Alpha
Consulting Engineers Pte Ltd

PROJECT QUALITY PLAN

PROPOSED ERECTION OF A TWO-STOREY MULTI-OCCUPIER WAREHOUSE BUILDING WITH ANCILLARY OFFICE ON LOT A2239200 MK 31 CHANGI NORTH WAY

For

HSBC INSTITUTIONAL TRUST SERVICES (SINGAPORE) LTD, as trustee of Ascendas Real Estate Investment Trust

Copy No.	

Prepared By: Chuan Kian Heng

Authorised By: Richard Teo

Date:16 July 2008

TABLE OF CONTENTS

SECTION	DESCRIPTION
-	**TITLE PAGE**
-	**TABLE OF CONTENTS**
1	**QUALITY PLAN CONTROL AND DISTRIBUTION**
1.1	List of Copy Holders
1.2	Revision Record
2	**PROJECT INFORMATION**
2.1	Project Description
2.2	Project Cost
2.3	Scope of Works
3	**ORGANISATION**
3.1	Organisation Chart
3.2	ACEPL's Project Team Member
3.3	Client/Client's Representative
3.4	Other Consultants - Local - Overseas – Not Used
3.5	Contractor/Sub-Contractors
3.6	Authorities
4	**PROGRAMME**
4.1	Overall Programme
4.2	Authority Submission Status for M&E Services – 1st Submission
4.3	Authority Submission Status for M&E Services (Amendment) – 2nd Submission – Not Used
5	**PROJECT RECORDS**
5.1	List of Internal Files
5.2	Filing of Drawings

TABLE OF CONTENTS

SECTION	DESCRIPTION
6	**INTERFACING**
6.1	Method of Interface
6.2	Internal Design Interface
6.3	Circulation of Documents to External Parties
7	**WORK AUTHORISATION**
8	**DESIGN INPUT AND METHODOLOGY**
8.1	List of Client's Standards, Reference Documents or Brief
8.2	List of Applicable Code of Practice and Regulations
8.3	List of Design Guide or Handbook Used
8.4	List of Applicable Quality System Procedures
8.5	List of Software Used for Design/Analysis
9	**ENVIRONMENTAL CONSIDERATIONS**
9.1	Sustainable Design Features / Criteria
9.2	Site PPE Requirement
9.3	Site Emergency Preparedness – Not Used
9.4	Reporting of Environmental Non-conformances – Not Used
9.5	List of Applicable Environmental Management System Procedures – Not Used
10	**CLIENT'S REQUIREMENTS**
10.1	List of Output Required by Client
10.2	Specific Procedures Required by Client – Not Used
11	**LIST OF SUB-JOB**
11.1	List of Sub-Job Numbers

SECTION 1

QUALITY PLAN CONTROL AND DISTRIBUTION

1.1 List of Copy Holders

Copy No.	Copy Holder	Date of Issue
1	6029-PQP File	15 June 2007

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	15 June 2007	1 to 10	26	+ 8 pgs (Sect 4.1 – Overall Programme
1	16 July 2008	1 to 11	28	+ 8 pgs (Sect 4.1 – Overall Programme)

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Full air conditioned warehouse with GMP compliance

Statistics of Development	
Site Area, m²	20,013
Nett Floor Area, m²	33,072
Gross Floor Area, m²	31,972
Covered Carpark, m²	1,100
No. of Covered Carpark Lots	45
No. of Apartments/Houses	NA
No. of Beds (for Hospitals)	NA
No. of Guestroom (for Hotels)	NA
No. of Blocks / No. of Storeys	Lower 1st storey 1st Mezzanine 2nd storey 2nd Mezzanine Roof
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)								
Services	EI	ACVI	LEI	FFAI	PSI	SPFI	Cold Room	
Estimate	4	3.900	0.3	1.950	0.5	NA	1.0	
Awarded	3.63	7.062	0.605	1.800	0.853	NA	0.996	

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

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*)
** Design proposal by Specialist*

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

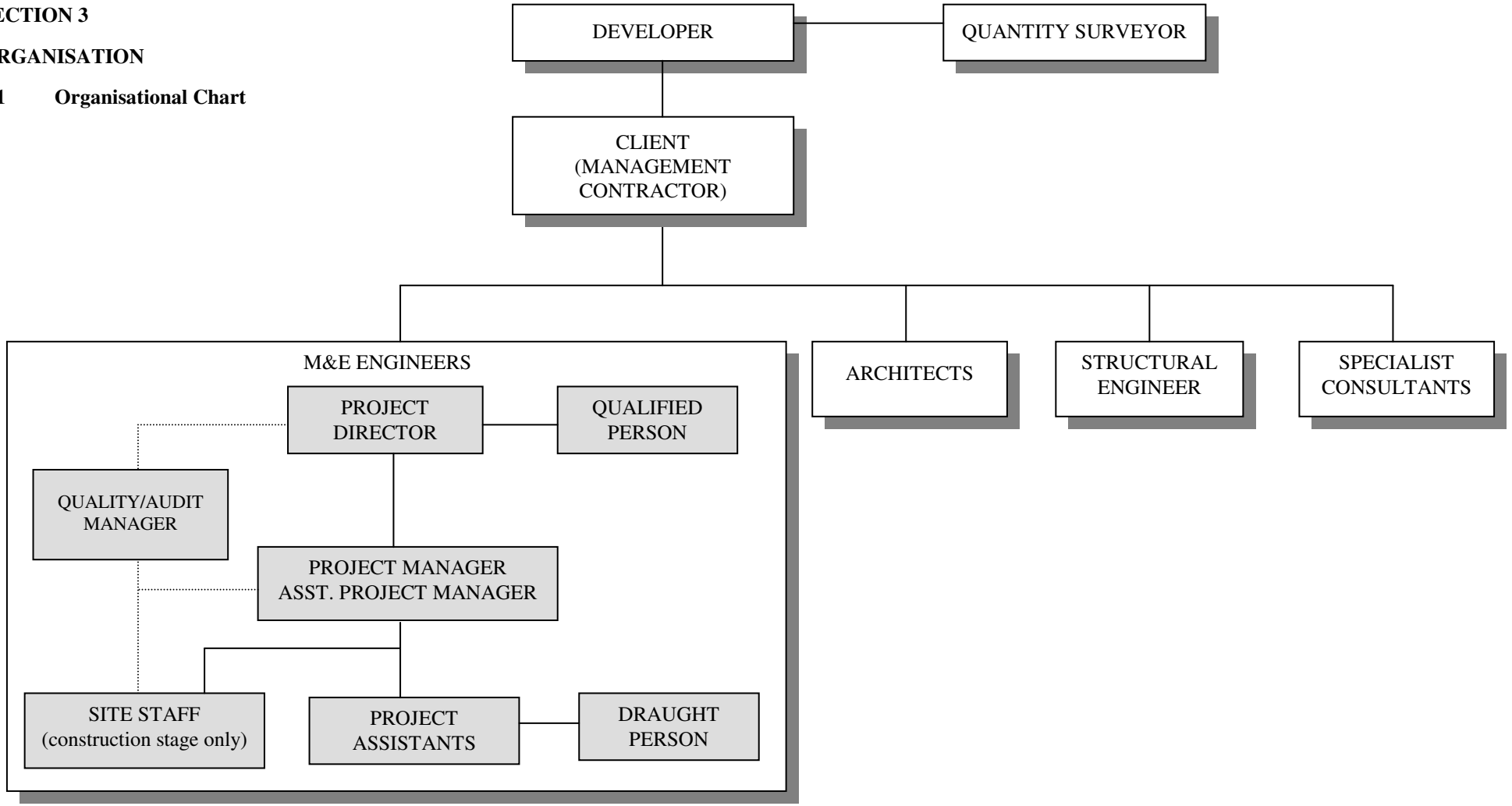
EJECTOR & DIVERTER		SUMP PUMP	✓	FUEL OIL TANK	✓	LIFT & ESCALATOR	✓	PRESSURE VESSEL		HOISTS		FOAM	

(✓*where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart



SECTION 3

ORGANISATION

3.2 ACEPL's Project Team Member

TITLE		NAME
Project Director		Richard Teo (RT)
Qualified Person	Mechanical	Choong Choon Guan (CCG)
	Electrical	Richard Teo (RT)
Project Manager		Chuan Kian Heng (CKH)
Assistant Project Manager		Soh Kai Yea (SKY)
Project Assistant (Mech)		Khor Bee Khoon (KBK)
Project Assistant (Elect)		Hia Chuen Ling (HCL)
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		-

3.3 Client/Client's Representatives

Developer:-	Ascendas Services Pte Ltd	Client:-	Jian Huang Construction Co Pte Ltd
Address:-	61 Science Park Road #04-01 The Galen Singapore Science Park III Singapore 117525	Address:-	No. 63 Hillview Avenue #08-03 Lam Soon Industrial Building Singapore 669569
Tel:-	6774 1033	Tel:-	6892 0356
Fax:-	6778 4761	Fax:-	6769 0894

Name of Company	Contact Person	Contact
Ascendas Services Pte Ltd	Name: Mr Adrian Ho Position: Senior Manager	Tel: 6774 9094 Fax: 6777 8962 Handphone: 9679 7963 Email: Adrian@ascendas.com
Jian Huang Construction Co Pte Ltd	Name: Mr Thomas Khong Position: Admin Manager	Tel: 6892 0356 Fax: 6769 0894 Handphone: 9673 0295 Email: thomaskhong@jianhuang.com.sg
Jian Huang Construction Co Pte Ltd	Name: Mr Lim Eng Seng Position: Division Manager (Construction Division)	Tel: 6892 0356 Fax: 6543 1237 Handphone: 9732 7718 Email: eslim@jianhuang.com.sg
Jian Huang Construction Co Pte Ltd	Name: Mr Tong Jian Yue Position: Senior Design Engineer	Tel: 6892 0356 Fax: 6769 0894 Handphone: 9822 7062 Email: tjy@jianhuang.com.sg
Jian Huang Construction Co Pte Ltd	Name: Mr Chew Wee Keong Position: M&E Engineer	Tel: 6892 0356 Fax: 6769 0894 Handphone: - Email: jasonchewwk@yahoo.com.sg

3.4 **Other Consultants** (Local)

Function / Name of Company	Contact Person	Contact
Architect 3HPArchitects Pte Ltd	Name: Mr Ramon C Cabel Position: Associate	Tel: 6235 8333 Fax: 6733 0809 Handphone: - Email: ramon@3hpa.com
Quantity Surveyor JIA Quantity Surveyors & Project Managers Pte Ltd	Name: Mr Lim Kah Soo Position: Director	Tel: 6471 7042 Fax: 6472 2018 Handphone: 9112 2198 Email: changinw@jiaqs.com.sg
Structural Engineer Ronnie & Koh Consultants Pte Ltd	Name: Mr Low Chee Kong Position: Director	Tel: 6225 7128 Fax: 6225 7182 Handphone: - Email: cklow@rkconsl.com
Interior Designer	Name: Position:	Tel: Fax: Handphone: Email:
Lighting Consultant	Name: Position:	Tel: Fax: Handphone: Email:
Acoustic Consultant	Name: Position:	Tel: Fax: Handphone: Email:
Fire Engineer IBC Management Pte Ltd	Name: Mr Siew Yee Cheong Position: Director	Tel: 6333 4211 Fax: 6333 4611 Handphone: 9751 0751 Email: ibc111@starhub.net.sg
GMP SeerPharma	Name: Mr John Rogers Position: Senior Consultant	Tel: 6774 5800 Fax: 6774 6800 Handphone: 9012 1419 Email: john.rogers@seerpharma.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	NA	Name: Position:	Tel: Fax: Handphone: Email:
Air Conditioning & Ventilation Installation Sub-Contractor Hitachi Plant Technologies, Ltd	DC	Name: Mr Sim Cheng Hong Position: Sr Project Manager	Tel: 6222 0665 Fax: 6224 8358 Handphone: - Email: simon@hitachiplant.com.sg
Plumbing & Sanitary Installation Sub-Contractor Fidens Engineering Pte Ltd	DC	Name: Mr Tan Teo Hoo Position: Director	Tel: 6741 2906 Fax: 6741 2419 Handphone: - Email: fidens@pacific.net.sg
Electrical Installation Sub-Contractor Bee Kong Electrical Engineering Pte Ltd	DC	Name: Mr Stephen Neo Position: -	Tel: 6898 4467 Fax: 6861 8846 Handphone: - Email: stephen@beekong.com.sg
Lift & Escalator Installation Sub-Contractor Fujitec Singapore Corporation Ltd	DC	Name: Mr Roger Lek Position: -	Tel: 6241 6222 Fax: 6444 7626 Handphone: - Email: fujitec@fujicsg.com
Fire Fighting & Alarm Installation Sub-Contractor Deluge Fire Protection (SEA) Pte Ltd	DC	Name: Mr Bvan Leong Position: -	Tel: 6862 3688 Fax: 6862 3600 Handphone: - Email: bvan_leong@deluge.com.sg
Swimming Pool Filtration Plant Installation Sub-Contractor	-	Name: Position:	Tel: Fax: Handphone: Email:
Carpark System Installation Sub-Contractor	-	Name: Position:	Tel: Fax: Handphone: Email:
_____		Name: Position:	Tel: Fax: Handphone: Email:

** Type of Contract*
- *NSC (Nominated Sub-Contract)*
- *DSC (Domesticated Sub-Contract)*
- *DC (Direct Contract)*
- *NS (Nominated Supplier)*

3.6 Authorities

Authorities/Department	Contact Person	Tel/Fax Nos./E-mail
SP PowerGrid:		
(a) Sub-Station	Mr Francis Chang	6823 8555
(b) Diversion		
SP Services:		
(a) Customer Supply	Mr Tan Ban Huat	6240 9264
(b) Installation		
(c) Meter Section	Mr Koh Teck Kuan	6277 7005
(d) Road Lighting		
TFCC:		
(a) SCV	Ms Paulyn Chew	6725 1507
(b) SingTel	Mr Mohamed Ghani	9735 3186
(c) IDA	Ms Valerie Ang	6825 6367
BCA:		
(a) Building Plan		
FSSD:		
(a) Building Plan	Mr Aidil Arghad	
(b) M&E Plan	Ms Alice Seto Lai Chee	6848 1408
PUB (Water Supply) Network Dept:		
(a) Water Conservation		
(b) Plumbing Plan	Mr Tham Tuck Kuan	6731 3695
(c) Diversion		
PUB Water Reclamation (Network) Dept:		
(a) Building Plan/CBPU	Mrs Alison Liew	6731 9663
(b) M&E Plan	Mrs Alison Liew	6731 9663
(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

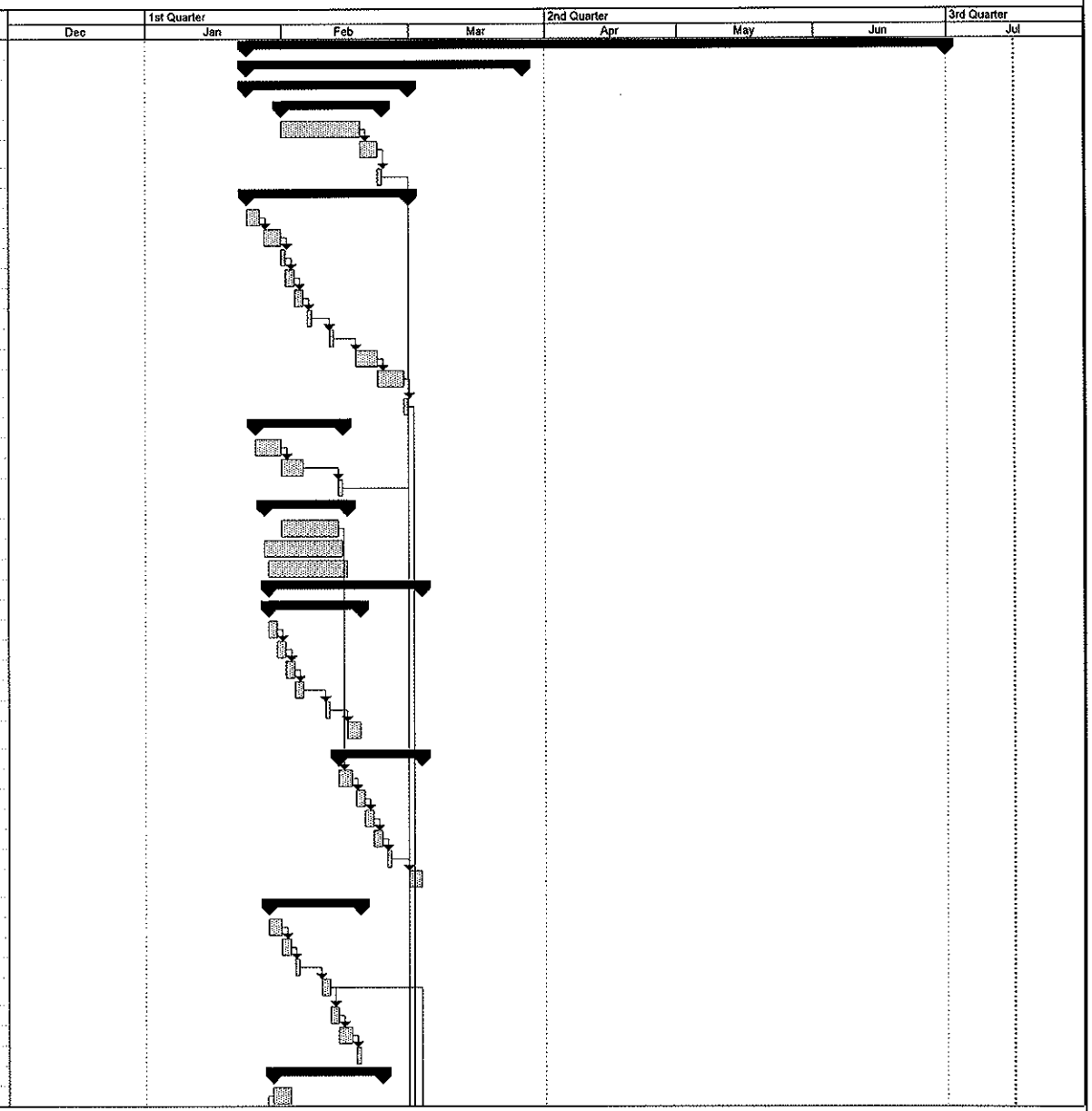
PROGRAMME

4.1 Overall Programme (refer to attach master programme)

ID	TASK NAME	MONTHS	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1.	Preliminary Planning																									
2.	Planning Submission																									
3.	Detail Design																									
4.	BP Submission																									
5.	BP Submission (Amendments)																									
6.	Tender Period for Piling																									
7.	Tender Period for Sub-Structure																									
8.	Tender Period for Super-Structure																									
9.	Piling Period																									
10.	Sub-Structure Construction Period																									
11.	Super-Structure Construction Period																									
12.	TOP																									
13.	CSC																									

PROPOSED ERECTION OF A TWO STOREY MULTI-OCCUPIER WAREHOUSE BUILDING WITH ANCILLARY OFFICE ON LOT 4323L PT (A1706877) MK31 CHANGI NORTH WAY

ID	Task Name	Duration	Start	Finish	Predecessors
1	Schedule of works	137 days?	Thu 1/24/08	Mon 6/30/08	
2	Structural works	65 days?	Thu 1/24/08	Wed 3/26/08	
3	Lift	33 days	Thu 1/24/08	Fri 2/29/08	
4	Passenger Lift 1	21 days	Fri 2/1/08	Sat 2/23/08	
5	Rectification for honeycomb	16 days	Fri 2/1/08	Mon 2/18/08	
6	Dismantling of internal scaffold and clearing of debris	4 days	Tue 2/19/08	Fri 2/22/08	5
7	Handing over of lift	1 day	Sat 2/23/08	Sat 2/23/08	6
8	Passenger Lift 2	33 days	Thu 1/24/08	Fri 2/29/08	
9	Lift shaft wall rebar (2M sty)	3 days	Thu 1/24/08	Sat 1/26/08	
10	Wall formwork	4 days	Mon 1/28/08	Thu 1/31/08	9
11	Casting	1 day	Fri 2/1/08	Fri 2/1/08	10
12	Roof slab formwork	2 days	Sat 2/2/08	Sun 2/3/08	11
13	Roof slab rebar	2 days	Mon 2/4/08	Tue 2/5/08	12
14	Roof slab perimeter formwork	1 day	Thu 2/7/08	Thu 2/7/08	13
15	Casting	1 day	Tue 2/12/08	Tue 2/12/08	14FS+4 days
16	Rectification for honeycomb	5 days	Mon 2/18/08	Fri 2/22/08	15
17	Dismantling of internal scaffold and clearing of debris	5 days	Sat 2/23/08	Thu 2/28/08	16
18	Handing over of lift	1 day	Fri 2/29/08	Fri 2/29/08	17
19	Cargo lift	18 days	Sat 1/26/08	Thu 2/14/08	
20	Rectification for honeycomb	5 days	Sat 1/26/08	Thu 1/31/08	
21	Dismantling of internal scaffold and clearing of de	5 days	Fri 2/1/08	Tue 2/5/08	20
22	Handing over of lift	1 day	Thu 2/14/08	Thu 2/14/08	21FS+5 days
23	Columns construction	18 days	Mon 1/28/08	Fri 2/15/08	
24	GL 12/ D-J	12 days	Fri 2/1/08	Wed 2/13/08	
25	GL 7-12/C-D	17 days	Mon 1/28/08	Thu 2/14/08	
26	GL L-M/7-12	17 days	Tue 1/29/08	Fri 2/15/08	
27	Tie beam construction	31 days	Tue 1/29/08	Mon 3/3/08	
28	GL 12/L-H	19 days	Tue 1/29/08	Mon 2/18/08	
29	Erection of scaffoldings	2 days	Tue 1/29/08	Wed 1/30/08	
30	Beam formwork	2 days	Thu 1/31/08	Fri 2/1/08	29
31	Beam Rebar	2 days	Sat 2/2/08	Sun 2/3/08	30
32	Beam Side formwork	2 days	Mon 2/4/08	Tue 2/5/08	31
33	Casting of tie beam	1 day	Mon 2/11/08	Mon 2/11/08	32
34	Removal of beam formwork and scaffolding	2 days	Sat 2/16/08	Mon 2/18/08	33FS+4 days
35	GL 12/D-H	16 days	Thu 2/14/08	Mon 3/3/08	
36	Erection of scaffoldings	3 days	Thu 2/14/08	Sat 2/16/08	24
37	Beam formwork	2 days	Mon 2/18/08	Tue 2/19/08	36
38	Beam Rebar	2 days	Wed 2/20/08	Thu 2/21/08	37
39	Beam side formwork	2 days	Fri 2/22/08	Sat 2/23/08	38
40	Casting of tie beam	1 day	Mon 2/25/08	Mon 2/25/08	39
41	Removal of beam formwork and scaffolding	2 days	Sat 3/1/08	Mon 3/3/08	40FS+4 days
42	GL 5-7/F-G+	19 days	Tue 1/29/08	Mon 2/18/08	
43	Beam Rebar	3 days	Tue 1/29/08	Thu 1/31/08	
44	Beam side formwork	2 days	Fri 2/1/08	Sat 2/2/08	43
45	Casting	1 day	Mon 2/4/08	Mon 2/4/08	44
46	Removal of beam formwork and scaffolding	2 days	Sun 2/10/08	Mon 2/11/08	45FS+4 days
47	Waterproofing	2 days	Tue 2/12/08	Wed 2/13/08	46
48	Rebar to floor slab GL 5-7/ E-G	3 days	Thu 2/14/08	Sat 2/16/08	47
49	Cast concrete topping	1 day	Mon 2/18/08	Mon 2/18/08	48
50	GL 2-6/M	23 days	Wed 1/30/08	Sat 2/23/08	
51	Erection of scaffoldings	4 days	Wed 1/30/08	Sat 2/2/08	



Project: Schedule of works rev1 (2003
Date: Wed 7/16/08

Task | Progress | Summary | External Tasks | Split
Split | Milestone | Project Summary | External MileTask

PROPOSED ERECTION OF A TWO STOREY MULTI-OCCUPIER WAREHOUSE BUILDING WITH ANCILLARY OFFICE ON LOT 4323L PT (A1706877) MK31 CHANGI NORTH WAY

ID	Task Name	Duration	Start	Finish	Predecessors
52	Beam formwork	4 days	Sat 2/2/08	Tue 2/5/08	51SS+3 days
53	Beam Rebar	4 days	Tue 2/5/08	Sat 2/9/08	52SS+3 days
54	Beam side formwork	4 days	Sat 2/9/08	Tue 2/12/08	53SS+3 days
55	Casting of tie beam	1 day	Sat 2/16/08	Sat 2/16/08	54SS+3 days
56	Removal of beam formwork and scaffolding	2 days	Fri 2/22/08	Sat 2/23/08	55FS+4 days
57	2nd Mezz slab construction	23 days	Sat 1/26/08	Wed 2/20/08	
58	GL 6-7/L-M	23 days	Sat 1/26/08	Wed 2/20/08	
59	Erection of scaffoldings for column construction	3 days	Sat 1/26/08	Tue 1/29/08	
60	Column formwork	2 days	Wed 1/30/08	Thu 1/31/08	59
61	Slab and beam formwork	2 days	Fri 2/1/08	Sat 2/2/08	60
62	Slab and beam rebar	2 days	Sun 2/3/08	Mon 2/4/08	61
63	Slab and beam side formwork	2 days	Tue 2/5/08	Thu 2/7/08	62
64	Casting	1 day	Mon 2/11/08	Mon 2/11/08	63
65	Removal of slab formwork and scaffolding	4 days	Sat 2/16/08	Wed 2/20/08	64FS+4 days
66	Column stump construction	29 days	Tue 1/29/08	Fri 2/29/08	
67	Installation of cast in bolts	26 days	Tue 1/29/08	Tue 2/26/08	
68	Closing of formwork	26 days	Thu 1/31/08	Thu 2/28/08	67SS+2 days
69	Casting of column stump	25 days	Sat 2/2/08	Fri 2/29/08	68SS+2 days
70	Staircases (landing)	51 days?	Tue 1/29/08	Wed 3/26/08	
71	S/C 1	21 days	Tue 1/29/08	Wed 2/20/08	
72	S/C 2	23 days	Tue 2/5/08	Sat 3/1/08	71SS+7 days
73	S/C 3	23 days	Wed 2/13/08	Mon 3/10/08	72SS+7 days
74	S/C 4	22 days	Tue 2/19/08	Fri 3/14/08	73SS+5 days
75	S/C 6	22 days	Mon 2/11/08	Thu 3/6/08	
76	S/C 7 + Roof	26 days	Mon 2/4/08	Tue 3/4/08	
77	Roof stair 1	13 days?	Fri 2/22/08	Fri 3/7/08	
78	Erect safety scaffold	3 days	Fri 2/22/08	Mon 2/25/08	
79	Column Fmwk	2 days	Tue 2/26/08	Wed 2/27/08	
80	Cast conc	1 day?	Thu 2/28/08	Thu 2/28/08	79
81	Fmwk to roof slab	4 days	Fri 2/29/08	Tue 3/4/08	80
82	rebar	2 days	Wed 3/5/08	Thu 3/6/08	81
83	cast conc	1 day?	Fri 3/7/08	Fri 3/7/08	82
84	PC stair 2	3 days	Mon 3/10/08	Wed 3/12/08	
85	PC stair 3	3 days	Tue 3/18/08	Thu 3/20/08	
86	PC stair 4	3 days	Mon 3/24/08	Wed 3/26/08	
87	PC stair 6	3 days	Sat 3/22/08	Tue 3/25/08	
88	Minor structural works	19 days	Thu 2/21/08	Thu 3/13/08	
89	RC Canopy @12/L~M	7 days	Sat 2/23/08	Sat 3/1/08	
90	A/12 Toilet @1st sty	8 days	Mon 3/3/08	Tue 3/11/08	
91	Dock level slab @ 7/D 2nd sty	3 days	Thu 2/21/08	Sat 2/23/08	
92	Ramp to tuck dock @ 2nd sty	4 days	Mon 3/10/08	Thu 3/13/08	
93	Apron slab & step @GL M/2~12	10 days	Mon 2/25/08	Thu 3/6/08	91
94	Handing over Schedule	105 days	Sat 2/9/08	Mon 6/9/08	
95	Warehouse 2-1 (GL 1-7/F-M)	86 days	Fri 2/15/08	Sat 5/24/08	
96	Structural Steel erection	15 days	Fri 2/15/08	Mon 3/3/08	
97	Erection of steel trusses & painting	12 days	Fri 2/15/08	Thu 2/28/08	69SS+11 days
98	Installation of purlins	11 days	Wed 2/20/08	Mon 3/3/08	97SS+4 days
99	Roof covering	10 days	Tue 2/26/08	Fri 3/7/08	98SS+5 days
100	Block works/ ALC	19 days	Mon 2/18/08	Mon 3/10/08	
101	GL1/D-M-2nd sty	8 days	Mon 2/18/08	Tue 2/26/08	
102	GL 1-7/M-2nd sty	9 days	Fri 2/29/08	Mon 3/10/08	101SS+10 days
103	Floor Finishes	32 days	Mon 2/18/08	Tue 3/25/08	

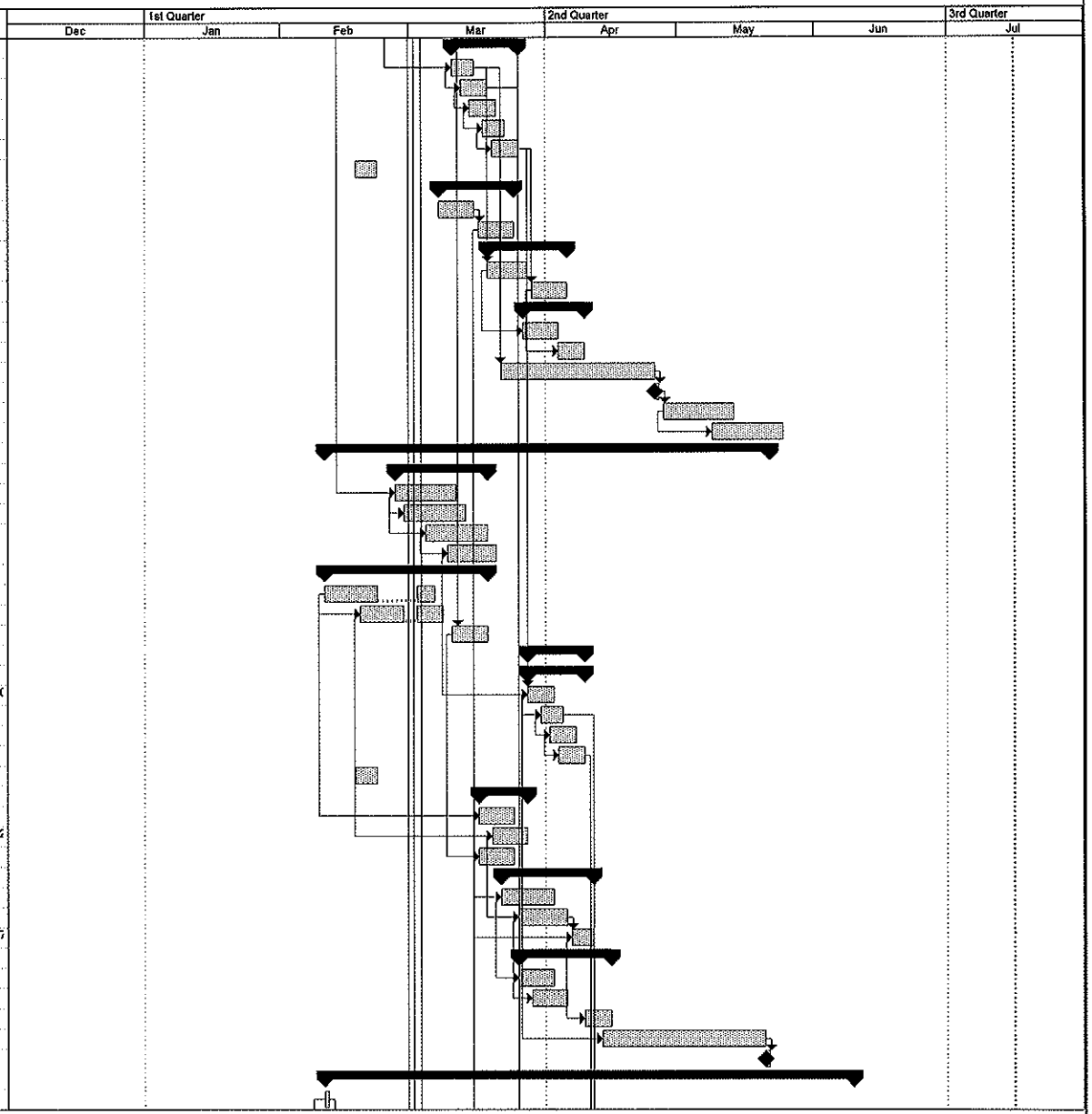


Project: Schedule of works rev1 (2003
Date: Wed 7/16/08

Task | Progress | Summary | External Tasks | Split
Split | Milestone | Project Summary | External MileTask

PROPOSED ERECTION OF A TWO STOREY MULTI-OCCUPIER WAREHOUSE BUILDING WITH ANCILLARY OFFICE ON LOT 4323L PT (A1706877) MK31 CHANGI NORTH WAY

ID	Task Name	Duration	Start	Finish	Predecessors
104	**FM3**	**13 days**	**Tue 3/11/08**	**Tue 3/25/08**	
105	GL 1-3/ F-J	5 days	Tue 3/11/08	Sat 3/15/08	99SS+12 days
106	GL 3~5/F~G	5 days	Thu 3/13/08	Tue 3/18/08	105SS+2 days
107	GL 1~3 / J~M	5 days	Sat 3/15/08	Thu 3/20/08	106SS+2 days
108	GL 3-5/J-M	5 days	Tue 3/18/08	Sat 3/22/08	107SS+2 days
109	GL 5-7/G-M	5 days	Thu 3/20/08	Tue 3/25/08	108SS+2 days
110	GL 1-7/D-F	5 days	Mon 2/18/08	Fri 2/22/08	
111	**Lourves and windows installation**	**14 days**	**Sat 3/8/08**	**Mon 3/24/08**	
112	GL1/D-M-2nd sty	7 days	Sat 3/8/08	Sat 3/15/08	
113	GL 1-7/M-2nd sty	7 days	Mon 3/17/08	Mon 3/24/08	112
114	**Internal Plastering**	**16 days**	**Wed 3/19/08**	**Sat 4/5/08**	
115	GL1/D-M- 2nd sty	8 days	Wed 3/19/08	Thu 3/27/08	105FS+2 days
116	GL 1-7/M- 2nd sty	7 days	Sat 3/29/08	Sat 4/5/08	109FS+3 days
117	**Internal Painting**	**12 days**	**Thu 3/27/08**	**Wed 4/9/08**	
118	GL1/D-M- 2nd sty	7 days	Thu 3/27/08	Thu 4/3/08	115SS+7 days
119	GL 1-7/M- 2nd sty	5 days	Fri 4/4/08	Wed 4/9/08	116SS+5 days
120	M&E installation	30 days	Sat 3/22/08	Fri 4/25/08	105FS+5 days
121	Handover Warehouse 2-1	1 day	Sat 4/26/08	Sat 4/26/08	120
122	Racking works (By Client)	14 days	Mon 4/28/08	Tue 5/13/08	121
123	In rack sprinkler installation works	14 days	Fri 5/9/08	Sat 5/24/08	122SS+10 days
124	**Warehouse 2-2 (GL 7-12/ D-M)**	**87 days**	**Mon 2/11/08**	**Wed 5/21/08**	
125	**Structural Steel**	**18 days**	**Wed 2/27/08**	**Tue 3/18/08**	
126	Assembling of steel members	12 days	Wed 2/27/08	Tue 3/11/08	97SS+10 days
127	Erection of steel trusses	12 days	Fri 2/29/08	Thu 3/13/08	126SS+2 days
128	Installation of purlins	12 days	Wed 3/5/08	Tue 3/18/08	126SS+2 days
129	**Roof covering**	**10 days**	**Mon 3/10/08**	**Thu 3/20/08**	128SS+4 days
130	**Block works/ ALC**	**32 days**	**Mon 2/11/08**	**Tue 3/18/08**	
131	GL12/D-M -1st sty	15 days	Mon 2/11/08	Thu 3/6/08	
132	GL12/D-M -2nd sty	15 days	Tue 2/19/08	Sat 3/8/08	131SS+7 days
133	GL 7-12/M-2nd sty	7 days	Tue 3/11/08	Tue 3/18/08	102
134	**Floor Finishes**	**11 days**	**Fri 3/28/08**	**Wed 4/9/08**	
135	**FM3**	**11 days**	**Fri 3/28/08**	**Wed 4/9/08**	
136	GL 10-12/L-H	5 days	Fri 3/28/08	Wed 4/2/08	129SS+12 days,1(
137	GL 10-12/H-D	5 days	Mon 3/31/08	Fri 4/4/08	136SS+2 days
138	GL 7-10/ L-H	5 days	Wed 4/2/08	Mon 4/7/08	137SS+2 days
139	GL 7-10/H-D	5 days	Fri 4/4/08	Wed 4/9/08	138SS+2 days
140	Concrete topping - Gen Man Office	5 days	Mon 2/18/08	Fri 2/22/08	
141	**Lourves and windows installation**	**10 days**	**Mon 3/17/08**	**Thu 3/27/08**	
142	GL12/D-M -1st sty	7 days	Mon 3/17/08	Mon 3/24/08	131SS+7 days
143	GL12/D-M -2nd sty	7 days	Thu 3/20/08	Thu 3/27/08	132SS+5 days,142
144	GL 7-12/M-2nd sty	7 days	Mon 3/17/08	Mon 3/24/08	133SS+5 days
145	**Internal Plastering**	**18 days**	**Sat 3/22/08**	**Fri 4/11/08**	
146	GL12/D-M -1st sty	10 days	Sat 3/22/08	Wed 4/2/08	142SS+5 days
147	GL12/D-M -2nd sty	10 days	Wed 3/26/08	Sat 4/5/08	143SS+5 days
148	GL 7-12/M-2nd sty	5 days	Mon 4/7/08	Fri 4/11/08	144SS+5 days,147
149	**Internal Painting**	**18 days**	**Wed 3/26/08**	**Tue 4/15/08**	
150	GL12/D-M -1st sty	7 days	Wed 3/26/08	Wed 4/2/08	146SS+3 days
151	GL12/D-M -2nd sty	7 days	Sat 3/29/08	Sat 4/5/08	147SS+3 days
152	GL 7-12/M-2nd sty	5 days	Thu 4/10/08	Tue 4/15/08	148SS+3 days
153	M&E Installation	32 days	Mon 4/14/08	Tue 5/20/08	136SS+3 days
154	Handover Warehouse 2-2	1 day	Wed 5/21/08	Wed 5/21/08	153
155	**Warehouse 1-1 (GL 1-5/E-H)**	**103 days**	**Mon 2/11/08**	**Mon 6/9/08**	
156	Column rebar -GL 3-4/M	1 day	Mon 2/11/08	Mon 2/11/08	

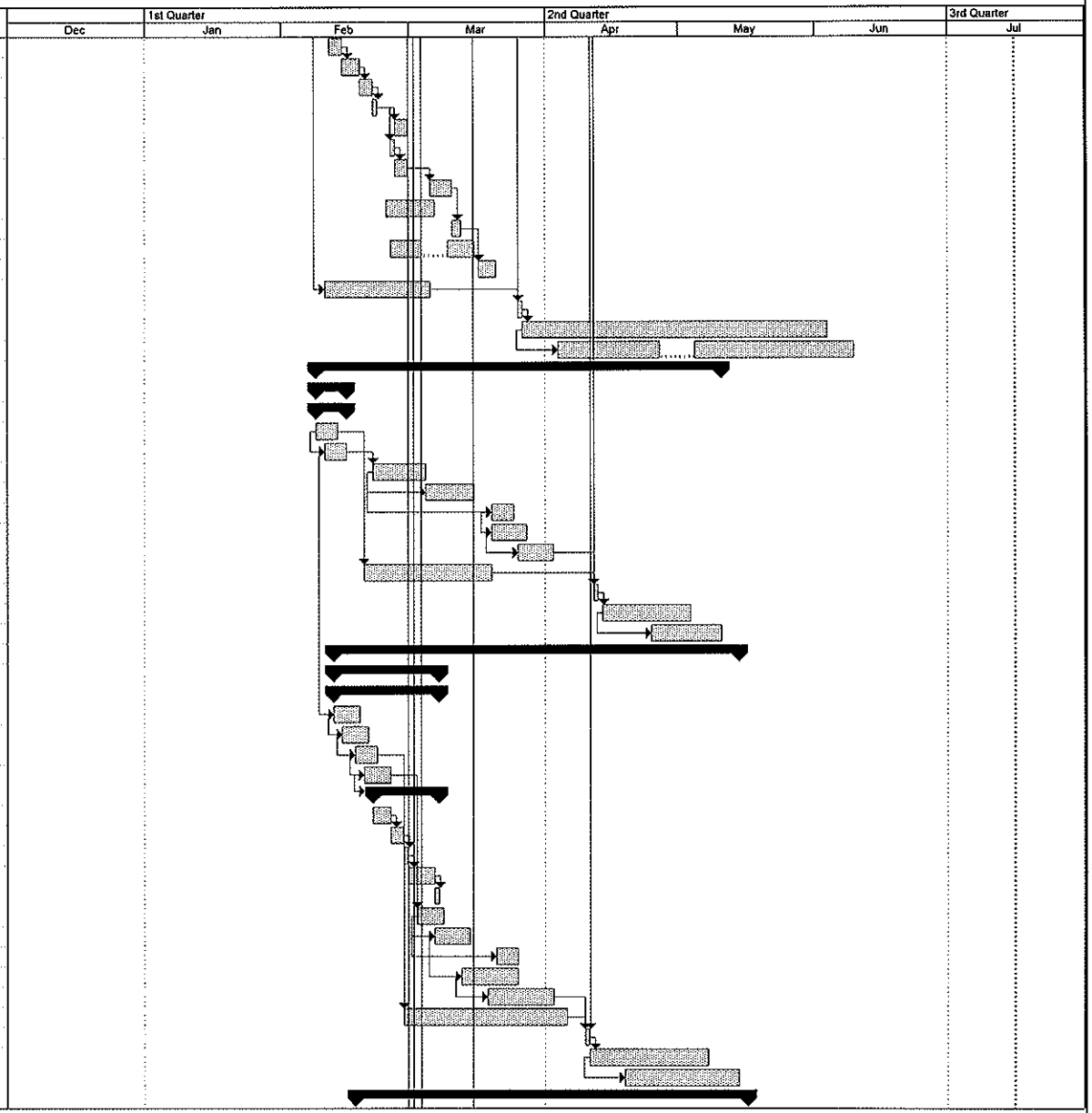


Project: Schedule of works rev1 (2003
Date: Wed 7/16/08

Task | Progress | Summary | External Tasks | Split
Split | Milestone | Project Summary | External MileTask

PROPOSED ERECTION OF A TWO STOREY MULTI-OCCUPIER WAREHOUSE BUILDING WITH ANCILLARY OFFICE ON LOT 4323L PT (A1706877) MK31 CHANGI NORTH WAY

ID	Task Name	Duration	Start	Finish	Predecessors
157	Column formwork and casting	3 days	Tue 2/12/08	Thu 2/14/08	156
158	False work for 2nd sty beam	3 days	Fri 2/15/08	Mon 2/18/08	157
159	Beam rebar and formwork	3 days	Tue 2/19/08	Thu 2/21/08	158
160	Casting of beam	1 day	Fri 2/22/08	Fri 2/22/08	159
161	Removal of falsework	3 days	Wed 2/27/08	Fri 2/29/08	160FS+3 days
162	Installation of hollow core slab	1 day	Tue 2/26/08	Tue 2/26/08	160FS+2 days
163	ALC Blockwork	3 days	Wed 2/27/08	Fri 2/29/08	162
164	Installation of louvres	4 days	Thu 3/6/08	Mon 3/10/08	163FS+3 days
165	Installation of Roller shutter	10 days	Mon 2/25/08	Thu 3/6/08	
166	Internal plastering	2 days	Tue 3/11/08	Wed 3/12/08	164
167	Rectification work to FM3	12 days	Tue 2/26/08	Sat 3/15/08	
168	Painting works	4 days	Mon 3/17/08	Thu 3/20/08	166FS+3 days
169	M&E Installation	21 days	Mon 2/11/08	Wed 3/5/08	156SS
170	Handover Warehouse 1-1	1 day	Wed 3/26/08	Wed 3/26/08	169,106,99
171	Racking works (By Client)	59 days	Thu 3/27/08	Tue 6/3/08	170
172	In rack sprinkler installation works	51 days	Fri 4/4/08	Mon 6/9/08	171SS+7 days
173	Non Air con Warehouse (GL 10-12/D-M)	80 days	Sat 2/9/08	Sat 5/10/08	
174	Floor Finishes	7 days	Sat 2/9/08	Fri 2/15/08	
175	FM3	7 days	Sat 2/9/08	Fri 2/15/08	
176	GL 10-12/H-M	5 days	Sat 2/9/08	Wed 2/13/08	
177	GL 10-12/D-H	5 days	Mon 2/11/08	Fri 2/15/08	176SS+2 days
178	ALC Blockwork	10 days	Fri 2/22/08	Tue 3/4/08	177FS+5 days
179	Installation of roller shutter	10 days	Wed 3/5/08	Sat 3/15/08	178SS+10 days
180	Installation of louvres	4 days	Thu 3/20/08	Mon 3/24/08	178SS+5 days
181	Internal plastering	7 days	Thu 3/20/08	Thu 3/27/08	180SS
182	Painting works	7 days	Wed 3/26/08	Wed 4/2/08	181SS+5 days
183	M&E Installation	25 days	Wed 2/20/08	Wed 3/19/08	176FS+5 days
184	Handover Non Air Con Warehouse 1-3	1 day	Sat 4/12/08	Sat 4/12/08	183,182,137
185	Racking works (By Client)	18 days	Mon 4/14/08	Sat 5/3/08	184
186	In rack sprinkler installation works	14 days	Fri 4/25/08	Sat 5/10/08	185SS+7 days
187	Warehouse 1-2 (GL 5-10/D-M)	79 days	Wed 2/13/08	Wed 5/14/08	
188	Floor Finishes	21 days	Wed 2/13/08	Fri 3/7/08	
189	FM3	21 days	Wed 2/13/08	Fri 3/7/08	
190	GL 5-7/D-H	5 days	Wed 2/13/08	Mon 2/18/08	177SS+2 days
191	GL 5-7/ H-M	5 days	Fri 2/15/08	Wed 2/20/08	190SS+2 days
192	GL 7-8/D-M	5 days	Mon 2/18/08	Fri 2/22/08	191SS+2 days
193	GL 9-10/D-M	5 days	Wed 2/20/08	Mon 2/25/08	192SS+2 days
194	GL 8-9/D-M	13 days	Fri 2/22/08	Fri 3/7/08	193SS+2 days
195	Excavation and lean concrete	3 days	Fri 2/22/08	Mon 2/25/08	
196	Built up rc pile	3 days	Tue 2/26/08	Thu 2/28/08	195
197	Backfilling and lean concrete to rc pile a	1 day	Fri 2/29/08	Fri 2/29/08	196
198	Slab reinforcement work	5 days	Sat 3/1/08	Thu 3/6/08	197
199	Cleaning and casting	1 day	Fri 3/7/08	Fri 3/7/08	198
200	ALC Blockwork	6 days	Mon 3/3/08	Sat 3/8/08	193FS+5 days
201	Installation of roller shutter	7 days	Fri 3/7/08	Fri 3/14/08	200SS+4 days
202	Installation of louvres	4 days	Fri 3/21/08	Tue 3/25/08	200SS+4 days
203	Internal plastering	11 days	Thu 3/13/08	Tue 3/25/08	201SS+5 days
204	Painting works	13 days	Wed 3/19/08	Wed 4/2/08	203SS+5 days
205	M&E Installation	32 days	Fri 2/29/08	Sat 4/5/08	192FS+5 days
206	Handover Warehouse 1-2	1 day	Thu 4/10/08	Thu 4/10/08	204,139,205
207	Racking works (By Client)	23 days	Fri 4/11/08	Wed 5/7/08	205
208	In rack sprinkler installation works	22 days	Sat 4/19/08	Wed 5/14/08	207SS+7 days
209	Architectural works	77 days	Mon 2/18/08	Fri 5/16/08	

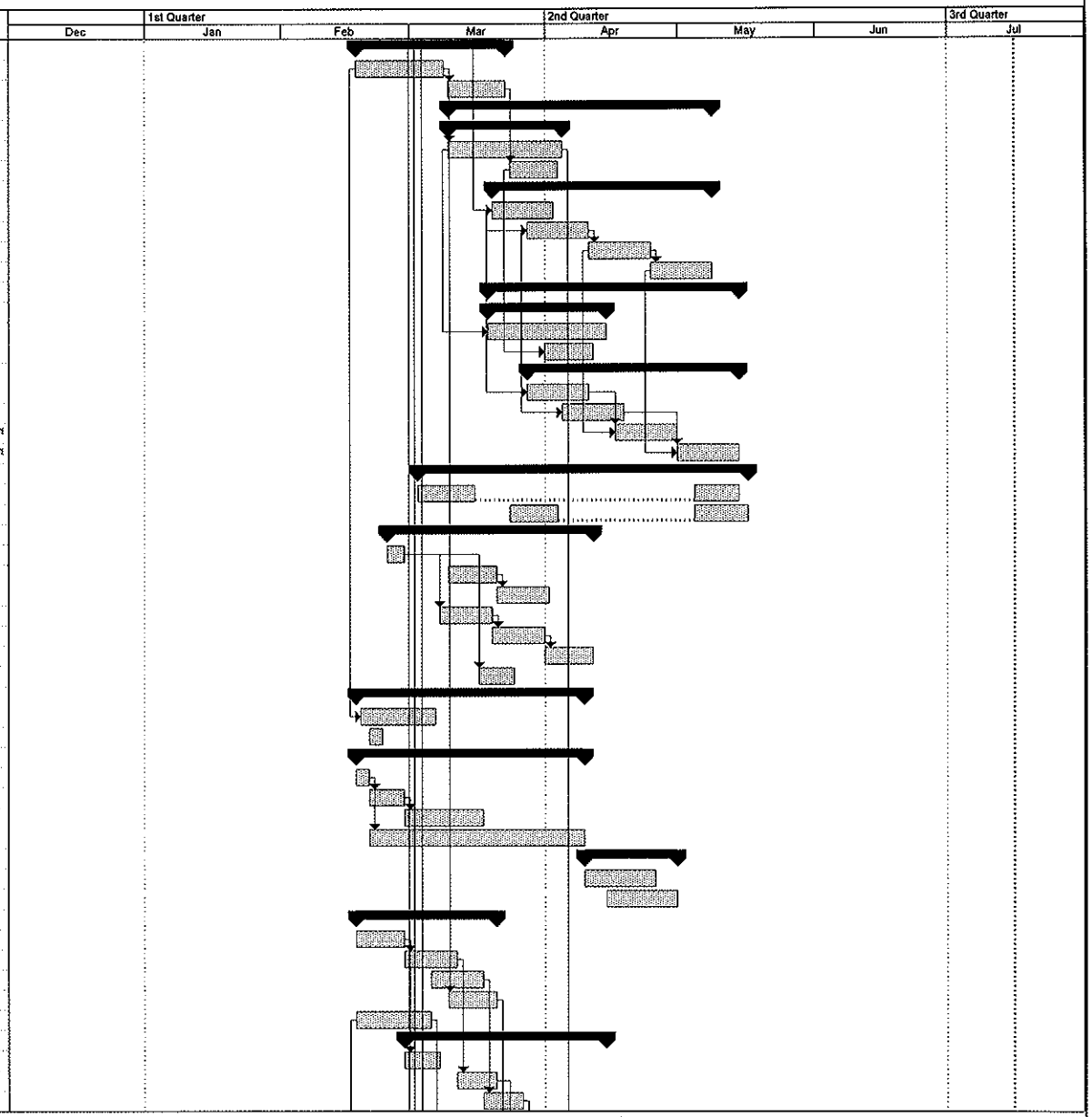


Project: Schedule of works rev1 (2003
Date: Wed 7/16/08

Task | Progress | Summary | External Tasks | Split
Split | Milestone | Project Summary | External MileTask

PROPOSED ERECTION OF A TWO STOREY MULTI-OCCUPIER WAREHOUSE BUILDING WITH ANCILLARY OFFICE ON LOT 4323L PT (A1706877) MK31 CHANGI NORTH WAY

ID	Task Name	Duration	Start	Finish	Predecessors
210	**Block works/ ALC**	30 days	Mon 2/18/08	Sat 3/22/08	
211	2nd sty Mezzanine @ elevation 1	18 days	Mon 2/18/08	Sat 3/8/08	
212	Roof sty @elevation 1	12 days	Mon 3/10/08	Sat 3/22/08	211
213	**Plastering**	52 days	Mon 3/10/08	Thu 5/8/08	
214	Internal	23 days	Mon 3/10/08	Fri 4/4/08	
215	2nd sty Mezzanine	23 days	Mon 3/10/08	Fri 4/4/08	211
216	Roof sty	10 days	Mon 3/24/08	Thu 4/3/08	212
217	External	43 days	Thu 3/20/08	Thu 5/8/08	
218	Elevation 1	12 days	Thu 3/20/08	Wed 4/2/08	113SS+3 days
219	Elevation 2	12 days	Fri 3/28/08	Thu 4/10/08	218SS+7 days
220	Elevation 3	12 days	Fri 4/11/08	Thu 4/24/08	219
221	Elevation 4	12 days	Fri 4/25/08	Thu 5/8/08	220
222	**Painting**	49 days	Wed 3/19/08	Wed 5/14/08	
223	Internal	23 days	Wed 3/19/08	Mon 4/14/08	
224	2nd sty Mezzanine	23 days	Wed 3/19/08	Mon 4/14/08	215SS+8 days
225	Roof sty	10 days	Tue 4/1/08	Fri 4/11/08	216SS+7 days
226	External	41 days	Fri 3/28/08	Wed 5/14/08	
227	Elevation 1	12 days	Fri 3/28/08	Thu 4/10/08	218SS+7 days
228	Elevation 2	12 days	Sat 4/5/08	Fri 4/18/08	219SS+7 days
229	Elevation 3	12 days	Thu 4/17/08	Wed 4/30/08	227,220SS+5 days
230	Elevation 4	12 days	Thu 5/1/08	Wed 5/14/08	228,221SS+5 days
231	**Roller Shutter**	65 days	Mon 3/3/08	Fri 5/16/08	
232	1st sty	21 days	Mon 3/3/08	Wed 5/14/08	
233	2nd sty	21 days	Mon 3/24/08	Fri 5/16/08	
234	**Metal Works**	41 days	Mon 2/25/08	Fri 4/11/08	
235	Shop drawing approval	4 days	Mon 2/25/08	Thu 2/28/08	
236	Lower 1st sty	10 days	Mon 3/10/08	Thu 3/20/08	
237	1st sty	10 days	Fri 3/21/08	Tue 4/1/08	236
238	1st Mezzanine	10 days	Sat 3/8/08	Wed 3/19/08	235FS+7 days
239	2nd sty	10 days	Thu 3/20/08	Mon 3/31/08	238
240	2nd Mezzanine	10 days	Tue 4/1/08	Fri 4/11/08	239
241	Roof	7 days	Mon 3/17/08	Mon 3/24/08	235FS+14 days
242	**Door and windows installation**	45 days	Mon 2/18/08	Wed 4/9/08	
243	2nd sty Mezzanine	15 days	Tue 2/19/08	Thu 3/6/08	211SS+1 day
244	Roof sty	3 days	Thu 2/21/08	Sat 2/23/08	
245	Rectification of Dock Opening for Section door	45 days	Mon 2/18/08	Wed 4/9/08	
246	Confirmation of sectional door size & colour by Zl	3 days	Mon 2/18/08	Wed 2/20/08	
247	Erect scaffolding and shift racking material	7 days	Thu 2/21/08	Thu 2/28/08	246
248	Demolish extg brick wall & construct stiffeners	15 days	Fri 2/29/08	Mon 3/17/08	247
249	Procurement of sectional door	42 days	Thu 2/21/08	Wed 4/9/08	246
250	**Dock levellers**	18 days	Thu 4/10/08	Wed 4/30/08	
251	1st sty	14 days	Thu 4/10/08	Fri 4/25/08	
252	2nd sty	14 days	Tue 4/15/08	Wed 4/30/08	
253	**Waterproofing**	28 days	Mon 2/18/08	Thu 3/20/08	
254	1st sty	10 days	Mon 2/18/08	Thu 2/28/08	
255	1st sty Mezzanine	10 days	Fri 2/29/08	Tue 3/11/08	254
256	2nd sty	10 days	Thu 3/6/08	Mon 3/17/08	
257	2nd sty Mezzanine	10 days	Mon 3/10/08	Thu 3/20/08	211
258	Roof sty	15 days	Mon 2/18/08	Wed 3/5/08	
259	**Tiling works**	39 days	Fri 2/29/08	Mon 4/14/08	
260	1st sty	7 days	Fri 2/29/08	Fri 3/7/08	254
261	1st sty Mezzanine	8 days	Wed 3/12/08	Thu 3/20/08	255
262	2nd sty	8 days	Tue 3/18/08	Wed 3/26/08	256

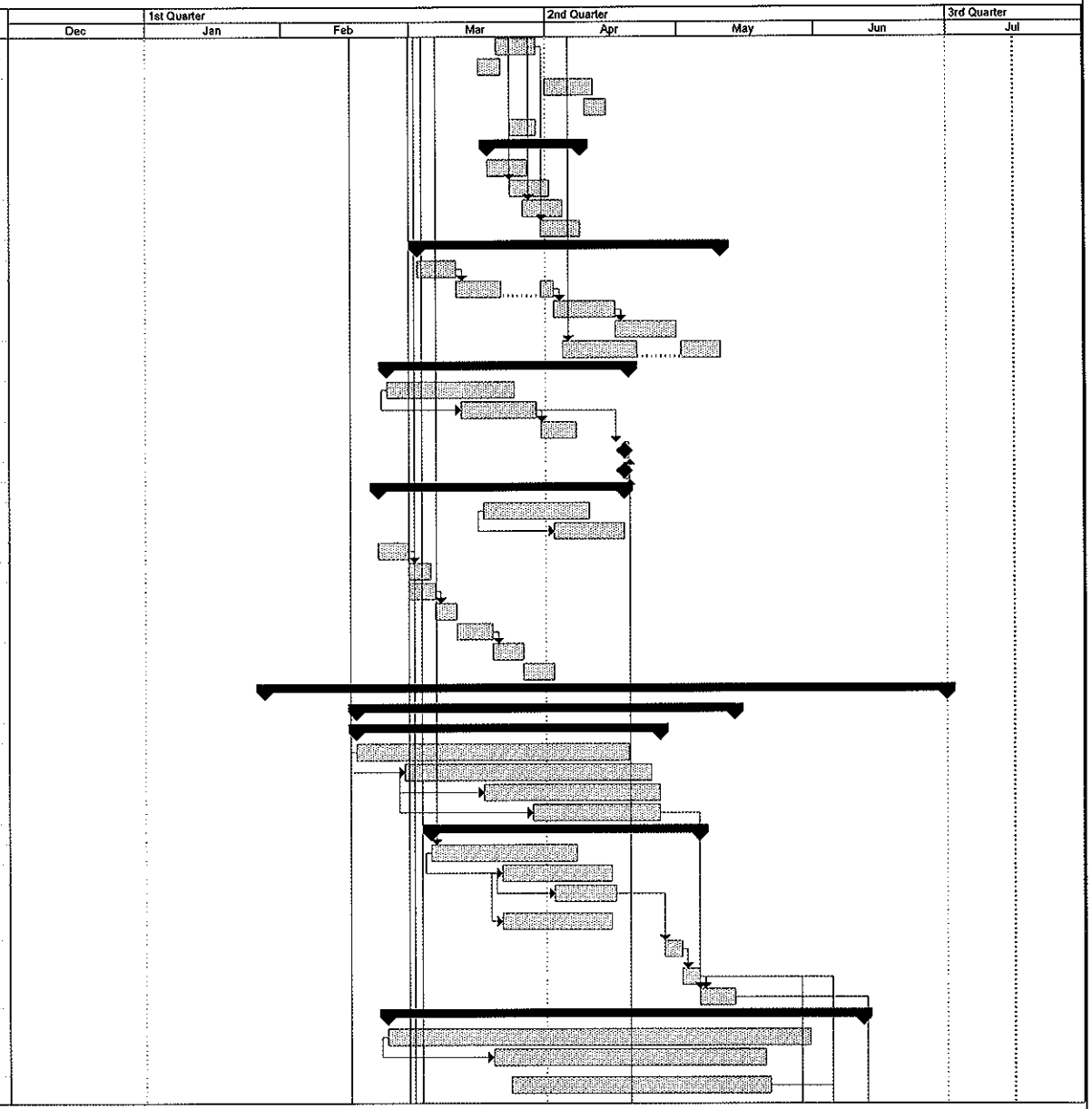


Project: Schedule of works rev1 (2003
Date: Wed 7/16/08

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

PROPOSED ERECTION OF A TWO STOREY MULTI-OCCUPIER WAREHOUSE BUILDING WITH ANCILLARY OFFICE ON LOT 4323L PT (A1706877) MK31 CHANGI NORTH WAY

ID	Task Name	Duration	Start	Finish	Predecessors
263	2nd sty Mezzanine	8 days	Fri 3/21/08	Sat 3/29/08	257
264	Guard House	5 days	Mon 3/17/08	Fri 3/21/08	
265	Lift lobby	10 days	Tue 4/1/08	Fri 4/11/08	
266	Bin Centre	4 days	Thu 4/10/08	Mon 4/14/08	
267	Receiving office & A/12 toilet @1st sty	6 days	Mon 3/24/08	Sat 3/29/08	
268	**Toilet cubicle**	**18 days**	**Wed 3/19/08**	**Tue 4/8/08**	
269	1st sty	8 days	Wed 3/19/08	Thu 3/27/08	
270	1st sty Mezzanine	8 days	Mon 3/24/08	Tue 4/1/08	261
271	2nd sty	8 days	Thu 3/27/08	Fri 4/4/08	262
272	2nd sty Mezzanine	8 days	Mon 3/31/08	Tue 4/8/08	263
273	**Ceiling**	**60 days**	**Mon 3/3/08**	**Sat 5/10/08**	
274	Lower 1st sty	8 days	Mon 3/3/08	Tue 3/11/08	
275	1st sty	12 days	Wed 3/12/08	Wed 4/2/08	274
276	1st sty Mezzanine	12 days	Thu 4/3/08	Wed 4/16/08	275
277	2nd sty	12 days	Thu 4/17/08	Wed 4/30/08	276
278	2nd sty Mezzanine	22 days	Sat 4/5/08	Sat 5/10/08	215
279	**Curtain wall installation**	**48 days**	**Mon 2/25/08**	**Sat 4/19/08**	
280	Framel structures installation	25 days	Mon 2/25/08	Mon 3/24/08	
281	Glazing installation	15 days	Thu 3/13/08	Sat 3/29/08	280SS+15 days
282	Sealant installation & water tightness test	7 days	Mon 3/31/08	Mon 4/7/08	281
283	ID move in 2nd sty & Mezz office @GL 7-12/L-M	1 day	Sat 4/19/08	Sat 4/19/08	281,411
284	ID Move in 2- sty Mezz office @GL 1-12/C-F	1 day	Sat 4/19/08	Sat 4/19/08	411
285	**Canopy**	**48 days**	**Sat 2/23/08**	**Fri 4/18/08**	
286	Installation of steel structures	21 days	Tue 3/18/08	Thu 4/10/08	
287	Installation of metal roofing	14 days	Thu 4/3/08	Fri 4/18/08	286SS+14 days
288	structure steel Roof to chiller plant room	6 days	Sat 2/23/08	Fri 2/29/08	
289	Installation of metal roofing	4 days	Sat 3/1/08	Wed 3/5/08	288
290	Structure steel to Roof AHU room	5 days	Sat 3/1/08	Thu 3/6/08	
291	Installation of metal roofing	4 days	Fri 3/7/08	Tue 3/11/08	290
292	Structure steel to receiving office @ 1st -sty	7 days	Wed 3/12/08	Wed 3/19/08	
293	Installation of metal roofing	6 days	Thu 3/20/08	Wed 3/26/08	292
294	spiral staircase to Gen Mgt office	6 days	Thu 3/27/08	Wed 4/2/08	
295	**M&E works**	**134 days?**	**Mon 1/28/08**	**Mon 6/30/08**	
296	**Electrical Installation**	**74 days**	**Mon 2/18/08**	**Tue 5/13/08**	
297	**Main Building**	**60 days**	**Mon 2/18/08**	**Sat 4/26/08**	
298	Conduits & cable support	54 days	Mon 2/18/08	Sat 4/19/08	
299	Wiring works	48 days	Fri 2/29/08	Thu 4/24/08	298SS+10 days
300	Fitting installation	35 days	Tue 3/18/08	Sat 4/26/08	299SS+15 days
301	Installation of DB	25 days	Sat 3/29/08	Sat 4/26/08	299SS+25 days
302	**Roof top installation**	**52 days**	**Thu 3/6/08**	**Mon 5/5/08**	
303	Conduit/Trunking installation	28 days	Thu 3/6/08	Mon 4/7/08	258
304	Cabling/ Wiring works	21 days	Sat 3/22/08	Tue 4/15/08	303SS+14 days
305	MSB/SSB/ EMSB/DB installation	12 days	Thu 4/3/08	Wed 4/16/08	304SS+10 days
306	400KVA and 1250KVA Gensets termination	21 days	Sat 3/22/08	Tue 4/15/08	304SS
307	T&C T/F, Gensets, MSB, SSB, EMSB	4 days	Mon 4/28/08	Thu 5/1/08	305
308	Turn on to MSB, SSB, EMSB	3 days	Fri 5/2/08	Mon 5/5/08	307
309	Testing and Commissioning	7 days	Tue 5/6/08	Tue 5/13/08	301,308
310	**Fire protection Installation**	**93 days**	**Mon 2/25/08**	**Wed 6/11/08**	
311	Installation of sprinkler pipe	83 days	Mon 2/25/08	Fri 5/30/08	
312	Fire alarm conduits/ trunking/ dry riser	53 days	Thu 3/20/08	Tue 5/20/08	311SS+21 days
313	Fire alarm wiring/ Hosereel/ call points	51 days	Mon 3/24/08	Wed 5/21/08	

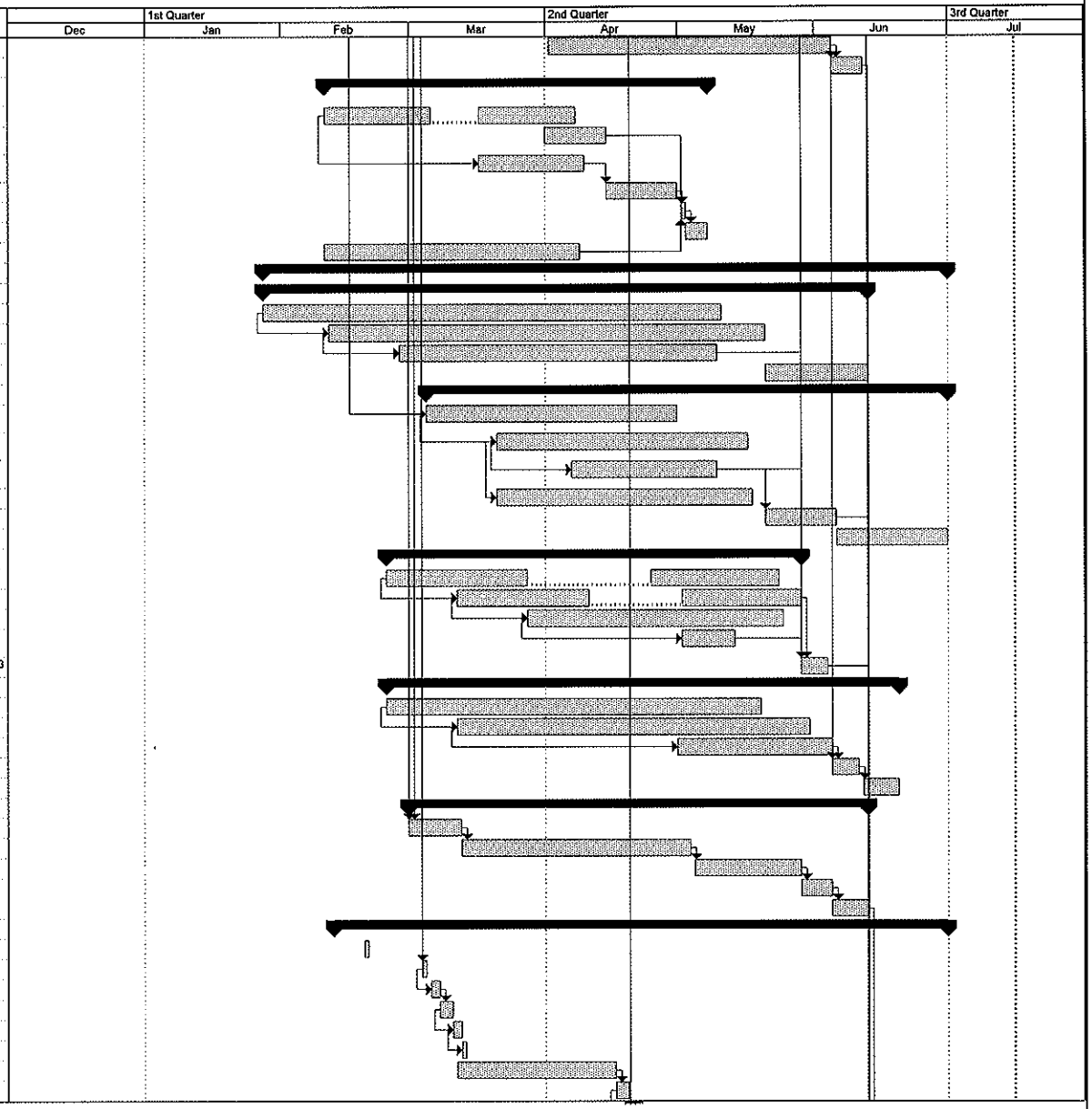


Project: Schedule of works rev1 (2003
Date: Wed 7/16/08

Task | Progress | Summary | External Tasks | Split
Split | Milestone | Project Summary | External MileTask

PROPOSED ERECTION OF A TWO STOREY MULTI-OCCUPIER WAREHOUSE BUILDING WITH ANCILLARY OFFICE ON LOT 4323L PT (A1706877) MK31 CHANGI NORTH WAY

ID	Task Name	Duration	Start	Finish	Predecessors
314	Sprinkler tank/ pump installation	55 days	Wed 4/2/08	Wed 6/4/08	
315	Testing and Commissioning	6 days	Thu 6/5/08	Wed 6/11/08	308,313,314
316	Plumbing and sanitary installation	75 days	Mon 2/11/08	Wed 5/7/08	
317	Main/ branch pipe installation	40 days	Mon 2/11/08	Mon 4/7/08	
318	Sanitary ware and fittings installation	12 days	Tue 4/1/08	Mon 4/14/08	
319	Watertank/ Booster pump installation	21 days	Mon 3/17/08	Wed 4/9/08	317SS+28 days
320	PUB/ CBPU inspection	14 days	Tue 4/15/08	Wed 4/30/08	319
321	Water turn on	1 day	Fri 5/2/08	Fri 5/2/08	318,323,320
322	Testing and Commissioning	4 days	Sat 5/3/08	Wed 5/7/08	321
323	Sewerline construction	50 days	Mon 2/11/08	Tue 4/8/08	
324	ACMV Installation	134 days	Mon 1/28/08	Mon 6/30/08	
325	Main Building	119 days	Mon 1/28/08	Thu 6/12/08	
326	Duct work installation	91 days	Mon 1/28/08	Sat 5/10/08	
327	Pipe work installation	85 days	Tue 2/12/08	Tue 5/20/08	326SS+14 days
328	BMS wiring	62 days	Thu 2/28/08	Fri 5/9/08	327SS+14 days
329	cGMP validation BMS	20 days	Wed 5/21/08	Thu 6/12/08	
330	Roof top installation	101 days	Wed 3/5/08	Mon 6/30/08	
331	Cooling tower/ Chiller installation	49 days	Wed 3/5/08	Wed 4/30/08	258SS+2 days
332	Plantroom and cooling tower pipework	49 days	Fri 3/21/08	Fri 5/16/08	331SS+14 days
333	Plantroom sec electrical/ BMS work	29 days	Mon 4/7/08	Fri 5/9/08	332SS+14 days
334	Duct work	50 days	Fri 3/21/08	Sat 5/17/08	332SS
335	T&C	14 days	Wed 5/21/08	Thu 6/5/08	333
336	GMP Validation	21 days	Fri 6/6/08	Mon 6/30/08	
337	Smoke purging system	81 days	Mon 2/25/08	Wed 6/28/08	
338	Duct work	53 days	Mon 2/25/08	Fri 5/23/08	
339	Fan installation	49 days	Wed 3/12/08	Wed 5/28/08	338SS+14 days
340	Conduits and wiring works	50 days	Fri 3/28/08	Sat 5/24/08	339SS+14 days
341	Control panel installation/ Termination	10 days	Fri 5/2/08	Tue 5/13/08	340SS+14 days
342	Testing and Commissioning	5 days	Thu 5/29/08	Tue 6/3/08	341,333,328,308,3
343	Security Installation	100 days	Mon 2/25/08	Thu 6/19/08	
344	Conduits, piping works	73 days	Mon 2/25/08	Mon 5/19/08	
345	Wiring works	69 days	Wed 3/12/08	Fri 5/30/08	344SS+14 days
346	Installation of security equipment	30 days	Thu 5/1/08	Wed 6/4/08	345SS+14 days
347	Testing and Commissioning	5 days	Thu 6/5/08	Tue 6/10/08	308,346
348	cGMP Validation	7 days	Thu 6/12/08	Thu 6/19/08	347
349	Lift installation	89 days	Sat 3/1/08	Thu 6/12/08	
350	Erection of scaffolding	10 days	Sat 3/1/08	Wed 3/12/08	7,18,22
351	Guide rail, wiring, door jamb,motor	45 days	Thu 3/13/08	Sat 5/3/08	350
352	Lift car installation	21 days	Mon 5/5/08	Wed 5/28/08	351
353	Load test	6 days	Thu 5/29/08	Wed 6/4/08	352
354	Testing and Commissioning	7 days	Thu 6/5/08	Thu 6/12/08	353
355	Cold room Construction	119 days?	Wed 2/13/08	Mon 6/30/08	
356	Handover partial cold room @GL E~F/6~7	1 day?	Wed 2/20/08	Wed 2/20/08	
357	Handing over of entire cold room area	1 day	Tue 3/4/08	Tue 3/4/08	46
358	Primer application	2 days	Thu 3/6/08	Fri 3/7/08	357SS+2 days
359	Membrane application and curing	2 days	Sat 3/8/08	Mon 3/10/08	358
360	Water Leakage Test	2 days	Tue 3/11/08	Wed 3/12/08	359SS+2 days
361	Floor screeding	1 day	Thu 3/13/08	Thu 3/13/08	360SS+2 days
362	Panel installation	31 days	Wed 3/12/08	Wed 4/16/08	
363	Floor Heating Mats installation	3 days	Thu 4/17/08	Sat 4/19/08	362

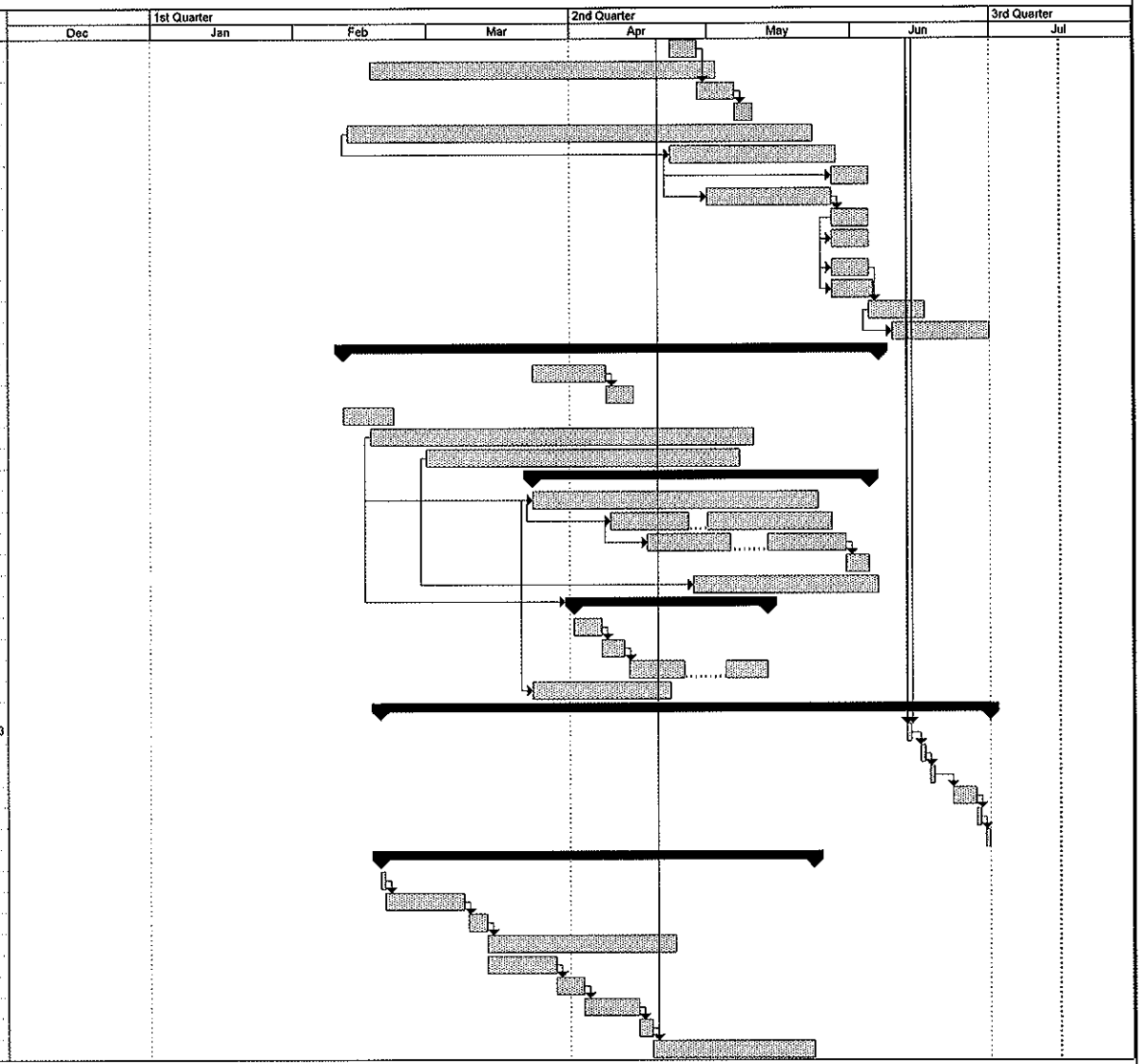


Project: Schedule of works rev1 (2003
Date: Wed 7/16/08

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

PROPOSED ERECTION OF A TWO STOREY MULTI-OCCUPIER WAREHOUSE BUILDING WITH ANCILLARY OFFICE ON LOT 4323L PT (A1706877) MK31 CHANGI NORTH WAY

ID	Task Name	Duration	Start	Finish	Predecessors
365	Casting of floor slab (FM3) and curing	5 days	Wed 4/23/08	Mon 4/28/08	364
366	Installation of brackets and piping	65 days	Mon 2/18/08	Fri 5/2/08	
367	Install steel plateform	7 days	Tue 4/29/08	Tue 5/6/08	365
368	Vermiculite spraying	4 days	Wed 5/7/08	Sat 5/10/08	367
369	Cold room wiring works/ sprinkle point	87 days	Wed 2/13/08	Fri 5/23/08	
370	Cold room blower	31 days	Wed 4/23/08	Wed 5/28/08	369SS+60 days
371	Cold room lighting	7 days	Wed 5/28/08	Wed 6/4/08	370SS+30 days
372	Condensing unit installation work	23 days	Thu 5/1/08	Tue 5/27/08	370SS+7 days
373	Condensing unit pressure test	7 days	Wed 5/28/08	Wed 6/4/08	372
374	Vacuum condensing unit and piping	7 days	Wed 5/28/08	Wed 6/4/08	373SS
375	Electrical control checking	7 days	Wed 5/28/08	Wed 6/4/08	374SS
376	Programming and checking	8 days	Wed 5/28/08	Thu 6/5/08	375SS
377	Testing and commissioning	10 days	Thu 6/5/08	Mon 6/16/08	375
378	Validating for cold room	18 days	Tue 6/10/08	Mon 6/30/08	377SS+4 days
379	External Works	100 days	Tue 2/12/08	Fri 6/6/08	
380	Bin Centre structural work	14 days	Mon 3/24/08	Tue 4/8/08	
381	Bin Centre Archi works	5 days	Wed 4/9/08	Mon 4/14/08	380
382	U/G Diesel tank	10 days	Tue 2/12/08	Fri 2/22/08	
383	Retaining wall	72 days	Mon 2/18/08	Sat 5/10/08	
384	Perimeter Drain	58 days	Sat 3/1/08	Wed 5/7/08	
385	Road work	63 days	Mon 3/24/08	Wed 6/4/08	
386	Road base	54 days	Mon 3/24/08	Sat 5/24/08	383SS
387	Slab reinforcement	38 days	Thu 4/10/08	Tue 5/27/08	386SS+15 days
388	Casting	30 days	Fri 4/18/08	Fri 5/30/08	387SS+7 days
389	Road marking	4 days	Sat 5/31/08	Wed 6/4/08	386
390	Landscaping work	35 days	Mon 4/28/08	Fri 6/6/08	384SS+14 days
391	Entrance box culvert	36 days	Wed 4/2/08	Tue 5/13/08	383SS+28 days
392	Demolish extg box drain	5 days	Wed 4/2/08	Mon 4/7/08	
393	Piling	5 days	Tue 4/8/08	Sat 4/12/08	392
394	Culvert RC work	19 days	Mon 4/14/08	Tue 5/13/08	393
395	Guard House	26 days	Mon 3/24/08	Tue 4/22/08	386SS
396	Handover and Authorities inspection	113 days	Wed 2/20/08	Mon 6/30/08	
397	Pre-RI inspection	1 day	Fri 6/13/08	Fri 6/13/08	309,335,315,342,3
398	R.I. inspection (Archi and M&E)	1 day	Mon 6/16/08	Mon 6/16/08	397
399	BCA inspection	1 day	Wed 6/18/08	Wed 6/18/08	398FS+1 day
400	Authorities Re-inspection	5 days	Mon 6/23/08	Fri 6/27/08	399FS+3 days
401	Obtain TOP	1 day	Sat 6/28/08	Sat 6/28/08	400
402	Handover	1 day	Mon 6/30/08	Mon 6/30/08	401
403	ID Fit out works	81 days	Wed 2/20/08	Fri 5/23/08	
404	ZP to initiate ID works incorporate with Main contract	1 day	Wed 2/20/08	Wed 2/20/08	
405	Consultant's commence design according ID layout	15 days	Thu 2/21/08	Sat 3/8/08	404
406	ZP to confirm consultant's design drawing	4 days	Mon 3/10/08	Thu 3/13/08	405
407	Amendment plan submission to authorities (URA,BCA	35 days	Fri 3/14/08	Wed 4/23/08	406
408	JH prepare and submit quotation to ZP/ASC	13 days	Fri 3/14/08	Fri 3/28/08	
409	Approval of quotation by ZP	5 days	Sat 3/29/08	Thu 4/3/08	408
410	Prepare and submit M&E shop drawing	10 days	Fri 4/4/08	Tue 4/15/08	409
411	Approval of M&E shop drawing	3 days	Wed 4/16/08	Fri 4/18/08	410
412	Commencen of ID fit out works	30 days	Sat 4/19/08	Fri 5/23/08	411



Project: Schedule of works rev1 (2003
Date: Wed 7/16/08

Task | Progress | Summary | External Tasks | Split
Split | Milestone | Project Summary | External MileTask

SECTION 4

PROGRAMME

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

Service	Authority	Original Submission		Comments/Resubmission						Approval/
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	Clearance
Application for Electricity Supply	SP Services Ltd	17/1/07	17/1/07							30/1/07
Power Supply Substation	SP PowerGrid Ltd	2/2/07	8/2/07		16/2/07	1/3/07	8/3/07	15/3/07	20/3/07	27/3/07
Metering Layout	SP Services Ltd	20/9/07	20/9/07							9/10/07
Sanitary Installation	PUB Water Reclamation (Network) Dept	18/5/07	24/5/07							29/5/07
Domestic Water Supply	PUB (Water Supply) Network Dept	2/3/07	5/3/07	3/4/07	18/4/07					14/5/07
Gas Supply Installation	City Gas Pte Ltd	NA	-							NA
Air Conditioning & Ventilation Inst.	FSSD	30/6/07	8/8/07							24/8/07
Fire Fighting & Alarm Installation	FSSD	15/7/07	5/12/07							17/12/07
Telephone Installation	TFCC	22/1/07	29/1/07							28/2/07
Broadband Co-axial Cable System (BCS)	Starhub Cable Vision	NA	-							NA
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:	
- IC	✓				

(✓*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 project drawings in soft copy to be saved in 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 - Shop Drawing (Electrical)	HCL
- Shop Drawing (Mechanical)	KBK

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

Item No.	Description*	Required From	Required By	Date Required	Remarks
1.	Electrical load of mechanical equipment	CKH	SKY	-	completed
2.	Location of SCP	CKH	SKY	-	completed

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

ITEM	KEPT BY
Design Brief	File 6029-Owner

8.2 List of Applicable Code of Practice and Regulations

Electrical Wiring	~~BS~~	SS	~~IEE~~	~~NFPA~~	
Lightning Protection System	~~BS~~	SS			
Emergency Voice Communication System	~~BS~~	SS	~~NFPA~~		
Air Conditioning & Ventilation Installation	~~BS~~	~~AS~~	~~NFPA~~	SS	~~MS~~
Lift ~~& Escalator~~ Installation	~~BS~~	SS			
Sprinkler System	~~BS~~	SS	NFPA	~~AS~~	~~LPC~~
Dry Riser System	~~BS~~	SS	~~NFPA~~	~~AS~~	~~MS~~
Automatic Fire Alarm System	~~BS~~	SS	~~NFPA~~	~~AS~~	~~MS~~
Sanitary System	~~BS~~	SS	~~NFPA~~	~~AS~~	~~MS~~
Plumbing System	~~BS~~	SS	~~NFPA~~	~~AS~~	~~MS~~
Town Gas/LPG Supply System	~~BS~~	~~SS~~	~~NFPA~~	~~AS~~	
Boiler and Steam Supply System	~~ASME~~	~~BS~~	~~AS~~		
Mechanical Smoke Control System	BS	~~NFPA~~	~~AS~~		

(Delete where necessary)

SECTION 8

DESIGN INPUT & METHODOLOGY

8.3 List of Design Guide or Handbook Used

Carrier's Handbook of Air Conditioning System Design

ASHRAE Handbooks

Institute of Plumbing's Plumbing Services Design Guide

8.4 List of Applicable Quality System Procedures

Alpha Consulting Engineers Pte Ltd's Quality Management System Procedures

Section	Title	✓ where applicable
M1	Preparation of Consultancy Offer	✓
M2	Project Commissioning and Service Agreement	✓
M3	Design Control	✓
M4	Design Change Control	✓
M5	Tender Process and Evaluation	✓
M6	Authority Submission	✓
M7	Construction Process Control	✓
M8	Testing and Commissioning	✓
S1	Document Control	✓
S2	Documentation of Quality & Environmental Management System Procedure	✓
S3	Documentation of Project Quality Plan	✓
S4	Specification Control	✓
S5	Library Control	✓
S6	Archive Control	✓
S7	Filing Control	✓
S8	Drawing Control	✓
S9	Administration Control	✓
S10	Purchasing Control	✓
S11	Training Control	✓
S12	Computer Control	✓
QE1	Quality & Environmental System Audit	✓
QE2	Feedback Reporting	✓
QE3	Clients Feedback	✓
QE4	Management Review	✓

8.5 List of Software Used For Design/Analysis

DESCRIPTION/ PACKAGE NAME	VERSION	SUPPLIER/ SOURCE	PURPOSE	
Calculux	2.30	Philips	Lighting design	
Cophos	3.31	Zumtobel	Lighting design	
Carrier E20-II	3.21	Carrier	Programme for determination of heat load, duct size and its losses, etc.	✓
Gensize 2	2.1	Onan	Generator sizing	
Lift Traffic	-	Alpha Consulting Engineers Pte Ltd	Lift traffic calculation	
Econdial	2.5	Merlin Gerlin	Design for low voltage network	
Hyena	4.00.1	ACADS-BSG	Fire Sprinkler & Hydrant Analysis	

(✓*where applicable*)

SECTION 9

ENVIRONMENTAL CONSIDERATIONS

9.1 Sustainable Design Features / Criteria

Item	Remarks
Green Mark criteria	NA
Green Design Features	NA

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 – NOT USED

Site staff shall comply with the site emergency preparedness and response procedure, established by the main contractor / owner, which shall include the following details.

Items	✓ where applicable
Evacuation Route	
Emergency Exit	
Assembly Point	
Emergency Contact List / Person	
Alarm system / methods	

SECTION 9

ENVIRONMENTAL CONSIDERATIONS

9.4 Reporting of Environmental Non-conformances – NOT USED

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 – NOT USED

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	NA
M&E Cost Estimate Report	NA
Pre-Qualification of Tenderers	A
Tender Documents	A
Tender Report	A
Payment Valuation for QS	NA
Certificates of Supervision for TOP/CSC	Re

* *Remarks*

A: for approval *C: for comment* *I: for Information* *Re: for record*

Other purposes and for action: please specify.

10.2 Specific Procedures Required By Client *(If applicable)*

NOT USED

SECTION 11

LIST OF SUB-JOB

11.1 List of Sub-Job Numbers

Sub Job No	Description	Allocation Details
6029-601	Changi North – Owner's changes	RT
6029-602	Design Fit-Out Work (2nd/2nd Mezz GMO & 2nd Mezz RDC Office)	RT