Alpha
Consulting Engineers Pte Ltd

PROJECT QUALITY PLAN

CORALIS

For

GROVEHILL PTE LTD

Copy No.	1

Prepared By: Yip Yoke Fun

Authorised By: Loh Fook Yuen

Date: 6 March 2013

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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	6121-PQP	6 March 2013

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	26 May 2008	1 to 11	28	
1	6 January 2011	1 to 11	28	+2pgs (Section 4.1 Overall Programme)
2	8 March 2012	1 to 11	28	+2pgs (Section 4.1 Overall Programme) +1pg (Section 9.1 Sustainable Design Features/Criteria)
3	6 March 2013	1 to 11	29	+2pgs (Section 4.1 Overall Programme) +1pg (Section 9.1 Sustainable Design Features/Criteria)

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Statistics of Development	
Site Area, m²	4,650.35
Nett Floor Area, m²	-
Gross Floor Area, m²	9,765.74
Covered Carpark, m²	4,379.61
No. of Covered Carpark Lots	124
No. of Apartments/Houses	127
No. of Beds (for Hospitals)	NA
No. of Guestroom (for Hotels)	NA
No. of Blocks / No. of Storeys	1 Block / 20-Storey
Green Mark Category	Certified
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	-	-	-	-	-	-				

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

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

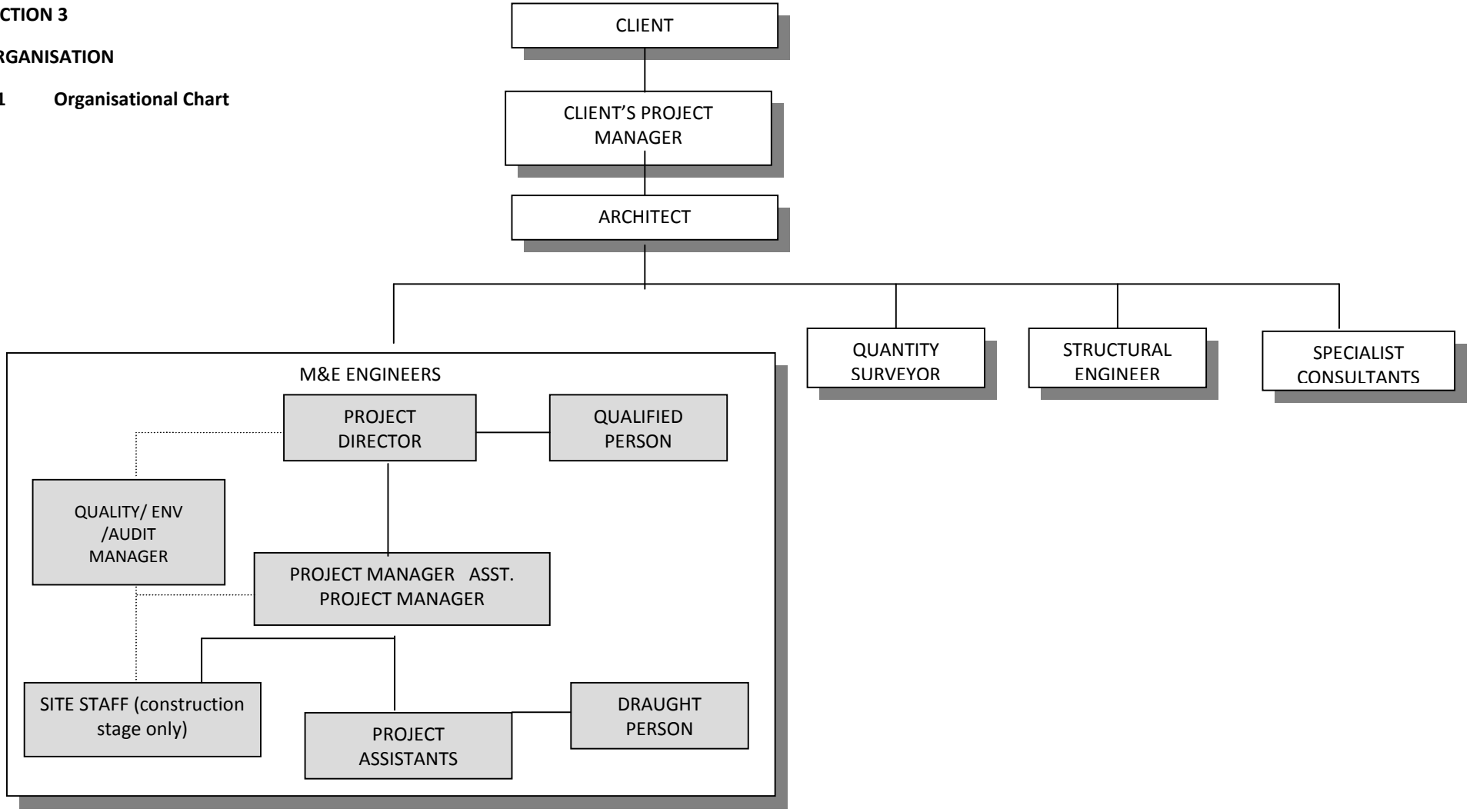
EJECTOR & DIVERTER	✓	SUMP PUMP	✓	FUEL OIL TANK	✓	LIFT & ESCALATOR	✓	PRESSURE VESSEL	✓	HOISTS		FOAM	

(✓*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		Derek Ong (DO)
Project Assistant (Mech)		-
Project Assistant (Elect)		Muhammad Sufiyan Bin Rahmat (MSR)
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		
Clerk-of-Work (M&E)		

3.3 Client/Client's Representatives

Client:- (Developer)	GroveHill Pte Ltd	Client: (Main Contractor)	Tiong Aik Construction Pte Ltd
Address:-	No. 1 Jalan Berseh #03-03 New World Centre Singapore 209037	Address:	No. 1 Jalan Berseh #03-03 New World Centre Singapore 209037
Tel:-	6392 2988	Tel:	6392 2988
Fax:-	6392 0988	Fax:	6392 0988

Client's Representatives:-

Name of Company	Contact Person	Contact
GroveHill Pte Ltd	Name: Mr Neo Thiam Boon/Ms Wendy Liong Position: Director / Business Development Executive	Tel: 6392 2988 Fax: 6392 0988 Handphone: Email: tiamboon@tiongaik.com.sg / wendy@tiongaik.com.sg
Tiong Aik Construction Pte Ltd	Name: Mr Chow Yew Seng Position: General Manager	Tel: 6392 2988 Fax: 6392 0988 Handphone: Email: yewseng@tiongaik.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 Park + Associates Pte Ltd	Name: Mr Lim Koon Park Position: Managing Director	Tel: 6282 0604 Fax: 6288 0604 Handphone: - Email: info@parkassociates.com.sg
Quantity Surveyor NA	Name: Position:	Tel: Fax: Handphone: Email:
Structural Engineer KTP Consultants Pte Ltd	Name: Mr Liu Yu Jun Position: Senior Engineer	Tel: 6273 5622 Fax: 6273 8454 Handphone: - Email: liuyj@ktp.com.sg
Interior Designer NA	Name: Position:	Tel: Fax: Handphone: Email:
Lighting Consultant NA	Name: Position:	Tel: Fax: Handphone: Email:
Acoustic Consultant NA	Name: Position:	Tel: Fax: Handphone: Email:
Landscape Architect 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 Company	Contract *	Contact Person	Contact
Main Contractor Tiong Aik Construction Pte Ltd	DSC	Name: Mr Chow Yew Seng Position: General Manager	Tel: 6392 2988 Fax: 6392 0988 Handphone: - Email: yewseng@tiongaik.com.sg
Air Conditioning & Ventilation Installation Sub-Contractor Aircon Design Pte Ltd	DSC	Name: Mr Francis Lau Position: Assistant Manger	Tel: 6482 8933 Fax: 6482 8977 Handphone: 9665 8308 Email: francis@adpl.com.sg
Plumbing & Sanitary Installation Sub-Contractor Sani-Flux Resources Pte Ltd	DSC	Name: Mr William Wong Position: Managing Director	Tel: 6396 4562 Fax: 6396 4561 Handphone: 9239 5381 Email: william-saniflux@hotmail.com
Electrical Installation Sub-Contractor King Hua Electrical Pte Ltd	DSC	Name: Mr Simon Ang Position: Managing Director	Tel: 6251 6786 Fax: 6251 6695 Handphone: 9619 5925 Email: angteowsan@kinghua.com.sg
Lift & Escalator Installation Sub-Contractor Mitsubishi Elevator (Singapore) Pte Ltd	DSC	Name: Mr Eric Lee Position: Sales Executive	Tel: 6842 5678 Fax: 6748 2292 Handphone: 9450 9680 Email: eric.lee@mesp.meap.com
Fire Fighting & Alarm Installation Sub-Contractor Maxx Engineering Pte Ltd	DSC	Name: Mr Lim Chun Leong Position: Manager	Tel: 6487 5044 Fax: 6487 5833 Handphone: 9764 4727 Email: maxxengrg@singnet.com.sg
Swimming Pool Filtration Plant Installation Sub-Contractor AquaTech Products & Services Pte Ltd	DSC	Name: Mr Jonathan Ang Position: General Manger	Tel: 6842 1188 Fax: 6842 0168 Handphone: 9789 9452 Email: aquatech@singnet.com.sg
Carpark System Installation Sub-Contractor -		Name: - Position: -	Tel: - Fax: - Handphone: - Email: -
-		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 Francis Chang See Tong	6378 8555
(b) Diversion		
SP Services:		
(a) Customer Supply		
(b) Installation	Mr Murugaiah Selvam	9145 1769
(c) Meter Section	Mr Caleb Seow	6876 4801
(d) Road Lighting		
TFCC:		
(a) SCV	Mr Kent Foo	9459 9500
(b) SingTel	Mr Mohd Ghani	9735 3186
(c) IDA	Mr Tan Huay San	6218 1870
BCA:		
(a) Building Plan		
(b) Green Mark		
FSSD:		
(a) Building Plan	Mrs Ling Yap Kim Har	6325 8649
(b) M&E Plan	Mr Ridzuwan Supari	6848 1418
PUB (Water Supply) Network Dept:		
(a) Water Conservation		
(b) Plumbing Plan	Mr Toh Tse Teck	6885 2466
(c) Diversion		
(d) NEWater		
PUB Water Reclamation (Network) Dept:		
(a) Building Plan/CBPU	Mr David Lim	6731 9629
(b) M&E Plan		
(c) Diversion		
City Gas Pte Ltd:		
(a) Planning/Submission	Mr Liew K B	6578 7603
(b) Installation/Inspection	Mr Lim Teck Seng	9007 5727
PowerGas Pte Ltd		
(a) Diversion		
NEA (Pollution Control)		
(a) Planning/Submission		
(b) Inspection		

SECTION 4

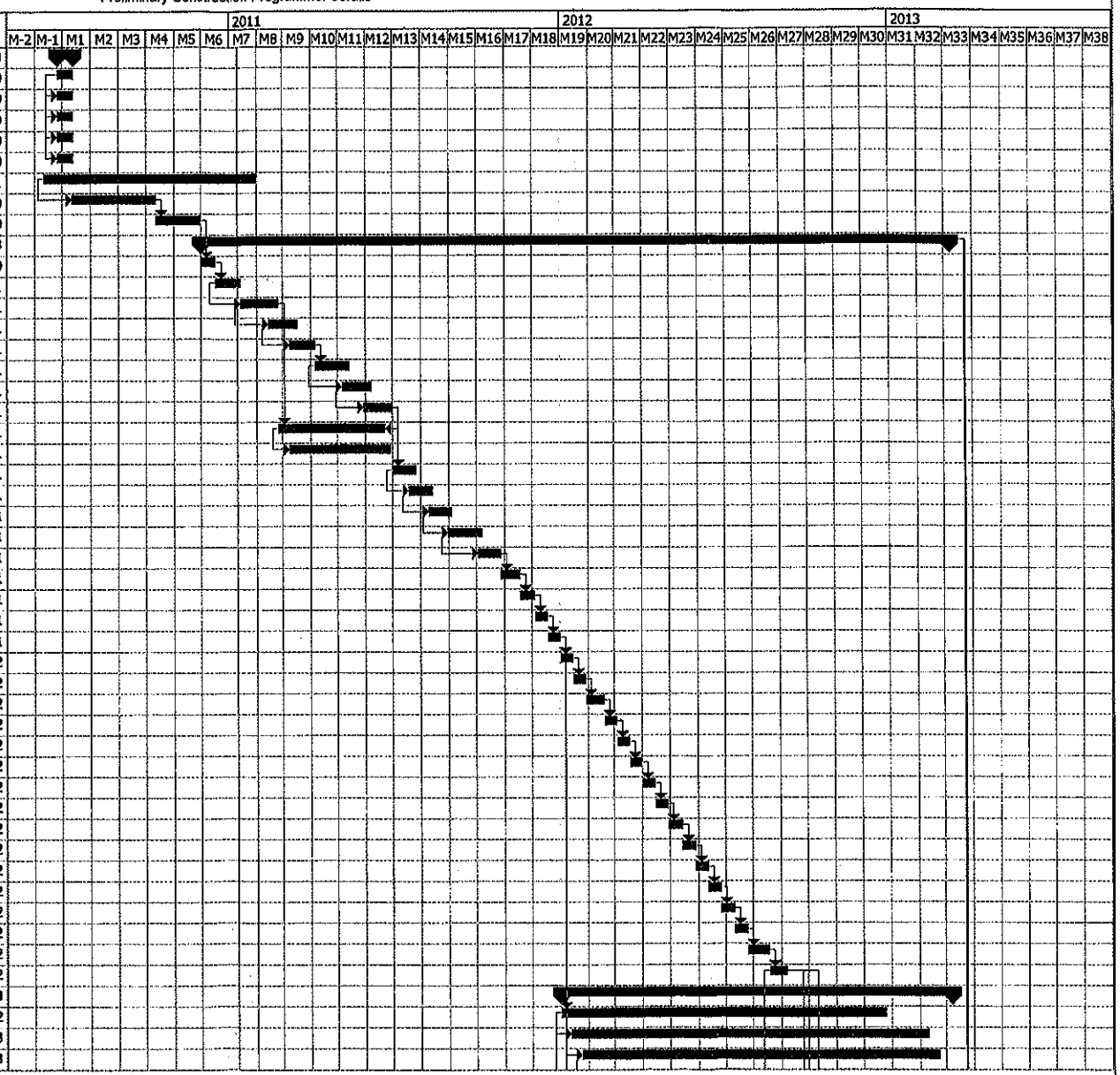
PROGRAMME

4.1 Overall Programme

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																									

Preliminary Construction Programme: Coralis

ID	Name	Duration	Start	Finish
1	**Preliminaries**	**14 days**	**6/26/10**	**7/12/10**
2	Application of factory licence	14 days	6/26/10	7/12/10
3	Pre-condition survey	14 days	6/26/10	7/12/10
4	Instrumentation monitoring	14 days	6/26/10	7/12/10
5	Cable detection	14 days	6/26/10	7/12/10
6	Site clearance/Parameter drain	14 days	6/26/10	7/12/10
7	**Design submission and approval (ST)**	200 days	6/11/10	1/31/11
8	**Piling work (148)**	78 days	7/12/10	10/11/10
9	**Temporary work (GMP)**	43 days	10/12/10	11/30/10
10	**Tower Block**	**694 days**	**12/1/10**	**3/7/13**
11	B1 strut slab at GMP area (101.95)	14 days	12/1/10	12/16/10
12	Excavation to B2 (Open cut area. 98.55)	24 days	12/17/10	1/13/11
13	Pilecaps/Pile cut off/Check ECCE (Open cut area)	30 days	1/14/11	2/24/11
14	B2 slab/beam/wall (Open cut area)	28 days	2/14/11	3/17/11
15	B1 slab (Open cut area. 101.95)	24 days	3/9/11	4/5/11
16	Excavation to B2 level (GMP/Tower Block area. 98.55)	32 days	4/6/11	5/13/11
17	Pilecaps/Pile cut off/Check ECC (GMP/TB area)	28 days	5/6/11	6/7/11
18	B2 slab (GMP/TB area)	28 days	5/30/11	6/30/11
19	Backfilling	100 days	2/25/11	6/22/11
20	Underground services	95 days	3/9/11	6/28/11
21	B2 wall	22 days	7/1/11	7/26/11
22	B1 slab	22 days	7/19/11	8/13/11
23	B1 wall	22 days	8/10/11	9/3/11
24	1st sty slab	32 days	8/31/11	10/6/11
25	2nd sty slab	22 days	10/3/11	10/27/11
26	3rd sty slab	18 days	10/28/11	11/17/11
27	4th sty slab	14 days	11/18/11	12/3/11
28	5th sty slab	12 days	12/5/11	12/17/11
29	6th sty slab	12 days	12/19/11	12/31/11
30	7th sty slab	12 days	1/2/12	1/14/12
31	8th sty slab	12 days	1/16/12	1/28/12
32	9th sty slab	12 days	1/30/12	2/18/12
33	10th sty slab	12 days	2/20/12	3/3/12
34	11th sty slab	12 days	3/5/12	3/17/12
35	12th sty slab	12 days	3/19/12	3/31/12
36	13th sty slab	12 days	4/2/12	4/14/12
37	14th sty slab	12 days	4/16/12	4/28/12
38	15th sty slab	12 days	4/30/12	5/14/12
39	16th sty slab	12 days	5/15/12	5/28/12
40	17th sty slab	12 days	5/29/12	6/11/12
41	18th sty slab	12 days	6/12/12	6/25/12
42	19th sty slab	13 days	6/26/12	7/10/12
43	20th sty slab	13 days	7/11/12	7/25/12
44	roof slab	20 days	7/26/12	8/18/12
45	Lift motor room	16 days	8/20/12	9/6/12
46	**Architectural work**	**362 days**	**1/2/12**	**3/7/13**
47	Wall	300 days	1/2/12	12/25/12
48	Ceiling work	330 days	1/13/12	2/9/13
49	Wall finishes	330 days	1/25/12	2/21/13

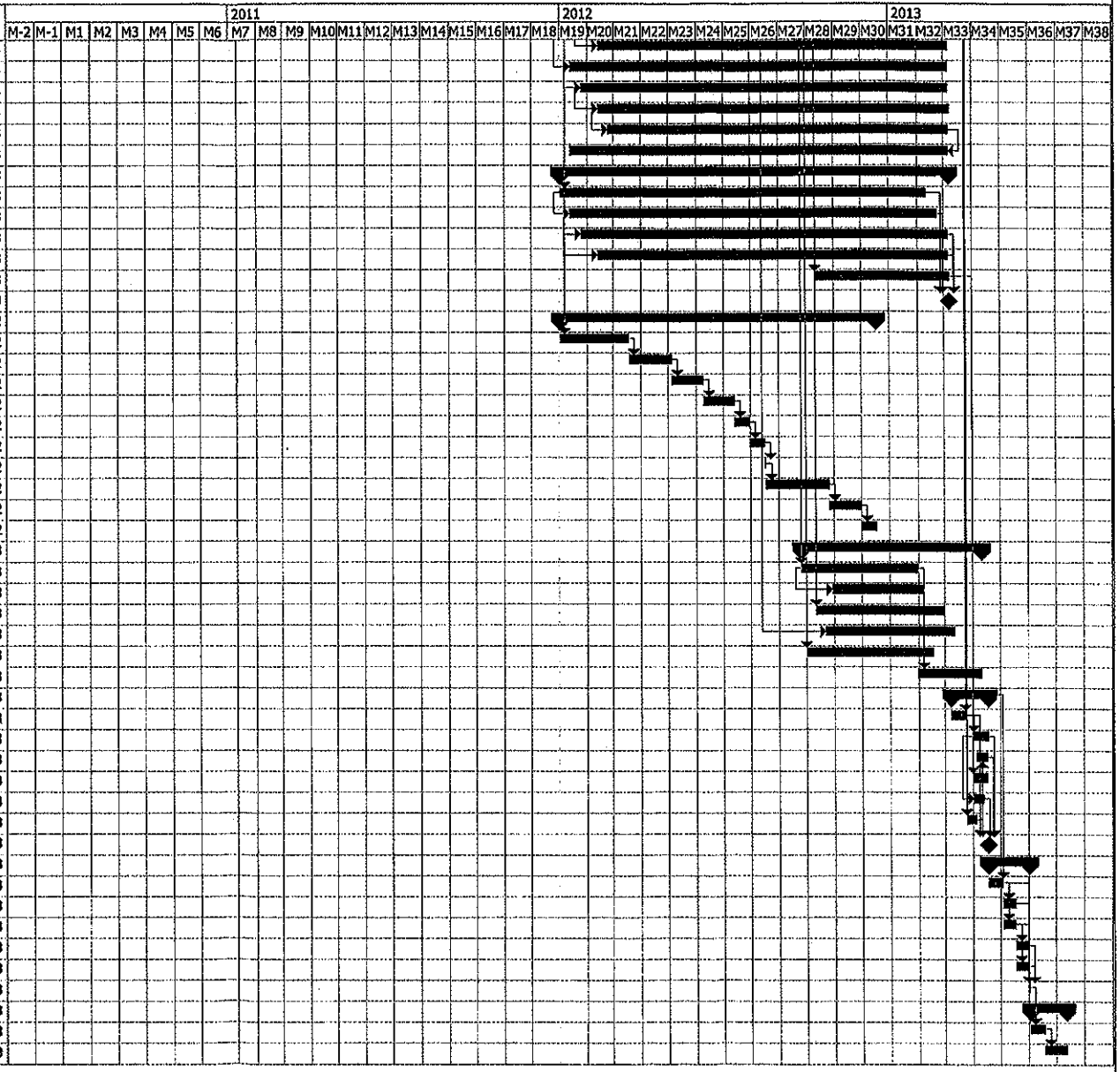


Tiong Aik Construction Pte Ltd
Date: Mon 1/10/11

Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline

Preliminary Construction Programme: Coralis

ID	Name	Duration	Start	Finish
50	Floor finishes	330 days	2/13/12	3/5/13
51	Window work	350 days	1/13/12	3/5/13
52	Door	340 days	1/25/12	3/5/13
53	Wardrobe & kitchen cabinet	332 days	2/13/12	3/7/13
54	Metal works	320 days	2/24/12	3/5/13
55	Kitchen & sanitary accessories	350 days	1/13/12	3/5/13
56	**M&E work**	**361 days**	**1/2/12**	**3/6/13**
57	Sanitary & plumbing	340 days	1/2/12	2/9/13
58	Electrical	340 days	1/13/12	2/21/13
59	Air-con	340 days	1/25/12	3/5/13
60	Fire protection	330 days	2/13/12	3/5/13
61	Lift Installation	125 days	10/12/12	3/6/13
62	Completion	0 days	3/6/13	3/6/13
63	**Electrical Sub-Station**	**293 days**	**1/2/12**	**12/17/12**
64	RC	60 days	1/2/12	3/17/12
65	Architechtural work	40 days	3/19/12	5/4/12
66	M&E work	30 days	5/5/12	6/8/12
67	Lead in pipes/draw pit	30 days	6/9/12	7/13/12
68	Powergrid 1st inspection	14 days	7/14/12	7/30/12
69	Powergrid 2nd inspection	14 days	7/31/12	8/16/12
70	Handing over to Power Grid	1 day	8/17/12	8/17/12
71	Powergrid substation energize	60 days	8/18/12	10/26/12
72	Consumer switch room energize	30 days	10/27/12	11/30/12
73	Power turn On	14 days	12/1/12	12/17/12
74	**External work**	**170 days**	**9/25/12**	**4/10/13**
75	Drain	110 days	9/25/12	1/30/13
76	Driveway	85 days	10/30/12	2/5/13
77	Decking	120 days	10/12/12	2/28/13
78	Fence/Boundary wall	120 days	10/23/12	3/11/13
79	Play area	120 days	10/1/12	2/16/13
80	Landscape	60 days	1/31/13	4/10/13
81	**M&E testing**	**35 days**	**3/8/13**	**4/17/13**
82	Power Grid testing	14 days	3/8/13	3/23/13
83	PUB water inspection	14 days	4/2/13	4/17/13
84	Water Turn On	10 days	4/5/13	4/16/13
85	Lift testing	14 days	4/1/13	4/16/13
86	Power Gas inspection	10 days	4/2/13	4/12/13
87	CBPU/ENV(Sewerage)	10 days	3/25/13	4/4/13
88	Completion of M&E Testing	0 days	4/17/13	4/17/13
89	**Authority Inspection**	**39 days**	**4/18/13**	**6/1/13**
90	Prerequisite for RI	14 days	4/18/13	5/3/13
91	M&E RI	12 days	5/4/13	5/17/13
92	Archi RI	12 days	5/4/13	5/17/13
93	Temporary Fire Permit	12 days	5/18/13	5/31/13
94	FSB	12 days	5/18/13	5/31/13
95	Completion of Authority Insp	1 day	6/1/13	6/1/13
96	**TOP**	**35 days**	**6/3/13**	**7/12/13**
97	Pre-Top Inspection	14 days	6/3/13	6/18/13
98	TOP Inspection	21 days	6/19/13	7/12/13



Tiong Aik Construction Pte Ltd
Date: Mon 1/10/11

Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By 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	-	12/2/10							19/2/10
Power Supply Substation	SP PowerGrid Ltd	28/2/11	7/12/11	30/12/11	19/1/12					23/2/12
Metering Layout	SP Services Ltd	-								-
Sanitary Installation	PUB Water Reclamation (Network) Dept	1/4/11	31/8/12							3/9/12
Domestic Water Supply	PUB (Water Supply) Network Dept	1/3/11	12/9/12	19/9/12	4/10/12					1/11/12
Gas Supply Installation	City Gas Pte Ltd	8/4/10	8/4/10							22/4/10
Air Conditioning & Ventilation Inst.	FSSD	2/5/11	7/1/13							7/2/13
Fire Fighting & Alarm Installation	FSSD	1/6/11	7/1/13							7/2/13
Telephone Installation	TFCC	15/2/11	20/2/12							14/3/12
Broadband Co-axial Cable System (BCS)	Starhub Cable Vision									
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:	
- 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	YYF
Incoming Architectural Sketches/Details	YYF
Incoming Structural Drawings	YYF
M&E Drawings	
- Electrical Installation	DO
- Lift & Escalator Installation	DO
- Air Conditioning & Ventilation Installation	YYF
- Fire Fighting & Alarm Installation	YYF
- Plumbing & Sanitary Installation	YYF
- Swimming Pool & Filtration Installation	YYF
Other Drawings	
- Landscape Drawings	DO
- FSSD Approval Building Plan	YYF

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

Services	Title of Code of Practice/Standard
Electrical Wiring	SS CP5
Lightning Protection System	SS 555
Emergency Voice Communication System	NA
Air Conditioning & Ventilation Installation	SS 553
Lift & Escalator Installation	SS 550
Sprinkler System	SS CP 52
Wet Riser System	SS CP 29
Automatic Fire Alarm System	SS CP 10
Sanitary System	Code of Practice on Sewerage & Sanitary Works
Plumbing System	SS CP 48
Town Gas/LPG Supply System	SS CP 51
Boiler and Steam Supply System	NA
Mechanical Smoke Control System	NA

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 – NOT USED

S/N	Description	Date of Application	Date of Approval	Remarks
1	*Clause number in Code of Practice for (Services) which require clarification or waiver. Consultation Ref No. Waiver Ref. No.			
2	*Clause number in Code of Practice for (Services) which require clarification or waiver. Consultation Ref No. Waiver Ref. No.			
3	*Clause number in Code of Practice for (Services) which require clarification or waiver. Consultation Ref No. Waiver Ref. No.			

*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	
QE1	Quality & Environmental System Audit	✓
QE2	Feedback Reporting	✓
QE3	Clients Feedback	✓
QE4	Management Review	

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	7.18	Elevate	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*)

ENVIRONMENTAL CONSIDERATIONS

9.1 Sustainable Design Features / Criteria

Item	Remarks
Green Mark criteria	Certified
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

List of green features
• T5 light fittings are used in basement car park • Motion sensors are used in private foyer of all apartment units • Clothes drying facilities is used in all apartment units. • Natural ventilation to units and common areas • Inverter and environmentally friendly air conditioner split units with 4 NEA 'ticks' green label is used in all apartment units • Variable frequency variable voltage (VVVF) drive lifts. The lights and fans in the lifts will be switched off after a predetermined time delay when there are no hall calls. • Basement car-park is provided with 2.5% openings as natural ventilation intake • CO sensor is used at basement car-park to control ductless exhaust system
• 1 tick for water efficient fittings • Collection of rainwater for irrigation system • Gas heater is used in all apartment units • Private sub-meter to common usage
• Green Concrete for footpath, kerbs, drains, wheel stopper • Recycled timber deck • Water proof membrane to toilets • Building users guide • Provision of bicycles parking for 5% of dwelling units.
Design for Other green features • Pneumatic waste collection system • Siphonic rainwater system • Eco pond • ECO-plug is used in all apartment units

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	NA
Pre-Qualification of Tenderers	NA
Tender Documents	A
Tender Report	NA
Payment Valuation for QS	NA
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)*

SECTION 11

LIST OF SUB-JOB

11.1 List of Sub-Job Numbers – NOT USED

Sub Job No	Description	Allocation Details