Alpha
Consulting Engineers Pte Ltd

# PROJECT QUALITY PLAN

**ROPOSED NEW ERECTION OF A SINGLE USER INDUSTRIAL BUILDING WITH ANCILLARY OFFICE ON LOT 01078K MK07 AT 11 TUAS AVENUE 12 SINGAPORE 639034**

**For**

**OPTO-PHARM PTE LTD**

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

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Prepared By : Chong Lai Meng

Authorised By : Loh Fook Yuen

Date : 23 November 2022

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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 | 6311 | 23 November 2022 |
| | | |
| | | |
| | | |
| | | |

### 1.2 Revision Record

| Revision | Date of Issue | Section Reference | Page(s) | Remarks |
|---|---|---|---|---|
| 0 | 23 November 2022 | 1 to 11 | 29 | |
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**SECTION 2**

**PROJECT INFORMATION**

## 2.1 Project Description

| | |
|---|---|
| Type of Development | Single User Industrial Building |

| Statistics of Development | |
|---|---|
| Site Area, m² | 4,999.80 sq.m |
| Nett Floor Area, m² | No information yet |
| Gross Floor Area, m² | 6,937.14 sq.m |
| Covered Carpark, m² | Open carpark,13 nos. |
| No. of Covered Carpark Lots | - |
| No. of Apartments/Houses | - |
| No. of Beds (for Hospitals) | - |
| No. of Guestroom (for Hotels) | - |
| No. of Blocks / No. of Storeys | 1/3 |
| Green Mark Category | Nil |
| No. of Phases | One |

## 2.2 Project Cost

| M&E Services Cost Plan (S$ x 1M) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Services | EI | ACVI | LEI | FFAI | PSI | SPFI | | | | |
| Estimate | 3.5 | 8.3 | 0.6 | 1.2 | 0.9 | - | | | | |
| Awarded | | | | | | | | | | |

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

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

## 2.3 Scope of Works

### 2.3.1 Scope of Consultancy Services

| | |
|---|---|
| Conceptual/Schematic Design (Took over from CCA Partners Pte Ltd) | ✓ |
| Detailed Design (Took over from CCA Partners Pte Ltd) | ✓ |
| 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

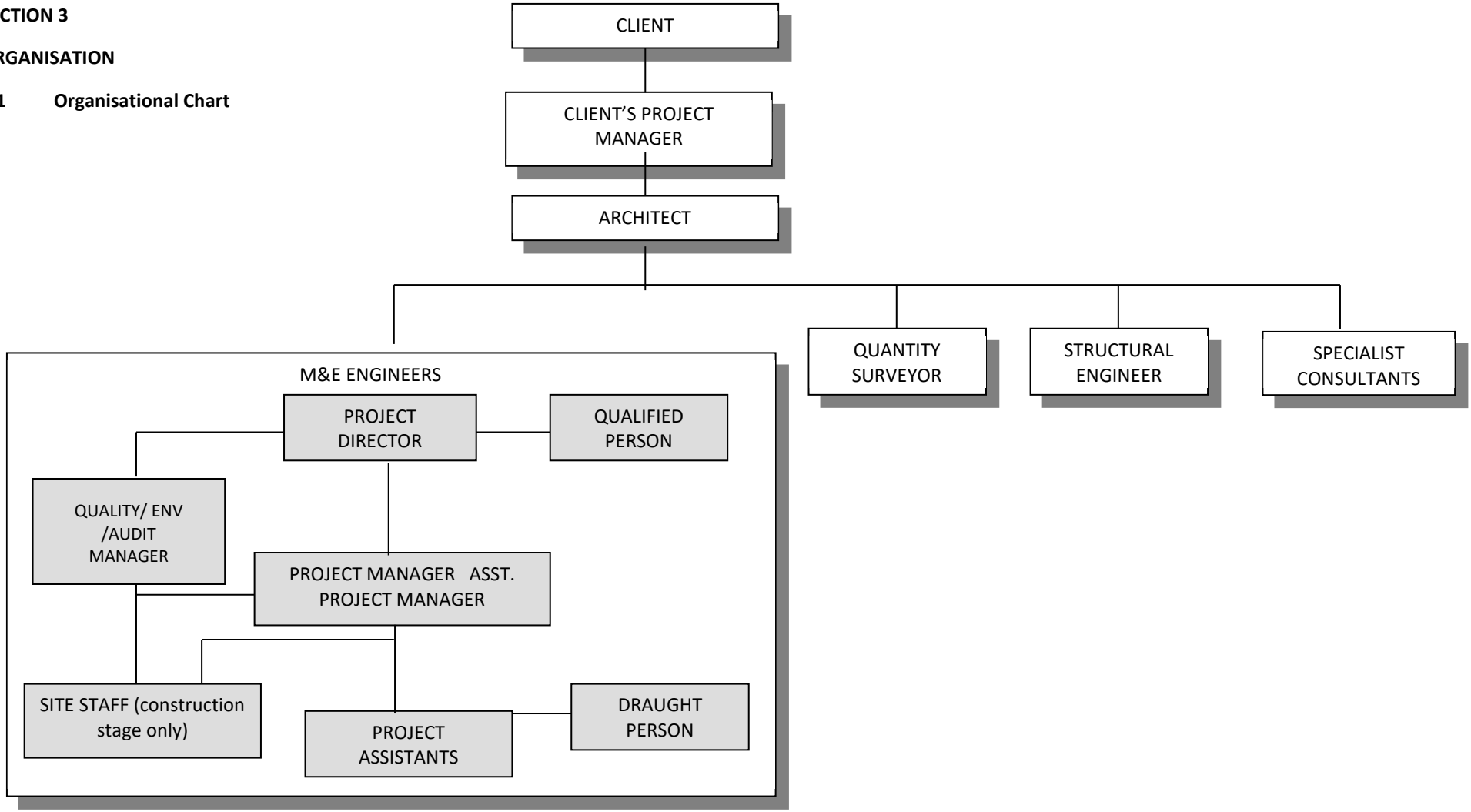
| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EJECTOR & DIVERTER | SUMP PUMP | ✓ | | FUEL OIL TANK | | LIFT & ESCALATOR | ✓ | PRESSURE VESSEL | | HOISTS | | FOAM | |

(✓*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 |
| Qualified Person | Mechanical | Choong Choon Guan |
| | Electrical | Loh Fook Yuen |
| Project Manager | | Chong Lai Meng |
| Assistant Project Manager | | Benedict Lim |
| Project Assistant (Mech) | | Low Qi Fan |
| Project Assistant (Elect) | | Benedict Lim |
| Draughtsperson | | Common Pool |
| Resident Engineer (M&E) | | Nil |
| Assistant Resident Engineer (M&E) | | Nil |
| Clerk-of-Work (M&E) | | Nil |
| | | |
| | | |

### 3.3 Client/Client's Representatives

Client:- Opto-Pharm Pte Ltd

Address:- 13 Tuas Avenue 12
Singapore 639035

Tel:- 6861 4801

Fax:-

Client's Representatives:-

| Name of Company | Contact Person | Contact |
|---|---|---|
| Opto-Pharm Pte Ltd | Name: Mr Simon Tang<br>Position: CEO | Handphone: 9776 5200<br>Email: simontang@optopharm.com.sg |
| Opto-Pharm Pte Ltd | Name: Mr Foo See Chiang<br>Position: CFO | Handphone: 9040 7786<br>Email: seechiangfoo@optopharm.com.sg |
| Opto-Pharm Pte Ltd | Name: Mr Goh Yoon Sin<br>Position: Director of Engineering | Handphone: 9826 4107<br>Email: ysgoh@optopharm.com.sg |
| | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |

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

| Function / Name of Company | Contact Person | Contact |
|---|---|---|
| Project Manager:<br>SIPM Consultants Pte Ltd | Name: Mervin Lum<br>Position: Senior Principal Project Manager | Handphone: 9875 2452<br>Email: Mervin.lumsf@sipmconsultants.com |
| Architect<br>LT& T AVID Architects Pte Ltd | Name: Malcolm Chua<br>Position: Design Director | Handphone: 9455 7843<br>Email: Malcolm_chua@avid.com.sg |
| Quantity Surveyor<br>Threesixty Cost Management Pte Ltd | Name: Warren Chua<br>Position: Deputy Director | Handphone: 9765 1930<br>Email: warren.chuakh@threesixtyconsultants.com |
| Structural Engineer<br>FT INC Cosnultants | Name: Timothy Tan<br>Position: Director | Handphone: 9732 3193<br>Email: timtan@ftinc.com.sg |
| Process Architect<br>Rieckermann- Synertec Asia Pte Ltd | Name: Julian Finta<br>Position: Principal Process Architect | Handphone: 9106 1736<br>Email: j.finat@rieckermann.com |
| Lighting Consultant<br>TBA | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Acoustic Consultant<br>Nil | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |

**3.4 Other Consultants** (Overseas)

| Function / Name of Company | Contact Person | Contact |
|---|---|---|
| Architect<br><br>Nil | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| M&E Consultant<br><br>Nil | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Quantity Surveyor<br><br>Nil | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Structural Engineer<br><br>Nil | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Interior Designer<br><br>Nil | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Lighting Consultant<br><br>Nil | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |
| Acoustic Consultant<br><br>Nil | Name:<br>Position: | Tel:<br>Fax:<br>Handphone:<br>Email: |

### 3.5 Contractors/Sub-Contractors

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

| Authorities/Department | Contact Person | Tel/Fax Nos./E-mail |
|---|---|---|
| SP PowerGrid:<br>(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

| | | | 2022 | | | | | | | | | | | | 2023 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 the piling, builder's, and M&E works (Full Packaged) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. | Piling Period | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. | Super-Structure Construction Period | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. | TOP | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. | CSC | | | | | | | | | | | | | | | | | | | | | | | | | |
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**SECTION 4**

**PROGRAMME**

## 4.2 Authority Submission Status for M&E Services - Pending

| 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

| 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: 6311 | | 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: 6319 | | File Ref: | | File Ref: | |
|---|---|---|---|---|---|
| General | ✓ | | | | |
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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 in softcopy in Teams |
| Incoming Architectural Sketches/Details | All in softcopy in Teams |
| Incoming Structural Drawings | All in softcopy in Teams |
| M&E Drawings | |
| - Electrical Installation | All in softcopy in Teams |
| - Lift & Escalator Installation | All in softcopy in Teams |
| - Air Conditioning & Ventilation Installation | All in softcopy in Teams |
| - Fire Fighting & Alarm Installation | All in softcopy in Teams |
| - Plumbing & Sanitary Installation | All in softcopy in Teams |
| - Swimming Pool & Filtration Installation | All in softcopy in Teams |
| Other Drawings | Nil |
| | |
| | |
| | |
| | |
| | |

**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 | |
| | Teams | ✓ |

(✓*where applicable*)

**SECTION 6**

**INTERFACING**

**6.2 Internal Design Interface**

| Item No. | Description* | Required From | Required By | Date Required | Remarks |
|---|---|---|---|---|---|
| | | | | | |
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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 | I | I | - | - | |
| b. | Project Administration | | | | | | |
| c. | Project Cost Estimate/Contract Cost | A | I | I | - | I | |
| **2.** | **Drawings** | | | | | | |
| a. | Outline Design Drgs. | A | I | C | I | I | |
| b. | Sketch Design Drgs. | A | I | C | I | I | |
| c. | Final Design Drgs. | A | I | C | I | I | |
| d. | Shop Drawings | I | I | A | - | - | |
| e. | As Built Drgs. | I | I | I | - | - | |
| **3.** | **Other Document** | | | | | | |
| a. | Specification | A | I | I | I | I | |
| b. | Tender Document | A | I | I | I | I | |
| c. | Tender Evaluation Report | A | I | I | I | I | |
| d. | Design Report | A | I | I | - | - | |
| e. | Progress Report | - | - | - | - | - | |
| f. | Financial Report | - | - | - | - | - | |
| g. | Minutes of Meeting | A | I | I | - | - | |
| h. | Inspection Report | I | I | I | - | - | |
| i. | Testing & Comm. Report | I | I | I | - | - | |
| j. | O & M Manual | I | I | I | - | - | |

*Note: Applicable only, if the client engaged a Project Manager.

**SECTION 7**

**WORK AUTHORISATION**

| Activity \ Authorised Signatories | PD | QP | PM | AE | SS |
|---|---|---|---|---|---|
| General Correspondences with Client | | | √ | √ | |
| General Correspondences with Other Consultants | | | √ | √ | |
| M&E Cost Estimate Report | √ | √ | √ | | |
| M&E Design Report | √ | √ | √ | | |
| Check Prints | | √ | | | |
| Tender Drawing Approval | √ | √ | √ | | |
| Tender Specification Approval | √ | √ | √ | | |
| List of Tenderers | √ | √ | √ | | |
| Tender Questionnaires | √ | √ | √ | | |
| Tender Reports | √ | √ | √ | | |
| Draft Letter of Award | √ | √ | √ | | |
| Review of Contractor's Shop Drawing | | | √ | √ | |
| Review of Contractor's Technical Submittal | | | √ | √ | |
| Review of Contractor's Sample Submittal | | | √ | √ | |
| Contractor's Request for Deviation | | √ | √ | | |
| Progress Payment Valuation Form | √ | | √ | | |
| Final Account Valuation | √ | | √ | | |
| Draft Variation Order | √ | | √ | | |
| Engineer/Architect's Instruction/Direction | √ | | √ | | |
| Site Instruction/Direction | | | √ | | |
| Correspondence/Submission to Authorities | √ | √ | | | |

(✓*where authorised*)

Key to abbreviations:-

PD : Project Director
QP : Qualified Person
PM : Project Manager/Assistant Project Manager
AE : Assistant Engineer
SS : ACEPL Site Staff

**SECTION 8**

**DESIGN INPUT & METHODOLOGY**

## 8.1 List of Client's Standards, Reference Documents or Brief

| ITEM | KEPT BY |
|---|---|
| | |
| | |
| | |
| | |
| | |

## 8.2 List of Applicable Code of Practice and Regulations

| Services | Title of Code of Practice/Standard |
|---|---|
| Electrical Wiring | SS 638 : 2018 |
| Lightning Protection System | SS 555 : 2018 |
| Earthing | SS 546 : 2009 |
| Standby Generator System | COPIF 2018 and the COPIF Guidelines |
| Emergency Voice Communication System | SS 546 : 2009 |
| Air Conditioning & Ventilation Installation | SS 553 : 2016 |
| Lift Installation | SS 550 : 2020 |
| Sprinkler System | CP 52 : 2004 |
| Dry/Wet Riser System | SS 575 : 2012 |
| Automatic Fire Alarm System | SS 645 : 2019 |
| Sanitary System | Code of Practice on Sewerage & Sanitary Works (2nd edition, Jan 2019) |
| Plumbing System | SS 636 : 2018 |
| Town Gas/LPG Supply System | SS 608 : 2015 |
| Boiler and Steam Supply System | N.A. |
| Mechanical Smoke Control System | N.A. |

**SECTION 8**

**DESIGN INPUT & METHODOLOGY**

### 8.3 List of Design Guide or Handbook Used

Carrier's Handbook of Air Conditioning System Design

ASHRAE Handbooks

Institute of Plumbing's Plumbing Services Design Guide

### 8.4 List of Pre-Consultation and Waiver

| S/N | Description | Date of Application | Date of Approval | Remarks |
|---|---|---|---|---|
| 1 | *Clause number in Code of Practice for (Services) which require clarification or waiver.<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 | |
|---|---|---|---|---|
| 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 | |
| Hyena | 4.00.1 | ACADS-BSG | Fire Sprinkler & Hydrant Analysis | |
| Dialux | 4.11 | Freeware | Lighting design | ✓ |
| Lift Traffic | 7.18 | Elevate | Lift traffic calculation | ✓ |
| Fault Level Calculation | 11.11 | ETAP | Calculation of fault level and voltage drop | |
| | | | | |

(✓*where applicable*)

**SECTION 9**

**ENVIRONMENTAL CONSIDERATIONS**

### 9.1 Sustainable Design Features / Criteria

| Item | Remarks |
|---|---|
| Green Mark criteria | |
| Green Design Features | |

### 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 | I |
| Pre-Qualification of Tenderers | N.A. |
| Tender Documents | C |
| Tender Report | I |
| Payment Valuation for QS | N.A. |
| Certificates of Supervision for TOP/CSC | Re |

* *Remarks*

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

*Other purposes and for action: please specify.*

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

**SECTION 11**

**LIST OF SUB-JOB**

**11.1 List of Sub-Job Numbers**

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