Alpha
Consulting Engineers Pte Ltd

PROJECT QUALITY PLAN

PROPOSED ERECTION OF A 5-STOREY INDUSTRIAL BUILDING WITH BASEMENT PUMP ROOM AND UNDERGROUND TANKS AT SERANGOON NORTH AVENUE 4

For

NTT WORLDWIDE TELECOMMUNICATIONS CORPORATION (SINGAPORE BRANCH)

Copy No.	1

Prepared By: See Sau Fong/Loke Yik Mun

Authorised By: Goh Soon Huat

Date: 21 November 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	PQP	21 November 2013

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	14 January 2011	1 to 11	28	+2 pgs (Sect 9.1 – Sustainable Design Feature/Criteria)
1	21 November 2013	1 to 11	30	+8 pgs (Sect 4.1 – Overall Programme) +2 pgs (Sect 9.1 – Sustainable Design Feature/Criteria)

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Industrial

Statistics of Development	
Site Area, m²	6,126.80
Nett Floor Area, m²	
Gross Floor Area, m²	15,317
Covered Carpark, m²	NA
No. of Covered Carpark Lots	NA
No. of Apartments/Houses	NA
No. of Beds (for Hospitals)	NA
No. of Guestroom (for Hotels)	NA
No. of Blocks / No. of Storeys	1 Block of 5-Storey
Green Mark Category	Platinum
No. of Phases	5

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M) for 6127-601										
Services	EI	ACVI	~~LEI~~	FFAI	PSI	SPFI	LI	DEG	SUPS	RUPS
Estimate										
Awarded	22.99						0.7315	4.723	1.05	6.322
Total Project Construction Cost (S$ x1M)										
	Site Clearance				Piling Works			Main Contract		
Estimate										
Awarded								97.85		

M&E Services Cost Plan (S$ x 1M) for 6127-602										
Services	EI	ACVI	~~LEI~~	FFAI	PSI	SPFI	LI	DEG	SUPS	RUPS
Estimate										
Awarded	21.509 (Architectural Included)						-	1.285	4.433	-
Total Project Construction Cost (S$ x1M)										
	Site Clearance				Piling Works			Main Contract		
Estimate										
Awarded										

M&E Services Cost Plan (S$ x 1M) for 6127-603										
Services	EI	ACVI	~~LEI~~	FFAI	PSI	SPFI	LI	DEG	SUPS	RUPS
Estimate										
Awarded	0.29 (Architectural Included)						-	-	-	-
Total Project Construction Cost (S$ x1M)										
	Site Clearance				Piling Works			Main Contract		
Estimate										
Awarded										

M&E Services Cost Plan (S$ x 1M) for 6127-604										
Services	EI	ACVI	~~LEI~~	FFAI	PSI	SPFI	LI	DEG	SUPS	RUPS
Estimate										
Awarded	12.246 (Architectural Included)						-	1.285	-	-
Total Project Construction Cost (S$ x1M)										
	Site Clearance				Piling Works			Main Contract		
Estimate										
Awarded										

M&E Services Cost Plan (S$ x 1M) for 6127-605										
Services	EI	ACVI	~~LEI~~	FFAI	PSI	SPFI	LI	DEG	SUPS	RUPS
Estimate										
Awarded	56.995 (Architectural Included)						-	4.555	4.485	3.455
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

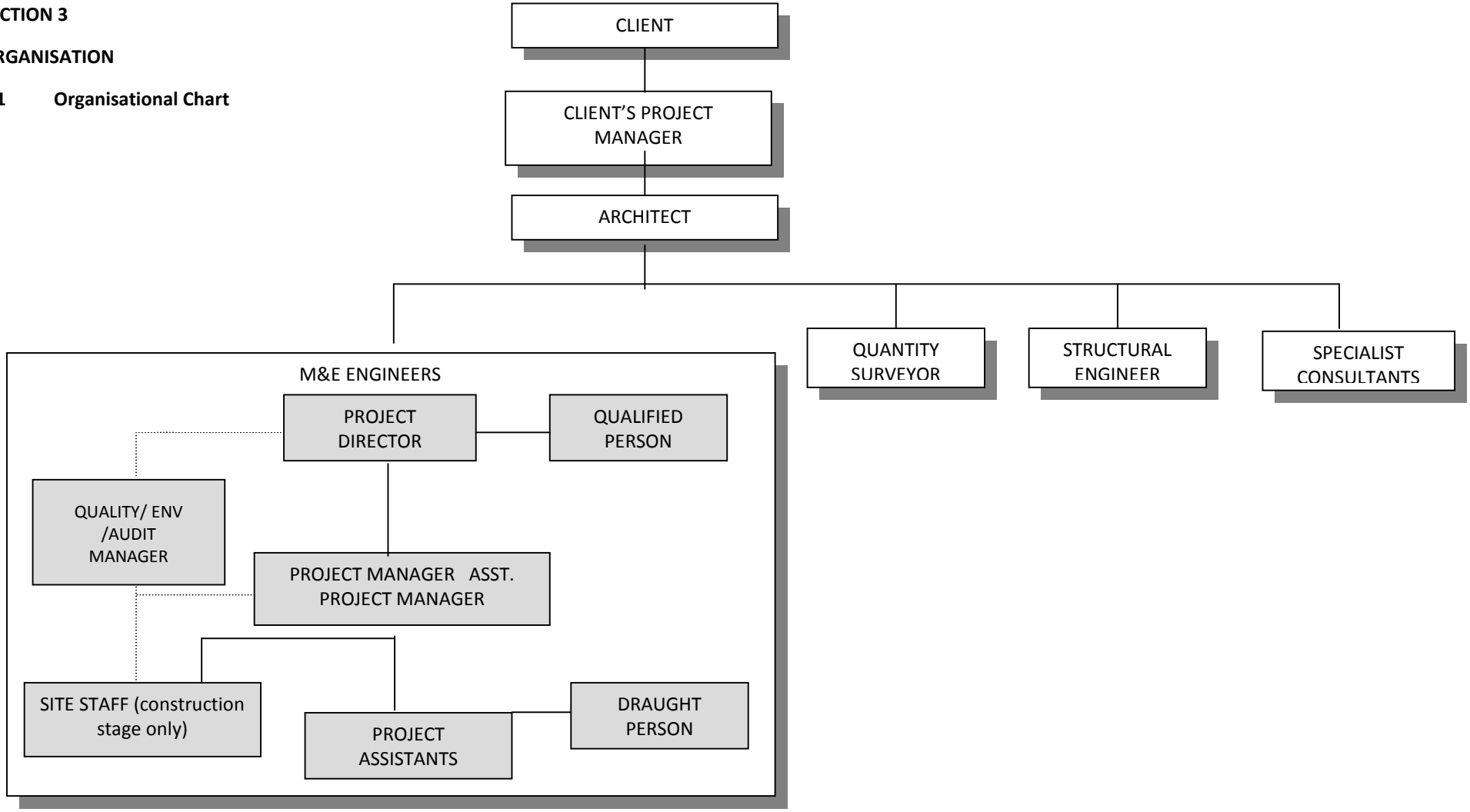
EJECTOR & DIVERTER		SUMP PUMP		FUEL OIL TANK	✓	LIFT & ESCALATOR		PRESSURE VESSEL		HOISTS		FOAM	

(✓*where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 ACEPL's Project Team Member

TITLE		NAME
Project Director		Choong Choon Guan (CCG)
Qualified Person	Mechanical	Choong Choon Guan (CCG)
	Electrical	Loh Fook Yuen (LFY)
Project Manager		Ms Chong Lai Meng (CLM)
Assistant Project Manager		Goh Soon Huat (GSH)
Project Assistant (Mech)		See Sau Fong (SSF)
Project Assistant (Elect)		Loke Yik Mun (LYM)
Draughtsperson		Common Pool
Resident Engineer (M&E)		
Assistant Resident Engineer (M&E)		
Clerk-of-Work (M&E)		Alan Yip Shee Leem

3.3 Client/Client's Representatives

Client:- NTT Worldwide Telecommunications Corporation (Singapore Branch)

Address:- 20 Pasir Panjang #11-28
Mapletree Business City
Singapore 117439

Tel:- 6438 3101

Fax:- 6438 3102

Client's Representatives:-

Name of Company	Contact Person	Contact
NTT Singapore Pte Ltd	Name: Mr Toshiro Aratake Position: Director	Tel: 6438 3101 Fax: 6438 3102 Handphone: - Email: -
NTT Facilities, Inc.	Name: Mr Seizo Kobayashi Position: Project Manager	Tel: +81 3 5444 2570 Fax: +81 3 5444 5680 Handphone: - Email: kobaya47@ntt-f.co.jp
NTT Facilities, Inc.	Name: Mr Yohei Ishihara Position: Engineer (Electrical)	Tel: +81 3 5444 2570 Fax: +81 3 5444 5680 Handphone: - Email: ishiha42@ntt-f.co.jp
NTT Facilities, Inc.	Name: Mr Kunihiro Satomi Position: Engineer (Mechanical)	Tel: +81 3 5444 2576 Fax: +81 3 5444 5599 Handphone: +81 90 4606 6636 Email: satomi23@ntt-f.co.jp
	Name: Position:	Tel: Fax: Handphone: Email:

3.4 **Other Consultants** (Local)

Function / Name of Company	Contact Person	Contact
Architect 3HPArchitects Pte Ltd	Name: M/s Benedict Lee/ Shee Ooi Yin Position: Consulant/Senior Associate	Tel: 6235 8333 Fax: 6733 0809 Handphone: - Email: sgdc@3hpa.com
Quantity Surveyor Langdon & Seah Singapore Pte Ltd	Name: Mr Lim Heng Bin Position: Director	Tel: 6222 3888 Fax: 6224 7089 Handphone: - Email: 6362@sg.langdonseah.com
Quantity Surveyor (M&E) Langdon & Seah Singapore Pte Ltd	Name: Mr Tung Kah Imm Position: Asst. Director	Tel: 6222 3888 Fax: 6224 7089 Handphone: - Email: 6362@sg.langdonseah.com
Quantity Surveyor (Main) Langdon & Seah Singapore Pte Ltd	Name: Mr Warren Chua/Mr Lee Way Keong Position: Director/Quantity Surveyor	Tel: 6222 3888 Fax: 6224 7089 Handphone: - Email: 6362@sg.langdonseah.com
Structural Engineer Chong & Lee Consultant	Name: Mr Zhang Zhe Position: Partner	Tel: 6222 0669 Fax: 6222 0979 Handphone: 9668 3979 Email: chonglee@pacific.net.sg
Interior Designer	Name: Position:	Tel: Fax: Handphone: Email:
Lighting Consultant	Name: Position:	Tel: Fax: Handphone: Email:
Acoustic Consultant	Name: Position:	Tel: Fax: Handphone: Email:
Green Mark Consultant Kaer Pte Ltd	Name: Ms Erika Yuniarti Position: Manager	Tel: 6735 5640 Fax: 6735 5420 Handphone: 9299 4392 Email: erika.yuniarti@kaer.com

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 Kajima Overseas Asia Pte Ltd	DC	Name: Mr Yuichi Matsushita Position: Project Manager	Tel: 6344 0066 Fax: 6348 2435 Handphone: 9699 2272 Email: y.matsushita@kajima.com.sg
Air Conditioning & Ventilation Installation Sub-Contractor Hitachi Plant Technologies Ltd	NSC	Name: Mr Chang Soon Ghee Position: Project Manager	Tel: 6222 0665 Fax: 6224 8358 Handphone: 9771 9715 Email: hpt.sgdc4@ml.hitachi-pt.com
Plumbing & Sanitary Installation Sub-Contractor		Name: - Position: -	Tel: Fax: Handphone: Email:
Electrical Installation Sub-Contractor Hitachi Plant Technologies Ltd	NSC	Name: Mr Chang Soon Ghee Position: Project Manager	Tel: 6222 0665 Fax: 6224 8358 Handphone: 9771 9715 Email: hpt.sgdc4@ml.hitachi-pt.com
Lift & Escalator Installation Sub-Contractor Toshiba Asia Pacific Pte Ltd	NSC	Name: Position:	Tel: 6297 0990 Fax: Handphone: Email:
Fire Fighting & Alarm Installation Sub-Contractor Hitachi Plant Technologies Ltd	NSC	Name: Mr Chang Soon Ghee Position: Project Manager	Tel: 6222 0665 Fax: 6224 8358 Handphone: 9771 9715 Email: hpt.sgdc4@ml.hitachi-pt.com
Swimming Pool Filtration Plant Installation Sub-Contractor		Name: - Position: -	Tel: Fax: Handphone: Email:
Carpark System Installation Sub-Contractor		Name: - Position: -	Tel: Fax: Handphone: Email:
Static Uninterruptible Power Supply Installation Eaton Industries Pte Ltd	NSC	Name: Mr Ang Yew Hock Position: Project Manager	Tel: 6825 1668 Fax: 6825 1689 Handphone: 9828 6365 Email: yewhockang@eaton.com
Rotary Uninterruptible Power Supply Installation (RUPS) Euro Diesel Pte Ltd	NSC	Name: Mr Marco Nijenhuis Position: General Manager	Tel: 6634 8334 Fax: 6634 8335 Handphone: 9790 9740 Email: marco-nijenhuis@euro-diesel.com.sg
Diesel Engine Generator Installation (DEG) Mech-Power Generator Pte Ltd	NSC	Name: Mr Cliff Loke Position: Managing Director	Tel: 6746 6228 Fax: 6746 6620 Handphone: - Email: cliff@mechpower.com.sg

** 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	6823 8555 / 6823 8564
(b) Diversion		
SP Services:		
(a) Customer Supply	Ms Jenny	6823 8008
(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	Mr Lee Kok Chuen	6848 1457
(b) M&E Plan		
PUB (Water Supply) Network Dept:		
(a) Water Conservation		
(b) Plumbing Plan	Ms Marie Chin	6731 3620
(c) Diversion		
(d) NEWater		
PUB Water Reclamation (Network) Dept:		
(a) Building Plan/CBPU	Mr Wong Hin Mun	6731 9644
(b) M&E Plan	Mr Ju Peng	6731 3297
(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 (For 6127-605)

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																									

Hitachi,Ltd,

Project Title : SGDC - PH4 Proposed A&A to level 4 (South) & Level 5 (North & South) to existing 5 storey building.
Scope of work : Architectural, C&S, Electriical,ACMV,FP,UPS..
Level: 5 South

Level 5 South

Date:	16/7/13	5/8/13	13/8/13	8/9/13	26/11/
Rev:	0	1	2	3	4

Date: 26 Nov 2013 Progress meeting 15

Perpared by: SG Chang

CRITICAL STAGE

CNY 30Jan~3Feb | IST 1 13~16 Mar | IST 22 ~ 29 Mar | Final Insp 1 Apr | Punch List 29Mar~4Apr

S/no	Description	Yr / Mth / Date	2013 July: 1 7 14 21 28	August: 1 7 14 21 28	September: 1 7 14 21 28	October: 1 7 14 21 28	November: 1 7 14 21 28	2013 December: 1 7 14 21 28	2014 January: 1 7 14 21 28	February: 1 7 14 21 28	March: 1 7 14 21 28	April: 1 7 14 21 28	Remarks
A	***Key Mile Stone***								Power Turn 'ON'		RI	Handover 7 Apr	
B	***Preparation & Mobilisation etc.***		LOI 1 July										
1	***Planning***												
a	Work notification application												
b	Mobilisation												
2	***Miscellaneous Works***												
a	Protection & Cleaning works												
b	Temporary Power & Lighting												
C	***Long Lead Equipment***												
1	***Electrical***												
a	SUPS 500KVA x 4 L5	4M		Manufacturing (Finland) / Submission / Approval		FAT 1 ~ 3Oct	Shipment	Installation		SAT/Testing 5 ~ 21 feb			
b	1250 KVA 6600/400V Transformer x 2 TR 'AC-5-2A', TR 'AC-5-2B'	4M		Submission / Approval	Manufacturing (China)		FAT 24-27 Nov	Shipment/Delivery		SAT/Testing 4 ~13Feb			
c	6.6 KV Switchgear x 2 MVSB 'SUPS-5A', MVSB 'SUPS-5B'	4M		Submission / Approval	Manufacturing (China)		FAT 28-30 Nov	Shipment/Delivery		SAT/Testing 4 ~13Feb			
d	MSB 'SUPS-5-1A', MSB 'SUPS-5-1B', MSB 'SUPS/5-1'	3M		Prepare Drawing / Submission / Approval		Manufacturing (Singapore)	FAT 25 Nov ~ 15 Jan	Delivery		SAT/Testing 12~ 30Feb			
e	ACSB, SSB, DB	3M		Prepare Drawing / Submission / Approval			Manufacturing	Delivery		SAT/Testing 19~26Feb			
f	PDU :22nos at L5	3M		Prepare Drawing / Submission / Approval			Manufacturing (Singapore)	FAT 9~14Jan / Delivery		SAT/Testing 26~5 Mar			
g	CRAC Unit : 33sets at L5	3M		Submission / Approval	Manufacturing (Italy)		FAT 10~11 1Nov	Shipment/Delivery Progressively		SAT/Testing 21Feb~12 Mar			
h	DEG-7 at Roof	6M		Manufacturing (Germany)/Engine/Alternator/Radiator/HT switch gear / Submission / Approval			Shipment to Malaysia	FAT 15 ~ 17 Jan / Generator assembly	25-Jan/8Feb Delivery / Fuel/Exh pipe	SAT/Testing 21Feb~12 Mar			
D	***Installation Works***												
1	***Architecture***												
a	Site Check & Marking			Shop Drawing submission & Approval / Marking, Setting									
b	Partition wall					Kerb / Hollow Section		Server Rm/ACMR Partition Wall & painting		Final painting & Touch Up			
c	C-shape Unit Strut				Manufacturing		Installation		Touch Up				
d	Floor Insulation												
e	Raised Floor	2M			Submission / Approval / Manufacturing (China)				**Pedestal Floor Panel**				
f	Door & Ironmongery	3M			Submission / Approval / Manufacturing (Door-Malaysia/ Ironmongery Germany)				Door Frame	Door & Ironmongery			
g	Painting								Soffit, Coloum				
h	Inner Corridor				Kerb Water Proofing			Epoxy Floor Painting		Epoxy (Final) / Ceiling support Insta / ceiling grid and board			
					Floor marking for Raised floor layout				Install raised floor incl. cut piece				
2	***Electrical & Security***												
a	Cable Trunking and Cable			Shop Drawing Submission & Approval			Overhead Installation	Under raised floor feeder ladder installation		Final Fix	Test Power Supply / Turn on to SB		
b	MVSB & Transformer installation												
c	DEG installation							Cable tray installation	Cable pulling/Termination	Testing			
d	SUPS installation						Cable tray installation	Battery Charge / Cable Termination / Test					
e	PDU installation								Installation & Cable Terminate		Turn ON/Tes		
f	LV Panel installation							Installation & Cable Termination	Insu Test		Turn On/ Testing		
g	Lighting Fixture, Power point			Shop Drawing Submission & Approval		Installation trunking & Conduit	Wiring		Lighting Installation	Insu Test	Turn ON/ Testing		
h	CCTV,PA, Security					Installation Trunking & Conduit	Wiring	Equip. Installation			Testing		

Final Inspection

PUNCH LIST CLEARANCE

Hitachi,Ltd,

Level 5 South

Project Title : SGDC - PH4 Proposed A&A to level 4 (South) & Level 5 (North & South) to existing 5 storey building.
Scope of work : Architectural, C&S, Electriical,ACMV,FP,UPS..
Level: 5 South

Date:	16/7/13	5/8/13	13/8/13	8/9/13	26/11/
Rev:	0	1	2	3	4

Date: 26 Nov 2013 Progress meeting 15

Perpared by: SG Chang

CRITICAL STAGE

CNY 30Jan~3Feb | I S T 1 13~16 Mar | IST 22 ~ 29 Mar | Final Insp 1 Apr | Punch List 29Mar~4Apr

S/no	Description	Yr / Mth / Date	2013 July	August	September	October	November	2013 December	2014 January	February	March	April	Remarks
3	*ACMV*												
a	Pipe & Support Fabrication				Shop Drawing submission & Approval		Installation of pipe support						
b	Piping & Insulation			Shop Drawing submission & Approval			Pipe fabrication						
							Chilled water pipe installation for CRAC			Press. Test	Flushing		
								Chilled water pipe insulation				System Test	
c	Ducting & Insulation						Ducting installation for MV Fans and CRACs						
d	BMS control			Shop Drawing Submission & Approval				Conduit/Trunking/Cable/ Panel installation				Test Control	
e	Sec Electrical			Shop Drawing Submission & Approval			Cable tray & Trunking & cable laying					Turn 'ON' / Testin	
4	*Fire Protection*												
a	Dismantle ring spk pipe					Existing pipe							
b	Spk pipe			Shop Drawing Submission & Approval		Pipe Fabrication			Pipe Installation			Testing	
c	Under Raised Floor Spk pipe				Pipe Fabrication			Pipe Installation				Testing	
d	N2 Gas	3M			Shop Drawing submission & Approval			Pipe fabrication & Installation				Testing	
							Nozzle Noise Test 15 Nov	N2 Nozzel manufacture					
										Application thru authority			
e	Fire alarm/VESDA			Shop Drawing Submission & Approval			Installation					Testing	

Hitachi,Ltd,

Level 5 North

Project Title : SGDC - PH4 Proposed A&A to level 4 (South) & Level 5 (North & South) to existing 5 storey building.
Scope of work : Architectural, C&S, Electriical,ACMV,FP,UPS..
Level: 5 North

Date :	16/7/13	5/8/13	13/8/13	26/11/13
Rev:	0	1	2	3

Progress Meeting 15
Date:26 Nov 13 Prepared by : SG Chang

CRITICAL STAGE

CNY 30Jan~3Feb

IST 1 12, 13 Ap

IST 2 26, 27 Ap

S/no	Description	Yr / Mth / Date	Remarks
A	***Key Mile Stone***		LOI 1 July; Power Turn 'ON'; RI; BCA Insp; Handover 15 May
B	***Preparation & Mobilisation etc.***		
1	***Planning***		
a	Work notification application		
b	Mobilisation		
2	***Miscellaneous Works***		
a	Protection & Cleaning works		
b	Temporary Power & Lighting		
C	***Long Lead Equipment***		
1	***Electrical***		
a	2000 KVA 6600/400V Transformer x 2 TR 'RUPS-5A', TR 'RUPS-5B'	4M	Submission; Approval; Manufacturing (China); FAT 25-27 Nov; Shipment/Delivery; SAT/Testing 10~ 23 Feb
b	1250 KVA 6600/400V Transformer x 2 TR 'AC-5-1A', TR 'AC-5-2B'	4M	Submission; Approval; Manufacturing (China); FAT 25-27 Nov; Shipment/Delivery; SAT/Testing 10 ~ 23 Feb
c	6.6 KV Switchgear x 2 MVSB 'AC-5A', MVSB 'AC-5B'	4M	Submission; Approval; Manufacturing (China); FAT 28-30 Nov; Shipment/Delivery; SAT/Testing 10 ~ 23 Feb
d	MSB 'RUPS-5A', MSB 'RUPS-5B',	3M	Prepare Drawing; Submission; Approval; Manufacturing (Singapore); FAT 25 Nov ~ 15 Jan; Delivery; SAT/Testing 22 Feb ~ 13 Mar
e	ACSB, SSB, DB	3M	Prepare Drawing; Submission Approval; Manufacturing (Singapore); FAT 25 Nov ~ 15 Jan; Delivery; SAT/Testing 7~28Mar
g	PDU :22nos at L5	3M	Prepare Drawing; Submission Approval; Manufacturing (Singapore); FAT 9Jan~7Feb; Delivery; SAT/Testing 14~ 30 Mar
h	CRAC Unit : 33sets at L5	3M	Submission; Approval; Manufacturing (Italy); FAT 10 ~11 Nov; Shipment/Delivery Porgressively; SAT/Testing 10 Mar~10 Apr
D	***Installation Works***		
1	***Architecture***		
a	Site Check & Marking		Shop Drawing submission & Approval; Marking, Setting
b	Partition wall		Kerb; Hollow Section; Server Rm/ACMR Partition Wall & painting; Final Painting & Touch Up
c	C-shape Unit Strut		Manufacturing; Installation; Touch Up
d	Floor Insulation		
e	Raised Floor	2M	Submission; Approval; Manufacturing (China); **Pedestal Floor Panel**
f	Door & Ironmongery	3M	Submission; Approval; Manufacturing (Door-Malaysia/ Ironmongery Germany); Door Frame; Door & Ironmongery; Touch Up
g	Painting		Soffit, Colbum; Touch Up; Kerb Water Proofing; Epoxy Floor Painting
2	***Electrical & Security***		
a	Cable Trunking and Cable		Shop Drawing Submission & Approval; Ovel head Installation; Under raised floor feeder ladder installation; Final Fix; Test Power Supply/Turn on to SB
b	MVSB & Transformer installation		
c	PDU installation		Installation & Cable Terminate; Turn ON/Test
d	LV Panel installation		Installation & Cable Termination; Insu Test; Turn On/ Testing
e	Lighting Fixture、Power point		Shop Drawing Submission & Approval; Installation trunking & Conduit/wiring; Lighting Installation; Insu Test; Turn ON/ Testing
f	CCTV,PA, Security		Installation Trunking & Conduit; Wiring; Equip. Installation; Testing

Training

Final Inspection

PUNCH LIST CLEARANCE

Hitachi,Ltd,

Level 5 North

Project Title : SGDC - PH4 Proposed A&A to level 4 (South) & Level 5 (North & South) to existing 5 storey building.
Scope of work : Architectural, C&S, Electriical,ACMV,FP,UPS..
Level: 5 North

Date :	16/7/13	5/8/13	13/8/13	26/11/13
Rev:	0	1	2	3

Progress Meeting 15
Date:26 Nov 13 Prepared by : SG Chang

CRITICAL STAGE

CNY 30Jan-3Feb

IST 1 12, 13 Ap

IST 2 26, 27 Ap

S/no	Description	Yr	2013					2013					2014					2014					2014					Remarks
		Mth	July					August					September					October					November					
		Date	1	7	14	21	28	1	7	14	21	28	1	7	14	21	28	1	7	14	21	28	1	7	14	21	28	
3	*ACMV*																											
a	Pipe & Support Fabrication												Shop Drawing submission & Approval										Fabrication & Installation of pipe support					
b	Piping & Insulation							Shop Drawing submission & Approval										Pipe fabrication										
c	Ducting & Insulation																											
d	BMS control							Shop Drawing Submission & Approval															Conduit/Trunking/Cable/ Panel installation					
e	Sec Electrical							Shop Drawing Submission & Approval										ACSB/Control Panel fabrication										
4	*Fire Protection*																											
a	Dismantle ring spk pipe													Existing pipe														
b	Spk pipe							Shop Drawing Submission & Approval											Pipe Fabrication									
c	Under Raised Floor Spk pipe																	Pipe Fabrication										
d	N2 Gas	3M											Shop Drawing submission & Approval															
e	Fire alarm/VESDA							Shop Drawing Submission & Approval																				

S/no	Description	Yr	2013					2014										2014										Remarks
		Mth	December					January						February				March						April					
		Date	1	7	14	21	28	1	7	14	21	#	1	7	14	21	28	1	7	14	21	28	1	7	14	20	26	28	
3	*ACMV*																											
a	Pipe & Support Fabrication																											
b	Piping & Insulation		Chilled water pipe installation for CRAC											Press. Test				Flushing					Flushing					
c	Ducting & Insulation		Chilled water pipe insulation					Ducting installation for MV Fans and CRACs																			System Test	
d	BMS control																	CH/CT/Pump test control										
e	Sec Electrical		Cable tray & Trunking & cable laying															Turn 'ON' / Testing										
4	*Fire Protection*																											
a	Dismantle ring spk pipe																											
b	Spk pipe							Pipe Installation										Testing			Touch Up							
c	Under Raised Floor Spk pipe							Pipe Installation										Testing			Touch Up							
d	N2 Gas	3M	Pipe fabrication & Installation															Testing			Touch Up							
			Nozzle noise test 15 Nov					N2 Nozzel manufacture																					
e	Fire alarm/VESDA		Installation															Application thru authority										
																		Testing			Touch Up							

Hitachi,Ltd,

Level 4 South

Project Title : SGDC - PH4 Pro[illegible] A&A to level 4 (South) & Level 5 (North & South) to existing 5 storey building.
Scope of work : Architectural, C&S, Electriical,ACMV,FP,UPS..
Level: 4 South

Date :	16/7/13	5/8/13	13/8/13	22/10/13	26/11/13
Rev:	0	1	2	3	4

Progress meeting 15
Date: 26 Nov 13 Prepared by : SG Chang

CRITICAL STAGE

CNY 30Jan~3Feb

IST 1 12, 13 Apr

IST 2 19, 20 Apr

| S/no | Description | Yr | 2013 | | |

Hitachi,Ltd,

Level 4 South

Project Title : SGDC - PH4 Proposed A&A to level 4 (South) & Level 5 (North & South) to existing 5 storey building.
Scope of work : Architectural, C&S, Electriical,ACMV,FP,UPS..
Level: 4 South

CRITICAL STAGE

CNY 30Jan-3Feb

IST 1 12, 13 Ap

IST 2 19, 20 Ap

Date :	16/7/13	5/8/13	13/8/13	22/10/13	26/11/13
Rev:	0	1	2	3	4

Progress meeting 15
Date: 26 Nov 13 Prepared by : SG Chang

Sno	Description	Yr / Mth / Date	Remarks
3	***ACMV***		
a	Pipe & Support Fabrication		Shop Drawing submission & Approval; Installation of pipe support
b	Piping & Insulation		Shop Drawing submission & Approval; Pipe fabrication; Chilled water pipe installation for CRAC; Press. Test; Flushing; Chilled water pipe insulation; System Test
c	Ducting & Insulation		Ducting installation for MV Fans and CRACs
d	BMS control		Shop Drawing Submission & Approval; Conduit/Trunking/Cable/ Panel installation; test control
e	Sec Electrical		Shop Drawing Submission & Approval; ACSB/Control Panel fabrication; Cable tray & Trunking & cable laying; Turn 'ON' / Testing
4	***Fire Protection***		
a	Dismantle ring spk pipe		Existing pipe
b	Spk pipe		Shop Drawing Submission & Approval; Pipe Fabrication; Pipe Installation; Testing; Touch Up
c	Under Raised Floor Spk pipe		Pipe Fabrication; Pipe Installation; Testing; Touch Up
d	N2 Gas	3M	Shop Drawing submission & Approval; Pipe fabrication & Installation; Testing; Touch Up; Nozzle noise testing 15 Nov; N2 Nozzel manufacture; Application thru authority
e	Fire alarm/VESDA		Shop Drawing Submission & Approval; Installation; Testing; Touch Up

Hitachi,Ltd,

Project Title : SGDC - PH4 Proposed A&A to level 4 (South) & Level 5 (North & South) to existing 5 storey building.
Scope of work : Architectural, C&S, Electriical,ACMV,FP,UPS..
Level: 1 and Roof

Level 1 & RF

Date :	20/6/13		
Rev:	0		

Progress meeting 15

Date: 26 Nov 13 Prepared by : SG Chang

CRITICAL STAGE

CNY 30Jan~3Feb

S/no	Description	Remarks
A	***Key Mile Stone***	LOI 1 July; Power Turn 'ON'; RI; BCA Insp; Handover 15 May
B	***Preparation & Mobilisation etc.***	
1	***Planning***	
a	Work notification application	
b	Mobilisation	
c	Pre -con survey plus report	L1, L3; L5,RF; L4
2	***Miscellaneous Works***	
a	Protection & Cleaning works	
b	Temporary Power & Lighting	
C	***L1 - Minor Works***	
1	***Architectural***	
a	Push Plate/Push Plate plus Kerb Plate	Submission & approval; Fabrication; Installation
b	Additional floor joint protection/ Modification of valve chamber	Submission & approval; Fabrication; Installation
D	***L1 - Chiller Plant Room (South)***	
1	***ACMV***	
a	Chiller Installation (2nos.)	Submission; Approval; Manufacturing (China); FAT 10~ 12 Dec; Shipment/Delivery; SAT/Testing 21 Mar 10 Apr
b	Pump installation (8nos.)	Submission; Approval; Manufacturing (China); Shipment/Delivery; SAT/Testing 10 Mar~10 Apr
c	Heat Exchanger installation (3nos.)	Submission; Approval; Manufacturing (China); Shipment/Delivery; SAT/Testing 21 Mar 10 Apr
d	CH Control Panel (2sets)	Prepare Drawings; Submission Approval; Manufacturing; FAT 20 Dec; Delivery; Cable support & Cable Installation & Termination; SAT/Testing 5 ~ 8 Mar
e	Piping installation work	Shop Drawing submission & Approval; Fabrication & Installation of pipe support; Pipe installation; Pipe insulation; Press Test; Flushing; System Test
2	***Electrical***	
a	Electrical Works	Shop Drawing submission & Approval; Cable support/Cable Laying /Termination; SAT/Testing 10~23Feb
3	***Architecture***	
a	Concrete Plint	Shop Drawing submission & Approval; Plinth construction; Epoxy Painting
E	***L1-Chiller Plant Room 2 (North)***	
1	***ACMV***	
a	Chiller Installation (1nos.)	Submission; Approval; Manufacturing (China); FAT 10 ~ 12 Dec; Shipment/Delivery; SAT/Testing 21 Mar 10 Apr
b	Pump installation (2nos.)	Submission; Approval; Manufacturing (China); Shipment/Delivery
c	CH Control Panel (1sets)	Prepare Drawings; Submission Approval; Manufacturing; FAT 20 Dec; Delivery; Cable support & Cable Installation & Termination; SAT/Testing 5 ~ 8 Mar
d	**Piping installation work**	Shop Drawing submission & Approval; Fabrication & Installation of pipe support; Pipe installation; Press Test; Flushing; System Test; Pipe insulation
2	***Electrical***	
a	Electrical Works	Shop Drawing submission & Approval; Cable Support/Cable Laying /Termination; SAT/Testing 10~23Feb
F	***L1-Power Plant Room1 (South)***	
1	***ACMA***	
a	Ducting & Insulation	Ducting modification

Training

As-Build Drawing, O&M Manual

PUNCH LIST CLEARANCE

Hitachi,Ltd,

Project Title : SGDC - PH4 Proposed A&A to level 4 (South) & Level 5 (North & South) to existing 5 storey building.
Scope of work : Architectural, C&S, Electriical,ACMV,FP,UPS..
Level: 1 and Roof

Level 1 & RF

Date :	20/8/13		
Rev:	0		

Progress meeting 15

Date: 26 Nov 13 Prepared by : SG Chang

CRITICAL STAGE

CNY 30Jan~3Feb

| S/no | Description | Yr | 2013 | | |

SECTION 4

PROGRAMME

4.2 Authority Submission Status for M&E Services - 1st Submission – For 6127-605

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	15/12/13								
Fire Fighting & Alarm Installation	FSSD	15/12/13								
Emergency Voice Communication Installation	TFCC	15/12/13								
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:	
- PP/VO	✓				

(✓*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	Drawings are saved in the server
Incoming Architectural Sketches/Details	
Incoming Structural Drawings	
M&E Drawings - Electrical Installation - Lift & Escalator Installation - Air Conditioning & Ventilation Installation - Fire Fighting & Alarm Installation - Plumbing & Sanitary Installation - Swimming Pool & Filtration Installation	
Other Drawings	

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	C	C	I	I	
b.	Project Administration	I	C	C	I	I	
c.	Project Cost Estimate/Contract Cost	A	C	I	I	I	
2.	**Drawings**						
a.	Outline Design Drgs.	A	C	C	C		
b.	Sketch Design Drgs.	A	C	C	C		
c.	Final Design Drgs.	A	C	C	C		
d.	Shop Drawings	C	C	C	C		
e.	As Built Drgs.	I	I	I	I		
3.	**Other Document**						
a.	Specification	A	C	I	I	I	
b.	Tender Document	A	C	I	I	I	
c.	Tender Evaluation Report						
d.	Design Report	A	C	C	I	I	
e.	Progress Report	I	I	I	I	I	
f.	Financial Report						
g.	Minutes of Meeting						
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	CP 5
Lightning Protection System	SS 555 : 2010
Emergency Voice Communication System	SS 546 : 2009
Air Conditioning & Ventilation Installation	SS 553 : 2009
Lift & Escalator Installation	SS 550 : 2009
Sprinkler System	CP 52 : 2004
Wet Riser System	CP 29 : 1998
Automatic Fire Alarm System	CP 10 : 2005
Sanitary System	Code of Practice on Sewerage & Sanitary Works
Plumbing System	CP 48 : 2005
Town Gas/LPG Supply System	NA
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

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.	Fire Code 2007 Clause 6.4.4(c) WVR/02999/13	14 Aug 2013	
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	-	Alpha Consulting Engineers Pte Ltd	Lift traffic calculation	
Econdial	2.5	Merlin Gerlin	Design for low voltage network	
Hyena	4.00.1	ACADS-BSG	Fire Sprinkler & Hydrant Analysis	
Fault Level Calculation	-	Alpha Consulting Engineers Pte Ltd	Calculation of voltage drop and fault level	
Dialux	4.7	Dial GmbH	Lighting Design	✓

(✓*where applicable*)

SECTION 9

ENVIRONMENTAL CONSIDERATIONS

9.1 Sustainable Design Features / Criteria

Item	Remarks
Green Mark criteria	Gold Plus
Green Design Features	See 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	✓

NTT WT Singapore New Datacenter

Summary of Green Features

This project has considered various 'green' approaches since design stage. The following is the summary of green features implemented or considered in design. As some of the features below are still under consideration, the green features presented in Green Mark assessment may vary from the following list.

Part 1 - Design for Energy Efficiency

- Targeted ETTV is below 40 W/m2; the overall thermal performance of building envelope is enhanced to minimise heat gain and thus reducing the overall cooling load requirement.
- Chiller plant efficiency is targeted to be 0.7kW/ton or better. VSD control will be implemented for chilled water pump and cooling tower. Air side efficiency is aimed at least 30% better than SS553.
- CO_2 sensor is installed to regulate outdoor air flow rate.
- Energy efficient T5 lightings are extensively used.
- Carpark is located on the ground level with natural ventilation.
- ACVVVF lifts with sleep mode features are used.
- Energy Efficiency Index (EEI) will be computed.
- The use of energy efficient features such as motion sensors are installed to interlock with all staircases' and toilet's lighting.
- Carpark and staircases use natural light to lit the space during daytime.
- Staircases and toilets implement natural ventilation and mechanical ventilation respectively.
- Heat pipe is used for heat recovery at precool AHU.

Part 2 - Design for Water Efficiency

- All water fittings are certified under the Water Efficiency Labelling Scheme (WELS) with excellent ratings.
- Water consumption of major water uses, such as cooling tower, ~~kitchen and swimming pool~~ are monitored by water submeters. These submeters are linked to the Building Management System (BMS) for leak detection as well.
- Water efficient plants are used in landscape design.
- Efficient water irrigation such as rainwater tank collection system and automatic drip irrigation controlled by rain sensor are considered.
- Compost fertilizer made from recycled horticulture waste will be used for all applicable area.
- Cooling tower uses NEWater and drift eliminator. Cooling tower water treatment system will be able to achieve 7 or better cycles of concentration at acceptable water quality.

Part 3 - Design for Environmental Protection

- The project is considering to use Ground Granulated Blastfurnance Slag (GGBS) to replace Ordinary Portland Cement by 10% by mass and Recycled Concrete Aggregates and Washed Copper Slag to replace coarse and fine aggregates.
- Environmental friendly products that are certified with Singapore Green Labelling Scheme (SGLS) and products consisting of at least 30% recycled content such as ceiling, drywall partition, external paint, waterproofing and etc will be used extensively.
- Effective environmental friendly programmes implementation such as recycling, resources control, energy and water monitoring to be adopted during construction and building operation.
- Project team consists of certified GMM and certified GMP.

- Provision of:
  - Building users' guide
  - Facilities or recycling bins for collection and storage of different recyclable waste such as paper etc.
- The development is located within 500m radius from MRT/LRT or bus stop.
- The occupant is encouraged to use bicycle by providing sufficient sheltered bicycles lots.
- The project will be assessed under Conquas.
- M&E and Main builder are ISO 14000 certified.
- Refrigerant with zero ODP is used in order to reduce the potential damage to the ozone layer and the increase in global warming. Refrigerant leak detection is also installed at critical areas of plant rooms containing chillers.

Part 4 - Design for Indoor Environmental Quality

- Internal noise level is maintained with good ambient sound levels, as recommended in SS 553.
- At least 90% of interior painted surfaces use low-VOC paints.
- At least 90% of all applicable areas served with fluorescent luminaries use high frequency ballast.
- High frequency ballast will be applied at least 90% of all applicable areas that are served by fluorescent luminaries.
- The ACMV system is designed to result in acceptable IAQ.

Part 5 - Other Green Features

The following other green features are under consideration:

- Use of siphonic rainwater discharge system at roof.
- Auto cleaning system for condenser tube
- Vehicle electric charging station

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, I
Pre-Qualification of Tenderers	C
Tender Documents	A
Tender Report	A
Payment Valuation for QS	I
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
6127-602	A&A Works at 2nd & 3rd Storey at SGDC	
6127-603	A&A Works at 2nd Storey GL (D-F, 4-6) at SGDC	
6127-604	A&A Works at 4th Storey North at SGDC	
6127-605	A&A Works at 4th Storey South & 5th Storey at SGDC	