Alpha
Consulting Engineers Pte Ltd

# PROJECT QUALITY PLAN

## PROPOSED NATIONAL CANCER CENTRE AT JERUDONG PARK, NEGARA BRUNEI DARUSSALAM

For

## JERUDONG PARK MEDICAL CENTRE

| Copy No. | 1 |
|---|---|

Prepared By: Ang Wee Loong / Arivoli K

Authorised By: Loh Fook Yuen

Date: 4 December 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 | 6128-601 PQP | 4 December 2013 |
| | | |
| | | |
| | | |
| | | |

### 1.2 Revision Record

| Revision | Date of Issue | Section Reference | Page(s) | Remarks |
|---|---|---|---|---|
| 0 | 4 December 2013 | 1 to 11 | 29 | +9 pgs (Sect 4.1 – Overall Programme) |
| | | | | |
| | | | | |
| | | | | |
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**SECTION 2**

**PROJECT INFORMATION**

## 2.1 Project Description

| | |
|---|---|
| Type of Development | |

| Statistics of Development | |
|---|---|
| Site Area, m² | - |
| Nett Floor Area, m² | 112,905 |
| Gross Floor Area, m² | 70,885 |
| Covered Carpark, m² | 32,605 |
| No. of Covered Carpark Lots | 563 |
| No. of Apartments/Houses | - |
| No. of Beds (for Hospitals) | 330 |
| No. of Guestroom (for Hotels) | - |
| No. of Blocks / No. of Storeys | 1 Block / 14 storeys + Roof |
| Green Mark Category | |
| No. of Phases | 2 Phases |

## 2.2 Project Cost

| M&E Services Cost Plan (S$ x 1M) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Services | EI | ACVI | LEI | FFAI | PSI | SPFI | | | | |
| Estimate | 86.50 | | | | | - | | | | |
| Awarded | - | - | - | - | - | - | | | | |

| Total Project Construction Cost (S$ x1M) | | | |
|---|---|---|---|
| | Site Clearance | Piling Works | Main Contract |
| Estimate | - | - | 200 |
| Awarded | | | |

*Site Clearance shall include earth work, soil improvement, service diversion and termination.*

## 2.3 Scope of Works

### 2.3.1 Scope of Consultancy Services

| | |
|---|---|
| Conceptual/Schematic Design | ✓ |
| Detailed Design | ✓ |
| Tender Documentation | ✓ |
| Tender Evaluation | ✓ |
| Contract Supervision | - |
| M&E Costing | - |
| Submissions to Authority | - |

(✓*where applicable*)

### 2.3.2 Scope of M&E Services

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ELECTRICAL | ✓ | AIR CONDITIONING | ✓ | SPRINKLER | ✓ | SANITARY | ✓ | SWIMMING POOL | |
| LIFT | ✓ | MECHANICAL VENTILATION | ✓ | FIRE ALARM | ✓ | COLD WATER | ✓ | STEAM BOILER | |
| ESCALATOR | ✓ | MECHANICAL SMOKE EXTRACT | ✓ | HOSEREEL | ✓ | HOT WATER | ✓ | FUEL STORAGE | |
| PABX | | COMPUTER A/C | ✓ | WET RISER | ✓ | TOWN GAS | | | |
| SECURITY | ✓ | BST CARPARK EXH | | DRY RISER | | LPG GAS | | | |
| TELELIFT | | HEATING | | | | MEDICAL GAS | ✓ | | |
| DATA COMM. | | | | | | | | | |
| FLUSHFLOOR TRUNKING | ✓ | | | | | | | | |

(✓*where applicable*)

### 2.3.3 Submission to Relevant Authorities by Others

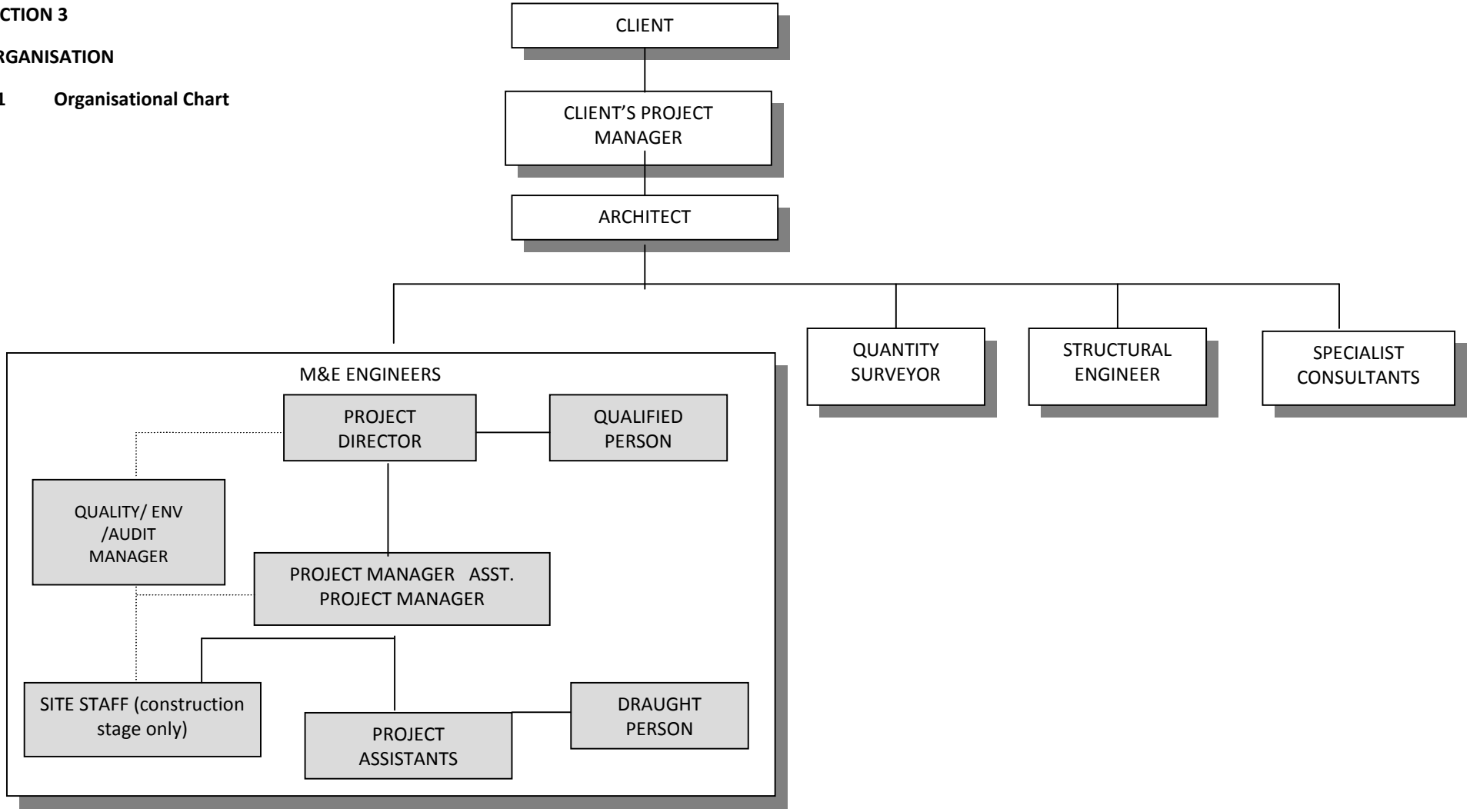
| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EJECTOR & DIVERTER | | SUMP PUMP | ✓ | FUEL OIL TANK | ✓ | LIFT & ESCALATOR | ✓ | PRESSURE VESSEL | ✓ | HOISTS | | FOAM | |

(✓*where applicable*)

**SECTION 3**

**ORGANISATION**

**3.1 Organisational Chart**



**SECTION 3**

**ORGANISATION**

### 3.2 ACEPL's Project Team Member

| TITLE | | NAME |
|---|---|---|
| Project Director | | Loh Fook Yuen (LFY) |
| Qualified Person | Mechanical | Ong Ngee Yong (ONY) |
| | Electrical | Loh Fook Yuen (LFY) |
| Project Manager | | Ang Wee Loong (AWL) |
| Assistant Project Manager | | - |
| Project Assistant (Mech) | | Arivoli K (KA)<br>Chua Andrew (CA) |
| Project Assistant (Elect) | | Chan Sheh Wei (CSW) |
| Draughtsperson | | Common Pool |
| Resident Engineer (M&E) | | - |
| Assistant Resident Engineer (M&E) | | - |
| Clerk-of-Work (M&E) | | - |
| | | |
| | | |

### 3.3 Client/Client's Representatives

Client:- Jerudong Park Medical Centre

Address:- Jerudong Park BG 3122
Brunei Darussalam

Tel:- (673) 2611433

Fax:- (673) 2612 461

Client's Representatives:-

| Name of Company | Contact Person | Contact |
|---|---|---|
| Jerudong Park Medical Centre | Name: Dr Isham Jaafar<br>Position: Executive Director / Medical Director | Tel: (673) 2611 433 Ext 2380<br>Fax: (673) 2612 461<br>Handphone: -<br>Email: md@jpmc.com.bn |
| Jerudong Park Medical Centre | Name: Mr Michael Phua<br>Position: Hospital Engineering Manager | Tel: (673) 2611 433 Ext 2142<br>Fax: (673) 2612 461<br>Handphone: -<br>Email: michael.phua@jpmc.com.bn |
| Bandtree Sdn Bhd | Name: Abdul Latiff Bin Hj Md Yusuf<br>Position: Director | Tel: (673) 2383 535<br>Fax: (673) 2383 518<br>Handphone: -<br>Email: lattif.yusuf@gmail.com |
| TBCC Sdn Bhd | Name: Dr Kenneth Kok<br>Position: Medical Director | Tel: (673) 2611433 Ext 2295<br>Fax: (673) 2612 461<br>Handphone: -<br>Email: dr.kok@jpmc.com.bn |
| Ministry of Health | Name: Dr Ong Sik Kim<br>Position: Palliative Care Consultant | Tel: (673) 2242 424<br>Fax: (673) 2381 946<br>Handphone: -<br>Email: sikim2000@gmail.com |
| Ministry of Health | Name: Ms Emily Voon<br>Position: Medical Physicist | Tel: (673) 2384 216<br>Fax: (673) 2381 946<br>Handphone:<br>Email: emily.voon@gmail.com |

### 3.4 **Other Consultants** (Local)

| Function / Name of Company | Contact Person | Contact |
|---|---|---|
| Architect<br>CIAP | Name: Mr Tham Tuck Cheong<br>Position: Managing Partner | Tel: 6336 3900<br>Fax: 6339 6258<br>Handphone: -<br>Email: kctham@ciap.sg |
| Architect<br>CIAP | Name: Ms Sim Choon Gek<br>Position: Director | Tel: 6336 3900<br>Fax: 6339 6258<br>Handphone: 9863 2027<br>Email: 1007jpmc_oc@ciap.sg |
| Structural Engineer | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Interior Designer | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Lighting Consultant | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Acoustic Consultant<br>CCW Associates Pte Ltd | Name: Mr Cheah Beng Kin<br>Position: Director | Tel: 6278 4918<br>Fax: 6275 7206<br>Handphone: 9818 2289<br>Email: bengkin@ccw.com.sg |
| Greenmark Consultant<br>ZEB Technology Pte Ltd | Name: Mr Kasirajan Kanagaraj<br>Position: Manager (Business & Operation) | Tel: 6743 8187<br>Fax: 6743 8760<br>Handphone: 9176 1890<br>Email: kasirajan@zeb-tech.com |
| Facade Consultant<br>Arup Singapore Pte Ltd | Name: Low Sin Ching<br>Position: Project Manager | Tel: 6411 2500<br>Fax: 6411 2501<br>Handphone: -<br>Email: low.sinching@arup.com |

### 3.4 **Other Consultants** (Overseas)

| Function / Name of Company | Contact Person | Contact |
|---|---|---|
| Architect<br>Arkitek Ting | Name: Ting Tiu Pheng<br>Position: Principal Architect | Tel: (673) 2451 318<br>Fax: (673) 2451 328<br>Handphone: -<br>Email: tingtp@yahoo.com.sg |
| M&E Consultant<br>Sepakat Setia Perunding (B) Sdn Bhd | Name: Low Lock San<br>Position: Director | Tel: (673) 2234 950/1/2<br>Fax: (673) 2234 949<br>Handphone: -<br>Email: ssplslow@yahoo.com |
| Quantity Surveyor<br>LAH Consultants | Name: Low Ah Hai<br>Position: Principal Quantity Surveyor | Tel: (673) 2428 131<br>Fax: (673)2448 597<br>Handphone: -<br>Email: lowahhai@gmail.com |
| Structural Engineer<br>Sepakat Setia Perunding (B) Sdn Bhd | Name: Ng Jin Hua<br>Position: C&S Engineer | Tel: (673) 2234 950/1/2<br>Fax: (673) 2234 949<br>Handphone: -<br>Email: sspnjh@gmail.com |
| Interior Designer<br>Wama Designs | Name: Wan Zainal Abidin<br>Position: Design Director | Tel: (673) 2231 031<br>Fax: (673) 2231 031<br>Handphone: -<br>Email: wan@wamadesigns.com |
| Lighting Consultant | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Acoustic Consultant | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Landscape Consultant<br>AT Landscape | Name: Richard Koh Chee Hong<br>Position: Project Manager | Tel: (673) 2676 600<br>Fax: (673) 2676 633<br>Handphone: --<br>Email: at.landscape@yahoo.com |
| Medical Equipment Planner<br>The Innova Group | Name: Peter Trice<br>Position: Project Director | Tel: (520) 8868 650<br>Fax: (520) 8868 706<br>Handphone: -<br>Email: peter.trice@theinnovagroup.com |

### 3.5 Contractors/Sub-Contractors - NOT USED

| Function / Name of Company | Contract * | Contact Person | Contact |
|---|---|---|---|
| Main Contractor | | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Air Conditioning & Ventilation Installation Sub-Contractor | | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Plumbing & Sanitary Installation Sub-Contractor | | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Electrical Installation Sub-Contractor | | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Lift & Escalator Installation Sub-Contractor | | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Fire Fighting & Alarm Installation Sub-Contractor | | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Swimming Pool Filtration Plant Installation Sub-Contractor | | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Carpark System Installation Sub-Contractor | | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| _____ | | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |

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

### 3.6 Authorities - NOT USED

| Authorities/Department | Contact Person | Tel/Fax Nos./E-mail |
|---|---|---|
| SP PowerGrid: | | |
| (a) Sub-Station | | |
| (b) Diversion | | |
| SP Services: | | |
| (a) Customer Supply | | |
| (b) Installation | | |
| (c) Meter Section | | |
| (d) Road Lighting | | |
| TFCC: | | |
| (a) SCV | | |
| (b) SingTel | | |
| (c) IDA | | |
| BCA: | | |
| (a) Building Plan | | |
| (b) Green Mark | | |
| FSSD: | | |
| (a) Building Plan | | |
| (b) M&E Plan | | |
| PUB (Water Supply) Network Dept: | | |
| (a) Water Conservation | | |
| (b) Plumbing Plan | | |
| (c) Diversion | | |
| (d) NEWater | | |
| PUB Water Reclamation (Network) Dept: | | |
| (a) Building Plan/CBPU | | |
| (b) M&E Plan | | |
| (c) Diversion | | |
| City Gas Pte Ltd: | | |
| (a) Planning/Submission | | |
| (b) Installation/Inspection | | |
| PowerGas Pte Ltd | | |
| (a) Diversion | | |
| NEA (Pollution Control) | | |
| (a) Planning/Submission | | |
| (b) Inspection | | |

**SECTION 4**

**PROGRAMME**

## 4.1 Overall Programme * Please refer to attached

| | | | 2010 | 2011 | | | | | | | | | | | | 2012 | | | | 2015 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ID | TASK NAME | MONTHS | Jun - Dec | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | Apr 12 – Mar 15 | A | M | J | July 15 – Jun 16 |
| 1. | Preliminary Planning | | | | | | | | | | | | | | | | | | | | | | |
| 2. | Planning Submission | | | | | | | | | | | | | | | | | | | | | | |
| 3. | Detail Design | | | | | | | | | | | | | | | | | | | | | | |
| 4. | BP Submission | | | | | | | | | | | | | | | | | | | | | | |
| 5. | BP Submission (Amendments) - TBA | | | | | | | | | | | | | | | | | | | | | | |
| 6. | Tender Period for Main Builder | | | | | | | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | | | | | | | |

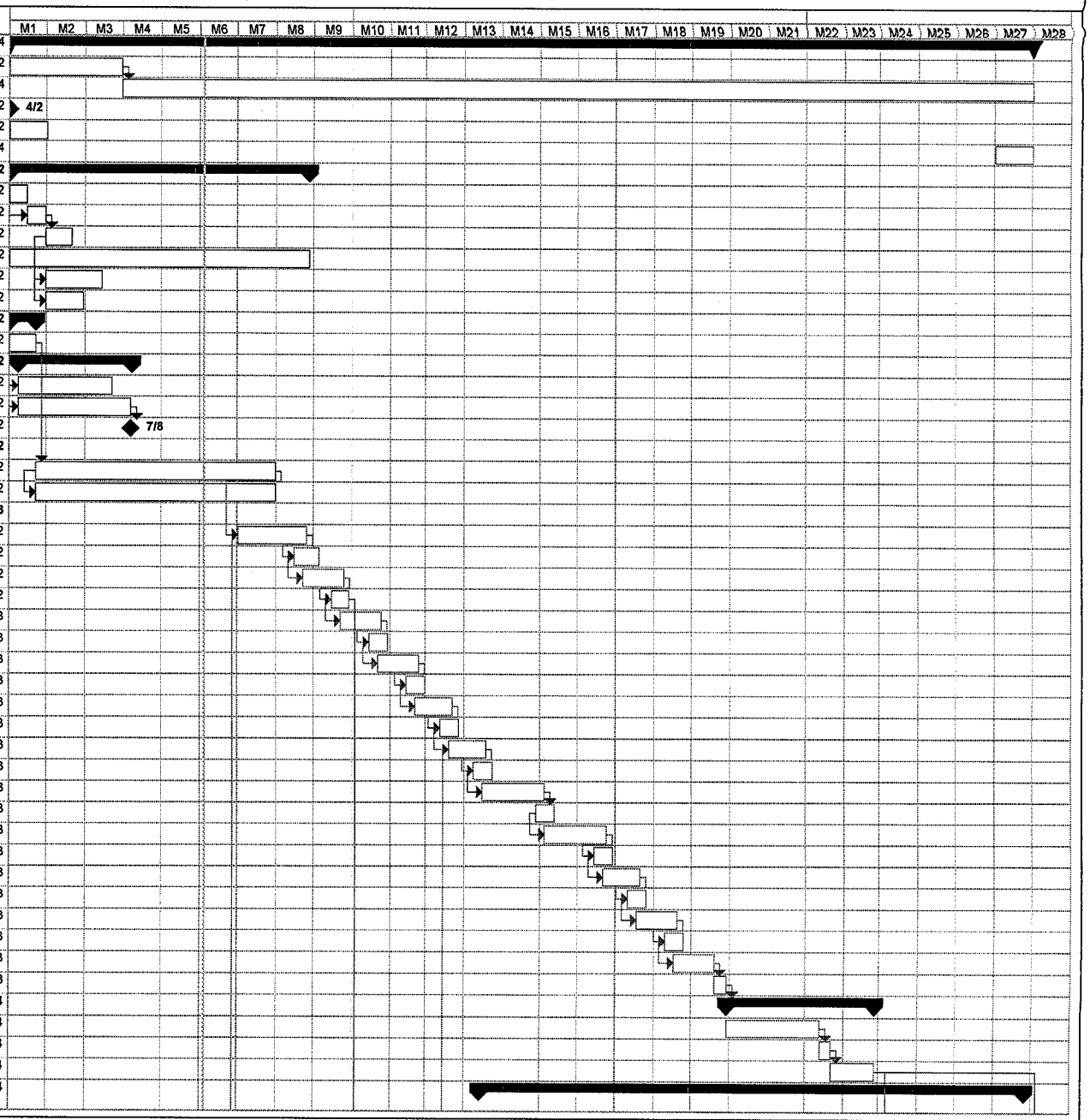
# 5. MASTER WORK PROGRAMME

## 5.1 Main Contractor - Builder Works Programme

Proposed National Cancer Centre
At Jerudong Park, Brunei Darussalam

TSL Construction Sdn Bhd - Master Works Programme -Rev.2
Date: 25th August 2012

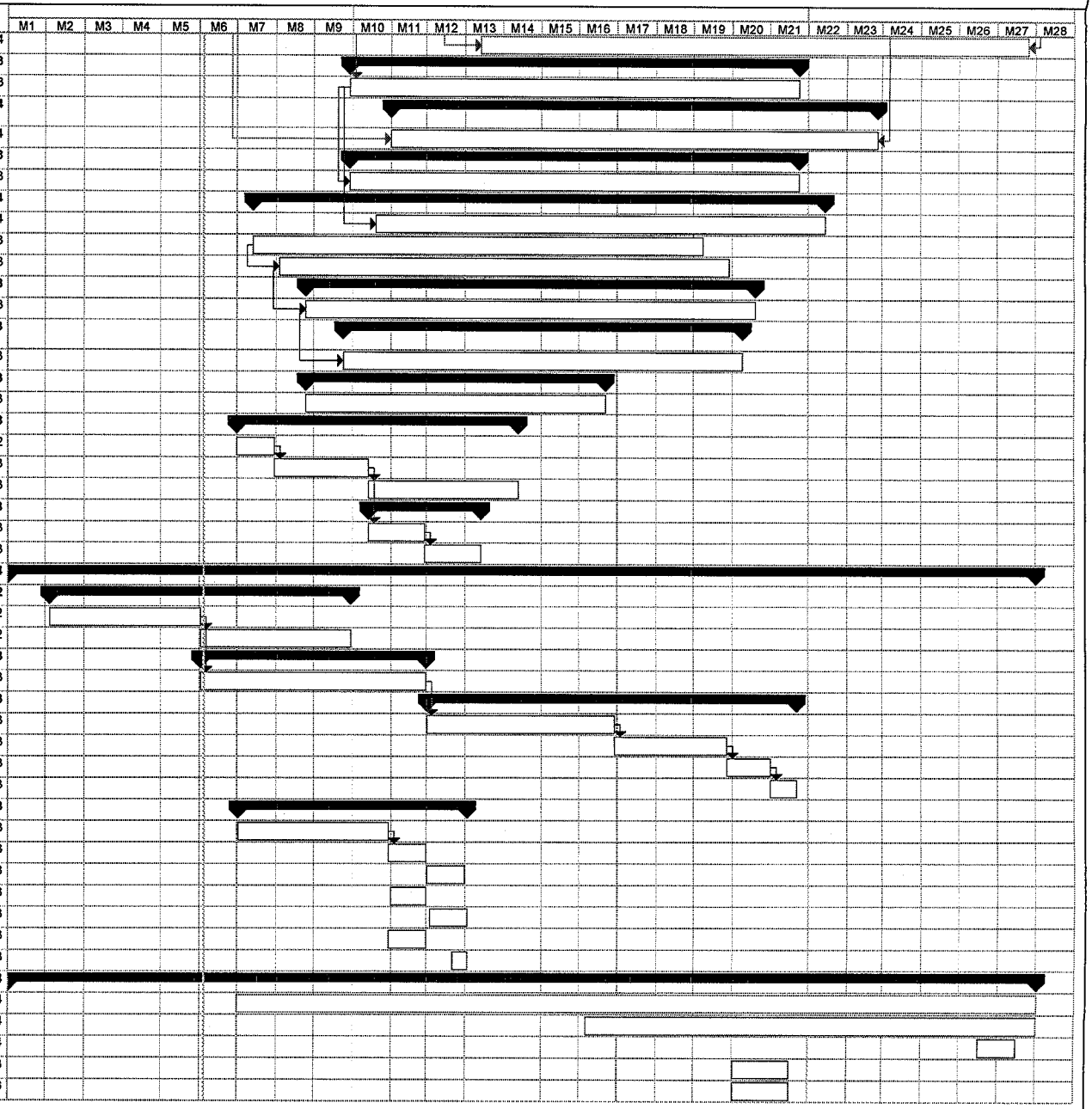
| ID | Task Name | Days | Start | Finish |
|---|---|---|---|---|
| 1 | **27 Months Contract** | 821 d | Mon 4/2/12 | Tue 7/1/14 |
| 2 | Initial Prelim Items | 90 d | Mon 4/2/12 | Sat 6/30/12 |
| 3 | Continual Prelim Items | 731 d | Sun 7/1/12 | Tue 7/1/14 |
| 4 | Site Possession | 1 d | Mon 4/2/12 | Mon 4/2/12 |
| 5 | Site Survey and Setting Out | 30 d | Mon 4/2/12 | Tue 5/1/12 |
| 6 | Demobilisation and Clearing | 30 d | Mon 6/2/14 | Tue 7/1/14 |
| 7 | **Mobilisation** | 240 d | Mon 4/2/12 | Tue 11/27/12 |
| 8 | Elect/Water and Telecommunication | 14 d | Mon 4/2/12 | Sun 4/15/12 |
| 9 | Consultant Site Offices | 15 d | Mon 4/16/12 | Mon 4/30/12 |
| 10 | Contractor Site Offices | 21 d | Tue 5/1/12 | Mon 5/21/12 |
| 11 | Machinery and Tower Cranes | 240 d | Mon 4/2/12 | Tue 11/27/12 |
| 12 | Fabrication Yard/Sheds | 45 d | Tue 5/1/12 | Thu 6/14/12 |
| 13 | Site Accomodation (Essential Personnel) | 30 d | Tue 5/1/12 | Wed 5/30/12 |
| 14 | **Earthworks** | 21 d | Mon 4/2/12 | Sun 4/22/12 |
| 15 | Site Clearing and demolishing works | 21 d | Mon 4/2/12 | Sun 4/22/12 |
| 16 | **Existing Waste Water Dischages** | 91 d | Mon 4/9/12 | Sun 7/8/12 |
| 17 | Sewerline MH12-MH20 | 75 d | Mon 4/9/12 | Fri 6/22/12 |
| 18 | Pumping Station and Temporary Pumps | 90 d | Mon 4/9/12 | Sat 7/7/12 |
| 19 | Disconnect Existing Sewer Main | 1 d | Sun 7/8/12 | Sun 7/8/12 |
| 20 | **Piling** | 192 d | Mon 4/23/12 | Wed 10/31/12 |
| 21 | Bored piles and PileCaps | 192 d | Mon 4/23/12 | Wed 10/31/12 |
| 22 | Work Below Lowest Floor Finish | 192 d | Mon 4/23/12 | Wed 10/31/12 |
| 23 | **Level 1 to Lower Roof** | 393 d | Tue 10/2/12 | Tue 10/29/13 |
| 24 | Level 1 - Ground Beams and Slabs | 55 d | Tue 10/2/12 | Sun 11/25/12 |
| 25 | Level 1 to 2 -Columns and Stairs | 20 d | Fri 11/16/12 | Wed 12/5/12 |
| 26 | Level 2- Beam and Slabs | 33 d | Fri 11/23/12 | Tue 12/25/12 |
| 27 | Level 2 to Level 3- Columns /Stairs | 14 d | Sun 12/16/12 | Sat 12/29/12 |
| 28 | Level 3 Beams and Slabs | 33 d | Sun 12/23/12 | Thu 1/24/13 |
| 29 | Level 3 to Level 4 Columns/Stairs | 15 d | Tue 1/15/13 | Tue 1/29/13 |
| 30 | Level 4 Beams/Slabs | 33 d | Tue 1/22/13 | Sat 2/23/13 |
| 31 | Level 4 to Level 5 Columns/Stairs | 15 d | Thu 2/14/13 | Thu 2/28/13 |
| 32 | Level 5 Beam/Slabs | 30 d | Thu 2/21/13 | Fri 3/22/13 |
| 33 | Level 5 to Level 6 Columns/Stairs | 15 d | Wed 3/13/13 | Wed 3/27/13 |
| 34 | Level 6 Beam/Slabs (Oral Center) | 30 d | Wed 3/20/13 | Thu 4/18/13 |
| 35 | Level 6 to Level 7 Columns/Stairs | 15 d | Tue 4/9/13 | Tue 4/23/13 |
| 36 | Level 7 Beams/Slabs (MPH,Roof Garden) | 50 d | Tue 4/16/13 | Tue 6/4/13 |
| 37 | Level 7 to 8 Columns | 15 d | Wed 5/29/13 | Wed 6/12/13 |
| 38 | Level 8 Beams/Slabs | 50 d | Wed 6/5/13 | Wed 7/24/13 |
| 39 | Level 8 to Level 9 Columns/Stairs | 15 d | Mon 7/15/13 | Mon 7/29/13 |
| 40 | Level 9 Beams/Slabs | 30 d | Mon 7/22/13 | Tue 8/20/13 |
| 41 | Level 9 to Level 10 Columns/Stairs | 15 d | Sun 8/11/13 | Sun 8/25/13 |
| 42 | Level 10 Beams/Slabs | 33 d | Sun 8/18/13 | Thu 9/19/13 |
| 43 | Level 10 to Level 11 Columns/stairs | 15 d | Tue 9/10/13 | Tue 9/24/13 |
| 44 | Level 11 | 33 d | Tue 9/17/13 | Sat 10/19/13 |
| 45 | Level 11 to Lower Roof | 10 d | Sun 10/20/13 | Tue 10/29/13 |
| 46 | **Roof** | 119 d | Wed 10/30/13 | Tue 2/25/14 |
| 47 | Lower Roof | 75 d | Wed 10/30/13 | Sun 1/12/14 |
| 48 | Lower Roof to Upper Room Columns | 9 d | Mon 1/13/14 | Tue 1/21/14 |
| 49 | Upper Roof | 35 d | Wed 1/22/14 | Tue 2/25/14 |
| 50 | **Curtain Walling, Glass Parpet, Glazing, Roller Shutters** | 438 d | Sun 4/14/13 | Wed 6/25/14 |



Proposed National Cancer Centre
At Jerudong Park, Brunei Darussalam

TSL Construction Sdn Bhd - Master Works Programme -Rev.2
Date: 25th August 2012

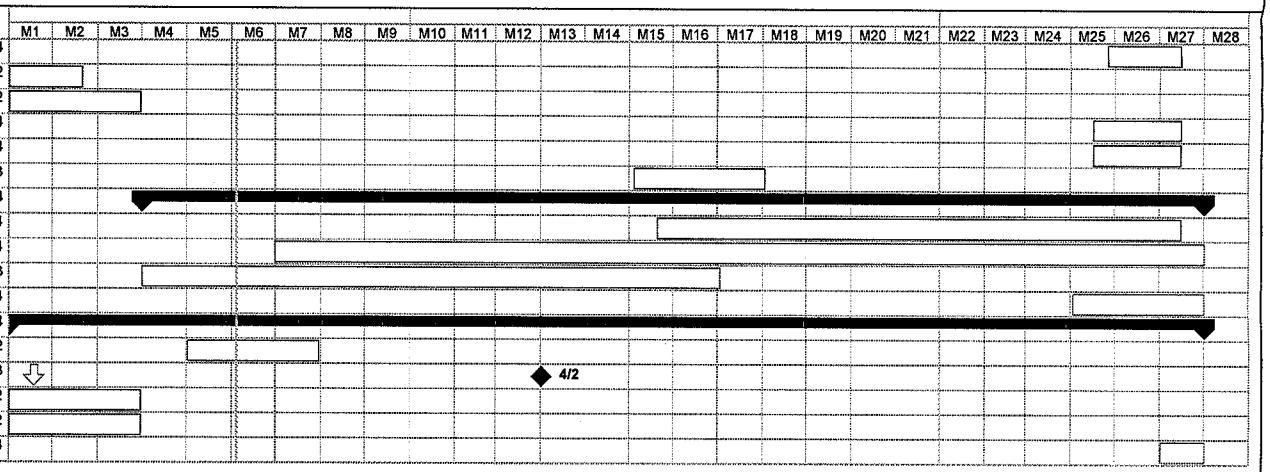
| ID | Task Name | Days | Start | Finish |
|---|---|---|---|---|
| 51 | Curtain Walling, Glass Parpet, Glazing | 438 d | Sun 4/14/13 | Wed 6/25/14 |
| 52 | **External & Internal Walls and Partitions** | **360 d** | **Sun 12/30/12** | **Tue 12/24/13** |
| 53 | Walls | 360 d | Sun 12/30/12 | Tue 12/24/13 |
| 54 | **Dispose Installation, WC/Discharge Pipes/Decay Tank & Water Installation** | **390 d** | **Fri 2/1/13** | **Tue 2/25/14** |
| 55 | M/E Conduits, Openings and intial fixtures | 390 d | Fri 2/1/13 | Tue 2/25/14 |
| 56 | **Doors and Windows Frames** | **360 d** | **Sun 12/30/12** | **Tue 12/24/13** |
| 57 | Doors and Windows Frames | 360 d | Sun 12/30/12 | Tue 12/24/13 |
| 58 | **Internal Finishes** | **458 d** | **Sun 10/14/12** | **Tue 1/14/14** |
| 59 | Plastering and Wall Finish | 360 d | Sun 1/20/13 | Tue 1/14/14 |
| 60 | Ceiling | 360 d | Sun 10/14/12 | Tue 10/8/13 |
| 61 | Floor Tiles and Finishes | 360 d | Sun 11/4/12 | Tue 10/29/13 |
| 62 | **Joinery** | **360 d** | **Sun 11/25/12** | **Tue 11/19/13** |
| 63 | Door and Window (Panels) | 360 d | Sun 11/25/12 | Tue 11/19/13 |
| 64 | **Dispose Installation, WC/Discharge Pipes/Decay Tank & Water Installation** | **320 d** | **Tue 12/25/12** | **Sat 11/9/13** |
| 65 | M/E final Installation and Testing | 320 d | Tue 12/25/12 | Sat 11/9/13 |
| 66 | **Fittings and Fixtures** | **240 d** | **Sun 11/25/12** | **Mon 7/22/13** |
| 67 | Fittings and Fixtures | 240 d | Sun 11/25/12 | Mon 7/22/13 |
| 68 | **Chiller Plant** | **225 d** | **Mon 10/1/12** | **Mon 5/13/13** |
| 69 | Foundation | 30 d | Mon 10/1/12 | Tue 10/30/12 |
| 70 | Structure/Roof | 75 d | Wed 10/31/12 | Sun 1/13/13 |
| 71 | M/E Installation | 120 d | Mon 1/14/13 | Mon 5/13/13 |
| 72 | **Rubbish Collection Centre** | **90 d** | **Mon 1/14/13** | **Sat 4/13/13** |
| 73 | Foundation/Structure | 45 d | Mon 1/14/13 | Wed 2/27/13 |
| 74 | Roof | 45 d | Thu 2/28/13 | Sat 4/13/13 |
| 75 | **External Works** | **821 d** | **Mon 4/2/12** | **Tue 7/1/14** |
| 76 | **Foul Drainage** | **240 d** | **Sat 5/5/12** | **Sun 12/30/12** |
| 77 | V clay pipes and Manholes | 120 d | Sat 5/5/12 | Sat 9/1/12 |
| 78 | Sewerage Treatment Plant | 120 d | Sun 9/2/12 | Sun 12/30/12 |
| 79 | **External Water Supply** | **180 d** | **Sun 9/2/12** | **Thu 2/28/13** |
| 80 | Piping, Valves and Chamber | 180 d | Sun 9/2/12 | Thu 2/28/13 |
| 81 | **Road and Carparks** | **296 d** | **Sat 3/2/13** | **Sun 12/22/13** |
| 82 | Subbase/Roadbase | 150 d | Sat 3/2/13 | Mon 7/29/13 |
| 83 | Road Kerbs/Walls | 90 d | Tue 7/30/13 | Sun 10/27/13 |
| 84 | Premix Surface | 35 d | Mon 10/28/13 | Sun 12/1/13 |
| 85 | Road Paint/Signs | 21 d | Mon 12/2/13 | Sun 12/22/13 |
| 86 | **Linkway to Existing Building** | **183 d** | **Tue 10/2/12** | **Tue 4/2/13** |
| 87 | Foundation/Structure | 120 d | Tue 10/2/12 | Tue 1/29/13 |
| 88 | Roof | 30 d | Wed 1/30/13 | Thu 2/28/13 |
| 89 | Doors | 30 d | Sat 3/2/13 | Sun 3/31/13 |
| 90 | Structural Steelworks/Metalworks/Glazing | 28 d | Fri 2/1/13 | Thu 2/28/13 |
| 91 | Finishes | 30 d | Mon 3/4/13 | Tue 4/2/13 |
| 92 | Plumbing | 30 d | Wed 1/30/13 | Thu 2/28/13 |
| 93 | Painting | 12 d | Fri 3/22/13 | Tue 4/2/13 |
| 94 | **Prime Cost and Provisional Sums Items** | **821 d** | **Mon 4/2/12** | **Tue 7/1/14** |
| 95 | M&E Installation by HSE Engineering Sdn Bhd | 639 d | Mon 10/1/12 | Tue 7/1/14 |
| 96 | Lift and Escalator Installation | 360 d | Sun 7/7/13 | Tue 7/1/14 |
| 97 | Door | 30 d | Sat 5/17/14 | Sun 6/15/14 |
| 98 | Finishes to Canteen | 45 d | Sat 11/2/13 | Mon 12/16/13 |
| 99 | Built-in-fittings | 45 d | Sat 11/2/13 | Mon 12/16/13 |



Proposed National Cancer Centre
At Jerudong Park, Brunei Darussalam

TSL Construction Sdn Bhd - Master Works Programme -Rev.2
Date: 25th August 2012

| ID | Task Name | Days | Start | Finish |
|---|---|---|---|---|
| 100 | ID Loose Furniture | 50 d | Sun 4/27/14 | Sun 6/15/14 |
| 101 | Builder Work In Connection | 50 d | Mon 4/2/12 | Mon 5/21/12 |
| 102 | Rectification Work to Foundation | 90 d | Mon 4/2/12 | Sat 6/30/12 |
| 103 | Signage/Graphic | 60 d | Thu 4/17/14 | Sun 6/15/14 |
| 104 | Diversion of Existing Building | 60 d | Thu 4/17/14 | Sun 6/15/14 |
| 105 | New Extension at Existing Building | 90 d | Wed 6/5/13 | Mon 9/2/13 |
| 106 | **Other Works** | **730 d** | **Mon 7/2/12** | **Tue 7/1/14** |
| 107 | Landscaping | 360 d | Fri 6/21/13 | Sun 6/15/14 |
| 108 | Medical Gas | 639 d | Mon 10/1/12 | Tue 7/1/14 |
| 109 | Sewage Treatment Plant | 397 d | Mon 7/2/12 | Fri 8/2/13 |
| 110 | Building Envelope Maintenance | 90 d | Thu 4/3/14 | Tue 7/1/14 |
| 111 | **Additional Works** | **821 d** | **Mon 4/2/12** | **Tue 7/1/14** |
| 112 | Vibration Monitoring Service | 90 d | Thu 8/2/12 | Tue 10/30/12 |
| 113 | Early Car Park Handover | 1 d | Tue 4/2/13 | Tue 4/2/13 |
| 114 | Acoustic Wall | 90 d | Mon 4/2/12 | Sat 6/30/12 |
| 115 | Ultra Water Filtration Plant | 90 d | Mon 4/2/12 | Sat 6/30/12 |
| 116 | **Inspection and Handover** | 30 d | Mon 6/2/14 | Tue 7/1/14 |



# 5. MASTER WORK PROGRAMME

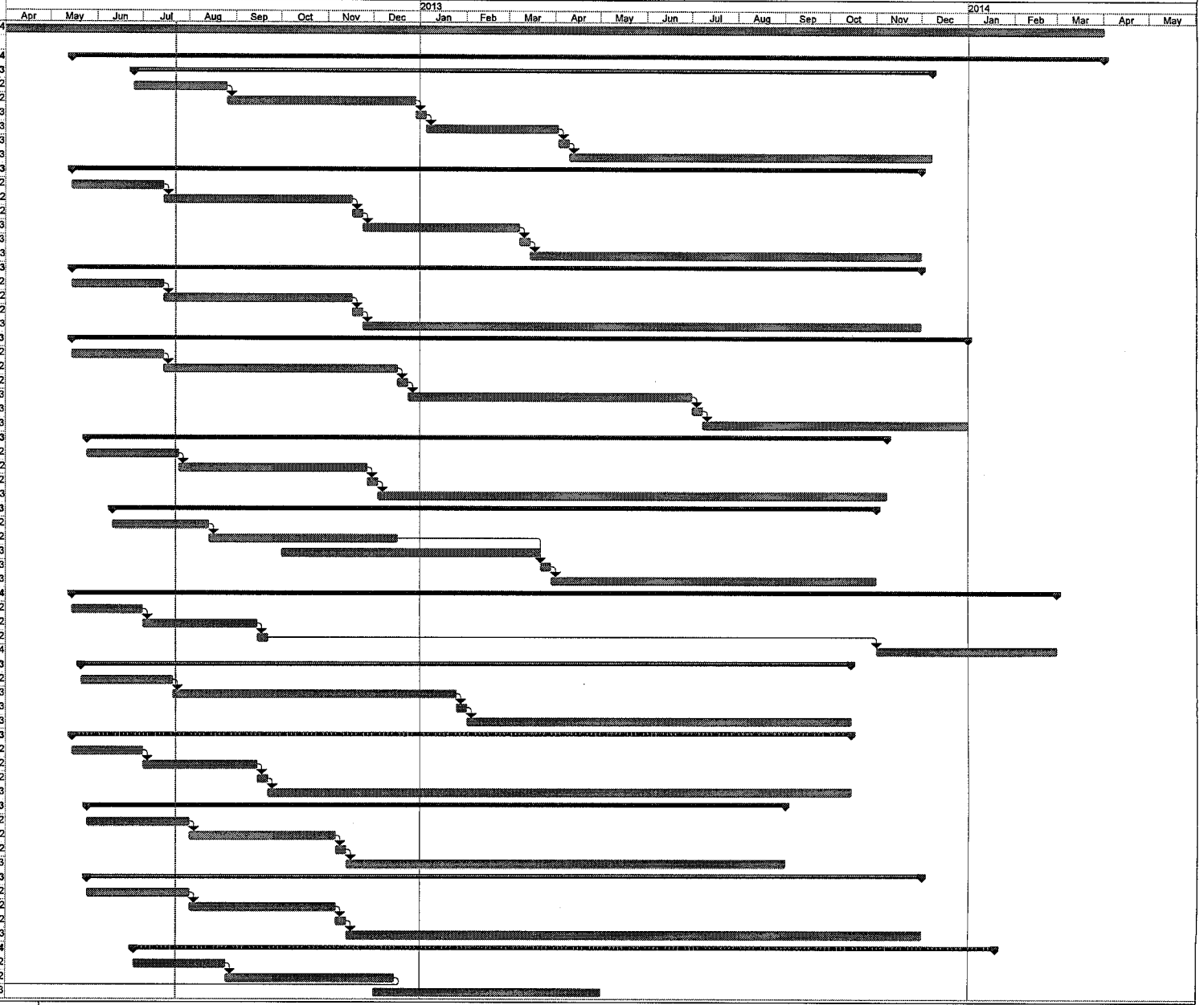
## 5.2 NSC - Electrical/Mechanical Works Programme

**PROJECT: PROPOSED NATIONAL CANCER CENTRE AT JERUDONG, BRUNEI DARUSSALAM**

**PROPOSED M & E MASTER WORK PROGRAMME**

Revision No. 02
Date: 10-May-2012

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | Preliminaries | 730 days | 01-04-12 | 31-03-14 |
| 2 | | | | |
| 3 | **Electrical Installation** | **686 days** | **15-05-12** | **31-03-14** |
| 4 | **MSB, SSB & DB** | **531 days** | **25-06-12** | **07-12-13** |
| 5 | Submission & Approval | 62 days | 25-06-12 | 25-08-12 |
| 6 | Order & Procurement | 125 days | 26-08-12 | 28-12-12 |
| 7 | ETA #1 | 7 days | 29-12-12 | 04-01-13 |
| 8 | Installation | 88 days | 05-01-13 | 02-04-13 |
| 9 | ETA #2 | 7 days | 03-04-13 | 09-04-13 |
| 10 | Installation | 242 days | 10-04-13 | 07-12-13 |
| 11 | **Submain Cables** | **565 days** | **15-05-12** | **30-11-13** |
| 12 | Submission & Approval | 61 days | 15-05-12 | 14-07-12 |
| 13 | Order & Procurement | 125 days | 15-07-12 | 16-11-12 |
| 14 | ETA #1 | 7 days | 17-11-12 | 23-11-12 |
| 15 | Installation | 104 days | 24-11-12 | 07-03-13 |
| 16 | ETA #2 | 7 days | 08-03-13 | 14-03-13 |
| 17 | Installation | 261 days | 15-03-13 | 30-11-13 |
| 18 | **Power & Lighting Points** | **565 days** | **15-05-12** | **30-11-13** |
| 19 | Submission & Approval | 61 days | 15-05-12 | 14-07-12 |
| 20 | Order & Procurement | 125 days | 15-07-12 | 16-11-12 |
| 21 | ETA | 7 days | 17-11-12 | 23-11-12 |
| 22 | Installation | 372 days | 24-11-12 | 30-11-13 |
| 23 | **Light Fittings** | **596 days** | **15-05-12** | **31-12-13** |
| 24 | Submission & Approval | 61 days | 15-05-12 | 14-07-12 |
| 25 | Order & Procurement | 155 days | 15-07-12 | 16-12-12 |
| 26 | ETA #1 | 7 days | 17-12-12 | 23-12-12 |
| 27 | Installation | 189 days | 24-12-12 | 30-06-13 |
| 28 | ETA #2 | 7 days | 01-07-13 | 07-07-13 |
| 29 | Installation | 177 days | 08-07-13 | 31-12-13 |
| 30 | **Busbar Trunking** | **532 days** | **25-05-12** | **07-11-13** |
| 31 | Submission & Approval | 61 days | 25-05-12 | 24-07-12 |
| 32 | Order & Procurement | 125 days | 25-07-12 | 26-11-12 |
| 33 | ETA | 7 days | 27-11-12 | 03-12-12 |
| 34 | Installation | 339 days | 04-12-12 | 07-11-13 |
| 35 | **Telephone System** | **508 days** | **11-06-12** | **31-10-13** |
| 36 | Submission & Approval | 64 days | 11-06-12 | 13-08-12 |
| 37 | Order & Procurement | 125 days | 14-08-12 | 16-12-12 |
| 38 | Installation - Wiring/Conduit | 172 days | 01-10-12 | 21-03-13 |
| 39 | ETA Brunei | 7 days | 22-03-13 | 28-03-13 |
| 40 | Installation - Equipment | 217 days | 29-03-13 | 31-10-13 |
| 41 | **Earthing Installation** | **655 days** | **15-05-12** | **28-02-14** |
| 42 | Submission & Approval | 47 days | 15-05-12 | 30-06-12 |
| 43 | Order & Procurement | 76 days | 01-07-12 | 14-09-12 |
| 44 | ETA | 7 days | 15-09-12 | 21-09-12 |
| 45 | Installation | 120 days | 01-11-13 | 28-02-14 |
| 46 | **Standby Generator set** | **512 days** | **21-05-12** | **14-10-13** |
| 47 | Submission & Approval | 61 days | 21-05-12 | 20-07-12 |
| 48 | Order & Procurement | 188 days | 21-07-12 | 24-01-13 |
| 49 | ETA | 7 days | 25-01-13 | 31-01-13 |
| 50 | Installation | 256 days | 01-02-13 | 14-10-13 |
| 51 | **Lightning Protection** | **518 days** | **15-05-12** | **14-10-13** |
| 52 | Submission & Approval | 47 days | 15-05-12 | 30-06-12 |
| 53 | Order & Procurement | 76 days | 01-07-12 | 14-09-12 |
| 54 | ETA | 7 days | 15-09-12 | 21-09-12 |
| 55 | Installation | 388 days | 22-09-12 | 14-10-13 |
| 56 | **Voice Communication System** | **464 days** | **25-05-12** | **31-08-13** |
| 57 | Submission & Approval | 68 days | 25-05-12 | 31-07-12 |
| 58 | Order & Procurement | 97 days | 01-08-12 | 05-11-12 |
| 59 | ETA | 7 days | 06-11-12 | 12-11-12 |
| 60 | Installation | 292 days | 13-11-12 | 31-08-13 |
| 61 | **MATV System** | **555 days** | **25-05-12** | **30-11-13** |
| 62 | Submission & Approval | 68 days | 25-05-12 | 31-07-12 |
| 63 | Order & Procurement | 97 days | 01-08-12 | 05-11-12 |
| 64 | ETA | 7 days | 06-11-12 | 12-11-12 |
| 65 | Installation | 383 days | 13-11-12 | 30-11-13 |
| 66 | **CCTV & Card Access System** | **573 days** | **25-06-12** | **18-01-14** |
| 67 | Submission & Approval | 61 days | 25-06-12 | 24-08-12 |
| 68 | Order & Procurement | 112 days | 25-08-12 | 14-12-12 |
| 69 | Installation - Wiring/Conduit | 151 days | 01-12-12 | 30-04-13 |






File: work program schedule
Date: 23-07-12

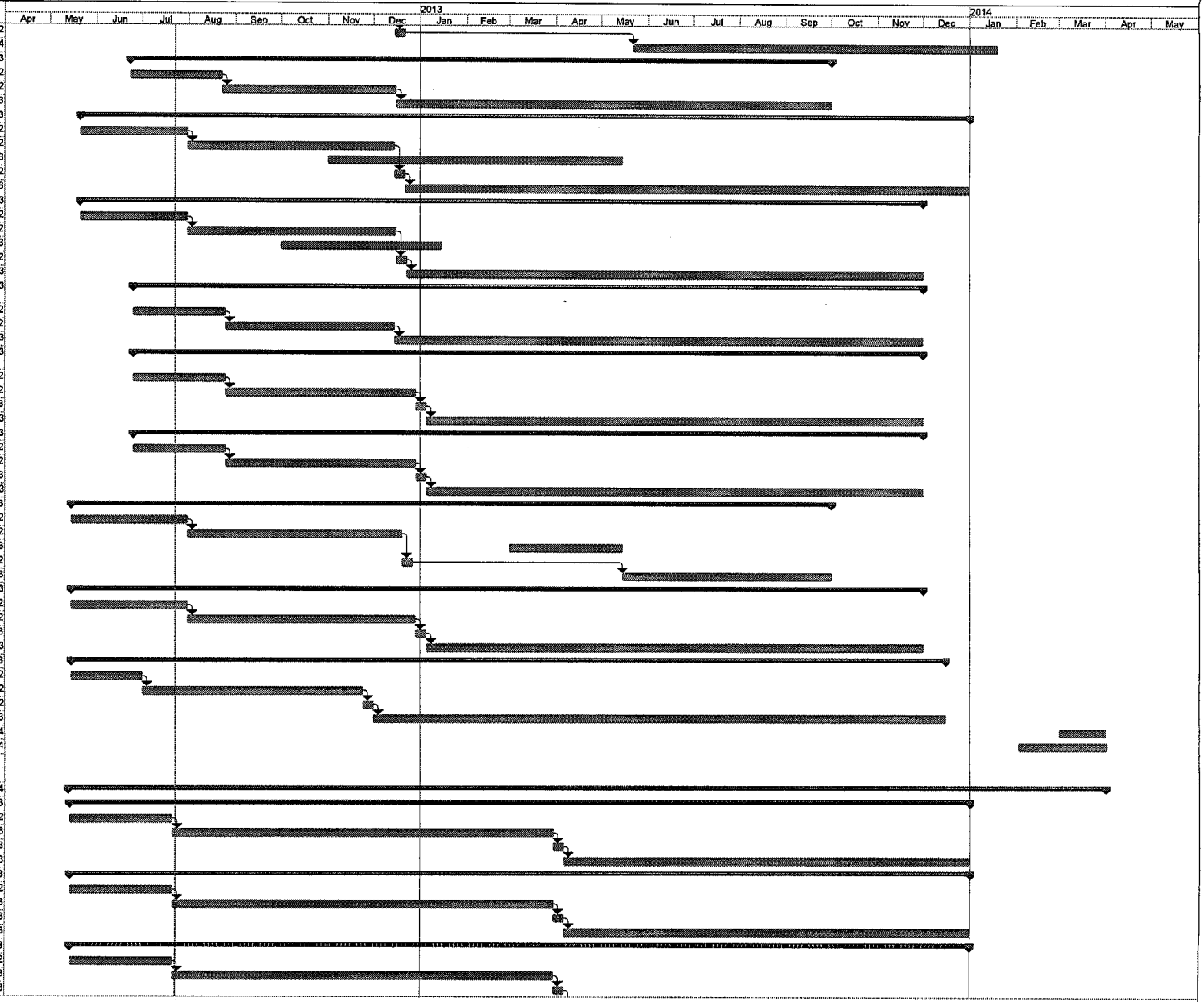
Task
Handover
Summary
Inactive Task
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Progress

**PROJECT: PROPOSED NATIONAL CANCER CENTRE AT JERUDONG, BRUNEI DARUSSALAM**

**PROPOSED M & E MASTER WORK PROGRAMME**

Revision No. 02
Date: 10-May-2012

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 70 | ETA | 7 days | 15-12-12 | 21-12-12 |
| 71 | Installation - Equipment | 242 days | 22-05-13 | 18-01-14 |
| 72 | **Structured Cabling System** | **465 days** | **23-06-12** | **30-09-13** |
| 73 | Submission & Approval | 61 days | 23-06-12 | 22-08-12 |
| 74 | Order & Procurement | 115 days | 23-08-12 | 15-12-12 |
| 75 | Installation | 289 days | 16-12-12 | 30-09-13 |
| 76 | **Nurse Call System** | **590 days** | **21-05-12** | **31-12-13** |
| 77 | Submission & Approval | 71 days | 21-05-12 | 30-07-12 |
| 78 | Order & Procurement | 137 days | 31-07-12 | 14-12-12 |
| 79 | Installation - Wiring/Conduit | 195 days | 01-11-12 | 14-05-13 |
| 80 | ETA | 7 days | 15-12-12 | 21-12-12 |
| 81 | Installation | 375 days | 22-12-12 | 31-12-13 |
| 82 | **Fire Alarm System** | **559 days** | **21-05-12** | **30-11-13** |
| 83 | Submission & Approval | 71 days | 21-05-12 | 30-07-12 |
| 84 | Order & Procurement | 138 days | 31-07-12 | 15-12-12 |
| 85 | Installation - Wiring/Conduit | 106 days | 01-10-12 | 14-01-13 |
| 86 | ETA | 7 days | 16-12-12 | 22-12-12 |
| 87 | Installation | 343 days | 23-12-12 | 30-11-13 |
| 88 | **Electronic Queue Management System** | **524 days** | **25-06-12** | **30-11-13** |
| 89 | Submission & Approval | 61 days | 25-06-12 | 24-08-12 |
| 90 | Order & Procurement | 112 days | 25-08-12 | 14-12-12 |
| 91 | Installation | 351 days | 15-12-12 | 30-11-13 |
| 92 | **OT Insulation Monitoring System** | **524 days** | **25-06-12** | **30-11-13** |
| 93 | Submission & Approval | 61 days | 25-06-12 | 24-08-12 |
| 94 | Order & Procurement | 126 days | 25-08-12 | 28-12-12 |
| 95 | ETA | 7 days | 29-12-12 | 04-01-13 |
| 96 | Installation | 330 days | 05-01-13 | 30-11-13 |
| 97 | **Pneumatic Tubing System** | **524 days** | **25-06-12** | **30-11-13** |
| 98 | Submission & Approval | 61 days | 25-06-12 | 24-08-12 |
| 99 | Order & Procurement | 126 days | 25-08-12 | 28-12-12 |
| 100 | ETA | 7 days | 29-12-12 | 04-01-13 |
| 101 | Installation | 330 days | 05-01-13 | 30-11-13 |
| 102 | **Photo Voltaic** | **504 days** | **15-05-12** | **30-09-13** |
| 103 | Submission & Approval | 77 days | 15-05-12 | 30-07-12 |
| 104 | Order & Procurement | 142 days | 31-07-12 | 19-12-12 |
| 105 | Installation - Wiring | 75 days | 01-03-13 | 14-05-13 |
| 106 | ETA | 7 days | 20-12-12 | 26-12-12 |
| 107 | Installation | 139 days | 15-05-13 | 30-09-13 |
| 108 | **Surge Diverters** | **565 days** | **15-05-12** | **30-11-13** |
| 109 | Submission & Approval | 77 days | 15-05-12 | 30-07-12 |
| 110 | Order & Procurement | 151 days | 31-07-12 | 28-12-12 |
| 111 | ETA | 7 days | 29-12-12 | 04-01-13 |
| 112 | Installation | 330 days | 05-01-13 | 30-11-13 |
| 113 | **11kV Power Management** | **580 days** | **15-05-12** | **15-12-13** |
| 114 | Submission & Approval | 47 days | 15-05-12 | 30-06-12 |
| 115 | Order & Procurement | 146 days | 01-07-12 | 23-11-12 |
| 116 | ETA | 7 days | 24-11-12 | 30-11-12 |
| 117 | Installation | 380 days | 01-12-12 | 15-12-13 |
| 118 | **DLP Maintenance** | **31 days** | **01-03-14** | **31-03-14** |
| 119 | PC Sum | 59 days | 02-02-14 | 01-04-14 |
| 120 | | | | |
| 121 | | | | |
| 122 | **AIRCONDITIONING SERVICES** | **688 days** | **13-05-12** | **31-03-14** |
| 123 | **Chiller Plant Room** | **597 days** | **14-05-12** | **31-12-13** |
| 124 | Submission & Approval | 68 days | 14-05-12 | 20-07-12 |
| 125 | Order & Procurement | 252 days | 21-07-12 | 29-03-13 |
| 126 | ETA | 7 days | 30-03-13 | 05-04-13 |
| 127 | Installation - Equipment | 270 days | 06-04-13 | 31-12-13 |
| 128 | **Air Handling Units** | **597 days** | **14-05-12** | **31-12-13** |
| 129 | Submission & Approval | 68 days | 14-05-12 | 20-07-12 |
| 130 | Order & Procurement | 252 days | 21-07-12 | 29-03-13 |
| 131 | ETA | 7 days | 30-03-13 | 05-04-13 |
| 132 | Installation - Equipment | 270 days | 06-04-13 | 31-12-13 |
| 133 | **Chilled Water Fan Coil Units** | **597 days** | **14-05-12** | **31-12-13** |
| 134 | Submission & Approval | 68 days | 14-05-12 | 20-07-12 |
| 135 | Order & Procurement | 252 days | 21-07-12 | 29-03-13 |
| 136 | ETA | 7 days | 30-03-13 | 05-04-13 |






File: work program schedule
Date: 23-07-12

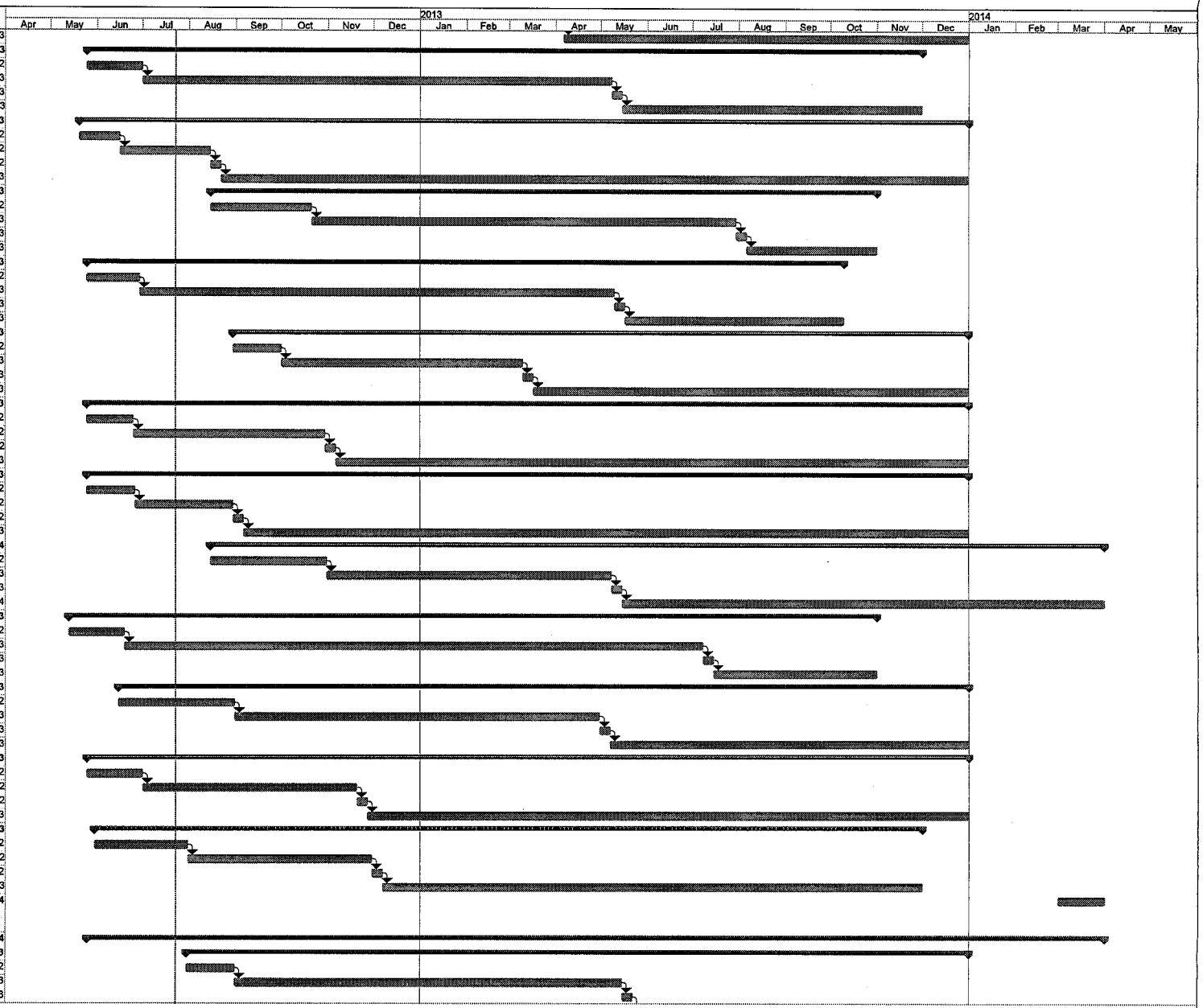
Task
Handover
Summary
Inactive Task
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Progress

**PROJECT: PROPOSED NATIONAL CANCER CENTRE AT JERUDONG, BRUNEI DARUSSALAM**

**PROPOSED M & E MASTER WORK PROGRAMME**

Revision No. 02
Date: 10-May-2012

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 137 | Installation - Equipment | 270 days | 06-04-13 | 31-12-13 |
| 138 | **Chilled & Condenser Water Pumps** | **555 days** | **25-05-12** | **30-11-13** |
| 139 | Submission & Approval | 37 days | 25-05-12 | 30-06-12 |
| 140 | Order & Procurement | 311 days | 01-07-12 | 07-05-13 |
| 141 | ETA | 7 days | 08-05-13 | 14-05-13 |
| 142 | Installation - Equipment | 200 days | 15-05-13 | 30-11-13 |
| 143 | **CHW Pipeworks & Fittings** | **591 days** | **20-05-12** | **31-12-13** |
| 144 | Submission & Approval | 27 days | 20-05-12 | 15-06-12 |
| 145 | Order & Procurement | 60 days | 16-06-12 | 14-08-12 |
| 146 | ETA | 7 days | 15-08-12 | 21-08-12 |
| 147 | Installation | 497 days | 22-08-12 | 31-12-13 |
| 148 | **OT & Clean Room** | **443 days** | **15-08-12** | **31-10-13** |
| 149 | Submission & Approval | 67 days | 15-08-12 | 20-10-12 |
| 150 | Order & Procurement | 282 days | 21-10-12 | 29-07-13 |
| 151 | ETA | 7 days | 30-07-13 | 05-08-13 |
| 152 | Installation - Equipment | 87 days | 06-08-13 | 31-10-13 |
| 153 | **Ventilation Fans** | **503 days** | **25-05-12** | **09-10-13** |
| 154 | Submission & Approval | 35 days | 25-05-12 | 28-06-12 |
| 155 | Order & Procurement | 315 days | 29-06-12 | 09-05-13 |
| 156 | ETA | 7 days | 10-05-13 | 16-05-13 |
| 157 | Installation - Equipment | 146 days | 17-05-13 | 09-10-13 |
| 158 | **Grilles & Diffusers** | **489 days** | **30-08-12** | **31-12-13** |
| 159 | Submission & Approval | 32 days | 30-08-12 | 30-09-12 |
| 160 | Order & Procurement | 160 days | 01-10-12 | 09-03-13 |
| 161 | ETA | 7 days | 10-03-13 | 16-03-13 |
| 162 | Installation | 290 days | 17-03-13 | 31-12-13 |
| 163 | **Fire Dampers/Silencers** | **586 days** | **25-05-12** | **31-12-13** |
| 164 | Submission & Approval | 31 days | 25-05-12 | 24-06-12 |
| 165 | Order & Procurement | 127 days | 25-06-12 | 29-10-12 |
| 166 | ETA | 7 days | 30-10-12 | 05-11-12 |
| 167 | Installation | 421 days | 06-11-12 | 31-12-13 |
| 168 | **Ductwork** | **586 days** | **25-05-12** | **31-12-13** |
| 169 | Submission & Approval | 32 days | 25-05-12 | 25-06-12 |
| 170 | Order & Procurement | 65 days | 26-06-12 | 29-08-12 |
| 171 | ETA | 7 days | 30-08-12 | 05-09-12 |
| 172 | Installation | 482 days | 06-09-12 | 31-12-13 |
| 173 | **Building Automation System** | **594 days** | **15-08-12** | **31-03-14** |
| 174 | Submission & Approval | 77 days | 15-08-12 | 30-10-12 |
| 175 | Order & Procurement | 189 days | 31-10-12 | 07-05-13 |
| 176 | ETA | 7 days | 08-05-13 | 14-05-13 |
| 177 | Installation - Equipment | 321 days | 15-05-13 | 31-03-14 |
| 178 | **Expansion Tank** | **537 days** | **13-05-12** | **31-10-13** |
| 179 | Submission & Approval | 37 days | 13-05-12 | 18-06-12 |
| 180 | Order & Procurement | 384 days | 19-06-12 | 07-07-13 |
| 181 | ETA | 7 days | 08-07-13 | 14-07-13 |
| 182 | Installation - Equipment | 109 days | 15-07-13 | 31-10-13 |
| 183 | **BIBO Filter, Heater Emitter, etc.** | **565 days** | **15-06-12** | **31-12-13** |
| 184 | Submission & Approval | 77 days | 15-06-12 | 30-08-12 |
| 185 | Order & Procurement | 242 days | 31-08-12 | 29-04-13 |
| 186 | ETA | 7 days | 30-04-13 | 06-05-13 |
| 187 | Installation - Equipment | 239 days | 07-05-13 | 31-12-13 |
| 188 | **Electrical Power & Wiring** | **586 days** | **25-05-12** | **31-12-13** |
| 189 | Submission & Approval | 37 days | 25-05-12 | 30-06-12 |
| 190 | Order & Procurement | 142 days | 01-07-12 | 19-11-12 |
| 191 | ETA | 7 days | 20-11-12 | 26-11-12 |
| 192 | Installation - Equipment | 400 days | 27-11-12 | 31-12-13 |
| 193 | **Valves and Accessories** | **550 days** | **30-05-12** | **30-11-13** |
| 194 | Submission & Approval | 62 days | 30-05-12 | 30-07-12 |
| 195 | Order & Procurement | 122 days | 31-07-12 | 29-11-12 |
| 196 | ETA | 7 days | 30-11-12 | 06-12-12 |
| 197 | Installation - Equipment | 359 days | 07-12-12 | 30-11-13 |
| 198 | **Testing, Commissioning & Maintenance** | **31 days** | **01-03-14** | **31-03-14** |
| 199 | | | | |
| 200 | **FIRE HYDRAULIC SERVICES** | **676 days** | **25-05-12** | **31-03-14** |
| 201 | **Sprinkler System** | **520 days** | **30-07-12** | **31-12-13** |
| 202 | Submission & Approval | 32 days | 30-07-12 | 30-08-12 |
| 203 | Order & Procurement | 257 days | 31-08-12 | 14-05-13 |
| 204 | ETA | 7 days | 15-05-13 | 21-05-13 |





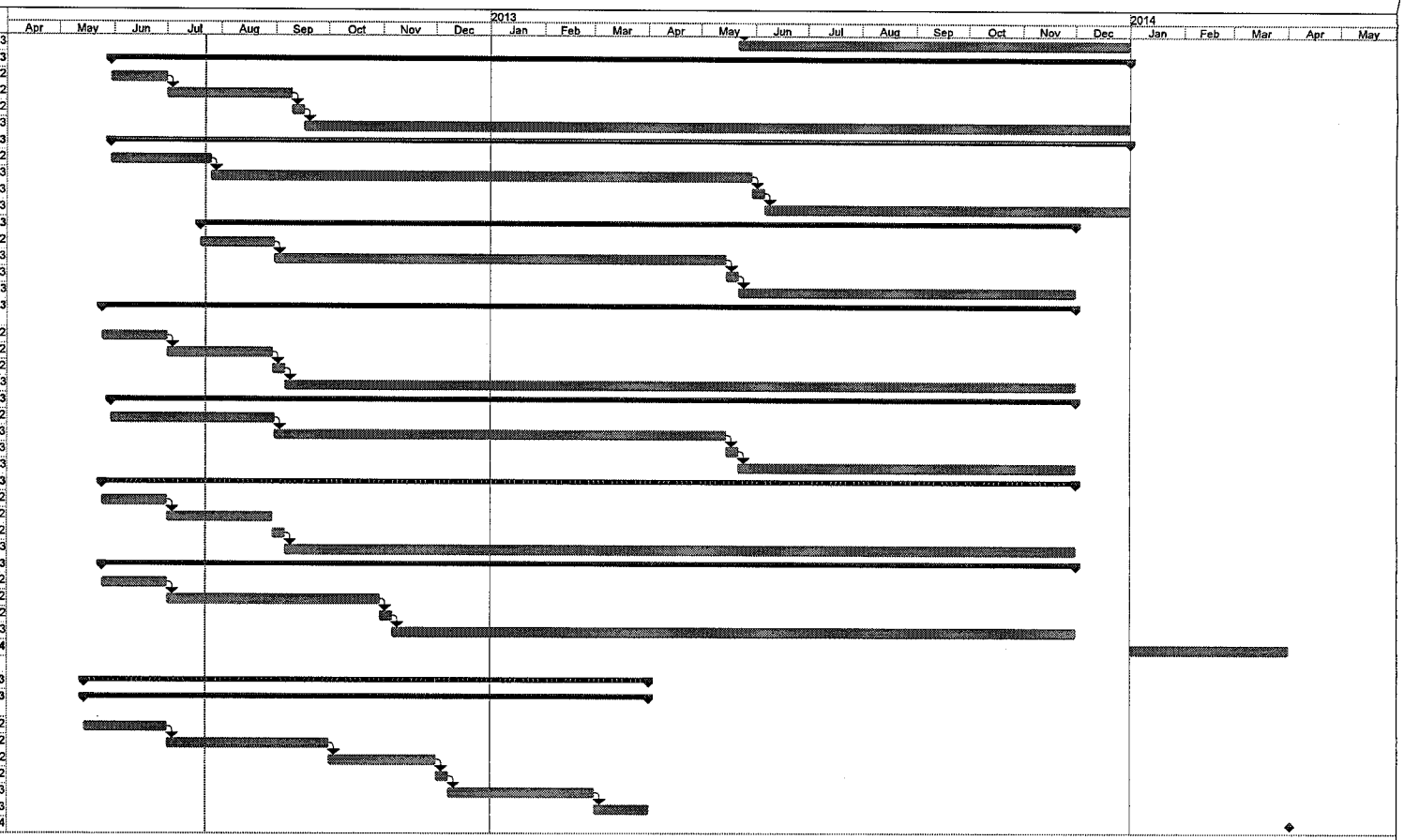

Task | Inactive Task | Inactive Summary | Manual Summary Rollup | Finish-only
Handover | Inactive Task | Manual Task | Manual Summary | Progress
Summary | Inactive Milestone | Duration-only | Start-only

**PROJECT: PROPOSED NATIONAL CANCER CENTRE AT JERUDONG, BRUNEI DARUSSALAM**

**PROPOSED M & E MASTER WORK PROGRAMME**

Revision No. 02
Date: 10-May-2012

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 205 | Installation - Equipment | 224 days | 22-05-13 | 31-12-13 |
| 206 | **Sprinkler Piping & Accessories** | **581 days** | **30-05-12** | **31-12-13** |
| 207 | Submission & Approval | 32 days | 30-05-12 | 30-06-12 |
| 208 | Order & Procurement | 71 days | 01-07-12 | 09-09-12 |
| 209 | ETA | 7 days | 10-09-12 | 16-09-12 |
| 210 | Installation - Equipment | 471 days | 17-09-12 | 31-12-13 |
| 211 | **Sprinkler Pumpsets** | **581 days** | **30-05-12** | **31-12-13** |
| 212 | Submission & Approval | 57 days | 30-05-12 | 25-07-12 |
| 213 | Order & Procurement | 308 days | 26-07-12 | 29-05-13 |
| 214 | ETA | 7 days | 30-05-13 | 05-06-13 |
| 215 | Installation - Equipment | 209 days | 06-06-13 | 31-12-13 |
| 216 | **Wet Riser System** | **499 days** | **20-07-12** | **30-11-13** |
| 217 | Submission & Approval | 42 days | 20-07-12 | 30-08-12 |
| 218 | Order & Procurement | 257 days | 31-08-12 | 14-05-13 |
| 219 | ETA | 7 days | 15-05-13 | 21-05-13 |
| 220 | Installation - Equipment | 193 days | 22-05-13 | 30-11-13 |
| 221 | **Wet Riser Pumps, Piping & Accessories** | **555 days** | **25-05-12** | **30-11-13** |
| 222 | Submission & Approval | 37 days | 25-05-12 | 30-06-12 |
| 223 | Order & Procurement | 60 days | 01-07-12 | 29-08-12 |
| 224 | ETA | 7 days | 30-08-12 | 05-09-12 |
| 225 | Installation - Equipment | 451 days | 06-09-12 | 30-11-13 |
| 226 | **Hosereel System** | **550 days** | **30-05-12** | **30-11-13** |
| 227 | Submission & Approval | 93 days | 30-05-12 | 30-08-12 |
| 228 | Order & Procurement | 257 days | 31-08-12 | 14-05-13 |
| 229 | ETA | 7 days | 15-05-13 | 21-05-13 |
| 230 | Installation - Equipment | 193 days | 22-05-13 | 30-11-13 |
| 231 | **HR Pipeworks** | **555 days** | **25-05-12** | **30-11-13** |
| 232 | Submission & Approval | 37 days | 25-05-12 | 30-06-12 |
| 233 | Order & Procurement | 60 days | 01-07-12 | 29-08-12 |
| 234 | ETA | 7 days | 30-08-12 | 05-09-12 |
| 235 | Installation - Equipment | 451 days | 06-09-12 | 30-11-13 |
| 236 | **Hosereel Pumps** | **555 days** | **25-05-12** | **30-11-13** |
| 237 | Submission & Approval | 37 days | 25-05-12 | 30-06-12 |
| 238 | Order & Procurement | 121 days | 01-07-12 | 29-10-12 |
| 239 | ETA | 7 days | 30-10-12 | 05-11-12 |
| 240 | Installation - Equipment | 390 days | 06-11-12 | 30-11-13 |
| 241 | **Testing & Commissioning** | **90 days** | **01-01-14** | **31-03-14** |
| 242 | | | | |
| 243 | **Car Park Block** | **321 days** | **15-05-12** | **31-03-13** |
| 244 | **Essential Services for Early Handover** | **321 days** | **15-05-12** | **31-03-13** |
| 245 | Submission & Approval | 47 days | 15-05-12 | 30-06-12 |
| 246 | Order & Procurement | 92 days | 01-07-12 | 30-09-12 |
| 247 | Installation - Wiring/Conduit | 61 days | 01-10-12 | 30-11-12 |
| 248 | ETA | 7 days | 01-12-12 | 07-12-12 |
| 249 | Installation - Equipment | 83 days | 08-12-12 | 28-02-13 |
| 250 | Testing & Commissioning | 31 days | 01-03-13 | 31-03-13 |
| 251 | **PROJECT HANDOVER** | 1 day | 01-04-14 | 01-04-14 |






Task | Inactive Task | Inactive Summary | Manual Summary Rollup | Finish-only
Handover | Inactive Task | Manual Task | Manual Summary | Progress
Summary | Inactive Milestone | Duration-only | Start-only

**SECTION 4**

**PROGRAMME**

## 4.2 Authority Submission Status for M&E Services - 1st Submission - NOT USED

| Service | Authority | Original Submission | | Comments/Resubmission | | | | | | Approval/ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Scheduled | Actual | Comment | Resubmit | Comment | Resubmit | Comment | Resubmit | Clearance |
| Application for Electricity Supply | SP Services Ltd | | | | | | | | | |
| Power Supply Substation | SP PowerGrid Ltd | | | | | | | | | |
| Metering Layout | SP Services Ltd | | | | | | | | | |
| Sanitary Installation | PUB Water Reclamation (Network) Dept | | | | | | | | | |
| Domestic Water Supply | PUB (Water Supply) Network Dept | | | | | | | | | |
| Gas Supply Installation | City Gas Pte Ltd | | | | | | | | | |
| Air Conditioning & Ventilation Inst. | FSSD | | | | | | | | | |
| Fire Fighting & Alarm Installation | FSSD | | | | | | | | | |
| Telephone Installation | TFCC | | | | | | | | | |
| Broadband Co-axial Cable System (BCS) | Starhub Cable Vision | | | | | | | | | |
| Fuel Storage | FSSD | | | | | | | | | |
| | NEA (Pollution Control ) | | | | | | | | | |
| | | | | | | | | | | |

**SECTION 4**

**PROGRAMME**

### 4.3 Authority Submission Status for M&E Services (Amendments) - 2nd Submission - NOT USED

| Service | Authority | Original Submission | | Comments/Resubmission | | | | | | Approval/ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Scheduled | Actual | Comment | Resubmit | Comment | Resubmit | Comment | Resubmit | Clearance |
| Application for Electricity Supply | SP Services Ltd | | | | | | | | | |
| Power Supply Substation | SP PowerGrid Ltd | | | | | | | | | |
| Metering Layout | SP Services Ltd | | | | | | | | | |
| Sanitary Installation | PUB Water Reclamation (Network) Dept | | | | | | | | | |
| Domestic Water Supply | PUB (Water Supply) Network Dept | | | | | | | | | |
| Gas Supply Installation | City Gas Pte Ltd | | | | | | | | | |
| Air Conditioning & Ventilation Inst. | FSSD | | | | | | | | | |
| Fire Fighting & Alarm Installation | FSSD | | | | | | | | | |
| Telephone Installation | TFCC | | | | | | | | | |
| Broadband Co-axial Cable System (BCS) | Starhub Cable Vision | | | | | | | | | |
| Fuel Storage | FSSD | | | | | | | | | |
| | NEA (Pollution Control ) | | | | | | | | | |
| | | | | | | | | | | |

**SECTION 5**

**PROJECT RECORDS**

## 5.1 List of Internal Files

**Standard Files**

| File Ref: | | File Ref: | |
|---|---|---|---|
| - Owner | ✓ | - Architect | ✓ |
| - Authorities | | - Other Consultants | ✓ |
| - Contractors | | - CC | ✓ |
| - CF | ✓ | - PQP/QSP | ✓ |

**Project Files to be initiated by PM as and when required**

| File Ref: | | File Ref: | | File Ref: | |
|---|---|---|---|---|---|
| 6128 – EC/MC | ✓ | | | | |
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(✓*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 softcopy to be saved in server |
| Incoming Architectural Sketches/Details | |
| Incoming Structural Drawings | |
| M&E Drawings<br>- Electrical Installation<br>- Lift & Escalator Installation<br>- Air Conditioning & Ventilation Installation<br>- Fire Fighting & Alarm Installation<br>- Plumbing & Sanitary Installation<br>- Medical Gas Installation | |
| Other Drawings | |
| | |
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**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 | Medical Equipment Load | KA | LFY | 19 Aug 2011 | |
| 2 | Mechanical Equipment Load | KA | LFY | 28 Oct 2013 | |
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** Information required by INTERNAL DESIGN TEAM MEMBERS*

**SECTION 6**

**INTERFACING**

### 6.3 Circulation of Documents to External Parties

| | Code:<br>A - Approval Required<br>C - For Comments<br>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 | |
| b. | Project Administration | I | - | I | I | I | |
| c. | Project Cost Estimate/Contract Cost | A | - | I | - | C | |
| **2.** | **Drawings** | | | | | | |
| a. | Outline Design Drgs. | C | - | C | C | - | |
| b. | Sketch Design Drgs. | C | - | C | C | - | |
| c. | Final Design Drgs. | A | - | C | I | I | |
| d. | Shop Drawings | - | - | C | C | - | |
| e. | As Built Drgs. | I | - | I | I | - | |
| **3.** | **Other Document** | | | | | | |
| a. | Specification | A | - | - | - | I | |
| b. | Tender Document | A | - | I | - | I | |
| c. | Tender Evaluation Report | A | - | I | - | I | |
| d. | Design Report | A | - | I | - | - | |
| e. | Progress Report | - | - | - | - | - | |
| f. | Financial Report | - | - | - | - | - | |
| g. | Minutes of Meeting | - | - | - | - | - | |
| h. | Inspection Report | I | - | I | - | - | |
| i. | Testing & Comm. Report | I | - | I | - | - | |
| j. | O & M Manual | 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 | By overseas Consultants | | | | |
| 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 |
|---|---|
| | |
| | |
| | |
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## 8.2 List of Applicable Code of Practice and Regulations

| Services | Title of Code of Practice/Standard |
|---|---|
| Electrical Wiring | CP5 |
| Lightning Protection System | SS555 |
| Emergency Voice Communication System | - |
| Air Conditioning & Ventilation Installation | SS553, SS554, ASHRAE, HTM |
| Lift & Escalator Installation | SS550 |
| Sprinkler System | CP52 |
| Wet Riser System | CP29 |
| Automatic Fire Alarm System | CP10 |
| Sanitary System | Code of Practice on Sewerage & Sanitary Works |
| Plumbing System | CP48 |
| Town Gas/LPG Supply System | CP51 |
| Boiler and Steam Supply System | - |
| Mechanical Smoke Control System | - |

**SECTION 8**

**DESIGN INPUT & METHODOLOGY**

### 8.3 List of Design Guide or Handbook Used

Carrier's Handbook of Air Conditioning System Design

ASHRAE Handbooks

Institute of Plumbing's Plumbing Services Design Guide

### 8.4 List of Pre-Consultation and Waiver – NOT USED

| S/N | Description | Date of Application | Date of Approval | Remarks |
|---|---|---|---|---|
| 1 | *Clause number in Code of Practice for (Services) which require clarification or waiver.<br>Consultation Ref No.<br>Waiver Ref. No. | | | |
| 2 | *Clause number in Code of Practice for (Services) which require clarification or waiver.<br>Consultation Ref No.<br>Waiver Ref. No. | | | |
| 3 | *Clause number in Code of Practice for (Services) which require clarification or waiver.<br>Consultation Ref No.<br>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 Dialux | 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 | |
| Elevate | 7.18 | Alpha Consulting Engineers Pte Ltd | Lift traffic calculation | ✓ |
| Econdial | 2.5 | Merlin Gerlin | Design for low voltage network | |
| Hyena | 4.00.1 | ACADS-BSG | Fire Sprinkler & Hydrant Analysis | |
| Fault Level Calculation | - | Alpha Consulting Engineers Pte Ltd | Calculation of voltage drop and fault level | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

(✓*where applicable*)

**SECTION 9**

**ENVIRONMENTAL CONSIDERATIONS**

### 9.1 Sustainable Design Features / Criteria

| Item | Remarks |
|---|---|
| Green Mark criteria | Platinum |
| Green Design Features | Refer to attached |

### 9.2 Site PPE Requirement

The necessary Personal Protective Equipment (detailed below) shall be provided by the main contractor / Company in accordance to the site EHS requirements prior to the site monitoring.

| PPE | ✓ where applicable |
|---|---|
| Safety Helmet | ✓ |
| Safety Shoes | ✓ |
| Eye Protection | ✓ |
| Ear Protection | ✓ |
| Safety Harness / Belt | ✓ |
| Others: | ✓ |

### 9.3 Site Emergency Preparedness

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

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

**SECTION 9**

**ENVIRONMENTAL CONSIDERATIONS**

### 9.4 Reporting of Environmental Non-conformances

When encountering environmental non-conformances, Site Staff shall be responsible to feedback to the main contractor.

### 9.5 List of Applicable Environmental management system Procedures

Alpha Consulting Engineers Pte Ltd's Environmental Management System Procedures

| Section | Title | ✓ where applicable |
|---|---|---|
| E1 | Aspect / Impact Identification, Risk Assessment & Risk Control | ✓ |
| E2 | Identifying Legal & Other Requirements | ✓ |
| E3 | Objectives, Targets & Programmes | ✓ |
| E4 | Communication | ✓ |
| E5 | Emergency Preparedness & Response | ✓ |
| E6 | Monitoring & Measurement | ✓ |
| E7 | Control of Air & Noise Pollution | ✓ |
| E8 | Management of Wastes | |

**SECTION 10**

**CLIENT'S REQUIREMENTS**

**10.1 List of Output Required by Client:-**

| Item | * Remarks |
|---|---|
| M&E Design Report | A |
| M&E Cost Estimate Report | A |
| Pre-Qualification of Tenderers | - |
| Tender Documents | - |
| Tender Report | A |
| Payment Valuation for QS | A |
| Certificates of Supervision for TOP/CSC | - |

* *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 - NOT USED

| Sub Job No | Description | Allocation Details |
|---|---|---|
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