Alpha
Consulting Engineers Pte Ltd

PROJECT QUALITY PLAN

PROPOSED DEVELOPMENT OF 6 BLOCKS OF 7-STOREY HEALTH CAMPUS COMPRISING ACUTE HOSPITAL, SPECIALIST OUTPATIENT CLINIC, COMMUNITY HOSPITAL, NURSING HOME AND 4 BASEMENT LEVELS WITH 2 LEVELS FOR CARPARKING ON LOTS 06065N (PT) & 05581T (PT) MK 13 AT WOODLANDS DRIVE 17/WOODLANDS AVENUE 12 (WOODLANDS 2 PLANNING AREA)

For

MINISTRY OF HEALTH SINGAPORE

Copy No.	1

Prepared By: Chuan Kian Heng / Rukiah Bte Suttan

Authorized By: Choong Choon Guan

Date: 8 January 2024

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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	6213-PQP	8 January 2024

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	31 October 2016	1 to 11	33	+ 8 pages (Section 4 – Overall Programme)
1	10 May 2019	1 to 11	34	+ 57 pages (Section 4 – Overall Programme) + 1 page (Section 9.1 – Sustainable Design Features / Criteria)
2	8 March 2022	1 to 11	34	+ 3 pages (Section 4 – Overall timeline) + 1 page (Section 9.1 – Sustainable Design Features / Criteria)
3	8 January 2024	1 to 11	34	+ 4 pages (Section 4 – Overall timeline) + 1 page (Section 9.1 – Sustainable Design Features / Criteria)

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Healthcare

Statistics of Development	
Site Area, m²	76,500
Nett Floor Area, m²	250,000
Gross Floor Area, m²	268,000
Covered Carpark, m²	26,436
No. of Covered Carpark Lots	1149
No. of Apartments/Houses	NA
No. of Beds (for Hospitals)	1400
No. of Guestroom (for Hotels)	NA
No. of Blocks / No. of Storeys	6 blocks / 7 Storeys
Green Mark Category	Platinum
No. of Phases	2 phase

2.2 Project Cost

(i) NSC

(a) Main Contract 2

M&E Services Cost Plan (S$)						
Services	LEI	ACMV & BMS (AC-1)	ACMV & BMS (AC-2)	EI (EL-1)	EI EL-2)	ELV & Security
Estimate	-	-	-	-	-	-
Awarded	16,568,832	78,817,700	35,084,460	70,800,000	21,660,000	37,800,000

(b) Main Contract 3

M&E Services Cost Plan (S$)		
Services	ACMV & BMS (AC-3)	EI (EL-3)
Estimate	-	-
Awarded	16,776,580	11,387,000

(ii) DSC

(a) Main Contract 2

M&E Services Cost Plan (S$)					
Services	SI	PI	HWI	TG	MG
Estimate	-	-	-	-	-
Awarded	17,843,915	10,615,333	6,858,666	644,650	22,027,500

M&E Services Cost Plan (S$)				
Services	FPI	Underground Fuel Storage Tank & Underground Lead-In	Earthing System	LPS
Estimate	-	-	-	-
Awarded	12,120,688	2,167,700	470,530	1,013,540

(b) Main Contract 3

M&E Services Cost Plan (S$)						
Services	SI	PI	HWI	MG	FPI	LPS
Estimate	-	-	-	-	-	-
Awarded	2,342,612	2,462,194	476,621	1,186,659	2,725,967	194,630

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

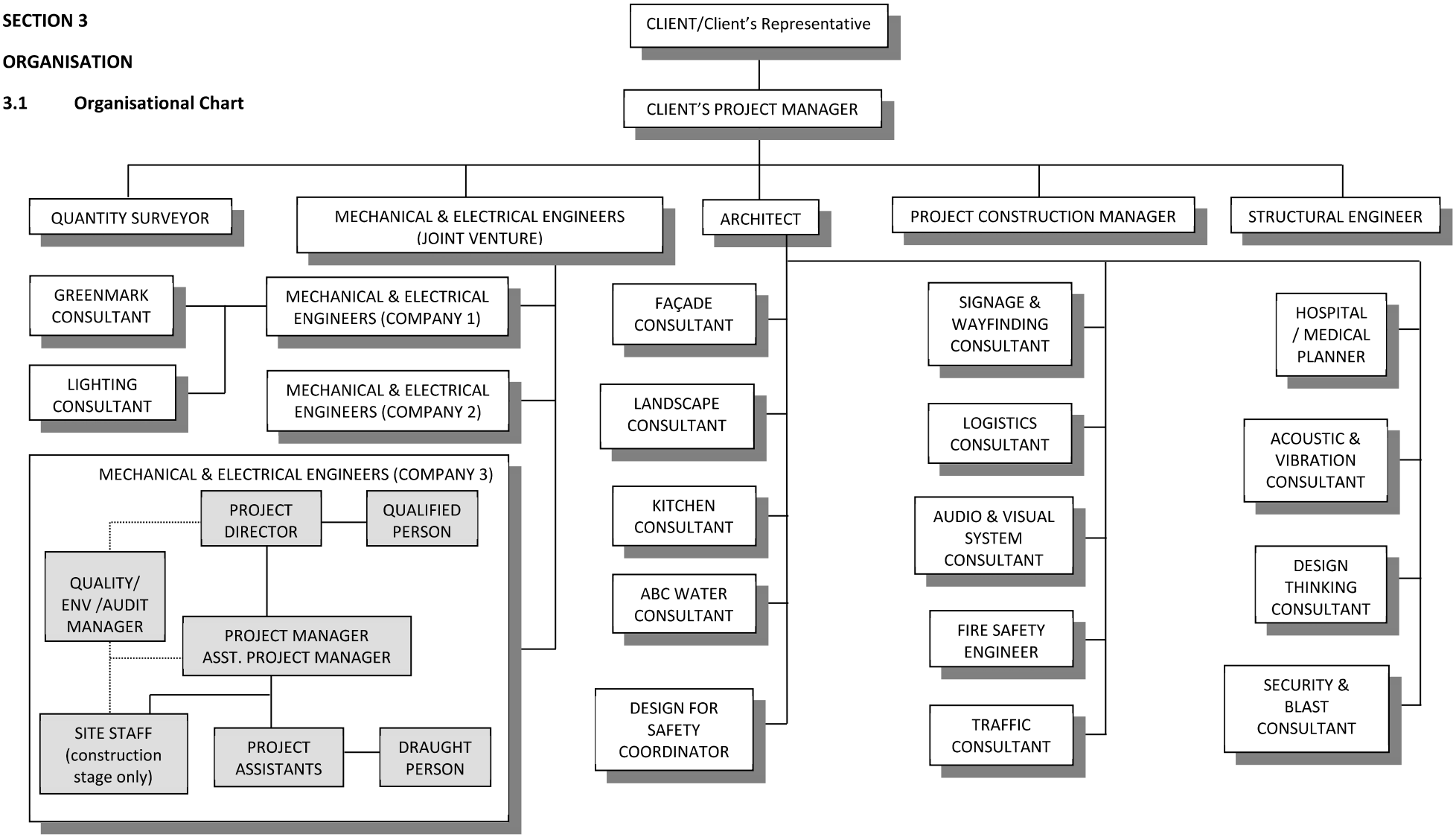
EJECTOR & DIVERTER		SUMP PUMP		FUEL OIL TANK		LIFT & ESCALATOR		PRESSURE VESSEL		HOISTS		FOAM	

(✓*where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 ACEPL's Project Team Member

TITLE		NAME
Project Director		Choong Choon Guan (CCG)
Assistant Project Director		Goh Soon Huat (GSH)
Qualified Person	Mechanical	Choong Choon Guan (CCG)
	Electrical	Loh Fook Yuen (LFY)
Project Manager		Chuan Kian Heng (CKH)
Assistant Project Manager		
Project Assistant (Mech)		
Project Assistant (Elect)		Rukiah Bte Suttan (RBS)
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		-

3.3 Client/Client's Representatives

Client: Ministry of Health

Address: College of Medicine Building, 16 College Road, Singapore 169854

Tel: 6325 9220

Fax: 6224 1677

Client's Representatives:-

Name of Company	Contact Person	Contact
-	Name: Position:	Tel: Fax: Handphone: Email:
-	Name: Position:	Tel: Fax: Handphone: Email:
-	Name: Position:	Tel: Fax: Handphone: Email:
-	Name: Position:	Tel: Fax: Handphone: Email:
-	Name: Position:	Tel: Fax: Handphone: Email:

3.3 Client/Client's Representatives

Client's Project Managers:-

Name of Company	Contact Person	Contact
MOH Holdings Pte Ltd	Name: Chang Peng Position: Director, Healthcare Infrastructure, Projects Division	Tel: 6818 1122 Fax: 6720 0980 Handphone: 9749 0405 Email: peng.chang@mohh.com.sg
MOH Holdings Pte Ltd	Name: Tan Ee Ling Position: Assistant Director Healthcare Infrastructure, Projects Division	Tel: 6818 5832 Fax: 6720 0980 Handphone: 9816 0620 Email: eeling.tan@mohh.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
Project Construction Management Arcadis Project Management Pte Ltd	Name: Lam Ming Sing Bill Position: Assistant Director	Tel: 6239 8550 Fax: 6224 7089 Handphone: Email: BillLam@arcadis.sg
Architect SAA Architects Pte Ltd	Name: Chew Chak Min Position: Project Director	Tel: 6514 0815 Fax: 6224 9929 Handphone: 9782 6593 Email: chew.cm@saaarchitects.com.sg
Structural Engineer T.Y.Lin International Pte Ltd	Name: Wong King Lung Position: Senior Engineer	Tel: 6277 153 Fax: 6278 2622 Handphone: 9499 6419 Email: wongkinglung@tylin.com.sg
Quantity Surveyor Rider Levett Bucknall LLP	Name: Annie Long Position: Senior Associate	Tel: 6339 1500 Fax: 6339 1521 Handphone: 9369 8300 Email: annie.long@sg.rlb.com
Mechanical & Electrical Engineers (Company 1) Surbana Jurong Consultants Pte Ltd	Name: Er. Darren Woo Position: Project Manager	Tel: 6267 8198 Fax: 6248 1291 Handphone: 9067 0366 Email:darren.woocs@surbanajurong.com
Mechanical & Electrical Engineers (Company 2) Squire Mech Pte Ltd	Name: Er. Tan Hwee Khoon Position: Project Director	Tel: 6248 1288 Fax: 6248 1284 Handphone: 9369 8297 Email: tanhweekhoon@squiremech.com
Kitchen Consultant IO-consultants Pte Ltd	Name: Kimberly Ann Roque Position: Project Manager	Tel: 6562 7875 ext. 311 Fax: - Handphone: 9738 1777 Email: Kimberly.Roque@io-consultants.com
Logistic Consultant IO-consultants Pte Ltd	Name: Alexander Buechner Position: Project Manager	Tel: 6562 7875 ext 313 Fax: - Handphone: 9781 7771 Email: Alexander.Buechner@io-consultants.com
Security & Blast Consultant K&C Protective Technologies Pte Ltd	Name: Dr.Liu Chunlin Position: Security Consultant/Engineer	Tel: 6258 0620 Fax: 6258 6210 Handphone: 8112 5186 Email: liu.chun.lin@kcpt.com.sg

3.4 **Other Consultants** (Local)

Function / Name of Company	Contact Person	Contact
Traffic Consultant Vertix Asia-Pacific	Name: Richard Sprosen Position: Project Manager	Tel: 6536 8714 Fax: - Handphone: 9395 4416 Email: richard.sprosen@vertixap.com
Acoustics & Vibration Consultant Acviron Acoustics Consultants Pte Ltd	Name: Lee Heng Soon Position: Lead Personnel	Tel: 6273 5426 Fax: 6270 5700 Handphone: 9853 0127 Email: acviron@singnet.com.sg
ABC Waters Professional AECOM Singapore Pte Ltd	Name: Dr Stephen Tan Position: Lead Personnel	Tel: 6299 2466 Fax: 6299 0297 Handphone: 9115 0948 Email: stephen.tan@aecom.com
Audio & Visual System Consultant Acviron Acoustics Consultants Pte Ltd	Name: Yin Yin Htike Position: Lead A&V System	Tel: 6273 5426 Fax: 6270 5700 Handphone: 9146 3831 Email: acviron@singnet.com.sg
Design for Safety Coordinator SAA Architects Pte Ltd	Name: Grace Chew Position: Design for Safety Co-ordinator	Tel: 6220 0411 Fax: 6224 9929 Handphone: 9126 5153 Email: chew.grace@saaarchitects.com.sg
Façade Consultant Arup Singapore Pte Ltd	Name: Michael Chin Position: Lead Personnel/ Project Director	Tel: 6411 2596 Fax: 6411 2501 Handphone: 9731 0676 Email: Michael.Chin@arup.com
Fire Safety Engineer Ignesis Consultants Pte Ltd	Name: Henry Ho Position: Lead Personnel	Tel: 6293 5431 Fax: 6292 3529 Handphone: 9685 9425 Email: wihc@ignesisconsultants.com
Landscape Consultant ICN Design International Pte Ltd	Name: Chia Jui Siang Position: Project Lead / Client Liaison	Tel: 6225 3006 Fax: 6225 0924 Handphone: 9857 0144 Email: juisiang@icn-design.com.sg
Signage & Wayfinding Consultant UDS Design	Name: Hui Hui Chua Position: Asst Manager / Sales and Marketing	Tel: 6551 2082 Fax: 6741 3925 Handphone: 9109 1885 Email: huihui@udsdesign.com
Lighting Consultant Lighting Planners Associates (S) Pte Ltd	Name: Mayumi Banno Position: Associate/ Lighting Designer Contact person	Tel: 6734 3086 Fax: - Handphone: 9452 6787 Email: m_banno@lighting.co.jp

3.4 **Other Consultants** (Local)

Function / Name of Company	Contact Person	Contact
Design Thinking Consultants Chemistry Form Pte Ltd	Name: John Chan Position: Design Director (Environment / Product)	Tel: 6440 3004 Fax: - Handphone: 9692 9533 Email: john@chemistryteam.com
-	Name: Position:	Tel: Fax: Handphone: Email:
-	Name: Position:	Tel: Fax: Handphone: Email:
-	Name: Position:	Tel: Fax: Handphone: Email:
-	Name: Position:	Tel: Fax: Handphone: Email:

3.4 Other Consultants (Overseas)

Function / Name of Company	Contact Person	Contact
Hospital / Medical Planner Perkins+Will Inc	Name: Emily Bateman Position: Medical Planner	Tel: 312 755 4743 Fax: - Handphone: 8799 4893 Email: emily.bateman@perkinswill.com
Design Thinking Consultants MediConsult Sdn Bhd	Name: Juliana Basheer Ali Position: Principal	Tel: +6-03-4253-320121 Fax: +6-03-4253-3199 Handphone: Email:Juliana.basheer@mediconsult.com.my
-	Name: Position:	Tel: Fax: Handphone: Email:
-	Name: Position:	Tel: Fax: Handphone: Email:
-	Name: Position:	Tel: Fax: Handphone: Email:
-	Name: Position:	Tel: Fax: Handphone: Email:
-	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 –Contract #1 Penta-Ocean Construction Co. Ltd	Main Contract 1	Name: Mr. Desmond Hill Position: Project Director	Tel: 6338 8966 Fax: Handphone: 9633 5904 Email: dhill@mypenta.net
Main Contractor –Contract #2&3 SDK Consortium (SsangYong Engineering & Construction Co., Ltd, Daewoo Engineering & Construction Co., Ltd & Koh Brothers Building & Civil Engineering Contractor Pte Ltd Joint Venture)	Main Contract 2 & 3	Name: Han Jung Sub Position: Senior Manager	Tel: 8437 3983 Fax: - Handphone: 8437 3983 Email: onefunction@ssyenc.com
Air Conditioning & Ventilation Installation Contractor Techniques Air-Conditioning & Engineering Pte Ltd	ACMV Contract 1,2&3	Name: Roger Wong Position: Project Director	Tel: 6744 6667 Fax: 6747 8342 Handphone: 9630 5441 Email: rogerwong@techniques83.com.sg
Plumbing & Sanitary Installation Sub-Contractor MEC Engineering Pte Ltd	DSC (MC2)	Name: Tan Poh Huat Richard Position: General Manager	Tel: 6842 2398 Fax: 6842 0128 Handphone: 9729 1141 Email: mecengg@singnet.com.sg
Plumbing & Sanitary Installation Sub-Contractor King Wan Construction Pte Ltd	DSC (MC3)	Name: David Poh Chee Hao Position: Assistant Project Manager	Tel: 6368 4300 Fax: 6365 7675 Handphone: 9018 3963 Email: david@kingwan.com.sg
Fire Fighting & Alarm Installation Sub-Contractor B-Mech Engineering Pe Ltd	DSC (MC2&3)	Name: Thomas Hoon Position: Project Director	Tel: 6216 9605 Fax: 6261 9606 Handphone: 9780 9800 Email: thomashoon@b-mech.com.sg
Electrical Installation Contractor Bee Kong Electrical Engineering Pte Ltd	NSC (EL1)	Name: Alex Foo Position: Project Manager	Tel: 6894 4467 Fax: 6861 8846 Handphone: 9008 6339 Email: alex@beekong.com.sg
Electrical Installation Contractor UG M&E Pte. LTd	NSC (EL2&3)	Name: Stanley Gan Position: Project Manager	Tel: 6818 8788 Fax: 68188787 Handphone: 8288 1137 Email: Stanley.gan@ugme.sg

3.5 Contractors/Sub-Contractors (cont'd)

Function / Name of Company	Contract *	Contact Person	Contact
Lift & Escalator Installation Contractor Schindler Lifts (Singapore) Pte. Ltd.	NSC	Name: Lim Taw Cheng Position: Project Manager	Tel: 9168 1227 Fax:6848 2212 Handphone: Email: info@sg.schindler.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		
(b) Diversion		
SP Services:		
(a) Customer Supply		
(b) Installation		
(c) Meter Section		
(d) Road Lighting		
TFCC:		
(a) SCV		
(b) SingTel		
(c) IDA		
BCA:		
(a) Building Plan		
(b) Green Mark		
FSSD:		
(a) Building Plan		
(b) M&E Plan		
PUB (Water Supply) Network Dept:		
(a) Water Conservation		
(b) Plumbing Plan		
(c) Diversion		
(d) NEWater		
PUB Water Reclamation (Network) Dept:		
(a) Building Plan/CBPU		
(b) M&E Plan		
(c) Diversion		
City Gas Pte Ltd:		
(a) Planning/Submission		
(b) Installation/Inspection		
PowerGas Pte Ltd		
(a) Diversion		
NEA (Pollution Control)		
(a) Planning/Submission		
(b) Inspection		

SECTION 4

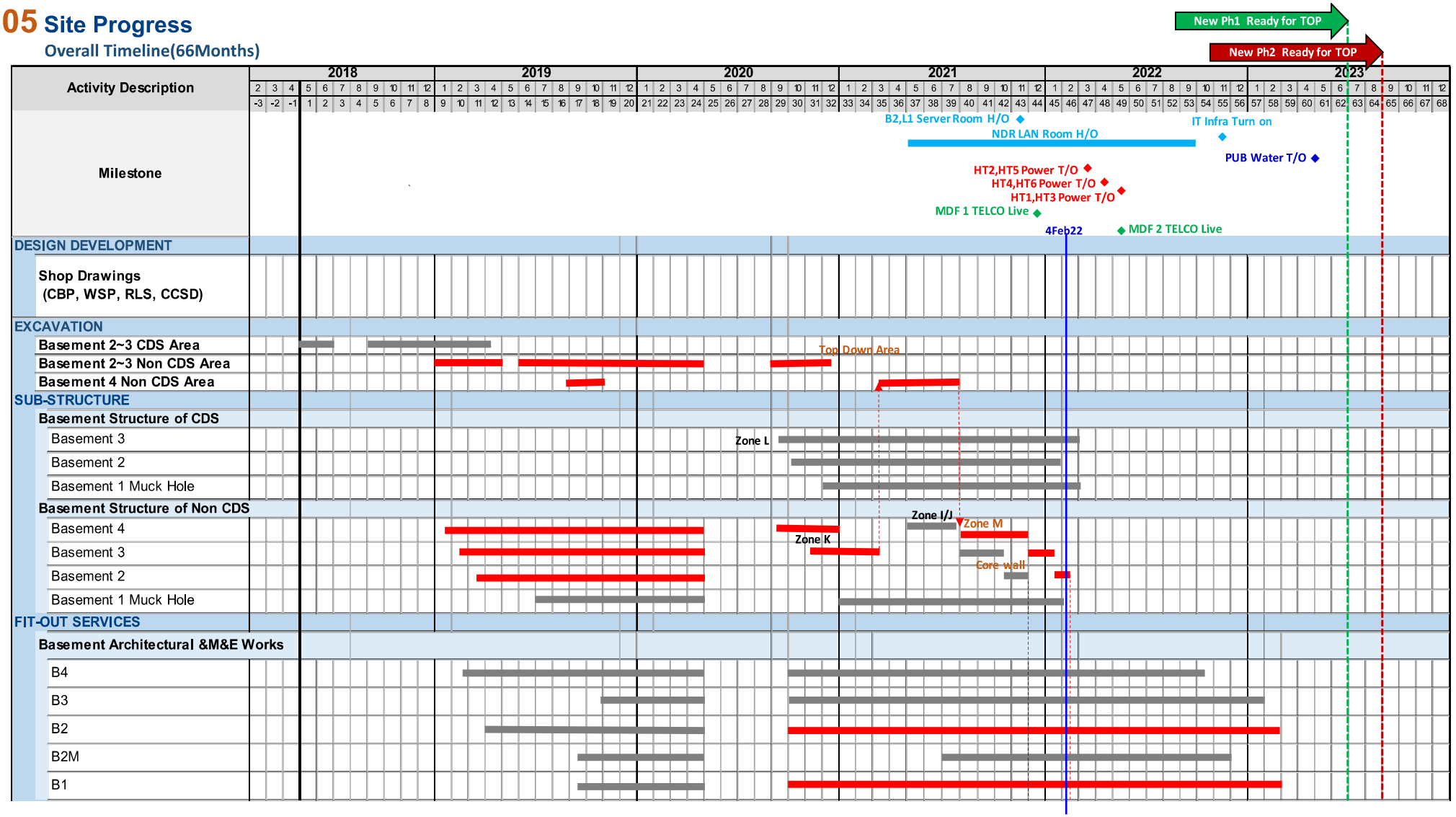
PROGRAMME

4.1 Overall Programme (Refer to attached)

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																									

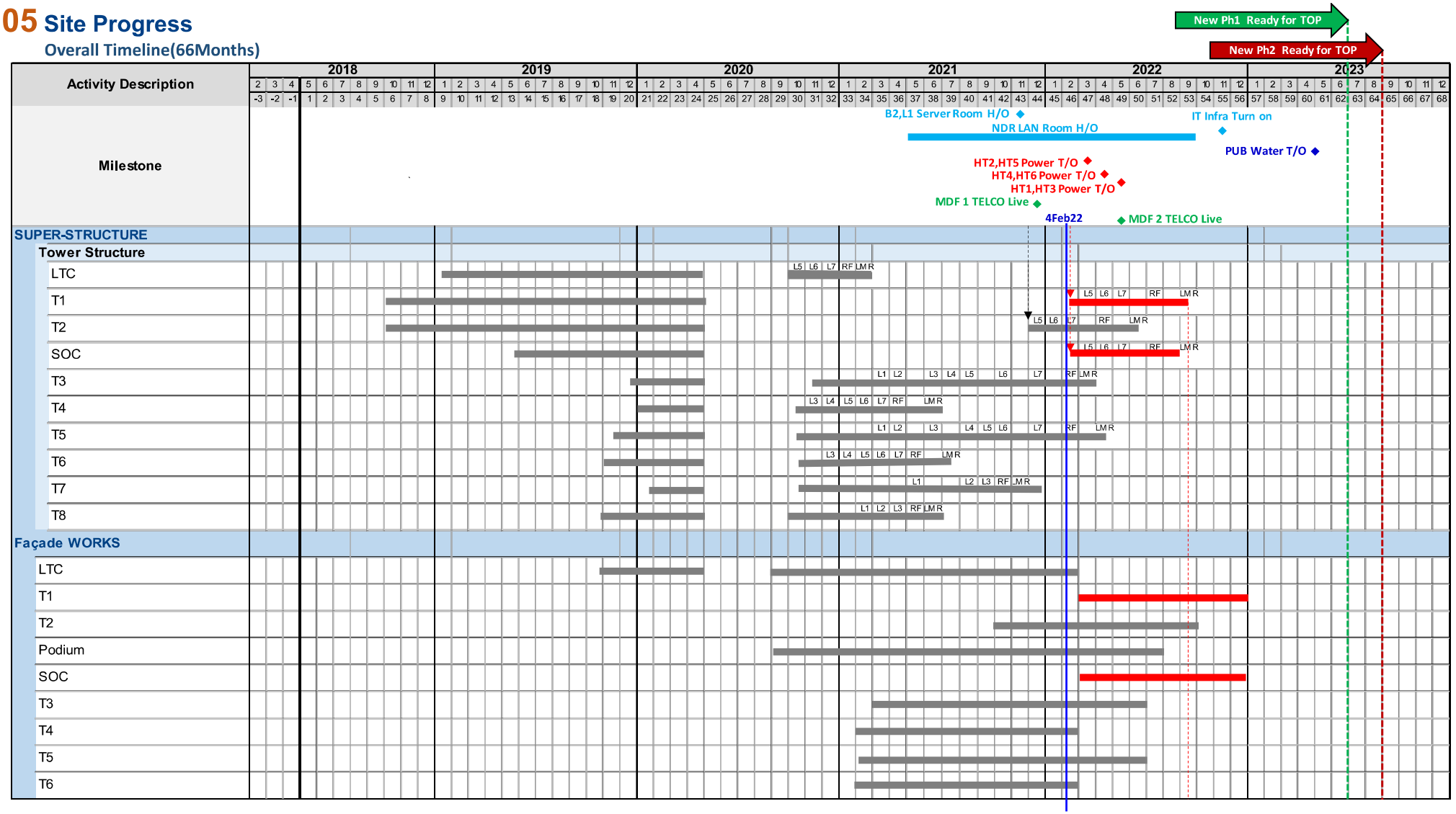
05 Site Progress

Overall Timeline(66Months)



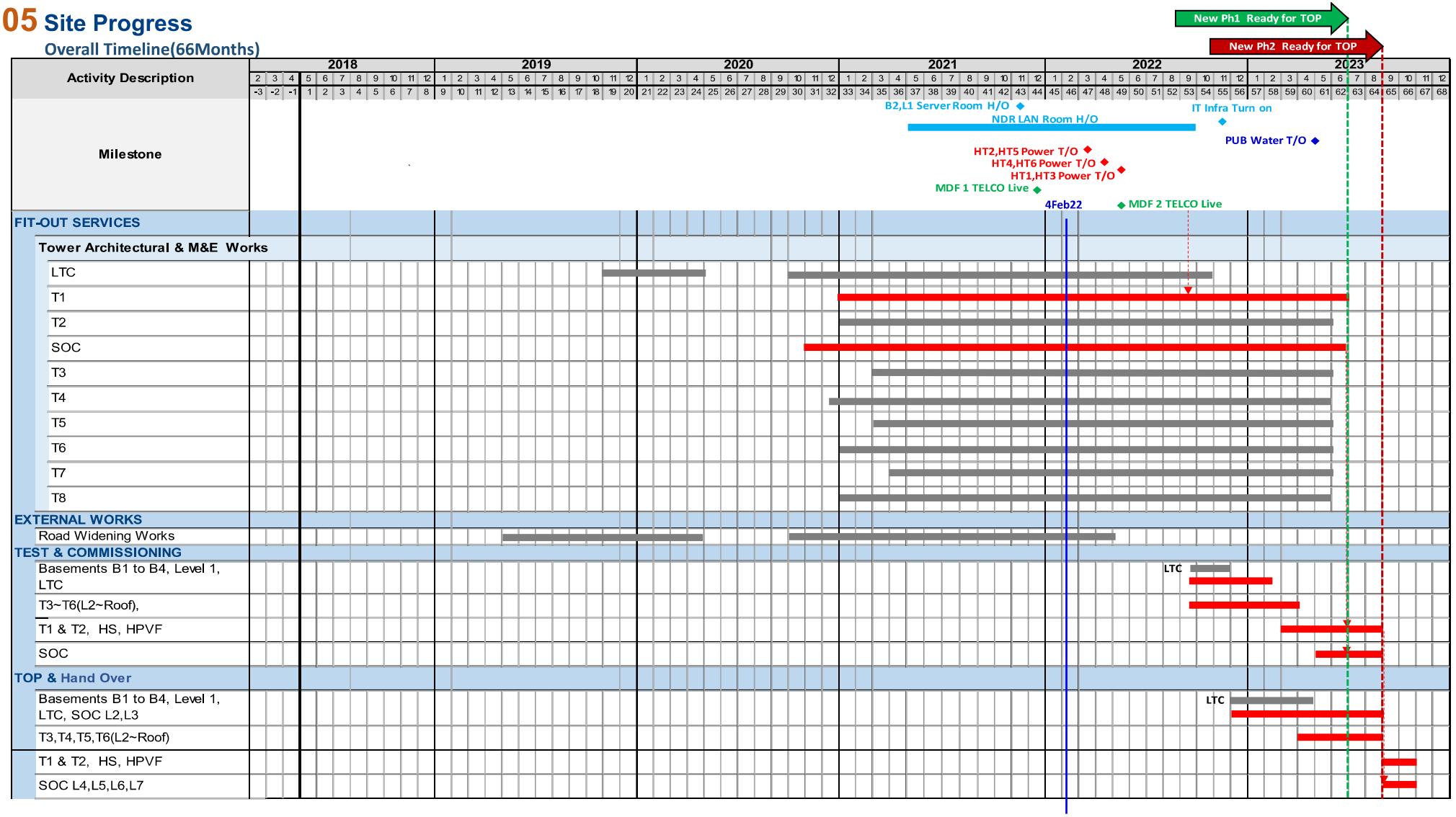
05 Site Progress

Overall Timeline(66Months)



05 Site Progress

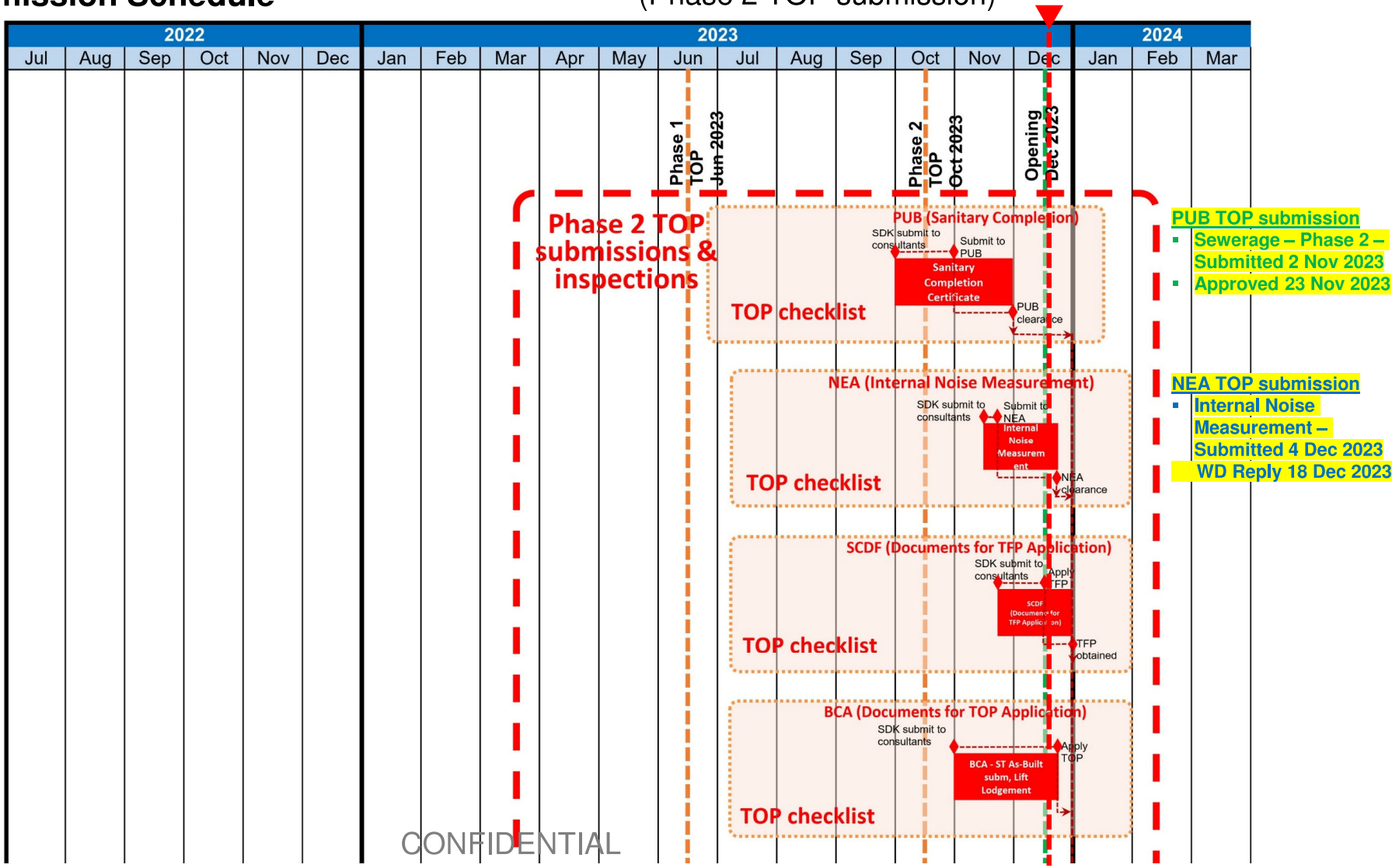
Overall Timeline(66Months)



TOP Submission Schedule

(Phase 2 TOP submission)

R19_12 Jan 2023



PUB TOP submission

- Sewerage – Phase 2 – Submitted 2 Nov 2023
- Approved 23 Nov 2023

NEA TOP submission

- Internal Noise Measurement – Submitted 4 Dec 2023
  WD Reply 18 Dec 2023

CONFIDENTIAL

SECTION 4

PROGRAMME

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

(✓*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	CKH
Incoming Architectural Sketches/Details	CKH
Incoming Structural Drawings	CKH
M&E Drawings	
- Electrical Installation	RBS
- Air Conditioning & Ventilation Installation	CKH
- Fire Fighting & Alarm Installation	CKH
- Plumbing & Sanitary Installation	CKH
Other Drawings - Drawings in Softcopy	All project drawings in softcopy to be saved in server / Teams Folder

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	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 USED

ITEM	KEPT BY

8.2 List of Applicable Code of Practice and Regulations

Services	Title of Code of Practice/Standard
Electrical Wiring	Singapore Standard CP 5: 1998 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 CP SS 546: 2009 Code of Practice for Emergency Voice Communication Systems in Buildings
Air Conditioning & Ventilation Installation	Singapore Standard CP SS 553: 2016 Code of Practice for Air-conditioning and Mechanical Ventilation in Buildings
Lift & Escalator Installation	Singapore Standard CP 550: 2009 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 CP 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
Plumbing System	Singapore Standard CP 48: 2005 Code of Practice for Water Services
Town Gas/LPG Supply System	-
Boiler and Steam Supply System	-
Mechanical Smoke Control System	Code of Practice for Fire Precautions in Building 2013

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	
Dialux	4.13	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	PLATINUM
Green Design Features	Refer to attached

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 Design Features

- LED lighting luminaires
- Motion Sensor at staircase
- Utilize Pneumatic Waste Collection System (PWCS)
- Regenerative Lift
- Private meters to monitor major water usage system
- Solar panels
- Heat exchange pumps for hot water 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	A
Tender Documents	A
Tender Report	A
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 USED

SECTION 11

LIST OF SUB-JOB

11.1 List of Sub-Job Numbers

Sub Job No	Description	Allocation Details
6213-601	Design change request by the operator (Renci)	