

COUNTRY AND MARINE PARKS BOARD

Pier Improvement Projects at Lai Chi Wo and Tung Ping Chau

1. Purpose

1.1 This paper aims to brief Members on two pier improvement projects within Yan Chau Tong Marine Park and Tung Ping Chau Marine Park respectively to be carried out by the Civil Engineering and Development Department (CEDD).

2. Background

2.1 In 2017 Policy Address, the Government was committed to improve a number of remote public piers to facilitate public access to outing destinations and natural heritage. To take forward the policy initiative, the Government has launched the Pier Improvement Programme to carry out improvement works for piers at remote areas, including the piers at Lai Chi Wo and Tung Ping Chau.

2.2 Lai Chi Wo Pier is located within Yan Chau Tong Marine Park and Plover Cove Country Park, whilst Tung Ping Chau Public Pier is located within Tung Ping Chau Marine Park. CEDD is required to seek prior approval/consent of the Country and Marine Parks Authority in respect of the proposed improvement works in marine parks and country parks in accordance with the Marine Parks Ordinance (Cap. 476) and Country Parks Ordinance (Cap. 208) respectively.

3. The Proposal

3.1 CEDD has carried out an investigation study for the improvement of piers at Lai Chi Wo and Tung Ping Chau. The scope of the study includes an environmental impact assessment (EIA), engineering studies, site investigation and stakeholder consultation. CEDD has also consulted the Marine Park Committee at its meeting held in December 2019.

3.2 Based on results of the investigation study and the comments of different stakeholders, CEDD has worked out detailed proposals for the improvement of the two

piers. An outline of the background and justification of the projects, the proposed works, associated impact and mitigation measures is set out at Appendix I.

3.3 The Agriculture, Fisheries and Conservation Department supports the proposed improvement works as they would improve the safety of the pier users and accessibility to the areas. In addition, CEDD has adopted appropriate design to avoid and minimise potential impacts on marine ecology, in particular the corals at Tung Ping Chau.

4. Environmental Impact Assessment

4.1 The Director of Environmental Protection, after reviewing the EIA Reports of the two projects against the corresponding EIA Study Briefs and Technical Memorandum on EIA Process and taking into account the advice from other relevant authorities, confirmed that the EIA Reports were suitable for public inspection on 6 October 2020.

4.2 The EIA Reports are now exhibited for public inspection under the EIA Ordinance (Cap. 499) from 8 October 2020 to 6 November 2020.

5. Advice Sought

5.1 Members are invited to comment on the two pier improvement projects proposed by CEDD as outlined in Appendix 1.

Country and Marine Parks Authority
Agriculture, Fisheries and Conservation Department
October 2020

Improvement Works to Lai Chi Wo and Tung Ping Chau Piers
Information Paper to Country and Marine Parks Board on 23.10.2020

1. Project Background

- 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.
- 1.1.2 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 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.
- 1.1.3 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 and Tung Ping Chau Public Pier are of the recommended proposed pier items.

2. Improvement works to Lai Chi Wo Pier

2.1 Objective of Project

2.1.1 The Project aims to upgrade the structural safety and facility standards of Lai Chi Wo (LCW) Pier for safe usage by the public, including local villagers, mariculturists, visitors and tourists.

2.1.2 It will also provide opportunities to bring other benefits such as barrier-free facilities, canopy, seats, etc.

2.2 Site Location and History

2.2.1 LCW Pier is located at the coastal area of Northeast New Territories and is located within the Geopark (Double Haven Geo-Area), Yan Chau Tong Marine Park and Plover Cove Country Park. Lai Chi Wo Beach Site of Special Scientific Interest (SSSI) was designated in 1979 in conservation of seagrass *Zostera japonica*, and this SSSI is located at about 150m to the south of the existing pier. The location of the Project Site is shown in **Figure 2.1**.

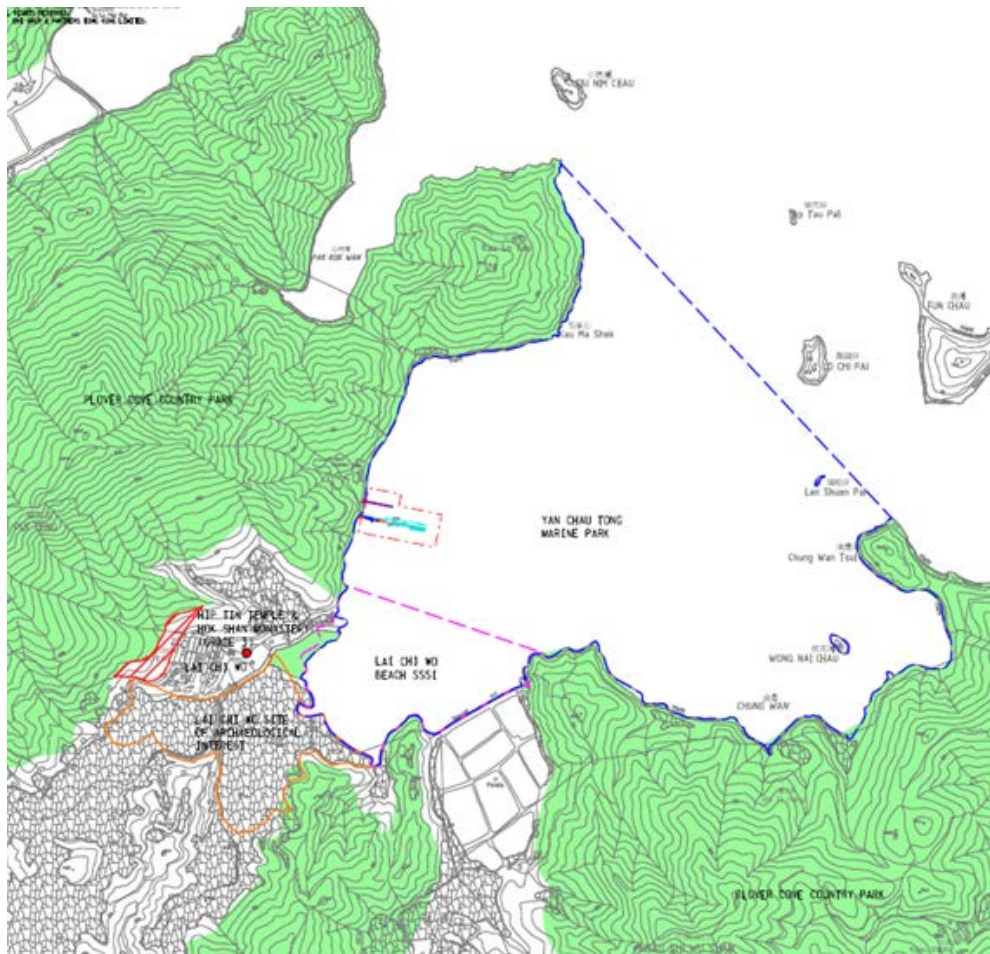


Figure 2.1 Location of Project (Lai Chi Wo)

2.3 Need of the Project

Existing Pier Condition

- 2.3.1 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 2.2**.

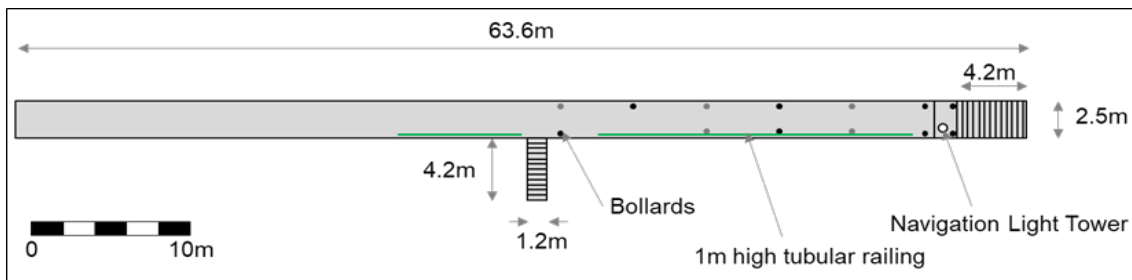


Figure 2.2 Layout of Existing LCW Pier

Safety Concerns

2.3.2 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:

- a. Deteriorating structural conditions;
- b. Insufficient water depth for berthing and manoeuvring;
- c. Low pier level;
- d. Undesirable berthing arrangement; and
- e. Non-fully restrained narrow pier.

Barrier-free Facilities

2.3.3 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.

Sustainable development of Geo-park

2.3.4 The LCW 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), of 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 being comparatively higher than in other areas of Geopark. With the implementation of the proposed pier improvement works, the LCW Pier would be provided with upgraded facilities and safer access enabling improvement of the experience of travellers visiting the geopark and thus supporting the sustainable development of the geopark.

Villagers’ / Pier User’s Concerns

- 2.3.5 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.

2.4 **Proposed Improvement Works**

Extension of the Existing Pier

- 2.4.1 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** and the proposed pier layout and arrangement is shown in **Annex A**.

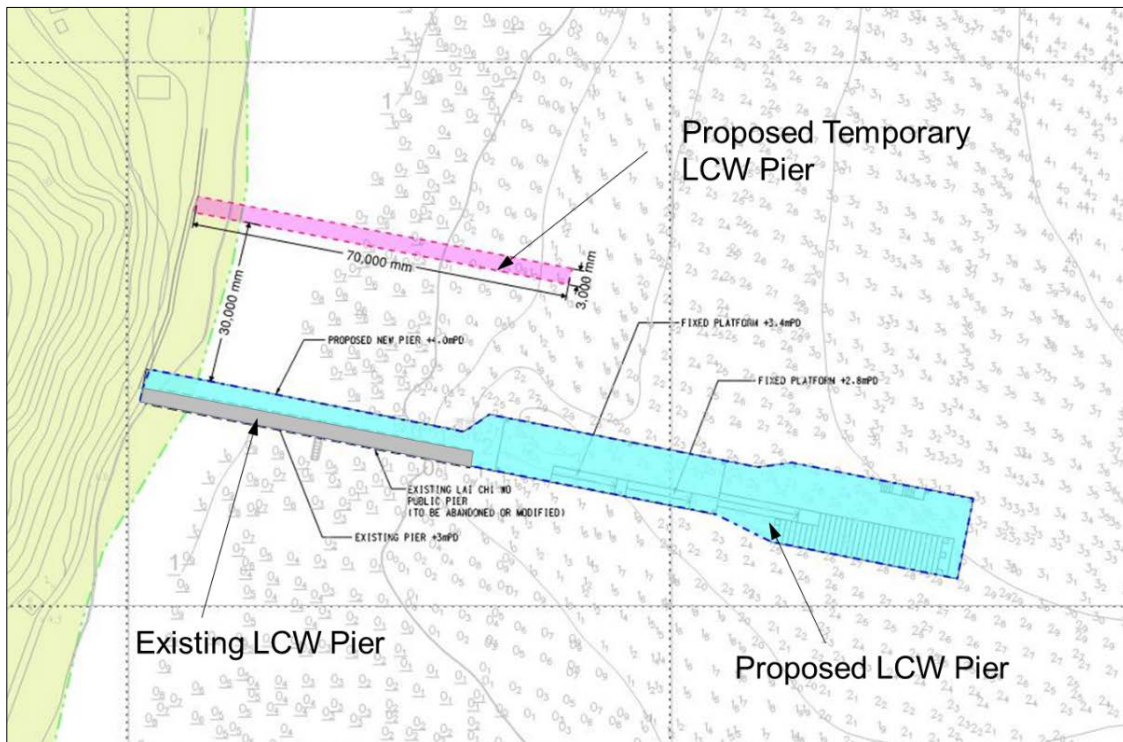


Figure 2.3 Location of Proposed LCW Pier and Proposed Temporary LCW Pier

2.4.2 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 facilities, and may include PV panels, interactive kiosk and/or smart lamppost.

Proposed Temporary Pier

2.4.3 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.

2.4.4 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**.

2.5 **Construction Sequence and Tentative Implementation Program**

Construction Sequence

- 2.5.1 Project-specific site investigation will be carried out before construction work. Vertical boreholes will be sunk for the Project. 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.
- 2.5.2 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. The prefabricated floating platform and gangway will be delivered via marine access. They will be transported by barges and/or derrick barges. The temporary pier will be subsequently demolished after the completion of the new pier.
- 2.5.3 Environmentally conscious construction methodologies are proposed and listed below to avoid, minimise and mitigate environmental impact from the Project as far as practicable.
- a. Use of pile casing and silt curtain to confine pollutants during pile construction. An illustrative figure of the setup of a marine bored pile construction is shown in **Figure 2.4**.
 - b. Prefabrication construction method for deck.

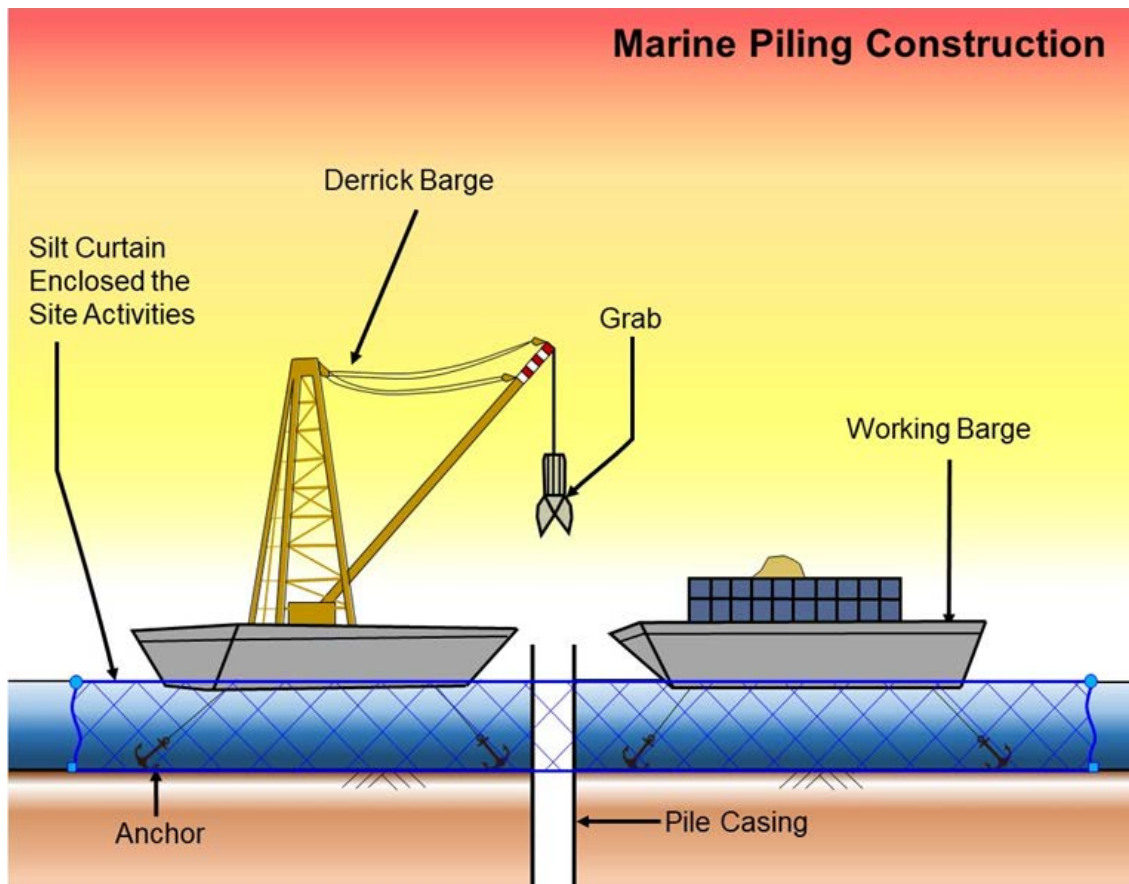


Figure 2.4 Pile Casing and Silt Curtain for Marine Bored Pile Construction

Tentative Implementation Program

- 2.5.4 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.

2.6 Possible Environmental Impacts and Proposed Mitigation Measures

Potential impacts during construction stage

2.6.1 Ecology

Impacts on Yan Chau Tong Marine Park

2.6.1.1 Yan Chau Tong Marine Park has a total sea area of about 680 ha. The proposed LCW Pier involves construction of a new pier head with floating pontoon and a walkway in Yan Chau Tong Marine Park. Piles will be constructed to support the pier head and the walkway, and thus there will be direct encroachment upon marine habitats, i.e. occupancy of sandy shore, seabed and water column. The total area of the pier footprint, including pier head and walkway, is about 0.156 ha, but the actual seabed loss due to occupancy by piles is much smaller at about 0.0058 ha only. During construction, only a small number of construction vessels will be used and they will be limited to the proposed works area of 1.4 ha around the existing pier.

2.6.1.2 Low coverage (less than 1%, equivalent to 0.006m²) of common hard coral mostly *Oulastrea crispata* was recorded in the subtidal area of the existing pier head. These hard corals are likely to be indirectly affected by the proposed pier improvement structures. As the coral species are very widespread and common in Hong Kong and, particularly *Oulastrea crispata*, tolerant to low light condition and adverse environment, in addition to the coverage of these hard corals is low and the sizes are tiny, the potential impacts to the corals are considered Minor.

Impacts on Lai Chi Wo Beach Site of Special Scientific Interest (SSSI)

2.6.1.3 The Lai Chi Wo Beach SSSI, which was designated for the presence of seagrass bed and mangrove stand with Moderate to High ecological values, is at about 150m to the south of the pier. Nevertheless, no construction works will be required within the Lai Chi Wo Beach SSSI. Potential ecological and water quality impacts on the two important habitats are considered Minor due to the small scale of pier works and the construction method adopted.

Impacts on Plover Cove Country Park

2.6.1.4 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 was under existing tree canopy and thus overlapped with woodland habitat on map.

2.6.1.5 The woodlands in Plover Cove Country Park are important land-based ecological resources. All the land-based construction activities for the pier works will be limited to connecting the two walkways to the existing footpath. Only small and/or manual handling equipment will be used to construct the walkways. No trees will be affected and there will be no actual woodland loss. Hence, ecological impact on the Plover Cove Country Park is considered insignificant.

Proposed Mitigation Measures

Considerations for Impact Avoidance

2.6.1.6 Though the proposed works are within the Yan Chau Tong Marine Park, important habitats such as mangrove stand, and seagrass bed are completely avoided. Other recognised sites of conservation importance such as Lai Chi Wo Beach SSSI and the coral communities identified in Hong Kong Reef Check are also avoided. Besides, although the area for construction work of the connecting walkway between the proposed LCW Pier and the existing footpath to Lai Chi Wo falls within Plover Cove Country Park, tree loss will be avoided, and no woodland loss is expected.

Considerations for Impact Minimisation

2.6.1.7 Construction impacts to marine ecological resources are largely avoided by adopting piling method instead of open sea dredging and extensive filling above seabed to support the new pier. By adopting the piled foundation method, the seabed loss can be greatly reduced and water quality will not be affected significantly as there will be no dredging of the seabed and land filling in the

water.

- 2.6.1.8 Silt curtain can further confine the drilling fluid in the works area to the surrounding sensitive receivers (e.g. Reef check site, mangrove, seagrass bed) arising from piling operation and minimise any accidental release. Flushing water for piling will be collected and stored in a barge, and recycled for re-use or discharging off site.
- 2.6.1.9 Wastewater coming from concreting of piles will be treated in sedimentation tank on a barge before discharging off site with a valid discharge license under the Water Pollution Control Ordinance.
- 2.6.1.10 Emergency Spillage Plan will be established during construction so that appropriate actions can be undertaken to prevent or reduce risks to the surrounding sensitive receivers in the event of an accidental spillage.
- 2.6.1.11 A no-dumping policy will be adopted as an initiative prohibiting dumping of wastes, chemicals, oil, trash, plastic, or any other substance that would potentially be harmful to marine habitats. It is mandatory that an educational program of the no-dumping policy be made available to all construction-site personnel for all project-related works. The policy needs to be strictly enforced. Ad hoc, on-site audits will be conducted.

2.6.2 **Water Quality**

- 2.6.2.1 Potential hydrodynamic and water quality impact from construction activities have been assessed and documented in the Environmental Impact Assessment (EIA) report. Given the small scale of the pier and the adoption of piled foundation with sufficient column-to-column spacing, hydrodynamic impact from the new structures of the improved pier and the temporary pier is not anticipated.

2.6.2.2 Potential water quality impact may be resulted from the construction activities, in particular the marine-based site investigation and foundation works. Drilling fluid from the site investigation and piling works should be handled with extra care and should not be directly discharged on-site and within the Yan Chau Tong Marine Park or other Water Sensitive Receivers (WSRs). Silt curtain should be deployed before the commencement of construction and should only be removed after completion of marine-based works. With full implementation of the mitigation measures, no residual impact is anticipated from the marine-based foundation works, the above-water construction works, surface runoff from construction site operation, accidental spillage of chemicals and sewage from workforce.

2.6.3 **Air Quality**

2.6.3.1 During construction, the site investigation and piling works are mostly below water. There are neither exposed workfronts nor heavy construction works which may have substantial dust emission. Hence, fugitive dust emission from the construction is anticipated to be limited. Prefabrication method will be adopted for the construction of the pier structures as much as practicable to further minimise the construction dust impact on-site. Although there is no adverse impact to the identified Air Sensitive Receivers (ASRs), dust control measures and good practices in accordance with Air Pollution Control (Construction Dust) Regulation will be followed to avoid and reduce any potential dust impact.

2.6.3.2 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,

no adverse air quality impact from the marine emissions is anticipated.

2.6.4 **Noise**

2.6.4.1 During construction, the only Noise Sensitive Receiver (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 of pier and the low complexity of the Project. Furthermore, no construction works will be carried out during the restricted hours, and prefabrication method will be adopted for the pier structure construction as far as practicable. In addition, a number of noise enhancement measures including good site practices, use of quality powered mechanical equipment (QPME), and use of temporary noise barriers, etc. will be implemented to further reduce the construction noise impact. Therefore, no adverse construction noise impact is anticipated.

2.6.5 **Waste Management**

2.6.5.1 Potential waste management implications from the generation of waste during the construction phase have been evaluated. Mitigation measures, including on-site sorting, reusing Construction and Demolition (C&D) materials etc., are devised in the construction methodology to minimise any surplus materials to be disposed of at waste reception facilities. With the proper implementation of the recommended mitigation measures, no adverse environmental impact from waste management during construction is anticipated.

2.6.6 **Cultural Heritage**

2.6.6.1 A Marine Archaeological Investigation (MAI) was conducted to identify any seabed features with archaeological potential. No marine archaeological resources were identified by both geophysical survey and diver survey. It is therefore concluded that no marine archaeological impact from the construction works is anticipated.

*Long-term impacts during operation stage***2.6.7 Landscape and Visual**

2.6.7.1 The improved pier structure will be designed in a manner to be compatible with the existing pier structure and the environment nearby. When comparing the visual appearance of the existing pier in poor condition with the improved pier in the photomontages, the Project is anticipated to provide slightly beneficial visual impact to the visually sensitive receivers (VSRs). In addition, the aesthetics of the pier can be further enhanced by colour and textural treatment of structures and therefore the visual impact could be enhanced to be moderately beneficial.

3. Improvement works to Tung Ping Chau Public Pier**3.1 Objective of the Project**

3.1.1 The Project aims to upgrade the structural and facility standards of Tung Ping Chau (TPC) Public Pier for safe pier usage by local villagers, visitors and tourists.

3.1.2 There have been repeated requests from Sai Kung North Rural Committee members, Tai Po District Council Members and Tung Ping Chau Village Representatives (VRs) to improve the safety of the passengers using the pier.

3.1.3 This Project will address these operational and safety problems and provide opportunities to bring benefits in enhancing TPC Public Pier with upgraded facilities such as barrier-free facilities, canopy, seats, etc.

3.2 Site Location and History

3.2.1 TPC Public Pier is located along the north-eastern coast of Tung Ping Chau facing towards Ping Chau Hoi. It falls within the Tung Ping Chau Marine Park and the Hong Kong UNESCO Global Geopark (Geopark). It is also adjacent to

the Ping Chau Site of Special Scientific Interest (SSSI) and the Plover Cove (Extension) Country Park. The location plan of TPC Public Pier is shown at **Figure 3.1**.

3.2.2 TPC Public Pier was constructed more than 50 years ago. It is composed of a causeway, catwalk and a pier head. The catwalk in the middle section and the pier head were re-constructed in 2008. The pier level is about +4.4 mPD at the causeway rising to about +4.9 mPD at the pier head.

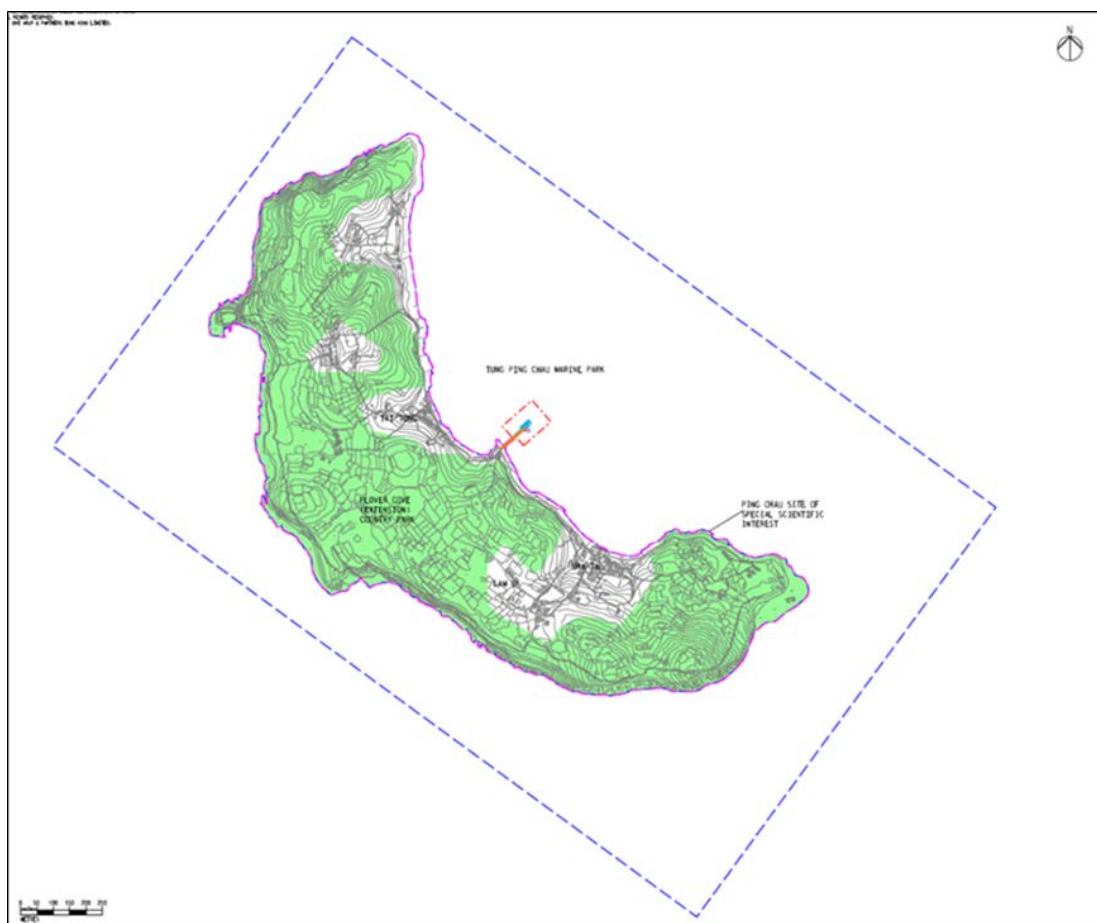


Figure 3.1 Location of Project (Tung Ping Chau)

3.3 Need of Project

Existing Pier Condition

3.3.1 TPC Public Pier was originally constructed in the 1960s and was upgraded in 2007 to address certain structural problems. The pier is located within the Tung Ping Chau Marine Park, which is well known for the protection of coral communities, algal bed and unique geological features. The existing TPC Public Pier is about 98m long, comprising an about 14m long solid pier head, about 35m long catwalk and an about 49m long rubble causeway. The solid pier head is about 5.5m wide, and consists of a 1.1m wide flight of steps on each side of the pier head. The pier head level is about 4.9m above the Principal Datum (PD), and the pier head is covered by a pitched roof structure. The layout of the existing pier is shown in **Figure 3.2**.

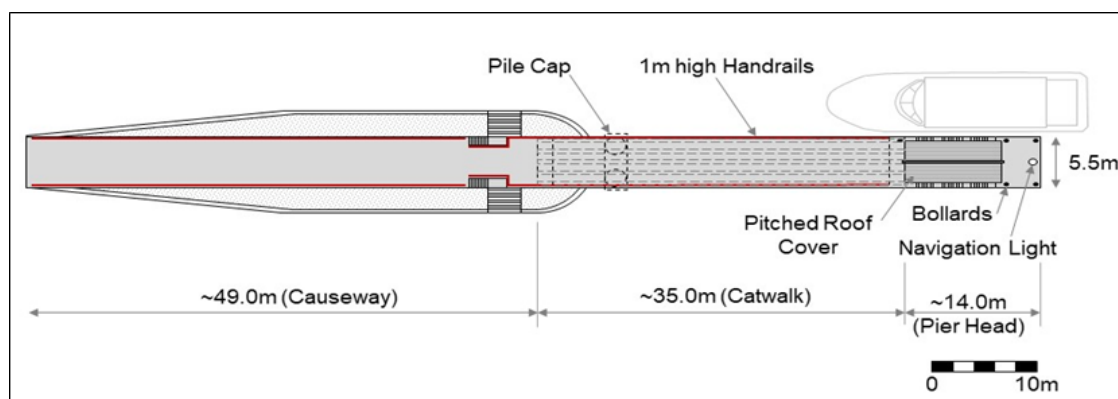


Figure 3.2 Layout of Existing TPC Public Pier

Safety Concerns

3.3.2 Due to poor structural conditions of the walkway at TPC Public Pier, pier improvement works in 2007 had been carried out, replacing it by a new walkway spanned between new piles and the existing pier head. The improvement works also comprised widening of the causeway and catwalk. The pier head was covered by a new canopy, and the structure of the pier head remained as it had been (see **Figure 3.3** and **Figure 3.4**).



Figure 3.3 Pier was built in 1960s

Figure 3.4 Improvement Works in 2007

3.3.3 However, as the pier improvement works in 2007 only involved small scale improvement and only fixed the structural issue of the catwalk, other safety concerns remain outstanding, including:

- a. Narrow and steep flights of landing steps; and
- b. Undesirable berthing arrangement.

3.3.4 There are two landing steps at the existing pier head, but the landing steps are narrow and steep. They have posed serious safety concerns for passengers boarding on / disembarkation off vessels to the pier; they are sub-standard according to the current code of practice (**Figure3.5**). Some near-miss accidents at the landing steps were reported by the locals and villagers. There is serious accessibility issue for those who are in need, including aged people, when using this pier.

3.3.5 Besides, the existing pier head is only 14.5m long and is too short to berth the full length of typical passenger vessels alongside the pier. Vessels can only berth undesirably at the boat bow (**Figure 3.6**). In view of these people and vessel navigation/berthing safety issues, it is crucial to carry out improvement works at this pier to ensure safe uses of this pier.



Figure 3.5 Existing Narrow and Steep Landing Steps of Tung Ping Chau Public Pier



Figure 3.6 Undesirable Berthing at the Boat Bow of Existing Tung Ping Chau Public Pier

Villagers’/ Pier Users’ Concerns

- 3.3.6 There have been repeated requests from Village Representatives (VRs) of the five villages on TPC, SKNRC members and TPDC members over the years to improve the safety condition when using the pier. During the consultation meetings held with elected-by-villagers VRs, SKNRC members and TPDC councillor in May 2019 for this Project, they reported that there had been near-miss accident in the past due to the narrow and steep landing steps. They expressed support to this Project and urged the earlier implementation of this improvement works.

Barrier-free Facilities

- 3.3.7 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.

Sustainable Development of the Geo-park

- 3.3.8 The Hong Kong UNESCO Global Geopark is currently a member of the Global Geoparks Network (GGN), of 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, Tung Ping Chau belongs to “Integrated Protection Area”, which carries function for geo-tourism due to its carrying capacity being comparatively higher than other areas of Geopark. With the implementation of the proposed pier improvement works, the TPC Public Pier would be provided with safer access for the public to visit, enabling improvement of the experience of travellers visiting the geopark and thus supporting the sustainable development of the geopark.

3.4 **Proposed Improvement Works**

Extension of the Existing Pier

3.4.1 The existing TPC Public Pier extends from the land towards the sea in the northwest direction. The proposed TPC Public Pier will integrate and extend from the existing pier head and will align in the same direction as the existing pier. The location of the proposed TPC Public Pier is shown in Figure 3.7 and proposed pier layout and arrangement **Annex B**.

3.4.2 The proposed TPC Public Pier will be a piled deck structure in order to minimise any impact on environment and hydrodynamics. The piled deck structure will extend the existing pier head by around 26m towards the sea. Its width ranges from 5.5m to 6m, and increased to a gross width of 15m (including the floating pontoon) at the pier head. The proposed TPC Public Pier will consist of a floating pontoon and a gangway for barrier-free facilities, and may include PV panels, interactive kiosk and/or smart lamppost.

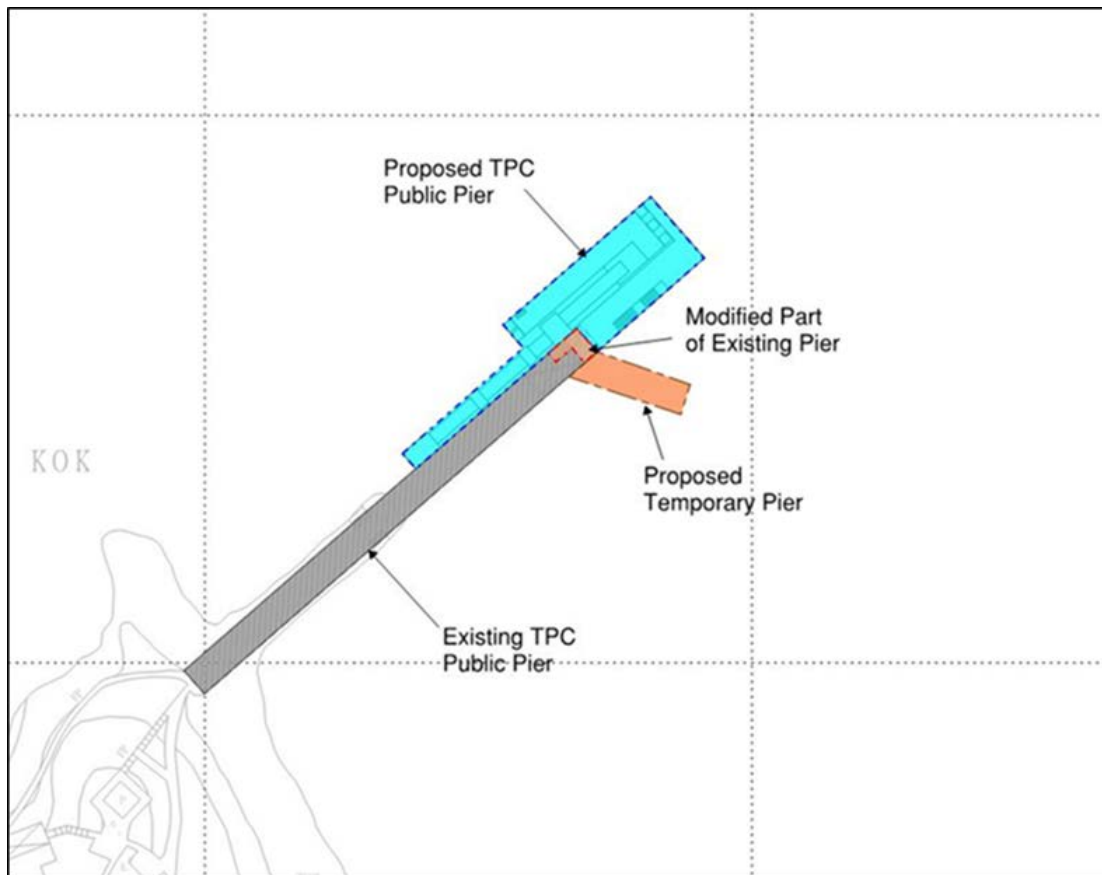


Figure 3.7 Location of Proposed TPC Public Pier and Proposed Temporary TPC Pier

Proposed Temporary Pier

- 3.4.3 During construction of the proposed TPC Public 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 extended from the head of the existing TPC Public Pier to maintain operation of the Kaito ferry service and to serve other public vessels.
- 3.4.4 The temporary TPC Pier will be located at the pier head of the existing pier. The proposed temporary pier is in the southeast of the existing pier and is about 20m long and 5.5m wide. The final arrangement of the temporary pier will be determined during the construction stage by the contractor to suit their final method and programme of construction. The pier will be in the form of floating

pontoon and/or steel structures supported by piles to minimise any environmental impact. The temporary pier will be demolished after completion of the permanent TPC Public Pier. The location of the proposed temporary TPC Public Pier is shown in **Figure 3.7**.

3.5 **Construction Sequence and Tentative Implementation Program**

Construction Sequence

- 3.5.1 Project-specific site investigation will be carried out before construction work. Vertical boreholes will be sunk for the Project. Before commencement of the work, the legs of barge and boreholes location will be inspected by diver survey to ascertain no coral colonies will be affected as far as practicable. 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.
- 3.5.2 Where practicable, prefabrication method will be used for the construction of the proposed TPC Public Pier. All the precast units will be transported by barges and/or derrick barges, and will be installed in-situ on site. The prefabricated floating platform and gangway will be delivered via marine access. They will be transported by barges and/or derrick barges. The temporary pier will be subsequently demolished after the completion of the new pier.
- 3.5.3 Environmentally conscious construction methodologies are proposed and listed below to avoid, minimise and mitigate environmental impact from the Project as far as practicable.
- a. Use of double casing to confine pollutants during bored pile construction. An illustrative figure of the setup of a marine bored pile construction is shown in **Figure 3.8**.
 - b. Prefabrication construction method.

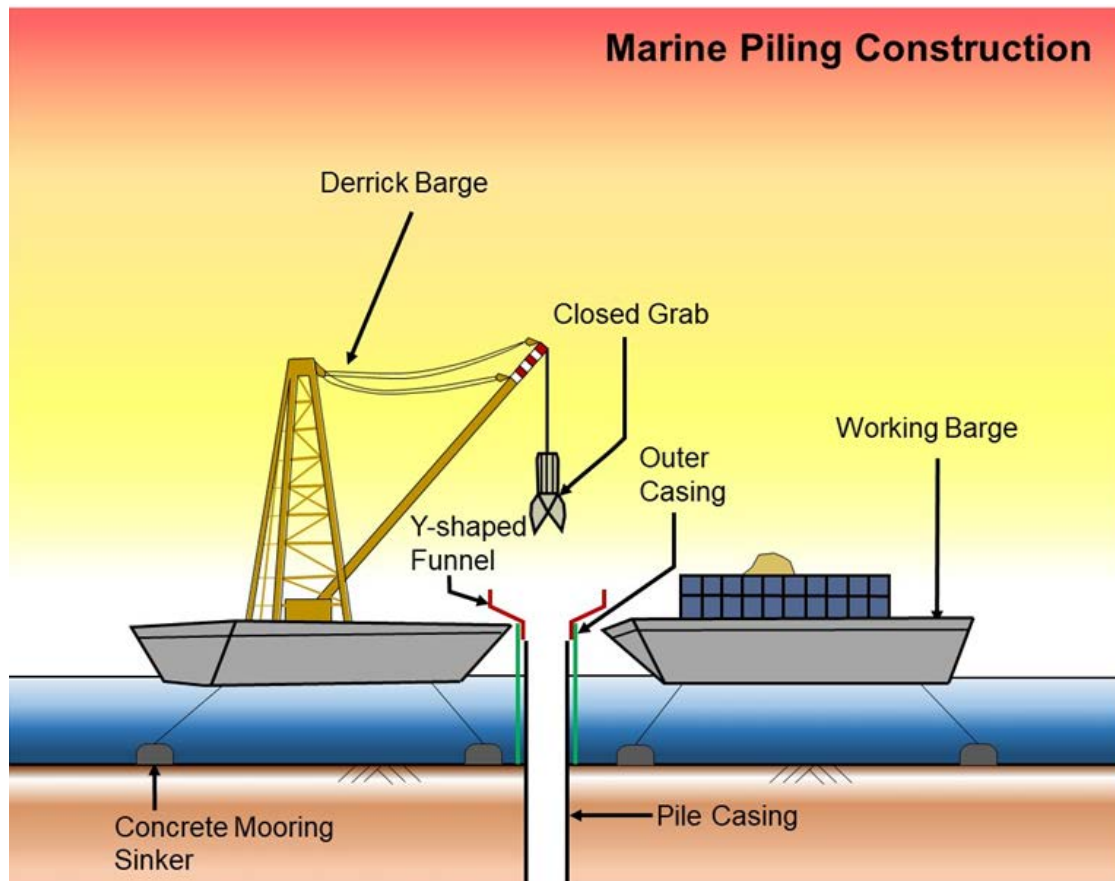


Figure 3.8 Outer Casing for Marine Bored Pile Construction

Tentative Implementation Program

- 3.5.4 Site Investigation works for detailed design will be carried out from Q4 2021 to Q1 2022. 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 2026. 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.

3.6 Possible Environmental Impacts and Proposed Mitigation Measures

Potential impacts during construction stage

3.6.1 Ecology

Impacts on Tung Ping Chau Marine Park and Hard Corals

- 3.6.1.1 Tung Ping Chau Marine Park has a total sea area of about 270 ha. The proposed pier extension at Tung Ping Chau involves construction of a new pier head with a floating pontoon and a ramp in Tung Ping Chau Marine Park. Piles will be constructed to support the pier head and the walkway, and thus there will be direct encroachment upon marine habitat, i.e. occupancy of seabed and water column. The total area of the pier footprint is about 0.056 ha, but the seabed and water column loss due to occupancy of piles and downstand wall is much smaller at about 0.002 ha of seabed and 0.004 ha of water column only. During construction, only a small number of construction vessels will be used and they will be limited to work in a sea space (i.e. proposed works area) of around 1.0 ha around the existing pier.
- 3.6.1.2 Throughout the site selection and option selection process, which is based upon all available information including coral dive survey for this EIA, the coral survey conducted for the previous pier improvement project and the annual Hong Kong Reef Check, the proposed works area and the proposed pier extension layout in this Project have already avoided areas with high coral density and coverage. Reclamation involving extensive filling over seabed to form the pier is avoided in this Project; the proposed pier extension and temporary pier will both be supported by piles, where the pile locations could be refined as far as practicable. Direct encroachment to corals due to the project has much been avoided.
- 3.6.1.3 The only exception is at the existing pier head, of which the outermost 3m section of the pier head will be demolished for connecting to the proposed pier extension. On this section of the existing pier, there are 12 coral colonies (which are all below 20cm

diameter and not rare species) that will be affected by the pier works. As it is difficult to dismantle the existing pier head whilst keeping these coral colonies intact, it is likely these 12 colonies will be directly impacted. As these 12 colonies do not constitute large size colonies and do not constitute rare species, the impact is considered Minor to Moderate. Except these 12 coral colonies on the existing pier head, no other coral colonies on the existing pier head, old pillars or seabed will be directly affected.

3.6.1.4 For corals on the seabed beneath the plan view area of the proposed pier extension, the pier structures will block some of the direct sunlight and the light received by corals will be reduced. In the new pier extension, most of the structures will be above sea level and at the same level of the existing pier (with sufficient clearance distance from the water surface) to allow light penetration from the sides. There will be a small floating pontoon on water surface, with ramps connecting the catwalk and pontoon. Coral colonies under the floating pontoon and ramps (in particular the section near the floating pontoon) will be subject to higher reduction of light. Certain reduction of light is anticipated for corals within the plan view area of the proposed pier extension and the influence would be permanent after the pier improvement work is completed. A total of 73 coral colonies on the seabed under the proposed pier extension will be indirectly affected. The impact for the coral colonies under the proposed pier extension that could potentially be impacted by sunlight reduction is considered Moderate.

3.6.1.5 A temporary pier will be required during the construction phase, which will be in the area with relatively fewer coral colonies. Only 5 coral colonies were recorded on the seabed under the plan view area of the temporary pier. Direct encroachment of the colonies on seabed can be avoided by adjusting the location of piles, as far as practicable, for supporting the temporary pier. However, sunlight reaching the seabed beneath would still be reduced as the temporary pier will be present for about 2 years. The impact for the colonies under the temporary pier is considered as Minor

to Moderate.

- 3.6.1.6 Coral translocation is recommended as mitigation measures for the corals to be directly encroached (those on the pier head) and to be indirectly affected by reduction of light permanently or for an extended duration (for those on the seabed beneath the pier extension and the temporary pier).
- 3.6.1.7 Similar to other pier improvement projects which involve site investigation work and piling construction to support the new pier structures, a jack-up barge and derrick barges (typically covering 0.014 ha water surface for jack-up barge and about 0.1 ha for derrick barges) will be mobilised to the works area. The jack-up barge is supported by 4 legs during operation and a few mooring sinkers are required to deploy for the derrick barge. Divers will check the seabed before the deployment of sinkers and landing of legs for the jack-up barge, to prevent impacts on corals.
- 3.6.1.8 Sunlight reaching the seabed beneath the jack-up barge and the derrick barge will be transitionally reduced due to the presence of the barges. For the jack-up barge, it generally takes few days at each location, and it generally takes about 4 to 5 days to complete each piling works for derrick barges. Although the site investigation works will take longer time at each location than the piling works, the platform of the jack-up barge can however be lifted up above water surface to allow more light reaching the seabed. Those barges will then move to another location for another work cycle, the seabed underneath the barges will be re-exposed to direct sunlight. Hence, the effect of reducing sunlight to the seabed and any corals upon will be transient during the pier improvement works. Precautionary measure is recommended as further protection.

Impacts on other Recognized Sites of Conservation Importance

- 3.6.1.9 Whilst the location of the proposed pier extension, the temporary pier and the proposed works area have selected areas with lower coral density, and impacts on

those corals have been addressed, significant impacts to recognized coral communities with high coral coverage/density (e.g. Hong Kong Reef Check locations and the Core Area of the Tung Ping Chau Marine Park) have been avoided and no impacts are expected due to the distance from the Project Site. The geological features in the Ping Chau SSSI, Geopark and Plover Cove (Extension) Country Park will not be affected either.

Mitigation Measures

Considerations for Impact Avoidance

- 3.6.1.10 Based on the selection of option to extend the existing pier instead of building a new pier, the need of having new access road or conducting works in backshore has been avoided. The proposed works area only covers subtidal habitats, and no terrestrial habitats, natural coastline or recognized sites of conservation importance such as Plover Cove (Extension) Country Park, Geopark, and the Ping Chau SSSI will be encroached. Besides, the Core Area of Tung Ping Chau Marine Park and reef check sites of Hong Kong Reef Check are also avoided.

Considerations for Impact Minimisation

- 3.6.1.11 The layout of the proposed pier extension was adjusted to further reduce the number of corals to be affected. The present design is the option with lower impacts to corals by adopting the layout with the minimal number of coral colonies beneath the proposed pier extension, reducing the coral colonies to be affected by one-third. By adopting pile-supporting design, the corals to be directly affected will be limited to the 12 colonies on the exiting pier head. It is expected that the detailed design would be based on the present survey results to maintain the current design principle, i.e. avoid encroaching the corals as far as possible.
- 3.6.1.12 Construction impacts to marine ecological resources are largely avoided by adopting piling method instead of extensive filling above seabed to support the

new pier extension. By adopting the piled foundation method, the seabed loss can be greatly reduced and water quality will not be affected significantly as there will be no dredging of the seabed and filling in the water.

- 3.6.1.13 In order to further minimise the increased suspended solid from the site investigation works and piling works, double casing system would be provided around the pile/inner casing to prevent the accidental release of muddy water to the surrounding marine waters during site investigation and piling works. The use of double casing system to confine the sediment is effective in local examples such as the Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road and reconstruction of the Sharp Island Pier.
- 3.6.1.14 Water contaminated with slurry rock fragment should be stored in the barge and recycled for use in the construction works. Wastewater coming from the grouting of piles shall be treated in sedimentation tank placed in a barge before discharging offsite with a valid discharge license under the Water Pollution Control Ordinance.
- 3.6.1.15 Emergency Spillage Plan will be established during the construction so that appropriate actions can be undertaken to prevent or reduce risks to the surrounding sensitive receivers in the event of an accidental spillage.
- 3.6.1.16 A no-dumping policy will be adopted as an initiative prohibiting dumping of wastes, chemicals, oil, trash, plastic, or any other substance that would potentially be harmful to marine habitats. It is mandatory that an educational program of the no-dumping policy be made available to all construction-site personnel for all project-related works. The policy needs to be strictly enforced. Ad hoc, on-site audits will be conducted.
- 3.6.1.17 Marker buoys shall be set up to demarcate the works area. All construction vessels shall be restricted to the marked areas. Besides, no overloading of the working barges during operation should be allowed, and movement of the construction

vessels close to the shallow waters particularly during low tide should be avoided.

Considerations for Impact Mitigation

- 3.6.1.18 According to the coral mapping results in this Study (Annex C), a total of 90 hard coral colonies were recorded for the proposed pier extension and the temporary pier (73 colonies on seabed beneath the proposed pier extension, 12 colonies on the existing pier head to be modified and 5 colonies on seabed beneath the proposed temporary pier). For the corals indirectly impacted by reduction of sunlight, although the pier extension structures and temporary pier will be supported by piles and above sea level, allowing sunlight penetrating from the sides to reach the seabed beneath, it is still recommended that all coral colonies within the plan view area of the proposed pier extension and the temporary pier should be translocated. A detailed coral translocation plan will be formulated that includes a pre-translocation survey at the donor and recipient sites, substrate type, coral composition, Rapid Ecological Assessment (REA) transect surveys, coral health condition etc. Monitoring on the translocated corals at the recipient sites should also be included in the coral translocation plan, in order to evaluate the effectiveness of the translocation task.
- 3.6.1.19 The whole stretch of eastern coast of Tung Ping Chau is generally suitable for coral translocation, and the Reef Check locations in Tung Ping Chau (i.e. A Ma Wan, A Ye Wan and Wong Ye Kok), for example, could all be considered as potential recipient sites for coral translocation. It is anticipated that one recipient site is enough for the translocation exercise of about 90 coral colonies in the present study. Both direct and indirect impacts to the coral communities at the three Reef Check locations are not expected. The final recommendation of recipient site however will be determined in the detailed coral translocation plan, but it should be located at a reasonable distance away from the proposed works area. With the implementation of coral translocation, the residual impact on coral due to the Project is considered acceptable.

3.6.1.20 Before marine-based site investigation works, the position of the jack-up barge will be fixed by extending its 4 legs and standing on seabed. Concrete mooring sinkers will also be deployed within the proposed works area to allow the derrick barge for piling works to position. The locations of the boring points, where the legs standing and where the concrete mooring sinkers deployed should be inspected by divers with knowledge about corals, to ascertain no coral colony will be affected.

Precautionary Measures

3.6.1.21 It is suggested that as a precautionary measure the programme of the site investigation and piling works could be planned in a way where practicable that there would be no overlapping of the positions for construction vessels between two sequential work cycles, to limit the duration with reduced sunlight reaching seabed. The site investigation works will take longer time at each location than the piling works, the jack-up barge should be lifted up as much above water surface as practicable to allow more light reaching the seabed.

3.6.1.22 Scheduling the pile construction works for the temporary pier to avoid the spawning seasons of hard corals (i.e. May to October) could be adopted as a precautionary measure, in view of its closer distances among piling locations with the southern end of the proposed works area (where the relatively higher coral density area within the proposed works area is located).

3.6.2 **Water Quality**

3.6.2.1 Potential hydrodynamic and water quality impact from the construction activities have been assessed and documented in the EIA report. Given the small scale of the pier and the adoption of piled foundation with sufficient spacing, hydrodynamic impact from the structures of the new pier and the temporary pier is not anticipated.

3.6.2.2 Water quality impact may be resulted from the construction activities, in

particular the marine-based site investigation and piling works. Nevertheless, the seabed features in the vicinity of the Project are mostly sand/silt, boulders and rocks, which have much higher settling velocity and could be quickly settled. With the implementation of recommended mitigation measures such as the use of double casing system, Y-shape funnel or closed grab to be implemented during marine-based site investigation and piling works, adverse water quality impact is not anticipated. There will neither be direct discharge on-site, within the Tung Ping Chau Marine Park nor other WSRs. With full implementation of the mitigation measures, no residual impact is anticipated from the marine-based foundation works, the above-water construction works, surface runoff from construction site operation, accidental spillage of chemicals and sewage from workforce.

3.6.3 **Air Quality**

3.6.3.1 During construction, the site investigation and piling works are mostly below water. There are neither exposed workfronts nor heavy construction works which may have dust emissions. Hence, fugitive dust emissions from the construction is anticipated to be limited. Prefabrication method will be adopted for the construction of the pier structure 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 will be followed to avoid and reduce any potential dust impact.

3.6.3.2 As the scale of construction works is relatively small, extensive use of the 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, no adverse air quality impact from the marine emissions is anticipated.

3.6.4 Noise

3.6.4.1 During construction, Tai Tong and Plover Cove (Extension) Country Park are identified as NSRs which are at approximately 210m and 70m away from the nearest works area respectively. Construction noise impact is anticipated to be limited in view of the small scale of the pier and the low complexity of the Project. Furthermore, no construction works will be carried out during the restricted hours, and prefabrication method will be adopted for the superstructure construction as far as practicable. In addition, a number of enhancement measures including good site practices, use of QPME, and use of temporary noise barriers, etc. will be implemented to further reduce the construction noise impact. Therefore, no adverse construction noise impact is anticipated.

3.6.5 Waste Management

3.6.5.1 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 any surplus materials to be disposed of at waste reception facilities. With the proper implementation of the recommended mitigation measures, no adverse environmental impacts from waste management during construction are anticipated.

3.6.6 Cultural Heritage

3.6.6.1 A MAI was conducted to identify any seabed features with archaeological potential. No marine archaeological resource was identified by the geophysical survey. It is therefore concluded that no marine archaeological impact from the construction works is anticipated.

Long-term impacts during operation stage

3.6.7 ***Landscape and Visual***

3.6.7.1 The improved pier structure will be designed in a manner compatible with the existing pier structures and the environment nearby. When comparing the visual appearance of the existing pier in poor condition with the improved pier in the photomontages, the Project is anticipated to provide slightly beneficial visual impact to VSRs. In addition, the aesthetics of the pier can be further enhanced by colour and textural treatment of structures and therefore the visual impact could be enhanced to be moderately beneficial.

4. Stakeholder Consultation

4.1 **Village Representatives, Rural Committee and District Councils**

The LCW Pier falls within the constituency of Sha Ta District of North District Council and Sha Tau Kok District Rural Committee. The TPC Public Pier falls within the constituency of Sai Kung North District of Tai Po District Council and Sai Kung North Rural Committee. The two proposed pier improvement schemes were presented to the relevant stakeholders including Village Representatives, Rural Committee members, District Councillors, and they fully supported and endorsed the Projects to go forward.

4.2 **Green Groups**

4.2.1 In August and October 2019, there were two consultation meetings held with green groups. In the first meeting, the attendees suggested the initial proposed preliminary design for TPC Public Pier was substantially large and required Project Proponent to re-consider the footprint area of the proposed preliminary design. After that, the

Project Proponent minimized the footprint area of TPC Public Pier in response to comments received from the first meeting and therefore a second meeting was held. Besides, some green groups representatives were concerned about the increasing number of visitors may place burden on the handling capacity of the island and increase man-made pollution. Project Proponent responded that after consulting related Government Departments, there is no plan to intensify the existing ferry/Kaito services. Therefore, an increase in the number of visitors to the island is not anticipated in the Project.

4.2.2 Regarding the LCW Pier, the attendees raised concerns about the land area within the proposed works boundary and how the trees nearby would be affected, and also water quality monitoring during construction works and demolishing the existing pier. The Project Proponent responded that most of the works will be carried out on a work barge, and therefore no trees are required to be felled by the Project. Regarding the water quality during construction works, two monitoring stations will be implemented during construction phase.

4.3 **Marine Parks Committee**

4.3.1 The Study was also discussed at Marine Parks Committee (MPC) meeting held on 6 December 2019. After the meeting, a document with additional information in response to members' comments raised during the meeting was circulated on 13 July 2020. Additional information included details of coral survey, details of designing the location of proposed floating platform and details of temporary piers.

5. **EIA Progress**

5.1 The EIA reports cover the review of ecological baseline condition, environmental impact assessment, and recommendation of mitigation measures for all environmental aspects, including air quality, noise, water quality, waste management,

land contamination, ecology, fisheries, landscape and visual, and cultural heritage. The EIA reports for Pier Improvement at Lai Chi Wo (EIA-264/2020) and Pier Improvement at Tung Ping Chau (EIA-265/2020) were submitted to EPD on 20 August 2020. Director of Environmental Protection (DEP) confirmed the suitability of the reports for public inspection on 6 October 2020. The statutory public inspection period is from 8 October 2020 to 6 November 2020.

6. Conclusion

- 6.1 The Projects will provide opportunities to resolve the aforementioned problems and benefits in enhancing the LCW Pier and TPC Public Pier with upgraded facilities such as barrier-free facilities, canopy, seats, etc. The Projects aim to upgrade the facility standards of LCW Pier and TPC Public Pier for safe pier usage by local villagers, mariculturists, visitors and tourists.
- 6.2 Possible environmental impacts, especially on marine ecology and water quality, have been duly considered in the two detailed proposals. Practical measures are then proposed to avoid, and to minimize the possible impacts particularly on the coral communities in Tung Ping Chau.
- 6.3 The Projects will meet all relevant environmental standards with the implementation of suitable mitigation measures/ good site practices during both construction and operational stages according to their EIA reports.

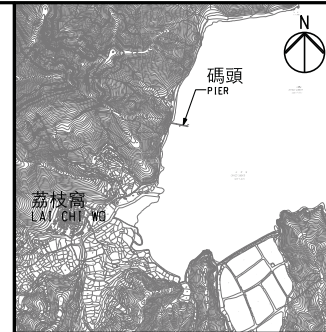
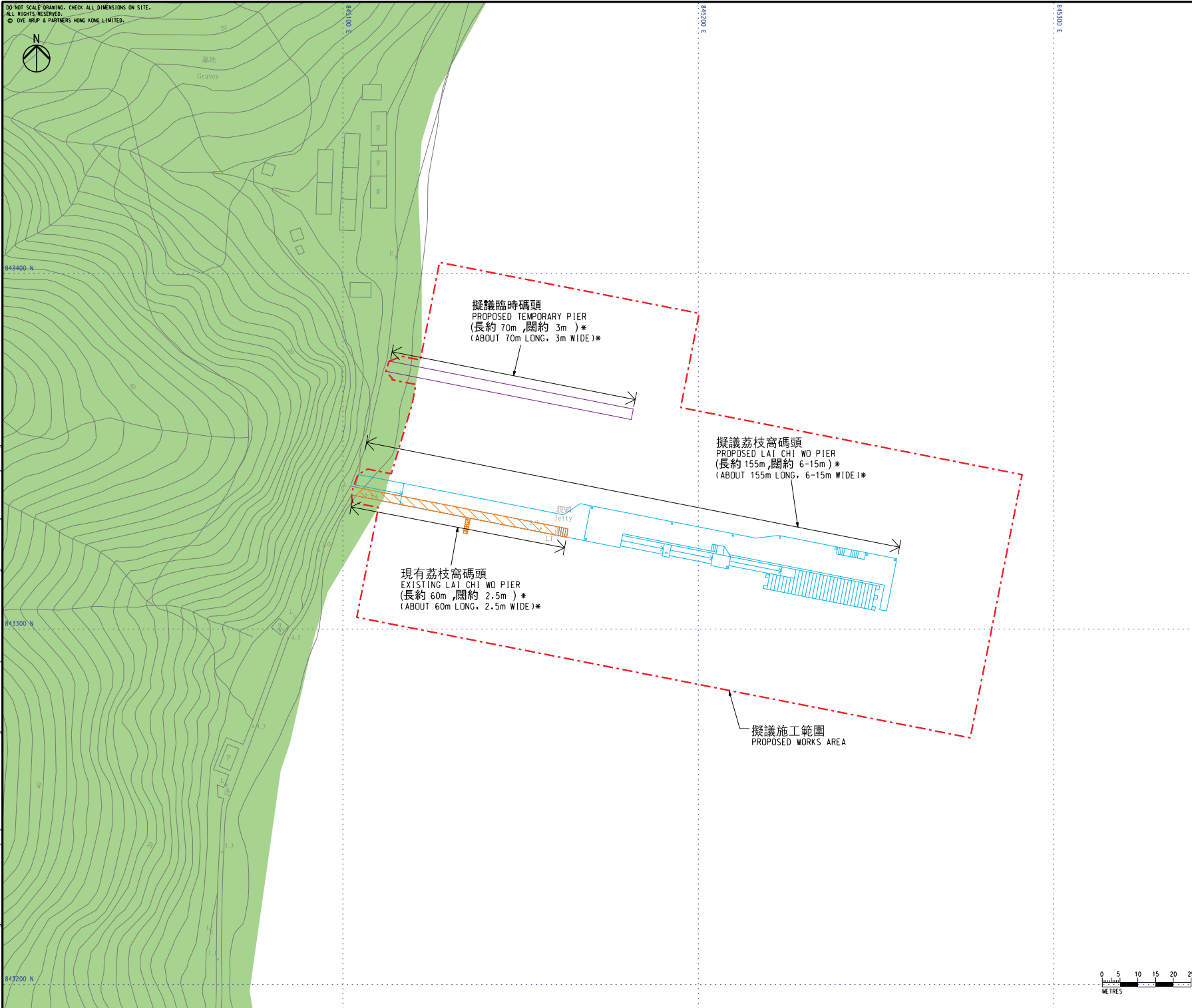
Civil Engineering and Development Department

October, 2020

Annex A

Proposed Pier Layout and Arrangement (Lai Chi Wo)

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索引圖 KEY PLAN n.t.s.

- LEGEND**
- 擬議荔枝窩碼頭
PROPOSED LAI CHI WO PIER
 - 現有荔枝窩碼頭
EXISTING LAI CHI WO PIER
 - 擬議施工範圍
PROPOSED WORKS AREA
 - 擬議臨時碼頭
PROPOSED TEMPORARY PIER
 - 船灣郊野公園
Plover Cove Country Park

NOTE:
*THE DIMENSION OF THE PIER IS INDICATIVE ONLY.

Rev	Description	By	Date
D	FOURTH ISSUE	SF	08/20
C	THIRD ISSUE	SF	07/20
B	SECOND ISSUE	SF	04/20
A	FIRST ISSUE	SF	08/19

Consultant
ARUP

Project title
Pier Improvement at Lai Chi Wo
荔枝窩碼頭改善工程

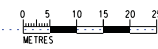
Drawing title
LAYOUT OF PROJECT
工程項目平面圖

Drawing no. FIGURE 1.3		Rev. D	
Drawn SF	Date 08/20	Checked AF	Approved FC
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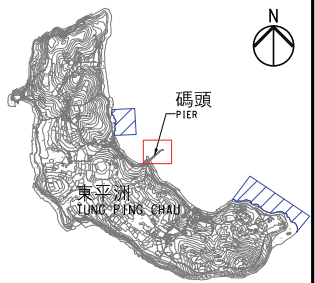
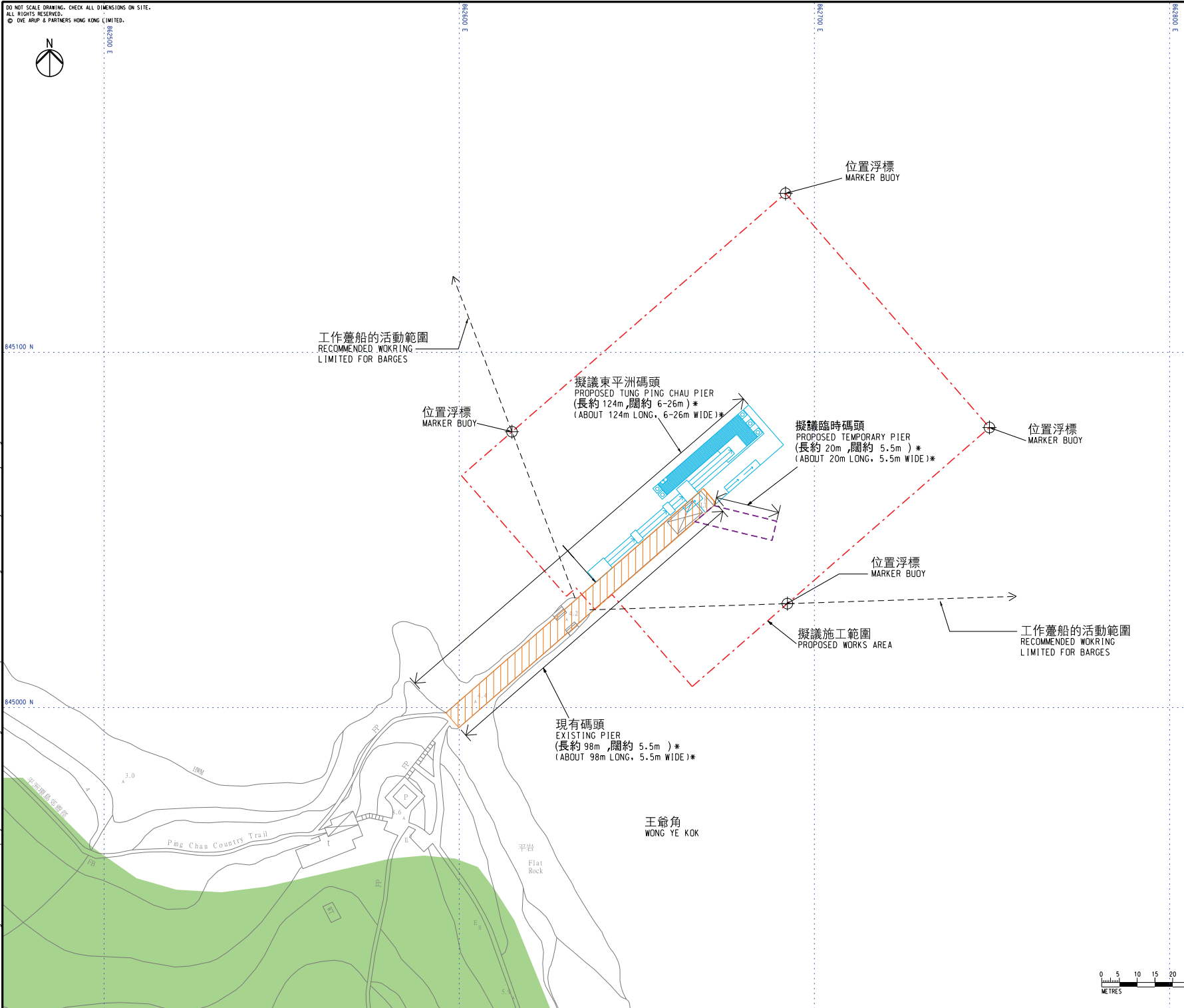
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Annex B

Proposed Pier Layout and Arrangement (Tung Ping Chau)

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索引圖 KEY PLAN N.T.S.

- LEGEND**
- 擬議施工範圍
PROPOSED WORKS AREA
 - 擬議東平洲碼頭
PROPOSED TUNG PING CHAU PIER
 - 現有東平洲碼頭
EXISTING TUNG PING CHAU PIER
 - 擬議臨時碼頭
PROPOSED TEMPORARY PIER
 - 船灣(擴建部分)郊野公園
Plover Cove (EXTENSION)
COUNTRY PARK
 - 東平洲海岸公園核心地區
(工作躉船的限製地區)
TUNG PING CHAU MARINE PARK CORE
AREA (RESTRICTED AREA FOR BARGE)

NOTE:
 *THE DIMENSION OF THE PIER IS INDICATIVE ONLY.

D	FOURTH ISSUE	SF	08/20
C	THIRD ISSUE	SF	07/20
B	SECOND ISSUE	SF	04/20
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Rev	Description	By	Date

Consultant
ARUP

Project title
**Pier Improvement at Tung Ping Chau
 東平洲公眾碼頭改善工程**

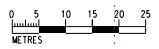
Drawing title
**LAYOUT OF PROJECT
 工程項目平面圖**

Drawing no. FIGURE 1.3		Rev. D	
Drawn SF	Date 08/20	Checked AF	Approved FC
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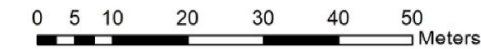
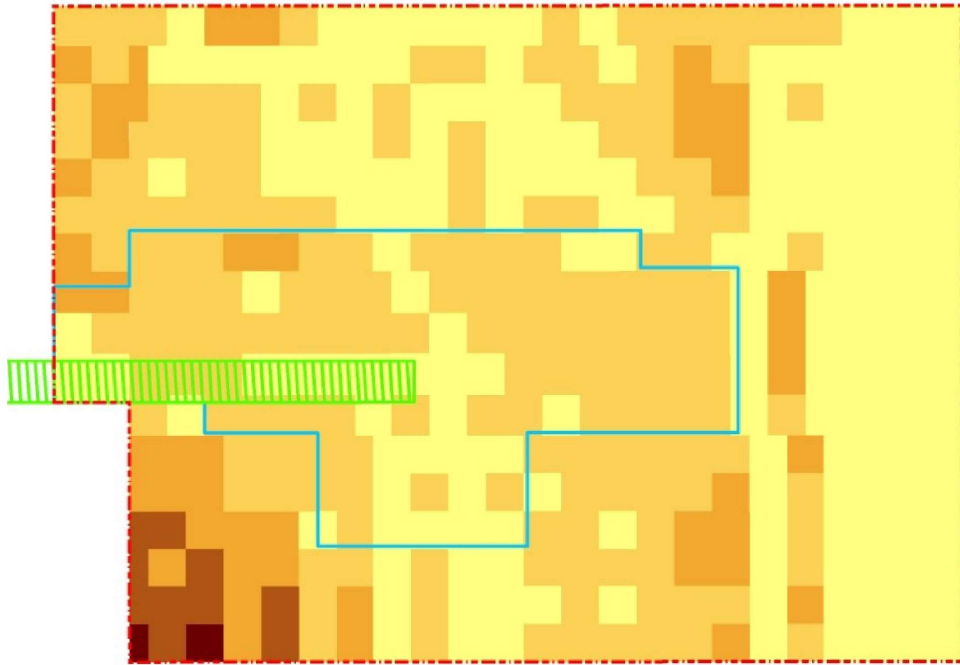
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 8/14/2020



Annex C

Coral Survey Results of the Study

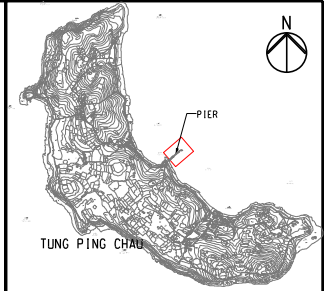
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- 擬議施工範圍 Proposed Works Area
- 現有碼頭 Existing Pier
- 初步碼頭改善範圍
Tentative Pier Improvement Area

每平方米的珊瑚個體數量
Number of Coral Colonies per m²

- < 0.2
- 0.2 - 0.9
- 1 - 4
- 5 - 9
- 9 - 12



KEY PLAN

Rev	Description	By	Date
B	SECOND ISSUE	SF	12/19
A	FIRST ISSUE	SF	11/19

Consultant

ARUP

Project title
 Pier Improvement at Tung Ping Chau
 東平洲碼頭改善工程

Drawing title
CORAL SURVEY RESULTS OF THE STUDY
 本工程研究的珊瑚調查結果

Drawing no. ANNEX C		Rev.	
Drawn SF	Date 12/19	Checked AF	Approved FC
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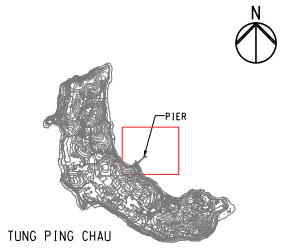
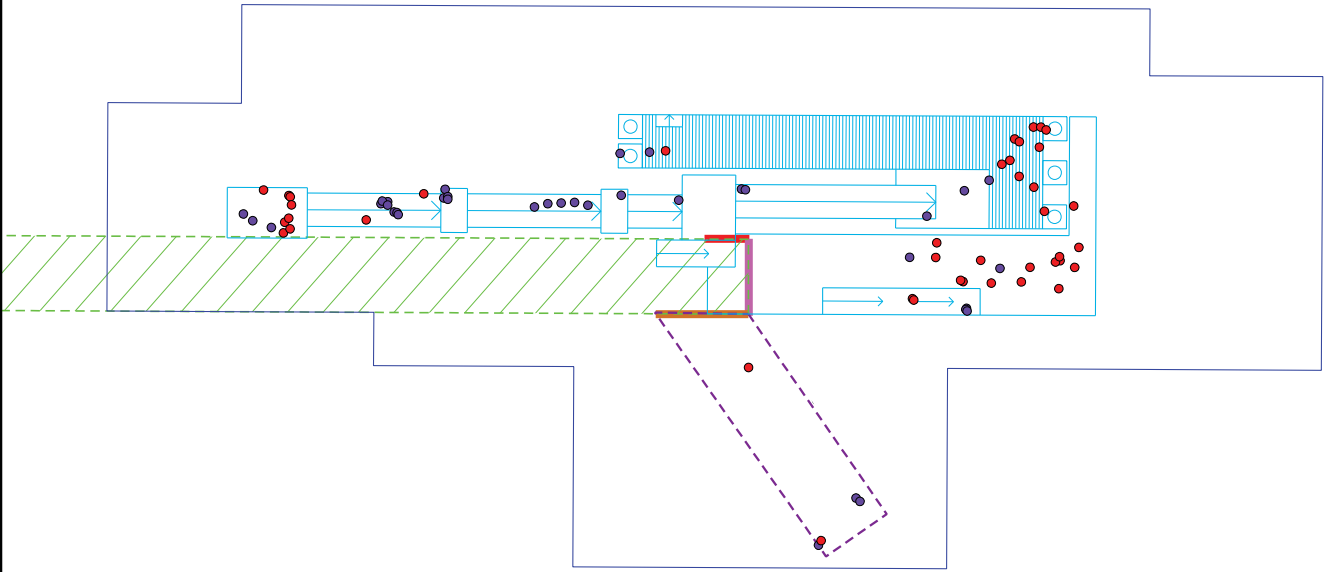


Printed By : HKCTRA014
 File name : \\hkgmts27\CEN\env\project\262145\13 Drawing_Deliverables\Reports\06_EIA\TPC\Figure_8.7 - Location of the Tentative Pier Improvement Area.dgn
 12/24/2019

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 Filename : \\hkgits27-CIEW\env\project\262145\13 Drawing Deliverables\Reports\06 EIA\TPC\Figure 8.11 - Hard Coral Distribution within the Proposed Pier Extension and the Temporary Pier.dgn



TUNG PING CHAU

KEY PLAN

LEGEND

- TENTATIVE PIER IMPROVEMENT AREA
 - PROPOSED NEW PIER
 - EXISTING TUNG PING CHAU PUBLIC PIER TO BE RETAINED
 - TEMPORARY PIER
- CORAL ON SEABED
- READILY MOVABLE:
 - COLONIES ON PROPOSED PIER: 39
 - COLONIES ON TEMPORARY PIER: 2
 - NOT READILY MOVABLE:
 - COLONIES ON PROPOSED PIER: 34
 - COLONIES ON TEMPORARY PIER: 3
- CORAL ON VERTICAL WALLS OF PIER HEAD (NOT READILY MOVABLE)
- NO. OF COLONIES: 2
 - NO. OF COLONIES: 5
 - NO. OF COLONIES: 5

C	THIRD ISSUE	SF	03/20
B	SECOND ISSUE	SF	12/19
A	FIRST ISSUE	SF	11/19
Rev	Description	By	Date

Consultant
ARUP

Project title
 Pier Improvement at Tung Ping Chau

Drawing title
**HARD CORAL DISTRIBUTION
 WITHIN THE PROPOSED PIER
 EXTENSION AND THE TEMPORARY
 PIER**

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