

Your Ref:  
Our Ref: 60479142/C/fyw1909131

**By Hand & By Email**

Chief Engineer/Project Management  
Water Supplies Department  
46/F., Immigration Tower  
7 Gloucester Road, Wanchai

Attn: Mr. H C Wong, Heinz

13 September 2019

Dear Sir,

**Contract No.3/WSD/15q**  
**In-situ reprovisioning of Sha Tin Water Treatment Works (South Works) Advance Works**  
**Submission of 42<sup>nd</sup> Monthly EM&A Report for August 2019**

Reference is made to Environmental Team (ET)'s 42<sup>nd</sup> Monthly EM&A Report for August 2019 (Rev. 0) submitted on 13 September 2019.

In accordance with the Condition 3.4 of the Environmental Permit (No.EP-494/2015), I verified and confirmed the submission of this Monthly EM&A Monitoring Report as compiled with the requirements as set in the approved Environmental Monitoring and Audit (EM&A) Manual of the EIA Report (Register No.: AEIAR-187/2015).

Should you have any queries, please feel free to contact the undersigned at 3922 9366.

Yours faithfully,  
AECOM Asia Co. Ltd.



Y W Fung  
Independent Environmental Checker

c.c. Environmental Team Leader

Your ref:

Our ref: CJO-3113

**By hand**

Chief Engineer /Project Management

Water Supplies Department

46/F., Immigration Tower

7 Gloucester Road, Wanchai

(Attn: Mr. H C Wong, Heinz)

13 Sep, 2019

Dear Sir,

**In-Situ Re provisioning of Sha Tin Water Treatment Works – South Works**

**Environmental Permit EP-494/2015**

**Submission of 42<sup>nd</sup> monthly EM&A Report**

In accordance with the Condition 3.4 of the Environmental Permit (No. EP-494/2015), we submit herewith 5 hard copies and 2 electronic copies of the 42<sup>nd</sup> monthly Environmental Monitoring and Audit (EM&A) Report (Rev.0) for your processing. I certified and confirmed the submission of this monthly EM&A Report had complied with the requirements as set out in the approved Environmental Monitoring and Audit (EM&A) Manual of the EIA Report (Register No.: AEIAR-187/2015).

Yours faithfully,



**Ir Leung, Jacky, C. H.**

Environmental Team Leader

c.c. Independent Environmental Checker



Water Supplies Department



**MONTHLY ENVIRONMENTAL MONITORING AND AUDIT  
(EM&A) REPORT (NO. 42)**





**FOR**

**CONTRACT NO. 3/WSD/15  
IN-SITU REPROVISIONING OF SHA TIN  
WATER TREATMENT WORKS – SOUTH WORKS**

**(Rev. 0)**

**MONTHLY ENVIRONMENTAL  
MONITORING AND AUDIT  
(EM&A) REPORT (NO. 42) –**

**FOR  
CONTRACT NO. 3/WSD/15  
IN-SITU REPROVISIONING OF SHA TIN WATER  
TREATMENT WORKS – SOUTH WORKS**

|                         | Name   | Signature   |
|-------------------------|--|---|
| Prepared by             | Ms, Fung Jessica   |  |
| Reviewed by             | Mr. Wong, Vega, T. L.                                      |  |
| Approved & Certified by | Ir Leung, Jacky, C. H.<br>Environmental Team Leader (ETL)  |  |
| Verified & Confirmed by | Mr. Fung, Y. W.<br>Independent Environmental Checker (IEC) |  |

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## EXECUTIVE SUMMARY

- A.1 Pursuant to the Environmental Impact Assessment (EIA) Ordinance, the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP- 494/2015) to the Water Supplies Department (WSD) to construct and operate the designated project for “In-situ Re-provisioning of Sha Tin Water Treatment Works - South Works” (“The Project”).
- A.2 Under Contract No. 3/WSD/15, Ming Hing - Ming Hing Civil - Vasteam Joint Venture (MMVJV) is commissioned by WSD to undertake the construction of the advance works while AECOM Asia Company Limited was appointed by WSD as the Engineer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, Acumen Environmental Engineering & Technologies Company Limited was appointed by MMVJV as the Environmental Team (ET). AECOM Asia Company Limited was also employed by the WSD as the Independent Environmental Checker (IEC).
- A.3 The construction phase of the Contract commenced on 30 October 2015 for completion by 2018. The impact monitoring of the EM&A programme, including air quality, noise, water quality monitoring as well as environmental site inspections, commenced on 17 February 2016.
- A.4 This is the 42<sup>nd</sup> monthly Environmental Monitoring and Audit Report for this Contract covering the period from 1 August 2019 to 31 August 2019 (the Reporting Period). As informed by the Contractor, major activities in the reporting period included:
- Construction of Logistics Centre at Wall C.
  - Construction lagging wall and bore piles at Wall D and C
  - External finish work at North Work Temporary House
  - Modification of clarifier no.1
  - Modification of valve chamber and construction of flow meter house
  - Construction of CLP steel cable support between CLP substation and North Work Washwater Pump House
- A.5 Environmental monitoring activities under the EM&A program in this reporting period are summarized below

| Issues             | Environmental Monitoring Parameters / Inspection | Occasions |
|--------------------|--|-----------|
| Air                | 1-Hour TSP                                       | 21        |
| Noise              | $L_{eq(30mins)}$ Daytime                         | 7         |
| Water Quality      | Water Sampling                                   | 14        |
| Inspection / Audit | ET Regular Environmental Site Inspection         | 5         |
|                    | IEC Monthly Environmental Site Audit             | 1         |

- A.6 No exceedance of air quality, noise and water quality monitoring were recorded in this reporting period.
- A.7 No environmental complaint were received via EPD in this reporting period.
- A.8 No notification of any summons and successful prosecutions was received in this reporting period.
- A.9 No reporting change was made in this reporting period.
- A.10 There was no EPD site inspection conducted in the reporting period.
- A.11 As informed by the Contractor, the major works for this Project in August 2019 will be:
- Construction of Logistics Centre at Wall C.
  - Construction lagging wall and bore piles at Wall D and C
  - External finish work at North Work Temporary House
  - Modification of clarifier no.1



- Modification of valve chamber and construction of flow meter house
- Construction of CLP steel cable support between CLP substation and North Work Washwater Pump House

A.12 EM&A monitoring for the 42<sup>nd</sup> reporting period has been completed. The 43<sup>rd</sup> monthly EM&A report will cover the period from 1 September 2019 to 30 September 2019.





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## 1. INTRODUCTION

### 1.1. PROJECT BACKGROUND

- 1.1.1 Pursuant to the Environmental Impact Assessment (EIA) Ordinance, the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP- 494/2015) on 28 January 2015, subsequent to approval of the EIA Report (Register No. AEIAR-187/2015), to the Water Supplies Department (WSD) to construct and operate the designated project for “In-situ Reprovisioning of Sha Tin Water Treatment Works - South Works” (“The Project”).
- 1.1.2 Under Contract No. 3/WSD/15, Ming Hing - Ming Hing Civil - Vasteam Joint Venture (MMVJV) is commissioned by WSD to undertake the construction of the advance works while AECOM Asia Company Limited was appointed by WSD as the Engineer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, Acumen Environmental Engineering & Technologies Company Limited was appointed by MMVJV as the Environmental Team (ET). AECOM Asia Company Limited was also employed by the WSD as the Independent Environmental Checker (IEC).
- 1.1.3 The construction phase of the Contract commenced on 30 October 2015 for completion by 28 October 2019. The general layout plan of the Contract components is presented in **Appendix A**.
- 1.1.4 ET conducted below baseline monitoring at designated locations according to the EM&A Manual.  
- Air quality and noise: from 21 December 2015 to 3 January 2016.  
- Water quality: from 15 December 2015 to 8 January 2016.
- 1.1.5 Baseline Monitoring Report was issued by the ET and verified by the IEC on 27 January 2016 and submitted to the EPD on 2 February 2016.
- 1.1.6 The impact monitoring of the EM&A programme, including air quality, noise, water quality monitoring as well as environmental site inspections, commenced on 17 February 2016.



## 1.2. ORGANIZATION STRUCTURE

1.2.1 The organization structure of the Contract is shown in **Appendix B**. Contact details of key personnel are summarized in below table:

Table 1-1: Key Personnel Contact for Environmental Works

| Party   | Position                                 | Name                       | Telephone |
|---|--|----------------------------|-----------|
| Water Supplies Department                           | Engineer / Project Management            | Mr. Chiu, Aletta C. M.     | 2829 5653 |
| AECOM   | Senior Resident Engineer (Civil)         | Mr. Ng, Derek, K. H.       | 9717 1420 |
|   | Independent Environmental Checker        | Mr. Fung, Y. W.            | 3922 9366 |
|   | Deputy Independent Environmental Checker | Ms. Lam, Lemon, M. C.      | 3922 9381 |
| Ming Hing - Ming Hing Civil - Vasteam Joint Venture | Project Manager                          | Mr. Lam, Larry, M. W.      | 6478 0501 |
|   | Site Agent                               | Mr. To, Eros, W. H.        | 9223 9590 |
| Acumen Env. Eng. & Tech. Co. Ltd.                   | Project Director                         | Ir Dr. Lam, Gabriel, C. K. | 2333 6823 |
|   | Environmental Team Leader                | Ir Leung, Jacky, C. H.     | 9060 2368 |
|   | Ecologist                                | Mr. Liu, Vincent, W. L.    | 6505 5827 |

## 1.3. SCOPE OF REPORT

1.3.1 This is the 42<sup>nd</sup> monthly EM&A Report under the Contract No. 3/WSD/15 In-situ Re-provisioning of Sha Tin Water Treatment Works (South Works) – Advance Works covering the period from 1 August 2019 to 31 August 2019 (the reporting period).

1.3.2 The EM&A requirements for impact monitoring are set out in the approved EM&A Manual. Environmental aspects such as the construction air quality, noise, water quality and ecology were identified as the key issues during the construction phase of the Project.

## 1.4. SUMMARY OF CONSTRUCTION WORKS

1.4.1 The construction phase of the Contract commenced on 30 October 2015. Latest construction programmes is shown in **Appendix C**.

1.4.2 As informed by the Contractor, details of the major works carried out in this reporting month are listed below:

- Construction of Logistics Centre at Wall C.
- Construction lagging wall and bore piles at Wall D and C
- External finish work at North Work Temporary House
- Modification of clarifier no.1
- Modification of valve chamber and construction of flow meter house
- Construction of CLP steel cable support between CLP substation and North Work Washwater Pump House

1.4.3 The locations of the construction activities are shown in **Appendix D**. The Environmental Sensitive Receivers in the vicinity of the Project are shown in **Appendix E**.



## 2. EM&A RESULTS

### 2.1. EM&A BACKGROUND

2.1.1 The EM&A programme required environmental monitoring for air quality, noise, water quality and ecology as well as environmental site inspections for air quality, noise, water quality, waste management and ecology impacts. The EM&A requirements and related findings for each component are summarized in the following sections. A summary of impact monitoring programme is presented in Table 2-1.

Table 2-1: Summary of Impact Monitoring Programme

| Impact Monitoring | Sampling Parameter  | Frequency   |
|-------------------|---|---|
| Air Quality       | 1-hour TSP  | 3 times in every 6 days when documented and valid complaint was received            |
| Noise             | $L_{eq}$ 30 min, $L_{eq}$ 5 min,<br>$L_{10}$ and $L_{90}$ as reference.   | 1 time per week:<br>◆ $L_{eq}$ 30 min for normal weekdays from 0700 - 1900;         |
| Water Quality     | Duplicate in-situ measurements: Dissolved Oxygen (DO), Turbidity and pH;<br>HOKLAS-accredited laboratory analysis: Suspended Solids (SS). | 3 days per week. The interval between 2 monitoring days will be more than 36 hours. |
| Ecology           | -   | A detailed at least 6 years post-planting monitoring and maintenance programme      |

**Remark: Sampling Depth for Water Quality:**

- (i) 3 depths: 1m below water surface, 1m above bottom and at mid-depth when the water depth exceeds 6m.
- (ii) If the water depth is between 3m and 6m, 2 depths: 1m below water surface and 1m above bottom.
- (iii) If the water depth is less than 3m, 1 sample at mid-depth is taken

2.1.2 A summary of the monitoring parameters is presented in Table 2-2.

Table 2-2: Summary of the monitoring parameters of EM&A Requirements

| Environmental Issue | Parameter   |
|---------------------|---|
| Air Quality         | ● 1-hour TSP Monitoring by Real-Time Portable Dust Meter  |
| Noise               | ● $L_{eq}$ (30min) during normal working hours  |
| Water Quality       | In-situ measurement <ul style="list-style-type: none"> <li>● Dissolved Oxygen (mg/L);</li> <li>● Dissolved Oxygen Saturation (%);</li> <li>● Turbidity (NTU);</li> <li>● pH value;</li> <li>● Water depth (m); and</li> <li>● Temperature (°C)</li> </ul> |
|                     | Laboratory analysis <ul style="list-style-type: none"> <li>● Suspended Solids (mg/L)</li> </ul>   |



- 2.1.3 Summary of determination of Action/Limit (A/L) Levels for air quality, noise and water quality are presented in **Appendix F**.
- 2.1.4 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan enclosed in **Appendix G**.
- 2.1.5 The impact monitoring schedules are presented in **Appendix H** and the monitoring results are detailed in the following sub-sections.

## 2.2. AIR QUALITY MONITORING

- 2.2.1 Impact monitoring for air quality had been carried out in accordance with Sections 2.29 of the approved EM&A Manual to determine the ambient 1-hour total suspended particulates (TSP) levels at the monitoring locations. 1-hour TSP sampling should be undertaken at least 3 times in every six-days at each monitoring station when the highest dust impacts are expected. General meteorological conditions (wind speed, direction and precipitation) and notes regarding any significant adjacent dust producing sources had also been recorded throughout the impact monitoring period.
- 2.2.2 Two (2) designated monitoring stations, AM1 located at the L Louey and AM2 located at Hin Keng Estate - Hin Wan House, were recommended in Section 2.18 of the approved EM&A Manual. In order to identify and seek for the access of the air monitoring locations designated in the EM&A Manual, site visit was conducted among ET, IEC and EPD.
- 2.2.3 During the site visit, all designated air monitoring locations were identified. Details of air monitoring stations are described in Table 2-3. The location plan of air quality monitoring stations is shown in **Appendix I**.

Table 2-3: Location of the Air Quality Monitoring Stations

| Air Quality Monitoring Station | Air Sensitive Receiver (ASR) ID in the approved EIA Report | Dust Monitoring Station   |
|--------------------------------|--|---|
| AM1                            | ASR2   | The L Louey (at a platform level of about 5m above road level nearby) |
| AM2                            | ASR4   | Hin Keng Estate - Hin Wan House (at the roof top)                     |

- 2.2.4 The monitoring equipment using for the air quality impact monitoring was proposed by ET and verified by IEC. 1-hour TSP levels had been measured with direct reading dust meter. It has been demonstrated its capability in achieving comparable results with high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50). The details of equipment using for impact monitoring are listed in Table 2-4 as below.

Table 2-4: Air Quality Impact Monitoring Equipment

| Equipment                        | Model                            |
|----------------------------------|----------------------------------|
| Portable dust meter – 1-hour TSP | TSI Model 8532                   |
| Portable Wind Speed Indicator    | The Kestrel Pocket Weather Meter |

- 2.2.5 The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90° light scattering. The 1-hour TSP monitor consists of the following:
- A pump to draw sample aerosol through the optic chamber where TSP is measured;
  - A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and



- A built-in data logger compatible with based program to facilitate data collection, analysis and reporting.

2.2.6 The 1-hour TSP meter was 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 followed manufacturer’s Operation and Service Manual. A valid calibration certificate is attached in **Appendix J**.

2.2.7 In this Reporting Period, a total of seven (7) sampling days perform air quality monitoring at the two designated locations. The results for 1-hour TSP are summarized in Table 2-5 and Table 2-6.

Table 2-5: Summary of 1-hour TSP Monitoring Results – AM1

| Date           | Weather | 1-hour TSP ( $\mu\text{g}/\text{m}^3$ ) |          |                             |                             |                             |
|----------------|---------|---|----------|-----------------------------|-----------------------------|-----------------------------|
|                |         | Start Time                              | End Time | 1 <sup>st</sup> Measurement | 2 <sup>nd</sup> Measurement | 3 <sup>rd</sup> Measurement |
| 1/8/2019       | Cloudy  | 09:05                                   | 12:05    | 114                         | 104                         | 101                         |
| 7/8/2019       | Sunny   | 13:13                                   | 16:13    | 110                         | 112                         | 108                         |
| 12/8/2019      | Fine    | 14:01                                   | 17:01    | 103                         | 107                         | 115                         |
| 16/8/2019      | Cloudy  | 13:01                                   | 16:01    | 100                         | 108                         | 120                         |
| 21/8/2019      | Sunny   | 09:11                                   | 12:11    | 110                         | 105                         | 109                         |
| 26/8/2019      | Cloudy  | 13:41                                   | 16:41    | 112                         | 107                         | 102                         |
| 30/8/2019      | Cloudy  | 13:22                                   | 16:22    | 103                         | 108                         | 106                         |
| <b>Average</b> |         |   |          | 108                         |                             |                             |
| <b>Range</b>   |         |   |          | 100 – 120                   |                             |                             |

Table 2-6: Summary of 1-hour TSP Monitoring Results – AM2

| Date           | Weather | 1-hour TSP ( $\mu\text{g}/\text{m}^3$ ) |          |                             |                             |                             |
|----------------|---------|---|----------|-----------------------------|-----------------------------|-----------------------------|
|                |         | Start Time                              | End Time | 1 <sup>st</sup> Measurement | 2 <sup>nd</sup> Measurement | 3 <sup>rd</sup> Measurement |
| 1/8/2019       | Cloudy  | 09:30                                   | 12:30    | 121                         | 125                         | 113                         |
| 7/8/2019       | Sunny   | 13:35                                   | 16:35    | 110                         | 106                         | 103                         |
| 12/8/2019      | Fine    | 14:25                                   | 17:25    | 112                         | 108                         | 109                         |
| 16/8/2019      | Cloudy  | 13:20                                   | 16:20    | 123                         | 128                         | 110                         |
| 21/8/2019      | Sunny   | 09:20                                   | 12:20    | 117                         | 110                         | 105                         |
| 26/8/2019      | Cloudy  | 13:50                                   | 16:50    | 128                         | 120                         | 115                         |
| 30/8/2019      | Cloudy  | 13:35                                   | 16:35    | 129                         | 119                         | 123                         |
| <b>Average</b> |         |   |          | 116                         |                             |                             |
| <b>Range</b>   |         |   |          | 103 - 129                   |                             |                             |

2.2.8 In this Reporting Month, all monitoring result were below the action level. Hence, no Action or Limit Level exceedance was triggered during this month. The impact air quality monitoring results and graphical presentation are shown in **Appendix K**.

**2.3. NOISE MONITORING**

- 2.3.1 Impact monitoring for noise levels had been measured in accordance with Sections 3.13 of approved EM&A Manual on normal weekdays at a frequency of once a week at logging interval of 30 minutes for daytime (between 0700 and 1900 hours of normal weekdays). The  $L_{eq}$  had been recorded at the specified intervals. The non-project related construction activity – Sha Tin to Central Link (SCL) for Hin Keng to Diamond Hill Tunnel, in the vicinity of the monitoring stations during the impact monitoring had been noted and the source and location of this activity had been recorded.
- 2.3.2 According to Section 3.7 of the approved EM&A Manual, 3 noise sensitive receivers designated for the construction noise monitoring. The designated monitoring stations are identified and successfully granted by the premises. The details of noise monitoring stations are described in Table 2-7 and the location plan of noise monitoring stations is shown in **Appendix L**.

Table 2-7: Details of Noise Monitoring Stations

| Noise Monitoring Station | Noise Sensitive Receiver (NSR) ID in the approved EIA Report | Identified Noise Monitoring Station   |
|--------------------------|--|---|
| NM1                      | HK2  | The L Louey (South)<br>(at a platform level of about 5m above road level nearby - free field measurement) |
| NM2                      | HK5  | Hin Keng Estate –<br>Hin Wan House<br>(at the roof level - facade measurement)                            |
| NM3                      | HK7  | C.U.H.K.F.A.A.<br>Thomas Cheung School<br>(at the roof level - free field measurement)                    |

- 2.3.3 The monitoring equipment using for the noise impact monitoring was proposed by ET and verified by IEC. Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications has been used for carrying out the noise monitoring. The sound level meter has been checked using an acoustic calibrator. The wind speed has been checked with a portable wind speed meter capable of measuring the wind speed in m/s. The details of equipment using for impact monitoring are listed in Table 2-8 as below.

Table 2-8: Noise Impact Monitoring Equipment

| Noise                         |                                  |
|-------------------------------|----------------------------------|
| Sound Level Meter             | NTi Audio XL2                    |
| Acoustic Calibrator           | Rion NC-74                       |
| Portable Wind Speed Indicator | The Kestrel Pocket Weather Meter |

- 2.3.4 All noise measurements were the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level ( $L_{eq}$ ).
- 2.3.5 Prior to the impact 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. Regular checking



was conducted in impact monitoring period. The calibration level before and after the noise measurement is agreed to within 1.0 dB.

2.3.6 An acoustic calibrator and sound level meter using impact monitoring is within the valid period and were calibrated per year. A set of valid calibration certificates is attached in **Appendix M**.

2.3.7 Noise measurements should not be made in presence of fog, rain, wind with a steady speed exceeding  $5 \text{ ms}^{-1}$  or wind with gusts exceeding  $10 \text{ ms}^{-1}$ . The wind speed was checked with a portable wind speed meter capable of measuring with speeds in  $\text{ms}^{-1}$ .

2.3.8 In this Reporting Period, a total seven (7) occasions noise monitoring was undertaken in Reporting period. The noise monitoring results at the designated locations are summarized in Tables 2-9 to 2-11.

Table 2-9: Summary of Noise Monitoring Results – NM1

| Date                           | Time          | Weather | 1 <sup>st</sup><br>Leq <sub>5min</sub> | 2 <sup>nd</sup><br>Leq <sub>5min</sub> | 3 <sup>rd</sup><br>Leq <sub>5min</sub> | 4 <sup>th</sup><br>Leq <sub>5min</sub> | 5 <sup>th</sup><br>Leq <sub>5min</sub> | 6 <sup>th</sup><br>Leq <sub>5min</sub> | Leq <sub>30min</sub> |
|--------------------------------|---------------|---------|--|--|--|--|--|--|----------------------|
| 1/8/2019                       | 14:45 - 15:15 | Cloudy  | 61.2                                   | 61.9                                   | 60.5                                   | 61.0                                   | 61.5                                   | 61.9                                   | 61.4                 |
| 7/8/2019                       | 10:18 - 10:48 | Sunny   | 59.7                                   | 60.9                                   | 61.1                                   | 59.6                                   | 59.8                                   | 60.8                                   | 60.4                 |
| 12/8/2019                      | 14:00 - 14:30 | Fine    | 61.2                                   | 61.8                                   | 60.8                                   | 60.3                                   | 61.2                                   | 61.9                                   | 61.2                 |
| 16/8/2019                      | 10:55 - 11:25 | Cloudy  | 60.7                                   | 61.5                                   | 61.9                                   | 61.0                                   | 59.9                                   | 60.8                                   | 61.0                 |
| 21/8/2019                      | 10:33 - 11:03 | Sunny   | 60.6                                   | 59.9                                   | 59.6                                   | 61.2                                   | 60.8                                   | 60.9                                   | 60.5                 |
| 26/8/2019                      | 10:28 - 10:58 | Cloudy  | 61.0                                   | 61.3                                   | 60.5                                   | 60.9                                   | 60.2                                   | 59.5                                   | 60.6                 |
| 30/8/2019                      | 14:08 - 14:38 | Cloudy  | 60.7                                   | 60.5                                   | 61.0                                   | 60.2                                   | 59.8                                   | 59.9                                   | 60.4                 |
| <b>Average</b>                 |               |         |  |  |  |  |  |  | 60.8                 |
| <b>Range</b>                   |               |         |  |  |  |  |  |  | 60.4 – 61.4          |
| <b>Limit Level &gt;75dB(A)</b> |               |         |  |  |  |  |  |  |                      |

Table 2-10: Summary of Noise Monitoring Results – NM2

| Date                           | Time          | Weather | 1 <sup>st</sup><br>Leq <sub>5min</sub> | 2 <sup>nd</sup><br>Leq <sub>5min</sub> | 3 <sup>rd</sup><br>Leq <sub>5min</sub> | 4 <sup>th</sup><br>Leq <sub>5min</sub> | 5 <sup>th</sup><br>Leq <sub>5min</sub> | 6 <sup>th</sup><br>Leq <sub>5min</sub> | Leq <sub>30min</sub> |
|--------------------------------|---------------|---------|--|--|--|--|--|--|----------------------|
| 1/8/2019                       | 13:02 - 13:32 | Cloudy  | 59.7                                   | 59.0                                   | 58.3                                   | 59.5                                   | 60.2                                   | 61.0                                   | 59.7                 |
| 7/8/2019                       | 11:05 - 11:35 | Sunny   | 59.3                                   | 60.1                                   | 60.5                                   | 61.2                                   | 59.6                                   | 59.9                                   | 60.1                 |
| 12/8/2019                      | 13:11 - 13:41 | Fine    | 60.5                                   | 61.2                                   | 61.9                                   | 60.3                                   | 60.8                                   | 60.4                                   | 60.9                 |
| 16/8/2019                      | 10:11 - 10:41 | Cloudy  | 58.6                                   | 59.1                                   | 59.9                                   | 60.2                                   | 60.4                                   | 60.9                                   | 59.9                 |
| 21/8/2019                      | 9:48 - 10:18  | Sunny   | 58.3                                   | 58.9                                   | 59.2                                   | 59.6                                   | 59.1                                   | 58.3                                   | 58.9                 |
| 26/8/2019                      | 9:07 - 9:37   | Cloudy  | 58.9                                   | 58.0                                   | 57.9                                   | 58.2                                   | 58.9                                   | 58.9                                   | 58.5                 |
| 30/8/2019                      | 13:21 - 13:51 | Cloudy  | 59.0                                   | 60.2                                   | 61.1                                   | 61.2                                   | 60.8                                   | 60.5                                   | 60.5                 |
| <b>Average</b>                 |               |         |  |  |  |  |  |  | 59.8                 |
| <b>Range</b>                   |               |         |  |  |  |  |  |  | 58.5 – 60.9          |
| <b>Limit Level &gt;75dB(A)</b> |               |         |  |  |  |  |  |  |                      |



Table 2-11: Summary of Noise Monitoring Results – NM3

| Date  | Time          | Weather | 1 <sup>st</sup><br>Leq <sub>5min</sub> | 2 <sup>nd</sup><br>Leq <sub>5min</sub> | 3 <sup>rd</sup><br>Leq <sub>5min</sub> | 4 <sup>th</sup><br>Leq <sub>5min</sub> | 5 <sup>th</sup><br>Leq <sub>5min</sub> | 6 <sup>th</sup><br>Leq <sub>5min</sub> | Leq <sub>30min</sub> |
|---|---------------|---------|--|--|--|--|--|--|----------------------|
| 1/8/2019  | 13:50 - 14:20 | Cloudy  | 61.2                                   | 61.8                                   | 60.9                                   | 60.2                                   | 60.8                                   | 60.5                                   | 60.9                 |
| 7/8/2019  | 13:39 - 14:09 | Sunny   | 61.6                                   | 61.9                                   | 60.4                                   | 60.2                                   | 60.8                                   | 61.2                                   | 61.1                 |
| 12/8/2019   | 14:49 - 15:19 | Fine    | 62.0                                   | 61.5                                   | 61.0                                   | 61.8                                   | 61.9                                   | 61.2                                   | 61.6                 |
| 16/8/2019   | 13:39 - 14:09 | Cloudy  | 63.0                                   | 62.5                                   | 62.9                                   | 61.2                                   | 61.9                                   | 61.5                                   | 62.2                 |
| 21/8/2019   | 9:05 - 9:35   | Sunny   | 60.3                                   | 60.8                                   | 60.9                                   | 61.2                                   | 61.5                                   | 61.9                                   | 61.1                 |
| 26/8/2019   | 9:45 - 10:15  | Cloudy  | 60.8                                   | 60.9                                   | 61.8                                   | 61.9                                   | 62.1                                   | 61.0                                   | 61.4                 |
| 30/8/2019   | 14:50 - 15:20 | Cloudy  | 60.5                                   | 61.3                                   | 61.9                                   | 61.8                                   | 61.1                                   | 61.0                                   | 61.3                 |
| <b>Limit Level</b>  |               |         | <b>Average</b>                         |  |  |  |  |  | 61.4                 |
| <b>70dB(A) during normal teaching periods<br/>or 65 dB(A) during examination<br/>periods*</b> |               |         | <b>Range</b>                           |  |  |  |  |  | 60.9 –<br>62.2       |

2.3.9 As shown in the results were well below the limit level, also no complaint was received by the RE, WSD, EPD and contractor. Hence, no Action or Limit Level exceedance was triggered during this month. The impact noise quality monitoring results and graphical presentation are shown in **Appendix N**.

#### 2.4. WATER QUALITY MONITORING

2.4.1 Water Impact monitoring had been taken three days per week with sampling or measurement in accordance with Sections 4.12 of the approved EM&A Manual at all designated monitoring stations in the 2 water courses. The interval between 2 sets of monitoring had been more than 36 hours. Replicate in-situ measures had been carried out in each sampling event.

2.4.2 Three (3) control and two (2) impact stations were recommended in the Section 4.7 of the approved EM&A Manual to carry out water quality monitoring. In order to identify and seek for the access of the water monitoring locations designated in the approved EM&A Manual, site visit was conducted among ET, IEC and Environmental Protection Department (EPD).

2.4.3 During the site visit, all designated monitoring locations were identified however one more impact stations (M3) along the same water course was introduced due to the concern on multiple site effect, in particular to address the potential impact to M2 from a source at upstream of the water course. Details and coordinates of the monitoring stations are described in Table 2-12 and the location plan of water quality monitoring stations is shown in **Appendix O**.

Table 2-12: Details of Water Quality Monitoring Station

| Water Quality Monitoring Station | Description                | Co-ordinates |          |
|----------------------------------|----------------------------|--------------|----------|
|                                  |                            | Easting      | Northing |
| C1                               | Control Stations           | 835110       | 824716   |
| C2                               |                            | 835403       | 824470   |
| C3                               |                            | 835642       | 824386   |
| M1                               | Impact Monitoring Stations | 835215       | 824827   |
| M2                               |                            | 835536       | 824775   |
| M3                               |                            | 835501       | 824648   |





2.4.4 The water monitoring equipment and analysis using for the water quality monitoring were proposed by ET and verified by IEC. The details of equipment using for impact monitoring are listed in the Table 2-13 below:

Table 2-13: Monitoring Equipment Used in Impact Monitoring Program

| <b>Water quality</b>                          |   |
|---|---|
| HORIBA Professional DSS Multifunctional Meter |   |
| Thermometer & DO meter                        | The instrument is a portable and weatherproof dissolved oxygen (DO) measuring instrument complete with cable and sensor, and use a DC power source. The equipment is capable of measuring as included a DO level in the range of 0 - 20mg/L and 0 - 200% saturation; and a temperature of 0 - 45°C. |
| pH meter                                      | The instrument consists of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It is readable to 0.1 pH in range of 0 to 14.   |
| Turbidimeter                                  | The instrument is a portable and weatherproof turbidity measuring instrument using a DC power source. It has a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU.  |
| Laboratory Analysis                           |   |
| Suspended Solids                              | HOKLAS-accredited laboratory (Acumen Laboratory and Testing Limited)  |

**Remark:**

- (i) *Water samples for suspended solids (SS) have been stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen).*

2.4.5 Before the commencement of the sampling, general information such as the date and time of sampling as well as the personnel responsible for monitoring were recorded on the monitoring field data sheet.

2.4.6 Water temperature, turbidity, DO, pH and water depth were measured in-situ. Since water depths at C1, C2, M1, M2 and M3 were less than 3 m, all in-situ measurements and sampling conducted at one water depth such as mid-depth are performed. Moreover, C3 was recorded dry throughout the sampling period. Therefore, in-situ measurements and sampling could not be conducted at C3 in accordance with the water monitoring requirements in the approved EM&A Manual.

2.4.7 At each sampling point, (two) 2 consecutive measurements of temperature, DO, turbidity and pH were measured. The Multi-Parameter Water Quality Monitoring Probe were retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of each set was more than 25% of the value of the first reading, the reading was discarded and further readings were taken. The certification of the Multi-parameter Water Quality Monitoring System is showed in **Appendix P**.

2.4.8 All water samples were delivered to the Acumen Laboratory and Testing Limited (HOKLAS registration no.: 241). SS testing was used HOKLAS accredited Analytical method APHA 2540 D. The certification of laboratory with HOKLAS accredited analytical tests are provided in **Appendix Q**.

2.4.9 In this reporting period, a total of fourteen (14) sampling days perform water monitoring at the six designated locations. Monitoring results of 4 key parameters: dissolved oxygen (DO), turbidity, suspended solids and pH in this Reporting Months, are summarized in Table 2-14.



Table 2-14: Summary of Water Quality Monitoring Results

| <b>Dissolved Oxygen – Mid Depth (mg/L)</b> | <b>C1</b> | <b>C2</b> | <b>C3</b> | <b>M1</b> | <b>M2</b> | <b>M3</b> |
|--|-----------|-----------|-----------|-----------|-----------|-----------|
| Average                                    | 8.58      | 8.58      | N/A       | 9.16      | 9.15      | 9.45      |
| Min.                                       | 8.32      | 8.21      | N/A       | 8.95      | 8.95      | 9.25      |
| Max.                                       | 8.80      | 8.81      | N/A       | 9.42      | 9.33      | 9.62      |
| <b>Turbidity – Mid Depth (NTU)</b>         | <b>C1</b> | <b>C2</b> | <b>C3</b> | <b>M1</b> | <b>M2</b> | <b>M3</b> |
| Average                                    | 2.57      | 2.60      | N/A       | 2.13      | 1.84      | 0.63      |
| Min.                                       | 1.90      | 2.30      | N/A       | 1.90      | 1.40      | 0.30      |
| Max.                                       | 2.90      | 2.90      | N/A       | 2.40      | 2.30      | 0.90      |
| <b>Suspended Solid – Mid depth (mg/L)</b>  | <b>C1</b> | <b>C2</b> | <b>C3</b> | <b>M1</b> | <b>M2</b> | <b>M3</b> |
| Average                                    | 3.53      | 5.05      | N/A       | 2.59      | 3.27      | <1        |
| Min.                                       | 2.10      | 3.10      | N/A       | 1.30      | 1.90      | <1        |
| Max.                                       | 5.50      | 7.80      | N/A       | 3.50      | 7.10      | <1        |
| <b>pH value (unit)</b>                     | <b>C1</b> | <b>C2</b> | <b>C3</b> | <b>M1</b> | <b>M2</b> | <b>M3</b> |
| Average                                    | 7.64      | 7.50      | N/A       | 7.69      | 7.69      | 7.58      |
| Min.                                       | 7.31      | 7.24      | N/A       | 7.29      | 7.51      | 7.10      |
| Max  | 7.89      | 7.76      | N/A       | 7.90      | 7.78      | 7.75      |

2.4.10 In this Reporting Month, all monitoring result were below or within the action level. Hence, no Action or Limit Level exceedance was triggered during this month. Detailed monitoring results including in-situ measurements, laboratory analysis data are shown in **Appendix R**.



## 2.5. ECOLOGY

- 2.5.1 Detailed Vegetation Survey Report and Woodland Compensation Plan submitted to EPD and approved on 17 February 2016. To ensure the planting works are properly implemented, bi-weekly monitoring is proposed throughout the planting phase. The frequency of monitoring is proposed to be bi-monthly during the first years of the planting stage, and then reduced to quarterly for the six (6) year post-planting period.
- 2.5.2 A 6 years post-planting review report will be submitted within a month after completion of the at least 6 years post-planting monitoring and maintenance.
- 2.5.3 Monitoring inspections were conducted on 30 August 2019. Three trees TA572, TA326 and TA327 were transplanted to tree compensation area within the Sha Tin Water Treatment Works (STWTW) in 20 June 2016.
- 2.5.4 The condition of TA572 was observed in poor condition due to the damage of two main trunks. TA327 was also in poor condition. The already dead tree TA326 collapsed due to big hit by the Signal No.10 typhoon Mangkhut on 16 September 2018. Tree guying cables have been installed to provide external support to the remaining two transplanted trees. Transplanted Lamb of Tartary (*Cibotium barometz*) seems to be received too much sunlight. Leaves of them were observed yellowish in colour. On the other hand, young foliage was growing out to replace the old one.
- 2.5.5 Since Sha Tin South Fresh Water Service Reservoir (STSFWSR) was still under preparation, Lamb of Tartary was still temporally stored in a nursery garden at Wang Toi Shan, Kam Tin.
- 2.5.6 In general, all transplanted Lamb of Tartary (*Cibotium barometz*) were in fair condition while Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was observed dead during inspection on 20 August 2016. The survival rate for Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was 96%. The Summary table for health condition and survival rate was shown in Appendix II.
- 2.5.7 All transplanted Lamb of Tartary (*Cibotium barometz*) have been severely damaged by Typhon Wipha on 30-31 July 2019; the next few monitoring will be critical to assess their survival and recovery progress.
- 2.5.8 It is recommended to retain transplanted Lamb of Tartary (*Cibotium barometz*) at the nursery garden under proper maintenance during current recovery stage. Once their condition has recovered to acceptable level, they can be moved to the transplantation site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) when the site is ready.
- 2.5.9 After transplantation, root ball of TA572 and TA327 tree should be kept moisture especially during non-raining day.



## **2.6. WASTE MANAGEMENT STATUS**

- 2.6.1 The Contractor has submitted application form for registration as chemical waste producer under the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting. The Waste Producer Number to the Contractor is assigned in respect of the project site.
- 2.6.2 Wastes generated during this reporting period include mainly construction wastes (inert and non-inert). Waste flow table was prepared by the Contractor to record amount of waste generated and disposed (**Appendix T**).
- 2.6.3 The Contractor was advised to properly maintain on site C&D materials and waste collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse/recycle of C&D materials and wastes.
- 2.6.4 The Contractor was also reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly. For chemical waste containers, the Contractor was reminded to treat properly and store temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

## **2.7. DELIVERY, STORAGE AND HANDLING OF CHLORINE**

- 2.7.1 Chlorine is delivered to Sha Tin WTW in batches of up to 6×1-tonne drums. The transport route from Sham Shui Kok dock on North Lantau is shown in **Figure 1**. The route passes along the North Lantau

Expressway, around the northern edge of Tsing Yi, through Tsuen Wan and along Tai Po Road (Piper’s Hill) to Sha Tin (Table 2-15).

Figure 1: Chlorine Transport Route to Sha Tin Water Treatment Works



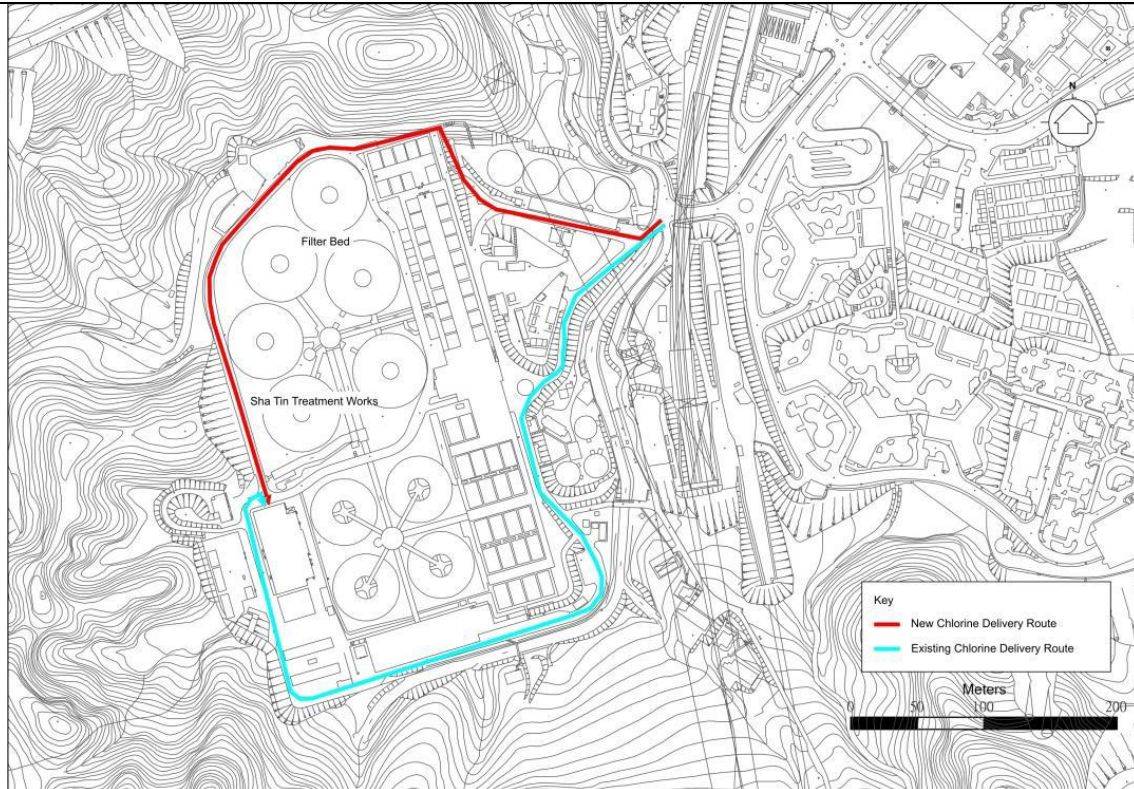
Table 2-15: Chlorine Truck Transport Route

| Destination                  | Route   |
|------------------------------|---|
| From SSK Dock to Sha Tin WTW | Sham Shui Kok Dock > Cheung Tung Road > Sunny Bay Road > N Lantau Highway > Lantau Link > NW Tsing Yi Interchange > Tsing Yi North Costal road > Tsing Tsuen Road > Tsuen Wan Road > Kwai Chung Road > Ching Cheung Road > Tai Po Road > Tai Po Road (Piper’s Hill) > Tai Po Road (Sha Tin Heights) > Tai Po Road > Tsing Sha Highway (Sha Tin) > Tai Po Rd (Sha Tin) > Sha Tin Rural Committee Rd > Tai Chung Kiu Rd > Che Kung Miu Road > Sha Tin WTW |

2.7.2 Unloading takes place inside the Chlorination House, with the doors closed, in a designated truck unloading bay. The movement of drums within the storage area and ‘drive-through’ unloading bay is carried out using a hoist/monorail system with a purpose-built lifting beam. Prior to usage, the drums are stored on cradles within the chlorine storage area.

2.7.3 The on-site chlorine delivery route is shown in Figure 2.

Figure 2: Chlorine Delivery Route at Sha Tin WTW



- 2.7.4 An emergency chlorine scrubbing system is installed to remove any leaked chlorine in the chlorine handling and storage areas. The system is a packed tower utilising sodium hydroxide as the neutralising agent. The plant and equipment are installed in a separate scrubber room.
- 2.7.5 On detection of chlorine at a concentration of 3 ppm or above in the chlorine handling or storage areas, the scrubbing system will activate automatically. The air/chlorine mixture in the affected areas is drawn into the scrubber by the scrubber fan via ducting connected to the normal ventilation system. An electrically-operated isolating damper is provided in the scrubber intake which opens automatically when the scrubber fan starts up.
- 2.7.6 The scrubber system is normally set at auto standby mode and is activated if the chlorine concentration rises above 3 ppm. A continuous chlorine monitor is installed at a point downstream of the packed tower and upstream of the vent/recycle changeover dampers to monitor the scrubber performance; a “Chlorine concentration high” alarm will be initiated if the concentration of chlorine in the tower exhaust exceeds the preset value.
- 2.7.7 According to the Fire Services Department’s fire safety requirements, an emergency repair/stoppage kit for chlorine spillage/leakage is provided and maintained in good working condition at all times for use



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by the trained persons and stowed adjacent to but outside the store/plant room. Regular drills are conducted to train personnel on the proper use of the breathing apparatus and protective clothing.

- 2.7.8 A Hazard Assessment of the risks associated with the storage, handling and transport of chlorine at Sha Tin WTW and the off-site transport of chlorine for the Construction and Operational Phases of the reprovisioning project has been conducted in the approved EIA Report (Register No. AEIAR-187/2015).
- 2.7.9 This In-situ Reprovisioning of Sha Tin WTW is an improvement project, following its completion the chlorine-related risks levels to the general public will be lowered due to the anticipated reduction of the chlorine storage and usage levels.
- 2.7.10 Implementation of the recommended mitigation measures would be regularly audited. No specific Environmental Monitoring would be required.

**2.8. EM&A SITE INSPECTION**

- 2.8.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. In the reporting period, four (4) site inspections were carried out on 2, 9, 16, 22 and 28 August 2019.
- 2.8.2 One joint site inspection with IEC also undertaken on 16 August 2019. Minor deficiencies were observed during weekly site inspection or joint site inspection. Key observations during the site inspections are summarized in Table 2-16.

Table 2-16: Site Observations

| <b>Date</b>    | <b>Environmental Observations</b>  | <b>Follow-up Status</b>  |
|----------------|--|--|
| 2 August 2019  | 1. Exposed earth was found without impervious cover at North Circulation Road. The Contractor was reminded to cover exposed earth with impervious sheeting.<br>2. Drainage channel was found filled with fallen leaf. The Contractor was reminded to clean the channel regularly.                      | 1. Impervious cover was provided.<br>2. Fallen leaf have been removed from drainage channel. |
| 9 August 2019  | 1. Drainage channel was found filled with fallen leaf at M123. The Contractor was reminded to clean the channel regularly.<br>2. Dusty material were found without impervious cover at North Circulation Road. The Contractor was reminded to cover dusty material with impervious sheeting.           | 1. Fallen leaf have been removed from drainage channel.<br>2. Impervious cover was provided  |
| 16 August 2019 | 1. Chemical waste container was found without proper chemical waste label at Bar Fixing Yard. The Contractor was reminded to display the label on chemical waste container.<br>2. Excavator at Logistic Center was found without NRMM. The Contractor was reminded to provide NRMM label on equipment. | 1. Chemical waste label was displayed.<br>2. NRMM label was displayed.                       |
| 22 August 2019 | 1. General refuse bin was found without proper cover at Bar Fixing Yard. The Contractor was reminded to replace the cover.   | 1. Cover was provided.   |
| 28 August 2019 | 1. General refuse bin was found without proper cover at Bar Fixing Yard. The Contractor was reminded to replace the cover.   | 1. Cover was provided.   |

- i. The Contractor has rectified all of the observations identified during environmental site inspections in the reporting period.

**2.9. ENVIRONMENTAL LICENSES AND PERMITS**

- 2.9.1 The status of environmental license and permit is summarized in Table 2-17 below:

Table 2-17: Summary of Environmental License and Permit

| <b>License / Permit</b> | <b>License / Permit No.</b> | <b>Date of Issue</b> | <b>Date of Expiry</b> | <b>License / Permit Holder</b> | <b>Remark</b> |
|-------------------------|-----------------------------|----------------------|-----------------------|--------------------------------|---------------|
| Environmental Permit    | EP- 494/2015                | 28/01/2015           | N/A                   | WSD                            |               |





| License / Permit                        | License / Permit No. | Date of Issue | Date of Expiry | License / Permit Holder | Remark                                    |
|---|----------------------|---------------|----------------|-------------------------|---|
| Registration of Chemical Waste Producer | WPN5218-759-M2936-01 | 31/12/2015    | N/A            | MMVJV                   |   |
| Trip Ticket (Chit) Account              | 7023723              | 10/12/2015    | N/A            | MMVJV                   |   |
| Waste Water Discharge License (Wall C)  | WT0023932-2016       | 01/04/2016    | 31/03/2021     | MMVJV                   |   |
| Waste Water Discharge License (Wall D)  | WT0024211-2016       | 10/06/2016    | 30/06/2021     | MMVJV                   |   |
| Construction Noise Permit               | GW-RN0403-19         | 06/06/2019    | 18/08/2019     | MMVJV                   | superseded by GW-RN0538-19 on 19 Aug 2019 |
| Construction Noise Permit               | GW-RN0538-19         | 02/08/2019    | 18/10/2019     | MMVJV                   |   |

## 2.10. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

- 2.10.1 In response to the site audit findings, the Contractors carried out corrective actions. A summary of the environmental mitigation measures implemented by the Contractor in this Reporting Period are summarized in Table 2-18.
- 2.10.2 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (EMIS) in the approved EM&A Manual covered the issues of dust, noise, water and waste and they are showed **Appendix U**.

Table 2-18: Environmental Mitigation Measures

| Issues      | Environmental Mitigation Measures   |
|-------------|---|
| Air Quality | <ul style="list-style-type: none"> <li>- Tarpaulin covering of any dusty materials on a vehicle leaving the site;</li> <li>- Imposition of speed controls for vehicles on site haul roads;</li> <li>- Use of regular watering to reduce dust emissions from exposed site surfaces and roads;</li> <li>- Side enclosure and covering of any aggregate or stockpiling of dusty materials to reduce emissions;</li> <li>- Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.</li> </ul> |
| Noise       | <ul style="list-style-type: none"> <li>- Good site practices to limit noise emissions at the sources;</li> <li>- Use of quiet plant and working methods;</li> <li>- Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs;</li> <li>- Scheduling of construction works outside school examination period in critical area.</li> </ul>   |
| Water       | <ul style="list-style-type: none"> <li>- Drainage systems were regularly and adequately maintained;</li> <li>- Effluent discharged from the construction site should comply with standards stipulated in the TM-DSS;</li> <li>- Open stockpiles of construction materials on sites should be covered.</li> </ul>  |
| General     | <ul style="list-style-type: none"> <li>- The site was generally kept tidy and clean.</li> </ul>   |



2.10.3 The necessary mitigation measures were implemented properly for this Contract.

**2.11. SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT**

2.11.1 Results for 1-hour TSP, noise and water quality monitoring complied with the Action/ Limit levels in the reporting period.

2.11.2 Cumulative statistics on exceedances is provided in **Appendix V**.



**2.12. SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTIONS**

2.12.1 The Environmental Complaint Handling Procedure is shown in below table:

Table 2-19: Environmental Complaint Handling Procedure

|  |  |
|--|--|
| Complaint Received via Project Hotline   | Complaint Received via 1823 or from other government departments   |
| MMVJV notify ER, ET and IEC  | ER notify MMVJV, ET and IEC  |
| Register of the complaint. MMVJV and ET to conduct investigation of complaint and report to ER and IEC the investigation results |  |
| If complaint is considered not valid   | If complaint is found valid  |
| ET or ER to reply the complainant if necessary   | MMVJV to implement necessary improvement measures in consultation with the IEC, ET and ER. ET to check and inspect if the situation is improved. ER to conduct further inspection as necessary.  |
|  | ER to report the follow up actions done to WSD and reply to complainant is necessary.<br>If the complaint is referred by the EPD, the Contractor to prepare interim report on the status of the complaint investigation and follow-up action |
| ER prepare complaint report for submission to WSD<br>ET to record the complaint case in monthly EM&A report                      |  |



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2.12.2 No environmental complaint were received in the reporting period.

2.12.3 No notification of summons and prosecution was received in the reporting period.

2.12.4 No visit from EPD in the reporting period.

2.12.5 Statistics on complaints, notifications of summons and successful prosecutions are summarized in **Appendix V**.

**2.13. DATA MANAGEMENT AND DATA QA/QC CONTROL**

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

2.13.2 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 computerized database properly. The laboratory results were input directly into the computerized database and checked by personnel other than those who had input the data.

2.13.3 For monitoring parameters that require laboratory analysis, the local laboratory had followed the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory testing.



### **3. FUTURE KEY ISSUES**

#### **3.1. CONSTRUCTION PROGRAMME FOR THE COMING MONTHS**

3.1.1 As informed by the Contractor, the major works for this Project from September 2019 to November 2019 will be:

- Construction of Logistics Centre at Wall C.
- Construction lagging wall and bore piles at Wall D and C
- External finish work at North Work Temporary House
- Modification of clarifier no.1
- Modification of valve chamber and construction of flow meter house
- Construction of CLP steel cable support between CLP substation and North Work Washwater Pump House

#### **3.2. KEY ISSUES FOR COMING MONTH**

3.2.1 Potential environmental impacts arising from the above upcoming construction activities in September 2019 are mainly associated with dust, noise, water quality issues and waste management issues.

3.2.2 Particular issues to be considered in the coming month include:

- Implementation of dust suppression measures at all times.
- Implementation of adequate measures to prevent discharge of site effluent to the nearby water bodies
- Desilting tanks and catch-pits should be regularly maintained.
- Implementation of construction noise preventative control measures.
- Avoidance of accumulation of stagnant water

3.2.2 The tentative monitoring schedule for September 2019 to November 2019 can be found in **Appendix W**.



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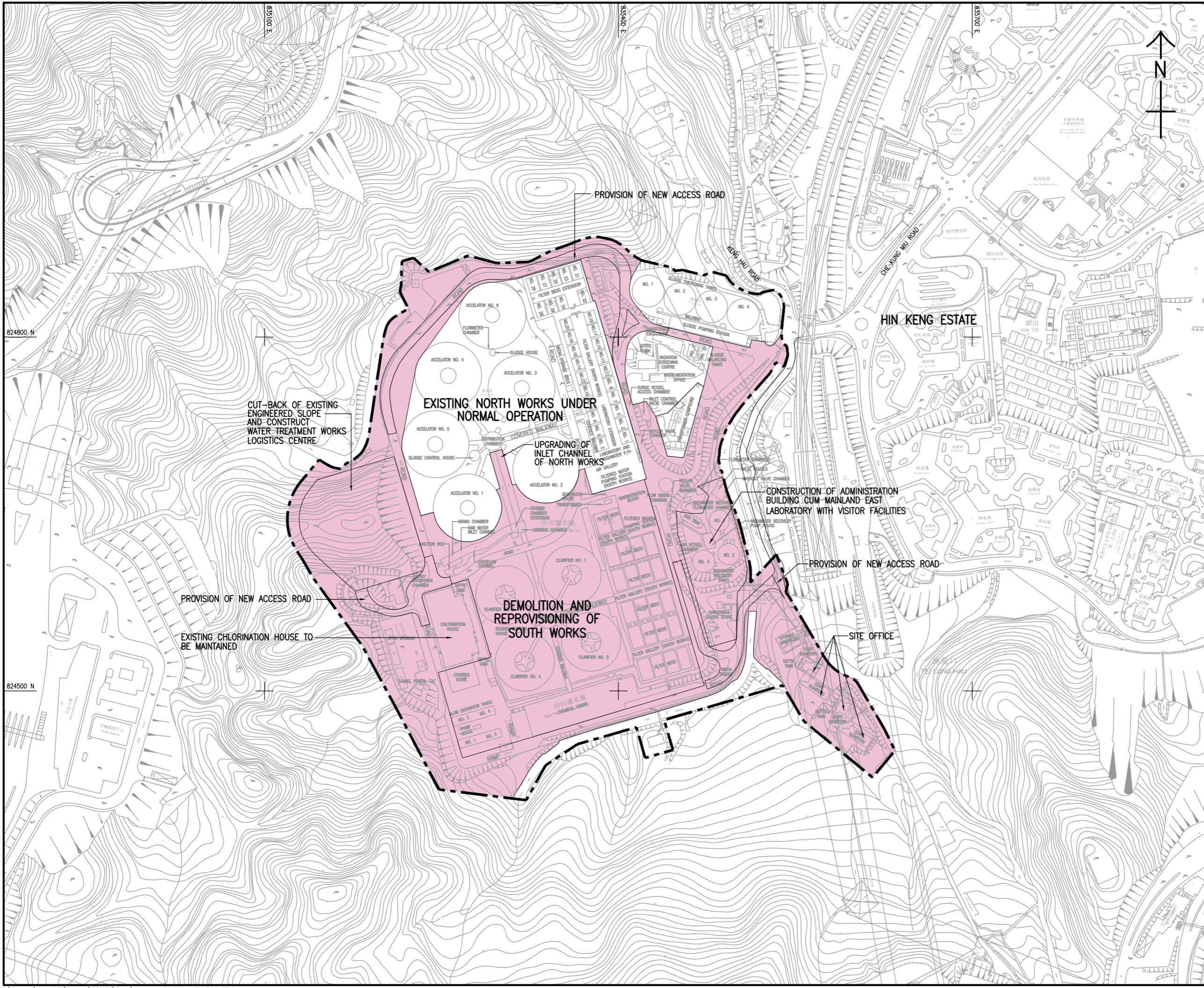
## **4. CONCLUSIONS AND RECOMMENDATIONS**

### **4.1. SUMMARY**

- 4.1.1 Air quality (including 1-hour TSP), noise, water quality and ecology impact monitoring were carried out in the reporting period. All monitoring results are satisfactory and no NOEs or associated corrective action was therefore issued.
- 4.1.2 Five (5 nos.) environmental site inspection were conducted during the reporting period. Joint site inspection with IEC were carried out on 16 August 2019. Minor deficiencies were observed during site inspection and were rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.
- 4.1.3 To control the site performance on waste management, the contractor 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. Contractor is also reminded to implement the recommended environmental mitigation measures according to the Environmental Monitoring and Audit Manual.
- 4.1.4 No environmental complaint were received in the reporting period.
- 4.1.5 No notification of summons or prosecution was received since commencement of the Contract.
- 4.1.6 The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

# Appendix A

## General Layout Plan



**LEGEND:**

- SITE BOUNDARY OF SHA TIN WATER TREATMENT WORKS
- WORKS AREA

**水務署**  
**WATER SUPPLIES DEPARTMENT**  
 AGREEMENT NO. CE 13/2009 (WS)  
 IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS - SOUTH WORKS  
 DESIGN AND CONSTRUCTION

**LOCATION PLAN AND THE MAJOR SCOPE OF WORKS**



DRG. NO. 圖紙編號 **60162073/EM&A/FIG 1**

|                |                                   |                     |
|----------------|-----------------------------------|---------------------|
| DESIGNED BY 設計 | CONTRACT NO. 合約編號                 | P. DR. APPROVED 批准人 |
| DRAWN BY 繪圖    | STATUS 階段                         |                     |
| SCALE 比例       | DIMENSIONS ARE IN METRES 尺寸單位: 公尺 |                     |
| A3 1 : 3000    | © COPYRIGHT RESERVED 版權所有         |                     |

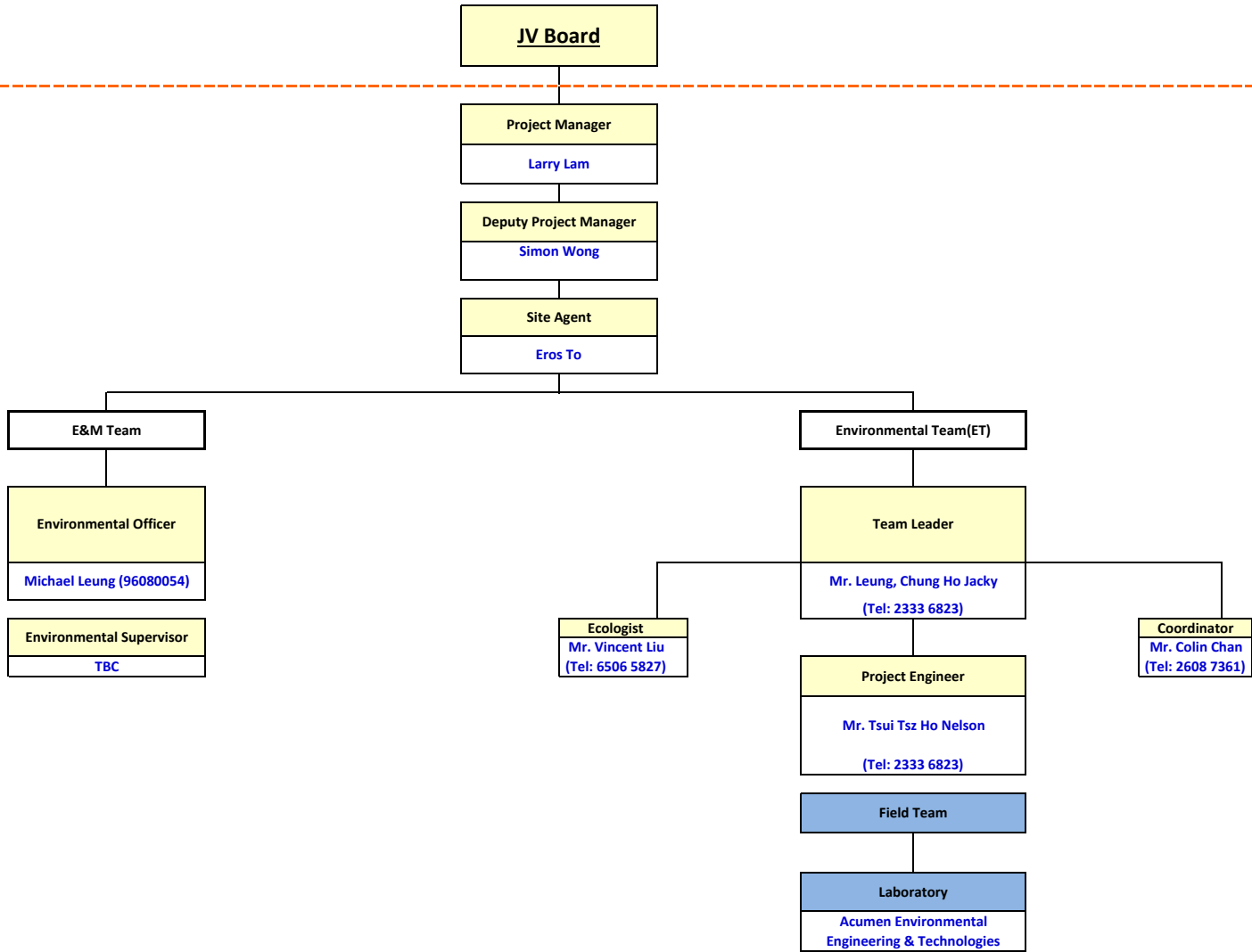


# Appendix B

## Project Organization

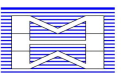
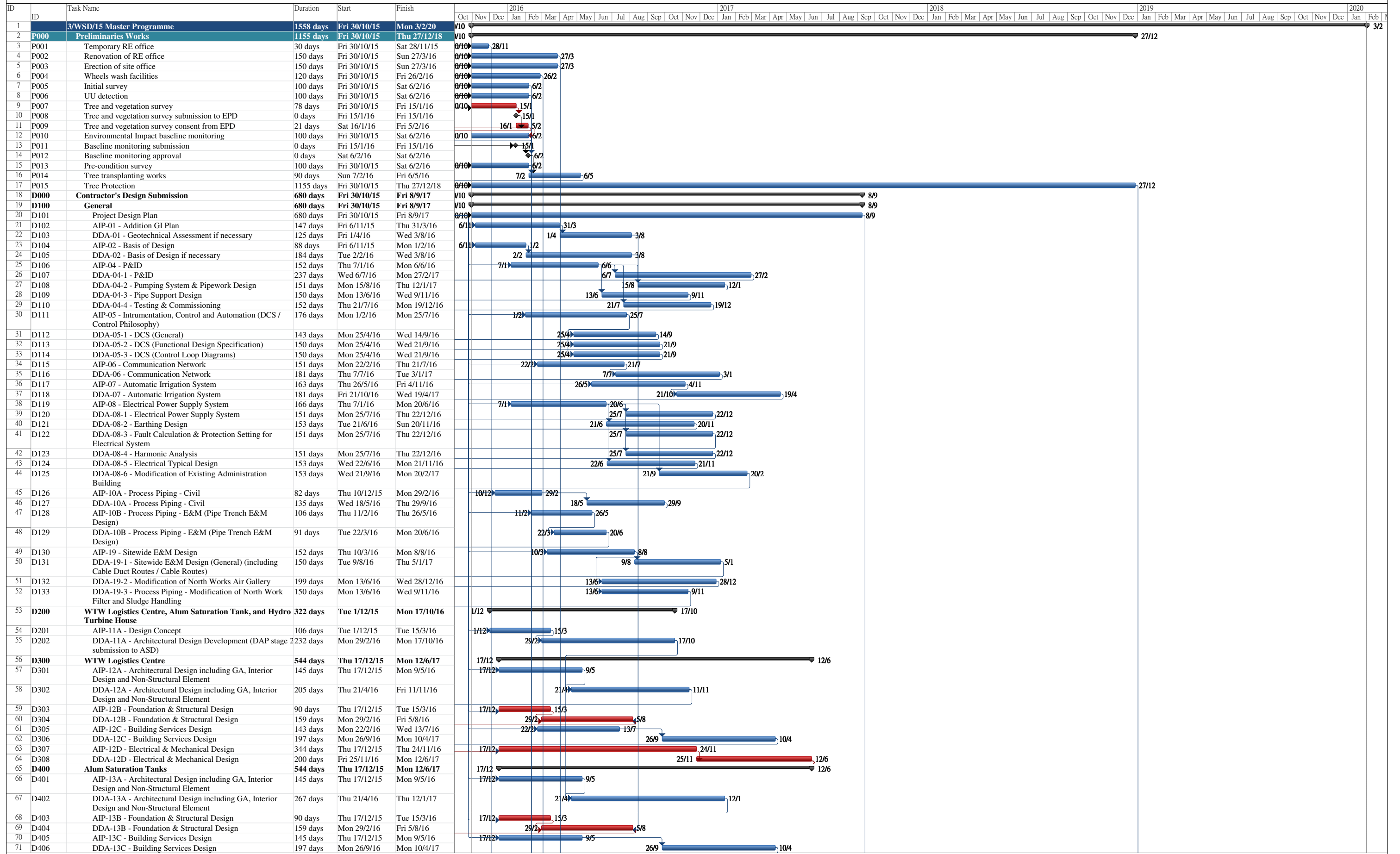
### Project Organization Chart

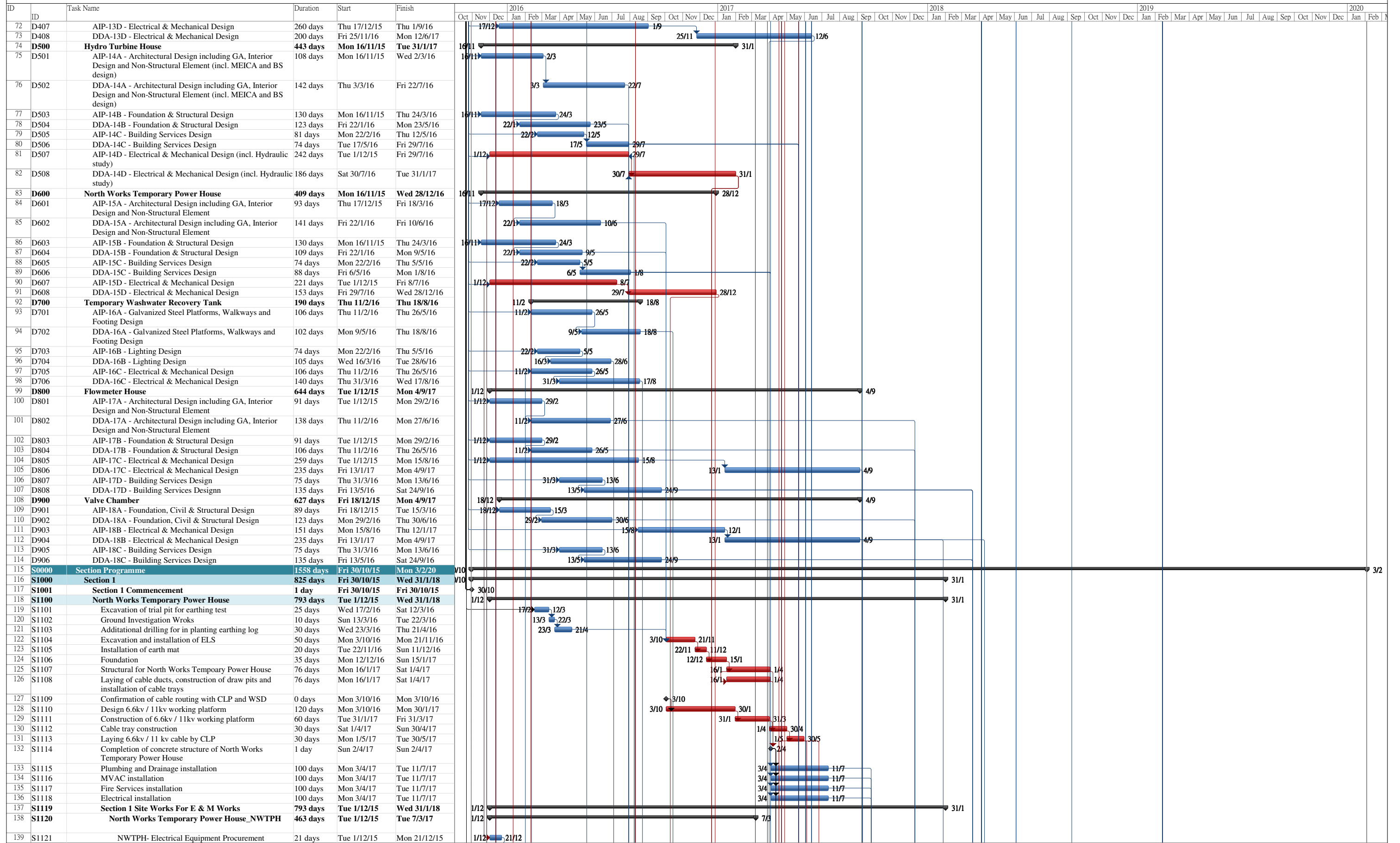
Head Office  
Site Office



# Appendix C

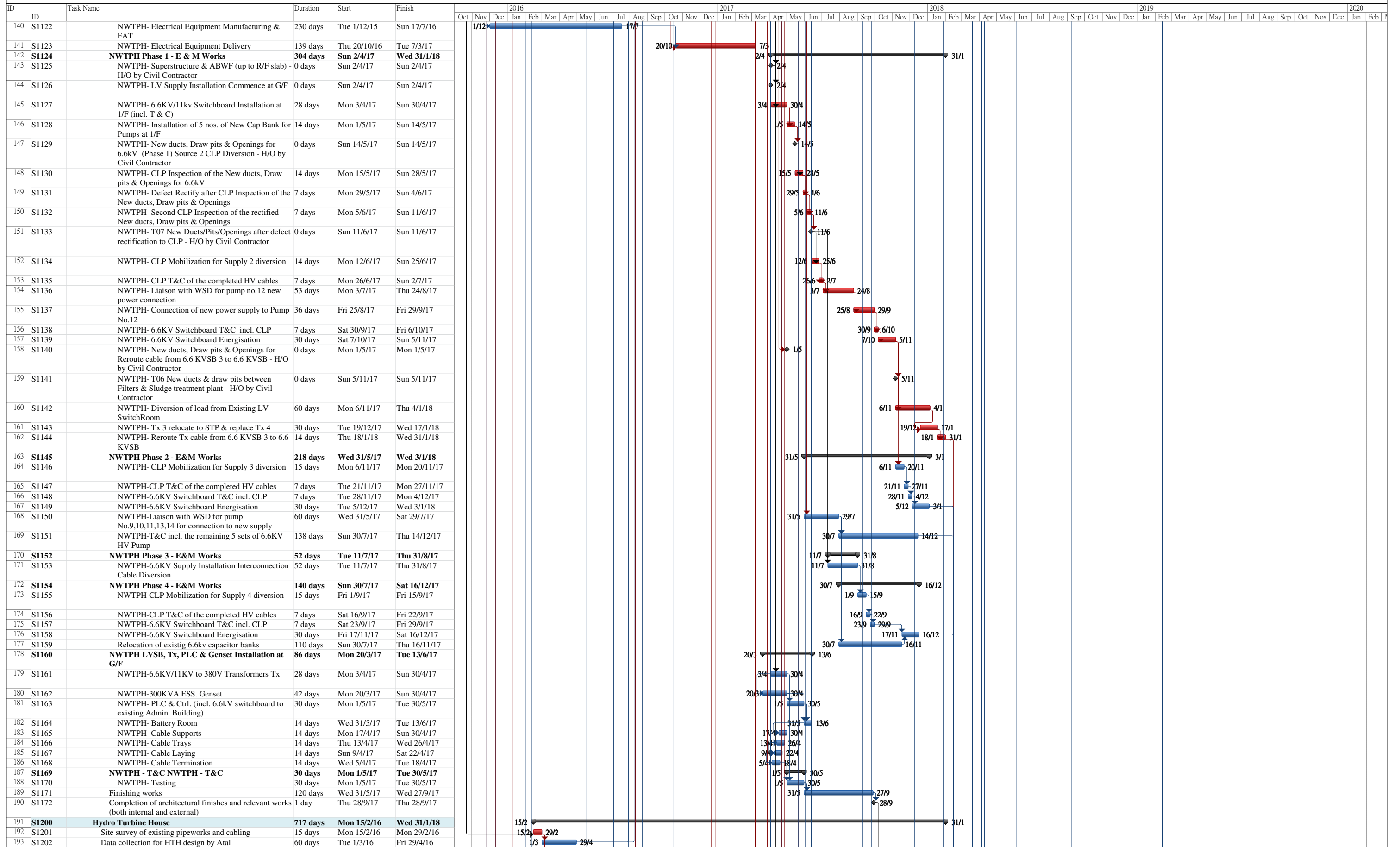
## Latest Construction Programme

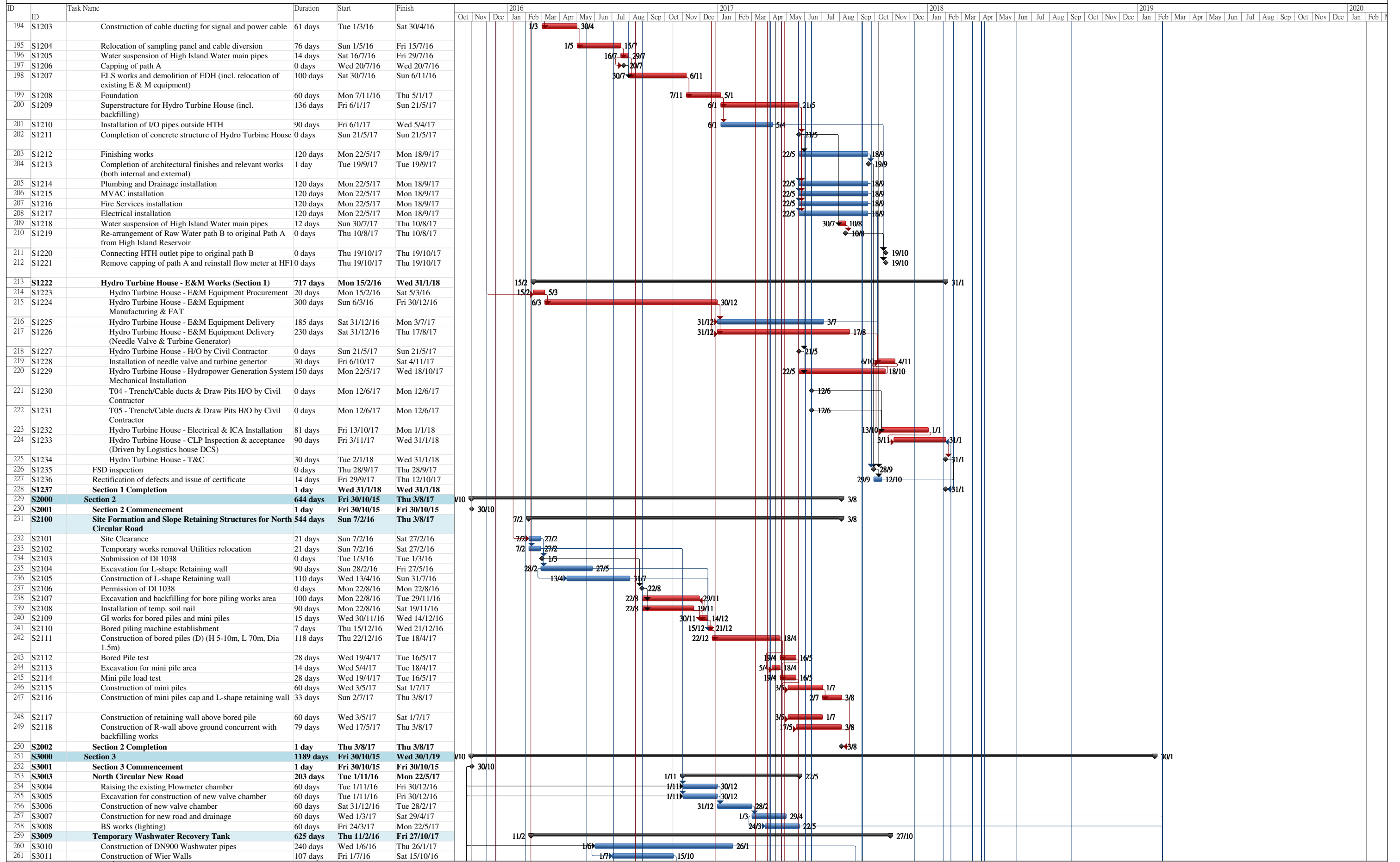


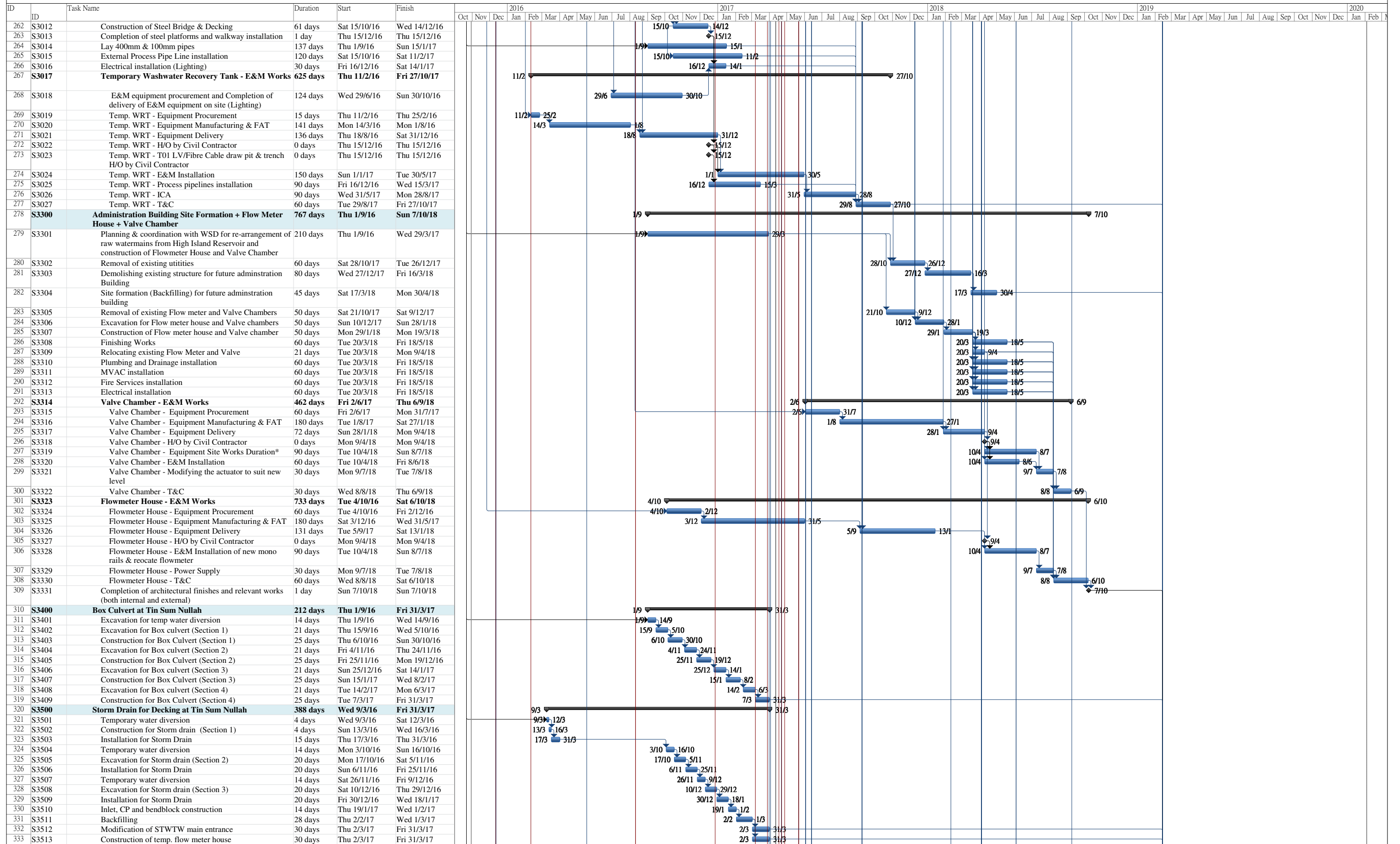


Critical Split ..... Task ■ Milestone ◆ Summary ▬ Manual Summary ▬ Critical ▬

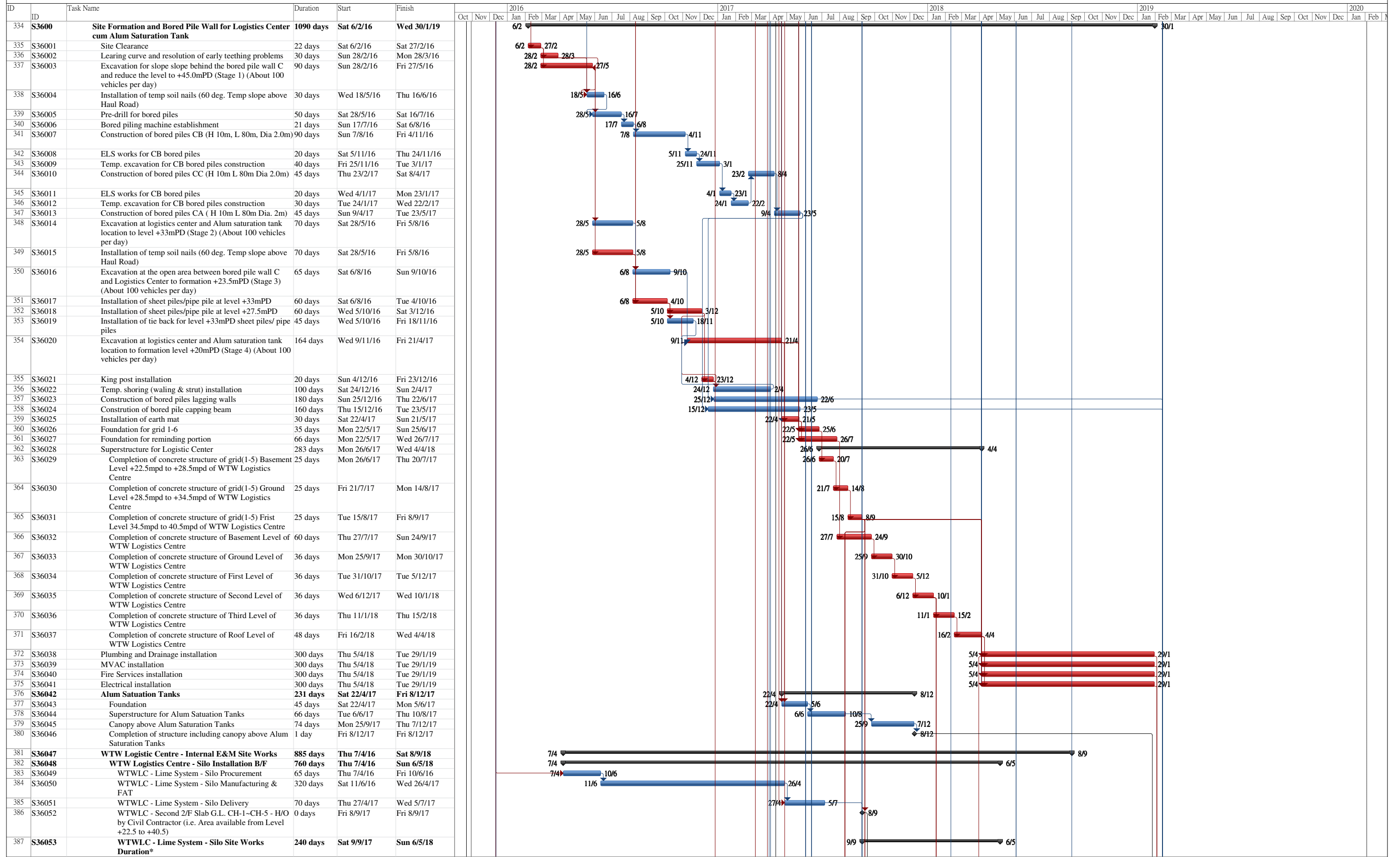


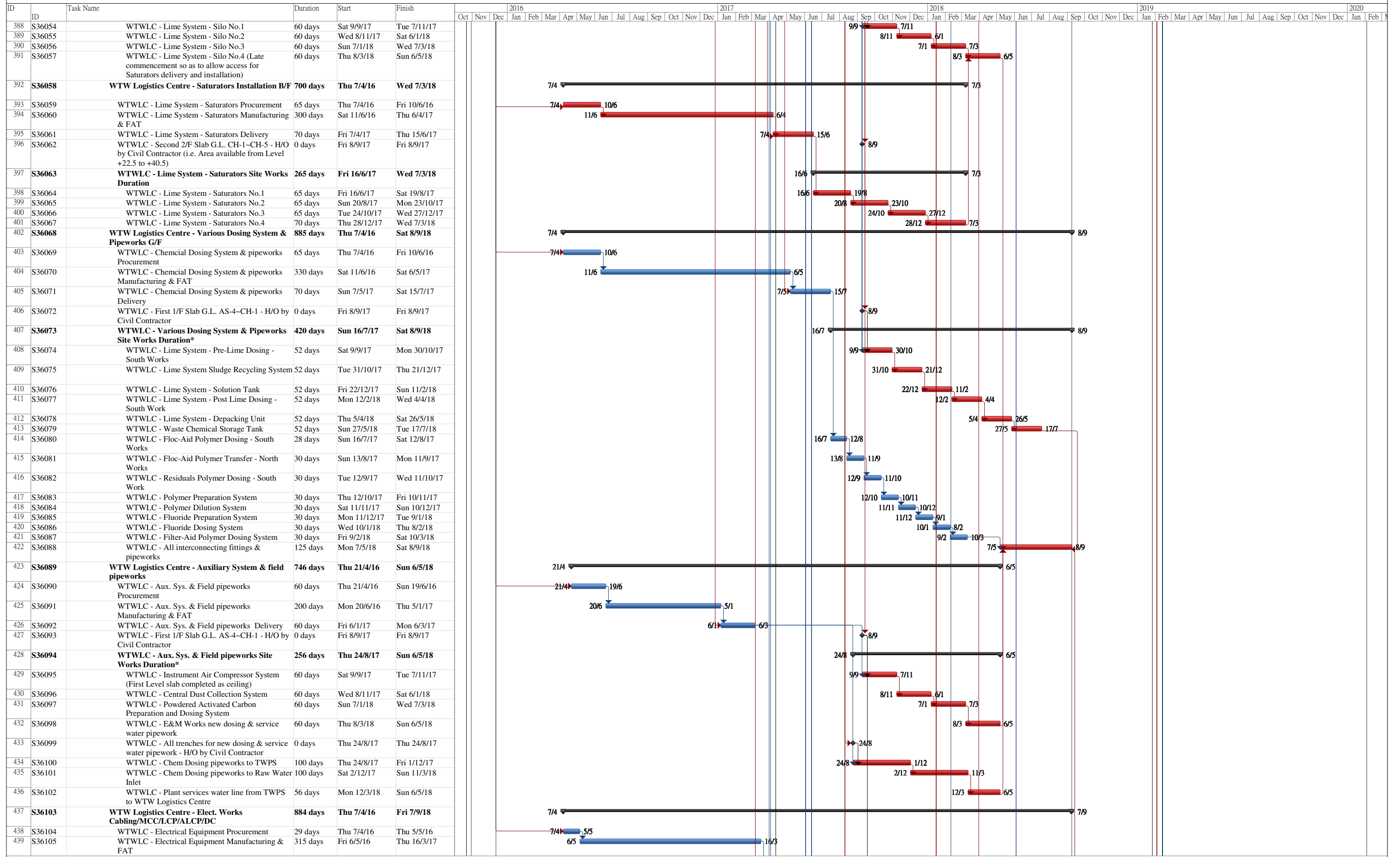


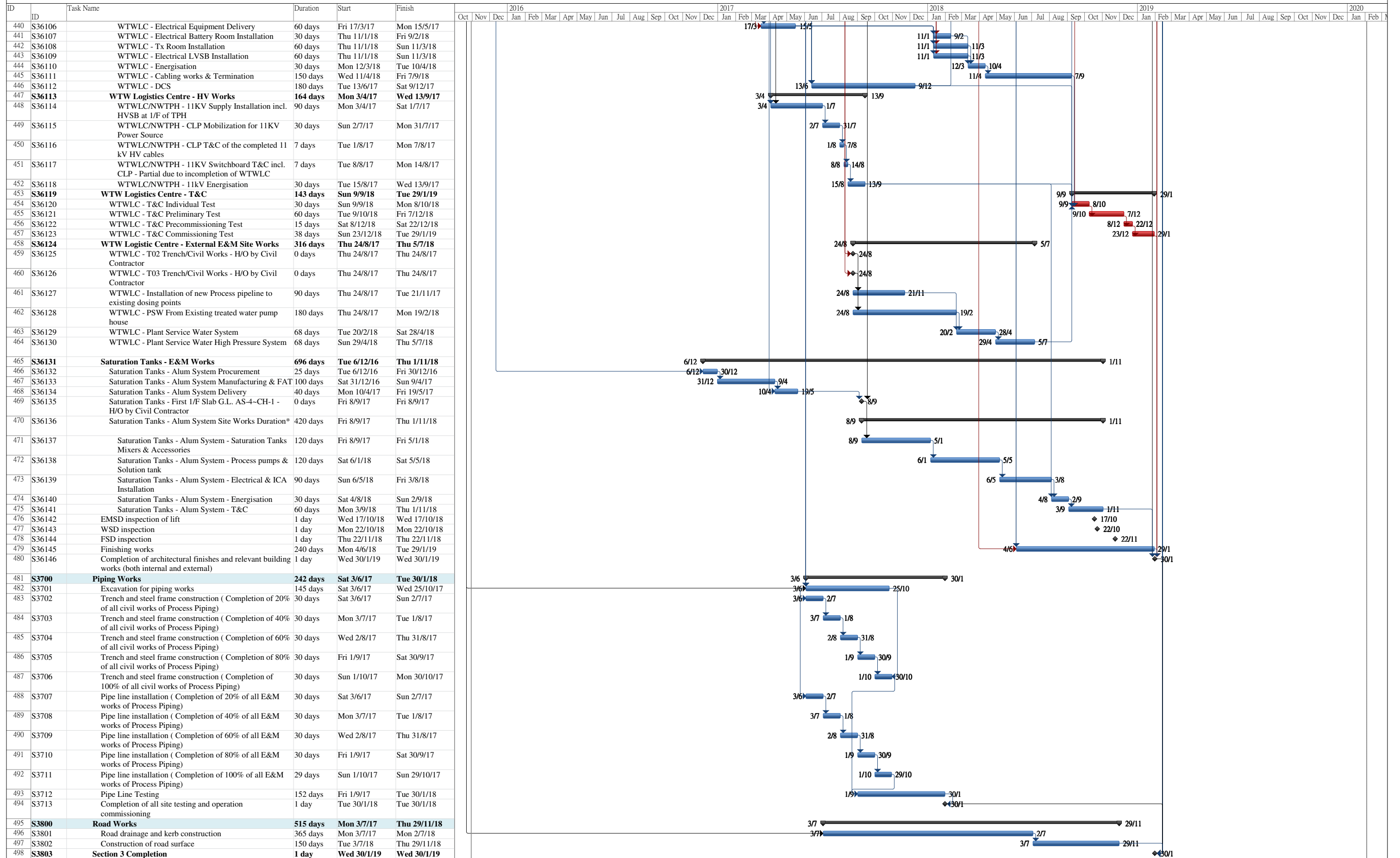


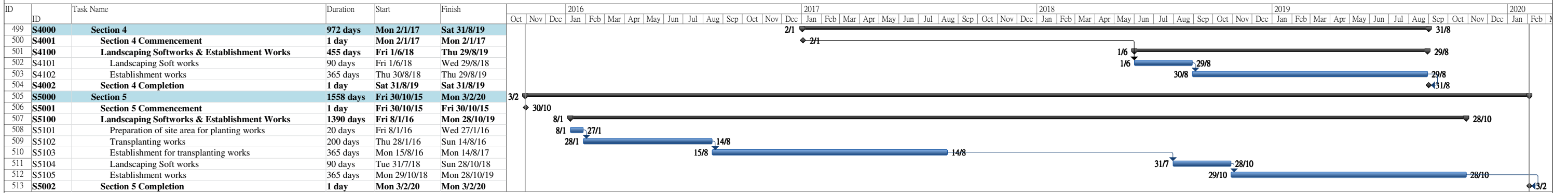








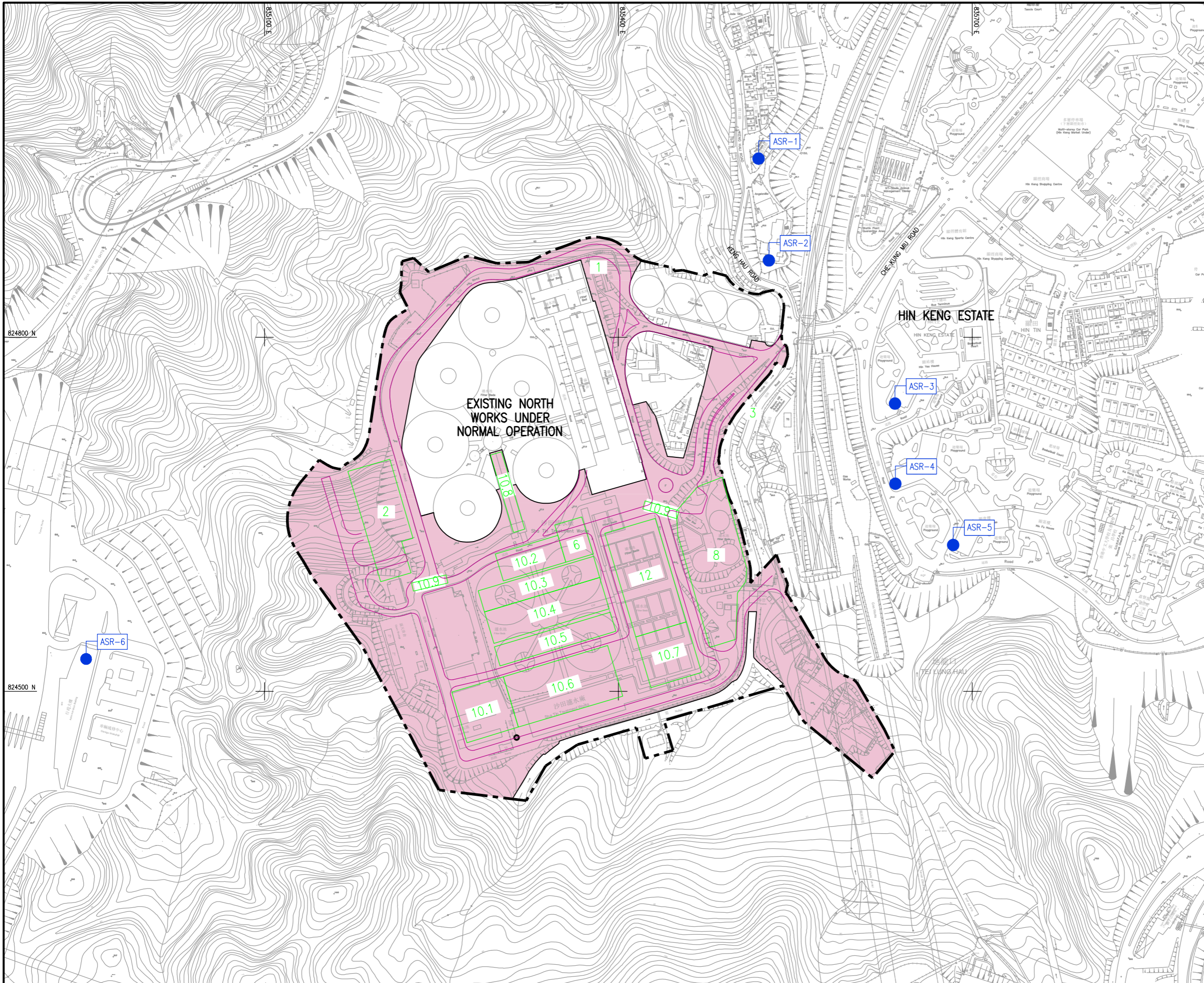




Critical Split ..... Task [Blue Bar] Milestone ◆ Summary [Black Arrow] Manual Summary [Grey Arrow] Critical [Red Bar]

# Appendix D

## Location of Construction Activities



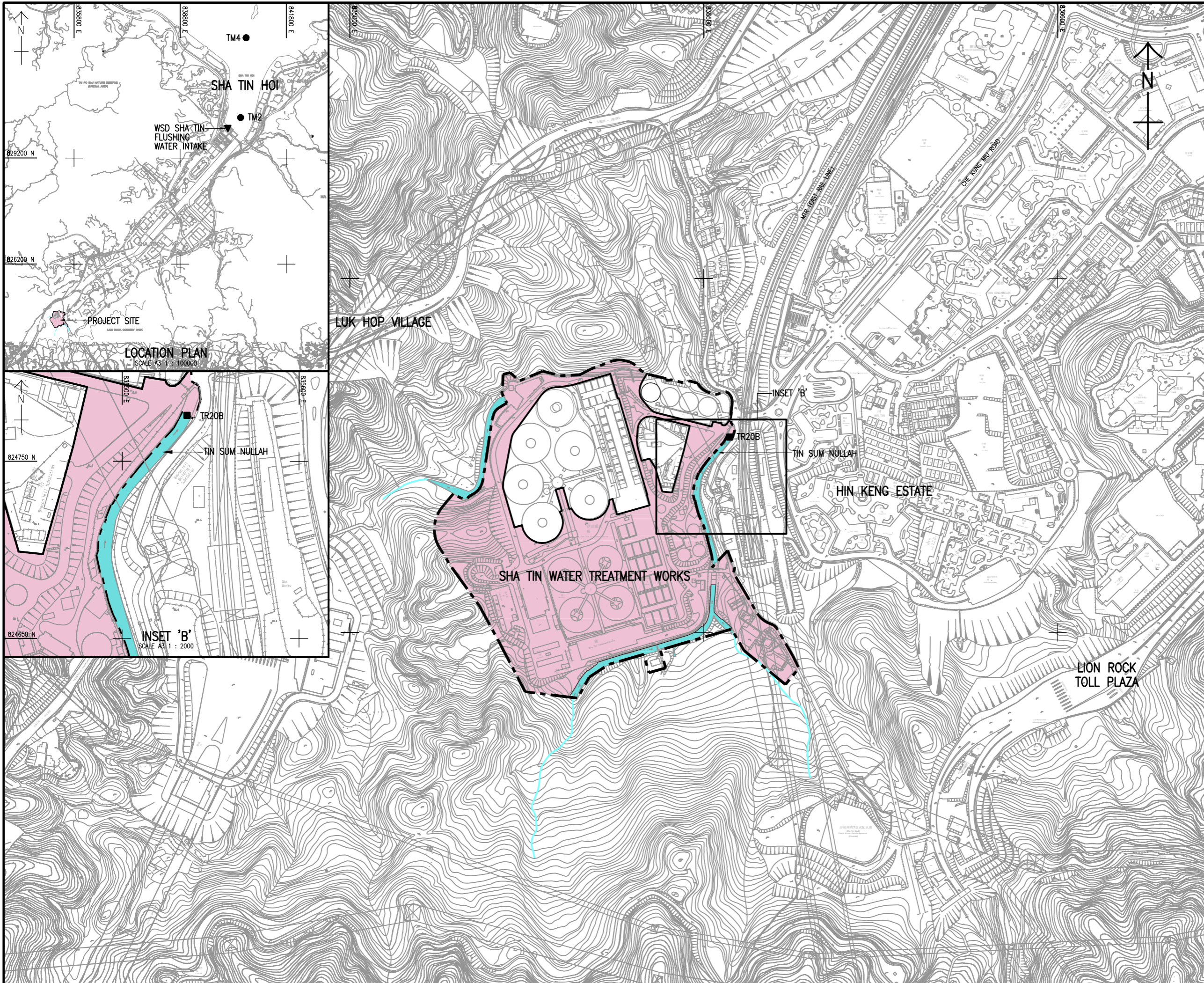
**LEGEND:**

|       |   |
|-------|---|
|       | SITE BOUNDARY OF SHA TIN WATER TREATMENT WORKS  |
|       | WORKS AREA                                      |
|       | RESPRESENTATIVE AIR SENSITIVE RECEIVERS (ASRS)  |
| ASR-1 | THE BLOSSOM PHASE 4                             |
| ASR-2 | THE L LOUEY                                     |
| ASR-3 | HIN KENG ESTATE - HIN YAU HOUSE                 |
| ASR-4 | HIN KENG ESTATE - HIN WAN HOUSE                 |
| ASR-5 | HIN KENG ESTATE - HIN KWAI HOUSE                |
| ASR-6 | SHA TIN HEIGHT TUNNEL ADMINISTRATION BUILDING   |
| 1     | RETAINING WALL AND NEW ACCESS ROAD              |
| 2     | WATER TREATMENT WORKS LOGISTICS CENTRE          |
| 3     | UPGRADED MAIN ENTRY ROAD                        |
| 6     | WASHWATER EQUALIZATION TANKS (NORTH WORKS)      |
| 8     | DEMOLITION OF EXISTING WASHWATER RECOVERY TANKS |
| 10    | CONSTRUCTION OF SOUTH WORKS                     |
| 10.1  | RESIDUAL MANAGEMENT FACILITIES                  |
| 10.2  | PRE-OZONATION HOUSE AND COAGULATION TANKS       |
| 10.3  | FLOCCULATION TANKS                              |
| 10.4  | HIGH RATE SEDIMENTATION TANKS                   |
| 10.5  | INTERMEDIATE OZONATION HOUSE                    |
| 10.6  | STAGE 1 BIOLOGICAL FILTERS                      |
| 10.7  | SOUTH WORKS PUMPING STATION                     |
| 10.8  | INLET CHANNEL STATIC MIXERS (NORTH WORKS)       |
| 10.9  | PEDESTRIAN WALKWAY                              |
| 12    | STAGE 2 GRANULAR MEDIA FILTERS & UV REACTORS    |
| 13    | OPERATION OF HAUL ROAD                          |

|   |   |                         |                      |                         |                |            |  |              |             |  |                           |        |  |
|---|---|-------------------------|----------------------|-------------------------|----------------|------------|--|--------------|-------------|--|---------------------------|--------|--|
| <p><b>水務署</b><br/>WATER SUPPLIES DEPARTMENT</p> <p>AGREEMENT NO. CE 13/2009 (WS)<br/>IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS - SOUTH WORKS<br/>DESIGN AND CONSTRUCTION</p> <p><b>LOCATIONS OF CONSTRUCTION WORKS AREA</b></p> <p><b>AECOM</b></p> <p>DRG. NO. 60162073/FIGURE 4.2</p> | <table border="1"> <tr> <td>DESIGNED BY<br/>設計</td> <td>CONTRACT NO.<br/>合約編號</td> <td>P. NO. APPROVED<br/>圖則編號</td> </tr> <tr> <td>DRAWN BY<br/>繪圖</td> <td>DATE<br/>日期</td> <td></td> </tr> <tr> <td>SCALE<br/>比例尺</td> <td colspan="2">A3 1 : 3000</td> </tr> <tr> <td>CONSTRUCTION AREA<br/>工程範圍</td> <td colspan="2">METRES</td> </tr> </table> <p>© COPYRIGHT RESERVED<br/>版權所有</p> | DESIGNED BY<br>設計       | CONTRACT NO.<br>合約編號 | P. NO. APPROVED<br>圖則編號 | DRAWN BY<br>繪圖 | DATE<br>日期 |  | SCALE<br>比例尺 | A3 1 : 3000 |  | CONSTRUCTION AREA<br>工程範圍 | METRES |  |
| DESIGNED BY<br>設計   | CONTRACT NO.<br>合約編號  | P. NO. APPROVED<br>圖則編號 |                      |                         |                |            |  |              |             |  |                           |        |  |
| DRAWN BY<br>繪圖  | DATE<br>日期  |                         |                      |                         |                |            |  |              |             |  |                           |        |  |
| SCALE<br>比例尺  | A3 1 : 3000   |                         |                      |                         |                |            |  |              |             |  |                           |        |  |
| CONSTRUCTION AREA<br>工程範圍   | METRES  |                         |                      |                         |                |            |  |              |             |  |                           |        |  |

# Appendix E

## Environmental Sensitive Receivers in the Vicinity of the Project



- LEGEND:**
- SITE BOUNDARY OF SHATIN WATER TREATMENT WORKS
  - WORKS AREA
  - INLAND WATER COURSE
  - EPD MARINE WATER QUALITY MONITORING STATION
  - EPD RIVER WATER QUALITY MONITORING STATION
  - WSD SHA TIN FLUSHING WATER INTAKE

| REV. | DESCRIPTION | BY | CHK. | DATE |
|------|-------------|----|------|------|
|      |             |    |      |      |

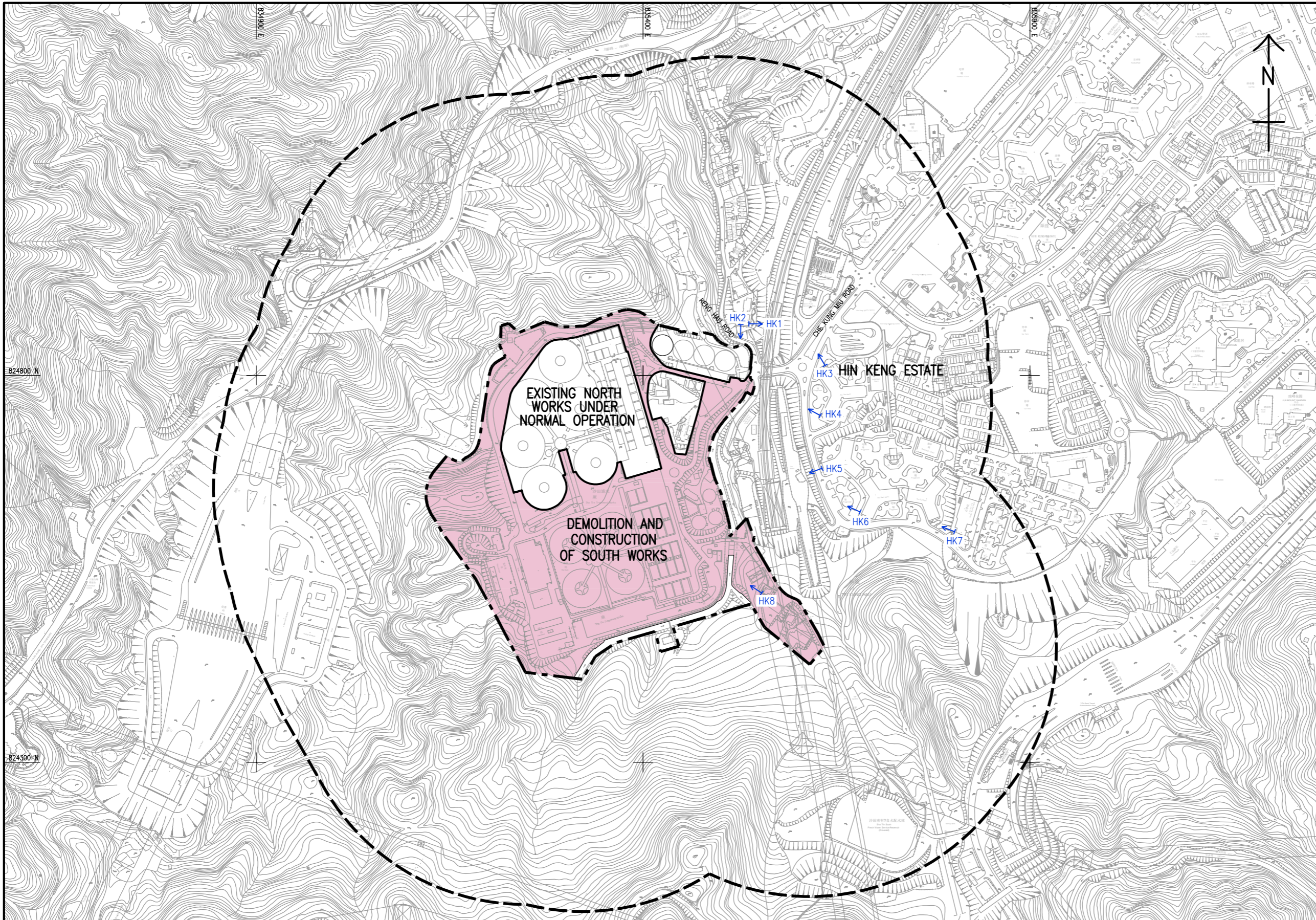
**水務署**  
**WATER SUPPLIES DEPARTMENT**  
 AGREEMENT NO. CE 13/2009 (WS)  
 IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS - SOUTH WORKS  
 DESIGN AND CONSTRUCTION

**LOCATIONS OF WATER SENSITIVE RECEIVERS**



|                              |                      |                        |
|------------------------------|----------------------|------------------------|
| DRG. NO.<br>圖紙編號             | 60162073/EIA/FIG 6.1 |                        |
| DESIGNED BY<br>設計            | CONTRACT NO.<br>合約編號 | P. No. APPROVED<br>批准人 |
| DRAWN BY<br>繪圖               | STATUS<br>階段         |                        |
| SCALE<br>比例                  | A3 1 : 5000          |                        |
| DIMENSIONS ARE IN<br>尺寸單位    | METRES               |                        |
| © COPYRIGHT RESERVED<br>版權所有 |                      |                        |





**LEGEND:**

- SITE BOUNDARY OF SHA TIN WATER TREATMENT WORKS
- 300m STUDY AREA
- WORKS AREA
- HK1 REPRESENTATIVE NOISE SENSITIVE RECEIVERS

| ID  | DESCRIPTION                            | CONSTRUCTION NOISE | OPERATIONAL FIXED PLANT NOISE |
|-----|--|--------------------|-------------------------------|
| HK1 | THE L LOUEY (EAST)                     | Y                  | Y                             |
| HK2 | THE L LOUEY (SOUTH)                    | Y                  | Y                             |
| HK3 | HIN KENG ESTATE, HIN YAU HOUSE (NORTH) | Y                  | Y                             |
| HK4 | HIN KENG ESTATE, HIN YAU HOUSE (SOUTH) | Y                  | Y                             |
| HK5 | HIN KENG ESTATE, HIN WAN HOUSE         | Y                  | Y                             |
| HK6 | HIN KENG ESTATE, HIN KWAI HOUSE        | Y                  | Y                             |
| HK7 | CUHKFAA THOMAS CHEUNG SCHOOL           | Y                  | Y                             |
| HK8 | SHA TIN WTW STAFF QUARTERS             | Y                  | Y                             |

|   |                      |                        |      |
|---|----------------------|------------------------|------|
| NO.   | DESCRIPTION          | DATE                   | CHK. |
|   |                      |                        |      |
| <b>水務署</b>  |                      |                        |      |
| <b>WATER SUPPLIES DEPARTMENT</b>                                      |                      |                        |      |
| AGREEMENT NO. CE 13/2009 (WS)   |                      |                        |      |
| IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS - SOUTH WORKS |                      |                        |      |
| DESIGN AND CONSTRUCTION   |                      |                        |      |
| <b>LOCATIONS OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS</b>          |                      |                        |      |
| <b>AECOM</b>  |                      |                        |      |
| DRG. NO.  | 60162073/EIA/FIG 5.1 |                        |      |
| 圖紙編號  | 60162073/EIA/FIG 5.1 |                        |      |
| DESIGNED BY   | CONTRACT NO.         | P. NO. APPROVED        |      |
| 繪圖  |                      | 圖號                     |      |
| DRAWN BY  | SCALE                | DRAWING AREA IN METRES |      |
| LJ  | A3 1 : 5000          | © COPYRIGHT RESERVED   |      |
|   |                      | 版權所有                   |      |



# Appendix F

## Summary of Action and Limit Levels

**Determination of Action and Limit Levels for Air Quality**

| <b>Monitoring Locations</b> | <b>Action Level<br/>1-hour TSP, (<math>\mu\text{g}/\text{m}^3</math>)</b> | <b>Limit Level<br/>1-hour TSP, (<math>\mu\text{g}/\text{m}^3</math>)</b> |
|-----------------------------|---|--|
| AM1                         | 357   | 500  |
| AM2                         | 334   | 500  |

**Determination of Action and Limit Levels for Noise**

| <b>Monitoring Location</b> | <b>Action Level</b>                       | <b>Limit Level in dB(A)</b>   |
|----------------------------|---|---|
|                            | 0700-1900 hours on normal weekdays        |   |
| NM1                        | When one documented complaint is received | For domestic premises: 75 dB(A) for NM1 & NM2   |
| NM2                        |   |   |
| NM3                        |   | For schools: 70dB(A) during normal teaching periods and 65 dB(A) during examination periods for NM3 |

**Determination of Action and Limit Levels for Water Quality**

| <b>Water monitoring stations</b> | <b>Dissolved Oxygen (mg/L)</b> |                    | <b>Suspended Solids (mg/L)</b> |                    | <b>Turbidity (NTU)</b> |                    | <b>pH</b>                    |                              |
|----------------------------------|--------------------------------|--------------------|--------------------------------|--------------------|------------------------|--------------------|------------------------------|------------------------------|
|                                  | <b>Action Level</b>            | <b>Limit Level</b> | <b>Action Level</b>            | <b>Limit Level</b> | <b>Action Level</b>    | <b>Limit Level</b> | <b>Action Level</b>          | <b>Limit Level</b>           |
| C1                               | 7.51                           | 7.44               | 4.19                           | 6.73               | 3.99                   | 4.00               | Beyond the range 6.6 to 7.9  | Beyond the range 6.5 to 8.0  |
| C2                               | 8.10                           | 7.98               | 4.33                           | 8.16               | 3.13                   | 3.28               | Beyond the range 6.6 to 8.8  | Beyond the range 6.5 to 8.9  |
| C3*                              | N/A                            | N/A                | N/A                            | N/A                | N/A                    | N/A                | N/A                          | N/A                          |
| M1                               | 8.90                           | 8.89               | 3.30                           | 3.56               | 4.36                   | 4.48               | Beyond the range 6.6 to 8.2  | Beyond the range 6.6 to 8.3  |
| M2                               | 8.92                           | 8.91               | 18.84                          | 26.80              | 12.64                  | 13.72              | Beyond the range 6.6 to 11.0 | Beyond the range 6.6 to 11.0 |
| M3                               | 9.16                           | 9.15               | 1.00                           | 1.00               | 1.10                   | 1.18               | Beyond the range 6.6 to 8.6  | Beyond the range 6.6 to 8.7  |

*Remark: For DO, action should be taken when monitoring result of either one of the surface, middle or bottom DO is lower than the proposed Action/Limit Levels.*

# Appendix G

## Event/Action Plan

# Air Quality

| EVENT   | ACTION  |  |   |  |
|---|---|--|---|--|
|   | ET  | IEC  | ER  | CONTRACTOR   |
| <b>ACTION LEVEL</b>                               |   |  |   |  |
| 1. Exceedance for one sample                      | <ul style="list-style-type: none"> <li>1. Inform the Contractor, IEC and ER;</li> <li>2. Discuss with the Contractor on the remedial measures required;</li> <li>3. Repeat measurement to confirm findings; and</li> <li>4. Increase monitoring frequency.</li> </ul>   | <ul style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET;</li> <li>2. Check Contractor's working method; and</li> <li>3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.</li> </ul> | <ul style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing.</li> </ul>  | <ul style="list-style-type: none"> <li>1. Identify source(s), investigate the causes of exceedance and propose remedial measures;</li> <li>2. Implement remedial measures; and</li> <li>3. Amend working methods agreed with the ER as appropriate.</li> </ul>                                   |
| 2. Exceedance for two or more consecutive samples | <ul style="list-style-type: none"> <li>1. Inform the Contractor, IEC and ER;</li> <li>2. Discuss with the ER and Contractor on the remedial measures required;</li> <li>3. Repeat measurements to confirm findings;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. If exceedance continues,</li> </ul> | <ul style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET;</li> <li>2. Check Contractor's working method; and</li> <li>3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.</li> </ul> | <ul style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Review and agree on the remedial measures proposed by the Contractor; and</li> <li>3. Supervise implementation of remedial measures.</li> </ul> | <ul style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance;</li> <li>2. Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification;</li> <li>3. Implement the agreed proposals; and</li> </ul> |

|                              |   |  |   |   |
|------------------------------|---|--|---|---|
|                              | arrange meeting with the IEC, ER and Contractor; and<br>6. If exceedance stops, cease additional monitoring.  |  |   | 4. Amend proposal as appropriate.   |
| <b>LIMIT LEVEL</b>           |   |  |   |   |
| <b>Event</b>                 | <b>ET</b>   | <b>IEC</b>   | <b>ER</b>   | <b>CONTRACTOR</b>   |
| 1. Exceedance for one sample | 1. Inform the Contractor, IEC, EPD and ER;<br>2. Repeat measurement to confirm findings;<br>3. Increase monitoring frequency to daily; and<br>4. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness. | 1. Check monitoring data submitted by the ET;<br>2. Check the Contractor's working method;<br>3. Discuss with the ET, ER and Contractor on possible remedial measures; and<br>4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures. | 1. Confirm receipt of notification of exceedance in writing;<br>2. Review and agree on the remedial measures proposed by the Contractor; and<br>3. Supervise implementation of remedial measures. | 1. Identify source(s) and investigate the causes of exceedance;<br>2. Take immediate action to avoid further exceedance;<br>3. Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification;<br>4. Implement the agreed proposals; and<br>5. Amend proposal if appropriate. |



|   | <b>ET</b>  | <b>IEC</b>  | <b>ER</b>  | <b>CONTRACTOR</b>  |
|---|--|---|--|--|
| 2. Exceedance for two or more consecutive samples | <p>1. Notify Contractor, IEC, EPD and ER;</p> <p>2. Repeat measurement to confirm findings;</p> <p>3. Increase monitoring frequency to daily;</p> <p>4. Carry out analysis of the Contractor's working procedures with the ER to determine possible mitigation to be implemented;</p> <p>5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken;</p> <p>6. Review the effectiveness of the Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and</p> <p>7. If exceedance stops, cease additional monitoring.</p> | <p>1. Check monitoring data submitted by the ET;</p> <p>2. Check the Contractor's working method;</p> <p>3. Discuss with ET, ER, and Contractor on the potential remedial measures; and</p> <p>4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.</p> | <p>1. Confirm receipt of notification of exceedance in writing;</p> <p>2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented;</p> <p>3. Supervise the implementation of remedial measures; and</p> <p>4. 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.</p> | <p>1. Identify source(s) and investigate the causes of exceedance;</p> <p>2. Take immediate action to avoid further exceedance;</p> <p>3. Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification;</p> <p>4. Implement the agreed proposals;</p> <p>5. Revise and resubmit proposals if problem still not under control; and</p> <p>6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.</p> |

# Noise

| EVENT               | ACTION  |   |   |  |
|---------------------|---|---|---|--|
|                     | ET  | IEC   | ER  | CONTRACTOR   |
| <b>ACTION LEVEL</b> | <p>1. Notify the Contractor, IEC and ER;</p> <p>2. Discuss with the ER and Contractor on the remedial measures required; and</p> <p>3. Increase monitoring frequency to check mitigation effectiveness.</p> | <p>1. Review the investigation results submitted by the Contractor; and</p> <p>2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.</p> | <p>1. Confirm receipt of notification of complaint in writing;</p> <p>2. Review and agree on the remedial measures proposed by the Contractor; and</p> <p>3. Supervise implementation of remedial measures.</p> | <p>1. Investigate the complaint and propose remedial measures;</p> <p>2. Report the results of investigation to the IEC, ET and ER;</p> <p>3. Submit noise mitigation proposals to the ER with copy to the IEC and ET within three working days of notification; and</p> <p>4. Implement noise mitigation proposals.</p> |
| <b>LIMIT LEVEL</b>  | <p>1. Notify the Contractor, IEC, EPD and ER;</p> <p>2. Repeat measurement to confirm findings;</p> <p>3. Increase monitoring frequency;</p> <p>4. Carry out analysis of</p>                                | <p>1. Check monitoring data submitted by the ET;</p> <p>2. Check the Contractor's working method;</p> <p>3. Discuss with the ER, ET and Contractor on the potential remedial measures;</p>      | <p>1. Confirm receipt of notification of failure in writing;</p> <p>2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be</p>  | <p>1. Identify source and investigate the causes of exceedance;</p> <p>2. Take immediate action to avoid further exceedance;</p> <p>3. Submit proposals for remedial measures to the ER</p>  |

|  |  |  |   |  |
|--|--|--|---|--|
|  | <p>Contractor's working procedures to determine possible mitigation to be implemented;</p> <p>5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken;</p> <p>6. Review the effectiveness of Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and</p> <p>7. If exceedance stops, cease</p> | <p>and</p> <p>4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.</p> | <p>implemented;</p> <p>3. Supervise the implementation of remedial measures; and</p> <p>4. 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.</p> | <p>with copy to the IEC and ET within three working days of notification;</p> <p>4. Implement the agreed proposals;</p> <p>5. Revise and resubmit proposals if problem still not under control; and</p> <p>6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.</p> |
|--|--|--|---|--|

# Water Quality

| EVENT   | ACTION   |  |   |   |
|---|--|--|---|---|
|   | ET Leader  | IEC  | ER  | CONTRACTOR  |
| Action level being exceeded by one sampling day | <ul style="list-style-type: none"> <li>● Repeat <i>in situ</i> measurement to confirm findings;</li> <li>● Identify reasons for non-compliance and source(s) of impact;</li> <li>● Inform IEC and Contractor;</li> <li>● Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>● Discuss mitigation measures with IEC and Contractor;</li> <li>● Repeat measurement on next day of exceedance.</li> </ul> | <ul style="list-style-type: none"> <li>● Discuss with ET and Contractor on the mitigation measures;</li> <li>● Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>● Assess the effectiveness of the Implemented mitigation measures.</li> </ul> | <ul style="list-style-type: none"> <li>● Discuss with IEC on the proposed mitigation measures;</li> <li>● Make agreement on the mitigation measures to be implemented.</li> <li>● Assess the effectiveness of the implemented mitigation measures.</li> </ul> | <ul style="list-style-type: none"> <li>● Inform the ER and confirm notification of the non-compliance in writing;</li> <li>● Rectify unacceptable practice;</li> <li>● Check all plant and equipment;</li> <li>● Consider changes of working methods;</li> <li>● Discuss with ET and IEC and propose mitigation measures to IEC and ER;</li> <li>● Implement the agreed mitigation measures.</li> </ul> |

|   | <b>ET Leader</b>   | <b>IEC</b>   | <b>ER</b>   | <b>CONTRACTOR</b>   |
|---|--|--|---|---|
| Action level being exceeded by more than one consecutive sampling day | <ul style="list-style-type: none"> <li>● Repeat <i>in situ</i> measurement to confirm findings;</li> <li>● Identify reasons for non-compliance and source(s) of impact;</li> <li>● Inform IEC and Contractor;</li> <li>● Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>● Discuss mitigation measures with IEC and Contractor;</li> <li>● Ensure mitigation measures are implemented;</li> <li>● Prepare to increase the monitoring frequency to daily;</li> </ul> | <ul style="list-style-type: none"> <li>● Discuss with ET and Contractor on the mitigation measures;</li> <li>● Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>● Assess the effectiveness of the implemented mitigation measures.</li> </ul> | <ul style="list-style-type: none"> <li>● Discuss with IEC on the proposed mitigation measures;</li> <li>● Make agreement on the mitigation measures to be implemented;</li> <li>● Assess the effectiveness of the implemented mitigation measures.</li> </ul> | <ul style="list-style-type: none"> <li>● Inform the ER and confirm notification of the non-compliance in writing;</li> <li>● Rectify unacceptable practice;</li> <li>● Check all plant and equipment;</li> <li>● Consider changes of working methods;</li> <li>● Discuss with ET and IEC and propose mitigation measures to IEC and ER within three working days;</li> <li>● Implement the agreed mitigation measures.</li> </ul> |

|  |  |  |  |   |
|--|--|--|--|---|
|  | <ul style="list-style-type: none"> <li>● Repeat measurement on next day of exceedance.</li> </ul>  |  |  |   |
|  | <b>ET Leader</b>   | <b>IEC</b>   | <b>ER</b>  | <b>CONTRACTOR</b>   |
| Limit level being exceeded by one sampling day | <ul style="list-style-type: none"> <li>● Repeat <i>in situ</i> measurement to confirm findings;</li> <li>● Identify reasons for non-compliance and source(s) of impact;</li> <li>● Inform IEC Contractor and EPD;</li> <li>● Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>● Discuss mitigation measures with IEC, ER and Contractor;</li> <li>● Ensure mitigation measures are implemented;</li> </ul> | <ul style="list-style-type: none"> <li>● Discuss with ET and Contractor on the mitigation measures;</li> <li>● Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>● Assess the effectiveness of the implemented mitigation measures.</li> </ul> | <ul style="list-style-type: none"> <li>● Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>● Request Contractor to critically review the working methods;</li> <li>● Make agreement on the mitigation measures to be implemented;</li> <li>● Assess the effectiveness of the implemented mitigation measures.</li> </ul> | <ul style="list-style-type: none"> <li>● Inform the ER and confirm notification of the non-compliance in writing;</li> <li>● Rectify unacceptable practice;</li> <li>● Check all plant and equipment;</li> <li>● Consider changes of working methods;</li> <li>● Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within three working days;</li> <li>● Implement the agreed mitigation measures.</li> </ul> |



|  |   |  |   |   |
|--|---|--|---|---|
|  | <ul style="list-style-type: none"> <li>● Increase the monitoring frequency to daily until no exceedance of Limit level.</li> </ul>  |  |   |   |
|  | <b>ET Leader</b>  | <b>IEC</b>   | <b>ER</b>   | <b>CONTRACTOR</b>   |
| Limit level being exceeded by more than one consecutive sampling day | <ul style="list-style-type: none"> <li>● Repeat <i>in situ</i> measurement to confirm findings;</li> <li>● Identify reasons for non-compliance and source(s) of impact;</li> <li>● Inform IEC Contractor and EPD;</li> <li>● Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>● Discuss mitigation measures with IEC, ER and Contractor;</li> <li>● Ensure mitigation measures are</li> </ul> | <ul style="list-style-type: none"> <li>● Discuss with ET and Contractor on the mitigation measures;</li> <li>● Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>● Assess the effectiveness of the implemented mitigation measures.</li> </ul> | <ul style="list-style-type: none"> <li>● Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>● Request Contractor to critically review the working methods;</li> <li>● Make agreement on the mitigation measures to be implemented;</li> <li>● Assess the effectiveness of the implemented mitigation measures;</li> <li>● Consider and instruct, if necessary, the Contractor to slow</li> </ul> | <ul style="list-style-type: none"> <li>● Inform the ER and confirm notification of the non-compliance in writing;</li> <li>● Rectify unacceptable practice;</li> <li>● Check all plant and equipment;</li> <li>● Consider changes of working methods;</li> <li>● Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within three working days;</li> <li>● Implement the agreed mitigation measures;</li> </ul> |

|  |  |  |  |  |
|--|--|--|--|--|
|  | implemented; Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. |  | down or to stop all or part of the construction activities until no exceedance of Limit level. | <ul style="list-style-type: none"><li>● As directed by the ER, to slow down or to stop all or part of the construction activities.</li></ul> |
|--|--|--|--|--|

# Appendix H

## Impact Monitoring Schedules

Impact Monitoring Schedule for STWTW

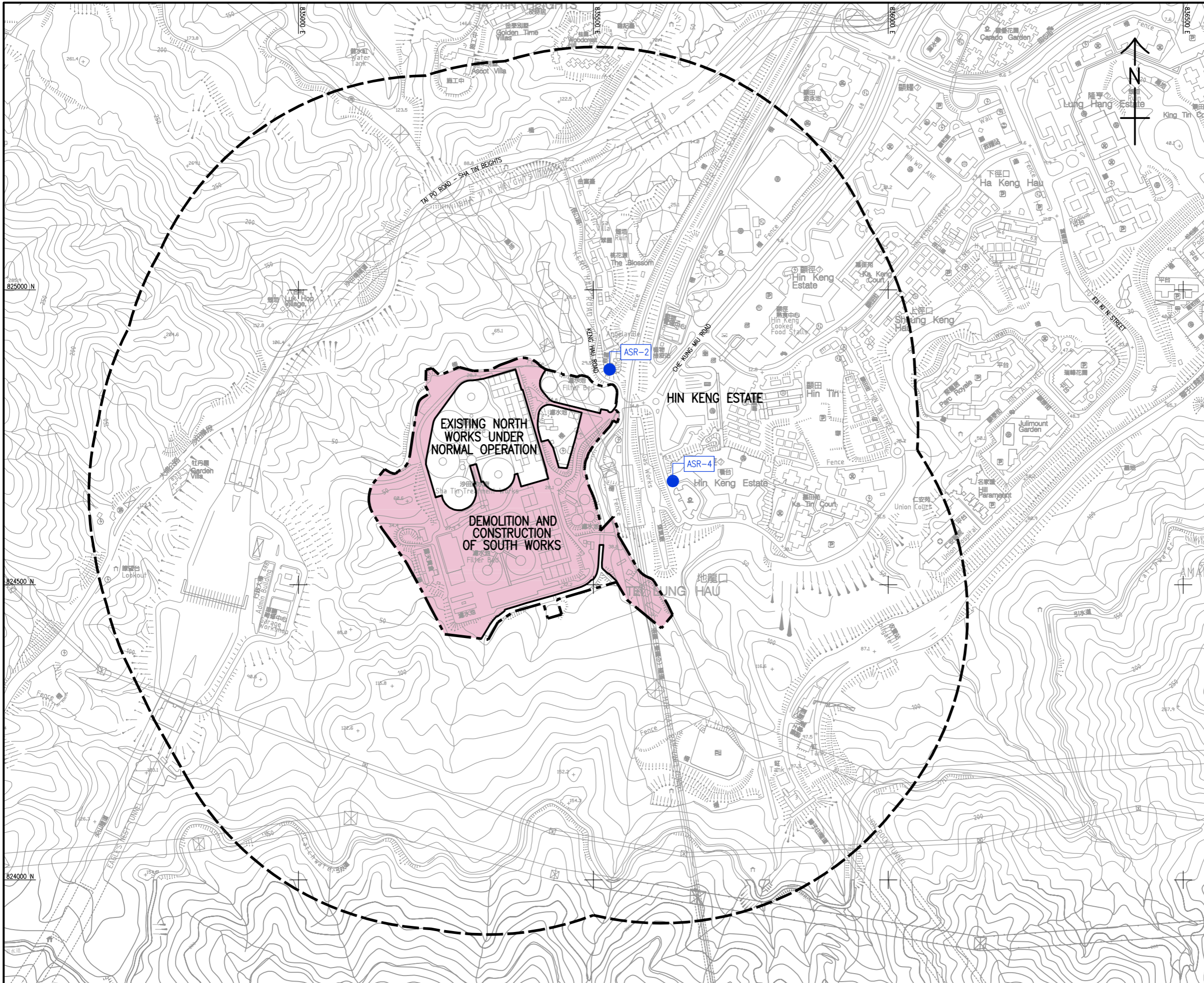
| Jul 19 |   |   |   |  |   |  |
|--------|---|---|---|--|---|--|
| Sun    | Mon   | Tue   | Wed   | Thur   | Fri   | Sat  |
|        | 1   | 2   | 3   | 4  | 5   | 6  |
|        |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3 |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3 |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3 |
| 7      | 8   | 9   | 10  | 11   | 12  | 13   |
|        | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  |  | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 |  |
| 14     | 15  | 16  | 17  | 18   | 19  | 20   |
|        | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3 |  | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  |  |
| 21     | 22  | 23  | 24  | 25   | 26  | 27   |
|        | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  |  | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 |  |
| 28     | 29  | 30  | 31  |  |   |  |
|        | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  |   |   |  |   |  |

Impact Monitoring Schedule for STWTW

| Aug 19    |  |           |  |   |  |  |
|-----------|--|-----------|--|---|--|--|
| Sun       | Mon  | Tue       | Wed  | Thur  | Fri  | Sat  |
|           |  |           |  | <p>1</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>2</p>   | <p>3</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p> |
| <p>4</p>  | <p>5</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>   | <p>6</p>  | <p>7</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p>  | <p>8</p>  | <p>9</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>   | <p>10</p>  |
| <p>11</p> | <p>12</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>13</p> | <p>14</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>  | <p>15</p>   | <p>16</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>17</p>  |
| <p>18</p> | <p>19</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>  | <p>20</p> | <p>21</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>22</p>   | <p>23</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>  | <p>24</p>  |
| <p>25</p> | <p>26</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>27</p> | <p>28</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>  | <p>29</p>   | <p>30</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>31</p>  |

# Appendix I

## Location Plan of Air Quality Monitoring Station



- LEGEND:**
- SITE BOUNDARY OF SHA TIN WATER TREATMENT WORKS
  - STUDY AREA (500m BOUNDARY)
  - WORKS AREA
  - REPRESENTATIVE AIR SENSITIVE RECEIVERS (ASRS)
  - ASR-2 THE L LOUEY
  - ASR-4 HIN KENG ESTATE - HIN WAN HOUSE

| REV. | DESCRIPTION | BY | CHK. | DATE |
|------|-------------|----|------|------|
|      |             |    |      |      |

**水務署**  
**WATER SUPPLIES DEPARTMENT**  
 AGREEMENT NO. CE 13/2009 (WS)  
 IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS - SOUTH WORKS  
 DESIGN AND CONSTRUCTION

**LOCATIONS OF PROPOSED DUST MONITORING STATIONS**

**AECOM**

|                                     |                              |                         |
|-------------------------------------|------------------------------|-------------------------|
| DRG. NO.<br>圖紙編號                    | 60162073/EM&A/FIG 3          |                         |
| DESIGNED BY<br>設計                   | CONTRACT NO.<br>合約編號         | P. NO. APPROVED<br>批准頁數 |
| DRAWN BY<br>繪圖                      | DATE<br>日期                   |                         |
| SCALE<br>比例                         | A3 1 : 6000                  |                         |
| CONSTRUCTION AREA IN METRES<br>工程範圍 | © COPYRIGHT RESERVED<br>版權所有 |                         |

# Appendix J

## Calibration Certificates

### (Air Monitoring)



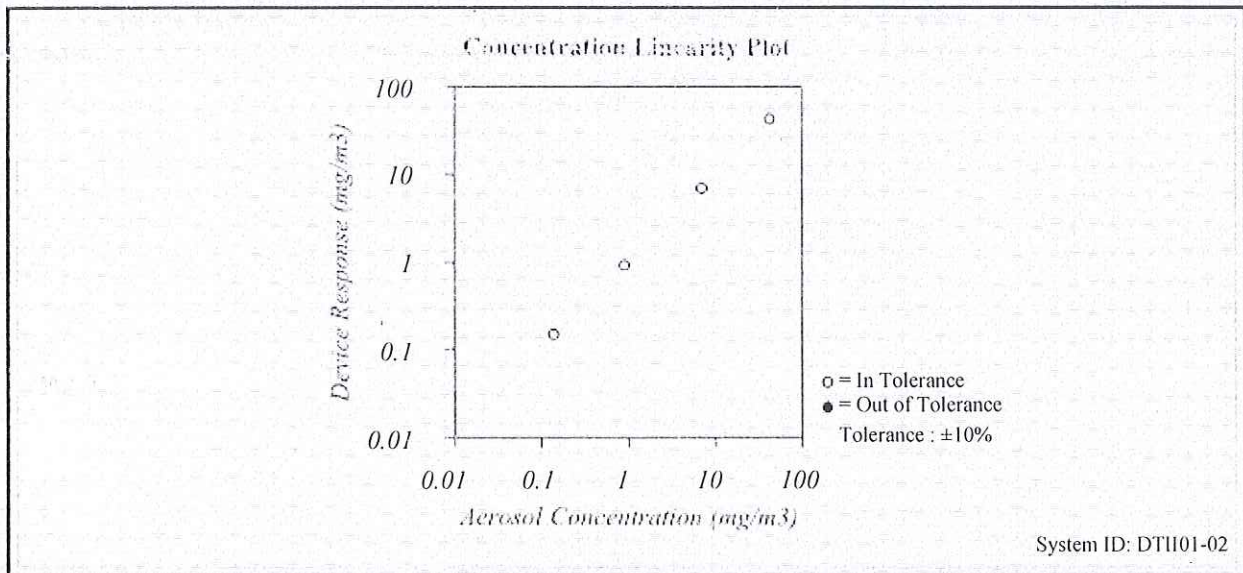


# CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
 Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

|                        |               |            |               |            |
|------------------------|---------------|------------|---------------|------------|
| Environment Conditions |               |            | Model         | 8532       |
| Temperature            | 75.43 (24.1)  | °F (°C)    | Serial Number | 8532120909 |
| Relative Humidity      | 28.7          | %RH        |               |            |
| Barometric Pressure    | 29.06 (984.1) | inHg (hPa) |               |            |

|  |  |
|--|--|
| <input type="checkbox"/> As Left             | <input checked="" type="checkbox"/> In Tolerance |
| <input checked="" type="checkbox"/> As Found | <input type="checkbox"/> Out of Tolerance        |



| FLOW AND PRESSURE VERIFICATION |          |          |                 | SYSTEM DT1101-02 |          |          |                 |
|--------------------------------|----------|----------|-----------------|------------------|----------|----------|-----------------|
| Parameter                      | Standard | Measured | Allowable Range | Parameter        | Standard | Measured | Allowable Range |
| Flow lpm                       | 3.00     | 2.97     | 2.85 ~ 3.15     | Pressure kPa     | 98.4     | 98.3     | 93.48 ~ 103.32  |

Pump run time: 3001 Hours, Pump voltage: 617 Bits

*TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and its customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1*

| Measurement Variable | System ID | Last Cal. | Cal. Due | Measurement Variable | System ID | Last Cal. | Cal. Due |
|----------------------|-----------|-----------|----------|----------------------|-----------|-----------|----------|
| Temp/Humidity        | E005657   | 02-15-19  | 02-29-20 | Temp/Humidity        | E005656   | 02-19-19  | 02-29-20 |
| DC Voltage           | E003314   | 02-25-19  | 02-29-20 | DC Voltage           | E003315   | 02-25-19  | 02-29-20 |
| Photometer           | E003319   | 02-22-19  | 08-31-19 | Microbalance         | M001324   | 10-03-18  | 10-31-20 |
| 1 µm PSL             | 698880    | n/a       | n/a      | 3 µm PSL             | 180387    | n/a       | n/a      |
| 10 µm PSL            | 198441    | n/a       | n/a      | Pressure             | E003511   | 10-29-18  | 10-31-19 |
| Flowmeter            | E004025   | 06-06-18  | 06-30-19 |                      |           |           |          |

\_\_\_\_\_  
 Verified

March 4, 2019  
 \_\_\_\_\_  
 Date

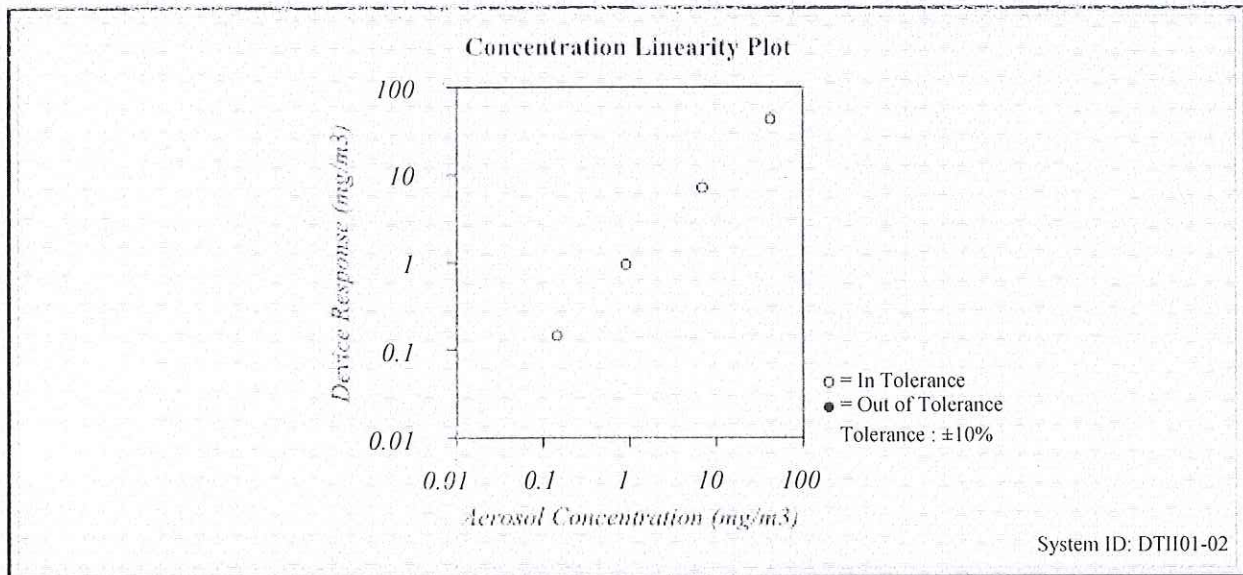


# CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
 Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

|                        |               |            |               |            |
|------------------------|---------------|------------|---------------|------------|
| Environment Conditions |               |            | Model         | 8532       |
| Temperature            | 74.49 (23.6)  | °F (°C)    | Serial Number | 8532120909 |
| Relative Humidity      | 28.3          | %RH        |               |            |
| Barometric Pressure    | 29.00 (982.1) | inHg (hPa) |               |            |

|   |  |
|---|--|
| <input checked="" type="checkbox"/> As Left | <input checked="" type="checkbox"/> In Tolerance |
| <input type="checkbox"/> As Found           | <input type="checkbox"/> Out of Tolerance        |



| FLOW AND PRESSURE VERIFICATION |          |          |                 | SYSTEM DTH101-02 |          |          |                 |
|--------------------------------|----------|----------|-----------------|------------------|----------|----------|-----------------|
| Parameter                      | Standard | Measured | Allowable Range | Parameter        | Standard | Measured | Allowable Range |
| Flow lpm                       | 3.00     | 3.05     | 2.91 ~ 3.09     | Pressure kPa     | 98.2     | 98.2     | 93.31 ~ 103.13  |

*TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1*

| Measurement Variable | System ID | Last Cal. | Cal. Due | Measurement Variable | System ID | Last Cal. | Cal. Due |
|----------------------|-----------|-----------|----------|----------------------|-----------|-----------|----------|
| Temp/Humidity        | E005657   | 02-15-19  | 02-29-20 | Temp/Humidity        | E005656   | 02-19-19  | 02-29-20 |
| DC Voltage           | E003314   | 02-25-19  | 02-29-20 | DC Voltage           | E003315   | 02-25-19  | 02-29-20 |
| Photometer           | E003319   | 02-22-19  | 08-31-19 | Microbalance         | M001324   | 10-03-18  | 10-31-20 |
| 1 um PSL             | 698880    | n/a       | n/a      | 3 um PSL             | 180387    | n/a       | n/a      |
| 10 um PSL            | 198441    | n/a       | n/a      | Pressure             | E003511   | 10-29-18  | 10-31-19 |
| Flowmeter            | E004025   | 06-06-18  | 06-30-19 |                      |           |           |          |

*John Fawcett*  
 \_\_\_\_\_  
 Calibrated

March 4, 2019

\_\_\_\_\_  
 Date

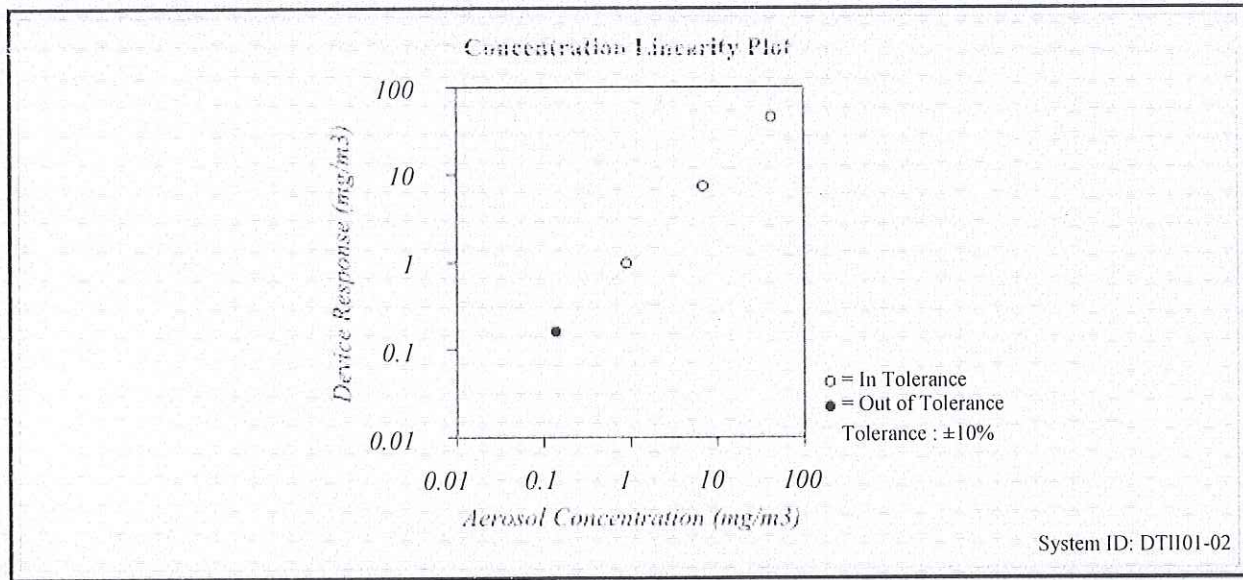


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 Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

|                        |               |            |               |                   |
|------------------------|---------------|------------|---------------|-------------------|
| Environment Conditions |               |            | Model         | <b>8532</b>       |
| Temperature            | 75.4 (24.1)   | °F (°C)    | Serial Number | <b>8532114409</b> |
| Relative Humidity      | 29            | %RH        |               |                   |
| Barometric Pressure    | 29.06 (984.1) | inHg (hPa) |               |                   |

|  |  |
|--|--|
| <input type="checkbox"/> As Left             | <input type="checkbox"/> In Tolerance                |
| <input checked="" type="checkbox"/> As Found | <input checked="" type="checkbox"/> Out of Tolerance |



| FLOW AND PRESSURE VERIFICATION |          |          |                 | SYSTEM DT1101-02 |          |          |                 |
|--------------------------------|----------|----------|-----------------|------------------|----------|----------|-----------------|
| Parameter                      | Standard | Measured | Allowable Range | Parameter        | Standard | Measured | Allowable Range |
| Flow lpm                       | 3.00     | 2.99     | 2.85 ~ 3.15     | Pressure kPa     | 98.4     | 98.3     | 93.45 ~ 103.28  |

Pump run time: 2551 Hours. Pump voltage: 617 Bits

*TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1*

| Measurement Variable | System ID | Last Cal. | Cal. Due | Measurement Variable | System ID | Last Cal. | Cal. Due |
|----------------------|-----------|-----------|----------|----------------------|-----------|-----------|----------|
| Temp/Humidity        | E005657   | 02-15-19  | 02-29-20 | Temp/Humidity        | E005656   | 02-19-19  | 02-29-20 |
| DC Voltage           | E003314   | 02-25-19  | 02-29-20 | DC Voltage           | E003315   | 02-25-19  | 02-29-20 |
| Photometer           | E003319   | 02-22-19  | 08-31-19 | Microbalance         | M001324   | 10-03-18  | 10-31-20 |
| 1 um PSL             | 698880    | n/a       | n/a      | 3 um PSL             | 180387    | n/a       | n/a      |
| 10 um PSL            | 198441    | n/a       | n/a      | Pressure             | E003511   | 10-29-18  | 10-31-19 |
| Flowmeter            | E004025   | 06-06-18  | 06-30-19 |                      |           |           |          |

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 Verified

March 4, 2019  


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 Date

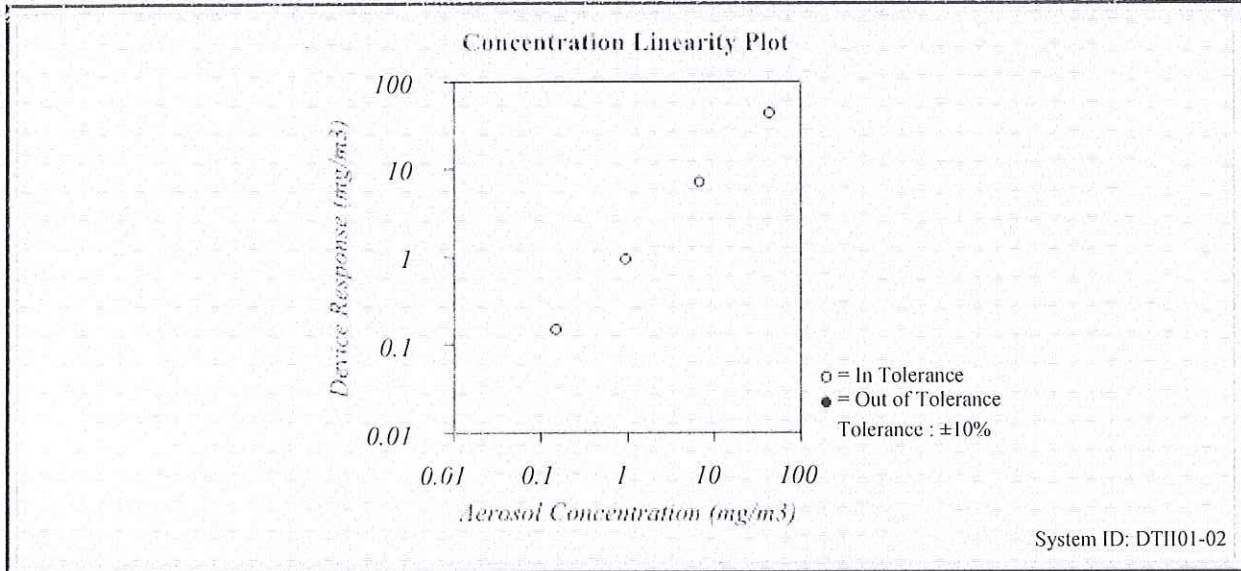


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 Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

|                        |               |            |               |                   |
|------------------------|---------------|------------|---------------|-------------------|
| Environment Conditions |               |            | Model         | <b>8532</b>       |
| Temperature            | 74.4 (23.6)   | °F (°C)    | Serial Number | <b>8532114409</b> |
| Relative Humidity      | 31            | %RH        |               |                   |
| Barometric Pressure    | 29.00 (982.1) | inHg (hPa) |               |                   |

|   |  |
|---|--|
| <input checked="" type="checkbox"/> As Left | <input checked="" type="checkbox"/> In Tolerance |
| <input type="checkbox"/> As Found           | <input type="checkbox"/> Out of Tolerance        |



| FLOW AND PRESSURE VERIFICATION |          |          |                 | SYSTEM DTH101-02 |          |          |                 |
|--------------------------------|----------|----------|-----------------|------------------|----------|----------|-----------------|
| Parameter                      | Standard | Measured | Allowable Range | Parameter        | Standard | Measured | Allowable Range |
| Flow lpm                       | 3.00     | 3.05     | 2.91 ~ 3.09     | Pressure kPa     | 98.2     | 98.2     | 93.25 ~ 103.07  |

*TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1*

| <table border="0" style="width: 100%;"> <tr> <th>Measurement Variable</th> <th>System ID</th> <th>Last Cal.</th> <th>Cal. Due</th> </tr> <tr> <td>Temp/Humidity</td> <td>E005657</td> <td>02-15-19</td> <td>02-29-20</td> </tr> <tr> <td>DC Voltage</td> <td>E003314</td> <td>02-25-19</td> <td>02-29-20</td> </tr> <tr> <td>Photometer</td> <td>E003319</td> <td>02-22-19</td> <td>08-31-19</td> </tr> <tr> <td>1 um PSL</td> <td>698880</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>10 um PSL</td> <td>198441</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Flowmeter</td> <td>E004025</td> <td>06-06-18</td> <td>06-30-19</td> </tr> </table> | Measurement Variable | System ID | Last Cal. | Cal. Due | Temp/Humidity | E005657 | 02-15-19 | 02-29-20 | DC Voltage | E003314 | 02-25-19 | 02-29-20 | Photometer | E003319 | 02-22-19 | 08-31-19 | 1 um PSL | 698880 | n/a | n/a | 10 um PSL | 198441 | n/a | n/a | Flowmeter | E004025 | 06-06-18 | 06-30-19 | <table border="0" style="width: 100%;"> <tr> <th>Measurement Variable</th> <th>System ID</th> <th>Last Cal.</th> <th>Cal. Due</th> </tr> <tr> <td>Temp/Humidity</td> <td>E005656</td> <td>02-19-19</td> <td>02-29-20</td> </tr> <tr> <td>DC Voltage</td> <td>E003315</td> <td>02-25-19</td> <td>02-29-20</td> </tr> <tr> <td>Microbalance</td> <td>M001324</td> <td>10-03-18</td> <td>10-31-20</td> </tr> <tr> <td>3 um PSL</td> <td>180387</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Pressure</td> <td>E003511</td> <td>10-29-18</td> <td>10-31-19</td> </tr> </table> | Measurement Variable | System ID | Last Cal. | Cal. Due | Temp/Humidity | E005656 | 02-19-19 | 02-29-20 | DC Voltage | E003315 | 02-25-19 | 02-29-20 | Microbalance | M001324 | 10-03-18 | 10-31-20 | 3 um PSL | 180387 | n/a | n/a | Pressure | E003511 | 10-29-18 | 10-31-19 |
|--|----------------------|-----------|-----------|----------|---------------|---------|----------|----------|------------|---------|----------|----------|------------|---------|----------|----------|----------|--------|-----|-----|-----------|--------|-----|-----|-----------|---------|----------|----------|---|----------------------|-----------|-----------|----------|---------------|---------|----------|----------|------------|---------|----------|----------|--------------|---------|----------|----------|----------|--------|-----|-----|----------|---------|----------|----------|
| Measurement Variable   | System ID            | Last Cal. | Cal. Due  |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| Temp/Humidity  | E005657              | 02-15-19  | 02-29-20  |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| DC Voltage   | E003314              | 02-25-19  | 02-29-20  |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| Photometer   | E003319              | 02-22-19  | 08-31-19  |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| 1 um PSL   | 698880               | n/a       | n/a       |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| 10 um PSL  | 198441               | n/a       | n/a       |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| Flowmeter  | E004025              | 06-06-18  | 06-30-19  |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| Measurement Variable   | System ID            | Last Cal. | Cal. Due  |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| Temp/Humidity  | E005656              | 02-19-19  | 02-29-20  |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| DC Voltage   | E003315              | 02-25-19  | 02-29-20  |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| Microbalance   | M001324              | 10-03-18  | 10-31-20  |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| 3 um PSL   | 180387               | n/a       | n/a       |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |
| Pressure   | E003511              | 10-29-18  | 10-31-19  |          |               |         |          |          |            |         |          |          |            |         |          |          |          |        |     |     |           |        |     |     |           |         |          |          |   |                      |           |           |          |               |         |          |          |            |         |          |          |              |         |          |          |          |        |     |     |          |         |          |          |

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 Calibrated

March 4, 2019  

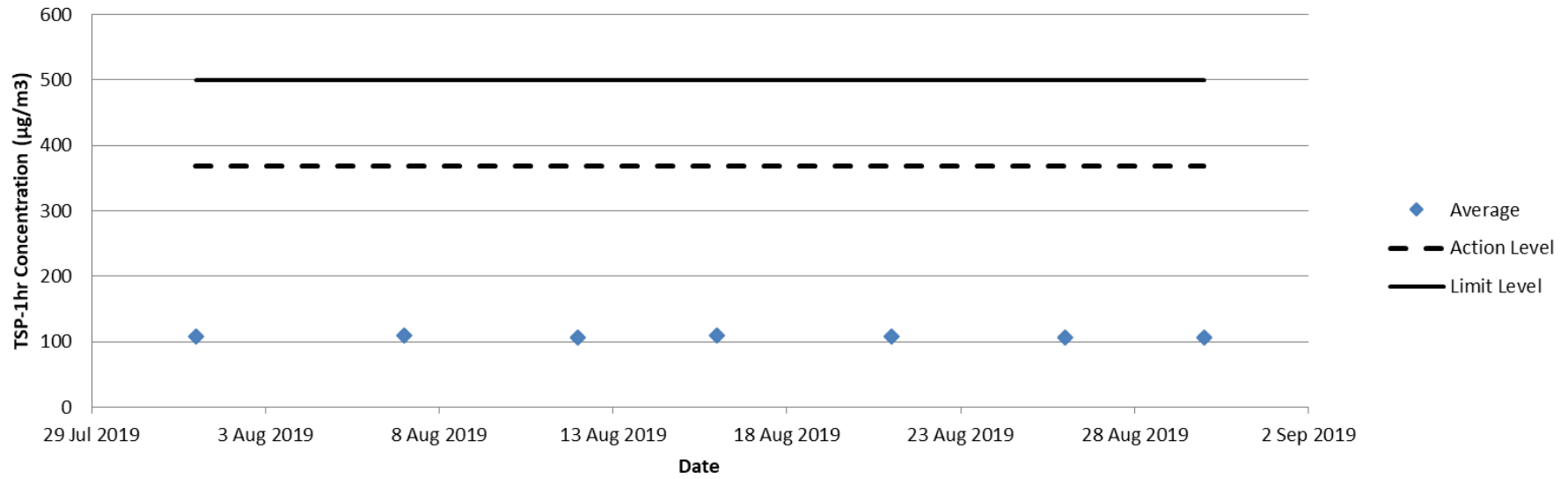

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 Date

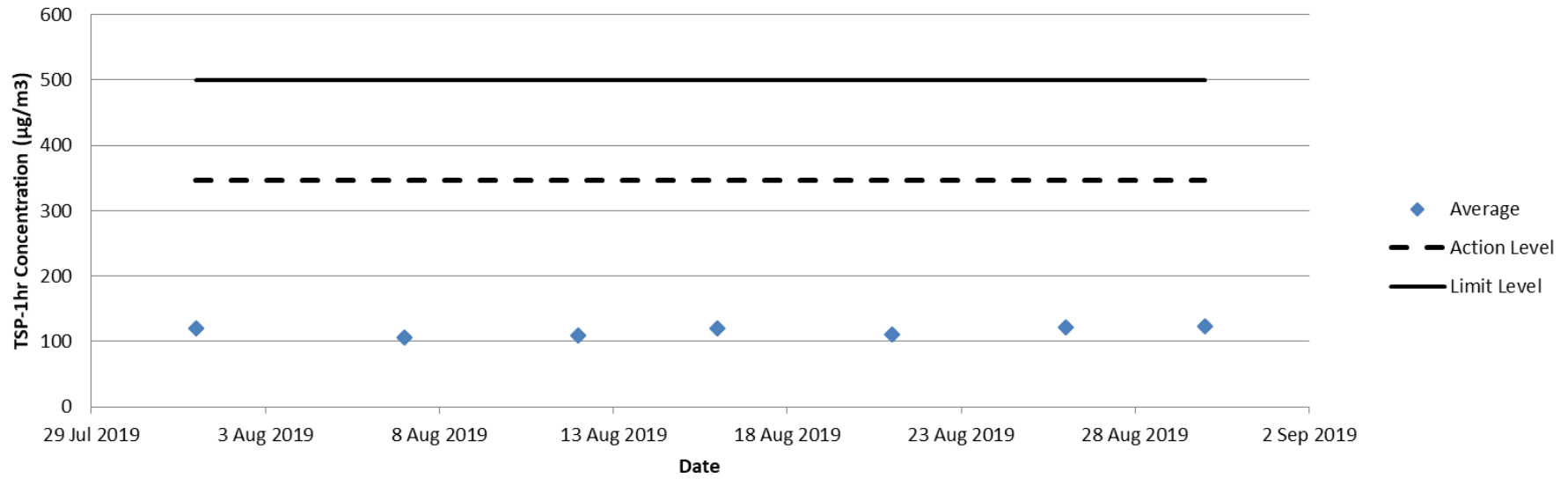
# Appendix K

## Impact Air Quality Monitoring Results and Graphical Presentation

## The Summary of TSP-1hr Concentration ( $\mu\text{g}/\text{m}^3$ ) at AM1 The L Louey



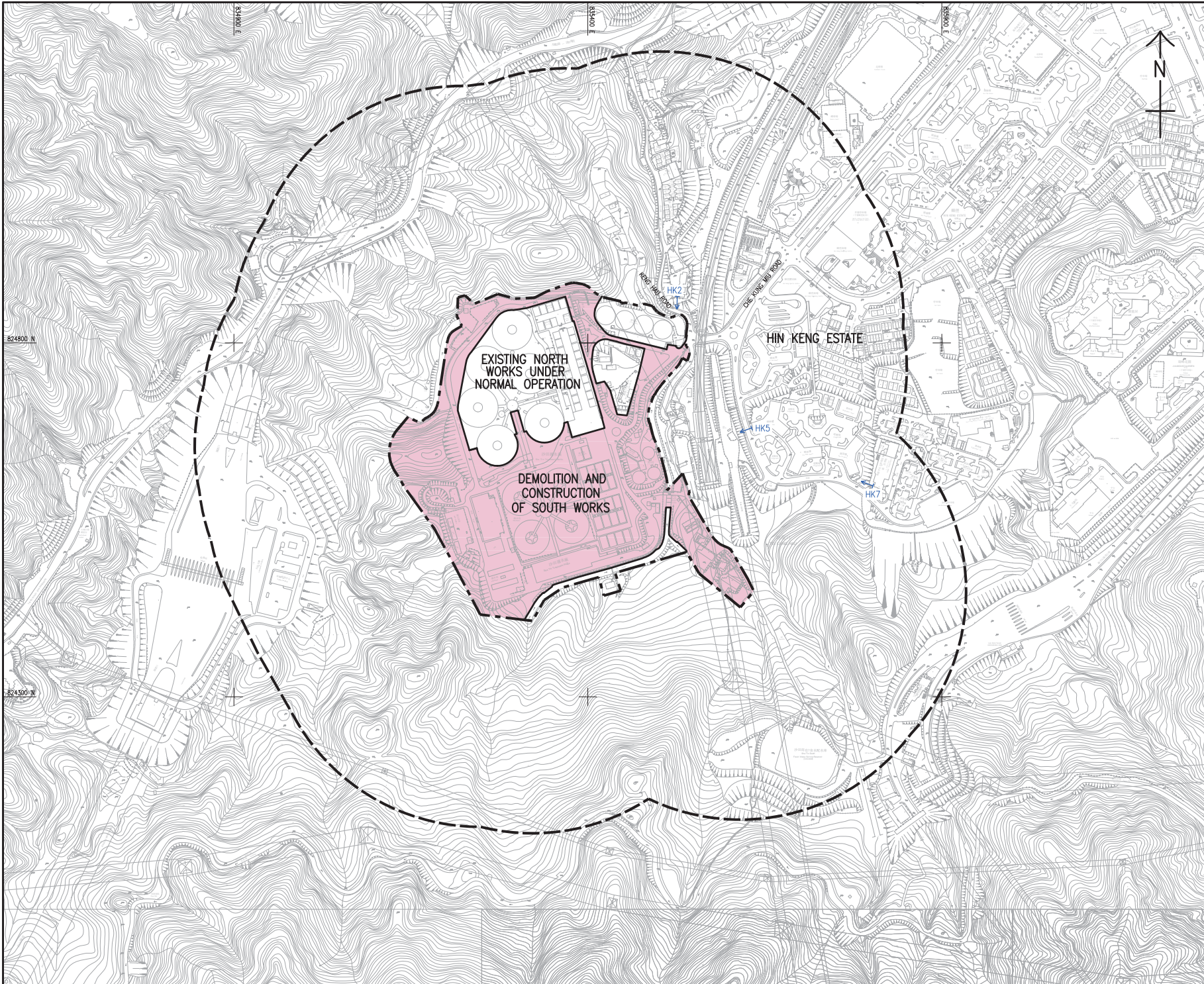
## The Summary of TSP-1hr Concentration ( $\mu\text{g}/\text{m}^3$ ) at AM2 Hin Keng Estate - Hin Wan House



# Appendix L

## Location Plan of Noise Monitoring Station





**LEGEND:**

- SITE BOUNDARY OF SHA TIN WATER TREATMENT WORKS
- 300m STUDY AREA
- WORKS AREA
- HK2
- THE L LOUEY (SOUTH)
- HK5
- HIN KENG ESTATE - HIN WAN HOUSE
- HK7
- CHEUKFAA THOMAS CHEUNG SCHOOL

水務署  
WATER SUPPLIES DEPARTMENT

AGREEMENT NO. CE 13/2009 (WS)  
IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS - SOUTH WORKS  
DESIGN AND CONSTRUCTION

LOCATIONS OF PROPOSED NOISE MONITORING STATIONS

**AECOM**

DRG NO 60162073/EM&A/FIG 4  
圖紙編號

|                                |          |         |
|--------------------------------|----------|---------|
| DESIGNED BY                    | DESIGNED | CHECKED |
| DRAWN BY                       | DRAWN    | CHECKED |
| SCALE                          | SCALE    | SCALE   |
| DATE                           | DATE     | DATE    |
| © COPYRIGHT RESERVED<br>版權 所 有 |          |         |

# Appendix M

## Calibration Certificates (Noise)

# Certificate of Calibration

for

**Description:** *Sound Level Meter*  
**Manufacturer:** *NTi Audio*  
**Type No.:** *XL2 (Serial No.: A2A-09696-E0)*  
**Microphone & Preamplifier:** *NTi Audio MA220 (Serial No.: 5235)*

**Submitted by:**

**Customer:** *Acumen Environmental Engineering and Technologies Co. Ltd.*  
**Address:** *No.12, Tam Kon Shan Road, Tsing Yi Island, Hong Kong*

Upon receipt for calibration, the instrument was found to be:

- Within**  
 **Outside**

the allowable tolerance.

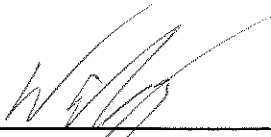
The test equipment used for calibration are traceable to National Standards via:

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

**Date of receipt:** 28 February 2019

**Date of calibration:** 28 February 2019

**Calibrated by:**   
Calibration Technician

**Certified by:**   
Mr. Ng Yan Wa  
Laboratory Manager

**Date of issue:** 28 February 2019



**Certificate No.:** APJ18-181-CC001

Page 1 of 4

**1. Calibration Precaution:**

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.

**2. Calibration Conditions:**

Air Temperature: 24.5 °C  
 Air Pressure: 1008 hPa  
 Relative Humidity: 62.3 %

**3. Calibration Equipment:**

|                          | Type     | Serial No. | Calibration Report Number | Traceable to |
|--------------------------|----------|------------|---------------------------|--------------|
| Multifunction Calibrator | B&K 4226 | 2288467    | AV180064                  | HOKLAS       |

**4. Calibration Results**

Sound Pressure Level

Reference Sound Pressure Level

| Setting of Unit-under-test (UUT) |                 |                | Applied value |               | UUT Reading, dB | IEC 61672 Class 1 Specification, dB |
|----------------------------------|-----------------|----------------|---------------|---------------|-----------------|-------------------------------------|
| Range, dB                        | Freq. Weighting | Time Weighting | Level, dB     | Frequency, Hz |                 |                                     |
| 30-130                           | dBA SPL         | Fast           | 94            | 1000          | 94.0            | ±0.4                                |

Linearity

| Setting of Unit-under-test (UUT) |                 |                | Applied value |               | UUT Reading, dB | IEC 61672 Class 1 Specification, dB |
|----------------------------------|-----------------|----------------|---------------|---------------|-----------------|-------------------------------------|
| Range, dB                        | Freq. Weighting | Time Weighting | Level, dB     | Frequency, Hz |                 |                                     |
| 30-130                           | dBA SPL         | Fast           | 94            | 1000          | 94.0            | Ref                                 |
|                                  |                 |                | 104           |               | 104.0           | ±0.3                                |
|                                  |                 |                | 114           |               | 114.0           | ±0.3                                |

Time Weighting

| Setting of Unit-under-test (UUT) |                 |                | Applied value |               | UUT Reading, dB | IEC 61672 Class 1 Specification, dB |
|----------------------------------|-----------------|----------------|---------------|---------------|-----------------|-------------------------------------|
| Range, dB                        | Freq. Weighting | Time Weighting | Level, dB     | Frequency, Hz |                 |                                     |
| 30-130                           | dBA SPL         | Fast           | 94            | 1000          | 94.0            | Ref                                 |
|                                  |                 | Slow           |               |               | 94.0            | ±0.3                                |

## Frequency Response

## Linear Response

| Setting of Unit-under-test (UUT) |                 |                | Applied value |               | UUT Reading,<br>dB | IEC 61672 Class 1<br>Specification, dB |            |
|----------------------------------|-----------------|----------------|---------------|---------------|--------------------|--|------------|
| Range, dB                        | Freq. Weighting | Time Weighting | Level, dB     | Frequency, Hz |                    |  |            |
| 30-130                           | dB              | SPL            | 94            | Fast          | 31.5               | 94.0                                   | +2.0       |
|                                  |                 |                |               |               | 63                 | 94.1                                   | ±1.5       |
|                                  |                 |                |               |               | 125                | 94.1                                   | ±1.5       |
|                                  |                 |                |               |               | 250                | 94.1                                   | ±1.4       |
|                                  |                 |                |               |               | 500                | 94.0                                   | ±1.4       |
|                                  |                 |                |               |               | 1000               | 94.0                                   | Ref        |
|                                  |                 |                |               |               | 2000               | 93.8                                   | ±1.6       |
|                                  |                 |                |               |               | 4000               | 93.6                                   | ±1.6       |
|                                  |                 |                |               |               | 8000               | 93.7                                   | +2.1; -3.1 |

## A-weighting

| Setting of Unit-under-test (UUT) |                 |                | Applied value |               | UUT Reading,<br>dB | IEC 61672 Class 1<br>Specification, dB |                |
|----------------------------------|-----------------|----------------|---------------|---------------|--------------------|--|----------------|
| Range, dB                        | Freq. Weighting | Time Weighting | Level, dB     | Frequency, Hz |                    |  |                |
| 30-130                           | dBA             | SPL            | 94            | Fast          | 31.5               | 54.6                                   | -39.4±2.0      |
|                                  |                 |                |               |               | 63                 | 67.9                                   | -26.2±1.5      |
|                                  |                 |                |               |               | 125                | 78.1                                   | -16.1±1.5      |
|                                  |                 |                |               |               | 250                | 85.5                                   | -8.6±1.4       |
|                                  |                 |                |               |               | 500                | 90.8                                   | -3.2±1.4       |
|                                  |                 |                |               |               | 1000               | 94.0                                   | Ref            |
|                                  |                 |                |               |               | 2000               | 95.0                                   | +1.2±1.6       |
|                                  |                 |                |               |               | 4000               | 94.6                                   | +1.0±1.6       |
|                                  |                 |                |               |               | 8000               | 92.7                                   | -1.1+2.1; -3.1 |

## C-weighting

| Setting of Unit-under-test (UUT) |                 |                | Applied value |               | UUT Reading,<br>dB | IEC 61672 Class 1<br>Specification, dB |                |
|----------------------------------|-----------------|----------------|---------------|---------------|--------------------|--|----------------|
| Range, dB                        | Freq. Weighting | Time Weighting | Level, dB     | Frequency, Hz |                    |  |                |
| 30-130                           | dBC             | SPL            | 94            | Fast          | 31.5               | 91.0                                   | -3.0±2.0       |
|                                  |                 |                |               |               | 63                 | 93.3                                   | -0.8±1.5       |
|                                  |                 |                |               |               | 125                | 94.0                                   | -0.2±1.5       |
|                                  |                 |                |               |               | 250                | 94.1                                   | -0.0±1.4       |
|                                  |                 |                |               |               | 500                | 94.1                                   | -0.0±1.4       |
|                                  |                 |                |               |               | 1000               | 94.0                                   | Ref            |
|                                  |                 |                |               |               | 2000               | 93.7                                   | -0.2±1.6       |
|                                  |                 |                |               |               | 4000               | 92.8                                   | -0.8±1.6       |
|                                  |                 |                |               |               | 8000               | 90.7                                   | -3.0+2.1; -3.1 |



### 5. Calibration Results Applied

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

|        |         |        |
|--------|---------|--------|
| 94 dB  | 31.5 Hz | ± 0.05 |
|        | 63 Hz   | ± 0.05 |
|        | 125 Hz  | ± 0.05 |
|        | 250 Hz  | ± 0.05 |
|        | 500 Hz  | ± 0.05 |
|        | 1000 Hz | ± 0.05 |
|        | 2000 Hz | ± 0.05 |
|        | 4000 Hz | ± 0.05 |
|        | 8000 Hz | ± 0.10 |
| 104 dB | 1000 Hz | ± 0.05 |
| 114 dB | 1000 Hz | ± 0.05 |

The uncertainties are evaluated for a 95% confidence level.

**Note:**

The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)\*L shall not be liable for any loss or damage resulting from the use of the equipment.



# Transmittal

To (Company): Acumen Environmental Engineering and Technologies Co. Ltd. Date: 1 March 2019

Address: No.12, Tam Kon Shan Road, Our Ref.: APJ18-181-TT001  
Tsing Yi Island, Hong Kong Your Ref.: --

Tel. No.: 6113-2368 / 2333-6823

Project No.: APJ18-181

Re: Calibration of Sound Level Meter

Attn.: Mr. Vega Wong

From: Acoustics & Air Testing Lab. Co. Ltd.

For your reference  
 Return after action  
 As requested

For your action  
 For your record  
 For your command / approval

| Quantity | Description  |
|----------|--|
| 1        | Calibration Certificate of Sound Level Meter<br>(PROJECT NO.: APJ18-181-CC001) |

Remarks: Please stamp the duplicated copy with your company chop and return to us.

Acoustics and Air Testing Laboratory Co. Ltd.

Received By:



\_\_\_\_\_  
Company Chop

\_\_\_\_\_  
Company Chop

Received Date:

\_\_\_\_\_







# MAXLAB

Certificate No. MLCN182167S

| <i>Calibration Data</i> |                  |                        |                         |                   |
|-------------------------|------------------|------------------------|-------------------------|-------------------|
| EUT Setting             | Standard Reading | EUT Error from Setting | Calibration Uncertainty | EUT Specification |
| 94 dB                   | 93.9 dB          | -0.1 dB                | 0.20 dB                 | ± 0.3 dB          |

- END -

Calibrated By :  
Date :

Dan  
11-Sep-18

Checked By :  
Date :

K.O. Lo  
11-Sep-18

Page 2 of 2



## Certificate of Conformity

This instrument was produced under rigorous factory production control and documented standard procedures. It was individually visually inspected, leak tested and function tested for display, backlight, button and software performance. The accuracy of each of its primary measurements was individually calibrated and/or tested against standards traceable to the National Institute of Standards and Technology ("NIST") or calibrated intermediary standards. This instrument is certified to have performed at the time of manufacture in compliance with the following specifications as they apply to this meter's specific model, measurements and features.

### Methods Used in Calibration and Testing

#### Wind Speed:

The Kestrel Pocket Weather Meter impeller installed in this unit was individually tested in a subsonic wind tunnel operating at approximately 300 fpm (1.5 m/s) and 1200 fpm (6.1 m/s) monitored by a Gill Instruments Model 1350 ultrasonic time-of-flight anemometer. The Standard's maximum combined uncertainty is  $\pm 1.04\%$  within the airspeed range 706.6 to 3923.9 fpm (3.59 to 19.93 m/s), and  $\pm 1.66\%$  within the airspeed range 166.6 to 706.6 fpm (0.85 to 3.59 m/s).

#### Temperature:

Temperature response is verified in comparison with a Eutechnics 4600 Precision Thermometer or a standard Kestrel 4000 Weather and Environmental Meter calibrated weekly against the Eutechnics 4600. The Eutechnics 4600 is calibrated annually and is traceable to NIST with a system accuracy of  $\pm 0.05$  °C.

#### Direction / Heading

The sensitivity of the magnetic directional sensor is verified at the component level by applying a magnetic field to the sensor and measuring the signal output at 4 points, as well as after assembly by orienting the unit to the cardinal directions and measuring the magnetic field output. In both cases the compass output must be accurate to within  $\pm 5$  degrees.

#### Relative Humidity:

Relative humidity receives a two-point calibration in humidity and temperature controlled chambers at 75.3% RH and 32.8% RH at 25° C. The calibration tanks are monitored with an Edgetech Model 2002 DewPrime II Standard Chilled Mirror Hygrometer. Following calibration, performance is further verified at an RH of approximately 43.2% against the Edgetech Hygrometer. The Edgetech Hygrometer is calibrated annually and is traceable to NIST with a maximum relative expanded uncertainty of  $\pm 0.2\%$  RH.

#### Barometric Pressure:

Pressure response is verified against a Mensor Series 6000 Digital Barometer or a standard Kestrel 4000 Weather and Environmental Meter calibrated weekly against the Mensor Barometer. The Mensor Barometer is calibrated annually and is traceable to NIST with a maximum relative expanded uncertainty of  $\pm 0.02\%$  F.S.

#### Approved By:

Michael Naughton, Engineering Manager

| SENSORS                |      |      |      |      |      |         |      |      |      |      |      |      |          |  |  |  |  |   |
|------------------------|------|------|------|------|------|---------|------|------|------|------|------|------|----------|--|--|--|--|---|
| SENSOR                 | 1000 | 2000 | 2500 | 3000 | 3500 | 3500 DT | 4000 | 4200 | 4250 | 4300 | 4400 | 4500 | 4500 HOR | ACCURACY (H+) <sup>1</sup>   | RESOLUTION   | SPECIFICATION RANGE  | OPERATIONAL RANGE  | NOTES   |
| Wind Speed   Air Flow  | •    | •    | •    | •    | •    | •       | •    | •    | •    | •    | •    | •    | •        | 0.1 m/s<br>Larger of 3% of reading, least significant digit or 20 ft/min<br>0.1 km/h<br>0.1 mph<br>1.2 to 77.8 knots<br>1 ft | 0.6 to 40.0 m/s<br>118 to 7,874 ft/min<br>2.2 to 144.0 km/h<br>1.3 to 89.5 mph<br>1.2 to 116.6 knots<br>0 to 12 ft | 0.6 to 60.0 m/s<br>118 to 11,811 ft/min<br>2.2 to 216.0 km/h<br>1.3 to 134.2 mph<br>1.2 to 116.6 knots<br>0 to 12 ft | 1 inch/25 mm diameter impeller with precision axle and low-friction 2Yzr88 bearings. Startup speed stated as lower limit, readings may be taken down to 0.4 m/s (78 ft/min)   1.5 km/h   0.9 mph   0.4 m/s after impeller startup. Off-axis accuracy: ±1% @ 5° off-axis; ±2% @ 10° off-axis. Calibration drift < 1% after 100 hours use at 16 MPH / 7 m/s. Replacement impeller (NK-PN-0801) field install without tools. (US Patent 5,763,753). Wind speed calibration and testing should be done with impeller located at the top front face of the Kestrel. |   |
| Ambient Temperature    | •    | •    | •    | •    | •    | •       | •    | •    | •    | •    | •    | •    | •        | 0.5 °F<br>0.1 °C   | 0.1 °F<br>0.1 °C   | -20.0 to 158.0 °F<br>-29.0 to 70.0 °C  | 14.0 to 131.0 °F<br>-10.0 to 55.0 °C   | Hermetically-sealed, precision thermistor mounted externally and thermally isolated (US Patent 5,939,645) for rapid response. Airflow of 2.2 m/s (1 m/s or greater) provides fastest response and reduction in insulation effect. Calibration drift negligible. Thermistor may also be used to measure temperature of water or snow by submerging thermistor portion into material - remove impeller prior to taking submerged measurements and ensure humidity sensor membrane is free of liquid water prior to taking humidity based measurements after submersion.                                 |
| Globe Temperature - Tg |      |      |      |      |      |         |      |      |      |      |      |      |          | 1.4 °F<br>0.1 °C   | 0.1 °F<br>0.1 °C   | -20.0 to 140.0 °F<br>-29.0 to 60.0 °C  | 14.0 to 131.0 °F<br>-10.0 to 55.0 °C   | Temperature inside 1in/25 mm black powder coated copper globe converted to Tg equivalent for standard 6 in/150 mm globe. Closest equivalence obtained with airflow greater than 2.2 m/s (1 m/s).  |
| Relative Humidity      |      |      |      |      |      |         |      |      |      |      |      |      |          | 3.0 %RH<br>0.1 %RH   | 5 to 95% non-condensing  | 0 to 100%  | 0 to 100%  | Polymer capacitive humidity sensor mounted in thin-walled chamber external to case for rapid, accurate response (US Patent 6,257,074). To achieve stated accuracy, unit must be permitted to equilibrate to external temperature when exposed to large, rapid temperature changes and be kept out of direct sunlight. Calibration drift < 2% over 24 months. Humidity sensor may be recalibrated at factory or in field using Kestrel Humidity Calibration Kit (NK-PN-0802).  |
| Pressure               |      |      |      |      |      |         |      |      |      |      |      |      |          | 0.03 inHg<br>1.0 hPa/mbar<br>0.01 PSI  | 0.01 inHg<br>0.1 hPa/mbar<br>0.01 PSI  | 30.0 to 32.49 inHg<br>300.0 to 1,030.0 hPa/mbar<br>4.35 to 15.95 PSI<br>and<br>33.0 to 185.0 °F<br>0.0 to 85.0 °C    | 0.30 to 48.87 inHg<br>10.0 to 1,654.7 hPa/mbar<br>0.14 to 24.0 PSI<br>and<br>14.0 to 131.0 °F<br>-10.0 to 55.0 °C  | Monolithic silicon piezoresistive pressure sensor with second-order temperature correction. Pressure sensor may be recalibrated at factory or in field. Adjustable reference altitude allows display of station pressure or barometric pressure corrected to MSL. Kestrel 4200 displays pressure on a dedicated screen. Kestrel 2500 and 3500 display continuously updating three-hour barometric pressure trend indicator: rising rapidly, rising, steady, falling, falling rapidly. Kestrel 4000 series displays pressure trend through graphing function. PSI display on Kestrel 4000 series only. |
| Compass                |      |      |      |      |      |         |      |      |      |      |      |      |          | 5°<br>1°<br>1/16th Cardinal Scale  | 0 to 360°  | 0 to 360°  | 0 to 360°  | 2-axis solid-state magnetoresistive sensor mounted perpendicular to unit plane. Accuracy of sensor dependent upon unit's vertical position. Self-calibration routine eliminates magnetic error from batteries or unit and must be run after every full power-down (battery removal or change). Readout indicates direction to which the back of the unit is pointed when held in a vertical orientation. Declination/variation adjustable for True North readout.   |

| CALCULATED MEASUREMENTS                          |      |      |      |      |      |         |      |      |      |      |      |      |          |   |                                       |  |   |   |
|--|------|------|------|------|------|---------|------|------|------|------|------|------|----------|---|---------------------------------------|--|---|---|
| MEASUREMENT                                      | 1000 | 2000 | 2500 | 3000 | 3500 | 3500 DT | 4000 | 4200 | 4250 | 4300 | 4400 | 4500 | 4500 HOR | ACCURACY (H+) <sup>1</sup>                                    | RESOLUTION                            | SPECIFICATION RANGE                                    | SENSORS EMPLOYED  | NOTES   |
| Air Density                                      |      |      |      |      |      |         |      |      |      |      |      |      |          | 0.0002 lbm³<br>0.003 kg/m³                                    | 0.001 lbm³<br>0.001 kg/m³             | Refer to Ranges for Sensors Employed                   | Temperature<br>Relative Humidity<br>Pressure  | Mass of air per unit volume   |
| Air Flow   |      |      |      |      |      |         |      |      |      |      |      |      |          | 6.71%   | 1 cfm<br>1 m³/hr<br>0.1 m³/s<br>1 L/s | Refer to Ranges for Sensors Employed                   | Air Flow<br>User Input (Duct Shape & Size)  | Volume of air flowing through an opening. Automatically calculated from Air Velocity measurement and user-specified duct shape (circle or rectangle) and dimensions (units: ft, in, cm or m). Maximum duct dimension input: 258.0 in   215.8   655.3 cm   6.55 m  |
| Altitude   |      |      |      |      |      |         |      |      |      |      |      |      |          | typical: 23.6 ft<br>7.2 m<br>max: 48.2 ft<br>14.7 m           | 1 ft<br>1 m                           | typical: 750 to 1100 mBar<br>max: 300 to 750 mBar      | Pressure<br>User Input (Reference Pressure)   | Height above Mean Sea Level (MSL). Temperature compensated pressure (barometric) altimeter requires accurate reference barometric pressure to produce maximum absolute accuracy. Both accuracy specs corresponds to a reference pressure anywhere from 890 to 1100 mBar.  |
| Barometric Pressure                              |      |      |      |      |      |         |      |      |      |      |      |      |          | 0.07 inHg<br>2.4 hPa/mbar<br>0.03 PSI                         | 0.01 inHg<br>0.1 hPa/mbar<br>0.01 PSI | Refer to Ranges for Sensors Employed                   | Pressure<br>User Input (Reference Altitude)   | Air pressure that would be present in identical conditions at MSL. Station pressure compensated for local elevation provided by reference altitude. Requires accurate reference altitude to produce maximum absolute accuracy.  |
| Crosswind & Headwind/Tailwind                    |      |      |      |      |      |         |      |      |      |      |      |      |          | 7.1%<br>1 mph<br>1 ft/min<br>0.1 km/h<br>0.1 m/s<br>1.1 knots | Refer to Ranges for Sensors Employed  | Wind Speed<br>Compass                                  | Effective wind relative to a target or travel direction. Auto-switching headwind/tailwind indication. |   |
| Delta T  |      |      |      |      |      |         |      |      |      |      |      |      |          | 3.2 °F<br>1.8 °C  | 0.1 °F<br>0.1 °C                      | Refer to Ranges for Sensors Employed                   | Temperature<br>Relative Humidity<br>Pressure  | Difference between dry bulb temperature and wet bulb temperature. When spraying, indicates evaporation rate and droplet lifetime. Safe range for pesticide spraying is 4 to 16 °F / 2 to 9 °C.  |
| Density Altitude                                 |      |      |      |      |      |         |      |      |      |      |      |      |          | 226 ft<br>69 m  | 1 ft<br>1 m                           | Refer to Ranges for Sensors Employed                   | Temperature<br>Relative Humidity<br>Pressure  | Local air density converted to equivalent elevation above sea level in a uniform layer consisting of the International Standard Atmosphere.   |
| Dewpoint   |      |      |      |      |      |         |      |      |      |      |      |      |          | 3.4 °F<br>1.9 °C  | 0.1 °F<br>0.1 °C                      | 15 to 95 % RH<br>Refer to Range for Temperature Sensor | Temperature<br>Relative Humidity  | Temperature that a volume of air must be cooled to at constant pressure for the water vapor present to condense into dew and form on a solid surface. Can also be considered to be the water-air saturation temperature.  |
| Evaporation Rate                                 |      |      |      |      |      |         |      |      |      |      |      |      |          | 0.01 lbm/hr<br>0.05 kg/m²/hr                                  | 0.01 lbm/hr<br>0.01 kg/m²/hr          | Refer to Ranges for Sensors Employed                   | Wind Speed<br>Temperature<br>Relative Humidity<br>Pressure<br>User Input (Concrete Temperature)       | The rate at which moisture is lost from the surface of curing concrete. Requires user measurement and entry of concrete temperature obtained with an accurate IR or probe thermometer (°F or °C, not included). Readings should be taken 20 inches above pour surface with the thermometer shaded, and averaged for 6-10 seconds using built-in averaging function. |
| Heat Index                                       |      |      |      |      |      |         |      |      |      |      |      |      |          | 7.1 °F<br>4.0 °C  | 0.1 °F<br>0.1 °C                      | Refer to Ranges for Sensors Employed                   | Temperature<br>Relative Humidity<br>Pressure  | Perceived temperature resulting from the combined effect of temperature and relative humidity. Calculated based on NWS Heat Index (HI) tables. Measurement range limited by extent of published tables.   |
| Moisture Content   Humidity Ratio ("Grains")     |      |      |      |      |      |         |      |      |      |      |      |      |          | 3 gpp<br>04<br>g/kg   | 0.1 gpp<br>0.01 g/kg                  | Refer to Ranges for Sensors Employed                   | Temperature<br>Relative Humidity<br>Pressure  | Mass of water vapor in a mass of air.   |
| Relative Air Density                             |      |      |      |      |      |         |      |      |      |      |      |      |          | 0.3%  | 0.1%                                  | Refer to Ranges for Sensors Employed                   | Temperature<br>Relative Humidity<br>Pressure  | The ratio, expressed as a percentage, of measured air density to the air density of a standard atmosphere as defined by the ICAO.   |
| Thermal Work Limit (TWL)                         |      |      |      |      |      |         |      |      |      |      |      |      |          | 10.9 W/m²   | 0.1 W/m²                              | Refer to Ranges for Sensors Employed                   | Wind Speed<br>Temperature<br>Globe Temperature<br>Relative Humidity<br>Pressure                       | Estimated safe maximum continuously sustainable human metabolic rate (W/m²) for the conditions and clothing factors. Based off of estimated metabolic output of typical human. On-screen zone warnings.   |
| Outdoor Wet Bulb Globe Temperature (WBGT)        |      |      |      |      |      |         |      |      |      |      |      |      |          | 1.3 °F<br>0.7 °C  | 0.1 °F<br>0.1 °C                      | Refer to Ranges for Sensors Employed                   | Wind Speed<br>Temperature<br>Globe Temperature<br>Relative Humidity<br>Pressure                       | Measure of human heat stress defined as the combination of effects due to radiation, convection, and conduction. Outdoor WBGT is calculated from a weighted sum of natural wet bulb (Twb), globe temperature (Tg), and dry bulb temperature (Td). User settable on-screen warning zones.  |
| Wet Bulb Temperature - Naturally Aspirated (Twb) |      |      |      |      |      |         |      |      |      |      |      |      |          | 1.4 °F<br>0.8 °C  | 0.1 °F<br>0.1 °C                      | Refer to Ranges for Sensors Employed                   | Wind Speed<br>Temperature<br>Globe Temperature<br>Relative Humidity<br>Pressure                       | Similar to psychrometric wet-bulb temperature (see below). However, Twb only undergoes forced convection from the ambient air velocity. Twb is a measure of the evaporative cooling that the air will allow. This is accounted for by combining the effects of, mainly, relative humidity and windspeed.  |
| Wet Bulb Temperature - Psychrometric             |      |      |      |      |      |         |      |      |      |      |      |      |          | 3.2 °F<br>1.8 °C  | 0.1 °F<br>0.1 °C                      | Refer to Ranges for Sensors Employed                   | Temperature<br>Relative Humidity<br>Pressure  | Temperature indicated by a sling psychrometer. Due to nature of the psychrometric ratio for a water-air system, this approximates the thermodynamic wet-bulb temperature. The thermodynamic wet-bulb temperature is the temperature a parcel of air would have if cooled adiabatically to saturation temperature via water evaporating into it.                     |
| Wind Chill                                       |      |      |      |      |      |         |      |      |      |      |      |      |          | 1.6 °F<br>0.9 °C  | 0.1 °F<br>0.1 °C                      | Refer to Ranges for Sensors Employed                   | Wind Speed<br>Temperature   | Perceived temperature resulting from combined effect of wind speed and temperature. Calculated based on the NWS Wind Chill Temperature (WCT) Index, revised 2001, with wind speed adjusted by a factor of 1.5 to yield equivalent results to wind speed measured at 10 m above ground. Measurement range limited by extent of published tables.                     |

| ADDITIONAL SPECIFICATIONS                            |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Display & Backlight                                  | • | • | • | • | • | • | • | • | • | • | • | • | • | Reflective 3 1/2 digit LCD. Digit height 0.29 in / 9 mm. Aviation green electroluminescent backlight. Manual activation with auto-off.   |
| Response Time & Display Update                       | • | • | • | • | • | • | • | • | • | • | • | • | • | Reflective 5 digit LCD. Digit height 0.36 in / 9 mm. Choice of aviation green or visible red (NV models only) electroluminescent backlight. Manual activation with auto-off.   |
| Max/Avg Wind   | • | • | • | • | • | • | • | • | • | • | • | • | • | Multi-function, multi-digit monochrome dot-matrix display. Choice of aviation green or visible red (NV models only) electroluminescent backlight. Automatic or manual activation.  |
| Data Storage & Archival Display, Min/Max/Avg History |   |   |   |   |   |   |   |   |   |   |   |   |   | All measurements except those based on relative humidity respond accurately within 1 second. Relative humidity and all measurements which include RH in their calculation may require as long as 1 minute to fully equilibrate to a large change in the measurement environment. Display updates every 1 second.   |
| Data Upload & Bluetooth® Data Connect Option         |   |   |   |   |   |   |   |   |   |   |   |   |   | One-button clear and restart of Max Wind Gust and Average Wind measurement.  |
| Clock / Calendar                                     | • | • | • | • | • | • | • | • | • | • | • | • | • | Max and average wind calculation may be started and stopped independently of data logging of other values, along with all other wind-related functions: air velocity, crosswind, headwind/tailwind, wind chill, WBGT, TWL, evaporation rate.   |
| Auto Shutdown  | • | • | • | • | • | • | • | • | • | • | • | • | • | Minimum, maximum, average and logged history stored and displayed for every measured value. Large capacity data logger with graphical display. Manual and auto data storage. Min/Max/Avg history may be reset independently. Auto-store interval settable from 2 seconds to 12 hours, overwrite on or off. Logs even when display off for 1 and 2 second intervals (code version 4.18 and later). Data capacity shown. |
| Languages  | • | • | • | • | • | • | • | • | • | • | • | • | • | Requires optional PC interface (USB or RS-232) or Bluetooth data transfer option and provided software.  |
| Certifications                                       | • | • | • | • | • | • | • | • | • | • | • | • | • | Requires optional PC interface (USB or RS-232) or Bluetooth data transfer option and provided software.  |
| Battery Origin                                       | • | • | • | • | • | • | • | • | • | • | • | • | • | Requires optional PC interface (USB or RS-232) or Bluetooth data transfer option and provided software.  |
| Shock Resistance                                     | • | • | • | • | • | • | • | • | • | • | • | • | • | Requires optional PC interface (USB or RS-232) or Bluetooth data transfer option and provided software.  |
| Sealing  | • | • | • | • | • | • | • | • | • | • | • | • | • | Requires optional PC interface (USB or RS-232) or Bluetooth data transfer option and provided software.  |
| Operational Temperature Limits                       | • | • | • | • | • | • | • | • | • | • | • | • | • | Standard Models: AAA Alkaline, two, included. Average life, 400 hours of use, reduced by backlight or Bluetooth radio transmission use.  |
| Storage Temperature                                  | • | • | • | • | • | • | • | • | • | • | • | • | • | MIL-STD-883C, Transient Shock, Method 516.5 Procedure IV, unit only, impact may damage replaceable impeller.   |
| Size & Weight  | • | • | • | • | • | • | • | • | • | • | • | • | • | Waterproof (IP67) and NEMA-6.  |

\* NOTE: Accuracy calculated as uncertainty of the measurement derived from statistical analysis considering the combined effects from primary sensor specifications, circuit conversions, and all other sources of error using a coverage factor of k=2, or two standard deviations (2σ).

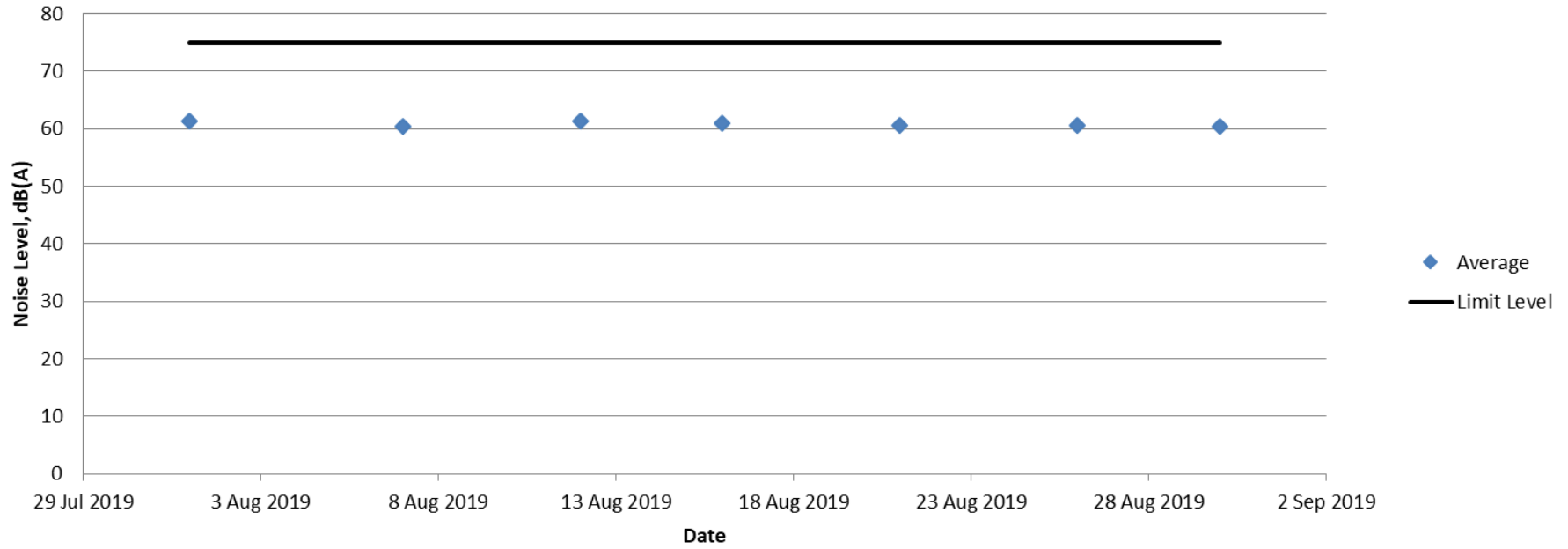
Please note, these specifications are valid for all Kestrel 4400 products and all other Kestrel 4000 series with a serial number higher than 659340. If your product has a lower serial number, please reference the previous version of the specifications.

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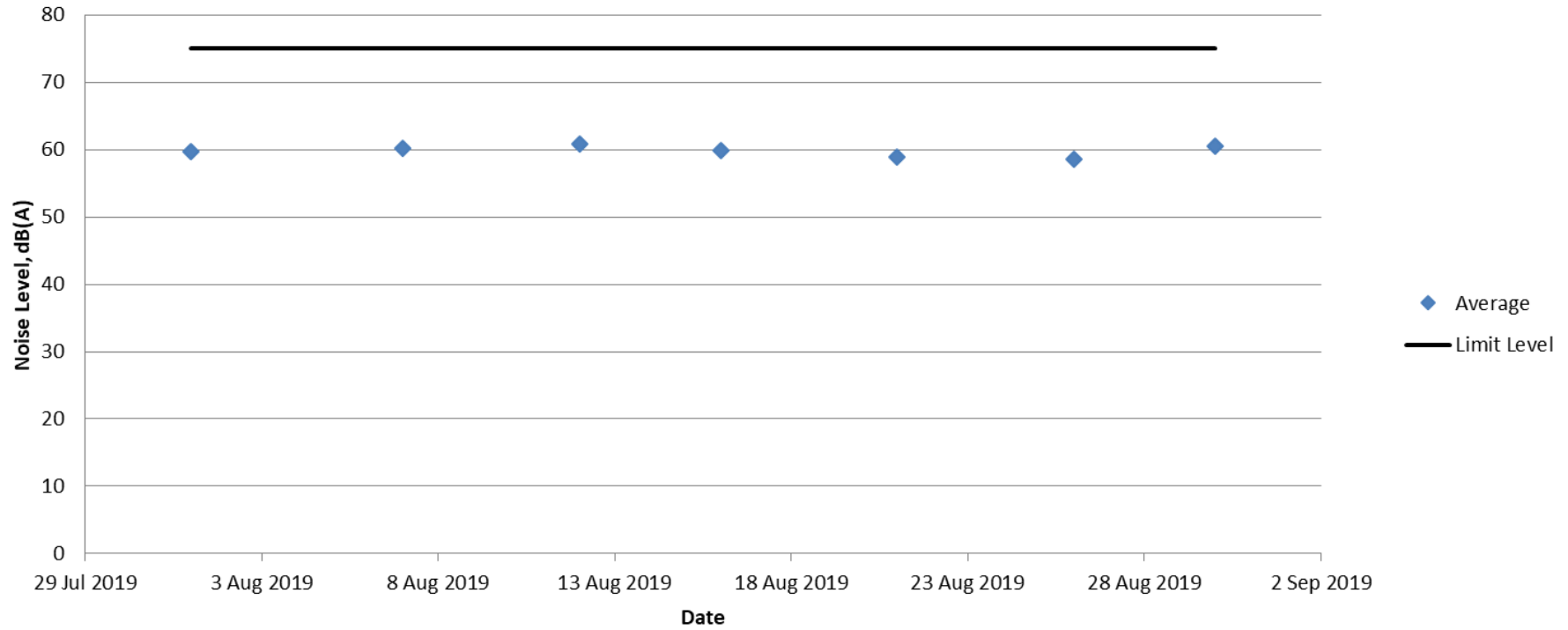
# Appendix N

## Impact Noise Monitoring Results and Graphical Presentation

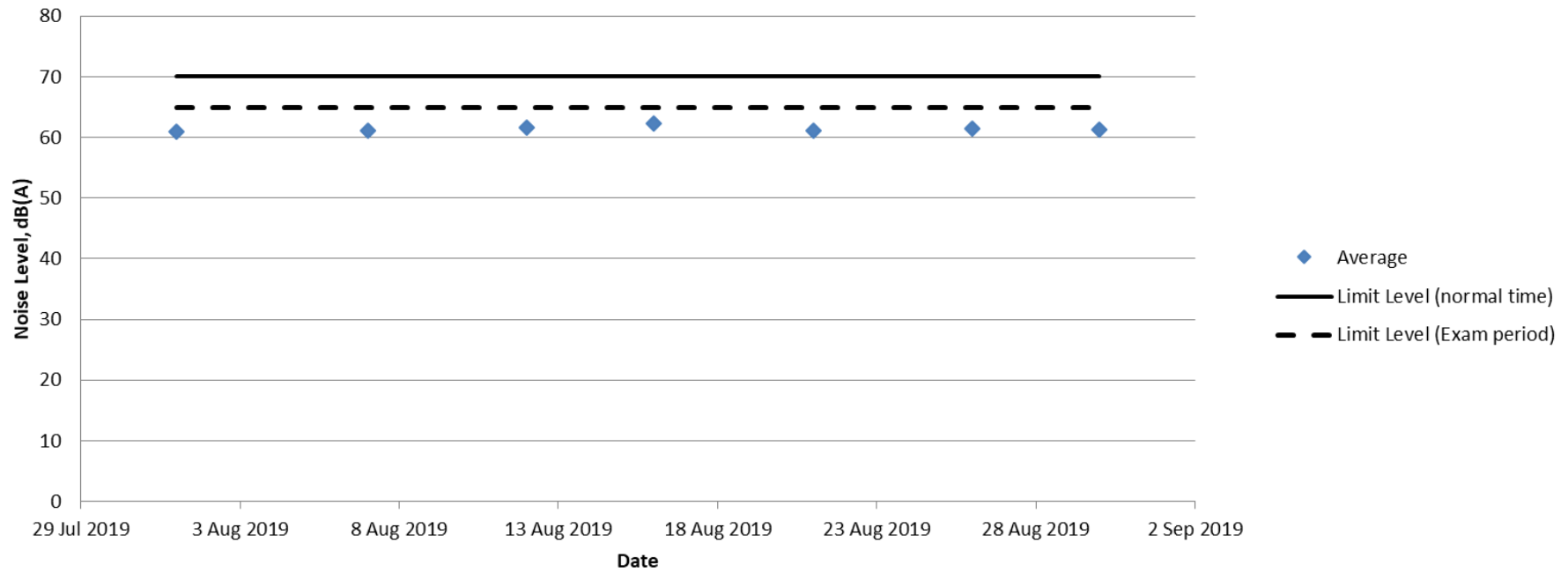
### Noise Level Results at NM1 -The L Louey (South)



## Noise Level Results at NM2 -Hin Keng Estate - Hin Wan House



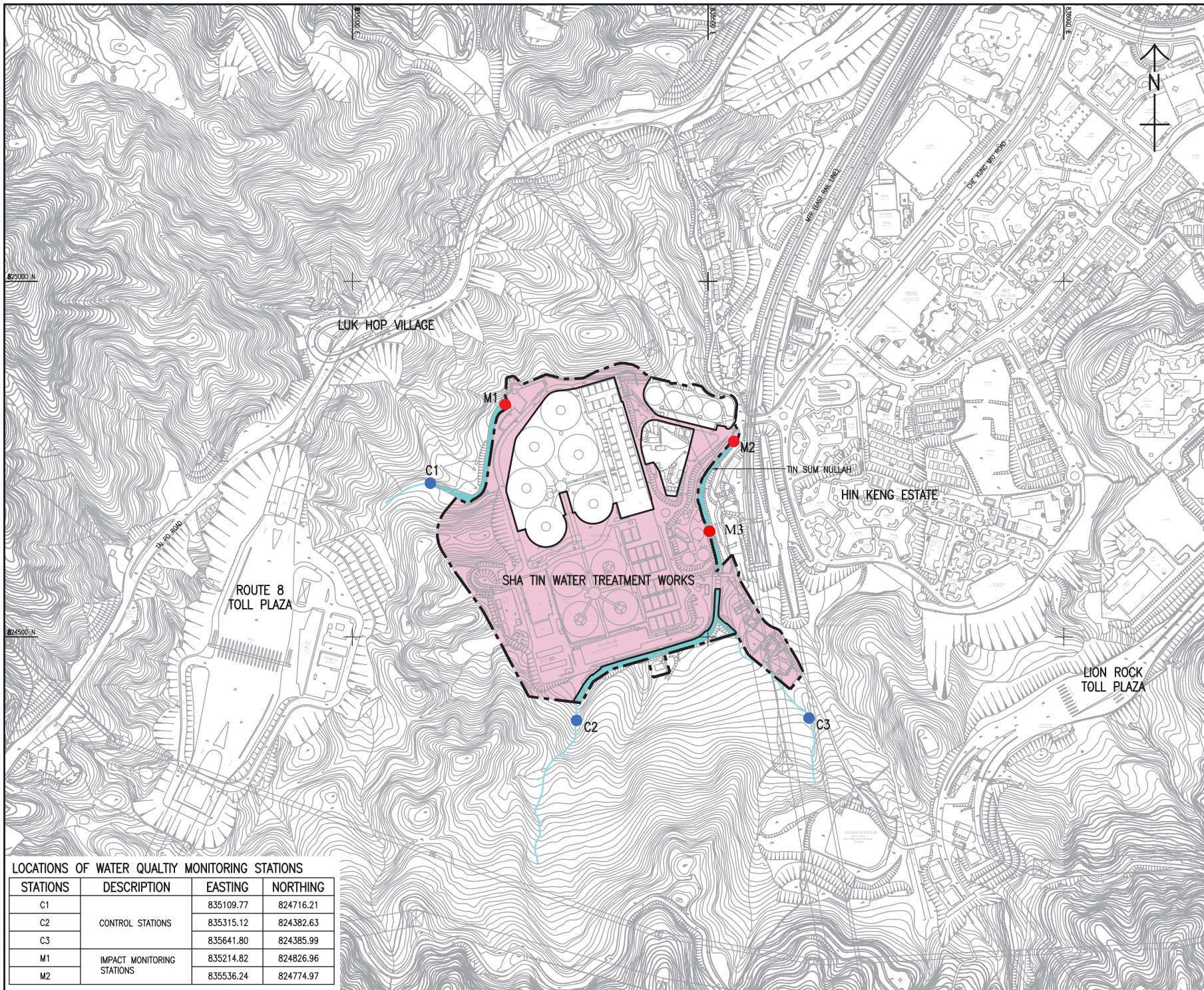
## Noise Level Results at NM3 -C.U.H.K.F.A.A. Thomas Cheung School








# Appendix O

## Location Plan of Water Quality Monitoring Station





**LEGEND:**

-  SITE BOUNDARY OF SHATIN WATER TREATMENT WORKS
-  WORKS AREA
-  INLAND WATER COURSE
-  IMPACT MONITORING STATION
-  CONTROL STATION

LOCATIONS OF WATER QUALITY MONITORING STATIONS

| STATIONS | DESCRIPTION                | EASTING   | NORTHING  |
|----------|----------------------------|-----------|-----------|
| C1       | CONTROL STATIONS           | 835109.77 | 824716.21 |
| C2       |                            | 835315.12 | 824382.63 |
| C3       |                            | 835641.80 | 824385.99 |
| M1       | IMPACT MONITORING STATIONS | 835214.82 | 824826.96 |
| M2       |                            | 835536.24 | 824774.97 |


**水務署**  
**WATER SUPPLIES DEPARTMENT**  
 AGREEMENT NO. CE 13/2009 (WS)  
 IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS--  
 SOUTH WORKS  
 DESIGN AND CONSTRUCTION

LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

**AECOM**

DRG NO 60162073/EM&A/FIG 5  
 圖紙編號  
 DESIGNED BY: DXL  
 CHECKED BY: A3 1 : 5000  
 DATE: 12/11/12  
 SCALE: A3 1 : 5000  
 DRAWING NO. 12/11/12  
 P. NO. APPROVED: 12/11/12  
 METRES  
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# Appendix P

## Calibration Certificate (Water Quality)



專業化驗有限公司  
QUALITY PRO TEST-CONSULT LIMITED

Unit 10, 14/F, Wah Wai Centre, 38-40 Au Pui Wan St., Fotan, Hong Kong  
Email: info@qualityprotest.com; Website: www.qualityprotest.com  
Tel: (852) 3956 8717; Fax: (852) 3956 3928

## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AI070052  
Date of Issue : 12 July, 2019  
Page No. : 1 of 2

### PART A – CUSTOMER INFORMATION

Acuity Sustainability Consulting Limited  
Unit 1908, Nos. 301-305  
Castle Peak Road, Kwai Chung  
N.T., HK  
Attn: Mr. Nelson TSUI

### PART B – DESCRIPTION

Name of Equipment : YSI ProDSS (Multi-Parameters)  
Manufacturer : YSI (a xylem brand)  
Serial Number : 15M101091  
Date of Received : Jul 09, 2019  
Date of Calibration : Jul 11, 2019  
Date of Next Calibration<sup>(a)</sup> : Oct 11, 2019

### PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

| Parameter        | Reference Method   |
|------------------|--|
| pH at 25°C       | APHA 21e 4500-H <sup>+</sup> B   |
| Dissolved Oxygen | APHA 21e 4500-O G  |
| Salinity         | APHA 21e 2520 B  |
| Turbidity        | APHA 21e 2130 B  |
| Temperature      | Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure. |

### PART D – CALIBRATION RESULTS<sup>(b,c)</sup>

#### (1) pH at 25°C

| Target (pH unit) | Displayed Reading <sup>(d)</sup> (pH Unit) | Tolerance <sup>(e)</sup> (pH Unit) | Results      |
|------------------|--|------------------------------------|--------------|
| 4.00             | 4.10                                       | 0.1                                | Satisfactory |
| 7.42             | 7.28                                       | -0.14                              | Satisfactory |
| 10.01            | 10.10                                      | 0.09                               | Satisfactory |

Tolerance of pH should be less than  $\pm 0.20$  (pH unit)

#### (2) Temperature

| Reading of Ref. thermometer (°C) | Displayed Reading (°C) | Tolerance (°C) | Results      |
|----------------------------------|------------------------|----------------|--------------|
| 15.0                             | 15.0                   | 0.0            | Satisfactory |
| 25.0                             | 25.5                   | 0.5            | Satisfactory |
| 52.0                             | 53.7                   | 1.7            | Satisfactory |

Tolerance limit of temperature should be less than  $\pm 2.0$  (°C)

~ CONTINUED ON NEXT PAGE ~

#### Remark(s): -

- <sup>(a)</sup> The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted from relevant international standards.  
<sup>(b)</sup> The results relate only to the calibrated equipment as received  
<sup>(c)</sup> The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.  
<sup>(d)</sup> "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.  
<sup>(e)</sup> The "Tolerance Limit" mentioned is referenced to YSI product specifications.

  
LEE Chun-ning, Desmond  
Senior Chemist



專業化驗有限公司

QUALITY PRO TEST-CONSULT LIMITED

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## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AI070052  
Date of Issue : 12 July, 2019  
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### PART D – CALIBRATION RESULTS (Cont'd)

#### (3) Dissolved Oxygen

| Expected Reading (mg/L) | Displayed Reading (mg/L) | Tolerance (mg/L) | Results      |
|-------------------------|--------------------------|------------------|--------------|
| 7.68                    | 7.75                     | 0.07             | Satisfactory |
| 5.81                    | 5.71                     | -0.1             | Satisfactory |
| 3.20                    | 3.38                     | 0.18             | Satisfactory |
| 0.20                    | 0.1                      | -0.10            | Satisfactory |

Tolerance limit of dissolved oxygen should be less than  $\pm 0.50$  (mg/L)

#### (4) Salinity

| Expected Reading (g/L) | Displayed Reading (g/L) | Tolerance (%) | Results      |
|------------------------|-------------------------|---------------|--------------|
| 10                     | 9.96                    | -0.4          | Satisfactory |
| 20                     | 20.26                   | 1.3           | Satisfactory |
| 30                     | 30.97                   | 3.2           | Satisfactory |

Tolerance limit of salinity should be less than  $\pm 10.0$  (%)

#### (5) Turbidity

| Expected Reading (NTU) | Displayed Reading <sup>(f)</sup> (NTU) | Tolerance <sup>(g)</sup> (%) | Results      |
|------------------------|--|------------------------------|--------------|
| 0                      | 0.24                                   | --                           | Satisfactory |
| 10                     | 10.58                                  | 5.8                          | Satisfactory |
| 20                     | 20.00                                  | 0.0                          | Satisfactory |
| 100                    | 97.60                                  | -2.4                         | Satisfactory |
| 800                    | 770.00                                 | -3.8                         | Satisfactory |

Tolerance limit of turbidity should be less than  $\pm 10.0$  (%)

~ END OF REPORT ~

**Remark(s): -**

<sup>(f)</sup> "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

<sup>(g)</sup> The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted from relevant international standards.

# Appendix Q

## The Certification of Laboratory with HOKLAS accredited Analytical Tests



Hong Kong Accreditation Service  
香港認可處

**Certificate of Accreditation**  
認可證書

*This is to certify that*  
特此證明

**ACUMEN LABORATORY AND TESTING LIMITED**  
浩科檢測中心有限公司

Lot 12, Tam Kon Shan Road, North Tsing Yi, New Territories, Hong Kong  
香港新界青衣北担杆山路12路段

*has been accepted by the HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a*  
在認可諮詢委員會的建議下獲香港認可處執行機關接受為

**HOKLAS Accredited Laboratory**  
「香港實驗所認可計劃」認可實驗所

*This laboratory meets the requirements of ISO/IEC 17025:2005 and it has been accredited for performing specific tests or calibrations as listed in the scope of accreditation within the test category of*

**Environmental Testing**

此實驗所符合ISO/IEC 17025:2005所訂的要求  
並獲認可進行載於認可範圍內下述測試類別中的指定測試或校正工作

**環境測試**

*This accreditation to ISO/IEC 17025:2005 demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (see Joint IAF-ILAC-ISO Communiqué).*  
此項 ISO/IEC 17025:2005 的認可資格證明此實驗所具備指定範圍內所須的技術能力並實施一套實驗所質量管理體系(見國際認可論壇、國際實驗所認可合作組織及國際標準化組織的聯合公報)。

*The common seal of the Hong Kong Accreditation Service is affixed hereto by the authority of the HKAS Executive*  
現經香港認可處執行機關授權在此蓋上香港認可處的印章

WONG Wang-wah, Executive Administrator  
執行幹事 黃宏華  
Issue Date: 16 July 2014  
簽發日期：二零一四年七月十六日

Registration Number: **HOKLAS 241**  
註冊號碼：



Date of First Registration: 16 July 2014  
首次註冊日期：二零一四年七月十六日

*This certificate is issued subject to the terms and conditions laid down by HKAS*  
本證書按照香港認可處訂立的條款及條件發出

**L 001195**

# Appendix R

## Impact Water Quality Monitoring Results

# Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong

Tel: (852) 2333 6823 Fax: (852) 2333 1316

## Test Report

Page 1 of 2

Report Number : Q190003aR190794  
Job Number : R190794  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-555  
Sample Description : SS test  
Laboratory ID : R190794/1-5  
Date of Sampling : 01/08/2019  
Date Received : 01/08/2019  
Test Period : 01/08/2019 – 02/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

Hong Kong Accreditation Service (HKAS) has accredited Acumen Laboratory and Testing Limited (Reg. No. HOKLAS 241 - TEST) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. This report is issued subject to Acumen Laboratory and Testing Limited standard TERMS AND CONDITIONS, and shall not be reproduced except in full or with written approval by Acumen Laboratory and Testing Limited. The result(s) of this report are applied to the sample(s) submitted only.

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E-mail: [htthui@acumenhk.com](mailto:htthui@acumenhk.com) / [jlcung@acumenhk.com](mailto:jlcung@acumenhk.com)



# Acumen Laboratory and Testing Limited

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Tel: (852) 2333 6823 Fax: (852) 2333 1316

## Test Report

Page 2 of 2

Report Number : Q190003aR190794

Job Number : R190794

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190794/1 | 01/08/2019       | C1               | 5.0                            |
| R190794/2 | 01/08/2019       | C2               | 7.2                            |
| R190794/3 | 01/08/2019       | M1               | 3.4                            |
| R190794/4 | 01/08/2019       | M2               | 6.3                            |
| R190794/5 | 01/08/2019       | M3               | <1                             |

- Note:
1. mg/L indicates milligram per liter
  2. mg O<sub>2</sub>/L indicates milligram oxygen per liter
  3. < indicates less than.
  4. > indicates more than.
  5. NA indicates Not Applicable.

\*\*\*End of Report\*\*\*

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## Test Report


Page 1 of 2

Report Number : Q190003aR190795  
Job Number : R190795  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-556  
Sample Description : SS test  
Laboratory ID : R190795/1-5  
Date of Sampling : 03/08/2019  
Date Received : 03/08/2019  
Test Period : 03/08/2019– 04/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D  
Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

  
Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190795

Job Number : R190795

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190795/1 | 03/08/2019       | C1               | 5.5                            |
| R190795/2 | 03/08/2019       | C2               | 7.8                            |
| R190795/3 | 03/08/2019       | M1               | 3.2                            |
| R190795/4 | 03/08/2019       | M2               | 7.1                            |
| R190795/5 | 03/08/2019       | M3               | <1                             |

- Note:
1. mg/L indicates milligram per liter
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  4. > indicates more than.
  5. NA indicates Not Applicable.

\*\*\*End of Report\*\*\*

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## Test Report


Page 1 of 2

Report Number : Q190003aR190796  
Job Number : R190796  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-557  
Sample Description : SS test  
Laboratory ID : R190796/1-5  
Date of Sampling : 05/08/2019  
Date Received : 05/08/2019  
Test Period : 05/08/2019– 06/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D  
  
Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

  
Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190796  
Job Number : R190796  
Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190796/1 | 05/08/2019       | C1               | 2.1                            |
| R190796/2 | 05/08/2019       | C2               | 4.2                            |
| R190796/3 | 05/08/2019       | M1               | 1.7                            |
| R190796/4 | 05/08/2019       | M2               | 2.7                            |
| R190796/5 | 05/08/2019       | M3               | <1                             |

Note:

1. mg/L indicates milligram per liter
2. mg O<sub>2</sub>/ L indicates milligram oxygen per liter
3. < indicates less than.
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## Test Report

Page 1 of 2


Report Number : Q190003aR190797  
Job Number : R190797  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-558  
Sample Description : SS test  
Laboratory ID : R190797/1-5  
Date of Sampling : 07/08/2019  
Date Received : 07/08/2019  
Test Period : 07/08/2019– 08/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

  
Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190797

Job Number : R190797

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190797/1 | 07/08/2019       | C1               | 2.4                            |
| R190797/2 | 07/08/2019       | C2               | 4.6                            |
| R190797/3 | 07/08/2019       | M1               | 3.3                            |
| R190797/4 | 07/08/2019       | M2               | 2.3                            |
| R190797/5 | 07/08/2019       | M3               | <1                             |

Note:

1. mg/L indicates milligram per liter
2. mg O<sub>2</sub>/ L indicates milligram oxygen per liter
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5. NA indicates Not Applicable.

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## Test Report


Page 1 of 2

Report Number : Q190003aR190798  
Job Number : R190798  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-559  
Sample Description : SS test  
Laboratory ID : R190798/1-5  
Date of Sampling : 09/08/2019  
Date Received : 09/08/2019  
Test Period : 09/08/2019– 10/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D  
  
Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

  
Hui Wai Fung, Huntington  
Laboratory Manager  
Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190798

Job Number : R190798

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190798/1 | 09/08/2019       | C1               | 3.2                            |
| R190798/2 | 09/08/2019       | C2               | 5.1                            |
| R190798/3 | 09/08/2019       | M1               | 3.5                            |
| R190798/4 | 09/08/2019       | M2               | 2.7                            |
| R190798/5 | 09/08/2019       | M3               | <1                             |

- Note:
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  5. NA indicates Not Applicable.

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## Test Report

Page 1 of 2


Report Number : Q190003aR190799  
Job Number : R190799  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-560  
Sample Description : SS test  
Laboratory ID : R190799/1-5  
Date of Sampling : 12/08/2019  
Date Received : 12/08/2019  
Test Period : 12/08/2019 – 13/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature:

  
\_\_\_\_\_  
Hui Wai Fung, Huntington  
Laboratory Manager  
Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190799

Job Number : R190799

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190799/1 | 12/08/2019       | C1               | 2.3                            |
| R190799/2 | 12/08/2019       | C2               | 3.1                            |
| R190799/3 | 12/08/2019       | M1               | 2.6                            |
| R190799/4 | 12/08/2019       | M2               | 2.1                            |
| R190799/5 | 12/08/2019       | M3               | <1                             |

- Note:
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  3. < indicates less than.
  4. > indicates more than.
  5. NA indicates Not Applicable.

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# Acumen Laboratory and Testing Limited

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## Test Report

Page 1 of 2


Report Number : Q190003aR190800  
Job Number : R190800  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-561  
Sample Description : SS test  
Laboratory ID : R190800/1-5  
Date of Sampling : 14/08/2019  
Date Received : 14/08/2019  
Test Period : 14/08/2019– 15/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature:

  
\_\_\_\_\_  
Hui Wai Fung, Huntington  
Laboratory Manager  
Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190800

Job Number : R190800

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190800/1 | 14/08/2019       | C1               | 2.1                            |
| R190800/2 | 14/08/2019       | C2               | 4.7                            |
| R190800/3 | 14/08/2019       | M1               | 1.3                            |
| R190800/4 | 14/08/2019       | M2               | 1.9                            |
| R190800/5 | 14/08/2019       | M3               | <1                             |

- Note:
1. mg/L indicates milligram per liter
  2. mg O<sub>2</sub>/ L indicates milligram oxygen per liter
  3. < indicates less than.
  4. > indicates more than.
  5. NA indicates Not Applicable.

\*\*\*End of Report\*\*\*

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## Test Report

Page 1 of 2

Report Number : Q190003aR190801  
Job Number : R190801  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-562  
Sample Description : SS test  
Laboratory ID : R190801/1-5  
Date of Sampling : 16/08/2019  
Date Received : 16/08/2019  
Test Period : 16/08/2019– 17/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190801

Job Number : R190801

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190801/1 | 16/08/2019       | C1               | 5.2                            |
| R190801/2 | 16/08/2019       | C2               | 3.3                            |
| R190801/3 | 16/08/2019       | M1               | 3.0                            |
| R190801/4 | 16/08/2019       | M2               | 3.2                            |
| R190801/5 | 16/08/2019       | M3               | <1                             |

- Note:
1. mg/L indicates milligram per liter
  2. mg O<sub>2</sub>/ L indicates milligram oxygen per liter
  3. < indicates less than.
  4. > indicates more than.
  5. NA indicates Not Applicable.

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## Test Report

Page 1 of 2

Report Number : Q190003aR190803  
Job Number : R190803  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-563  
Sample Description : SS test  
Laboratory ID : R190803/1-5  
Date of Sampling : 19/08/2019  
Date Received : 19/08/2019  
Test Period : 19/08/2019– 20/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D  
Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

  
Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190803  
Job Number : R190803  
Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190803/1 | 19/08/2019       | C1               | 4.2                            |
| R190803/2 | 19/08/2019       | C2               | 5.6                            |
| R190803/3 | 19/08/2019       | M1               | 2.1                            |
| R190803/4 | 19/08/2019       | M2               | 2.3                            |
| R190803/5 | 19/08/2019       | M3               | <1                             |

Note:

1. mg/L indicates milligram per liter
2. mg O<sub>2</sub>/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

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## Test Report

Page 1 of 2


Report Number : Q190003aR190804  
Job Number : R190804  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-564  
Sample Description : SS test  
Laboratory ID : R190804/1-5  
Date of Sampling : 21/08/2019  
Date Received : 21/08/2019  
Test Period : 21/08/2019– 22/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

  
Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190804

Job Number : R190804

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190804/1 | 21/08/2019       | C1               | 2.3                            |
| R190804/2 | 21/08/2019       | C2               | 5.6                            |
| R190804/3 | 21/08/2019       | M1               | 2.3                            |
| R190804/4 | 21/08/2019       | M2               | 2.4                            |
| R190804/5 | 21/08/2019       | M3               | <1                             |

- Note:
1. mg/L indicates milligram per liter
  2. mg O<sub>2</sub>/ L indicates milligram oxygen per liter
  3. < indicates less than.
  4. > indicates more than.
  5. NA indicates Not Applicable.

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## Test Report

Page 1 of 2


Report Number : Q190003aR190805  
Job Number : R190805  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-565  
Sample Description : SS test  
Laboratory ID : R190805/1-5  
Date of Sampling : 23/08/2019  
Date Received : 23/08/2019  
Test Period : 23/08/2019 – 24/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

  
Hui Wai Fung, Huntington  
Laboratory Manager  
Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190805  
Job Number : R190805  
Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190805/1 | 23/08/2019       | C1               | 3.2                            |
| R190805/2 | 23/08/2019       | C2               | 4.1                            |
| R190805/3 | 23/08/2019       | M1               | 2.4                            |
| R190805/4 | 23/08/2019       | M2               | 2.8                            |
| R190805/5 | 23/08/2019       | M3               | <1                             |

- Note:
1. mg/L indicates milligram per liter
  2. mg O<sub>2</sub>/ L indicates milligram oxygen per liter
  3. < indicates less than.
  4. > indicates more than.
  5. NA indicates Not Applicable.

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## Test Report

Page 1 of 2

Report Number : Q190003aR190806  
Job Number : R190806  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-566  
Sample Description : SS test  
Laboratory ID : R190806/1-5  
Date of Sampling : 26/08/2019  
Date Received : 26/08/2019  
Test Period : 26/08/2019 – 27/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D  
Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190806

Job Number : R190806

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190806/1 | 26/08/2019       | C1               | 3.8                            |
| R190806/2 | 26/08/2019       | C2               | 4.3                            |
| R190806/3 | 26/08/2019       | M1               | 1.8                            |
| R190806/4 | 26/08/2019       | M2               | 3.2                            |
| R190806/5 | 26/08/2019       | M3               | <1                             |

- Note:
1. mg/L indicates milligram per liter
  2. mg O<sub>2</sub>/ L indicates milligram oxygen per liter
  3. < indicates less than.
  4. > indicates more than.
  5. NA indicates Not Applicable.

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
Page 1 of 2

Report Number : Q190003aR190807  
Job Number : R190807  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-567  
Sample Description : SS test  
Laboratory ID : R190807/1-5  
Date of Sampling : 28/08/2019  
Date Received : 28/08/2019  
Test Period : 28/08/2019 – 29/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D  
Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

  
Hui Wai Fung, Huntington  
Laboratory Manager  
Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190807

Job Number : R190807

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190807/1 | 28/08/2019       | C1               | 3.5                            |
| R190807/2 | 28/08/2019       | C2               | 4.9                            |
| R190807/3 | 28/08/2019       | M1               | 3.0                            |
| R190807/4 | 28/08/2019       | M2               | 3.7                            |
| R190807/5 | 28/08/2019       | M3               | <1                             |

- Note:
1. mg/L indicates milligram per liter
  2. mg O<sub>2</sub>/ L indicates milligram oxygen per liter
  3. < indicates less than.
  4. > indicates more than.
  5. NA indicates Not Applicable.

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## Test Report

Page 1 of 2

Report Number : Q190003aR190808  
Job Number : R190808  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-568  
Sample Description : SS test  
Laboratory ID : R190808/1-5  
Date of Sampling : 30/08/2019  
Date Received : 30/08/2019  
Test Period : 30/08/2019 – 31/08/2019  
Test Required : 1. Suspended Solids (SS)  
Method Used : 1. QPL-15e, APHA 22ed 2540 D  
Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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## Test Report

Page 2 of 2

Report Number : Q190003aR190808

Job Number : R190808

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID | Suspended Solids (SS),<br>mg/L |
|-----------|------------------|------------------|--------------------------------|
| R190808/1 | 30/08/2019       | C1               | 4.6                            |
| R190808/2 | 30/08/2019       | C2               | 6.2                            |
| R190808/3 | 30/08/2019       | M1               | 2.7                            |
| R190808/4 | 30/08/2019       | M2               | 3.1                            |
| R190808/5 | 30/08/2019       | M3               | <1                             |

- Note:
1. mg/L indicates milligram per liter
  2. mg O<sub>2</sub>/ L indicates milligram oxygen per liter
  3. < indicates less than.
  4. > indicates more than.
  5. NA indicates Not Applicable.

\*\*\*End of Report\*\*\*

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| Date        | Time   | Weather | Location | Co-ordinates |        | Water Depth<br>m | Sample Depth<br>m | Temp. |      | DO con. |       | DO Saturation |      | Turbidity |      | pH   |      | SS<br>mg/L |
|-------------|--------|---------|----------|--------------|--------|------------------|-------------------|-------|------|---------|-------|---------------|------|-----------|------|------|------|------------|
|             |        |         |          | East         | North  |                  |                   | °C    |      | mg/L    |       | %             |      | NTU       |      | unit |      |            |
| 1 Aug 2019  | 13:17  | Cloudy  | C1       | 835110       | 824716 | 0.04             | 0.02              | 28.1  | 28.2 | 8.72    | 8.71  | 87.3          | 87.2 | 2.3       | 2.3  | 7.6  | 7.59 | 5.0        |
|             | 13:30  | Cloudy  | C2       | 835403       | 824470 | 0.02             | 0.01              | 27.9  | 27.8 | 8.58    | 8.57  | 89.3          | 89.3 | 2.6       | 2.7  | 7.24 | 7.25 | 7.2        |
|             | N/A    | N/A     | C3       | 835642       | 824386 | N/A              | N/A               | N/A   | N/A  | N/A     | N/A   | N/A           | N/A  | N/A       | N/A  | N/A  | N/A  | N/A        |
|             | 13:42  | Cloudy  | M1       | 835215       | 824827 | 0.8              | 0.4               | 27.6  | 27.7 | 9.08    | 9.09  | 96.2          | 96.1 | 2.0       | 2.1  | 7.62 | 7.61 | 3.4        |
|             | 13:55  | Cloudy  | M2       | 835536       | 824775 | 0.05             | 0.025             | 27.5  | 27.6 | 9.33    | 9.32  | 96.1          | 96.0 | 1.6       | 1.5  | 7.73 | 7.72 | 6.3        |
| 14:10       | Cloudy | M3      | 835501   | 824648       | 0.02   | 0.01             | 27.6              | 27.5  | 9.6  | 9.6     | 98.8  | 98.7          | 0.5  | 0.6       | 7.53 | 7.52 | <1   |            |
| 3 Aug 2019  | 14:28  | Cloudy  | C1       | 835110       | 824716 | 0.04             | 0.02              | 29.4  | 29.3 | 8.69    | 8.68  | 89.5          | 89.6 | 2.6       | 2.7  | 7.31 | 7.32 | 5.5        |
|             | 14:36  | Cloudy  | C2       | 835403       | 824470 | 0.02             | 0.01              | 29.5  | 29.5 | 8.59    | 8.59  | 87.7          | 87.6 | 2.5       | 2.6  | 7.35 | 7.34 | 7.8        |
|             | N/A    | N/A     | C3       | 835642       | 824386 | N/A              | N/A               | N/A   | N/A  | N/A     | N/A   | N/A           | N/A  | N/A       | N/A  | N/A  | N/A  | N/A        |
|             | 14:45  | Cloudy  | M1       | 835215       | 824827 | 0.8              | 0.4               | 29.4  | 29.4 | 9.06    | 9.05  | 96.3          | 96.2 | 2         | 2    | 7.89 | 7.90 | 3.2        |
|             | 14:55  | Cloudy  | M2       | 835536       | 824775 | 0.05             | 0.025             | 29.6  | 29.6 | 9.3     | 9.3   | 96.8          | 96.7 | 2.2       | 2.1  | 7.73 | 7.72 | 7.1        |
| 15:09       | Cloudy | M3      | 835501   | 824648       | 0.02   | 0.01             | 29.5              | 29.4  | 9.59 | 9.6     | 100.5 | 100.5         | 0.9  | 0.9       | 7.60 | 7.61 | <1   |            |
| 5 Aug 2019  | 9:09   | Sunny   | C1       | 835110       | 824716 | 0.04             | 0.02              | 28.1  | 28.1 | 8.51    | 8.51  | 88.6          | 88.6 | 2.5       | 2.4  | 7.83 | 7.82 | 2.1        |
|             | 9:17   | Sunny   | C2       | 835403       | 824470 | 0.02             | 0.01              | 28.1  | 28   | 8.42    | 8.43  | 92.7          | 92.7 | 2.4       | 2.4  | 7.76 | 7.76 | 4.2        |
|             | N/A    | N/A     | C3       | 835642       | 824386 | N/A              | N/A               | N/A   | N/A  | N/A     | N/A   | N/A           | N/A  | N/A       | N/A  | N/A  | N/A  | N/A        |
|             | 9:50   | Sunny   | M1       | 835215       | 824827 | 0.8              | 0.4               | 27.2  | 27.3 | 8.95    | 8.96  | 94.9          | 95.0 | 2.2       | 2    | 7.71 | 7.70 | 1.7        |
|             | 9:38   | Sunny   | M2       | 835536       | 824775 | 0.05             | 0.025             | 27.5  | 27.4 | 9.32    | 9.32  | 94.8          | 94.8 | 1.9       | 1.8  | 7.75 | 7.74 | 2.7        |
| 9:28        | Sunny  | M3      | 835501   | 824648       | 0.02   | 0.01             | 27.5              | 27.5  | 9.48 | 9.49    | 98.1  | 98.0          | 0.6  | 0.6       | 7.66 | 7.65 | <1   |            |
| 7 Aug 2019  | 13:30  | Sunny   | C1       | 835110       | 824716 | 0.04             | 0.02              | 29.3  | 29.4 | 8.77    | 8.76  | 90.5          | 90.5 | 2.7       | 2.6  | 7.89 | 7.88 | 2.4        |
|             | 13:45  | Sunny   | C2       | 835403       | 824470 | 0.02             | 0.01              | 29.2  | 29.2 | 8.63    | 8.62  | 92.9          | 92.9 | 2.3       | 2.4  | 7.72 | 7.71 | 4.6        |
|             | N/A    | N/A     | C3       | 835642       | 824386 | N/A              | N/A               | N/A   | N/A  | N/A     | N/A   | N/A           | N/A  | N/A       | N/A  | N/A  | N/A  | N/A        |
|             | 14:18  | Sunny   | M1       | 835215       | 824827 | 0.8              | 0.4               | 29.1  | 29.1 | 9.31    | 9.32  | 95.8          | 95.8 | 2.1       | 2.1  | 7.68 | 7.69 | 3.3        |
|             | 14:05  | Sunny   | M2       | 835536       | 824775 | 0.05             | 0.025             | 29.1  | 29   | 9.05    | 9.06  | 96.7          | 96.6 | 1.8       | 1.9  | 7.72 | 7.72 | 2.3        |
| 13:55       | Sunny  | M3      | 835501   | 824648       | 0.02   | 0.01             | 28.9              | 28.9  | 9.57 | 9.57    | 99.0  | 99.0          | 0.6  | 0.5       | 7.66 | 7.66 | <1   |            |
| 9 Aug 2019  | 9:45   | Sunny   | C1       | 835110       | 824716 | 0.04             | 0.02              | 29.1  | 29.1 | 8.32    | 8.33  | 86.8          | 86.7 | 2.5       | 2.5  | 7.78 | 7.76 | 3.2        |
|             | 9:38   | Sunny   | C2       | 835403       | 824470 | 0.02             | 0.01              | 29    | 29.1 | 8.60    | 8.61  | 90.6          | 90.6 | 2.7       | 2.8  | 7.5  | 7.5  | 5.1        |
|             | N/A    | N/A     | C3       | 835642       | 824386 | N/A              | N/A               | N/A   | N/A  | N/A     | N/A   | N/A           | N/A  | N/A       | N/A  | N/A  | N/A  | N/A        |
|             | 9:02   | Sunny   | M1       | 835215       | 824827 | 0.8              | 0.4               | 28.9  | 28.9 | 8.98    | 8.97  | 97.1          | 97.2 | 2.3       | 2.4  | 7.88 | 7.88 | 3.5        |
|             | 9:18   | Sunny   | M2       | 835536       | 824775 | 0.05             | 0.025             | 28.7  | 28.8 | 8.99    | 8.98  | 95.8          | 95.9 | 1.9       | 1.9  | 7.72 | 7.72 | 2.7        |
| 9:25        | Sunny  | M3      | 835501   | 824648       | 0.02   | 0.01             | 29                | 29    | 9.25 | 9.26    | 99.6  | 99.6          | 0.6  | 0.7       | 7.74 | 7.75 | <1   |            |
| 12 Aug 2019 | 13:38  | Fine    | C1       | 835110       | 824716 | 0.04             | 0.02              | 28.1  | 28.1 | 8.48    | 8.47  | 86.8          | 86.7 | 2.7       | 2.8  | 7.61 | 7.61 | 2.3        |
|             | 13:49  | Fine    | C2       | 835403       | 824470 | 0.02             | 0.01              | 28.2  | 28.2 | 8.69    | 8.70  | 90.6          | 90.6 | 2.7       | 2.8  | 7.45 | 7.47 | 3.1        |
|             | N/A    | N/A     | C3       | 835642       | 824386 | N/A              | N/A               | N/A   | N/A  | N/A     | N/A   | N/A           | N/A  | N/A       | N/A  | N/A  | N/A  | N/A        |
|             | 14:18  | Fine    | M1       | 835215       | 824827 | 0.8              | 0.4               | 27.8  | 27.8 | 9.14    | 9.15  | 97.1          | 97.2 | 2.3       | 2.2  | 7.66 | 7.66 | 2.6        |
|             | 14:09  | Fine    | M2       | 835536       | 824775 | 0.05             | 0.025             | 27.9  | 27.8 | 8.99    | 8.99  | 95.8          | 95.9 | 1.8       | 1.9  | 7.72 | 7.73 | 2.1        |
| 13:55       | Fine   | M3      | 835501   | 824648       | 0.02   | 0.01             | 28.6              | 28.6  | 9.40 | 9.41    | 99.6  | 99.6          | 0.7  | 0.8       | 7.66 | 7.66 | <1   |            |

|             |       |        |    |        |        |      |       |      |      |      |      |      |      |     |     |      |      |     |
|-------------|-------|--------|----|--------|--------|------|-------|------|------|------|------|------|------|-----|-----|------|------|-----|
| 14 Aug 2019 | 15:00 | Cloudy | C1 | 835110 | 824716 | 0.04 | 0.02  | 27.3 | 27.4 | 8.8  | 8.79 | 89.4 | 89.4 | 2.9 | 2.9 | 7.73 | 7.74 | 2.1 |
|             | 15:18 | Cloudy | C2 | 835403 | 824470 | 0.02 | 0.01  | 27.5 | 27.4 | 8.59 | 8.6  | 89.2 | 89.2 | 2.6 | 2.6 | 7.39 | 7.38 | 4.7 |
|             | N/A   | N/A    | C3 | 835642 | 824386 | N/A  | N/A   | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A | N/A | N/A  | N/A  | N/A |
|             | 15:52 | Cloudy | M1 | 835215 | 824827 | 0.8  | 0.4   | 27.6 | 27.6 | 9.41 | 9.42 | 95.3 | 95.4 | 2.2 | 2.2 | 7.8  | 7.81 | 1.3 |
|             | 15:40 | Cloudy | M2 | 835536 | 824775 | 0.05 | 0.025 | 27.8 | 27.8 | 9.17 | 9.18 | 94.4 | 94.4 | 2.3 | 2.2 | 7.78 | 7.77 | 1.9 |
|             | 15:29 | Cloudy | M3 | 835501 | 824648 | 0.02 | 0.01  | 27.6 | 27.6 | 9.28 | 9.27 | 98.7 | 98.7 | 0.8 | 0.9 | 7.69 | 7.69 | <1  |
| 16 Aug 2019 | 11:49 | Cloudy | C1 | 835110 | 824716 | 0.04 | 0.02  | 29.6 | 29.5 | 8.71 | 8.72 | 90.3 | 90.4 | 1.9 | 2.0 | 7.62 | 7.61 | 5.2 |
|             | 11:39 | Cloudy | C2 | 835403 | 824470 | 0.02 | 0.01  | 29.4 | 29.5 | 8.4  | 8.39 | 88.2 | 88.2 | 2.5 | 2.5 | 7.45 | 7.46 | 3.3 |
|             | N/A   | N/A    | C3 | 835642 | 824386 | N/A  | N/A   | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A | N/A | N/A  | N/A  | N/A |
|             | 11:05 | Cloudy | M1 | 835215 | 824827 | 0.8  | 0.4   | 29.4 | 29.4 | 9.09 | 9.1  | 95.3 | 95.3 | 2.0 | 1.9 | 7.66 | 7.65 | 3.0 |
|             | 11:19 | Cloudy | M2 | 835536 | 824775 | 0.05 | 0.025 | 29.3 | 29.3 | 8.96 | 8.95 | 94.6 | 94.5 | 1.8 | 1.8 | 7.72 | 7.73 | 3.2 |
|             | 11:28 | Cloudy | M3 | 835501 | 824648 | 0.02 | 0.01  | 29.2 | 29.2 | 9.34 | 9.33 | 98.6 | 98.6 | 0.3 | 0.3 | 7.67 | 7.66 | <1  |
| 19 Aug 2019 | 10:00 | Sunny  | C1 | 835110 | 824716 | 0.04 | 0.02  | 28   | 28   | 8.50 | 8.50 | 90.1 | 90.0 | 2.7 | 2.7 | 7.47 | 7.48 | 4.2 |
|             | 10:09 | Sunny  | C2 | 835403 | 824470 | 0.02 | 0.01  | 27.9 | 27.9 | 8.21 | 8.22 | 90.5 | 90.5 | 2.7 | 2.6 | 7.65 | 7.64 | 5.6 |
|             | N/A   | N/A    | C3 | 835642 | 824386 | N/A  | N/A   | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A | N/A | N/A  | N/A  | N/A |
|             | 10:45 | Sunny  | M1 | 835215 | 824827 | 0.8  | 0.4   | 27.7 | 27.7 | 9.14 | 9.15 | 96.7 | 96.6 | 1.9 | 2.0 | 7.73 | 7.74 | 2.1 |
|             | 10:30 | Sunny  | M2 | 835536 | 824775 | 0.05 | 0.025 | 27.7 | 27.7 | 9.18 | 9.17 | 98.5 | 98.4 | 1.9 | 1.8 | 7.76 | 7.75 | 2.3 |
|             | 10:19 | Sunny  | M3 | 835501 | 824648 | 0.02 | 0.01  | 27.4 | 27.3 | 9.52 | 9.51 | 98.3 | 98.4 | 0.7 | 0.6 | 7.52 | 7.53 | <1  |
| 21 Aug 2019 | 16:08 | Sunny  | C1 | 835110 | 824716 | 0.04 | 0.02  | 28.1 | 28.2 | 8.67 | 8.68 | 89.4 | 89.4 | 2.3 | 2.2 | 7.39 | 7.39 | 2.3 |
|             | 16:19 | Sunny  | C2 | 835403 | 824470 | 0.02 | 0.01  | 28   | 28   | 8.59 | 8.58 | 89.2 | 89.2 | 2.5 | 2.6 | 7.31 | 7.32 | 5.6 |
|             | N/A   | N/A    | C3 | 835642 | 824386 | N/A  | N/A   | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A | N/A | N/A  | N/A  | N/A |
|             | 16:55 | Sunny  | M1 | 835215 | 824827 | 0.8  | 0.4   | 28.1 | 28   | 9.21 | 9.22 | 95.3 | 95.4 | 2.0 | 2.1 | 7.76 | 7.78 | 2.3 |
|             | 16:39 | Sunny  | M2 | 835536 | 824775 | 0.05 | 0.025 | 27.9 | 27.9 | 9.00 | 8.99 | 94.4 | 94.4 | 1.8 | 1.7 | 7.63 | 7.62 | 2.4 |
|             | 16:29 | Sunny  | M3 | 835501 | 824648 | 0.02 | 0.01  | 27.9 | 27.9 | 9.46 | 9.47 | 98.7 | 98.7 | 0.6 | 0.5 | 7.59 | 7.59 | <1  |
| 23 Aug 2019 | 10:11 | Fine   | C1 | 835110 | 824716 | 0.04 | 0.02  | 29.2 | 29.2 | 8.33 | 8.33 | 92.6 | 92.7 | 2.5 | 2.6 | 7.69 | 7.69 | 3.2 |
|             | 10:19 | Fine   | C2 | 835403 | 824470 | 0.02 | 0.01  | 29.1 | 29.1 | 8.63 | 8.62 | 92.1 | 92.1 | 2.9 | 2.8 | 7.6  | 7.59 | 4.1 |
|             | N/A   | N/A    | C3 | 835642 | 824386 | N/A  | N/A   | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A | N/A | N/A  | N/A  | N/A |
|             | 10:59 | Fine   | M1 | 835215 | 824827 | 0.8  | 0.4   | 28.8 | 28.8 | 9.22 | 9.21 | 96.3 | 96.3 | 2.2 | 2.1 | 7.79 | 7.8  | 2.4 |
|             | 10:45 | Fine   | M2 | 835536 | 824775 | 0.05 | 0.025 | 28.6 | 28.7 | 9.17 | 9.16 | 98.1 | 98.1 | 2   | 2   | 7.72 | 7.73 | 2.8 |
|             | 10:29 | Fine   | M3 | 835501 | 824648 | 0.02 | 0.01  | 28.6 | 28.6 | 9.30 | 9.31 | 97.6 | 97.7 | 0.5 | 0.5 | 7.59 | 7.59 | <1  |
| 26 Aug 2019 | 13:13 | Cloudy | C1 | 835110 | 824716 | 0.04 | 0.02  | 28.1 | 28.0 | 8.37 | 8.36 | 86.3 | 86.4 | 2.6 | 2.7 | 7.54 | 7.53 | 3.8 |
|             | 13:19 | Cloudy | C2 | 835403 | 824470 | 0.02 | 0.01  | 28.2 | 28.2 | 8.7  | 8.69 | 88.3 | 88.4 | 2.5 | 2.6 | 7.41 | 7.4  | 4.3 |
|             | N/A   | N/A    | C3 | 835642 | 824386 | N/A  | N/A   | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A | N/A | N/A  | N/A  | N/A |
|             | 13:50 | Cloudy | M1 | 835215 | 824827 | 0.8  | 0.4   | 27.6 | 27.8 | 9.25 | 9.24 | 91.5 | 91.6 | 2.1 | 2.1 | 7.51 | 7.5  | 1.8 |
|             | 13:59 | Cloudy | M2 | 835536 | 824775 | 0.05 | 0.025 | 27.8 | 27.8 | 9.23 | 9.22 | 92.4 | 92.5 | 1.8 | 1.9 | 7.51 | 7.52 | 3.2 |
|             | 13:37 | Cloudy | M3 | 835501 | 824648 | 0.02 | 0.01  | 28.6 | 28.6 | 9.54 | 9.53 | 92.4 | 92.5 | 0.6 | 0.7 | 7.1  | 7.11 | <1  |
| 28 Aug 2019 | 9:09  | Sunny  | C1 | 835110 | 824716 | 0.04 | 0.02  | 29.2 | 29.3 | 8.41 | 8.40 | 94.2 | 94.1 | 2.8 | 2.9 | 7.76 | 7.77 | 3.5 |
|             | 9:15  | Sunny  | C2 | 835403 | 824470 | 0.02 | 0.01  | 29.1 | 29.1 | 8.64 | 8.65 | 93   | 93.1 | 2.6 | 2.6 | 7.65 | 7.66 | 4.9 |
|             | N/A   | N/A    | C3 | 835642 | 824386 | N/A  | N/A   | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A | N/A | N/A  | N/A  | N/A |
|             | 9:28  | Sunny  | M1 | 835215 | 824827 | 0.8  | 0.4   | 29   | 29   | 9.22 | 9.23 | 98.2 | 98.3 | 2.3 | 2.3 | 7.69 | 7.69 | 3.0 |
|             | 9:39  | Sunny  | M2 | 835536 | 824775 | 0.05 | 0.025 | 28.7 | 28.9 | 9.16 | 9.15 | 96.1 | 96   | 1.4 | 1.4 | 7.68 | 7.69 | 3.7 |
|             | 9:49  | Sunny  | M3 | 835501 | 824648 | 0.02 | 0.01  | 28.6 | 28.6 | 9.29 | 9.30 | 92.6 | 92.5 | 0.8 | 0.8 | 7.62 | 7.63 | <1  |
| 30 Aug 2019 | 16:17 | Cloudy | C1 | 835110 | 824716 | 0.04 | 0.02  | 29.4 | 29.5 | 8.79 | 8.8  | 93.1 | 93.2 | 2.8 | 2.8 | 7.68 | 7.69 | 4.6 |
|             | 16:29 | Cloudy | C2 | 835403 | 824470 | 0.02 | 0.01  | 29.2 | 29.2 | 8.81 | 8.8  | 93.2 | 93.3 | 2.7 | 2.6 | 7.52 | 7.53 | 6.2 |
|             | N/A   | N/A    | C3 | 835642 | 824386 | N/A  | N/A   | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A | N/A | N/A  | N/A  | N/A |
|             | 16:39 | Cloudy | M1 | 835215 | 824827 | 0.8  | 0.4   | 29   | 29.1 | 9.1  | 9.09 | 98.6 | 98.7 | 2.2 | 2.3 | 7.29 | 7.3  | 2.7 |

|       |        |    |        |        |      |       |      |      |      |      |      |      |     |     |      |      |     |
|-------|--------|----|--------|--------|------|-------|------|------|------|------|------|------|-----|-----|------|------|-----|
| 17:03 | Cloudy | M2 | 835536 | 824775 | 0.05 | 0.025 | 28.9 | 28.9 | 9.23 | 9.24 | 96.6 | 96.6 | 1.8 | 1.7 | 7.52 | 7.51 | 3.1 |
| 16:51 | Cloudy | M3 | 835501 | 824648 | 0.02 | 0.01  | 29   | 29   | 9.62 | 9.62 | 99.9 | 99.8 | 0.6 | 0.5 | 7.43 | 7.42 | <1  |

# Acumen Laboratory and Testing Limited

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## Test Report


Page 1 of 2

Report Number : Q190003aR190802  
Job Number : R190802  
Issue Date : 10/09/2019  
Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.  
Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.  
Project Name : CJO-3113-562-01  
Sample Description : pH Value, TSS and COD tests  
Laboratory ID : R190802/1  
Date of Sampling : 16/08/2019  
Date Received : 16/08/2019  
Test Period : 16/08/2019 –17/08/2019  
Test Required : 1. pH Value;  
2. Total Suspended Solids (TSS);  
3. Chemical Oxygen Demand (COD)  
Method Used : 1. QPL-15d, APHA 22ed 4500-H<sup>+</sup> B  
2. QPL-15e, APHA 22ed 2540 D  
3. QPL-15f, APHA 22ed 5220 B  
Test Result : Refer to the results on page 2.

*For and on behalf of*

Acumen Laboratory and Testing Limited

Authorized Signature: \_\_\_\_\_

  
Hui Wai Fung, Huntington  
Laboratory Manager  
Chemical Division

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# Acumen Laboratory and Testing Limited

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## Test Report

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Report Number : Q190003aR190802

Job Number : R190802

Issue Date : 10/09/2019

### Test Result:

| Lab ID    | Date of Sampling | Client Sample ID     | pH Value<br>at (measured<br>temperature °C) | Total Suspended<br>Solids (TSS),<br>mg/L | Chemical Oxygen<br>Demand<br>(COD), mg O <sub>2</sub> /L |
|-----------|------------------|----------------------|---|--|--|
| R190802/1 | 16/08/2019       | Hing Keng, Wall<br>C | 7.8 (23)                                    | <2.5                                     | <50  |

- Note:
1. mg/L indicates milligram per liter
  2. mg O<sub>2</sub>/ L indicates milligram oxygen per liter
  3. < indicates less than.
  4. > indicates more than.
  5. NA indicates Not Applicable.

\*\*\*End of Report\*\*\*

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# Appendix S

## Impact Monitoring report for Ecology

# **Post-Transplantation Monitoring Report**

**for Agreement No. CE 13/2009 (WS)**

IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS – SOUTH WORKS

**Report No.60**

**August 2019**

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## **1. INTRODUCTION**

- 1.1 Pursuant to the Environmental Impact Assessment (EIA) Ordinance, the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP- 494/2015) to the Water Supplies Department (WSD) to construct and operate the designated project for “In-situ Reprovisioning of Sha Tin Water Treatment Works - South Works” (“The Project”).
- 1.2 Upon the requirement of the Environmental Permit, a detailed vegetation report presenting the baseline vegetation condition for flora species with conservation interest, transplanting and monitoring programme for the Project has been prepared and approved by DEP in February 2016.
- 1.3 There were 4 flora species of conservation importance were recorded in the woodland habitat within project site including Ailanthus (*Ailanthus fordii*), Incense Tree (*Aquilaria sinensis*), Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle’s Claw (*Artabotrys hongkongensis*). In total, 2 nos. of Incense Tree (*Aquilaria sinensis*), 1 no. of Ailanthus (*Ailanthus fordii*) trees, 5 colonies of Lamb of Tartary (*Cibotium barometz*) and 1 no. Hong Kong Eagle’s Claw (*Artabotrys hongkongensis*) was recommended to be transplanted in the approved detailed vegetation survey report.
- 1.4 Detailed vegetation report was planned that Incense Tree (*Aquilaria sinensis*) and Ailanthus (*Ailanthus fordii*) trees will be transplanted within existing Sha Tin Water Treatment Works (STWTW). All other shrubs including Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle’s Claw (*Artabotrys hongkongensis*) will be transplanted to the hillside slope at Sha Tin South Fresh Water Service Reservoir (STSFWSR).
- 1.2 Upon the requirement of the Environmental Permit, a qualified Ecologist was commissioned to prepare a post-transplantation monitoring report to present the status (health condition and survival rate) of transplanted vegetation and submitted to the DEP.
- 1.3 Monitoring of transplanted flora was conducted after the transplantation. The monitoring will be conducted at twice per month during the first year and once per month during the course of planting works. The parameters to be monitoring will include the health condition and survival rate of the transplanted flora. Any observations and recommendations will be reported in monthly EM&A reports.
- 1.3 This is Tree Report presents data collected on 30 August 2019. It contains the following information:
  - Introduction (Section 1)
  - Description Of Tree Monitoring Area (Section 2)
  - Monitoring Methodology (Section 3)
  - Result (Section 4)
  - Summary

- Photos (Appendix I)
- Summary table (Appendix II)
- Typhoon information (Appendix III)

## **2. DESCRIPTION OF TREE MONITORING SITE**

- 2.1 Incense Tree (*Aquilaria sinensis*) and Ailanthus (*Ailanthus fordii*) trees was transplanted within existing Sha Tin Water Treatment Works (STWTW) where is the extended compensatory plantation area. The area was flat and without covering with concrete.
- 2.2 Lamb of Tartary (*Cibotium barometz*) will be transplanted to the Sha Tin South Fresh Water Service Reservoir (STSFWSR) where is currently covered with concrete. Plough is required before planting on to this area.
- 2.3 The planting site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) was still under preparation. Lamb of Tartary (*Cibotium barometz*) to be transplanted was temporally stored at a nursery garden at Shui Mei Tsuen, Kam Tin. Once the planting site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) was prepared and temporally stored transplanted vegetation were in fair condition, all transplanted Lamb of Tartary (*Cibotium barometz*) will be planted at the planting site.

## **3. MONITORING METHODOLOGY**

- 3.1 Site inspection will be carried out by walking through the transplanting area. Health condition and survival rate will be observed during inspection.
- 3.4 Health condition of all transplanted vegetation including trees/Shrubs surveyed was evaluated according to the following criteria:
  - Transplanted vegetation with good health are classified as **good**;
  - Transplanted vegetation with few or no visible defects or health problems are classified as being **fair**;
  - Transplanted vegetation was badly damaged or clearly suffering from decay die back or the effects of very heavy vine growth are classified as **poor**.
- 3.5 Survival rate for each of transplanted vegetation species will be calculated based on site observation.

#### 4. RESULT

- 4.1 Monitoring inspections were conducted on 30 August 2019. Three trees TA572, TA326 and TA327 were transplanted to tree compensation area within the Sha Tin Water Treatment Works (STWTW) in 20 June 2016.
- 4.2 The condition of TA572 was observed in poor condition due to the damage of two main trunks. TA327 was also in poor condition. The already dead tree TA326 collapsed due to big hit by the Signal No.10 typhoon Mangkhut on 16 September 2018. Tree guying cables have been installed to provide external support to the remaining two transplanted trees.
- 4.3 All transplanted Lamb of Tartary (*Cibotium barometz*) have been severely damaged by Typhon Wipha on 30-31 July 2019; the next few monitoring will be critical to assess their survival and recovery progress.
- 4.4 Since Sha Tin South Fresh Water Service Reservoir (STSFWSR) was still under preparation, Lamb of Tartary was still temporally stored in a nursery garden at Shui Mei Tsuen, Kam Tin.
- 4.5 In general, all transplanted Lamb of Tartary (*Cibotium barometz*) were in poor condition while Hong Kong Eagle’s Claw (*Artabotrys hongkongensis*) was observed dead during inspection on 20 August 2016. The survival rate for Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle’s Claw (*Artabotrys hongkongensis*) was 96%. The Summary table for health condition and survival rate was shown in Appendix II.

#### 5. MITIGATION MEASURE

- 5.1 Hong Kong Eagle’s Claw (*Artabotrys hongkongensis*) was observed dead during inspection on 20 August 2016. In order to compensate for the loss of transplanted Hong Kong Eagle’s Claw which is in climber growing form, it is recommended to plant an individual of native climber species at compensatory planting site (Sha Tin South Fresh Water Service Reservoir (STSFWSR)) together with compensatory tree planting. Recommended list of species are given in the Table 1 below. It is suggested that about 1 species of climber to be selected from the following list according to availability of the nursery source. The recommended plant species have been recorded from adjacent secondary woodland in an approved EIA Report (AEIAR-187/2015). These species would have certain ecological value in terms of plant ecology and the associated wildlife including birds.

**Table 1. Table for Recommended climber species list to be planted**

| <b>Native Tree Species</b> |                        |                     |                     |
|----------------------------|------------------------|---------------------|---------------------|
| <b>Common Name</b>         | <b>Latin Name</b>      | <b>Chinese Name</b> | <b>Growing Form</b> |
| Climbing Bauhinia          | <i>Bauhinia glauca</i> | 粉葉羊蹄甲               | Climber             |

|                           |                                 |       |         |
|---------------------------|---------------------------------|-------|---------|
| Spiny-fruited Vine        | <i>Byttneria aspera</i>         | 刺果藤   | Climber |
| Bentham,s Rose-wood       | <i>Dalbergia benthamii</i>      | 兩廣黃檀  | Climber |
| Desmos                    | <i>Desmos chinensis</i>         | 假鷹爪   | Climber |
| Glaucouscent Diploclisia  | <i>Diploclisia glaucescens</i>  | 蒼白秤鈞風 | Climber |
| Luofushan Joint-fir       | <i>Gnetum luofuense</i>         | 羅浮買麻藤 | Climber |
| Australian Cow-plant      | <i>Gymnema sylvestre</i>        | 匙羹藤   | Climber |
| Shining Hypserpa          | <i>Hypserpa nitida</i>          | 夜花藤   | Climber |
| Large-floweredHoneysuckle | <i>Lonicera macrantha</i>       | 大花忍冬  | Climber |
| Splash-of-white           | <i>Mussaenda pubescens</i>      | 玉葉金花  | Climber |
| Rusty-haired Raspberry    | <i>Rubus reflexus</i>           | 鏽毛莓   | Climber |
| Sandpaper Vine            | <i>Tetracera asiatica</i>       | 錫葉藤   | Climber |
| Hong Kong Eagle’s Claw    | <i>Artabotrys hongkongensis</i> | 鷹爪花   | Climber |

- 5.2 All transplanted Lamb of Tartary (*Cibotium barometz*) had shown yellow foliage, probably due to high exposure of sunlight at the new nursery site before the hit of Typhoon Wipha. It is recommended to retain them at the nursery garden under proper maintenance during current recovery stage. Shelter (such as 遮光網) shall be provided to reduce the amount of sunlight received and avoid direct hit of rainstorm/ typhoon. Once their condition has recovered to acceptable level, they can be moved to the transplantation site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) when the site is ready.
- 5.3 After transplantation, root ball of TA572 and TA327 tree should be kept moisture especially during non-raining day.
- 5.4 Incense Tree (*Aquilaria sinensis*) tagged as TA326 was observed dead during inspection on 10 August 2017. Its DBH was measured as 346cm. In according to the Tree Preservation, Development Bureau Technical Circular (Works) No. 7/2015, the compensatory planting will try to achieve the compensatory planting ratio of 1:1 in terms of aggregated DBH.
- 5.5 In total, 3 individual of native tree species with heavy standard size will be planted with 2.5-3 meters (center to center) spacing at compensatory planting site. Recommended list of species are given in the Table 2 below. It is suggested that at least 1 tree species to be selected from the following list according to availability of the nursery source. The recommended plant species have been recorded from adjacent secondary woodland in an approved EIA Report (AEIAR-187/2015). These species would have certain ecological value in terms of plant ecology and the associated wildlife including birds.

**Table 2. Table for Recommended tree species list to be planted**

| <u>Native Tree Species</u> |            |              |              |
|----------------------------|------------|--------------|--------------|
| Common Name                | Latin Name | Chinese Name | Growing Form |

|                       |                               |       |      |
|-----------------------|-------------------------------|-------|------|
| Ivy Tree              | <i>Schefflera heptaphylla</i> | 鴨腳木   | Tree |
| Levine’s Syzygium     | <i>Syzygium levinei</i>       | 山蒲桃   | Tree |
| Chekiang Machilus     | <i>Machilus chekiangensis</i> | 浙江潤楠  | Tree |
| Aporusa               | <i>Aporusa dioica</i>         | 銀柴    | Tree |
| Mountain Tallow Tree  | <i>Sapium discolor</i>        | 山烏柏   | Tree |
| Fragrant Litsea       | <i>Litsea cubeba</i>          | 山蒼樹   | Tree |
| Chinese Apea Ear-ring | <i>Archidendron lucidum</i>   | 亮葉猴耳環 | Tree |
| Chinese Hackberry     | <i>Celtis sinensis</i>        | 朴樹    | Tree |
| Turn-in-the-wind      | <i>Mallotus paniculatus</i>   | 白楸    | Tree |
| Acronychia            | <i>Acronychia pedunculata</i> | 降真香   | Tree |

## 6. SUMMARY

- 6.1 The condition of TA572 was observed in poor condition due to broken of main trunk. TA327 was also in poor condition; while already dead TA326 collapsed under Signal No. 10 typhoon Mangkhut in September 2018. Tree guying cables have been installed to provide external support to the two remaining transplanted trees.
- 6.2 All transplanted Lamb of Tartary (*Cibotium barometz*) have been severely damaged by Typhon Wipha on 30-31 July 2019. A few new fronds of transplanted Lamb of Tartary were still observed growing out. Next few monitoring will be critical to assess their survival and recovery progress. Shelter (遮光網) was recommended to reduce the intensity of sunlight and avoid direct hit of rainstorm/ typhoon. Currently, Lamb of Tartary was temporally stored in a nursery garden at Shui Mei Tsuen, Kam Tin. It is recommended to retain them at the nursery garden under proper maintenance during current recovery stage. Hong Kong Eagle’s Claw (*Artabotrys hongkongensis*) was observed dead during inspection on 20 August 2016.
- 6.3 In general, all transplanted Lamb of Tartary (*Cibotium barometz*) were in poor condition while Hong Kong Eagle’s Claw (*Artabotrys hongkongensis*) and one Incense Tree (*Aquilaria sinensis*) TA326 were observed dead during inspection on 20 August 2016 and on 10 August 2017 respectively.
- 6.4 In order to compensate for the loss of transplanted Hong Kong Eagle’s Claw and Incense Tree, it is recommended to plant an individual of native climber species and 3 heavy standard native tree species at compensatory planting site. The suggested species in planting list would have certain ecological value in terms of plant ecology and the associated wildlife including birds.
- 6.5 After transplantation, root ball of TA572 and TA327 tree should be kept moisture especially during dry and non-raining day.



## **APPENDIX I**

### Photo



Photo 1. General view of *Cibotium barometz* to be transplanted.



Photo 2. *Cibotium barometz* severely damaged by Typhoon Wipha



Photo 3. *Cibotium barometz* severely damaged by Typhoon Wipha



Photo 4. *Cibotium barometz* severely damaged by Typhoon Wipha



Photo 5 & 6. New sprout of *Cibotium barometz*. Shelter (such as 遮光網) is recommended for reducing intensity of sunlight and avoid direct hit of rainstorm/ typhoon on the plants.



Photo 7. Transplanted Incense Tree (*Aquilaria sinensis*) – TA327 (left);  
and Ailanthus (*Ailanthus fordii*) – TA572 (right)



Photo 8. Weak crown with dead twigs observed in  
of TA327.



Photo 9. Watersprouts at lower trunk of TA327.



Photo 10. Cracks and wounds observed in one of the trunks of TA572.



Photo 11. Weak crown and two broken trunks of TA572.

## **APPENDIX II**

Table for condition of transplanted plant

Shrubs of Lamb of Tartary and Hong Kong Eagle’s Claw

| No.               | Species   | Condition | Alive/Dead | Remark  |
|-------------------|---|-----------|------------|---|
| 1                 | <i>Cibotium barometz</i>  | Poor      | Alive      | Severely damaged by Typhon Wipha on 30-31 July 2019 ; the next few monitoring will be critical to assess their survival and recovery progress |
| 2                 | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 3                 | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 4                 | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 5                 | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 6                 | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 7                 | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 8                 | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 9                 | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 10                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 11                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 12                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 13                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 14                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 15                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 16                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 17                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 18                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 19                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 20                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 21                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 22                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 23                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 24                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 25                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 26                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
| 27                | <i>Cibotium barometz</i>  | Poor      | Alive      |   |
|                   | Shelter (such as 遮光網) is recommended for reducing intensity of sunlight and direct hit of rainstorm/ typhoon on the plants. |           |            |   |
| 28                | <i>Artabotrys hongkongensis</i>   | --        | Dead       | --  |
| Survival rate (%) |   |           | 96%        |   |

Trees of Ailanthus and Incense Tree

| No.               | Species                   | Condition | Alive/Dead | Remark   |
|-------------------|---------------------------|-----------|------------|--|
| TA572             | <i>Ailanthus fordii</i>   | Poor      | Alive      | Two main trunks were broken during typhoon on 23 August 2017. Cracks and wounds observed in one of the trunks. Weak canopy formed only by sprouts. |
| TA327             | <i>Aquilaria sinensis</i> | Poor      | Alive      | Tree crown of TA327 was thinner after transplantation. Water sprouts and cracks on tree bark observed.   |
| TA326             | <i>Aquilaria sinensis</i> | Dead      | Dead       | Collapsed due to the Signal No.10 typhoon Mangkhut in September 2018.  |
| Survival rate (%) |                           |           | 67%        |  |

# Appendix T

## Monthly Summary of Waste Flow Table



**Water Supplies Department**  
**Monthly Summary Waste Flow Table**  
**for Contract with Environmental Management Plan under ETWB TCW No. 19/2005 and its Interim Guidance Note**  
**Reporting Year: 2019**  
**Contract No. 3/WSD/15**

*(To be submitted to C&D MM Coordinator of Respective Division/Region via Engineer's Representative before 15th of the following month)*

| Month           | Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m <sup>3</sup> ) |  |                               |                                 |                                |                       | Actual Quantities of Other C&D Materials / Wastes Generated |   |   |                               |   |
|-----------------|---|--|-------------------------------|---------------------------------|--------------------------------|-----------------------|---|---|---|-------------------------------|---|
|                 | Total Quantities Generated<br>[a+b+c+d]   | Broken Concrete<br>(including rock for recycling into aggregates)<br>(a) | Reused in the Contract<br>(b) | Reused in Other Projects<br>(c) | Disposed as Public Fill<br>(d) | Imported C&D Material | Metal<br>(in '000kg)  | Paper/ Cardboard Packaging<br>(in '000kg) | Plastic<br>(bottles/containers, plastic sheets/ foams from package material)<br>(in '000kg) | Chemical Waste<br>(in '000kg) | Others (e.g. General Refuse etc.)<br>(in '000m <sup>3</sup> ) |
| January         | 1.754   | 0.000  | 0.000                         | 0.000                           | 1.754                          | 0.000                 | 0.000   | 0.000                                     | 0.000   | 0.047                         |   |
| February        | 0.275   | 0.000  | 0.000                         | 0.000                           | 0.275                          | 0.000                 | 0.000   | 0.000                                     | 0.000   | 0.030                         |   |
| March           | 0.621   | 0.000  | 0.000                         | 0.000                           | 0.621                          | 0.000                 | 0.000   | 0.000                                     | 0.000   | 0.095                         |   |
| April           | 0.467   | 0.000  | 0.000                         | 0.000                           | 0.467                          | 0.000                 | 0.000   | 0.000                                     | 0.000   | 0.086                         |   |
| May             | 0.581   | 0.000  | 0.000                         | 0.000                           | 0.581                          | 0.000                 | 0.000   | 0.000                                     | 0.000   | 0.080                         |   |
| June            | 0.664   | 0.000  | 0.000                         | 0.000                           | 0.664                          | 0.000                 | 0.000   | 0.000                                     | 0.000   | 0.063                         |   |
| Half-year total | 4.362   | 0.000  | 0.000                         | 0.000                           | 4.362                          | 0.000                 | 0.000   | 0.000                                     | 0.000   | 0.401                         |   |
| July            | 0.617   | 0.000  | 0.000                         | 0.000                           | 0.617                          | 0.000                 | 0.000   | 0.000                                     | 0.000   | 0.075                         |   |
| August          | 0.218   | 0.000  | 0.000                         | 0.000                           | 0.218                          | 0.000                 | 0.000   | 0.000                                     | 0.000   | 0.124                         |   |
| September       | 0.000   |  |                               |                                 |                                |                       |   |   |   |                               |   |
| October         | 0.000   |  |                               |                                 |                                |                       |   |   |   |                               |   |
| November        | 0.000   |  |                               |                                 |                                |                       |   |   |   |                               |   |
| December        | 0.000   |  |                               |                                 |                                |                       |   |   |   |                               |   |
| Yearly Total    | 5.197   | 0.000  | 0.000                         | 0.000                           | 5.197                          | 0.000                 | 0.000   | 0.000                                     | 0.000   | 0.600                         |   |

# Appendix U

## Implementation Schedule of Environmental Mitigation Measures (EMIS)

Environmental Mitigation and Enhancement Measure Implementation Schedule at Construction Stage

| EIA Ref.             | Recommended Mitigation Measures   | Location of the Measures            | Implementation Agent | Relevant Legislation and Guidelines   | Implementation Phase |   |   | Status |
|----------------------|---|-------------------------------------|----------------------|---|----------------------|---|---|--------|
|                      |   |                                     |                      |   | D                    | C | O |        |
| <b>Air Quality</b>   |   |                                     |                      |   |                      |   |   |        |
| 4.7.1                | Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.   | All works areas                     | Contractor           | Air Pollution Control Ordinance and Air Pollution Control (Construction Dust) Regulation<br><br>EM&A Manual |                      | √ |   | Y      |
| 4.7.1                | Side enclosure and covering of any aggregate or stockpiling of dusty material to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. | All works areas                     | Contractor           |   |                      | √ |   | Y      |
| 4.7.1                | Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.  | All works areas                     | Contractor           |   |                      | √ |   | Y      |
| 4.7.1                | Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.  | All works areas                     | Contractor           |   |                      | √ |   | Y      |
| 4.7.1                | Imposition of speed controls for vehicles on site haul roads.   | All works areas                     | Contractor           |   |                      | √ |   | Y      |
| 4.7.1                | Implement EM&A program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.  | All works areas / Monitoring points | Contractor           |   |                      | √ |   | Y      |
| <b>Noise</b>         |   |                                     |                      |   |                      |   |   |        |
| 5.6.4                | Implement good site practices to reduce noise level   | All works areas                     | Contractor           | Noise Control Ordinance   |                      | √ |   | Y      |
| 5.6.5                | Adoption of Quiet PME   | All works areas                     | Contractor           |   |                      | √ |   | N/A    |
| 5.6.6                | Use of Movable Noise Barrier  | All works areas                     | Contractor           |   |                      | √ |   | N/A    |
| 5.8                  | Noise monitoring  | Monitoring points                   | Contractor           |   | √                    |   | Y |        |
| <b>Water Quality</b> |   |                                     |                      |   |                      |   |   |        |
| 6.8.1                | Surface run-off from construction sites should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand  | All works areas                     | Contractor           | ProPECC PN 1/94 Construction  |                      | √ |   | Y      |

|        |  |                 |            |  |  |   |  |     |
|--------|--|-----------------|------------|--|--|---|--|-----|
|        | traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks. |                 |            | Site Drainage<br>TM-DSS<br>Water Pollution Control Ordinance |  |   |  |     |
| 6.8.2  | Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to prevent local flooding.   | All works areas | Contractor |  |  | √ |  | Y   |
| 6.8.3  | Temporary exposed slope surfaces should be covered and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided to prevent storm run-off from washing across exposed soil surfaces.   | All works area  | Contractor |  |  | √ |  | Y   |
| 6.8.4  | Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.  | All works areas | Contractor |  |  | √ |  | N/A |
| 6.8.5  | Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.   | All works areas | Contractor |  |  | √ |  | Y   |
| 6.8.6  | Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms.   | All works areas | Contractor |  |  | √ |  | Y   |
| 6.8.7  | Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system.  | All works areas | Contractor |  |  | √ |  | Y   |
| 6.8.8  | Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area.  | All works areas | Contractor |  |  | √ |  | Y   |
| 6.8.9  | All vehicles and plant should be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains.   | All works areas | Contractor |  |  | √ |  | Y   |
| 6.8.10 | Before commencing any demolition works, all drainage connections should be sealed to prevent building debris, soil, sand etc. from entering  | All works areas | Contractor |  |  | √ |  | N/A |

|                  |   |                   |            |  |  |   |  |     |
|------------------|---|-------------------|------------|--|--|---|--|-----|
|                  | drains.   |                   |            |  |  |   |  |     |
| 6.8.11           | Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be tankered off site for disposal into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary. | All works areas   | Contractor |  |  | √ |  | Y   |
| 6.8.12           | Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10. The neutralized wastewater should be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters.  | All works areas   | Contractor |  |  | √ |  | N/A |
| 6.8.13           | All surface run-off must proper collected and discharge at designated location. The discharge quality must meet the requirements specified in the discharge license.  | All works areas   | Contractor |  |  | √ |  | Y   |
| 6.8.15           | Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.  | All works areas   | Contractor |  |  | √ |  | Y   |
| 6.8.16           | Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges  | All works areas   | Contractor |  |  | √ |  | Y   |
| 6.8.17           | Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance.  | All works areas   | Contractor |  |  | √ |  | Y   |
| 6.8.18           | Sewage generated from the workforce should be properly treated by interim treatment facilities, such as chemical toilets which are properly maintained with the employment of licensed collectors for the collection and disposal on a regular basis.   | All works areas   | Contractor |  |  | √ |  | Y   |
| 6.8.19           | Adopt relevant measures stated in ETWB TC (Works) No. 5/2005 "Protection of Natural Streams/rivers from Adverse Impacts arising from Construction Works" to minimize the potential water quality impacts from the construction works near any water courses.  | All works areas   | Contractor |  |  | √ |  | Y   |
| 6.10             | Water quality monitoring  | Monitoring points | Contractor |  |  | √ |  | Y   |
| Waste Management |   |                   |            |  |  |   |  |     |

|        |   |                 |            |  |  |   |  |     |
|--------|---|-----------------|------------|--|--|---|--|-----|
| 7.6.1  | Appropriate waste handling, transportation and disposal methods for all waste arisings generated during the construction works for the Project should be implemented to ensure that construction wastes do not enter the nearby streams or drainage channel.  | All works areas | Contractor | Waste Disposal Ordinance<br><br>DEVB TCW No. 6/2010,<br><br>ETWB TCW No. 19/2005 Land<br><br>(Miscellaneous Provisions) Ordinance<br><br>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes |  | √ |  | Y   |
| 7.6.2  | Implementation of good site practices for waste management  | All works areas | Contractor |  |  | √ |  | Y   |
| 7.6.3  | Implementation of trip ticket system to control waste disposal  | All works areas | Contractor |  |  | √ |  | Y   |
| 7.6.4  | Implementation of good site practices to reduce waste generations   | All works areas | Contractor |  |  | √ |  | Y   |
| 7.6.5  | Re-use of excavated C&D materials on site as far as practical. A suitable area should be designated within the site for temporary stockpiling of C&D material and to facilitate the sorting process.  | All works areas | Contractor |  |  | √ |  | Y   |
| 7.6.8  | General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material.   | All works areas | Contractor |  |  | √ |  | Y   |
| 7.6.9  | All storage of asbestos waste should be carried out properly in a secure place isolated from other substances so as to prevent any possible release of asbestos fibres into the atmosphere and contamination of other substances. The storage area should bear warning panels to alert people of the presence of asbestos waste.  | All works areas | Contractor |  |  | √ |  | N/A |
| 7.6.10 | A licensed asbestos waste collector will be appointed to collect the asbestos waste and deliver to the designated landfill for disposal. Application should be submitted to EPD.  | All works areas | Contractor |  |  | √ |  | N/A |
| 7.6.11 | If chemical wastes were to be produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer, and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport the chemical wastes. The licensed collector shall deliver the waste to the Chemical Waste Treatment Centre at Tsing Yi, or other licenced facility, in accordance with | All works areas | Contractor |  |  | √ |  | Y   |

|              |   |  |                             |                        |  |   |  |     |
|--------------|---|--|-----------------------------|------------------------|--|---|--|-----|
|              | the<br>Waste Disposal (Chemical Waste) (General) Regulation.  |  |                             |                        |  |   |  |     |
| Ecology      |   |  |                             |                        |  |   |  |     |
| 8.8.1        | Ecological impacts on important habitats and the associated wildlife caused by the proposed development should be mitigated and compensation approaches to the maximum practical extent   | All works areas<br>in particular<br>important<br>habitats<br>All works areas | The Engineer/<br>Contractor | EIAO-TM<br>EM&A Manual |  | √ |  | Y   |
| 8.8.2        | Reduce the amount of vegetation removal required and thereby minimize the footprint of the slope at the woodland habitat  |  | The Engineer/<br>Contractor |                        |  | √ |  | Y   |
| 8.8.3        | Conduct detailed vegetation survey and implement suggested measures for species of conservation importance.   |  | The Engineer/<br>Contractor |                        |  | √ |  | Y   |
| 8.8.4        | The affected Incense Tree and Ailanthus as mentioned in the detailed vegetation survey report within the works area will be transplanted  |  | The Engineer/<br>Contractor |                        |  | √ |  | Y   |
| 8.8.5        | To avoid impacts on Short-nosed Fruit Bat, the tree with records of an active roost and trees showing evidence of roosting activity should be retained where possible. Where Chinese Fan-palm ( <i>Livistona chinensis</i> ) removal is required, these should be checked by suitably qualified ecologist with over 7 years relevant experience for roosting bats prior to their removal. If roosting bats are observed, a strategy for passive removal will be agreed with the AFCD and implemented. This could include undertaking the works just after the bats have left the roost (i.e. dusk). |  | The Engineer/<br>Contractor |                        |  | √ |  | N/A |
| 8.8.6        | The inclusion of Chinese Fan-palm of similar size as the affected plant within the areas of compensatory planting or other suitable areas is recommended to replace affected specimens, and compensate for the impact to roosting opportunities for this bat species  |  | The Engineer/<br>Contractor |                        |  | √ |  | N/A |
| 8.8.7        | Implement good site measures to minimize the disturbance impacts to terrestrial habitat and associated wildlife arising from the land-based construction activities.  |  | The Engineer/<br>Contractor |                        |  | √ |  | Y   |
| 8.8.8        | To minimize the contamination of wastewater discharge, accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as diverting the site runoff to silt trap facilities before discharging into storm drain, proper waste and dumping management and standard good site practice for land-based construction.  |  | The Engineer/<br>Contractor |                        |  | √ |  | Y   |
| 8.8.9-8.8.11 | Implement woodland compensation   |  | The Engineer/<br>Contractor |                        |  | √ |  | N/A |

| Landscape and Visual |   |                 |                          |  |  |   |  |     |
|----------------------|---|-----------------|--------------------------|--|--|---|--|-----|
| 9.8.1                | Existing trees to be retained on site shall be carefully protected during construction. Trees unavoidably affected by the works shall be transplanted as far as possible.           | All works areas | Contractor               | DEVB TCW No. 10/2013   |  | √ |  | Y   |
|                      | Compensatory Planting shall be provided in accordance with DEVB TCW No. 10/2013 – Tree Preservation.  | All works areas | Contractor               | EIAO TM  |  | √ |  | Y   |
|                      | Control of night-time lighting glare.   | All works areas | Contractor               |  |  | √ |  | Y   |
|                      | Erection of decorative screen hoarding compatible with the surrounding setting.   | All works areas | Contractor               |  |  | √ |  | Y   |
|                      | Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs. | All works areas | Contractor               |  |  | √ |  | Y   |
| Cultural Heritage    |   |                 |                          |  |  |   |  |     |
| 10.6.2               | Vibration monitoring at Ex KCR Beacon Hill Tunnel during piling works of Administration Building  | Work site       | The Engineer /Contractor |  |  | √ |  | N/A |
| Land Contamination   |   |                 |                          |  |  |   |  |     |
| 11.7                 | Identify contamination and implement appropriate remedial measures on site. Provide relevant submission and obtain approval from EPD if necessary.                                  | All works areas | Contractor               | Guidance Note for Contaminated Land Assessment and Remediation   |  |   |  |     |
|                      |   |                 |                          | Guidance Manual for Use of Risk based Remediation Goals for Contaminated Land Management (Guidance Manual) |  | √ |  | N/A |
| Hazard to Life       |   |                 |                          |  |  |   |  |     |
| Table 12.22          | Ensure speed limit enforcement is specified in the contractor's Method Statement to limit the speed of construction vehicles on site  | All works areas | The Engineer             | EIAO-TM  |  | √ |  | Y   |
|                      | Develop an audit procedure to ensure enforcement of speed limits and to ensure adequate site access control   | All works areas | The Engineer             |  |  | √ |  | Y   |
|                      | Ensure construction method statement is endorsed by the Engineer (AECOM)  | All works areas | The Engineer             |  |  | √ |  | Y   |



|   |  |                                      |  |   |  |     |
|---|--|--------------------------------------|--|---|--|-----|
| Ensure designated manoeuvring area for the new access road construction is away from the Chlorination House   | New access road area                         | Contractor/<br>The Engineer          |  | √ |  | Y   |
| Ensure that the emergency response plan and procedures (including drills) cover the reprovisioning activities   | All works areas                              | Contractor/<br>The Engineer          |  | √ |  | Y   |
| Safety training to be provided to construction workers and WSD/Engineer staff regarding evacuation procedures   | All works area                               | Contractor/<br>The Engineer          |  | √ |  | Y   |
| Ensure communication protocol is in place between construction and operation staff with regard to the change of chlorine delivery route and the switchover from the existing to new chlorinated water piping;   | All works areas                              | Contractor/<br>The Engineer          |  | √ |  | N/A |
| Ensure temporary suspension of crane operation and construction truck movements during chlorine delivery  | All works areas                              | Contractor/<br>The Engineer          |  | √ |  | Y   |
| Provide a crash barrier between the construction site and the north side of the Chlorination House.   | Chlorination House area                      | Contractor                           |  | √ |  | Y   |
| Conduct vibration monitoring at the Chlorination House during piling activities to ensure vibration levels are acceptable and will not lead to any damage of the Chlorination House   | Chlorination House area                      | Contractor                           |  | √ |  | Y   |
| Civil engineering calculation to be performed to confirm differential settlement from excavation work is within acceptable limits for the Chlorination House  | Chlorination House area                      | Contractor                           |  | √ |  | Y   |
| Provide settlement monitoring for the Chlorination House to ensure no subsidence occurs from nearby excavation works.   | Chlorination House area                      | Contractor                           |  | √ |  | Y   |
| Confirm the chlorine concentration for the chlorinated water before the switchover from the existing to new piping. This is to avoid the potential for chlorine gas vapours being released if the concentration is too high and there is spillage during switchover | Chlorinated water piping                     | WSD                                  |  | √ |  | N/A |
| Develop an operating procedure for performing the chlorinated water switchover from the existing piping to new piping.  | All works areas                              | Contractor/<br>The Engineer /<br>WSD |  | √ |  | N/A |
| Ensure the location/height of the lifting equipment is such there is no impact on Chlorination House/chlorine delivery route in case of falling, swinging or dropped load.  | Chlorination House area                      | Contractor/<br>The Engineer          |  | √ |  | Y   |
| Implement the controlled demolition of the existing E&M workshop to ensure that any steel structural elements can only fall away from the Chlorination House  | Existing E&M Workshop and Chlorination House | Contractor/<br>The Engineer          |  | √ |  | N/A |

|  |   |   |                                  |  |  |   |  |        |
|--|---|---|----------------------------------|--|--|---|--|--------|
|  |   | areas   |                                  |  |  |   |  |        |
|  | Stop any construction activities which may lead to vibrations and potential slope/boulder disturbance during the chlorine deliveries  | All works areas   | Contractor                       |  |  | √ |  | Y      |
|  | Installation of Chlorine gas monitors with audible alarms in the relevant reprovisioning works area   | Reprovisioning works areas  | Contractor/<br>The Engineer      |  |  | √ |  | k.i.v. |
|  | Provision of an accompanying vehicle for the chlorine truck on the WTW site and ensuring that during the chlorine drums delivery construction works are stopped and the construction workers moved away from Chlorination House | All works areas   | Contractor                       |  |  | √ |  | Y      |
|  | Establish a liaison between the contractor and HKCG and develop a chlorine/town gas emergency plan to ensure gas safety during the Construction Phase   | Beacon Hill North Gas Offtake Station and Gas Pipelines in Old Beacon Hill Tunnel | The Engineer / Contractor / HKCG |  |  | √ |  | k.i.v. |
|  | Temporary suspend chlorine delivery during the short period of construction of the concerned section of elevated walkway to avoid mobile crane impact on the chlorine truck   |   | The Engineer / Contractor        |  |  | √ |  | N/A    |
|  | Provide clear road signs for site vehicles  | Chlorine delivery route and reprovisioning works access roads                     | The Engineer / Contractor        |  |  | √ |  | Y      |
|  | Large equipment/plant movement should be controlled by 'Permit-to-move' system  | All works areas   | The Engineer / Contractor / WSD  |  |  | √ |  | Y      |
|  | Define restricted zone for the equipment (i.e. keep the equipment from the Chlorination House at a safe distance). The extent of the restricted zone would be determined by the size of the equipment                           | Chlorination House area   | The Engineer / Contractor        |  |  | √ |  | Y      |
|  | Locate the construction site office at or near property boundary away from the Chlorination House as far as possible  | Construction Office area  | The Engineer / Contractor        |  |  | √ |  | Y      |
|  | Entry of non-authorized personnel to the construction site to be prohibited   | All works areas   | Contractor                       |  |  | √ |  | Y      |

|                                   |   |  |                                  |         |                         |   |   |        |
|-----------------------------------|---|--|----------------------------------|---------|-------------------------|---|---|--------|
| 12.15.4,<br>12.18.1,<br>12.22.9   | GPS fleet management system with driver training to help enforce truck speeds   | Chlorine delivery trucks, fleet management centre  | WSD / Chlorine Supply Contractor | EIAO-TM |                         | √ |   | k.i.v. |
|                                   | Improved clamps with independent checks to prevent load shedding  | Chlorine delivery trucks   |                                  |         |                         | √ |   | F      |
|                                   | Installation of fire screen and larger fire extinguishers to prevent engine and wheel fires from spreading to the cargo area  |  |                                  |         |                         | √ |   | F      |
|                                   | Adoption of the chlorine delivery route from Sham Shui Kok Dock to Sha Tin WTW  |  |                                  |         |                         | √ |   | F      |
|                                   | Provision of emergency repair kit   |  |                                  |         |                         | √ |   | F      |
| 12.34.3<br>Table 12.37<br>& 12.38 | Ban the use of retreaded tyres and perform regular visual checks on the tyres.  |  | WSD                              | EIAO-TM |                         | √ |   | F      |
|                                   | A vehicle accompanying chlorine truck along critical road sections in Sha Tin. The truck should be equipped with emergency kit, fire extinguisher, radio set for communication. The accompanying vehicle will be ahead of the chlorine truck after the vehicles entering the water treatment works site – An accompanying vehicle may provide rapid response to an incident but any action would be limited to containing a small leak. |  |                                  |         |                         | √ |   | F      |
|                                   | Limit fuel tanks capacity at the beginning of the Project (Item 2.3 of Table 12.37 – advance measure).  |  |                                  |         |                         | √ |   | F      |
|                                   | Review the practicality of reducing combustible materials or use of fire retardant materials in the cab. (Item 2.3 of Table 12.37 – further measure)  |  |                                  |         |                         | √ |   | k.i.v. |
|                                   | Annual periodic radiography or ultrasonic test inspections of the chlorine drums should be considered for implementation as soon as feasible (Item 3.8 of Table 12.37).   |  |                                  |         | Chlorine drums          |   | √ |        |
|                                   | Implement side, front and rear crash guards with high energy absorption in coordination and accordance with the relevant authorities.   | Chlorine delivery trucks   |                                  |         |                         | √ |   | k.i.v. |
|                                   | Implement a sturdy steel frame to minimize the potential for chlorine release due to truck rollover   |  |                                  |         |                         | √ |   | k.i.v. |
|                                   | 12.34.4   | WSD will continue to keep under review the latest development of use of alternative disinfectants in water supply industry to aim at minimising on-site chlorine storage.4 |                                  |         | Chlorine delivery Route |   |   |        |

|  |  |  |  |   |  |        |
|--|--|--|--|---|--|--------|
| Training should be provided for the use of the GPS fleet management and improved safe driving.   |  |  |  | √ |  | k.i.v. |
| Ensured that independent checks are performed to ensure proper chlorine drum latching and clamping.  |  |  |  | √ |  | F      |
| Chlorine truck drivers or driver attendants should be further trained to check and detect potential chlorine leaks during transport. This should include the timely application of the emergency kit.  |  |  |  | √ |  | k.i.v. |
| Training should be provided to driver and driver attendant for the emergency use of the new 2 × 9L AFFF extinguishers.   |  |  |  | √ |  | F      |
| Induction training for new drivers and driver attendant should include familiarisation with the route, familiarisation with chlorine risks, defensive driving, application of emergency kits, use of fire extinguishers and emergency response |  |  |  | √ |  | k.i.v. |
| Provision of a fire screen between the cab and cargo as well as fire retardant materials for the wheel arches on the chlorine truck should be planned and provided   |  |  |  | √ |  | F      |
| To keep under review alternate chlorine receiving dock in Sha Tin/Tai Po area for chlorine delivery to STWTW.  |  |  |  | √ |  | k.i.v. |

Legend

D – Design Phase

C – Construction Phase

O – Operation Phase

Y - Compliance of Mitigation Measures

N/A – Not Applicable in Reporting Period

k.i.v – Keep In View

F - Completed

# Appendix V

## Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions



Statistical Summary of Exceedances

| Air Quality   |              |           |     |             |             |           |     |       |       |
|---------------|--------------|-----------|-----|-------------|-------------|-----------|-----|-------|-------|
| Location      | Action Level |           |     | Limit Level |             |           |     | Total |       |
| AM1           | 0            |           |     | 0           |             |           |     | 0     |       |
| AM2           | 0            |           |     | 0           |             |           |     | 0     |       |
| Noise         |              |           |     |             |             |           |     |       |       |
| Location      | Action Level |           |     | Limit Level |             |           |     | Total |       |
| NM1           | 0            |           |     | 0           |             |           |     | 0     |       |
| NM2           | 0            |           |     | 0           |             |           |     | 0     |       |
| NM3           | 0            |           |     | 0           |             |           |     | 0     |       |
| Water Quality |              |           |     |             |             |           |     |       |       |
| Location      | Action Level |           |     |             | Limit Level |           |     |       | Total |
|               | DO           | Turbidity | SS  | pH          | DO          | Turbidity | SS  | pH    |       |
| C1            | 0            | 0         | 0   | 0           | 0           | 0         | 0   | 0     | 0     |
| C2            | 0            | 0         | 0   | 0           | 0           | 0         | 0   | 0     | 0     |
| C3            | N/A          | N/A       | N/A | N/A         | N/A         | N/A       | N/A | N/A   | 0     |
| M1            | 0            | 0         | 0   | 0           | 0           | 0         | 0   | 0     | 0     |
| M2            | 0            | 0         | 0   | 0           | 0           | 0         | 0   | 0     | 0     |
| M3            | 0            | 0         | 0   | 0           | 0           | 0         | 0   | 0     | 0     |

Statistical Summary of Environmental Complaints

| Reporting Period   | Environmental Complaint Statistics |            |                  |
|--------------------|------------------------------------|------------|------------------|
|                    | Frequency                          | Cumulative | Complaint Nature |
| 1 August-31 August | 0                                  | 0          | N/A              |

Statistical Summary of Environmental Summons

| Reporting Period   | Environmental Summons Statistics |            |         |
|--------------------|----------------------------------|------------|---------|
|                    | Frequency                        | Cumulative | Details |
| 1 August-31 August | 0                                | 0          | N/A     |

Statistical Summary of Environmental Prosecution

| Reporting Period   | Environmental Prosecution Statistics |            |         |
|--------------------|--------------------------------------|------------|---------|
|                    | Frequency                            | Cumulative | Details |
| 1 August-31 August | 0                                    | 0          | N/A     |

# Appendix W

## Tentative schedule for environmental monitoring

| Sep-19 |   |     |   |      |   |     |
|--------|---|-----|---|------|---|-----|
| Sun    | Mon   | Tue | Wed   | Thur | Fri   | Sat |
| 1      | 2<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3   | 3   | 4<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3  | 5    | 6<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3   | 7   |
| 8      | 9<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3  | 10  | 11<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 12   | 13<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3 | 14  |
| 15     | 16<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 17  | 18<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3 | 19   | 20<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 21  |
| 22     | 23<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3 | 24  | 25<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 26   | 27<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3 | 28  |
| 29     | 30<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  |     |   |      |   |     |



| Oct 19 |   |  |   |  |   |  |
|--------|---|--|---|--|---|--|
| Sun    | Mon   | Tue  | Wed   | Thur   | Fri   | Sat  |
|        |   | 1  | 2<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2        | 3  | 4<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3   | 5  |
| 6      | 7   | 8<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 | 9   | 10<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3 | 11  | 12<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3 |
| 13     | 14<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 | 15   | 16<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 17   | 18<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 | 19   |
| 20     | 21<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 22   | 23<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3 | 24   | 25<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 26   |
| 27     | 28<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 | 29   | 30<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 31   |   |  |

| Nov 19 |   |     |   |      |   |     |
|--------|---|-----|---|------|---|-----|
| Sun    | Mon   | Tue | Wed   | Thur | Fri   | Sat |
|        |   |     |   |      | 1<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2  | 2   |
| 3      | 4<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3   | 5   | 6<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2        | 7    | 8<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3   | 9   |
| 10     | 11<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 | 12  | 13<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 14   | 15<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 | 16  |
| 17     | 18<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 19  | 20<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3 | 21   | 22<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 23  |
| 24     | 25<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 | 26  | 27<br>Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  | 28   | 29  | 30  |

Impact Monitoring Schedule for STWTW

| Jul 19 |   |   |   |  |   |  |
|--------|---|---|---|--|---|--|
| Sun    | Mon   | Tue   | Wed   | Thur   | Fri   | Sat  |
|        | 1   | 2   | 3   | 4  | 5   | 6  |
|        |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3 |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3 |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3 |
| 7      | 8   | 9   | 10  | 11   | 12  | 13   |
|        | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  |  | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 |  |
| 14     | 15  | 16  | 17  | 18   | 19  | 20   |
|        | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 & NM3 |  | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  |  |
| 21     | 22  | 23  | 24  | 25   | 26  | 27   |
|        | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 |   | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  |  | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3<br>Air monitoring for AM1 & AM2<br>Noise monitoring for NM1, NM2 |  |
| 28     | 29  | 30  | 31  |  |   |  |
|        | Impact<br>Water Quality monitoring for C1, C2, C3, M1, M2 & M3  |   |   |  |   |  |

Impact Monitoring Schedule for STWTW

| Aug 19    |  |           |  |   |  |  |
|-----------|--|-----------|--|---|--|--|
| Sun       | Mon  | Tue       | Wed  | Thur  | Fri  | Sat  |
|           |  |           |  | <p>1</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>2</p>   | <p>3</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p> |
| <p>4</p>  | <p>5</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>   | <p>6</p>  | <p>7</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p>  | <p>8</p>  | <p>9</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>   | <p>10</p>  |
| <p>11</p> | <p>12</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>13</p> | <p>14</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>  | <p>15</p>   | <p>16</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>17</p>  |
| <p>18</p> | <p>19</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>  | <p>20</p> | <p>21</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>22</p>   | <p>23</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>  | <p>24</p>  |
| <p>25</p> | <p>26</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>27</p> | <p>28</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3</p>  | <p>29</p>   | <p>30</p> <p>Impact</p> <p>Water Quality monitoring for C1, C2, C3, M1, M2 &amp; M3<br/>Air monitoring for AM1 &amp; AM2<br/>Noise monitoring for NM1, NM2 &amp; NM3</p> | <p>31</p>  |