For discussion
on 6 June 2022

Legislative Council Panel on Housing

Hong Kong Housing Authority's Modular Integrated Construction Projects, Design and Build procurement and other measures to expedite public housing construction

Purpose

This paper briefs Members on the Hong Kong Housing Authority (HA)'s Modular Integrated Construction (MiC) projects, Design and Build (D&B) procurement and other measures to expedite public housing construction.

Background

2. With the greatest determination, the Government has been actively identifying land for housing development in a persistent manner. The Government has identified about 350 hectares of land required for providing about 330 000 public housing units, which can meet the estimated public housing demand of 301 000 public housing units in the coming ten-year period from 2022-23 to 2031-32. Of the 330 000 public housing units mentioned above, more than 100 000 units are scheduled for completion in the first five-year period, among which about 80% are under construction. As for public housing projects anticipated for completion in the second five-year period, they are mostly at the "land production", planning and design stage.

3. HA makes every endeavour to compress the housing construction workflow in order to deliver more public housing units as early as possible. HA will also adopt MiC and innovative construction technology more widely to speed up public housing construction. Besides, to cope with the increasing housing production, HA will leverage on resources and the expertise of the construction industry by adopting a new D&B contract procurement model in suitable projects to allow contractors to undertake design and construction in a single contract. HA can then allocate its existing manpower in performing design work to focus on expediting pre-construction planning of new projects with a view to awarding the construction contracts as early as possible.

MiC Projects

4. At present, HA has achieved about 90% precast rate in certain public housing projects and is able to construct a typical floor with over 20 public housing units in six working days. Taking into consideration factors such as transportation network, site constraints and availability of temporary storage area in the vicinity, HA will adopt MiC in the following public housing projects -

(a) A 12-storey domestic block (about 200 units) at Tung Chung Area 99

Construction works has commenced and is expected to be completed in 2024 tentatively. This project is located in a new development area with adjacent vacant site for temporary storage which can to a certain extent alleviate the risks in site logistics and temporary storage. HA can assess the effectiveness of applying MiC in public housing projects in terms of productivity, time and cost through this project;

(b) A 33-storey domestic block (about 400 units) at Tak Tin Street, Kwun Tong

Construction works is anticipated to commence in 2023 and is expected to be completed in 2027 tentatively. This project is located in an area of busy traffic and involves high complexity of structural connections and subsequent waterproofing works for a high-rise block. The adoption of MiC will therefore be very challenging. This project is also situated at a congested site without much storage area which may impose a certain degree of difficulty for the planning of site logistics. Nevertheless, since most of the sites allocated to HA for public housing development have similar site constraints, testing out MiC in this project can provide useful reference for HA to improve the standards in the selection of MiC projects in future; and

(c) Anderson Road Quarry Sites R2-6 and R2-7

This project involves two sites. One of the sites comprises two 28- storey domestic blocks (about 1 000 units). Construction works has commenced and is expected to be completed in 2025 tentatively. The other site comprises a 17-storey domestic block (about 400 units). Construction works has commenced and is expected to be completed in 2024 tentatively. There are other projects of similar scale in the vicinity using non-MiC construction method and they will serve as good benchmark for cost and time comparison with these two sites.

5. In addition to the above-mentioned projects, HA has also identified additional projects suitable for MiC application, mainly located in new development areas with less site constraints. According to preliminary estimation, about 20 000 units can be provided.

6. In order to draw up suitable works specification, ensure sufficient transportation network, secure an adequate and stable upstream supply chain with a view to reducing the risk of causing impact to the construction time and the overall public housing development programme prior to a wider application of MiC, HA held a workshop in January 2022 to discuss and collect views on the future MiC application. The workshop was attended by over 100 stakeholders from the industry including trade associations, contractors, as well as HA Members and representatives from the Development Bureau (DEVB). The industry generally acknowledged that the challenges arising from site constraints and logistic control would need to be overcome when applying MiC and that the pace with the first batch of some 20 000 MiC flats as a start would be conducive to driving the market forward. HA will continue to actively identify more projects suitable for MiC to prepare and drive the industry for wider application of MiC in public housing developments, and collaborate with the industry to resolve the challenges ahead.

D&B Procurement Method

7. HA has all along been adopting a "design-tender-build" procurement method for public housing developments whereby the Housing Department (HD) is responsible for the detailed design and construction drawings, while the contractors are responsible for building construction. Given the substantially increased public housing production in future, HA will adopt a new D&B procurement model in suitable projects which can leverage on resources and expertise of the construction industry to further enhance the entire construction workflow. Contractors can make good use of their advantages in mobilisation and coordination efforts during the construction process, and will be allowed greater flexibility in the procurement of materials, construction methods and construction workflow. Under this model, HD can suitably allocate its limited resources to focus on the planning, coordination and supervision of public housing developments.

8. Under the new D&B procurement model, HA will provide the basic layout and overall development requirements in the tender documents as a framework. The contractor awarded with the contract will be responsible for developing the design, obtaining statutory approvals from relevant authorities, and the subsequent construction works. While the contractors will undertake detailed design work, HD will reserve adequate manpower to ensure effective control and monitoring of the critical aspects of public housing developments such as construction quality and site safety.

9. In October 2021, HA endorsed the factors of consideration for adopting D&B procurement in projects, including that the projects concerned have established the planning requirements, development parameters and design concept at an early stage and there would not be major changes of these requirements in the detailed design stage so that substantial changes are minimised after the award of tender. HD has also established a framework for the D&B procurement and formulated a detailed implementation mechanism for project governance, quality assurance and procurement practices in respect of D&B projects.

10. In the past months, HA solicited the industry's views on D&B procurement model through various channels and occasions. Overall speaking, the stakeholders are generally supportive of HD's proposals and agreed that the D&B approach would allow more opportunities for the industry to participate in public housing developments and also further enhance the entire construction workflow. Compared with the conventional "design-tender-build" procurement model, D&B procurement model can shorten the construction period by about four months. In addition, tenderers may further propose a shortened programme to gain extra marks in the tender to increase their chance of getting the contract. However, as D&B contract procurement incurs substantial resources and higher tendering costs to tenderers, stakeholders consider that HA should take into account the capacity of the industry and launch D&B tenders in a suitable pace to avoid issuing too many D&B tenders at the same time which may deplete the industry's resources. HD had submitted a proposal consolidating the stakeholders' views and obtained approval from HA in March 2022.

11. The first D&B public housing project, i.e. Kwu Tung North Area 19 involving about 4 330 units, will be tendered out in June 2022. The second project, i.e. Tuen Mun Area 54 involving about 2 350 units, will be tendered out in December 2022. HD will continue to identify more suitable projects for D&B procurement and monitor the market's response to D&B tendering for public housing developments.

Other Measures to Expedite Public Housing Construction

12. The Government endeavours to expedite the development process and optimise the development potential of each and every public housing site where practicable. As mentioned above, most of the projects scheduled for completion in the second five-year are still at "land production" stage. In order to expedite the land and housing supply, DEVB and its departments are actively drawing up streamlining proposals to expedite the development process. To save time, HA will carry out pre-construction preparatory tasks, including planning brief formulation, detailed design, site investigations and tender invitations, in parallel with the Government's "land production" processes, such

that the construction works can be commenced as soon as possible after the sites are handed over HA.

13. To optimise land utilisation, HA needs to increase the provision of social welfare and car parking facilities, etc. within public housing sites. Projects with site constraints will require the construction of multi-storey podium or basement to house these facilities before residential blocks can be built on top, which inevitably lengthens the lead time for construction works. Depending on individual site conditions, HA will adopt the most suitable planning, design and construction measures to expedite construction and facilitate phased completion of the projects and residential blocks as far as practicable. Besides, HA will optimise the development potential of the sites by, for instance, submitting planning applications to suitably relax the development restrictions of the sites, and increase site area through enlarging and/or amalgamating sites, with a view to increasing housing production.

14. In terms of building design, HA has been applying modular flat design of four different sizes of flat to domestic blocks in public housing development. Productivity has been enhanced through the adoption of consistent design standards, wider application of mechanised construction and volumetric precast components. For some development projects of adequate scale with less site constraints, HA would design domestic blocks of similar configuration in the same project as far as possible to further enhance and facilitate the construction efficiency.

15. As regards construction, HA actively adopts technologies to enhance efficiency in construction, including extending the application of Building Information Modelling and other innovative technologies such as laser scanning and unmanned aerial systems in the planning, design and construction stages; utilising mobile devices and mobile applications for site supervision to streamline on-site communication and workflow; using construction robotics to address labour shortage; making use of technologies to improve site safety management; and applying and actively exploring MultiTrade Integrated Mechanical, Electrical and Plumbing (MiMEP) for building services installation.

16. In addition, the Government adopts a positive attitude towards tapping the resources of the private market to assist in providing subsidised housing. With reference to past experience, the arrangements should be effective in providing sufficient incentives for private organisations to ensure quality of the flats constructed. Recently, a private developer has openly expressed intention to provide subsidised housing on its private land. The Government welcomes such a proposal. If the proposal is materialised, it will help increase the supply of subsidised housing and can provide an additional option for potential homebuyers. The Government will maintain communications with the private developer concerned and provide assistance as appropriate.

17. Members are invited to note the paper.

Transport and Housing Bureau
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