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OUR REF: (19) in MS25012

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By Fax and/or email

16 February 2026

To : Prospective Tenderer

Dear Sir/Madam,

Tender Ref.: MS25012

Tender for Provision of Services for Measurements of Vehicle Emissions at Roadside with Remote Sensing Devices

Tender Closing Date on 25 March 2026 at 12:00 noon (Hong Kong Time)

(Responses to Enquiries on Tender Document as of 15 February 2026 – 1st Batch)

Please find enclosed our response to enquiries concerning the above tender received from the prospective tenderers during the pre-tender briefing session held on 10 February 2026 and through emails as of 15 February 2026. Relevant information can be downloaded from the EPD's website at https://www.epd.gov.hk/epd/english/business_job/business_opp/tender.html.

Interested parties are reminded to note the above Tender Closing Date. To be considered as a valid tender, tenderers must deposit their tenders in the Specified Tender Box stated in the Tender Documents or submit their tenders through the e-Tender Box (ETB) of the Procurement and Contract Management System (PCMS) before **the above Tender Closing Date and time** in accordance with the requirements stipulated in the Tender Documents. **Late tender will not be considered.**

Any enquiry from a prospective tenderer in relation to this tender shall be initiated in writing and addressed to the EPD pursuant to Paragraph 13 of the Terms of Tender at least 3 working days before the above Tender Closing Date.

Should you have any enquiry on the technical issue or specifications, please feel free to contact Mr. WONG Hok-lai, Anson at fax number: (852) 3121 5701 or email address: ansonwong@epd.gov.hk.

Yours faithfully,

(TAM Yuk Man)
for Director of Environmental Protection

Encl. - Responses to enquiries on Tender Document – 1st Batch (6 pages)
c.c. E(MS)51

Tender Ref.: MS25012
Tender for Provision of Services for Measurements of Vehicle Emissions at Roadside with Remote Sensing Devices

Responses to enquiries on Tender Document – 1st Batch

Enquiries on the scope of the Services

Question 1
Team Structure - Whether the service is operated by one team, or if multiple teams are required?

Answer to Question 1
The scope of the Contract is to provide the Services for a maximum of 1,900 hours during the 18-month contract period and the operation time is any 8 hours (maximum) between 9:00am and 9:30pm on each Operation Day. There is no specific requirement on the number of team; however, Clauses 6.1 and 6.3 of Service Specifications have stipulated the manpower requirements of the Contract, which are extracted below:

a) Clause 6.1 of Service Specifications – "*Throughout the Contract Period, the Contractor shall assign a Project Team comprising at least one (1) Project Manager and one (1) Operator…*"

b) Clause 6.3 of Service Specifications – "*The Measurement Team shall comprise at least one (1) On-site Supervisor and one (1) Operator each…*"

Question 2
The tender mentions a Project Manager is mandatory, with 3 or more years of experience in vehicle emissions remote sensing. Can the Project Manager be based outside Hong Kong, but have a full-time dedicated focal point in Hong Kong for this project? Is it possible to delegate physical presence to a local partner?

Answer to Question 2
Clause 6.2(a) of Service Specifications has stipulated that "*The Project Manager shall be a full-time staff of the Contractor working in Hong Kong with normal working hour from 9a.m. to 5p.m. on working days.*"

Question 3
Can you confirm that the service consists of a single set of two RSDs operating in synchrony at one measurement site per day?

Answer to Question 3
The required number of Devices to be deployed for delivering the Services under the Contract is specified below:

a) Clause 8.1 of Service Specifications – "*In delivering the Services, the Contractor shall deploy at least two (2) sets of Devices meeting the requirements stipulated in Clause 8.*"

b) Clause 8.3 of Service Specifications – "*Each set of Device provided by the Contractor shall comprise the following major components:*

- *Source and detector module (the SDM);*
- *Optical beam reflector module (the OBRM);*
- *Automatic licence plate recognition system (the ALPRS); and*
- *Speed and acceleration module (the S&AM).*"

c) Clause 8(a) of Appendix 4 to the Service Specifications – "*For remote monitoring of two (2) sets of Devices ("dual-Device system") simultaneously during the Measurement Operations at each Site, a laptop computer, tablet or similar handheld device shall be used as a CCCM. Each CCCM shall be provided with wireless and wired interface hubs; and accessories.*"

Question 4

In Annex C, the tender includes the following text: "The ownership of all Intellectual Property Rights which exist in the Materials which are produced or provided by the Sub-contractor shall as from creation become, and at all times thereafter, remain vested in the Government". We understand that this clause would only affect materials, data, and any results produced within the framework of the project, and that in any case, all of our remote sensing device's intellectual property, including the RSD hardware and code, would be protected at all levels. Can you confirm that this interpretation is correct?

Answer to Question 4

The terms on the ownership and Intellectual Property Rights are specified in Clause 17 of Special Conditions of Contract.

In addition, the Tenderer shall provide the required information in the sub-contractor's undertaking on the terms set out at Annex C only if any obligations of the Contractor are proposed to be performed by a sub-contractor, details as per Paragraph 19 of the Terms of Tender (Supplement).

Please be reminded that this is a service contract in which the Government will not own the Devices during and after the Contract Period.

Enquiries on equipment technology and design

Question 5

The service requires portable or fixed remote sensing devices? As for fixed devices, is it necessary to apply for permit(s)? Which department should be approached for application of permit(s)?

Answer to Question 5
There is no limitation on using portable or fixed remote sensing devices in this Contract. However, please note the following requirements:

a) Clause 8.1 of Service Specifications – "*In delivering the Services, the Contractor shall deploy at least two (2) sets of Devices meeting the requirements stipulated in Clause 8.*"

b) Clause 9.1 of Service Specifications – "*The designated sites for the Measurement Operations (the Sites) locate at a wide range of locations in Hong Kong Island, Kowloon, New Territories and Lantau Island…*"

c) Clause 3.1 of Service Specifications – "*The Contractor shall conduct the Measurement Operations according to the weekly schedule designated by the Government Representative (the Schedule)…*"

d) Clause 3.3(b) of Service Specifications – The Project Manager of the Contractor shall make necessary preparation including "*permit applications with the relevant Government departments in Hong Kong such as the Hong Kong Police Force, the Transport Department and the Highways Department; and tunnel and closed areas operators, etc. (the Site Authorities), when applicable;*"

e) Clause 8.8(c) of Service Specifications – The Contractor shall "*use portable batteries as the power sources for the Devices and other equipment to avoid electrical noise interference to the Devices. The Contractor may seek prior approval from the Government Representative to use fuel-powered portable electricity generators at the Site(s) as the energy source for auxiliary devices, but not for the Devices.*"

Question 6
Our remote sensing device is adopting the DOAS technology but using IR for measuring CO and CO_2, and UV for measuring HC and NO, would it be accepted by the EPD.

Answer to Question 6
No. Clause 3(a)(ii) of Appendix 4 to the Service Specifications specifies "*The IR optical regime shall cover the measurements of CO_2, CO, HC, and the UV optical regime shall cover the measurements of NO.*"

Question 7
Are pressure and temperature sensors required to be installed in the gas chambers for calibration?

Answer to Question 7
Clauses 3 and 7(e) of Appendix 3 to the Service Specifications specifies the requirements of pressure and temperature measurements, which are extracted below:

a) Clause 3 of Appendix 3 to Service Specifications – "*For on-site calibrations and audits at*

roadsides, the Contractor shall design and construct a set of calibration equipment (CE) in form of a set of gas chambers capable of calibrating the column density of each of the pollutants, namely CO, CO_2, HC and NO, with reference to the reference column densities calculated from the depth of the optical path, absolute pressure, temperature and the certified concentrations of the gases inside the gas chambers."

b) Clause 7(e) of Appendix 3 to Service Specifications – "*The gas chambers shall allow the measurement of temperature and absolute pressure within each chamber. The Device software shall include fields for the Contractor to enter measured values, with automatic corrections applied to ensure precise column density measurements for calibration purposes. The Contractor shall also propose a plan to monitor the CE for gas leakage by regularly recording the temperature and absolute pressure of each chamber. All sensors in the CE employed shall be calibrated at least once every year.*"

Question 8

Emission Data Requirements – For the equipment required to read emission data from petrol and diesel engines, may I confirm whether the measurement parameters include the concentrations of CO, CO_2, HC, and NOx? Or in the ratio of CO_2?

Answer to Question 8

a) According to Clause 2 of Appendix 3 to the Service Specifications, "*the Contractor shall ensure that the Device software provides live readings of all the pollutant quantities in terms of column density which is defined as the number of pollutant molecules within the RS optical volume per unit cross-sectional area of the RS optical beam. The unit is expressed in micromoles per square centimeter (µmol/cm²)*"

b) According to Clause 3(a)(iv) of Appendix 4 to the Service Specifications, "*when triggered, the SDM shall determine the concentration ratio of CO-to-CO_2, HC-to-CO_2, and NO-to-CO_2 from the samples, or from the reference gases, based on the differential measurements between the sample and the dynamic background, corrected by the variations of the reference channels.*"

Question 9

The tender restricts the RSD's triggering method for taking a measurement. It defines that the measurement should be taken after the vehicle body has passed. However, a more refined system is established that begins the measurement using other triggering method, which allows vehicles with exhausts that are not necessarily at the rear of the vehicle to be measured. Would this method be valid?

Answer to Question 9

Clause 8.5 of Service Specifications has stipulated that "*The Devices shall be designed and operated such that the tailpipe emission measurement of a pass-by vehicle driven at any speed below 100 km/hour commences instantaneously when the very rear edge of the vehicle passes by a position at a specified separation distance from the SDM of the Devices.*" The reasons and detailed requirements for adopting this vehicle body triggering mechanism by the Devices have been specified in Appendix 1 to the Service Specifications.

Question 10
Regarding the acceptance test gases, could you confirm whether the test gas is a mixed calibration gas containing CO, CO_2, HC, NO, and N_2? If so, should the analyser output be expressed in gas concentration units?

Answer to Question 10
In this Tender/Contract, there is no term expressed as "acceptance test". The requirements for the tests/checks in different stages are detailed as follows:

a) During the Stage II of Tender evaluation as stipulated in Paragraph 5 of Marking Scheme and Assessment Criteria, Tenders will be checked to determine their compliance with one of the essential requirements as set out in Clause 8(b) of the Terms of Tender (Supplement), which is extracted below:
"*the Tenderer shall prove its Devices' compliance with the accuracy requirements in the practical demonstration ... according to Appendix 2 (Practical Demonstration) to the Terms of Tender (Supplement)"*.

b) After awarding the Contract, the Contractor shall submit a performance test report before deploying the Devices to deliver the Services (Clause 5 of Service Specifications). Appendices 2 and 3 to the Service Specifications are part of the requirements of the performance test report, which specify the requirements of the open path gas measurement checks and on-site column density calibrations, respectively. Answer to Question 12 below further clarifies the on-site column density calibrations and the unit of the column density.

Enquiries on equipment calibration

Question 11
The tender is very specific regarding equipment calibration requirements. It mentions the use of a calibration instrument consisting of a large cell placed in front of the RSD, into which gases are injected. However, we do not have such an instrument, but use an "open-path" calibration procedure. This is a similar procedure, in which the gas from the bottle is released just in front of the RSD window, so that the gas is not confined in a closed volume, but disperses into the environment. This method is validated by multiple regulatory agencies in other countries and is the most common method in the industry. The difference is that the reference gas is diluted rather than kept stable in a cell. We believe this is a more robust and realistic method because it evaluates the actual dispersion of gases, which is what happens in vehicle exhaust gases in reality. We want to confirm that this calibration method at the measurement sites would be valid for the EPD.

Answer to Question 11
a) As clarified in Item b) of Answer to Question 10 above, a performance test report shall be submitted before delivering the Services, which consists of open path gas measurement checks **and** on-site column density calibrations, as detailed in Appendices 2 and 3 to the Service Specifications, respectively.

b) Also, Clause 9.16 of Service Specifications stipulates that "*The Contractor shall conduct on-site verification procedures according to the Clause 3 of Appendix 5 to the Service Specifications before commencement and after completion of the Measurement Operations each Operation Day; and the column density calibration at bi-hourly interval or the time interval to be agreed by the Government Representative during which the Measurement Operations is in progress or as situations warranted to offset the effect of change in ambient conditions as well as to ensure accuracy throughout the period of Measurement Operations.*"

Question 12

Please confirm if it would be possible to use a single bottle (with a single mixture) at the measurement sites for audits and daily calibrations. Could we fill in different chambers with different gas concentrations for the calibration of the Devices?

Answer to Question 12

a) Clause 4 of Appendix 3 to the Service Specifications specifies the suggested calibration gas mixture to be used for on-site calibrations and audits at roadsides. There is no limitation on the combination of the gas mixture(s) to be used for on-site provided that applicable statutory requirement(s) and regulation(s) in Hong Kong will be complied with.

b) However, Clauses 2 and 10 of Appendix 3 to the Service Specifications specify that at least five (5) gas chambers with different column densities and pollutant-to-CO_2 column density ratios shall be utilized, and the unit of the column density shall be expressed in micromoles per square centimeter ($\mu mol/cm^2$), which is an expression of concentration per unit cross-sectional area.

c) Clause 5 of Appendix 3 to the Service Specifications also specifies the requirements on the full span range of the column density of each pollutant in the calibration equipment.