

Government accepts holistic assessment strategy for Hung Hom Station Extension under Shatin to Central Link Project

The Government today (December 5) accepted the proposed holistic assessment strategy submitted by the MTR Corporation Limited (MTRCL) regarding the platform slabs and diaphragm walls of the Hung Hom Station Extension under the Shatin to Central Link (SCL) Project. The MTRCL has uploaded the full version of the proposal to its SCL project website.

To verify the as-constructed condition of the structures including the platform slabs of the Hung Hom Station Extension, the Government has requested the MTRCL to formulate a holistic strategy. The MTRCL submitted a proposal on November 23. The Transport and Housing Bureau, together with the relevant government departments, the Expert Adviser Team for the SCL Project and university professors in the field of structural engineering, statistics and actuarial science, scrutinised the proposal in detail. The MTRCL was requested to clarify some technical details and provide further information. A revised proposal was submitted yesterday (December 4) and it was accepted by the Government today.

A Government spokesman stressed, "The holistic assessment strategy must put safety in the first place and be based on evidence and statistical principles to verify issues surrounding the overall structural safety of the East West Line (EWL) and North South Line (NSL) of the Hung Hom Station Extension under the SCL Project."

The MTRCL proposed a three-stage approach for the holistic assessment strategy. The first stage is a desktop exercise which includes reviewing of related design drawings amended and works records consolidated during construction. The second stage is the physical investigation for which opening up and inspection of some of the connections between the platform slabs and the diaphragm walls is required. Non-destructive tests on coupler connections will also be conducted. The second stage will also include a review on other irregularities suspected or made known during the investigation, including honeycombed concrete at the EWL slab soffit, incomplete infill of the gaps between the soffit and other structural elements, and suspected improper installation of shear links reinforcement, so as to investigate the severity, extent and impact of these issues in detail. In the third stage, the MTRCL will consolidate test results and other construction issues found in the first two stages. It will conduct a detailed structural analysis on the Hung Hom Station Extension works to ascertain if the overall condition of the works is acceptable and identify remedial works required should it be undesirable.

As the MTRCL is unable to provide the drawings adopted during the construction of the Hung Hom Station Extension and the as-constructed records, the Government cannot grasp the as-constructed details. Although the MTRCL has lately tried to gather the construction documentation for the slabs and diaphragm walls concerned, these drawings and records are incomplete. Hence, there is a need to open up the concrete for physical investigation to verify the as-constructed conditions due to the gaps in the documentation. This serves the first purpose of the opening up. Meanwhile, in view of the allegation on the cutting-short of steel bars, the MTRCL should open up certain connections between the slabs and diaphragm walls for detailed inspection and non-destructive tests on coupler connections. The locations of opening up would be randomly selected based on a statistical approach. This serves the second purpose of the opening up.

The proposed holistic assessment strategy covers the slabs and diaphragm walls at both the EWL and NSL. The locations of opening up include (i) connections between the top of the EWL slab and diaphragm walls (at least 24 locations) to verify the as-constructed details for the first purpose mentioned above; and (ii) connections between the top and bottom of the EWL slab and the diaphragm walls, and connections between the top of the NSL slab and the diaphragm walls (each with 28 locations randomly selected, i.e. 56 locations in total, to expose at least 168 couplers) to verify the as-constructed coupler connections for the second purpose. A greater sampling size may be considered subject to investigation findings and needs. As the NSL slab is constructed at the formation level, it is infeasible to open up the bottom of the NSL slab for inspection. The MTRCL would review the assumptions to be adopted for the detailed structural analysis in the third stage based on the investigation findings from the above opening up.

The MTRCL indicated that for each slab, if all the exposed couplers are found to be properly connected during the inspection, based on statistics there would be no more than 3.5 per cent of the coupler population with improper connections under a 95 per cent confidence level for each slab. The findings from the opening up would be taken into consideration for the third stage structural assessment to assess the overall condition of the EWL slab, the NSL slab and the diaphragm walls, and whether remedial works would be required.

The holistic assessment strategy also mentions that the MTRCL is monitoring the long-term movement of the structure of the Hung Hom Station Extension. It also recommends a load test, if necessary, to assure the structural integrity of the work.

The MTRCL has largely completed the review of the records at the first stage of assessment and expects to commence the second stage of opening up and examination of the platform slab next Monday (December 10). The MTRCL estimates that it will take at least 16 weeks to complete the entire check as the installed tracks and railway facilities will have to be removed and re-installed before and after the examination. If a load test is needed to ascertain the structural integrity of the Hung Hom Station Extension works, it will take eight additional weeks.