FORM 5

Application No. :
Reference No. :
(For official use)

FORM 5
ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE
(CHAPTER 499)
SECTION 13(1)

Application for Variation of an Environmental Permit

PART A PREVIOUS APPLICATIONS

☐ No previous application for variation of an environmental permit.

☑ The environmental permit was previously amended.

Application No. : VEP-625/2023

PART B DETAILS OF APPLICANT

B1. Name : (person or company)

TAI PO GOLF CLUB LIMITED

[Note : In accordance with section 13(1) of the Ordinance, the person holding an environmental permit or a person who assumes responsibility for the designated project may apply for variation of the environmental permit.]

B2. Business Registration No. : (if applicable) [redacted]

B3. Correspondence Address : [redacted]

B4. Name of Contact Person : [redacted]

B5. Position of Contact Person : [redacted]

B6. Telephone No. : [redacted]

B7. Fax No. : [redacted]

B8. E-mail Address : (if any) [redacted]

PART C DETAILS OF CURRENT ENVIRONMENTAL PERMIT

C1. Name of the Current Environmental Permit Holder :

TAI PO GOLF CLUB LIMITED

C2. Application No. of the Current Environmental Permit : VEP-625/2023

C3. The Current Environmental Permit was Issued in : month / year

06 2023

Important Notes : Please submit the application together with

(a) 3 copies of this completed form; and

(b) appropriate fee as stipulated in the Environmental Impact Assessment (Fees) Regulation

to the Environmental Protection Department at the following address :

The EIA Ordinance Register Office,
27th floor, Southorn Centre,130 Hennessy Road,
Wan Chai, Hong Kong.

RECEIVED
- 4 AUG 2025
EIAO Register Office, E.P.D.

☐ Tick (✓) the appropriate box

PART D PROPOSED VARIATIONS TO THE CONDITIONS IN CURRENT ENVIRONMENTAL PERMIT

D1. Condition(s) in the Current Environmental Permit :	D2. Proposed Variation(s) :	D3. Reason for Variation(s) :	D4. Describe the environmental changes arising from the proposed variation(s) :	D5. Describe how the environment and the community might be affected by the proposed variation(s) :	D6. Describe how and to what extent the environmental performance requirements set out in the EIA report previously approved or project profile previously submitted for this project may be affected :	D7. Describe any additional measures proposed to eliminate, reduce or control any adverse environmental impact arising from the proposed variation(s) and to meet the requirements in the Technical Memorandum on Environmental Impact Assessment Process :
Condition 2.39 Underground storage tank(s) with a total capacity of not less than 30,000 m3 shall be constructed before commencement of operation of the Project for collection of surface runoff at the Project Site during operation phase of the Project. Condition 2.40 Underground storage tank(s) shall be constructed prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation.	Condition 2.39 *Water storage system(s)* with a total capacity of not less than 30,000 m3 *or with total capacity identified in Turfgrass Management Plan* shall be constructed before commencement of operation of the Project for collection of surface runoff *from the golf area* at the Project Site during operation phase of the Project. Condition 2.40 *Water storage system(s) or equivalent system(s)* shall be constructed prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation.	The variation is proposed to optimise the drainage system and water storage system(s) design to cater the Project Site constraints. Please refer to Section 3 of the ERR for Application of VEP. The variation is proposed to optimise the drainage system and water storage system(s) design to cater the Project Site constraints. Please refer to Section 3 of the ERR for Application of VEP.	An environmental review has been conducted for the proposed variation on various environmental aspects. There is no adverse environmental impact arising from the proposed amendments. Please refer to Section 3 of the ERR for Application of VEP.	An environmental review has been conducted for the proposed variation on various environmental aspects. There is no adverse environmental impact arising from the proposed amendments. Please refer to Section 3 of the ERR for Application of VEP.	The environmental performance requirements set out in the approved EIA Report will be maintained. The proposed variation would not change the extent of environmental impacts predicted in the approved EIA report.	No additional measures is required. Please refer to Section 3 of the ERR for Application of VEP.

PART D PROPOSED VARIATIONS TO THE CONDITIONS IN CURRENT ENVIRONMENTAL PERMIT

D1. Condition(s) in the Current Environmental Permit :	D2. Proposed Variation(s) :	D3. Reason for Variation(s) :	D4. Describe the environmental changes arising from the proposed variation(s) :	D5. Describe how the environment and the community might be affected by the proposed variation(s) :	D6. Describe how and to what extent the environmental performance requirements set out in the EIA report previously approved or project profile previously submitted for this project may be affected :	D7. Describe any additional measures proposed to eliminate, reduce or control any adverse environmental impact arising from the proposed variation(s) and to meet the requirements in the Technical Memorandum on Environmental Impact Assessment Process :
Condition 2.46 Underground storage tanks with a total capacity of not less than 30,000 m^3 shall be properly maintained during operation phase of the Project for collection of surface runoff at the Project Site. All surface runoff and water collected in the drainage system shall be stored in the underground storage tanks for re-use on-site, unless when the storage tank(s) are full, upon which time the surface runoff and water collected in the drainage system may bypass the underground storage tanks and, after passing through the requisite grease traps and silt traps, and flow into Tolo Harbour. Such bypass into Tolo Harbour shall cease once the water storage tanks system has recovered its storage capacity.	Condition 2.46 *Water storage system(s)* with a total capacity of not less than 30,000 m3 *or with total capacity identified in Turfgrass Management Plan* shall be properly maintained during operation phase of the Project for collection of surface runoff at the Project Site. All surface runoff and water *from the golf area* collected in the drainage system shall be stored in the *water storage system(s)* for re-use on-site, unless when the *water storage system(s)* are full, upon which time the surface runoff and water collected in the drainage system may bypass the *water storage system(s)* and, after passing through the requisite grease traps and silt traps, and flow into Tolo Harbour. Such bypass into Tolo Harbour shall cease once the *water storage system(s)* has recovered its storage capacity. *Turfgrass Management Plan and water quality monitoring will be conducted to assess and monitor the water quality impacts resulting from the possible discharge from the Project into Tolo Harbour.*	The variation is proposed to optimise the drainage system and water storage system(s) design to cater the Project Site constraints. Please refer to Section 3 of the ERR for Application of VEP.	An environmental review has been conducted for the proposed variation on various environmental aspects. There is no adverse environmental impact arising from the proposed amendments. Please refer to Section 3 of the ERR for Application of VEP.	An environmental review has been conducted for the proposed variation on various environmental aspects. There is no adverse environmental impact arising from the proposed amendments. Please refer to Section 3 of the ERR for Application of VEP.	The environmental performance requirements set out in the approved EIA Report will be maintained. The proposed variation would not change the extent of environmental impacts predicted in the approved EIA report.	No additional measures is required. Please refer to Section 3 of the ERR for Application of VEP.

PART E DECLARATION BY APPLICANT

E1. I hereby certify that the particulars given above are correct and true to the best of my knowledge and belief. I understand the environmental permit may be suspended, varied or cancelled if any information given above is false, misleading, wrong or incomplete.

[redacted] [redacted] [redacted]

Signature of Applicant | Full Name in Block Letters | Position

TAI PO GOLF CLUB LIMITED 大埔高爾夫球會有限公司

on behalf of _____ 01 AUG 2025

Company Name and Chop (as appropriate) | Date

NOTES :

1. A person who constructs or operates a designated project in Part I of Schedule 2 of the Ordinance or decommissions a designated project listed in Part II of Schedule 2 of the Ordinance without an environmental permit or contrary to the permit conditions commits an offence under the Ordinance and is liable to a maximum fine of $5,000,000 and to a maximum imprisonment for 2 years.

2. A person for whom a designated project is constructed, operated or decommissioned and who permits the carrying out of the designated project in contravention of the Ordinance commits an offence and is liable to a maximum fine of $5,000,000 and to a maximum imprisonment for 2 years.

ARUP

Tai Po Golf Club Limited

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

Environmental Review Report for Application of Variation of Environmental Permit (VEP)

Reference: 289499-REP-013-06

Job number 289499

Ove Arup & Partners Hong Kong Limited
Level 5 Festival Walk
80 Tat Chee Avenue
Kowloon Tong
Kowloon
Hong Kong
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Contents

Appendices

1. Introduction

1.1 Background

1.1.1.1 In June 2017, the Chief Executive in Council has agreed in principle to the government proposal to grant a piece of land in Tai Po in exchange for its private land in Sha Lo Tung which has high ecological values. Under the non-in-situ land exchange proposal, the piece of land at the Shuen Wan Restored Landfill in Tai Po will be granted and the Sha Lo Tung site would be considered by government for active conservation management to avoid degradation and damage for long-term public enjoyment. This land exchange proposal is a unique, exceptional and isolated case, adding the idea is technically feasible as the private land ownership is largely unified under one entity and both Sha Lo Tung and the land at the landfill site, which has been planned for golf course development, are located in Tai Po, as shown in Figure 1 of FEP-01/571/2019/A (extracted as **Appendix 1.1**). The non-in-situ land exchange proposal has been completed in July 2022, and the Project Site has been handed over to the Project Proponent (PP).

1.1.1.2 The Project is a Designated Project (DP) under Environmental Impact Assessment Ordinance (EIAO), and an Environmental Impact Assessment (EIA) study was conducted in 2017. The *Shuen Wan Golf Course EIA Report* was approved by the Director of Environmental Protection (DEP) on 5 July 2019 (AEIAR-221/2019) ("the approved EIA Report") with the Environmental Permit (EP, EP-571/2019) issued on 20 September 2019. An application of Further Environmental Permit (FEP) has been made by Tai Po Golf Club Limited (the PP) and FEP was issued on 29 November 2022 (FEP-01/571/2019). Besides, surrender of EP-571/2019 has been applied and approved on 9 December 2022. In addition, an application for variation of EP has been made on 16 May 2023 to amend FEP-01/571/2019, and the amended EP was issued on 6 June 2023 (FEP-01/571/2019/A).

1.1.1.3 However, there has been changes to the detailed design of the Project. As more information is collected throughout the design phase, there are inevitably some changes / optimisations to the design adopted in the approved EIA Report (AEIAR-221/2019), as summarised in the subsequent sections.

1.2 Need for the Proposed Amendments

1.2.1.1 As mentioned above, the non-in-situ land exchange proposal has been completed in July 2022, and the Project Site has been handed over to the PP. The Project is currently under detailed design stage to optimise the design adopted in the approved EIA Report (AEIAR-221/2019), and the construction phase of the Project has commenced in October 2024. As the Project is a DP under EIAO, the Project shall be designed, constructed and operated in accordance with the information or mitigation measures in the issued EP (FEP-01/571/2019/A).

1.2.1.2 During the detailed design stage, construction programme, construction methodology, recent design in other golf courses, turfgrass species selection, application of agrochemicals, rainfall data, catchment area, etc. have been reviewed and/ or optimised to facilitate the construction and operation of the Project. In addition, EP conditions have also been reviewed such that the Project will be constructed and operated according to Condition 1.6 of the FEP-01/571/2019/A.

1.2.1.3 According to the FEP-01/571/2019/A, underground storage tank(s) with a total capacity of not less than 30,000 m^3 shall be constructed for collection of surface runoff at the Project Site during operation phase of the Project. Since the Project Site was once a landfill site, the locations of underground storage tanks are limited to the area along the eastern and western side of the Project Site. Due to the ex-landfill waste bodies underneath, excavation is not allowed and thus the depth of the water storage tanks is also limited. Furthermore, in accordance with the Tree Preservation, Transplantation and Compensation Plan (TPTCP) under Condition 2.13 of the EP, no less than 6.1 ha of the Project Site is reserved for existing tree groups and core roosting area, compensatory planting of no less than 10 ha is also required to maximize the ecological capacity of the Project Site. Besides, the rainfall data, catchment area and the consideration of filter system have been reviewed and found to be varied from the EIA study. In view of the site constraints and reviewed rainfall data, catchment area, turfgrass species, and consideration of filter system mentioned above, there is potential to review and optimize the total capacity of the water storage system(s) at the Project Site.

1.2.1.4 Besides, according to the FEP-01/571/2019/A, underground storage tank(s) shall be constructed prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation. According to the approved EIA Report and under the current detailed design, temporary sedimentation tanks will be installed to intercept the surface runoff during construction phase, which can be able to cater for the surface runoff and minimise the bypass to Tolo Harbour during rainfall events. It is therefore considered adequate for mitigating the potential water quality impact. The construction of water storage tank(s) prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation is therefore considered not necessary. Thus, it is recommended to have water storage system(s) or equivalent measures to be constructed prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation during construction phase.

1.2.1.5 In addition, since the Project Site was once a landfill site, plenty of landfill facilities (i.e. landfill gas management system, leachate management system, engineering capping layer, etc.) were installed at the Project Site. To avoid extensive drainage system causing potential interruption or damage to the landfill facilities, a separate drainage system collecting the surface runoff from the non-golf area (i.e. with residual agrochemicals not anticipated) with direct discharge is recommended. Detailed discussions will be provided in **Section 3**.

1.2.1.6 After review, the proposed amendments under this Project comprise the followings, and details refer to the subsequent sections.

- The water storage system(s) comprising water storage tanks and attenuation ponds for the collection of surface runoff from the golf area at the Project Site as stipulated in Conditions 2.39 and 2.46 of FEP-01/571/2019/A.

- The construction of water storage system(s) prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation as stipulated in Condition 2.40 of FEP-01/571/2019/A.

1.3 Interfacing with Other Projects

1.3.1.1 During the construction and operational phases of the Project, there would be concurrent projects within 500m assessment area. The concurrent projects have been reviewed to include those in the approved EIA Report (AEIAR-221/2019), and other projects within 500m assessment area based on the best available information. They are listed below:

- Shuen Wan Landfill Restoration Contract;
- Food Waste Pre-treatment Facilities (FWPF) for Food Waste / Sewage Sludge Anaerobic Co-Digestion Pilot Trial in Tai Po Sewage Treatment Works (TPSTW);
- Upgrading of Sewage Pumping Stations and Sewerage along Ting Kok Road;
- Columbarium Development at Shuen Wan Landfill, Tai Po;
- Development of a Bathing Beach at Lung Mei, Tai Po;
- Upgrading of Tai Po Sewage Treatment Works (TPSTW);
- Proposed Tolo Harbour Effluent Export Scheme (THEES) Upgrading;
- Proposed Organic Waste Pre-treatment Centre (OWPC); and
- Planned Residential Development at Ting Kok.

1.4 Purpose of This Environmental Review Report

1.4.1.1 This environmental review report (ERR) provides information to identify and describe the potential impacts on the environment and the community due to the proposed amendments and evaluate the potential impacts, and to confirm the compliance of relevant environmental standards. The information presented herein forms part of the submission to the Environmental Protection Department (EPD) for an Application for VEP. The purpose of this ERR is to demonstrate that no unacceptable impacts will be resulted from the proposed amendments. In addition, it will also demonstrate no exceedance or violation of environmental performance requirement as set out in the approved EIA Report (AEIAR-221/2019) and hence a VEP can be granted.

1.5 Structure of This Environmental Review Report

1.5.1.1 The structure of the ERR is given below:

Section 1 Introduces the project background, purposes and objectives of this ERR. Describes the need for the proposed amendments.

Section 2 Describes the proposed amendments, as well as the proposed variation to the EP condition.

Section 3 Describes the reason to amend Conditions 2.39, 2.40 and 2.46 under FEP-01/571/2019/A and reviews environmental changes arising from the proposed amendment.

Section 4 Identifies and reviews the changes in the environmental monitoring and auditing scope arising from the proposed amendments.

Section 5 Reviews and justifies whether there are any material changes to the designated project

Section 6 Summarises and concludes the findings.

2. Proposed Amendments

2.1 Proposed Amendments

2.1.1.1 As discussed in **Section 1.2**, there would be amendments on the original design adopted in the approved EIA Report (AEIAR-221/2019) and conditions stipulated in FEP-01/571/2019/A respectively. The proposed amendments are presented in **Table 2.1**.

Table 2.1 Proposed amendment item

EP Condition	Original Conditions in FEP-01/571/2019/A	Proposed Amendments	Reason for Variations
The storage tank(s) for collection of surface runoff at the Project Site			
2.39	Underground storage tank(s) with a total capacity of not less than 30,000 m^3 shall be constructed before commencement of operation of the Project for collection of surface runoff at the Project Site during operation phase of the Project.	*Water storage system(s)* with a total capacity of not less than 30,000 m^3 *or with total capacity identified in Turfgrass Management Plan* shall be constructed before commencement of operation of the Project for collection of surface runoff *from the golf area* at the Project Site during operation phase of the Project.	Refer to **Section 3**.
2.40	Underground storage tank(s) shall be constructed prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation.	*Water storage system(s) or equivalent system(s)* shall be constructed prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation.	Refer to **Section 3**.
2.46	Underground storage tanks with a total capacity of not less than 30,000 m^3 shall be properly maintained during operation phase of the Project for collection of surface runoff at the Project Site. All surface runoff and water collected in the drainage system shall be stored in the underground storage tanks for re-use on-site, unless when the storage tank(s)	*Water storage system(s)* with a total capacity of not less than 30,000 m^3 *or with total capacity identified in Turfgrass Management Plan* shall be properly maintained during operation phase of the Project for collection of surface runoff at the Project Site. All surface runoff and water *from the golf area* collected in the drainage system shall be stored in the *water storage*	Refer to **Section 3**.

EP Condition	Original Conditions in FEP-01/571/2019/A	Proposed Amendments	Reason for Variations
	are full, upon which time the surface runoff and water collected in the drainage system may bypass the underground storage tanks and, after passing through the requisite grease traps and silt traps, and flow into Tolo Harbour. Such bypass into Tolo Harbour shall cease once the water storage tanks system has recovered its storage capacity.	*system(s)* for re-use on-site, unless when the *water storage system(s)* are full, upon which time the surface runoff and water collected in the drainage system may bypass the *water storage system(s)* and, after passing through the requisite grease traps and silt traps, and flow into Tolo Harbour. Such bypass into Tolo Harbour shall cease once the *water storage system(s)* has recovered its storage capacity. *Turfgrass Management Plan and water quality monitoring will be conducted to assess and monitor the water quality impacts resulting from the possible discharge from the Project into Tolo Harbour.*	

3. Proposed Amendment on Total Capacity of Water Storage System(s) supplemented with Attenuation Ponds under Conditions 2.39, 2.40 and 2.46

3.1 General

3.1.1.1 As stipulated in Conditions 2.39 and 2.46 of FEP-01/571/2019/A (**Table 2.1**), underground storage tank(s) of not less than 30,000 m^3 shall be constructed before commencement of operation of the Project for collection of surface runoff at the Project Site during operation phase of the Project. Besides, as required in Condition 2.40 of FEP-01/571/2019/A (**Table 2.1**), underground storage tank(s) shall be constructed prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation. According to the approved EIA Report (AEIAR-221/2019), two interconnected water storage tanks with a total capacity of 30,000 m^3 were proposed with one of them located underneath the access road running generally along the eastern side of the Project and another one located underneath the car park. Surface runoff containing residual agrochemicals would be collected by surface channels and were pumped to the water storage tanks through the pumping station. The proposed water storage tanks could reduce the likelihood of bypassing surface runoff to Tolo Harbour, as well as to recycle surface runoff for irrigation. With the provision of drainage system and water storage tanks, together with proper outfall location from the Water Sensitive Receivers (WSRs), no residual adverse water quality impact is anticipated during the operational phase as recommended in the approved EIA Report.

3.1.1.2 Besides, as stipulated in Condition 2.40 of FEP-01/571/2019/A (**Table 2.1**), underground storage tank(s) shall be constructed prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation. As mentioned in the approved EIA Report, temporary sedimentation tanks will be installed to intercept the surface runoff. Once one of the water storage tanks are constructed, they would be used to intercept any surface runoff for sedimentation during construction phase. With the implementation of proper mitigation measures during construction phase, no adverse water quality is anticipated during the construction phase as recommended in the approved EIA Report.

3.1.1.3 Under the current detailed design stage, construction programme, construction methodology, proposed golf course design, etc. have been reviewed and optimised to facilitate the construction and operation of the Project. As mentioned in **Section 1.2.1.3**, the Project Site is located on a restored landfill where feasible space for constructing storage tank(s) is limited. Also, to maximize the ecological capacity of the Project Site, part of the Project Site is reserved for existing tree groups and core roosting area, as well as compensatory planting which further limit the size of storage tank(s). In view of the Project Site constraints, the proposed drainage system and water storage system(s) have been reviewed and recommended with an optimised design to cater the Project Site constraints.

3.1.1.4 In the latest stormwater drainage design presented in **Appendix 3.1**, water storage system(s) is proposed with water storage tanks with a capacity of 15,000 m^3 (i.e. comprising 8,000 m^3 at the Practice Range and 7,000 m^3 at the Clubhouse) supplemented with three attenuation ponds with a combined capacity of approximately 4,800m^3, forming

a total capacity of about 19,800 m^3. Under the latest stormwater drainage design, a summary of water storage plan has been formulated as **Table 3.1** below. The overflow of the attenuation ponds will ultimately connect to the water storage tanks. The proposed water storage system(s) has been optimised to address the Project Site constraints while maximising the capacity of the water storage tanks and attenuation ponds. It is therefore proposed to reduce the total capacity of the water storage system(s) supplemented with attenuation ponds from the original 30,000 m^3 to 19,800 m^3 as required in Conditions 2.39 and 2.46 of FEP-01/571/2019/A, and to be further reviewed in the Turfgrass Management Plan (TMP) under Condition 2.26 of FEP-01/571/2019/A. The subsequent sections will present the factors considered for the proposed amendments.

Table 3.1 Summary of Water Storage Plan

Stages	Details	Analysis
Normal Operation	• 50% capacity of the water storage system(s) for irrigation • 50% capacity for runoff storage purpose during rainfall	• A capacity of 9,900m^3 of water storage system(s) reserved for runoff storage purpose
Pre-prolonged rainfall	<u>When prolonged rainfall is forecasted</u> • Cease the application of agrochemicals in the golf course • Fully consume the water in the water storage system(s) for the preparation to store 19,800m^3 rain water which can handle daily accumulated rainfall	• Similar arrangement as in the approved EIA Report with the total capacity of 19,800m^3 comprising water storage tanks and attenuation ponds
Full capacity of water storage system(s)	<u>Full capacity of water storage system(s) under rare prolonged or intense rainfall</u> • Bypass any additional water through the outfall	• Same arrangement as in the approved EIA Report with the total capacity of 19,800m^3 comprising water storage tanks and attenuation ponds

3.1.1.5 During construction phase, temporary sedimentation tanks will be installed to intercept the surface runoff, which can be able to cater for the surface runoff and minimise the bypass to Tolo Harbour during rainfall events. It is therefore considered adequate for mitigating the potential water quality impact. The construction of water storage system(s) prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation is therefore considered not necessary.

3.1.1.6 Under the current detailed design, there will be a double-layer drainage system, including catch basins at the surface and open channel to cut off and collect the surface runoff, for the golf area. With the double-layer drainage system, the surface runoff within the golf area will be collected and directed to the water storage system(s). Given the agrochemicals will only be applied at golf area, residual agrochemicals at non-golf area, e.g. access road, building area, etc. are not anticipated. As such, direct discharge of surface runoff collected at non-golf area is proposed to avoid extensive drainage system causing potential interruption or damage to the landfill facilities. The surface runoff collected at non-golf area can be controlled by the implementation of best management practices such as trap catchpit, etc. With the best management practices, the potential water quality impact from direct discharge of surface runoff from non-golf area is not anticipated, which will be discussed in **Section 3.6**.

3.1.1.7 In addition, under the current detailed design stage, plenty of landfill facilities (i.e. landfill gas management system, leachate management system, engineering capping layer, etc.) are found near the proposed location of outfall in the approved EIA Report. To avoid interruption and damage to the landfill facilities, and any marine works required, another existing drainage outfall has been selected as the proposed location for the outfall as shown in **Appendix 3.1**, which is duly situated to allow an optimum distance from the adjacent WSRs. The potential water quality impact from the proposed location of outfall will be discussed in **Section 3.6**.

3.2 Review of Historical Rainfall Records

3.2.1.1 According to the approved EIA Report (AEIAR-221/2019), the nearest existing rain-gauge is located at Tai Po Wong Shui Chi Secondary School and the number of rainfall exceedance events in 1998-2018 has been reviewed. As mentioned in the approved EIA Report, there were 113 days of total daily accumulated rainfall depth that exceeded 85mm in 1998-2018 records around studied rain-gauge location with the maximum annual exceedance of 14 days occurred in Year 2001. When looking at the total daily accumulated rainfall depth that exceeded 145mm, there were a total of 38 days in the historical records with the average annual exceedance of 1.81 days for 1998-2018.

3.2.1.2 As shown in **Table 3.2**, the exceedance events in the past 21 years (i.e. 2004-2024) have also be reviewed. There were 109 days of total daily accumulated rainfall depth exceeded 85mm in records with the maximum annual exceedance of 10 days occurred in Year 2016. When looking at the total daily accumulated rainfall depth that exceeded 145mm, there were a total of 36 days in the historical records with the average annual exceedance of 1.71 days for the past 21 years, which is lower than the record for 1998-2018 for about 5.5%. The reviewed rainfall records (i.e. 2004-2024) exhibit a similar pattern to those presented in the approved EIA Report (i.e. 1998–2018), with comparable numbers of exceedance events and only minor variations.

Table 3.2 Recorded number of rainfall exceedance events

Year	Daily Accumulated Rainfall > (mm)						
	85	95	105	115	125	135	145
1998	3	3	3	2	2	2	2
1999	6	5	4	4	4	4	2
2000	5	4	3	3	3	3	3
2001	14	11	8	7	5	3	3
2002	7	5	5	3	3	2	2
2003	5	5	3	2	1	1	1
2004	2	2	1	1	1	1	1
2005	4	3	3	3	2	2	2
2006	7	6	5	5	4	3	2
2007	1	1	1	0	0	0	0
2008	8	6	5	5	5	5	4
2009	4	3	3	2	2	2	0
2010	2	1	1	1	1	1	1
2011	3	2	2	2	2	1	0

Year	Daily Accumulated Rainfall > (mm)						
	85	95	105	115	125	135	145
2012	5	4	2	1	0	0	0
2013	5	4	3	3	3	3	2
2014	4	3	2	2	2	1	1
2015	5	3	2	2	1	1	1
2016	10	8	5	5	4	3	3
2017	7	6	5	5	5	3	3
2018	6	5	5	5	5	5	5
2019	5	2	2	2	2	1	0
2020	7	4	3	3	3	3	3
2021	7	5	4	4	3	3	3
2022	5	4	2	1	1	1	1
2023	6	5	4	3	3	3	3
2024	6	5	4	3	2	2	1
Total (1998-2018)	**113**	**90**	**71**	**63**	**55**	**46**	**38**
Total (2004-2024)	**109**	**82**	**64**	**58**	**51**	**44**	**36**
Average (1998-2018)	**5.4**	**4.3**	**3.4**	**3.0**	**2.6**	**2.2**	**1.8**
Average (2004-2024)	**5.2**	**3.9**	**3.0**	**2.8**	**2.4**	**2.1**	**1.7**

3.3 Review of Catchment Area

3.3.1.1 According to the approved EIA Report (AEIAR-221/2019), the calculation of surface runoff was based on the effective catchment area within the Project Site. Under the detailed design stage, the catchment area has been reviewed based on the latest golf course design as shown in **Table 3.3**. Under current detailed design stage, the effective catchment area within the Project Site is 198,111m^2. The effective catchment area under the detailed design remains broadly consistent with that presented in the approved EIA Report, with a slight reduction of approximately 4%, indicating a similar finding.

Table 3.3 Effective Catchment Area within Project Site

	Approved EIA Report (m^2)	Detailed Design Stage (m^2)
Paved Area within Project Site	35,750	80,045
Unpaved Area within Project Site	498,020	420,235
Paved Area Runoff Coefficient	0.9	0.9
Unpaved Area Runoff Coefficient	0.35	0.3
Effective Catchment Area within Project Site	206,482	198,111

3.4 Highly Sustainable Selected Turfgrass Species

3.4.1.1 Based on the latest golf course operation design presented in **Appendix 3.2** considering the Environmental Management Framework Plan water management, turfgrass species selection, etc. prepared by the turfgrass specialist, there will be an approximate 350mm of sand-cap across the golf course, which will act as a water storage attenuation system, holding water within the sand-cap during any storms. Any surplus drainage water will be collected and diverted to the water storage system(s) and discharge to Tolo Harbour. Also, as advised by the turfgrass specialist in **Appendix 3.2**, the proposed turfgrass species has been selected with low nutrient requirements and high resistant to attack from pathogens and insects. Thus, it is anticipated that the amount of agrochemicals including fungicides, insecticides and fertilizers used could be minimized as shown in **Appendix 3.3**. Besides, the latest design in terms of the sand-cap capacity and volume of water storage system(s), have been presented in **Appendix 3.3** as a comparison. **Appendix 3.3** indicates that, compared to the proposal outlined in the approved EIA Report, the proposed application rates of fungicides, insecticides and fertilizers will be reduced in the latest proposal. The operator plans to establish a highly sustainable golf course with the utilisation of organic fertilisers in both granular and foliar forms. The selection of Zoysia matrella turfgrass which is a highly sustainable turfgrass, known for its drought tolerance and reduced nitrogen requirements combined with precise calibration of nutrient and agrochemicals formulations, application rates, and targeted delivery methods, exemplifies the operator's commitment to an ecologically responsible management programme. The application of the agrochemicals to the turf area will be reviewed in the TMP under Condition 2.26 of FEP-01/571/2019/A.

3.5 Consideration of Filter System at Drainage System

3.5.1.1 With reference to the approved EIA Report for the Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung (AEIAR-091/2005) ("the approved KSC EIA Report"), filter system was proposed for the removal of surface runoff pollutant as a mitigation measure, which could remove both nutrients and pesticides (i.e. fungicides and insecticides). The product and design information of the filter system is shown in **Appendix 3.4**, and its performance is presented in **Table 3.4** below. According to the approved KSC EIA Report and Environmental Monitoring & Audit (EM&A) Manual, routine water quality monitoring of the filter system effluent water quality on nutrients and pesticides removal performance during the operation of the filter system was recommended to ensure the filter systems function properly. With reference to the Monthly EM&A Report for the 2-year operation phase monitoring period at the Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung, there were no water discharge through the drainage system and filter system on some occasions, and thus, there were reporting months with no water sample collected for the filter system effluent water quality.

Table 3.4 Performance of Filter System

Analysed Components	Influent concentration (mg/L)	Effluent concentration (mg/L)	Removal Rate (%)
Total Nitrogen (TN)	54.4	17.7	67.46
Total Phosphorus (TP)	28.9	7.39	74.43
Total Petroleum Hydrocarbons (TPH) [1] Fungicides [2] Daconil Bayleton Insecticides [2] Chlorpyrifos Fipronil	320	16	95.00

Note:

[1] Total Petroleum Hydrocarbons (TPH) includes a broad family of several hundred chemical compounds and they are mixture of chemicals basically made from hydrogen and carbon which represent between 50% and 98% of its composition.

[2] These are the fungicides and insecticides proposed in the approved EIA Report (AEIAR-221/2019) and considered in the detailed calculation of residual concentrations of agrochemicals.

3.5.1.2 Under the current detailed design stage, the filter system will be considered in the design of the drainage system to avoid potential water quality impact resulting from the discharge to Tolo Harbour. The consideration of filter system and the location(s) of deployment will be reflected in the water quality assessment under the TMP under Condition 2.26 of FEP-01/571/2019/A if considered appropriate. Besides, routine water quality monitoring of the filter system effluent water quality on nutrients and agrochemicals removal performance during the operation of the filter system will be recommended to ensure the filter systems function properly. The relevant details will be included in the TMP.

3.5.1.3 According to the approved EIA Report (AEIAR-221/2019), the water storage tanks with a total capacity of 30,000 m^3 has been proposed for mitigating potential water quality impact during operation phase. Based on the assumptions and operation parameters considered in the approved EIA Report (AEIAR-221/2019), including application rates, turf area, residual percentage of agrochemicals, etc., with the abovementioned filter system considered in the design of the drainage system, the capacity of water storage system(s) required to mitigate adverse water quality impact could be reduced to 9,100 m^3 as shown in **Table 3.5** below. Similar to the conservative approach adopted in the approved EIA Report, the effluent concentration during the first flush stored in water storage system(s) is assumed to represent the bypass concentration passing through the filter system before discharge. This is based on the consideration that the first flush contains the most concentrated chemicals.

Table 3.5 Capacity of Water Storage System(s) Required

Capacity of Water Storage System(s) Required (m^3) [1]	
Without Filter System Considered in Drainage System before Stormwater Bypass	**With Filter System Considered in Drainage System before Stormwater Bypass**
30,000	9,100

Note:

[1] For a conservative assessment, the effluent concentration during the first flush stored in the water storage system(s) is assumed to be the bypass concentration passing through the filter system prior to discharge.

3.6 Review of Potential Environmental Impacts

3.6.1.1 As discussed in **Section 3.1.1.5**, temporary sedimentation tanks will be installed to intercept the surface runoff during construction phase, and it is considered adequate for mitigating the potential water quality impact. As mentioned in the above sections, with the latest golf course design in **Appendix 3.2**, consideration of filter system, etc., potential impacts to the water quality and hence to the surrounding WSRs are not anticipated due to the reduction of size of the water storage system(s).

3.6.1.2 According to the approved EIA Report, there are no numeric criteria for total inorganic nitrogen (TIN) and total phosphorus (TP) in Water Quality Objectives (WQOs) for Tolo Harbour and Channel WCZ. For the proposed criteria for TIN and TP in the approved EIA Report, the marine water quality monitoring data for the nearest marine monitoring station TM3 in the Tolo Harbour and Channel Water Control Zones (WCZ) in 2013-2017 has been reviewed and the range of the marine water monitoring data in 2013-2017 for TIN and TP (as shown in **Table 3.6**) was adopted as the criteria for any bypass of the water storage tanks. In other words, if the concentrations of TIN and TP in the bypass of the water storage tanks do not exceed the monitoring results, adverse water quality impact is not anticipated from the stormwater bypass with residual fertilizers. As shown in **Table 3.6**, the marine water monitoring data for Station TM3 in 2013-2024 for TIN and TP have been reviewed for the criteria for any bypass of the water storage system(s) under the current detailed design.

Table 3.6 Marine Water Quality Data at Station TM3 for Tolo Harbour and Channel WCZ in 2013-2024

Year	Annual Mean of TIN (mg/L)	Annual Mean of TP (mg/L)
2013	0.087	0.043
2014	0.116	0.047
2015	0.081	0.043
2016	0.068	0.025
2017	0.059	0.028
2018	0.051	0.021
2019	0.044	0.030
2020	0.061	0.036
2021	0.078	0.046
2022	0.104	0.046
2023	0.067	0.052
2024	0.061	0.072

3.6.1.3 Similar to the conservative approach adopted in the approved EIA Report, the effluent concentration during the first flush stored in water storage system(s) is assumed to represent the bypass concentration passing through the filter system before discharge. This is based on the consideration that the first flush contains the most concentrated chemicals. Based on the assumptions and operation parameters considered in the approved EIA Report (AEIAR-221/2019), including turf area, residual percentage of agrochemicals, etc. and the reduced application rates of agrochemicals in **Appendix 3.3**, and the consideration of filter system in the drainage system mentioned in **Section 3.5**, water storage system(s) comprising water storage tanks with a capacity of 15,000m^3 (i.e. comprising 8,000 m^3 at the Practice Range and 7,000 m^3 at the Clubhouse) supplemented with attenuation ponds with a combined

capacity of approximately 4,800m^3, forming a total capacity of about 19,800m^3 is adequate to comply with the proposed criteria in the approved EIA Report and **Table 3.6** as presented in **Appendix 3.5** and **Table 3.7**.

Table 3.7 Concentrations of Agrochemicals after Passing through Filter System

Agrochemicals/ Nutrients	Proposed Criteria in the Approved EIA Report (AEIAR-221/2019) and Table 3.6 (mg/L)	Calculated Concentration after Passing through Filter System (mg/L) [2]	Compliance (Y/N)
Fungicides			
Daconil	4.7E-04	2.583E-06	Y
Bayleton	2.0E-02	1.002E-06	Y
Insecticides			
Chlorpyrifos	1.7E-05	1.157E-06	Y
Fipronil	6.8E-04	4.626E-09	Y
Fertilizers			
Total Inorganic Nitrogen (TIN)[1]	0.044-0.116	0.041	Y
Total Phosphorus (TP)[1]	0.021-0.072	0.012	Y

Note:

[1] The marine water monitoring data for Station TM3 in 2013-2024 for TIN and TP have been reviewed in **Table 3.6** for the criteria for any bypass of the water storage system(s) under the current detailed design.

[2] For a conservative assessment, the effluent concentration during the first flush stored in the water storage system(s) is assumed to be the bypass concentration passing through the filter system prior to discharge.

3.6.1.4 According to the approved EIA Report (AEIAR-221/2019), water storage tanks with a total capacity of 30,000m^3 was recommended to collect surface runoff. As discussed in **Section 1**, in view of the limited lands and site constraints, the rainfall data, catchment area and turfgrass species have been reviewed and discussed in above sections. As mentioned above, with the latest golf course design of highly sustainable turfgrass species, consideration of filter system, and provision of water storage tanks with attenuation ponds with a total capacity of 19,800m^3, potential impacts to the water quality and hence to the surrounding WSRs are not anticipated. Similar to the approved EIA Report, with a view to further minimize the water quality impact arising from the use of agrochemicals and first flush, a number of measures and practices have been incorporated in the golf course design from the drainage system to the turfgrass management. A summary of all the water quality assessment viewpoints regarding the proposed measures and practices is shown below:

- As mentioned in **Section 3.1**, there will be double-layer drainage system, including catch basins at the surface and open channel to cut off and collect the surface runoff for the golf area. With the double-layer drainage system, surface runoff within the golf area will be collected and directed to the water storage system(s) for first flush control.
- All the agrochemicals in the first flush from surface runoff will be retained in the water storage system(s) and will be recycled for irrigation of turfgrass.

- Even if the agrochemicals in the first flush are anticipated to have higher concentrations, the estimated agrochemical concentration after passing though the filter system is still in compliance with the relevant assessment criteria.
- Most of the residual agrochemicals will have been carried away by the first flush which will be stored in the water storage system(s) without bypassing to the sea. The remaining residual agrochemicals in turfgrass are generally in a trace amount and will be further diluted by the prolonged and heavy rainfall. These remaining residual agrochemicals if being bypassed to Tolo Harbour will be further diluted by dispersion in seawater. Therefore, the actual agrochemical concentrations at WSRs are anticipated to be much lower than the estimated agrochemical concentrations in the first flush stored in water storage system(s) after passing through the filter system. Nevertheless, the higher-than-actual estimated agrochemical concentrations after passing through the filter system are still in compliance with the relevant criteria.
- Since bypass events would be minimized with the water storage system(s) in place, and the actual agrochemical concentrations are much lower compared to those in the approved EIA Report, the loading of agrochemicals to Tolo Harbour are intermittent and low.
- None of the currently proposed agrochemicals are Persistent Organic Pollutants set out in Schedule 1 of Pesticides Ordinance (Cap.133). Moreover, all the agrochemicals will be further reviewed under the TMP and whether the agrochemical is environmental friendly (e.g. bioaccumulation, half-life, soil absorption rate, etc.) would be one of the important considerations. Hence, there will not be significant accumulation.

3.6.1.5 As mentioned in **Section 3.1**, direct discharge of surface runoff collected at non-golf area is proposed to avoid extensive drainage system causing potential interruption or damage to the landfill facilities. Under the current detailed design, there will be double-layer drainage system, including catch basins at the surface and open channel to cut off and collect the surface runoff for the golf area. With the double-layer drainage system, the surface runoff within the golf area will be collected and directed to the water storage system(s) for recirculation and first flush control. Since the agrochemicals will only be applied at golf area, residual agrochemicals at non-golf area, e.g. access road, building area, etc. are not anticipated. Hence, residual agrochemicals contained in the surface runoff from the non-golf area are also not anticipated. The surface runoff collected at non-golf area can be controlled by the implementation of best management practices such as trap catchpit, etc. With the best management practices, the potential impacts to the water quality and hence to the surrounding WSRs are not anticipated. Besides, as mentioned in above section, there will be water quality monitoring carried out during operational phase to ensure compliance. To ensure the implementation of the recommended mitigation measures, the monitoring location for the water quality monitoring to be conducted during operational phase will be further reviewed in the TMP under Condition 2.26 of FEP-01/571/2019/A.

3.6.1.6 As discussed in **Section 3.1**, another existing drainage outfall has been selected as the proposed location of outfall under the current detailed design stage, as shown in **Appendix 3.1**. Compared to the proposed outfall location in the approved EIA Report, the new proposed outfall location is further away from the Yim Tin Tsai Fish Culture Zone but slightly closer to the WSRs, e.g. Water Services Department Seawater Intake in Tai Po and the corals located south of the Project Site, etc. As discussed in **Section 3.5**, with the latest

golf course design of highly sustainable turfgrass species, consideration of filter system, and provision of water storage system(s), potential impacts to the water quality and hence to the surrounding WSRs are not anticipated. Besides, according to the approved EM&A Manual, there will be water quality monitoring carried out at the south of Project Site near the coral sites during operational phase to ensure compliance with the EIA recommendations. In addition, to ensure the implementation of the recommended mitigation measures, the monitoring location for the water quality monitoring to be conducted during operational phase will be further reviewed in the TMP under Condition 2.26 of FEP-01/571/2019/A.

3.6.1.7 As discussed in **Section 1.3**, a number of concurrent projects in the vicinity of the Project has been identified. Surface runoff collected will only be bypassed from the water storage system(s) when there is prolonged rainfall. With the implementation of the mitigation measures, it is anticipated that the water quality impacts generated would be localized and there would be no adverse cumulative water quality impacts with concurrent projects during the operational phase.

3.6.1.8 As required in Condition 2.26 of FEP-01/571/2019/A, a TMP shall be submitted to include information on the turfgrass species, usage of agrochemicals, management methodology, as well as worst-case assessments on the water quality impacts resulting from landfill leachate and the possible discharge from the Project into Tolo Harbour. As such, the reduced capacity of water storage system(s) and its associated water quality impacts resulting from the possible discharge from the Project will be further reviewed in the TMP under Condition 2.26 of FEP-01/571/2019/A.

3.6.1.9 In addition to water quality impact, all environmental aspects considered in the EIA report are revisited to identify any environmental changes arising from the proposed amendments. For the amendment on the water storage system(s), with the proper implementation of the recommended mitigation measures in the approved EIA Report (AEIAR-221/2019), potential impacts on air quality, noise, hazard to life, waste management implications, land contamination, landfill gas hazards, ecology, fisheries and landscape and visual are not anticipated.

4. Change of Environmental Monitoring & Audit (EM&A) Scope

4.1 General

4.1.1.1 As discussed in **Section 3.1.1.5**, temporary sedimentation tanks will be installed to intercept the surface runoff during construction phase, and it is considered adequate for mitigating the potential water quality impact. Based on the latest stormwater drainage design discussed in **Section 3**, water storage system(s) is proposed with two water storage tanks (i.e. 15,000 m^3 comprising 8,000 m^3 at the Practice Range and 7,000 m^3 at the Clubhouse) supplemented with three attenuation ponds (combined capacity of approximately 4,800m^3), forming a total capacity of about 19,800m^3. Besides, according to the latest golf course operation design discussed in **Section 3**, the selection of turfgrass and application of agrochemicals, as well as the consideration of filter system, subsequent water quality impact have been reviewed. Considering the provision of a water storage system(s) with a total capacity of about 19,800m^3, appropriate selection of turfgrass, reduced application of fungicides, insecticides, and fertilizers, and the consideration of filter system, the proposed amendments would not result in significant environmental impacts as compared with those recommended in the approved EIA report. Also, as mentioned in **Section 3**, the reduced capacity of water storage system(s) and its associated water quality impacts resulting from the possible discharge from the Project will be further reviewed in the TMP under Condition 2.26 of FEP-01/571/2019/A.

4.1.1.2 Moreover, the EM&A requirements for water quality monitoring stations and monitoring requirements have been reviewed. Considering that the water quality monitoring stations proposed in the approved EM&A Manual have already covered areas outside the 500m assessment area (i.e. WM-5 at over 1km from the Project Site), additional monitoring stations for impact monitoring during operational phase are considered not required. As recommended in **Section 3.5**, routine water quality monitoring of the filter system effluent water quality on nutrients and agrochemicals removal performance during the operation of the filter system will be recommended to ensure the filter systems function properly. Besides, as discussed in **Section 3.6.1.4**, due to the new proposed location of outfall, to ensure the implementation of the recommended mitigation measures, the monitoring location for the water quality monitoring to be conducted during operational phase will be further reviewed in the TMP. The relevant details will be reviewed and included in the TMP under Condition 2.26 of FEP-01/571/2019/A.

4.1.1.3 The first year of the operational phase is critical to demonstrate the environmental performance can be achieved with the latest proposed water storage system(s). Considering that bi-weekly monitoring has already been proposed for the first year in the approved EM&A Manual, the extension of the monitoring period or the increase in monitoring frequency during the operational phase is not proposed in this ERR. As stipulated in Condition 3.2 of FEP-01/571/2019/A, the need to extend operational phase water quality monitoring programme will be reviewed no later than two months before the end of the monitoring period. Additionally, the monitoring parameters and frequency will be further reviewed in the TMP under Condition 2.26 of FEP-01/571/2019/A.

4.1.1.4 According to the approved KSC EM&A Manual, all fertilizers and pesticides will be well-documented including location of applications, type of fertilizer applied, amount applied, date of applications and product applied. The inclusion of relevant details in the EM&A reports for the operational phase will be further reviewed in the TMP.

4.1.1.5 In view of the above, the EM&A requirements recommended for the water quality monitoring to be conducted during operational phase will be further reviewed in the TMP.

5. Justification on Material Change

5.1 General

5.1.1.1 Details of the proposed amendments under the VEP application have been listed out in **Table 2.1**. The proposed amendments would not involve any circumstances stated under Section 6 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) which are regarded as material changes to a designated project, as listed below:

- A change to physical alignment layout or design of the project causing an environmental impact likely to affect existing or planned community, ecologically important areas \or sites of cultural heritage;
- A physical change resulting in an increase in the extent of reclamation or dredging affecting water flow or quality likely to affect ecologically important areas, or disrupting sites of cultural heritage;
- An increase in pollution emissions or discharges or waste generation likely to violate guidelines or criteria in this technical memorandum without mitigation measures in place;
- An increase in throughput or scale of the project leading to physical additions or alterations that are likely to violate the guidelines or criteria in this technical memorandum without mitigation measures in place; or
- A change resulting in physical works that are likely to affect a rare, endangered or protected species, or an important ecological habitat, or a site of cultural heritage.

5.1.1.2 Hence, the proposed amendments do not constitute material changes to the DP.

6. Conclusion

6.1.1.1 This document has discussed there will be no environmental changes result from the proposed amendment items:

- The water storage system(s) comprising water storage tanks and attenuation ponds for the collection of surface runoff from the golf area at the Project Site as stipulated in Conditions 2.39 and 2.46 of FEP-01/571/2019/A.

- The construction of water storage system(s) prior to the construction of access road in each of the construction phases to collect surface runoff for sedimentation as stipulated in Condition 2.40 of FEP-01/571/2019/A.

6.1.1.2 An environmental review has been conducted for the proposed variation on various environmental aspects, including water quality, air quality, noise, hazard to life, waste management implications, land contamination, landfill gas hazards, ecology, fisheries and landscape and visual. According to **Section 3.5** and **Section 3.6**, based on the assumptions and operation parameters considered in the approved EIA Report (AEIAR-221/2019), and the consideration of filter system in the drainage system mentioned in **Section 3.5**, water storage system(s) with capacity 9,100 m^3 is adequate to mitigate the potential water quality impact. Under the current design, water storage system(s) comprising water storage tanks with a capacity of 15,000 m^3 (i.e. comprising 8,000 m^3 at the Practice Range and 7,000 m^3 at the Clubhouse) supplemented with attenuation ponds with a combined capacity of approximately 4,800m^3, forming a total capacity of about 19,800m^3 with the consideration of filter system is therefore adequate to comply with the proposed criteria in the approved EIA Report as shown in **Table 3.5**. Hence, there is no adverse environmental impact arising from the proposed amendments. The potential water quality impact resulting from the discharge to Tolo Harbour will be further reviewed in the TMP under Condition 2.26 of FEP-01/571/2019/A. If adverse water quality impact is predicted under the TMP with the latest design, more than one filter system discussed in **Section 3.5** would be considered to provide further removal of the residual agrochemicals to achieve compliance.

6.1.1.3 There will be no material change to the environmental impact even with the proposed amendments. The project will remain in compliance with the EIAO-TM requirements, and no deterioration of the surrounding environmental is anticipated.

Appendix 1.1

Figure 1 of FEP-01/571/2019/A

Legend 圖例

Project Location
工程項目位置

1.2 ha Core Roosting Area
1.2 公頃核心夜間棲息地

Aquilaria sinensis
土沉香

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

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

Appendix 3.1

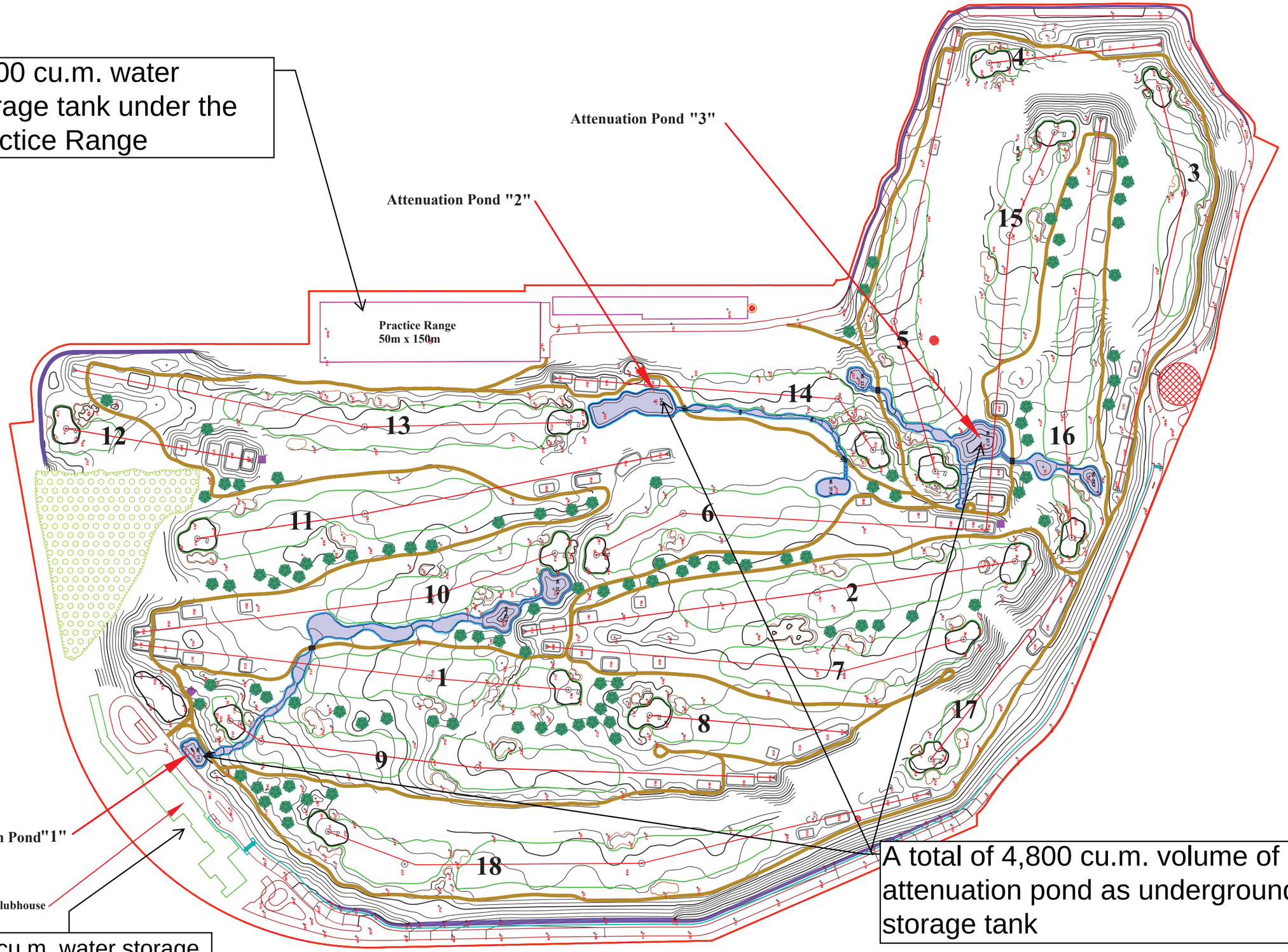
Latest Stormwater Drainage Design

8,000 cu.m. water storage tank under the Practice Range

Attenuation Pond "3"

Attenuation Pond "2"

Practice Range
50m x 150m



Attenuation Pond"1"

Clubhouse

7,000 cu.m. water storage tank at the Clubhouse

A total of 4,800 cu.m. volume of attenuation pond as underground storage tank

Indicative Only

Prepared By:
Fry / Straka Global Golf Course Design
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Web: www.frystraka.com
FRY STRAKA
GLOBAL GOLF COURSE DESIGN

Tai Po Golf Club

Hong Kong

Attenuation Ponds Location

Jason Straka
Mr. Jason Straka, MPS, ASGCA
Principal

Accepted By

Signature

Title

Date

NORTH

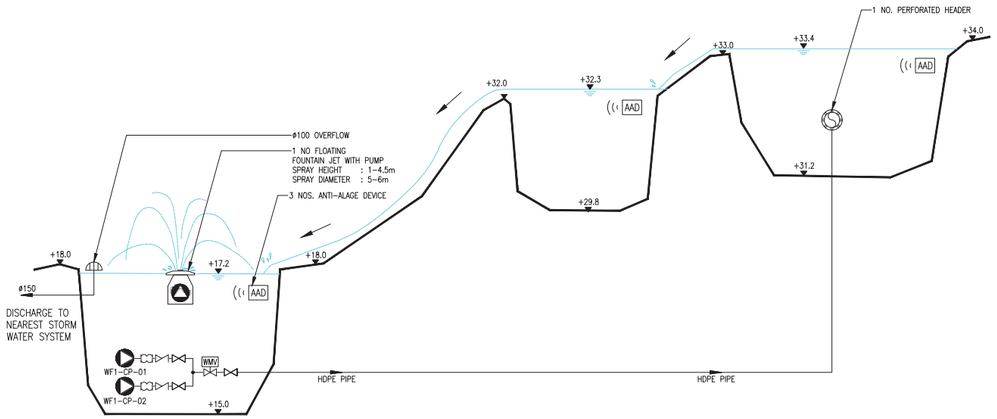
SCALE: 1:1500
0 50 100 200

DESIGN: JAS

DATE: 3/28/2024

REVISIONS:	DATE:	INITIAL:

SHEET 9



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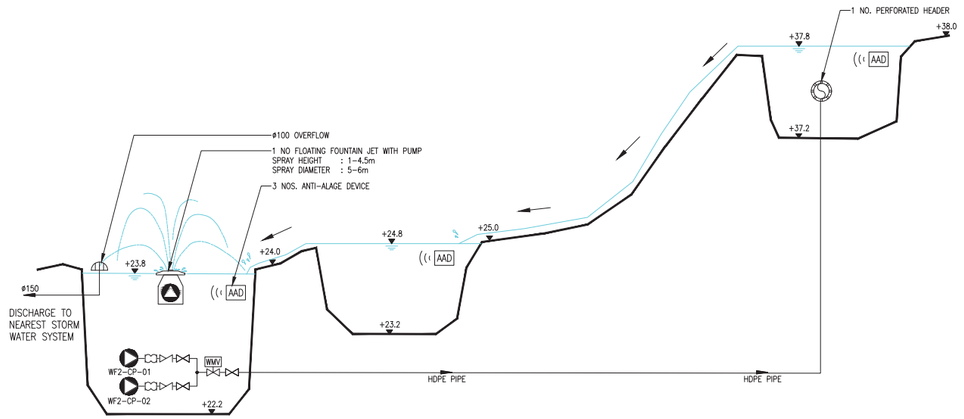

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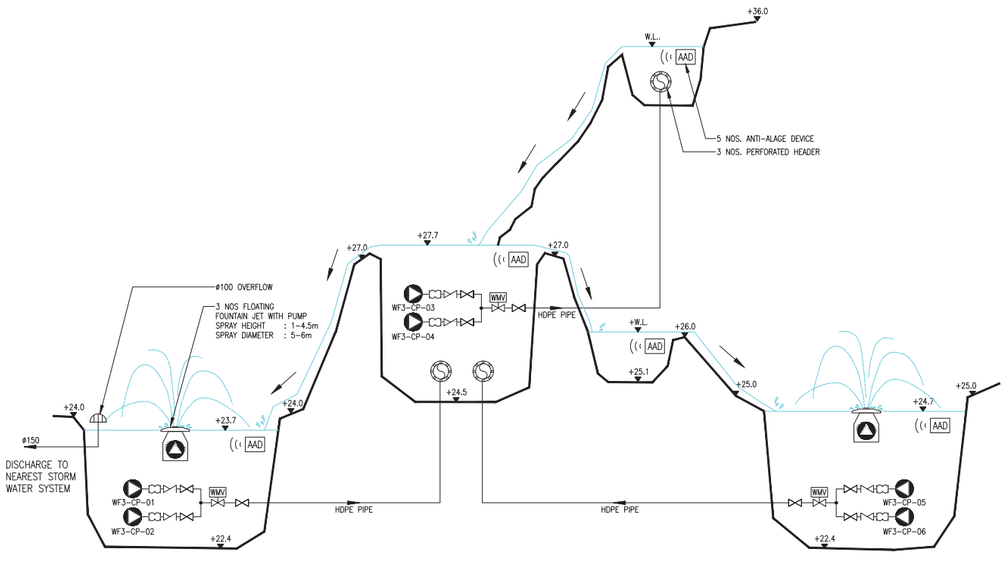


ATTENUATION POND 3

Indicative Only

NOTES

- All dimension should be checked and verified on site before commencing any works, discrepancies found in this drawing shall be notified to Aquascape immediately.
- 所有尺寸於工程開始前須於地盤核對清楚，圖則上出現之矛盾處須盡快通知本司．

LEGEND

- PUMP
- FLOATING FOUNTAIN JET WITH PUMP
- ANTI-ALAGE DEVICE
- ø100 OVERFLOW
- PERFORATED HEADER
- WASHING MACHINE VALVE
- GATE VALVE
- FLEXIBLE CONNECTOR
- CHECK VALVE

REV.	DATE	DESCRIPTION
0	08 JAN 2024	FIRST SUBMISSION

DEVELOPER 發展商

TAI PO GOLF CLUB LIMITED

ARCHITECT 建築師

FRY STRAKA GLOBAL GOLF COURSE DESIGN

E&M CONSULTANT 機電顧問工程師

LANDSCAPE ARCHITECT 園藝建築師

AQUASCAPE LTD. 滌藝有限公司

PROJECT 項目

Tai Po Golf Course, Hong Kong

DRAWING TITLE 圖則名稱

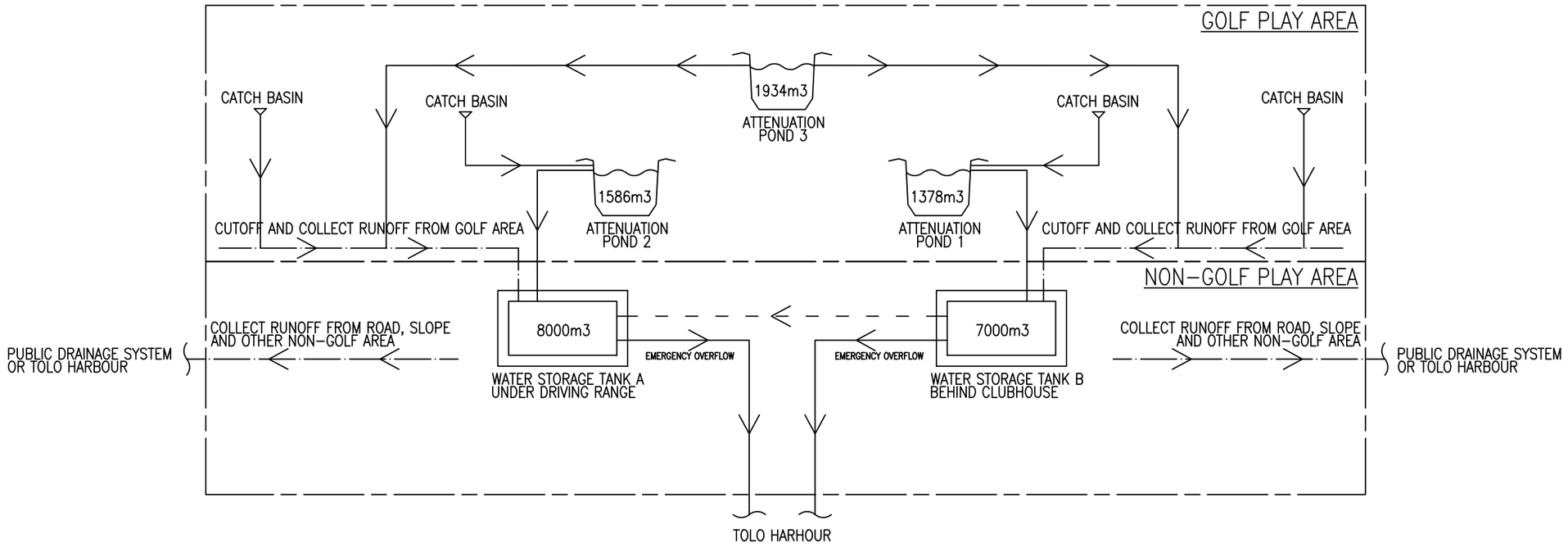
SCHEMATIC FLOW DIAGRAM FOR WATER FEATURE 1 TO 4

DESIGNED BY 設計: BL	DATE 日期: 12 SEP 2023
DRAWN BY 繪圖: MC	SCALE 比例: N.I.L. @ A1
CHECKED BY 核實: BL	PROJECT NO. 項目編號: HAT23072
DRAWING NO. 圖則編號: WF01	REVISION 修改: 0

U–CHANNEL

DRAIN PIPE

RISING MAIN



STORMWATER DRAINAGE SCHEMATIC DIAGRAM

NUMBER / 編號	DATE / 日期	AMENDMENT / 修訂

CIVIL, STRUCTURAL & GEOTECHNICAL ENGINEER

wsp

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

PROJECT / 工程項目

PROPOSED GOLF COURSE DEVELOPMENT AT TAI PO TOWN LOT NO. 246 SHUEN WAN, TING KOK, TAI PO

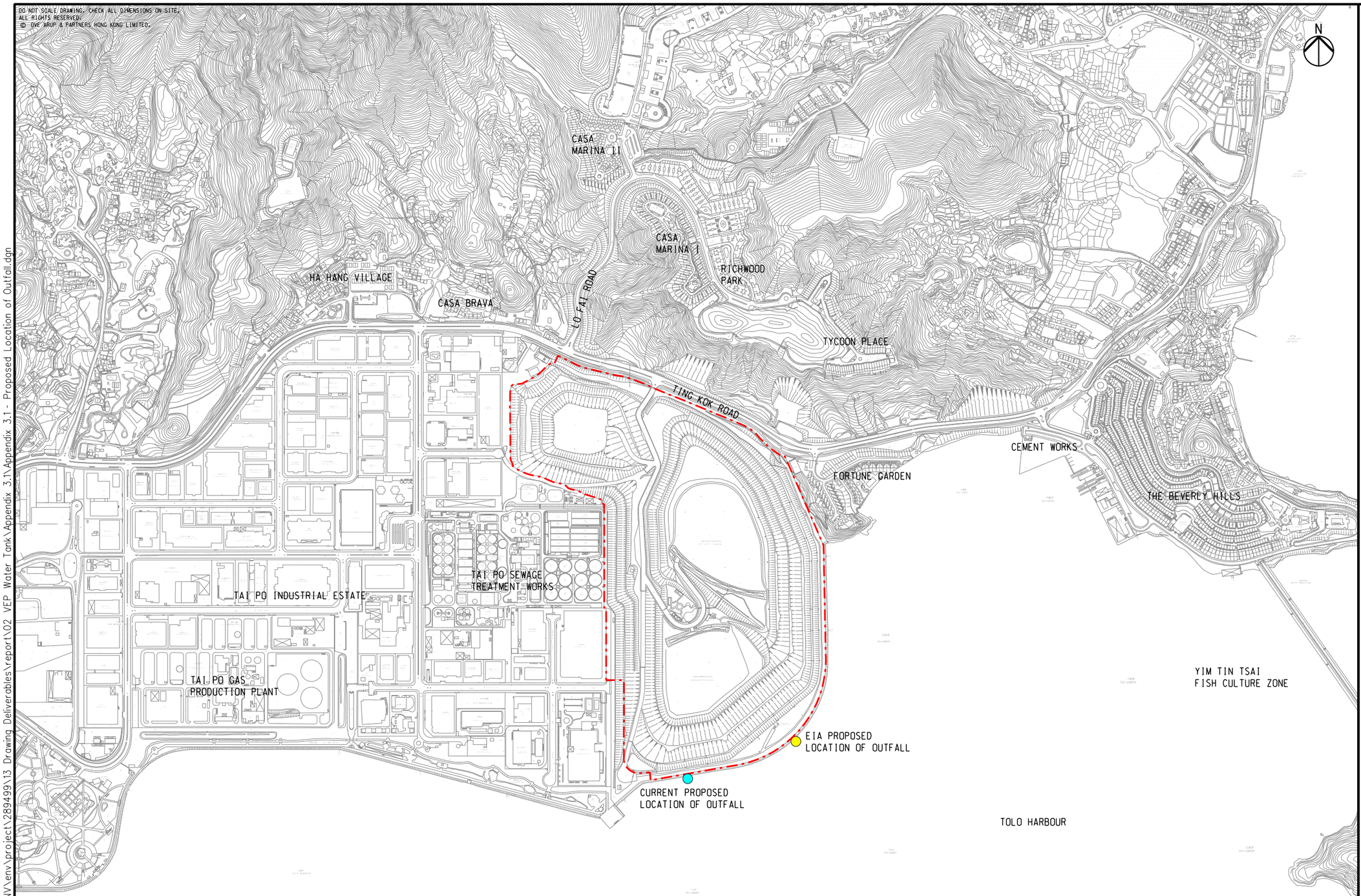
DRAWING / 圖名

STORMWATER DRAINAGE SCHEMATIC DIAGRAM

SCALE / 比例	JOB NUMBER / 工程編號
	2537124
DATE / 日期	DRAWING NUMBER / 圖號

DESIGNED / 設計	CHECKED / 審核	APPROVED / 審定

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED
除特別注明外, 所有尺寸是以毫米制
- DO NOT SCALE DRAWING
圖中以所有標注尺寸為準, 不應量度
- ALL MEASUREMENTS SHOULD BE VERIFIED ON SITE
最終尺寸須在現場核對準確



LEGEND

PROJECT BOUNDARY

Rev	Description	By	Date
A	FIRST ISSUE	GL	07/25

Consultant

ARUP

Contract No. and Title

PROPOSED GOLF COURSE DEVELOPMENT AT TAI PO LOT NO. 246 SHUEN WAN

Drawing title

PROPOSED LOCATION OF OUTFALL

Drawing no.			Rev.
APPENDIX 3.1			A
Drawn: GL	Date: 07/25	Checked: EL	Approved: FC
Scale: 1:10000 @A3		Status: PRELIMINARY	

TAI PO GOLF CLUB LIMITED

Printed by : 11/7/2025
Filename : \\global\EastAsia\HKG\Group\C1ENV\env\project\289499\13 Drawing Deliverables\report\02 VEP Water Tank\Appendix 3.1\Appendix 3.1- Proposed Location of Outfall.dgn

Appendix 3.2

Latest Golf Course Design prepared by Turfgrass Specialist

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Zoysiagrass Turfgrass Selection

Plover Cove Golf Club

18th February 2025

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Document Purpose	Information that details the turfgrass selection, maintenance programme and references to scientific supporting documentation as to the sustainable section and suitability.
Circulation	Dean Nelson, Plover Cove Golf Club Erik Chan, Plover Cove Golf Club Johnston Li, Plover Cove Golf Club Raymond Fong, Fecil Dana Fry, Fry Straka Jason Straka, Fry Straka Bill Kerman, Fry Straka Julian Mooney, Turfgrass® John Clarkin, Turfgrass®
Author	Jonathan Pendry, Turfgrass®

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Executive Summary

This document should be read in conjunction with the previously submitted "*Environmental Management Framework Plan and Examples of Best Practice for the Golf Development at Tai Po, Hong Kong* (now marketed as Plover Cove Golf Club).

This document aims to outline the selection of turfgrass suitable in Hong Kong, with a focus on research supporting the use of *Zoysia matrella* in this climate due to its low environmental impact and sustainable reliance on minimal fertiliser and pesticide use. Additionally, it highlights an example of the programs to be implemented, which will be adjusted based on sand-cap elemental analysis.

Further details can be found within the Agronomy Specifications, also previously submitted. Detailed references have been identified to support its selection as the most sustainable turfgrass species.

There are examples of golf courses, old and new, across the world that exist in protected areas. These designations range from local to internationally significant including RAMSAR and UNESCO designations. Five of the eleven projects with GEO Certified Development Status are situated within or adjacent to an area with a major protection designation. Around 20% of all golf courses registered to GEO's global OnCourse® platform are operating responsibly within an area that is designated for protection.

A key goal of Plover Cove Golf Club has been to design and specify a golf course that has a low environmental footprint, which takes care to select appropriate construction materials to support the overall objective. In summary to design, build and operate a sustainable golf facility.

Turfgrasses Species and Cultivar Selection

The golf course at Plover Cove will be grassed entirely with *Zoysia spp*. (*Zoysia matrella*.). Zoysiagrass is recognised as an environmentally beneficial turfgrass due to its exceptional ability to filter pesticides and nutrients, contributing to the protection of water resources and soil health. Its unique structural and biological features enable efficient interception, absorption, and breakdown of chemical inputs, making it an ideal choice for sustainable turf management (Loch 2013). Zoysiagrass's inherent resistance to pests and diseases, attributed to its C4 (warm season turfgrass) metabolism, reduces reliance on pesticides, further lowering the environmental footprint of its management (Loch, 2013; Kim & Beard, 1989).

Specifically, it is the intention at Plover Cove Golf Club to utilise a 2nd generation ultra dwarf zoysiagrass named **Lynkz** (*Z. minima x Z. matrella*) on the putting greens and **Stadium** (*Zoysia matrella*) on the remainder of the playing area. These two cultivars have been bred specifically for the Southeast Asian climate and selected largely due to their ability to perform under periods of cloud cover which Hong Kong suffers from. Zoysiagrass is currently utilised at both the Hong Kong Golf Club at Fanling, and at Clearwater Bay Golf & Country Club. These are to be procured from a certified turf farm owned by Sportsturf Solutions, Hoi An, Vietnam. They are a full member of the International Turfgrass Genetic Assurance Program (ITGAP) with the golf course guaranteed to receive weed and pest free, genetically pure zoysiagrasses.

These varieties have been selected following extensive research into the sustainability of the future golf operation. It is a core part of the developer's vision. The capabilities of zoysiagrass align well with sustainable turf management practices. By reducing reliance on synthetic fertilisers and pesticides, zoysiagrass supports environmentally responsible golf course management. Its ability to thrive under low-input conditions further reduces the environmental footprint of turf maintenance, making it a preferred choice for areas where water and nutrient conservation are priorities (Braun et al., 2021; Patton et al., 2017).

Zoysiagrass as a Bio-filter of Pesticides and Fertilisers

Zoysiagrass is characterised by its dense canopy and robust thatch layer. This dense growth acts as a physical barrier, intercepting applied chemicals such as pesticides and nutrients, preventing them from rapidly entering the soil and potentially leaching into groundwater. The thatch layer further contributes by slowing water infiltration and providing a medium for chemical decomposition and microbial activity. This structure allows for extended interaction between chemicals, turfgrass, and soil, facilitating the breakdown and absorption of nutrients and pesticides (Patton et al., 2017; Chandran et al., 2016).

The dense growth of zoysiagrass also promotes sediment capture and nutrient retention, which are crucial for reducing runoff and improving water quality in turf and vegetative buffer zones. This function has been shown to significantly mitigate nutrient and pesticide transport, making zoysiagrass an effective environmental buffer (Dabney et al., 2006; Arora et al., 2010).

The root system of zoysiagrass is another critical component of its filtration capability. This grass develops a network of extensive, deep, and fibrous roots that enhance soil stability and increase the surface area available for nutrient and pesticide absorption. Microbial activity within the root zone metabolises pesticides into less harmful compounds, thereby reducing their environmental impact (Arora et al., 2010; Chandran et al., 2016). Additionally, these roots improve soil water retention and provide a physical and biological barrier against chemical movement into deeper soil layers or water sources.

Zoysiagrass's low nutrient and pesticide requirements further amplify its environmental benefits. Studies show that it requires approximately 30% less nitrogen compared to other turfgrasses, such as Bermudagrass (*Cynodon dactylon* var *transvaalensis*), due to its efficient nutrient uptake mechanisms (Braun et al., 2021; Patton et al., 2017). This reduced dependency on chemical inputs directly decreases the risks of nutrient leaching and groundwater contamination. Zoysia spp. absorbs very little Nitrogen during the first month after planting with the grass prioritising root development. Basic fertilisers with ratios of 1:2:3 (N:P:K) or 1:3:4 are adequate during this period. Rates of 0.33-0.50 lbs/1000 sq. ft. biweekly for the first month are adequate if P and K soil levels are medium to high (Raymer 2004).

As part of the best management practice requirements only very precise and modest applications of N will be applied. This also avoids excessive thatch build up should too much N be applied. A reasonable and correct thatch layer (<0.5in.) can help to prevent the runoff of fertilisers, as also generally can the promotion of a healthy dense sward, as well as allowing for the correct ball response. N will accordingly be applied sparingly and in a targeted and systematic manner.

A predominantly foliar organic feeding regime will be pursued at Plover Cove Golf Club. The benefits are numerous, and furthermore, approximately 90% of the nutrients applied are taken in by the plants within the first three hours following application, and up to 98% within five hours, depending on climatic conditions. Using the latest precision guided applicators all applications will be plant specific.

The natural resistance of zoysiagrass to pests and diseases also plays a role in its environmental advantage. Its resilience reduces the need for pesticide applications, lowering the potential for chemical runoff or infiltration into groundwater (Patton et al., 2017).

Golf Course Design and Sustainable Material Selection

Golf Course Design Drainage Strategy

Fry Straka have identified low points of a site where water may gather and can use this existing topography to guide drainage designs with natural filtration and re-capture of water as key concepts. The course will be graded and drained to move excess surface water into dedicated U-channels fed into the water storage tank for irrigation purposes. The sand-cap itself as a key part of the site's drainage design.

Sand-Cap

A shaped sand cap is required to be placed above the re-shaped and drained subgrade fill. This sand-cap primarily acts as a drainage layer, which permits golf to be played all year round on a dry surface. Earlier in the project's development, it was considered to use 50cm for a sand-cap. However, following laboratory testing of various local sand options, it has been determined that the depth of a sand-cap will be 35cm, which reduces the volume of capillary pore space, from a previous 94,000m^3 to a 65,818m^3 capacity. (This water is held tightly in the sand-caps capillary pore space, which is available to the zoysiagrass root system with any excess released in a controlled manner to the drainage system). Crucially, any fertilisers applied are solubilised and utilised.

USGA Putting Greens

Together with the use of the sand-cap, Fry Straka has adopted USGA (rev. ed. 2018) greens construction for the golf course, a method that provides several agronomic benefits. Chiefly, these include a perched water table, rapid water infiltration and percolation, and resistance to compaction. Such characteristics make USGA greens highly suitable for maintaining playability across diverse weather conditions.

In sub-tropical climates, the rapid water infiltration and percolation inherent to USGA greens contribute to effective drainage. The rapid percolation rate leaves air-filled voids in the root zone that limit root water uptake, necessitating consistent re-watering. However, this construction method significantly reduces the risk of disease by preventing waterlogging and compaction, which are conducive to turf stress and pathogen development (Carrow et al., 2001). Healthier turfgrass underpins IPM strategies, as plants grown in well-drained conditions are less reliant on pesticides to mitigate disease pressure.

USGA greens are widely regarded as the optimal method for producing quality playing surfaces while contributing to the long-term reduction of pesticide use. Proper construction and maintenance ensure a balance between agronomic performance and environmental stewardship.

Sustainable Materials used in Construction

Profile PPC

Soil amendments like Profile PPC and ProGanics Biotic Soil Medium enhance the nutrient and water retention capabilities of sand-based root zones by increasing the cation exchange capacity (CEC). This facilitates greater retention of fertiliser and water in the rootzone, extending their availability to plants and reducing application rates. By optimising the soil's physical and chemical properties, these amendments support cost savings and minimise environmental impacts, such as nutrient leaching and chemical runoff (Carrow, 1995; Chandran et al., 2016).

Profile PPC is an inorganic amendment offering 74% pore space, split between water-holding and aeration pores. Its inclusion in greens mixes improves drainage, reduces localised dry spots, and resists compaction while delaying irrigation needs by holding and releasing water efficiently. Its benefits have been demonstrated in promoting healthy root systems that improve disease resistance and reduce maintenance inputs (Patton et al., 2017; Braun et al., 2021).

ProGanics BSM

On degraded soils, ProGanics BSM provides essential organic matter and biological inputs. It has shown significant improvements in soil health metrics, including tripling organic matter, boosting soil respiration by over 400%, and increasing beneficial microbial activity by 304%. These enhancements accelerate soil regeneration and plant establishment in reclaimed environments such as landfills and former mining sites (Huang et al., 1997).

Microbial inoculants, humates, and seaweed applications complement these amendments by fostering biological activity in low-biota soils. This holistic approach underpins sustainable turf management by reducing dependency on synthetic inputs and water, aligning with modern environmental standards (Arora et al., 2010; Dabney et al., 2006).

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Appendix 3.3

Comparison Table for the Scheme in the Approved EIA Report and the Current Scheme

Project Title: **Proposed Golf Course Development at Tai Po Lot No. 246 Shuen Wan**
Project No.: **289499**

Comparison of Application Rates of Fungicides, Insecticides and Herbicides of the Approved EIA and Current Scheme

Approved EIA Scheme			Current Scheme		
Agrochemicals	**Application Rate (kg/ha)**	**Application Frequency**	**Agrochemicals**	**Application Rate (kg/ha)**	**Application Frequency**
Fungicides			**Fungicides**		
Daconil	8.2	Weekly	Daconil	6.7	Weekly
Bayleton	3	Biweekly	Bayleton	2.6	Biweekly
Insecticides			**Insecticides**		
Chlorpyrifos	3	When needed	Chlorpyrifos	3	When needed
Fipronil	0.014	Annually	Fipronil	0.012	Annually
Herbicides			**Herbicides**		
Monosodium Methanearsonate (MSMA)	[1]	[3]	Monosodium Methanearsonate (MSMA)	[1]	[3]
Roundup/ Glyphosate	[2]	[3]	Roundup/ Glyphosate	[2]	[3]
Monument	[1]	[3]	Monument	[1]	[3]
Ronstar	[1]	[3]	Ronstar	[1]	[3]

Note:

[1] According to the approved EIA Report and under the current scheme, rate of application dependent on: (a) target weeds, (b) turfgrass mix with types of weed, and (c) product type.

[2] According to the approved EIA Report and under the current scheme, spot spray, strength dependent on target weeds and their stage of growth.

[3] According to the approved EIA Report and under the current scheme, herbicides will only be applied, when needed. Thus, the application frequency is not fixed.

Project Title: **Proposed Golf Course Development at Tai Po Lot No. 246 Shuen Wan**
Project No.: **289499**

Comparison of Application Rates of Fertilizers of the approved EIA and Current Scheme

Approved EIA Scheme			Current Scheme		
Agrochemicals	**Application Rate (kg/ha)**	**Application Frequency**	**Agrochemicals**	**Application Rate (kg/ha)**	**Application Frequency**
Fertilizers			**Fertilizers**		
Anderson 18-9-18 (for Green, Tee)	54.3	Monthly	Anderson 18-9-18 (for Green, Tee)	33.6	Monthly
Nitrophoska 12:12:17:2 (for Fairway)	66.7	Monthly	Nitrophoska 12:12:17:2 (for Fairway)	51.2	Monthly
Nitrophoska 12:12:17:2 (for Rough)	33.3	Monthly	Nitrophoska 12:12:17:2 (for Rough)	26.1	Monthly
Gypsum/ Dolomite	Soil pH dependent	Monthly	Gypsum/ Dolomite	Soil pH dependent	Monthly
Ferrous Sulfate	[1]	Monthly	Ferrous Sulfate	[1]	Monthly

Comparison of Sand Cap Volume (m^3) of EIA and Current Scheme

Approved EIA Scheme	Current Scheme [2]
Not Provided	65,818

Comparison of Water Tank Size (m^3) of EIA and Current Scheme

Approved EIA Scheme	Current Scheme
30,000	19,800

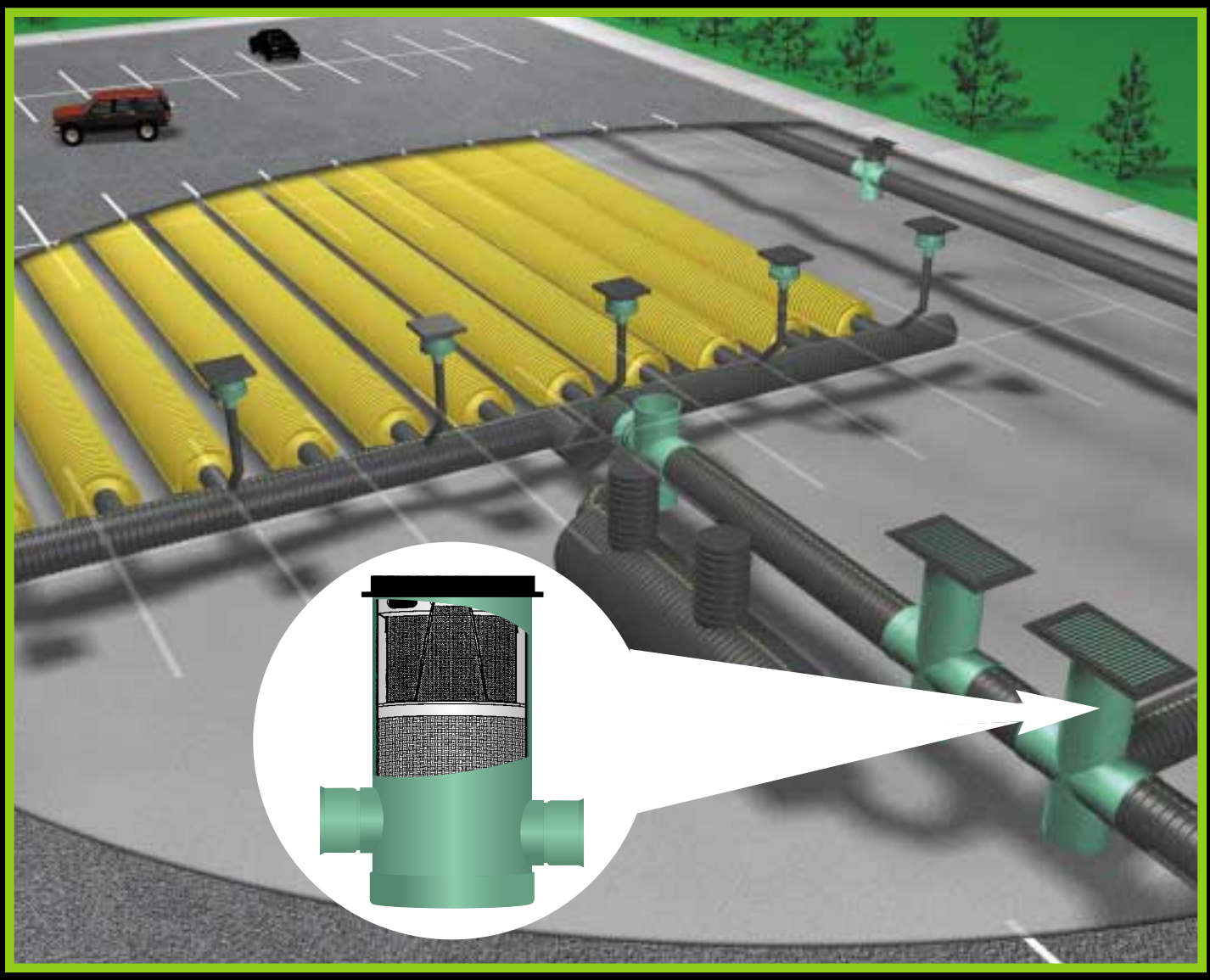
Note:
[1] According to the EIA Report and under the current scheme, rate dependent on turf grass species and their acceptable level of injury symptoms.
[2] Refer to Appendix 3.2 of this ERR.

Appendix 3.4

Product and Design Information of Filter System

StormPURE™

Catch Basin Insert



Exceptional hydrocarbon removal at the head of the storm water treatment train

ADS®

Treating storm water at the source

Phase II of EPA's National Pollution Discharge Elimination System requires all but the smallest municipal and industrial storm sewer systems to treat storm water discharge to the "maximum extent practicable." The regulations are not clear on the allowable concentration of specific pollutants, but it is generally agreed that significant removal of suspended solids, hydrocarbons, sediment, metals and nutrients is required.

The EPA lists a variety of best management practices (BMPs) for treating storm water, and local jurisdictions are free to choose the ones they believe will provide the most effective and economical compliance. One important factor is the ease with which the BMP can be adapted to the existing storm sewer system.

Catch Basin Inserts

Storm water treatment is especially important in locations with higher pollutant concentrations, such as roadways, parking lots, and maintenance and loading areas. Catch basin inserts are increasingly being selected for these applications because of their adaptability to existing drainage systems, fast installation, high flow volume, relatively low cost, and pollutant removal performance.

Storm-PURE™

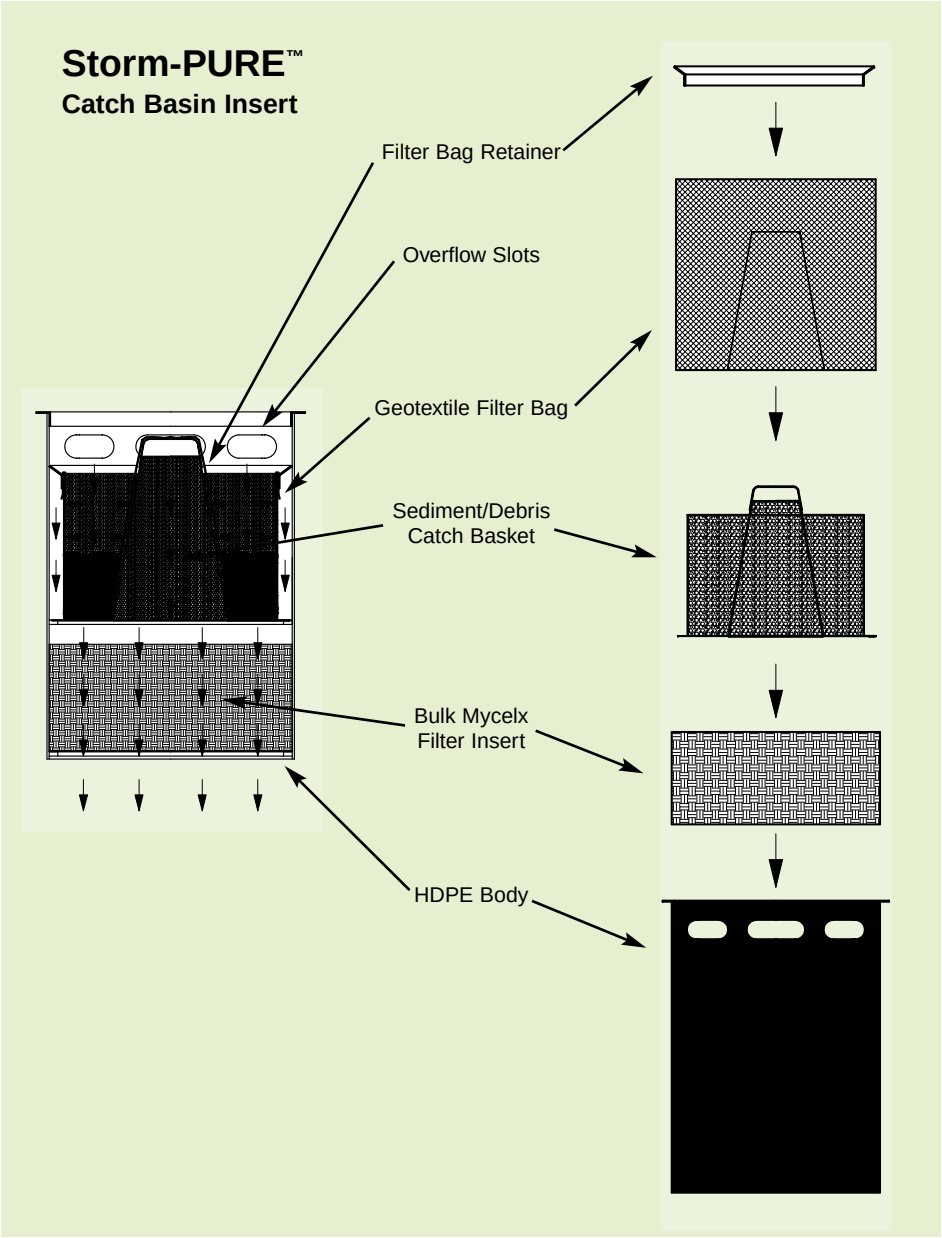
The Nyloplast Division of Advanced Drainage Systems has developed a catch basin insert that provides all of the above benefits, and is particularly efficient at removing pollutants. The Storm-PURE catch basin insert is a two-stage unit that will fit into 24" nominal diameter catch basins (additional sizes to be developed as demand dictates).

The upper section consists of a perforated metal catch basket covered by a geotextile filter bag. This assembly captures sediment and debris while allowing filtered water to pass freely down through the center cone.

The lower stage contains a patented Mycelx® filter insert that attracts and holds tiny particles of hydrocarbons and oil-bound pollutants. The specially treated adsorbent material instantly bonds contaminant particles, resulting in a 95.0% removal rate of total petroleum hydrocarbons.

Both stages are housed in a corrosion-resistant high density polyethylene body with overflow slots at the top to act as a bypass in unusually high flow conditions. The complete assembly will pass 230 gpm without bypassing the flow.

The Storm-PURE catch basin insert fits readily into standard 24" Nyloplast catch basins (including curb inlets and road and highway basins), providing a highly engineered solution for treating storm water. A kit is available for retrofitting standard concrete basins.



Unmatched pollutant removal

The Storm-PURE water quality basin stands apart from competitive units in its ability to remove suspended solids, hydrocarbons and other pollutants. In a laboratory test, polluted storm water was processed through the unit, and samples of the influent and effluent were analyzed by Energy Laboratories Inc. to determine removal efficiency.

The results are shown in the table below, which also includes the published analysis of similar tests conducted at the University of Arkansas on four competitive catch basin inserts. As can be seen, the Storm-Pure basin has **more than double the pollutant removal efficiency than any of the competing brands.**

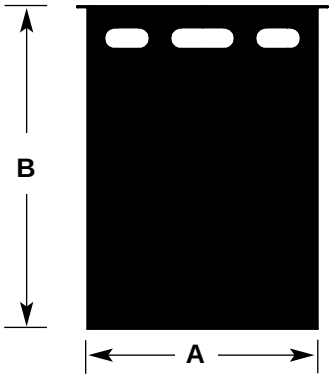
Pollution Removal Performance

Analyzed Components	Storm-PURE Basin Influent	Effluent	Removal Rate	Competitive Catch Basin Inserts Removal Rate A	B	C	D
Total Suspended Solids	295 mg/L	9 mg/L	**96.95%**	45%	10%	40%	21%
Total Petroleum Hydrocarbons	320 mg/L (at 150 gpm flow rate)	16 mg/L	**95.00%**	16%	18%	18%	16%
Zinc	0.45 mg/L	0.06 mg/L	**86.67%**	NA	NA	NA	NA
Oxygen Demand, Biochemical (BOD)	250 mg/L	26 mg/L	**89.60%**	NA	NA	NA	NA
Oxygen Demand, Chemical (COD)	650 mg/L	130 mg/L	**80.00%**	NA	NA	NA	NA
Nitrogen, Total	54.4 mg/L	17.7 mg/L	**67.46%**	NA	NA	NA	NA
Phosphorus, Total as P	28.9 mg/L	7.39 mg/L	**74.43%**	NA	NA	NA	NA
Sediment and Debris	–	–	**98.00%**	NA	NA	NA	NA

Storm-Pure Specifications

Max. Flow Rate of Filter (at 0 ft. of head weir flow)	230 gpm	(0.51 cfs)
Max. Flow Rate of Bypass (at 0.5 ft. of head orifice flow)	1189 gpm	(2.65 cfs)
Max. Flow Rate of Filter & Bypass (at 0.5 ft. of head orifice flow)	1419 gpm	(3.16 cfs)
Primary Filter (Upper Section) Sediment/Debris Storage Capacity	1.42 cu ft	(170 lbs)
Sediment/Debris Particle Size Captured by Primary Filter	>0.033 in	(838 micron)
Sediment/Debris Particle Size Captured by Secondary (Micelx) Filter	>0.012 in	(300 micron)
Secondary Filter Hydrocarbon Removal Storage Capacity	15 lbs	(2.04 gal)
Secondary Filter Media Volume	1.60 cu ft	–

Dimensions *



Nom. Diameter	A	B
24”	21.38”	30.00”

* Additional sizes to be developed as dictated by demand.

Recommended Maintenance Schedule and Procedure

(Personnel should wear protective gear on hands and proper eye protection.)

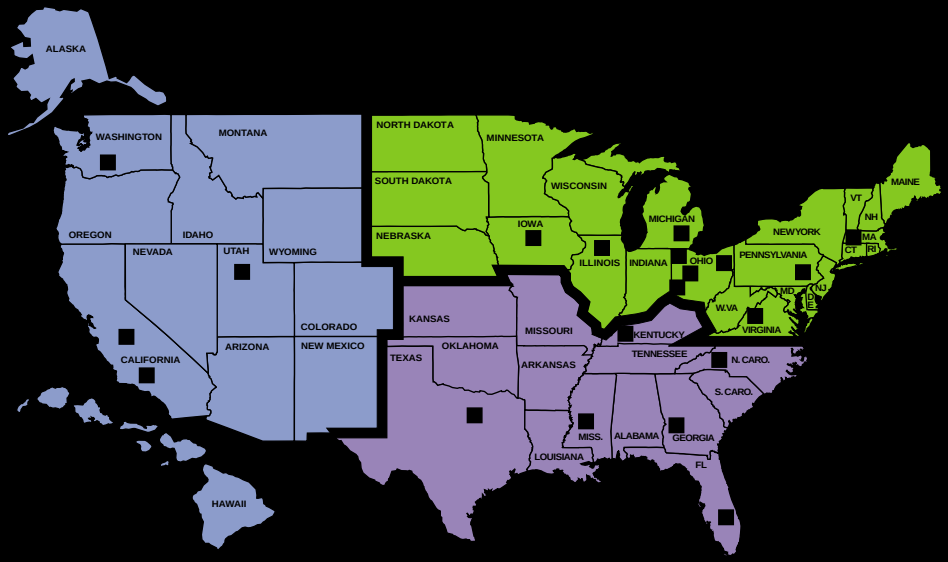
Monthly, or following 6" of accumulated rainfall:

1. Remove grate.
2. Lift out the catch basket (upper chamber) by hand or mechanical lifting device.
3. Remove the gasket material and lift out the geotextile filter bag from the basket.
4. Dispose of sediment and debris. If sediment has dried or caked, it may be necessary to wash the bag.
5. Inspect the filter bag. If too much sediment has dried and cannot be washed out, or if any tears or holes are discovered, the bag should be replaced.
6. Re-position the bag in the catch basket and re--install the basket into the top of the Storm-Pure unit.
7. Replace the grate.

Every 6 months, or after oil/fuel or other hazmat spill event:

1. Clean and inspect the filter bag as outlined at left.
2. The Mycelx hydrocarbon adsorption bag is located in the lower chamber of the Storm-Pure assembly.
3. Obtain a replacement Mycelx filter by calling 800-821-6710.
4. Prior to removing filter, consult with local waste management authorities to determine proper disposal procedure.
5. Remove Mycelx filter bag and dispose of in accordance with local requirements.
6. Install a fresh Mycelx filter into the lower chamber, making sure it is lying flat and is equally displaced.
7. Re-assemble the unit and replace the grate.

ADS Sales and Service Locations



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  1-800-733-8523
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Form # 10527 07/04

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Appendix 3.5

Concentrations of Agrochemicals after Passing through Filter System

Project Title: Proposed Golf Course Development at Tai Po Lot No. 246 Shuen Wan
Project Number: 289499

Concentration of Fungicides and Insecticides after Passing through Filter System

	Application Rate (kg/ha) [1]
Fungicides	
Daconil	6.7
Bayleton	2.6
Insecticides	
Chlorpyrifos	3.0
Fipronil	0.012

Predicted Concentrations after Passing through Filter System

Agrochemicals	Turf Area (ha) [2]	Volume of Water Storage System(s) (m^3) [3]	Residual Percentage (%) [4]	Runoff Residual Load (kg) [5]	Filter System Removal Rate (%) [6]	Calculated Concentration after Passing through Filter System (mg/L) [7][8]	Criteria (mg/L) [9]	Compliance
Fungicides								
Daconil	21.20	19800	0.00072%	1.023E-03	95%	2.583E-06	4.700E-04	Y
Bayleton	21.20		0.00072%	3.969E-04	95%	1.002E-06	2.010E-02	Y
Insecticides								
Chlorpyrifos	21.20	19800	0.00072%	4.580E-04	95%	1.157E-06	1.700E-05	Y
Fipronil	21.20		0.00072%	1.832E-06	95%	4.626E-09	6.800E-04	Y

Notes:
[1] The application rates mentioned in the Appendix 3.3 of this ERR.
[2] According to the outline of Turfgrass Management Plan in Section 2.7 of the approved EIA Report (AEIAR-221/2019), the turgrass green, tee, rough and fairway would be separately applied with insecticdie and fungicides. Among them, the largest area is rough which has 21.2 ha.
[3] The volume of the water storage tanks required.
[4] The residual percentage of pesticides is calculated based on the residual mass in water reservoirs and the application loading using the data from Appendix 6.2 – Annex I of the approved Kau Sai Chau EIA (AEIAR-091/2005).
[5] = [1] x [2] x [4]
[6] The filter system removal rate is extracted from the product and design information of the filter system as shown in **Appendix 3.4**.
[7] = ([5]/[3]) x 1000 x (1-[6])
[8] For a conservative assessment, the effluent concentration during the first flush stored in the water storage system(s) is assumed to be the bypass concentration passing through the filter system prior to discharge.
[9] The calculation of the criteria is shown in Appendix 6.1 of the approved EIA Report (AEIAR-221/2019).
[10] Some shown figures may have been rounded for easy reference.

Project Title: Proposed Golf Course Development at Tai Po Lot No. 246 Shuen Wan
Project Number: 289499

Concentration of Fertilizers after Passing through Filter System

Fertilizers	Application Rate (kg/ha) [1]	Nutrient Loading				Remark
		Total Nitrogen		Total Phosphorus		
		Proportion [2]	Loading (kg/ha) [3]	Proportion [4]	Loading (kg/ha) [5]	
Anderson 18-9-18	33.6	18%	6.0	9%	3.0	Green, Tee
Nitrophoska 12:12:17:2	51.2	12%	6.1	12%	6.1	Fairway
Nitrophoska 12:12:17:2	26.1	12%	3.1	12%	3.1	Rough

Predicted Concentrations after Passing through Filter System

Turf	Turf Area (ha) [6]	Volume of Water Storage Tanks (m^3) [7]	Residual Percentage (%) [8]		Filter System Removal Rate (%) [9]		Runoff Residual Fertilizer Load [10]		Calculated Concentration after Passing through Filter System [11][12]	
			TIN	TP	TIN	TP	TIN (kg)	TP (kg)	TIN (mg/L)	TP (mg/L)
Green, Tee	1.79	19800	1.6%	0.6%	67.46%	74.43%	0.056	0.008	0.041	0.012
Fairway	12.52		1.6%	0.6%	67.46%	74.43%	0.400	0.118		
Rough	21.20		1.6%	0.6%	67.46%	74.43%	0.346	0.102		

Criteria and Compliance

	TIN (mg/L)	TP (mg/L)
Water Quality Monitoring Data of TM3 in 2013-2024 [13]	0.044-0.116	0.021-0.072
Compliance	Y	Y

Notes:
[1] The application rates mentioned in the Appendix 3.3 of this ERR.
[2] The proportion of total nitrogen in the product label is adopted. As a conservative approach, all nitrogen contents is assumed to be total inorganic nitrogen.
[3] = [1] x [2]
[4] The proportion of total phosphorus in the product label is adopted.
[5] = [1] x [4]
[6] Area of turf with application of agrochemicals.
[7] The volume of the water storage tanks.
[8] The residual percentage of fertilizer is obtained based on the nutrient adsorption rate from Appendix 6.2 –Table 10 of the approved Kau Sai Chau EIA (AEIAR-091/2005).
[9] The filter system removal rate is extracted from the product and design information of the filter system as shown in **Appendix 3.4**.
[10] = [3] x [6] x [8] x [9]
[11] = ([9]/[7]) x 1000
[12] For a conservative assessment, the effluent concentration during the first flush stored in the water storage system(s) is assumed to be the bypass concentration passing through the filter system prior to discharge.
[13] Annual mean of TIN and TP monitoring data at Water Quality Monitoring station TM3 in Year 2016 and 2024 for TIN and TP respectively is adopted as criteria.
[14] Some shown figures may have been rounded for easy reference.