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九龍長沙灣道三零三號
長沙灣政府合署五樓

AGRICULTURE, FISHERIES AND CONSERVATION DEPARTMENT
5th Floor, Cheung Sha Wan Government Offices
303 Cheung Sha Wan Road,
Kowloon, Hong Kong

本處檔號 OUR REF.: (10) in L/M (419/2023) in AF GR CPA 12/34
來函檔號 YOUR REF.:
電　　話 TEL NO.: 2150 6841
圖文傳真 FAX.: 2317 0482

26 January 2024

To: Potential Tenderers

Dear Sir/Madam,

Addendum No. 1
Tender Ref.: AFCD/FCC/01/24
Provision for Supply, Design and Installation of Hill Fire Detection System in the Country Parks

Further to our invitation to tender dated 5 January 2024 on the above subject, we would like to inform you that the following amendments have been made to the tender document:

Page No.	Amendment
130	To revise the fire detection capability. **Original** 4.8 Functional requirements of Hill Fire Detectors (a) .....The HFD shall be able to detect wood or vegetation based fires with size of 2m x 1m at the distance up to 5 km away from the HFD. The detection capability..... **Revised** 4.8 Functional requirements of Hill Fire Detectors (a) .....The HFD shall be able to detect wood or vegetation based fires with size of ***3 meter square at the distance up to 6 km away from the HFD.*** The detection capability .....

<table>
<tr><td>139</td><td>To add specification of A.I. model performance on false alarm reduction
<u>Original</u>
(c) .....The A.I. model should be continuously trained for positive detection of hill fires with automatic generation of alert reports to the operators but shall be trained to minimise false positive rate and to avoid false alarms.

<u>Revised</u>
(c) .....The A.I. model should be continuously trained for positive detection of hill fires with automatic generation of alert reports to the operators but shall be trained to minimise false positive rate and to avoid false alarms. For every 10,000 ha detected, the number of false alarms cannot be more than 3 per day, while the missing rate should not exceed 0.5%.</td></tr>
<tr><td>163</td><td>To revise the detection range in Table (iii) Specifications of Infra-red Sensor
<u>Original</u>
<table><tr><td>Detection Distance</td><td>2 meter square wildfire @ 5 km distance (50mm lens)
6 meter square wildfire @ 8 km distance (50mm lens) with AI Engine assistance</td></tr></table>
<u>Revised</u>
<table><tr><td>Detection Distance</td><td>3 meter square wildfire @ 6 km distance (50mm lens)
6 meter square wildfire @ 8 km distance (50mm lens) with AI Engine assistance</td></tr></table></td></tr>
<tr><td>164</td><td>To add a table for the Specifications of CCTV in Annex III

Part C – Specifications of CCTV for surveillance of the HFD system
The proposed CCTV to be installed shall meet at least the basic specifications and requirements listed below.
<table><tr><td>Sensor Type</td><td>1/3” progressive scan CCD/CMOS sensor, or better</td></tr><tr><td>Resolution</td><td>1920 x 1080</td></tr><tr><td>Optical Zoom</td><td>25x optical zoom or more</td></tr><tr><td>Angle of view</td><td>Wide angle lens with at least 55 degrees</td></tr><tr><td>Minimum illumination</td><td>1.5 lux / F1.6 for color image</td></tr><tr><td>Communication Interface</td><td>RJ45, RS485 or RS232</td></tr><tr><td>Compression standard</td><td>H.264/MJPEG/MPEG4 or better</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>165</td>
<td>To revise the title of configuration of VSS in Table (i) Supported Server Specifications
<u>Original</u>
(i) Supported Server Specifications
<table>
<tr><td>VSS installed at each Fire Lookout with Insight Globe UI Configuration</td><td>Minimum Local Server Configuration for the UCS installed at the Fire Control Center</td></tr>
</table>
<u>Revised</u>
(i) Supported Server Specifications
<table>
<tr><td>Minimum Configuration of VSS installed at each Fire Lookout</td><td>Minimum Local Server Configuration for the UCS installed at the Fire Control Center</td></tr>
</table>
</td>
</tr>
</table>

The relevant amendments on Page 130, Page 139, Page 163, Page 164 and Page 165 of the Tender Document (with indication of "Addendum No. 1) are attached for your replacement. The original Page 130, Page 139, Page 163, Page 164 and Page 165 are now treated as null and void.

The above amendments shall form part of the tender document. Despite the above, all other terms and conditions of the Tender Document shall remain unchanged.

Interested parties are reminded to deposit their tender proposals before **12:00 noon (Hong Kong time) on <u>14 February 2024</u>**. A late tender, including a tender posted prior to, but received after the closing date, will not be considered.

If you have already submitted your tender proposals and wish to make changes to them, you should do so by submitting a revised proposal in accordance with the manner stipulated in the tender documents.

Yours faithfully,

(LEE Ying-ming)
for Director of Agriculture, Fisheries and Conservation

c.c. Internal SO
Encl. (5 pages)

(l) The Contractor shall take into consideration the need for the outdoor installations to withstand typhoon and heavy rain storms in Hong Kong during the selection and installation of outdoor equipment. The high temperature and high humidity environment of the installation venue(s) and the hazard due to typhoon / heavy rainstorm shall be taken into consideration for the enclosure design of the equipment which are installed outdoor. The enclosure for modules/components to be installed in outdoor environment shall be fully sealed for protection against water.

(m) The Contractor shall design and provide appropriate lightning protection systems, including copper tape lightning conductors and earth pits, for the System.

(n) All outdoor equipment including underground cables shall be weather-proof and well protected against lightning.

(o) All equipment and enclosures supplied shall be rust-resistant and corrosion-resistant suitable for the environmental conditions under which the equipment will be required to operate.

(p) All outdoor equipment shall be designed to work continuously at ambient temperature of 40℃ under outdoor and unsheltered environment unless otherwise specified.

(q) Equipment for the set up of UCS and the Video Storage System (VSS) shall be proposed in the procurement report, according with the mandatory feautes specified as **Annex IV (Technical Requirements of the Video Storage System and the User Control System)**, for approval from Government Representative.

4.8 Functional requirements of Hill Fire Detectors

(a) The HFD shall be capable of operating day and night, in high temperature and in low visibility conditions, such as rain, smoke, fog, smog and haze etc. The HFD shall be able to detect wood or vegetation based fires with size of ***3 meter square at the distance up to 6 km away from the HFD.*** The detection capability shall be unaffected at night or in low-visibility conditions.

(b) The HFD shall be able to adjust appropriate heat threshold at which an alarm shall be sent to the UCS. The threshold shall be based on the distance of the heat source from the HFD. The Contractor shall liaise and coordinate with the Government Representative for the temperature threshold of the System for detection of hill

(b) The proposed Hill Fire Detection System covers the monitoring of a significant area of country parks. Installation of additional heat sensors, smoke detectors, visual cameras, or thermal sensors for local warning in a country park, although commonly considered an approach for false alarm reduction, significantly increases the initial cost and the subsequent maintenance cost of the System. Therefore, the use of additional detectors and sensors in a country park is considered undesirable.

(c) The software proposed shall include collecting images and videos of hill fire occurrences, labelling the image data, building an image database and A.I. model for image analysis of spatial and temporal patterns of hill fires occurring in the country parks. The A.I. model should be continuously trained for positive detection of hill fires with automatic generation of alert reports to the operators but shall be trained to minimise false positive rate and to avoid false alarms. ***For every 10,000 ha detected, the number of false alarms cannot be more than 3 per day, while the missing rate should not exceed 0.5%.***

(d) The Contractor shall collect and label hill fire images for A.I. model input and machine learning after installation of first batch of Hill Fire Detectors and report the progress **within five (5)** months after commencement of the Contract Period. The Contractor shall continue fine-tuning the A.I. model of all Hill Fire Detectors to enhance detection accuracy for image analysis of spatial and temporal patterns of hill fire incidents and report the testing results **within nine 9 months, 12 months and 15 months** after commencement of the Contract Period;

(e) Real-time image of the cameras shall be fed into the computing devices for real-time analysis. The Contractor shall assist to fine-tune the parameter of optimiser to improve the accuracy during training of A.I. model.

(f) Virtual machine images shall provide at least 2 TB free storage (not include operating system) for data upload.

(g) Subject to Clause 21 of **Conditions of Contract**, all intellectual property rights, including the entire system design, A.I. engine, all data collected and analysed, should be vested in the Government.

(h) All data collected in this project, including video-analytics of hill fire incidents and personnel particulars, should be protected and not be used for any commercial purposes. All data in this project should not be disclosed to any third parties without written consent of AFCD**.**

(iii) Specifications of Infra-red Sensor

Sensor Type	Uncooled Micro Bolometer
Resolution	640 x 480
Field of View (FOV)	12.4 degrees (H) x 9.3 degrees (V) 50mm motorized focus germanium lens
Thermal Sensitivity	<50 mk @ F/1.0, 30Hz, 300K
Aperture	F1.0
Image Frame Rate	50Hz (PAL) / 60Hz (NTSC)
Probe Temperature Range	-20°C ~ 120°C / -20°C ~ 650°C
Output Video Format	NTSC / PAL
Accuracy	±2°C or 2%
Communication	1 Gbps Ethernet
Operation Voltage	DC 12V
Detection Distance	***3 meter square wildfire @ 6 km distance (50mm lens)*** 6 meter square wildfire @ 8 km distance (50mm lens) with AI Engine assistance

(iv) Specifications of Electro-optical Sensor

Sensor Type	1/1.8” or larger CMOS progressive scan CMOS
Max Sensor Resolution	Native Pixels 3840 x 2160 or better
Shutter	1 sec ~ 1/10,000 sec
Day and Night Mode	ICR filter (Auto/schedule/Alarm/Trigger) or Night time enhanced Full Color mode
Wide Dynamic Range	Digital Wide Dynamic Range 120db or better
Video Compression Standard	H.265/H.264/MJPEG/MPEG4
H.264 codec Profile	Baseline Profile/Main Profile/High Profile
Compression Output Rate	32Kbps ~ 16Mbps or better
Optical Zoom	23x (Focal length = 5.9 ~ 135.7 mm)
Low Light Capability	Color 0.005 Lux @ F1.5
Storage Function	Support SD/SDHC/SDXC, NAS
Communication Interface	1xRJ45, 1xRS485, 1xRS232
Operating Voltage	DC 12V

Part B – Installation Prerequisites of Hill Fire Detectors

Supporting Pole or Platform	Each Hill Fire Detector shall be mounted on, a supporting pole, platform or structure at the fire lookouts, which is elevated above the tree line at the installation site. The supporting pole / platform shall be capable of supporting the Hill Fire Detector and other accessories/equipment for up to a total of 300 kg. Remarks: The Contractor shall develop a suitable mounting solution for each location, subject to agreement by the Government Representative.
Power	Voltage: DC 24V (an AC to DC power adaptor will be included for 110-220 VAC power source) Wattage: 80W nominal 95W peak UPS: 1000 VA is recommended when power is not stable Remarks: For installation locations without power supply, the Contractor shall develop a suitable solution for power supply to the Hill Fire Detectors, subject to agreement by the Government Representative
Data Connectivity	Standard IP connection with minimum 5 MB/sec stable bandwidth per fire detector. Network latency < 80 ms, one fixed IP address. Wired Lan, Wi-Fi Point to Point (Preferred), or 5G/4G LTE (VPN)

Part C – Specifications of CCTV for surveillance of the HFD system

The proposed CCTV to be installed shall meet at least the basic specifications and requirements listed below.

Sensor Type	1/3” progressive scan CCD/CMOS sensor, or better
Resolution	1920 x 1080
Optical Zoom	25x optical zoom or more
Angle of view	Wide angle lens with at least 55 degrees
Minimum illumination	1.5 lux / F1.6 for color image
Communication Interface	RJ45, RS485 or RS232
Compression standard	H.264/MJPEG/MPEG4 or better

Annex IV

Technical Requirements of the Video Storage System and the User Control System

The technical requirements of the Video Storage System (VSS) and the User Control System (UCS) listed below are mandatory features. The proposed VSS and UCS shall meet at least the basic specifications and requirements listed below.

(i) Supported Server Specifications

	Minimum Configuration of VSS installed at each Fire Lookout	Minimum Local Server Configuration for the UCS installed at the Fire Control Center
Infrastructure	Custom Made Barebone Server Hardware	Custom Made Barebone Server Hardware
Connection	Gigabit Ethernet + 1000Mbps Fiber connection to ISP, or better	Internet Connection 100Mbps and above at Datacenter
No. of FD Support	1 ~ 200	1 ~ 100
CPU	16-core 3.0Ghz Base Clock 128MB Level 3 Cache PCLe 4.0 x 128 Lane	AMD Ryzen Threadripper PRO 3955WX
RAM	64 GB ECC DDR4 minimum	512GB DDR4 minimum
OS Drive	2 TB x 2 Mirror RAID SSD	512GB x 2 Mirror RAID SSD
Storage Drive	2 TB Harddrive per FD per month storage or NAS A 12 unit setup will require a 7.68TB Enterprise Grade SSD for storing 1 month of archive image data	30 x 16TB HDD Cables for connecting to Fast NAS Storage Unit 100GB Network Card
OS	Ubuntu	Ubuntu
Database	Cassandra	Cassandra
Data Redundancy	RAID 1 / RAID 6 / ZFS RAID-Z2 / ZFS RAID-Z3 or equivalent configuration	RAID 1 / RAID 6 / ZFS RAID-Z2 / ZFS RAID-Z3 or equivalent configuration