

Civil Engineering and Development
Department

Pier Improvement at Lai Chi Wo

Environmental Impact Assessment –
Executive Summary

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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Contents

	Page
1 Introduction	1
1.1 Background	1
1.2 Site Location and History	1
1.3 Scope of the Project	4
1.4 Scope of this EIA Report	4
1.5 Purpose of this Executive Summary	4
2 Project Description	5
2.1 Purposes and Objectives of the Project	5
2.2 Environmental Benefits of the Project	8
2.3 Tackling Environmental Challenges and Options Considered	9
2.4 Proposed Development Scheme	11
2.5 Construction of the Project	13
2.6 Environmental Initiatives	14
2.7 Summary of Environmental Benefits and Environmental Achievements of the Project	15
2.8 Tentative Implementation Programme	17
3 Summary of Environmental Impact Assessment	18
3.1 Approach to Environmental Impact Assessment	18
3.2 Air Quality	18
3.3 Noise Impact	19
3.4 Water Quality	19
3.5 Waste Management Implications	20
3.6 Land Contamination	20
3.7 Ecology	21
3.8 Landscape and Visual	22
3.9 Fisheries	24
3.10 Cultural Heritage	24
4 Environmental Monitoring and Audit	26
5 Conclusion	27

Figures

- Figure 1.1** Location of Project (Lai Chi Wo)
Figure 1.2 Layout of Project (Lai Chi Wo)
Figure 2.1 Layout of Existing LCW Pier
Figure 2.2 Location Options of LCW Pier Improvement
Figure 2.3 Locations of Proposed LCW Pier and Proposed Temporary LCW Pier

- Figure 2.4** Pile Casing and Silt Curtain for Marine Bored Pile Construction
- Figure 3.1** Photomontages of Project during Operational Phase
- Figure 3.2** Photomontages of Project during Operational Phase

1 Introduction

1.1 Background

- 1.1.1.1 In Hong Kong, there are currently 117 public piers built, maintained and managed by the Government. Whilst the Government has carried out regular inspections and maintenance for public piers to ensure their structural integrity, some public piers at remote areas are in service for many years suffering from aging problem, or cannot cope with the current needs/ usages, such as:
- (a) unsatisfactory boarding condition of small or primitive piers leading to potential safety concerns to passengers especially for kids and the elderly;
 - (b) inadequate water depth for larger vessels to berth especially during low tide;
 - (c) limited berthing space or narrow accesses which cannot cope with the fluctuating utilization rate during festive times or weekends; and
 - (d) aged pier structures with a need for improvement works.
- 1.1.1.2 In 2017 Policy Address, the Government committed to improve a number of remote public piers to facilitate public access to outing destinations and natural heritage such as Hakka village at Lai Chi Wo and Hong Kong UNESCO Global Geopark. To take forward the policy initiative, the Government has launched the Pier Improvement Programme (PIP) for the implementation of improvement works for piers at remote areas.
- 1.1.1.3 A Committee on Piers spearheaded by the Development Bureau, comprising members of relevant bureaux and departments was set up to examine the requests received by different departments concerning improvement suggestions for public piers in the New Territories and outlying islands and set priority for pier improvement items under the PIP taking into account a host of factors including structural and public safety concerns. The Committee has recommended implementing a list of 10 proposed pier improvement items under the first implementation phase of the PIP. Lai Chi Wo Pier is one of the recommended proposed pier items.
- 1.1.1.4 In June 2018, Civil Engineering and Development Department (CEDD) commissioned Ove Arup and Partners Hong Kong Limited (Arup) to provide consultancy services for Agreement No. CE2/2018 (CE) “Study for Pier Improvement at Lai Chi Wo and Tung Ping Chau – Investigation” (the Study).
- 1.1.1.5 This Environmental Impact Assessment (EIA) report covers the EIA of the proposed Pier Improvement at Lai Chi Wo. The EIA report for Tung Ping Chau Public Pier is separately submitted under the EIAO.

1.2 Site Location and History

- 1.2.1.1 The Lai Chi Wo Pier is located along the coastal area of Northeast New Territories. It is located within the Hong Kong UNESCO Global Geopark (Double Haven Geo-Area), Yan Chau Tong Marine Park and partly within Plover Cove Country Park. Lai Chi Wo Beach SSSI is located at about 150m to the south of the existing pier. A historical building at the nearby Lai Chi Wo Village, namely Hip Tin Temple & Hok Shan Monastery, is a Grade 3 historic building and Lai Chi Wo Site of Archaeological Interest is also located nearby. The location of the Project Site is shown in **Figure 1.1**.

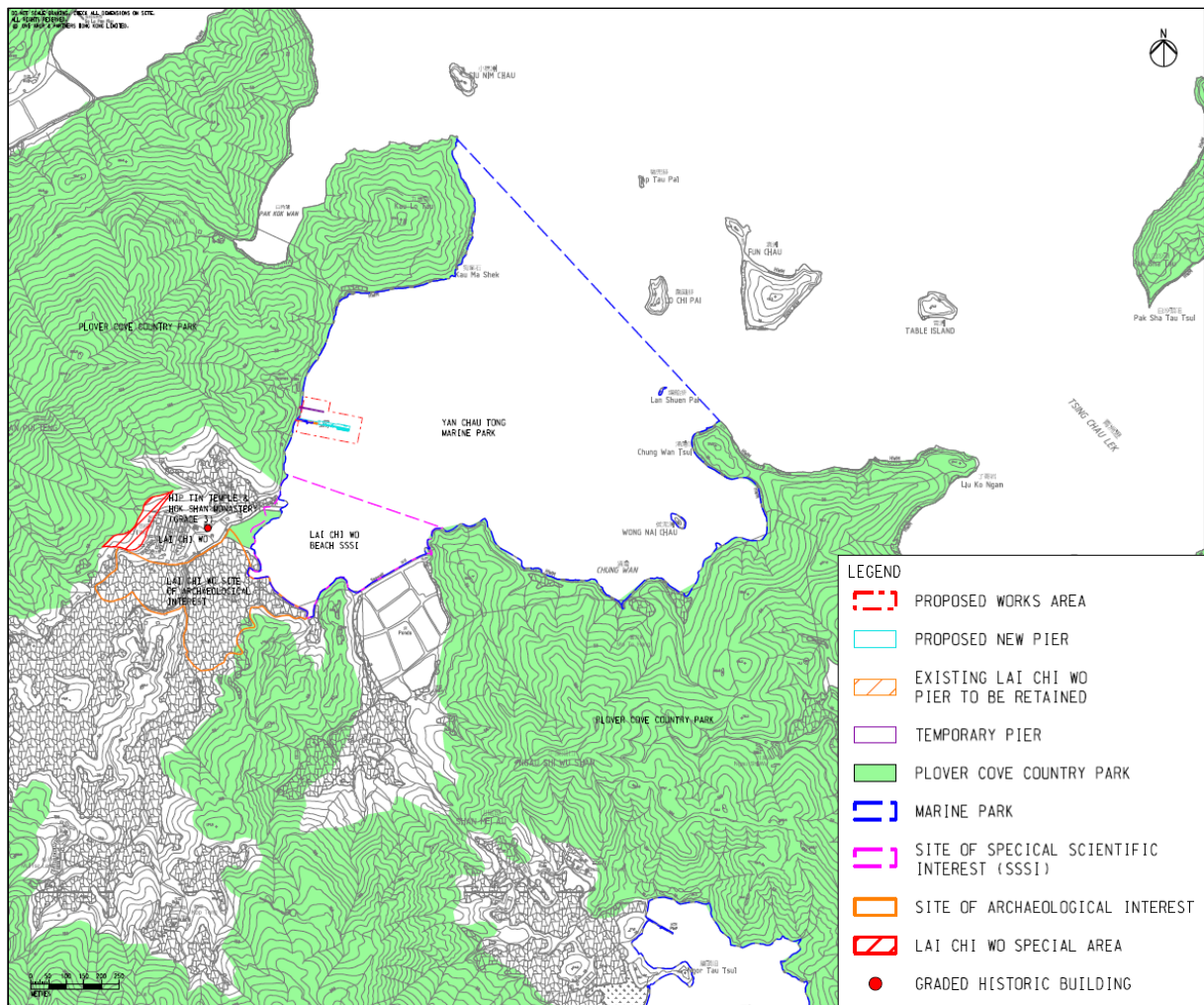


Figure 1.1 Location of Project (Lai Chi Wo)

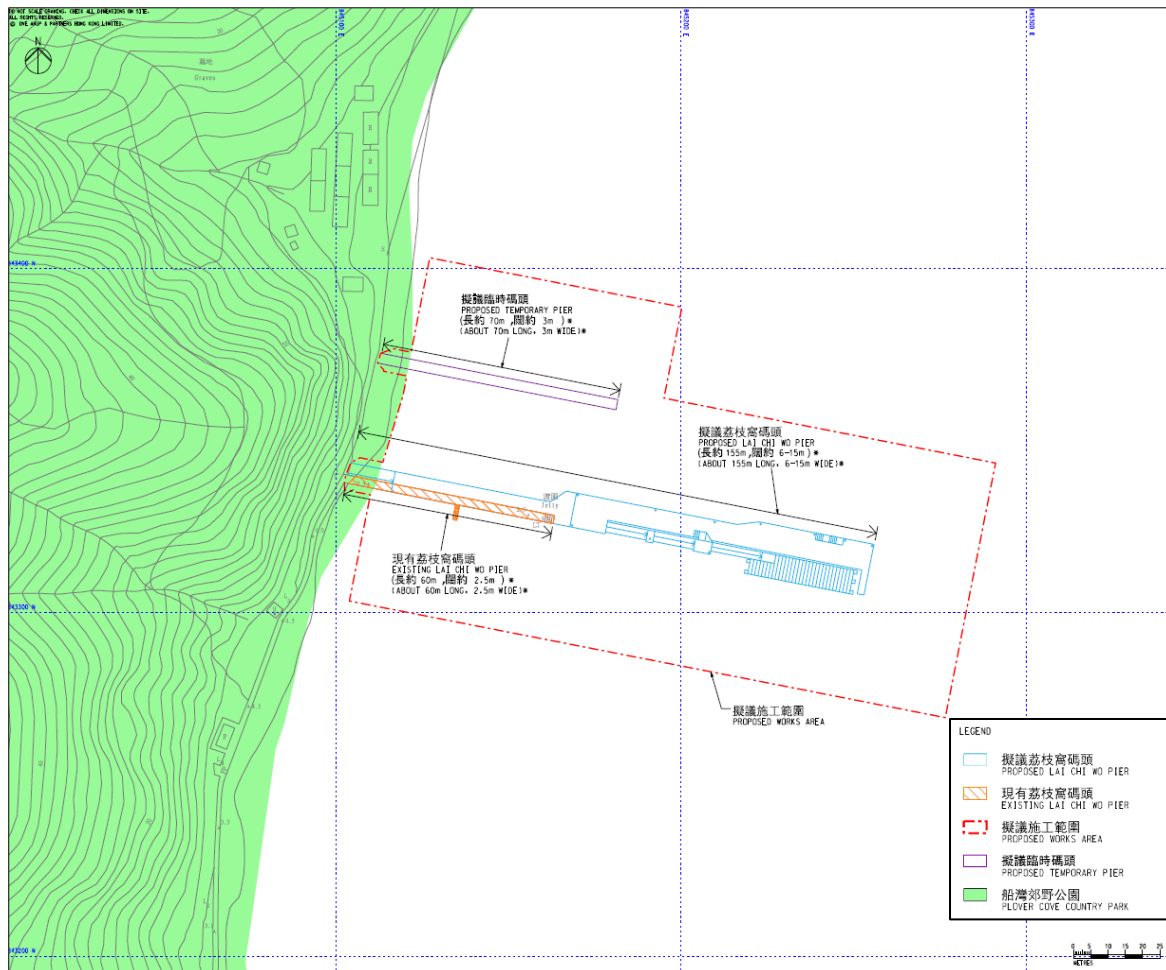


Figure 1.2 Layout of Project (Lai Chi Wo)

- 1.2.1.2 Lai Chi Wo pier was constructed in the 1960s and is primitive and aging. It is a solid concrete finger pier of about 64m long and 2.5m wide. The pier level is about +3metres above Principal Datum (mPD), and the water depth is about 0.5m at low tide. At low tides, there is inadequate water depth for the vessels to berth.
- 1.2.1.3 The pier is the main access for the public to Lai Chi Wo village as the nearest land access is from Wu Kau Teng which is about two hours of walk by trail. There is currently Kaito-ferry service operating between Ma Liu Shui Ferry Pier and Lai Chi Wo Pier on Sundays and public holidays.
- 1.2.1.4 The existing pier has only one primitive berth with inadequate draft for berthing at low tide. Although the Government departments carry out regular inspection and maintenance, the existing Lai Chi Wo Pier has been in service for many years suffering from aging problem and cannot cope with the current growing needs.
- 1.2.1.5 There have been repeated requests from Sha Tau Kok District Rural Committee members, North District Council members and Village Representatives (VRs) to improve Lai Chi Wo Pier to facilitate public access to Lai Chi Wo. Therefore, Pier Improvement at Lai Chi Wo (the Project) is being proposed and taken forward.
- 1.2.1.6 The overall objective of this Project is to conduct an environmental impact assessment (EIA) study and preliminary engineering studies before proceeding with the detailed design and construction of the Project.

1.3 Scope of the Project

- 1.3.1.1 According to the latest design, the Project will extend the pier length from about 64m to about 155m, and will increase the width from 2.5m to around 6m to 8m along the walkway and 15m at the pier head. It also includes associated facilities such as renewable energy provisions, covered waiting area with seats, floating platform to enhance the accessibility of people in need by the addition of ramps between the catwalk and the floating platform to facilitate boarding.
- 1.3.1.2 The major works items for the Project include the following:
- (a) Carrying out site investigation works for detailed design;
 - (b) Provision of plants, equipment and materials on working barge(s) for implementation of the Project;
 - (c) Provision of temporary berthing and mooring facilities (temporary pier) using working barge and/or steel structures supported by piles to maintain access to Lai Chi Wo throughout the construction stage;
 - (d) Installation of piles for the new pier and as guide piles for the floating pontoon;
 - (e) Modification of the existing pier and construction of new pier structures (e.g. installation of precast elements of the pier structure etc.);
 - (f) Construction of associated facilities on the pier; and
 - (g) Removal of temporary pier after completion of the improvement works on the existing pier.
- 1.3.1.3 The Project comprises demolition, construction and operation works within Yan Chau Tong Marine Park and Plover Clove Country Park. The Project is a Designated Project (DP) by virtue of Item Q.1, Part 1 of Schedule 2 of the EIAO which specifies *“All projects including new access roads, railways, sewers, sewage treatment facilities, earthworks, dredging works and other building works partly or wholly in an existing or gazetted proposed country park or special area, a conservation area, and existing or gazetted proposed marine park or marine reserve, a site of cultural heritage, and a site of special scientific interest, ...”*.

1.4 Scope of this EIA Report

- 1.4.1.1 In accordance with the requirements of Section 5(1) of the EIAO, a Project Profile (No. PP-561/2017) for the Project was submitted to the Director of Environmental Protection (DEP) for application for an EIA Study Brief on 27 December 2017. Pursuant to Section 5(7)(a) of the EIAO, the DEP issued a Study Brief (No.: ESB-305/2017 dated 9 February 2018) for the EIA study.

1.5 Purpose of this Executive Summary

- 1.5.1.1 This Executive Summary (ES) highlights the key information and assessment findings of the EIA Study for Pier Improvement at Lai Chi Wo.

2 Project Description

2.1 Purposes and Objectives of the Project

- 2.1.1.1 The Project aims to upgrade the structural and facility standards of Lai Chi Wo (LCW) Pier for safe pier usage by local villagers, mariculturists, visitors and tourists.
- 2.1.1.2 The existing LCW Pier has already been in service for many years and is beyond its design life in current standards. It has been suffering from aging problem and there are concerns on its structural integrity as well. Due to its primitive nature, there is not sufficient water depth for safe berthing and manoeuvring of vessels at or near the pier head, in particular during low tide, but the pier could also be nearly flooded during high tide. The pier itself is narrow, and it might not be safe to wait or walk when the pier was over-crowded with for pier users.
- 2.1.1.3 This Project will address these operational and safety problems and provide opportunities to bring benefits in enhancing the LCW Pier with upgraded facilities such as barrier-free access, canopy, seats, etc.

2.1.2 Description of the Existing Pier

- 2.1.2.1 The existing LCW Pier is a straight solid concrete finger pier of about 64m long and 2.5m wide. The pier top level is about 3m above the Principal Datum (mPD). The seabed level at the existing pier head was about -1.0mPD. A 4.2m long flight of steps is at the sea end of the pier. Another 4.2m long and 1.2m wide flight of steps is at 25-30m from the pier end and normal to the pier. In addition, a navigation light is at the head of the pier and a row of bollards is on each side of the pier. Two sets of 1m high galvanised steel tubular railing are along the southwestern edge of the pier. A general view of the pier is shown in **Figure 2.1**.

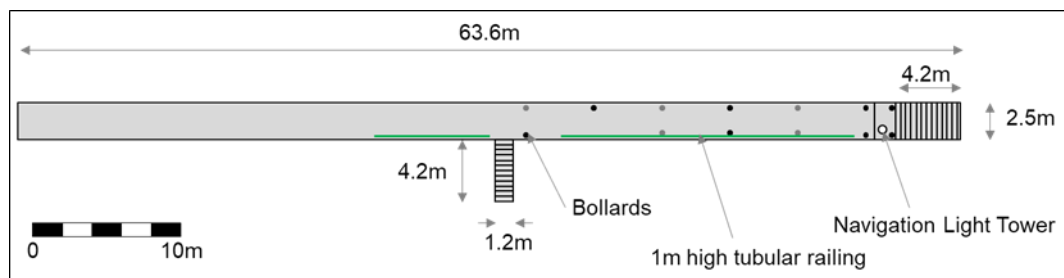


Figure 2.1 Layout of Existing LCW Pier

2.1.3 Safety Concerns

- 2.1.3.1 Due to the primitive nature and existing conditions of the existing LCW Pier, there are safety concerns for vessels and passengers using the pier. These concerns are listed as follows and are elaborated in the following paragraphs.
- (1) Deteriorating structural conditions;
 - (2) Insufficient water depth for berthing and manoeuvring;
 - (3) Low pier level;
 - (4) Undesirable berthing arrangement; and
 - (5) Non-fully restrained narrow pier.

Deteriorating Structural Conditions

- 2.1.3.2 The existing LCW Pier has been in service for more than 50 years, and the pier would have reached the end of its design life. Notwithstanding the continuous efforts by government departments in regular maintenance and inspection over the years, the aging condition of the LCW Pier is still deteriorating and cannot be completely fixed. Cracks and bulging are found on the side faces of the existing pier. Structural integrity of the existing pier is a key issue in maintaining the function of the pier.

Insufficient Water Depth for Berthing and Manoeuvring

- 2.1.3.3 The seabed level around the existing LCW Pier is generally very shallow. The approximate seabed levels at the existing pier head is around -1mPD. The water depth is just about 1.5m during low tide condition. Vessels that currently use LCW Pier include licenced Kaito ferries and government vessels such as AFCD patrol vessels. The drafts of these vessels could be up to 2m. Thus, the water depth at the existing pier head could be too low for berthing and manoeuvring of these vessels at low tide conditions. To ensure sufficient water depth at the berths, the pier berths shall be better located at seabed of about -2.4mPD or lower.

Low Pier Level

- 2.1.3.4 The existing pier top level is about +3.0mPD. During high tides, the sea level can rise higher than the pier top level, and completely floods the pier. It poses safety concerns for pier users and vessels. These conditions would be exacerbated when sea level rises due to the effects of climate change in the future. According to the Port Works Design Manual Corrigendum No. 1/2018, mean sea level will rise by about half a meter by the end of century.

Undesirable Berthing Arrangement

- 2.1.3.5 The pier head is only about 4.2m long compared to the licensed Kaito ferries which are typically 25m to 30m long. The ferries cannot berth alongside of the vessels for boarding. Hence, there are safety concerns for passengers boarding from the bow of the ferry.

Non-Fully Restrained Narrow Pier

- 2.1.3.6 The existing pier is only 2.5m wide and is only restrained by tubular handrail on one side of the pier for some sections of the pier. The risk of falling into water could be very high when the pier was crowded with people. Crowd management is therefore difficult to be implemented in such a narrow pier when bi-directional movements of people along the pier and boarding on /disembarkation off vessels occur concurrently.

2.1.4 Barrier-Free Access

- 2.1.4.1 It has been the Government's established policy to provide barrier-free facilities for people in need with a view to enabling them to freely access premises and make use of community facilities and services on an equal basis with others. To improve accessibility of public pier, the accessibility (1) between the vessel and the pier, and (2) within the pier shall be improved. A series of fixed and movable ramps is therefore proposed for the Project.

2.1.5 Sustainable Development of the Geopark

- 2.1.5.1 As mentioned in **Section 1.2.1.1**, the Lai Chi Wo Pier is located within the Hong Kong UNESCO Global Geopark (Double Haven Geo-Area). The Hong Kong UNESCO Global Geopark is currently a member of the Global Geoparks Network (GGN), which one of the key features is to promote earth science and sustainable development through geo-tourism and education. According to the protection level of Geopark, Lai Chi Wo belongs to “Integrated Protection Area”, which carries function for geo-tourism due to its carrying capacity is comparatively higher than in other areas of Geopark. With the implementation of the proposed pier improvement works, the Lai Chi Wo Pier would be provided with upgraded facilities and safer access, so as to improve the experience of travellers visiting the geopark and thus supporting the sustainable development of the geopark.

2.1.6 Villagers’ / Pier User’s Concerns

- 2.1.6.1 There have been repeated requests from Village Representatives (VRs) of Lai Chi Wo Village, Sha Tau Kok District Rural Committee (STKDRC) members and North District Council (NDC) members over the years to improve the safety and accessibility of the pier. During the consultation meetings held with elected-by-villagers VRs, STKDRC members and NDC councillor in May 2019, they shared the inconvenience that vessels could only berth at specific time due to inadequate water depth at the pier, and hence they fully support the Project and urge the earlier implementation of the improvement works.

2.1.7 Scenarios “With” and “Without” the Project

Without Project Scenario

- 2.1.7.1 Without the Project, the current users including villagers and visitors still have to rely on the existing LCW Pier for waterborne transport to access Lai Chi Wo village and the adjacent areas. Considering that the pier has already reached the end of its design life in current design standards, the condition of the aging internal structure could have deteriorated and be hazardous to pier users. Moreover, the safety issues such as insufficient water depth for berthing and manoeuvring, low pier level, undesirable berthing arrangement and non-fully restrained narrow pier would continue to exist and pose threats to pier users, especially those with special needs. Enhancing accessibility using barrier-free facilities would not be possible if the Project was not implemented.
- 2.1.7.2 From environmental perspectives, the amenity and visual aesthetic of the existing aging pier cannot be enhanced without the Project. In addition, the water depth is insufficient for berthing and manoeuvring at the existing pier. This inevitably causes disturbance to the seabed and therefore result in release of suspended solids to the water column. This situation could not be improved unless sufficient water depth is provided for vessel berthing and manoeuvring via the implementation of the Project.

With Project Scenario

- 2.1.7.3 With the Project, the LCW Pier will be upgraded to be integrated with a new pier structure extending to a location that can allow safe access, manoeuvring and berthing of vessels, and providing safe means of access for the patrons and pier users. Other enhancement facilities such as barrier-free access, canopy, seats, etc. could enhance the convenience, pleasures and satisfaction of pier users.

- 2.1.7.4 From the environmental perspectives, the pier improvement works can also benefit the coral communities in the long term by increasing the surface area of hard substratum for the attachment of coral. After the Project, a pier with modern design and more compatible colour scheme and texture will be provided. This enhances the visual amenity of the pier. More comfortable environment would also be offered to the passengers awaiting the ferries. In addition, the proposed pier will be lengthened so that the berthing areas would be located farther away from the air sensitive receivers and noise sensitive receivers. Besides, by increasing the water depth of the berthing areas, disturbance to the seabed by the vessels could be minimised.
- 2.1.7.5 The implementation of the Project would not cause adverse environmental impacts during the construction phase if mitigation measures and good site management practices are properly adopted. Those potential impacts include water quality, marine ecological and fisheries impacts from the marine-based construction works, air quality impact from fugitive dust emission, noise impact from the use of powered mechanical equipment and waste and environmental hygiene implications. Environmental impacts are therefore duly assessed throughout the EIA stage. A series of mitigation measures and good site management practices are recommended to avoid, minimise and mitigate the potential adverse environmental impacts where practicable. A comprehensive and effective environmental monitoring and audit programme is also proposed to ensure the mitigation measures and good site practices are properly implemented.
- 2.1.7.6 As there would be no planned increment in the frequency of licenced Kaito services after the pier improvement work, no operational environmental impact is anticipated.

2.2 Environmental Benefits of the Project

- 2.2.1.1 A summary of the environmental benefits of the Project is given in **Table 2.1**.

Table 2.1 Summary of Environmental Benefits

Environmental Benefits	Descriptions
Increase surface area for corals	The muddy seabed substrate in the assessment area does not provide a suitable hard surface for epibenthos like corals to attach and survive. The Project will extend the LCW Pier to deeper water, and the new pier structures comprise underwater hard structural elements, thus providing additional hard surface areas for corals to attach and grow.
Enhance visual amenity	The existing pier is in poor physical and amenity condition. By the implementation of the pier improvement works with modern design and more compatible colour scheme and texture, the visual appearance of the LCW Pier can be better enhanced. Hence, the status of Lai Chi Wo, as a popular destination for eco-tourism, can be uplifted.
Reduce air quality and noise impacts during operational phase	As the length of the pier will increase from 64m to approximately 155m with the landing steps shifted seawards, the proposed berthing locations associated with the marine traffic emissions and marine traffic noise will be farther away from the coast and the residential sensitive receivers at Lai Chi Wo village as compared with the current condition without pier improvement. Hence, the sensitive receivers may result in some improvement of air quality and noise impacts.

Environmental Benefits	Descriptions
Sufficient water depth to avoid seabed disturbance	The water depth at pier berth is just about 1.5m during low tide condition. The drafts of vessels currently using the LCW Pier could be up to 2m. With the Project, the pier berth would be provided with a water depth of 2.9m during low tide condition, which would be sufficient for vessels to manoeuvre. Seabed disturbance could therefore be minimised during the operation of the Project. Resuspension of suspension solids could also be minimised.

2.3 Tackling Environmental Challenges and Options Considered

2.3.1.1 During the course of the EIA study, the key principles adopted to tackle all the environmental challenges are discussed in **Table 2.2**.

Table 2.2 Environmental Challenges of the Project

Environmental Challenges	Approaches to Tackle Environmental Challenges
Avoidance of open sea dredging works	Open sea dredging works would not be adopted to avoid any adverse water quality impacts during the construction phase and hence ecological impacts on the seagrass which is sensitive to suspended solids.
Avoidance of wastewater / effluent discharge during both construction and operational phases	All practicable measures will be implemented to avoid any discharge of wastewater / effluent discharge into Yan Chau Tong Marine Park during both the construction and operational phases. During the construction phase, any wastewater and effluent would be transported away for proper treatment and disposal. During the operational phase, the Project has been designed to avoid any need for using detergents/chemicals during routine maintenance.
Avoidance of solid pier design	The structure of the proposed pier would adopt concrete decks on top supported by piled foundation. The diameter of the foundation would be approximately 0.8m to 1m and the column-to-column spacing is approximately 5m to 8m. Such a configuration is typical for other similar piers in Hong Kong, for instance, Sai Kung Public Pier. Due to small footprint of the new supportive piles, changes in the flow regime and hydrodynamic are limited.
Minimisation of works in country park	The existing connecting walkway between the pier and the footpath to Lai Chi Wo falls partly within the Plover Cove Country Park. As the connecting walkway made of concrete will have to be reconstructed between the proposed pier and the existing footpath to Lai Chi Wo, the work is inevitably located within the intertidal shore within the boundary of the Country Park. Based on the ecological survey results, the ecological values of the intertidal shore are ranked as Low to Moderate. The proposed works area of the Project has been limited (e.g. 2m wide on each side of the proposed piers) to the footpaths and the intertidal shore at the boundary of the Plover Cove Country Park. Given the scale of works within Plover Cove Country Park is small and that the works mainly fall within an existing footpath/connecting walkway, ecological impact on the Country Park is therefore considered limited.

Environmental Challenges	Approaches to Tackle Environmental Challenges
Minimisation of waste generation during construction phase	The Project aims to minimise the waste generation in relation to integrate the structures of the existing pier to the new pier structures. The Project will also limit works on land and avoids tree felling during the construction of pier and hence further reduce waste generation.
Minimisation of construction vessels during construction phase	As open sea marine dredging would be avoided and pre-cast elements would be adopted as much as practicable, the number of construction vessels would also be minimised. Since the Project is located within the Yan Chau Tong Marine Park, any indirect impacts caused by those vessels on the marine park would also be minimised. Nevertheless, appropriate good practices would be adopted by the Contractor to operate the construction vessels.

2.3.2 Options Considered

2.3.2.1 Due considerations have been given in formulating the pier design to address environmental challenges in this Project. The hierarchy of “Avoid, Minimise and Mitigate” has been fully adopted in the process to protect the environment as much as practicable. Hence, the design has given due consideration on the locations of the pier improvement works to minimise the environmental impacts (see **Figure 2.2**).

2.3.2.2 The options that have been duly considered include the following:

- **Option 1:** A new pier to the north of the existing LCW Pier;
- **Option 2:** Extension of the existing LCW Pier to provide a new structure for construction of landing steps and incorporation of floating pontoon; and
- **Option 3:** A new pier to the south of the existing LCW Pier.

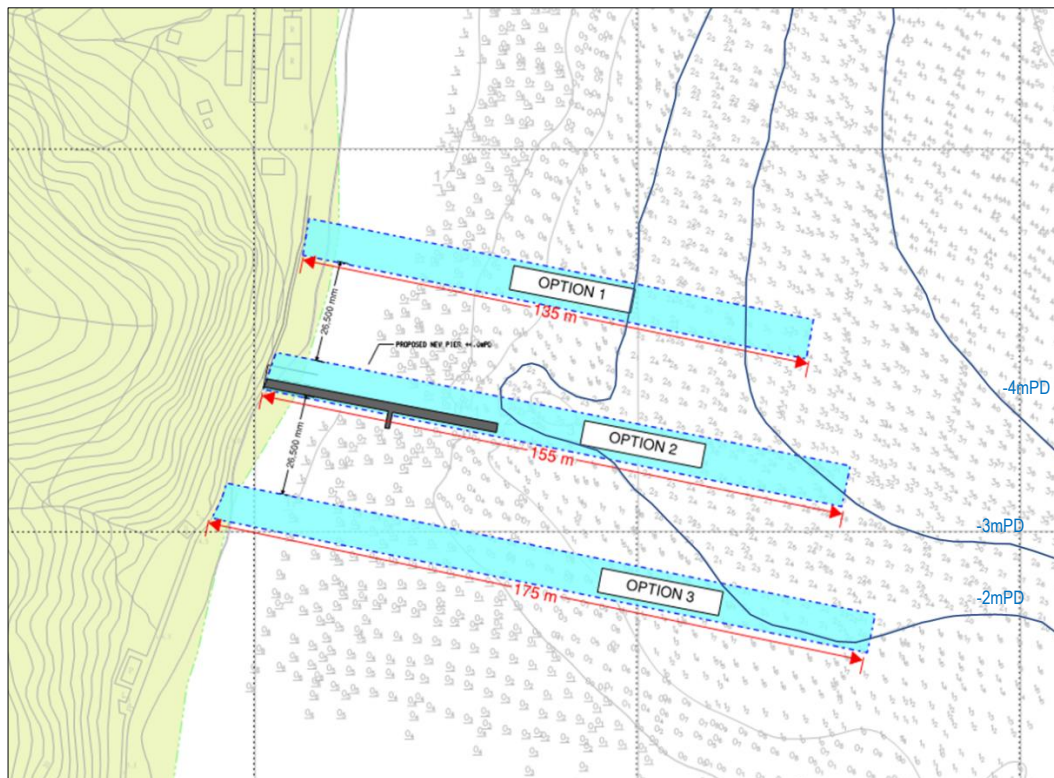


Figure 2.2 Location Options of LCW Pier Improvement

2.3.2.3 Taking the potential environmental impacts into consideration, **Option 2** has been selected as the preferred option. Though this Option will require the construction of a temporary pier, it avoids the demolition of the existing solid pier. Conversely, for **Option 1** and **Option 3**, notwithstanding that the construction or provision of the temporary pier is not required, the existing pier will need to be demolished after the completion of the construction of the new pier due to its aging condition. When comparing the potential water quality impact from the demolition of temporary pier, which is supported by pile columns, with the demolition of the existing pier, which is a solid finger pier, the demolition of the solid finger pier for **Option 1** and **Option 3** will involve more marine works than the cutting of the pile columns by wire saw, resulting in higher water quality impact. In terms of waste generation, the demolition of the existing solid pier will generate more C&D materials for offsite disposal, and therefore increase the number of trips required to deliver the C&D material offsite.

2.3.2.4 Other than the locations of the pier, the size of the pier has also been duly optimised during the design process without compromising safety for berthing and manoeuvring.

2.4 Proposed Development Scheme

2.4.1 Proposed LCW Pier

2.4.1.1 The existing LCW Pier extends from the land towards the sea in the east-southeast direction. The proposed LCW Pier will be constructed on top of the existing LCW Pier, and will be integrated with it. The proposed LCW Pier will align in the same direction as the existing pier, and extend to deeper water. The location of the proposed LCW Pier is shown in **Figure 2.3**.

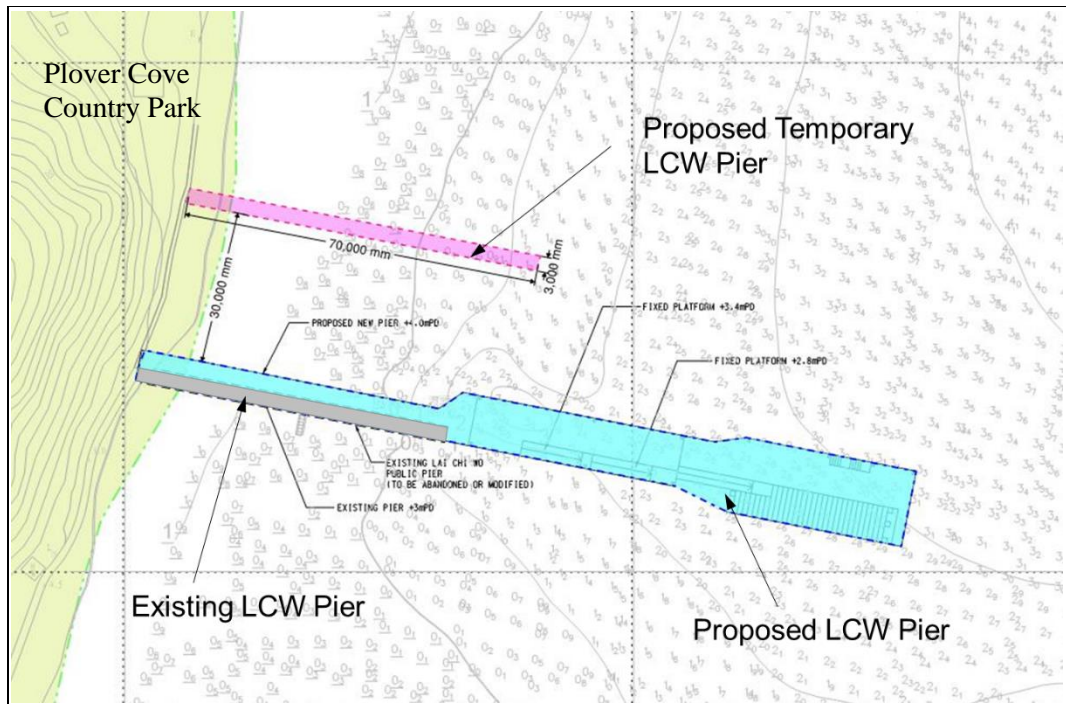


Figure 2.3 Location of Proposed LCW Pier and Proposed Temporary LCW Pier

- 2.4.1.2 The proposed LCW Pier will be a piled deck structure in order to minimise any impact on environment and hydrodynamics. The piled deck structure will be of a length of about 155m and widths ranging from 6m to 8m increased to 15m at the pier head for both traditional pier head and floating pontoon provision. The proposed LCW Pier will consist of a floating pontoon and a gangway for barrier-free access, and may include PV panels, interactive kiosk and/or smart lamppost.

2.4.2 Proposed Temporary Pier

- 2.4.2.1 During construction of the proposed LCW Pier, concurrent undertaking of improvement works at the existing pier and berthing of vessels is not spatially feasible, and it would not be safe. A temporary pier will be provided to maintain operation of the licensed Kaito ferry service and to serve other public vessels.
- 2.4.2.2 The temporary pier will be located at about 30m north from the existing LCW Pier. The proposed temporary LCW Pier will align in the same direction as the existing one. The proposed temporary LCW Pier will be about 70m long and 3m wide, and will largely be in the form of floating pontoon and/or steel structures supported by piles to minimise any environmental impact. The location of the proposed temporary LCW Pier is shown in **Figure 2.3**.

2.4.3 Ramp Width

- 2.4.3.1 According to the Barrier Free Access Design Manual published by the Buildings Department, the width of a ramp should be at least 1.5m to allow 2 wheelchairs to pass. The pier improvement provides a 2m of clearance for passage of 2 wheelchairs and a 0.5m of width for the installation of handrails and fenders on both sides.

2.5 Construction of the Project

2.5.1 Construction Sequence

- 2.5.1.1 Project-specific site investigation will be carried out before construction work. Vertical boreholes will be carried out for the Project.
- 2.5.1.2 Due to the location of the site, construction materials will be delivered via marine access. They will be transported by barges and installed using derrick barges and/or multi-purpose jack-up barges and/or temporary steel structures.
- 2.5.1.3 Where practicable, prefabrication method will be used for the construction of the proposed LCW Pier. All the precast units will be transported by barges and/or derrick barges, and will be installed on site.
- 2.5.1.4 The prefabricated floating platform and gangway will be delivered via marine access. They will be transported by barges and/or derrick barges.
- 2.5.1.5 The temporary pier will be subsequently demolished after the completion of the new pier.

2.5.2 Consideration of Environmentally Conscious Construction Methodologies

- 2.5.2.1 Potential environmental impacts have been duly considered and assessed throughout the EIA stage to avoid the adverse environmental impacts of the Project. As such, environmentally conscious construction methodologies have been adopted to avoid, minimise and mitigate environmental impact from the Project as far as practicable.

Use of Pile Casing and Silt Curtain to Confine Pollutants during Pile Construction

- 2.5.2.2 To avoid the potential water quality impact, the foundations of the proposed LCW Pier and the temporary pier will be composed of *in-situ* bored piles or similar pile types (e.g. rock socketed Steel H-pile). The proposed construction method has totally avoided the need of open sea dredging. For each pile construction, pile casing shall be first slowly drilled through the seabed and would disturb small areas of seabed, only limited resuspension of sediment is expected. Once the pile casing penetrates the layers of marine sediment, all excavation work would be carried out inside the pile casing to avoid spillage of sediment and water containing suspended solids (SS) during piling works. All grabbed material will be conveyed to and be settled in the sedimentation tank, and will be sequentially delivered to the designated disposal outlets by marine transportation. Hence, the practical measures to avoid grabbed material making in direct contact with the open sea water would be implemented. To further eliminate the probability of release of fines to the surrounding water body during construction works, installation of silt curtain to confine the site activities shall be adopted. An illustrative figure of the setup of a marine bored pile construction is shown in **Figure 2.4**.

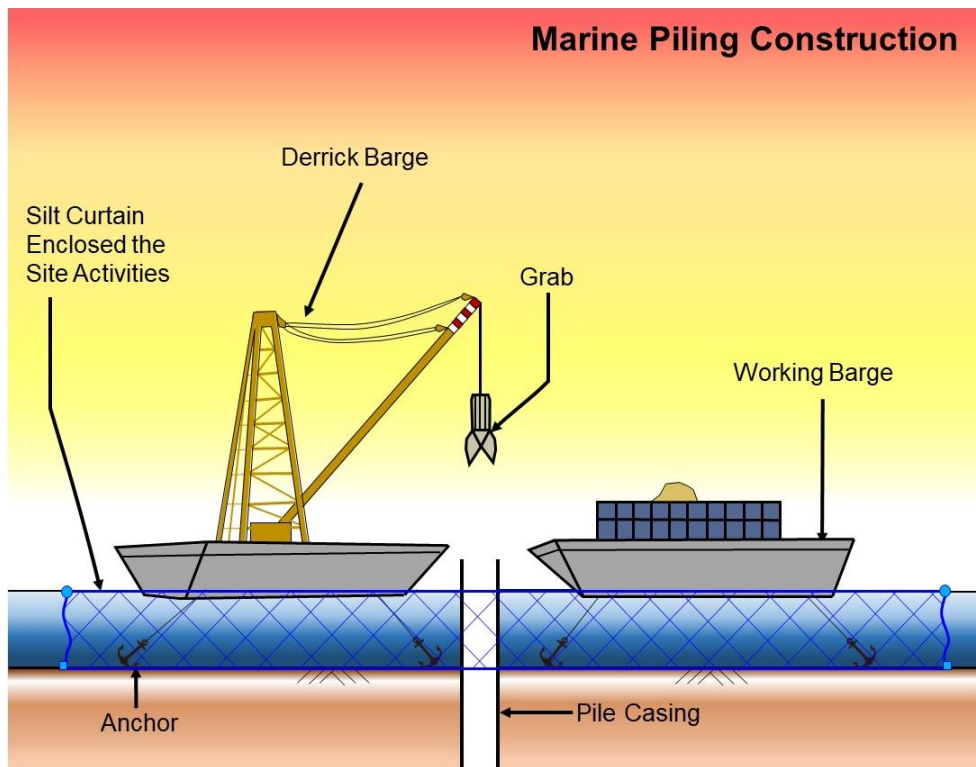


Figure 2.4 Pile Casing and Silt Curtain for Marine Bored Pile Construction

Prefabrication Construction Method for Deck

2.5.2.3 Prefabrication approach will be considered when designing concrete superstructures. Selected concrete superstructures will be formed by pre-cast concrete offsite in a controlled environment and installed onsite when ready. This can avoid on-site casting activities that could have potential impact on water quality by minimising the storage of casting materials. Moreover, this approach can minimise the extent and duration of on-site construction activities. The prefabrication method also minimises the waste generation on-site during the construction phase. As a result, the air quality, noise, water quality impacts and waste implications associated with these construction activities including emissions, site run-off, accidental spillage of chemicals and sewage from workforce could thus be avoided or minimised in comparison with on-site casting method.

2.6 Environmental Initiatives

2.6.1.1 Whilst a number of design initiatives have been proactively implemented to tackle various environmental challenges, the Project aims to achieve more than the statutory requirements. Thus, various environmental initiatives have been identified for the Project. These initiatives cover different aspects including:

- Clean energy / energy saving;
- Waste minimisation; and
- Enhance biodiversity / greening.

2.6.1.2 However, whilst these initiatives are generally considered as practicable at this stage, the extent of applications and other details have to be revisited and further established during the detailed design stage when the engineering design is further

developed. **Table 2.3** summarises all those environmental initiatives envisioned at this stage.

Table 2.3 Environmental initiatives to be further developed during detailed design stage

Aspect	Environmental Initiatives	Environmental Benefits
Enhance biodiversity	<ul style="list-style-type: none"> • Priority using eco-tiles or eco-concrete for the surface of the foundation. 	<ul style="list-style-type: none"> • Promote seamless integration of biodiversity into the pier design
Clean energy / energy saving	<ul style="list-style-type: none"> • PV panels (e.g. for lights at waiting area) • Priority using of LED lighting 	<ul style="list-style-type: none"> • Use of solar energy and energy-saving equipment to minimise energy consumption
Waste minimization	<ul style="list-style-type: none"> • Use recycle glass bricks for pavement 	<ul style="list-style-type: none"> • Promote the use of recycled materials / products

2.6.1.3 Subject to the detailed design of the Project, eco-tile or eco-concrete is recommended for the provision of hard surfaces for vitalising the ecological functions at sub-tidal artificial pier structures such as the downstand wall and piles. The uneven surfaces or selected patterns of eco-tiles provide microhabitats for various marine organisms to colonise and grow, and develop into communities to provide feeding and hiding habitats for juveniles of marine fauna, and thereby effectively enhance biodiversity and ecosystem functions of the new man-made structures. During the detailed design of the Project, the feasibility, detailed design and the implementation programme of the eco-tile or eco-concrete will be submitted for the approval of the authority before commencement of the works.

2.7 Summary of Environmental Benefits and Environmental Achievements of the Project

2.7.1.1 Throughout the EIA study, site constraints and impacts have been identified and assessed and mitigation measures/good site practices/enhancement measures, if necessary, have been recommended to avoid negative environmental impacts to the surroundings. In addition, comments from District Councils, residential, green groups and other stakeholders have also been reviewed and incorporated where practicable. A number of environmental initiatives covering good managing practices, waste minimisation and natural conservation have been recommended for incorporation in the detailed design.

2.7.1.2 A summary of the key environmental benefits and achievements of the Project is given in **Table 2.4** for reference:

Table 2.4 Key Recommended Mitigation Measures/Good Site Practices/Enhancement Measures and their Associated Benefits

Aspect	Key recommended mitigation measures/good site practices/enhancement measures	Associated Benefits
Air Quality	<ul style="list-style-type: none"> • Routing of barges used for delivery of goods should be as far away from the identified ASRs as practicable. • The number of boat trips should be minimised as far as practicable by appropriate planning. 	<ul style="list-style-type: none"> • Protect air sensitive receivers by reducing

Aspect	Key recommended mitigation measures/good site practices/enhancement measures	Associated Benefits
		fugitive dust emission
Noise	<ul style="list-style-type: none"> • Use of Quality Powered Mechanical Equipment (QPME). • Use of temporary noise barriers to screen noise from relatively static Powered Mechanical Equipment (PME). • Alternative use of plant items within one worksite, wherever practicable. 	<ul style="list-style-type: none"> • Protect noise sensitive receivers by reducing construction noise impact
Water Quality	<ul style="list-style-type: none"> • Water quality monitoring. • Adoption of good site practices for foundation works, such as use of silt curtains and pile casings, to avoid and minimise water quality impacts. • Excavation should only be conducted inside pile casing. Only one grab should be used at the same time. • Only 1-2 piles to be constructed at the same time. • Prefabrication construction method should be adopted as far as practicable. • Contractor to prepare Emergency Spillage Plan for accidental spillage of chemicals. 	<ul style="list-style-type: none"> • Protect the neighbouring water sensitive receivers such as coral, seagrass and mangrove
Waste Management	<ul style="list-style-type: none"> • Good waste management and control practices to avoid generation of excessive amount of waste materials. • Employ waste collectors for disposal of general refuse to prevent potential nuisance caused by mistreating general refuse, such as windblown, vermin, water pollution and visual impact. • Good management practices for handling and disposal of marine sediments at dedicated marine disposal sites. 	<ul style="list-style-type: none"> • Minimise waste generation • Ensure proper handling of chemical waste
Land Contamination	<ul style="list-style-type: none"> • No mitigation measures would be required. 	<ul style="list-style-type: none"> • No land contamination anticipated
Ecology	<ul style="list-style-type: none"> • Seagrass monitoring • Pre-construction dive survey to verify the conditions of small coral colonies on the existing LCW pier before construction works • Avoidance of encroaching the trees in particular within the country park. • Priority using eco-tiles or eco-concrete for the surface of the foundation to promote seamless integration of biodiversity into the pier design. 	<ul style="list-style-type: none"> • Minimise the impact to coral, seagrass bed and mangrove stand in proximity to the Project • Protect trees in country park • Enhance biodiversity of the site
Landscape and Visual	<ul style="list-style-type: none"> • Sensitive design and disposition of the pier structures to minimise visual intrusion to VSRs as far as practicable. 	<ul style="list-style-type: none"> • Enhance the visual appearance for

Aspect	Key recommended mitigation measures/good site practices/enhancement measures	Associated Benefits
		the operational phase
Fisheries	<ul style="list-style-type: none"> • Avoidance of mariculture site and waters of high fisheries production • Adoption of good site practices for water quality in marine works to ensure no adverse fisheries impact would be anticipated. 	<ul style="list-style-type: none"> • Protect fisheries resources
Cultural Heritage	<ul style="list-style-type: none"> • No mitigation measures would be required. 	<ul style="list-style-type: none"> • No impact of cultural heritage anticipated

2.8 Tentative Implementation Programme

- 2.8.1.1 Site Investigation works for detailed design will be carried out in mid-2021. Prefabrication method will be adopted as far as practicable for the construction works. Construction is scheduled to commence in Year 2023 and completed by Year 2025. Construction works are planned to be carried out during non-restricted hours (i.e. 0700-1900 hours from Monday to Saturday other than public holidays). The exact schedule of construction depends upon factors such as the granting of necessary permit for its construction and the awarding of the contract to the contractor.

3 Summary of Environmental Impact Assessment

3.1 Approach to Environmental Impact Assessment

- 3.1.1.1 The EIA process provides a means of scoping, assessing and reporting the environmental impacts and benefits of the Project. It is an iterative process that has been followed in parallel with the design process to identify the potential environmental effects of various design options, and develop alternatives as well as mitigation measures to be incorporated into the design, construction and operation of the proposed pier at Lai Chi Wo. Public concerns have also been duly considered and incorporated where appropriate. Mitigation measures/good site practices have been proposed to avoid potential environmental impacts, or to minimise or mitigate to acceptable levels.

3.2 Air Quality

- 3.2.1.1 Potential air quality impacts associated with the Project have been assessed in accordance with Clause 3.4.4 and Appendix B of the Study Brief and Section 1 of Annex 4 and Annex 12 of the Technical Memorandum on EIA Process (TM-EIAO) to ensure compliance of relevant standards and guidelines.

3.2.2 Construction Phase

- 3.2.2.1 The key air pollution sources in association with the Project have been identified and the potential construction dust and gaseous emission impacts have been evaluated. During construction, since the site investigation and foundation works are mostly below water, there are neither exposed workfronts or heavy construction works which may arise dust emissions. Hence, fugitive dust emissions from its construction are anticipated to be limited. Prefabrication method would be adopted for the construction of the superstructures as much as practicable to further minimise the construction dust impact on-site. Although there is no adverse impact to the identified ASRs, dust control measures and good practices in accordance with Air Pollution Control (Construction Dust) Regulation would be followed to avoid the potential dust impact.

- 3.2.2.2 As the scale of construction works is relatively small, extensive use of the Powered Mechanical Equipment (PME) is not required. Emissions from PME are therefore considered relatively small. Adverse cumulative impact is considered unlikely. Given that the trip frequency of marine transportation for the commuting of site personnel and the delivery of goods per day would be limited and the vessels will be throttled down when they arrive at the Project site, adverse air quality impact from the marine emissions is not anticipated.

3.2.3 Operational Phase

- 3.2.3.1 The Project itself does not intend to increase Kaito services. No additional air pollution sources would be introduced due to the implementation of the Project. Conversely, the main objectives of the Project are to enhance pier facilities and provide adequate structural integrity for safe pier usage. As the Project would increase the separation distance between the ASRs and the vessels, the ASRs would result in a slight improvement of air quality. Therefore, adverse air quality impact during the operation phase of the Project is not anticipated.

3.3 Noise Impact

- 3.3.1.1 Potential noise impacts associated with the Project have been assessed in accordance with Clause 3.4.5 and Appendix C of the Study Brief and Annexes 5 and 13 of the TM-EIAO to ensure compliance of relevant standards and guidelines.

3.3.2 Construction Phase

- 3.3.2.1 During construction phase, the only NSR identified is the Plover Cove Country Park which does not bear a statutory noise limit. Construction noise impact is anticipated to be limited in view of the small scale and low complexity of the Project. Furthermore, no construction works will be carried out during the restricted hours, and the prefabrication method for the superstructure construction will be adopted as far as practicable. In addition, a number of noise enhancement measures including good site practices, the use of quality powered mechanical equipment (QPME), and the use of temporary noise barriers, etc. have been proposed to further reduce the construction noise impact. Therefore, no adverse construction noise impact is anticipated.

3.3.3 Operational Phase

- 3.3.3.1 During the operational phase, the improved pier will not have any planned fixed noise sources. In addition, there would be no planned increase in the licensed Kaito services after the pier improvement works. Therefore, no operational noise impact is anticipated.

3.4 Water Quality

- 3.4.1.1 Potential water quality impacts associated with the Project have been assessed in accordance with Clause 3.4.6 and Appendix D of the Study Brief and Annexes 6 and 14 of the TM-EIAO to ensure compliance of relevant standards and guidelines. No dredging is required under the Project.

- 3.4.1.2 Major Water Sensitive Receivers (WSRs) located in the vicinity including Yan Chau Tong Marine Park, Lai Chi Wo Beach SSSI, conservation areas, fish culture zone at Sai Lau Kong, ponds, watercourses and coral colonies have been included for assessment.

3.4.2 Construction Phase

- 3.4.2.1 Potential hydrodynamic and water quality impact from the construction activities have been assessed. Given the small scale of the pier and the adoption of concrete pile foundation with sufficient column-to-column spacing, hydrodynamic impact from the new structures of the improved pier and the temporary pier is not anticipated.

- 3.4.2.2 Potential water quality impact would arise from the construction activities, in particular the marine-based site investigation and foundation works. Nevertheless, with the implementation of recommended mitigation measures such as the use of silt curtain to confine the SS, adverse water quality impact is not anticipated. There will neither be directly discharge on-site, within the Yan Chau Tong Marine Park nor other WSRs. In addition, with good site control practices, emergency spillage plan and provision of portable toilets, adverse impacts from surface runoff from construction site operation, accidental spillage of chemicals and sewage from workforce are not anticipated.

3.4.3 Operational Phase

- 3.4.3.1 The main objectives of the Project are to improve the existing pier facilities such as providing standard landing steps, adequate berthing space and enhancing accessibility to those in need. During operation, there is no planned increase in the existing Kaito services nor alteration of their routing. Therefore, no adverse water quality impact is anticipated from the Project during the operation phase. Given the small scale of the pier and the adoption of concrete pile foundation with sufficient column-to-column spacing, hydrodynamic impact from the new pier is not anticipated.

3.5 Waste Management Implications

- 3.5.1.1 Waste management implications associated with the Project have been assessed in accordance with Clause 3.4.7 and Appendix E of the Study Brief and the criteria and guidelines stipulated in Annexes 7 and 15 respectively of the TM-EIAO.

3.5.2 Construction Phase

- 3.5.2.1 Potential waste management implications from the generation of waste during the construction phase have been evaluated. Mitigation measures, including on-site sorting, reusing C&D materials etc., are devised in the construction methodology to minimise the surplus materials to be disposed of to a landfill. With the proper implementation of the recommended mitigation measures, adverse environmental impacts from waste management during construction phase are not anticipated.

3.5.3 Operational Phase

- 3.5.3.1 The types of waste that would be generated during the operational phase would be general refuse from the pier users. The Project itself does not intend to increase Kaito services. Hence, it will not induce any additional general refuse from additional visitors and pier users during the operational phase. Sufficient number of trash bins and recycling bins have already been provided for the collection of general refuse generated by visitors and pier users along the existing footpath to Lai Chi Wo. No bin will be required to be provided as no general refuse is anticipated by the Project during the operational phase. Adverse waste management implications are not anticipated.

3.6 Land Contamination

- 3.6.1.1 Potential land contamination impacts associated with the Project have been assessed in accordance with Clause 3.4.8 of the Study Brief and Appendix F and the guidelines as stipulated in Section 3.1 and 3.2 of Annex 19 of the TM-EIAO.
- 3.6.1.2 This land contamination assessment has examined the potential contaminative land uses within the boundary of the Project. Based on the desktop review findings of the aerial photos, the information collected during site surveys as well as the information provided by EPD and FSD, no potential land contamination issue is identified within the boundary of the Project. Further site investigation or mitigation measures are therefore not required.

3.7 Ecology

- 3.7.1.1 Potential ecological impacts associated with the Project have been assessed in accordance with Clause 3.4.9 and Appendix G of the Study Brief, and Annexes 8 and 16 of the TM-EIAO.
- 3.7.1.2 Lai Chi Wo Pier is within Yan Chau Tong Marine Park and partly within Plover Cove Country Park. This marine park contains a number of important habitat types, including two intertidal habitats in Lai Chi Wo, i.e. seagrass bed and mangroves. Site selection process has considered different locations and concluded that the location of the existing pier would cause least impacts to the Marine Park, site for Hong Kong Reef Check, SSSI and the important intertidal habitats.
- 3.7.1.3 Ecological surveys covering a 12-month duration were conducted. While the seabed surrounding the existing pier was muddy and void of corals, only low coverage of very tiny common hard coral was recorded at the existing pier head. No faunal species of conservation importance was identified in intertidal surveys.

3.7.2 Construction Phase

- 3.7.2.1 The proposed LCW Pier will be constructed on top of the existing LCW Pier and the pier desk structure will be supported by piles. Pile will be constructed through the marine water. The plan view of the proposed LCW Pier will be about 0.156ha but the actual seabed loss will be much smaller (about 0.0058 ha) as only the piled foundation will directly encroach the seabed. The potential impacts due to the loss of small areas for the future piles and the concrete landing (total area around 0.0058 ha) as well as the low coverage of common hard corals (i.e. <1%) on the existing pier head are considered Minor. It is anticipated that the future piles could provide new and additional hard substrates for coral colonization.
- 3.7.2.2 There will be two connecting walkways to connect the temporary pier/ the proposed LCW pier and the existing footpath to Lai Chi Wo. Parts of these two walkways would fall within the Plover Cove Country Park boundary and a small area overlapped with woodland habitat, but no trees will be affected and no actual woodland loss will occur. Hence, the potential direct impact to terrestrial ecology is ranked as insignificant.
- 3.7.2.3 As no dredging and reclamation are required during the construction of the Project, and release of suspended solids due to construction works of pile and during site investigation works would be contained due to adoption of bored casing. In order to further minimize the increased suspended solid from the site investigation works and piling works, silt curtain will be deployed to confine the works area to prevent the accidental release of muddy water to the surrounding marine waters during site investigation works and piling construction. Besides, prefabrication approach will first be considered when designing concrete superstructures.
- 3.7.2.4 As the Project mainly consisted of marine-based works, potential impacts to terrestrial recognized sites of conservation importance including Lai Chi Wo Special Area, Conservation Area, Fung Shui Woodland and the Ecologically Important Stream are not expected.
- 3.7.2.5 Two short walkways connecting the proposed Lai Chi Wo Pier and the temporary pier to the existing footpath inside Plover Cove Country Park will partly fall within the country park boundary, but the scale of works will be very small and will not cause any tree loss, significant impact to the country park is not anticipated.

- 3.7.2.6 The proposed Lai Chi Wo Pier is within Yan Chau Tong Marine Park and close to Lai Chi Wo Beach SSSI. Seagrass bed and mangrove are the two important habitats within the marine park and SSSI. However, no seagrass bed and mangrove will directly be affected or indirectly impacted by water quality given the scale of the works and construction method.
- 3.7.2.7 The coral communities in Hong Kong Reef Check site “Lai Chi Wo” is located over 500m from the Lai Chi Wo Pier. Impacts to the coral communities are not likely both directly and indirectly.
- 3.7.2.8 Except the mitigation measures for water quality, no specific ecological mitigation measures for marine ecology are required. As a precautionary measure, a pre-construction dive survey should be conducted to verify the conditions of the small coral colonies on the existing LCW pier before any construction works, and site inspection should be conducted to make sure no trees within the Plover Cove Country Park will be affected.

3.7.3 Operational Phase

- 3.7.3.1 During operational phase, as there will be only a limited number of piles and a small above-seabed downstand wall in the marine habitats, change in hydrodynamic regime or water quality is not anticipated. It is not anticipated the frequency of vessels or visitor numbers would increase due to the Project. Pollution from marine traffics to marine waters is also not expected. No maintenance dredging would be required for the pier, and therefore no water quality impacts could be induced. No significant impact is also expected for the water sensitive receivers in the vicinity. Disturbance to terrestrial habitats or fauna due to the lighting at the pier head is not likely. Hence, no significant operational phase impacts to marine ecology, recognized sites or species of conservation importance are anticipated from the Project. Residual impacts are also acceptable.

3.8 Landscape and Visual

- 3.8.1.1 Potential landscape and visual impacts as a result of the Project have been assessed in accordance with Clause 3.4.10 and Appendix H of the Study Brief, EIAO Guidance Note No. 8/2010, and Annexes 10 and 18 of the TM-EIAO.

3.8.2 Construction Phase

- 3.8.2.1 The landscape resources (LRs) and landscape character areas (LCAs) within 500m boundary of the Project, as well as the visually sensitive receivers (VSRs) within the visual envelope (VE) of the Project, were identified and assessed.
- 3.8.2.2 During construction phase, insubstantial impacts are anticipated for most of the LRs and LCAs. Landscape impacts are anticipated to be slightly adverse on the LR3 Rocky Shore along the Coastline of Crooked Harbour and LR8 Lai Chi Wo Pier and moderately adverse for the LR1 Inshore Water of Crooked Harbour near Lai Chi Wo, LCA1 Inshore Water Landscape of Crooked Harbour and LCA2 Coastal Upland and Hillside Landscape of Pan Pui Teng. With the implementation of mitigation measures in construction phase, the residual landscape impacts are insubstantial on most LRs and LCAs and slightly adverse on LR1, LCA1 and LCA2, which are considered acceptable.
- 3.8.2.3 During construction phase, the visual impacts on VSRs are anticipated to be in the range of slightly adverse to moderately adverse without the provision of mitigation

measures during construction phase. Nevertheless, with the full implementation of mitigation measures, the residual visual impacts on VSRs are mitigated to slightly adverse to insubstantial and considered acceptable with mitigation measures.

- 3.8.2.4 Only five trees were identified within the tree survey extent 2m from the Project boundary, which were located outside of the site boundary. All associated construction activities will be limited to the site boundary and thus, no direct impact on trees due to the Project are anticipated.

3.8.3 Operational Phase

- 3.8.3.1 During operational phase, the residual landscape impacts on most of the LRs and LCAs are considered insubstantial, while on the affected LR1 and LCA1, the impacts will be alleviated to slightly adverse with mitigation measures. The landscape impact of LR8 will be enhanced to moderately beneficial by adopting the enhancement measures of the Project.
- 3.8.3.2 During operational phase, the impacts of all VSR will be enhanced from slightly beneficial to moderately beneficial due to the improved appearance of the Pier after adopting the enhancement measures of the Project.
- 3.8.3.3 Photomontages at the representative viewpoints at the VSRs are shown in **Figure 3.1** and **Figure 3.2**.



Figure 3.1 Photomontage of Project during Operational Phase



Figure 3.2 Photomontage of Project during Operational Phase

3.9 Fisheries

- 3.9.1.1 Potential fisheries impacts associated with the Project have been assessed in accordance with Clause 3.4.11 and Appendix I of the Study Brief and the criteria and guidelines stipulated in Annexes 9 and 17 of TM-EIAO.

3.9.2 Construction Phase

- 3.9.2.1 As only piles foundation will be constructed at the pier, and prefabricated structures will be built on-top, together with the approaches for avoidance and minimisation of impacts, potential fisheries impacts on fisheries resources due to construction of the pier are considered minor. Silt curtain will be installed to further minimize the increased suspended solids during construction phase. Potential negative impacts from the deployment of silt curtain such as further reduction of fisheries resources are very limited. Since no unacceptable adverse impacts on fisheries resources and fishing operations are anticipated, fisheries-specific mitigation measures are not required.

3.9.3 Operational Phase

- 3.9.3.1 The footprint of the LCW Pier would occupy a total area of about 0.156ha and cause a permanent loss of fishing ground. The loss is considered to be of insignificant proportion compared with the 1,651 km² (approximately 165,100 ha) of Hong Kong's total marine waters which is mostly available for fishing. Hence, the permanent loss of fishing ground is considered insignificant. Since no unacceptable adverse impacts on fisheries resources and fishing operations are anticipated, fisheries-specific mitigation measures are not required.

3.10 Cultural Heritage

- 3.10.1.1 Potential impacts on cultural heritage as a result of the Project have been assessed in accordance with Clause 3.4.12 and Appendix J of the Study Brief, and Annexes 10 and 19 of the TM-EIAO.

3.10.2 Construction Phase

- 3.10.2.1 A Marine Archaeological Investigation (MAI) has been conducted to identify any seabed features with archaeological potential. For the assessment of any potential cultural heritage impact due to seabed disturbance is anticipated during the construction of bored piles for the proposed pier. However, no marine archaeological resources are identified by the geophysical survey and visual diver survey. It is therefore concluded that no marine archaeological impact from the construction works of the Project is anticipated.

- 3.10.2.2 In addition, terrestrial archaeological resources and built heritage are not identified in the vicinity of the Project and adverse terrestrial cultural heritage impact is therefore not anticipated during the construction of the Project.

3.10.3 Operational Phase

- 3.10.3.1 During the operational phase, with the improved pier head located farther away from the shoreline and at a deeper seabed level, a deeper draft can be provided for vessel berthing. Besides, the Project does not plan to increase the number of Kaito or alter the existing Kaito routing. No adverse impact to marine cultural heritage is anticipated from the Project during the operational phase.

3.10.3.2 In addition, terrestrial archaeological resources and built heritage are not identified in the vicinity of the Project and adverse terrestrial cultural heritage impact is therefore not anticipated during the operation of the Project.

4 Environmental Monitoring and Audit

- 4.1.1.1 An Environmental Monitoring and Audit (EM&A) programme has been formulated for Project which is a DP listed under Schedule 2 of the EIAO, with details presented in the separate EM&A Manual.
- 4.1.1.2 The EM&A programme will provide management actions to check the effectiveness of the recommended mitigation measures/good site practices and compliance with relevant statutory criteria, thereby ensuring the environmental acceptability of the construction and operation of the Project.

5 Conclusion

- 5.1.1.1 The existing LCW Pier has already been in service for more than its design life, posing concerns to its structural integrity. Due to its primitive nature, it is unable to provide sufficient boarding space and berthing depth for pier users and hence poses safety concerns to pier users. Hence, LCW Pier has been selected as one of the proposed pier items at remote rural areas for priority improvement under the first phase of the Pier Improvement Programme delineated in the 2017 Policy Address in January 2017.
- 5.1.1.2 The Project will provide opportunities to resolve the aforementioned problems and benefits in enhancing the LCW Pier with upgraded facilities such as barrier-free access, canopy, seats, etc. The Project aims to upgrade the structural and facility standards of LCW Pier for safe pier usage by local villagers, mariculturists, visitors and tourists. As the Project comprises construction works within Yan Chau Tong Marine Park and Plover Clove Country Park, the Project is a DP under the EIAO.
- 5.1.1.3 The Project has considered alternative development options including pier location, pier shape design, pier size, construction methodology and sequence of construction works, to avoid and minimise potential environmental impacts during construction and operational phases of the Project.
- 5.1.1.4 This EIA Study has demonstrated the overall environmental acceptability of the proposed Pier Improvement at LCW, in accordance with the Study Brief (ESB-305/2017) and the TM-EIAO. The Project will meet all relevant environmental standards with the implementation of suitable mitigation measures/good site practices during both construction and operational stages.