

Environmental Permit No. FEP-01/571/2019/A

Proposed Golf Course Development at Tai Po Lot No. 246 Shuen Wan

Environmental Team Leader Certification

Reference Document

Document to be Certified: Construction Phase Water Quality Mitigation Measures and Monitoring Plan

Date of Report: August 2024

Date received by ETL: 5 August 2024

Reference EP Condition

Environmental Permit Condition: 2.16

The Permit Holder shall, no later than two months before the commencement of construction of the Project, submit 4 hard copies and 1 electronic copy of a Water Quality Mitigation Measures and Monitoring Plan (WQMMMP) to the Director for approval. The WQMMMP shall be based on the approved Construction Phasing Plan under Condition 2.15 of this Permit, and shall address potential water quality impact on Tolo Harbour during construction phase of the Project, and shall include comprehensive information on measures to reduce soil erosion, deployment of temporary sedimentation tanks as well as other measures to intercept any surface runoff and water quality monitoring requirements during the construction phase. The WQMMMP shall be certified by the ET Leader and verified by the IEC as conforming to the findings and recommendations of the approved EIA Report (Register No. AEIAR-221/2019) for approval of the Director. All measures recommended in the approved WQMMMP shall be fully implemented during construction phase of the Project.

ETL Certification

I hereby certify that the above reference report complies with the above referenced condition of FEP-01/571/2019/A.



Mr. Calvin Leung
Environmental Team Leader

Date: 7 August 2024

Environmental Permit No. FEP-01/571/2019/A

Proposed Golf Course Development at Tai Po Lot No. 246 Shuen Wan

Independent Environmental Checker Verification

Reference Document

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|--------------------------|--|
| Document to be Verified: | Construction Phase Water Quality Mitigation Measures and Monitoring Plan |
| Date of Report: | August 2024 |
| Date received by IEC: | 5 August 2024 |

Reference EP Condition

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IEC Verification

I hereby verify that the above reference report complies with the above referenced condition of FEP-01/571/2019/A.



Mr. Adi Lee
Independent Environmental Checker

Date: 7 August 2024

Tai Po Golf Club Limited

Proposed Golf Course Development at Tai Po Lot No. 246 Shuen Wan

Construction Phase Water Quality Mitigation Measures and Monitoring Plan

Reference: 289499-REP-018-06

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 289499

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Contents

| | | |
|-----|---|----|
| 1. | Introduction | 1 |
| 1.1 | Background | 1 |
| 1.2 | Purpose of the WQMMMP | 1 |
| 1.3 | Structure of the WQMMMP | 2 |
| 2. | Potential Water Quality Impacts on Tolo Harbour during Construction Phase | 3 |
| 2.1 | Identification of Environmental Impacts | 3 |
| 3. | Mitigation Measures for Mitigating Potential Water Quality Impacts | 6 |
| 3.1 | Mitigation Measures | 6 |
| 4. | Water Quality Monitoring Requirement | 9 |
| 4.1 | Monitoring Requirements | 9 |
| 4.2 | Monitoring Parameters | 9 |
| 4.3 | Monitoring Equipment | 9 |
| 4.4 | Laboratory Measurement / Analysis | 11 |
| 4.5 | Monitoring Locations | 12 |
| 4.6 | Impact Monitoring during Construction Phase | 12 |
| 4.7 | Action and Limit Levels | 13 |
| 4.8 | Event and Action Plan | 14 |
| 5. | Conclusion | 17 |

Appendices

Appendix 1.1

Figure 1 in FEP-571/2019/A

Appendix 2.1

Construction Phasing Plan

Appendix 2.2

Figure 2 of FEP-01/571/2019/A

Appendix 3.1

Implementation Schedule of Water Quality Mitigation Measures

Appendix 3.2

Location of Reinforced Fill Slope

Appendix 4.1

Figure 7.1 in the Approved EM&A Manual

1. Introduction

1.1 Background

- 1.1.1.1 In June 2017, the Chief Executive in Council has agreed in principle to the government proposal to grant a piece of land in Tai Po in exchange for its private land in Sha Lo Tung which has high ecological values. Under the non-in-situ land exchange proposal, the piece of land at the Shuen Wan Restored Landfill in Tai Po will be granted and the Sha Lo Tung site would be considered by government for active conservation management to avoid degradation and damage for long-term public enjoyment. This land exchange proposal is a unique, exceptional and isolated case, adding the idea is technically feasible as the private land ownership is largely unified under one entity and both Sha Lo Tung and the land at the landfill site, which has been planned for golf course development, are located in Tai Po, as shown in Figure 1 of FEP-01/571/2019/A (extracted as **Appendix 1.1**). The non-in-situ land exchange proposal has been completed in July 2022, and the Project Site has been handed over to the Project Proponent (PP).
- 1.1.1.2 The Project is a Designated Project (DP) under Environmental Impact Assessment Ordinance (EIAO), and an Environmental Impact Assessment (EIA) study was conducted in 2017. The *Shuen Wan Golf Course EIA Report* was approved by the Director of Environmental Protection (DEP) on 5 July 2019 (AEIAR-221/2019) (“the approved EIA Report”) with the Environmental Permit (EP, EP-571/2019) issued on 20 September 2019. An application of Further Environmental Permit (FEP) has been made by Tai Po Golf Club Limited (the PP) and FEP was issued on 29 November 2022 (FEP-01/571/2019). Besides, surrender of EP-571/2019 has been applied and approved on 9 December 2022. In addition, an application for variation of EP has been made on 16 May 2023 to amend FEP-01/571/2019, and the amended EP was issued on 6 June 2023 (FEP-01/571/2019/A).
- 1.1.1.3 As stipulated in Condition 2.16 of FEP-01/571/2019/A, the Permit Holder shall, no later than two months before the commencement of construction of the Project, submit 4 hard copies and 1 electronic copy of a Water Quality Mitigation Measures and Monitoring Plan (WQMMMP) to the DEP for approval. The WQMMMP shall be based on the approved Construction Phasing Plan (CPP) under Condition 2.15 of the EP, and shall address potential water quality impact on Tolo Harbour during construction phase of the Project, and shall include comprehensive information on measures to reduce soil erosion, deployment of temporary sedimentation tanks as well as other measures to intercept any surface runoff and water quality monitoring requirements during the construction phase. The WQMMMP shall be certified by the Environmental Team (ET) Leader and verified by the Independent Environmental Checker (IEC) as conforming to the findings and recommendations of the approved EIA Report for approval by the DEP. All measures recommended in the approved WQMMMP shall be fully implemented during construction phase of the Project.

1.2 Purpose of the WQMMMP

- 1.2.1.1 The WQMMMP is prepared to comply with Condition 2.16 of FEP-01/571/2019/A. This WQMMMP contains details of potential water quality impact on Tolo Harbour during

construction phase of the Project, mitigation measures to intercept any surface runoff, and water quality monitoring requirements.

1.3 Structure of the WQMMMP

1.3.1.1 The structure of the WQMMMP is given below:

- Section 1** Introduces the project background, purposes and structure of this WQMMMP.
- Section 2** Describes the potential water quality impacts on Tolo Harbour during construction phase.
- Section 3** Propose the water quality mitigation measures to reduce soil erosion, deployment of temporary sedimentation tanks and other mitigation measures to intercept any surface runoff during construction phase.
- Section 4** Describes the water quality monitoring requirements during construction phase.
- Section 5** Summarises and concludes the findings.

2. Potential Water Quality Impacts on Tolo Harbour during Construction Phase

2.1 Identification of Environmental Impacts

- 2.1.1.1 The Project is currently under detailed design stage to optimise the design adopted in the approved EIA Report, and the construction of the Project involves site formation works, superstructure works, etc. During the detailed design stage, construction programme and the design of proposed golf course have been reviewed and optimised to facilitate the construction and operation of the Project.
- 2.1.1.2 According to the CPP under Condition 2.15 of the EP (**Appendix 2.1**), the current CPP has adopted the general principles of the construction phasing stated in the approved EIA Report, i.e.:
- Enabling existing plantation trees to be lost gradually, so that the roosting habitats will not be impacted in one time;
 - The construction works near the core roosting area would fall under the last phase; and
 - New planting will be provided gradually.
- 2.1.1.3 Under the CPP, there are 3 phases during the construction period, i.e. Phase 1, Phase 2, and Phase 3 (further sub-divided into Phase 3A and Phase 3B), while the construction of ancillary facilities is planned in Phase 1 to Phase 3. Hence, the existing plantation and trees will not be lost in one-go, but by phases to minimise soil erosion and its potential adverse impact on the water quality.
- 2.1.1.4 As the maintenance facilities building is an essential component before construction of the proposed golf course, it will be included in Phase 1. Besides, certain water storage tanks have to be constructed in Phase 1 in order to intercept any surface runoff for sedimentation as recommended in the approved EIA Report, and as required under EP Condition 2.40. Access will also be needed to connect the required site entry at Ting Kok Road to these structures, and also to the ancillary facilities. Apart from the above works, Phase 1 will also include formation of rainwater overflow control along construction access to the proposed water storage tank, formation of earth retaining structures for soil fill in the subsequent phases and extension of existing slope toe around the site to form a base for the site formation above.
- 2.1.1.5 Phase 2 and Phase 3 are major soil filling phases, and the demarcation line between phase 2 and 3 works depends on the golf hole design. Phase 2, located at the eastern seaside, will commence first owing to the following engineering consideration:
- a) Advantage in construction water control towards the sea. In original construction phasing, the soil filling works commence from the Ting Kok Road site towards the seaside whilst the flooding/ construction water control is located at the ancillary facilities (**Appendix 2.2**). Water flow is designed towards the existing seawall. In current proposal, water storage tank A is located inland at Phase 1 area with water storage tank B below the access road located adjoining Phase 2 (**Appendix 2.1**). With the current proposal, the construction water is mostly

directed towards inland area instead of towards the seaside to enable a better flooding/ construction water control. Based on the approved CPP under EP Condition 2.15, the construction works for Phase 1 involving the construction of both access road and water storage tanks. The construction of water tank A and B would be carried out prior to the construction of access road as required under EP Condition 2.40.

- 2.1.1.6 Phase 3 is the last phase, and it is located at the western side of the Project Site including the area around the core roosting area. There is an existing road within Phase 3, the existing road will be used as site internal access during the whole construction period therefore it is retained to the last phase. This phase is further sub-divided into Phase 3A and Phase 3B, and the construction works will start from Phase 3A to Phase 3B (i.e. from landward side to seaward side), so as to balance the need for minimizing the potential impacts to the core roosting area.
- 2.1.1.7 The area for ancillary facilities is situated at the southeast part of the Project Site which is tally with proposed phasing plan under the EIA stage. Same as the proposal under the EIA stage, as the ancillary facilities building takes the longest time to build from foundation, superstructure, exterior and interior installation, it will span across the 3 phases.
- 2.1.1.8 Construction works will start from Phase 1 to Phase 2 and finally to Phase 3. Upon completion of site formation at each phase, landscape planting will be implemented immediately before the beginning of next phase such that new tree groups aiming for roosting site provision will be planted before the clearance in next phase, so that the affected Collared Crow (CC) can have alternative roosting sites and minimise soil erosion with landscape planting.
- 2.1.1.9 In the current detailed design, all the works of this Project would be land-based and no marine works would be required. Since there will be no modification of the existing seawall, sediment loss is not anticipated. The potential water quality impacts identified during construction phase are summarised as follows, and further discussion on identified water quality impacts towards Tolo Harbour during construction phase will be given in the following sections.

- Site runoff from general site operation;
- Accidental spillage of chemicals; and
- Sewage from workforce.

2.1.2 Site Runoff from General Site Operation

- 2.1.2.1 Construction site runoff would come from all over the works sites during the Project. The surface runoff might be polluted by:
- Wheel washing water;
 - Wastewater from building construction, site facilities and road works;
 - Acid cleaning, etching and pickling wastewater;

- Accidental spillage of chemicals; and
- Soil erosion.

2.1.2.2 Construction runoff may cause physical, biological and chemical effects. The physical effects include potential blockage of drainage channels and an increase of suspended solids (SS) levels near the shore of the Project Site. Runoff containing significant amounts of concrete and cement-derived material may cause primary chemical effects such as increasing turbidity and discoloration, elevation in pH, and accretion of solids. A number of secondary effects may also result in toxic effects to water biota due to elevated pH values, and reduced decay rates of faecal micro-organisms and photosynthetic rate due to the decreased light penetration.

2.1.2.3 The approved CPP has been proactively mindful to avoid and minimise the amount of surface runoff during site formation that may be released to Tolo Harbour as in **Section 2.1**. During construction phase, temporary sedimentation tanks will be installed at the start of site establishment with the perimeter cut-off channels to intercept the surface runoff. Water storage tank(s) will be constructed in phases as required under the EP to mitigate potential water quality impact. As mentioned in **Section 2.1**, once part of these water storage tank(s) is constructed in Phase 1, they would be used to intercept any surface runoff for sedimentation.

2.1.2.4 Since perimeter cut-off channels will be constructed to direct off-site water around the site and dikes or embankments will also be implemented for flood protection, thus, significant adverse impacts resulting from soil erosion is not anticipated.

2.1.2.5 Others appropriate precautionary measures as listed in **Section 3** shall be adopted to prevent site runoff to Tolo Harbour. With the proper implementation of mitigation measures stated in **Section 3**, no adverse water quality impact is anticipated.

2.1.3 Accidental Spillage of Chemicals

2.1.3.1 The chemicals used during construction, such as fuel, oil, solvents and lubricants from maintenance of construction machinery and equipment, may cause pollution and trigger physicochemical effects in the nearby water bodies if accidental spillage occurs. With the implementation of mitigation measures stated in **Section 3**, adverse water quality impact is not anticipated.

2.1.4 Sewage from Workforce

2.1.4.1 It is estimated that the volume of sewage from workforce would be insignificant. With the proper implementation of mitigation measures stated in **Section 3**, no adverse water quality impact is anticipated.

3. Mitigation Measures for Mitigating Potential Water Quality Impacts

3.1 Mitigation Measures

3.1.1.1 To reduce the potential water quality impacts during construction phase mentioned in **Section 2**, mitigation measures have been recommended in the following sections. The implementation schedule of the recommended mitigation measures is summarised in **Appendix 3.1**.

3.1.2 Site Runoff from General Site Operation

3.1.2.1 To reduce the potential water quality impact due to construction site runoff, the following good site practices in accordance with Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department (EPD), 2023 (ProPECC PN 2/23) should be implemented to avoid potential adverse water quality impacts.

- Once part of the water storage tanks is completed, use the water storage tank for sedimentation as in **Section 2.1**.
- Construct perimeter cut-off drains to direct off-site water around the site and provide channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers on site to direct stormwater to silt removal facilities.
- Implementation of dikes or embankments for flood protection and provide temporary ditches to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap.
- Design efficient silt removal facilities based on the guidelines in Appendix A1 of ProPECC PN 2/23.
- Schedule construction works to minimize surface excavation works during the rainy seasons. Complete and vegetate all exposed earth areas as soon as possible after earthworks have been completed.
- Inspect and maintain all drainage facilities and erosion and sediment control structures regularly to ensure proper and efficient operation at all times and particularly following rainstorms.
- Implementation of measures to minimize the ingress of site drainage into excavations. If the excavation of trenches in rainy seasons is necessary, it should be dug and backfilled in short sections of length wherever practicable.
- Cover all construction materials at temporary storage area with tarpaulin or similar fabric during rainstorms and implementation of measures to prevent the washing away of construction materials, soil, silt or debris into any drainage system.

- Cover manholes (including newly constructed ones) adequately and seal temporarily to prevent silt, construction materials or debris from getting into the drainage system and prevent surface runoff from getting into foul sewers.
- Take precautions at any time of year when rainstorms are likely. The actions to be taken based on the guidelines in Appendix A2 of ProPECC PN 2/23.
- Clean all vehicles and plant before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads and provide adequately designed and sited wheel washing facilities at every construction site exit where practicable. 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. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.
- Provide oil interceptors in the drainage system downstream of any oil/fuel pollution sources. Empty and clean the oil interceptors regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage.
- Collect, handle and dispose construction solid waste, debris and rubbish on site to avoid water quality impacts.
- Provide locks for all fuel tanks and storage areas and locate on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby.

3.1.2.2 In addition, reinforced fill slope or alternative mitigation measures, e.g. provision of sand bags along the seaside of the Project Site proposed in the current design would be constructed in Phase 1 to prevent overflow of stormwater into Tolo Harbour (**Appendix 3.2**).

3.1.3 Accidental Spillage of Chemicals

3.1.3.1 To reduce the potential water quality impact due to accidental spillage of chemicals, best practices of chemical storage practices such as storage under a covered area, provision of secondary containment and material safety data sheets are advised. Spill kits are also advised to handle spillage and the staff should be trained for handling spillage. The following mitigation measures should also be implemented to avoid potential adverse water quality impacts.

- Properly store and contain the chemicals used during construction, such as fuel, oil, solvents and lubricants in a designated area with secondary containment to prevent spillage and contamination of the nearby water environment.
- Locate any maintenance activities and workshops with chemicals use away from watercourses on hard standings within a bunded area and provide sumps and oil interceptors as appropriate.

- The Contractor shall register as a chemical waste producer and employ licensed collector for collection of chemical waste from the construction site. Any chemical waste generated shall be managed in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

3.1.4 Sewage from workforce

3.1.4.1 To mitigate the water quality impacts of sewage arising from the on-site construction workers, the following measures should be implemented:

- Provide temporary sanitary facilities, e.g. portable chemical toilets collect the sewage.
- Post notices at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the surrounding environment during the construction phase of the Project.

4. Water Quality Monitoring Requirement

4.1 Monitoring Requirements

4.1.1.1 **Section 2** has assessed the potential water quality impacts associated with the Project during construction phase, and the potential water quality impact could be minimised with the implementation of mitigation measures recommended in **Section 3**. The water quality monitoring programme proposed in the approved Environmental Monitoring and Audit (EM&A) Manual of the approved EIA Report has been reviewed and recommended in the following sections to ensure the implementation of the recommended mitigation measures and provide continue improvements to the environmental conditions. For baseline water quality monitoring, a separate Baseline Monitoring Report required under EP Condition 3.4 could be referred.

4.2 Monitoring Parameters

- 4.2.1.1 The monitoring shall be established by measuring the dissolved oxygen (DO), dissolved oxygen saturation (DO%), temperature, turbidity, salinity, pH and SS in the water body at all designated locations as specified in **Section 4.5**.
- 4.2.1.2 The measurements shall be taken at all designated monitoring stations 3 days per week during construction phase. The interval between two sampling surveys shall not be less than 36 hours.
- 4.2.1.3 Replicate in-situ measurements and samples collected from each independent sampling event shall be collected to ensure a robust statistically interpretable database. DO, pH value, salinity, temperature and turbidity should be measured in-situ whereas other parameters should be determined by an accredited laboratory.
- 4.2.1.4 Other relevant data shall be recorded, including monitoring location / position, time, water depth, tidal stages, weather conditions and any special phenomena or work underway at the Project Site.

4.3 Monitoring Equipment

4.3.1 Dissolved Oxygen, Dissolved Oxygen Saturation and Temperature Measuring Equipment

- 4.3.1.1 The DO measuring instruments should be portable and weatherproof. The equipment should complete with cable and sensor, and DC power source. It should be capable of measuring:
- A DO level in the range of 0 – 20 mg/L and 0 – 200% saturation; and
 - A temperature of 0 – 45 degree Celsius.
- 4.3.1.2 The equipment should have a membrane electrode with automatic temperature compensation complete with a cable.

4.3.1.3 Should salinity compensation not be built-in to the DO equipment, in-situ salinity should be measured to calibrate the DO measuring instruments prior to each measurement.

4.3.2 Turbidity Measuring Equipment

4.3.2.1 The turbidity measuring instruments should be portable and weatherproof with DC power source. It should have a photoelectric sensor capable of measuring turbidity level between 0 – 1000 NTU (for example, Hach model 2100P or an approved similar instrument).

4.3.3 Salinity Measuring Equipment

4.3.3.1 A portable salinometer capable of measuring salinity in the range of 0 – 40 parts per thousand (ppt) should be provided for measuring salinity of the water at each monitoring location.

4.3.4 pH Measuring Equipment

4.3.4.1 A portable pH meter of measuring a pH range between 0.0 and 14.0 shall be provided under the specified conditions (for example Orion Model 250A or an approved similar equipment).

4.3.5 Positioning Equipment

4.3.5.1 A hand-held or boat-fixed type digital Differential Global Positioning System (DGPS) with way point bearing indication and Radio Technical Commission for Maritime (RTCM) Type 16 error message “screen pop-up” facilities (for real-time auto-display of error messages and DGPS corrections from the Hong Kong Hydrographic Office), or other equipment instrument of similar accuracy, should be provided and used during marine water monitoring to ensure the monitoring vessel is at the correct location before taking measurements.

4.3.6 Water Depth Detector

4.3.6.1 A portable, battery-operated echo sounder should be used for water depths determination at each designated monitoring station. The detector can either be hand-held or affixed to the bottom of the work boat, if the same vessel is to be used throughout the monitoring programme.

4.3.7 Water Sampling Equipment

4.3.7.1 Proper water samplers are required for monitoring. It should comprise a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler should have a positive latching system to keep it open to prevent premature closure until released by a messenger when the sampler is at the selected water depth (for example, Kahlsico Water Sampler or an approved similar instrument).

4.3.8 Sample Containers and Storage

4.3.8.1 Water samples for SS should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen) and shipment to the testing laboratory. The samples shall be delivered to the laboratory of collection and be analysed as soon as possible after collection.

4.3.9 Calibration of In-Situ Instruments

4.3.9.1 The pH meter, DO meter and turbidimeter shall be checked and calibrated before use. DO meter and turbidimeter shall be certified by a laboratory accredited under Hong Kong Laboratory Accreditation Scheme (HOKLAS) or any other international accreditation scheme, and subsequently re-calibrated on quarterly basis throughout all stages of the water quality monitoring. Responses of sensors and electrodes should be checked with certified standard solutions before each use. Wet bulb calibration for a DO meter shall be carried out before measurement at each monitoring station.

4.3.10 Back-up Equipment and Vessels

4.3.10.1 Sufficient stocks of spare parts shall be maintained for replacements when necessary. Backup monitoring equipment shall also be made available so that monitoring can proceed uninterrupted even when some equipment is under maintenance, calibration, malfunction, etc.

4.3.10.2 The water quality monitoring will involve two monitoring stations for the construction phase, and measurements should be conducted within the prescribed tidal conditions in order to ensure the measurement / samples are representative. A multi-probe monitoring equipment set integrated with water sampler(s) is highly recommended to improve the monitoring efficiency. Depending on the actual operation, more than one field survey vessels might be required simultaneously to ensure the monitoring are conducted within the acceptable monitoring period. The ET shall also consider the use of unattended automatic sampling / monitoring devices at fixed stations where monitoring are required throughout the construction period. The use of such unattended automatic devices, however, shall be subject to the approval of the Engineer's Representative (ER), IEC and EPD.

4.4 Laboratory Measurement / Analysis

4.4.1.1 At least 3 replicate samples from each independent sampling event are required for the SS measurement which shall be carried out in HOKLAS or international accredited laboratory. Where water depth is allowed, sampling should be conducted at three water depths which are 1m below water surface, mid-depth, and 1m above the sea bed. If the sampling water depth is less than 6m, the mid-depth may be omitted. If the water depth is less than 3m, only the mid-depth may be monitored. Sufficient water samples shall be collected at the monitoring stations for carrying out the laboratory measurement and analysis. The laboratory determination work shall start within 24 hours after the collection of water samples. The analysis for suspended solids is presented in **Table 4.1**.

Table 4.1 Laboratory analysis for construction phase water quality monitoring

| Parameters | Analytical Method | Reporting Limit |
|------------------|-------------------|-----------------|
| Suspended Solids | APHA 2540-D | 0.5 mg/L |

4.5 Monitoring Locations

- 4.5.1.1 Water quality monitoring will be carried out at two locations at Tolo Harbour Water Control Zone nearby the Project Site.
- 4.5.1.2 The proposed water quality monitoring locations during the construction phase are shown in Figure 7.1 of the approved EM&A Manual (extracted as **Appendix 4.1**) and listed in **Table 4.2**. The ET shall seek approval from IEC and EPD for any alternative monitoring locations.

Table 4.2 Locations of proposed water quality monitoring stations during construction phase

| Monitoring Station ID | Description | Easting | Northing |
|-----------------------|--|---------|----------|
| WM-1 | South of Project Site near coral sites | 838145 | 834573 |
| WM-2 | West of Yim Tin Tsai Fish Culture Zone | 839362 | 834856 |

4.6 Impact Monitoring during Construction Phase

- 4.6.1.1 The impact monitoring shall be conducted during construction periods. The purpose of impact monitoring is to ensure the implementation of the recommended mitigation measures, provide effective control of any malpractices, and provide continuous improvements to the environmental conditions. The proposed water quality monitoring schedule shall be submitted to EPD by the ET at least 2 weeks before the first day of the monitoring month. The interval between two sets of monitoring shall not be less than 36 hours with a frequency of 3 days in a week, at mid-flood and mid-ebb tides. EPD shall also be notified immediately for any changes in schedule.
- 4.6.1.2 In general, where the difference in value between the first and second in-situ measurement of DO or turbidity parameters is more than 25% of the value of the first reading, the reading shall be discarded and further readings should be taken.
- 4.6.1.3 In case of project-related exceedances of Action and/or Limit Levels, the impact monitoring frequency shall be increased according to the requirement of Event and Action Plan. The details of Event and Action Plan will be discussed in **Section 4.8**.
- 4.6.1.4 **Table 4.3** below summarizes the proposed water quality monitoring programme for impact monitoring during construction phase.

Table 4.3 Proposed water quality monitoring programme for impact monitoring during construction phase

| Item | Impact Monitoring during Construction Phase |
|--|--|
| Monitoring Period | During the entire construction phase |
| Monitoring Frequency | 3 Days in a Week |
| Monitoring Locations | All stations in Table 4.2 |
| Monitoring Parameters | Dissolved oxygen (DO), dissolved oxygen saturation (DO%), temperature, turbidity, salinity, pH and suspended solids (SS) |
| Intervals between 2 Sets of Monitoring | Not less than 36 hours |

4.7 Action and Limit Levels

4.7.1.1 The Action and Limit levels for water quality of all water monitoring stations during the construction phase are defined in **Table 4.4** below.

Table 4.4 Action and Limit levels for water quality

| Parameters | Action Level | Limit Level |
|---|--|--|
| DO in mg/L (Surface, Middle & Bottom) | Surface and Middle 5 percentile of baseline data. ^[1] Bottom 5 percentile of baseline data. ^[1] | Surface and Middle 4 mg/L except 5 mg/L for fish culture zone; or 1 percentile of baseline data. ^[1] Bottom 2 mg/L or 1 percentile of baseline data. ^[1] |
| SS in mg/L (depth-averaged) ^[3] | 95 percentile of baseline data ^[2] | 99 percentile of baseline data ^[2] |
| Turbidity in NTU (depth-averaged) ^[3] | 95 percentile of baseline data ^[2] | 99 percentile of baseline data ^[2] |

Notes:

[1] For DO, non-compliance occurs when monitoring results is lower than the limits.

[2] For SS and turbidity, non-compliance occurs when monitoring results is larger than the limits.

[3] "Depth-averaged" is calculated by taking the arithmetic means of readings of all three depths.

4.8 Event and Action Plan

4.8.1.1 Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan in the **Table 4.5** below shall be carried out.

Table 4.5 Event and Action Plan for water quality

| Event | Action | | | |
|---|--|---|--|---|
| | ET | IEC | ER | Contractor |
| Action level exceedance for one sampling day | <ol style="list-style-type: none"> 1. Inform IEC, Contractor and ER; 2. Check monitoring data, all plant, equipment and Contractor's working methods; and 3. Discuss remedial measures with IEC and Contractor and ER. | <ol style="list-style-type: none"> 1. Discuss with ET, ER and Contractor on the implemented mitigation measures; 2. Review proposals on remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. | <ol style="list-style-type: none"> 1. Discuss with IEC, ET and Contractor on the implemented mitigation measures; 2. Make agreement on the remedial measures to be implemented; 3. Supervise the implementation of agreed remedial measures. | <ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment; 5. Consider changes of working methods; 6. Discuss with ER, ET and IEC and purpose remedial measures to IEC and ER; and 7. Implement the agreed mitigation measures. |
| Action level exceedance for more than one consecutive sampling days | <ol style="list-style-type: none"> 1. Repeat in-situ measurement on next day of exceedance to confirm findings; 2. Inform IEC, contractor and ER; 3. Check monitoring data, all plant, equipment and Contractor's working methods; 4. Discuss remedial measures with IEC, contractor and ER 5. Ensure remedial measures are implemented | <ol style="list-style-type: none"> 1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. | <ol style="list-style-type: none"> 1. Discuss with ET, IEC and Contractor on the proposed mitigation measures; 2. Make agreement on the remedial measures to be implemented ; and 3. Discuss with ET, IEC and Contractor on the effectiveness of the implemented remedial measures. | <ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of remedial measures to ER and IEC within 3 working days of notification; and |

| Event | Action | | | |
|--|---|--|---|--|
| | ET | IEC | ER | Contractor |
| | | | | 6. Implement the agreed mitigation measures. |
| Limit level exceedance for one sampling day | <ol style="list-style-type: none"> Repeat measurement on next day of exceedance to confirm findings; Inform IEC, contractor and ER; Rectify unacceptable practice; Check monitoring data, all plant, equipment and Contractor's working methods; Consider changes of working methods; Discuss mitigation measures with IEC, ER and Contractor; and Ensure the agreed remedial measures are implemented | <ol style="list-style-type: none"> Discuss with ET, Contractor and ER on the implemented mitigation measures; Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. | <ol style="list-style-type: none"> Discuss with ET, IEC and Contractor on the implemented remedial measures; Request Contractor to critically review the working methods; Make agreement on the remedial measures to be implemented; and Discuss with ET, IEC and Contractor on the effectiveness of the implemented remedial measures. | <ol style="list-style-type: none"> Identify source(s) of impact; Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment and consider changes of working methods; Discuss with ET, IEC and ER and submit proposal of additional mitigation measures to ER and IEC within 3 working days of notification; and Implement the agreed remedial measures. |
| Limit level exceedance for more than one consecutive sampling days | <ol style="list-style-type: none"> Inform IEC, contractor and ER; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; and Ensure mitigation measures are implemented; and Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days | <ol style="list-style-type: none"> Discuss with ET, Contractor and ER on the implemented mitigation measures; Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. | <ol style="list-style-type: none"> Discuss with ET, IEC and Contractor on the implemented remedial measures; Request Contractor to critically review the working methods; Make agreement on the remedial measures to be implemented; Discuss with ET and IEC on the effectiveness of the implemented mitigation measures; and Consider and instruct, if necessary, the Contractor to | <ol style="list-style-type: none"> Identify source(s) of impact; Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment and consider changes of working methods; Discuss with ET, IEC and ER and submit proposal of additional mitigation measures to ER and IEC within 3 working days of notification; and |

| Event | Action | | | |
|-------|--------|-----|---|--|
| | ET | IEC | ER | Contractor |
| | | | slow down or to stop all or part of the dredging activities until no exceedance of Limit level. | <p>6. Implement the agreed remedial measures.</p> <p>7. As directed by the ER, to slow down or stop all or part of the dredging activities until no exceedance of Limit level.</p> |

Note:

ET – Environmental Team

IEC – Independent Environmental Checker

ER – Engineer’s Representative

Each step of actions required shall be implemented within 1 working days unless otherwise specified or agreed with EPD.

5. Conclusion

- 5.1.1.1 According to Condition 2.16 of FEP-01/571/2019/A, this WQMMMP has comprised in the identified potential water quality impact on Tolo Harbour during construction phase, recommended mitigation measures to reduce soil erosion, deployment of temporary sedimentation tanks as well as other measures to intercept any surface runoff, and water quality monitoring requirement during construction phase.

Appendix 1.1

Figure 1 in FEP-571/2019/A



Legend 圖例

- Project Location
工程項目位置
- 1.2 ha Core Roosting Area
1.2 公頃核心夜間棲息地
- Aquilaria sinensis*
土沉香

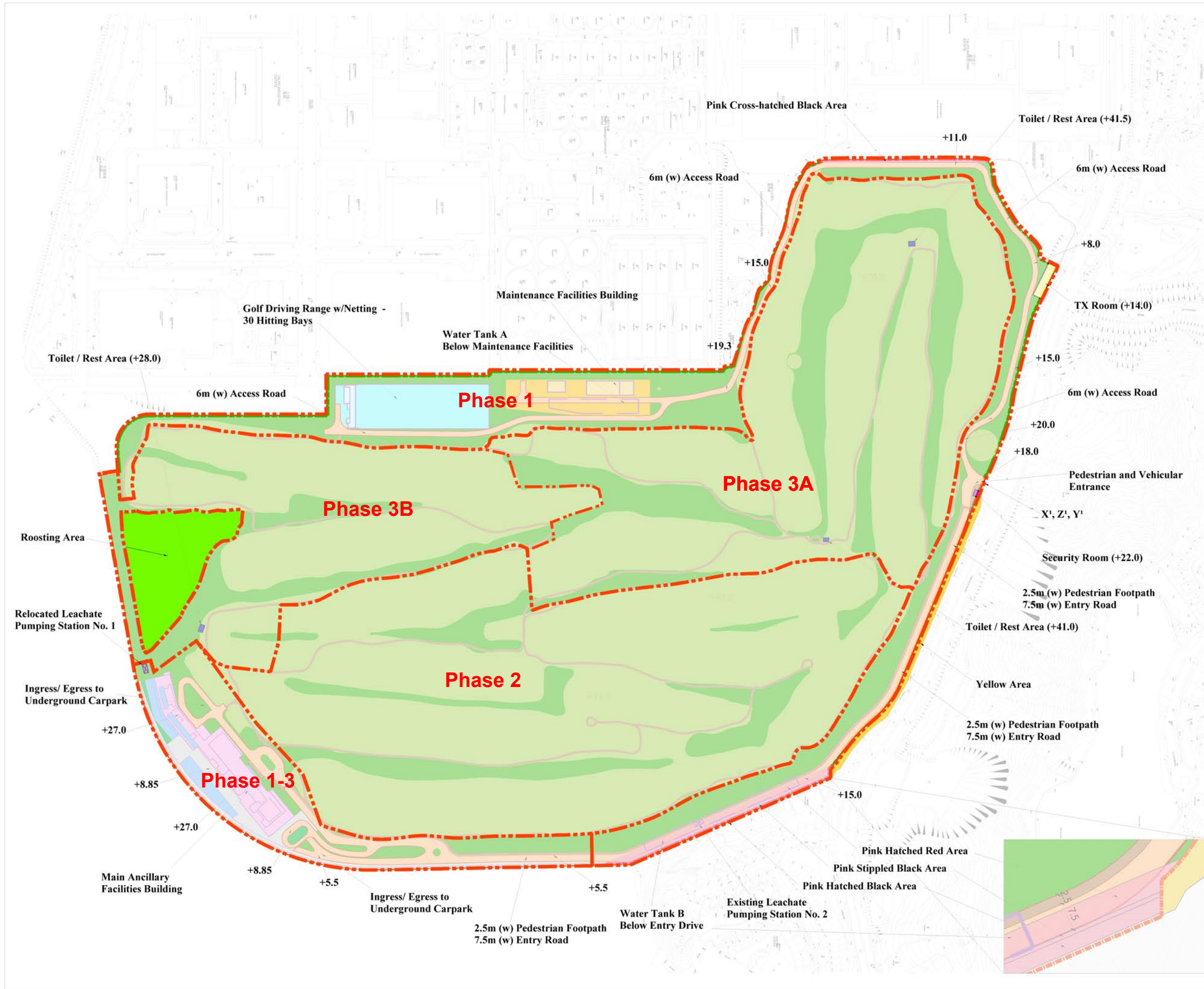
| | |
|--------------------------------|---|
| Project Title 工程項目名稱 | Shuen Wan Golf Course 船灣高爾夫球場 |
| Figure 1 圖一 | Project Location and Conceptual Layout Plan 工程項目位置及概念佈局圖 [This figure was prepared based on Figure 2.1 of EIA Report (Register No.: AEIAR-221/2019)] [本圖是根據環境影響評估報告 (登記冊編號: AEIAR-221/2019) 圖 2.1 編制] |

Environmental Permit No.:
環境許可證編號:
FEP-01/571/2019/A



Appendix 2.1

Construction Phasing Plan



- LEGEND:**
- MAIN ANCILLARY FACILITIES
 - GOLF DRIVING RANGE
 - TOILETS / REST AREA
 - TRANSFORMER ROOM
 - MAINTENANCE FACILITIES
 - SECURITY ROOM
 - UNDERGROUND WATER TANK A
 - UNDERGROUND WATER TANK B
 - PEDESTRIAN FOOTPATH
 - ROAD
 - OUTDOOR POOL / WATER FEATURES
 - LANDSCAPED TERRACE
 - GOLF HOLES
 - PLANTING AREA
 - SPECIAL TREE PRESERVED IN-SITU
 - SPECIAL TREE PROPOSED TO BE TRANSPLANTED
 - DEVELOPMENT SITE BOUNDARY
 - LEACHATE PUMPING STATION

| | | |
|-----|------------|----------------|
| NO. | DATE | DESCRIPTION |
| 1 | 23/11/2023 | MLP SUBMISSION |
| 2 | 23/11/2023 | MLP SUBMISSION |

P&T Architects Limited
 巴馬丹拿建築師有限公司
 www.p-t-group.com | T: 852-2575 6575

PROJECT / 工程項目
 PROPOSED GOLF COURSE DEVELOPMENT
 AT TAI PO TOWN LOT NO. 246
 SHUEN WAN, TING KOK, TAI PO

DRAWING / 圖名
 INDICATIVE MASTER LAYOUT PLAN

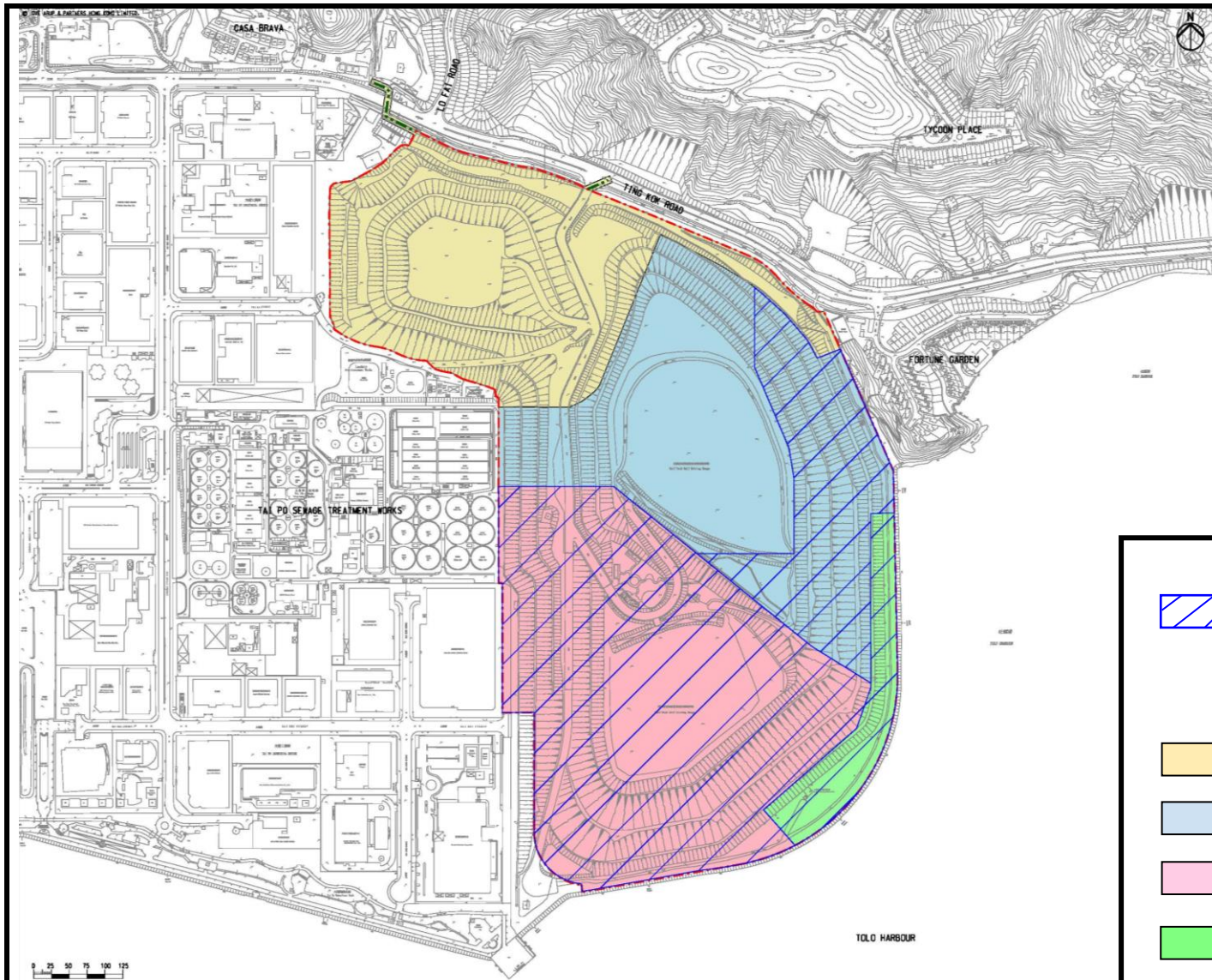
| | |
|------------|---------------------|
| SCALE / 比例 | JOB NUMBER / 工程編號 |
| 1:1,400 | 5973 |
| DATE / 日期 | DRAWING NUMBER / 圖號 |
| XX/4/2023 | MLP-01 |

| | | |
|---------------|--------------|---------------|
| DESIGNED / 設計 | CHECKED / 審核 | APPROVED / 審定 |
| | | |


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 除特別註明外, 所有尺寸是以毫米制
 ALL MEASUREMENTS SHOULD BE VERIFIED ON-SITE
 最終尺寸須在現場核對準確
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Appendix 2.2


Figure 2 of FEP-01/571/2019/A





Legend 圖例


 Powered Mechanical Equipment Restriction Zones
限制機動設備使用時間的地點

Construction Phases Assumed in EIA Report
環評報告假設的施工分段

 Area 1
第一分段

 Area 2
第二分段

 Area 3
第三分段

 Ancillary Facilities
附屬設施分段

| | | | |
|--------------------------------|---|---------------------------------------|---|
| Project Title 工程項目名稱 | Shuen Wan Golf Course 船灣高爾夫球場 | Environmental Permit No.: 環境許可證編號： |  |
| Figure 2 圖二 | Locations with Restricted Hours for Powered Mechanical Equipment 限制機動設備使用時間的地點 [This figure was prepared based on Figure 10.10 of EIA Report (Register No.: AEIAR-221/2019)] [本圖是根據環境影響評估報告 (登記冊編號: AEIAR-221/2019) 圖 10.10 編制] | FEP-01/571/2019/A | |

Appendix 3.1

Implementation Schedule of Water Quality Mitigation Measures

**Water Quality Mitigation Implementation Schedule
Shuen Wan Golf Course**

| WQMMMP Ref. | EM&A Log Ref | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concerns to address | Implementation Agent | Location / Timing | Implementation Stage |
|---|--------------|---|--|----------------------|---|----------------------|
| <i>Water Quality (Construction Phase)</i> | | | | | | |
| S2.1.2.3 S3.1.2 | W1 | <p><u>Site Runoff from General Site Operation</u></p> <p>To reduce the potential water quality impact due to construction site runoff, the following good site practices in accordance to Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 2023 (ProPECC PN 2/23) should be implemented to avoid potential adverse water quality impacts:</p> <ul style="list-style-type: none"> • Installation of temporary storage tanks to treat construction surface runoff. Once one of the water storage tanks is completed, use the water storage tank for sedimentation. • Construct perimeter cut-off drains to direct off-site water around the site and provide channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers on site to direct stormwater to silt removal facilities. • Implementation of dikes or embankments for flood protection and provide temporary ditches to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. • Design efficient silt removal facilities based on the guidelines in Appendix A1 of ProPECC PN 2/23. • Schedule construction works to minimize surface excavation works during the rainy seasons. Complete and vegetate all exposed earth areas as soon as possible after earthworks have been completed. | To minimise water quality impact from construction site runoff, soil erosion and general construction activities | Contractor | All construction sites where applicable | Construction stage |

**Water Quality Mitigation Implementation Schedule
Shuen Wan Golf Course**

| WQMMMP Ref. | EM&A Log Ref | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concerns to address | Implementation Agent | Location / Timing | Implementation Stage |
|-------------|--------------|--|---|----------------------|-------------------|----------------------|
| | | <ul style="list-style-type: none"> • Inspect and maintain all drainage facilities and erosion and sediment control structures regularly to ensure proper and efficient operation at all times and particularly following rainstorms. • Implementation of measures to minimize the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. • Cover all construction materials at temporary storage area with tarpaulin or similar fabric during rainstorms and implementation of measures to prevent the washing away of construction materials, soil, silt or debris into any drainage system. • Cover manholes (including newly constructed ones) adequately and seal temporarily to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers. • Take precautions at any time of year when rainstorms are likely. The actions to be taken based on the guidelines in Appendix A2 of ProPECC PN 2/23. • Clean all vehicles and plant before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads and provide adequately designed and sited wheel washing facilities at every construction site exit where practicable. • Provide oil interceptors in the drainage system downstream of any oil/fuel pollution sources. Empty and clean the oil interceptors regularly to prevent the | | | | |

**Water Quality Mitigation Implementation Schedule
Shuen Wan Golf Course**

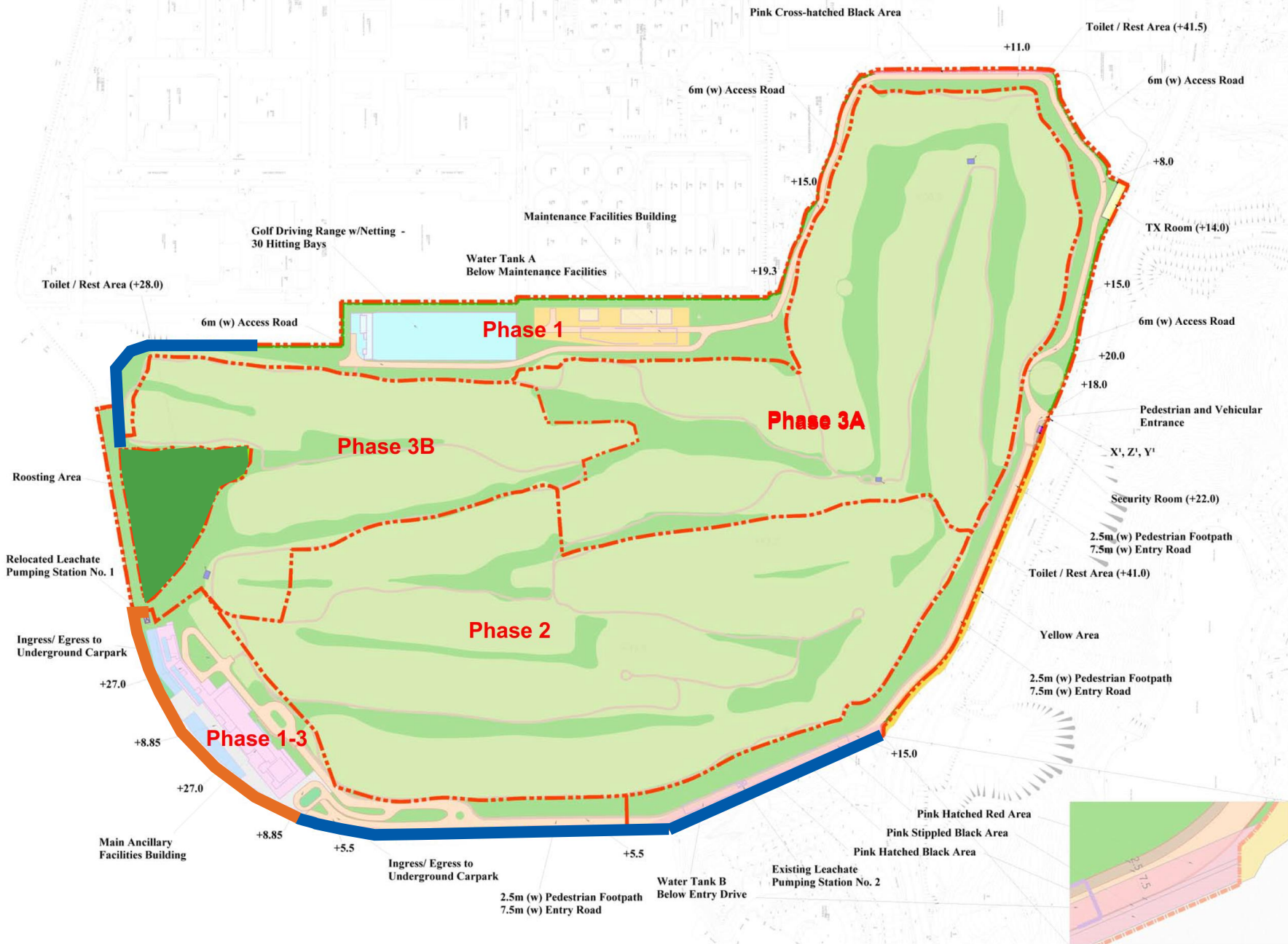
| WQMMMPP Ref. | EM&A Log Ref | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concerns to address | Implementation Agent | Location / Timing | Implementation Stage |
|--------------|--------------|--|--|----------------------|---|----------------------|
| | | <p>release of oil and grease into the storm water drainage system after accidental spillage.</p> <ul style="list-style-type: none"> • Collect, handle and dispose construction solid waste, debris and rubbish on site to avoid water quality impacts. • Provide locks for all fuel tanks and storage areas and locate on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby. • Reinforced fill slope or alternative mitigation measures, e.g. provision of sand bags along the seaside of the Project Site are also recommended. | | | | |
| S3.1.3 | W2 | <p><u>Accidental Spillage of Chemicals</u></p> <p>To reduce the potential water quality impact due to accidental spillage of chemicals, the following mitigation measures should be implemented to avoid potential adverse water quality impacts:</p> <ul style="list-style-type: none"> • Properly store and contain the chemicals used during construction, such as fuel, oil, solvents and lubricants in a designated area with secondary containment to prevent spillage and contamination of the nearby water environment. • Locate any maintenance activities and workshops with chemicals use away from watercourses on hard standings within a bunded area and provide sumps and oil interceptors as appropriate. • The Contractor shall register as a chemical waste producer and employ licensed collector for collection of chemical waste from the construction | To minimise water quality impact from accidental spillage of chemicals | Contractor | All construction sites where applicable | Construction stage |

**Water Quality Mitigation Implementation Schedule
Shuen Wan Golf Course**

| WQMMMP Ref. | EM&A Log Ref | Recommended Mitigation Measures | Objectives of the Recommended Measures & Main Concerns to address | Implementation Agent | Location / Timing | Implementation Stage |
|-------------|--------------|--|---|----------------------|---|----------------------|
| | | site. Any chemical waste generated shall be managed in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. | | | | |
| S3.1.4 | W3 | <p><u>Sewage from workforce</u></p> <p>To mitigate the water quality impacts of sewage arising from the on-site construction workers, the following measures should be implemented:</p> <ul style="list-style-type: none"> • Provide temporary sanitary facilities, e.g. portable chemical toilets to collect the sewage. Regular collection by licensed collectors should be arranged. • Post notices at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the surrounding environment during the construction phase of the Project. | To minimise water quality impact from sewage from workforce | Contractor | All construction sites where applicable | Construction stage |

Appendix 3.2

Location of Reinforced Fill Slope



Legend

- Preservation Area
- Reinforced Fill Slope*
- Alternative mitigation measures, e.g. provision of sand bag

*The reinforced fill slope will be with a minimum height of 300mm.

Appendix 4.1

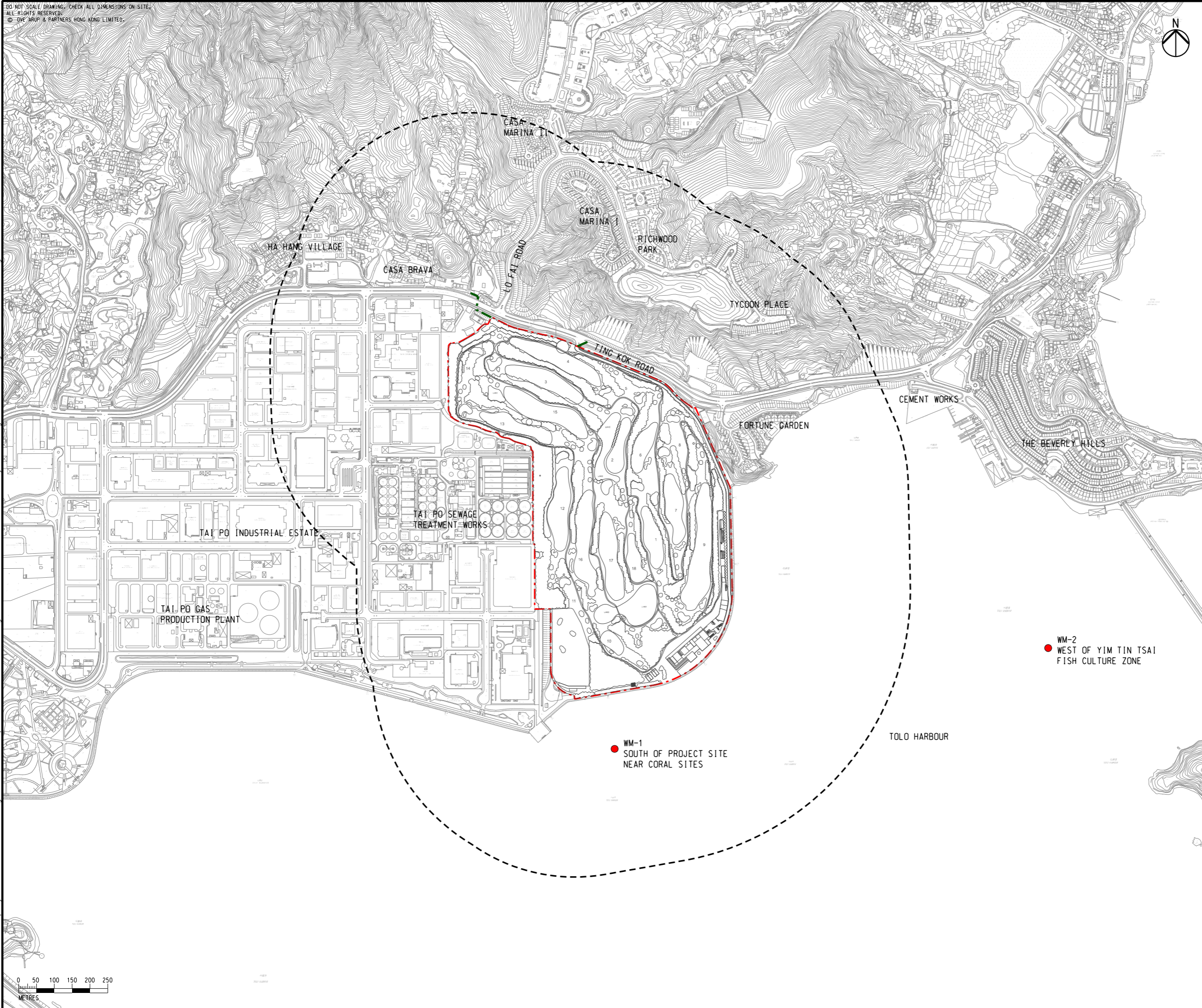
Figure 7.1 in the Approved EM&A Manual

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- LEGEND**
- PROJECT BOUNDARY
 - 500m ASSESSMENT AREA
 - PROPOSED DRAINAGE / SEWERAGE / WATERWORKS OUTSIDE SITE BOUNDARY
 - PROPOSED WATER QUALITY MONITORING STATION

Printed by : 3/18/2019
 Filename : G:\env\project\256383\13 Drawing Deliverables\report\007 EM&A Manual\Figure 7.1 - Locations of Water Quality Monitoring Stations during Construction Phase.dgn



| | | | |
|-----|--------------|----|-------|
| C | THIRD ISSUE | GL | 03/19 |
| B | SECONS ISSUE | GL | 01/19 |
| A | FIRST ISSUE | GL | 04/18 |
| Rev | Description | By | Date |

Consultant
ARUP

Contract No. and Title
SHUEN WAN GOLF COURSE

Drawing title
LOCATIONS OF WATER QUALITY MONITORING STATIONS DURING CONSTRUCTION PHASE

| | | | |
|-------------|-------------|---------|-------------|
| Drawing no. | FIGURE 7.1 | Rev. | C |
| Drawn | Date | Checked | Approved |
| GL | 03/19 | EL | FC |
| Scale | 1:10000 @A3 | Status | PRELIMINARY |

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