# Drainage Services Department

## Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A

Monthly EM&A Report

(April 2018)

**Verified by** : Mr. Adi Lee

**Position** : Independent Environmental Checker

**Date** : 16 May 18

# Drainage Services Department

# Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A

## Monthly EM&A Report

(April 2018)

**Certified by** : Mr. T. W. Tam

**Position** : Environmental Team Leader of Contract No. DC/2013/09

**Date** : 15 May 2018

# Drainage Services Department

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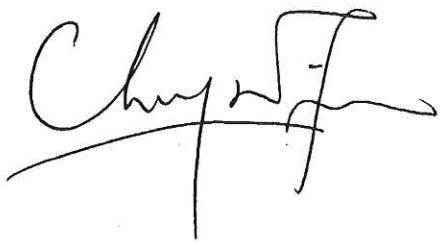

**Certified by** : Dr. Priscilla Choy

**Position** : Environmental Team Leader of Contract No. DE/2014/01

**Date** : 16 May 2018

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# 1. EXECUTIVE SUMMARY

**1.1** This is the Monthly EM&A Report for the Project which summarises the EM&A works undertaken by the ETs of the respective Contractors of Contract No. DC/2013/09 and No. DE/2014/01 under FEP No. FEP-02/474/2013 from 1 to 30 April 2018 (the reporting period).

**Summary of Major Construction Works taken in the Reporting Period**

**1.2** In the reporting period, the major construction works being undertaken by the respective Contractors are summarized in the below table.

| Works Contract | Contract Title | Major Construction Works |
|---|---|---|
| DC/2013/09 | Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road | • Excavation, installation of formwork and reinforcement of base slab of chemical storage room<br>• Concreting of base slab of LV switch room<br>• Excavation of DN80, DN100 and DN300 pumping pipe outside MFB<br>• Installation of FRP handrailing at membrane facilities building<br>• Excavation of trench for installation of E&M cable duct<br>• Removal of Puddle pipe at BR1<br>• Laying granolithic kerb for staircase of membrane facilities building<br>• Installation of multi part cover of flowmeter chamber and flow drain chamber<br>• Internal Finishing and installation of trench cover<br>• Construction of underground drainage pipe<br>• Construction of steel platform at basement of membrane facilities building |
| DE/2014/01 | Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station | • Mechanical Installation of lifting appliance at 1/F, MBR Facilities Building<br>• Mechanical Installation of Air Blowers at 1/F, MBR Facilities Building<br>• Mechanical Installation of MBR Pre-treatment Screen Facilities<br>• Mechanical Installation in Bioreactor No.1 (BR1)<br>• Electrical Installation in 11kV HV Switchroom |

**Environmental Monitoring and Audit Activities**

**1.3** The environmental monitoring activities under the EM&A programme are summarized in the below table. No Action and Limit Level exceedance of air quality and construction noise monitoring was recorded during the reporting period.

| Environmental Issue | Environmental Monitoring Parameters / Inspection | Occasions | Action Level Exceedance | Limit Level Exceedance |
|---|---|---|---|---|
| Air Quality | 1-hour TSP | 36 | 0 | 0 |
| | 24-hour TSP | 10 | 0 | 0 |
| Construction Noise | $L_{Aeq(30min)}$ Daytime | 10 | 0 | 0 |

**Environmental Complaint**

**1.4** No environmental complaint, notification of summons or successful prosecutions were received during the reporting period. It is summarized in the below table.

| Works Contract | Environmental Complaints | Notification of Summons | Successful Prosecutions | Status / Follow-up Actions |
|---|---|---|---|---|
| DC/2013/09 | 0 | 0 | 0 | N/A |
| DE/2014/01 | 0 | 0 | 0 | N/A |

**Site Inspection**

**1.5** Joint site inspections to evaluate the site environmental performance by the RE, the respective ETs and the Contractors were carried out on the following dates during the reporting period.

Contract No. DC/2013/09: 6, 12, 19, 26 and 30 April 2018
Contract No. DE/2014/01: 4, 10, 19, 27 and 30 April 2018

**1.6** IEC conducted site audit on 30 April 2018. No environmental non-compliance was identified in the reporting period.

**Reporting Changes**

**1.7** There were no reporting changes during the reporting period.

**Future Key Issues**

**1.8** Key issues to be considered in the next reporting period for the Project are as follow:

| Work Contract | Major Construction Works | Potential Pollution Issues | Mitigation Measures |
|---|---|---|---|
| DC/2013/09 | • Excavation, installation of formwork and reinforcement of wall and roof slab of chemical storage room<br>• Concreting of base slab of chemical storage room<br>• Installation of formwork and reinforcement of wall and roof slab of LV switch room<br>• Concreting the wall and roof slab of chemical storage room and LV switch room<br>• Excavation of DN80, DN100 and DN300 pumping pipe outside MFB<br>• Excavation of DN80, DN100 pipe near pretreatment chamber<br>• Excavation of trench for installation of E&M cable duct<br>• Installation of FRP railing at roof of membrane facilities building<br>• Installation of multi part cover of flowmeter chamber and flow drain chamber<br>• Construction of underground drainage pipe<br>• Laying subbase for road work construction | • Dust impact from excavation work, dusty material handling and during concrete production<br>• Muddy runoff water generated from the dusty material stockpile during rainy days | • Implement dust suppression measures at all times<br>• Implement construction site runoff control practices and measures at all times |
| DE/2014/01 | • Electrical Installation of switchboards in LV Switchroom at G/F, MBR Facilities Building<br>• Electrical Installation in Transformer Room No.2 at 1/F, MBR Facilities Building<br>• Mechanical Installation of Air Blowers at 1/F, MBR Facilities Building<br>• Mechanical Installation of MBR Pre-treatment Screen Facilities<br>• Mechanical Installation of Membrane in MBR tank<br>• Mechanical Installation of Diffusers and associated equipment in Bioreactor No.1 (BR1) | • Storage of chemicals containers<br>• Waste accumulation<br>• Silt and dust getting into the public area by the leaving site vehicles at the site exits without adequate wheel washing facilities | • Drip tray should be provided to chemical containers<br>• Waste should be disposed properly and avoid accumulation<br>• Accumulated materials to be recycled onsite<br>• Wheel washing should be provided to vehicles before leaving the site area |

# 2. INTRODUCTION

## 2.1 Background

2.1.1 The existing Shek Wu Hui Sewage Treatment Works (SWHSTW) is operated and maintained by the Drainage Services Department (DSD). It provides secondary level treatment to sewage collected from Sheung Shui, Fanling and adjacent areas, with design capacity of 93,000m3/day at ADWF.

2.1.2 To cope with the latest population growth and new developments in the catchment, further expansion of SWHSTW is planned to be carried out in three phases, namely Phases 1A, 1B and 2. Further Expansion Phase 1A is to cope with the forecast increase in sewage flow from local developments and extension of village sewerage in Sheung Shui, Fanling and adjacent areas. The scope of the Phase 1A Project comprises the followings:

(a) the construction of proposed treatment facilities to increase the treatment capacity of SWHSTW by at least 40,000m3/day with tertiary treatment level, with suitable allowance to cater for a further increase of treatment capacity by 20,000m3/day in Phase 1B; and
(b) modification/upgrading of the existing facilities of SWHSTW.

2.1.3 To cope with the projected sewage flow buildup and meet the tight implementation programme, Advance Works for SWHSTW Further Expansion Phase 1A (hereinafter referred as "the Project") are proposed to be carried out between 2015 and 2018. The Phase 1A Advance Works comprise a civil works contract and an Electrical & Mechanical (E&M) works contract. The civil works Contract No. DC/2013/09 "Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road" is supervised by the Sewerage Projects Division (SPD) of DSD. The E&M works Contract No. DE/2014/01 "Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station" is supervised by the Electrical & Mechanical Projects Division (E&MPD) of DSD.

2.1.4 The scope of Phase 1A Advance Works comprises the followings:

(a) the conversion of one existing bioreactor (BR1) and two existing final sedimentation tanks (FST1 and FST2) into one membrane bioreactor; and
(b) the ancillary works.

2.1.5 This Project is a part of designated project under item F.2 of Part 1, Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance. The EIA for the further expansion of SWHSTW Phases 1A, 1B and 2 is covered under the EIA Report of NENT NDAs (Register No. AEIAR-175-2013).

2.1.6 An Environment Permit (EP) No. EP-474/2013 for the further expansion of SWHSTW Phases 1A, 1B and 2 was issued by EPD to CEDD on 21 November 2013. On 23 January 2014, Further Environmental Permit (FEP) No. FEP-01/474/2013 was issued by EPD to DSD for the further expansion of SWHSTW Phase 1A works. On 15 February 2018, FEP No. FEP-02/474/2013 was issued by EPD to DSD covering the upgrading works of SWHSTW Phases 1A, 1B and 2.

2.1.7 With the issue of FEP No. FEP-02/474/2013, DSD will surrender FEP No. FEP-01/474/2013 which covering Phase 1A works only.

## 2.2 Project Programme

Two construction works contracts of the Project, i.e. civil works and E&M works, were awarded in 2015 and 2016 respectively. The construction of the Project commenced in October 2015 and is expected to complete in 2018 tentatively. ***Table 2.1*** summarises the information of the awarded Works Contracts.

**Table 2.1 Summary of Awarded Works Contracts**

| Works Contract | Description | Construction Start Date | Contractor | Environmental Team |
|---|---|---|---|---|
| DC/2013/09 | Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road | October 2015 | Tsun Yip Waterworks Construction Co Ltd (Tsun Yip) | Action-United Environmental Services & Consulting (AUES) |
| DE/2014/01 | Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station | October 2017 | Jardine Engineering Corporation Limited (JEC) | Cinotech Consultants Limited (Cinotech) |

## 2.3 Purpose of the Report

2.3.1 The Environmental Monitoring and Audit (EM&A) programme for DC/2013/09 and DE/2014/01 commenced in October 2015 and October 2017 respectively. This is the Monthly EM&A Report for the Project which summarises the EM&A works undertaken by the respective Contractor's ETs from 1 to 30 April 2018 (the reporting period).

## 2.4 Project Organization

Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in ***Table 2.2*** below.

**Table 2.2 Key Project Contacts**

| Works Contract | Organization | Role | Name | Tel No. |
|---|---|---|---|---|
| DC/2013/09 | DSD | Resident Engineer | Mr. Michael Leung | 2594 7463 |
| | ANewR Consulting Limited | Independent Environmental Checker | Mr. Adi Lee | 2618 2836 |
| | Tsun Yip | Site Agent | Mr. Ken Wong | 9161 9627 |
| | | Environmental Officer | Mr. M. T. Ho | 9507 9634 |
| | AUES | Environmental Team Leader | Mr. T. W. Tam | 2959 6059 |
| DE/2014/01 | DSD | Resident Engineer | Mr. Fong Mo | 2594 7329 |
| | ANewR Consulting Limited | Independent Environmental Checker | Mr. Adi Lee | 2618 2836 |
| | JEC | Project Manager | Mr. Kim Hung Lau | 2947 1125 |
| | | Environmental Officer | Mr. George Ng | 2947 1125 |
| | Cinotech | Environmental Team Leader | Dr. Priscilla Choy | 2151 2089 |

## 3. ENVIRONMENTAL MONITORING AND AUDIT

**3.1** The Project has been divided into two construction works contracts which are covered by EP No. EP-474/2013 and FEP No. FEP-02/474/2013. As per the EP Conditions, EM&A Reports for Works Contract No. DC/2013/09 and No. DE/2014/01 prepared by the respective Contractor's ETs are provided in ***Appendices A*** and ***B*** respectively.

**3.2** The EM&A Reports provide details of the project information, EM&A requirements, impact monitoring and audit results for the corresponding Contracts.

**3.3** A summary of the major construction activities undertaken by the respective Contractors of various Works Contracts during the reporting period are presented in ***Table 3.1***.

**Table 3.1 Summary of Major Construction Activities in the Reporting Period**

| Works Contract | Contract Title | Major Construction Works |
|---|---|---|
| DC/2013/09 | Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road | • Excavation, installation of formwork and reinforcement of base slab of chemical storage room<br>• Concreting of base slab of LV switch room<br>• Excavation of DN80, DN100 and DN300 pumping pipe outside MFB<br>• Installation of FRP handrailing at membrane facilities building<br>• Excavation of trench for installation of E&M cable duct<br>• Removal of Puddle pipe at BR1<br>• Laying granolithic kerb for staircase of membrane facilities building<br>• Installation of multi part cover of flowmeter chamber and flow drain chamber<br>• Internal Finishing and installation of trench cover<br>• Construction of underground drainage pipe<br>• Construction of steel platform at basement of membrane facilities building |
| DE/2014/01 | Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station | • Mechanical Installation of lifting appliance at 1/F, MBR Facilities Building<br>• Mechanical Installation of Air Blowers at 1/F, MBR Facilities Building<br>• Mechanical Installation of MBR Pre-treatment Screen Facilities<br>• Mechanical Installation in Bioreactor No.1 (BR1)<br>• Electrical Installation in 11kV HV Switchroom |

**3.4** Impact monitoring for air quality and construction noise were conducted in accordance with the Updated EM&A Manual in the reporting period. The air quality and construction noise for this reporting month are summarised in ***Tables 3.2*** to ***3.4.*** Details of the monitoring requirements, locations, equipment, methodology and QA/QC procedures are presented in the EM&A Reports as provided in ***Appendices A*** and ***B***.

**3.5** No Action and Limit Level exceedance of air quality and construction noise monitoring was recorded during the reporting period.

**3.6** No environmental complaint, notification of summons or successful prosecutions were received during the reporting period. Log for environmental complaints, notification of summons and successful prosecutions are provided in ***Table 3.5***.

**3.7** Regular site inspections were conducted by the respective Contractor's ETs on a weekly basis to check the implementation of environmental pollution control and mitigation measures for the Project. No non-compliance was identified in the reporting period. Joint site inspections for Contract No. DC/2013/09 were carried out on 6, 12, 19, 26 and 30 April 2018 and for Contract No. DE/2014/01 were carried out on 4, 10, 19, 27 and 30 April 2018 during the reporting period. No environmental non-compliance was identified in the reporting period.

**Table 3.2 Summary of 1-Hour TSP Monitoring Results in the Reporting Period**

| Monitoring Station ID | Location | TSP Concentration ($mg/m^3$) | Action Level ($mg/m^3$) | Limit Level (mg/m3) | Exceedance due to the Project Construction (Yes/No) |
|---|---|---|---|---|---|
| AM1 | No. 31 Wai Loi Tsuen | 37-79 | 286 | 500 | No |
| AM2 | Fu Tei Au | 45-89 | 276 | 500 | No |

**Note:**
(1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract No. DC/2013/09 in accordance with the Updated EM&A Manual.

**Table 3.3 Summary of 24-Hour TSP Monitoring Results in the Reporting Period**

| Monitoring Station ID | Location | TSP Concentration ($mg/m^3$) | Action Level ($mg/m^3$) | Limit Level (mg/m3) | Exceedance due to the Project Construction (Yes/No) |
|---|---|---|---|---|---|
| AM1 | No. 31 Wai Loi Tsuen | 24-66 | 147 | 260 | No |
| AM2a | RE's Site Office | 55-70 | 155 | 260 | No |

**Note:**
(1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract No. DC/2013/09 in accordance with the Updated EM&A Manual.

**Table 3.4 Summary of Construction Noise Monitoring Results in the Reporting Period**

| Monitoring Station ID | Location | Noise Level (LAeq,30mins, dB(A)) | Action Level (dB(A)) | Limit Level (dB(A)) | Exceedance due to the Project Construction (Yes/No) |
|---|---|---|---|---|---|
| NM1 | No. 31 Wai Loi Tsuen | 52-59 | When one documented complaint is received | >75 | No |
| NM2 | Fu Tei Au | 49-51 | | >75 | No |

**Note:**
(1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract No. DC/2013/09 in accordance with the Updated EM&A Manual.

**Table 3.5 Log for Environmental Complaints, Notification of Summons and Successful Prosecutions for the Reporting Month**

| Works Contract | Environmental Complaints | Notification of Summons | Successful Prosecutions |
|---|---|---|---|
| DC/2013/09 | 0 | 0 | 0 |
| DE/2014/01 | 0 | 0 | 0 |

## 4. WASTE MANAGEMENT

**4.1** Waste management was carried out by on-site Environmental Officer or an Environmental Supervisor of respective Contractors from time to time.

**4.2** The quantities of waste for disposal in this Reporting Period are summarized in ***Tables 4.1*** and ***4.2*** and the Monthly Summary Waste Flow Tables of respective Contracts are presented in the EM&A Reports as provided in ***Appendices A*** and ***B***. Whenever possible, materials were reused on-site as far as practicable.

**Table 4.1 Summary of Quantities of Inert C&D Materials and C&D Wastes for Contract No. DC/2013/09**

| Type of Waste | Quantity | | | Disposal Location |
|---|---|---|---|---|
| | Prior Months | Reporting Month | Cumulated | |
| Total C&D Materials (Inert) (in '000m$^3$) | 20.80 | 0.99 | 21.79 | -- |
| Hard Rock and Large Broken Concrete (Inert) (in '000m$^3$) | 1.79 | 0.33 | 2.12 | Tuen Mun 38 |
| Reused in this Project (Inert) (in '000m$^3$) | 3.27 | 0.10 | 3.37 | -- |
| Reused in other Projects (Inert) (in '000m$^3$) | 2.23 | 0 | 2.23 | -- |
| Disposal as Public Fill (Inert) (in '000m$^3$) | 13.61 | 0.56 | 14.17 | Tuen Mun 38 |
| Metals (in '000kg) | 142.00 | 0 | 142.00 | -- |
| Paper / Cardboard Packing (in '000kg) | 0.07 | 0 | 0.07 | -- |
| Plastics (in '000kg) | 0 | 0 | 0 | -- |
| Chemical Wastes (in '000kg) | 0 | 0 | 0 | -- |
| General Refuses (in '000m$^3$) | 0.97 | 0.04 | 1.01 | NENT |

**Table 4.2 Summary of Quantities of Inert C&D Materials and C&D Wastes for Contract No. DE/2014/01**

| Type of Waste | Quantity | | | Disposal Location |
|---|---|---|---|---|
| | Prior Months | Reporting Month | Cumulated | |
| Total C&D Materials (Inert) (in '000m$^3$) | 0 | 0 | 0 | -- |
| Hard Rock and Large Broken Concrete (Inert) (in '000m$^3$) | 0 | 0 | 0 | -- |
| Reused in this Project (Inert) (in '000m$^3$) | 0 | 0 | 0 | -- |
| Reused in other Projects (Inert) (in '000m$^3$) | 0 | 0 | 0 | -- |
| Disposal as Public Fill (Inert) (in '000m$^3$) | 0 | 0 | 0 | -- |
| Metals (in '000kg) | 0 | 0 | 0 | -- |
| Paper / Cardboard Packing (in '000kg) | 0 | 0 | 0 | -- |
| Plastics (in '000kg) | 0 | 0 | 0 | -- |
| Chemical Wastes (in '000kg) | 0 | 0 | 0 | -- |
| General Refuses (in tonne) | 1 | 7.16 | 8.16 | NENT |

# 5. IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS

**5.1** The respective Contractors have implemented all mitigation measures and requirements as stated in the EIA Reports, EM&A Manuals, EP No. EP-474/2013 and FEP No. FEP-02/474/2013. Summary of the relevant permits, licenses, and/or notifications on environmental protection for this Project in this reporting period are summarised in ***Tables 5.1*** and ***5.2***.

**Table 5.1 Summary of Environmental Licenses and Permits for Contract No. DC/2013/09**

| Item | Valid License/Permit | License/Permit Number |
|---|---|---|
| 1 | Further Environmental Permit | FEP-02/474/2013 |
| 2 | Air Pollution Control (Construction Dust) Regulation | N/A |
| 3 | Chemical Waste Producer Registration | WPN5213-624-T3148-04 |
| 4 | Water Pollution Control Ordinance | WT00022503-2015 |
| 5 | Billing Account for Disposal of Construction Waste | Account Number: 7022898 |

**Table 5.2 Summary of Environmental Licenses and Permits for Contract No. DE/2014/01**

| Item | Valid License/Permit | License/Permit Number |
|---|---|---|
| 1 | Further Environmental Permit | FEP-02/474/2013 |
| 2 | Chemical Waste Producer Registration | WPN5213-624-T3685-01 |
| 3 | Billing Account for Disposal of Construction Waste | Account Number: 7024165 |

## 6. CONCLUSION AND RECOMMENDATION

### Conclusion

**6.1** This is the Monthly EM&A Report for the Project which summarises the EM&A works undertaken by the respective Contractor's ETs from 1 to 30 April 2018 (the reporting period).

**6.2** No Action and Limit Level exceedance of 1-hour and 24-hour TSP monitoring was recorded during the reporting period.

**6.3** No Action and Limit Level exceedance of construction noise monitoring was recorded during the reporting period.

**6.4** Joint site inspections to evaluate the site environmental performance by the RE, the respective ETs and the Contractors were carried out on the following dates during the reporting period.

Contract No. DC/2013/09: 6, 12, 19, 26 and 30 April 2018
Contract No. DE/2014/01: 4, 10, 19, 27 and 30 April 2018

**6.5** IEC conducted site audit on 30 April 2018. No environmental non-compliance was identified in the reporting period.

**6.6** No documented complaint, notification of summons or successful prosecution was received during the reporting period.

### Recommendation

**6.7** The following recommendations were made for future reporting periods:

*Air Quality*

- Maintain wet surface on access road
- All vehicles must be used wheel washing facility before off site
- Spray water during breaking works
- A cleaning truck was regularly performed on the public road to prevent fugitive dust emission

*Noise*

- Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday.
- Keep good maintenance of plants
- Shut down the plants when not in used

*Water Quality*

- Identify any discharge of wastewater from the construction site
- Avoid blockage of U channel and drainage system by sediment
- Avoid water accumulation on site and carry out larviciding against mosquito breeding for stagnant water when mosquito larvae are observed
- Avoid spoilage of run-off from construction site to public area
- The discharge quality must meet the requirements specified in the discharge license

*Waste/Chemical Management*

- On-site sorting prior to disposal
- Follow requirements and procedures of the "Trip-ticket System"
- Predict required quantity of concrete accurately
- Collect the unused fresh concrete at designated locations in the sites for subsequent disposal

# APPENDIX A

# MONTHLY EM&A REPORT FOR CONTRACT NO. DC/2013/09

**JOB NO.: TCS00757/15**

# DSD CONTRACT NO. DC/2013/09 – ADVANCE WORKS FOR SHEK WU HUI SEWAGE TREATMENT WORKS – FURTHER EXPANSION PHASE 1A AND SEWERAGE WORKS AT PING CHE ROAD

# 31ST MONTHLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT – APRIL 2018

**PREPARED FOR**

**TSUN YIP WATERWORKS CONSTRUCTION CO LTD**

| Date | Reference No. | Prepared By | Certified By |
|---|---|---|---|
| 14 May 2018 | TCS00757/15/600/R0123v4 | Martin Li (Assistant Environmental Consultant) | Tam Tak Wing (Environmental Team Leader) |

| Version | Date | Remarks |
|---|---|---|
| 1 | 8 May 2018 | First Submission |
| 2 | 9 May 2018 | Amended against IEC's comments |
| 3 | 11 May 2018 | Amended against IEC's comments |
| 4 | 14 May 2018 | Amended against IEC's comments |

## EXECUTIVE SUMMARY

ES.01 This is the **31st** Monthly Environmental Monitoring and Audit Report covering the period from **1** to **30 April 2018** (the Reporting Period).

### ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.02 Environmental monitoring activities under the EM&A program in this Reporting Period are summarized in the following table.

| Issues | Environmental Monitoring Parameters / Inspection | Occasions |
|---|---|---|
| Air Quality | 1-hour TSP | **36** |
| | 24-hour TSP | **10** |
| Construction Noise | $L_{Aeq(30min)}$ Daytime | **10** |
| Inspection / Audit | ET Regular Environmental Site Inspection | **5** |
| | IEC Monthly Environmental Site Audit | **1** |

### BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.03 No exceedance of air quality and construction noise monitoring were recorded in this Reporting Period. No Notification of Exceedance (NOE) was therefore issued. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

| Environmental Issues | Monitoring Parameters | Action Level | Limit Level | Event & Action | | |
|---|---|---|---|---|---|---|
| | | | | NOE Issued | Investigation | Corrective Actions |
| Air Quality | 1-hour TSP | 0 | 0 | 0 | - | - |
| | 24-hour TSP | 0 | 0 | 0 | - | - |
| Construction Noise | $L_{Aeq(30min)}$ | 0 | 0 | 0 | - | - |

*Note: NOE – Notification of Exceedance*

### ENVIRONMENTAL COMPLAINT

ES.04 No environmental complaint was recorded or received in this Reporting Period. The statistics of environmental complaint are summarized in the following table.

| Reporting Period | Environmental Complaint Statistics | | |
|---|---|---|---|
| | Frequency | Cumulative | Complaint Nature |
| 1 to 30 April 2018 | 0 | 0 | NA |

### NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.05 No environmental summons or successful prosecutions were recorded in this Reporting Period. The statistics of environmental complaint are summarized in the following tables.

| Reporting Period | Environmental Summons Statistics | | |
|---|---|---|---|
| | Frequency | Cumulative | Complaint Nature |
| 1 to 30 April 2018 | 0 | 0 | NA |

| Reporting Period | Environmental Prosecution Statistics | | |
|---|---|---|---|
| | Frequency | Cumulative | Complaint Nature |
| 1 to 30 April 2018 | 0 | 0 | NA |

### REPORTING CHANGE

ES.06 There were no reporting changes in the Reporting Period.

### SITE INSPECTION BY EXTERNAL PARTIES

ES.07 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor was carried out on **6, 12, 19, 26 and 30 April 2018**. Furthermore, IEC attend site inspection was on **30 April 2018.** No non-compliance was noted.

**FUTURE KEY ISSUES**

ES.08 Key issues to be considered in the coming month for the Contract include:

| Major Construction Works | Potential Pollution Issues | Mitigation Measures |
|---|---|---|
| Excavation Works | - Dust impact from excavation work, dusty material handling and during concrete production | 1. Implement dust suppression measures at all times;<br>2. Implement construction site runoff control practices and measures at all times |
| Concreting Works | - Muddy runoff water generated from the dusty material stockpile during rainy days. | |

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# 1 INTRODUCTION

## 1.1 PROJECT BACKGROUND

1.1.1 The existing Shek Wu Hui Sewage Treatment Works (hereafter referred as "SWHSTW") with secondary level treatment to sewage collected from Sheung Shui, Fanling and adjacent areas is operated and maintained by Drainage Services Department (hereafter referred as "DSD"). Based on the preliminary design of the Project, the scope of works for the Project comprises the following major components:

(a) Demolition of the existing Inlet Works and construction of the new Inlet Works, including inlet pumping station, screening and degritting facilities;
(b) Demolition of 4 existing circular Primary Sedimentation Tanks (PSTs) and construction of new rectangular PSTs;
(c) Construction of new pre-membrane screens;
(d) Modification of existing Bioreactor (BR) 1 and 2 to suit the proposed membrane bioreactor (MBR) process;
(e) Construction of a new standby Bioreactor;
(f) Demolition of 4 existing circular Final Sedimentation Tanks (FSTs) and construction of new Membrane Tanks and Membrane Facility Building;
(g) Reconstruction of sludge treatment facilities, including thickening, anaerobic digestion, biogas handling, sludge holding and dewatering facilities; and
(h) Other ancillary works.

1.1.2 According to the Project implementation programme, the construction of most of the above proposed works (hereinafter referred to as "Main Works") will be commencement in 2016 and completion in 2022. Furthermore, Advance Works as part of the above proposed works will carry out before Main Works commencement. The Advance Works will be commencement in third quarter of 2015 and comprise the following major components:

(a) Modification of BR1, through upgrading of electrical and mechanical (E&M) equipment and minor civil works, to suit the proposed MBR process;
(b) Demolition of FSTs 1 and 2 and construction of Membrane Tanks and the first phase of Membrane Facility Building; and
(c) Tree felling and transplanting, to facilitate timely construction of the new Inlet Works during the implementation of Main Works (under review).

1.1.3 The general layout of Advance Works and Main Works of SWHSTW Further Expansion Phase 1A show in ***Appendix A***. Subsequent to Further Expansion Phase 1A, the SWHSTW will be further expanded under separate projects (namely Further Expansion Phase 1B and Phase 2).

1.1.4 In July 2015, Tsun Yip Waterworks Construction Co Ltd (hereinafter referred as "Tsun Yip" or "the Contractor") has awarded the DSD Contract No. DC/2013/09 – ***Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road*** (hereinafter referred as "the Contract"). The Contract is the Advance Works for Shek Wu Hui Sewage Treatment Works as part of SWHSTW Further Expansion which is a Designated Project under Environmental Permit number FEP-02/474/2013 (hereinafter referred as "the FEP-02/474/2013" or "the EP").

1.1.5 The works under the Contract at Shek Wu Hui Sewage Treatment Works will be included the conversion of one existing bioreactor and two existing final sedimentation tanks into one membrane bioreactor. Moreover, construction of about 1.5 kilometres length of sewers at Ping Che Road and other ancillary works will be undertaken. The works of Contract are scheduled to be conduct about 25 months. Layout plan of the Contract is shown in ***Appendix B***.

1.1.6 Action-United Environmental Services & Consulting (hereinafter referred as "AUES") was appointed by the Contractor as an Environmental Team (hereinafter referred as "the ET") to implement the relevant EM&A program in accordance with the Updated EM&A Manual, as well as the associated duties.

1.1.7 As part of the EM&A program, baseline monitoring is required to determine the ambient environmental conditions. Hence baseline monitoring including air quality and noise were carried out between ***28 August 2015*** and ***12 September 2015*** at the proposed locations before construction work commencement. The "Baseline Monitoring Report (TCS00757/15/600/R0014 Version 2)" had submitted to EPD by the DSD before commencement of major construction works and approved by the IEC on 24 September 2015. Further to Tsun Yip's instructions, the EM&A program was commenced on 1 October 2015 and the monitoring schedule had been issued to relevant parties on 29 September 2015.

1.1.8 This is the **31st** Monthly EM&A Report presenting the monitoring results and inspection findings for the reporting period from **1** to **30 April 2018**.

## 1.2 REPORT STRUCTURE

1.2.1 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

| | |
|---|---|
| *SECTION 1* | *INTRODUCTION* |
| *SECTION 2* | *PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS* |
| *SECTION 3* | *SUMMARY OF MONITORING REQUIREMENTS* |
| *SECTION 4* | *MONITORING METHODOLOGY* |
| *SECTION 5* | *IMPACT MONITORING RESULTS* |
| *SECTION 6* | *WASTE MANAGEMENT* |
| *SECTION 7* | *SITE INSPECTIONS* |
| *SECTION 8* | *ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCE* |
| *SECTION 9* | *IMPLEMENTATION STATUES OF MITIGATION MEASURES* |
| *SECTION 10* | *CONCLUSIONS AND RECOMMENDATION* |

# 2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

## 2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.1.1 Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in ***Appendix C***.

## 2.2 CONSTRUCTION PROGRESS

2.1.2 3-Month Rolling Programme of the Project is enclosed in ***Appendix D*** and the major construction activities undertaken in this Reporting Month are illustrated in ***Appendix B*** and listed below:-

- Excavation, installation of formwork and reinforcement of base slab of chemical storage room
- Concreting of base slab of LV switch room
- Excavation of DN80, DN100 and DN300 pumping pipe outside MFB
- Installation of FRP handrailing at membrane facilities building
- Excavation of trench for installation of E&M cable duct
- Removal of Puddle pipe at BR1
- Laying granolithic kerb for staircase of membrane facilities building
- Installation of multi part cover of flowmeter chamber and flow drain chamber
- Internal Finishing and installation of trench cover
- Construction of underground drainage pipe
- Construction of steel platform at basement of membrane facilities building

## 2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.1.3 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Period is presented in ***Table 2-1***.

**Table 2-1 Status of Environmental Licenses and Permits**

| Item | Description | License/Permit Status |
|---|---|---|
| 1 | Air Pollution Control (Construction Dust) Regulation | Notified EPD on 30 July 2015 |
| 2 | Chemical waste Producer Registration (WPN: 5213-624-T3148-04) | Application date: 19/08/2015<br>Date approved: 18/9/2015 |
| 3 | Water Pollution Control Ordinance (Discharge License: WT00022503-2015) | Application date: 19/08/2015<br>Date approved: 18/9/2015 |
| 4 | Billing Account for Disposal of Construction Waste (Account Number: 7022898) | Granted on 02/09/2015 |
| 5 | Further Environmental Permit No. FEP-02/474/2013 | Granted on 15/02/2018 |

2.1.4 In accordance with the Further EP No. FEP-02/474/2013 Condition 2.3, an Updated Environmental Monitoring and Audit (EM&A) Manual (TCS00757/15/600/R0012v3) which certified by the Environmental Team (ET) Leader and verified by the Independent Environmental Checker (IEC), has submitted to DSD and EPD endorsement.

2.1.5 Baseline Monitoring Report (TCS00757/15/600/R0014v2) as certified by the ETL and verified by the IEC was submitted to the EPD on 24 September 2015 for endorsement.

# 3 SUMMARY OF IMPACT MONITORING REQUIREMENT

## 3.1 GENERAL

3.1.1 The Environmental Monitoring and Audit requirements are set out in the Updated EM&A manual. Environmental issues such as air quality and construction noise were identified as the key issues during the construction phase of Advance Works of the Project.

3.1.2 A summary of EM&A programme of construction phase are presented in the sub-sections below.

## 3.2 MONITORING PARAMETERS

3.2.1 The EM&A programme of construction phase shall cover the following environmental issues:
- Air quality; and
- Construction noise

3.2.2 A summary of the monitoring parameters is presented in ***Table 3-1*** below

**Table 3-1 Summary of EM&A Requirements**

| Environmental Issue | Parameters |
|---|---|
| Air Quality | • 1-hour TSP by Real-Time Portable Dust Meter; and<br>• 24-hour TSP by High Volume Air Sampler. |
| Construction Noise | • $Leq_{(30min)}$ during normal working hours; and<br>• $Leq_{(15min)}$ for the construction works undertaken in Restricted Hours, if necessary. |

## 3.3 MONITORING LOCATIONS

3.3.1 According to the *Updated EM&A Manual of* Advance Works which submitted to EPD on ***25 August 2015***, three air quality sensitive receivers and two construction noise sensitive receivers are proposed to monitor the environmental performance of the Contract. The proposed monitoring locations are summarized in ***Table 3-2*** and shown in ***Appendix E***.

**Table 3-2 Proposed Air Quality and Construction Noise Monitoring Locations**

| Aspect | Station ID | Location | Parameter |
|---|---|---|---|
| Air Quality | AM1 | No. 31 Wai Loi Tsuen | 1- hour and 24- hour TSP |
| | AM2 | Fu Tei Au | 1- hour |
| | AM2a | RE's Site Office | 24- hour TSP |
| Noise | NM1 | No. 31 Wai Loi Tsuen | $L_{eq(30min)}$ |
| | NM2 | Fu Tei Au | $L_{eq(30min)}$ |

## 3.4 MONITORING FREQUENCY AND PERIOD

3.4.1 The requirements of baseline monitoring are stipulated in *Sections 2.1.7 and 3.2.5* of the Updated *EM&A Manual* and presented as follows.

*Air Quality Monitoring*

3.4.2 Monitoring frequency for air quality baseline monitoring is as follows:
- 1-Hour TSP — 3 sets of 1-hour TSP monitoring shall be carried out once in every six days.
- 24-Hour TSP — 24-hour shall be carried out once in every six days.

*Noise Monitoring*

3.4.3 Construction noise monitoring should be carried out at the designated monitoring station when there are Project-related construction activities being undertaken within a radius of 300m from the monitoring stations. The monitoring frequency should depend on the scale of the construction activities. An initial guide on the monitoring is to obtain one set of 30-minute

measurement at each station between 0700 and 1900 hours on normal weekdays at a frequency of once a week when construction activities are underway.

3.4.4 If construction works are extended to include works during the hours of 1900 - 0700, additional weekly impact monitoring shall be carried out during evening and night-time works. Applicable permits under NCO shall be obtained by the Contractor.

## 3.5 MONITORING EQUIPMENT

*Air Quality Monitoring*

3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve.

3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

3.5.3 All equipment as used air quality monitoring is listed in ***Table 3-3***.

**Table 3-3 Air Quality Monitoring Equipment**

| Equipment | Model |
|---|---|
| ***24-Hr TSP*** | |
| High Volume Air Sampler | TISCH High Volume Air Sampler, HVS Model TE-5170 |
| Calibration Kit | TISCH Model TE-5025A |
| ***1-Hour TSP*** | |
| Portable Dust Meter | Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter |

*Wind Data Monitoring Equipment*

3.5.4 According to the Updated EM&A Manual Sections 2.1.3.8, alternative methods to obtain representative wind data was proposed by the ET. Meteorological information as extracted from "the Hong Kong Observatory Ta Kwu Ling Station" is alternative method to obtain representative wind data. For Ta Kwu Ling Station, it is located nearby the Project site. Moreover, this station is situated the sea level above 15mPD. The station's wind data monitoring equipment is set above the existing ground ten meters in compliance with the general setting up requirement. Furthermore, this station can also provide the humidity, rainfall, and air pressure and temperature etc. meteorological information. In a lot of Hong Kong development projects, weather information extracted from Hong Kong Observatory is a common alternative method if installation of weather station is not allowed.

*Noise Monitoring*

3.5.5 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m $s^{-1}$.

3.5.6 Noise monitoring equipment to be used for impact monitoring is listed in ***Table 3-4***.

**Table 3-4 Construction Noise Monitoring Equipment**

| Equipment | Model |
|---|---|
| Integrating Sound Level Meter | Rion NL - 52 |
| Calibrator | Rion NC – 74 |
| Portable Wind Speed Indicator | Testo Anemometer |

3.5.7 Sound level meters listed above comply with the *International Electrotechnical Commission*

*Publications 651: 1979 (Type 1)* and *804: 1985 (Type 1)* specifications, as recommended in TM issued under the NCO. The acoustic calibrator and sound level meter to be used in the baseline monitoring will be calibrated yearly.

## 3.6 DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.6.1 According to the baseline monitoring results and the Updated EM&A Manual, the air quality and construction noise criteria were set up, namely Action and Limit levels are listed in ***Tables 3-5 & 3-6*** as below.

**Table 3-5 Action and Limit Levels for 24-Hr TSP and 1-Hr TSP Air Quality, μg $m^{-3}$**

| Monitoring Stations | Action Level ($\mu g/m^3$) | | Limit Level ($\mu g/m^3$) | |
|---|---|---|---|---|
| | 1-hour | 24-hour | 1-hour | 24-hour |
| AM1 | 286 | 147 | 500 | 260 |
| AM2 | 276 | *NA* | 500 | *NA* |
| AM2a | *NA* | 155 | *NA* | 260 |

**Table 3-6 Action and Limit Levels for Construction Noise**

| Monitoring Stations | Action Level | Limit Level in dB(A) |
|---|---|---|
| **Time Period:** 0700-1900 hours on normal weekdays | | |
| NM1 and NM2 | When one documented complaint is received | > 75* dB(A) |

*Note: (*) Reduces to 70 dB(A) for schools and 65 dB(A) during the school examination periods.*

## 3.7 EVENT ACTION PLAN

3.7.1 If non-compliance or exceedance of the Action/Limit Levels is occurred, actions shall be taken in accordance with the Event Action Plan in ***Appendix F***.

# 4 MONITORING METHDOLOGY

## 4.1 AIR QUALITY MONITORING

### Monitoring Location

4.1.1 The detailed information of air quality monitoring stations referred to ***Table 3-2*** and the graphical plot of monitoring locations shown in ***Appendix E*** in this report.

### Monitoring Equipment

4.1.2 All the monitoring equipment to be used in the EM&A program as listed in ***Table 3-3*** has been agreed with the IEC.

### Monitoring Procedures

*1-hour TSP*

4.1.3 The 1-hour TSP monitor, a Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter was used for baseline monitoring, which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on $90^0$ light scattering. The 1-hour TSP monitor consisted of the following:

a. A pump to draw sample aerosol through the optic chamber where TSP is measured;
b. A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
c. A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

4.1.4 The 1-hour TSP meter used is within the valid period, calibrated by the manufacturer prior to purchasing. Zero response of the instrument was checked before and after each monitoring event. Operation of the 1-hour TSP meter was follow manufacturer's Operation and Service Manual. A valid calibration certificate is attached in ***Appendix G***.

*24-hour TSP*

4.1.5 The equipment used for 24-hour TSP measurement is a Tisch Environmental, Inc. Model TE-5170 TSP high volume air sampling system, which complied with EPA Code of Federal Regulation, Appendix B to Part 50. The High Volume Air Sampler (HVS) consists of the following:

a. An anodized aluminum shelter;
b. A 8"x10" stainless steel filter holder;
c. A blower motor assembly;
d. A continuous flow/pressure recorder;
e. A motor speed-voltage control/elapsed time indicator;
f. A 7-day mechanical timer, and
g. A power supply of 220v/50 hz

4.1.6 Prior to 24-hour TSP monitoring, the HVS was calibrated in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). The 24-hour TSP Monitoring using the HVS was also processed in accordance with the manufacturer's Operations Manual. A valid calibration certificate of the calibration kit with the certificate of HVS calibrated is attached in ***Appendix G***.

4.1.7 24-hour TSP was collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET keeps all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% HR (Relative Humidity) and 25°C, for six months prior to disposal.

## 4.2 CONSTRUCTION NOISE MONITORING

### Monitoring Location

4.2.1 The detailed information of construction noise monitoring stations referred to ***Table 3-2*** and the graphical plot of monitoring locations shown in ***Appendix E*** in this report.

### Monitoring Equipment

4.2.2 All the monitoring equipment to be used in the EM&A program as listed in ***Table 3-3*** has been agreed with the IEC.

4.2.3 Sound level meter listed in ***Table 3-4*** is complied with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications, as recommended in Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO). A valid of calibration certificates including sound level meter and an acoustic were shown in ***Appendix G.***

### Monitoring Procedures

4.2.4 The noise measurement was performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq(30min) in six consecutive Leq(5 min) measurements were used as the monitoring parameter throughout the baseline monitoring period.

4.2.5 During the monitoring, the sound level meter was mounted on a tripod at a height of about 1.2 m and placed at the monitoring locations and oriented such that the microphone was pointed to the site with the microphone facing perpendicular to the line of sight. The windshield was fitted for the measurement. For construction noise monitoring, all monitoring stations were conducted 1 m from the exterior of the building façade.

4.2.6 Prior to noise measurement, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. The calibration level from before and after the noise measurement agrees to within 1.0dB.

4.2.7 During the noise measurement, a portable wind speed meter was used to check wind speed (m/s). For impact noise monitoring, no wind speed was exceeding 5m/s or gusts exceeding 10m/s. Also, noise measurement in time was no fog and rain.

## 4.3 DATA MANAGEMENT AND DATA QA/QC CONTROL

4.3.1 The monitoring data were handled by the ET's in-house data recording and management system.

4.3.2 The monitoring data recorded in the equipment were downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data were input into a computerized database properly maintained by the ET. The laboratory results were input directly into the computerized database and checked by personnel other than those who input the data.

4.3.3 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

# 5 IMPACT MONITORING RESULTS

## 5.1 GENERAL

5.1.1 Air quality and construction noise monitoring scheduled in the Reporting Period is enclosed in ***Appendix H*** and the monitoring results are shown in the following sub-sections.

## 5.2 RESULTS OF AIR QUALITY MONITORING

5.2.1 The results for 24-hour and 1-hour TSP are summarized in ***Tables 5-1 to 5-2***. The 24-hour TSP data are shown in ***Appendix I*** and graph plots including 1-hour TSP and 24-hour TSP are shown in ***Appendix J***.

**Table 5-1 Summary of 1-Hour TSP Monitoring Results, µg/m³**

| DATE | AM1 | | | | AM2 | | | |
|---|---|---|---|---|---|---|---|---|
| | Start Time | 1st Meas. | 2nd Meas. | 3rd Meas. | Start Time | 1st Meas. | 2nd Meas. | 3rd Meas. |
| 3-Apr-18 | 9:41 | 51 | 50 | 56 | 13:14 | 45 | 49 | 50 |
| 9-Apr-18 | 9:33 | 55 | 52 | 54 | 13:41 | 54 | 53 | 55 |
| 13-Apr-18 | 9:34 | 37 | 42 | 45 | 13:08 | 49 | 54 | 58 |
| 19-Apr-18 | 9:31 | 50 | 48 | 50 | 13:28 | 61 | 59 | 60 |
| 25-Apr-18 | 9:42 | 77 | 78 | 79 | 13:09 | 81 | 84 | 89 |
| 30-Apr-18 | 9:21 | 64 | 58 | 60 | 13:03 | 75 | 74 | 61 |
| Average (Range) | **56 (37 - 79)** | | | | **62 (45 - 89)** | | | |

**Table 5-2 Summary of 24-hour TSP Monitoring Results, µg/m³**

| Date | AM1 | AM2a |
|---|---|---|
| 4-Apr-18 | 43 | 66 |
| 10-Apr-18 | 66 | 70 |
| 16-Apr-18 | 61 | 64 |
| 21-Apr-18 | 24 | 55 |
| 27-Apr-18 | 31 | 62 |
| Average (Range) | **45 (24 - 66)** | **63 (55 - 70)** |

5.2.2 As shown in ***Tables 5-1*** and ***5-2***, the 24-hour and 1-hour TSP monitoring results were below the Action/ Limit Level. No Notification of Exceedances (NOE) of air quality criteria or corrective action was therefore required.

5.2.3 The meteorological data during the Reporting Month is summarized in ***Appendix K***.

5.2.4 Construction dust assessment for short term impact was undertaken in the EIA study. In view of the current contract, monitoring locations AM1 and AM2a are not an ASR during the EIA study and therefore no prediction was made. For 1-hour TSP monitoring location AM2, it is very near the assessment point FLN-E13 in the EIA. According to the EIA prediction, the predicted result for Tier 2 in assessment year 2018 is 91.0µg/m³ for 1-hour TSP and the cumulative 1-hour concentrations would comply with the respective criteria and adverse short-term construction dust impact is not anticipated. It is concluded that the overall 1-hour TSP monitoring result in the Reporting Period is comparable to the EIA prediction.

## 5.3 RESULTS OF CONSTRUCTION NOISE MONITORING

5.3.1 In the Reporting Period, a total of 10 event noise measurements were carried out at the two designated locations. During construction noise monitoring, the sound level meter was set in 1m from the exterior of the building façade. Therefore, no façade correction (+3dB(A)) is added according to acoustical principles and EPD guidelines. The construction noise monitoring results at the designated locations are summarized in ***Table 5-3.*** The detailed noise monitoring data are presented in ***Appendix I*** and the relevant graphical plots are shown in ***Appendix J.***

**Table 5-3 Summary of Construction Noise Monitoring Results, dB(A)**

| Date | NM1 | | NM2 | |
|---|---|---|---|---|
| | Time of Measurement | ($L_{eq30min}$) | Time of Measurement | ($L_{eq30min}$) |
| 3-Apr-18 | 10:10 | 53 | 13:26 | 50 |
| 9-Apr-18 | 9:46 | 52 | 13:21 | 50 |
| 19-Apr-18 | 9:34 | 52 | 13:36 | 49 |
| 25-Apr-18 | 9:41 | 59 | 10:26 | 51 |
| 30-Apr-18 | 9:31 | 53 | 10:35 | 50 |
| **Limit Level** | **75 dB(A)** | | | |

5.3.2 As shown in ***Table 5-3***, the noise level measured at the designated monitoring locations are well below 75dB(A). Furthermore, there was no noise complaints (Action Level exceedance) received by the RE, Contractors or DSD in the Reporting Period. Therefore, no Action or Limit Level exceedance was triggered and no corrective action was required.

# 6 WASTE MANAGEMENT

## 6.1 GENERAL WASTE MANAGEMENT

6.1.1 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

## 6.2 RECORDS OF WASTE QUANTITIES

6.2.1 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

6.2.2 The quantities of waste for disposal in this Reporting Period are summarized in ***Tables 6-1*** and ***6-2*** and the Monthly Summary Waste Flow Table is shown in ***Appendix L***. Whenever possible, materials were reused on-site as far as practicable.

**Table 6-1 Summary of Quantities of Inert C&D Materials for the Project**

| Type of Waste | Quantity | | | Disposal Location |
|---|---|---|---|---|
| | Prior Months | Reporting Month | Cumulated | |
| Total C&D Materials (Inert) (in '000$m^3$) | 20.80 | 0.99 | 21.79 | -- |
| Hard Rock and Large Broken Concrete (Inert) (in '000 $m^3$) | 1.79 | 0.33 | 2.12 | Tuen Mun 38 |
| Reused in this Project (Inert) (in '000 $m^3$) | 3.27 | 0.10 | 3.37 | -- |
| Reused in other Projects (Inert) (in '000 $m^3$) | 2.23 | 0.00 | 2.23 | -- |
| Disposal as Public Fill (Inert) (in '000 $m^3$) | 13.61 | 0.56 | 14.17 | Tuen Mun 38 |

Remark: The figures were rounded off to two decimal places.

**Table 6-2 Summary of Quantities of C&D Wastes for the Project**

| Type of Waste | Quantity | | | Disposal Location |
|---|---|---|---|---|
| | Prior Months | Reporting Month | Cumulated | |
| Metals ('000kg) | 142.00 | 0.00 | 142.00 | -- |
| Paper / Cardboard Packing ('000kg) | 0.07 | 0.00 | 0.07 | -- |
| Plastics ('000kg) | 0.00 | 0.00 | 0.00 | -- |
| Chemical Wastes ('000kg) | 0.00 | 0.00 | 0.00 | -- |
| General Refuses ('000$m^3$) | 0.97 | 0.04 | 1.01 | NENT |

Remark: The figures were rounded off to two decimal places.

# 7 SITE INSPECTION

## 7.1 REQUIREMENTS

7.1.1 According to the Updated EM&A Manual, the environmental site inspection shall be formulated by ET Leader. Weekly environmental site inspections should carry out to confirm the environmental performance.

## 7.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

7.2.1 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor has been carried out on **6, 12, 19, 26 and 30 April 2018.** Furthermore, IEC attend site inspection was on **30 April 2018.** No non-compliance was noted.

7.2.2 Observations for the site inspections and monthly audit within this Reporting Period are summarized in ***Table 7-1***.

**Table 7-1 Site Observations**

| Date | Findings / Deficiencies | Follow-Up Status |
|---|---|---|
| 27 March 2018 | • Dry unpaved haul road was observed near main building. The Contractor should spray water regularly for dust suppression. | • Water spray for dry haul road was provided. Last observation closed. |
| 6 April 2018 | • Drip tray should be provided for free-standing chemcial to avoid land contamination.<br>• The Contractor was reminded to place generator inside drip tray when use it. | • Chemical containers were removed from site area. Last observation closed.<br>• Not required for reminder. |
| 12 April 2018 | • Fire extiguishers were observed at the drip tray under generator next to main building. The Contractor should remove fire extinguishers from drip tray. | • Fire extiguishers were removed from drip tray. Last obsetvation closed. |
| 19 April 2018 | • The Contractor was reminded to clean mud on the public road within site area. | • Not required for reminder. |
| 26 April 2018 | • Stagnant water was observed at drip tray under the generator. The Contractor should remove the stagnant water to prevent mosquito breeding. | • On-going. |
| 30 April 2018 | • No adverse environemtal issue was observed during site inspection. | • Nil. |

7.2.3 In the Reporting Period, the overall environmental performance was considered satisfactory.

# 8 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

## 8.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

8.1.1 No environmental complaint, summons and prosecution was received in this reporting period. The statistical summary table of environmental complaint is presented in ***Tables 8-1, 8-2*** and ***8-3***.

**Table 8-1 Statistical Summary of Environmental Complaints**

| Reporting Period | Environmental Complaint Statistics | | |
|---|---|---|---|
| | Frequency | Cumulative | Complaint Nature |
| 1 to 30 April 2018 | 0 | 0 | NA |

**Table 8-2 Statistical Summary of Environmental Summons**

| Reporting Period | Environmental Summons Statistics | | |
|---|---|---|---|
| | Frequency | Cumulative | Complaint Nature |
| 1 to 30 April 2018 | 0 | 0 | NA |

**Table 8-3 Statistical Summary of Environmental Prosecution**

| Reporting Period | Environmental Prosecution Statistics | | |
|---|---|---|---|
| | Frequency | Cumulative | Complaint Nature |
| 1 to 30 April 2018 | 0 | 0 | NA |

# 9 IMPLEMENTATION STATUS OF MITIGATION MEASURES

## 9.1 GENERAL REQUIREMENTS

9.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the Updated EM&A Manual covered the issues of dust, noise, water and waste and they are summarized presented in ***Appendix M***.

9.1.2 The Contract under the Project shall be implementing the required environmental mitigation measures according to the Updated EM&A Manual as subject to the site condition. Environmental mitigation measures generally implemented by the Contract in this Reporting Period are summarized in ***Table 9-1***.

**Table 9-1 Environmental Mitigation Measures**

| Issues | Environmental Mitigation Measures |
|---|---|
| Water Quality | • Wastewater to be treated by the filtration systems i.e. sedimentation tank before to discharge. |
| Air Quality | • Maintain wet surface on access road<br>• All vehicles must be used wheel washing facility before off site<br>• Spray water during breaking works<br>• A cleaning truck was regularly performed on the public road to prevent fugitive dust emission |
| Noise | • Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday.<br>• Keep good maintenance of plants<br>• Shut down the plants when not in used. |
| Waste and Chemical Management | • On-site sorting prior to disposal<br>• Follow requirements and procedures of the "Trip-ticket System"<br>• Predict required quantity of concrete accurately<br>• Collect the unused fresh concrete at designated locations in the sites for subsequent disposal |
| General | • The site was generally kept tidy and clean. |

9.1.3 Based on monitoring results including air quality and construction noise, it is considered that the environmental mitigation measures implemented by the Contractor in this Reporting Period are effective.

## 9.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

9.2.1 Construction activities listed below will be undertaken in the coming month for the Contract of the Project.

- Excavation, installation of formwork and reinforcement of wall and roof slab of chemical storage room
- Concreting of base slab of chemical storage room
- Installation of formwork and reinforcement of wall and roof slab of LV switch room
- Concreting the wall and roof slab of chemical storage room and LV switch room
- Excavation of DN80, DN100 and DN300 pumping pipe outside MFB
- Excavation of DN80, DN100 pipe near pretreatment chamber
- Excavation of trench for installation of E&M cable duct
- Installation of FRP railng at roof of membrane facilities building
- Installation of multi part cover of flowmeter chamber and flow drain chamber
- Construction of underground drainage pipe
- Laying subbase for road work construction

## 9.3 KEY ISSUES FOR THE COMING MONTH

9.3.1 Key issues to be considered in the coming month for the Contract include:

| Major Construction Works | Potential Pollution Issues | Mitigation Measures |
|---|---|---|
| Excavation Works | - Dust impact from excavation work, dusty material handling and during concrete production | 1. Implement dust suppression measures at all times;<br>2. Implement construction site runoff control practices and measures at all times |
| Concreting Works | - Muddy runoff water generated from the dusty material stockpile during rainy days. | |

# 10 CONCLUSIONS AND RECOMMENTATIONS

## 10.1 CONCLUSIONS

10.1.1 This is the **31st** Monthly EM&A report, covering the construction period from **1 to 30 April 2018**.

10.1.2 No 24-hour or 1-hour TSP monitoring results that triggered the Action or Limit Levels were recorded. No NOEs or the associated corrective actions were therefore issued.

10.1.3 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in this Reporting Period. No NOEs or the associated corrective actions were therefore issued.

10.1.4 No documented complaint, notification of summons or successful prosecution was received.

10.1.5 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor was carried out on **6, 12, 19, 26 and 30 April 2018**. Furthermore, IEC attend site inspection was on **30 April 2018.** No non-compliance was noted.

## 10.2 RECOMMENDATIONS

10.2.1 As wet season is approaching, special attention should be paid to avoid ingress of surface runoff into nearby water bodies from the construction site. Water quality mitigation measures should be fully implemented.

10.2.2 Moreover, air quality mitigation measures including wheel wash facilities, watering of haul roads and covering of dusty materials with tarpaulin sheet, etc. should be properly maintained.

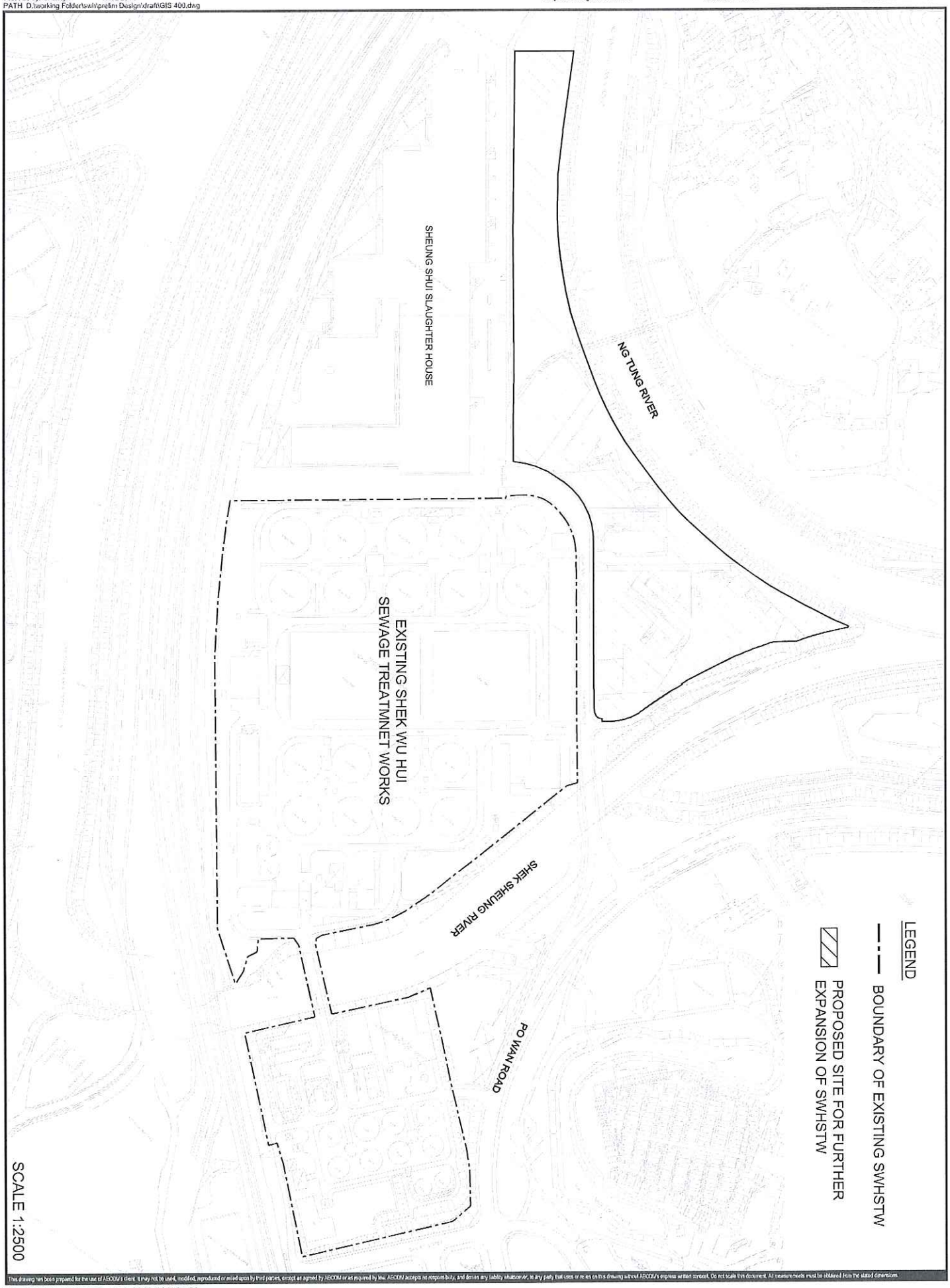
10.2.3 To control the site performance on waste management, Tsun Yip shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration. Tsun Yip is also reminded to implement the recommended environmental mitigation measures according to the Updating Environmental Monitoring and Audit Manual.

# Appendix A

# GENERAL LAYOUT OF ADVANCE WORKS AND MAIN WORKS OF SWHSTW FURTHER EXPANSION PHASE 1A

Plot File by: Chancp1 19/02/2014
PATH D:\working Folder\swh\prelim Design\draft\GIS 400.dwg

Project Management Initials: Checked: CYKY ISO A3 297mm x 420mm






**AGREEMENT NO. CE 40/2012 (DS)**
**SHEK WU HUI SEWAGE TREATMENT WORKS**
**- FURTHER EXPANSION PHASE 1A**
**- INVESTIGATION**
Project No.: 60284037 Date: FEB. 2014

LOCATION OF THE EXISTING SWHSTW AND THE PROPOSED SITE FOR FURTHER EXPANSION

AECOM

**Drawing 60284037/EM&AM/400**

Plot File by: Champ1 19/02/2014
PATH: D:\working Folder\swh\prelim Design\draft\GIS 401.dwg

Project Management Initials: Checked: CYKY

ISO A3 297mm x 420mm




| ZONE | EXISTING USAGE | PROPOSED USAGE |
|---|---|---|
| A | SLUDGE TREATMENT (SOLID STREAM) AND ANCILLARY FACILITIES | ANCILLARY FACILITIES |
| B | SEWAGE TREATMENT (LIQUID STEAM) | SEWAGE TREATMENT (LIQUID STREAM) |
| C | TEMPORARY WORKS SITE | SLUDGE TREATMENT (SOLID STREAM) |
| D | VACANT | RECLAIMED WATER FACILITIES |

SCALE 1:2500



**AGREEMENT NO. CE 40/2012 (DS)**
**SHEK WU HUI SEWAGE TREATMENT WORKS**
**- FURTHER EXPANSION PHASE 1A**
**- INVESTIGATION**
Project No.: 60284037 Date: FEB. 2014

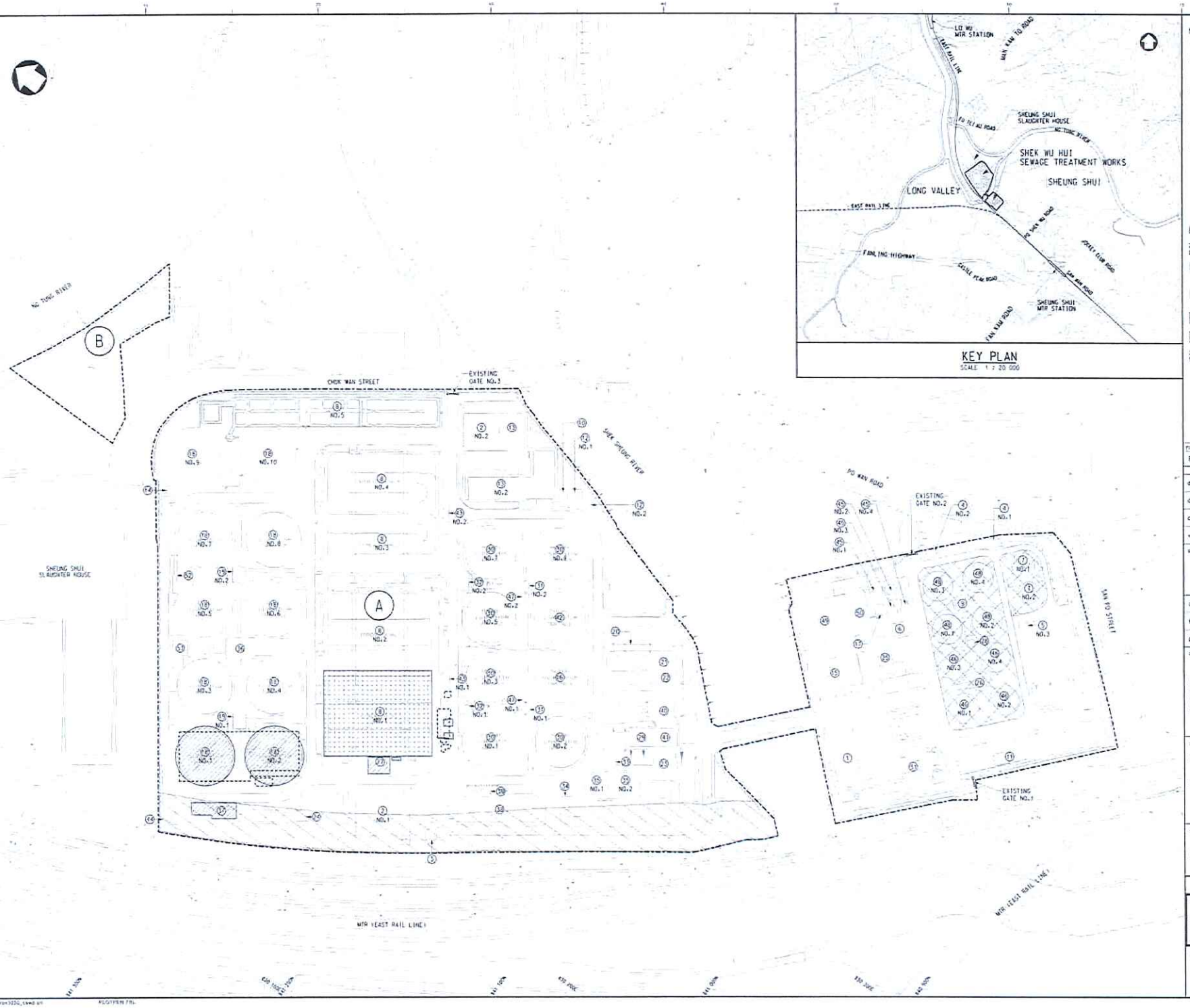
PREFERRED SITE UTILIZATION
ACCORDING TO BRIEF

AECOM

**Drawing 60284037/EM&AM/401**

# Appendix B

# LAYOUT PLAN OF ADVANCE WORKS




NOTES

1. ALL GRIDS REFER TO HONG KONG 1980 GRID.
2. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF SCC 22 AND PS CLAUSES 1.66(1)(b) AND PS APPENDIX 1.15 FOR WORKS IN THE VICINITY OF MTR.
3. PORTION 'A' IS INSIDE EXISTING SWMSTW. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF PS CLAUSE 1.45 AND 26.27 FOR WORKS INSIDE SWMSTW.
4. THE CONTRACTOR'S ATTENTION IS DRAWN TO PS SECTION 29 FOR THE SAFETY REQUIREMENTS FOR WORKS IN GAS RISK AREA.
5. CHOK WAN STREET IS THE MAIN ACCESS FOR THE SHEUNG SHUI SLAUGHTER HOUSE. THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTION TO ENSURE THE CHOK WAN STREET WILL NOT BE AFFECTED FOR ANY OF HIS WORKS NEARBY.

LEGEND :

- SITE BOUNDARY
- GAS RISK AREA
- AREA WITHIN WHICH SCC 22 AND PS CLAUSES 1.66(1)(b) AND 1.13(c) & PS APPENDIX 1.39 SHALL APPLY
- EXISTING STRUCTURE TO BE DEMOLISHED
- EXISTING STRUCTURE TO BE MODIFIED
- PROPOSED STRUCTURE
- (A) PORTION A OF THE SITE

| no. | date | description | initial |
|---|---|---|---|
| REVISION | | | |

| | name | date |
|---|---|---|
| designed | K. F. IPANG | 12 DEC 2014 |
| drawn | C. C. CHAN | 12 DEC 2014 |
| checked | K. C. POON | 12 DEC 2014 |
| vetted | Ir K. W. LAU | 12 DEC 2014 |

approved

Ir C. H. LAI
Chief Engineer — 12 DEC 2014 Date

| | |
|---|---|
| contract no. | DC/2013/09 |
| hkr no. | SP8/4388DS |
| project no. | 4388DS |

contract

ADVANCE WORKS FOR SHEK WU HUI SEWAGE TREATMENT WORKS - FURTHER EXPANSION PHASE 1A AND SEWERAGE WORKS AT PING CHE ROAD

drawing title

PORTION A - PORTIONS OF THE SITE

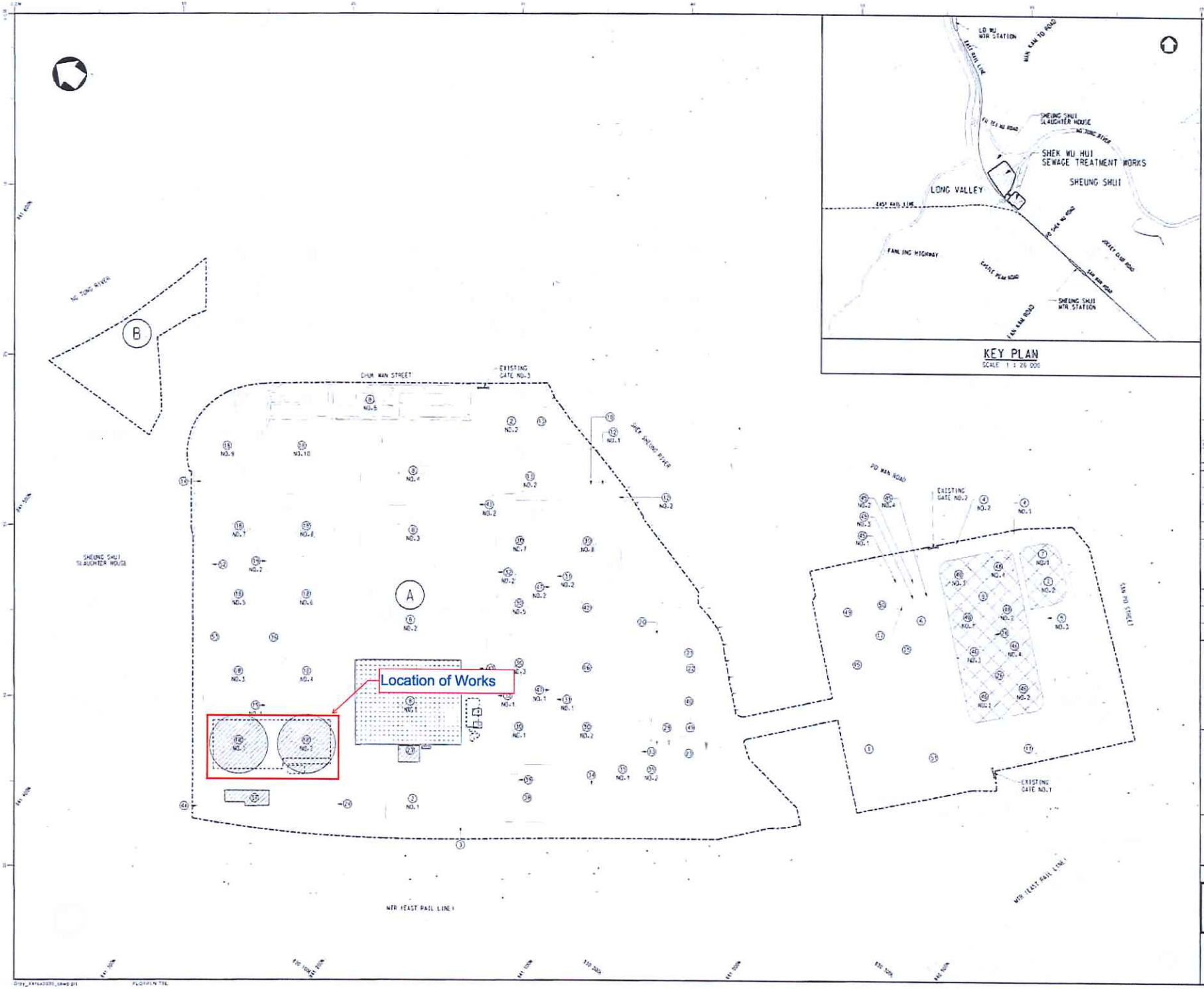
| drawing no. | scale |
|---|---|
| DSP/DC1309/11021 | 1 : 1000 OR AS SHOWN |



office

SEWERAGE PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION







KEY PLAN
SCALE 1 : 20 000

NOTES:

1. ALL GRIDS REFER TO HONG KONG 1980 GRID.
2. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF DCC 22 AND PS CLAUSES 1.66(10) AND PS APPENDIX 1.18 FOR WORKS IN THE VICINITY OF MTR.
3. PORTION "A" IS INSIDE EXISTING SWMSTW. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF PS CLAUSE 7.45 AND 28.27 FOR WORKS INSIDE SWMSTW.
4. THE CONTRACTOR'S ATTENTION IS DRAWN TO PS SECTION 28 FOR THE SAFETY REQUIREMENTS FOR WORKS IN GAS RISK AREA.
5. CHUK WAN STREET IS THE MAIN ACCESS FOR THE SHEUNG SHUI SLAUGHTER HOUSE. THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTION TO ENSURE THE CHUK WAN STREET WILL NOT BE AFFECTED FOR ANY OF HIS WORKS NEARBY.

LEGEND :

- SITE BOUNDARY
- GAS RISK AREA
- EXISTING STRUCTURE TO BE DEMOLISHED
- EXISTING STRUCTURE TO BE MODIFIED
- PROPOSED STRUCTURE
- (A) PORTION A OF THE SITE

**FOR TENDER PURPOSES ONLY**

| no. | date | description | initial |
|---|---|---|---|
| 1 | 26 JAN 2015 | GENERAL REVISION | |

REVISION

| | | name | date |
|---|---|---|---|
| designed | SIGNED | H. F. FUNG | 12 DEC 2014 |
| drawn | SIGNED | C. S. CHAN | 12 DEC 2014 |
| checked | SIGNED | W. C. YUEN | 12 DEC 2014 |
| vetted | SIGNED | [illegible] | 12 DEC 2014 |

approved

SIGNED
[illegible]
Chief Engineer — 12 DEC 2014 Date

| | |
|---|---|
| contract no. | DC/2013/09 |
| file no. | SP8/4388DS |
| project no. | 4388DS |

contract

ADVANCE WORKS FOR SHEK WU HUI SEWAGE TREATMENT WORKS - FURTHER EXPANSION PHASE 1A AND SEWERAGE WORKS AT PING CHE ROAD

drawing title

PORTION A -

PORTIONS OF THE SITE

| drawing no. | scale |
|---|---|
| DSP/DC1309/11021A | 1 : 1000 OR AS SHOWN |



office

SEWERAGE PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

# Appendix C

# ORGANIZATION STRUCTURE AND CONTACT DETAILS OF RELEVANT PARTIES

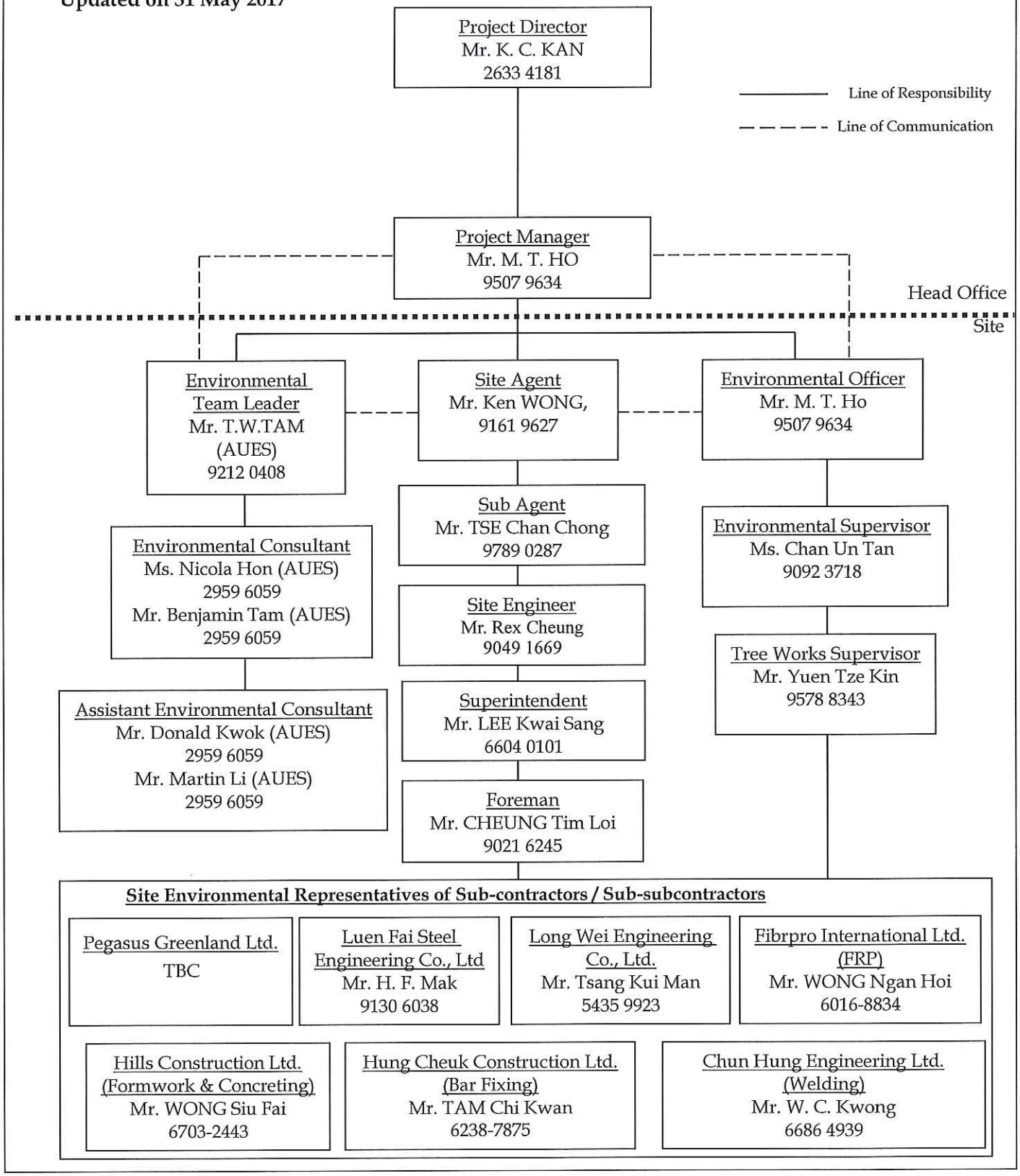
**Tsun Yip Waterworks Construction Company Limited**
**進業水務建築有限公司**

**Contract No. DC/2013/09**

***Advance Works for Shek Wu Hui Sewage Treatment Works***
***- Further Expansion Phase 1A and Sewerage Works at Ping Che Road***

## SITE ENVIRONMENTAL TEAM ORGANIZATION CHART

**Updated on 31 May 2017**



**Contact Details of Relevant Parties**

| Organization | Project Role | Name of Key Staff | Tel No. | Fax No. |
|---|---|---|---|---|
| DSD | Resident Site Engineer | Mr. Michael Leung | 2594 7463 | 2827 8700 |
| ANewR | Independent Environmental Checker | Mr. Adi Lee | 2618 2836 | 3007 8648 |
| Tsun Yip | Project Director | Mr. K. C. KAN | 2633 4181 | 2633 4691 |
| Tsun Yip | Project Manager | Mr. M. T. HO | 9507 9634 | 2633 4691 |
| Tsun Yip | Site Agent | Mr. Ken WONG | 9161 9627 | 2633 4691 |
| Tsun Yip | Environmental Officer | Mr. M.T.HO | 9507 9634 | 2633 4691 |
| AUES | Environmental Team Leader | Mr. T. W. Tam | 2959 6059 | 2959 6079 |
| AUES | Environmental Consultant | Ms. Nicola Hon | 2959 6059 | 2959 6079 |
| AUES | Environmental Consultant | Mr. Ben Tam | 2959 6059 | 2959 6079 |
| AUES | Assistant Environmental Consultant | Mr. Martin Li | 2959 6059 | 2959 6079 |

Legend:

*DSD (Employer & Resident Site Engineer) – Drainage Service Department*

*Tsun Yip (Main Contractor) – Tsun Yip Waterworks Construction Co Ltd*

*ANEWR (IEC) – ANEWR Consulting Limited*

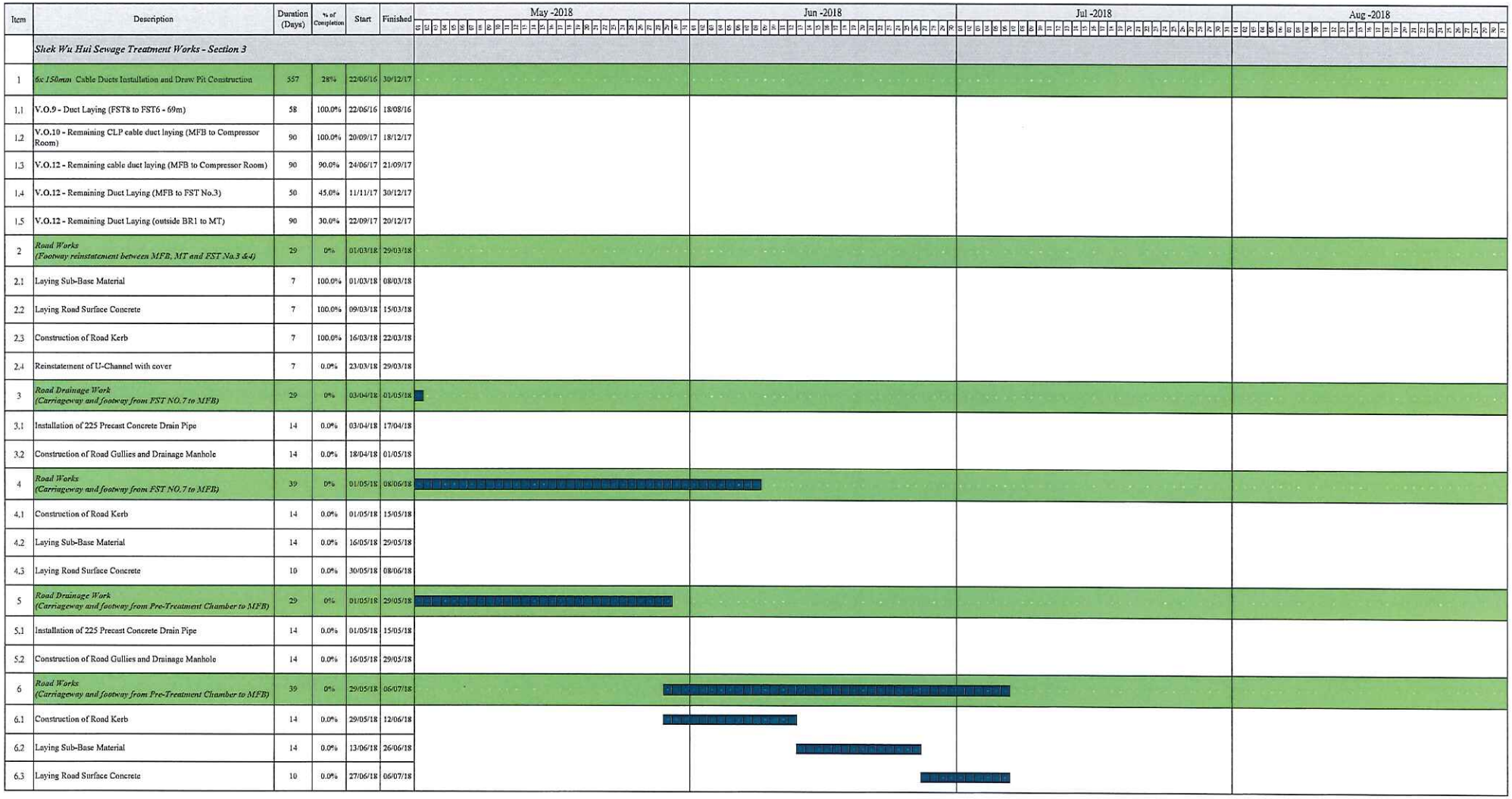
*AUES (ET) – Action-United Environmental Services & Consulting*

# Appendix D

# 3-MONTH ROLLING PROGRAM

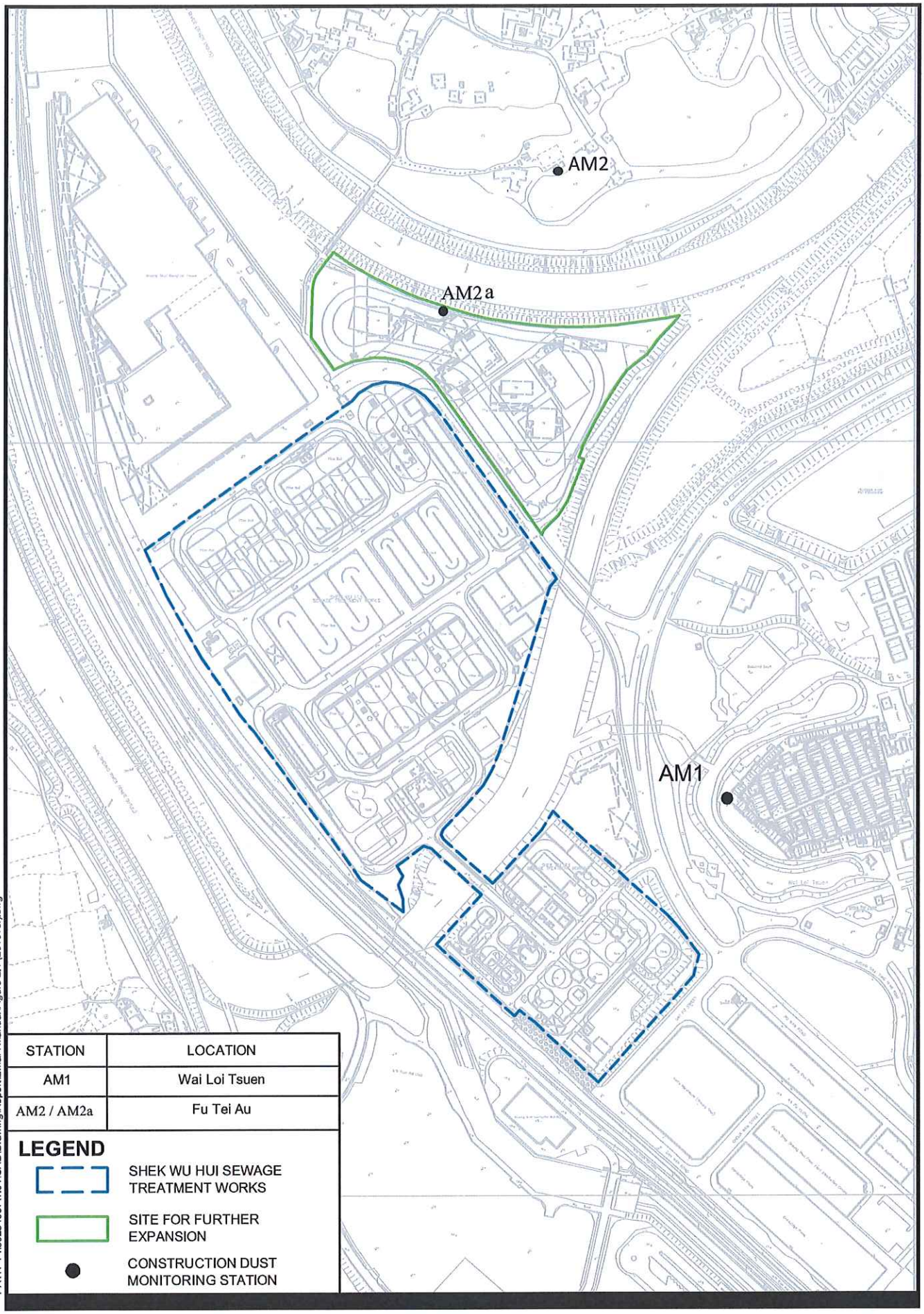
**Contract No. DC/2013/09**
**Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road**
**3-Month Rolling Programme (Shek Wu Hui Sewage Treatment Works - Section 3) in May 2018**

| Item | Description | Duration (Days) | % of Completion | Start | Finished |
|---|---|---|---|---|---|
| | *Shek Wu Hui Sewage Treatment Works - Section 3* | | | | |
| 1 | *6x 150mm* Cable Ducts Installation and Draw Pit Construction | 557 | 28% | 22/06/16 | 30/12/17 |
| 1.1 | **V.O.9** - Duct Laying (FST8 to FST6 - 69m) | 58 | 100.0% | 22/06/16 | 18/08/16 |
| 1.2 | **V.O.10** - Remaining CLP cable duct laying (MFB to Compressor Room) | 90 | 100.0% | 20/09/17 | 18/12/17 |
| 1.3 | **V.O.12** - Remaining cable duct laying (MFB to Compressor Room) | 90 | 90.0% | 24/06/17 | 21/09/17 |
| 1.4 | **V.O.12** - Remaining Duct Laying (MFB to FST No.3) | 50 | 45.0% | 11/11/17 | 30/12/17 |
| 1.5 | **V.O.12** - Remaining Duct Laying (outside BR1 to MT) | 90 | 30.0% | 22/09/17 | 20/12/17 |
| 2 | *Road Works (Footway reinstatement between MFB, MT and FST No.3 &4)* | 29 | 0% | 01/03/18 | 29/03/18 |
| 2.1 | Laying Sub-Base Material | 7 | 100.0% | 01/03/18 | 08/03/18 |
| 2.2 | Laying Road Surface Concrete | 7 | 100.0% | 09/03/18 | 15/03/18 |
| 2.3 | Construction of Road Kerb | 7 | 100.0% | 16/03/18 | 22/03/18 |
| 2.4 | Reinstatement of U-Channel with cover | 7 | 0.0% | 23/03/18 | 29/03/18 |
| 3 | *Road Drainage Work (Carriageway and footway from FST NO. 7 to MFB)* | 29 | 0% | 03/04/18 | 01/05/18 |
| 3.1 | Installation of 225 Precast Concrete Drain Pipe | 14 | 0.0% | 03/04/18 | 17/04/18 |
| 3.2 | Construction of Road Gullies and Drainage Manhole | 14 | 0.0% | 18/04/18 | 01/05/18 |
| 4 | *Road Works (Carriageway and footway from FST NO. 7 to MFB)* | 39 | 0% | 01/05/18 | 08/06/18 |
| 4.1 | Construction of Road Kerb | 14 | 0.0% | 01/05/18 | 15/05/18 |
| 4.2 | Laying Sub-Base Material | 14 | 0.0% | 16/05/18 | 29/05/18 |
| 4.3 | Laying Road Surface Concrete | 10 | 0.0% | 30/05/18 | 08/06/18 |
| 5 | *Road Drainage Work (Carriageway and footway from Pre-Treatment Chamber to MFB)* | 29 | 0% | 01/05/18 | 29/05/18 |
| 5.1 | Installation of 225 Precast Concrete Drain Pipe | 14 | 0.0% | 01/05/18 | 15/05/18 |
| 5.2 | Construction of Road Gullies and Drainage Manhole | 14 | 0.0% | 16/05/18 | 29/05/18 |
| 6 | *Road Works (Carriageway and footway from Pre-Treatment Chamber to MFB)* | 39 | 0% | 29/05/18 | 06/07/18 |
| 6.1 | Construction of Road Kerb | 14 | 0.0% | 29/05/18 | 12/06/18 |
| 6.2 | Laying Sub-Base Material | 14 | 0.0% | 13/06/18 | 26/06/18 |
| 6.3 | Laying Road Surface Concrete | 10 | 0.0% | 27/06/18 | 06/07/18 |



# Appendix E

# PROPOSED MONITORING LOCATIONS




| STATION | LOCATION |
|---|---|
| AM1 | Wai Loi Tsuen |
| AM2 / AM2a | Fu Tei Au |

**LEGEND**

- SHEK WU HUI SEWAGE TREATMENT WORKS
- SITE FOR FURTHER EXPANSION
- CONSTRUCTION DUST MONITORING STATION

ISO A4 210mm x 297mm

Checked:

Project Management Initials:

Plot File by: Shumyji 26/02/2014
PATH P:\60284037\1.01\CAD\Drawing\Report\EM&A Manual\Figure 2.1 (2010ver).dwg

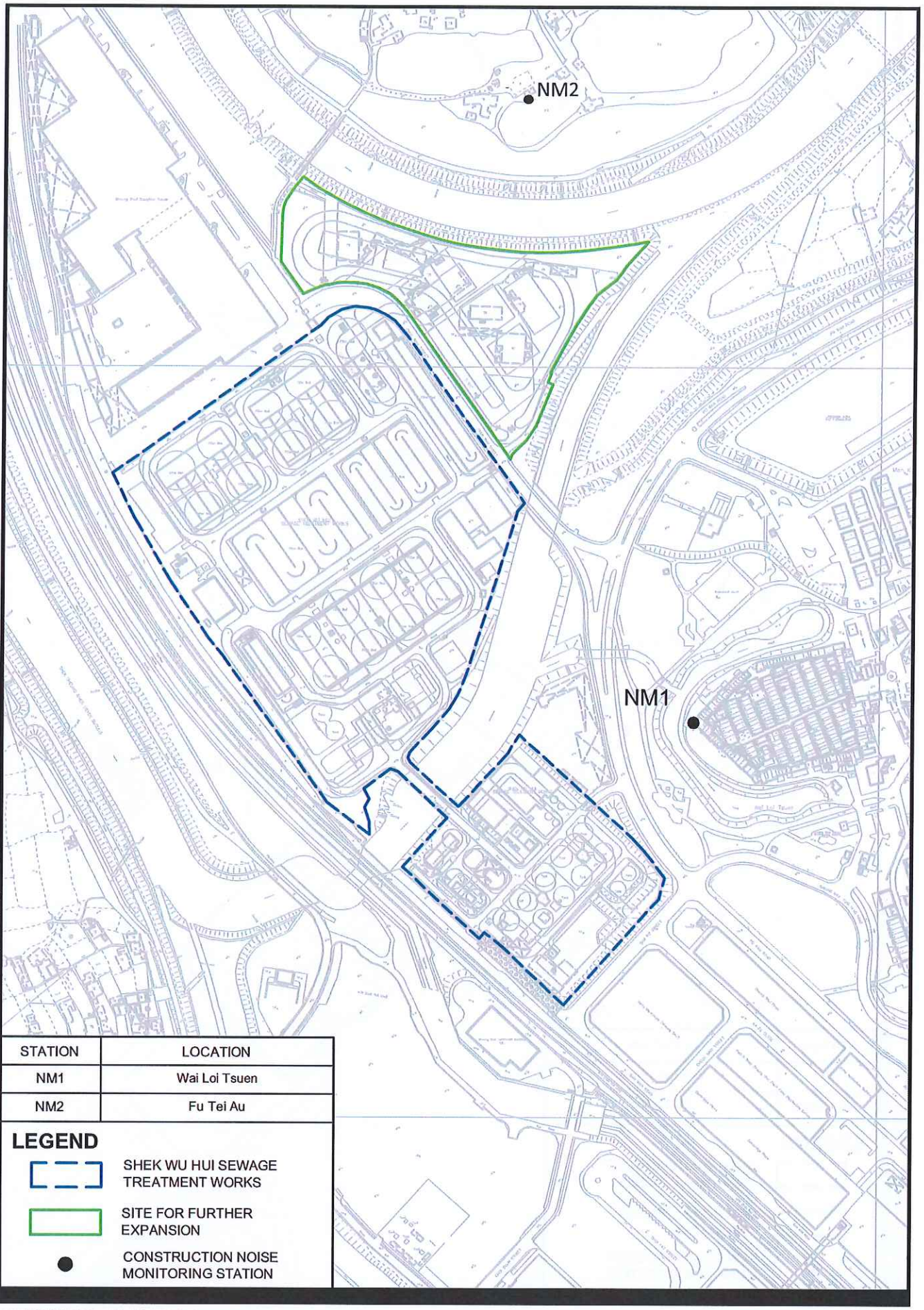
**AGREEMENT NO. CE 40/2012 (DS)**
**SHEK WU HUI SEWAGE TREATMENT WORKS**
**- FURTHER EXPANSION PHASE 1A**
**- INVESTIGATION**

**PROPOSED CONSTRUCTION DUST MONITORING STATIONS FOR CONSTRUCTION PHASE AND OPERATION PHASE**

AECOM

Project No.: 60284037 Date: FEB. 2014

**Drawing No.**
**60284037/EM&AM/405**




| STATION | LOCATION |
|---|---|
| NM1 | Wai Loi Tsuen |
| NM2 | Fu Tei Au |

**LEGEND**

- SHEK WU HUI SEWAGE TREATMENT WORKS
- SITE FOR FURTHER EXPANSION
- CONSTRUCTION NOISE MONITORING STATION

ISO A4 210mm x 297mm

Checked:

Project Management Initials:

Plot File by: Shumyl 26/02/2014
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**AGREEMENT NO. CE 40/2012 (DS)**
**SHEK WU HUI SEWAGE TREATMENT WORKS**
**- FURTHER EXPANSION PHASE 1A**
**- INVESTIGATION**

**LOCATIONS OF CONSTRUCTION NOISE MONITORING STATIONS**

AECOM

Project No.: 60284037 Date: FEB. 2014

**Drawing No.**
**60284037/EM&AM/407**

# Appendix F

# EVENT ACTION PLAN

## Event and Action Plan for Construction Dust

| Event | Action | | | |
|---|---|---|---|---|
| | ET | IEC | ER | Contractor |
| Action level being exceeded by one sampling | 1. Identify source, investigate the causes of complaint and propose remedial measures;<br>2. Inform IEC and ER;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method. | 1. Notify Contractor. | 1. Rectify any unacceptable practice;<br>2. Amend working methods if appropriate. |
| Action level being exceeded by two or more consecutive sampling | 1. Identify source;<br>2. Inform IEC and ER;<br>3. Advise the ER on the effectiveness of the proposed remedial measures;<br>4. Repeat measurements to confirm findings;<br>5. Increase monitoring frequency to daily;<br>6. Discuss with IEC and Contractor on remedial actions required;<br>7. If exceedance continues, arrange meeting with IEC and ER;<br>8. If exceedance stops, cease additional monitoring. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the ET on the effectiveness of the proposed remedial measures;<br>5. Supervise Implementation of remedial measures. | 1. Confirm receipt of notification of exceedance in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented. | 1. Submit proposals for remedial actions to IEC within three working days of notification;<br>2. Implement the agreed proposals;<br>3. Amend proposal if appropriate. |
| Limit level being exceeded by one sampling | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform Contractor ,IEC, ER, and EPD;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily;<br>5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the ER on the effectiveness of the proposed remedial measures;<br>5. Supervise implementation of remedial measures. | 1. Confirm receipt of notification of exceedance in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within three working days of notification;<br>3. Implement the agreed proposals;<br>4. Amend proposal if appropriate. |
| Limit level being exceeded by two or more consecutive sampling | 1. Notify IEC, ER, Contractor and EPD;<br>2. Identify source;<br>3. Repeat measurement to confirm findings;<br>4. Increase monitoring frequency to daily;<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;<br>6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;<br>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of exceedance in writing;<br>2. Notify Contractor;<br>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Ensure remedial measures properly implemented;<br>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within three working days of notification;<br>3. Implement the agreed proposals;<br>4. Resubmit proposals if problem still not under control;<br>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated. |

**Event and Action Plan for Construction Noise**

| Event | Action | | | |
|---|---|---|---|---|
| | **ET** | **IEC** | **ER** | **Contractor** |
| **Action Level** | 1. Notify IEC and Contractor;<br>2. Carry out investigation;<br>3. Report the results of investigation to the IEC, ER and Contractor;<br>4. Discuss with the Contractor and formulate remedial measures;<br>5. Increase monitoring frequency to check mitigation effectiveness. | 1. Review the analysed results submitted by the ET;<br>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly;<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Require Contractor to propose remedial measures for the analysed noise problem;<br>4. Ensure remedial measures are properly implemented. | 1. Submit noise mitigation proposals to IEC;<br>2. Implement noise mitigation proposals. |
| **Limit Level** | 1. Identify source;<br>2. Inform IEC, ER, EPD and Contractor;<br>3. Repeat measurements to confirm findings;<br>4. Increase monitoring frequency;<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;<br>6. Inform IEC, ER and EPD the causes and actions taken for the exceedances;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;<br>2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Require Contractor to propose remedial measures for the analysed noise problem;<br>4. Ensure remedial measures properly implemented;<br>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Resubmit proposals if problem still not under control;<br>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated. |

# Appendix G

## VALID CALIBRATION CERTIFICATES

# TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : No. 31 Wai Loi Tsuen
Location ID : AM1

Date of Calibration: 1-Mar-18
Next Calibration Date: 1-May-18
Technician: Fai So

## CONDITIONS

| | | | |
|---|---|---|---|
| Sea Level Pressure (hPa) | 1012.5 | Corrected Pressure (mm Hg) | 759.375 |
| Temperature (°C) | 21.3 | Temperature (K) | 294 |

## CALIBRATION ORIFICE

| | | | |
|---|---|---|---|
| Make-> | TISCH | Qstd Slope -> | 2.02017 |
| Model-> | 5025A | Qstd Intercept -> | -0.03691 |
| Serial # -> | 1612 | | |

## CALIBRATION

| Plate No. | H20 (L) (in) | H2O (R) (in) | H20 (in) | Qstd (m3/min) | I (chart) | IC corrected | LINEAR REGRESSION |
|---|---|---|---|---|---|---|---|
| 18 | 6.10 | 6.10 | 12.2 | 1.757 | 52 | 52.63 | Slope = 25.7790 |
| 13 | 5.30 | 5.30 | 10.6 | 1.639 | 48 | 48.58 | Intercept = 6.7618 |
| 10 | 4.00 | 4.00 | 8.0 | 1.427 | 43 | 43.52 | Corr. coeff. = 0.9981 |
| 7 | 2.20 | 2.20 | 4.4 | 1.063 | 33 | 33.40 | |
| 5 | 1.40 | 1.40 | 2.8 | 0.851 | 29 | 29.35 | |

***Calculations :***

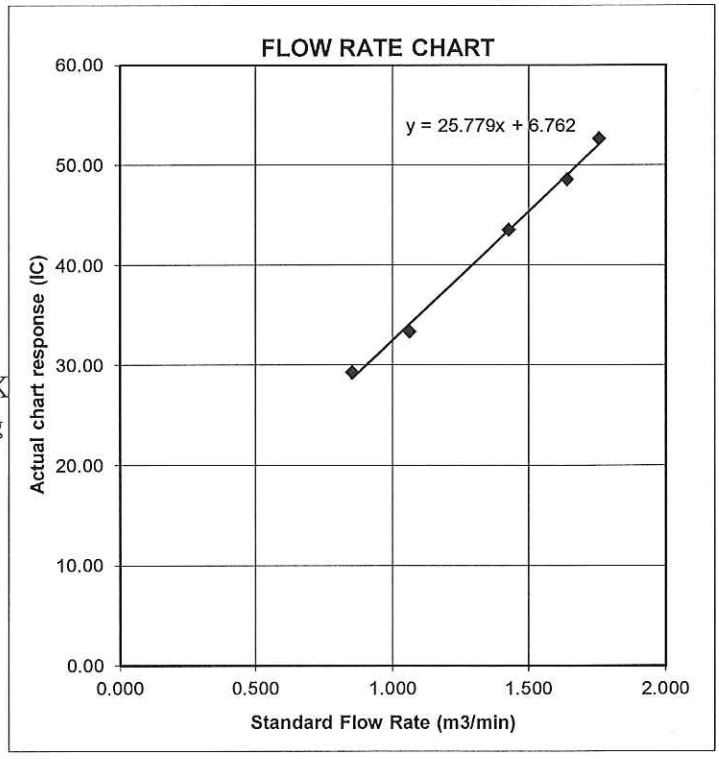
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration ( deg K
Pstd = actual pressure during calibration ( mm Hg

***For subsequent calculation of sampler flow:***

1/m(( I )[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



# TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : RE's Site Office
Location ID : AM2a

Date of Calibration: 1-Mar-18
Next Calibration Date: 1-May-18
Technician: Fai So

## CONDITIONS

| | | | |
|---|---|---|---|
| Sea Level Pressure (hPa) | 1020.5 | Corrected Pressure (mm Hg) | 765.375 |
| Temperature (°C) | 17.3 | Temperature (K) | 290 |

## CALIBRATION ORIFICE

| | | | |
|---|---|---|---|
| Make-> | TISCH | Qstd Slope -> | 2.02017 |
| Model-> | 5025A | Qstd Intercept -> | -0.03691 |
| Serial # -> | 1612 | | |

## CALIBRATION

| Plate No. | H20 (L) (in) | H2O (R) (in) | H20 (in) | Qstd (m3/min) | I (chart) | IC corrected | LINEAR REGRESSION |
|---|---|---|---|---|---|---|---|
| 18 | 6.20 | 6.20 | 12.4 | 1.791 | 53 | 54.60 | Slope = 25.9854 |
| 13 | 5.40 | 5.40 | 10.8 | 1.672 | 49 | 50.48 | Intercept = 7.5509 |
| 10 | 4.10 | 4.10 | 8.2 | 1.460 | 44 | 45.33 | Corr. coeff. = 0.9993 |
| 7 | 2.10 | 2.10 | 4.2 | 1.050 | 34 | 35.03 | |
| 5 | 1.40 | 1.40 | 2.8 | 0.860 | 29 | 29.87 | |

***Calculations :***

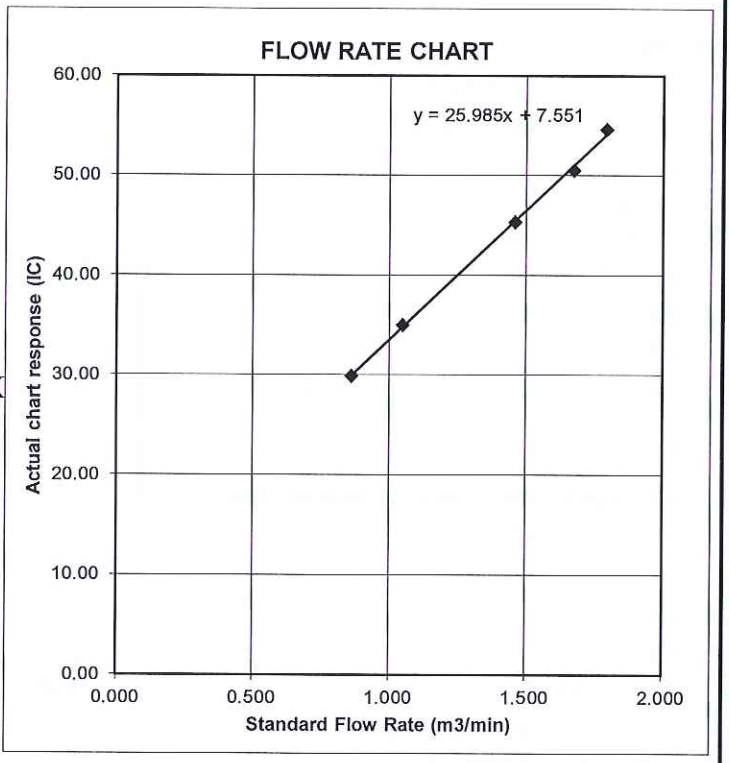
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration ( deg K
Pstd = actual pressure during calibration ( mm Hg

***For subsequent calculation of sampler flow:***

1/m(( I )[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TISCH Environmental

| RECALIBRATION DUE DATE: |
|---|
| February 13, 2019 |

# Certificate of Calibration

| Calibration Certification Information | | | | |
|---|---|---|---|---|
| Cal. Date: | February 13, 2018 | Rootsmeter S/N: 438320 | Ta: 293 | °K |
| Operator: | Jim Tisch | | Pa: 763.3 | mm Hg |
| Calibration Model #: | TE-5025A | Calibrator S/N: **1612** | | |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 1 | 1.3970 | 3.2 | 2.00 |
| 2 | 3 | 4 | 1 | 1.0000 | 6.3 | 4.00 |
| 3 | 5 | 6 | 1 | 0.8900 | 7.9 | 5.00 |
| 4 | 7 | 8 | 1 | 0.8440 | 8.7 | 5.50 |
| 5 | 9 | 10 | 1 | 0.7010 | 12.6 | 8.00 |

**Data Tabulation**

| Vstd (m3) | Qstd (x-axis) | $\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis) | Va | Qa (x-axis) | $\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis) |
|---|---|---|---|---|---|
| 1.0172 | 0.7281 | 1.4293 | 0.9958 | 0.7128 | 0.8762 |
| 1.0130 | 1.0130 | 2.0213 | 0.9917 | 0.9917 | 1.2392 |
| 1.0109 | 1.1358 | 2.2599 | 0.9896 | 1.1120 | 1.3854 |
| 1.0098 | 1.1964 | 2.3702 | 0.9886 | 1.1713 | 1.4530 |
| 1.0046 | 1.4331 | 2.8586 | 0.9835 | 1.4030 | 1.7524 |
| **QSTD** | **m=** | **2.02017** | **QA** | **m=** | **1.26500** |
| | **b=** | **-0.03691** | | **b=** | **-0.02263** |
| | **r=** | **0.99988** | | **r=** | **0.99988** |

**Calculations**

| | | | |
|---|---|---|---|
| **Vstd=** | ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta) | **Va=** | ΔVol((Pa-ΔP)/Pa) |
| **Qstd=** | Vstd/ΔTime | **Qa=** | Va/ΔTime |

**For subsequent flow rate calculations:**

**Qstd=** $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

**Qa=** $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

| Standard Conditions | |
|---|---|
| Tstd: | 298.15 °K |
| Pstd: | 760 mm Hg |

| Key |
|---|
| ΔH: calibrator manometer reading (in H2O) |
| ΔP: rootsmeter manometer reading (mm Hg) |
| Ta: actual absolute temperature (°K) |
| Pa: actual barometric pressure (mm Hg) |
| b: intercept |
| m: slope |

| RECALIBRATION |
|---|
| US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30 |

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

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FAX: (513)467-900

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

### SUB-CONTRACTING REPORT

| | | | |
|---|---|---|---|
| CONTACT | : MR BEN TAM | WORK ORDER | : **HK1825886** |
| CLIENT | : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING | | |
| ADDRESS | : RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG | SUB-BATCH | : 1 |
| | | DATE RECEIVED | : 12-APR-2018 |
| | | DATE OF ISSUE | : 19-APR-2018 |
| PROJECT | : ITEM B5 (CALIBRATION SERVICE) OF WATER ANALYSIS IN YEAR 2018 | NO. OF SAMPLES | : 1 |
| | | CLIENT ORDER | : |

### *General Comments*

- Sample(s) were received in ambient condition.
- Sample(s) analysed and reported on an as received basis.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

### *Signatories*

This document has been signed by those names that appear on this report and are the authorised signatories

| *Signatories* | *Position* |
|---|---|
| p.p. Richard Fung | General Manager |

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
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11/F. Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

| | |
|---|---|
| WORK ORDER | : HK1825886 |
| SUB-BATCH | : 1 |
| CLIENT | : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING |
| PROJECT | : ITEM B5 (CALIBRATION SERVICE) OF WATER ANALYSIS IN YEAR 2018 |

| ALS Lab ID | Client's Sample ID | Sample Type | Sample Date | External Lab Report No. |
|---|---|---|---|---|
| HK1825886-001 | S/N. 366407 | Equipments | 17-Apr-2018 | S/N. 366407 |

## Equipment Verification Report (TSP)

**Equipment Calibrated:**

| | |
|---|---|
| Type: | Laser Dust monitor |
| Manufacturer: | Sibata LD-3B |
| Serial No. | 366407 |
| Equipment Ref: | EQ107 |
| Job Order | HK1825886 |

**Standard Equipment:**

| | |
|---|---|
| Standard Equipment: | Higher Volume Sampler |
| Location & Location ID: | AUES office (calibration room) |
| Equipment Ref: | HVS 018 |
| Last Calibration Date: | 27 February 2018 |

**Equipment Verification Results:**

Testing Date: 12 & 13 March 2018

| Hour | Time | Mean Temp °C | Mean Pressure (hPa) | Concentration in mg/m³ (Standard Equipment) | Total Count (Calibrated Equipment) | Count/Minute (Total Count/60min) |
|---|---|---|---|---|---|---|
| 2hr07min | 9:50 ~ 11:57 | 19.6 | 1019.0 | 0.073 | 4126 | 32.6 |
| 2hr14min | 12:05 ~ 14:19 | 19.6 | 1019.0 | 0.075 | 4414 | 32.8 |
| 2hr17min | 9:50 ~ 12:07 | 20.9 | 1016.7 | 0.075 | 4723 | 34.4 |

Sensitivity Adjustment Scale Setting (Before Calibration) 565 (CPM)

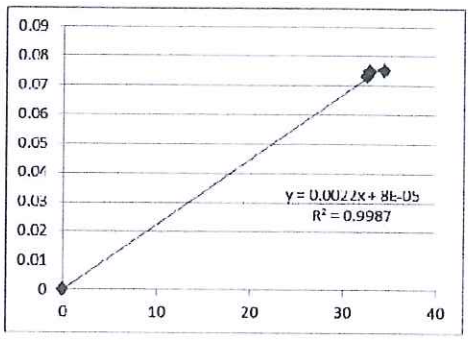
Sensitivity Adjustment Scale Setting (After Calibration) 566 (CPM)

**Linear Regression of Y or X**

Slope (K-factor): 0.0022

Correlation Coefficient (R) 0.9993

Date of Issue 15 March 2018




Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Martin Li Signature : Date : 15 March 2018

QC Reviewer : Ben Tam Signature : Date : 15 March 2018

# TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

| | | | |
|---|---|---|---|
| Location : | Gold King Industrial Building, Kwai Chung | Date of Calibration: | 27-Feb-18 |
| Location ID : | Calibration Room | Next Calibration Date: | 27-May-18 |

## CONDITIONS

| | | | |
|---|---|---|---|
| Sea Level Pressure (hPa) | 1017.3 | Corrected Pressure (mm Hg) | 762.975 |
| Temperature (°C) | 19.1 | Temperature (K) | 292 |

## CALIBRATION ORIFICE

| | | | |
|---|---|---|---|
| Make-> | TISCH | Qstd Slope -> | 2.11965 |
| Model-> | 5025A | Qstd Intercept -> | -0.02696 |
| Calibration Date-> | 28-Feb-17 | Expiry Date-> | 28-Feb-18 |

## CALIBRATION

| Plate No. | H20 (L) (in) | H2O (R) (in) | H20 (in) | Qstd (m3/min) | I (chart) | IC corrected | LINEAR REGRESSION |
|---|---|---|---|---|---|---|---|
| 18 | 6.2 | 6.2 | 12.4 | 1.694 | 52 | 52.63 | Slope = 39.8525 |
| 13 | 5.1 | 5.1 | 10.2 | 1.538 | 46 | 46.55 | Intercept = -14.3322 |
| 10 | 3.9 | 3.9 | 7.8 | 1.346 | 40 | 40.48 | Corr. coeff. = 0.9974 |
| 8 | 2.6 | 2.6 | 5.2 | 1.101 | 30 | 30.36 | |
| 5 | 1.7 | 1.7 | 3.4 | 0.893 | 20 | 20.24 | |

***Calculations :***

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

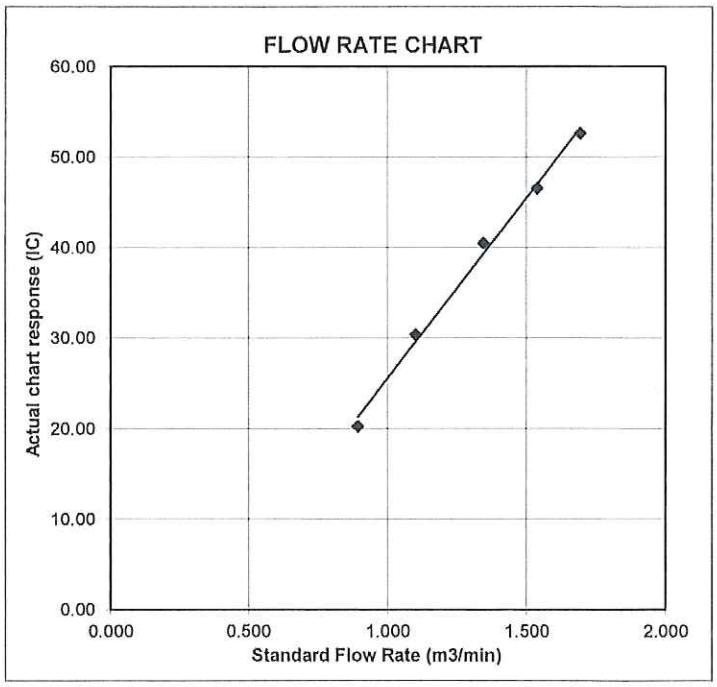
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration ( deg K )
Pstd = actual pressure during calibration ( mm Hg )

***For subsequent calculation of sampler flow:***

1/m(( I )[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

### SUB-CONTRACTING REPORT

| | | | |
|---|---|---|---|
| CONTACT | : MR BEN TAM | WORK ORDER | : HK1815073 |
| CLIENT | : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING | | |
| ADDRESS | : RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG | SUB-BATCH | : 1 |
| | | DATE RECEIVED | : 5-JAN-2018 |
| | | DATE OF ISSUE | : 5-FEB-2018 |
| PROJECT | : ---- | NO. OF SAMPLES | : 1 |
| | | CLIENT ORDER | : ---- |

### *General Comments*

- Sample(s) were received in ambient condition.
- Sample(s) analysed and reported on an as received basis.

### *Signatories*

This document has been signed by those names that appear on this report and are the authorised signatories

| *Signatories* | *Position* |
|---|---|
| Richard Fung | General Manager |

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the ALS Laboratory Group
11/F Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax +852 2610 2021 www.alsglobal.com

WORK ORDER : HK1815073
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ----

| ALS Lab ID | Client's Sample ID | Sample Type | Sample Date | External Lab Report No. |
|---|---|---|---|---|
| HK1815073-001 | S/N: 2X6145 | AIR | 05-Jan-2018 | S/N: 2X6145 |

## Equipment Verification Report (TSP)

**Equipment Calibrated:**

| | |
|---|---|
| Type: | Laser Dust monitor |
| Manufacturer: | Sibata LD-3B |
| Serial No. | 2X6145 |
| Equipment Ref: | EQ105 |
| Job Order | HK1815073 |

**Standard Equipment:**

| | |
|---|---|
| Standard Equipment: | Higher Volume Sampler |
| Location & Location ID: | AUES office (calibration room) |
| Equipment Ref: | HVS 018 |
| Last Calibration Date: | 1 December 2017 |

**Equipment Verification Results:**

Testing Date: 5 January 2018

| Hour | Time | Mean Temp °C | Mean Pressure (hPa) | Concentration in mg/m³ (Standard Equipment) | Total Count (Calibrated Equipment) | Count/Minute (Total Count/60min) |
|---|---|---|---|---|---|---|
| 2hr07min | 10:27 ~ 12:34 | 19.3 | 1015.3 | 0.011 | 511 | 4.0 |
| 2hr01min | 12:38 ~ 14:39 | 19.3 | 1015.3 | 0.012 | 598 | 4.9 |
| 2hr08min | 14:42 ~ 16:50 | 19.3 | 1015.3 | 0.036 | 2111 | 16.5 |

Sensitivity Adjustment Scale Setting (Before Calibration) 583 (CPM)

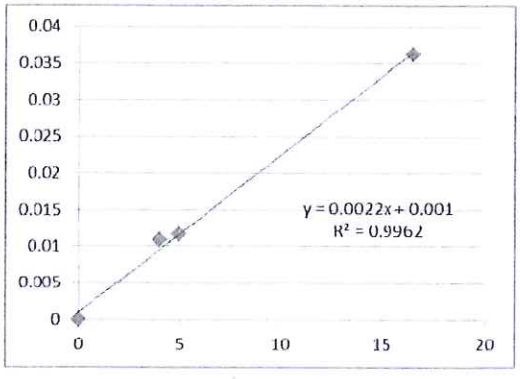
Sensitivity Adjustment Scale Setting (After Calibration) 583 (CPM)

**Linear Regression of Y or X**

Slope (K-factor): 0.0022

Correlation Coefficient 0.9981

Date of Issue 9 January 2018




Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Martin Li Signature : Date : 9 January 2018

QC Reviewer : Ben Tam Signature : Date : 9 January 2018

# TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

| | | | |
|---|---|---|---|
| Location : | Gold King Industrial Building, Kwai Chung | Date of Calibration: | 1-Dec-17 |
| Location ID : | Calibration Room | Next Calibration Date: | 1-Mar-18 |

## CONDITIONS

| | | | |
|---|---|---|---|
| Sea Level Pressure (hPa) | 1018.8 | Corrected Pressure (mm Hg) | 764.1 |
| Temperature (°C) | 21.2 | Temperature (K) | 294 |

## CALIBRATION ORIFICE

| | | | |
|---|---|---|---|
| Make-> | TISCH | Qstd Slope -> | 2.11965 |
| Model-> | 5025A | Qstd Intercept -> | -0.02696 |
| Calibration Date-> | 28-Feb-17 | Expiry Date-> | 28-Feb-18 |

## CALIBRATION

| Plate No. | H20 (L) (in) | H2O (R) (in) | H20 (in) | Qstd (m3/min) | I (chart) | IC corrected |
|---|---|---|---|---|---|---|
| 18 | 6.3 | 6.3 | 12.6 | 1.703 | 54 | 54.49 |
| 13 | 5 | 5 | 10.0 | 1.518 | 48 | 48.44 |
| 10 | 3.9 | 3.9 | 7.8 | 1.342 | 42 | 42.38 |
| 8 | 2.4 | 2.4 | 4.8 | 1.056 | 32 | 32.29 |
| 5 | 1.0 | 1.0 | 2.0 | 0.686 | 23 | 23.21 |

LINEAR REGRESSION

Slope = 31.2239
Intercept = 0.7901
Corr. coeff. = 0.9971

***Calculations :***

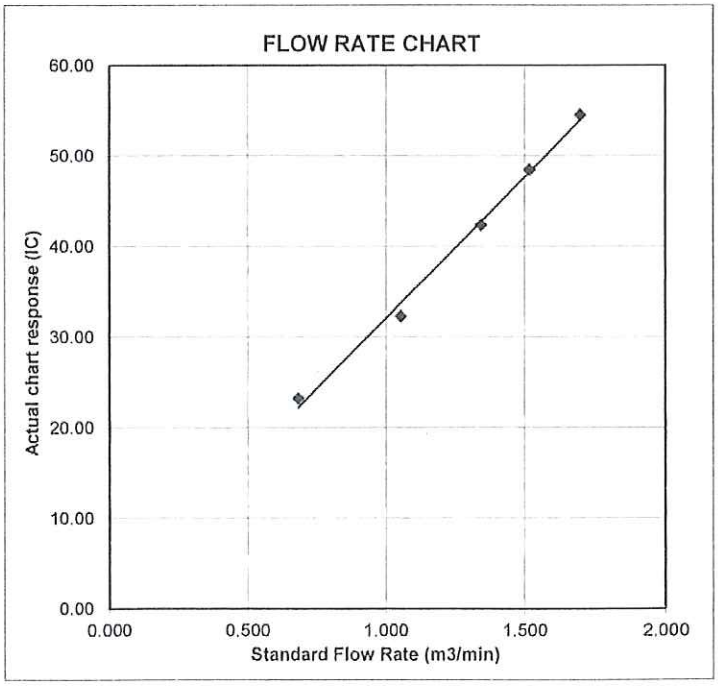
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration ( deg K )
Pstd = actual pressure during calibration ( mm Hg )

***For subsequent calculation of sampler flow:***

1/m(( I )[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

# Certificate of Calibration
# 校正證書

Certificate No. : C173479
證書編號

**ITEM TESTED / 送檢項目** ( Job No. / 序引編號 : IC17-0924 ) Date of Receipt / 收件日期 : 20 June 2017

Description / 儀器名稱 : Sound Calibrator (EQ086)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-74
Serial No. / 編號 : 34657230
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

**TEST CONDITIONS / 測試條件**

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

**TEST SPECIFICATIONS / 測試規範**

Calibration check

**DATE OF TEST / 測試日期** : 28 June 2017

**TEST RESULTS / 測試結果**

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong
Technical Officer

Certified By 核證 : K C Lee
Engineer

Date of Issue 簽發日期 : 30 June 2017



Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

# Certificate of Calibration
# 校正證書

Certificate No. : C173479
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

| Equipment ID | Description | Certificate No. |
|---|---|---|
| CL130 | Universal Counter | C163709 |
| CL281 | Multifunction Acoustic Calibrator | PA160023 |
| TST150A | Measuring Amplifier | C161175 |

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

| UUT Nominal Value | Measured Value (dB) | Mfr's Spec. (dB) | Uncertainty of Measured Value (dB) |
|---|---|---|---|
| 94 dB, 1 kHz | 94.1 | ± 0.3 | ± 0.2 |

5.2 Frequency Accuracy

| UUT Nominal Value (kHz) | Measured Value (kHz) | Mfr's Spec. | Uncertainty of Measured Value (Hz) |
|---|---|---|---|
| 1 | 1.002 | 1 kHz ± 1 % | ± 1 |

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.



Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

# Certificate of Calibration
# 校正證書

Certificate No. : C172793
證書編號

**ITEM TESTED / 送檢項目** ( Job No. / 序引編號 : IC17-0924 ) Date of Receipt / 收件日期 : 16 May 2017

Description / 儀器名稱 : Sound Level Meter (EQ011)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 01121362
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

**TEST CONDITIONS / 測試條件**

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

**TEST SPECIFICATIONS / 測試規範**

Calibration check

**DATE OF TEST / 測試日期** : 23 May 2017

**TEST RESULTS / 測試結果**

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong
Technical Officer

Certified By 核證 : K C Lee
Engineer

Date of Issue 簽發日期 : 24 May 2017



Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

# Certificate of Calibration
# 校正證書

Certificate No. : C172793
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

| Equipment ID | Description | Certificate No. |
|---|---|---|
| CL280 | 40 MHz Arbitrary Waveform Generator | C170048 |
| CL281 | Multifunction Acoustic Calibrator | PA160023 |

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

| UUT Setting | | | | Applied Value | | UUT Reading (dB) | IEC 61672 Class 1 Spec. (dB) |
|---|---|---|---|---|---|---|---|
| Range (dB) | Function | Frequency Weighting | Time Weighting | Level (dB) | Freq. (kHz) | | |
| 30 - 130 | $L_A$ | A | Fast | 94.00 | 1 | 93.2 | ± 1.1 |

6.1.2 Linearity

| UUT Setting | | | | Applied Value | | UUT Reading (dB) |
|---|---|---|---|---|---|---|
| Range (dB) | Function | Frequency Weighting | Time Weighting | Level (dB) | Freq. (kHz) | |
| 30 - 130 | $L_A$ | A | Fast | 94.00 | 1 | 93.2 (Ref.) |
| | | | | 104.00 | | 103.2 |
| | | | | 114.00 | | 113.2 |

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

| UUT Setting | | | | Applied Value | | UUT Reading (dB) | IEC 61672 Class 1 Spec. (dB) |
|---|---|---|---|---|---|---|---|
| Range (dB) | Function | Frequency Weighting | Time Weighting | Level (dB) | Freq. (kHz) | | |
| 30 - 130 | $L_A$ | A | Fast | 94.00 | 1 | 93.2 | Ref. |
| | | | Slow | | | 93.2 | ± 0.3 |



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6.3 Frequency Weighting

6.3.1 A-Weighting

| UUT Setting | | | | Applied Value | | UUT Reading (dB) | IEC 61672 Class 1 Spec. (dB) |
|---|---|---|---|---|---|---|---|
| Range (dB) | Function | Frequency Weighting | Time Weighting | Level (dB) | Freq. | | |
| 30 - 130 | $L_A$ | A | Fast | 94.00 | 63 Hz | 66.9 | -26.2 ± 1.5 |
| | | | | | 125 Hz | 76.9 | -16.1 ± 1.5 |
| | | | | | 250 Hz | 84.5 | -8.6 ± 1.4 |
| | | | | | 500 Hz | 89.9 | -3.2 ± 1.4 |
| | | | | | 1 kHz | 93.2 | Ref. |
| | | | | | 2 kHz | 94.4 | +1.2 ± 1.6 |
| | | | | | 4 kHz | 94.2 | +1.0 ± 1.6 |
| | | | | | 8 kHz | 92.1 | -1.1 (+2.1 ; -3.1) |
| | | | | | 12.5 kHz | 88.7 | -4.3 (+3.0 ; -6.0) |

6.3.2 C-Weighting

| UUT Setting | | | | Applied Value | | UUT Reading (dB) | IEC 61672 Class 1 Spec. (dB) |
|---|---|---|---|---|---|---|---|
| Range (dB) | Function | Frequency Weighting | Time Weighting | Level (dB) | Freq. | | |
| 30 - 130 | $L_C$ | C | Fast | 94.00 | 63 Hz | 92.3 | -0.8 ± 1.5 |
| | | | | | 125 Hz | 93.0 | -0.2 ± 1.5 |
| | | | | | 250 Hz | 93.2 | 0.0 ± 1.4 |
| | | | | | 500 Hz | 93.2 | 0.0 ± 1.4 |
| | | | | | 1 kHz | 93.2 | Ref. |
| | | | | | 2 kHz | 93.0 | -0.2 ± 1.6 |
| | | | | | 4 kHz | 92.4 | -0.8 ± 1.6 |
| | | | | | 8 kHz | 90.2 | -3.0 (+2.1 ; -3.1) |
| | | | | | 12.5 kHz | 86.8 | -6.2 (+3.0 ; -6.0) |

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# Certificate of Calibration
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Certificate No. : C172793
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Remarks : - UUT Microphone Model No. : UC-59 & S/N : 07549

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

| | | |
|---|---|---|
| 94 dB | 63 Hz - 125 Hz | : ± 0.35 dB |
| | 250 Hz - 500 Hz | : ± 0.30 dB |
| | 1 kHz | : ± 0.20 dB |
| | 2 kHz - 4 kHz | : ± 0.35 dB |
| | 8 kHz | : ± 0.45 dB |
| | 12.5 kHz | : ± 0.70 dB |
| 104 dB | 1 kHz | : ± 0.10 dB (Ref. 94 dB) |
| 114 dB | 1 kHz | : ± 0.10 dB (Ref. 94 dB) |

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.



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# Appendix H

# IMPACT MONITORING SCHEDULE

## Impact Monitoring Schedule for Reporting Month – April 2018

| Date | | Dust Monitoring | | Noise Monitoring |
|---|---|---|---|---|
| | | 1-hour TSP | 24-hour TSP | |
| Sun | 1-Apr-18 | | | |
| Mon | 2-Apr-18 | | | |
| Tue | 3-Apr-18 | ✓ | | ✓ |
| Wed | 4-Apr-18 | | ✓ | |
| Thu | 5-Apr-18 | | | |
| Fri | 6-Apr-18 | | | |
| Sat | 7-Apr-18 | | | |
| Sun | 8-Apr-18 | | | |
| Mon | 9-Apr-18 | ✓ | | ✓ |
| Tue | 10-Apr-18 | | ✓ | |
| Wed | 11-Apr-18 | | | |
| Thu | 12-Apr-18 | | | |
| Fri | 13-Apr-18 | ✓ | | |
| Sat | 14-Apr-18 | | | |
| Sun | 15-Apr-18 | | | |
| Mon | 16-Apr-18 | | ✓ | |
| Tue | 17-Apr-18 | | | |
| Wed | 18-Apr-18 | | | |
| Thu | 19-Apr-18 | ✓ | | ✓ |
| Fri | 20-Apr-18 | | | |
| Sat | 21-Apr-18 | | ✓ | |
| Sun | 22-Apr-18 | | | |
| Mon | 23-Apr-18 | | | |
| Tue | 24-Apr-18 | | | |
| Wed | 25-Apr-18 | ✓ | | ✓ |
| Thu | 26-Apr-18 | | | |
| Fri | 27-Apr-18 | | ✓ | |
| Sat | 28-Apr-18 | | | |
| Sun | 29-Apr-18 | | | |
| Mon | 30-Apr-18 | ✓ | | ✓ |

| | |
|---|---|
| ✓ | Monitoring Day |
| | Sunday or Public Holiday |

Monitoring Location

| | | |
|---|---|---|
| Air Quality | 1-hour TSP | AM1 and AM2 |
| | 24-hour TSP | AM1 and AM2a |
| Construction Noise | | NM1 and NM2 |

## Impact Monitoring Schedule for next Reporting Period – May 2018

| Date | | Dust Monitoring | | Noise Monitoring |
|---|---|---|---|---|
| | | 1-hour TSP | 24-hour TSP | |
| Tue | 1-May-18 | | | |
| Wed | 2-May-18 | | | |
| Thu | 3-May-18 | | ✓ | |
| Fri | 4-May-18 | | | |
| Sat | 5-May-18 | ✓ | | |
| Sun | 6-May-18 | | | |
| Mon | 7-May-18 | | | |
| Tue | 8-May-18 | | | |
| Wed | 9-May-18 | | ✓ | |
| Thu | 10-May-18 | | | |
| Fri | 11-May-18 | ✓ | | ✓ |
| Sat | 12-May-18 | | | |
| Sun | 13-May-18 | | | |
| Mon | 14-May-18 | | | |
| Tue | 15-May-18 | | ✓ | |
| Wed | 16-May-18 | | | |
| Thu | 17-May-18 | ✓ | | ✓ |
| Fri | 18-May-18 | | | |
| Sat | 19-May-18 | | | |
| Sun | 20-May-18 | | | |
| Mon | 21-May-18 | | ✓ | |
| Tue | 22-May-18 | | | |
| Wed | 23-May-18 | ✓ | | ✓ |
| Thu | 24-May-18 | | | |
| Fri | 25-May-18 | | | |
| Sat | 26-May-18 | | ✓ | |
| Sun | 27-May-18 | | | |
| Mon | 28-May-18 | | | |
| Tue | 29-May-18 | ✓ | | ✓ |
| Wed | 30-May-18 | | | |
| Thu | 31-May-18 | | | |

| | |
|---|---|
| ✓ | Monitoring Day |
| | Sunday or Public Holiday |

Monitoring Location

| | | |
|---|---|---|
| Air Quality | 1-hour TSP | AM1 and AM2 |
| | 24-hour TSP | AM1 and AM2a |
| Construction Noise | | NM1 and NM2 |

# Appendix I

# 24-HOUR TSP AND CONSTRUCTION NOISE MONITORING DATA

**24-Hr TSP Monitoring Data for AM1**

| DATE | SAMPLE NUMBER | ELAPSED TIME | | | CHART READING | | | AVG TEMP | AVG AIR PRESS | STANDARD FLOW RATE | AIR VOLUME | FILTER WEIGHT (g) | | DUST WEIGHT COLLECTED | 24-Hr TSP (μg/m³) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | INITIAL | FINAL | (min) | MIN | MAX | AVG | (℃) | (hPa) | (m³/min) | (std m³) | INITIAL | FINAL | (g) | |
| 4-Apr-18 | 22455 | 17043.35 | 17067.35 | 1440.00 | 21 | 22 | 21.5 | 20.8 | 1014.1 | 0.58 | 832 | 2.6946 | 2.7300 | 0.0354 | 43 |
| 10-Apr-18 | 22477 | 17067.35 | 17091.35 | 1440.00 | 22 | 23 | 22.5 | 22 | 1013 | 0.61 | 885 | 2.6621 | 2.7207 | 0.0586 | 66 |
| 16-Apr-18 | 22362 | 17091.35 | 17115.36 | 1440.60 | 21 | 23 | 22.0 | 22.3 | 1013.3 | 0.59 | 857 | 2.6610 | 2.7129 | 0.0519 | 61 |
| 21-Apr-18 | 22498 | 17115.36 | 17139.36 | 1440.00 | 21 | 23 | 22.0 | 23.8 | 1012.6 | 0.59 | 853 | 2.6677 | 2.6882 | 0.0205 | 24 |
| 27-Apr-18 | 22556 | 17139.36 | 17163.32 | 1437.60 | 21 | 23 | 22.0 | 24.9 | 1015 | 0.59 | 851 | 2.6760 | 2.7026 | 0.0266 | 31 |

**24-Hr TSP Monitoring Data for AM2a**

| DATE | SAMPLE NUMBER | ELAPSED TIME | | | CHART READING | | | AVG TEMP | AVG AIR PRESS | STANDARD FLOW RATE | AIR VOLUME | FILTER WEIGHT (g) | | DUST WEIGHT COLLECTED | 24-Hr TSP (μg/m³) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | INITIAL | FINAL | (min) | MIN | MAX | AVG | (℃) | (hPa) | (m³/min) | (std m³) | INITIAL | FINAL | (g) | |
| 4-Apr-18 | 22458 | 13703.68 | 13727.68 | 1440.00 | 38 | 40 | 39.0 | 20.8 | 1014.1 | 1.22 | 1759 | 2.6699 | 2.7859 | 0.1160 | 66 |
| 10-Apr-18 | 22478 | 13727.68 | 13751.68 | 1440.00 | 39 | 40 | 39.5 | 22 | 1013 | 1.24 | 1781 | 2.6629 | 2.7879 | 0.1250 | 70 |
| 16-Apr-18 | 22363 | 13751.68 | 13775.68 | 1440.00 | 38 | 40 | 39.0 | 22.3 | 1013.3 | 1.22 | 1753 | 2.6608 | 2.7733 | 0.1125 | 64 |
| 21-Apr-18 | 22497 | 13775.68 | 13799.69 | 1440.60 | 38 | 40 | 39.0 | 23.8 | 1012.6 | 1.21 | 1747 | 2.6657 | 2.7612 | 0.0955 | 55 |
| 27-Apr-18 | 22555 | 13799.69 | 13823.68 | 1439.40 | 38 | 40 | 39.0 | 24.9 | 1015 | 1.21 | 1744 | 2.6808 | 2.7884 | 0.1076 | 62 |

**Noise Measurement Results (dB) of NM1**

| Date | Start Time | 1st $Leq_{5min}$ | L10 | L90 | 2nd $Leq_{5min}$ | L10 | L90 | 3nd $Leq_{5min}$ | L10 | L90 | 4th $Leq_{5min}$ | L10 | L90 | 5th $Leq_{5min}$ | L10 | L90 | 6th $Leq_{5min}$ | L10 | L90 | Leq30min |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3-Apr-18 | 10:10 | 52.8 | 60.6 | 48.4 | 53.9 | 61.7 | 50.3 | 53.1 | 59.7 | 51.4 | 52.8 | 60.3 | 50.4 | 53.6 | 58.9 | 51.7 | 54.5 | 60.2 | 50.9 | 53 |
| 9-Apr-18 | 9:46 | 52.9 | 60.4 | 51.3 | 51.7 | 59.9 | 50.4 | 52.6 | 58.4 | 51.6 | 51.4 | 60.7 | 49.5 | 52.6 | 58.7 | 50.4 | 52.6 | 59.4 | 51.3 | 52 |
| 19-Apr-18 | 9:34 | 53.8 | 61.7 | 52.6 | 51.2 | 58.4 | 50.8 | 52.4 | 57.6 | 51.3 | 50.6 | 58.8 | 49.2 | 51.3 | 59.7 | 50.6 | 52.4 | 60.9 | 51.7 | 52 |
| 25-Apr-18 | 9:41 | 56.4 | 59.5 | 50.6 | 56.2 | 58.7 | 51.5 | 57.2 | 59.4 | 53.3 | 57.7 | 59.7 | 54.1 | 57.5 | 59.9 | 54.4 | 63.2 | 64.0 | 52.1 | 59 |
| 30-Apr-18 | 9:31 | 53.9 | 61 | 50.4 | 55.2 | 61.2 | 52 | 52.8 | 57.6 | 49.5 | 51.1 | 58.7 | 49.9 | 51.6 | 58.1 | 49.5 | 51.4 | 57.9 | 50.7 | 53 |

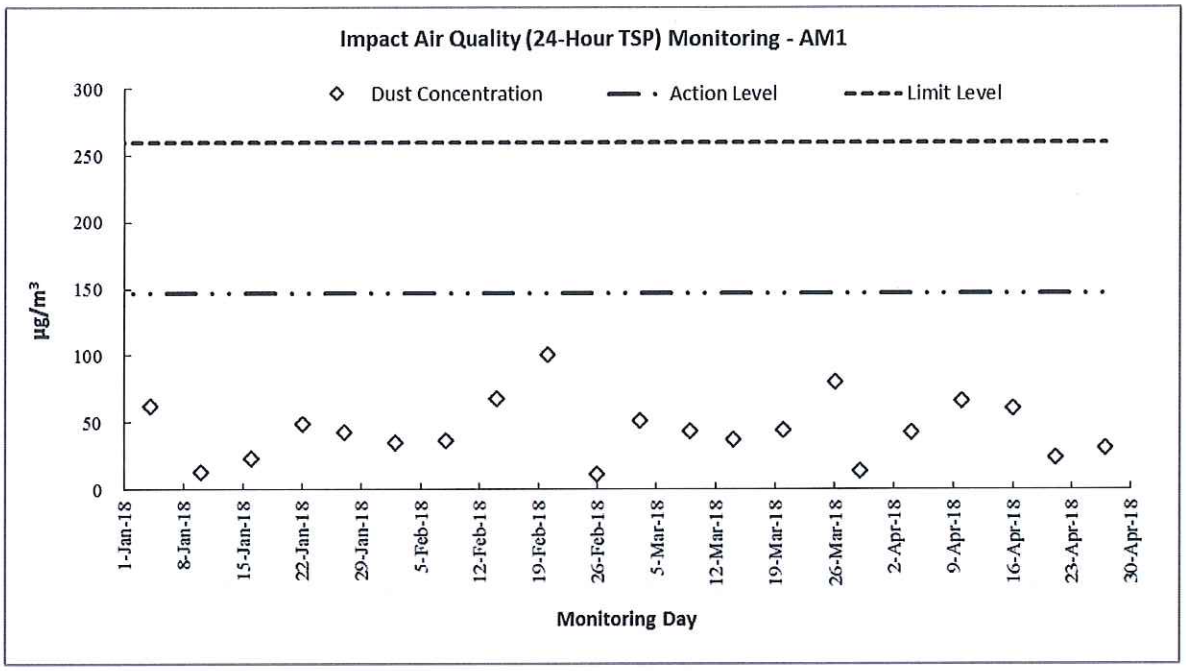
**Noise Measurement Results (dB) of NM2**

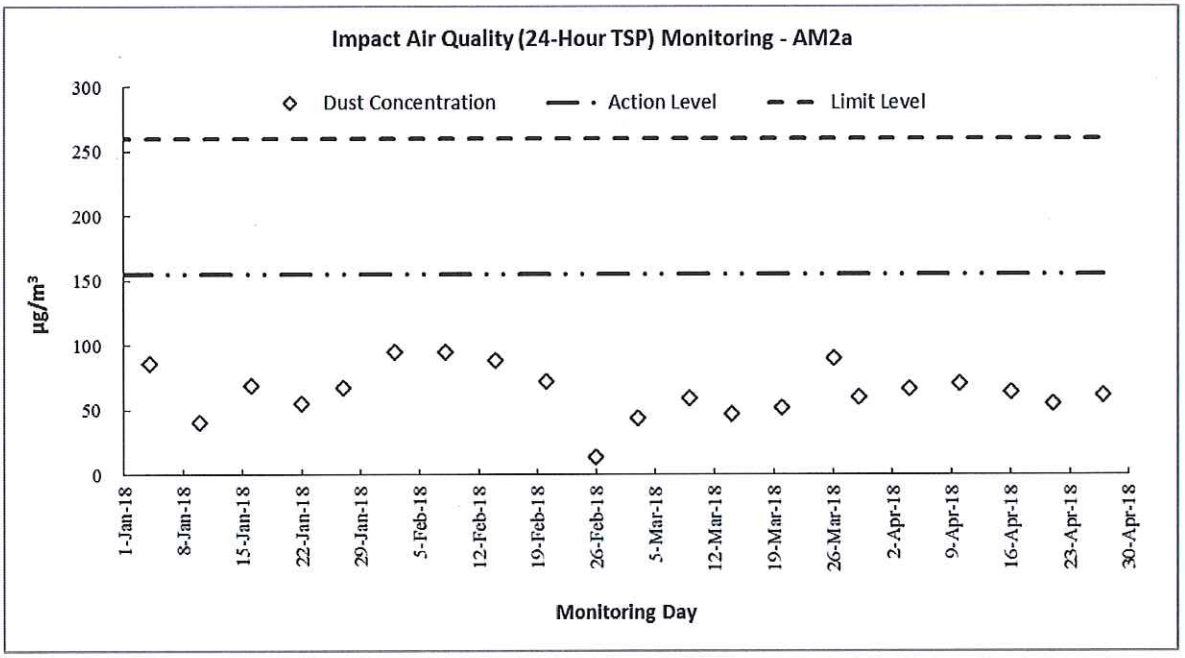
| Date | Start Time | 1st $Leq_{5min}$ | L10 | L90 | 2nd $Leq_{5min}$ | L10 | L90 | 3nd $Leq_{5min}$ | L10 | L90 | 4th $Leq_{5min}$ | L10 | L90 | 5th $Leq_{5min}$ | L10 | L90 | 6th $Leq_{5min}$ | L10 | L90 | Leq30min |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3-Apr-18 | 13:26 | 48.2 | 55.6 | 45.9 | 49.6 | 54.2 | 46.7 | 50.3 | 54.7 | 45.8 | 51.2 | 55.3 | 48.9 | 51.7 | 54.3 | 49.2 | 50.4 | 53.3 | 47.2 | 50 |
| 9-Apr-18 | 13:21 | 51.3 | 55.7 | 49.4 | 52.6 | 54.6 | 50.3 | 49.4 | 53.1 | 48.7 | 47.3 | 52.6 | 45.3 | 46.9 | 53.1 | 44.1 | 46.8 | 51.4 | 45.6 | 50 |
| 19-Apr-18 | 13:36 | 50.6 | 55.6 | 48.2 | 49.4 | 54.6 | 48.1 | 47.4 | 53.1 | 45.1 | 46.9 | 53.7 | 45.6 | 48.6 | 54.9 | 45.7 | 49.3 | 52.6 | 45.3 | 49 |
| 25-Apr-18 | 10:26 | 53.0 | 55.3 | 49.1 | 53.3 | 57.8 | 47.4 | 50.4 | 53.8 | 48.5 | 48.9 | 49.8 | 46.6 | 47.4 | 49.5 | 46.0 | 52.3 | 48.4 | 45.3 | 51 |
| 30-Apr-18 | 10:35 | 51.4 | 57.0 | 48.6 | 50.8 | 56.1 | 47.4 | 49.6 | 54.8 | 49.0 | 49.5 | 54.4 | 47.8 | 48.6 | 53.3 | 45.4 | 47.5 | 51.8 | 45.7 | 50 |

# Appendix J

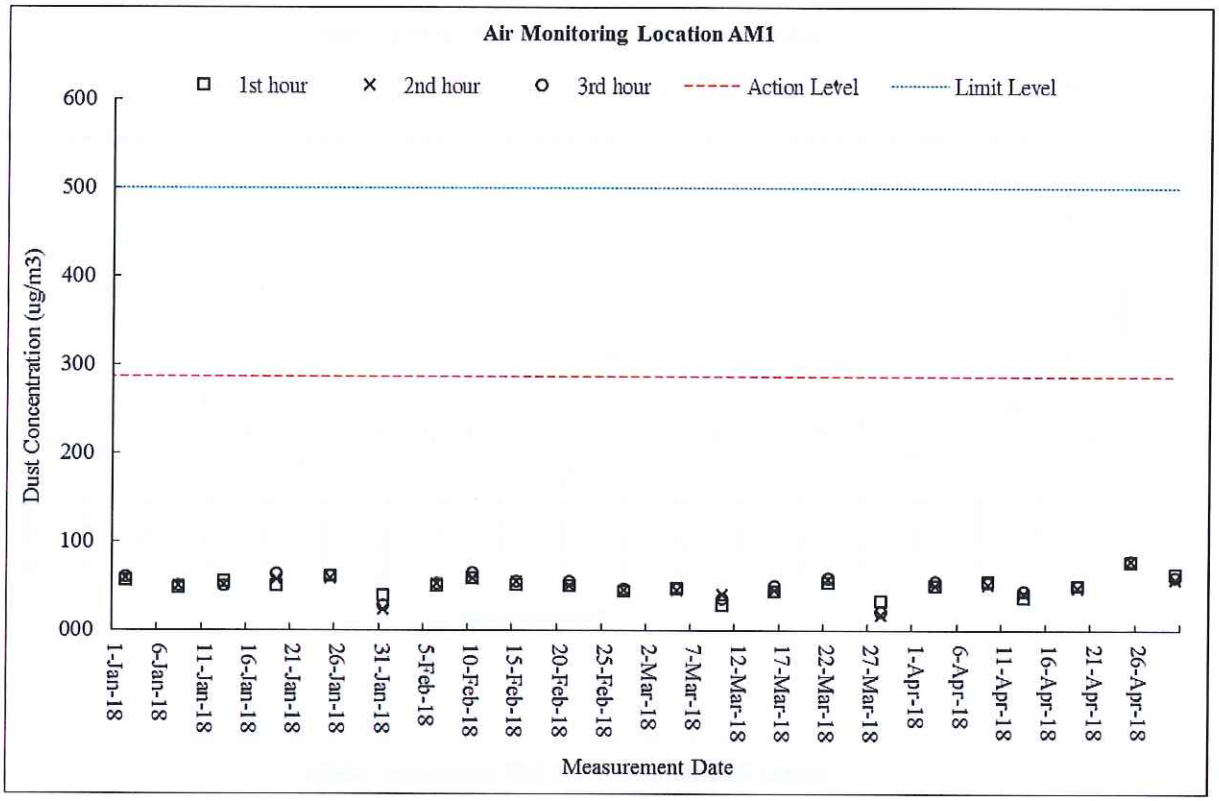
# GRAPHICAL PLOTS

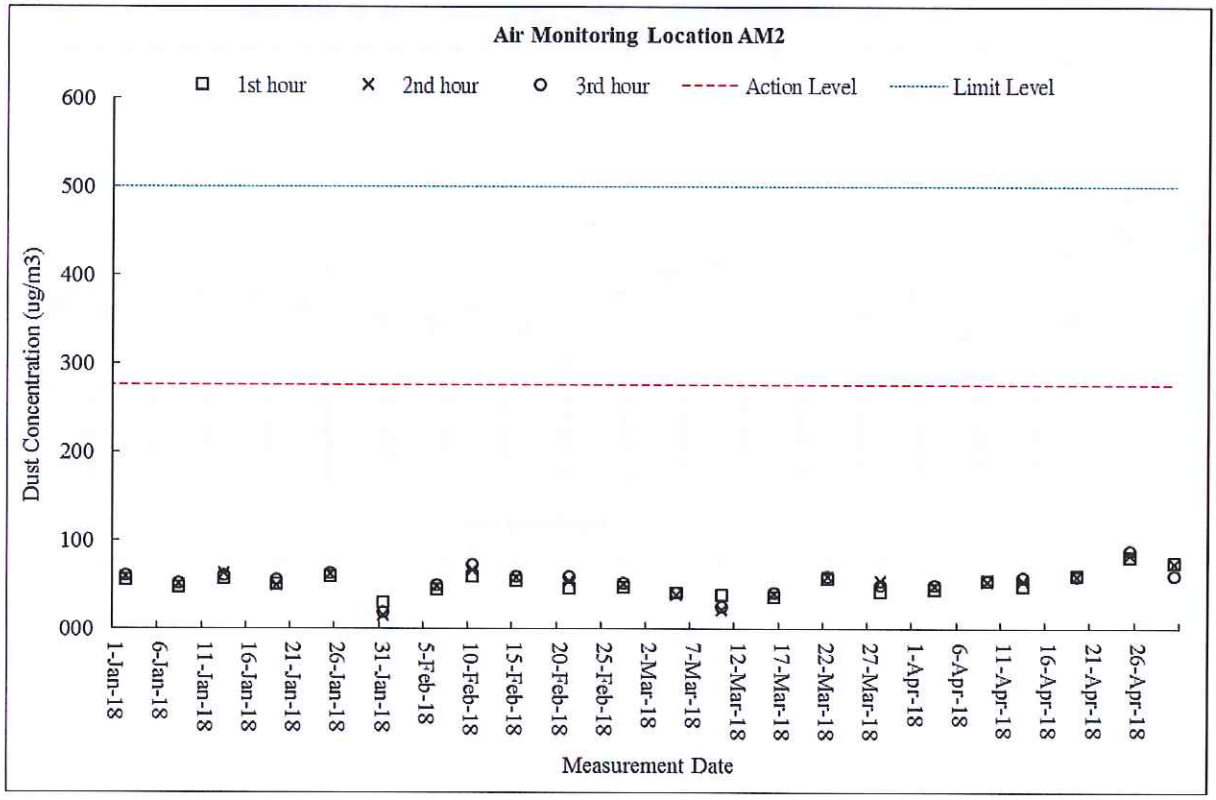
## Air Quality – 24-Hour TSP



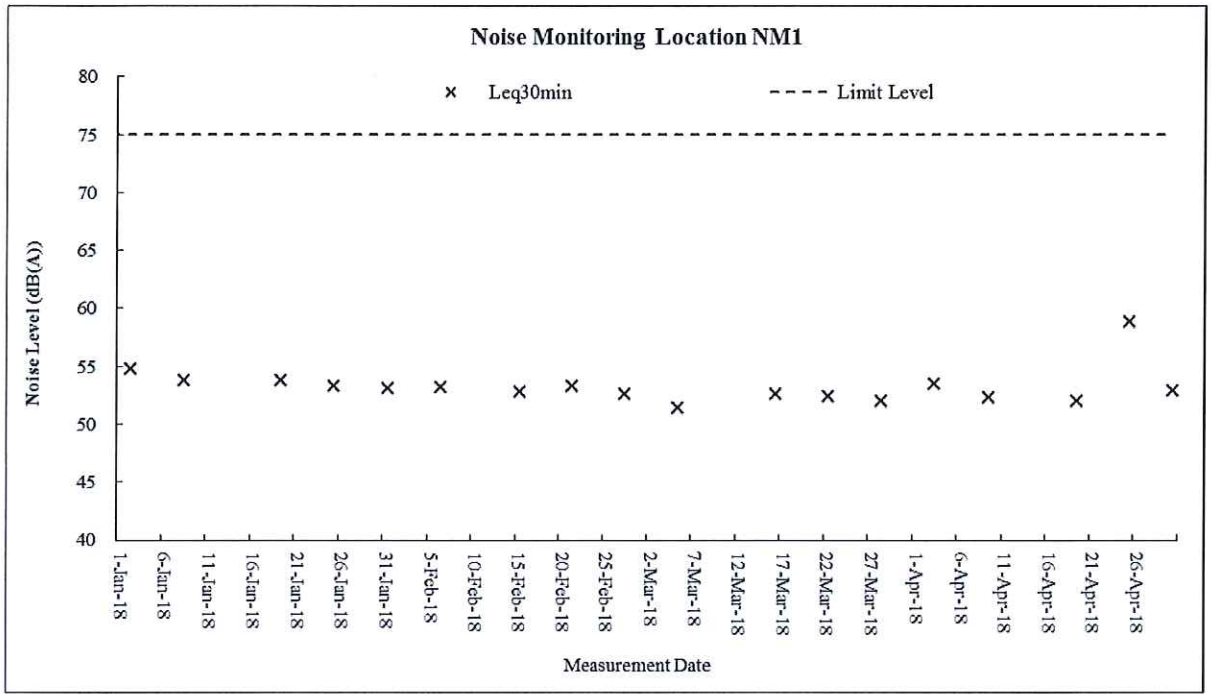



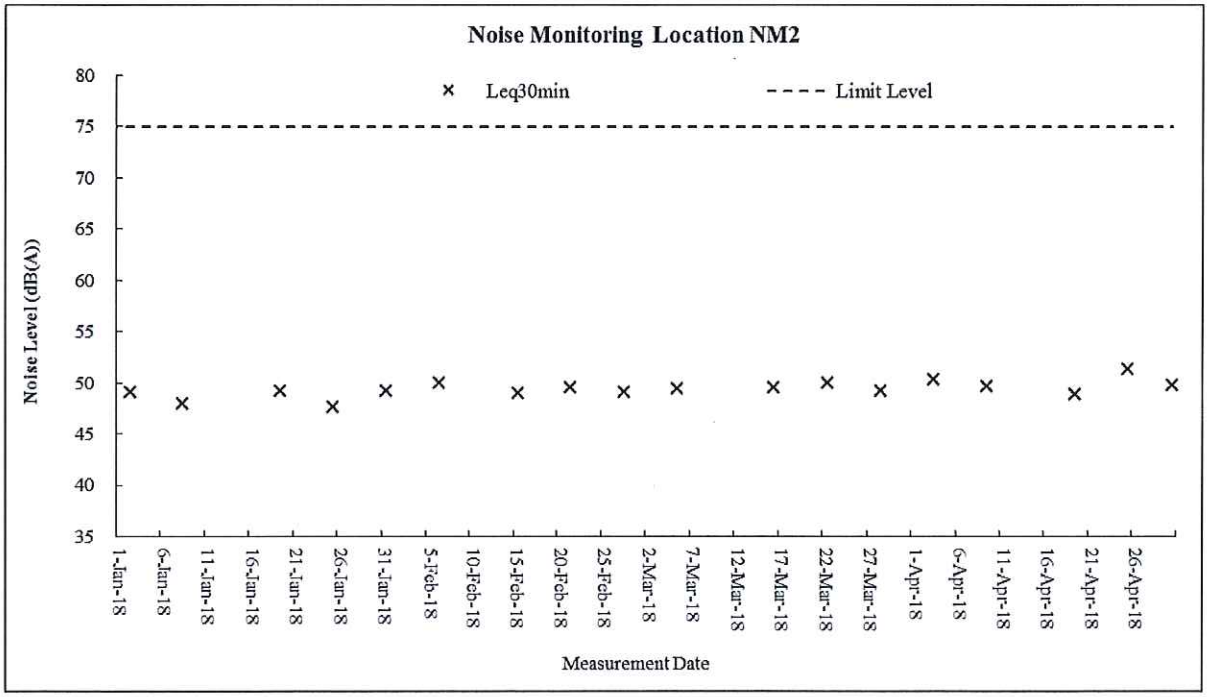
## Air Quality – 1-Hour TSP



## Construction Noise



# Appendix K

## METEOROLOGICAL DATA DURING THE REPORTING MONTH (TA KWU LING STATION)

| Date | | Weather | Total Rainfall (mm) | Ta Kwu Ling Station | | | |
|---|---|---|---|---|---|---|---|
| | | | | Mean Air Temp. (°C) | Wind Speed (km/h) | Mean Relative Humidity (%) | Wind Direction |
| 1-Apr-18 | Sun | Hot and dry in the afternoon. Light winds. | 0 | 24.2 | 7.1 | 85.1 | SE |
| 2-Apr-18 | Mon | Hot and dry in the afternoon. Light winds. | 0 | 23.9 | 6.6 | 70.5 | E/SE |
| 3-Apr-18 | Tue | Hot and dry in the afternoon. Light winds. | 0 | 23.6 | 7.3 | 72.5 | E/SE |
| 4-Apr-18 | Wed | Mainly fine. | 0 | 23.9 | 7.3 | 74 | E/NE |
| 5-Apr-18 | Thu | Hot and dry in the afternoon. Light winds. | 0 | 24.5 | 8.2 | 66 | E/SE |
| 6-Apr-18 | Fri | Hot and dry in the afternoon. Light winds. | Trace | 21.8 | 12.7 | 74 | N |
| 7-Apr-18 | Sat | Mainly fine. | Trace | 16.6 | 11.1 | 73 | E |
| 8-Apr-18 | Sun | Light to moderate east to southeasterly winds.Mainly fine. | 0 | 16.6 | 6.1 | 56 | E/NE |
| 9-Apr-18 | Mon | Light to moderate east to southeasterly winds.Mainly fine. | 0 | 19.8 | 6.6 | 73.5 | E/NE |
| 10-Apr-18 | Tue | Moderate easterly winds, occasionally fresh offshore. | 0 | 23.1 | 7 | 75.5 | E/NE |
| 11-Apr-18 | Wed | Hot and dry in the afternoon. Light winds. | 0 | 24.5 | 6.5 | 78.2 | E/NE |
| 12-Apr-18 | Thu | Mainly fine. | 0 | 26 | 6.6 | 77 | E/SE |
| 13-Apr-18 | Fri | Light to moderate east to southeasterly winds.Mainly fine. | Trace | 27.6 | 8.5 | 74 | E/SE |
| 14-Apr-18 | Sat | Mainly fine. | Trace | 26.5 | 8.4 | 84 | SE |
| 15-Apr-18 | Sun | Cloudy to overcast with rain. | 17.2 | 20.7 | 7.5 | 84.5 | N/NW |
| 16-Apr-18 | Mon | Cloudy to overcast with rain. | 2 | 16 | 6.1 | 89.2 | N/NW |
| 17-Apr-18 | Tue | Mainly cloudy. Bright periods in the afternoon. | 0.2 | 19.8 | 5.4 | 78.2 | N/NW |
| 18-Apr-18 | Wed | Mainly cloudy. Bright periods in the afternoon. | 0.1 | 23 | 7.3 | 75.5 | E/NE |
| 19-Apr-18 | Thu | Mainly cloudy with one or two showers. | 0 | 23.6 | 7.8 | 69.7 | E/NE |
| 20-Apr-18 | Fri | Moderate easterly winds. | Trace | 24.5 | 9.5 | 73.7 | E |
| 21-Apr-18 | Sat | Mainly cloudy with one or two showers. | Trace | 25.5 | 8.1 | 71.1 | NE |
| 22-Apr-18 | Sun | Moderate easterly winds. | Trace | 26.2 | 8.2 | 78.5 | E |
| 23-Apr-18 | Mon | Moderate easterly winds. | Trace | 26.6 | 6.5 | 76.7 | E/NE |
| 24-Apr-18 | Tue | Moderate east to northeasterly winds. | 8.2 | 25.3 | 5.7 | 84.7 | E/NE |
| 25-Apr-18 | Wed | Cloudy. Isolated showers in the afternoon. | Trace | 22.5 | 3.5 | 79.7 | E/NE |
| 26-Apr-18 | Thu | Fine and hot. Light to moderate southerly winds. | 0.3 | 23.2 | 5.6 | 83.7 | E/NE |
| 27-Apr-18 | Fri | Fine and hot. Light to moderate southerly winds. | Trace | 24.7 | 4.5 | 82.2 | E/NE |
| 28-Apr-18 | Sat | Fine and hot. Light to moderate southerly winds. | 0.1 | 25.2 | 4.6 | 82.1 | E |
| 29-Apr-18 | Sun | Fine and hot. Light to moderate southerly winds. | Trace | 26.6 | 6.8 | 81.2 | E/NE |
| 30-Apr-18 | Mon | Fine and hot. Light to moderate southerly winds. | Trace | 26.5 | 6.9 | 82.5 | E/NE |

# Appendix L

# MONTHLY SUMMARY WASTE FLOW TABLE

Appendix L

# Monthly Summary Waste Flow Table

Department: Drainage Services Department  Contract No.: DC/2013/09

Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road

Commencement Date: 21-Jul-15  Estimated completion Date: 19-Aug-16  Estimated Contract Sum: 1.56M

| Month | Actual Quantities of Inert C&D Materials Generated Monthly | | | | | | Actual Quantities of C&D Wastes Generated Monthly | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rock and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Imported Fill | Metals | Paper/ cardboard packaging | Plastics (see Note 3) | Chemical Waste | Others, e.g. general refuse |
| | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000 kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000$m^3$) |
| Jan 15 | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA |
| Feb 15 | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA |
| Mar 15 | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA |
| Apr 15 | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA |
| May 15 | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA |
| June 15 | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA | NIA |
| **Sub-total** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** |
| July 15 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Aug 15 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Sep 15 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 |
| Oct 15 | 0.035 | 0.028 | 0.000 | 0.000 | 0.007 | 0.000 | 43.790 | 0.000 | 0.000 | 0.000 | 0.014 |
| Nov 15 | 1.119 | 0.263 | 0.001 | 0.000 | 0.855 | 0.273 | 44.170 | 0.000 | 0.000 | 0.000 | 0.000 |
| Dec 15 | 1.300 | 0.744 | 0.001 | 0.000 | 0.555 | 6.123 | 25.550 | 0.000 | 0.000 | 0.000 | 0.026 |
| **Total** | **2.454** | **1.035** | **0.002** | **0.000** | **1.417** | **6.396** | **113.510** | **0.000** | **0.000** | **0.000** | **0.051** |

Notes: (1) The waste flow table should cover the whole construction period of the Contract.

(2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.

(3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.

(4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.

(5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(6) Broken concrete for recycling into aggregates.

# Monthly Summary Waste Flow Table

Department: Drainage Services Department Contract No.: DC/2013/09

Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road

Commencement Date: 21-Jul-2015 Estimated completion Date: 19-Aug-2017 Estimated Contract Sum: 1.56M

| Month | Actual Quantities of Inert C&D Materials Generated Monthly | | | | | | Actual Quantities of C&D Wastes Generated Monthly | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rock and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Imported Fill | Metals | Paper/ cardboard packaging | Plastics (see Note 3) | Chemical Waste | Others, e.g. general refuse |
| | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000 kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000$m^3$) |
| Jan-16 | 0.335 | 0.111 | 0.060 | 0.000 | 0.164 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Feb-16 | 2.377 | 0.089 | 0.050 | 2.228 | 0.010 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 |
| Mar-16 | 0.141 | 0.015 | 0.050 | 0.000 | 0.076 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 |
| Apr-16 | 0.160 | 0.010 | 0.050 | 0.000 | 0.100 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.023 |
| May-16 | 0.334 | 0.000 | 0.010 | 0.000 | 0.324 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.026 |
| Jun-16 | 2.517 | 0.024 | 0.300 | 0.000 | 2.193 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.013 |
| **Sub-total** | **5.863** | **0.249** | **0.520** | **2.228** | **2.866** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** | **0.076** |
| Jul-16 | 3.284 | 0.000 | 0.150 | 0.000 | 3.134 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 |
| Aug-16 | 0.396 | 0.005 | 0.100 | 0.000 | 0.291 | 0.000 | 4.720 | 0.000 | 0.000 | 0.000 | 0.012 |
| Sep-16 | 0.529 | 0.000 | 0.100 | 0.000 | 0.429 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 |
| Oct-16 | 1.151 | 0.000 | 0.300 | 0.000 | 0.851 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.013 |
| Nov-16 | 0.266 | 0.000 | 0.100 | 0.000 | 0.166 | 0.000 | 14.700 | 0.000 | 0.000 | 0.000 | 0.028 |
| Dec-16 | 0.520 | 0.022 | 0.100 | 0.000 | 0.398 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.019 |
| **Total** | **12.008** | **0.275** | **1.370** | **2.228** | **8.135** | **0.000** | **19.420** | **0.000** | **0.000** | **0.000** | **0.158** |

Notes: (1) The waste flow table should cover the whole construction period of the Contract.

(2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.

(3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.

(4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.

(5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

# Monthly Summary Waste Flow Table

Department: Drainage Services Department Contract No.: DC/2013/09

Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road

Commencement Date: 21-Jul-2015 Estimated completion Date: 19-Aug-2017 Estimated Contract Sum: 1.56M

| Month | Actual Quantities of Inert C&D Materials Generated Monthly | | | | | | Actual Quantities of C&D Wastes Generated Monthly | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rock and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Imported Fill | Metals | Paper/ cardboard packaging | Plastics (see Note 3) | Chemical Waste | Others, e.g. general refuse |
| | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000 kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000$m^3$) |
| Jan-17 | 0.304 | 0.089 | 0.100 | 0.000 | 0.115 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.023 |
| Feb-17 | 0.660 | 0.000 | 0.400 | 0.000 | 0.260 | 0.000 | 1.830 | 0.000 | 0.000 | 0.000 | 0.051 |
| Mar-17 | 0.326 | 0.076 | 0.200 | 0.000 | 0.050 | 0.000 | 1.190 | 0.015 | 0.000 | 0.000 | 0.029 |
| Apr-17 | 1.100 | 0.000 | 0.200 | 0.000 | 0.900 | 0.000 | 0.620 | 0.000 | 0.000 | 0.000 | 0.029 |
| May-17 | 0.600 | 0.000 | 0.100 | 0.000 | 0.500 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.019 |
| Jun-17 | 0.600 | 0.000 | 0.200 | 0.000 | 0.400 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.031 |
| **Sub-total** | **3.590** | **0.165** | **1.200** | **0.000** | **2.225** | **0.000** | **3.640** | **0.015** | **0.000** | **0.000** | **0.182** |
| Jul-17 | 0.344 | 0.000 | 0.100 | 0.000 | 0.244 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.041 |
| Aug-17 | 0.461 | 0.011 | 0.400 | 0.000 | 0.050 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.067 |
| Sep-17 | 0.602 | 0.016 | 0.000 | 0.000 | 0.586 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.082 |
| Oct-17 | 0.515 | 0.106 | 0.100 | 0.000 | 0.309 | 0.000 | 5.060 | 0.000 | 0.000 | 0.000 | 0.063 |
| Nov-17 | 0.331 | 0.062 | 0.000 | 0.000 | 0.268 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.126 |
| Dec-17 | 0.234 | 0.068 | 0.000 | 0.000 | 0.166 | 0.000 | 0.370 | 0.059 | 0.001 | 0.000 | 0.100 |
| **Total** | **6.077** | **0.428** | **1.800** | **0.000** | **3.848** | **0.000** | **9.070** | **0.074** | **0.001** | **0.000** | **0.662** |

Notes: (1) The waste flow table should cover the whole construction period of the Contract.

(2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.

(3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.

(4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.

(5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

Appendix I

# Monthly Summary Waste Flow Table

Department: Drainage Services Department Contract No.: DC/2013/09

Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road

Commencement Date: 2015-7-21 Estimated completion Date: 2017-8-19 Estimated Contract Sum: 1.56M

| Month-Year | Actual Quantities of Inert C&D Materials Generated Monthly | | | | | | Actual Quantities of C&D Wastes Generated Monthly | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rock and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Imported Fill | Metals | Paper/ cardboard packaging | Plastics (see Note 3) | Chemical Waste | Others, e.g. general refuse |
| | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000$m^3$) | (in '000 kg) | (in '000kg) | (in '000kg) | (in '000kg) | (in '000$m^3$) |
| Jan-2018 | 0.072 | 0.049 | 0.000 | 0.000 | 0.023 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.046 |
| Feb-2018 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.022 |
| Mar-2018 | 0.190 | 0.006 | 0.000 | 0.000 | 0.184 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.030 |
| Apr-2018 | 0.991 | 0.328 | 0.100 | 0.000 | 0.563 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.041 |
| May-2018 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| June-2018 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Sub-total** | **1.253** | **0.383** | **0.100** | **0.000** | **0.770** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** | **0.139** |
| July-2018 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Aug-2018 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Sep-2018 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Oct-2018 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Nov-2018 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Dec-2018 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Total** | **1.253** | **0.383** | **0.100** | **0.000** | **0.770** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** | **0.139** |

*March 2018 date have been revised

Notes:
(1) The waste flow table should cover the whole construction period of the Contract.
(2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.
(3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.
(4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.
(5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

# Appendix M

# IMPLEMENTATION SCHEDULE FOR ENVIRONMENTAL MITIGATION MEASURES (ISEMM)

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| **Air Quality Impact** | | | | | | |
| S2.4.1.3 | Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:<br>• Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading;<br>• Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;<br>• A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones;<br>• The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle;<br>• Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;<br>• When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period.<br>• The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials;<br>• Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously;<br>• Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; | To minimize the dust impact | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | Air Pollution Control Ordinance (APCO) and Air Pollution Control (Construction Dust) Regulation |

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| **Air Quality Impact** | | | | | | |
| | • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;<br>• Any skip hoist for material transport should be totally enclosed by impervious sheeting;<br>• Every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;<br>• Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed;<br>• Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and<br>• Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabilizer within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. | | | | | |

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| **Noise Impact** | | | | | | |
| S3.4.1.1 | Use of movable barrier, enclosure, acoustic mat and quiet plant. Use of wooden frames barrier with a small-cantilevered upper portion of superficial density not less than 14kg/m² on a skid footing with 25mm thick internal sound absorptive lining. | To minimize construction noise impact arising from the Project at the affected noise sensitive receivers (NSRs) | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM, Noise Control Ordinance (NCO) |
| S3.4.1.2 | Good Site Practice:<br>• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.<br>• Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program.<br>• Mobile plant, if any, should be sited as far away from NSRs as possible.<br>• Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.<br>• Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.<br>• Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. | To minimize construction noise impact arising from the Project at the affected NSRs | Contractor | Work Sites | Construction period of Advance Works and Main Works of Phase 1A | EIAO-TM, NCO |

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| **Ecological Impact** | | | | | | |
| S4.2.1.1 | Solid dull green noise/visual barriers of at least 2m high shall be erected and maintained between active works area and all areas of ecological importance. | Minimize noise and human disturbances during construction phase. | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM |
| S4.2.1.2 | Avoid unnecessary lighting. | Minimize mortality impacts on birds. | Design / Contractor/ Plant Operator | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM |
| S4.2.1.3 | Good construction site practice to minimise dust generation should be followed on all construction sites. Measures to avoid, minimise and mitigate impacts on air quality are detailed in this schedule | Minimize dust generation from construction sites. | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM |
| S4.2.1.4 | The following measures to avoid, minimise and mitigate impact on water quality during construction phase shall be implemented<br>• Temporary sewerage and drainage to be designed and installed to collect wastewater and prevent it from entering water bodies;<br>• Proper locations well away from nearby water bodies should be used for temporary storage of materials (i.e. equipment, filling materials, chemicals and fuel) and temporary stockpiles of construction debris and spoil, and these should be identified before commencement of works;<br>• To prevent muddy water entering nearby water bodies, work sites close to nearby water bodies should be isolated, using such items as sandbags or silt curtains with lead edge at bottom and properly supported props. Other protective measures should also be taken to ensure that no pollution or siltation occurs to the water gathering grounds of the work sites;<br>• Construction debris and spoil should be covered and/or properly disposed of as soon as possible to avoid these being washed into nearby water bodies;<br>• Proper locations for discharge outlets of temporary wastewater treatment facilities well away from sensitive receivers should be identified; | Avoid, minimise and mitigate impact on water quality | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM |

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| **Ecological Impact** | | | | | | |
| | • Adequate lateral support should be erected where necessary in order to prevent soil/mud from slipping into water bodies;<br>• Site boundaries should be clearly marked and any works beyond the boundary strictly prohibited;<br>• Regular water monitoring and site audit should be carried out at adequate points along any watercourses where construction works are underway upstream within their catchments and also on the Ng Tung, Sheung Yue and Shek Sheung Rivers. If the monitoring and audit results show that pollution occurs, adequate measures including temporarily cessation of works should be considered;<br>• Excavation profiles should be properly designed and executed with attention to the relevant requirements for environment, health and safety;<br>• Where soil to be excavated is situated beneath the groundwater table, it may be necessary to lower the groundwater table by installing well points or similar means;<br>• Stockpiling sites should be lined with impermeable sheeting and bunded. Stockpiles should be properly covered by impermeable sheeting to reduce dust emission during dry season or contaminated run-off during rainy season. Watering should be avoided on stockpiles of contaminated soil to minimize contaminated runoff and construction materials should be properly covered and located away from nearby water bodies; and<br>• Supply of suitable clean backfill material after excavation, if required.<br>• Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated run-off, and truck bodies and tailgates should be sealed to prevent discharge during transport or during wet season;<br>• Speed control for the trucks carrying contaminated materials should be enforced;<br>• Vehicle wheel washing facilities at construction sites' exit points should be established and used, where necessary; and<br>• Other measures as detailed in this schedule. | | | | | |

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| **Water Quality Impact** | | | | | | |
| S5.2.2.1 | Construction Site Runoff Practices and measures provided in the Practice Note for Professional Persons on Construction Site Drainage, (PROPECC PN1/94) should be followed where applicable. | Control construction runoff | Contractors | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM, WPCO, EIAO |
| S5.2.2.2 – S5.2.2.3 | Sewage from Workforce<br>• Portable chemical toilets and sewage holding tanks should be provided for handling the construction sewage generated by the workforce. A licensed Contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.<br>• Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. Regular environmental audit on construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. It is anticipated that sewage generation during the construction phase of the Project would not cause water quality impact after undertaking all required measures | Handling of site sewage | Contractors | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM, WPCO, EIAO |

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| **Waste Management** | | | | | | |
| S6.2.2.1 | Good Site Practices and Waste Reduction Measures:<br>• Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site;<br>• Training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling;<br>• Provision of sufficient waste disposal points and regular collection for disposal;<br>• Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;<br>• Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;<br>• An Environmental Management Plan (EMP) should be prepared by the contractor and submitted to the Engineer for approval. | Minimize waste generation during construction | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | Waste Disposal Ordinance (WDO) |
| S6.2.3.1 | Waste Reduction Measures:<br>• Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal;<br>• Proper storage and site practices to minimize the potential for damage and contamination of construction materials;<br>• Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste;<br>• Sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); and<br>• Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. | Reduce waste generation | Contractor | Work Sites | Prior to the commencement of construction of Advance Works and Main Works of Phase 1A | WDO |
| S6.2.4.1 - S6.2.4.2 | Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:<br>• Waste, such as soil, should be handled and stored well to ensure secure | Minimize waste impacts arising from waste storage | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | WDO |

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| **Waste Management** | | | | | | |
| | containment, thus minimizing the potential of pollution;<br>• Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and<br>• Different locations should be designated to stockpile each material to enhance reuse.<br>• Remove waste in timely manner;<br>• Employ the trucks with cover or enclosed containers for waste transportation;<br>• Obtain relevant waste disposal permits from the appropriate authorities; and<br>• Disposal of waste should be done at licensed waste disposal facilities. | | | | | |
| S6.2.5.2 | C&D Materials from Site Formation<br>• Maintain temporary stockpiles and reuse excavated fill material for backfilling;<br>• Carry out on-site sorting;<br>• Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate;<br>• Adopt "selective demolition" technique to demolish the existing structure and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; and<br>• Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified. | Minimize waste impacts from excavated and C&D materials | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | Land (Miscellaneous Provisions) Ordinance, WDO, ETWB TCW No. 19/2005 |
| S6.2.5.3 | C&D Material from Buildings Demolition and New Building Construction<br>• The Contractor should recycle as much as possible of the C&DM on-site. Public fill and C&DM waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. For example, concrete and masonry can be crushed and used as fill, and steel reinforcing bar can be used by scrap steel mills. Different areas of the work sites should be designated for such segregation and storage.<br>• The use of wooden hoardings shall not be allowed. An alternative material, such as metal, aluminium or alloy etc, could be used.<br>• Government has developed a charging policy for the disposal of waste to landfill at present. It will provide additional incentive to reduce the volume of generated waste and ensure proper segregation to allow | Minimize waste impacts from building demolition and new building construction | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | Land (Miscellaneous Provisions) Ordinance, WDO, ETWB TCW No. 19/2005 |

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| **Waste Management** | | | | | | |
| | reuse of the inert material on site when implemented.<br>• In order to minimize the impacts of the demolition works, the generated wastes must be cleared as quickly as possible after demolition. Therefore, the demolition and clearance works should be undertaken simultaneously. To facilitate proper segregation of inert and non-inert C&D material arising from demolition works, selective demolition method should be adopted. | | | | | |
| S6.2.5.4 | Chemical Waste<br>• If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producers.<br>• Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste contractor. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation | Control the chemical waste and ensure proper storage, handling and disposal | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | Waste Disposal (Chemical Waste General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste |
| S6.2.5.5 | General Refuse<br>• General refuse should be stored in enclosed bins separately from construction and chemical wastes.<br>• Recycling bins should also be placed to encourage recycling.<br>• Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean.<br>• A reputable waste collector should be employed to remove general refuse on a daily basis. | Minimize production of the general refuse and avoid odour, pest and litter impacts | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | Waste Disposal (Chemical Waste General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste |

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| **Landscape and Visual** | | | | | | |
| S7.3.1.1 | Good Site Practices<br>• For areas unavoidably disturbed by the Project on a short term basis e.g. works areas, the general principle to try and restore these to their former state to suit future land use, should be adhered to.<br>• With regard to topsoil, where identified, it should be stripped, treated appropriately, and where suitable and practical stored for re-use in the construction of the soft landscape works such as roadside amenity strips, and open space sites. | Minimize the impact to the landscape and visual | Contractor | Work Sites | Prior to construction and construction phase | |
| S7.3.2.1 | MM4 - Tree Protection & Preservation<br>• Existing trees to be retained within the Project Site should be carefully protected during construction. In particular Old and Valuable Trees (OVTs) will be preserved according to ETWB TC (Works) No. 29/2004. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in Contractor's works areas. A detailed tree survey will be carried out for the Tree Removal Application (TRA) process which will be carried out at the later detailed design stage of the Project. The detailed tree survey will propose which trees should be retained, transplanted or felled and will include details of tree protection measures for those trees to be retained. | Protect and Preserve Trees | Designer / Contractor | Work Sites | Prior to construction and construction phase | ETWB TCW No. 10/2013, 29/2004 and 3/2006 |
| S7.3.2.1 | MM5 - Tree Transplantation<br>• Trees unavoidably affected by the Project works should be transplanted where practical. Trees should be transplanted straight to their final receptor site and not held in a temporary nursery as far as possible. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, where applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme. A detailed transplanting proposal will be submitted to relevant government departments for approval in accordance with ETWBTC 2/2004 and 3/2006 and final | Transplant Trees where suitable for transplantation | Designer / Contractor | Work Sites where possible. Otherwise consider offsite locations | Prior to construction, construction phase and operation phase | WB TCW No. 10/2013, 3/2006 and 2/2004 |

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| **Landscape and Visual** | | | | | | |
| | locations of transplanted trees should be agreed prior to commencement of the work. | | | | | |
| S7.3.2.1 | MM17 - Light Control<br>• Construction day and night time lighting should be controlled to minimize glare impact to adjacent VSRs during the Construction phase. Street and night time lighting shall also be controlled to minimize glare impact to adjacent VSRs during the operation phase. | To minimize glare impact to adjacent VSRs. | Designer / Contractor | Work Sites and/or the Plant | Construction phase and operation phase | |

# APPENDIX B

# MONTHLY EM&A REPORT FOR CONTRACT NO. DE/2014/01

**Jardine Engineering Corporation Ltd.**

# Contract No. DE/2014/01
# Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station

## Monthly Environmental Monitoring and Audit Report April 2018

**(Version 1.0)**

Certified By

(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties

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## ABBREVIATION AND ACRONYM

| | |
|---|---|
| AL Levels | Action and Limit Levels |
| DSD | Drainage Services Department |
| E / ER | Engineer/Engineer's Representative |
| EIA | Environmental Impact Assessment |
| EM&A | Environmental Monitoring and Audit |
| EMIS | Environmental Mitigation Implementation Schedule |
| EP | Environmental Permit |
| EPD | Environmental Protection Department |
| ET | Environmental Team |
| HVS | High Volume Sampler |
| IEC | Independent Environmental Checker |
| RE | Resident Engineer |
| RH | Relative Humidity |
| QA/QC | Quality Assurance / Quality Control |
| SLM | Sound Level Meter |
| WMP | Waste Management Plan |
| SCISTW | Shek Wu Hui Sewage Treatment Works |

# EXECUTIVE SUMMARY

## Introduction

1. This is the 7th Monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for DSD Contract No. DE/2014/01 "Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station" (The Project) which documents the key information of EM&A and environmental monitoring works undertaken by other Contract at the Shek Wu Hui Sewage Treatment Works under Phase 1A with Environmental Permit (Permit No. FEP-02/474/2013).

2. The site activities undertaken in the reporting month included:

- Mechanical Installation of lifting appliance at 1/F, MBR Facilities Building.
- Mechanical Installation of Air Blowers at 1/F, MBR Facilities Building.
- Mechanical Installation of MBR Pre-treatment Screen Facilities.
- Mechanical Installation in Bioreactor No.1 (BR1).
- Electrical Installation in 11kV HV Switchroom.

## Environmental Monitoring Works

3. The environmental monitoring works of the Project were conducted by the ET of Contract DC/2013/09 at the SWHSTW under Phase 1A with same Environmental Permit in accordance with the Updated EM&A Manual for Contract DE/2014/01 which has been submitted and verified by IEC. The current impact monitoring methodology conducted by DC/2013/09 under the requirements of the Updated EM&A Manual for Shek Wu Hui Sewage Treatment Works, are also applicable for the installation works of DE/2014/01 since the two Contracts have shared the same site areas and will execute their works under the same EP.

4. Site audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.

5. Summary of the non-compliance of the reporting month is tabulated in **Table I**.

**Table I Summary Table for Non-compliance (Exceedances) Recorded in the Reporting Month**

| Monitored By | Monitoring Station | Parameter | No. of Exceedance | | No. of Exceedance Due to the Project | | Action Taken |
|---|---|---|---|---|---|---|---|
| | | | Action Level | Limit Level | Action Level | Limit Level | |
| DC/2013/09 | AM1 | 1-hr TSP | 0 | 0 | 0 | 0 | N/A |
| | | 24-hr TSP | 0 | 0 | 0 | 0 | N/A |
| | AM2 | 1-hr TSP | 0 | 0 | 0 | 0 | N/A |
| | AM2a | 24-hr TSP | 0 | 0 | 0 | 0 | N/A |
| | NM1 | Noise | 0 | 0 | 0 | 0 | N/A |
| | NM2 | | 0 | 0 | 0 | 0 | N/A |

*1-hour TSP Monitoring*

6. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

*24-hour TSP Monitoring*

7. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

*Construction Noise*

8. All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

**Environmental Licenses and Permits**

9. Licenses/Permits granted to Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A include the Environmental Permit (EP no. FEP-02/474/2013); Registered as a Chemical Waste Producer and Billing account for Disposal of Construction Waste for the Project.

**Environmental Mitigation Implementation Schedule**

10. According to the Updated EM&A Manual, air quality, noise and waste management would be the key environmental issues and mitigation measures shall be implemented during the construction phase. Details of the implementation of mitigation measures are provided in the **Appendix F**.

**Key Information in the Reporting Month**

11. Summary of key information in the reporting month is tabulated in **Table II**

**Table II Summary Table for Key Information in the Reporting Month**

| Event | Event Details | | Action Taken | Status | Remark |
|---|---|---|---|---|---|
| | Number | Nature | | | |
| Complaint received | 0 | --- | N/A | N/A | --- |
| Reporting Changes | --- | --- | --- | --- | --- |
| Notifications of any summons & prosecutions received | 0 | --- | N/A | N/A | --- |

**Site Inspection Conducted by Government Department**

12. No site inspection for Contract DE/2014/01 was conducted by Government Department in the reporting month.

**Summary of Complaints, Prosecutions, Reporting Changes and Notification of Summons**

13. No environmental complaint, prosecution, reporting changes and notification of summons were received or reported for the Project in the reporting month.

14. There were no environmental complaint and prosecution received since the commencement

of the Project. The Complaint Log is presented in **Appendix G**.

15. No notification of summons and prosecution was received by the Contractor in the reporting month.

**Future Key Issues**

16. Key issues to be considered in the coming month for the Contract include:

**Table III Future Key Issue for the next Reporting Month**

| Major Construction Works | Potential Pollution Issues | Mitigation Measures |
|---|---|---|
| • Electrical Installation of switchboards in LV Switchroom at G/F, MBR Facilities Building.<br>• Electrical Installation in Transformer Room No.2 at 1/F, MBR Facilities Building.<br>• Mechanical Installation of Air Blowers at 1/F, MBR Facilities Building.<br>• Mechanical Installation of MBR Pre-treatment Screen Facilities.<br>• Mechanical Installation of Membrane in MBR tank.<br>• Mechanical Installation of Diffusers and associated equipment in Bioreactor No.1 (BR1). | • Storage of chemicals containers.<br>• Waste accumulation.<br>• Silt and dust getting into the public area by the leaving site vehicles at the site exits without adequate wheel washing facilities. | • Drip tray should be provided to chemical containers.<br>• Waste should be disposed properly and avoid accumulation.<br>• Accumulated materials to be recycled on-site.<br>• Wheel washing should be provided to vehicles before leaving the site area. |

# 1. INTRODUCTION

## Background

1.1 The Project 'Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station' under Contract No: DE/2014/01 mainly comprises the Design, manufacture, supply, delivery, installation, inspection, testing and commissioning of E&M installations for the Advance Works in the SWHSTW. The general location plan of the Project is shown in **Figure 1**.

1.2 The Project is under North East New Territories New Development Areas and is part of the designated project with Register No. : AEIAR-175/2013. The current works under the Project and other Contracts at SWHSTW are covered by the Environmental Permit (Permit No. FEP-02/474/2013), which was issued on 15th February 2018 by the Environmental Protection Department (hereinafter called EPD) to the Drainage Services Department (hereinafter called the DSD) as the Permit Holder.

1.3 The environmental monitoring works on air quality and noise were covered by the ET of Contract DC/2013/09 for the Project.

1.4 The Jardine Engineering Corporation, Limited was commissioned by the DSD to undertake the construction of the Contract No. DE/2014/01 "Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station".

1.5 The site activities undertaken in the reporting month included:

- Mechanical Installation of lifting appliance at 1/F, MBR Facilities Building.
- Mechanical Installation of Air Blowers at 1/F, MBR Facilities Building.
- Mechanical Installation of MBR Pre-treatment Screen Facilities.
- Mechanical Installation in Bioreactor No.1 (BR1).
- Electrical Installation in 11kV HV Switchroom.

1.6 Cinotech Consultants Limited was commissioned and appointed by The Jardine Engineering Corporation Limited as the Environmental Team (ET) of Contract No. DE/2014/01 under Condition 2.1 of the FEP. The Environmental Monitoring and Audit (EM&A) works were conducted and reported during the reporting month according to the Updated EM&A Manual of this designated project.

1.7 This is the 7th monthly EM&A report summarizing the EM&A works conducted for the Project in April 2018.

## Project Organizations

1.8 The contacts of the Project are shown in **Table 1.1** and the Project Organization Chart is shown in **Figure 4**.

**Table 1.1 Key Project Contacts**

| Party | Role | Name | Position | Phone No. |
|---|---|---|---|---|
| Drainage Service Department | Resident Site Engineer | Mr. Fong Mo | Resident Engineer | 2594 7329 |
| Cinotech | Environmental Team | Dr. Priscilla Choy | ET Leader | 2151 2089 |
| ANewR | Independent Environmental Checker | Mr. Adi Lee | Independent Environmental Checker | 2618 2836 |
| The Jardine Engineering Corporation, Limited | Contractor | Mr. Kim Hung Lau | Project Manager | 2947 1125 |
| | | Mr. George Ng | Environmental Officer | 2947 1125 |

**Summary of EM&A Requirements**

1.9 The EM&A programme requires construction phase monitoring for air quality and construction noise, landscape and visual and environmental site audit. The EM&A requirements for each parameter are described in the following sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event Action Plans;
- Environmental mitigation measures, as recommended in the project EIA study final report; and
- Environmental requirements in contract documents.

1.10 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in **Section 4** of this report.

1.11 This report presents the monitoring results, observations, locations, equipment, period, for required monitoring parameter namely air quality, noise and audit works conducted for the Project during this reporting month. For the methodology and QA/QC procedures of the monitoring parameters, please refer to the respective monthly reports for the other contract at SWHSTW.

## 2. AIR QUALITY

### Monitoring Requirements

2.1 1-hour and 24-hour TSP monitoring were conducted to monitor the air quality. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.

### Monitoring Locations

2.2 Three designated monitoring stations, AM1, AM2 and AM2a were selected for impact dust monitoring for the Project. **Table 2.1** describes the air quality monitoring locations and **Figure 2** indicated their positions in relation to the site boundary.

**Table 2.1 Locations for Air Quality Monitoring**

| Monitoring Station | Monitored by | Location of Measurement |
|---|---|---|
| AM1 | DC/2013/09 | No. 31 Wai Loi Tsuen |
| AM2 | | Fu Tei Au |
| AM2a | | RE's Site Office |

### Monitoring Equipment

2.3 The details of the monitoring equipment and copies of the calibration certificates used during the reporting month could be referred to the monthly EM&A reports of Contract DC/2013/09.

### Monitoring Parameters, Frequency and Duration

2.4 **Table 2.2** summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period. The air quality monitoring schedule for the reporting period could refer to the respective monthly reports.

**Table 2.2 Impact Dust Monitoring Parameters, Frequency and Duration**

| Monitoring Station | Parameter | Period | Frequency |
|---|---|---|---|
| AM1 | 1-hour TSP | 0700-1900 hrs | At least three times every 6 days |
| AM2 | | | |
| AM1 | 24-hour TSP | 0000-2400 hrs | At least once every 6 days |
| AM2a | | | |

### Monitoring Methodology and QA/QC Procedure

2.5 The monitoring methodology and QA/QC procedure could be referred to the monthly report of Contract DC/2013/09.

### Results and Observations

2.6 The monitoring results at AM1, AM2 and AM2a in reporting month could be referred to the monthly report of Contract DC/2013/09. The monitoring results has been checked by the ET of Contract DC/2013/09 and verified by the IEC.

2.7 All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. Summary of exceedance is presented in **Appendix B.**

2.8 All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. Summary of exceedance is presented in **Appendix B.**

2.9 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results could be referred to Appendix I and Appendix J of the monthly report of Contract DC/2013/09.

2.10 According to field observations during site inspection, identifiable dust sources near the monitoring stations were mainly from construction works and vehicles movement operating for the Project.

# 3. NOISE

## Monitoring Requirements

3.1 Two noise monitoring station, namely NM1 and NM2 were designated in the Updated EM&A Manual for impact monitoring. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

## Monitoring Locations

3.2 Noise monitoring was conducted at the designated monitoring stations as listed in **Table 3.1** and **Figure 3** indicated their positions in relation to the site boundary

**Table 3.1 Location of Noise Monitoring Stations**

| Monitoring Station | Monitored By | Location of Measurement |
|---|---|---|
| NM1 | DC/2013/09 | No. 31 Wai Loi Tsuen |
| NM2 | | Fu Tei Au |

## Monitoring Equipment

3.3 The details of the monitoring equipment and copies of the calibration certificates used during the reporting month could be referred to the monthly EM&A reports of Contract DC/2013/09.

## Monitoring Parameters, Frequency and Duration

3.4 **Table 3.2** summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule for the reporting period could refer to the respective monthly reports.

**Table 3.2 Noise Monitoring Parameters, Frequency and Duration**

| Monitoring Stations | Parameter | Period | Frequency |
|---|---|---|---|
| NM1 | $L_{10}$(30 min.) dB(A)<br>$L_{90}$(30 min.) dB(A)<br>$L_{eq}$(30 min.) dB(A) | 0700-1900 hrs on normal weekdays | Once per week |
| NM2 | | | |

## Monitoring Methodology and QA/QC Procedures

3.5 The monitoring methodology and QA/QC procedure could be referred to the monthly report of Contract DC/2013/09.

## Results and Observations

3.6 The monitoring results at NM1 and NM2 in the reporting month could be referred to the monthly report of Contract DC/2013/09. The monitoring results has been checked by the ET of Contract DC/2013/09 and verified by the IEC.

3.7 The monitoring results and graphical presentations could be referred to Appendix I and Appendix J of the monthly report of Contract DC/2013/09.

3.8 No Action/Limit Level exceedance was recorded in the reporting month. Summary of exceedance is presented in **Appendix B**.

3.9 The major noise sources identified at the designated noise monitoring stations were mainly from construction works and vehicles movement operating for the Project.

# 4. ENVIRONMENTAL AUDIT

## Site Audits

4.1 Site audits were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in **Appendix C**.

4.2 Site audits were conducted on 4 10, 19. 27 and 30 April 2018 by ET after the commencement of construction works for the Contract. A joint site audit with the representative of IEC was carried out on 30 April 2018. The details of observations during site audit can refer to **Table 4.1**.

## Implementation Status of Environmental Mitigation Measures

4.3 Details of the implementation of mitigation measures are provided in the **Appendix F.**

4.4 During the weekly environmental site inspections in the reporting period, no non-conformance was identified. The observations of the site audit for the Projects are summarized in **Table 4.1.**

**Table 4.1 Observations of Site Audit**

| Parameters | Date | Ref. Number | Observations | Follow Up Action |
|---|---|---|---|---|
| **Water Quality** | N/A | N/A | -- | -- |
| **Air Quality** | N/A | N/A | -- | -- |
| **Noise** | N/A | N/A | -- | -- |
| **Waste/ Chemical Management** | N/A | N/A | -- | -- |
| **Permit/ Licenses** | N/A | N/A | -- | -- |

## Review of Environmental Monitoring Procedures

4.5 The monitoring works was conducted by the monitoring teams of Contracts DC/2013/09. The monitoring procedures were reviewed by its respective ET.

## Status of Environmental Licensing and Permitting

4.6 All permits/licenses obtained for the Contract DE/2014/01 are summarized in **Table 4.2**.

**Table 4.2 Summary of Environmental Licensing and Permit Status**

| Permit No. | Valid Period | | Details | Status |
|---|---|---|---|---|
| | From | To | | |
| **Environmental Permit** | | | | |
| FEP-02/474/2013 | 15/2/2018 | N/A | The FEP was approved on 15/2/2018 | Valid |
| **Registered Chemical Waste Producer** | | | | |
| WPN5213-624-T3685-01 | 3/7/2017 | N/A | The application was approved on 3/7/2017 | Valid |
| **Billing Account for Disposal of Construction Waste** | | | | |
| A/C No.7024165 | 4/2/2016 | N/A | The application was approved on 4/2/2016 | Valid |

**Status of Waste Management**

4.7 The amount of wastes generated by the activities of the Project in the reporting month is shown in **Appendix D and Table 4.3.**

**Table 4.3 Quantities of Waste Generated from the Reporting Month**

| Type of waste | | Quantity | Disposal Location |
|---|---|---|---|
| **C&D Materials (inert)** | | 0 $m^3$ | - |
| **C&D Materials (non-inert)** | **General Refuse** | 7.16 *tonne* | NENT |
| | **Chemical Waste** | 0 *kg* | - |
| | **Paper/ cardboard** | 0 *kg* | - |
| | **Plastics** | 0 *kg* | - |
| | **Metals** | 0 *kg* | - |

**Implementation Status of Event Action Plans**

4.8 The Event Action Plans for air quality and noise are presented in **Appendix E.**

1-hr TSP

4.9 No Action/Limit Level exceedance was recorded.

24-hr TSP

4.10 No Action/Limit Level exceedance was recorded.

Construction Noise

4.11 No Action/Limit Level exceedance was recorded.

Landscape and Visual

4.12 No non-compliance was recorded.

**Site Inspection Conducted by Government Department**

4.13 No site inspection for Contract DE/2014/01 was conducted by Government Department in the reporting month.

**Summary of Complaints, Prosecutions, Reporting Changes and Notification of Summons**

4.14 No environmental complaint, prosecution, reporting changes and notification of summons were received or reported for the Project in the reporting month.

4.15 There were no environmental complaint and prosecution received since the commencement of the Project. The Complaint Log is presented in **Appendix G.**

# 5. FUTURE KEY ISSUES

## Key Issues for the Coming Month

5.1 Key issues to be considered in the coming month for the Contract include:

**Table 5.1 Future Key Issue for the next Reporting Month**

| Major Construction Works | Potential Pollution Issues | Mitigation Measures |
|---|---|---|
| • Electrical Installation of switchboards in LV Switchroom at G/F, MBR Facilities Building.<br>• Electrical Installation in Transformer Room No.2 at 1/F, MBR Facilities Building.<br>• Mechanical Installation of Air Blowers at 1/F, MBR Facilities Building.<br>• Mechanical Installation of MBR Pre-treatment Screen Facilities.<br>• Mechanical Installation of Membrane in MBR tank.<br>• Mechanical Installation of Diffusers and associated equipment in Bioreactor No.1 (BR1). | • Storage of chemicals containers.<br>• Waste accumulation.<br>• Silt and dust getting into the public area by the leaving site vehicles at the site exits without adequate wheel washing facilities. | • Drip tray should be provided to chemical containers.<br>• Waste should be disposed properly and avoid accumulation.<br>• Accumulated materials to be recycled on-site.<br>• Wheel washing should be provided to vehicles before leaving the site area. |

## Monitoring Schedule for the Next Month

5.2 The tentative environmental monitoring schedules for the next reporting month are shown in the monthly reports of Contract DC/2013/09 (Appendix H).

## Construction Program for the Next Month

5.3 The tentative construction program is provided in **Appendix H.**

# 6. CONCLUSIONS AND RECOMMENDATIONS

## Conclusions

6.1 Environmental monitoring and audit works were performed in the reporting month for the Project. The results were checked and reviewed by the ET of Contract DC/2013/09.

1-hour TSP Monitoring

6.2 The monitoring works for the Project were covered by the ET of Contract DC/2013/09. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

24-hour TSP Monitoring

6.3 The monitoring works for the Project were covered by the ET of Contract DC/2013/09. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Construction Noise Monitoring

6.4 The monitoring works for the Project were covered by the ET of Contract DC/2013/09. All Construction Noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Environmental Audit

6.5 Weekly environmental site audits were conducted by the ET of Contract No. DE/2014/01 at the site area of Contract No. DE/2014/01 during the reporting month. No non-compliance was recorded.

Complaint, notification of summons and Prosecution

6.6 No environmental complaint, notification of summons and prosecution was received in the reporting month.

## Recommendations for Future Reporting Months:

6.7 The following recommendations were made for future reporting months:

*Air Quality*

- To regularly maintain the machinery and vehicles on site;
- To follow up any exceedance caused by the construction works;
- Non-Road Mobile Machinery (NRMM) labels must be demonstrated on the registered equipment for inspection.

*Noise*

- To inspect the noise source inside the site;

- To follow up any exceedance caused by the construction works;
- To space out noisy equipment and position the equipment as far away as possible from sensitive receivers;
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers in an appropriate location.
- To provide adequate lubricant on mechanical equipment to reduce frictional noise; and
- To well maintain the mechanical equipment/ machineries to avoid abnormal noise nuisance.

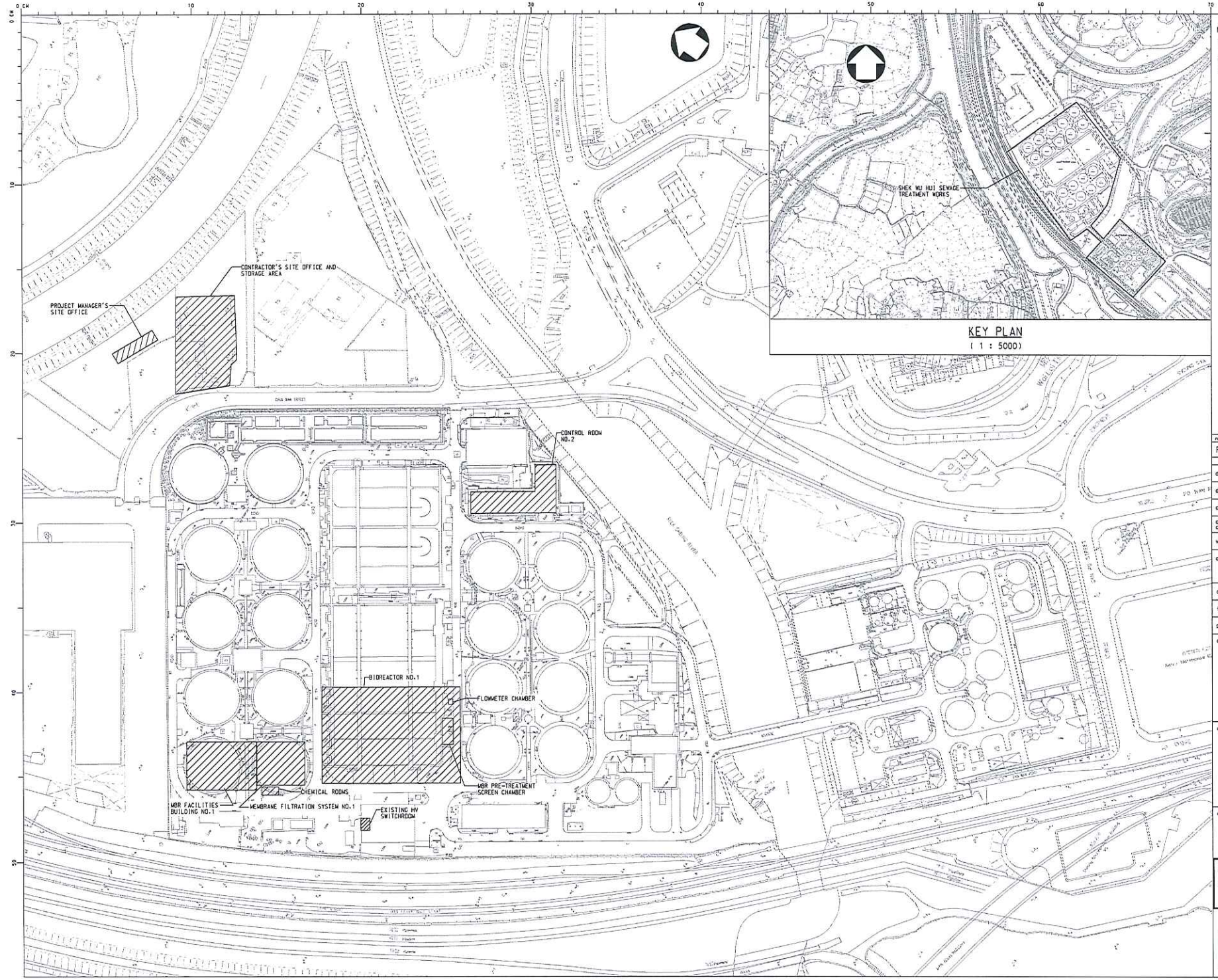
*Water Quality*

- To identify any discharge of wastewater from the construction site;
- To avoid blockage of U channel and drainage system by sediment;
- To avoid water accumulation on site and carry out larviciding against mosquito breeding for stagnant water when mosquito larvae are observed; and
- To avoid spoilage of run-off from construction site to public area.
- The discharge quality must meet the requirements specified in the discharge licence.

*Waste/Chemical Management*

- To provide proper rubbish bins / skips for waste collection;
- To check for any accumulation of wasted materials or rubbish on site;
- To provide proper storage area or drip trays for oil and chemical containers on site;
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment;
- To avoid improper handling or storage of oil drum on site.

# FIGURES







KEY PLAN
( 1 : 5000)

NOTES :

1. GENERAL NOTES REFER TO DRAWING NO. DEM1619/M01 UNLESS OTHERWISE SPECIFIED.
2. LEGEND REFER TO DRAWING NO. DEM1619/M04.
3. CONTRACT COMPUTER FACILITIES AND FURNITURE FOR PROJECT MANAGER'S SITE OFFICE SHALL BE PROVIDED BY THE E&M CONTRACTOR.

WORKING AREA OF ADVANCE WORKS

| no. | date | description | name initial |
|---|---|---|---|

REVISION

| | name | date |
|---|---|---|
| designed | Y Y WONG | 22 APR 2015 |
| drawn | C Y CHEUNG | 22 APR 2015 |
| checked | C S CHOI | 22 APR 2015 |
| counter checked | Y L CHAN | 22 APR 2015 |
| vetted | W C FUNG | 22 APR 2015 |

approved

RICKY LI — 23 APR 2015
CE/E&MP — Date

contract no. DE/2014/01

file no.

project no. 44060S AND 50330R

contract

PROVISION OF ELECTRICAL AND MECHANICAL FACILITIES FOR SHEK WU HUI SEWAGE TREATMENT WORKS - FURTHER EXPANSION PHASE 1A - ADVANCE WORKS AND NG CHOW SOUTH ROAD SEWAGE PUMPING STATION

drawing title

KEY PLAN AND LOCATION PLAN

drawing no. DEM1619/M02

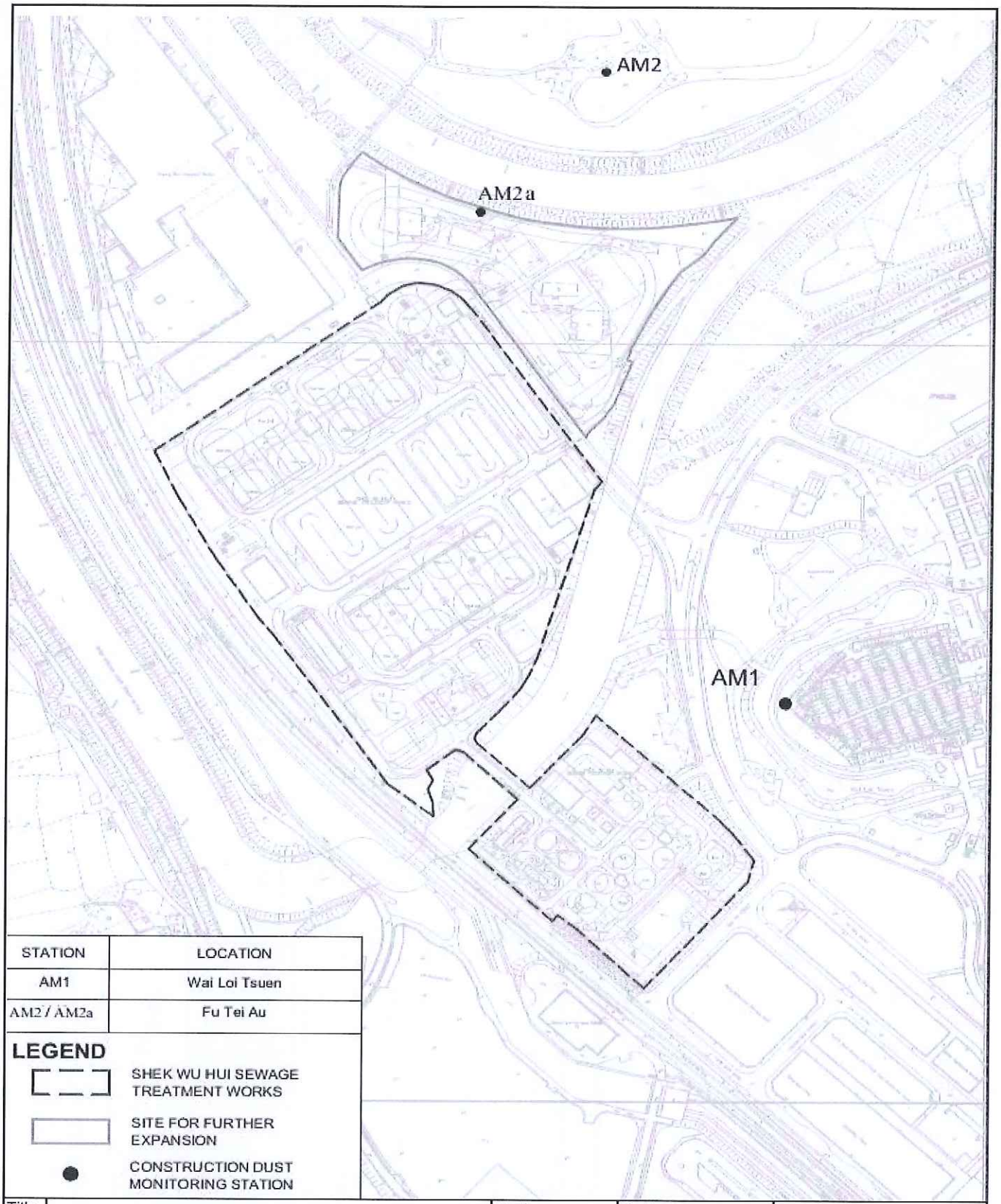
scale 1 : 1000 OR AS SHOWN

office

ELECTRICAL AND MECHANICAL PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

A1 PAPER SIZE

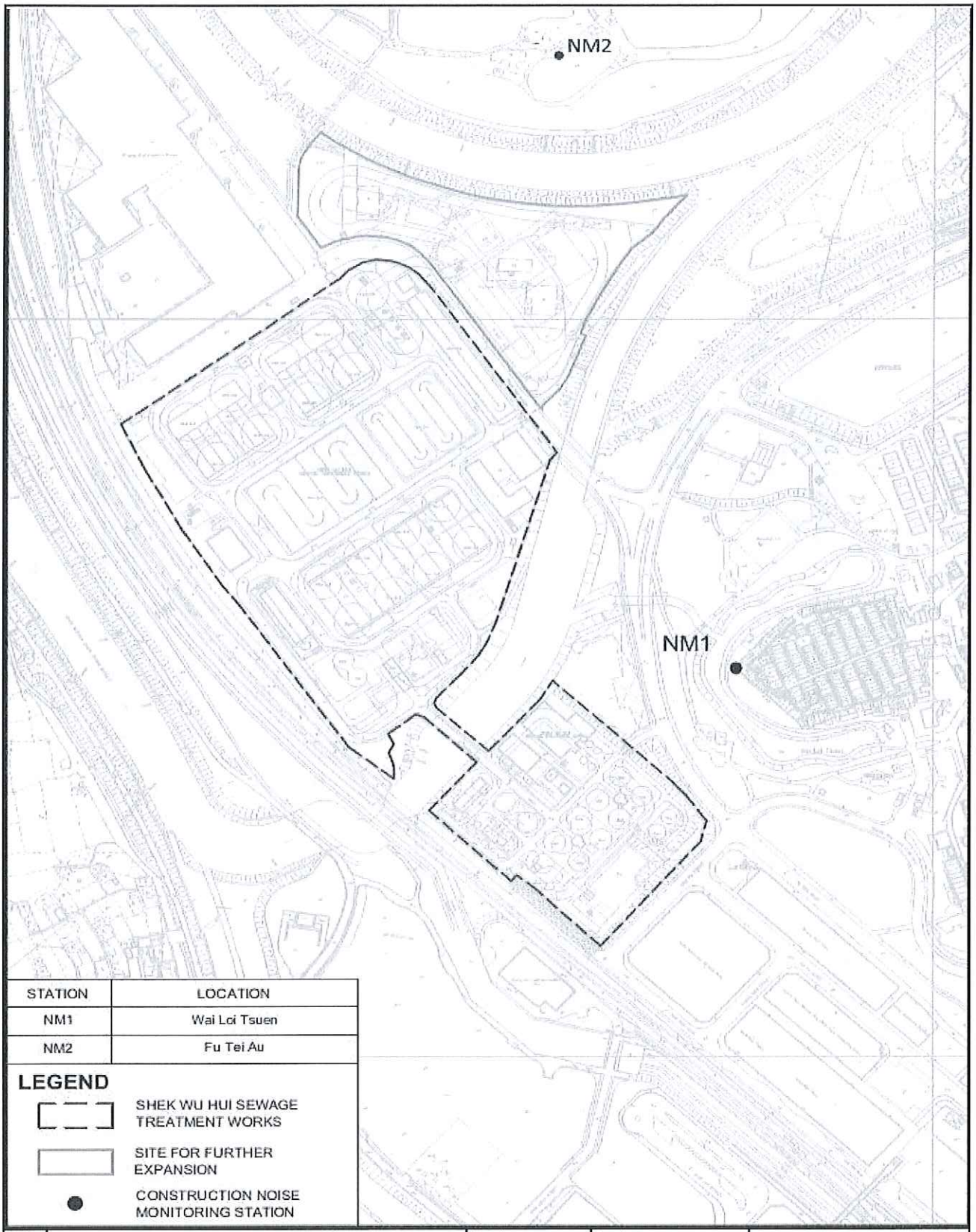



| STATION | LOCATION |
|---|---|
| AM1 | Wai Loi Tsuen |
| AM2 / AM2a | Fu Tei Au |

**LEGEND**

- SHEK WU HUI SEWAGE TREATMENT WORKS
- SITE FOR FURTHER EXPANSION
- CONSTRUCTION DUST MONITORING STATION

| | | | | |
|---|---|---|---|---|
| Title | Contract No. DE/2014/01<br>Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station | Scale: N.T.S | Project No.: MA16002 | CINOTECH |
| | Locations of Impact Air Quality Monitoring Stations | Date: Oct-17 | Figures: 2 | |

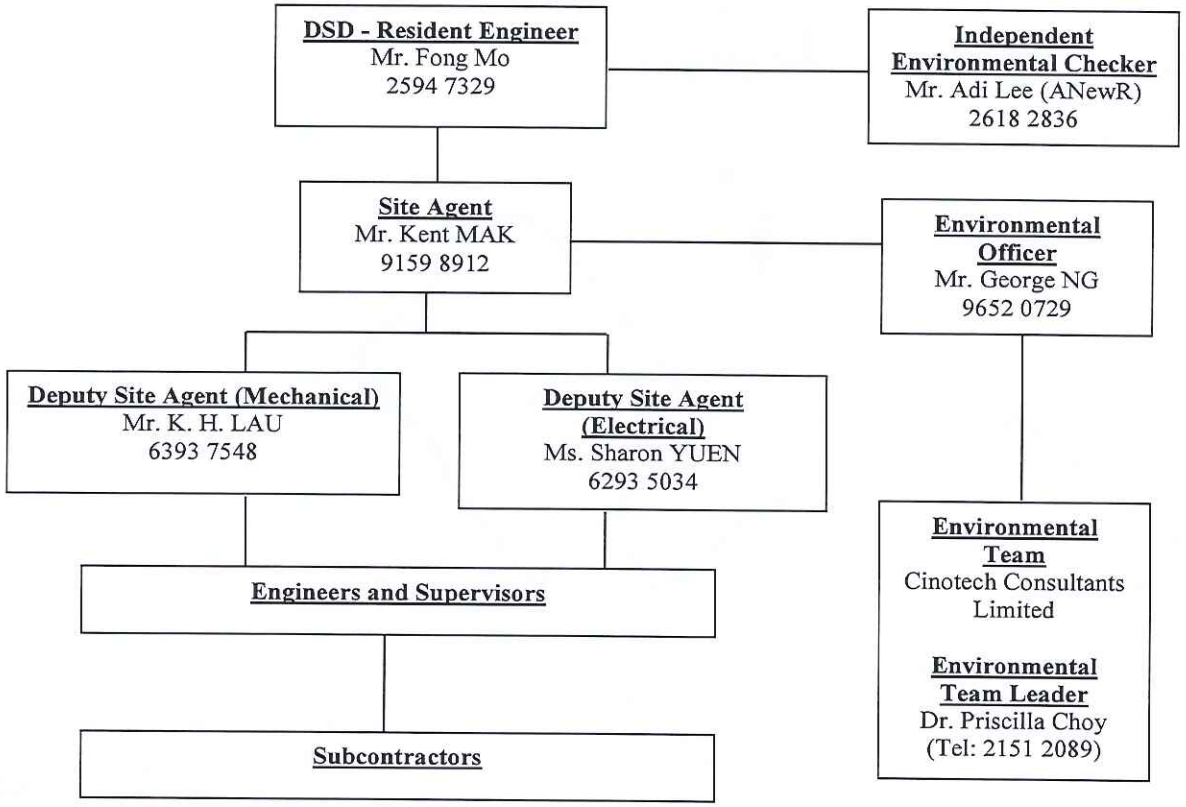



| STATION | LOCATION |
|---|---|
| NM1 | Wai Loi Tsuen |
| NM2 | Fu Tei Au |

**LEGEND**

- SHEK WU HUI SEWAGE TREATMENT WORKS
- SITE FOR FURTHER EXPANSION
- CONSTRUCTION NOISE MONITORING STATION

| | | | | |
|---|---|---|---|---|
| Title | Contract No. DE/2014/01<br>Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station | Scale<br>N.T.S | Project No.<br>MA16002 | CINOTECH |
| | Locations of Impact Noise Monitoring Stations | Date<br>Oct-17 | Figures<br>3 | |




| Title | | Scale | Project No. |
|---|---|---|---|
| | Contract No. DE/2014/01<br>Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station<br>Project Organization Chart | N.T.S | MA16002 |
| | | Version v.1 | Figure 4 |

CINOTECH

# APPENDIX A
# ACTION AND LIMIT LEVELS FOR AIR QUALITY AND NOISE

# Appendix A Action and Limit Levels

## Table A-1 Action and Limit Levels for 1-Hour TSP and 24-Hour TSP

| Monitoring Stations | Action Level ($\mu g/m^3$) | | Limit Level ($\mu g/m^3$) | |
|---|---|---|---|---|
| | 1-hour | 24-hour | 1-hour | 24-hour |
| AM1 | 286 | 147 | 500 | 260 |
| AM2 | 276 | N/A | 500 | N/A |
| AM2a | N/A | 155 | N/A | 260 |

## Table A-2 Action and Limit Level for Construction Noise

| Monitoring Stations | Time Period | Action Level | Limit Level in dB(A) |
|---|---|---|---|
| NM1 | 0700-1900 hours on normal weekdays | When one documented complaint is received | >75* |
| NM2 | | | |

Note: (*) Reduces to 70 dB(A) for schools and 65 dB(A) during the school examination periods.

# APPENDIX B
# SUMMARY OF EXCEEDANCE

## APPENDIX B – SUMMARY OF EXCEEDANCE

**Reporting Month:** April 2018

**a) Exceedance Report for 1-hr TSP (NIL)**

**b) Exceedance Report for 24-hr TSP (NIL)**

**c) Exceedance Report for Construction Noise (NIL)**

# APPENDIX C
# SITE AUDIT SUMMARY

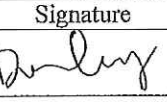
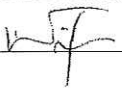
**Record Summary of Environmental Site Inspection**

**Inspection Information**

| | |
|---|---|
| Checklist Reference Number | 180404 |
| Date | 4 April 2018 (Wednesday) |
| Time | 16:00-17:30 |

| Ref. No. | Non-Compliance | Related Item No. |
|---|---|---|
| - | None identified | - |

| Ref. No. | Remarks/Observations | Related Item No. |
|---|---|---|
| | *Part C - Water Quality*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part D - Air Quality*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part E – Construction Noise Impact*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part F – Waste / Chemical Management*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part G - Permit / Licenses*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Others / Remarks*<br>• - | |

| | Name | Signature | Date |
|---|---|---|---|
| Recorded by | Donley Fung |  | 4 April 2018 |
| Checked by | Dr. Priscilla Choy |  | 6 April 2018 |

**Record Summary of Environmental Site Inspection**

**Inspection Information**

| | |
|---|---|
| Checklist Reference Number | 180410 |
| Date | 10 April 2018 (Wednesday) |
| Time | 16:00-17:30 |

| Ref. No. | Non-Compliance | Related Item No. |
|---|---|---|
| - | None identified | - |

| Ref. No. | Remarks/Observations | Related Item No. |
|---|---|---|
| | *Part C - Water Quality*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part D - Air Quality*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part E – Construction Noise Impact*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part F – Waste / Chemical Management*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part G - Permit / Licenses*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Others / Remarks*<br>• - | |

| | Name | Signature | Date |
|---|---|---|---|
| Recorded by | Donley Fung | Donley. | 10 April 2018 |
| Checked by | Dr. Priscilla Choy | | 13 April 2018 |

**Record Summary of Environmental Site Inspection**

Inspection Information

| | |
|---|---|
| Checklist Reference Number | 180419 |
| Date | 19 April 2018 (Thursday) |
| Time | 16:00-17:30 |

| Ref. No. | Non-Compliance | Related Item No. |
|---|---|---|
| - | None identified | - |

| Ref. No. | Remarks/Observations | Related Item No. |
|---|---|---|
| | *Part C - Water Quality*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part D - Air Quality*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part E – Construction Noise Impact*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part F – Waste / Chemical Management*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part G - Permit / Licenses*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Others / Remarks*<br>• - | |

| | Name | Signature | Date |
|---|---|---|---|
| Recorded by | Donley Fung | | 19 April 2018 |
| Checked by | Dr. Priscilla Choy | | 20 April 2018 |

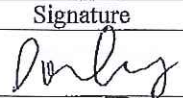
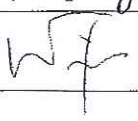
**Record Summary of Environmental Site Inspection**

**Inspection Information**

| | |
|---|---|
| Checklist Reference Number | 180427 |
| Date | 27 April 2018 (Friday) |
| Time | 16:00-17:30 |

| Ref. No. | Non-Compliance | Related Item No. |
|---|---|---|
| - | None identified | - |

| Ref. No. | Remarks/Observations | Related Item No. |
|---|---|---|
| | ***Part C - Water Quality***<br>• No environmental deficiency was identified during the site inspection.<br><br>***Part D - Air Quality***<br>• No environmental deficiency was identified during the site inspection.<br><br>***Part E – Construction Noise Impact***<br>• No environmental deficiency was identified during the site inspection.<br><br>***Part F – Waste / Chemical Management***<br>• No environmental deficiency was identified during the site inspection.<br><br>***Part G - Permit / Licenses***<br>• No environmental deficiency was identified during the site inspection.<br><br>***Others / Remarks***<br>• - | |

| | Name | Signature | Date |
|---|---|---|---|
| Recorded by | Donley Fung |  | 27 April 2018 |
| Checked by | Dr. Priscilla Choy |  | 30 April 2018 |

**Record Summary of Environmental Site Inspection**

**Inspection Information**

| | |
|---|---|
| Checklist Reference Number | 180430 |
| Date | 30 April 2018 (Monday) |
| Time | 09:30-11:00 |

| Ref. No. | Non-Compliance | Related Item No. |
|---|---|---|
| - | None identified | - |

| Ref. No. | Remarks/Observations | Related Item No. |
|---|---|---|
| | *Part C - Water Quality*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part D - Air Quality*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part E – Construction Noise Impact*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part F – Waste / Chemical Management*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Part G - Permit / Licenses*<br>• No environmental deficiency was identified during the site inspection.<br><br>*Others / Remarks*<br>• - | |

| | Name | Signature | Date |
|---|---|---|---|
| Recorded by | Donley Fung | | 30 April 2018 |
| Checked by | Dr. Priscilla Choy | | 30 April 2018 |

**APPENDIX D**
**SUMMARY OF THE AMOUNT OF WASTE GENERATED**

Name of Department: Drainage Services Department Contract No. : DE/2014/01

## Monthly Summary Waste Flow Table for 2018

| Month | Annual Quantities of Inert C&D Materials Generated Monthly | | | | | | Annual Quantities of C&D Materials Generated Monthly | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rock & Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Imported Fill | Metals | Paper/ cardboard packaging | Plastics (see Note 3) | Chemicals Waste | Others, e.g. general refuse |
| | (in '000m$^3$) | (in '000m$^3$) | (in '000m$^3$) | (in '000m$^3$) | (in '000m$^3$) | (in '000m$^3$) | (in '000 kg) | (in '000 kg) | (in '000 kg) | (in '000 kg) | (in tonne) |
| Jan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 |
| Mar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Apr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.16 |
| May | | | | | | | | | | | |
| June | | | | | | | | | | | |
| Sub-total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8.16 |
| July | | | | | | | | | | | |
| Aug | | | | | | | | | | | |
| Sept | | | | | | | | | | | |
| Oct | | | | | | | | | | | |
| Nov | | | | | | | | | | | |
| Dec | | | | | | | | | | | |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8.16 |

| Forecast of Total Quantities of C&D Materials to be Generated from the Contractor | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Quantity Generated | Hard Rock & Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Imported Fill | Metals | Paper/ cardboard packaging | Plastics (see Note 3) | Chemicals Waste | Others, e.g. general refuse |
| (in '000 m$^3$) | (in '000 m$^3$) | (in '000 m$^3$) | (in '000 m$^3$) | (in '000 m$^3$) | (in '000 m$^3$) | (in '000 kg) | (in '000 kg) | (in '000 kg) | (in '000 kg) | (in tonne) |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 30 |

Notes: (1) The performance targets are given in PS Clause 6.21.8(14).
(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m$^3$. (PS Clause 6.21.7(4)(b) refers).

# APPENDIX E
# EVENT ACTION PLANS

**APPENDIX E – Event / Action Plans**

**Table E-1 Event / Action Plan For Air Quality**

| EVENT | ACTION | | | |
|---|---|---|---|---|
| | **ET** | **IEC** | **ER** | **CONTRACTOR** |
| ACTION LEVEL | | | | |
| 1. Exceedance for one sample | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform IEC and ER;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method. | 1. Notify Contractor. | 1. Rectify any unacceptable practice;<br>2. Amend working methods if appropriate. |
| 2. Exceedance for two or more consecutive samples | 1. Identify source;<br>2. Inform IEC and ER;<br>3. Advise the ER on the effectiveness of the proposed remedial measures;<br>4. Repeat measurements to confirm findings;<br>5. Increase monitoring frequency to daily;<br>6. Discuss with IEC and Contractor on remedial actions required;<br>7. If exceedance continues, arrange meeting with IEC and ER;<br>8. If exceedance stops, cease additional monitoring | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the ET on the effectiveness of the proposed remedial measures;<br>5. Supervise Implementation of remedial measures. | 1. Confirm receipt of notification of exceedance writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented | 1. Submit proposals for remedial actions to IEC within three working days of notification;<br>2. Implement the agreed proposals;<br>3. Amend proposal if appropriate. |

| EVENT | ACTION | | | |
|---|---|---|---|---|
| | ET | IEC | ER | CONTRACTOR |
| LIMIT LEVEL | | | | |
| 1. Exceedance for one sample | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform Contractor ,IEC, ER, and EPD;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily;<br>5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the ER on the effectiveness of the proposed remedial measures;<br>5. Supervise implementation of remedial measures | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Amend proposal if appropriate |
| 2. Exceedance for two or more consecutive samples | 1. Notify IEC, ER, Contractor and EPD;<br>2. Identify source;<br>3. Repeat measurement to confirm findings;<br>4. Increase monitoring frequency to daily;<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;<br>6. Arrange meeting with IEC and ER to discuss the remedial actions to be | 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;<br>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of exceedance in writing;<br>2. Notify Contractor;<br>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Ensure remedial measures properly implemented;<br>5. If exceedance continues, | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Resubmit proposals if problem still not under control;<br>5. Stop the relevant portion of works as determined by |

| EVENT | ACTION | | | |
|---|---|---|---|---|
| | **ET** | **IEC** | **ER** | **CONTRACTOR** |
| | taken;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;<br>8. If exceedance stops, cease additional monitoring | | consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. | the ER until the exceedance is abated |

**Table E-2 Event / Action Plan For Construction Noise**

| EVENT | ACTION | | | |
|---|---|---|---|---|
| | **ET** | **IEC** | **ER** | **CONTRACTOR** |
| Action Level being exceeded | 1. Notify IEC and Contractor;<br>2. Carry out investigation;<br>3. Report the results of investigation to the IEC, ER and Contractor;<br>4. Discuss with the Contractor and formulate remedial measures;<br>5. Increase monitoring frequency to check mitigation effectiveness | 1. Review the analysed results submitted by the ET;<br>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly;<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Require Contractor to propose remedial measures for the analysed noise problem;<br>4. Ensure remedial measures are properly implemented. | 1. Submit noise mitigation proposals to IEC;<br>2. Implement noise mitigation proposals. |
| Limit Level being exceeded | 1. Identify source;<br>2. Inform IEC, ER, EPD and Contractor;<br>3. Repeat measurements to confirm findings;<br>4. Increase monitoring frequency;<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;<br>6. Inform IEC, ER and EPD the causes and actions taken for the exceedances;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;<br>2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Require Contractor to propose remedial measures for the analysed noise problem;<br>4. Ensure remedial measures properly implemented;<br>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Resubmit proposals if problem still not under control;<br>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated. |

# APPENDIX F
# ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE (EMIS)

## APPENDIX F IMPLEMENTATION SCHEDULE OF ENVIRONMENTAL MITIGATION MEASURES (EMIS)

| EM&A Ref. | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concern to Address | Who to implement the measures? | Location of the measure | When to implement the measures? | What requirements or standards for the measure to achieve |
|---|---|---|---|---|---|---|
| A | **Air Quality** | | | | | |
| S2.4.1.3 | Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:<br>• Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading;<br>• Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;<br>• A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones;<br>• The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle;<br>• Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;<br>• The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials;<br>• Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; | To minimize the dust impact | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | Air Pollution Control Ordinance (APCO) and Air Pollution Control (Construction Dust) Regulation |

| | | | | | | |
|---|---|---|---|---|---|---|
| | • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet;<br>• Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;<br>• Any skip hoist for material transport should be totally enclosed by impervious sheeting;<br>• Every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;<br>• Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed;<br>• Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system. | | | | | |
| **B** | **Noise** | | | | | |
| S3.4.1.1 | Use of movable barrier, enclosure, acoustic mat and quiet plant. Use of wooden frames barrier with a small-cantilevered upper portion of superficial density not less than 14kg/m² on a skid footing with 25mm thick internal sound absorptive lining. | To minimize construction noise impact arising from the Project at the affected noise sensitive receivers (NSRs) | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM, |
| S3.4.1.2 | Good Site Practice:<br>• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.<br>• Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the | To minimize construction noise impact arising from the Project at the affected NSRs | Contractor | Work Sites | Construction period of Advance Works and Main Works of Phase 1A | EIAO-TM, NCO |

| | | | | | | |
|---|---|---|---|---|---|---|
| | construction program.<br>• Mobile plant, if any, should be sited as far away from NSRs as possible.<br>• Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.<br>• Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.<br>• Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. | | | | | |
| C | **Ecological Impact** | | | | | |
| S4.2.1.2 | Avoid unnecessary lighting. | Minimize mortality impacts on birds. | Design/ Contractor/ Plant Operator | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM |
| S4.2.1.3 | Good construction site practice to minimise dust generation should be followed on all construction sites. Measures to avoid, minimise and mitigate impacts on air quality are detailed in this schedule | Minimize dust generation from construction sites. | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM |
| S4.2.1.4 | The following measures to avoid, minimise and mitigate impact on water quality during construction phase shall be implemented<br>• Temporary sewerage and drainage to be designed and installed to collect wastewater and prevent it from entering water bodies;<br>• Proper locations well away from nearby water bodies should be used for temporary storage of materials (i.e. equipment, filling materials, chemicals and fuel) and temporary stockpiles of construction debris and spoil, and these should be identified before commencement of works;<br>• To prevent muddy water entering nearby water bodies, work sites close to nearby water bodies should be isolated, using such items as sandbags or silt curtains with lead edge at bottom and properly supported props. Other protective | Avoid, minimise and mitigate impact on water quality | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM |

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| | measures should also be taken to ensure that no pollution or siltation occurs to the water gathering grounds of the work sites;<br>• Construction debris and spoil should be covered and/or properly disposed of as soon as possible to avoid these being washed into nearby water bodies;<br>• Proper locations for discharge outlets of temporary wastewater treatment facilities well away from sensitive receivers should be identified;<br>• Adequate lateral support should be erected where necessary in order to prevent soil/mud from slipping into water bodies;<br>• Site boundaries should be clearly marked and any works beyond the boundary strictly prohibited;<br>• Regular water monitoring and site audit should be carried out at adequate points along any watercourses where construction works are underway upstream within their catchments and also on the Ng Tung, Sheung Yue and Shek Sheung Rivers. If the monitoring and audit results show that pollution occurs, adequate measures including temporarily cessation of works should be considered;<br>• Excavation profiles should be properly designed and executed with attention to the relevant requirements for environment, health and safety;<br>• Where soil to be excavated is situated beneath the groundwater table, it may be necessary to lower the groundwater table by installing well points or similar means;<br>• Stockpiling sites should be lined with impermeable sheeting and bunded. Stockpiles should be properly covered by impermeable sheeting to reduce dust emission during dry season or contaminated run-off during rainy season. Watering should be avoided on stockpiles of contaminated soil to minimize contaminated runoff and construction materials should be properly covered and located away from nearby water bodies; and<br>• Supply of suitable clean backfill material after excavation, if required.<br>• Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated run-off, and truck bodies and tailgates should be sealed to prevent discharge during transport or during wet | | | | | |

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| | season;<br>• Speed control for the trucks carrying contaminated materials should be enforced;<br>• Vehicle wheel washing facilities at construction sites' exit points should be established and used, where necessary; and<br>• Other measures as detailed in this schedule. | | | | | |
| **D** | **Water Quality Impact** | | | | | |
| S5.2.2.1 | Construction Site Runoff Practices and measures provided in the Practice Note for Professional Persons on Construction Site Drainage, (PROPECC PN1/94) should be followed where applicable. | Control construction runoff | Contractors | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM, WPCO, EIAO |
| S5.2.2.2–<br>S5.2.2.3 | Sewage from Workforce<br>• Portable chemical toilets and sewage holding tanks should be provided for handling the construction sewage generated by the workforce. A licensed Contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.<br>• Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. Regular environmental audit on construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. It is anticipated that sewage generation during the construction phase of the Project would not cause water quality impact after undertaking all required measures | Handling of site sewage | Contractors | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | EIAO-TM, WPCO, EIAO |
| **E** | **Waste Management** | | | | | |
| S6.2.2.1 | Good Site Practices and Waste Reduction Measures:<br>• Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site;<br>• Training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling;<br>• Provision of sufficient waste disposal points and regular | Minimize waste Generation during construction | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | Waste Disposal Ordinance (WDO) |

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| | collection for disposal;<br>• Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;<br>• Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;<br>• An Environmental Management Plan (EMP) should be prepared by the contractor and submitted to the Engineer for approval. | | | | | |
| S6.2.3.1 | Waste Reduction Measures:<br>• Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal;<br>• Proper storage and site practices to minimize the potential for damage and contamination of construction materials;<br>• Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste;<br>• Sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); and<br>• Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. | Reduce waste generation | Contractor | Work Sites | Prior to the commencement of construction of Advance Works and Main Works of Phase 1A | WDO |
| S6.2.4.1 - S6.2.4.2 | Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:<br>• Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimizing the potential of pollution;<br>• Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and<br>• Different locations should be designated to stockpile each material to enhance reuse.<br>• Remove waste in timely manner;<br>• Employ the trucks with cover or enclosed containers for waste transportation;<br>• Obtain relevant waste disposal permits from the appropriate authorities; and<br>• Disposal of waste should be done at licensed waste disposal | Minimize waste impacts arising from waste storage | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | WDO |

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| | facilities. | | | | | |
| S6.2.5.3 | C&D Material from Buildings Demolition and New Building Construction<br>• The Contractor should recycle as much as possible of the C&DM on-site. Public fill and C&DM waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. For example, concrete and masonry can be crushed and used as fill, and steel reinforcing bar can be used by scrap steel mills. Different areas of the work sites should be designated for such segregation and storage.<br>• The use of wooden hoardings shall not be allowed. An alternative material, such as metal, aluminium or alloy etc, could be used.<br>• Government has developed a charging policy for the disposal of waste to landfill at present. It will provide additional incentive to reduce the volume of generated waste and ensure proper segregation to allow reuse of the inert material on site when implemented.<br>• In order to minimize the impacts of the demolition works, the generated wastes must be cleared as quickly as possible after demolition. Therefore, the demolition and clearance works should be undertaken simultaneously. To facilitate proper segregation of inert and non-inert C&D material arising from demolition works, selective demolition method should be adopted. | Minimize waste impacts from building demolition and new building construction | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | Land (Miscellaneous Provisions) Ordinance, WDO, ETWB TCW No. 19/2005 |
| S6.2.5.4 | Chemical Waste<br>• If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producers.<br>• Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste contractor. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal<br>• (Chemical Waste) (General) Regulation | Control the chemical waste and ensure proper storage, handling and disposal | Contractor | Work Sites | Construction phase of Advance Works and Main Works of Phase 1A | Waste Disposal (Chemical Waste General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste |
| S6.2.5.5 | General Refuse<br>• General refuse should be stored in enclosed bins separately from construction and chemical wastes. | Minimize production of the general refuse and avoid odour, pest | Contractor | Work Sites | Construction phase of Advance Works | Waste Disposal (Chemical Waste General) Regulation, |

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| | • Recycling bins should also be placed to encourage recycling.<br>• Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean.<br>• A reputable waste collector should be employed to remove general refuse on a daily basis. | and litter impacts | | | and Main Works of Phase 1A | Code of Practice on the Packaging, Labelling and Storage of Chemical Waste |

**APPENDIX G**
**COMPLAINT LOG**

## APPENDIX G – COMPLAINT LOG

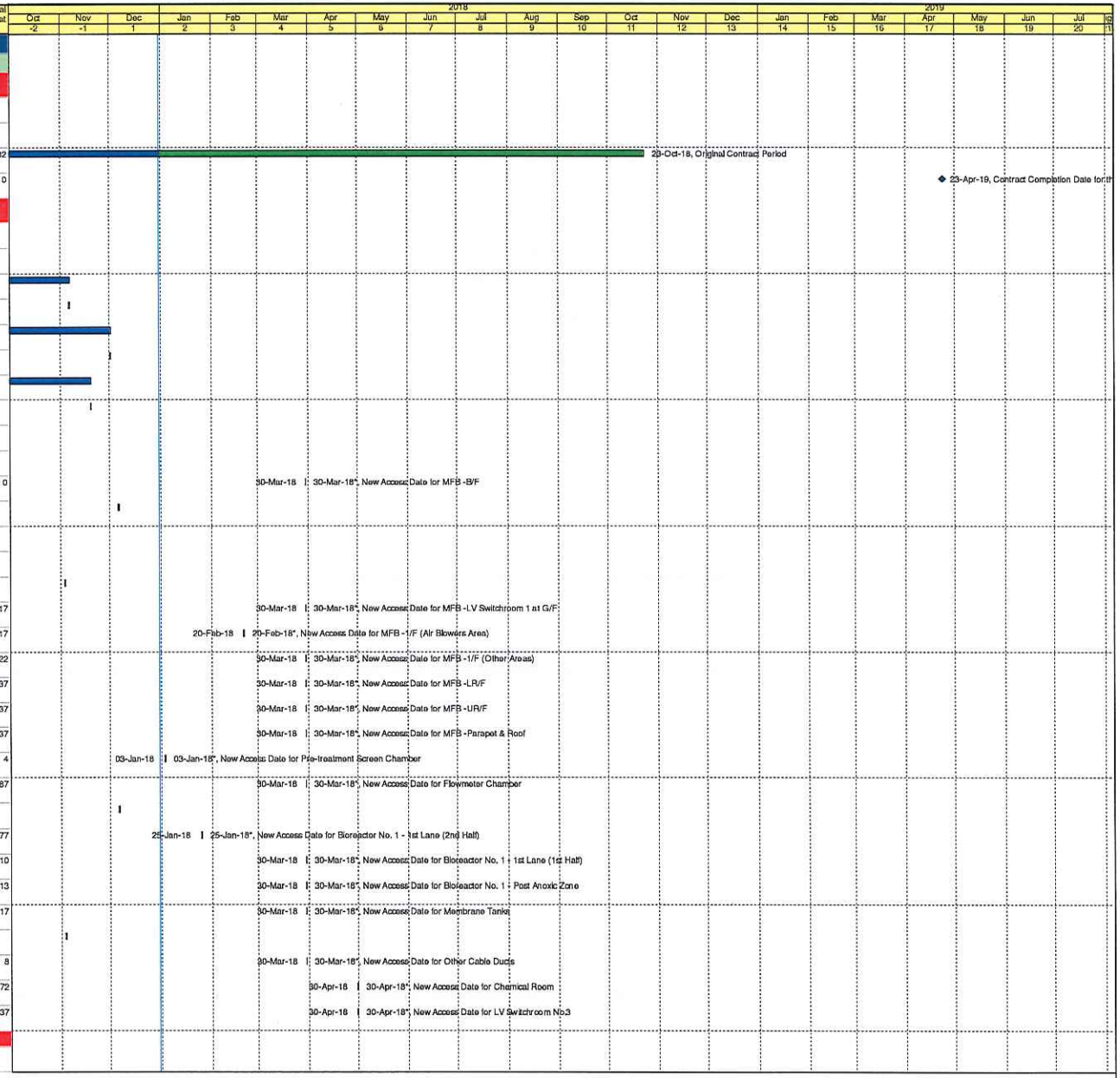
**Reporting Month**: April 2018

| Log Ref. | Location | Received Date | Details of Complaint | Investigation/Mitigation Action | Status |
|---|---|---|---|---|---|
| N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |

**Remarks**: No environmental complaint was received in the reporting month.

# APPENDIX H
# CONSTRUCTION PROGRAMME

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| **Shek Wu Hui STW - Master Programme DE/2014/01** | | | | | |
| **Contract Data** | | | | | |
| **Starting Date & Completion Date** | | | | | |
| AS000010 | Contract Date (LOA) | 0 | 28-Dec-15 A | | |
| AS000020 | Contract Starting Date | 0 | 30-Dec-15 A | | |
| AS000110 | Original Contract Period | 297 | 30-Dec-15 A | 23-Oct-18 | 182 |
| AS000220 | Contract Completion Date for the whole of the Works | 0 | | 23-Apr-19 | 0 |
| **Access Date** | | | | | |
| AS001010 | PM's Site Office and Contractor's Site Office and Storage Area, (within 120 days) | 0 | 30-Dec-15 A | 27-Apr-16 A | |
| AS001012 | Planned Access Date for PM's Site Office and Contractor's Site Office and Storage Area | 0 | 27-Apr-16 A | 27-Apr-16 A | |
| AS001020 | Flowmeter Chamber, MBR Pre-treatment Screen Chamber and its vicinity, (within 560 days) | 0 | 30-Dec-15 A | 06-Nov-17 A | |
| AS001022 | Planned Access Date for Flowmeter Chamber, MBR Pre-treatment Screen Chamber and its vicinity | 0 | 06-Nov-17 A | 06-Nov-17 A | |
| AS001030 | Bioreactor no.1 (BR1) and its vicinity, (within 560 days) | 0 | 30-Dec-15 A | 01-Dec-17 A | |
| AS001032 | Planned Access Date for Bioreactor no.1 (BR1) and its vicinity | 0 | 01-Dec-17 A | 01-Dec-17 A | |
| AS001040 | MBR Facilities Building, Membrane Filtration System No.1 (MFS1) and its vicinity, (within 566 days) | 0 | 30-Dec-15 A | 19-Nov-17 A | |
| AS001042 | Planned Access Date for MBR Facilities Building, Membrane Filtration System No.1 (MFS1) and its vicinity | 0 | 19-Nov-17 A | 19-Nov-17 A | |
| AS001050 | Ng Chow South Road Sewage Pumping Station - (within 158 days) | 0 | 30-Dec-15 A | 04-Jun-16 A | |
| AS001052 | Planned Access Date for Ng Chow South Road Sewage Pumping Station | 0 | 04-Jun-16 A | 04-Jun-16 A | |
| AS001100 | New Access Date for MFB -B/F | 1 | 30-Mar-18 | 30-Mar-18* | 0 |
| AS001120 | New Access Date for MFB -G/F | 0 | 06-Dec-17 A | 06-Dec-17 A | |
| AS001150 | New Access Date for MFB -CLP Rm C | 0 | 29-Sep-17 A | 29-Sep-17 A | |
| AS001160 | New Access Date for MFB -CLP Rm D | 0 | 26-Sep-17 A | 26-Sep-17 A | |
| AS001170g | New Access Date for MFB -11kV Switchroom | 0 | 03-Nov-17 A | 03-Nov-17 A | |
| AS001175g | New Access Date for MFB -LV Switchroom 1 at G/F | 1 | 30-Mar-18 | 30-Mar-18* | 17 |
| AS001180 | New Access Date for MFB -1/F (Air Blowers Area) | 1 | 20-Feb-18 | 20-Feb-18* | 17 |
| AS001180g | New Access Date for MFB -1/F (Other Areas) | 1 | 30-Mar-18 | 30-Mar-18* | 22 |
| AS001200 | New Access Date for MFB -LR/F | 1 | 30-Mar-18 | 30-Mar-18* | 237 |
| AS001220 | New Access Date for MFB -UR/F | 1 | 30-Mar-18 | 30-Mar-18* | 237 |
| AS001240 | New Access Date for MFB -Parapet & Roof | 1 | 30-Mar-18 | 30-Mar-18* | 237 |
| AS001300 | New Access Date for Pre-treatment Screen Chamber | 1 | 03-Jan-18 | 03-Jan-18* | 4 |
| AS001320 | New Access Date for Flowmeter Chamber | 1 | 30-Mar-18 | 30-Mar-18* | 87 |
| AS001340 | New Access Date for Bioreactor No. 1 - 2nd Lane | 0 | 06-Dec-17 A | 06-Dec-17 A | |
| AS001342 | New Access Date for Bioreactor No. 1 - 1st Lane (2nd Half) | 1 | 25-Jan-18 | 25-Jan-18* | 77 |
| AS001342g | New Access Date for Bioreactor No. 1 - 1st Lane (1st Half) | 1 | 30-Mar-18 | 30-Mar-18* | 10 |
| AS001344 | New Access Date for Bioreactor No. 1 - Post Anoxic Zone | 1 | 30-Mar-18 | 30-Mar-18* | 13 |
| AS001360 | New Access Date for Membrane Tanks | 1 | 30-Mar-18 | 30-Mar-18* | 17 |
| AS001380 | Availability of CLP Cable Ducts | 0 | 03-Nov-17 A | 03-Nov-17 A | |
| AS001400 | New Access Date for Other Cable Ducts | 1 | 30-Mar-18 | 30-Mar-18* | 8 |
| AS001420 | New Access Date for Chemical Room | 1 | 30-Apr-18 | 30-Apr-18* | 72 |
| AS001440 | New Access Date for LV Switchroom No.3 | 1 | 30-Apr-18 | 30-Apr-18* | 37 |
| **Key Dates** | | | | | |
| AS002010 | Completion of NCSRPSP E&M Works including testing and commissioning | 0 | 30-Dec-15 A | 28-Jul-17 A | |




JEC

File Name: DE/2014/01G3
Layout: DE1401 (Rev. G) - WBS
TASK filter: All Activities

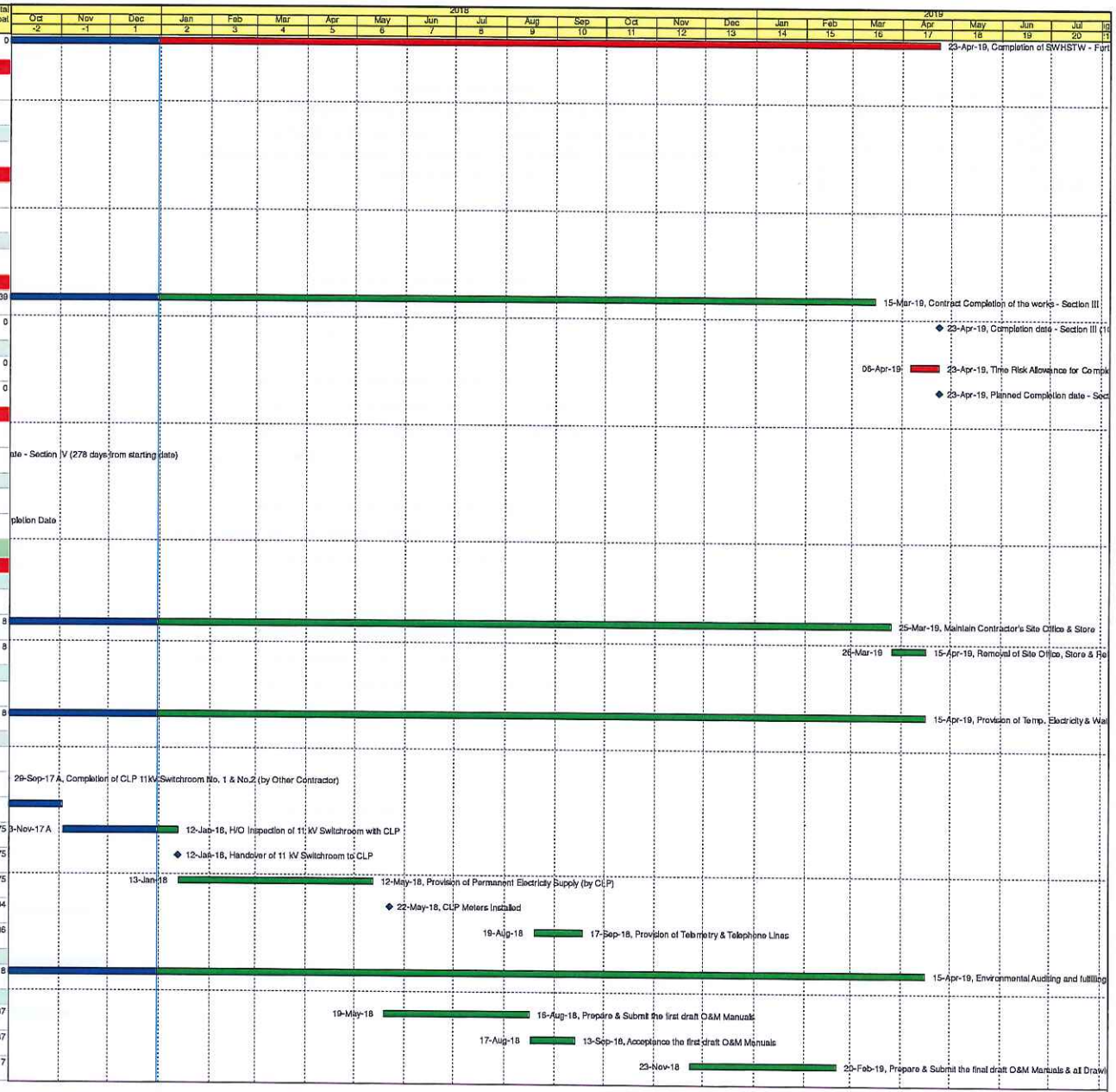


Remaining Work
Critical Activity
Milestone
Actual Progress

**Contract No. DE/2014/01**
**Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station**
**Master Programme**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 08-Jan-16 | Rev. 0 | KH Lau | KM |
| 22-Jun-17 | Rev. D | KH Lau | KM |
| 12-Jul-17 | Rev. E | KH Lau | KM |
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
| | | | |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS002020 | Completion of SWHSTW - Further Expansion Phase 1A - Advance Works E&M Works including T&C, process commissioning | 380 | 30-Dec-15 A | 23-Apr-19 | 0 |
| **Section I** | | | | | |
| AS200010 | Contract Completion of the works - Section I | 0 | 30-Dec-15 A | 23-Sep-16 A | |
| AS200020 | Completion date - Section I (272 days from starting date) | 0 | | 23-Sep-16 A | |
| Time Risk Allowance and Planned Completion | | | | | |
| AS200040 | Planned Completion date - Section I | 0 | | 23-Sep-16 A | |
| **Section II** | | | | | |
| AS300010 | Contract Completion of the works - Section II | 0 | 30-Dec-15 A | 18-Mar-16 A | |
| AS300020 | Completion date - Section II (80 days from starting date) | 0 | | 18-Mar-16 A | |
| Time Risk Allowance and Planned Completion | | | | | |
| AS300040 | Planned Completion date - Section II | 0 | | 18-Mar-16 A | |
| **Section III** | | | | | |
| AS400010 | Contract Completion of the works - Section III | 440 | 30-Dec-15 A | 15-Mar-19 | 39 |
| AS400020 | Completion date - Section III (1029 days from starting date) | 0 | | 23-Apr-19 | 0 |
| Time Risk Allowance and Planned Completion | | | | | |
| AS400030 | Time Risk Allowance for Completion of Function Test of Section III (4% of installation duration, 463-469 days) | 18 | 06-Apr-19 | 23-Apr-19 | 0 |
| AS400040 | Planned Completion date - Section III | 0 | | 23-Apr-19 | 0 |
| **Section IV** | | | | | |
| AS500010 | Contract Completion of the works - Section IV | 0 | 30-Dec-15 A | 28-Jul-17 A | |
| AS500020 | Completion date - Section IV (278 days from starting date) | 0 | | 28-Jul-17 A | |
| Time Risk Allowance and Planned Completion | | | | | |
| AS500030 | Time Risk Allowance for Section IV (4% of installation duration, 120 days) | 0 | 22-Jun-17 A | 28-Jul-17 A | |
| AS500040 | Planned Completion Date | 0 | | 28-Jul-17 A | |
| **Activity Schedule No.1 - Preliminaries** | | | | | |
| **1.01 - Preliminaries** | | | | | |
| Contractor's Site Office Construction | | | | | |
| AS101010 | Construction of Contractor's Site Office & Store | 0 | 22-Jul-16 A | 23-Sep-16 A | |
| AS101012 | Maintain Contractor's Site Office & Store | 450 | 27-Oct-16 A | 25-Mar-19 | 8 |
| AS101014 | Removal of Site Office, Store & Relevant Facilities | 21 | 26-Mar-19 | 15-Apr-19 | 8 |
| Site Facilities | | | | | |
| AS101030 | Set up Temp. Electricity Supply, Water Supply | 0 | 18-Aug-16 A | 23-Sep-16 A | |
| AS101032 | Provision of Temp. Electricity & Water Supply for execution for the Contract | 471 | 27-Oct-16 A | 15-Apr-19 | 8 |
| Permanent Utilities Services | | | | | |
| AS101040 | Applications to the Public Utilities for Provision of Services | 0 | 29-Jan-16 A | 23-Sep-16 A | |
| AS101041 | Completion of CLP 11kV Switchroom No. 1 & No.2 (by Other Contractor) | 0 | | 29-Sep-17 A | |
| AS101042 | BS Works for CLP 11 kV Switchroom No.1 & No. 2 | 0 | 30-Sep-17 A | 02-Nov-17 A | |
| AS101042g | H/O Inspection of 11 kV Switchroom with CLP | 13 | 03-Nov-17 A | 12-Jan-18 | 75 |
| AS101043 | Handover of 11 kV Switchroom to CLP | 0 | | 12-Jan-18 | 75 |
| AS101045 | Provision of Permanent Electricity Supply (by CLP) | 120 | 13-Jan-18 | 12-May-18 | 75 |
| AS101045a | CLP Meters Installed | 0 | | 22-May-18 | 94 |
| AS101046 | Provision of Telemetry & Telephone Lines | 30 | 19-Aug-18 | 17-Sep-18 | 36 |
| Provide all necessary labour, tools, materials, equipment and supervision | | | | | |
| AS101050 | Environmental Auditing and fulfilling the Environmental Permit | 471 | 29-Jan-16 A | 15-Apr-19 | 8 |
| O&M Manuals and As-Built Drawings | | | | | |
| AS101061 | Prepare & Submit the first draft O&M Manuals | 90 | 19-May-18 | 16-Aug-18 | 87 |
| AS101062 | Acceptance the first draft O&M Manuals | 28 | 17-Aug-18 | 13-Sep-18 | 87 |
| AS101071 | Prepare & Submit the final draft O&M Manuals & all Drawings | 90 | 23-Nov-18 | 20-Feb-19 | 17 |

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File Name: DE/2014/01G3
Layout: DE1401 (Rev. G) - WBS
TASK filter: All Activities

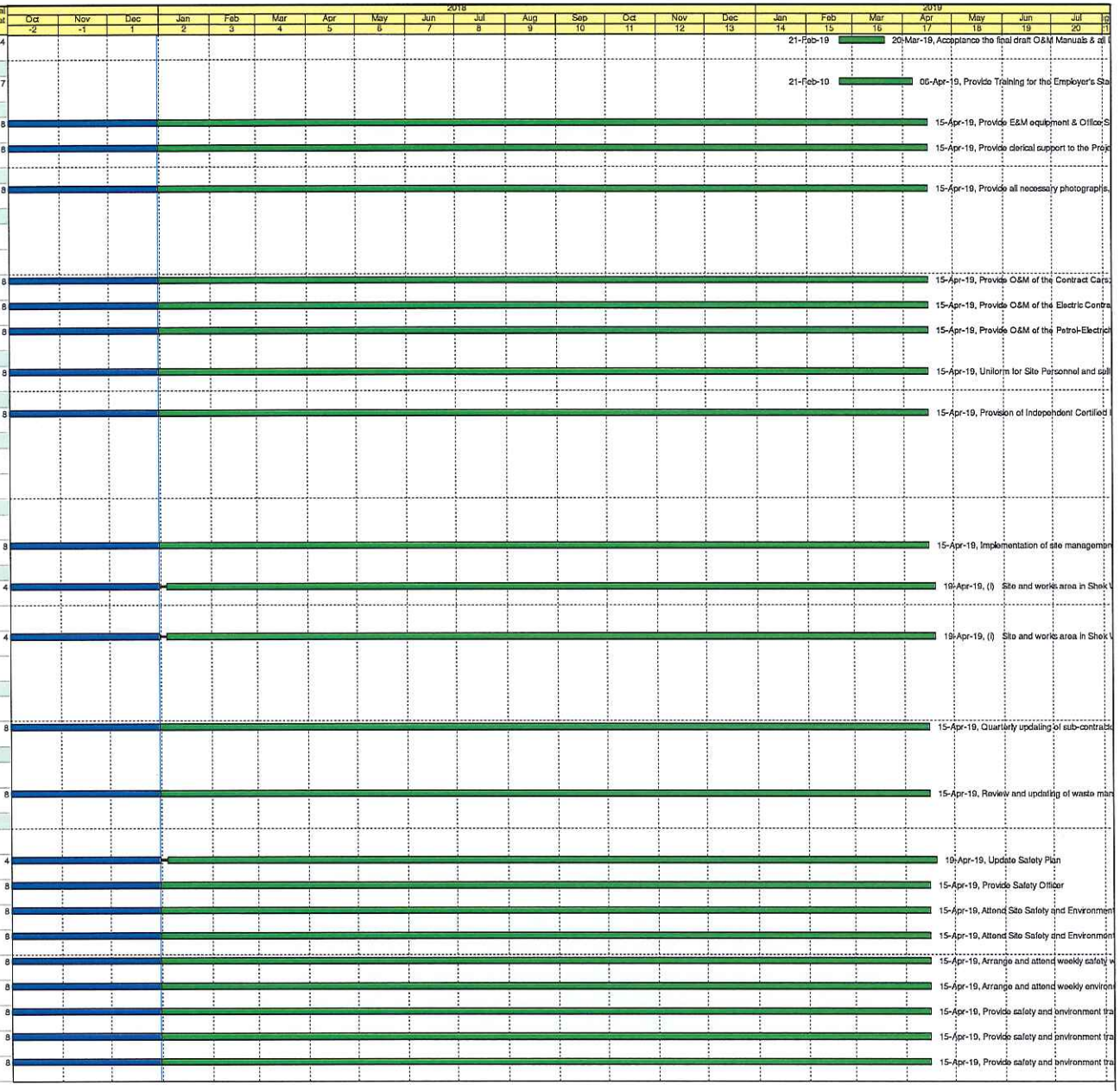


Remaining Work
Critical Activity
Milestone
Actual Progress

**Contract No. DE/2014/01**
**Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works**
**Further Expansion Phase 1A - Advance Works and**
**Ng Chow South Road Sewage Pumping Station**
**Master Programme**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 08-Jan-16 | Rev. 0 | KH Lau | KM |
| 22-Jun-17 | Rev. D | KH Lau | KM |
| 12-Jul-17 | Rev. E | KH Lau | KM |
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
| | | | |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS101072 | Acceptance the final draft O&M Manuals & all Drawings | 28 | 21-Feb-19 | 20-Mar-19 | 34 |
| **Training to Employer's Staff on the O&M of the Plant** | | | | | |
| AS101080 | Provide Training for the Employer's Staff | 45 | 21-Feb-19 | 06-Apr-19 | 17 |
| **PM's Site Office** | | | | | |
| AS101090 | Provide E&M equipment & Office Stationary for the use of Project Manager and Supervisors | 471 | 29-Mar-16 A | 15-Apr-19 | 8 |
| AS101160 | Provide clerical support to the Project Manager's site office | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| **Site Progress** | | | | | |
| AS101100 | Provide all necessary photographs, video clips and accessories | 471 | 07-Jun-16 A | 15-Apr-19 | 8 |
| **Contract Vehicle** | | | | | |
| AS101110 | Provision of one contract vehicle service (Electric Vehicle) during the normal working hours | 0 | 30-Dec-15 A | 28-Jan-16 A | |
| AS101120 | Provide Contract Vehicle Service; one (Petrol-Electricity) & one (Electric) during the normal working hours | 0 | 30-Dec-15 A | 28-Jan-16 A | |
| AS101130 | Provide O&M of the Contract Cars; Driving Services; Mobile Phone Services (normal working hours) | 471 | 29-Jan-16 A | 15-Apr-19 | 8 |
| AS101140 | Provide O&M of the Electric Contract Cars; Driving Services (outside normal working hours) | 471 | 29-Jan-16 A | 15-Apr-19 | 8 |
| AS101150 | Provide O&M of the Petrol-Electricity Contract Cars; Driving Services (outside normal working hours) | 471 | 29-Jan-16 A | 15-Apr-19 | 8 |
| **Uniform** | | | | | |
| AS101170 | Uniform for Site Personnal and self-employed workers | 471 | 29-Jan-16 A | 15-Apr-19 | 8 |
| **Independent Checking Engineer** | | | | | |
| AS101180 | Provision of Independent Certified Engineer in accordance with the Specification | 471 | 29-Jan-16 A | 15-Apr-19 | 8 |
| **Automated External Defibrillator (AED)** | | | | | |
| AS101190 | Provide Automated External Defibrillator (AED) and associated accessories | 0 | 18-Nov-16 A | 12-Dec-16 A | |
| AS101192 | Provide Training for Qualified on-site personnels for the use of AED | 0 | 13-Dec-16 A | 22-Dec-16 A | |
| **Site Management Plan for Trip Ticket System** | | | | | |
| AS102010 | Complete site management plan for trip ticket system | 0 | 30-Dec-15 A | 13-Mar-16 A | |
| AS102020 | Implementation of site management plan for trip ticket system | 471 | 14-Mar-16 A | 15-Apr-19 | 8 |
| **Site Cleaning and Tidiness** | | | | | |
| AS103010 | (i) Site and works area in Shek Wu Hui Sewage Treatment Works - Daily | 471 | 26-Sep-17 A | 19-Apr-19 | 4 |
| AS103020 | (ii) Site and works area in Ng Chow Nam Road Sewage Pumping Station - Daily | 0 | 05-Jun-16 A | 27-Sep-16 A | |
| AS103030 | (i) Site and works area in Shek Wu Hui Sewage Treatment Works - Weekly | 471 | 26-Sep-17 A | 19-Apr-19 | 4 |
| AS103040 | (ii) Site and works area in Ng Chow Nam Road Sewage Pumping Station - Weekly | 0 | 05-Jun-16 A | 27-Sep-16 A | |
| **Subocontractor Management Plan** | | | | | |
| AS104010 | Complete sub-contractor management plan | 0 | 30-Dec-15 A | 27-Feb-16 A | |
| AS104020 | Quarterly updating of sub-contractor management plan | 471 | 29-May-16 A | 15-Apr-19 | 8 |
| **Waste Management Plan** | | | | | |
| AS105010 | Complete waste management plan | 0 | 30-Dec-15 A | 28-Mar-16 A | |
| AS105020 | Review and updating of waste management plan | 471 | 29-Mar-16 A | 15-Apr-19 | 8 |
| **Safety Scheme** | | | | | |
| AS106010 | Complete Safety Plan | 0 | 30-Dec-15 A | 27-Feb-16 A | |
| AS106030 | Update Safety Plan | 471 | 29-Feb-16 A | 19-Apr-19 | 4 |
| AS106050 | Provide Safety Officer | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS106070 | Attend Site Safety and Environment Management Committee | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS106080 | Attend Site Safety and Environment Committee | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS106090 | Arrange and attend weekly safety walk | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS106100 | Arrange and attend weekly environmental walk | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS106110 | Provide safety and environment training - (i) 1 day course ( for first attendance) | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS106120 | Provide safety and environment training - (ii) 0.5 day revalidation course | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS106130 | Provide safety and environment training - site specific induction training | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |

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File Name: DE/2014/01G3
Layout: DE1401 (Rev. G) - WBS
TASK filter: All Activities



Remaining Work
Critical Activity
Milestone
Actual Progress

**Contract No. DE/2014/01**
**Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station**
**Master Programme**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 08-Jan-16 | Rev. 0 | KH Lau | KM |
| 22-Jun-17 | Rev. D | KH Lau | KM |
| 12-Jul-17 | Rev. E | KH Lau | KM |
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
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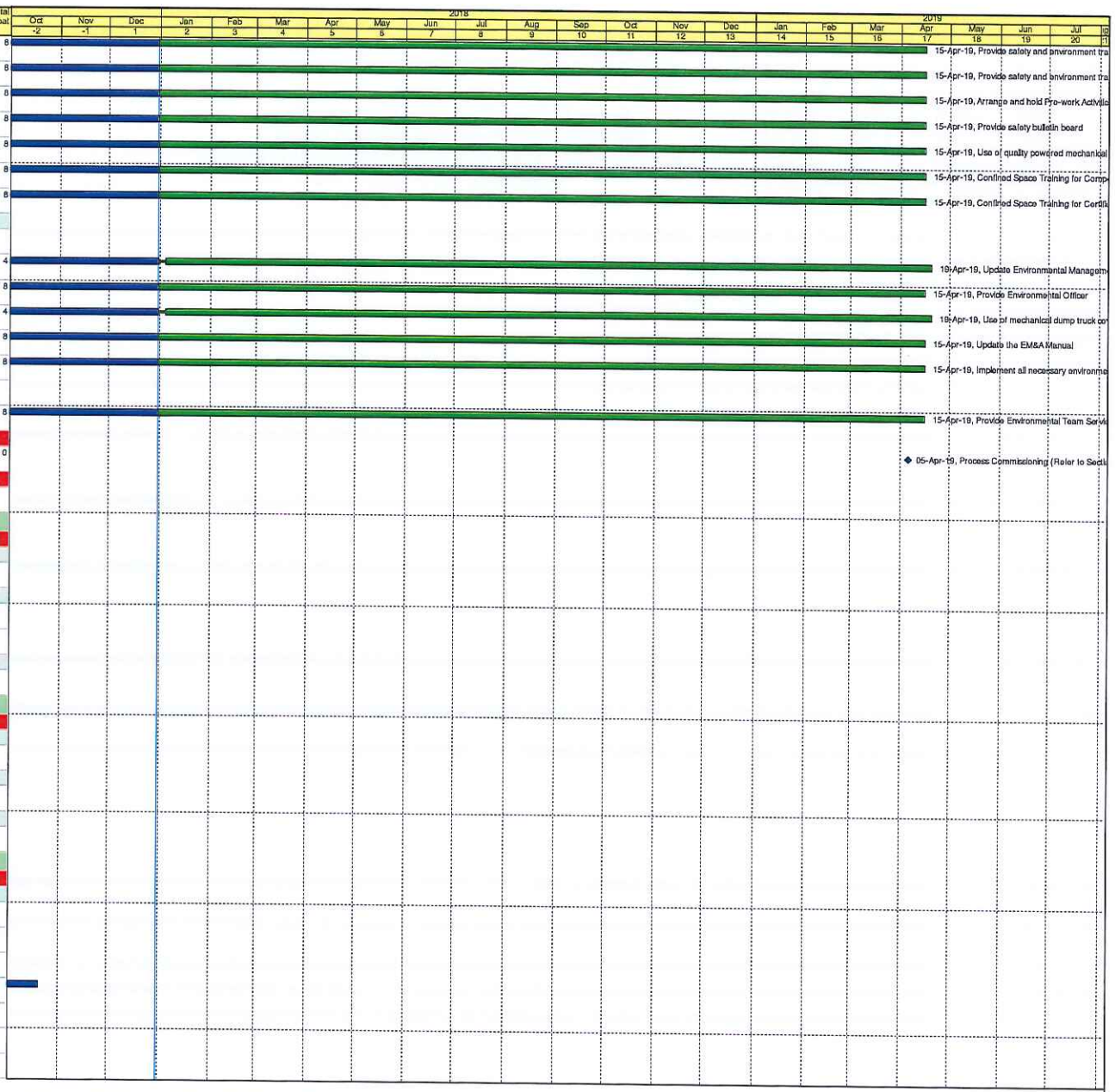
| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS108140 | Provide safety and environment training - toolbox talks | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS108150 | Provide safety and environment training:Participate in safety promotional campaign as instructed by the Engineer | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS107010 | Arrange and hold Pre-work Activities of Site Safety Cycle | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS107020 | Provide safety bulletin board | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS107030 | Use of quality powered mechanical equipment | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS109010 | Confined Space Training for Competent Persons to competent persons | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| AS109020 | Confined Space Training for Certified Workers to certified workers | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| **Environmental Scheme** | | | | | |
| AS106020 | Complete Environmental Management Plan | 0 | 30-Dec-15 A | 27-Feb-16 A | |
| AS106040 | Update Environmental Management Plan | 471 | 29-Feb-16 A | 19-Apr-19 | 4 |
| AS106060 | Provide Environmental Officer | 471 | 29-Jan-16 A | 15-Apr-19 | 8 |
| AS108010 | Use of mechanical dump truck covers | 471 | 29-Feb-16 A | 19-Apr-19 | 4 |
| AS111010 | Update the EM&A Manual | 471 | 28-Feb-16 A | 15-Apr-19 | 8 |
| AS111020 | Implement all necessary environmental impact mitigation measures | 471 | 28-Feb-16 A | 15-Apr-19 | 8 |
| AS111030 | Employ Environmental Team | 0 | 30-Dec-15 A | 27-Apr-16 A | |
| AS111032 | Provide Environmental Team Services | 471 | 28-Apr-16 A | 15-Apr-19 | 8 |
| **1.12 - Process Commissioning** | | | | | |
| AS112000 | Process Commissioning (Refer to Section III) | 0 | | 05-Apr-19 | 0 |
| **Procurement Procurement Programme** | | | | | |
| AS003000 | Prepare & Submit Procurement Programme | 0 | 30-Dec-15 A | 27-Feb-16 A | |
| **Section I of Works** | | | | | |
| **Activity Schedule No.2** | | | | | |
| **1 - Design Calculation of Plant and Materials** | | | | | |
| AS201100 | Complete Design Calculation of Plant & Material (Refer to P&M Submission Schedule for details) | 0 | 30-Dec-15 A | 23-Sep-16 A | |
| **2 - Civil Requirment Drawings for the Plant** | | | | | |
| AS202100 | Complete Civil Requirment Drawings for Flowmeter Chamber, Pre-treatment Screen, MF Tanks & MFB (BL) | 0 | 30-Dec-15 A | 28-Mar-18 A | |
| AS202200 | Complete Other Civil Requirment Drawings (Refer to Dwgs Submission Schedule for details) | 0 | 30-Dec-15 A | 23-Sep-16 A | |
| **3 - Detailed Design and Plant Layout Drawings** | | | | | |
| AS203100 | Complete Detailed Design and Plant Layout Drawings (Refer to Dwgs Submission Schedule for details) | 0 | 29-Mar-16 A | 23-Sep-16 A | |
| **Section II of Works** | | | | | |
| **Activity Schedule No. 3** | | | | | |
| **1 - Design Calculation of Plant and Material** | | | | | |
| AS301100 | Complete Design Calculation of Plant & Material (Refer to P&M Submission Schedule for details) | 0 | 30-Dec-15 A | 18-Mar-16 A | |
| **2 - Civil Requirment Drawings for the Plant** | | | | | |
| AS302100 | Complete Civil Requirment Drawings (Refer to Dwgs Submission Schedule for details) | 0 | 30-Dec-15 A | 18-Mar-16 A | |
| **3 - Detailed Design and Plant Layout Drawings** | | | | | |
| AS303100 | Complete Detailed Design and Plant Layout Drawings (Refer to Dwgs Submission Schedule for details) | 0 | 30-Dec-15 A | 18-Mar-16 A | |
| **Section III of Works** | | | | | |
| **Plant & Material Procurement** | | | | | |
| **Tender and Award of Suppliers - Mechanical - MBR1** | | | | | |
| AS400100 | Procurement of BR Feedpumps & Associated Equipment | 0 | 28-May-16 A | 23-Sep-16 A | |
| AS400110 | Procurement of MBR Pre-treatment Screen | 0 | 29-Mar-16 A | 21-Jun-16 A | |
| AS400120 | Procurement of Wash compactors, bagging system | 0 | 28-May-16 A | 25-Aug-16 A | |
| AS400120a | Procurement of screenings skips | 0 | 30-Sep-16 A | 19-Oct-17 A | |
| AS400130 | Procurement of Associated ductworks, pipeworks and valves | 0 | 30-Sep-16 A | 20-Sep-17 A | |
| AS400140 | Procurement of Mist system, FRP kiosk and drain pumping system | 0 | 30-Sep-16 A | 05-Sep-17 A | |
| AS400150 | Procurement of Ancillary aeration system | 0 | 27-Jun-16 A | 22-Sep-16 A | |

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File Name: DE/2014/01G3
Layout: DE1401 (Rev. G) - WBS
TASK filter: All Activities



Remaining Work
Critical Activity
Milestone
Actual Progress

**Contract No. DE/2014/01**
**Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station**
**Master Programme**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 08-Jan-16 | Rev. 0 | KH Lau | KM |
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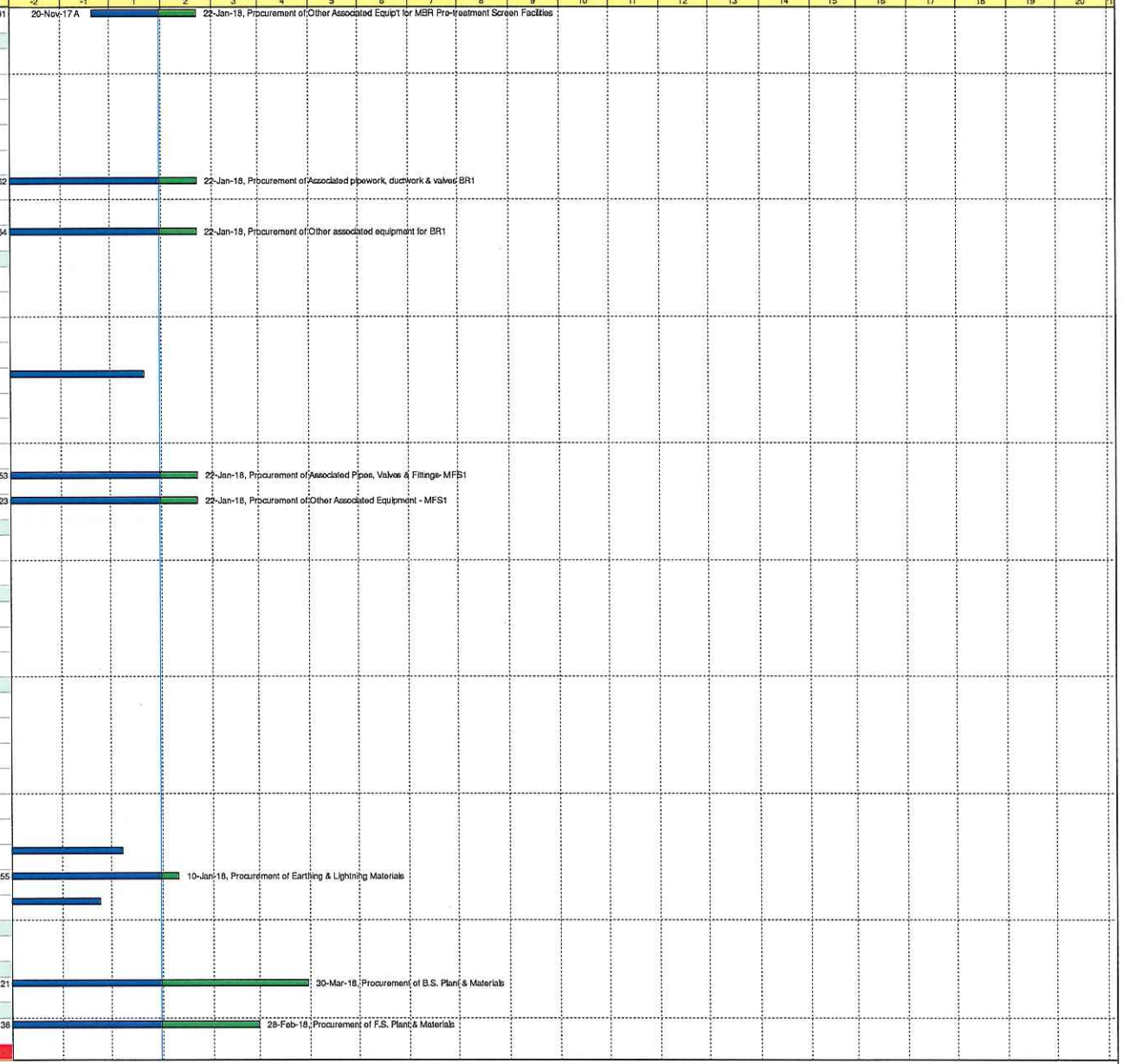
| 12-Jul-17 | Rev. E | KH Lau | KM |
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
| | | | |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS400160 | Procurement of Other Associated Equip't for MBR Pre-treatment Screen Facilities | 23 | 20-Nov-17 A | 22-Jan-18 | 91 |
| **Tender and Award of Suppliers - Mechanical - BR1** | | | | | |
| AS400200 | Procurement of Aeration Blowers | 0 | 27-Jun-16 A | 24-Aug-16 A | |
| AS400210 | Procurement of Submersible Mixers | 0 | 28-May-16 A | 22-Sep-16 A | |
| AS400220 | Procurement of Mixed Liquor Return pumps | 0 | 28-May-16 A | 22-Sep-16 A | |
| AS400230 | Procurement of Surplus Activated Sludge Pumps | 0 | 28-May-16 A | 22-Sep-16 A | |
| AS400240 | Procurement of Air Diffusion System | 0 | 29-Mar-16 A | 01-Jun-16 A | |
| AS400250 | Procurement of Associated pipework, ductwork & valves BR1 | 23 | 30-Sep-16 A | 22-Jan-18 | 62 |
| AS400260 | Procurement of Foam control system and wash water spraying system | 0 | 27-Jun-16 A | 22-Sep-16 A | |
| AS400270 | Procurement of Other associated equipment for BR1 | 23 | 30-Sep-16 A | 22-Jan-18 | 84 |
| **Tender and Award of Suppliers - Mechanical - MFS1** | | | | | |
| AS400300 | Procurement of Membrane Modules - MFS1 | 0 | 14-Mar-16 A | 29-Apr-16 A | |
| AS400310 | Procurement of Permeate Pumps - MFS1 | 0 | 12-Jun-16 A | 23-Sep-16 A | |
| AS400320 | Procurement of RAS / Backwash Pumps - MFS1 | 0 | 12-Jun-16 A | 23-Sep-16 A | |
| AS400330 | Procurement of Air Scouring Blowers - MFS1 | 0 | 13-May-16 A | 24-Aug-16 A | |
| AS400340 | Procurement of Air Compressor - MFS1 | 0 | 14-Mar-16 A | 21-Dec-17 A | |
| AS400350 | Procurement of Chemical Dosing System | 0 | 30-Sep-16 A | 29-Jun-17 A | |
| AS400360 | Procurement of Permeate Drain Pumps, Drain Pumps for MFS1 & Cleaning drain pumps | 0 | 30-Sep-16 A | 05-Sep-17 A | |
| AS400370 | Procurement of Wash Water Pumping System | 0 | 03-Jul-17 A | 05-Sep-17 A | |
| AS400380 | Procurement of Associated Pipes, Valves & Fittings- MFS1 | 23 | 09-Jan-17 A | 22-Jan-18 | 53 |
| AS400390 | Procurement of Other Associated Equipment - MFS1 | 23 | 09-Jan-17 A | 22-Jan-18 | 23 |
| **Tender and Award of Suppliers - Mechanical - Flowmeter Chamber** | | | | | |
| AS400400 | Procurement of Flowmeters | 0 | 28-May-16 A | 22-Sep-16 A | |
| AS400410 | Procurement of Flange Adaptors & Other Associated Equipment | 0 | 27-Oct-16 A | 20-Sep-17 A | |
| **Tender and Award of Suppliers - Penstocks, Lifting Appliance & Deorderisation System** | | | | | |
| AS400500 | Procurement of Stoplogs | 0 | 30-Sep-16 A | 15-Feb-17 A | |
| AS400510 | Procurement of Penstocks | 0 | 30-Sep-16 A | 15-Feb-17 A | |
| AS400520 | Procurement of Deodorisers System | 0 | 24-Feb-17 A | 26-Jul-17 A | |
| **Tender and Award of Suppliers - Electrical Main & Sub-main** | | | | | |
| AS400600 | Procurement of 11kV HV Switchboard | 0 | 28-Apr-16 A | 21-Sep-16 A | |
| AS400610 | Procurement of 3.3kV HV Switchboard | 0 | 28-Apr-16 A | 21-Sep-16 A | |
| AS400620 | Procurement of Transformer | 0 | 28-Apr-16 A | 21-Sep-16 A | |
| AS400630 | Procurement of L.V. Switchboard | 0 | 28-Apr-16 A | 22-Sep-16 A | |
| AS400640 | Procurement of Variable Speed Drive | 0 | 30-Sep-16 A | 02-Mar-17 A | |
| AS400650 | Procurement of Starter for Motor, Screen & Mixer etc. | 0 | 22-Aug-16 A | 22-Sep-16 A | |
| AS400660 | Procurement of Power Supply Cables | 0 | 30-Sep-16 A | 07-Dec-17 A | |
| AS400670 | Procurement of Earthing & Lightning Materials | 11 | 26-Nov-16 A | 10-Jan-18 | 55 |
| AS400680 | Procurement of Cable Tray & Trunking etc. | 0 | 26-Nov-16 A | 24-Nov-17 A | |
| **Tender and Award of Suppliers - Monitoring and Control System** | | | | | |
| AS400700 | Procurement of Monitoring & Control System | 0 | 26-Nov-16 A | 18-Jul-17 A | |
| **Tender and Award of Suppliers - Building Services** | | | | | |
| AS400720 | Procurement of B.S. Plant & Materials | 90 | 26-Nov-16 A | 30-Mar-18 | 21 |
| **Tender and Award of Suppliers - Fire Services** | | | | | |
| AS400740 | Procurement of F.S. Plant & Materials | 60 | 26-Nov-16 A | 28-Feb-18 | 38 |
| **Subcontracting Process** | | | | | |

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Remaining Work
Critical Activity
Milestone
Actual Progress

**Contract No. DE/2014/01**
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**Master Programme**

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|---|---|---|---|
| 08-Jan-16 | Rev. 0 | KH Lau | KM |
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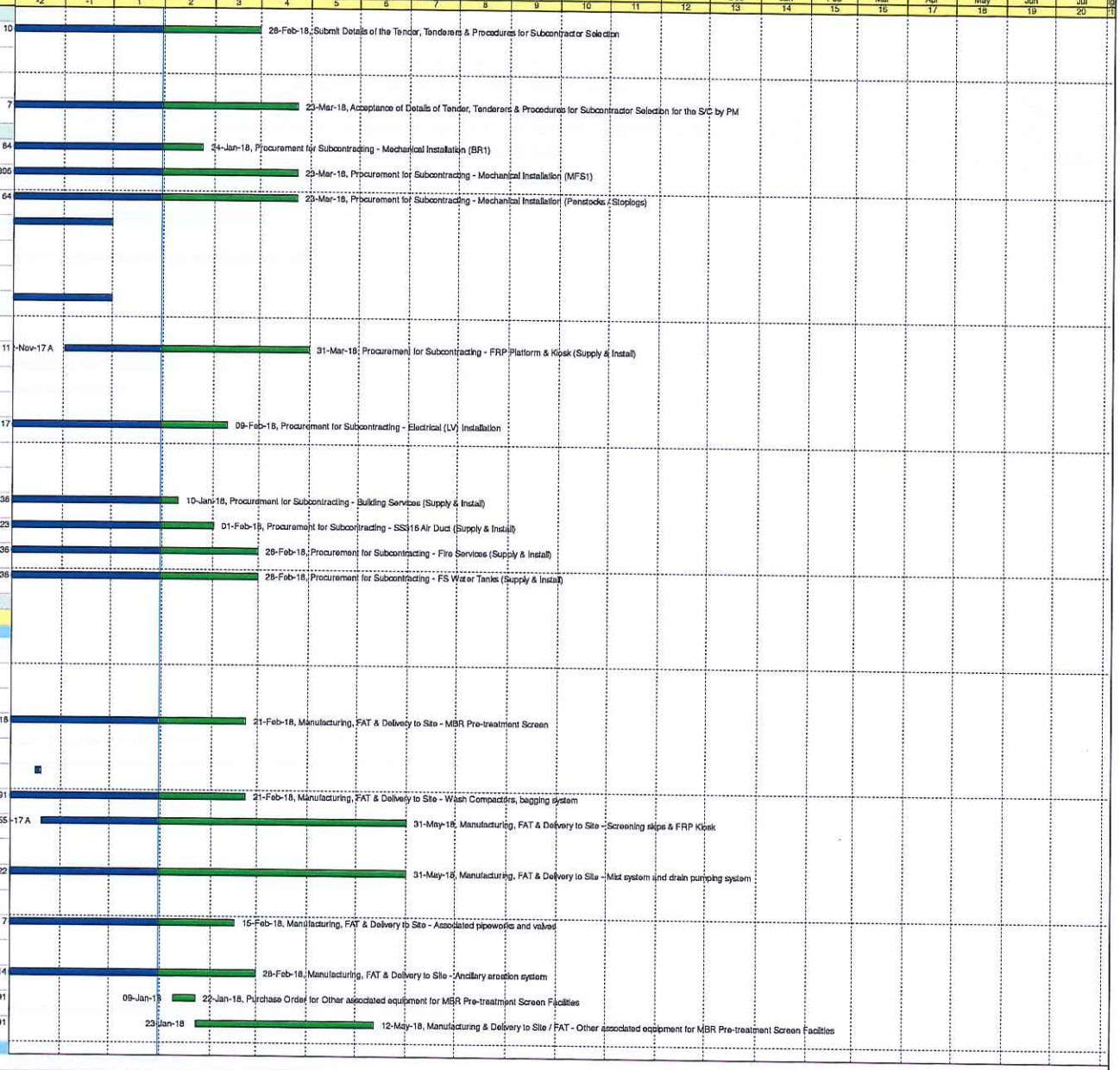
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
| | | | |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| **Subcontracting Prodedure and Acceptance** | | | | | |
| AS400800 | Submit Details of the Tender, Tenderers & Procedures for Subcontractor Selection | 60 | 30-Dec-15 A | 28-Feb-18 | 10 |
| AS400810 | Comment on Details of the Tender, Tenderers & Procedures for Subcontractor Selection | 0 | 31-Aug-16 A | 31-Aug-16 A | |
| AS400820 | Resubmit Details of the Tender, Tenderers & Procedures for Subcontractor Selection | 0 | 31-Aug-16 A | 31-Aug-16 A | |
| AS400830 | Acceptance of Details of Tender, Tenderers & Procedures for Subcontractor Selection for the S/C by PM | 83 | 20-Sep-16 A | 23-Mar-18 | 7 |
| **Tender and Award of Subontractors** | | | | | |
| AS300850 | Procurement for Subcontracting - Mechanical Installation (BR1) | 25 | 14-Mar-17 A | 24-Jan-18 | 64 |
| AS300860 | Procurement for Subcontracting - Mechanical Installation (MFS1) | 83 | 01-Aug-17 A | 23-Mar-18 | 306 |
| AS300870 | Procurement for Subcontracting - Mechanical Installation (Penstocks / Stoplogs) | 83 | 14-Mar-17 A | 23-Mar-18 | 64 |
| AS300880 | Procurement for Subcontracting - Mechanical Installation (Flowmeter Chamber) | 0 | 14-Mar-17 A | 30-Nov-17 A | |
| AS300890 | Procurement for Subcontracting - Mechanical Installation (DO System -Supply & Install) | 0 | 28-Feb-17 A | 26-Jul-17 A | |
| AS300900 | Procurement for Subcontracting - Mechanical Installation (NCSRSPS) | 0 | 25-May-16 A | 12-Sep-18 A | |
| AS400840 | Procurement for Subcontracting - Mechanical Installation (MBR Pre-treatment Screen Chamber) | 0 | 21-Mar-17 A | 30-Nov-17 A | |
| AS400910 | Procurement for Subcontracting - FRP Cover (Supply & Install) | 0 | 28-Feb-17 A | 08-May-17 A | |
| AS400920 | Procurement for Subcontracting - FRP Platform & Kiosk (Supply & Install) | 91 | 02-Nov-17 A | 31-Mar-18 | 11 |
| AS400930 | Procurement for Subcontracting - Lifting Appliances (Supply & Install) | 0 | 25-Oct-16 A | 19-Jan-17 A | |
| AS400940 | Procurement for Subcontracting - Electrical (HV) Installation | 0 | 20-Oct-16 A | 01-Sep-17 A | |
| AS400950 | Procurement for Subcontracting - Electrical (LV) Installation | 41 | 19-Nov-16 A | 09-Feb-18 | 117 |
| AS400960 | Procurement for Subcontracting - POEM System (Supply & Install) | 0 | 08-May-17 A | 18-Jul-17 A | |
| AS400970 | Procurement for Subcontracting - SCADA / PLC System (Supply & Install) | 0 | 30-Sep-16 A | 18-Jul-17 A | |
| AS400980 | Procurement for Subcontracting - Building Services (Supply & Install) | 11 | 10-Feb-17 A | 10-Jan-18 | 36 |
| AS400982 | Procurement for Subcontracting - SS316 Air Duct (Supply & Install) | 33 | 10-Feb-17 A | 01-Feb-18 | 123 |
| AS400990 | Procurement for Subcontracting - Fire Services (Supply & Install) | 60 | 10-Feb-17 A | 28-Feb-18 | 36 |
| AS400992 | Procurement for Subcontracting - FS Water Tanks (Supply & Install) | 60 | 10-Feb-17 A | 28-Feb-18 | 36 |
| **Activity Schedule No. 4** | | | | | |
| ***4.1 Works for MBR Pre-treatment Screen Chamber*** | | | | | |
| **Manufacturing, FAT and Delivery** | | | | | |
| AS401010 | Purchase Order for BR Feedpumps & Associated Equipment | 0 | 06-Sep-16 A | 23-Sep-16 A | |
| AS401012 | Manufacturing, FAT & Delivery to Site - BR Feedpumps & Associated Equipment | 0 | 14-Oct-16 A | 18-Jul-17 A | |
| AS401030 | Purchase Order for MBR Pre-treatment Screen | 0 | 01-Jun-16 A | 21-Jun-16 A | |
| AS401032 | Manufacturing, FAT & Delivery to Site - MBR Pre-treatment Screen | 53 | 06-Jul-16 A | 21-Feb-18 | 18 |
| AS401050 | Purchase Order for Wash Compactors, bagging system | 0 | 23-May-16 A | 21-Jun-16 A | |
| AS401050a | Purchase Order for Screening skips & FRP Kiosk | 0 | 16-Oct-17 A | 19-Oct-17 A | |
| AS401052 | Manufacturing, FAT & Delivery to Site - Wash Compactors, bagging system | 53 | 31-Aug-16 A | 21-Feb-18 | 91 |
| AS401052a | Manufacturing, FAT & Delivery to Site - Screening skips & FRP Kiosk | 152 | 20-Oct-17 A | 31-May-18 | 55 |
| AS401070 | Purchase Order for Mist system and drain pumping system | 0 | 14-Aug-17 A | 05-Sep-17 A | |
| AS401072 | Manufacturing, FAT & Delivery to Site - Mist system and drain pumping system | 152 | 06-Sep-17 A | 31-May-18 | 22 |
| AS401090 | Purchase Order for Associated pipeworks and valves | 0 | 18-Sep-17 A | 20-Sep-17 A | |
| AS401092 | Manufacturing, FAT & Delivery to Site - Associated pipeworks and valves | 47 | 21-Sep-17 A | 15-Feb-18 | 7 |
| AS401110 | Purchase Order for Ancillary aeration system | 0 | 13-Sep-16 A | 22-Sep-16 A | |
| AS401112 | Manufacturing, FAT & Delivery to Site - Ancillary aeration system | 60 | 05-May-17 A | 28-Feb-18 | 114 |
| AS401130 | Purchase Order for Other associated equipment for MBR Pre-treatment Screen Facilities | 14 | 09-Jan-18 | 22-Jan-18 | 91 |
| AS401132 | Manufacturing & Delivery to Site / FAT - Other associated equipment for MBR Pre-treatment Screen Facilities | 110 | 23-Jan-18 | 12-May-18 | 91 |
| **Install, T&C for Pre-treatment Screen Chamber (Incl. Provision for Health & Safety Requirements)** | | | | | |

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Layout: DE1401 (Rev. G) - WBS
TASK filter: All Activities



Remaining Work
Critical Activity
Milestone
Actual Progress

**Contract No. DE/2014/01**
**Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station**
**Master Programme**

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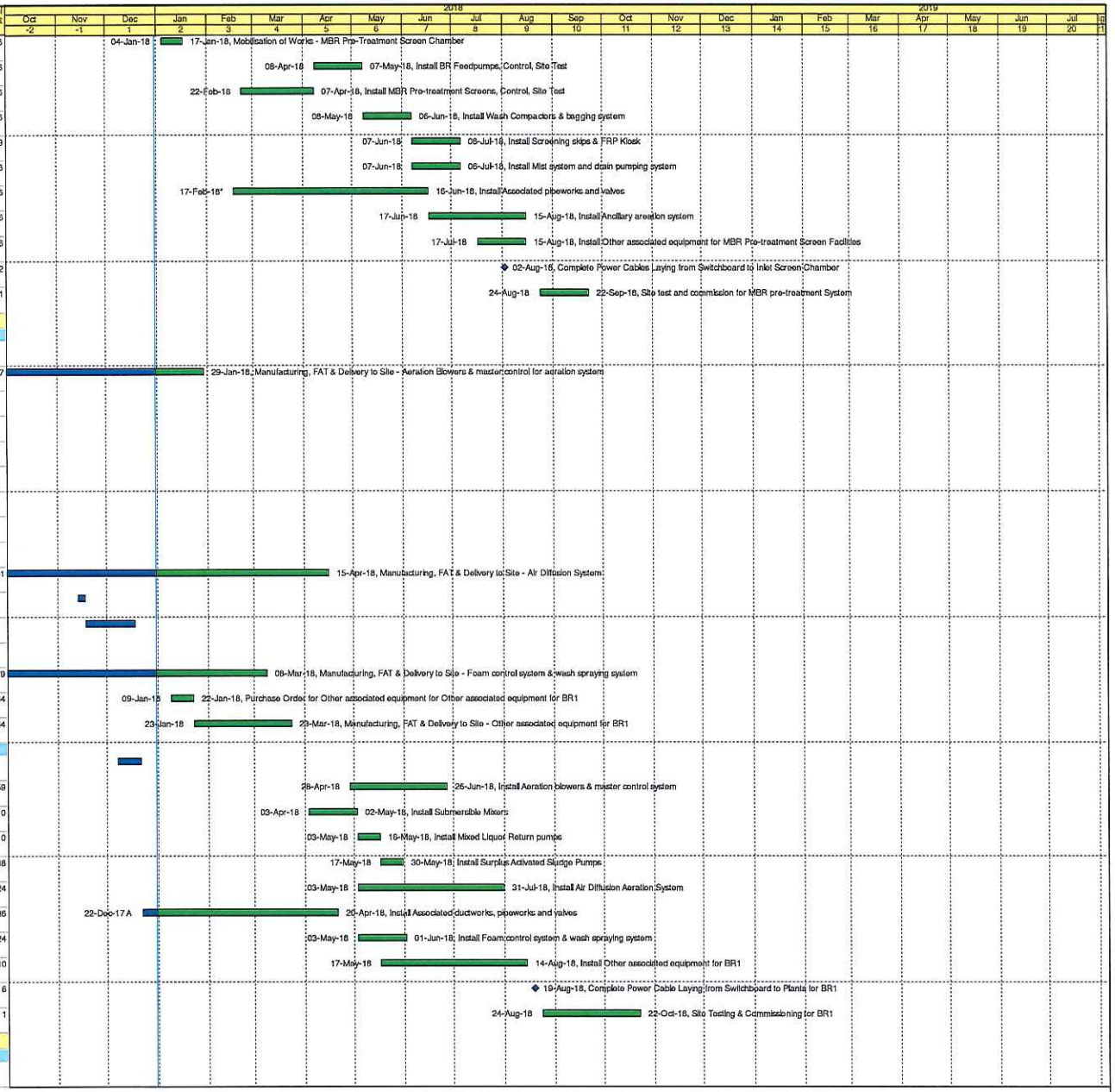
| 12-Jul-17 | Rev. E | KH Lau | KM |
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
| | | | |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS401002 | Mobilisation of Works - MBR Pre-Treatment Screen Chamber | 14 | 04-Jan-18 | 17-Jan-18 | 36 |
| AS401020 | Install BR Feedpumps, Control, Site Test | 30 | 08-Apr-18 | 07-May-18 | 16 |
| AS401040 | Install MBR Pre-treatment Screens, Control, Site Test | 45 | 22-Feb-18 | 07-Apr-18 | 16 |
| AS401060 | Install Wash Compactors & bagging system | 30 | 08-May-18 | 06-Jun-18 | 16 |
| AS401080a | Install Screening skips & FRP Kiosk | 30 | 07-Jun-18 | 06-Jul-18 | 49 |
| AS401080 | Install Mist system and drain pumping system | 30 | 07-Jun-18 | 06-Jul-18 | 16 |
| AS401100 | Install Associated pipeworks and valves | 120 | 17-Feb-18* | 16-Jun-18 | 6 |
| AS401120 | Install Ancillary areation system | 60 | 17-Jun-18 | 15-Aug-18 | 6 |
| AS401140 | Install Other associated equipment for MBR Pre-treatment Screen Facilities | 30 | 17-Jul-18 | 15-Aug-18 | 6 |
| AS401800 | Complete Power Cables Laying from Switchboard to Inlet Screen Chamber | 0 | | 02-Aug-18 | 22 |
| AS401900 | Site test and commission for MBR pre-treatment System | 30 | 24-Aug-18 | 22-Sep-18 | 1 |
| ***4.2 Works for Bioreactor No. 1 (BR1)*** | | | | | |
| Manufacturing, FAT and Delivery | | | | | |
| AS402010 | Purchase Order for Aeration Blowers & master control for aeration system | 0 | 18-Aug-16 A | 24-Aug-16 A | |
| AS402012 | Manufacturing, FAT & Delivery to Site - Aeration Blowers & master control for aeration system | 30 | 04-Jul-16 A | 29-Jan-18 | 147 |
| AS402030 | Purchase Order for Submersible Mixers | 0 | 06-Sep-16 A | 22-Sep-16 A | |
| AS402032 | Manufacturing, FAT & Delivery to Site - Submersible Mixers | 0 | 14-Oct-16 A | 22-Sep-17 A | |
| AS402050 | Purchase Order for Mixed Liquor Return pumps | 0 | 06-Sep-16 A | 22-Sep-16 A | |
| AS402052 | Manufacturing, FAT & Delivery to Site - Mixed Liquor Return pumps | 0 | 14-Oct-16 A | 06-Jul-17 A | |
| AS402070 | Purchase Order for Surplus Activated Sludge Pumps | 0 | 06-Sep-16 A | 23-Sep-16 A | |
| AS402072 | Manufacturing, FAT & Delivery to Site - Surplus Activated Sludge Pumps | 0 | 14-Oct-16 A | 26-Sep-17 A | |
| AS402090 | Purchase Order for Air Diffusion System | 0 | 02-May-16 A | 01-Jun-16 A | |
| AS402092 | Manufacturing, FAT & Delivery to Site - Air Diffusion System | 106 | 31-Mar-17 A | 15-Apr-18 | 41 |
| AS402110 | Purchase Order for Associated ductworks, pipeworks and valves | 0 | 13-Nov-17 A | 17-Nov-17 A | |
| AS402112 | Manufacturing, FAT & Delivery to Site - Associated ductworks, pipeworks and valves | 0 | 18-Nov-17 A | 18-Dec-17 A | |
| AS402130 | Purchase Order for Foam control system & wash spraying system | 0 | 13-Sep-16 A | 22-Sep-16 A | |
| AS402132 | Manufacturing, FAT & Delivery to Site - Foam control system & wash spraying system | 68 | 14-Oct-16 A | 08-Mar-18 | 79 |
| AS402150 | Purchase Order for Other associated equipment for Other associated equipment for BR1 | 14 | 09-Jan-18 | 22-Jan-18 | 64 |
| AS402152 | Manufacturing, FAT & Delivery to Site - Other associated equipment for BR1 | 60 | 23-Jan-18 | 23-Mar-18 | 64 |
| Install, T&C for BR1 (Incl. Provision for Health & Safety Requirements) | | | | | |
| AS402002 | Mobilisation of Works - BR1 | 0 | 07-Dec-17 A | 21-Dec-17 A | |
| AS402020 | Install Aeration blowers & master control system | 60 | 26-Apr-18 | 26-Jun-18 | 59 |
| AS402040 | Install Submersible Mixers | 30 | 03-Apr-18 | 02-May-18 | 10 |
| AS402060 | Install Mixed Liquor Return pumps | 14 | 03-May-18 | 16-May-18 | 10 |
| AS402080 | Install Surplus Activated Sludge Pumps | 14 | 17-May-18 | 30-May-18 | 88 |
| AS402100 | Install Air Diffusion Aeration System | 90 | 03-May-18 | 31-Jul-18 | 24 |
| AS402120 | Install Associated ductworks, pipeworks and valves | 111 | 22-Dec-17 A | 20-Apr-18 | 35 |
| AS402140 | Install Foam control system & wash spraying system | 30 | 03-May-18 | 01-Jun-18 | 24 |
| AS402160 | Install Other associated equipment for BR1 | 90 | 17-May-18 | 14-Aug-18 | 10 |
| AS402800 | Complete Power Cable Laying from Switchboard to Plants for BR1 | 0 | | 19-Aug-18 | 6 |
| AS402900 | Site Testing & Commissioning for BR1 | 60 | 24-Aug-18 | 22-Oct-18 | 1 |
| ***4.3 Works for Membrane Filtration System (MFS1)*** | | | | | |
| Manufacturing, FAT and Delivery | | | | | |
| AS403010 | Purchase Order for Membrane Modules | 0 | 18-Apr-16 A | 29-Apr-16 A | |

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TASK filter: All Activities



Remaining Work
Critical Activity
Milestone
Actual Progress

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**Further Expansion Phase 1A - Advance Works and**
**Ng Chow South Road Sewage Pumping Station**
**Master Programme**

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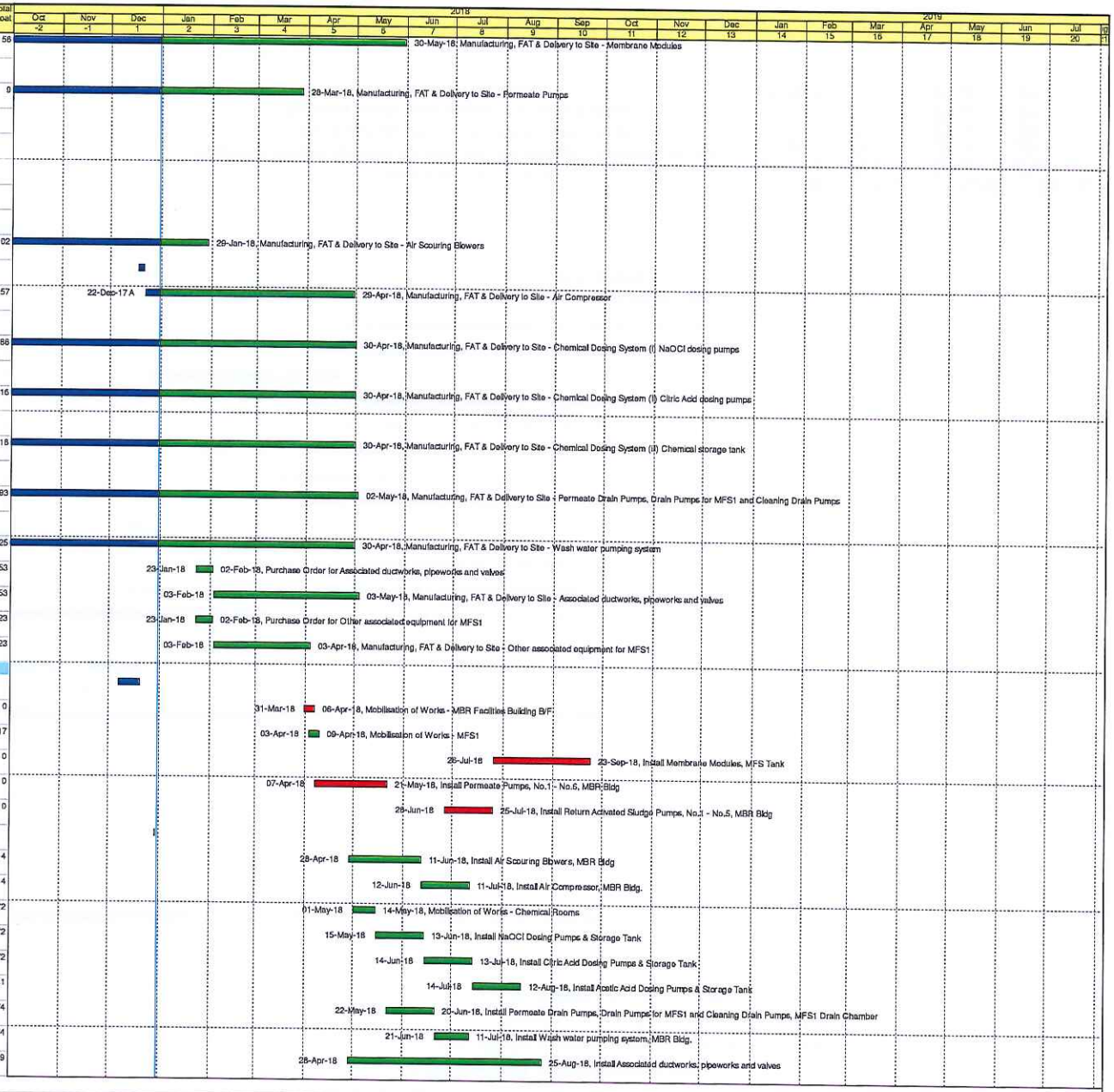
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
| | | | |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS403012 | Manufacturing, FAT & Delivery to Site - Membrane Modules | 151 | 28-Mar-16 A | 30-May-18 | 58 |
| AS403030 | Purchase Order for Permeate Pumps | 0 | 13-Sep-16 A | 23-Sep-16 A | |
| AS403032 | Manufacturing, FAT & Delivery to Site - Permeate Pumps | 88 | 07-Oct-16 A | 28-Mar-18 | 0 |
| AS403050 | Purchase Order for Return Activated Sludge Pumps | 0 | 13-Sep-16 A | 23-Sep-16 A | |
| AS403052 | Manufacturing, FAT & Delivery to Site - Return Activated Sludge Pumps | 0 | 07-Oct-16 A | 06-Sep-17 A | |
| AS403070 | Purchase Order for Backwash Pumps (Item Deleted) | 0 | 31-Aug-16 A | 31-Aug-16 A | |
| AS403072 | Manufacturing, FAT & Delivery to Site - Backwash Pumps (Item Deleted) | 0 | 31-Aug-16 A | 31-Aug-16 A | |
| AS403090 | Purchase Order for Air Scouring Blowers | 0 | 15-Aug-16 A | 24-Aug-16 A | |
| AS403092 | Manufacturing, FAT & Delivery to Site - Air Scouring Blowers | 30 | 11-Apr-16 A | 29-Jan-18 | 102 |
| AS403110 | Purchase Order for Air Compressor | 0 | 18-Dec-17 A | 21-Dec-17 A | |
| AS403112 | Manufacturing, FAT & Delivery to Site - Air Compressor | 120 | 22-Dec-17 A | 29-Apr-18 | 57 |
| AS403130 | Purchase Order for Chemical Dosing System (I) NaOCl dosing pumps | 0 | 05-Jun-17 A | 29-Jun-17 A | |
| AS403132 | Manufacturing, FAT & Delivery to Site - Chemical Dosing System (I) NaOCl dosing pumps | 121 | 30-Jun-17 A | 30-Apr-18 | 88 |
| AS403150 | Purchase Order for Chemical Dosing System (II) Citric Acid dosing pumps | 0 | 05-Jun-17 A | 29-Jun-17 A | |
| AS403152 | Manufacturing, FAT & Delivery to Site - Chemical Dosing System (II) Citric Acid dosing pumps | 121 | 30-Jun-17 A | 30-Apr-18 | 116 |
| AS403170 | Purchase Order for Chemical Dosing System (iii) Chemical storage tank | 0 | 06-Feb-17 A | 28-Feb-17 A | |
| AS403172 | Manufacturing, FAT & Delivery to Site - Chemical Dosing System (III) Chemical storage tank | 121 | 01-Mar-17 A | 30-Apr-18 | 118 |
| AS403190 | Purchase Order for Permeate Drain Pumps, Drain Pumps for MFS1 and Cleaning Drain Pumps | 0 | 28-Aug-17 A | 05-Sep-17 A | |
| AS403192 | Manufacturing, FAT & Delivery to Site - Permeate Drain Pumps, Drain Pumps for MFS1 and Cleaning Drain Pumps | 123 | 06-Sep-17 A | 02-May-18 | 93 |
| AS403210 | Purchase Order for Wash water pumping system | 0 | 28-Aug-17 A | 05-Sep-17 A | |
| AS403212 | Manufacturing, FAT & Delivery to Site - Wash water pumping system | 121 | 06-Sep-17 A | 30-Apr-18 | 125 |
| AS403230 | Purchase Order for Associated ductworks, pipeworks and valves | 11 | 23-Jan-18 | 02-Feb-18 | 53 |
| AS403232 | Manufacturing, FAT & Delivery to Site - Associated ductworks, pipeworks and valves | 90 | 03-Feb-18 | 03-May-18 | 53 |
| AS403250 | Purchase Order for Other associated equipment for MFS1 | 11 | 23-Jan-18 | 02-Feb-18 | 23 |
| AS403252 | Manufacturing, FAT & Delivery to Site - Other associated equipment for MFS1 | 60 | 03-Feb-18 | 03-Apr-18 | 23 |
| Install, T&C for MFS1 (incl. Provision for Health & Safety Requirements) | | | | | |
| AS403002 | Mobilisation of Works - MBR Facilities Building G/F | 0 | 07-Dec-17 A | 20-Dec-17 A | |
| AS403002a | Mobilisation of Works - MBR Facilities Building B/F | 7 | 31-Mar-18 | 06-Apr-18 | 0 |
| AS403004 | Mobilisation of Works - MFS1 | 7 | 03-Apr-18 | 09-Apr-18 | 17 |
| AS403020 | Install Membrane Modules, MFS Tank | 60 | 26-Jul-18 | 23-Sep-18 | 0 |
| AS403040 | Install Permeate Pumps, No.1 - No.6, MBR Bldg | 45 | 07-Apr-18 | 21-May-18 | 0 |
| AS403060 | Install Return Activated Sludge Pumps, No.1 - No.5, MBR Bldg | 30 | 26-Jun-18 | 25-Jul-18 | 0 |
| AS403080 | Install Backwash Pumps -MBR Bldg (Not required) | 0 | 30-Dec-17 A | 30-Dec-17 A | |
| AS403100 | Install Air Scouring Blowers, MBR Bldg | 45 | 28-Apr-18 | 11-Jun-18 | 14 |
| AS403120 | Install Air Compressor, MBR Bldg. | 30 | 12-Jun-18 | 11-Jul-18 | 14 |
| AS403140 | Mobilisation of Works - Chemical Rooms | 14 | 01-May-18 | 14-May-18 | 72 |
| AS403142 | Install NaOCl Dosing Pumps & Storage Tank | 30 | 15-May-18 | 13-Jun-18 | 72 |
| AS403160 | Install Citric Acid Dosing Pumps & Storage Tank | 30 | 14-Jun-18 | 13-Jul-18 | 72 |
| AS403180 | Install Acetic Acid Dosing Pumps & Storage Tank | 30 | 14-Jul-18 | 12-Aug-18 | 81 |
| AS403200 | Install Permeate Drain Pumps, Drain Pumps for MFS1 and Cleaning Drain Pumps, MFS1 Drain Chamber | 30 | 22-May-18 | 20-Jun-18 | 74 |
| AS403220 | Install Wash water pumping system, MBR Bldg. | 21 | 21-Jun-18 | 11-Jul-18 | 74 |
| AS403240 | Install Associated ductworks, pipeworks and valves | 120 | 28-Apr-18 | 25-Aug-18 | 29 |

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Layout: DE1401 (Rev. G) - WBS
TASK filter: All Activities



Remaining Work
Critical Activity
Milestone
Actual Progress

**Contract No. DE/2014/01**
**Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station**
**Master Programme**

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| 08-Jan-16 | Rev. 0 | KH Lau | KM |
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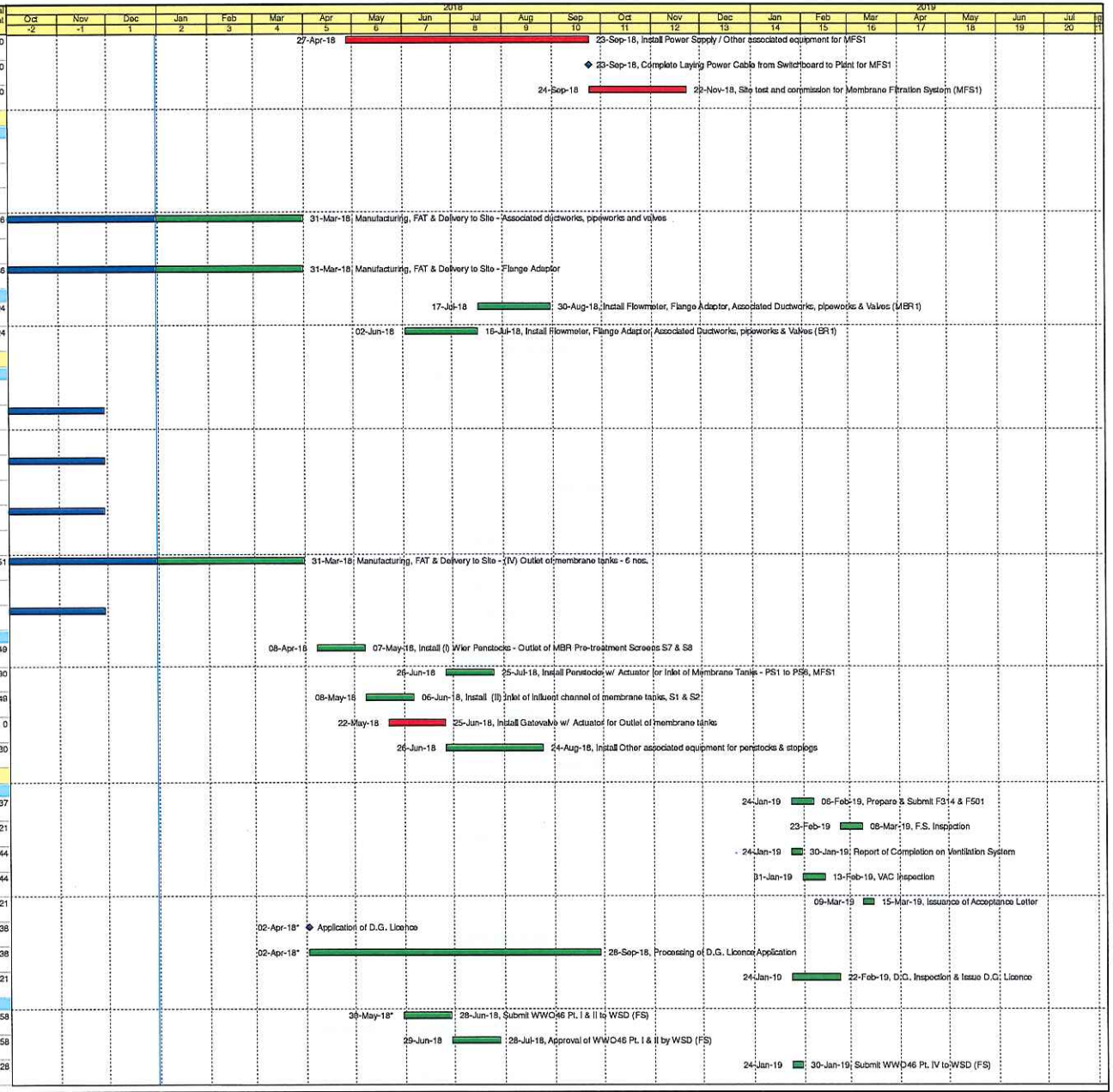
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS403260 | Install Power Supply / Other associated equipment for MFS1 | 150 | 27-Apr-18 | 23-Sep-18 | 0 |
| AS403800 | Complete Laying Power Cable from Switchboard to Plant for MFS1 | 0 | | 23-Sep-18 | 0 |
| AS403900 | Site test and commission for Membrane Filtration System (MFS1) | 60 | 24-Sep-18 | 22-Nov-18 | 0 |
| **4.4 Works for Flowmeter Chamber** | | | | | |
| Manufacturing, FAT and Delivery | | | | | |
| AS404010 | Purchase Order for Flowmeter | 0 | 28-Aug-16 A | 22-Sep-16 A | |
| AS404012 | Manufacturing, FAT & Delivery to Site - Flowmeter | 0 | 04-Oct-16 A | 21-Aug-17 A | |
| AS404030 | Purchase Order for Associated ductworks, pipeworks and valves | 0 | 18-Sep-17 A | 20-Sep-17 A | |
| AS404032 | Manufacturing, FAT & Delivery to Site - Associated ductworks, pipeworks and valves | 91 | 21-Sep-17 A | 31-Mar-18 | 86 |
| AS404050 | Purchase Order for Flange Adaptor | 0 | 18-Sep-17 A | 18-Sep-17 A | |
| AS404052 | Manufacturing, FAT & Delivery to Site - Flange Adaptor | 91 | 21-Sep-17 A | 31-Mar-18 | 86 |
| Install, T&C for Flowmeter Chamber (incl. Provision for Health & Safety Requirements) | | | | | |
| AS404020 | Install Flowmeter, Flange Adaptor, Associated Ductworks, pipeworks & Valves (MBR1) | 45 | 17-Jul-18 | 30-Aug-18 | 24 |
| AS404040 | Install Flowmeter, Flange Adaptor, Associated Ductworks, pipeworks & Valves (BR1) | 45 | 02-Jun-18 | 16-Jul-18 | 24 |
| **4.5 Works for Penstocks, Actuators and Stoplogs** | | | | | |
| Manufacturing, FAT and Delivery | | | | | |
| AS405010 | Purchase Order for (I) Weir Penstocks - Outlet of MBR Pre-treatment Screens S7 & S8 | 0 | 08-Feb-17 A | 15-Feb-17 A | |
| AS405012 | Manufacturing, FAT & Delivery to Site - (I) Weir Penstocks - Outlet of MBR Pre-treatment Screens S7 & S8 | 0 | 16-Feb-17 A | 28-Nov-17 A | |
| AS405030 | Purchase Order for (II) Inlet of Influent channel of membrane tanks, S1 & S2 | 0 | 08-Feb-17 A | 15-Feb-17 A | |
| AS405032 | Manufacturing, FAT & Delivery to Site - (II) Inlet of Influent channel of membrane tanks, S1 & S2 | 0 | 16-Feb-17 A | 28-Nov-17 A | |
| AS405050 | Purchase Order for (III) Inlet of membrane tanks PS1 - PS6 | 0 | 09-Feb-17 A | 15-Feb-17 A | |
| AS405052 | Customs Manufacturing, FAT & Delivery to Site - (III) Inlet of membrane tanks PS1 - PS6 | 0 | 16-Feb-17 A | 28-Nov-17 A | |
| AS405070 | Purchase Order for (IV) Outlet of membrane tanks Gate Valves | 0 | 26-Jun-17 A | 07-Jul-17 A | |
| AS405072 | Manufacturing, FAT & Delivery to Site - (IV) Outlet of membrane tanks - 6 nos. | 91 | 08-Jul-17 A | 31-Mar-18 | 51 |
| AS405090 | Purchase Order for Other associated equipment for penstocks & stoplogs | 0 | 09-Feb-17 A | 15-Feb-17 A | |
| AS405092 | Manufacturing, FAT & Delivery to Site - Other associated equipment for penstocks & stoplogs | 0 | 16-Feb-17 A | 28-Nov-17 A | |
| Install, T&C for Penstocks, Actuators & Stoplogs (Incl. Provision for Health & Safety Requirements) | | | | | |
| AS405020 | Install (I) Weir Penstocks - Outlet of MBR Pre-treatment Screens S7 & S8 | 30 | 08-Apr-18 | 07-May-18 | 49 |
| AS405040 | Install Penstocks w/ Actuator for Inlet of Membrane Tanks - PS1 to PS6, MFS1 | 30 | 26-Jun-18 | 25-Jul-18 | 30 |
| AS405060 | Install (II) Inlet of Influent channel of membrane tanks, S1 & S2 | 30 | 08-May-18 | 06-Jun-18 | 48 |
| AS405080 | Install Gatevalve w/ Actuator for Outlet of membrane tanks | 35 | 22-May-18 | 25-Jun-18 | 0 |
| AS405100 | Install Other associated equipment for penstocks & stoplogs | 60 | 26-Jun-18 | 24-Aug-18 | 30 |
| **4.6 Works for Building Services and Fire Services** | | | | | |
| Statutory Submission / Inspection (FSD) | | | | | |
| AS406500 | Prepare & Submit F314 & F501 | 14 | 24-Jan-19 | 06-Feb-19 | 37 |
| AS406510 | F.S. Inspection | 14 | 23-Feb-19 | 08-Mar-19 | 21 |
| AS406520 | Report of Completion on Ventilation System | 7 | 24-Jan-19 | 30-Jan-19 | 44 |
| AS406530 | VAC Inspection | 14 | 31-Jan-19 | 13-Feb-19 | 44 |
| AS406540 | Issuance of Acceptance Letter | 7 | 09-Mar-19 | 15-Mar-19 | 21 |
| AS406550 | Application of D.G. Licence | 0 | 02-Apr-18* | | 138 |
| AS406560 | Processing of D.G. Licence Application | 180 | 02-Apr-18* | 28-Sep-18 | 138 |
| AS406570 | D.G. Inspection & Issue D.G. Licence | 30 | 24-Jan-19 | 22-Feb-19 | 21 |
| Statutory Submission / Inspection (WSD) | | | | | |
| AS406600 | Submit WWO46 Pt. I & II to WSD (FS) | 30 | 30-May-18* | 28-Jun-18 | 158 |
| AS406610 | Approval of WWO46 Pt. I & II by WSD (FS) | 30 | 29-Jun-18 | 28-Jul-18 | 158 |
| AS406620 | Submit WWO46 Pt. IV to WSD (FS) | 7 | 24-Jan-19 | 30-Jan-19 | 28 |

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**Contract No. DE/2014/01**
**Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works**
**Further Expansion Phase 1A - Advance Works and**
**Ng Chow South Road Sewage Pumping Station**
**Master Programme**

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| 12-Jul-17 | Rev. E | KH Lau | KM |
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
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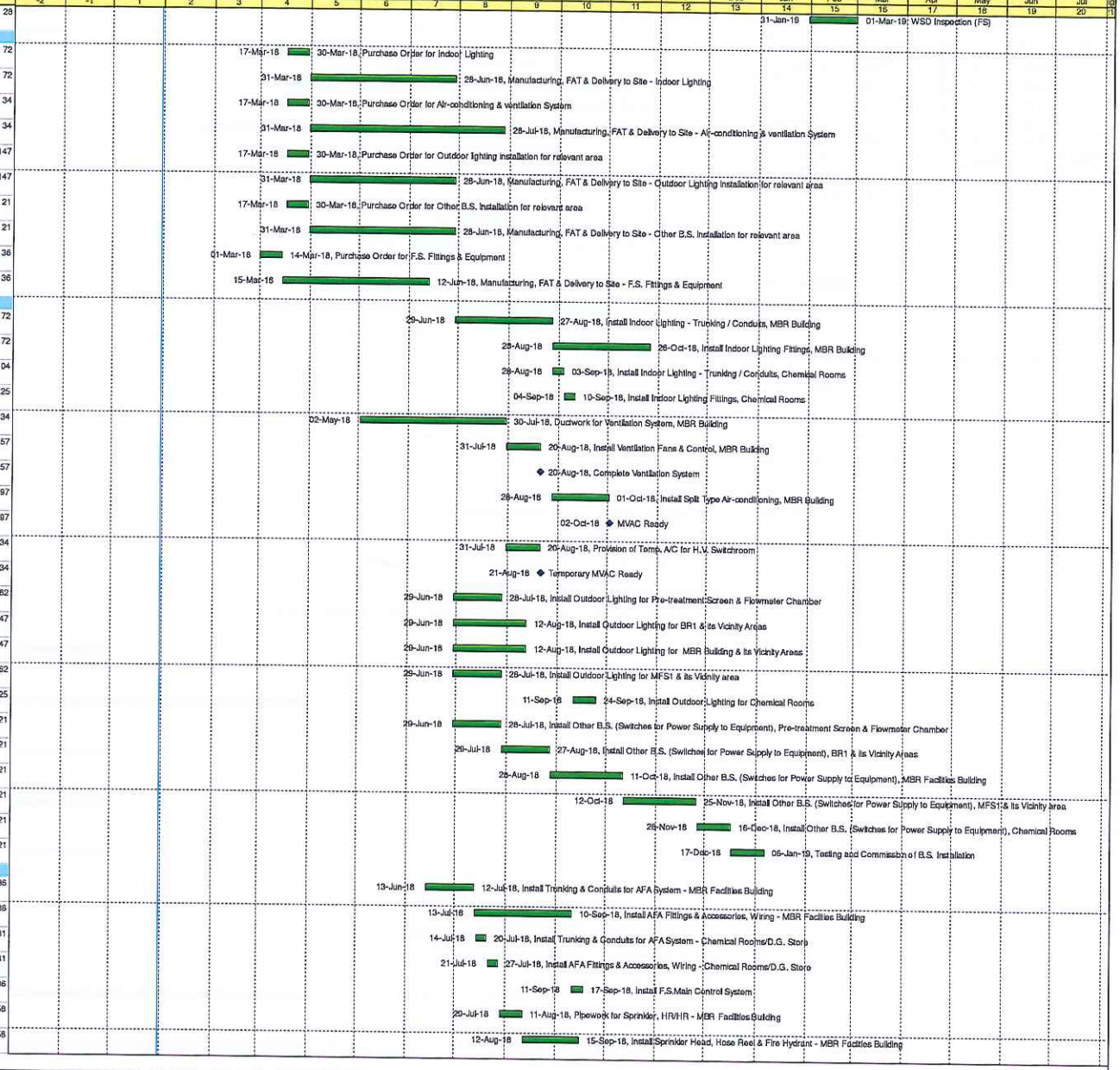
| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS406630 | WSD Inspection (FS) | 30 | 31-Jan-19 | 01-Mar-19 | 28 |
| **Manufacturing, FAT and Delivery** | | | | | |
| AS406010 | Purchase Order for Indoor Lighting | 14 | 17-Mar-18 | 30-Mar-18 | 72 |
| AS406012 | Manufacturing, FAT & Delivery to Site - Indoor Lighting | 90 | 31-Mar-18 | 28-Jun-18 | 72 |
| AS406030 | Purchase Order for Air-conditioning & ventilation System | 14 | 17-Mar-18 | 30-Mar-18 | 34 |
| AS406032 | Manufacturing, FAT & Delivery to Site - Air-conditioning & ventilation System | 120 | 31-Mar-18 | 28-Jul-18 | 34 |
| AS406050 | Purchase Order for Outdoor lighting installation for relevant area | 14 | 17-Mar-18 | 30-Mar-18 | 147 |
| AS406052 | Manufacturing, FAT & Delivery to Site - Outdoor Lighting installation for relevant area | 90 | 31-Mar-18 | 28-Jun-18 | 147 |
| AS406070 | Purchase Order for Other B.S. installation for relevant area | 14 | 17-Mar-18 | 30-Mar-18 | 21 |
| AS406072 | Manufacturing, FAT & Delivery to Site - Other B.S. installation for relevant area | 90 | 31-Mar-18 | 28-Jun-18 | 21 |
| AS406090 | Purchase Order for F.S. Fittings & Equipment | 14 | 01-Mar-18 | 14-Mar-18 | 36 |
| AS406092 | Manufacturing, FAT & Delivery to Site - F.S. Fittings & Equipment | 90 | 15-Mar-18 | 12-Jun-18 | 36 |
| **Install, T&C for Building Services (incl. Provision for Health & Safety Requirements)** | | | | | |
| AS406020 | Install Indoor Lighting - Trunking / Conduits, MBR Building | 60 | 29-Jun-18 | 27-Aug-18 | 72 |
| AS406022 | Install Indoor Lighting Fittings, MBR Building | 60 | 28-Aug-18 | 26-Oct-18 | 72 |
| AS406024 | Install Indoor Lighting - Trunking / Conduits, Chemical Rooms | 7 | 28-Aug-18 | 03-Sep-18 | 104 |
| AS406026 | Install Indoor Lighting Fittings, Chemical Rooms | 7 | 04-Sep-18 | 10-Sep-18 | 125 |
| AS406040 | Ductwork for Ventilation System, MBR Building | 90 | 02-May-18 | 30-Jul-18 | 34 |
| AS406041 | Install Ventilation Fans & Control, MBR Building | 21 | 31-Jul-18 | 20-Aug-18 | 57 |
| AS406042 | Complete Ventilation System | 0 | | 20-Aug-18 | 57 |
| AS406043 | Install Split Type Air-conditioning, MBR Building | 35 | 28-Aug-18 | 01-Oct-18 | 97 |
| AS406044 | MVAC Ready | 0 | 02-Oct-18 | | 97 |
| AS406045 | Provision of Temp. A/C for H.V. Switchroom | 21 | 31-Jul-18 | 20-Aug-18 | 34 |
| AS406046 | Temporary MVAC Ready | 0 | 21-Aug-18 | | 34 |
| AS406060 | Install Outdoor Lighting for Pre-treatment Screen & Flowmeter Chamber | 30 | 29-Jun-18 | 28-Jul-18 | 182 |
| AS406061 | Install Outdoor Lighting for BR1 & its Vicinity Areas | 45 | 29-Jun-18 | 12-Aug-18 | 147 |
| AS406062 | Install Outdoor Lighting for MBR Building & its Vicinity Areas | 45 | 29-Jun-18 | 12-Aug-18 | 147 |
| AS406063 | Install Outdoor Lighting for MFS1 & its Vicinity area | 30 | 29-Jun-18 | 28-Jul-18 | 162 |
| AS406064 | Install Outdoor Lighting for Chemical Rooms | 14 | 11-Sep-18 | 24-Sep-18 | 125 |
| AS406080 | Install Other B.S. (Switches for Power Supply to Equipment), Pre-treatment Screen & Flowmeter Chamber | 30 | 29-Jun-18 | 28-Jul-18 | 21 |
| AS406081 | Install Other B.S. (Switches for Power Supply to Equipment), BR1 & its Vicinity Areas | 30 | 29-Jul-18 | 27-Aug-18 | 21 |
| AS406082 | Install Other B.S. (Switches for Power Supply to Equipment), MBR Facilities Building | 45 | 28-Aug-18 | 11-Oct-18 | 21 |
| AS406083 | Install Other B.S. (Switches for Power Supply to Equipment), MFS1 & its Vicinity area | 45 | 12-Oct-18 | 25-Nov-18 | 21 |
| AS406084 | Install Other B.S. (Switches for Power Supply to Equipment), Chemical Rooms | 21 | 26-Nov-18 | 16-Dec-18 | 21 |
| AS406800 | Testing and Commission of B.S. Installation | 21 | 17-Dec-18 | 05-Jan-19 | 21 |
| **Install, T&C for Fire Services (incl. Provision for Health & Safety Requirements)** | | | | | |
| AS406101 | Install Trunking & Conduits for AFA System - MBR Facilities Building | 30 | 13-Jun-18 | 12-Jul-18 | 36 |
| AS406102 | Install AFA Fittings & Accessories, Wiring - MBR Facilities Building | 60 | 13-Jul-18 | 10-Sep-18 | 36 |
| AS406104 | Install Trunking & Conduits for AFA System - Chemical Rooms/D.G. Store | 7 | 14-Jul-18 | 20-Jul-18 | 81 |
| AS406106 | Install AFA Fittings & Accessories, Wiring - Chemical Rooms/D.G. Store | 7 | 21-Jul-18 | 27-Jul-18 | 81 |
| AS406108 | Install F.S.Main Control System | 7 | 11-Sep-18 | 17-Sep-18 | 36 |
| AS406180 | Pipework for Sprinkler, HR/HR - MBR Facilities Building | 14 | 29-Jul-18 | 11-Aug-18 | 158 |
| AS406182 | Install Sprinkler Head, Hose Reel & Fire Hydrant - MBR Facilities Building | 35 | 12-Aug-18 | 15-Sep-18 | 158 |

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TASK filter: All Activities



Remaining Work
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**Master Programme**

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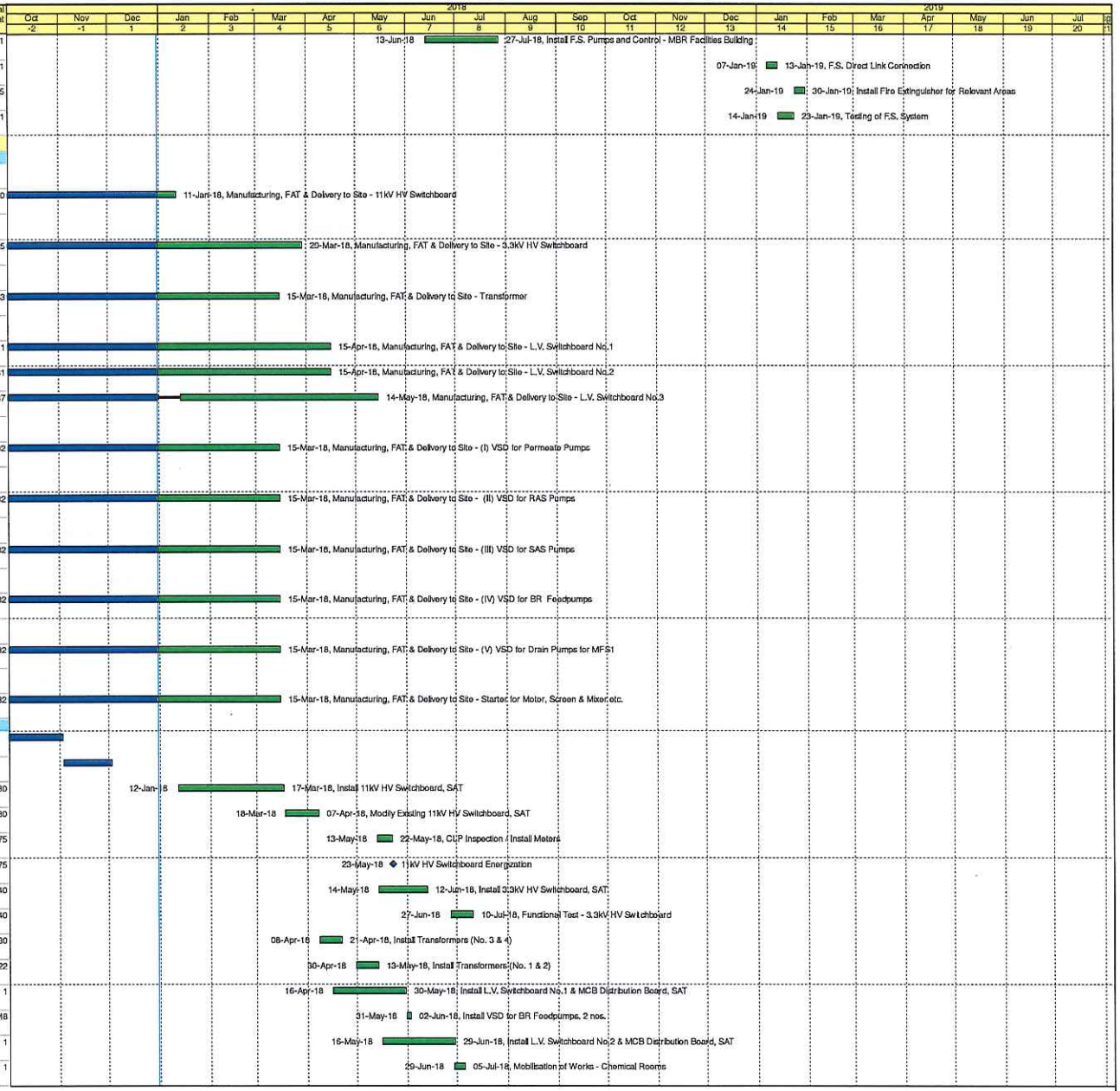
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
| | | | |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS406184 | Install F.S. Pumps and Control - MBR Facilities Building | 45 | 13-Jun-18 | 27-Jul-18 | 81 |
| AS406240 | F.S. Direct Link Connection | 7 | 07-Jan-19 | 13-Jan-19 | 21 |
| AS406260 | Install Fire Extinguisher for Relevant Areas | 7 | 24-Jan-19 | 30-Jan-19 | 65 |
| AS406900 | Testing of F.S. System | 10 | 14-Jan-19 | 23-Jan-19 | 21 |
| | ***4.7 HV Switchgear, Transformer, LV Switchgear, LV Control Gear etc..*** | | | | |
| | Manufacturing, FAT and Delivery | | | | |
| AS407010 | Purchase Order for 11kV HV Switchboard | 0 | 12-Sep-16 A | 21-Sep-16 A | |
| AS407012 | Manufacturing, FAT & Delivery to Site - 11kV HV Switchboard | 12 | 07-Oct-16 A | 11-Jan-18 | 30 |
| AS407030 | Purchase Order for 3.3kV HV Switchboard | 0 | 12-Sep-16 A | 21-Sep-16 A | |
| AS407032 | Manufacturing, FAT & Delivery to Site - 3.3kV HV Switchboard | 89 | 07-Oct-16 A | 20-Mar-18 | 85 |
| AS407050 | Purchase Order for Transformer | 0 | 13-Sep-16 A | 21-Sep-16 A | |
| AS407052 | Manufacturing, FAT & Delivery to Site - Transformer | 75 | 07-Oct-16 A | 15-Mar-18 | 53 |
| AS407070 | Purchase Order for L.V. Switchboard | 0 | 13-Sep-16 A | 22-Sep-16 A | |
| AS407072 | Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.1 | 106 | 30-Sep-16 A | 15-Apr-18 | 1 |
| AS407074 | Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.2 | 106 | 30-Sep-16 A | 15-Apr-18 | 31 |
| AS407076 | Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.3 | 121 | 30-Sep-16 A | 14-May-18 | 37 |
| AS407090 | Purchase Order for (I) VSD for Permeate Pumps | 0 | 03-Mar-17 A | 16-Mar-17 A | |
| AS407092 | Manufacturing, FAT & Delivery to Site - (I) VSD for Permeate Pumps | 75 | 17-Mar-17 A | 15-Mar-18 | 32 |
| AS407110 | Purchase Order for (II) VSD for RAS Pumps | 0 | 03-Mar-17 A | 16-Mar-17 A | |
| AS407112 | Manufacturing, FAT & Delivery to Site - (II) VSD for RAS Pumps | 75 | 17-Mar-17 A | 15-Mar-18 | 32 |
| AS407130 | Purchase Order for (III) VSD for SAS Pumps | 0 | 03-Mar-17 A | 16-Mar-17 A | |
| AS407132 | Manufacturing, FAT & Delivery to Site - (III) VSD for SAS Pumps | 75 | 17-Mar-17 A | 15-Mar-18 | 32 |
| AS407150 | Purchase Order for (IV) VSD for BR Feedpumps | 0 | 03-Mar-17 A | 16-Mar-17 A | |
| AS407152 | Manufacturing, FAT & Delivery to Site - (IV) VSD for BR Feedpumps | 75 | 17-Mar-17 A | 15-Mar-18 | 32 |
| AS407170 | Purchase Order for (V) VSD for Drain Pumps for MFS1 | 0 | 03-Mar-17 A | 16-Mar-17 A | |
| AS407172 | Manufacturing, FAT & Delivery to Site - (V) VSD for Drain Pumps for MFS1 | 75 | 17-Mar-17 A | 15-Mar-18 | 32 |
| AS407190 | Purchase Order for Starter for Motor, Screen & Mixer etc. | 0 | 13-Sep-16 A | 22-Sep-16 A | |
| AS407192 | Manufacturing, FAT & Delivery to Site - Starter for Motor, Screen & Mixer etc. | 75 | 30-Sep-16 A | 15-Mar-18 | 32 |
| | Install, T&C for MBR Facilities Building (incl. Provision for Health & Safety Requirements) | | | | |
| AS407001 | Mobilisation & Preparation Works - MBR Facilities Building CLP RmC & D | 0 | 30-Sep-17 A | 02-Nov-17 A | |
| AS407002 | Mobilisation of Works - MBR Facilities Building | 0 | 03-Nov-17 A | 02-Dec-17 A | |
| AS407020 | Install 11kV HV Switchboard, SAT | 65 | 12-Jan-18 | 17-Mar-18 | 30 |
| AS407022 | Modify Existing 11kV HV Switchboard, SAT | 21 | 18-Mar-18 | 07-Apr-18 | 30 |
| AS407024 | CLP Inspection / Install Meters | 10 | 13-May-18 | 22-May-18 | 75 |
| AS407026 | 11kV HV Switchboard Energization | 0 | 23-May-18 | | 75 |
| AS407040 | Install 3.3kV HV Switchboard, SAT | 30 | 14-May-18 | 12-Jun-18 | 40 |
| AS407042 | Functional Test - 3.3kV HV Switchboard | 14 | 27-Jun-18 | 10-Jul-18 | 40 |
| AS407060 | Install Transformers (No. 3 & 4) | 14 | 08-Apr-18 | 21-Apr-18 | 30 |
| AS407062 | Install Transformers (No. 1 & 2) | 14 | 30-Apr-18 | 13-May-18 | 22 |
| AS407080 | Install L.V. Switchboard No.1 & MCB Distribution Board, SAT | 45 | 16-Apr-18 | 30-May-18 | 1 |
| AS407081 | Install VSD for BR Feedpumps, 2 nos. | 3 | 31-May-18 | 02-Jun-18 | 48 |
| AS407082 | Install L.V. Switchboard No.2 & MCB Distribution Board, SAT | 45 | 16-May-18 | 29-Jun-18 | 1 |
| AS407083 | Mobilisation of Works - Chemical Rooms | 7 | 29-Jun-18 | 05-Jul-18 | 1 |

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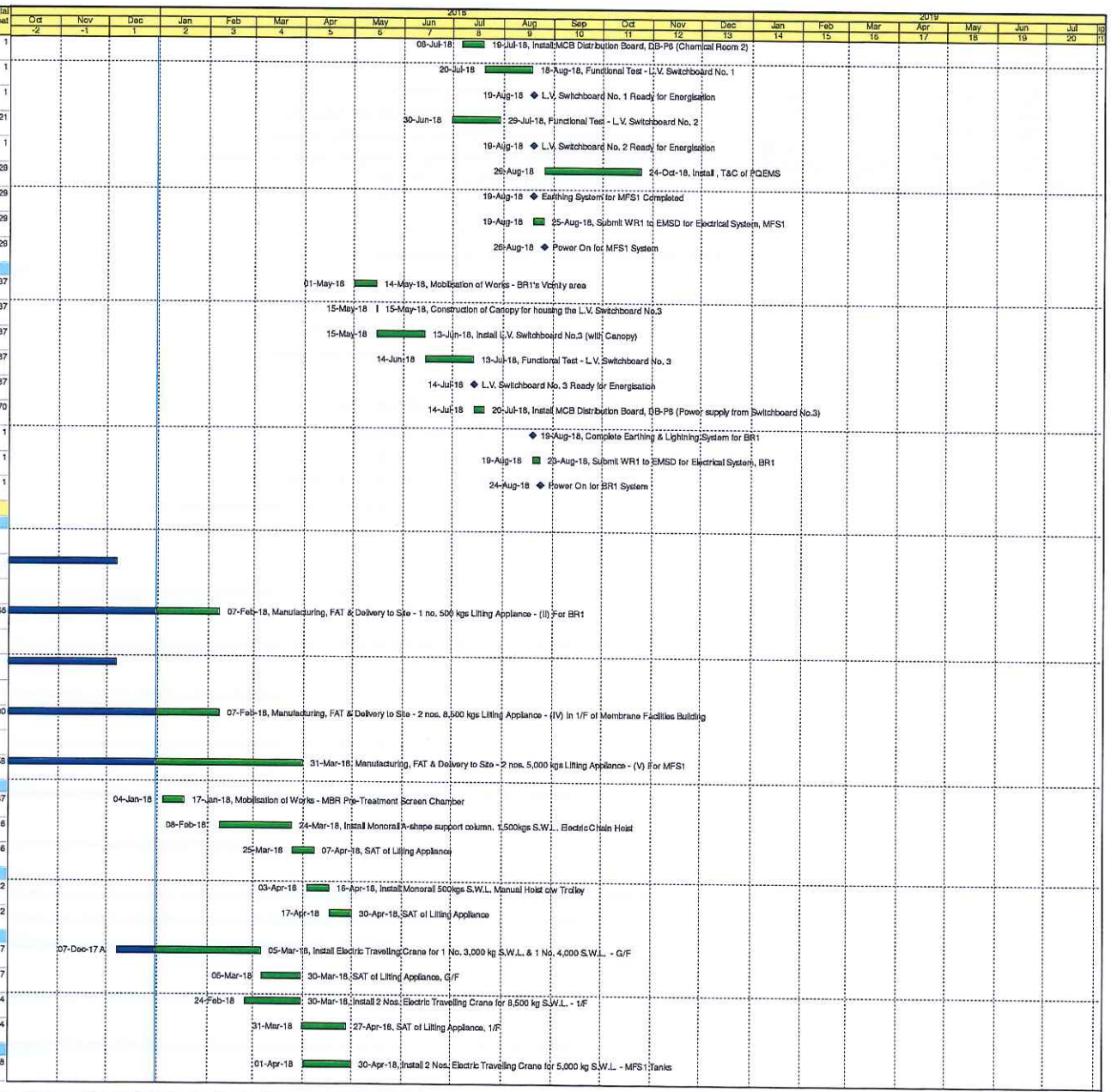
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
| | | | |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS407084 | Install MCB Distribution Board, DB-P6 (Chemical Room 2) | 14 | 06-Jul-18 | 19-Jul-18 | 1 |
| AS407085 | Functional Test - L.V. Switchboard No. 1 | 30 | 20-Jul-18 | 18-Aug-18 | 1 |
| AS407086 | L.V. Switchboard No. 1 Ready for Energisation | 0 | 19-Aug-18 | | 1 |
| AS407087 | Functional Test - L.V. Switchboard No. 2 | 30 | 30-Jun-18 | 29-Jul-18 | 21 |
| AS407088 | L.V. Switchboard No. 2 Ready for Energisation | 0 | 19-Aug-18 | | 1 |
| AS407500 | Install , T&C of PQEMS | 60 | 26-Aug-18 | 24-Oct-18 | 29 |
| AS407600 | Earthing System for MFS1 Completed | 0 | 19-Aug-18 | | 29 |
| AS407620 | Submit WR1 to EMSD for Electrical System, MFS1 | 7 | 19-Aug-18 | 25-Aug-18 | 29 |
| AS407640 | Power On for MFS1 System | 0 | 26-Aug-18 | | 29 |
| | Install, T&C for BR1's Vicinity Area (Incl. Provision for Health & Safety Requirements) | | | | |
| AS407003 | Mobilisation of Works - BR1's Vicinity area | 14 | 01-May-18 | 14-May-18 | 37 |
| AS407004 | Construction of Canopy for housing the L.V. Switchboard No.3 | 0 | 15-May-18 | 15-May-18 | 37 |
| AS407089a | Install L.V. Switchboard No.3 (with Canopy) | 30 | 15-May-18 | 13-Jun-18 | 37 |
| AS407089b | Functional Test - L.V. Switchboard No. 3 | 30 | 14-Jun-18 | 13-Jul-18 | 37 |
| AS407089c | L.V. Switchboard No. 3 Ready for Energisation | 0 | 14-Jul-18 | | 37 |
| AS407089d | Install MCB Distribution Board, DB-P8 (Power supply from Switchboard No.3) | 7 | 14-Jul-18 | 20-Jul-18 | 170 |
| AS407700 | Complete Earthing & Lightning System for BR1 | 0 | | 19-Aug-18 | 1 |
| AS407720 | Submit WR1 to EMSD for Electrical System, BR1 | 5 | 19-Aug-18 | 23-Aug-18 | 1 |
| AS407740 | Power On for BR1 System | 0 | 24-Aug-18 | | 1 |
| | ***4.8 Lifting Appliance*** | | | | |
| | Manufacturing, FAT and Delivery | | | | |
| AS408010 | Purchase Order for 1 no. 1,500 kgs Lifting Appliance - (I) For Pre-treatment Screen Chamber | 0 | 08-Feb-17 A | 14-Feb-17 A | |
| AS408012 | Manufacturing, FAT & Delivery to Site - 1 no. 1,500 kgs Lifting Appliance - (I) For Pre-treatment Screen Chamber | 0 | 15-Feb-17 A | 06-Dec-17 A | |
| AS408030 | Purchase Order for 1 no. 500 kgs Lifting Appliance - (II) For BR1 | 0 | 08-Feb-17 A | 14-Feb-17 A | |
| AS408032 | Manufacturing, FAT & Delivery to Site - 1 no. 500 kgs Lifting Appliance - (II) For BR1 | 39 | 15-Feb-17 A | 07-Feb-18 | 56 |
| AS408050 | Purchase Order for 1 no. 3,000 kgs & 1 no. 4,000 kgs Lifting Appliance - (III) In G/F of Membrane Facilities Building | 0 | 08-Feb-17 A | 14-Feb-17 A | |
| AS408052 | Manufacturing, FAT & Delivery to Site - 1 no. 3,000 kgs & 1 no. 4,000 kgs Lifting Appliance - (III) In G/F of MF Bldg. | 0 | 15-Feb-17 A | 06-Dec-17 A | |
| AS408070 | Purchase Order for 2 nos. 8,500 kgs Lifting Appliance - (IV) In 1/F of Membrane Facilities Building | 0 | 08-Feb-17 A | 14-Feb-17 A | |
| AS408072 | Manufacturing, FAT & Delivery to Site - 2 nos. 8,500 kgs Lifting Appliance - (IV) In 1/F of Membrane Facilities Building | 39 | 15-Feb-17 A | 07-Feb-18 | 30 |
| AS408090 | Purchase Order for 2 nos. 5,000 kgs Lifting Appliance - (V) For MFS1 | 0 | 08-Feb-17 A | 14-Feb-17 A | |
| AS408092 | Manufacturing, FAT & Delivery to Site - 2 nos. 5,000 kgs Lifting Appliance - (V) For MFS1 | 91 | 15-Feb-17 A | 31-Mar-18 | 58 |
| | Install, T&C for Pre-Treatment Screen Chamber (Incl. Provision for Health & Safety Requirements) | | | | |
| AS408020 | Mobilisation of Works - MBR Pre-Treatment Screen Chamber | 14 | 04-Jan-18 | 17-Jan-18 | 37 |
| AS408022 | Install Monorail A-shape support column, 1,500kgs S.W.L. Electric Chain Hoist | 45 | 08-Feb-18* | 24-Mar-18 | 16 |
| AS408024 | SAT of Lifting Appliance | 14 | 25-Mar-18 | 07-Apr-18 | 16 |
| | Install, T&C for Bioreactor No.1 (BR1) (Incl. Provision for Health & Safety Requirements) | | | | |
| AS408040 | Install Monorail 500kgs S.W.L. Manual Hoist c/w Trolley | 14 | 03-Apr-18 | 16-Apr-18 | 12 |
| AS408042 | SAT of Lifting Appliance | 14 | 17-Apr-18 | 30-Apr-18 | 12 |
| | Install, T&C for MBR Facilities Building (Incl. Provision for Health & Safety Requirements) | | | | |
| AS408060 | Install Electric Travelling Crane for 1 No. 3,000 kg S.W.L. & 1 No. 4,000 S.W.L. - G/F | 65 | 07-Dec-17 A | 05-Mar-18 | 7 |
| AS408062 | SAT of Lifting Appliance, G/F | 25 | 06-Mar-18 | 30-Mar-18 | 7 |
| AS408080 | Install 2 Nos. Electric Travelling Crane for 8,500 kg S.W.L. - 1/F | 35 | 24-Feb-18 | 30-Mar-18 | 14 |
| AS408082 | SAT of Lifting Appliance, 1/F | 28 | 31-Mar-18 | 27-Apr-18 | 14 |
| | Install, T&C for MFS1 (Incl. Provision for Health & Safety Requirements) | | | | |
| AS408101 | Install 2 Nos. Electric Travelling Crane for 5,000 kg S.W.L. - MFS1 Tanks | 30 | 01-Apr-18 | 30-Apr-18 | 58 |

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TASK filter: All Activities



Remaining Work
Critical Activity
Milestone
Actual Progress

**Contract No. DE/2014/01**
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| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
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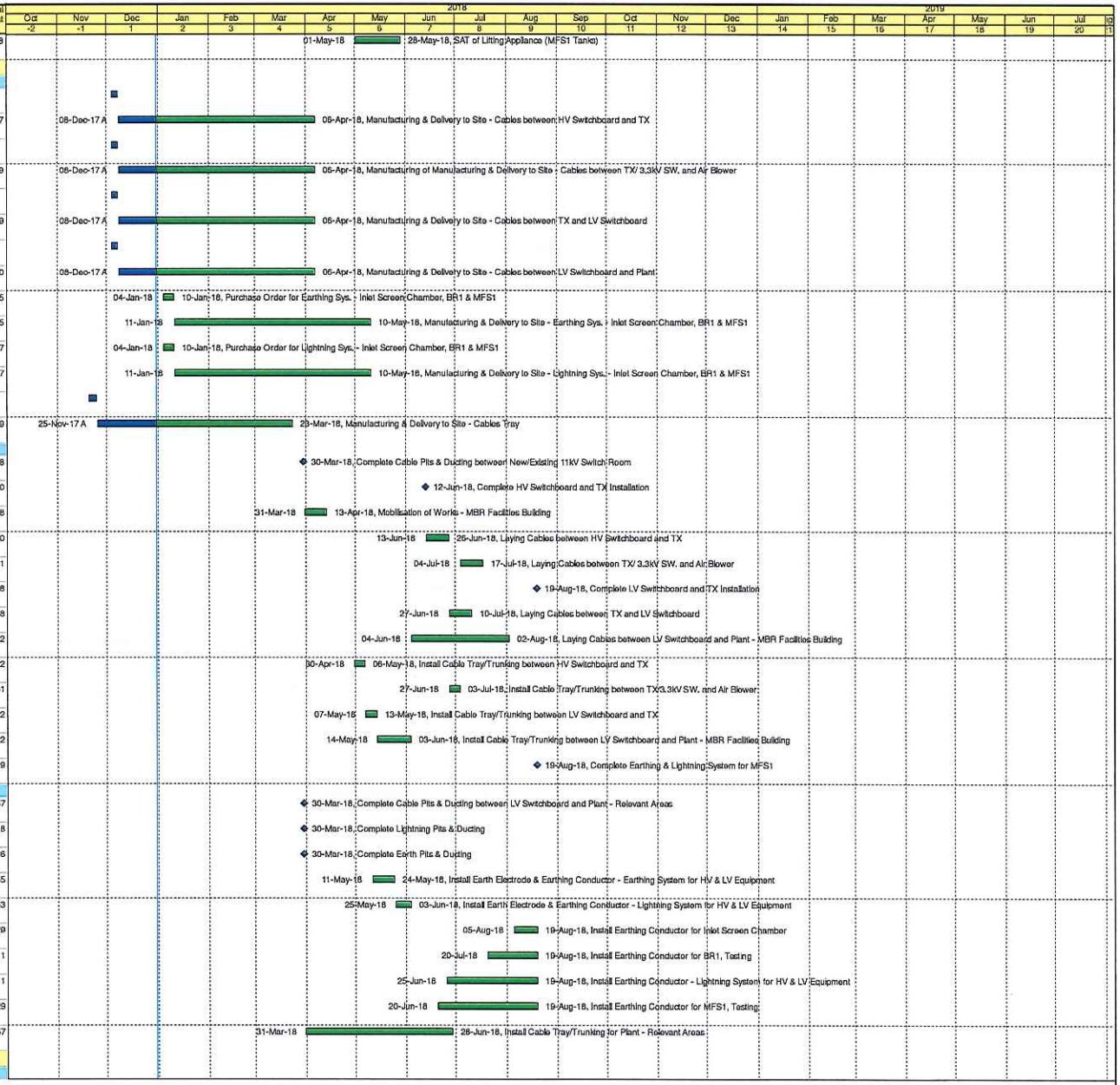
| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS408102 | SAT of Lifting Appliance (MFS1 Tanks) | 28 | 01-May-18 | 28-May-18 | 58 |
| | ***4.9 Cabling, Earthing and Lightning Protection System*** | | | | |
| | Manufacturing, FAT and Delivery | | | | |
| AS409010 | Purchase Order for Cables between HV Switchboard and TX | 0 | 04-Dec-17 A | 07-Dec-17 A | |
| AS409012 | Manufacturing & Delivery to Site - Cables between HV Switchboard and TX | 97 | 08-Dec-17 A | 06-Apr-18 | 107 |
| AS409014 | Purchase Order for Cables between TX/ 3.3kV SW. and Air Blower | 0 | 04-Dec-17 A | 07-Dec-17 A | |
| AS409016 | Manufacturing of Manufacturing & Delivery to Site - Cables between TX/ 3.3kV SW. and Air Blower | 97 | 08-Dec-17 A | 06-Apr-18 | 149 |
| AS409030 | Purchase Order for Cables between TX and LV Switchboard | 0 | 04-Dec-17 A | 07-Dec-17 A | |
| AS409032 | Manufacturing & Delivery to Site - Cables between TX and LV Switchboard | 97 | 08-Dec-17 A | 06-Apr-18 | 149 |
| AS409050 | Purchase Order for Cables between LV Switchboard and Plant | 0 | 04-Dec-17 A | 07-Dec-17 A | |
| AS409052 | Manufacturing & Delivery to Site - Cables between LV Switchboard and Plant | 97 | 08-Dec-17 A | 06-Apr-18 | 80 |
| AS409070 | Purchase Order for Earthing Sys. - Inlet Screen Chamber, BR1 & MFS1 | 7 | 04-Jan-18 | 10-Jan-18 | 55 |
| AS409072 | Manufacturing & Delivery to Site - Earthing Sys. - Inlet Screen Chamber, BR1 & MFS1 | 120 | 11-Jan-18 | 10-May-18 | 55 |
| AS409090 | Purchase Order for Lightning Sys. - Inlet Screen Chamber, BR1 & MFS1 | 7 | 04-Jan-18 | 10-Jan-18 | 77 |
| AS409092 | Manufacturing & Delivery to Site - Lightning Sys. - Inlet Screen Chamber, BR1 & MFS1 | 120 | 11-Jan-18 | 10-May-18 | 77 |
| AS409110 | Purchase Order for Cables Tray | 0 | 20-Nov-17 A | 24-Nov-17 A | |
| AS409112 | Manufacturing & Delivery to Site - Cables Tray | 83 | 25-Nov-17 A | 23-Mar-18 | 59 |
| | Install, T&C for MBR Facilities Building (incl. Provision for Health & Safety Requirements) | | | | |
| AS409001 | Complete Cable Pits & Ducting between New/Existing 11kV Switch Room | 0 | | 30-Mar-18 | 38 |
| AS409002 | Complete HV Switchboard and TX Installation | 0 | | 12-Jun-18 | 40 |
| AS409003 | Mobilisation of Works - MBR Facilities Building | 14 | 31-Mar-18 | 13-Apr-18 | 38 |
| AS409020 | Laying Cables between HV Switchboard and TX | 14 | 13-Jun-18 | 26-Jun-18 | 40 |
| AS409022 | Laying Cables between TX/ 3.3kV SW. and Air Blower | 14 | 04-Jul-18 | 17-Jul-18 | 61 |
| AS409039 | Complete LV Switchboard and TX Installation | 0 | | 19-Aug-18 | 248 |
| AS409040 | Laying Cables between TX and LV Switchboard | 14 | 27-Jun-18 | 10-Jul-18 | 68 |
| AS409060 | Laying Cables between LV Switchboard and Plant - MBR Facilities Building | 60 | 04-Jun-18 | 02-Aug-18 | 22 |
| AS409121 | Install Cable Tray/Trunking between HV Switchboard and TX | 7 | 30-Apr-18 | 06-May-18 | 22 |
| AS409122 | Install Cable Tray/Trunking between TX/3.3kV SW. and Air Blower | 7 | 27-Jun-18 | 03-Jul-18 | 61 |
| AS409123 | Install Cable Tray/Trunking between LV Switchboard and TX | 7 | 07-May-18 | 13-May-18 | 22 |
| AS409124 | Install Cable Tray/Trunking between LV Switchboard and Plant - MBR Facilities Building | 21 | 14-May-18 | 03-Jun-18 | 22 |
| AS409900 | Complete Earthing & Lightning System for MFS1 | 0 | | 19-Aug-18 | 29 |
| | Install, T&C for Plant's Vicinity Areas (incl. Provision for Health & Safety Requirements) | | | | |
| AS409006 | Complete Cable Pits & Ducting between LV Switchboard and Plant - Relevant Areas | 0 | | 30-Mar-18 | 57 |
| AS409007 | Complete Lightning Pits & Ducting | 0 | | 30-Mar-18 | 118 |
| AS409080 | Complete Earth Pits & Ducting | 0 | | 30-Mar-18 | 98 |
| AS409081 | Install Earth Electrode & Earthing Conductor - Earthing System for HV & LV Equipment | 14 | 11-May-18 | 24-May-18 | 55 |
| AS409082 | Install Earth Electrode & Earthing Conductor - Lightning System for HV & LV Equipment | 10 | 25-May-18 | 03-Jun-18 | 63 |
| AS409083 | Install Earthing Conductor for Inlet Screen Chamber | 14 | 05-Aug-18 | 19-Aug-18 | 29 |
| AS409084 | Install Earthing Conductor for BR1, Testing | 30 | 20-Jul-18 | 19-Aug-18 | 1 |
| AS409085 | Install Earthing Conductor - Lightning System for HV & LV Equipment | 55 | 25-Jun-18 | 19-Aug-18 | 1 |
| AS409086 | Install Earthing Conductor for MFS1, Testing | 60 | 20-Jun-18 | 19-Aug-18 | 29 |
| AS409125 | Install Cable Tray/Trunking for Plant - Relevant Areas | 90 | 31-Mar-18 | 28-Jun-18 | 57 |
| | ***4.10 Deodorising System*** | | | | |
| | Manufacturing, FAT and Delivery | | | | |

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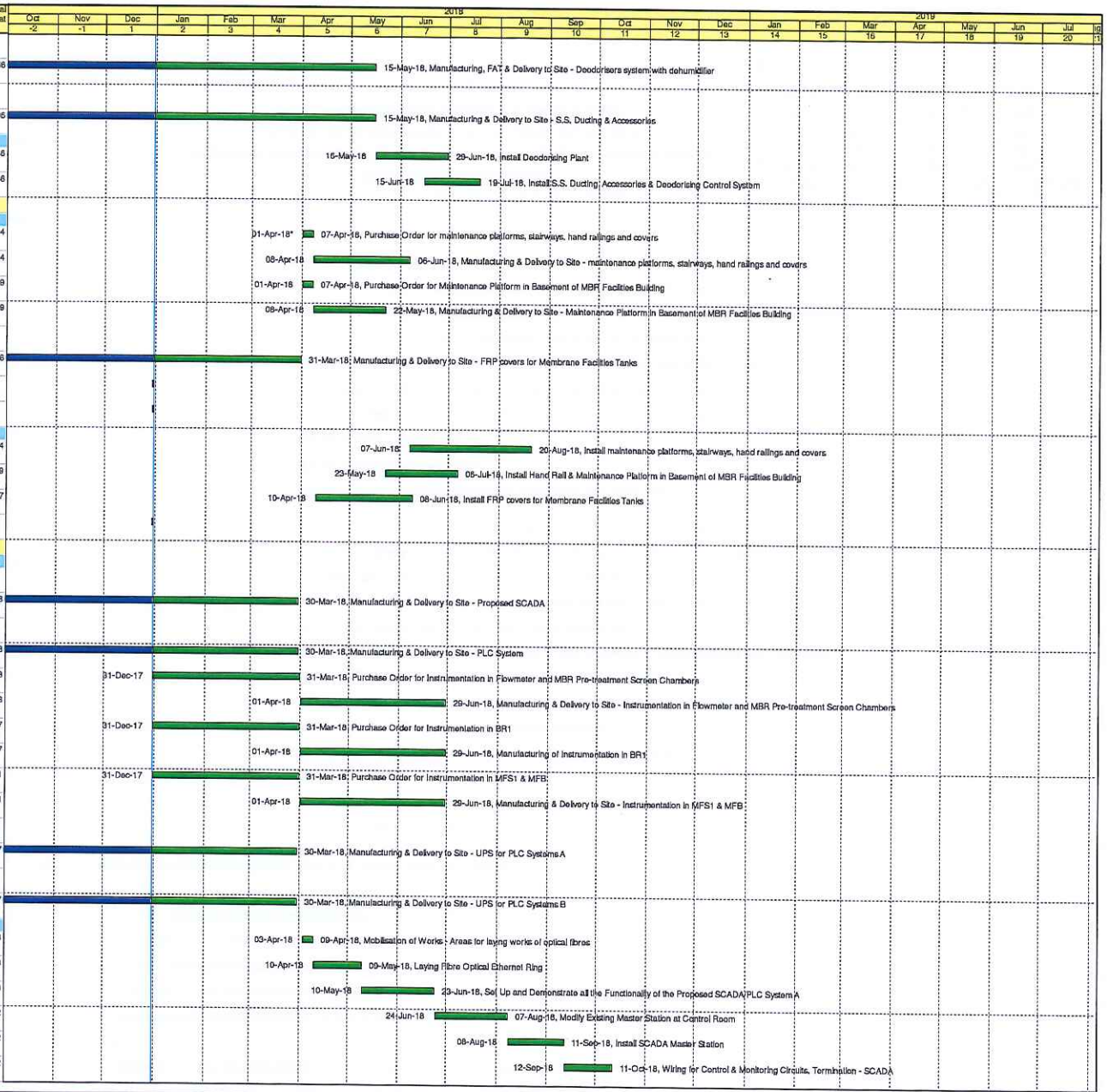
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
| | | | |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS410010 | Purchase Order for Deodorisers system with dehumidifier | 0 | 10-Jul-17 A | 26-Jul-17 A | |
| AS410012 | Manufacturing, FAT & Delivery to Site - Deodorisers system with dehumidifier | 136 | 27-Jul-17 A | 15-May-18 | 66 |
| AS410030 | Purchase Order for S.S. Ducting & Accessories | 0 | 24-Jul-17 A | 26-Jul-17 A | |
| AS410032 | Manufacturing & Delivery to Site - S.S. Ducting & Accessories | 136 | 27-Jul-17 A | 15-May-18 | 95 |
| Install, T&C for MBR Facilities Building (incl. Provision for Health & Safety Requirements) | | | | | |
| AS410020 | Install Deodorising Plant | 45 | 16-May-18 | 29-Jun-18 | 66 |
| AS410040 | Install S.S. Ducting, Accessories & Deodorising Control System | 35 | 15-Jun-18 | 19-Jul-18 | 66 |
| **4.11 Maintenance Platform & Covers** | | | | | |
| Manufacturing, FAT and Delivery | | | | | |
| AS411010 | Purchase Order for maintenance platforms, stairways, hand railings and covers | 7 | 01-Apr-18* | 07-Apr-18 | 4 |
| AS411012 | Manufacturing & Delivery to Site - maintenance platforms, stairways, hand railings and covers | 60 | 08-Apr-18 | 06-Jun-18 | 4 |
| AS411030 | Purchase Order for Maintenance Platform in Basement of MBR Facilities Building | 7 | 01-Apr-18 | 07-Apr-18 | 19 |
| AS411032 | Manufacturing & Delivery to Site - Maintenance Platform in Basement of MBR Facilities Building | 45 | 08-Apr-18 | 22-May-18 | 19 |
| AS411050 | Purchase Order for FRP covers for Membrane Facilities Tanks | 0 | 02-May-17 A | 08-May-17 A | |
| AS411052 | Manufacturing & Delivery to Site - FRP covers for Membrane Facilities Tanks | 91 | 09-May-17 A | 31-Mar-18 | 26 |
| AS411070 | Purchase Order for Steel Cover for Air Blower Opening on 1/F of MBR Bldg. (Not required) | 0 | 30-Dec-17 A | 30-Dec-17 A | |
| AS411072 | Manufacturing & Delivery to Site - Steel Cover for Air Blower Opening on 1/F of MBR Bldg. (Not required) | 0 | 30-Dec-17 A | 30-Dec-17 A | |
| Install, T&C for Maintenance Platform & Covers (incl. Provision for Health & Safety Requirements) | | | | | |
| AS411020 | Install maintenance platforms, stairways, hand railings and covers | 75 | 07-Jun-18 | 20-Aug-18 | 4 |
| AS411040 | Install Hand Rail & Maintenance Platform in Basement of MBR Facilities Building | 45 | 23-May-18 | 06-Jul-18 | 19 |
| AS411060 | Install FRP covers for Membrane Facilities Tanks | 60 | 10-Apr-18 | 08-Jun-18 | 17 |
| AS411080 | Install Steel Cover for Air Blower Opening on 1/F of MBR Bldg. (Not required) | 0 | 30-Dec-17 A | 30-Dec-17 A | |
| **4.12 SCADA** | | | | | |
| Manufacturing, FAT and Delivery | | | | | |
| AS412010 | Purchase Order for Proposed SCADA | 0 | 03-Jul-17 A | 18-Jul-17 A | |
| AS412012 | Manufacturing & Delivery to Site - Proposed SCADA | 90 | 19-Jul-17 A | 30-Mar-18 | 48 |
| AS412030 | Purchase Order for PLC System | 0 | 10-Jul-17 A | 18-Jul-17 A | |
| AS412032 | Manufacturing & Delivery to Site - PLC System | 90 | 19-Jul-17 A | 30-Mar-18 | 48 |
| AS412050 | Purchase Order for Instrumentation in Flowmeter and MBR Pre-treatment Screen Chambers | 91 | 31-Dec-17 | 31-Mar-18 | 23 |
| AS412052 | Manufacturing & Delivery to Site - Instrumentation in Flowmeter and MBR Pre-treatment Screen Chambers | 90 | 01-Apr-18 | 29-Jun-18 | 23 |
| AS412070 | Purchase Order for Instrumentation in BR1 | 91 | 31-Dec-17 | 31-Mar-18 | 37 |
| AS412072 | Manufacturing of Instrumentation in BR1 | 90 | 01-Apr-18 | 29-Jun-18 | 37 |
| AS412090 | Purchase Order for Instrumentation in MFS1 & MFB | 91 | 31-Dec-17 | 31-Mar-18 | 51 |
| AS412092 | Manufacturing & Delivery to Site - Instrumentation in MFS1 & MFB | 90 | 01-Apr-18 | 29-Jun-18 | 51 |
| AS412110 | Purchase Order UPS for PLC Systems A | 0 | 03-Jul-17 A | 18-Jul-17 A | |
| AS412112 | Manufacturing & Delivery to Site - UPS for PLC Systems A | 90 | 19-Jul-17 A | 30-Mar-18 | 177 |
| AS412130 | Purchase Order UPS for PLC Systems B | 0 | 03-Jul-17 A | 18-Jul-17 A | |
| AS412132 | Manufacturing & Delivery to Site - UPS for PLC Systems B | 90 | 19-Jul-17 A | 30-Mar-18 | 177 |
| Install, T&C for SCADA (incl. Provision for Health & Safety Requirements) | | | | | |
| AS412001 | Mobilisation of Works - Areas for laying works of optical fibres | 7 | 03-Apr-18 | 09-Apr-18 | 8 |
| AS412020 | Laying Fibre Optical Ethernet Ring | 30 | 10-Apr-18 | 09-May-18 | 8 |
| AS412021 | Set Up and Demonstrate all the Functionality of the Proposed SCADA/PLC System A | 45 | 10-May-18 | 23-Jun-18 | 8 |
| AS412022 | Modify Existing Master Station at Control Room | 45 | 24-Jun-18 | 07-Aug-18 | 12 |
| AS412023 | Install SCADA Master Station | 35 | 08-Aug-18 | 11-Sep-18 | 12 |
| AS412024 | Wiring for Control & Monitoring Circuits, Termination - SCADA | 30 | 12-Sep-18 | 11-Oct-18 | 12 |

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TASK filter: All Activities



Remaining Work
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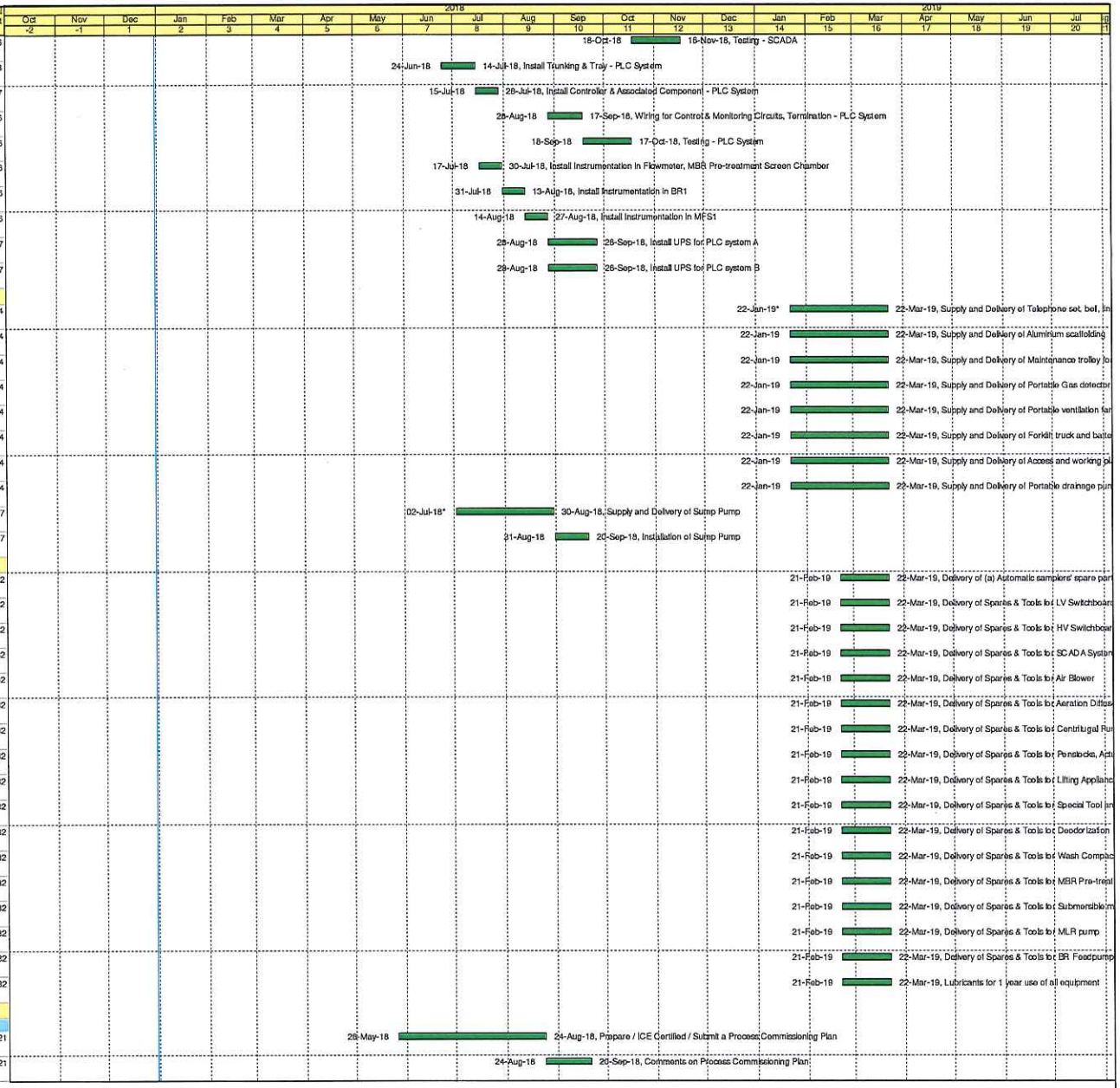
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |
| | | | |
| | | | |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS412025 | Testing - SCADA | 30 | 18-Oct-18 | 16-Nov-18 | 6 |
| AS412040 | Install Trunking & Tray - PLC System | 21 | 24-Jun-18 | 14-Jul-18 | 8 |
| AS412042 | Install Controller & Associated Component - PLC System | 14 | 15-Jul-18 | 28-Jul-18 | 57 |
| AS412044 | Wiring for Control & Monitoring Circuits, Termination - PLC System | 21 | 28-Aug-18 | 17-Sep-18 | 6 |
| AS412046 | Testing - PLC System | 30 | 18-Sep-18 | 17-Oct-18 | 6 |
| AS412060 | Install Instrumentation in Flowmeter, MBR Pre-treatment Screen Chamber | 14 | 17-Jul-18 | 30-Jul-18 | 6 |
| AS412080 | Install Instrumentation in BR1 | 14 | 31-Jul-18 | 13-Aug-18 | 6 |
| AS412100 | Install Instrumentation in MFS1 | 14 | 14-Aug-18 | 27-Aug-18 | 6 |
| AS412120 | Install UPS for PLC system A | 30 | 28-Aug-18 | 26-Sep-18 | 27 |
| AS412140 | Install UPS for PLC system B | 30 | 28-Aug-18 | 26-Sep-18 | 27 |
| ***4.13 Supply & Delivery of Miscellaneous Equipment*** | | | | | |
| AS413010 | Supply and Delivery of Telephone set, bell, line and accessories | 60 | 22-Jan-19* | 22-Mar-19 | 14 |
| AS413020 | Supply and Delivery of Aluminum scaffolding | 60 | 22-Jan-19 | 22-Mar-19 | 14 |
| AS413030 | Supply and Delivery of Maintenance trolley for Air Circuit Breaker | 60 | 22-Jan-19 | 22-Mar-19 | 14 |
| AS413040 | Supply and Delivery of Portable Gas detector | 60 | 22-Jan-19 | 22-Mar-19 | 14 |
| AS413050 | Supply and Delivery of Portable ventilation fan | 60 | 22-Jan-19 | 22-Mar-19 | 14 |
| AS413060 | Supply and Delivery of Forklift truck and battery charger | 60 | 22-Jan-19 | 22-Mar-19 | 14 |
| AS413070 | Supply and Delivery of Access and working platforms | 60 | 22-Jan-19 | 22-Mar-19 | 14 |
| AS413080 | Supply and Delivery of Portable drainage pump | 60 | 22-Jan-19 | 22-Mar-19 | 14 |
| AS413090 | Supply and Delivery of Sump Pump | 60 | 02-Jul-18* | 30-Aug-18 | 197 |
| AS413100 | Installation of Sump Pump | 21 | 31-Aug-18 | 20-Sep-18 | 197 |
| ***4.14 Supply & Delivery of Spares & Tools*** | | | | | |
| AS414010 | Delivery of (a) Automatic samplers' spare parts & (b) Sight glasses for MFS | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414020 | Delivery of Spares & Tools for LV Switchboard, Control Panels and SCADA System | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414030 | Delivery of Spares & Tools for HV Switchboard (including capacitor correction units) | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414040 | Delivery of Spares & Tools for SCADA System, PLC system and Instrumentation | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414050 | Delivery of Spares & Tools for Air Blower | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414060 | Delivery of Spares & Tools for Aeration Diffusor | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414070 | Delivery of Spares & Tools for Centrifugal Pump | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414080 | Delivery of Spares & Tools for Penstocks, Actuator and Valve | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414090 | Delivery of Spares & Tools for Lifting Appliances | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414100 | Delivery of Spares & Tools for Special Tool and measuring equipment | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414110 | Delivery of Spares & Tools for Deodorization Unit | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414120 | Delivery of Spares & Tools for Wash Compactor | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414130 | Delivery of Spares & Tools for MBR Pre-treatment Screens | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414140 | Delivery of Spares & Tools for Submersible mixer | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414150 | Delivery of Spares & Tools for MLR pump | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414160 | Delivery of Spares & Tools for BR Feedpump | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| AS414170 | Lubricants for 1 year use of all equipment | 30 | 21-Feb-19 | 22-Mar-19 | 32 |
| ***Process Commissioning*** | | | | | |
| Commissioning Plan & Procedure | | | | | |
| AS112010 | Prepare / ICE Certified / Submit a Process Commissioning Plan | 90 | 26-May-18 | 24-Aug-18 | 21 |
| AS112012 | Comments on Process Commissioning Plan | 28 | 24-Aug-18 | 20-Sep-18 | 21 |

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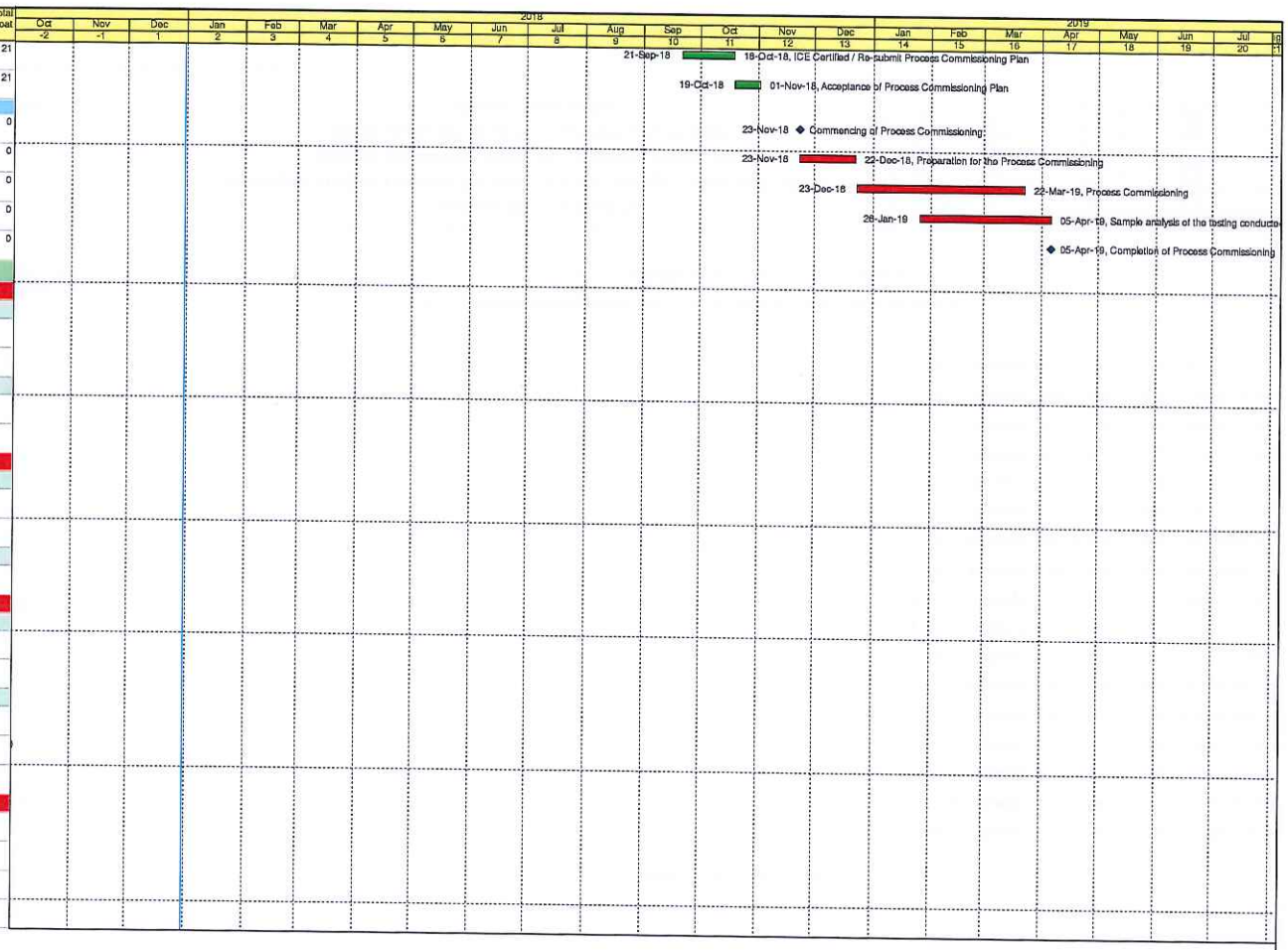
| | | | |
| | | | |

| Activity ID | Activity Name | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|
| AS112014 | ICE Certified / Re-submit Process Commissioning Plan | 28 | 21-Sep-18 | 18-Oct-18 | 21 |
| AS112016 | Acceptance of Process Commissioning Plan | 14 | 19-Oct-18 | 01-Nov-18 | 21 |
| **Commissioning Process Period** | | | | | |
| AS112020 | Commencing of Process Commissioning | 0 | 23-Nov-18 | | 0 |
| AS112022 | Preparation for the Process Commissioning | 30 | 23-Nov-18 | 22-Dec-18 | 0 |
| AS112024 | Process Commissioning | 90 | 23-Dec-18 | 22-Mar-19 | 0 |
| AS112030 | Sample analysis of the testing conducted for process commissioning by an Independent Lab. (HOKLAS) | 70 | 26-Jan-19 | 05-Apr-19 | 0 |
| AS112040 | Completion of Process Commissioning | 0 | | 05-Apr-19 | 0 |
| **Section IV of Works** | | | | | |
| **Valve with Electric Actuators** | | | | | |
| **Manufacturing, FAT and Delivery** | | | | | |
| AS501100 | Procument of Valves with electric actuators | 0 | 13-Feb-16 A | 28-Apr-16 A | |
| AS501120 | Manufacturing & Delivery / FAT of Valve with electric actuators | 0 | 29-Mar-16 A | 09-Sep-16 A | |
| **Install, T&C for Valve with Electric Actuators (Incl. Provision for Health & Safety Requirements)** | | | | | |
| AS502100 | Mobilisation and Enabling Works for NCSRSPS | 0 | 31-Aug-16 A | 09-Sep-16 A | |
| AS502120 | Install Valves with Electric Actuators | 0 | 10-Sep-16 A | 23-Sep-16 A | |
| **Modification of Control System** | | | | | |
| **Manufacturing, FAT and Delivery** | | | | | |
| AS503100 | Procument of Control System | 0 | 19-Mar-16 A | 01-Jun-16 A | |
| AS503120 | Manufacturing, FAT & Delivery of Control System | 0 | 02-Jun-16 A | 22-Sep-16 A | |
| **Install, T&C for Control System (Incl. Provision for Health & Safety Requirements)** | | | | | |
| AS504100 | Modification of Existing Pump Control System | 0 | 17-Mar-17 A | 11-May-17 A | |
| **Associated Pipework and Fittings** | | | | | |
| **Manufacturing, FAT and Delivery** | | | | | |
| AS505100 | Procument of Associated Pipework and Fittings | 0 | 26-Feb-16 A | 01-Jun-16 A | |
| AS505120 | Manufacturing, FAT & Delivery of Associated Pipework and Fittings | 0 | 29-Mar-16 A | 09-Sep-16 A | |
| **Install, T&C for Associated Pipework & Fittings (Incl. Provision for Health & Safety Requirements)** | | | | | |
| AS506100 | Install Associated Pipework and Fittings | 0 | 10-Sep-16 A | 23-Sep-16 A | |
| AS506200a | Available of New Rising Main to Hung Leng SPS (By Others) | 0 | | 11-Apr-17 A | |
| AS506220a | Pipe connection to New Rising Main to Hung Leng SPS | 0 | 01-Mar-17 A | 27-Mar-17 A | |
| **Commissioning of the Pumping System** | | | | | |
| AS513100 | Site Tests / Functional Test for level control and sensing equipment | 0 | 12-Apr-17 A | 11-May-17 A | |
| AS513110a | Further Coordination with DSD for Carrying Out Commissioning Test | 0 | 12-May-17 A | 05-Jun-17 A | |
| AS513120 | Commission of the Pumping System | 0 | 06-Jun-17 A | 09-Jun-17 A | |
| AS513120a | Upload PLC Programme for Modified Pump Control System | 0 | 28-Jul-17 A | 28-Jul-17 A | |






Remaining Work
Critical Activity
Milestone
Actual Progress

**Contract No. DE/2014/01**
**Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station**
**Master Programme**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 08-Jan-16 | Rev. 0 | KH Lau | KM |
| 22-Jun-17 | Rev. D | KH Lau | KM |
| 12-Jul-17 | Rev. E | KH Lau | KM |
| 17-Oct-17 | Rev. F | KH Lau | KM |
| 27-Mar-18 | Rev. G | KH Lau | KM |