



Agreement No. CE 15/2023 (CE)

First Phase Development of the
**New Territories North –
San Tin / Lok Ma Chau
Development Node**

Package 1 – Design and Construction

Interim Wetland Enhancement Plan (Final) (Ref. Z9-05)
August 2026



土木工程拓展署
Civil Engineering and
Development Department

AECOM

Halcrow



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Interim Wetland Enhancement Plan (Final)

(Ref. Z9-05)

July 2026

Reviewed:

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24 July 2026

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TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	Background	1
1.2	The Project	2
1.3	Interim Wetland Enhancement Measures	2
1.4	Scope of Interim Wetland Enhancement Plan (IWEP)	2
2	IDENTIFICATION OF SUITABLE PONDS FOR INTERIM WETLAND ENHANCEMENT WORKS	4
2.1	Objectives of Interim Wetland Enhancement Measures	4
2.2	Target Species for Interim Wetland Enhancement Works	4
2.3	Target Habitat Restoration Works	5
2.4	Criteria for Identifying Suitable Ponds for Interim Enhancement Works	5
2.5	Existing Baseline Conditions of Identified Ponds for Interim Wetland Enhancement	6
2.6	Environmental Impact Assessment Ordinance (EIAO) Implications	8
3	WETLAND ENHANCEMENT PLANNING AND DESIGN	9
3.1	Overview of Interim Wetland Enhancement Works for Identified Ponds	9
3.2	Habitat Creation and Construction Method: <i>Gei Wai</i>	10
3.3	Habitat Creation and Construction Method: Enhanced Freshwater Wetland (EFW)	11
3.4	Habitat Creation and Construction Method: Ecologically Enhanced Fishponds (EEF)	12
3.5	Implementation Programme of Interim Wetland Enhancement Measures	14
4	SPECIFIC HABITAT MANAGEMENT AND MONITORING REQUIREMENTS	16
4.1	Habitat Management Requirements	16
4.2	Monitoring Requirements	18
4.3	Reporting Requirements	19
5	ENVIRONMENTAL PROTECTION MEASURES	21
6	REFERENCES	25

Interim Wetland Enhancement Plan (Final)

Lists of Tables

Table 2.1	Summary Table of Identified Pond Status
Table 3.1	Targeted Habitats and Species for Interim Wetland Enhancement Work
Table 3.2	Summary of Construction Components at Identified Ponds
Table 4.1	Tentative Drain Down Sequence for EEF Habitats
Table 4.2	Target species Monitoring Methodologies
Table 5.1	Implementation Schedule of Proposed Additional Interim Wetland Enhancement Measures

Lists of Figures

Figure 2.1	Ponds under Management Initiative in the Inner Deep Bay Area
Figure 2.2	Ponds Selected for Enhancement Under IWEP
Figure 3.1	Proposed Wetland Enhancement Measures for Pond B
Figure 3.2	Proposed Wetland Enhancement Measures for Pond C
Figure 3.3	Proposed Wetland Enhancement Measures for Pond D
Figure 3.4	Proposed Wetland Enhancement Measures for Pond E

Lists of Appendices

Appendix A	Representative Photographs of Habitat Condition at Ponds Identified for the Interim Wetland Enhancement Works
Appendix B	Historical Aerial Imagery Comparison of Ponds Identified for the Interim Wetland Enhancement Works
Appendix C	Proposed Design Details of Habitat Enhancement Features
Appendix D	Habitat Requirements for Target Species
Appendix E	Standard Water Infrastructure Reference

1 INTRODUCTION

1.1 Background

- 1.1.1.1 The 2013 Policy Address first stated the need to take forward development of the New Territories North (NTN) with a view to building a modern new town there on a similar scale to the Fanling or Sheung Shui New Towns. In 2014, the Hong Kong Government commissioned the Preliminary Feasibility Study on Developing NTN (referred hereafter as “the Preliminary Study”), and an area in San Tin / Lok Ma Chau (STLMC) was identified as having potential for further development. In October 2016, a Broad Land Use Concept Plan (BLCP) of the area was promulgated for public engagement in “Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030” (Hong Kong 2030+).
- 1.1.1.2 Following the announcement of advancing the studies on developing brownfield sites in the NTN in the 2018 Policy Address and the acceptance of the eight land supply options recommended by the Task Force on Land Supply in February 2019, the Feasibility Study on STLMC Development Node (STLMC DN) as the first phase development of NTN was jointly commissioned by the Civil Engineering and Development Department (CEDD) and the Planning Department (PlanD) in September 2019, to further develop the BLCP into a Preliminary Outline Development Plan (PODP) and confirm its feasibility. The PODP was presented to the Legislative Council in mid-2021 in the form of an Initial Land Use Plan.
- 1.1.1.3 In October 2021, the 2021 Policy Address announced the expansion of the STLMC DN into San Tin Technopole (STT) together with the Hong Kong-Shenzhen Innovation and Technology Park (HSITP) at the Loop. By making use of the land to be released by the Lok Ma Chau Boundary Control Point (LMC BCP) upon commissioning of the new Huanggang Port with co-location arrangement, and the replanning of rural areas and fishponds around LMC BCP, it was proposed to increase the land supply for innovation and technology (I&T) development to achieve an industry clustering effect with economy of scale. It was also proposed to increase the housing supply in STT to help address the housing shortage across Hong Kong SAR, with some of the units providing talent apartments for I&T enterprises and research institutes. The Northern Metropolis has been incorporated in the Conceptual Spatial Framework promulgated in the Final Report of Hong Kong 2030+.
- 1.1.1.4 In the same month, CEDD and PlanD jointly commenced an Investigation Study on STLMC DN (hereinafter referred to as “the Investigation Study”) to take forward the STT initiative and formulate the Recommended Outline Development Plan (RODP) for STLMC area, carry out engineering and technical assessments including the statutory Environmental Impact Assessment (EIA), and conduct public engagement (PE) to facilitate public discussions and foster consensus building. A 2-month PE was conducted between June and August 2023 to solicit public views on the RODP. Taking into account the public views collected in the PE, planning and engineering considerations, technical assessments as well as departmental comments and advice, a Revised RODP was formulated.
- 1.1.1.5 According to the Revised RODP, STLMC area will be developed into an I&T hub and a new community providing about 50,000 to 54,000 flats for a new population of about 147,000 to 159,000. It will generate about 165,000 jobs, including 120,000 jobs on I&T sites. It will be an integral part of STT, providing ample amount of I&T land for different I&T uses, as well as an integrated community with wide range of commercial, retail, community, recreational and cultural facilities.
- 1.1.1.6 The EIA Report for STLMC DN was approved by the Director of Environmental Protection (EIAO register no.: AEIAR-261/2024) with conditions in accordance with the EIAO on 17 May 2024.

Interim Wetland Enhancement Plan (Final)

1.2 The Project

- 1.2.1.1 AECOM-HALCROW JV (hereafter refers as the Consultants) were commissioned by CEDD to undertake Agreement No. CE 15/2023 (CE) – First Phase Development of the New Territories North – San Tin/Lok Ma Chau Development Node – Package 1 – Design and Construction. The consultancy commenced on 27 September 2023 for a contract period of 138 months.
- 1.2.1.2 The proposed scope of the Project comprises the following principal works elements:
- (a) site formation of land at the STLMC DN, of which covers about 250ha of land for innovation and technology development, housing, community, commercial and other developments;
 - (b) engineering infrastructure works including but not limited to roadworks, drainage, sewerage, waterworks, pumping stations, fresh water and flushing water service reservoirs, Common Utility Enclosure (CUE) and other associated buildings/structures/E&M/systems for the STLMC DN;
 - (c) landscaping works; and
 - (d) implementation of environmental monitoring and mitigation measures works mentioned in (a) to (c) above.

Construction Phasing of Development of STLMC DN

- 1.2.1.3 The STLMC DN is being developed in phases. Under the Agreement No. CE15/2023 (CE), it comprises part of the Phase 1 Stage 1 and Stage 2 of the STLMC DN. Details can be referred to the Development Scheme in the webpage <https://nm-santintech.hk/en/implementation-arrangement/development-schedule/>. The construction contracts for the Phase 1 Stage 1 and Stage 2 of the STLMC DN would commence starting from December 2024 and tentatively in 2027 respectively. The target commencement date for proposed pond filling works is subject to the approval of the Detailed Habitat Creation and Management Plan (HCMP) under Approval Condition (1) of the approved EIA report. No pond filling works of the Project will be carried out prior to the commencement of construction of ecologically enhanced fish ponds at the proposed SPS WCP according to Approval Condition (9) of the approved EIA report (therein referred to as “EIA Approval Conditions”).

1.3 Interim Wetland Enhancement Measures

- 1.3.1.1 Under the Approved STLMC DN EIA, a wetland compensation strategy has been developed to achieve the compensation requirement in accordance with the EIAO-TM, by enhancement of ecological function and capacity of the existing habitats to sufficiently compensate the wetland loss arising from the STLMC DN development and achieve no-net-loss in ecological function and capacity of the wetlands concerned. The location of the proposed enhanced wetland was preliminarily identified within the future Sam Po Shue Wetland Conservation Park (SPS WCP) and is anticipated to improve the connectivity of wetland habitats in the region, while conservation strategies to be implemented within the SPS WCP are anticipated to provide ecological enhancement. The target commencement date for proposed pond filling works is subject to the approval of the Detailed Habitat Creation and Management Plan (HCMP) under Approval Condition (1) of the approved EIA report. No pond filling works of the Project will be carried out prior to the commencement of construction of ecologically enhanced fish ponds at the proposed SPS WCP according to Item (9) of the EIA Approval Condition.
- 1.3.1.2 With reference to Sections 10.11.3.39 and 10.11.3.47 of the Approved EIA Report of the STLMC DN, additional interim wetland enhancement measures on suitable ponds in the Inner Deep Bay area would also be implemented prior to the commencement of pond filling works of the STLMC DN to enhance the overall ecological value of wetland habitats in the Deep Bay Area. Suitable ponds in the Inner Deep Bay area shall be identified for implementing interim enhancement works, which may comprise restoration of abandoned ponds and arrangement of active management including fish stocking for suitable ponds.

1.4 Scope of Interim Wetland Enhancement Plan (IWEP)

- 1.4.1.1 This Report is prepared in line with Section 10.11.3.47 of the Approved EIA Report of the San Tin / Lok Ma Chau Development Node (STLMC DN) (Register No.: AEIAR-261/2024) and Item

Interim Wetland Enhancement Plan (Final)

(4) of the STLMC DN EIA Approval Conditions, with an aim to setting out the details of the interim wetland enhancement measures for the identified ponds, including active management such as trash fish stocking, as set out in the approved EIA Report. Reference has also been made to the Draft Habitat Creation Management Plan (HCMP) of the Approved STLMC DN EIA (Appendix 10.8 of AEIAR-261/2024).

- 1.4.1.2 As required under Item (5) of the EIA Approval Conditions, an Environmental Committee (EC) of STLMC DN (also referred to as “San Tin Technopole”) has been established to advise on the preparation of the ecological mitigation and enhancement plans required under the EIA Approval Conditions and to monitor the effectiveness of the implementation of the proposed ecological mitigation / enhancement measures, including the IWEP. Details of the recommended additional interim wetland enhancement measures on suitable ponds have been consulted with the AFCD and EC. Recommendations on detailed design / operation of the interim enhanced pond from the EC have been incorporated in this Report accordingly, including design alignment with permanent works under SPS WCP to avoid abortive works, trash-fish stocking species, bird island extent to accommodate a variety of waterbirds, vegetation management (e.g. exotic *Sonneratia* and other plant species management), habitat design considerations for target species besides of waterbirds (e.g. vegetation for fruit bats and insectivorous bats utilising existing fishpond bunds / wetland).
- 1.4.1.3 Apart from this introductory section, other sections of this Report are as follows:
- **Section 2** describes the objectives, target and criteria for implementation of the interim wetland enhancement, as well as the Environmental Impact Assessment Ordinance implications (EIAO) of the proposed works;
 - **Section 3** describes the planning and design of the interim wetland enhancement works for the identified ponds, as well as the implementation programme of the works;
 - **Section 4** describes the management and monitoring of the interim wetland enhancement works;
 - **Section 5** describes the environmental protection measures for the construction of the interim wetland enhancement works for the selected ponds; and
 - **Section 6** provides the references.

2 IDENTIFICATION OF SUITABLE PONDS FOR INTERIM WETLAND ENHANCEMENT WORKS

2.1 Objectives of Interim Wetland Enhancement Measures

- 2.1.1.1 Fishponds are a common habitat within the Northwestern New Territories (NWNT) area of Hong Kong spanning from Fung Lok Wai area to Hoo Hok Wai area (AFCD, 2024a). They are mainly managed for aquaculture production and/or conservation purposes. Together with other habitats within the Mai Po Inner Deep Bay Ramsar Site, the NWNT wetlands regularly support over 50,000 waterbirds in winter, providing important feeding and resting grounds for migratory birds (AFCD, 2023).
- 2.1.1.2 Traditional aquaculture practices in the NWNT include pond draw-down to facilitate harvesting: a process that plays an important role in supporting waterbirds in the region by providing high quality feeding opportunities. Currently, some fishponds are engaged by the Hong Kong Bird Watching Society (HKBWS), Heung Yee Kuk Foundation Limited and Hong Kong Wetland Conservation Association Limited under Management Agreement (MA) Scheme (CCO, 2025a-c), which aims at conserving the integrity of wetland and ecological value of all fishponds in the Deep Bay area through collaboration with fishpond operators in fishpond habitat management, public education, scientific study and local fishery promotion (ponds participating under the Scheme are shown in **Figure 2.1**).
- 2.1.1.3 Despite these efforts, human activities leading to disturbance are also observed in the area, including installation of bird deterrent devices to prevent waterbirds from preying on fish stocks (HKBWS, 2024a), pond filling activities (HKBWS, 2024b), which reduce the value of ponds to avifauna. It is also observed that quite a number of the ponds within the area are now abandoned or inactive. Ponds that are not actively managed would be subject to quick colonisation by emergent and/or terrestrial vegetation, succeeding from wetland to terrestrial habitat, thereby losing their value as wetlands (CEDD, 2021).
- 2.1.1.4 The primary objective of the interim wetland enhancement works is to increase the ecological function and capacity of the Inner Deep Bay wetland habitats before pond filling works of the STL MC DN through habitat restoration (i.e., reinstatement of abandoned ponds) and interim implementation of active conservation management (e.g., trash-fish stocking), with particular focus on wildlife species of conservation importance that commonly use fishpond habitats, such as those identified in the Approved STL MC DN EIA Report and its Draft HCMP (Section 10.11.3.27 and Appendix 10.8 of AEIAR-261/2024). The necessary land acquisition for the proposed pond enhancement works would be carried out in conjunction with the SPS WCP project in consultation with Lands Department (LandsD). Given the tight timeline for additional enhancement works before pond filling works of the STL MC DN and development of the SPS WCP (i.e. earliest by 2026/27), the interim wetland enhancement works would therefore focus on abandoned or otherwise degraded pond / wetland habitats in the SPS WCP that can be readily improved in order to provide a rapid increase in the ecological capacity of wetland habitats in the area.

2.2 Target Species for Interim Wetland Enhancement Works

- 2.2.1.1 As outlined under the Draft HCMP of the Approved STL MC DN EIA Report, four larger wetland avifauna species: black-faced spoonbill (*Platalea minor*), great cormorant (*Phalacrocorax carbo*), great egret (*Ardea alba*) and grey heron (*Ardea cinerea*) were used as indicator species given the common occurrence of these species in wetland (primarily fishpond) habitats, and their relative sensitivity to disturbance. These four species are considered as key target species for the interim enhancement works.
- 2.2.1.2 In addition to the four indicator species, target species for habitat enhancement identified in the Draft HCMP of the Approved STL MC DN EIA Report also cover other fish-eating / non-fish-eating avifauna and non-avifaunal species of conservation interest that are relatively common in and/or restricted to the wetland habitats affected by the STL MC DN development, including other ardeids, ducks and grebes (e.g. Eurasian teal *Anas crecca* and little grebe *Tachybaptus ruficollis*), shorebirds and gulls (e.g. little ringed plover *Charadrius dubius* and black-headed gull *Chroicocephalus ridibundus*), freshwater wetland and other wetland associated avifauna (e.g. black-winged stilt *Himantopus himantopus* and red-billed starling *Spodiopsar sericeus*), raptors (e.g. eastern imperial eagle *Aquila heliaca* and greater spotted

Interim Wetland Enhancement Plan (Final)

eagle *Clanga clanga*), Eurasian otter (*Lutra lutra*) and other non-avifaunal species of conservation importance such as herpetofauna (e.g. Chinese bullfrog *Hoplobatrachus rugulosus*) and odonate (e.g. scarlet basker *Urothemis signata signata*).

- 2.2.1.3 All of the above target species are identified and anticipated to be benefited from the interim wetland enhancement measures provided under the Project. By monitoring of the abundance and presence of these species, the potential uplift in ecological value and effectiveness of the interim enhancement measures shall be assessed. Habitat requirements of these key species are detailed in **Appendix D**.

2.3 Target Habitat Restoration Works

- 2.3.1.1 The Draft HCMP of the Approved STLMC DN EIA Report identified two broad categories of enhanced habitats that would be suitable for the identified target species, namely Ecologically Enhanced Fishpond (EEF) and Enhanced Freshwater Wetland (EFW).

2.3.2 Ecological Enhanced Fishpond (EEF)

- 2.3.2.1 With the creation of larger pond habitat with shallower pond margins and active management, piscivorous avifauna (e.g. black-faced spoonbill, great cormorant, great egret, grey heron), shorebirds and gulls (e.g. little ringed plover, red-necked stint, black-headed gull), freshwater wetland avifauna (e.g. black-winged stilt), wetland-associated avifauna species (e.g. collared crow, red-billed starling) and raptors (greater spotted eagle, eastern imperial eagle), as well as mammal species of conservation importance (e.g. Eurasian otters) would be the primary target species for the EEF habitat to be created.
- 2.3.2.2 *Gei Wai* habitat is not specifically described under the Approved STLMC DN EIA Report's draft HCMP but can also function as part of the EEF habitat given its fisheries production and high ecological value by provision of foraging grounds for various species. In fact, *Gei wai* located within the Mai Po Nature Reserve (MPNR) are managed for conservation, especially as feeding and roosting grounds for over-wintering birds (WWF HK, 2018). *Gei wai* in Deep Bay, together with mudflat and fishponds, provide feeding ground for over 40,000 over-wintering birds (HKBWS, 2022). Target species for *gei wai* habitat would be similar to that of other EEF; but can also potentially attract other species such as ducks (e.g. Eurasian teal, Northern shoveler *Spatula clypeata*, tufted duck *Aythya fuligula*). The management efforts and methods to be adopted at proposed *gei wai* habitat will be similar to *gei wai* at MPNR, which is further discussed in **Section 4.1.5**.

2.3.3 Enhanced Freshwater Wetland (EFW)

- 2.3.3.1 With the creation of permanently inundated, shallow freshwater wetland habitats, EFW habitats can support freshwater wetland avifauna (e.g. Chinese pond heron *Ardeola bacchus*, red-throated pipit *Anthus cervinus*, yellow bittern *Ixobrychus sinensis*, zitting cisticola *Cisticola juncidis*) as well as dragonflies and amphibians (e.g. scarlet basker and Chinese bullfrog).

2.4 Criteria for Identifying Suitable Ponds for Interim Enhancement Works

- 2.4.1.1 With reference to the Approved STLMC DN EIA Report, ponds suitable for interim wetland enhancement measures shall be located within the Inner Deep Bay Area. With consideration of the existing fishpond status and other management initiatives in the area, as well as the enhancement potential of the concerned ponds within a short period of time, suitable ponds would be identified based on the following criteria in consultation with AFCD:
- Ponds located on Government land;
 - Ponds outside of existing mitigation wetlands;
 - Ponds that are currently not actively engaged under any Management Agreement schemes (i.e. MA Scheme) under the Countryside Conservation Funding Scheme;
 - Abandoned pond, degraded wetland habitats or ponds (including ponds covered by MA Schemes but with no signs of active management); and
 - Availability of access to pond and ease of implementation of enhancement.

Interim Wetland Enhancement Plan (Final)

- 2.4.1.2 Priority would also be given to ponds that are located along avifauna major flight path between the MPNR and the Hoo Hok Wai area, and those in proximity to the MPNR to ensure the restored habitats could effectively enhance ecological value in the Deep Bay area. Existing conditions of pond management in the Deep Bay area are shown in **Figure 2.1**.

2.5 Existing Baseline Conditions of Identified Ponds for Interim Wetland Enhancement

2.5.1 Existing Site Conditions

- 2.5.1.1 Four suitable ponds (Ponds B – E), which meet all the criteria described under **Section 2.4**, were identified across the Inner Deep Bay Area in consultation with AFCD, as shown in **Figure 2.2**. Existing site conditions of the ponds are described below, with representative photographs provided in **Appendix A**.

Pond B

- 2.5.1.2 Pond B is approximately 6.7ha in size and located within the Proposed Sam Po Shue Wetland Conservation Park (SPS WCP). It is located outside of the Exclusion Zone (EZ) and Reduced Density Zone (RDZ) under the Approved STL MC DN EIA Report, adjoining the northeastern part of MPNR and within the Frontier Closed Area (FCA). With reference to historical images, the pond was managed as fishpond until the 1990s (**Appendix B** refers), with a strip of marshy vegetation along the western side adjacent to the water channel. By the mid-2000s, the pond began to be colonised by terrestrial vegetation and eventually densely covered by vegetations in the mid-2010s (**Appendix B** refers). The pond is currently dominated by mangroves (including invasive *Sonneratia* sp., native species *Kandelia obovate* and *Acrostichum aureum*) and reed *Phragmites australis* that are gradually transforming into terrestrial habitat through succession. An active night roost, i.e. Mai Po San Tsuen Cormorant Night Roost, is identified to the northern side and within 100m range of the Pond B.

Pond C

- 2.5.1.3 Pond C is approximately 1.0ha in size and located within the Proposed SPS WCP. It is located to the immediate north of Tam Kon Chau Road, nearby the World Wide Fund Jockey Club Peter Scott Visitor Centre, outside of the EZ and RDZ under the Approved STL MC DN EIA Report. With reference to historical images, Pond C was once part of the adjacent water channel (**Appendix B** refers), where vegetation was visible on the bank of the channel from the 1970s to the 1990s. It was observed that terrestrial vegetation slowly colonised the entire channel over time, where the main channel was no longer visible in the mid-2000s. The pond is now covered with dense terrestrial vegetation (e.g. *Ipomoea cairica*, *Bidens alba*) on the banksides and emergent species (e.g., *Phragmites australis*) as well as mangrove *Acrostichum aureum* due to minimum water flow as a result of changes to the local hydrological regime. To the immediate southeastern side of Pond C is a private lot which was once an area with a small pocket of pond habitat, but was filled in the late 2010s for conversion into a livestock farm. Temporary structures are located at the northeastern end of the pond.

Pond D

- 2.5.1.4 Pond D is approximately 2.8ha in size and located within the Proposed SPS WCP, to the northwest of Lin Barn Tsuen, out of the EZ and RDZ under the Approved STL MC DN EIA Report. With reference to historical images (**Appendix B** refers), Pond D was once a single large fishpond in 1975 which was split into different sizes of fishponds throughout the 1980s to early 2000s. Colonisation of emergent species was observed at the northwestern pond in mid-2010s and spread to the southwestern pond in the 2020s. Pond D now comprises of three abandoned fishponds of marshy and reedbed habitats at the western side (including exotic and invasive *Typha* sp.), and a small area of banana plantation *Musa x paradisaca* at the eastern side, separated by a footpath to the Border Road gate. The pond bunds are densely covered by trees, especially the northern side along the border fence.

Pond E

- 2.5.1.5 Pond E is approximately 1.8ha in size and located within the Proposed SPS WCP, to the north of Lin Barn Tsuen, outside of the EZ and RDZ under the Approved STL MC DN EIA Report.

Interim Wetland Enhancement Plan (Final)

With reference to historical images (**Appendix B** refers), Pond E was a portion of two ponds located adjacent to the Shenzhen River. Throughout the 1970s to 1990s, the group of ponds received little reprofiling and active management was observed. The boundary of Pond E was amended due to the construction of the border fence in the early 2000s, and later densely colonised by both terrestrial and emergent / riparian vegetation. No active management was observed since the early 2000s. It now comprises three abandoned fishponds, occupied by seasonal wet grassland and reedbed habitats (including exotic and invasive *Typha* sp.) with a small area of open pond habitat. The pond bunds are densely overgrown with emergent vegetation and shaded by terrestrial trees especially along the northern bunds, with temporary structures observed at the northeastern corner. An active seasonal ardeid night roost, i.e. Lin Barn Tsuen Night Roost (Overwintering), identified in the Approved STLMC DN EIA Report, is located to the southeast side and within 100m range of Pond E.

Table 2.1 Summary Table of Identified Pond Status

Criteria	Pond B	Pond C	Pond D	Pond E
Located on Government Land	✓	✓	✓	✓
Outside of existing mitigation wetlands	✓	✓	✓	✓
Currently not actively engaged under any Management Agreement schemes (i.e. MA Scheme) under the Countryside Conservation Funding Scheme;	✓	✓	✓	✓
Abandoned pond, degraded wetland habitats or ponds (including ponds covered by MA Schemes but with no signs of active management);	✓	✓	✓	✓
Availability of access to pond and ease of implementation of enhancement	✓	✓	✓	✓

2.5.2 Existing Ecological Baseline

- 2.5.2.1 The proposed interim wetland enhancement works will take place within or adjacent to various sites of conservation importance. All of the proposed works areas fall within the Mai Po Inner Deep Bay Ramsar Site, Ramsar Site Priority Site for Enhanced Conservation, and Wetland Conservation Area (WCA). Pond B is also located adjacent to the Mai Po Marshes SSSI.
- 2.5.2.2 Other sites of conservation importance are also identified in close proximity to the proposed wetland enhancement works areas, including Deep Bay Wetland outside Ramsar Site Priority Site for Enhanced Conservation, Wetland Buffer Area (WBA), Conservation Area ("CA"), as well as other sensitive ecological resources such as night roosting areas for avifauna, and Inner Deep Bay and Shenzhen River Catchment Important Bird Area (IBA).
- 2.5.2.3 The area generally comprises ecologically sensitive wetland habitats, including intertidal mangrove and mudflat, as well as fishponds, watercourses, and *gei wais*. These habitats serve as important foraging habitats, breeding and/or nursery grounds for various species. In particular, some species of conservation importance were previously recorded in the area, including mammals (such as Eurasian otter), various waterbird species (including black-faced spoonbill, great cormorant and Anatidae (duck species)), as well as Mai Po bent-winged firefly (*Pteroptyx maipo*). Among the four identified ponds, a total of 22 species of conservation importance were recorded during 12 months pre-construction surveys of the Project, including the four indicative species and seven target species mentioned in **Section 2.2** and **Table 3.1**. The wetland habitats in the area are known to provide important habitats for these species, and also form part of the movement corridors (e.g. avifauna flight line) connecting Hoo Hok Wai at the east toward intertidal areas at the west, and foraging ground in the broader area of Deep Bay. Environmental protection measures as detailed in **Section 5** are recommended to be implemented to avoid and minimise potential adverse environmental impacts from the habitat creation works.

Interim Wetland Enhancement Plan (Final)

2.6 Environmental Impact Assessment Ordinance (EIAO) Implications

- 2.6.1.1 By virtue of Item Q1, Part I, Schedule 2 of the EIAO, all projects involving earthworks, dredging works and other building works partly or wholly in an existing or gazetted proposed country park or special area, a conservation area, an existing or gazetted proposed marine park or marine reserve, a site of cultural heritage, and a site of special scientific interest are considered as a “designated project” (DP).
- 2.6.1.2 The proposed interim enhancement works at Ponds B to E are located outside of the sensitive areas listed under Item Q1, Part I, Schedule 2 of the EIAO (**Figure 2.1** refers) and hence no EIAO implications would be anticipated.

3 WETLAND ENHANCEMENT PLANNING AND DESIGN

3.1 Overview of Interim Wetland Enhancement Works for Identified Ponds

3.1.1.1 According to existing ecological conditions / characteristics described in **Section 2.5**, three types of wetland habitats would be created for the identified ponds that would benefit target species identified in **Section 2.2**, including *gei wai*, EFW and EEf. *Gei Wai* would provide open water and intertidal mudflat habitats which is high value feeding ground for wetland avifauna target species; EFW would provide shallow water marsh and open water habitats that can provide screening, shelter and foraging grounds for avifauna, odonate and herpetofauna target species; while EEf would be reprofiled with bird islands and drained down regularly for avifauna breeding and foraging. The targeted habitats for the identified ponds are described in **Table 3.1**, which aims to restore abandoned ponds or degraded habitat through habitat creation and active management to enhance ecological functions of the four identified ponds. The layout of proposed habitat enhancement measures and design details of the four identified ponds are shown in **Figures 3.1 – 3.4** and **Appendix C** respectively.

Table 3.1 Targeted Habitats and Species for Interim Wetland Enhancement Work

Pond	Area (ha)	Targeted Habitats	Target Species	Habitat Features	
Pond B	6.7	<i>Gei wai</i>	<i>Avifauna:</i>	<i>Open Water</i>	<i>Intertidal Mudflat</i>
			• Black-faced Spoonbill (<i>Platalea minor</i>)		✓
			• Black-headed Gull (<i>Chroicocephalus ridibundus</i>)		✓
			• Black-winged Stilt (<i>Himantopus himantopus</i>)		✓
			• Collared Crow (<i>Corvus torquatus</i>)		✓
			• Eastern Imperial Eagle (<i>Aquila heliaca</i>)	✓	
			• Eurasian Teal (<i>Anas crecca</i>)	✓	
			• Great Cormorant (<i>Phalacrocorax carbo</i>)	✓	
			• Great Egret (<i>Ardea alba</i>)		✓
			• Greater Spotted Eagle (<i>Clanga clanga</i>)	✓	
			• Grey Heron (<i>Ardea cinerea</i>)		✓
			• Little Grebe (<i>Tachybaptus ruficollis</i>)		✓
			• Little Ringed Plover (<i>Charadrius dubius</i>)		✓
			• Northern Shoveler (<i>Spatula clypeata</i>)	✓	
			• Red-billed Starling (<i>Spodiopsar sericeus</i>)		✓
			• Red-necked Stint (<i>Calidris ruficollis</i>)		✓
			• Tufted Duck (<i>Aythya fuligula</i>)	✓	
			<i>Non-avifaunal species:</i>		
			• Eurasian Otter (<i>Lutra lutra</i>)	✓	✓
Pond C	1.0	Enhanced Freshwater Wetland	<i>Avifauna:</i>	<i>Floating Marsh</i>	<i>Tall/ Short Marsh</i>
			• Chinese Pond Heron (<i>Ardeola bacchus</i>)		✓
			• Red-throated Pipit (<i>Anthus cervinus</i>)		✓
			• Yellow Bittern (<i>Ixobrychus sinensis</i>)		✓
			• Zitting cisticola (<i>Cisticola juncidis</i>)		✓
			<i>Non-avifaunal species:</i>		
			• Scarlet Basker (<i>Urothemis signata signata</i>)	✓	
Pond D	2.8	Ecological Enhanced Fishpond	<i>Avifauna:</i>	<i>Bird Island</i>	<i>Pond Drain down</i>
			• Black-faced Spoonbill (<i>Platalea minor</i>)	✓	✓
Pond E	1.8		• Black-headed Gull (<i>Chroicocephalus ridibundus</i>)		✓
			• Black-winged Stilt (<i>Himantopus himantopus</i>)		✓
			• Collared Crow (<i>Corvus torquatus</i>)		✓
			• Eastern Imperial Eagle (<i>Aquila heliaca</i>)		✓
			• Great Cormorant (<i>Phalacrocorax carbo</i>)		✓
			• Great Egret (<i>Ardea alba</i>)	✓	✓
			• Grey Heron (<i>Ardea cinerea</i>)	✓	✓
			• Greater Spotted Eagle (<i>Clanga clanga</i>)		✓
			• Little Egret (<i>Egretta garzetta</i>)	✓	✓
			• Little Ringed Plover (<i>Charadrius dubius</i>)	✓	✓
			• Red-necked Stint (<i>Calidris ruficollis</i>)	✓	✓
			<i>Non-avifaunal species:</i>		
			• Eurasian Otter (<i>Lutra lutra</i>)		✓

3.2 Habitat Creation and Construction Method: *Gei Wai*

3.2.1 Identified Ponds for Habitat Creation

- 3.2.1.1 Pond B would be reinstated into *gei wai* to create open water and intertidal mudflat habitats. Removal of overgrown vegetation and de-silting works of approximately 4.8ha would be conducted at Pond B, respectively. The habitat design and construction method are detailed below. Detail of the habitat requirements of target species is summarised in **Appendix D**.

3.2.2 Habitat Design

- 3.2.2.1 Habitat reinstatement at Pond B (**Figure 3.1**) would reference traditional *gei wai* design, similar to existing *gei wai* at MPNR (WWF HK, 2017).
- 3.2.2.2 Given the extensive coverage of the of invasive *Sonneratia* spp., it is anticipated that clearance of all *Sonneratia* spp. while retaining native mangroves at Pond B under the current timeframe will be challenging. The *gei wai* habitat at Pond B would therefore focus on habitat creation at the eastern side of the pond. A perimeter channel graded to a depth of about 2m at average low tide will be created (**Figure 3.1** refers), with 2m buffers running at both sides of the channel, along the eastern pond bund. Any *Sonneratia* spp. within the extent of the buffers and perimeter channel would be removed.
- 3.2.2.3 The water level of the reinstated *gei wai* would be largely determined by natural tidal fluctuation with the Inner Deep Bay. In this way, mudflat and shallow waters would be exposed during low tides, providing a high value feeding ground to be utilised by target species for food foraging, including black-faced spoonbill, ardeids, shorebirds red-necked stint and black-headed gull. During high tides, open water habitat with deeper water level would attract ducks species like Northern shoveler and tufted duck, as well as raptors such as eastern imperial eagle and greater spotted eagle which prey on ducks. Sluice gates would be installed at the tidal connections to facilitate water management and maintenance (i.e. allowing for pond drain down and maintenance, as well as retention of tidal water to control vegetation growth). Removal of predatory fish species during dry season drain down could be carried out to alleviate predatory pressures of predatory fishes on prey item of target species, including small fishes and shrimps (WWF HK, 2024), enhancing the overall habitat quality.

3.2.3 Vegetation Management

- 3.2.3.1 Vegetation enhancement works at Pond B would largely comprise removal of terrestrial / mangrove vegetation for creation of *gei wai* habitats. Considering the current enhancement would serve as an interim measure, no additional planting is required. As a transition to the establishment of the SPS WCP, remaining mangrove clearance and replacement planting with native mangrove species could potentially be required in the future when handed over to SPS WCP to replace existing terrestrial vegetation where necessary.
- 3.2.3.2 All pond bunds at Pond B would be maintained as open bunds with relatively short vegetation. All removed vegetation should be appropriately loaded and disposed off-site at landfill.

3.2.4 Construction Method

- 3.2.4.1 The reinstatement of *gei wai* habitat mainly involved vegetation removal and desilting works within the confines of the pond conducted by backhoe mounted on a floating pontoon. Construction components for *gei wai* is summarised in **Table 3.2**.
- 3.2.4.2 The desilted materials from pond excavation would be transferred to trucks for disposal via Tam Kon Chau Road through footpath leading into Pond B¹. All excavated materials generated from the pond excavation works should be collected, properly handled and disposed offsite in compliance with the Waste Disposal Ordinance.
- 3.2.4.3 Environmental protection and good site practices including standard pollution control measures, as detailed in **Section 5** would be implemented to avoid and minimise potential adverse environmental impact to the adjacent wetland habitats during the construction phase.

¹ With reference to the Frontier Closed Area (Amendment) Order 2026, Pond B will be excluded from the FCA effective on 24 July 2026.

3.3 Habitat Creation and Construction Method: Enhanced Freshwater Wetland (EFW)

3.3.1 Identified Pond for Habitat Creation

- 3.3.1.1 Pond C would be constructed and managed as EFW habitat. The pond would be excavated, lined with clay and reprofiled to create various microhabitats, including shallow water and open water habitats. Detail of the habitat requirements of target species is summarised in **Appendix D**.

3.3.2 Habitat Design

- 3.3.2.1 A shallow water zone (created and managed at various water depth from 10cm to <1m deep) of permanently inundated areas would be created at the western portion of Pond C, whereas the eastern portion would include some open water habitat with gentle slope and pocket of deeper water in the center (up to 1.5m deep). The proposed habitat design is shown in **Figure 3.2** and proposed water level detailed in **Appendix C**.
- 3.3.2.2 The water level of Pond C would primarily be maintained by direct rainfall and local run-off. An overflow weir would be installed at the existing connection with the old water channel to maintain designed water level during the operation phase (**Appendix C** refers). The pond bottom would be lined with clay to minimise water leakage. Reference design of adjustable weir is shown in **Appendix E**.
- 3.3.2.3 Target species such as dragonfly scarlet basker and Chinese bullfrog would benefit from the improved water quality and utilise this habitat for foraging and/or breeding ground. While other avifauna target species like yellow bittern and zitting cisticola would also utilise the dense bankside and emergent vegetation for shelter and foraging ground. Details of vegetation is further discussed under **Section 3.3.3**.

3.3.3 Vegetation Management

- 3.3.3.1 Existing vegetation within the pond would be removed and replanted with marsh vegetation with coverage maintained at about 70 – 80%. Given that Pond C is directly adjacent to Tam Kon Chau Road, which is subject to human disturbance, the southern bund would be densely vegetated (**Figure 3.2** refers) to provide screening from the nearby road. The remaining pond bunds would be maintained as open bunds with relatively short vegetation, although any native trees would be retained as far as practicable. Provision of floating-leaf vegetation at open water habitat and emergent vegetation along pond bunds would provide suitable microhabitats utilised by both dragonflies and herpetofauna species, as well as other targeted avifauna species.

3.3.4 Construction Method

- 3.3.4.1 The reprofiling of Pond C would begin with removal of terrestrial vegetation within the EFW, followed by clay lining. The pond base would then be reprofiled with planting medium, which are evenly textured, free draining topsoil, according to the grading plan shown in **Appendix C**. Construction components for EFW is summarised in **Table 3.2**.
- 3.3.4.2 The excavation work would be performed by excavator and bulldozer. The heavy machineries would be transported to Pond C via Tam Kon Chau Road, and stored at designated location on site. Prior to any earthworks, the pond should be drained and dried, in which the installed overflow weir (**Section 3.3.2.2** refers) would prevent an influx of water during the construction. Excavated materials generated during the works would be reused on site to minimise disposal of materials off-site as far as possible, including any pond reprofiling works. Management of excess materials from proposed works will be formulated in accordance with DEVB TC(W) No. 6/2010 and Chapter 4 Section 4.1.3 of Project Administration Handbook for Civil Engineering Works (2022 Edition). Disposal at the Public Fill Reception Facilities would be considered as the last resort.
- 3.3.4.3 The reprofiled pond should be structurally stable upon completion of works. The adjacent roads including the existing Tam Kon Chau Road and footpath along the northern side could be used as work access and should not be affected by works related to the creation of EFW habitat.

3.4 Habitat Creation and Construction Method: Ecologically Enhanced Fishponds (EEF)

3.4.1 Identified Ponds for Habitat Creation

- 3.4.1.1 Ponds D and Pond E would be reinstated and managed as EEF habitat. Removal of overgrown vegetation and reprofiling works of approximately 2.8ha and 1.8ha would be conducted at Pond D and E, respectively. The habitat design and construction method are detailed below. Details of the habitat requirements of target species are summarised in **Appendix D**.

3.4.2 Habitat Design

- 3.4.2.1 Habitat reinstatement at both Ponds D and E would consolidate adjacent small abandoned / inactive ponds to create larger pond habitat, which are potentially more attractive to disturbance sensitive target species such as black-faced spoonbill and grey heron. Both ponds would be reprofiled to have a maximum water depth of about 2 – 2.5m with gentle bund gradient (proposed design details shown in **Appendix C**). The pond bund height will remain similar to existing pond bund, with modification using excavated materials where necessary. Different water depth profiles would be adopted at both ponds, about 20 – 25% of the peripheral pond area would be maintained as shallow water (<50cm) habitat, with gradual increase of water depth towards the centre of the EEF, allowing progressive increase in feeding area for birds when pond is drained. Bird islands with gentle slope would also be created in both ponds, to provide foraging and resting habitat for waterbirds and other species. Various target species are expected to be attracted by the drain down process at different water levels: larger avifauna species great cormorant at deeper water level (AEC, 2019), great egret and grey heron attracted to prey trapped at shallower water level, while shorebirds like little ringed plover and red-necked stint would forage at drained pond bottoms or edges for small insects and other invertebrates (HKBWS, n.d.).
- 3.4.2.2 At Pond D, the three abandoned ponds will be consolidated into a large L-shaped pond at the west. The existing banana plantation will be converted into a smaller pond at the east, separated by a footpath leading to the Border Road gate (**Figure 3.3** refers). The L-shaped pond would be formed by excavating the existing abandoned pond and partially removing the bunds. The excavated bund material can provide material to reprofile pond edges. A bird island would also be created between the two western ponds by partially removing the two ends of the bund. The bird island would be utilised by target freshwater wetland avifauna and shorebird species as a nesting and resting area, which is free from potential disturbances / threats like dogs. Target freshwater wetland avifauna and shorebird species including black-winged stilt and little ringed plover are expected to utilise different parts of the bird island as nesting ground with reference to records in nearby conservation managed “Duck Pond” by HKBWS under MA Scheme and Long Valley Nature Park (HKBWS, 2024c; AFCD, 2024b). Detail design of bird island is summarised in **Section 3.4.3**.
- 3.4.2.3 Similarly at Pond E, three abandoned fishponds currently occupied by seasonally wet grassland and reedbed habitat would be reinstated into two large pond habitats by removal of pond bunds (**Figure 3.4** refers). A bird island would be created at the centre of the southern pond by partial retention of existing pond bund and material from reprofiling.
- 3.4.2.4 Water for the EEF would largely be derived from direct rainfall. The water levels would be managed with the use of portable water pump as necessary. Suitable water level would be maintained to coordinate with trash-fish stocking practice to maximise feeding opportunities for piscivorous bird species and other wetland-dependent species.
- #### **3.4.3 Creation of Bird Islands**
- 3.4.3.1 Bird islands would be created for both Pond D and Pond E by retaining and reprofiling part of the existing pond bunds, with shallow-sloping muddy edges around the water to provide waterbird foraging habitats. The centre of the bird island would be lined with a layer of impermeable geotextile, with a layer of 75% rocks with diameter of 150-250mm on top to inhibit vegetation growth and provide resting area for birds. The area with impermeable geotextile would have a buffer zone of two to three meters away from the water edge at maximum water level and would also provide nesting habitat for target species little ringed plover, that prefer sparsely vegetated area with gravel or stones and no tall vegetation (Wiersma *et al.*, 2024).

Interim Wetland Enhancement Plan (Final)

Some short, emergent vegetation along the fringe of the island would also be provisioned to provide breeding and nesting area for target species, such as black-winged stilt.

- 3.4.3.2 Both islands will be located in the middle of the created EEF habitat (**Figure 3.3** and **Figure 3.4** refer). With the gradual increase of water depth from the peripheral towards bird islands in the centre, deepest water profile (about 2m deep) with width of 3 to 4m would be surrounding the islands, creating an isolated habitat to minimise potential disturbance / threats (i.e. feral dogs). Apart from the potential breeding target species mentioned above, other wetland avifauna species are also expected to utilise the bird islands, including ardeids, rails and snipes for shelter and resting. The proposed habitat design is shown in **Appendix C**.

3.4.4 Construction Method

- 3.4.4.1 Full drain-down, vegetation removal and partial removal of existing pond bunds to form larger EEF habitat would be carried out first, followed by recontouring ponds into different water depth profile and slope gradient according to **Section 3.4.2.1** and habitat design shown in **Appendix C**. The excavation works and disposal requirement of excavation materials at Pond D and E would be identical to Pond C (**Section 3.3.4.2** refers). Construction components for EEF are summarised in **Table 3.2**.
- 3.4.4.2 The reprofiling of pond base including creation of shallow depth and deep-water profile of 2m deep around the bird island would reuse material excavated from ponds that have dried up and material from the removed bunds. Part of the existing pond bunds would be retained to create the bird island and be consolidated using dried excavated materials through aggregating around the retained pond bunds. Suitable edging would be constructed on the fringe of bird island and installation of impermeable geotextile on the island to inhibit vegetation growth and provide resting area for birds (**Section 3.4.3.1** refers). Management of excess materials from proposed works will be formulated in accordance with DEVB TC(W) No. 6/2010 and Chapter 4 Section 4.1.3 of Project Administration Handbook for Civil Engineering Works (2022 Edition). Disposal at the Public Fill Reception Facilities would be considered as the last resort.
- 3.4.4.3 In addition, portable water pump would be installed for EEF for the convenience to control water level of the ponds during construction and operation phase. The re-profiled ponds and bunds should be structurally stable upon completion of works. Access to Pond D and Pond E would be land access by existing roads and footpaths. Both ponds could be accessed by existing footpath or Border Road along the FCA, if necessary. The nearby existing roads and border fences should not be affected by works related to the creation of EEF habitat.

3.4.5 Vegetation Management

- 3.4.5.1 Some removal of terrestrial and emergent vegetation would be carried out at Ponds D and Pond E, with existing fruit trees on pond bunds retained for bat feeding as far as possible. Existing vegetation along the northern, western and southern bunds of the L-shaped pond at Pond D would be retained, whereas the remaining bunds of the L-shaped pond, as well as the smaller pond separated by footpath on the east would be maintained as open bunds with relatively short vegetation (**Figure 3.3** refers). For Pond E, vegetation would be retained along the northern Border Road bund, as well as the densely vegetated portion of the northern and southwestern bunds. The remaining bunds would be maintained as open habitat with relatively short vegetation (**Figure 3.4** refers).
- 3.4.5.2 Given that Pond E is located near Lin Barn Tsuen Night Roost, the retained vegetation could potentially be utilised as avifauna roosting sites, while the larger pond habitat with open bunds could provide foraging habitat for waterbirds.
- 3.4.5.3 Native tree species would be retained as far as practicable whereas invasive species would be removed. Considering the current enhancement would serve as an interim measure and the interim enhanced ponds will needed be progressively integrated into the Phase 1 SPS WCP works and be handed over to the SPS WCP Project for further habitat enhancement and integration into the long-term management of SPS WCP to ensure continuity of ecological function, no additional planting is recommended at this stage to avoid abortive works.

Table 3.2 Summary of Construction Components at Identified Ponds

	Pond B (<i>Gei Wai</i>)	Pond C (Enhanced Freshwater Wetland)	Pond D (Ecological Enhanced Fishpond)	Pond E (Ecological Enhanced Fishpond)
Vegetation Removal	✓	✓	✓	✓
Pond Draining / Drying	✓	✓	✓	✓
Desilting	✓			
Pond Reprofilling	✓	✓	✓	✓
Bank Modification	✓	✓	✓	✓
Pond Bund Removal and Formation of Bird Island			✓	✓
Geotextile Lining (Bird Island)			✓	✓
Clay Lining		✓		
Infrastructure Installation	✓	✓	✓	✓
Pond Refilling	✓	✓	✓	✓

3.5 Implementation Programme of Interim Wetland Enhancement Measures

3.5.1.1 The latest proposed interim wetland enhancement works for identified ponds are summarised in **Figure 3.1 – Figure 3.4**.

3.5.1.2 Following the completion of land acquisition procedures and handover of the ponds concerned to CEDD in November 2025, further non-intrusive survey works, such as topographic surveys for ponds to be de-silted or re-profiled, and surveys on vegetation coverage, soil / mud conditions and site access, were carried out in phases between Q4 2025 and Q1 2026 to formulate the detailed specifications (e.g. locations, dimensions, levels) of the proposed habitat enhancement works illustrated in **Appendix C**. Both Pond B and E were recorded within 100m range of existing night roosts (i.e., Mai Po San Tsuen Cormorant Night Roost and Lin Barn Tsuen Night Roost (Overwintering) respectively), noisy construction works are recommended to cease before 1630 hours, and shall commence after 0900 hours on all days, to minimise disturbance to night roosts. The survey method and programme were consulted with AFCD for prior approval to avoid any potential disturbance impacts on over-wintering birds.

3.5.1.3 The associated interim habitat modification measures include restoration of abandoned ponds through vegetation clearance, pond reprofiling (including shallow water zones), formation of bird islands, consolidation of ponds where appropriate, construction of sluice gates and perimeter channels for *gei wai*. The habitat restoration works would commence outside of the peak overwintering season (i.e. Apr to Sep), when there is a lower abundance of avifauna to minimise disturbance. The habitat restoration works for all identified ponds would be conducted at the same time. The overall implementation of interim enhancement works is scheduled to commence in Q1/Q2 2026 for targeted completion of key habitat modification works and commencement of active management measures (e.g. fish stocking) for individual ponds between 2026 and 2027. EEf habitats (i.e. Pond D and Pond E) will adopt trash-fish stocking during the entire overwintering season (i.e. Oct to Mar) as far as possible as management strategy to enhance ecological functions and to provide readily improvement and rapid increase in the ecological capacity of wetland habitats. Agreement with relevant authorities (including EPD and AFCD) prior to commencement of work is required on the works area, works method, logistic arrangement, estimated duration and implementation programme. The interim enhanced ponds will be progressively integrated into the Phase 1 SPS WCP works to avoid abortive works. The enhanced ponds will subsequently be handed over to the SPS WCP Project for further habitat enhancement and integration into the long-term management of SPS WCP to ensure continuity of ecological function.

3.5.2 Interfacing with the SPS WCP Development

3.5.2.1 The SPS WCP will be established in phases. Ponds B to E are located within Phase 1 of the SPS WCP, where Pond B will continue to be managed as *gei wai* habitat, Pond C will be further modified into EEf habitat. Ponds D and E will be further modified into *gei wai* habitat, which functions as part of the EEf habitat identified under the approved STL MC DN EIA

Interim Wetland Enhancement Plan (Final)

Report (**Section 2.3.2.2** refers). Abortive works will also largely be avoided during the further modification of Ponds D and E into *gei wai* habitat by retaining the bird island created under IWEP as part of the future *gei wai* habitat (which is also EEFs). To minimise abortive works and double handling upon commencement of SPS WCP works, the works for Ponds C under IWEP are designed with due regard to the general arrangement, pond profiles, landscape and habitat requirements, and will be fully compatible with the permanent works of SPSWCP. Specifically, the water level of Pond C will eventually be maintained at 2.0-2.5m.

- 3.5.2.2 Phase 1 of the SPS WCP covers an area of about 150 ha of mainly fishpond areas sandwiched between the Tam Kon Chau Road and Shenzhen River, and eastern fringe the existing mitigation wetlands. The Phase 1 works are expected to commence in 2026/2027 the earliest for completion in 2031. According to the latest implementation schedule, the handover sequence to SPS WCP would first be Pond D and E, followed by Pond B and C.
- 3.5.2.3 CEDD (as San Tin Technopole's and SPS WCP Phase 1's works agent) and AFCD (as SPS WCP's sponsoring department) will coordinate closely on the interim management and handover schedule of the interim enhanced ponds, as well as the potential interfacing issues on work schedules of the interim enhanced ponds and future habitat modification / management works under Phase 1 of SPS WCP.

4 SPECIFIC HABITAT MANAGEMENT AND MONITORING REQUIREMENTS

4.1 Habitat Management Requirements

4.1.1.1 The habitat management of identified ponds varies according to the proposed habitats. Proposed *gei wai* habitat for Pond B would be passively managed by natural conditions, such as tidal fluctuation, and thus no intensive management is anticipated. This mimics a more natural environment for sensitive species while reducing potential labour work required. Whereas Pond C to E provide different ecological functions according to the proposed habitats, specific habitat management of Pond C to E is summarised in the following sections.

4.1.2 Soil Management

4.1.2.1 Existing ecological management practices for fishpond habitat in the Sam Po Shue area demonstrated that soils in the area could retain sufficient water and no additional lining is required to seal the ponds. If major seepage is identified in the EEF ponds, remodelling of pond bund and/or reinstatement of pond bund with clay layer should be undertaken as necessary.

4.1.3 Pond Liming

4.1.3.1 Pond liming to manage soil and water pH should be adopted after reprofiling for Pond D and E. Lime would be spread over the pond base prior to refilling. The amount of lime applied needs to be carefully gauged to avoid the death of fish and other aquatic organisms. Food and Agriculture Organisation (FAO) (n.d.) provides basic guidance on liming for fishponds, which is recommended be considered if pond water and/or pond soils are consistently below pH 5.5 – 6.5. Finely ground calcium carbonate (CaCO_3) can be applied directly to the pond soils. The amount of CaCO_3 to be applied varies from 2,000kg/ha (sandy soil) to 4,000kg/ha (heavy clay soils). Alternative substrate to CaCO_3 would be peanut residue which could also reduce acidity in water and is commonly used by local fish farmers (KCRC, 2006). Sampling for water alkalinity is recommended to be taken and examine after one to two months' time, to determine whether further liming is required.

4.1.4 Water Regime

4.1.4.1 The water regime at the created *gei wai* habitat (Pond B) would be passively managed and subject to the tidal fluctuation at Deep Bay area. Drain down of the *gei wai* habitats may be carried out to further enhance habitat quality for target species and maintenance if necessary (**Section 3.2.2.3** refers).

4.1.4.2 The water regime at the EFW habitat (Pond C) would rely on local precipitation and adjacent stormwater run-off. Existing habitat management projects at nearby MPNR suggest that there is typically sufficient precipitation in the area to support the rain fed pond annually (WWF HK, 2006a). However, with marsh vegetation being sensitive to small changes in water levels, water regime for the EFW habitat is recommended be closely monitored. Maintenance of the designed water levels (**Appendix C** refers) is crucial, as plant communities within marsh habitats become less diverse over time with fast-growing species such as *Phragmites* sp. would quickly dominate. As mentioned in **Section 3.3.2.2**, water level would be maintained with the use of an overflow weir. If water level was not sufficient to maintain its ecological function, water could be pumped from nearby water source (e.g., adjacent fishponds) with portable pumps to refill.

4.1.4.3 Pond D and E that are managed as EEF habitats would maintain low water regime with the use of portable water pump to provide feeding opportunities for avifauna and other species (**Section 4.1.6.1** refers). Regular monthly drain down of Pond D and E in the peak migratory bird season (i.e. November till March) will be managed sequentially to maximise the availability of feeding opportunities, with the drain down sequence alternating between the two ponds (see below **Table 4.1**). During the drain down, water level should be lowered and filled gradually to less than 1m over a 14-day period, with at least 50% of the pond bottom exposed for at least 7 days. The two EEF habitats would be coordinated and drain down alternatively, to maximise feeding opportunities in the area. The drained water will be transferred within different compartments of Pond D and E for storage and replenish after drain down is completed. As contingency, transferring to and replenished from adjacent ponds, which is

subjected to agreement with relevant government authorities (i.e. LandsD) on acquisition status of these ponds.

Table 4.1 Tentative Drain Down Sequence for EEF Habitats

Month	Pond D	Pond E
November	Drain-down	Full
December	Full	Drain-down
January	Drain-down	Full
February	Full	Drain-down
March	Drain-down	Full

4.1.5 Vegetation Management and Desilting Works

- 4.1.5.1 Regular vegetation management and desilting works will be required at all ponds to maintain desired water levels for optimal ecological performance. These works are typically undertaken infrequently (once every few years), where the ponds will be drained and excess silt / vegetation removed before re-filling.
- 4.1.5.2 Monthly vegetation management is required at EEF pond bunds to control vegetation height (i.e. less than 10 cm in height for open pond bunds) and control / remove exotic species such as *Mikania micrantha*. Vegetation clearance will be carried out manually. Longer grass should be retained as part of the pond bunds (about 15 – 20%) to provide refugia for small birds and herpetofauna. Following detailed habitat design, aquatic and emergent plants can be maintained along pond bunds and permanent vegetated islands to provide vegetation cover for birds and insects during the wet season. The cut grass can be used to feed the grass carp (*Ctenopharyngodon idella*) in the EEF.
- 4.1.5.3 Whilst it is not anticipated that Pond B require intensive management, potential desilting works within the *gei wai* habitats on perimeter channels may still be undertaken, when necessary, for maintenance and maintaining optimal water regime. Desilting works at Pond D and E would be similar to common fishpond operations in the area. Fishponds would be drained completely and sun-dried during the dry season, followed by bulldozing to level the bottom and repair pond bunds to its original depth. The frequency of desilting would be every two to three years and waterbirds would benefit from small fishes remained in the ponds during the drain-down process (HKBWS, 2025).

4.1.6 Trash-fish Stocking

- 4.1.6.1 EEF habitats (i.e. Pond D and Pond E) will adopt trash-fish stocking during the entire overwintering season (i.e. Oct to Mar) as far as possible as management strategy to enhance ecological functions. It is recommended to repeat stocking each pond two times during its corresponding drain down month, during the peak winter migrant period (i.e. November till March), with the ponds drained down in sequence to low water level to maximise feeding opportunities for target species. The stocking shall commence at early morning (e.g., 0800 hour) and the daily temperature is recommended be monitored before stocking (WWF HK, 2006b). In case of a temperature lower than 10 degrees Celsius, stocking shall be postponed as trash fish species *Tilapia* spp. might not be tolerant of cold temperatures and might result in death (FAO, 2006; WWF HK, 2006b). Details on the drain down practices are detailed in **Section 4.1.4.3**.
- 4.1.6.2 Proposed trash-fish species is suggested to be easily obtained and locally farmed species, such as grey mullet (*Mugil cephalus*) and *Tilapia* species, where highly invasive fish species such as catfish, snakehead and climbing perch should be avoided. Suitable size of trash fish is recommended to have a mean length of 10cm or less and based on a standard length of a sample 50 fish per consignment, of which 95% shall be smaller than 15cm. The stocking density is recommended to be 1000kg/ha and amount of trash-fish to be stocked at Pond D and E during each stocking attempt to be based on the pond size (MTRC, 2014). The stocking would commence in the early morning, with water temperatures measured before stocking to prevent death of trash fish from sudden change in temperature or low temperature (i.e. <10°C) (FAO, 2006; WWF-HK, 2006). The consumption of fish stocks and water quality would be

Interim Wetland Enhancement Plan (Final)

monitored by monthly netting and water sampling respectively and adjusted for further adaptive management.

- 4.1.6.3 Larger target avifauna species such as great cormorant, grey heron and great egret are expected to occur during the earlier stage of the drain down and trash-fish stocking process, where the water level is generally higher (e.g., 0.5 – 1.5m water depth for great cormorant) (AEC, 2019). While other target species, for instance, black-faced spoonbills or shorter legged avifauna (e.g. little egret) would be attracted to the drained ponds with lower water level at later stages (AEC, 2019). Other target species such as red-necked stint and little ringed plover would also utilise the drained ponds for forage activities when the pond bottom is exposed.

4.2 Monitoring Requirements

4.2.1 Overview of Monitoring of Interim Wetland Enhancement

- 4.2.1.1 Monitoring of the enhanced wetland habitats is required to ensure enhancement measures are benefiting target species. The main aspects of the monitoring include:

- Target species monitoring; and
- Monitoring of general conditions at the identified ponds to maximise habitat value for target species.

- 4.2.1.2 Subsequent to the monitoring of the interim enhancement works, review of management strategy is recommended be conducted to implement specific monitoring and adaptive management measures where necessary.

4.2.2 Target Species Monitoring

- 4.2.2.1 The avifaunal communities at each identified ponds will be monitored by point count surveys to determine the presence and abundance of all bird species encountered. As some bird target species (**Section 2.3** refers) are passage migrants / winter visitors, surveys will be conducted twice a month between October and March, and once a month during other time of the year.
- 4.2.2.2 Utilisation of the identified ponds by targeted mammal species of conservation important such as Eurasian otter will be determined by infrared camera trapping and monthly survey. All direct sightings, tracks and signs of these species will be actively searched along the identified ponds. Infrared cameras will be set up at areas with potential occurrence of these species. The cameras will be checked monthly to record appearance of target species and usage of enhanced habitat. Other mammal species of conservation importance sighted will also be reported.
- 4.2.2.3 Daytime and nighttime surveys of herpetofauna target species will be conducted monthly between April and October at the identified ponds. The presence and abundance of target species encountered visually or aurally will be recorded. Other herpetofauna species of conservation importance sighted will be reported.
- 4.2.2.4 Presence and abundance of adult odonate target species will be estimated for each identified pond. Surveys will be conducted monthly between April and October, when the target species are more active (Tam *et al.*, 2021). Other odonate species of conservation importance sighted will also be reported.
- 4.2.2.5 Apart from the target species summarised in **Section 2.2.1.2** and **Table 3.1**, the presence and locations of any species of conservation importance observed during the monitoring at each identified pond is recommended be recorded for future adaptive management measures. Summary of target species monitoring methodologies are shown in **Table 4.2**.

Table 4.2 Target species Monitoring Methodologies

Fauna Group	Methodology	Frequency	Parameter
Avifauna	Point Count Survey	Twice a month (Oct to Mar) and once a month (Apr to Sep)	Presence / Absence
Mammal	Transect Count Survey	Monthly	Presence / Absence
	Camera Trapping		

Interim Wetland Enhancement Plan (Final)

Herpetofauna	Transect Count Survey	Monthly (Apr to Oct)	Presence / Absence
Odonates	Transect Count Survey	Monthly (Apr to Oct)	Presence / Absence

- 4.2.2.6 As mentioned in **Section 3.5.2**, upon handover to the SPS WCP, these enhanced ponds shall continue to be managed as *gei wai* habitat (Pond B), or be further modified into EEF habitat (Pond C) or *gei wai* habitat (Ponds D and E, which also function as EEFs). Monitoring of these ponds shall follow the monitoring requirement detailed in the SPS WCP HCMP.

4.2.3 Monitoring of Habitat Conditions

Vegetation and Invasive Species

- 4.2.3.1 Monthly monitoring of the condition of pond vegetation and invasive or harmful species, such as *Mikania micrantha*, apple snail, algae, etc. will be conducted to inform implementation of necessary active management measures to control the height of vegetation and spread of invasive species.

Water Depth

- 4.2.3.2 Water depths in EFW and EEF will be maintained to designed level with weekly checks to be conducted. If levels are more than 25% more or less than designed levels, remedial measures will be undertaken. It is expected that there will be sufficient rainfall in the area to maintain the designed levels throughout the year. As mentioned in **Section 3.2.2.3**, the water depth at *gei wai* will be largely determined by natural fluctuation of tidal at Inner Deep Bay. Gates will be installed and set at a desired level and adjust accordingly to tidal forecast and site condition, which allow water being drained down during low tide and exposing the mudflat habitat in *gei wai* for attracting avifauna species.
- 4.2.3.3 However, if there are frequent issues with water levels during the dry season, potential options for supplementary water-sources, such as adjacent fishponds for Pond D and Pond E, existing old water channel connected to Pond C could be explored. Use of these water sources would not require additional water control hardware structures, as portable electric pumps used should be sufficient for this purpose. In case of unacceptable external water quality, the exchange and replenishment of water is recommended be postponed until external water meets water quality standards, or agreement with relevant authorities (including EPD and AFCD) should be sought.

Water Quality

- 4.2.3.4 Water quality in each pond / marsh under the interim wetland enhancement plan will be monitored monthly. The following parameters will be measured:
- pH;
 - Dissolved oxygen;
 - Nitrogen;
 - Ammonia concentration; and
 - Turbidity

4.3 Reporting Requirements

- 4.3.1.1 A Quarterly and Annual Monitoring and Management Report will be prepared for the interim wetland enhancement works before handover to SPS WCP. The Quarterly and Annual Monitoring and Management Report should be submitted within 10 working days of the end of each reporting month to EPD and AFCD for information. This Report will include:
- A summary of the field data collected, performance in respect of species targets, interpretation of the monitoring data with respect to ecological attributes and recommendations for remedial or other action to be taken;

Interim Wetland Enhancement Plan (Final)

- Management activities undertaken during the previous month. This will include routine activities such as drain-down and refilling, stocking and vegetation management. Additionally, response to events such as adverse weather, fires or other damage to habitats and equipment shall be documented; and
- Any reportable incidents during the previous month: including human disturbance, adverse weather events, accidental or deliberate damage to mitigation areas, leakages and water quality problems.

4.3.1.2 During the monitoring period of interim enhancement works, the information collected from the ecological monitoring programme and wetland management actions will be reviewed and summarised into quarterly and annual reports. The Report will also assess the degree of success of the active Interim Wetland Enhancement Plan by assessing the habitat creation and species recorded. Subsequent habitat management and/or modifications to the Interim Wetland Enhancement Plan will be proposed (if necessary) to improve management of the enhanced wetland habitats before handover to SPS WCP.

5 ENVIRONMENTAL PROTECTION MEASURES

- 5.1.1.1 All four ponds identified for interim wetland enhancement are located within the Inner Deep Bay which supports high diversity and abundance of waterbirds, especially during the overwintering season. All proposed construction works are recommended to commence outside of the peak overwintering season (i.e. April to Oct) when there is a lower abundance of avifauna as far as possible to minimise disturbance impacts. In case of necessary works during the dry season, agreement with relevant authorities (including EPD and AFCD) on the works methods to minimise disturbance impacts to the overwintering waterbirds should be sought.
- 5.1.1.2 Lin Barn Tsuen Night Roost and Mai Po San Tsuen Cormorant Night Roost, which are located within 100m from Pond E and Pond B respective, were active during overwintering season (i.e. October to March). With good site practices, potential direct injury / mortality to the roosting ardeids and great cormorant from the habitat enhancement works would be unlikely. As the condition, location and extent of the night roosts may fluctuate naturally, a pre-construction site check within 100m from the Pond B and E should be undertaken to check for any presence of night roost prior to the commencement of any vegetation clearance works. In case of presence of active night roost within 100m from the proposed construction works, noisy construction activities (with the use of PME) within the 100m from the active night roost should cease before 1630 hours, and shall commence after 0900 hours on all days.
- 5.1.1.3 Pre-construction site check for presence of any otter holts / signs of otter activities and other notable species of conservation importance (e.g. Mai Po bent-winged firefly) in the proposed works area should be undertaken to avoid injuries to wildlife. Given that no night-time construction works would be undertaken, as well as the transient and localised nature of works within the identified ponds, it is expected that no unacceptable disturbance impacts on wildlife would arise from the proposed interim wetland enhancement works.
- 5.1.1.4 All the ponds / wet areas to be reprofiled should be isolated and not connected to any existing watercourse. The associated construction works would include draining the water in ponds / watercourses before commencement of any excavation and construction works. The water of these ponds and wet areas to be drained for excavation and construction works would potentially be sediment-laden and would carry a certain level of pollutants. Direct dumping of these drained waters to the nearby watercourse will not be allowed. The drained water generated from dewatering of the ponds / wet areas to be removed will be pumped to adjacent ponds for temporary storage, or diverted to on-site sedimentation / treatment facilities for reuse on-site upon completion of the reprofiling works as far as practicable. No direct discharge of drained water from these construction works will be allowed.
- 5.1.1.5 Excavation / reprofiling works for habitat restoration may result in potential water quality impact to the nearby ponds due to uncontrolled discharge of wastewater from the general construction activities, construction site run-off, accidental spillage, and sewage effluent from construction workforce. The site practices as outlined in the ProPECCPN 2/24 “*Construction Site Drainage*” are recommended to minimise the potential water quality impacts from the construction activities. Proper site management and good site practices are also recommended to ensure that construction wastes and other construction-related materials would not enter the nearby waterbodies. Sewage effluent arising from the construction workforce would be handled through provision of portable toilets.
- 5.1.1.6 Fuel combustion from the use of Powered Mechanical Equipment (PME) (e.g. amphibious backhoe / tractor) during construction works could be a potential source of air pollutants such as NO₂, SO₂ and CO. To improve air quality and protect public health, EPD has introduced the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation on 1 June 2015 and since 1 December 2015, only approved or exempted non-road mobile machinery are allowed to be used in construction sites. In addition, all construction plants are required to use Ultra-Low Sulphur Diesel (ULSD) (defined as diesel fuel containing not more than 0.001% sulphur by weight) as stipulated in Air Pollution Control (Fuel Restriction) (Amendment) Regulations.
- 5.1.1.7 No construction activity is expected during restricted hours, i.e. the time between 1700 and 0900 hours on all days, and any time on general holidays, including Sunday. A Construction

Interim Wetland Enhancement Plan (Final)

Noise Permit (CNP) is required under the Noise Control Ordinance (NCO) (Cap. 400) in case the construction works are to be carried out during restricted hours. In general, noise control measures stipulated in EPD's "Recommended Pollution Control Clauses for Construction Contracts" should be implemented during construction phase to minimise any construction noise nuisance.

- 5.1.1.8 The latest proposed interim wetland enhancement measures summarised in **Table 5.1**.

Table 5.1 Implementation Schedule of Proposed Additional Interim Wetland Enhancement Measures

Implementation Schedule of Proposed Additional Interim Wetland Enhancement Measures				
	Identified Ponds for Interim Enhancement			
	Pond B	Pond C	Pond D	Pond E
Recommended Enhancement Measures	Restoration of abandoned ponds to <i>gei wai</i>	Restoration of abandoned ponds to EFW	Restoration of abandoned ponds to EEF	Restoration of abandoned ponds to EEF
Objectives and Environmental Performance of the Interim Enhancement Measures	To create open water and intertidal mudflat habitats which is high value feeding ground for wetland avifauna target species	To provide shallow water marsh and open water habitats that can provide screening, shelter and foraging grounds for avifauna, odonate and herpetofauna target species	To consolidate adjacent small abandoned / inactive ponds to create larger pond habitat, which are potentially more attractive to large waterbirds and other disturbance-sensitive target species (especially the four indicator species in the Approved STLMC DN EIA)	
Responsible Parties to Implement the Enhancement Measures	Contractor of CEDD on habitat modification works and interim management before handover to Phase 1 of SPS WCP for further integration and management			
Locations	- Located within Phase 1 of SPS WCP and outside of the EZ and RDZ under the Approved STLMC DN EIA Report - Adjoins the northeastern part of MPNR and within the FCA (Figure 2.2)	- Located within Phase 1 of SPS WCP and outside of the EZ and RDZ under the Approved STLMC DN EIA Report - Located to the immediate north of Tam Kon Chau Road, nearby the World Wide Fund Jockey Club Peter Scott Visitor Centre (Figure 2.2)	- Located within Phase 1 of SPS WCP and outside of the EZ and RDZ under the Approved STLMC DN EIA Report - Located within the Proposed SPS WCP, to the northwest of Lin Barn Tsuen (Figure 2.2)	- Located within Phase 1 of SPS WCP and outside of the EZ and RDZ under the Approved STLMC DN EIA Report - Located to the north of Lin Barn Tsuen (Figure 2.2)
Time and Period to Implement the Measures	Following the completion of land acquisition procedures and handover of the ponds concerned to CEDD in November 2025, further non-intrusive survey works, such as topographic surveys for ponds to be de-silted or re-profiled, and surveys on vegetation coverage, soil / mud conditions and site access, were carried out in phases between Q4 2025 and Q1 2026 to formulate the detailed specifications (e.g. locations, dimensions, levels) of the proposed habitat enhancement works. The associated interim habitat modification measures include restoration of abandoned ponds through vegetation clearance, pond reprofiling (including shallow water zones), formation of bird islands, consolidation of ponds where appropriate, construction of sluice gates and perimeter channels for <i>gei wai</i>. The habitat restoration works would commence outside of the peak overwintering season (i.e. Apr to Sep), when there is a lower abundance of avifauna to minimise disturbance. The habitat restoration works for all identified ponds would be conducted at the same time. The overall implementation of interim enhancement works is scheduled to commence in Q1/Q2 2026 for targeted completion of key habitat modification works and commencement of active management measures (e.g. fish stocking) for individual ponds between 2026 and 2027. EEF habitats (i.e. Pond D and Pond E) will adopt trash-fish stocking during the entire overwintering season (i.e. Oct to Mar) as far as possible as management strategy to enhance ecological functions and to provide readily improvement and rapid increase in the ecological capacity of wetland habitats. Agreement with relevant authorities (including EPD and AFCD) prior to commencement of work is required on the works area, works method, logistic arrangement, estimated duration and implementation programme. The targeted completion of habitat modification works and commencement of active management works (e.g. fish stocking) are as follows. - Pond B: Partial vegetation clearance and construct perimeter channel by mid-2027 - Pond C: Vegetation clearance by end of 2026			

	Identified Ponds for Interim Enhancement			
	Pond B	Pond C	Pond D	Pond E
	- Pond D: Conduct fish stocking in open water portion of the pond between January and March 2026 to offer early ecological benefits and optimise site-specific implementation of fish stocking measures; complete habitat modification works (vegetation clearance and reprofiling) by Oct 2026 and undertake fish stocking in wintering season of 26/27. - Pond E: Complete habitat modification works (vegetation clearance and reprofiling) by Oct 2026 and undertake fish stocking in wintering season of 26/27.			

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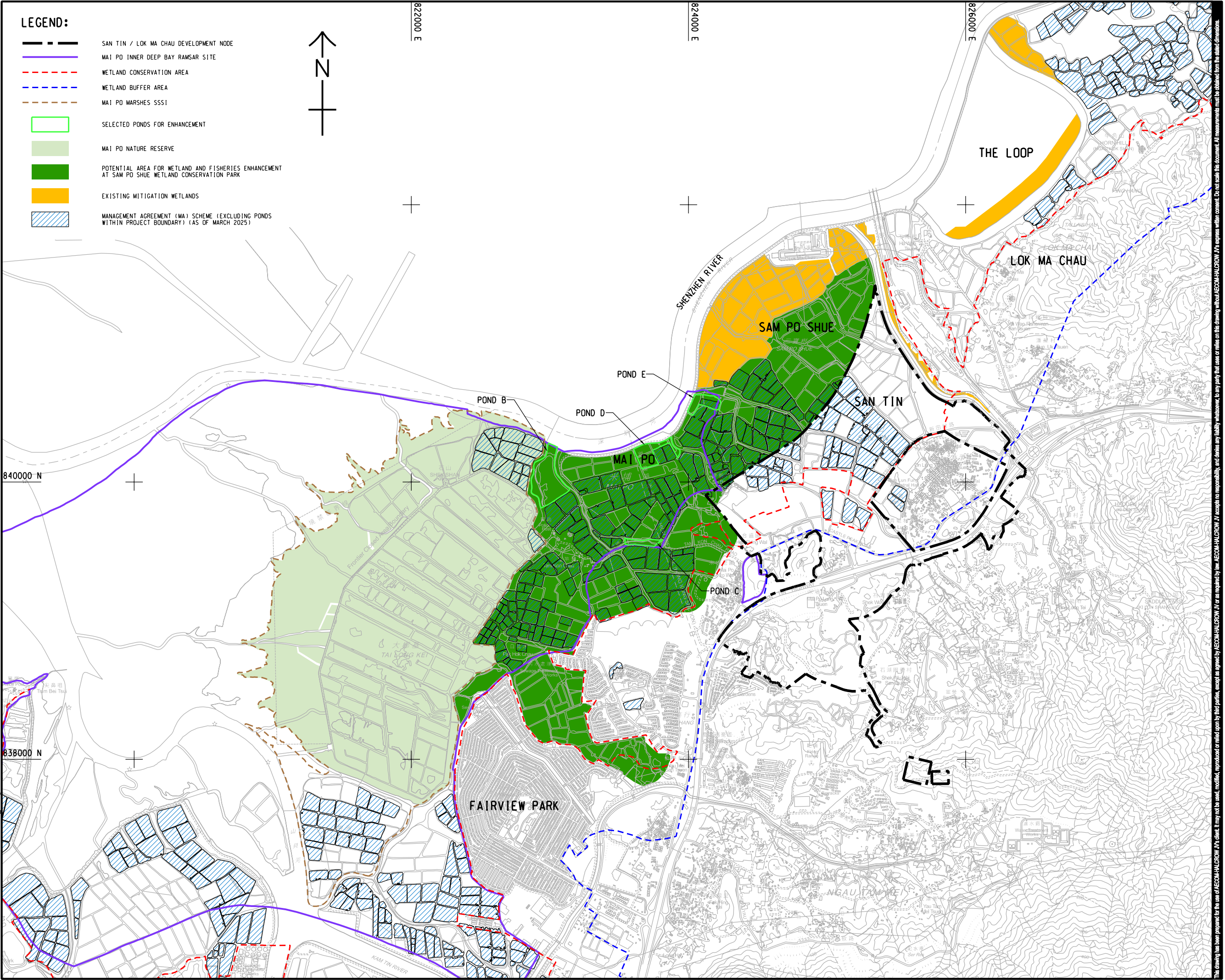
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FIGURES

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Checked:
Designer:
Project Management Initials:



- LEGEND:**
- SAN TIN / LOK MA CHAU DEVELOPMENT NODE
 - MAI PO INNER DEEP BAY RAMSAR SITE
 - WETLAND CONSERVATION AREA
 - WETLAND BUFFER AREA
 - MAI PO MARSHES SSSI
 - SELECTED PONDS FOR ENHANCEMENT
 - MAI PO NATURE RESERVE
 - POTENTIAL AREA FOR WETLAND AND FISHERIES ENHANCEMENT AT SAM PO SHUE WETLAND CONSERVATION PARK
 - EXISTING MITIGATION WETLANDS
 - MANAGEMENT AGREEMENT (MA) SCHEME (EXCLUDING PONDS WITHIN PROJECT BOUNDARY) (AS OF MARCH 2025)



PROJECT
項目
FIRST PHASE DEVELOPMENT OF
THE NEW TERRITORIES NORTH –
SAN TIN / LOK MA CHAU
DEVELOPMENT NODE –
PACKAGE 1 –
DESIGN AND CONSTRUCTION

CLIENT
業主
 土木工程拓展署
Civil Engineering and
Development Department

CONSULTANT
工程顧問公司
AECOM - HALCROW JOINT VENTURE

SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION			
修訂			
I/R	DATE	DESCRIPTION	CHK.
修訂	日期	內容摘要	校核

STATUS
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DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號
60718076

CONTRACT NO.
合約編號
CE 15/2023 (CE)

SHEET TITLE
圖紙名稱
PONDS UNDER MANAGEMENT
INITIATIVE IN THE INNER
DEEP BAY AREA

SHEET NUMBER
圖紙編號
60718076/Z9/FIGURE 2.1

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Approved:
Checked:
Designer:
Project Management Initials:

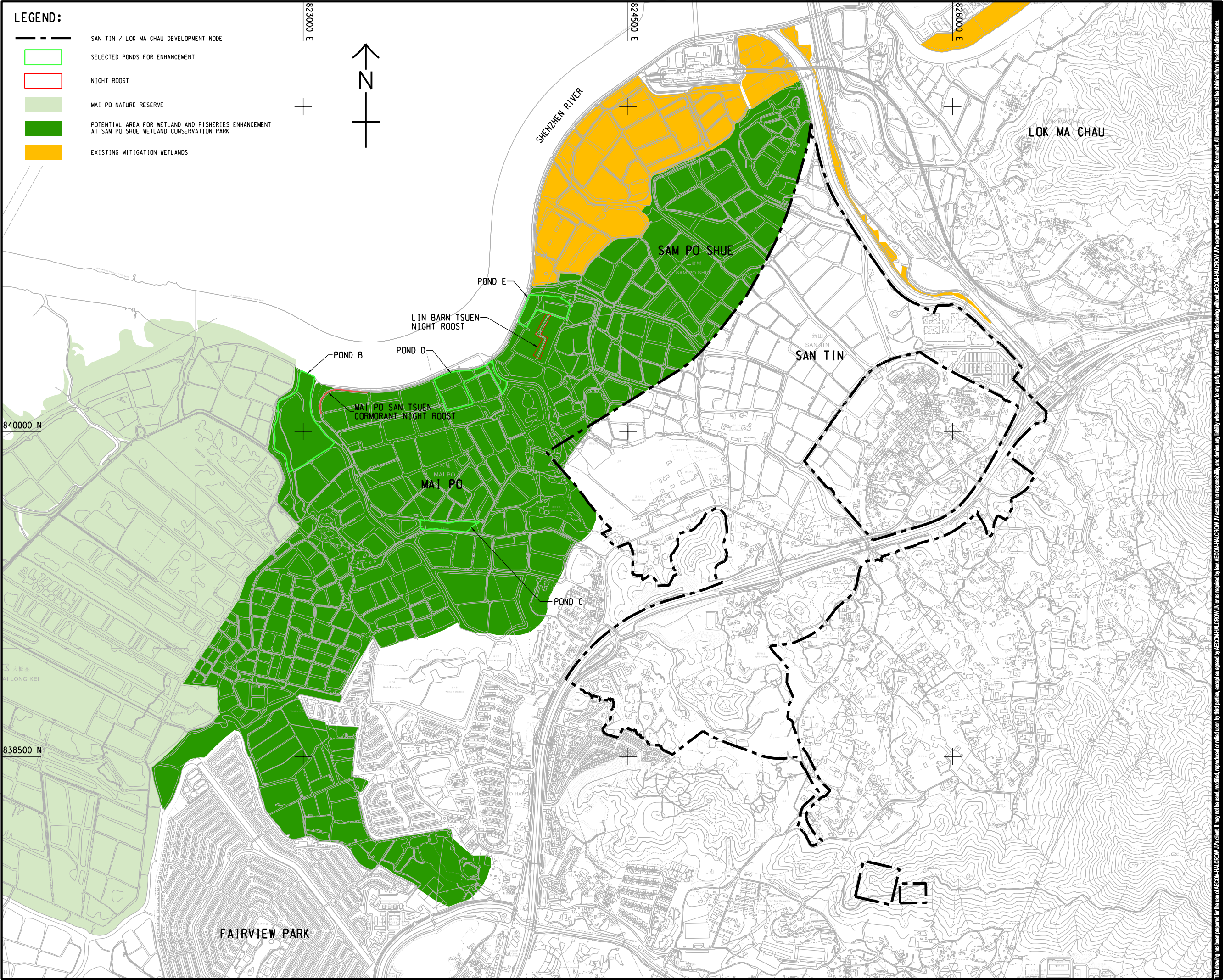
- LEGEND:
- SAN TIN / LOK MA CHAU DEVELOPMENT NODE
 - SELECTED PONDS FOR ENHANCEMENT
 - NIGHT ROOST
 - MAI PO NATURE RESERVE
 - POTENTIAL AREA FOR WETLAND AND FISHERIES ENHANCEMENT AT SAM PO SHUE WETLAND CONSERVATION PARK
 - EXISTING MITIGATION WETLANDS

823000 E



824500 E

826000 E



AECOM Halcrow

PROJECT
項目
FIRST PHASE DEVELOPMENT OF
THE NEW TERRITORIES NORTH –
SAN TIN / LOK MA CHAU
DEVELOPMENT NODE –
PACKAGE 1 –
DESIGN AND CONSTRUCTION

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I/R 修訂	DATE 日期	DESCRIPTION 內容簡述	CHK. 校核

STATUS
階段

SCALE
比例
A1 1: 8000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號
60718076

CONTRACT NO.
合約編號
CE 15/2023 (CE)

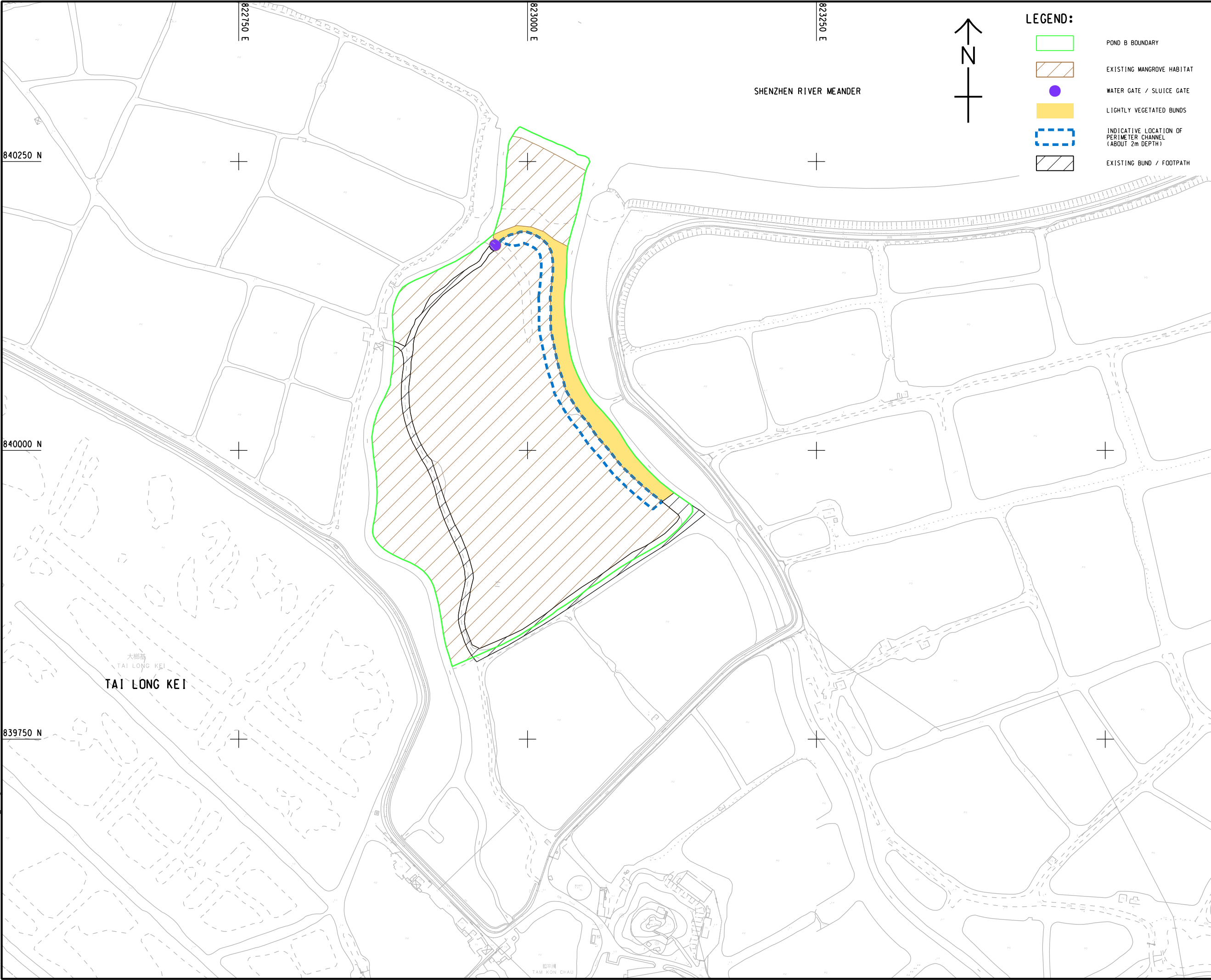
SHEET TITLE
圖紙名稱
PONDS SELECTED FOR
ENHANCEMENT UNDER IWEP

SHEET NUMBER
圖紙編號
60718076/Z9/FIGURE 2.2

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PROJECT
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FIRST PHASE DEVELOPMENT OF
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修訂	日期	內容摘要	校核

STATUS
階段

SCALE	DIMENSION UNIT
比例	尺寸單位
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KEY PLAN
索引圖

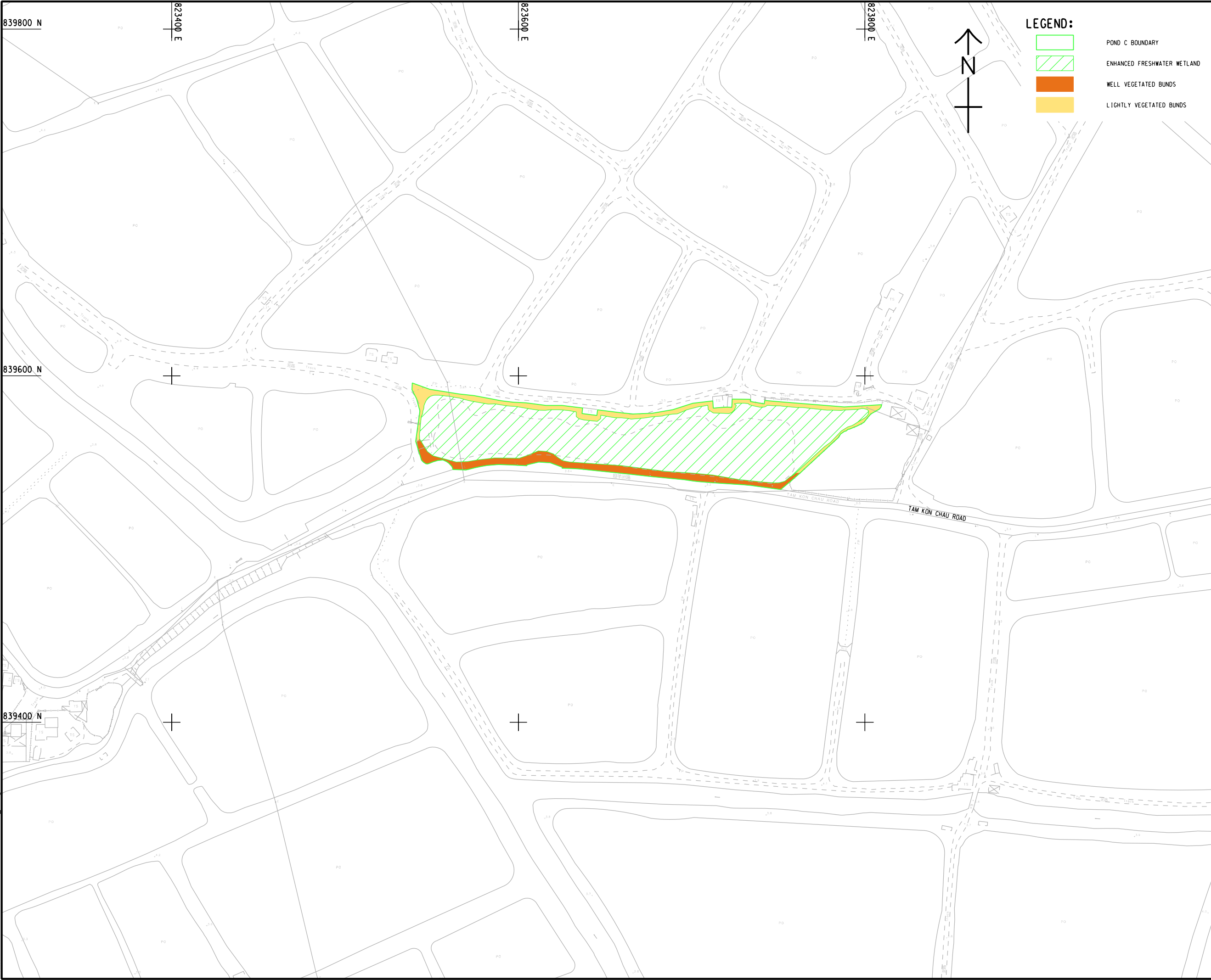
PROJECT NO.	CONTRACT NO.
項目編號	合約編號
60718076	CE 15/2023 (CE)

SHEET TITLE
圖紙名稱
WETLAND MEASURES
ENHANCEMENT FOR POND B

SHEET NUMBER
圖紙編號
60718076/Z9/FIGURE 3.1

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ISO A1 841mm x 594mm
Approved:
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LEGEND:

POND C BOUNDARY

ENHANCED FRESHWATER WETLAND

WELL VEGETATED BUNDS

LIGHTLY VEGETATED BUNDS



PROJECT
項目
FIRST PHASE DEVELOPMENT OF
THE NEW TERRITORIES NORTH –
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STATUS
階段

SCALE
比例
A1 1: 1000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號
60718076

CONTRACT NO.
合約編號
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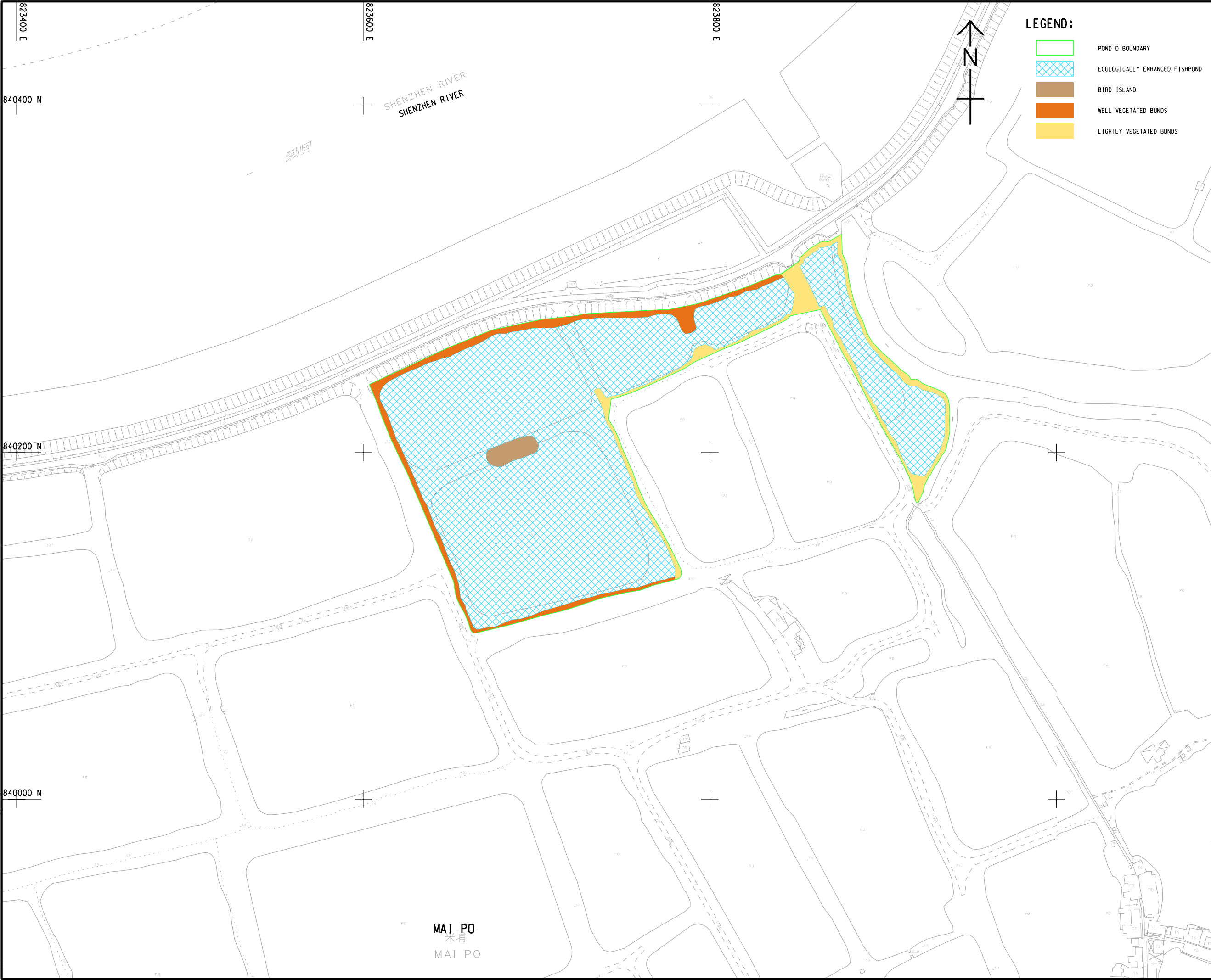
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圖紙名稱
WETLAND MEASURES
ENHANCEMENT FOR POND C

SHEET NUMBER
圖紙編號
60718076/Z9/FIGURE 3.2

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ISO A1 841mm x 594mm
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修訂	日期	內容簡述	校核

STATUS
階段

SCALE	DIMENSION UNIT
比例	尺寸單位
A1 1: 1000	METRES

KEY PLAN
索引圖

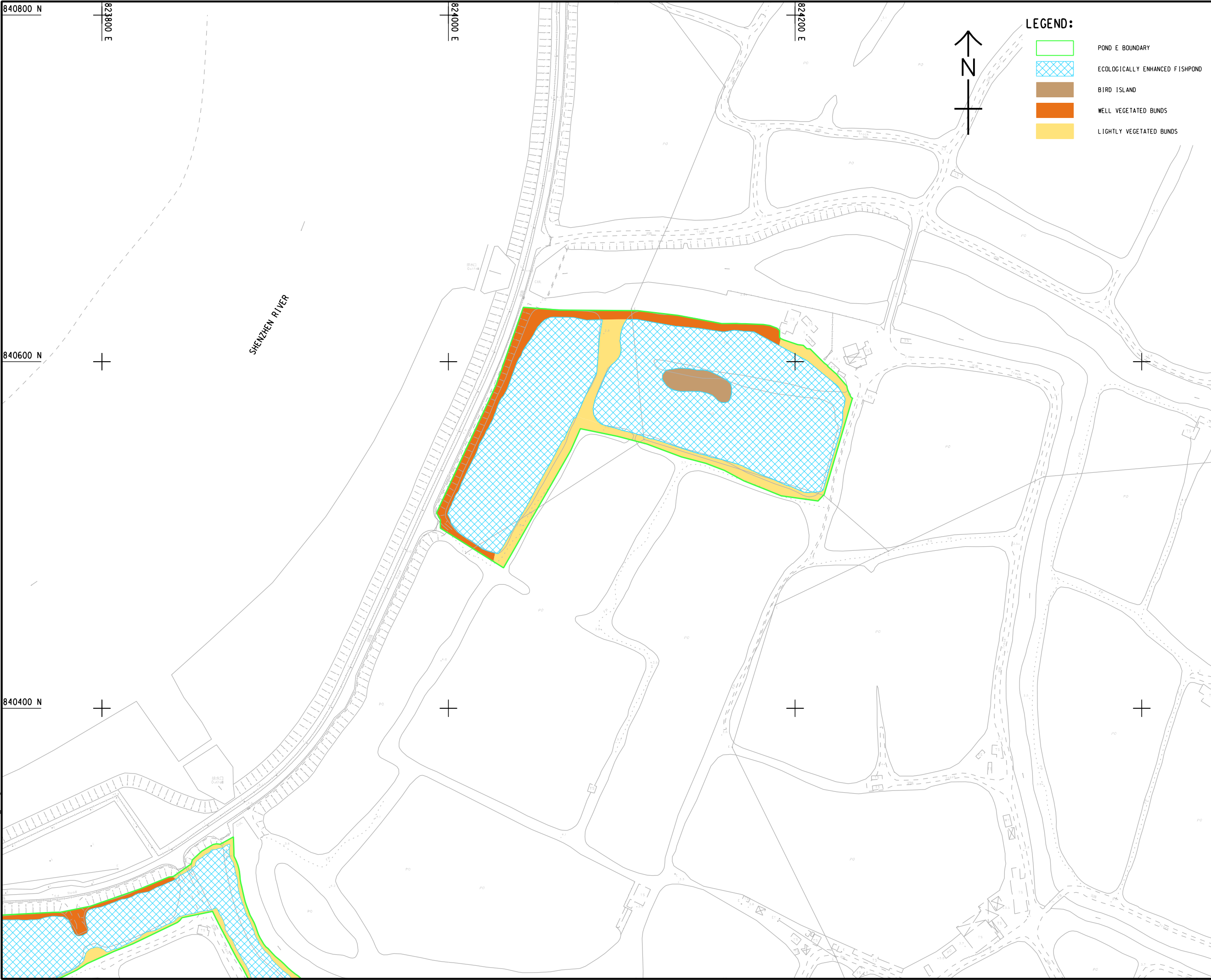
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60718076	CE 15/2023 (CE)

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WETLAND ENHANCEMENT
MEASURES FOR POND D

SHEET NUMBER
圖紙編號
60718076/Z9/FIGURE 3.3

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ISO A1 841mm x 594mm
Approved:
Checked:
Designer:
Project Management Initials:



LEGEND:

- POND E BOUNDARY
- ECOLOGICALLY ENHANCED FISHPOND
- BIRD ISLAND
- WELL VEGETATED BUNDS
- LIGHTLY VEGETATED BUNDS



PROJECT
項目
FIRST PHASE DEVELOPMENT OF
THE NEW TERRITORIES NORTH –
SAN TIN / LOK MA CHAU
DEVELOPMENT NODE –
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修訂	日期	內容簡述	校核

STATUS
階段

SCALE
比例
A1 1: 1000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號
60718076

CONTRACT NO.
合約編號
CE 15/2023 (CE)

SHEET TITLE
圖紙名稱
WETLAND ENHANCEMENT
MEASURES FOR POND E

SHEET NUMBER
圖紙編號
60718076/Z9/FIGURE 3.4

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APPENDICES

Appendix A
Representative Photographs of Habitat Condition at Ponds
Identified for the Interim Wetland Enhancement Works

						
Pond A		Pond B				
						
Pond C		Pond D				
		N.A.				
Pond E						
	Agreement No. CE 15/2023 (CE) First Phase Development of the New Territories North – San Tin/Lok Ma Chau Development Node – Package 1 – Design and Construction Interim Wetland Enhancement Plan for Pilot Pond Enhancement Works		SCALE	N.T.S.	DATE	Jan-25
			CHECK	-	DRAWN	-
	Representative Photographs of Habitat Condition at Pilot Ponds Identified for the Interim Wetland Enhancement Works		JOB NO.	60718076	Appendix No. A	Rev -

Appendix B
Historical Aerial Imagery Comparison of Ponds Identified for
the Interim Wetland Enhancement Works

Pond B



1975



1984



1995



2005



2015



2024

Note: All aerial imageries are obtained from the Lands Department.

AECOM

Agreement No. CE 15/2023 (CE)
First Phase Development of the New Territories North – San Tin/Lok Ma
Chau Development Node – Package 1 – Design and Construction
Interim Wetland Enhancement Plan for Pilot Pond Enhancement Works

SCALE

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DATE

Jan-25

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JOB NO.

60718076

Appendix No.

B

Rev

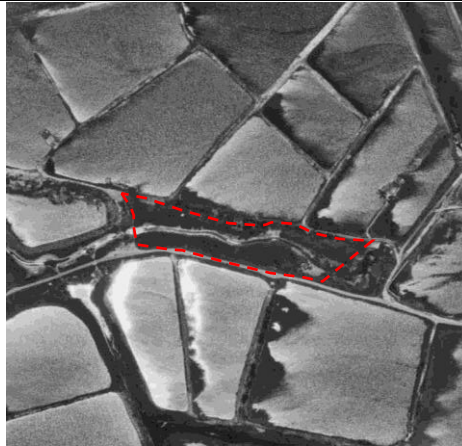
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Historical Aerial Imagery Comparison of Pilot Pond Identified for the
Interim Wetland Enhancement Works

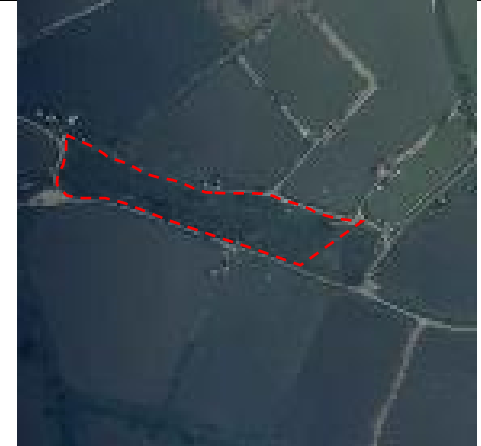
Pond C



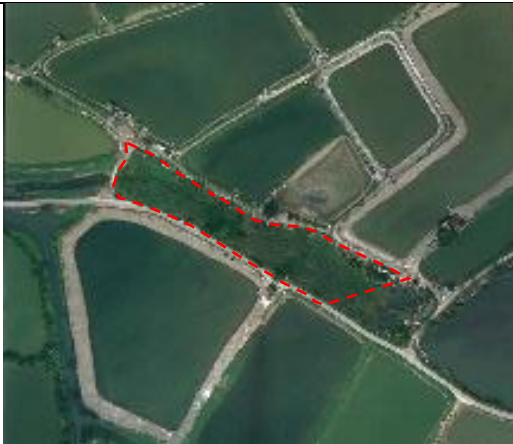
1975



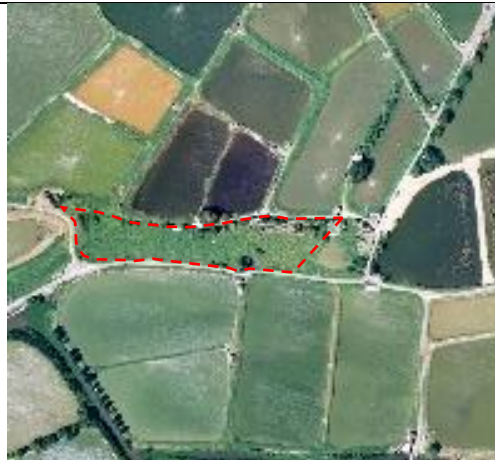
1984



1995



2005



2015



2024

Note: All aerial imageries are obtained from the Lands Department.

AECOM

Agreement No. CE 15/2023 (CE)
First Phase Development of the New Territories North – San Tin/Lok Ma
Chau Development Node – Package 1 – Design and Construction
Interim Wetland Enhancement Plan for Pilot Pond Enhancement Works

SCALE

N.T.S.

DATE

Jan-25

CHECK

-

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Historical Aerial Imagery Comparison of Pilot Pond Identified for the
Interim Wetland Enhancement Works

JOB NO.

60718076

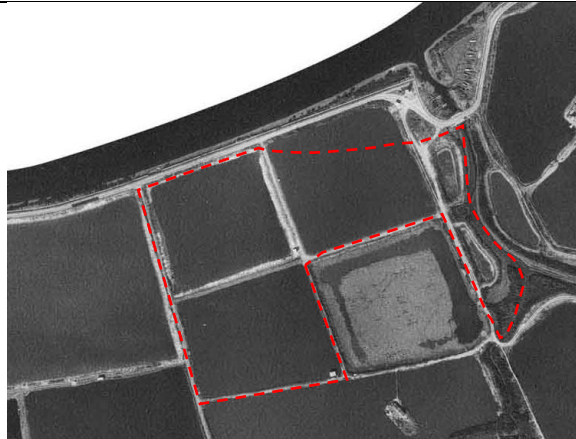
Appendix No.
B

Rev
-

Pond D



1975



1984



1995



2005



2015



2024

Note: All aerial imageries are obtained from the Lands Department.

AECOM

Agreement No. CE 15/2023 (CE)
First Phase Development of the New Territories North – San Tin/Lok Ma
Chau Development Node – Package 1 – Design and Construction
Interim Wetland Enhancement Plan for Pilot Pond Enhancement Works

Historical Aerial Imagery Comparison of Pilot Pond Identified for the
Interim Wetland Enhancement Works

SCALE

N.T.S.

DATE

Jan-25

CHECK

-

DRAWN

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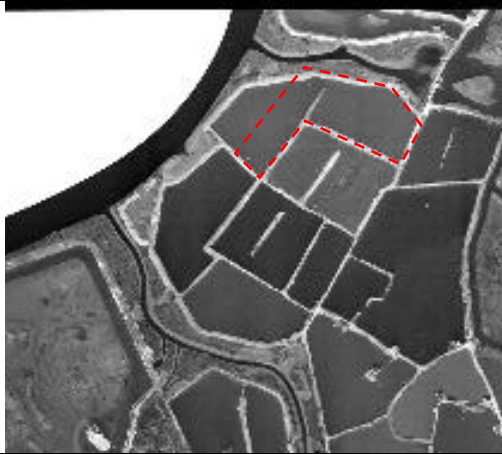
JOB NO.

60718076

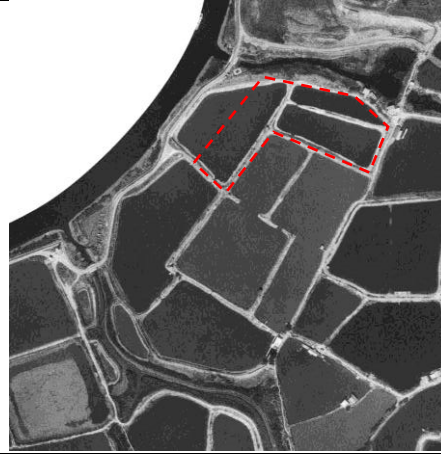
Appendix No.
B

Rev
-

Pond E



1975



1984



1995



2005



2015



2024

Note: All aerial imageries are obtained from the Lands Department.

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Interim Wetland Enhancement Plan for Pilot Pond Enhancement Works

SCALE

N.T.S.

DATE

Jan-25

CHECK

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Historical Aerial Imagery Comparison of Pilot Pond Identified for the
Interim Wetland Enhancement Works

JOB NO.

60718076

Appendix No.

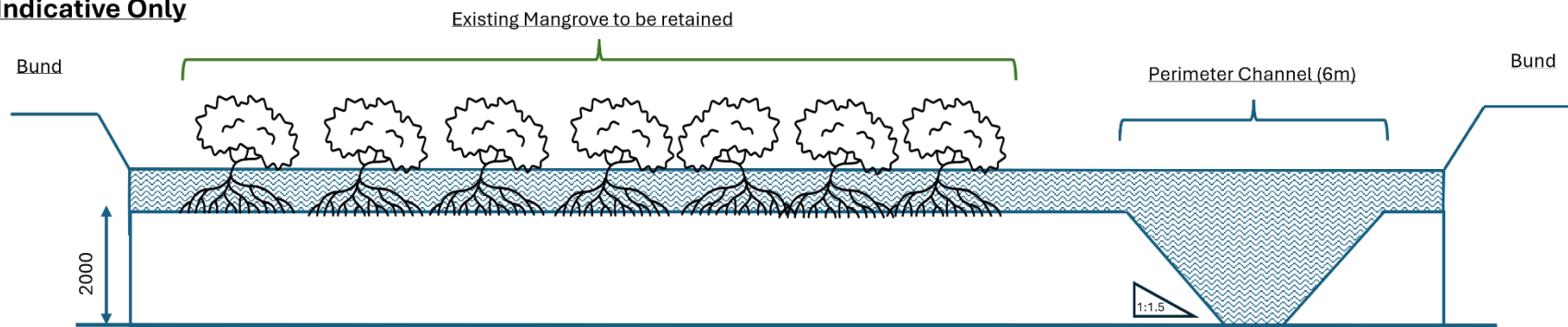
B

Rev

-

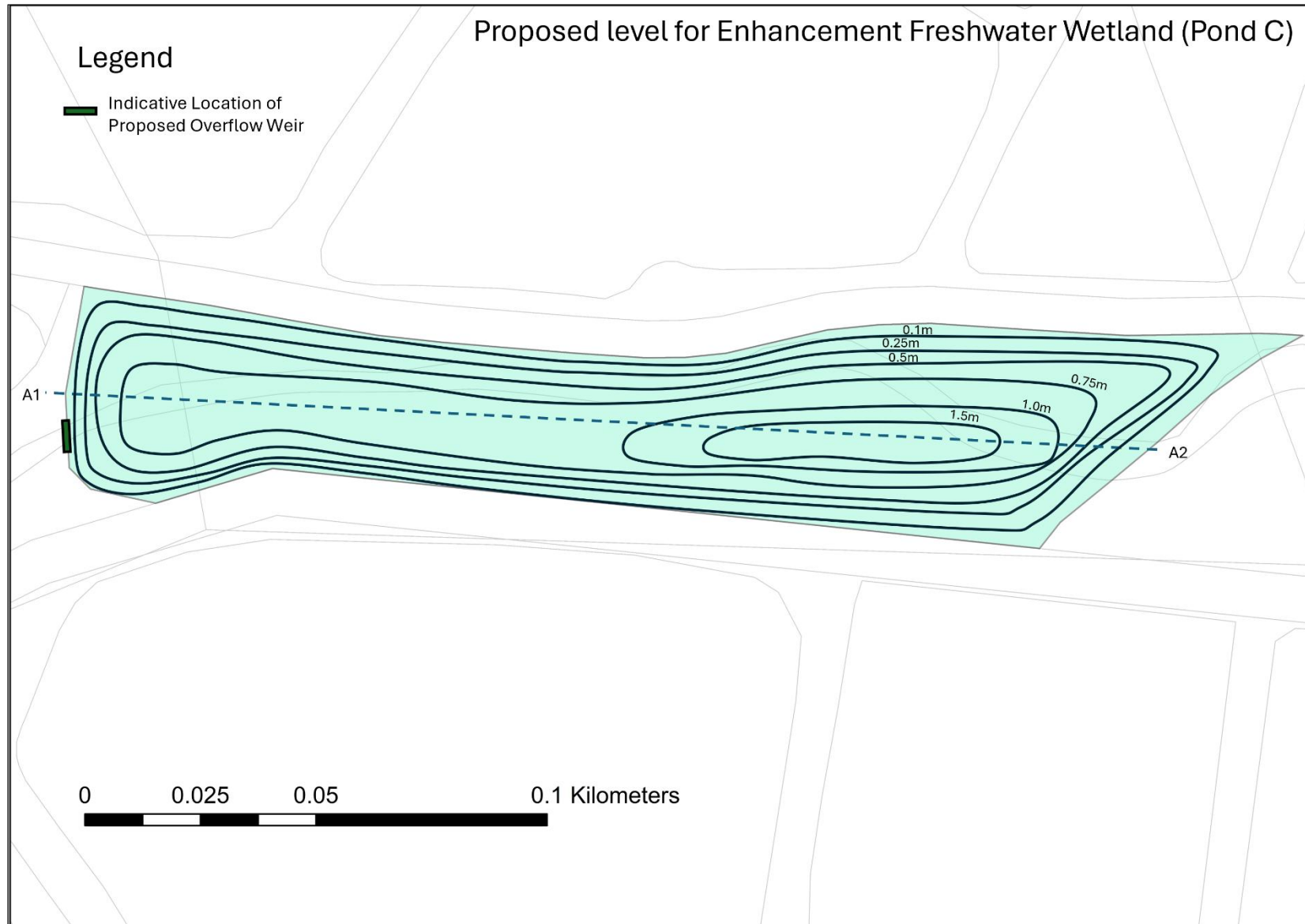
Appendix C
Proposed Design Details of Habitat Enhancement Features

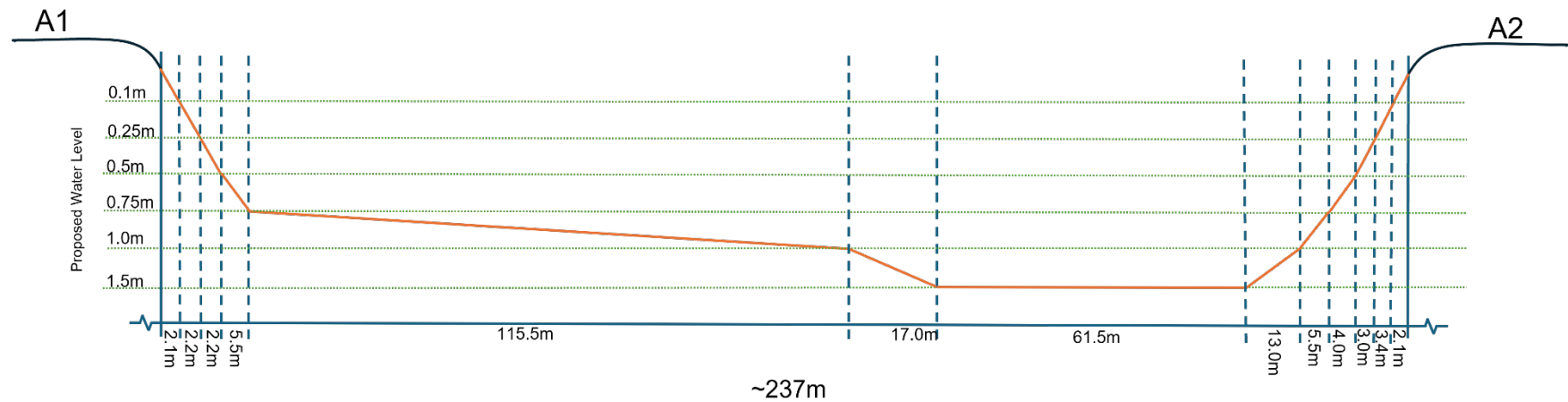
Indicative Only



Note:

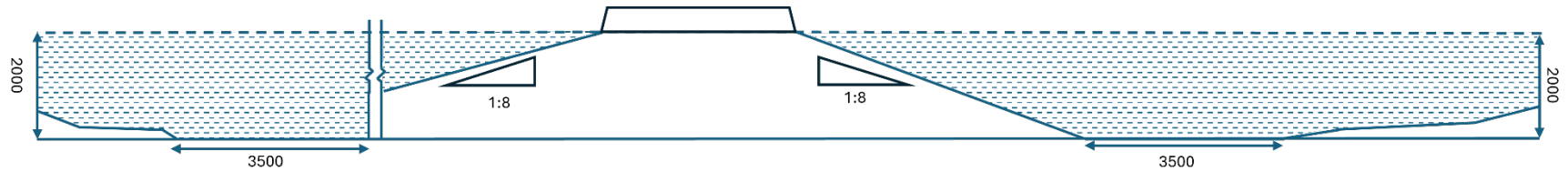
1. Drawing and proposed water levels are indicative only, final design subjected to on site condition.
2. Unit presented is in mm.
3. Perimeter channel running internally with water depth of 2m, and width of 6m.





Note: Drawing and proposed water levels are indicative only, final design subjected to on-site condition

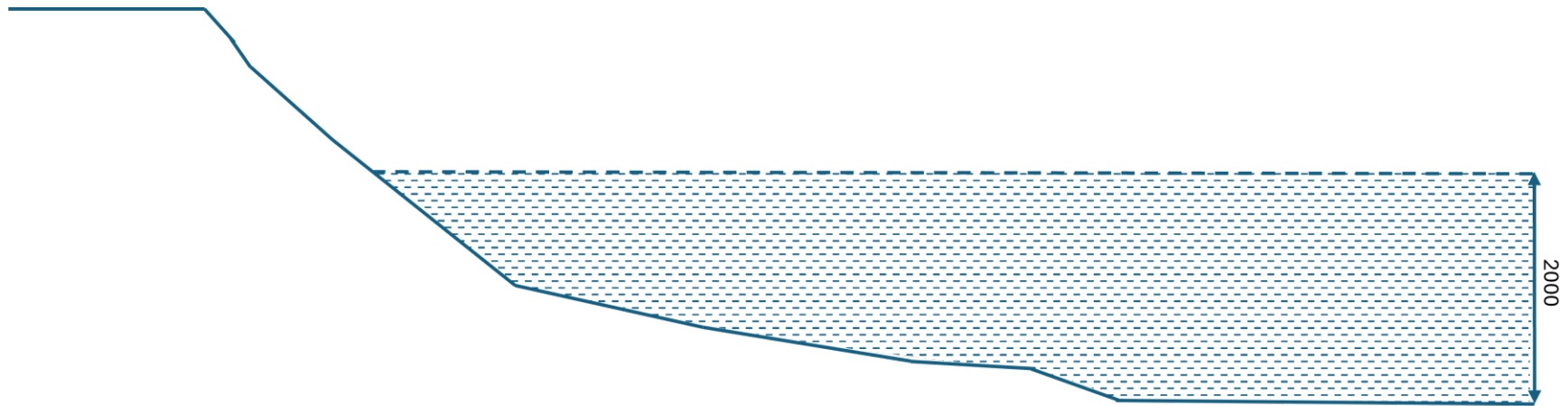
Proposed Water Level for Enhanced Freshwater Wetland (Pond C)



Notes:

1. Drawing and proposed water levels are indicative only, final design subjected to on-site condition
2. Unit presented is in mm.
3. Towards the bird islands located at the middle of the larger EEF habitats of Pond D and E, water depth would increase progressively. Surrounding the bird island, a deep water pool of about 2m depth and 3.5 – 4m wide would be created to isolate disturbance / threats of feral dogs.

Cross Section for Bird Island at Pond D & E



Notes:

1. Drawing and proposed water levels are indicative only, final design subjected to on-site condition
2. Unit presented is in mm.

Typical Pond Bund Section for Ecological Enhanced Fishponds

Appendix D
Habitat Requirements for Target Species

APPENDIX D HABITAT REQUIREMENTS FOR TARGET SPECIES

1.1 Avifauna

1.1.1 Piscivorous Avifauna

Black-faced spoonbill

- 1.1.1.1 Black-faced spoonbill is common winter visitor to Hong Kong and commonly found in the Deep Bay area. The species is listed as Endangered in both Red List of China Vertebrates and IUCN Red List (Jiang *et al.*, 2016; IUCN, 2025). It is piscivorous and prey items include tilapia, mullet, shrimps and other invertebrates. The species generally prefer open habitats and would avoid dense vegetation for feeding and roosting (Swennen and Yu, 2005). Common foraging grounds are drained *gei wai*, commercial fishponds, rivers, intertidal areas during low tide. During pond drain down, mean abundance of black-faced spoonbill per fishpond could increase up to 4 times compared to before the drain down, showing greater feeding success (ACE, 2016).

Great cormorant

- 1.1.1.2 Great cormorant is a common winter visitor to HK and is abundant in the Deep Bay area. It is an entirely piscivorous species and forages in commercial fishponds, rivers, intertidal areas and at sea. Prey items may include tilapia and grey mullet, which both are dominant species stocked by fish farmers in the Deep Bay area (HKBWS, n.d.). The species forms very large night-time roosts and utilizes smaller day-time roosts in less disturbed areas as they startle easily (HKBWS, n.d.). During pond drain down, mean abundance of great cormorant per fishpond could be doubled when compared to before the drain down (ACE, 2016).

Great egret

- 1.1.1.3 Great egret is common resident, migrant and winter visitor that is widely distributed in Hong Kong, which is of Potential Regional Concern (Fellowes *et al.* 2002). The species is primarily piscivorous and forages in commercial fishponds, freshwater marshes and shallow intertidal areas. Great egret would be benefited by drained down fishponds as prey items were trapped in smaller water volume which enhance feeding success (AFCD, 2023). Mean abundance of ardeids per fishpond could increase by 29 times when comparing before and after drain down of fishpond (ACE, 2016). Large breeding population has established in the intertidal mangrove of Deep Bay area. By 2020, over 800 breeding pairs were recorded in Hong Kong, with most pairs recorded in Deep Bay (HKBWS, n.d.).

Grey heron

- 1.1.1.4 Grey heron is common winter visitor that occur mainly in Deep Bay area. Small number of grey heron can also be found elsewhere in habitats like coastal and inland wetland areas such as Starling Inlet, Kowloon Park, Cape D'Aguilar. The species is primarily piscivorous and forages in both intertidal, freshwater and brackish fishponds, river, intertidal area and at sea. Prey items recorded for the species includes tilapia and grey mullet, which are common fish stocks in commercial ponds in the Deep Bay area. Local breeding was recorded in Mai Po Nature Reserve in June 2020 (HKBWS, n.d.).

1.1.2 Ducks and Grebe

Eurasian teal

- 1.1.2.1 Eurasian teal is common and abundant winter visitor to Hong Kong, which is of Region Concern (Fellowes *et al.* 2002). It roosts and flies in large flocks, and often occurs in intertidal areas and brackish and freshwater marshes, as well as fishponds and along river channels in Deep Bay area, Shuen Wan, Tai Lam Chung Reservoir, Victoria Harbour, urban parks (HKBWS, n.d.). The diet of Eurasian teal includes vegetation, insects, small fish and other

invertebrates. During drain down of fishponds, mean abundance of ducks per fishponds could increase up to 14 times when compared to before drain down (ACE, 2016).

Northern shoveler

- 1.1.2.2 Northern shoveler is an abundant winter visitor found in the Deep Bay area. The species is often recorded foraging and roosting on the water, at the intertidal areas of the Inner Deep Bay, as well as shallow waters of brackish *gei wais* and freshwater ponds in the Mai Po Nature Reserves and nearby commercial fishponds (HKBWS, n.d.). It is also observed to forage in small groups and diet may include small invertebrates, seeds and vegetation remains (Dubowy, Carboneras and Kirwan, 2020).

Tufted duck

- 1.1.2.3 Tufted duck is an abundant winter visitor found in the Deep Bay area, Nam Chung and Starling Inlet of Hong Kong. The species occurs in open water habitat (e.g. tidal bays), and freshwater wetlands, as well as breeding in large freshwater lakes, ponds and reservoirs with marginal and emergent vegetation. One of the highest counts in historical record of this species recorded over 4000 birds roosting at Mai Po Nature Reserve in 2007 (HKBWS, n.d.). In general, the species tends to occur in large flocks to forage and roost (HKBWS, n.d.). Its diet mainly includes molluscs, aquatic plants, crustaceans and aquatic insects (Carboneras and Kirwan., 2020).

Little grebe

- 1.1.2.4 Little grebe is a common resident that occurs mainly in fishponds and freshwater wetland of Deep Bay area all year round. It prefers fishponds and *gei wai* that have emergent or submergent vegetation with lower numbers of fish. Little grebe is presumed to be insectivorous as well as consuming small fish. The species is fairly tolerant to disturbance. When disturbed, it readily dives or skitter across water for refuge (HKBWS, n.d.; RSPB, n.d.).

1.1.3 Shorebirds and Gulls

Little ringed plover

- 1.1.3.1 Little ringed plover is resident, common winter visitor and passage migrant which is widely distributed in freshwater areas throughout Hong Kong. The small wader prefers margins of low-lying areas of fresh / brackish water, including wet agricultural land, freshwater marsh and drained fishponds area. Diet mainly comprised of insects, shrimps and other invertebrates. One record of breeding activity at fishponds at San Tin was recorded during the survey period of the Approved EIA of San Tin / Lok Ma Chau Development Node (CEDD & PlanD, 2024).

Black-headed gull

- 1.1.3.2 Black-headed gull is an abundant winter visitor that is found in Deep Bay area and coastal waters of Hong Kong. It mainly occurs at commercial fishponds, the sea and river during low tide. Black-headed gull is omnivorous and opportunistic, diet consists predominantly of aquatic and terrestrial insects, occasionally fish and rodents (IUCN, 2025). The species can be found forming large and vocal flocks on mudflats (HKBWS, n.d.).

Red-necked stint

- 1.1.3.3 Red-necked stint is an abundant winter passage migrant that is found in the Deep Bay area of Hong Kong. It is listed as Near Threatened on the IUCN Red List and Least Concern on the Red List of China's Vertebrate (Jiang *et al.*, 2016; IUCN, 2025). The species primarily occurs on the intertidal mudflat and roosts at Mai Po Nature Reserve. It is also regularly reported to appear at drained fishponds in Deep Bay (HKBWS, n.d.). It is usually observed foraging in dense flocks, in which the diet comprises insects, small invertebrates, crustaceans and molluscs (Van Gils *et al.*, 2020).

1.1.4 Freshwater Wetland Avifauna

Black-winged stilt

- 1.1.4.1 Black-winged stilt has a wide distribution across the Deep Bay area, which is of Region Concern (Fellowes *et al.* 2002). The species mainly occurs in freshwater marsh, brackish *gei wai* and commercial fishponds during drained down, as well as river and wet agricultural land in the northwest New Territories. Breeding activities were recorded in Long Valley and Mai Po Nature Reserve (HKBWS, n.d.). The species mainly forages at shallow water area of fishponds and marshes, especially during drained-down process of ponds. Diet includes insects, small fishes and other invertebrates.

Red-throated pipit

- 1.1.4.2 Red-throated pipit is a common passage migrant and winter visitor in Hong Kong, which is of Local Concern and Least Concern (Fellowes *et al.*, 2002; IUCN,2025). The species mainly occurs in wet grassy habitats, freshwater marsh, agricultural land and fishponds areas in the northwest New Territories. Forages in small loose flocks. It is insectivorous and normally forages among freshwater marsh, wet agricultural fields, as well as the top and sides of fishpond bunds (HKBWS, n.d.).

Yellow bittern

- 1.1.4.3 Yellow bittern is a common summer visitor and passage migrant to wetland areas primarily in the Deep Bay area in Hong Kong. The species mainly occurs in freshwater marshes, reedbeds and other dense aquatic vegetation fringes of wetland habitats. The species also prefer other lowland habitats such as swamps, floodplains. Breeding of this ardeid is usually observed deep inside reed marshes and utilises reed as raw material for nesting. Yellow Bittern forages at the edge of wetland habitats and is generally difficult to observe (HKBWS, n.d.), its diet preference includes aquatic insects and small fishes, as well as small amphibians and crustaceans (Martínez-Vilalta *et al.*,2024).

Chinese Pond Heron

- 1.1.4.4 The Chinese pond heron commonly occurs at a variety of freshwater and brackish wetlands across Hong Kong throughout the year, with both migratory and resident populations. Chinese pond heron occurs in most low-lying damp area in New Territories. Around 80% of Chinese pond herons nest in Deep Bay Area. Their diet includes fish such as Mosquito Fish and Swampy Eel, frogs, shrimps, dragonflies and insects such as flies.

1.1.5 Other Wetland-associated Avifauna Species

Collared Crow

- 1.1.5.1 Collared crow is locally common resident that can be found in the Inner Deep Bay area, which is listed as Near Threatened in the Red List of China Vertebrates (Jiang *et al.*, 2016) and Vulnerable in the IUCN Red List (IUCN, 2025). It has been assessed as of Moderate Risk locally (Or and Chan, 2025). It occurs at open lowland habitats near water such as agricultural lands and fields, as well as fishpond areas, rivers and watercourses. The species usually forages at drained *gei wai* and fishponds, while roosting in intertidal mangroves of *Kandelia obovata* at night (WWF, 2010; Stanton, Smith and Leung, 2014). An increase by a factor of 0.93 per fishpond is recorded in the abundance of Collared Crow during pond drain down (ACE, 2016). Regionally, population decline in numbers was due to prey depletion and overuse of pesticides across Southern China (WWF, 2010; IUCN, 2025). However, the collared crow population was found to have steadily increased at Mai Po Nature Reserve and its environs between 2004 and 2013 (Stanton, Smith and Leung, 2014).

Red-billed starling

- 1.1.5.2 Red-billed starling is an abundant winter visitor that is widely distributed in Hong Kong. Its wintering population mainly occurs in the northwest New Territories including Mai Po, San Tin and Tai Sang Wai. The species is omnivorous and opportunistic, which is associated with the fishponds in northwest New Territories as food is readily available in the form of spilled and wasted fish meal (HKBWS, n.d.). It also occurs in other habitats such as reedbeds, freshwater marshes and watercourses. The species nests in tree holes, cavities in roof or wall of village houses or under air-conditioning units, and have been recorded in Tai Mei Tuk, Kowloon Park and Hung Shui Kiu. It is suspected that a large breeding population exists regionally in or nearby Shenzhen, given double-figure estimates of juveniles had been made in the Deep Bay area midsummer. (HKBWS, 2024)

Zitting cisticola

- 1.1.5.3 Zitting cisticola is a common passage migrant and winter visitor in Hong Kong. The species is insectivorous, which is widespread in open grassland, grassy wetland, meadows, agricultural land and fishponds, including the Long Valley area (HKBWS, n.d.). Grassy areas that are recently cleared or urban edges are also utilised by the species. It usually forages in grassy and reedy vegetation and flies low when flushed. The diet of this species primarily comprises insects and small invertebrates.

1.1.6 Raptors

Eastern imperial eagle

- 1.1.6.1 Eastern imperial eagle is common winter visitor that is recorded mainly in the Deep Bay area and Ma Tso Lung. The species is carnivorous and tends to prey on waterbirds including domestic ducks that used to be raised in fishponds. It prefers open areas around wetlands and may be seen perching on trees near pond margins in the Deep Bay area. The species is listed as Endangered in the Red List of China Vertebrates and Vulnerable in the IUCN Red List (Jiang *et al.*, 2016; IUCN, 2025).

Greater spotted eagle

- 1.1.6.2 Greater spotted eagle is common winter visitor to Hong Kong that mainly occur in Deep Bay area. It is listed as Endangered in the Red List of China Vertebrates and Vulnerable in the IUCN Red List (Jiang *et al.*, 2016; IUCN, 2025). The species favours forest edges that are often adjoining marshes and other wetlands, which can be found in the fishpond areas in Deep Bay, as well as manmade habitats like agricultural land. It is omnivorous and opportunist, which tends to prey on waterbirds such as ducks and other small mammals or amphibians.

1.2 Mammal

Eurasian otter

- 1.2.1.1 Eurasian otter is highly restricted and mainly confined to the northwest New Territories. According to Shek (2006) and Shek *et al.* (2007), it primarily occurs in the Mai Po and Inner Deep Bay Area, and work for LMC Loop indicates that LMC Meander and adjacent areas of LMC Loop and Hoo Hok Wai are important for the species. Eurasian otters feed largely on fish and amphibians. Recent study by Mcmillian (2021) identified that fish as major prey group for otters in the Deep Bay area. Analysis on otter spraints shown that otters mainly prey on dominant species stocked by fish farmers in the area. This suggested that fishponds and the availability of stable food resources are crucial factors influencing the survivorship of otter population in Deep Bay. Sighting and monitoring had also suggested the species would utilise river channels as important movement corridors (CEDD and PlanD, 2013).

1.3 Herpetofauna

Chinese bullfrog

- 1.3.1.1 Chinese bullfrog is of Potential Regional Concern (Fellowes *et al.* 2002), and is a Class II Protected Species in China. It is recorded from many localities in Hong Kong and is fairly common and widespread in the New Territories, but the local population appears to be diminishing due to habitat destruction and hunting for food (Chan *et al.* 2005). This is generally a lowland species that can occur in a range of waterbodies, though it prefers deeper pools. Generally, it feeds on large insects, but can also take small rodents and frogs (Karsen *et al.* 1998).

1.4 Odonate

Scarlet basker

- 1.4.1.1 Scarlet basker was considered by Fellowes *et al.* (2002) to be of Local Concern, but recent evidence suggests this species has since colonized much of the lowland habitat in Hong Kong, especially in the northwest New Territories where it shows a preference for abandoned fishponds (Tam *et al.* 2011). The larvae utilized weedy ponds and marshes, while adults may be seen on conspicuous branches on warm days (HKWP, 2024).

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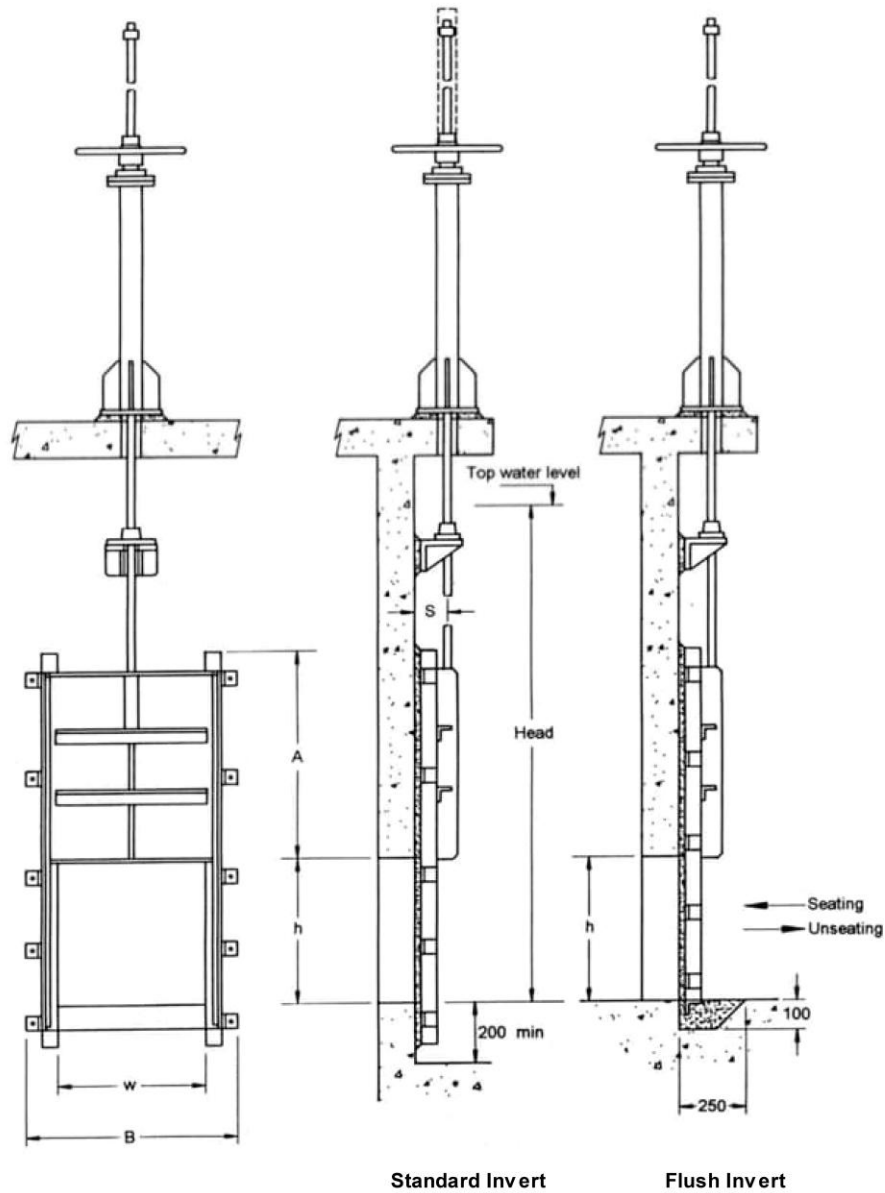
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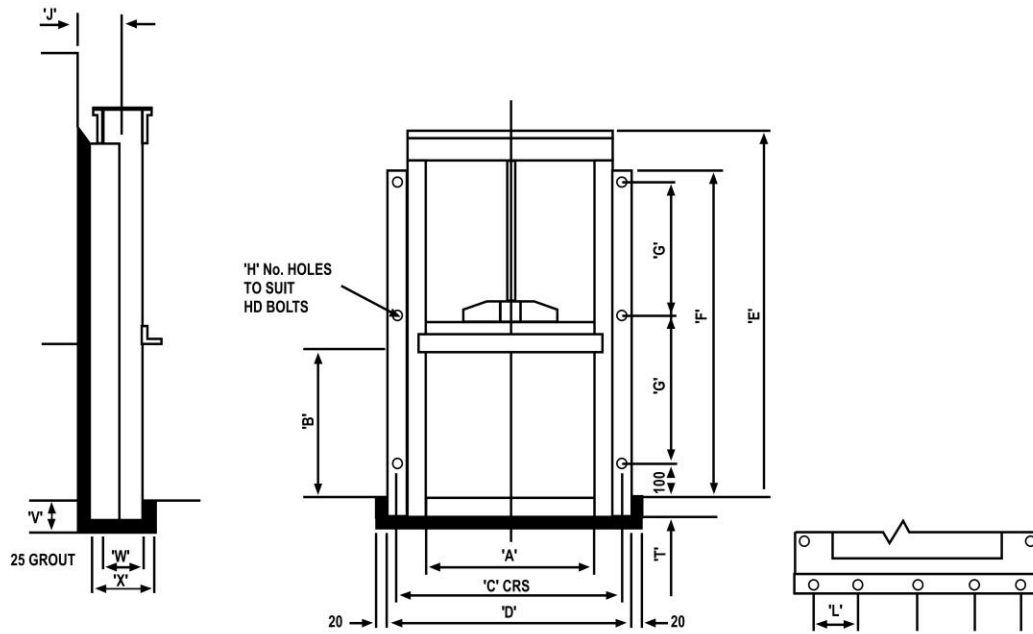
Appendix E
Standard Water Infrastructure Reference

APPENDIX E STANDARD WATER INFRASTRUCTURE REFERENCE

1.1 Standard Sluice Gate

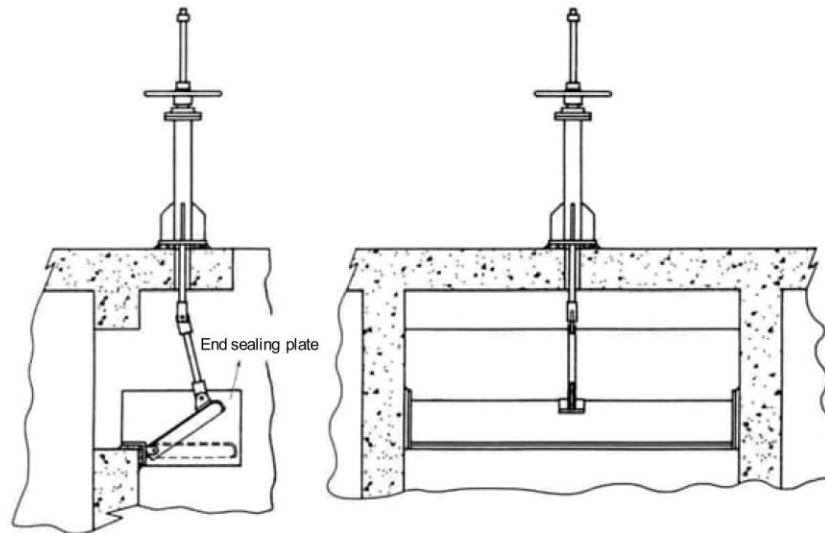


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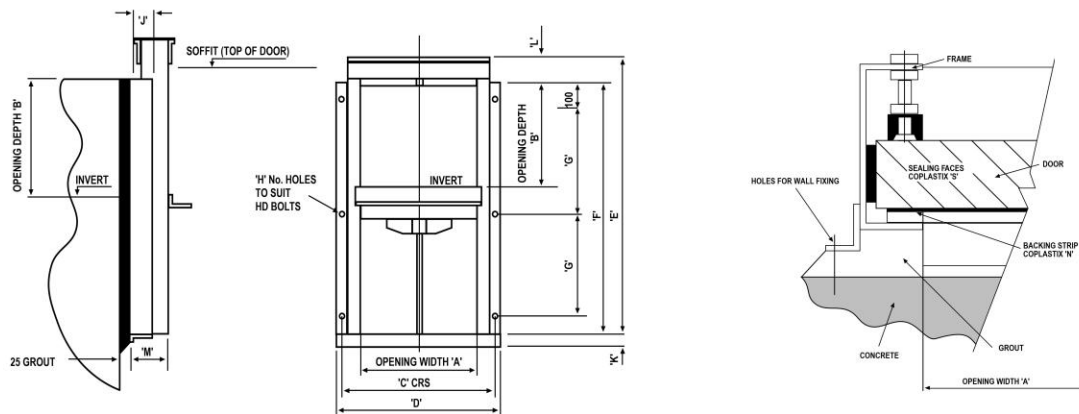


Standard Sluice Gate Reference 2

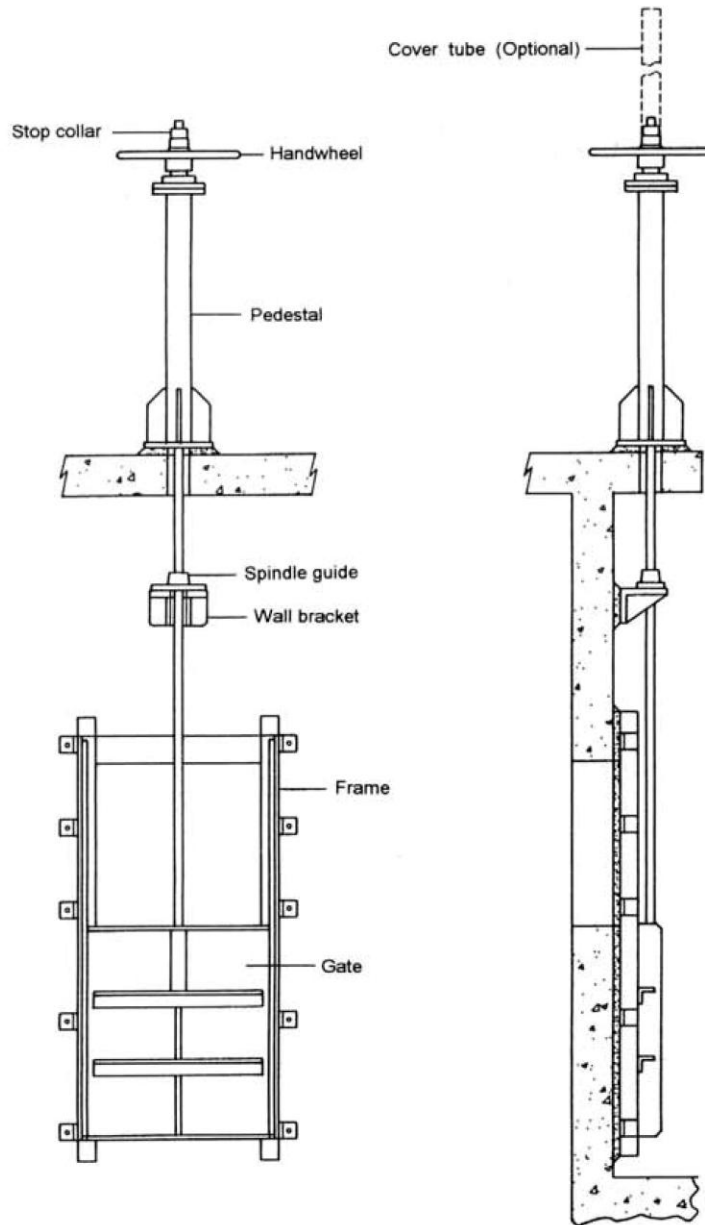
1.2 Standard Adjustable Weir



Standard Adjustable Weir Reference (Tilting)



Standard Adjustable Weir Reference (Downward Opening)



Standard Adjustable Weir Reference (Downward Opening)