

**MTR submits report on the steel bar fixing works
for the platform slab at the Hung Hom Station extension**

The MTR Corporation today (15 June 2018) submitted to the Government a Report on the construction of the steel bar fixing works for the East West Corridor (“EWL”) platform slab at the Hung Hom Station extension under the Shatin to Central Link Project (“SCL”).

The Report includes a chronology of key events, information on the Corporation’s project management regime and quality assurance and quality control procedures and documentation demonstrating that the steel bar fixing works comply with relevant specifications and approved drawings. The Report was reviewed by the Capital Works Committee of the MTR Board at a special meeting held yesterday.

The SCL project is a highly complex project. Considerable time and effort has been made to collect information from MTR staff, the contractor (Leighton Contractors (Asia) Limited (“Leighton”)) and its sub-contractors for the purpose of preparing the Report. However, it must be recognized that the works in question were carried out two to three years ago. Much of the information gathered has, by necessity, been sourced from interviews with those involved in the works based on their recollection and, unfortunately, there are some differences between the recollections of certain individuals. All information gathered has been included or referred to in the Report submitted to Government.

Appended to the Report is the documentation provided by Leighton verifying the effective assembly and connection of all reinforcing bars with couplers in accordance with the specifications, approved design drawings and the statutory Quality Supervision Plan, as well as documentation provided by the Corporation confirming that it has completed its necessary quality supervision in accordance with the statutory Site Supervision Plan approved by the Buildings Department. Leighton has also confirmed to the Corporation in writing that the works in the Hung Hom Station and Stabling Sidings project have been undertaken in strict accordance with its quality systems and the specifications of the Contract, and in accordance with statutory requirements.

The quality and safety of railway projects has always been the Corporation’s top priority. As in all other railway projects which have been successfully delivered, the Corporation has and continues to adhere to its well established project management processes in the construction of the SCL. We will seek continuous improvements in our processes. To give additional assurance on the structural integrity of the EWL platform slab at the Hung Hom Station extension, the Corporation has appointed an independent consultant to conduct a safety test, the results of which will be submitted to Government and made public once they are available.

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The Government has announced that it will set up a Commission of Inquiry to investigate the integrity of the steel works for the EWL platform slab. The Corporation will give full support to the Commission in its investigation. The report submitted to the Government today will also be made available to the Commission of Inquiry for reference.

An executive summary of the Report, a chronology of key events and a chronology for the steel fixing and concreting for EWL slab extracted from the Report are attached. The full Report (English version only) can be found at the Shatin to Central Link project website (www.mtr-shatincentrallink.hk).

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About MTR Corporation

MTR Corporation is regarded as one of the world's leading railway operators for safety, reliability, customer service and cost efficiency. In its home base of Hong Kong, the Corporation operates ten commuter railway lines, a Light Rail network and a high-speed Airport Express link on which about 5.8 million passenger trips are made on a normal week day. Another 6.5 million passenger trips are made on the rail services it operates outside Hong Kong in the Mainland of China, the United Kingdom, Sweden and Australia. In addition, the Corporation is involved in a range of railway construction projects as well as railway consultancy and contracting services around the world. Leveraging on its railway expertise, the Corporation is involved in the development of transit-related residential and commercial property projects, property management, shopping malls leasing and management, advertising media and telecommunication services.

For more information about MTR Corporation, please visit www.mtr.com.hk.

1. Executive Summary

On 29 May, we received an enquiry from the media asking a number of questions about the steel fixing works for the East West Line platform slab of the extended Hung Hom Station being constructed as part of the Shatin to Central Link (“**SCL**”) project.

On 31 May, the Railway Development Office of the Highways Department of Government wrote to us expressing their concern on the alleged non-compliant steel fixing works found at the joints between diaphragm walls and the platform slab at Hung Hom Station under Contract 1112 and requesting us to prepare a Report into this matter, of which this Executive Summary forms part.

SCL is a strategic railway project which connects existing railway lines to form an East West Corridor (“**EWL**”) (Tai Wai to Hung Hom Section) and a North South Corridor (Hung Hom to Admiralty Section) with six interchange stations. In 2012, Government appointed MTR Corporation Limited (“**MTRCL**”) to project manage the construction and commissioning of the SCL project under an Entrustment Agreement dated 29 May 2012 (“**EA3**”). MTRCL therefore has the role and responsibilities of a project manager working on behalf of Government in carrying out the entrustment activities. The responsibilities for the actual construction of the project rest with the contractors appointed to build various parts of the project in accordance with the specifications and terms of their respective construction contracts.

The contractor appointed for the construction contract relevant to the EWL platform slab works (Contract 1112) is Leighton Contractors (Asia) Limited (“**Leighton**”). Under its construction contract, Leighton has an overarching obligation to construct the works in a manner that complies in all respects with the contract and the specification and approved design drawings. In addition, the contract specifies certain quality control and assurance processes which must be followed. These are described in more detail below and in the body of the Report. From a statutory perspective, Leighton also has obligations under, inter alia, a Site

Supervision Plan and a Quality Supervision Plan (“**QSP**”) in accordance with the requirements of the Buildings Department (“**BD**”). These obligations include carrying out full time and continuous supervision of **all** the reinforcing bar and coupler splicing assemblies on site, thus obliging Leighton to verify the effective assembly and connection of all reinforcing bar with couplers in accordance with the specification, approved design drawings and QSP. The same QSP obliges MTRCL to supervise at least 20% of the splicing assemblies in general, increased to 50% where the structure acts as a transfer plate.

In project managing the construction of the SCL project, MTRCL is obliged (under EA3) to follow our Project Integrated Management System (“**PIMS**”). This system is certified to be ISO9001 compliant and has been used to manage railway projects for over 20 years. The system, which is embedded within our construction contracts, including Contract 1112, requires a number of “hold points” in any construction activity i.e. points at which a notice of permission, consent or no objection is required before the next activity can be proceeded with. In the construction of the EWL platform slab, there were a number of hold points, including one after completion of the slab bar bending, preparation and fixing works and another before the pouring of concrete. At these hold points, Leighton, once it had inspected and was satisfied that the relevant works had been completed in accordance with the specification, the approved drawings and the QSP, was required to sign and submit a Request for Inspection and Survey Checks (“**RISC**”) form to MTRCL, and we would then perform our own inspection, which would be signed off by, in the case of the slab bar bending, preparation and fixing works RISC form, both an on-site MTRCL inspector and an on-site MTRCL engineer and, in the case of the pre-pouring of concrete RISC form, an on-site MTRCL inspector. However, work in progress issues discovered during regular on-site inspections before hold points are not required to be documented, as such issues would be rectified before the next hold point. Hence, verbal instructions are usually given on site by MTRCL inspectors to Leighton to rectify such issues.

As Government's appointed project manager for the SCL project we have, since being notified of this issue and within the limited time available, taken all steps practicable to carry out an investigation into the matter with a view to answering all of the questions raised by RDO and BD and to addressing any subsequent concerns or comments raised in the media. These steps have included interviewing 19 relevant current and ex members of MTRCL staff, interviewing three individuals made available by Leighton and interviewing representatives from two of Leighton's sub-contractors, Fang Sheung Construction Company ("**Fang Sheung**") and China Technology Corporation Limited ("**China Technology**"). In relation to the EWL platform slab, Fang Sheung was responsible to Leighton for carrying out the slab bar bending, preparation and fixing works and China Technology was responsible for erecting formwork, carrying out cleaning prior to pouring concrete and for concrete pouring. We have also reviewed relevant documentation and site records within our possession and made available to us by Leighton. Further details of the evidence gathering exercise we have carried out are set out in Section 3 of this Report.

While, as can be seen from the above, considerable time and effort has been made in the evidence gathering exercise and the subsequent compilation of this Report, it must be recognised that the works in question were carried out some 2 to 3 years ago. As the issue at hand relates to work in progress matters, much of the evidence gathered has, by necessity, been sourced from interviews with those involved in the works and there are, unfortunately, some differences between the recollections of certain individuals.

In addition, oral statements made during the interview of one of Leighton's sub-contractors contradict assurances given to us by Leighton. Following the interview during which such statements were made (which was observed by two representatives of Leighton) Leighton has strenuously denied such allegations. MTRCL has not seen any documentation which substantiates the allegations and emphasises that it does not form any opinion on the credibility or reliability of the allegations.

Bearing in mind the nature of the statements, the inevitable limitations on the investigation to date and taking into

consideration legal advice, information relating to the statements will be passed to Government separately. Noting that a Commission of Inquiry has been established, it is anticipated that all relevant information relating to the allegations will be provided to the Commission in due course. We welcome the work to be carried out by the Commission, which has extensive powers, and will cooperate fully with the Commission.

Based on the recollections of all the current and ex-MTRCL staff members interviewed, none of them actually witnessed the threaded sections of reinforcement steel bars being cut. However, two members of site staff recall either seeing themselves or having reported to them evidence that such cutting had taken place, such as a gap between a threaded steel bar and a coupler connection or the cut ends of threaded steel bars.

One member of site staff recalls that, on five occasions between August 2015 and December 2015, he either saw or had reported to him that the threaded section of reinforcement steel bars had been cut. Following what he believes to be the third of these occasions in December 2015 (which he recalls was originally reported to him by the second member of site staff referred to below and subsequently observed by him in an inspection), the issue was raised to Leighton by email, with a request to *“strengthen their quality checks and keep a high level of quality control”*. As a result of this email, Leighton issued a formal Non-Conformance Report to Fang Sheung, which was actioned and closed out.

The second member of site staff recalls that, on two occasions over the same time period, he saw evidence that the threaded section of reinforcement steel bars had been cut. His memory is that, on the first of these occasions, he took a photograph of the cut threaded end of a steel bar in his hand. Having seen a copy of the email to Leighton referred to above (which had a number of photos attached to it), he believes that this photograph is one of those which was attached to the email.

It is highly likely that the third occurrence recollected by the first member of site staff was the same as the first occasion recollected by the second member of site staff.

Again, according to the recollections of those interviewed, no further incidences of cut threaded steel bars were discovered by MTRCL staff after December 2015.

On each occasion on which the MTRCL inspectorate staff recall that they found such issues or had the issues reported to them, they further recollect that they raised the issues with Leighton and asked Leighton to rectify the works in accordance with the process described above for work in progress issues. The site and engineering staff recollect that they subsequently inspected the works and, subject to one occasion, did not observe any further irregularities. There is one occasion in relation to which one of the members of site staff recollects that three threaded steel bars remained unrectified. However, it should be noted that this recollection was not shared by other members of staff during the interviews and all RISC forms relating to these works were signed.

In January 2017, China Technology sent an email to Leighton alleging “*malpractice use (sic) of coupler in this project SCL1112*” (which email Leighton forwarded to MTRCL). As a result of such allegation, Leighton requested its Head of Engineering to lead an investigation into this matter, which investigation concluded that the construction and checking process had been carried out in accordance with the approved method statement and the inspection and test plan. The report produced to record the findings of this investigation was shared with MTRCL. Based on this investigation report, MTRCL concluded that the issue had been dealt with.

On 15 September 2017, China Technology sent an email to Government’s Transport and Housing Bureau requesting a discussion on “*an important issue ... on the execution of the works*”, a request which was subsequently withdrawn by China Technology (on 18 September 2017) on the basis that they had reached a “*satisfactory and full clarification ... on the suspecting (sic) technical issue*” and they believed “*it is a*

full and final end to the issue and may we invite (sic) to close all relevant files accordingly”.

The records for Contract 1112 contain all relevant RISC forms for the EWL platform slab works and do not contain reference to any outstanding issues relating to trimming of the threaded sections of reinforcement steel bars. In addition, Leighton has confirmed to us in writing that “*the works on the Hung Hom Station and Stabling Sidings project were undertaken in strict accordance with its quality systems and the specifications of the contract*” and that “*the Works have been constructed in accordance with the Contract and statutory requirements.*” At our request, these statements were reconfirmed by Leighton following the allegations referred to above. Separately, from a statutory perspective and as required under the QSP approved by BD, Leighton has certified completion of the EWL platform slab works, which includes certification of compliance with the quality site supervision requirements referred to above (i.e. a requirement for full time and continuous supervision of all the reinforcing bar and coupler splicing assemblies). MTRCL also confirms compliance with our requirement to supervise at least 20% of the splicing assemblies in general, increased to 50% where the structure acts as a transfer plate.

Notwithstanding the above and to provide additional assurance to the public over the structural integrity and safety of the EWL platform slab, we have engaged an independent expert to carry out a safety test to confirm the structural safety of the relevant structure. The methodology for this test is being developed and the results of the test (once available, which may take a number of months) will be made public and available to the Commission of Inquiry.

6.2 Key Events relating to the EWL Slab Steel Bar and Coupler Connections

Period	Description
03/2013	Contract commencement
02/2015	Commence construction of EWL slab
05/2015	First pour of EWL slab
08/2015 to 09/2015	1 st occurrence of deficiency in steelwork (less than 5 numbers of threaded steel bars) found and rectified
10/2015 to 11/2015	2 nd occurrence of deficiency in steelwork (less than 5 numbers of threaded steel bars) found and rectified
15/12/2015	3 rd occurrence of deficiency in steelwork (5 numbers of threaded steel bars) found and rectified
Late 12/2015	4 th and 5 th occurrence of deficiencies in steelwork (1 to 2 threaded steel bars on each occurrence) found and rectified
08/2016	Last pour of EWL slab
01/2017	China Technology sent email to Leighton for the cut threaded bars (email forwarded to MTRCL by Leighton on the same day)
10/02/2017	Leighton submitted to MTRCL a report of the Review of EWL Slab Rebar Installation and Checking Procedures confirming their compliance with the relevant contract requirements and statutory requirements
09/2017	China Technology sent email to THB to request meeting regarding technical issues, they subsequently clarified that the issue is resolved
03/2018	China Technology sent email to Leighton regarding to the dispute on the invoice

Summary of a chronology for the steel fixing and concreting for EWL slab
(on page 31 of the Report)

Location	Bay No.	Rebar Fixing commencement	Rebar Fixing completion	RISC for Rebar Fixing		RISC for Pre-Pour Check		Concrete Poured	Concrete Volume (m ³)
				Leighton Approved	MTRCL sign-off	Leighton Approved	MTRCL sign-off		
Area A	Bay 1	05-May-15	14-May-15	√	√	√	√	16-May-15	256
	Bay 2	18-May-15	20-May-15	√	√	√	√	26-May-15	400
	Bay 3	25-May-15	29-May-15	√	√	√	√	03-Jun-15	230
	Bay 4	01-Jun-15	03-Jun-15	√	√	√	√	06-Jun-15	175
	Bay 5	19-Jun-15	24-Jun-15	√	√	√	√	29-Jun-15	187
	Bay 6	16-Jul-15	21-Jul-15	√	√	√	√	24-Jul-15	208
	Bay 7	04-Jul-15	10-Jul-15	√	√	√	√	14-Jul-15	227
HKC	HKC - Bay 1	04-Jul-16	08-Jul-16	√	√	√	√	11-Jul-16	320
	HKC - Bay 2	14-Jul-16	18-Jul-16	√	√	√	√	21-Jul-16	245
	HKC - Bay 3	05-Aug-16	11-Aug-16	√	√	√	√	16-Aug-16	555
Area B	Area B - Bay 1	05-Dec-15	11-Dec-15	√	√	√	√	15-Dec-15	1078
	Area B - Bay 2	16-Nov-15	23-Nov-15	√	√	√	√	25-Nov-15	1050
	Area B - Bay 3	30-Nov-15	05-Dec-15	√	√	√	√	09-Dec-15	812
	Area B - Bay 4	02-Jan-16	08-Jan-16	√	√	√	√	12-Jan-16	961
	Area B - Bay 5	02-Jan-16	08-Jan-16	√	√	√	√	12-Jan-16	289
Area C1	Area C1 - Bay 1	13-Jul-15	25-Jul-15	√	√	√	√	28-Jul-15	286
	Area C1 - Bay 2	01-Aug-15	13-Aug-15	√	√	√	√	22-Aug-15	1017
	Area C1 - Bay 3	29-Aug-15	04-Sep-15	√	√	√	√	07-Sep-15	819
	Area C1 - Bay 4	14-Sep-15	26-Sep-15	√	√	√	√	29-Sep-15	798
	Area C1 - Bay 5	10-Dec-15	16-Dec-15	√	√	√	√	23-Dec-15	1320
	1875	10-Mar-15	27-May-15	√	√	√	√	30-May-15	190
Area C2	Area C2 - Bay 1	07-Nov-15	19-Nov-15	√	√	√	√	23-Nov-15	889
	Area C2 - Bay 3	23-Sep-15	05-Oct-15	√	√	√	√	08-Oct-15	1068
	Area C2 - Bay 4	19-Oct-15	26-Oct-15	√	√	√	√	29-Oct-15	1449
	Area C2 - Bay 5	29-Aug-15	07-Sep-15	√	√	√	√	14-Sep-15	812
	Area C2 - Bay 6	01-Oct-15	05-Oct-15	√	√	√	√	07-Oct-15	991
Area C3	Area C3 - Bay 1	28-Oct-15	07-Nov-15	√	√	√	√	10-Nov-15	784
	Area C3 - Bay 2	12-Dec-15	23-Dec-15	√	√	√	√	28-Dec-15	741
	Area C3 - Bay 3	12-Dec-15	23-Dec-15	√	√	√	√	28-Dec-15	914
	Area C3 - Bay 4	14-Nov-15	25-Nov-15	√	√	√	√	30-Nov-15	839
	Area C3 - Bay 5	10-Oct-15	21-Oct-15	√	√	√	√	24-Oct-15	876
	Area C3 - Bay 6	26-Oct-15	04-Nov-15	√	√	√	√	07-Nov-15	497
Total 21,283									