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By post and by email at panel_dev@legco.gov.hk

25 March 2019

Clerk to Panel on Development
Legislative Council Secretariat
Legislative Council Complex
1 Legislative Council Road
Central, Hong Kong

[Attn: Ms Doris LO, Clerk to Panel on Development]

Dear Ms LO

Legislative Council Panel on Development - Meeting on 26 March 2019
Views on "Studies related to artificial islands in the central waters, Lantau Conservation Fund and work progress of the Sustainable Lantau Office"

Regarding the captioned LegCo meeting on 26 March 2019, the Institution is pleased to provide herewith our views and suggestions on the subject matters for your consideration.

Thank you for your attention.

Yours sincerely

Ir Ringo S M YU
President
The Hong Kong Institution of Engineers

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NEW PERSPECTIVE MOMENTUM 新視野·新動力

Enclosure

Legislative Council
Panel on Development

Views from the Hong Kong Institution of Engineers on Studies Related to Artificial Islands in the Central Waters, Lantau Conservation Fund and Work Progress of the Sustainable Lantau Office

INTRODUCTION

The Hong Kong Institution of Engineers (the HKIE) notes the Administration's Paper on "Studies related to Artificial Islands in the Central Waters, Lantau Conservation Fund and Work Progress of the Sustainable Lantau Office" submitted to the Legislative Council Panel on Development for its meeting to be held on 26 March 2019.

2. The Administration has proposed in the Paper to undertake the studies related to the artificial islands in the Central Waters between Hong Kong Island and Lantau and to set up a Lantau Conservation Fund (LCF) to support conservation and related projects and minor local improvement works in Lantau. The HKIE expresses our support to the proposals, and early funding for the proposals should be sought and approved so as to facilitate rolling out the corresponding works as soon as possible to contain the expenditure. In regard to the relevant proposals, the HKIE would like to provide our views for consideration.

SUPPORT FOR INCREASING LAND SUPPLY

3. The Institution has been advocating for a multi-pronged approach to increase land supply, and in particular we support creating a large area of new land through reclamation. We believe that creating artificial islands in the Central Waters is a technically feasible way for increasing land supply, while the Lantau Tomorrow Vision (the Vision) as announced by the Chief Executive is a forward-looking project to address the issue of land shortage as well as the long term development of Hong Kong. An extra land reserve gained from reclamation will certainly serve to sustain the long term development needs of Hong Kong. To ensure that the significant benefits of the Vision can be realised, the HKIE believes that the project should be implemented timely, and hence prompt allocation of sufficient funding for carrying out relevant detailed planning and engineering studies is necessary and crucial.

IMPORTANCE OF CONDUCTING THE PROPOSED STUDIES

4. There are different voices in the community concerning the feasibility and technicality of the Vision. To foster a consensus and come up with an informed decision for taking forward this mega project, the HKIE believes that conducting relevant studies would aptly address various issues of concern with scientific and objective information. In formulating the strategies and detailed design for the

Vision, thorough assessments on various aspects, including technical, environmental etc. would be necessary, and this would also facilitate for a well-planned implementation schedule for the project. The Administration is also suggested to set up mechanism to monitor and rationalise the resources to be spent on the project. Moreover, the Vision which is of such a significant scale should be, and could be, carried out in phases. Similar to the common practice for all mega-sized major engineering projects, the number and timing of phasing of the project for the Vision should be based on the data and findings of the feasibility studies and the preliminary design that suit the project circumstances taking account the appropriate distribution of workforce across the lifetime of the project. The outcome of the studies could also shed light on identifying the possibility/ flexibility on adjusting the scope of reclamation as required.

5. The HKIE is of the view that in setting the scope of the proposed studies, a number of issues as elaborated in the ensuing paragraphs should be taken into consideration, as these issues are instrumental and critical for the successful execution of the project to yield the best interest to Hong Kong.

Technical Concerns

6. Technically speaking, the reclamation works of the proposed artificial islands could be more costly and complicated compared to near shore reclamation, due to the longer sea walls and the water depth. But reclamation in the Central Waters would lessen the effects to the neighbourhood and habitat of the existing coastal areas. Accordingly, having updated facts and figures through comprehensive survey and site investigation of the marine seabed geology and geotechnical properties would be necessary for the detailed design phase, to facilitate selection of the most suitable ground improvement strategy and method of reclamation as well as to control the cost and programme of the reclaimed land formation and the residual settlement after reclamation works.

7. It is noted that there are some non-scientific speculations about the height of towering wave and tide as well as the rising sea level caused by climate change or extreme weather that might affect the proposed artificial islands under the Vision. The HKIE, with a view of constructive deliberation, welcomes rational, scientific and objective discussions on this subject. We believe that the expertise of various engineering disciplines in the HKIE could provide solutions and step up precautionary measures in a number of aspects such as marine, geotechnical, drainage and infrastructure. Moreover, as the locations of the proposed artificial islands are not in an open sea, the impact of tide and storms to them is expected similar to that to other islands in Hong Kong. In fact, well proven engineering techniques such as building higher sea walls or placing wave breakers would be some of the feasible measures to address the concern on the storm surges and wave impact, which should not be deterring factors to the project. Nevertheless, the HKIE hopes that the proposed studies to be conducted by the Administration could address these issues and provide a scientific basis for making an informed decision, which would be essential to gain public confidence of the project and for carrying out subsequent detailed design.

Environmental Issues

8. Hong Kong has the Environmental Impact Assessment (EIA) Ordinance in place which provides a comprehensive, scientific, objective and transparent assessment mechanism to control the impact of infrastructure projects on the environment. All major reclamation projects should strictly follow the statutory environmental impact assessment process, and where necessary, introduce mitigation measures accordingly. The HKIE supports the Administration to conduct EIA studies for the artificial islands and the road/ rail links under the requirements of the Ordinance to ensure that the project would have minimal and controllable negative impact to the environment.

9. The HKIE stresses the importance of ecology conservation in carrying out engineering projects. To maintain the integrity of coastal ecosystem, recent major coastal infrastructure works in Hong Kong have now incorporated eco-shoreline or green seawall concept into the design of waterfront. The projects for the expansion of Three-Runway System for Hong Kong International Airport and the reclamation of East Tung Chung in north Lantau, where the project sites are in the waters rich in marine fauna, have already incorporated the element of eco-shoreline. As for the project under the Vision, the Central Waters is also rich in marine fauna. Therefore, the Administration is expected to give due consideration on the preservation of natural shoreline.

10. After years of trial, experiences have been accumulated on eco-shoreline design, which not only serves for ecological conservation but also for leisure enjoyment and a living community. With the policy directives of "Conservation to precede Development" as mentioned in the Administration's Paper, we see the Vision an opportunity for further application of our knowledge on eco-shoreline design tailored for local marine ecology which will ultimately benefit for the sustainable development of Hong Kong.

11. The HKIE suggests that the proposed studies of the Administration should include conducting a comprehensive flow and sediment transport study to gauge the effects of the new reclamation on sedimentation / erosion in the vicinity (which can affect benthic ecology and siltation of navigation channels) and the likelihood of creating other unintended water quality problems, such as low flush zones that may be prone to dissolved oxygen depletion and algal blooms.

12. Moreover, baseline water quality and flow velocity data should be collected, covering the Southern, Western Buffer and Victoria Harbour Water Control Zones, for a duration of at least one full year to capture seasonality effects.

13. According to the available dolphin survey data, there would be no significant population and activities of finless porpoises at the locations of the proposed artificial islands near Kau Yi Chau and Hei Ling Chau[1]. However, a detailed survey programme for finless porpoises by means of a regular and systematic approach at

[1] Hong Kong Cetacean Research Project (2017-18) (2018), Monitoring of Marine Mammals in Hong Kong Waters, Retrieved from: https://www.afcd.gov.hk/english/conservation/con_mar/con_mar_chi/con_mar_chi_chi/files/Final_Report_2017_18.pdf

south-eastern water region of Lantau is suggested to be conducted. The survey programme should include investigating the potential night-time activities through using the underwater acoustic device, which has already been used at west and south-western water regions of Lantau for Chinese White Dolphin, for more comprehensive and accurate results so as to facilitate the formulation of corresponding mitigation strategies.

14. Noting that the coastal areas to the south of Peng Chau and north of Hei Ling Chau have record of existence of hard corals, the reclamation works for the proposed artificial islands near these shorelines might have impact to the hard coral communities which need to be protected in Hong Kong. Although the Government has initiated advance commencement of conservation of the existing ecological resources on Lantau Island, the direct impact that might be induced by the construction of the proposed artificial islands will be marine based, and justification of the enhancement at the terrestrial habitats / species that could be compensated for the loss of marine habitats in terms of functionality and quality might need to be addressed. It is suggested that further detailed studies should be conducted and where necessary more mitigation measures should be designed to address these concerns. It would be appropriate for the Administration's current proposal on the studies and the LCF to address these concerns.

15. According to the findings of the Port Survey 2016/17[2] by Agriculture, Fisheries and Conservation Department, the areas of the Central Waters are heavily used by fishing vessels especially sampan, though the production by weight is not high. The sites are also close to Cheung Sha Wan Marine Fish Culture Zone. The HKIE is of the view that the existing fisheries resources should not be neglected, and it would also require to address the fishing industry's concern. Hence, the Administration's proposed studies should also take into consideration of the direct and indirect impacts on fisheries and resources due to the change in water quality and hydrodynamics during the construction and operation phases.

16. We would expect that the relevant proposed studies of the Administration would take into consideration of the aforementioned aspects, while the proposed LCF would also provide capacity to allow further initiatives for the purpose. In addition, the LCF should cover terrestrial/ marine ecological enhancement and sustainable fisheries elements.

Land Use Planning

17. The project creates a large piece of newly reclaimed land. It offers an excellent opportunity for cost-effective developments of underground space and facilities. A three-dimensional (3D) land use planning concept with consideration given to layered zonation of ground could be adopted to allow for development of additional spaces in subsurface. This could bring about an enhancement to the economic value of the project and features to achieve the "single site, multiply uses" principle. A strategically planned integration of the surface and subsurface facilities can improve

[2] Agriculture, Fisheries and Conservation Department, Port Survey 2016/17, Retrieved from: https://www.afcd.gov.hk/english/fisheries/fish_cap/fish_cap_latest/files/common/PS201617_ENG.pdf

connectivity and amenity values to local communities and business, as well as the convenience and vibrancy of the living environment of the development areas under the Vision.

18. Underground space development in the proposed reclaimed land will not be restricted by any existing facilitates provided that a holistic layered zonation concept is adopted. We recommend the Administration to consider launching an initiative to establish high-level strategic guiding principles to steer the development of 3D land use planning. The establishment of the guiding principles would stand for multiple benefits, as they would not only steer the land use planning of this artificial islands project but also serve as guidelines to unlock the potential of underground space as a source of land supply, applicable for other new development areas or large-scale redevelopment areas within our city. The HKIE would endeavour to provide necessary technical expertise to resolve challenges of different engineering disciplines encountered in the development of the guiding principles.

Transportation Network Planning

19. The HKIE agrees that a strategic transport network for the proposed artificial islands at the Central Waters should be planned, which can be a mix of roads, bridges, tunnels and rails to the Hong Kong Island and Lantau Island (including Mui Wo, the proposed Sunny Bay near shore reclamation area, and the Hong Kong-Zhuhai-Macao Bridge Hong Kong port area). These priority transport links will on the one hand soothe the loading of traffic flow of Tsing Ma Bridge, and on the other hand facilitate realising the one-hour living circle with Zhuhai and Macao. With the completion of these transport links, people in Hong Kong will have a wider variety of residential choices around the vicinity.

20. The HKIE opined that the proposed rail links in the project under the Vision can improve the overloading situation of existing West Rail Line (WRL) (or the future Tuen Ma Line) as well as addressing the future transportation needs of the increasing number of residents in Northwest New Territories (NWNT) region. An area-wide transport study to determine the design of the new rail links under the Vision to determine the setting of their connection with the existing railways, or with the proposed North South Corridor is suggested. These transport links, including both priority or future possible road and rail links, can form a circular route through the artificial islands to urban area and the airport, enabling a shortcut for NWNT region and Hong Kong Island commuters, and serving as an alternative route to the airport in case of service disruption in the existing road links.

21. The HKIE supports the Administration to seek funding to support for a comprehensive transport infrastructure study related to the project. On top of that, to facilitate future territory-wide transportation planning with the implementation of the Vision, the Administration is also recommended to conduct a comprehensive study under the proposed "Strategic Studies on Railways and Major Roads beyond 2030" (RMR2030+ Studies), and/or to study an update of Railway Development Strategy for all the related railway schemes with the proposed railway lines under the Railway Development Strategy 2014 (RDS-2014).

CONCLUSION

22. While materialising the Vision being a mega project, it is anticipated that there would be a lot of issues to be addressed. Hong Kong has a pool of experienced engineers who have engaged in projects of similar scale both locally and in overseas, and from the experiences gained we are confident that the Hong Kong engineers could resolve all the technical challenges. The HKIE will endeavour to provide advice to the Administration with our engineering expertise to maximise the efficiency and benefits of the project under the Vision and to proceed building a better Hong Kong together.