Alpha
Consulting Engineers Pte Ltd

PROJECT QUALITY PLAN

PROPOSED INTEGRATED DEVELOPMENT CONSISTING OF BUS INTERCHANGE, FOOD CENTRE, HERITAGE WALK AND PUBLIC HOUSING DEVELOPMENT COMPRISING 3 BLOCKS OF 13 STOREY RESIDENTIAL BUILDING (TOTAL 330 UNITS) WITH 1 BLOCK OF MULTI-STOREY CAR PARK, ESS, PRECINCT PAVILION AND SOCIAL COMMUNITY FACILITIES AT UPPER SERANGOON ROAD (BIDADARI C5) MK24 ON LOT 10986M UPPER SERANGOON ROAD (TOA PAYOH PLANNING AREA)

For

HOUSING & DEVELOPMENT BOARD

Copy No.	1

Prepared By : Chong Lai Meng/Noraini Sairi/Benedict Lim

Authorised By : Loh Fook Yuen

Date : 12 December 2023

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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	6218	12 December 2023

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	15 February 2016	1 to 11	29	+1 pg (Section 4.1 – Program Schedule)
1	14 August 2017	1 to 11	30	+1 pg (Section 4.1 – Program Schedule) +1 pg (Section 9.1 – Sustainable Design Features/Criteria)
2	1 December 2017	1 to 11	30	+15 pgs (Section 4.1 – Program Schedule) +1 pg (Section 9.1 – Sustainable Design Features/Criteria)
3	15 January 2021	1 to 11	33	+1 pg (Section 4.1 – Program Schedule) +1 pg (Section 9.1 – Sustainable Design Features/Criteria)
4	23 March 2022	1 to 11	33	+1 pg (Section 4.1 – Program Schedule) +1 pg (Section 9.1 – Sustainable Design Features/Criteria)
5	12 December 2023	1 to 11	33	+1 pg (Section 4.1 – Program Schedule) +1 pg (Section 9.1 – Sustainable Design Features/Criteria)

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Integrated Development Comprising Bus Interchange (BI), Gateway, NEA Food Centre (FC), HDB Residential Blocks, Multi-Storey Car Park and Communal Facilities

Statistics of Development	
Site Area, m²	20,782 (C5 Site) & 5,506 (Heritage Walk)
Nett Floor Area, m²	-
Gross Floor Area, m²	48,927.53
Covered Carpark, m²	-
No. of Covered Carpark Lots	378
No. of Apartments/Houses	330
No. of Beds (for Hospitals)	-
No. of Guestroom (for Hotels)	-
No. of Blocks / No. of Storeys	3 Residential Blocks of 13 Storeys each
Green Mark Category	Gold Plus
No. of Phases	-

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)										
Services	EI	ACVI	LEI	FFAI	PSI	SPFI				
Estimate (BI)	1.65	3.4	1.5	0.7	0.5	-				
Estimate (FC)	0.55	1.2	0.15	0.3	0.4	-				
Estimate (HDB)	2.93	2.7	-	1.03	2.7	-				
Awarded	6.35	5.4	1.81	1.36	3.43	-				

Total Project Construction Cost (S$ x1M)			
	Site Clearance	Piling Works	Main Contract
Estimate	1.0	-	117.2
Awarded	-	-	105.6

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 EXTRACTION	√	HOSEREEL	√	HOT WATER	√	FUEL STORAGE	
PABX		COMPUTER A/C		WET RISER		TOWN GAS	√		
SECURITY	√	CARPARK EXHAUST SYSTEM	√	DRY RISER	√	LPG GAS			
TELELIFT		HEATING				MEDICAL GAS			
DATA COMM.									
FLUSHFLOOR TRUNKING									

(✓*where applicable*)

2.3.3 Submission to Relevant Authorities by Others

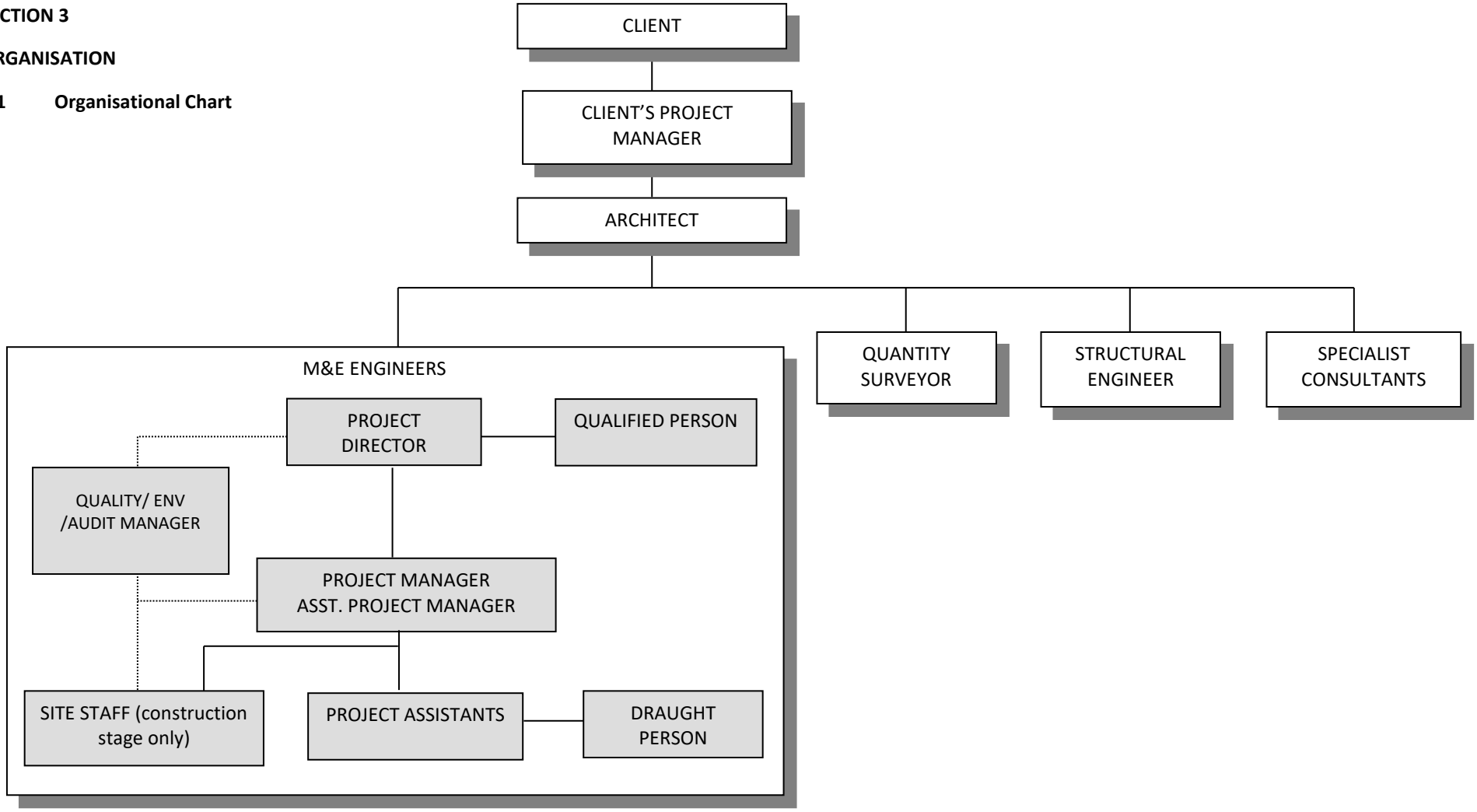
EJECTOR & DIVERTER	√	SUMP PUMP	√	FUEL OIL TANK		LIFT & ESCALATOR	√	PRESSURE VESSEL		HOISTS		FOAM	

(✓*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		Chong Lai Meng (CLM)
Assistant Project Manager		
Project Assistant (Mech)		Noraini Sairi (NHS)
Project Assistant (Elect)		Benedict Lim (LSH)
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Resident Technical Officer (M&E)		Chinnathambi Mani

3.3 Client/Client's Representatives

Client: Housing & Development Board

Address: HDB Hub
480 Lorong 6, Toa Payoh
Singapore 310480

Tel: 6490 2043

Fax: 6490 2030

Client's Representatives:

Name of Company	Contact Person	Contact
Housing & Development Board (Development & Procurement Group)	Name: Ms Ho Mai Mink, Vivien Position: Project Coordinator (Senior Architect) Name: Mr SF Keck, Jeremy Position: Project Director (Senior Engineer)	Tel: 6490 2056 Fax: – Handphone: – Email: Vivien_MM_HO@hdb.gov.sg Tel: 6490 3166 Fax: – Handphone: – Email: Jeremy_SF_KECK@hdb.gov.sg
Land Transport Authority (Bus Infrastructure Development)	Name: Ms Jody Wong Position: Deputy Manager	Tel: 6585 3563 Fax: 6553 5607 Handphone: – Email: jody_Wong@lta.gov.sg
National Environment Agency (Hawker Centres Division)	Name: Ms Goh Poh Poh Position: Deputy Principal Engineer	Tel: 6690 6472 Fax: 6690 6528 Handphone: – Email: goh_poh_poh@nea.gov.sg
	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 MKPL Architects Pte Ltd	Name: Ms Catherina Bonang Position: Director	Tel: 6202 4212 Fax: 6223 4233 Handphone: – Email: bidadaric5integdevt1503@mkpl.com.sg
Structural Engineer KTP Consultants Pte Ltd	Name: Mr Liu Shaoyong Position: Director	Tel: 6248 1288 Fax: – Handphone: 9100 5818 Email: 15.00054_BidadariC5@ktp.com.sg
Quantity Surveyor Rider Levett Bucknall LLP	Name: Ms Ruby Wang Position: Associate	Tel: 6339 1500 Fax: 6339 1521 Handphone: – Email: rlb.bidadaric5@sg.rlb.com
Fire Safety Engineer LKH Fire Engineering Pte Ltd	Name: Mr Liew Kim Hoe Position: Director	Tel: 6604 6900 Fax: 6604 9611 Handphone: – Email: kim.liew@lkhfire.com
CFD Engineer Building System & Diagnostics Pte Ltd	Name: Mr Po Woei Ken Position: Associate Director	Tel: 6560 0702 Fax: 6795 0020 Handphone: 9863 9363 Email: powk@bsd.com.sg
Interior Designer	Name: Position:	Tel: Fax: Handphone: Email:
Lighting Consultant	Name: Position:	Tel: Fax: Handphone: Email:
Acoustic Consultant Acviron Acoustics Consultants Pte Ltd	Name: Dr. Lim Chiak Hwee Position: Principal Consultant	Tel: 6273 5426 Fax: 6270 5700 Handphone: – Email: acviron@singnet.com.sg
Landscape Consultant STX Landscape Architects	Name: Ms Helen Smith-Yeo Position: Principal	Tel: 6327 4452 Fax: 6327 8042 Handphone: – Email: helensmithyeo@stxla.com
Green Mark Consultant Building System & Diagnostics Pte Ltd	Name: Ms Luey Mun Yee Position: Senior Engineer	Tel: 6560 0702 Fax: 6795 0020 Handphone: – Email: bidadari_esd@bsd.com.sg

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 (South Pacific) Development Co Pte Ltd	DSC	Name: Mr Chen Ming Feng Position: Project Manager	Tel: – Fax: – Handphone: 9337 5086 Email: chenmingfeng@chinaconstruction.com.sg
Air Conditioning & Ventilation Installation Sub-Contractor Great Resources M&E Contractor		Name: Mr Xu Chang Cun Position: Deputy Project Manager	Tel: 6397 5030 Fax: 6397 5046 Handphone: 9774 7748 Email: xuchangcun@chinaconstruction.com.sg
Plumbing & Sanitary Installation Sub-Contractor Great Resources M&E Contractor Pte Ltd		Name: Mr Simon Lin Position: Project Manager	Tel: 6756 6123 Fax: 6756 6597 Handphone: 9753 0898 Email: simonlin@chinaconstruction.com.sg
Electrical Installation Sub-Contractor Great Resources M&E Contractor Pte Ltd		Name: Mr Zhang Wei Wei Position: Project Manager	Tel: 6397 5030 Fax: 6397 5046 Handphone: 9325 7869 Email: zhangweiwei@chinaconstruction.com.sg
Lift Installation Sub-Contractor (HDB) EM Services Pte Ltd		Name: Mr Yim Kok Loong Position: Project Manager	Tel: – Fax: – Handphone: 9723 0119 Email: klyim@emservices.com.sg
Lift & Escalator Installation Sub-Contractor (LTA) KONE Pte Ltd		Name: Mr Sundararaj Suther David Position: Project Manager	Tel: – Fax: – Handphone: – Email: sutherdavid.sundararaj@kone.com
Fire Fighting & Alarm Installation Sub-Contractor Great Resources M&E Contractor Pte Ltd		Name: Mr Cui Pan Position: Deputy Head of Department (Fire)	Tel: 6397 5030 Fax: 6397 5046 Handphone: 9271 4569 Email: cuipan@chinaconstruction.com.sg

3.5 Contractors/Sub-Contractors (Cont'd)

Function/Name of Company	Contract *	Contact Person	Contact
Swimming Pool Filtration Plant Installation Sub-Contractor		Name: Position:	Tel: Fax: Handphone: Email:
Carpark System Installation Sub-Contractor		Name: Position:	Tel: Fax: Handphone: Email:
Engineered Smoke Control System CCA & PARTNERS PTE LTD		Name: Mr Erick Tan Position:	Tel: 6476 2272 Fax: 6475 6229 Handphone: 9824 9992 Email: erick_tan@cheechoon.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:		
(a) Sub-Station	Abbas Bin Md Suppiah	6196 8557
(b) Diversion	Andrew Chu Jian Tek	6240 9239
SP Services:		
(a) Customer Supply		
(b) Installation		
(c) Meter Section		
(d) Road Lighting		
TFCC:		
(a) SCV		
(b) SingTel	Chia Seng Sen	8182 3207
(c) IDA		
BCA:		
(a) Building Plan		
(b) Green Mark		
FSSD:		
(a) Building Plan		
(b) M&E Plan		
PUB (Water Supply) Network Dept:		
(a) Water Conservation		
(b) Plumbing Plan	Ng Khor Peng (Infrastructure)	6380 9843
	Shamon Sabtu (Potable water meter)	63809823
	Chia Choon Kwan (for HDB Resi)	
(c) Diversion	Kua Cheng Chuan	9783 1461
(d) NEWater	Muhd Khidhir (NeWater meter)	9785 5149
PUB Water Reclamation (Network) Dept:		
(a) Building Plan/CBPU		
(b) M&E Plan		
(c) Diversion		
(d) Pre-completion audit	Mohd Sofian Kemat	6731 3127
City Gas Pte Ltd:		
(a) Planning/Submission	Misnal Bin Pagi/Liew Khee Boon	6578 7816/6578 7603
(b) Installation/Inspection	Kamarulzaman/Md Jaffar Bin Mohd Ani	8123 0324/6578 7895
PowerGas Pte Ltd		
(a) Diversion	Muhammad Satria Abdul Aziz	6595 5921
(b) Site matters	Muhammad Tasrif Bin Azman	9271 9024

3.6 Authorities (Cont'd)

Authorities/Department	Contact Person	Tel/Fax Nos./E-mail
NEA (Pollution Control) (a) Planning/Submission (b) Inspection		
LTA (DBC)	Mr Wang Hao	
LTA (PSES)	Ms Veronica Wee / Mr Chu Sheng Hong	
SBS Transit (NEL)	Mr Kamal Arifin Bin Jumari/ Mr Andy Er Wei SIang	

SECTION 4

PROGRAMME

4.1 Overall Programme – Refer to attached Program Schedule

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																									

Bidadari C5

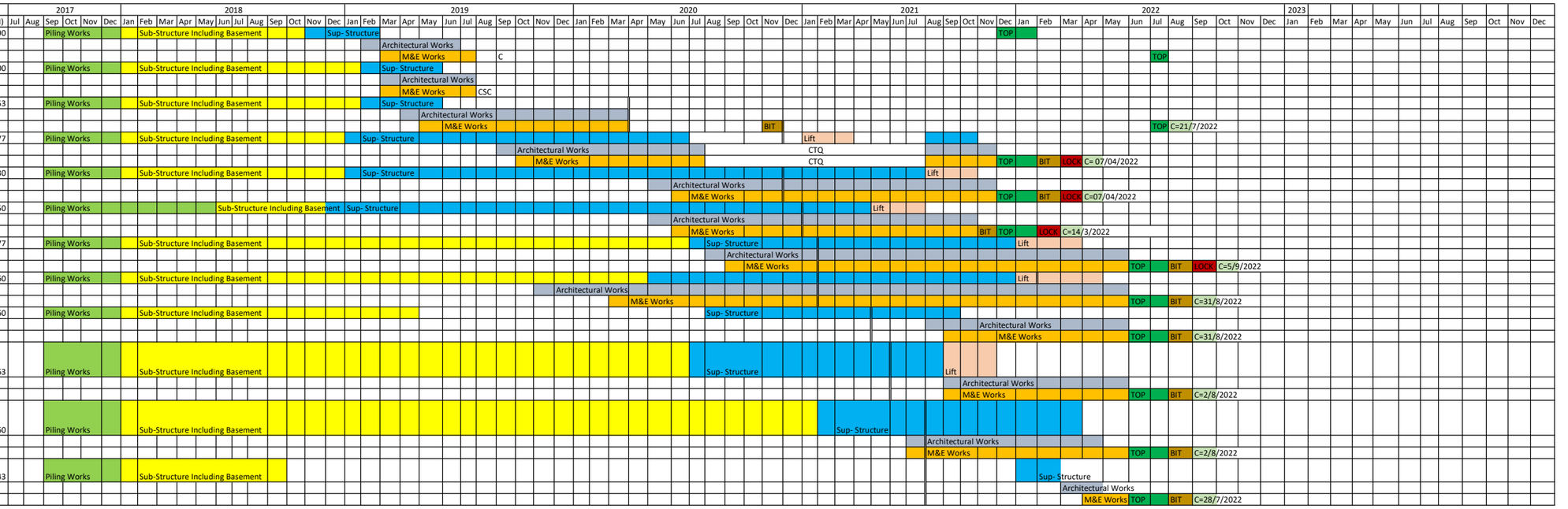
Schedule Works (incorporate Structural, Achitectural and M&E works)

Contract Commencement Date : 21 Jul 2017

Rev 03 Resume on 01 Oct 2020



Phase	Description	contract Duration		ECD	PACD	EOT (D)	EOT (M)
		Start Date	OCD Date				
1	Block 202D (ESS)	21-Jul-17	20-Aug-19	20-Aug-20	16-Sep-19	27.00	0.90
2A	Block 202B PWCS	21-Jul-17	20-Aug-19	31-Dec-21	20-Aug-19	0.00	0.00
2B	Block 202B PWCS	21-Jul-17	20-Mar-20	31-Dec-21	30-Apr-21	406.00	13.53
3	Block 201 MSCP	21-Jul-17	20-Nov-20	31-Dec-21	7-Apr-22	503.00	16.77
4	Block 201B	21-Jul-17	4-Dec-20	31-Dec-21	7-Apr-22	489.00	16.30
5	Block 201C	21-Jul-17	3-Jan-21	31-Dec-21	14-Mar-22	435.00	14.50
6	Block 201A	21-Jul-17	20-Jan-21	31-Dec-21	5-Sep-22	593.00	19.77
7	Block 203 Bus Interchang	21-Jul-17	20-Jan-21	31-Dec-21	31-Aug-22	588.00	19.60
8	Block 202C Food Centre	21-Jul-17	20-Apr-21	31-Dec-21	31-Aug-22	498.00	16.60
9	Block 202 E Deck, Gateway Plaza, CCC, SCF	21-Jul-17	20-May-21	31-Dec-21	2-Aug-22	439.00	14.63
10	Block 202A Precinct Pavilion, Heritage Walk & Site Works	21-Jul-17	20-Jul-21	31-Dec-21	2-Aug-22	378.00	12.60
11	Pedestrian Overhead Bridge	21-Jul-17	20-Jul-21	31-Dec-21	28-Jul-22	373.00	12.43



Piling Works	Piling Works
Sub-St Incl Basement	Sub-Structure Including Basement
Sup- Structure	Super Structure
Architectural Works	Architectural Works
Lift	Lift Installation and T&C
M&E Works	M&E Works and T&C
Landscape Work	Landscape Work
TOP	TOP
PHASE 1 TOP	01 Feb 2022 10-Dec-21
PHASE 2 TOP	21 July 2022 25/5/2022
Heritage Walk	22 Mar 2023
BIT	1st BIT & 2nd BIT
LOCK	Lock Up
C	Costing Form

	Dismantle
TC1	31/7/2021
TC2	31/7/2021
TC3	15/1/2022
TC4	30/4/2021
TC5	30/4/2021
TC6	30/9/2021

SECTION 4

PROGRAMME

4.2 Authority Submission Status for M&E Services

Service	Authority	Original Submission		Comments/Resubmission						Approval
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	Clearance
Application for Electricity Supply	SP Services Ltd	01/04/16	15/09/16	HW: 06/08/19 PP: 06/08/19 PWCS:07/09/20	HW:08/08/19 PP:- PWCS:-	HW:22/08/19 PP:- PWCS:-	HW:29/08/19 PP:- PWCS:-	HW:29/08/19 PP:- PWCS:-	HW:04/09/19 PP:- PWCS:-	HW:11/10/19 PP:08/08/21 PWCS:07/09/20
Power Supply Substation	SP PowerGrid Ltd	01/08/16	13/12/16	26/01/17	15/02/17	11/03/17	20/04/17	15/05/17	17/05/17	25/05/17
LT Cable Reticulation	SP PowerGrid Ltd	01/09/17	30/11/17	HDB: 15/12/17	HDB: 22/01/18	16/08/18	20/09/18	11/10/18	02/11/19	HDB: 14/02/20
				LTA: 15/12/17	LTA: 22/01/18					LTA: 16/08/18
				NEA: 15/12/17	NEA: 22/01/18					NEA: 16/08/18
Metering Layout	SP Services Ltd	01/09/16								
Sanitary Installation	PUB (BPU)	15/08/16	24/09/19	-	-	-	-	-	-	26/09/19
Water Supply	PUB (WSN)	01/08/16	-	-	-	-	-	-	-	-
Water Supply For HDB Residential	PUB (WSN)	-	21/02/20	-	-	-	-	-	-	15/04/20
Water Supply For LTA	PUB (WSN)	20/02/21								03/08/21
Water Supply For NEA	PUB (WSN)	20/02/21								03/08/21
Gas Supply Installation	City Gas Pte Ltd	29/08/16	15/06/17	25/7/17	15/11/17	28/12/17	15/05/20			18/08/21
Air Conditioning & Ventilation Installation	FSSD	19/09/16								
Fire Fighting & Alarm Installation	FSSD	05/09/16								
Emergency Voice Communication Installation	FSSD	05/09/16	22/04/21	12/05/21	11/06/21					21/06/21

4.2 Authority Submission Status for M&E Services (Cont'd)

Service	Authority	Original Submission		Comments/Resubmission						Approval
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	Clearance
Telephone Installation	TFCC	01/08/16	27/12/16							29/12/16
Broadband Co-axial Cable System (BCS)	Starhub Cable Vision	-								
Fuel Storage	FSSD	-								
	NEA (Pollution Control)	-								
Air Conditioning & Ventilation Installation	HDB BQG	03/04/17	28/04/17	23/05/17	14/06/17					16/06/17
Fire Fighting & Alarm Installation	HDB BQG	03/04/17	17/07/17	24/07/17	2/10/17	20/10/17				12/12/18
Water and Gas Installation	HDB BQG	03/04/17	28/04/17	16/07/17	22/5/17	19/6/17	02/10/17	09/10/17		29/08/18
Sanitary Installation	HDB BQG	03/04/17	28/04/17	16/05/17	18/07/17	24/07/17	18/8/17	23/8/17	13/10/17	30/08/18
Electrical Installation	HDB BQG	23/12/16	25/12/16	23/5/17						23/5/17

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									
Power Supply Substation	SP PowerGrid Ltd									
Metering Layout	SP Services Ltd									
Sanitary Installation	PUB Water Reclamation (Network) Dept									On-going TOP As-Built Submission
Domestic Water Supply	PUB (Water Supply) Network Dept									On-going TOP As-Built Submission
Gas Supply Installation	City Gas Pte Ltd	-	18/08/21							27/07/22
Air Conditioning & Ventilation Inst.	FSSD									
Emergency Voice Communication System	FSSD		05/05/21							18/07/22
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:	

(✓*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
Incoming Architectural Sketches/Details	ALL
Incoming Structural Drawings	ALL
M&E Drawings	
- Electrical Installation	LSH
- Lift & Escalator Installation	LSH
- Air Conditioning & Ventilation Installation	NHS
- Fire Fighting & Alarm Installation	NHS
- Plumbing & Sanitary Installation	NHS
- Swimming Pool & Filtration Installation	-
Other Drawings	
- Coordinated Service Drawing	LSH/NHS

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

ITEM	KEPT IN
HDB Guide Drawings	S:\Project\6218 - Bidadari C5\Client's Standards
ADC Section 4_Commuter Facilities Design Requirements (May 2013)	S:\Project\6218 - Bidadari C5\Client's Standards
M&E Design Brief for Bidadari C5	S:\Project\6218 - Bidadari C5\Client's Standards\Consultants - CD-Rom\13_Design brief_Guidelines_Checklist\q_HDB_M&E
Design Brief for the Bus Interchange and the Associated Works at Bidadari Estate	S:\Project\6218 - Bidadari C5\Client's Standards\Consultants - CD-Rom\13_Design brief_Guidelines_Checklist\o_LTA_Bus Interchange
Food Centre at Bidadari (Design Guideline)	S:\Project\6218 - Bidadari C5\Client's Standards\Consultants - CD-Rom\13_Design brief_Guidelines_Checklist\n_NEA_Food Centre

8.2 List of Applicable Code of Practice and Regulations

Services	Title of Code of Practice/Standard
Electrical Wiring	Singapore Standard SS 638: 2018 Code of Practice for Electrical Installations
Lightning Protection System	Singapore Standard SS 555: 2010 Code of Practice for Protection against Lightning
Emergency Voice Communication System	Singapore Standard SS 546: 2009 Code of Practice for Emergency Voice Communication Systems in Buildings
Air Conditioning & Ventilation Installation	Singapore Standard SS 553: 2016 Code of Practice for Air-conditioning and Mechanical Ventilation in Buildings
Lift & Escalator Installation	Singapore Standard SS 550: 2020 Code of Practice for Installation, Operation and Maintenance of Electric Passenger and Goods Lifts
Sprinkler System	Singapore Standard CP 52: 2004 Code of Practice for Automatic Fire Sprinkler System
Dry Riser System	Singapore Standard SS 575: 2012 Code of Practice for Fire Hydrant, Rising Mains and Hose Reel Systems
Automatic Fire Alarm System	Singapore Standard CP 10: 2005 Code of Practice for Installation and Servicing of Electrical Fire Alarm Systems
Sanitary System	Code of Practice on Sewerage & Sanitary Works

8.2 List of Applicable Code of Practice and Regulations (cont'd)

Services	Title of Code of Practice/Standard
Plumbing System	Singapore Standard SS 636: 2018 Code of Practice for Water Services
Town Gas/LPG Supply System	Singapore Standard SS 608: 2015 Code of Practice for Gas Installation
Engineered Smoke Control System	Code of Practice for Fire Precautions in Building 2013 and BR186, BR258 & CP10:2005

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	Consultation to SP PowerGrid Ltd Switchgear Room & Transformer Room sizes Consultation Ref No. 2015C00288	27/08/2015	29/08/2015	-
2	Pre-Consultation to PUB(WRN) Clause 3.1.3.7(a) and Drawing No. 3-9b for Code of Practice on Sewerage and Sanitary Works. Consultation Ref No. 4303	25/11/2015	25/11/2015	-
3	Pre-Consultation to SCDF List of items to refer to Consultation Ref. No. CON/C06010/15	19/11/2015	-	No response from FSSB (submitted by Architect)
4	Follow-up to pre-consultation on 25/11/2015	25/5/2016	-	To follow-up with PUB comments

8.4 List of Pre-Consultation and Waiver (Cont'd)

S/N	Description	Date of Application	Date of Approval	Remarks
5	Pre-Consultation to SCDF Location of Sprinkler Control Valve Consultation Ref. No. CON/C00902/17	03/03/2017	03/03/2017	Approval via e-mail
6	Pre-Consultation to PUB BPU Follow-up to Consultation done on 25/05/2016 Ref No. BR2016102510245574 Confirmation Code: CR201610251004	28/10/16	-	PUB has no objection in principal. To submit the sanitary layout via Corenet to PUB.

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 and Corrective Action Procedures	
S14	Quality & Environmental System Audit	√
S15	Feedback Reporting	√
S16	Clients 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	
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	
Dialux	4.13	Freeware	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
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 with 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
- Utilize Pneumatic Waste Collection System (PWCS)
- Regenerative Lift
- Ductless fan for basement ventilation
- Private meters to monitor major water usage system

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	-
Tender Documents	-
Tender Report	-
Payment Valuation for QS	A
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 APPLICABLE**

SECTION 11

LIST OF SUB-JOB

11.1 List of Sub-Job Numbers – NOT APPLICABLE

Sub Job No	Description	Allocation Details