	13 days	01/06/09	14/06/09
10	1.4.2 power turn on from substation to LV switch room	5 days	15/06/09	19/06/09
11	1.4.3 power turn on form switch room to risers	24 days	06/06/09	02/07/09
12	1.4.4 SP services inspection for electrical system	78 days	03/08/09	31/10/09
13	**1.5 PUB water**	**11 days**	**03/11/09**	**16/11/09**
16	**1.6 PUB Plumbing & sanitary**	**140 days**	**25/05/09**	**02/11/09**
17	1.6.1 last IC & minor sewer connection	87 days	25/05/09	01/09/09
18	1.6.2 plumbing & sanitary inspection by PUB	7 days	26/10/09	02/11/09
19	**1.7 City Gas**	**8 days**	**21/12/09**	**30/12/09**
20	1.7.1 citygas inspection	8 days	21/12/09	29/12/09
21	1.7.2 gas tun on	0 days	30/12/09	30/12/09
22	**1.8 RI Archi Inspection**	**6 days**	**02/12/09**	**08/12/09**
23	**1.9 RI M&E inspection**	**8 days**	**07/12/09**	**15/12/09**
24	**1.10 Call for TOP Inspection**	0 days	30/12/09	30/12/09
25	**1.11 TOP inspection**	0 days	28/01/10	28/01/10
26	**1.12 TOP Obtained**	0 days	28/02/10	28/02/10
27	**1.13 Handing over of Project**	0 days	28/02/10	28/02/10
28				
29	**2 Construction works**	**1154 days**	**19/06/06**	**22/02/10**
30	**2.1 Stage 1: Demolition works**	**120 days**	**19/06/06**	**04/11/06**
31	2.1.1 demolition of existing building	120 days	19/06/06	04/11/06
32	**2.2 Stage 2: foundation works**	**775 days**	**09/12/06**	**30/05/09**
33	2.2.1 bored piling	163 days	09/12/06	16/06/07
34	2.2.2 H piling	25 days	02/05/09	30/05/09
35	**2.3 Stage 3: TERS**	**199 days**	**22/01/07**	**10/09/07**
36	2.3.1 Sheet piling	195 days	22/01/07	05/09/07
37	2.3.2 Ring slab	109 days	07/05/07	10/09/07
38	**2.4 Stage 4: Basement works**	**627 days**	**17/07/07**	**15/07/09**
39	2.4.1 basement slab & column	627 days	17/07/07	15/07/09
40	**2.5 Stage 5: Superstructure works**	**34 days**	**24/12/08**	**02/02/09**
41	2.5.1 Block 1 - topping up	0 days	23/01/09	23/01/09
42	2.5.2 Block 3 - topping up	0 days	02/02/09	02/02/09
43	2.5.3 Block 7 - topping up	0 days	24/12/08	24/12/08
44	2.5.4 Block 9 - topping up	0 days	26/01/09	26/01/09
45	**2.6 Stage 6: Edeck Works**	**204 days**	**14/03/09**	**05/11/09**
46	**2.6.1 Zone 1**	**130 days**	**14/03/09**	**11/08/09**
80	**2.6.2 Zone 2**	**149 days**	**28/03/09**	**16/09/09**
105	**2.6.3 Zone 3**	**124 days**	**02/04/09**	**22/08/09**
136	**2.6.4 Zone 4**	**127 days**	**11/06/09**	**05/11/09**
151	**2.6.5 Zone 5**	**138 days**	**11/05/09**	**16/10/09**
173	**2.6.6 Zone 6**	**113 days**	**16/06/09**	**01/11/09**
189	**2.6.7 Zone 7**	**98 days**	**15/06/09**	**06/10/09**
198	**2.6.8 Zone 8**	**80 days**	**15/07/09**	**15/10/09**
207	**2.6.9 Zone 9**	**81 days**	**18/07/09**	**20/10/09**
216	**2.6.10 Zone 10**	**80 days**	**31/07/09**	**31/10/09**
224				
225	**2.7 Stage 7: Boundary wall & drain works**	**189 days**	**14/05/09**	**18/12/09**
226	**2.7.1 Authority requirement**	**0 days**	**14/05/09**	**14/05/09**
228	**2.7.2 Setting out**	**7 days**	**18/05/09**	**25/05/09**
231	**2.7.3 Perimeter D to E (90m)**	**84 days**	**27/05/09**	**31/08/09**
241	**2.7.4 Perimeter F to C (120m)**	**87 days**	**01/07/09**	**09/10/09**
251	**2.7.5 Perimeter A to B (120m)**	**103 days**	**03/08/09**	**30/11/09**
261	**2.7.6 Perimeter B to C (100m)**	**92 days**	**03/09/09**	**18/12/09**
271				
272	**2.8 Softscape work**	**150 days**	**01/09/09**	**22/02/10**
273	2.8.1 Sub-soil drainage works	30 days	01/09/09	05/10/09
274	2.8.2 Soil fill	40 days	06/10/09	20/11/09
275	2.8.3 Trees and plants	60 days	21/11/09	29/01/10
276	2.8.4 Maintenance	120 days	06/10/09	22/02/10
277				
278	3 Clubhouse	**154 days**	**16/07/09**	**09/01/10**
279	3.1 structure	120 days	15/07/09	01/12/09
280	3.2 archi	60 days	02/11/09	09/01/10
281				
282	4 AC ledge	**75 days**	**23/06/09**	**17/09/09**
283	4.1 C5	75 days	23/06/09	17/09/09
284	4.2 C7	75 days	23/06/09	17/09/09
285				
286	5 Swimming pool	**142 days**	**19/06/09**	**01/12/09**
287	5.1 structure remaining works	50 days	19/06/09	15/08/09
288	5.2 structure ponding test	14 days	17/08/09	01/09/09
289	5.3 leakage repair	14 days	02/09/09	17/09/09
290	5.4 waterproofing	14 days	18/09/09	03/10/09
291	5.5 tiling	50 days	05/10/09	01/12/09
292				
293	6 Staircase & Lobby	**189 days**	**15/04/09**	**19/11/09**
294	6.1 Blk 7	178 days	15/04/09	06/11/09
295	6.2 Blk 9	178 days	15/04/09	06/11/09
296	6.3 Blk 1	180 days	15/04/09	09/11/09
297	6.4 Blk 3	180 days	25/04/09	19/11/09
298				
299	7 Architecture works - internal units	**392 days**	**25/11/08**	**23/02/10**
300	**7.1 Blk 7- internal units finishes include QM inspection**	**338 days**	**25/11/08**	**22/12/09**
302	**7.2 Blk 9- internal units finishes include QM inspection**	**332 days**	**12/01/09**	**01/02/10**
304	**7.3 Blk 1- internal units finishes include QM inspection**	**329 days**	**26/01/09**	**11/02/10**
306	**7.4 Blk 3- internal units finishes include QM inspectiom**	**300 days**	**12/03/09**	**23/02/10**
308				
309	8 TOP Inspecton	0 days	28/01/10	28/01/10
310	9 TOP Obtained	0 days	28/02/10	28/02/10
311	10 Project Completion & Handing Over	0 days	28/02/10	28/02/10



Prepared by: China Construction (SP) Development Co Pte Ltd
Date: 25th June 2009

Task — Milestone — External Tasks
Split — Summary — External Milestone
Progress — Project Summary — Deadline

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	-	27/7/05							5/8/05
Power Supply Substation	SP PowerGrid Ltd	15/12/05	27/1/06		22/3/06		22/10/07		30/10/07	12/11/07
Metering Layout	SP Services Ltd									
Sanitary Installation	PUB Water Reclamation (Network) Dept	16/7/07	16/4/08							29/4/08
Domestic Water Supply	PUB (Water Supply) Network Dept	23/7/07	19/12/08							9/1/09
Gas Supply Installation	City Gas Pte Ltd	30/7/07	3/10/07	9/10/07	23/10/07					29/10/07
Air Conditioning & Ventilation Inst.	FSSD	6/8/07	10/2/09							25/2/09
Fire Fighting & Alarm Installation	FSSD	6/8/07	13/2/09							25/2/09
Telephone Installation	TFCC	6/8/07	29/8/07	26/9/07	23/1/08					28/2/08
Broadband Co-axial Cable System (BCS)	Starhub Cable Vision	6/8/07	29/8/07	26/9/07	23/1/08					28/2/08
Fuel Storage	FSSD									
	NEA (Pollution Control)									

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:	
- PP/VO	✓				
- EC/MC	✓				

(✓*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	LCY
Incoming Architectural Sketches/Details	LCY
Incoming Structural Drawings	LCY
M&E Drawings - Electrical Installation	LCY
- Lift & Escalator Installation	LCY
- Air Conditioning & Ventilation Installation	CLM
- Fire Fighting & Alarm Installation	CLM
- Plumbing & Sanitary Installation	CLM
- Swimming Pool & Filtration Installation	CLM
Other Drawings - Interior Design	LCY
- Landscape	LCY

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

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~~	
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 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	
Fault Level Calculation	-	Alpha Consulting Engineers Pte Ltd	Calculation of voltage drop and fault level	

(✓*where applicable*)

SECTION 9

ENVIRONMENTAL CONSIDERATIONS

9.1 Sustainable Design Features / Criteria

Item	Remarks
Green Mark criteria	-
Green Design Features	-

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	✓

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	C
M&E Cost Estimate Report	NA
Pre-Qualification of Tenderers	NA
Tender Documents	NA
Tender Report	NA
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 – NOT USED

Sub Job No	Description	Allocation Details