

LCQ9: Impacts of nearby construction works on railway facilities

Following is a question by the Hon Leung Che-cheung and a written reply by the Secretary for Transport and Housing, Mr Frank Chan Fan, in the Legislative Council today (January 16):

In August last year, there were 64 construction works projects under settlement monitoring within the railway protection area, of which 56 involved works in the vicinity of heavy rail and eight involved works in the vicinity of light rail; and the works for three projects had been suspended due to settlement. In this connection, will the Government inform this Council if it knows:

- (1) the latest results of settlement monitoring for the aforesaid 64 works projects;
- (2) the details of the remedial and mitigating measures carried out by the works contractors concerned for the aforesaid three projects for which works had been suspended, and whether the relevant works have now been resumed;
- (3) whether there have been projects within the railway protection area newly put under settlement monitoring since August last year; if there have been, of the number and other details; and
- (4) whether the MTR Corporation Limited (MTRCL) made any compensation claims in the past five years against the relevant parties for its existing railway facilities having been affected by nearby construction works; if MTRCL did, of the details?

Reply:

President,

To ensure railway safety, the Government and the MTR Corporation Limited (MTRCL) have put in place stringent monitoring mechanisms to handle settlement of railway facilities arising from construction works within the railway protection areas. The Electrical and Mechanical Services Department (EMSD) regulates and monitors the operation of the railway system according to the Mass Transit Railway Ordinance and its subsidiary regulations. The Buildings Department (BD) regulates the planning, design and construction of buildings and associated works on private land to ascertain compliance with building safety standards according to the Buildings Ordinance (BO).

To ensure the structural safety of railway facilities, the BD would require the registered building professionals responsible for the private construction works to monitor the impact of the works on the adjacent railway structures according to the requirements set out in the BO and its subsidiary regulations as well as the "Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers" (PNAP) issued by

the BD. Comments would be sought from the MTRCL on the building plans of the proposed private works and the monitoring proposal. In consultation with the Geotechnical Engineering Office (GEO) of the Civil Engineering and Development Department and the MTRCL, the BD would vet the settlement monitoring checkpoints and the pre-set provisional settlement limit for works suspension proposed by the registered building professionals for the private development projects concerned in order to safeguard the relevant railway facilities. The monitoring thresholds prescribed for private development projects to the adjacent railway facilities (including the provisional settlement limit) will be varied from each other, depending on various factors including the structures of the railway facilities, locations and conditions of the construction sites and railway facilities, construction methods, as well as the geological conditions. The BD has stipulated in the relevant PNAP that the registered building professionals may set a provisional settlement limit for the project at 20 mm based on experience. The registered building professionals of the concerned development project may nonetheless devise appropriate specific settlement limit for individual locations based on engineering approach on condition that such limit can safeguard public safety and is approved by the BD.

Apart from complying with the requests stipulated in the B0, the responsible registered building professional should inform the MTRCL direct of the private works before the commencement of any construction works within the railway protection areas so as to enable the MTRCL to formulate an appropriate monitoring plan, including requesting the developer to install monitoring checkpoints as per the established procedures for railway protection, to facilitate the monitoring of settlement data and ensure that structural safety of railway facilities and safe operation of the railway will not be affected by the works.

During the construction period, the person responsible for the construction works should regularly monitor the impact of the works on nearby railway structures and submit reports in a timely manner so that relevant departments and the MTRCL can monitor the situation and, as and when necessary, request the registered building professional concerned to take follow-up actions, such as conducting more frequent monitoring and measurement, or even suspending the works.

My reply to the various parts of the Hon Leung Che-cheung's question is as follows:

(1) and (3) In August last year, the MTRCL announced a list of 64 projects under settlement monitoring in railway protection areas. Relevant government departments and the MTRCL have been closely monitoring the projects in accordance with the aforesaid mechanisms to ensure the safety of railway facilities and railway operation.

Since August 2018, five additional railway-related facilities have been put under settlement monitoring, while settlement monitoring for 19 facilities have ceased as the relevant works were completed. On January 4, 2019, the MTRCL uploaded to its website the latest information on railway facilities under settlement monitoring in railway protection areas. The

information includes the pre-set settlement limits for works suspension and the updated settlement readings for 50 facilities currently under monitoring. The details are set out at Annex. According to the MTRCL, it will update the information when there are changes in railway-related facilities under settlement monitoring and updates in the pre-set settlement limits for works suspension, and when the latest settlement readings exceed the pre-set settlement limits for works suspension.

(2) The three cases where works had been suspended or currently still under suspension due to settlement readings for railway-related facilities exceeding the pre-set settlement limits involved viaduct piers of Yuen Long Station of the West Rail Line (Item 53 at Annex), platform of Light Rail Tin Wing Stop (Item 62 at Annex) and railway facilities of Tai Wai Station of the East Rail Line (Item 38 at Annex). Upon the suspension of works, the BD, EMSD and MTRCL have been closely monitoring the situation in accordance with the established mechanisms to ensure structural safety of railway facilities and safe railway operation. Below are the updates on the three cases:

Viaduct Piers of Yuen Long Station of the West Rail Line

Regarding the property development project next to Yuen Long Station of the West Rail Line, works have been suspended since mid-2013. The responsible registered structural engineer of the subject development project has been discussing with the BD and the GEO for formulating mitigation and preventive measures in preparation for resumption of the pile foundation works. The responsible registered structural engineer of the subject development project has submitted an amendment plan for the piling works of the development project to the BD in January 2019, incorporating proposed enhanced mitigation and preventive measures to ensure that the progression of the remaining piling works will not affect the safety of adjacent viaduct piers and railway operation. The proposal also specified that application for resumption of the foundation works would not be made before the completion of the underpinning works for the viaduct piers near Yuen Long Station. The BD is now consulting relevant government departments and the MTRCL in accordance with the established mechanisms. The amendment plan will be subject to stringent scrutiny by the BD under the overarching consideration of ensuring structural safety of railway facilities and securing MTRCL's confirmation that railway safety will not be compromised.

To facilitate the remaining piling works, preventive underpinning works for the two concrete columns of the viaduct piers at Yuen Long Station had commenced in September 2017, are now in progress and scheduled for completion this year. At present, the settlement readings at the four checkpoints installed at the two viaduct piers are maintained at 16 to 17 mm and have not exceeded the pre-set 20 mm settlement limit for works suspension.

The Platform of Light Rail Tin Wing Stop

The property development project at Light Rail Tin Wing Stop has been suspended since late June 2018. The registered structural engineer responsible for the project subsequently submitted to the BD in July 2018 the structural assessment and analysis with proposed enhanced mitigation measures

to prevent the settlement from deteriorating. The BD then consulted the GEO and the MTRCL as per the established mechanisms. After consolidating the views from various parties, the BD wrote to the registered structural engineer requesting thorough consideration of those views and an amendment plan.

The registered building professionals are actively exploring with relevant government departments on the construction method and mitigation measures which can effectively control and further mitigate the settlement of the platform. The registered building professionals will only apply for resuming the construction works on condition that structural safety of railway facilities and safe operation of the railway will not be affected by the works to be carried out later on. The BD will scrutinise the proposal stringently under the overarching consideration of ensuring structural safety of railway facilities and securing MTRCL's confirmation that railway safety and operation will not be affected. The latest settlement readings at the monitoring checkpoint on the platform of Tin Wing Stop is 93 mm. Since the suspension of works, the BD has carried out regular inspections to the platform of the Tin Wing Stop. According to the recent inspection carried out on January 7, 2019, the BD did not find any obvious safety problem at the platform. The EMSD will also closely monitor the situation to ensure safe operation of the railway operation.

For the two development projects at Yuen Long Station of the West Rail Line and Light Rail Tin Wing Stop respectively, the construction works can only be resumed on condition that structural safety of railway facilities and safe operation of the railway will not be affected by the works to be carried out later on and that consent of the MTRCL and relevant government departments has been obtained. The Government will report the situation to the public according to the mechanisms by then.

Railway Facilities of Tai Wai Station of the East Rail Line

Piling works of the development project at Tai Wai Station have been suspended since mid-July last year. Subsequent to the suspension, the responsible registered structural engineer submitted an incident report together with an amendment plan for the piling works to the BD, proposing appropriate mitigation measures (Note) with a view to reducing the impact of the pile foundation works on the structural safety of nearby railway facilities. Upon consultation with the GEO and MTRCL, the BD approved the amendment plan in late October 2018 and accepted the amendment to the specific settlement limit for works suspension to 40mm after considering the engineering assessment submitted by the responsible registered structural engineer. Subsequently, the registered structural engineer requested resumption of the works. Upon scrutinising the request for resumption of works, the relevant government departments and the MTRCL confirmed that the resumption would not affect railway safety, and the request was accepted. The suspended pile foundation works resumed on January 5, 2019, and the proposed mitigation measures will be completed prior to the commencement of the remaining works. On January 4, the Government announced the arrangements for the resumption of works.

The Government and the MTRCL will continue to closely monitor the relevant situation to ensure the structural safety of railway-related facilities of Tai Wai Station and the safe operations of the railway.

(4) The MTRCL's dedicated railway protection team will monitor the status of various railway facilities according to a set of stringent railway protection measures and procedures. In accordance with the established mechanism, the MTRCL will strictly require registered building professionals hired by developers for construction works within railway protection areas to assess the impact of the works on existing railway facilities (such as tracks, platforms and overhead lines), formulate a monitoring plan, and pre-set various monitoring indicators (including settlement thresholds) and corresponding containment measures for the works so as to enable the MTRCL to monitor the condition of various railway facilities. Such a monitoring plan requires the MTRCL's consent and the scrutiny of the BD. In case the monitoring indicators have reached the pre-set threshold during the construction works, the MTRCL will require relevant person to adopt remedial and mitigation measures accordingly, and will closely liaise with government departments to ensure that structural safety of railway facilities and safe operation of the railway are not affected. In the past five years, there was no need for the MTRCL to make any compensation claim against any person carrying out works within railway protection areas.

Note: The mitigation measures include: (i) carrying out grouting works for the soil beneath the affected platform and overhead line mast to strengthen the soil prior to the resumption of pile foundation works; (ii) setting up additional settlement monitoring checkpoints near the overhead line mast, and increasing the frequency of settlement measurement for the platform and overhead line mast; and (iii) taking soil samples for scientific analysis upon the completion of grouting works with a view to assessing the effectiveness of the grouting works, and reviewing and improving the design of the excavation works as appropriate to control and further mitigate the condition of settlement.