



# **TERMS OF REFERENCE**

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**SUPPLY & DELIVERY OF CCTV EQUIPMENT FOR AGRI BOAT**

## 1. BACKGROUND

Agro National Corporation (AgroNat) is a state-owned enterprise formed on 21 April 2020, with the overall mandate of developing the agricultural industry and making it an economically viable industry. To expand agriculture in Maldives and work towards reducing the dependency on imports, the company aims to establish mechanisms to ensure sales of agricultural produce from local farmers and provide income generating opportunities to the farmers.

To address the challenges faced by farmers in timely delivery of agricultural produce to the market, the company is building two purpose-built transport vessels, which will be utilized for transportation of local agricultural produce.

## 2. OBJECTIVES

The main objective of this TOR is to obtain a vendor to supply and deliver CCTV Equipment.

## 3. SCOPE OF SERVICES AND EXPECTED DELIVERABLES

- i. Supply and delivery of CCTV Equipment.

## 4. MARKING CRITERIA

#	Details	Marks
1	Price	60
2	Delivery Duration	10
3	Experience	5
4	Technical evaluation	25

### 4.1 Price (60% of the Total score)

The highest score shall be awarded to the bid with the lowest bid price. For the remaining bids, points will be given to using the formula below:

$$\text{Price Score} = \frac{\text{Lowest proposed total price from among the bids received}}{\text{Particular Bidder's proposed total price}} \times 60\%$$

## 5.2 Duration (10% of the Total score)

The maximum points allocated under this criterion will be awarded to the bidder with the lowest proposed Delivery Period, and the remaining bidders will be awarded points on a pro rata basis in descending order.

The formula thus used for the computation of the score is as follows:

Delivery Period Score:

$$\frac{\text{Lowest Proposed delivery period from among the bids received}}{\text{Particular Bidder's proposed delivery period}} \times 10\%$$

## 5.3 Experience (5% of the Total score)

Experience will be considered for the work completed in the last 5 years related to supply and delivery of IT Equipment.

The work experience letter should be on the contractor's letterhead with the contractor's stamp and signature. Marks will be given to a maximum of 5 experience letters. Each letter will carry 1 mark.

## 5.4 Technical Evaluation (25% of the Total score)

#	DETAILS	MARKS
1	Compliance with required specifications	90
2	Warranty (Minimum 1 year)	10

<b>NO</b>	<b>QTY</b>	<b>DESCRIPTION</b>
1	10	Surveillance CCTV Camera
2	1	NVR with management server
3	1	Surveillance-grade 3.5" 1TB HDD
4	1	HDMI Extender Connector
5	1	32" LCD Monitor - CCTV Viewing
6	1	24 Port PoE manageable switch
7	1	Mini Rack 6U
8	6	All-In-One Sensors
9	2	Access Point
10	2	Reader Hub / Reader
11	2	Additional Reader
12	2	Door Access Control

<b>Surveillance CCTV Camera</b>	
<b>Mechanical</b>	
<b>Enclosure materials</b>	Aluminum alloy, polycarbonate, hard-coated dome
<b>Mount materials</b>	Polycarbonate, stainless steel
<b>Weatherproofing</b>	IPX4
<b>Resistance</b>	IK08
<b>Optics</b>	
<b>Sensor</b>	5MP CMOS sensor
<b>Lens</b>	Fixed focal length
<b>View angle</b>	H: 102.4°, V: 71.4°, D: 134.3°
<b>Night mode</b>	Built-in IR LED illumination and IR cut filter
<b>Video</b>	
<b>Video compression</b>	H.264
<b>Resolution</b>	4MP 2688 x 1512 (16:9)
<b>Max. frame rate</b>	30 FPS
<b>Image settings</b>	Color, brightness, sharpness, contrast, white balance, exposure control, 2DNR, 3DNR, NR by motion, masking, text overlay
<b>System</b>	
<b>Processor</b>	Dual-core Arm® Cortex®-A7 based chip
<b>Networking interface</b>	10/100 MbE RJ45 port
<b>Max. power consumption</b>	5W
<b>Power method</b>	PoE
<b>Supported voltage range</b>	37–57V DC
<b>LED</b>	R/G/B/W
<b>Button</b>	Factory reset
<b>Mounting</b>	Wall, ceiling mount
<b>Operating temperature</b>	-20 to 40° C (-4 to 104° F)
<b>Audio</b>	
<b>Microphone</b>	Yes (Can be disabled)
<b>Speaker</b>	Yes

<b>NVR/Controller/Router/Gateway (All in one device)</b>	
<b>Mechanical</b>	
Enclosure materials	Aluminium CNC, SGCC steel
Mount material	SGCC steel
<b>Hardware</b>	
Processor	Quad-core ARM® Cortex®-A57 at 1.7 GHz
System memory	4 GB DDR4
On-board storage	16 GB eMMC Integrated 128 GB SSD
Management interface	Ethernet Bluetooth
Networking interface	(8) LAN: GbE RJ45 ports (1) WAN: 2.5 GbE RJ45 port
SFP+ interface	(1) LAN: 10G SFP+ (1) WAN: 10G SFP+
PoE interface	(6) PoE (Pair A 1, 2+; 3, 6-) (2) PoE+ (Pair A 1, 2+; 3, 6-)
IDS/IPS throughput	3.5 Gbps
Power method	(1) Universal AC input, 100–240V AC, 4.4A Max., 50/60 Hz (1) USP-RPS DC input, 52V DC, 3.94A
Power supply	AC/DC, internal, 240W
Supported voltage range	100–240V AC
Max. power consumption	50W (Excluding PoE output)
Max. PoE wattage per port by PSE	PoE: 15.4W PoE+: 30W
Voltage range PoE mode	PoE: 44–57V PoE+: 50–57V
ESD/EMP protection	Air: ± 15kV, contact: ± 8kV
Button	Factory reset
Operating temperature	-10 to 40° C (14 to 104° F)
<b>Gateway Features</b>	
Performance	Redundant WAN with failover and load balancing WiFi QoS with APs Application, domain, and country-based QoS Application and device type identification Additional internet failover with LTE Backup Internet quality and outage reporting
<b>Next-generation security</b>	
Advanced networking	License-free SD-WAN WireGuard, L2TP and OpenVPN server OpenVPN client OpenVPN and IPsec site-to-site VPN Policy-based WAN and VPN routing DHCP relay Customizable DHCP server

	IGMP proxy IPv6 ISP support
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### Industrial-grade 3.5" 1TB HDD

#### Mechanical

Dimensions	147 x 101.6 x 26.1 mm (5.75 x 4 x 1")
Hard disk form factor	3.5-inch

#### Hardware

Management interface	SATA 6Gb/s
Rotation speed	5400 RPM
Power method	5V/12V input
Supported voltage range	5V ± 5%/12V ± 5%
Power consumption	Spin-up, max: 17.6W Read/write: 3.3W

### HDMI EXTENDER CONNECTOR

#### Hardware

Processor	Octa-core ARM®
Memory	4 GB low power DDR4X
Networking interface	GbE RJ45 port
Power method	PoE
Max. power consumption	9.5W
ESD/EMP protection	Air: ± 8kV, contact: ± 4kV
Bluetooth	5.0
Antennas	Bluetooth
Antenna gain	2 dB
Button	Factory-reset

### 32" LCD TV - CCTV Viewing

#### Configuration

Operation System	Android 11.0
	ARM A55 Quad core, 1.5GHz, GPU: Mali G31MP2, DDR: 1GB, Flash: 8GB

#### Display

Screen Size	32 inch
Resolution	1366 x 768
Backlight Type	Direct
Direct distance	OD38
Set Brightness (nit) (Typ.)	200
Full Screen	Yes
Refresh frequency	50/60Hz, HDR10

#### Terminal (Ports):

USB – X2, HDMI – X2, LAN – X1

### Switching

Enclosure material	SGCC steel 1U
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#### Hardware

Management interface	Ethernet In-Band
Networking interface	(24) GbE RJ45 ports (2) 1/10G SFP+ ports
PoE interface	(16) PoE/PoE+ (Pins 1, 2+; 3, 6-) (8) 60W PoE++; PoE/PoE+ (Pins 1, 2+; 3, 6-) / PoE++ (Pair A 1, 2+; 3, 6-) (Pair B 4, 5+; 7, 8-)
Total non-blocking throughput	44 Gbps
Switching capacity	88 Gbps
Forwarding rate	65.472 Mpps
Power method	Universal input, 100–240V AC, 50/60 Hz USP RPS DC input, 52V DC, 7.69A / 11.5V DC, 2.61A
Power supply	AC/DC, internal, 450W
Supported voltage range	100–240V AC
Max. power consumption	50W (Excluding PoE output)
Total available PoE	400W
Max. PoE wattage per port by PSE	PoE+: 32W PoE++: 64W
Voltage range PoE mode	PoE: 44–57V PoE+: 50–57V
ESD/EMP protection	Air: ± 16kV, contact: ± 12kV
Button	Factory reset



### Mini Rack

#### Mechanical

<b>Materials</b>	Frame/bracket: Cold rolled carbon steel (SPCC) Handle: Stainless steel
<b>Treatment</b>	Liquid coating
<b>U height</b>	6U
<b>Rack type</b>	Open frame

### All-In-One Sensor - Environment Sensors - Cold Storage/Storage/Engine Room/Genset

<b>Enclosure material</b>	Polycarbonate
<b>Mount materials</b>	Flat wall mount: polycarbonate, adhesive Corner mount: polycarbonate, adhesive
<b>Additional gear</b>	Magnet Water sensor adapter
<b>Hardware</b>	
<b>Networking interface</b>	Bluetooth 5.0, BLE
<b>Max. TX power</b>	5 dBm
<b>Max. power consumption</b>	77mW
<b>Power method</b>	Lithium battery CR123A
<b>Sensor features</b>	Motion sensor (5 m/16 ft max. range) Magnetic entry sensor for door or window open/close Accelerometer for garage door open/close Temperature sensor Humidity sensor Ambient light sensor Alarm sound sensor Water sensor for detecting leaks and floods BLE connectivity from access point in indoor setting
<b>Antenna</b>	2.4GHz
<b>Antenna gain</b>	0.5 dBi
<b>Button</b>	Factory reset

Access Point	
<b>Enclosure materials</b>	UV-stabilized polycarbonate
<b>Mount materials</b>	Polycarbonate, SGCC steel, plastic
<b>Wind survivability</b>	33.2 N at 200 km/h (7.5 lbf at 125 mph)
<b>Weatherproofing</b>	IPX6
<b>Networking interface</b>	(1) GbE RJ45 port
<b>Management interface</b>	Ethernet
<b>Power method</b>	PoE
<b>Supported voltage range</b>	44–57V DC
<b>Max. power consumption</b>	8W
<b>Max. TX power</b> 2.4 GHz 5 GHz	20 dBm 20 dBm
<b>MIMO</b> 2.4 GHz 5 GHz	2 x 2 2 x 2
<b>Throughput rate</b> 2.4 GHz 5 GHz	300 Mbps 866.7 Mbps
<b>Antenna gain</b> 2.4 GHz 5 GHz	4.7 dBi 6 dBi
<b>Antenna</b>	(1) Internal antenna (2) RP-SMA connectors for optional external antennas
<b>Button</b>	Factory reset
<b>Mounting</b>	Wall, ceiling, pole mount (Included)
<b>WiFi standards</b>	802.11a/b/g/n/ac
<b>Wireless security</b>	WPA-PSK, WPA-Enterprise (WPA/WPA2, TKIP/AES)
<b>BSSID</b>	8 per radio

<b>VLAN</b>	802.1Q
<b>Advanced QoS</b>	Per-user rate limiting
<b>Guest traffic isolation</b>	Supported
<b>Concurrent clients</b>	200+
<b>Supported Data Rates</b>	
<b>802.11a</b>	6, 9, 12, 18, 24, 36, 48, 54 Mbps
<b>802.11b</b>	1, 2, 5.5, 11 Mbps
<b>802.11g</b>	6, 9, 12, 18, 24, 36, 48, 54 Mbps
<b>802.11n (WiFi 4)</b>	6.5 Mbps to 300 Mbps (MCS0 - MCS15, HT 20/40)
<b>802.11ac (WiFi 5)</b>	6.5 Mbps to 866.7 Mbps (MCS0 - MCS9 NSS1/2, VHT 20/40/80)

<b>Reader Hub / Reader - Cold Storage 1</b>	
<b>Enclosure material</b>	Polycarbonate
<b>Mounting material</b>	Polycarbonate
<b>Hardware</b>	
<b>Networking interface</b>	(5) 10/100/1000 Base-T
<b>Power method</b>	PoE++ UL 294 Power-limited Class 2 PSU UL 60950/62368 LPS/PS2 PSU
<b>Max. power consumption</b>	Without PoE output: 30W With PoE output: 50W
<b>PoE input</b>	50V DC, 1A
<b>PoE output</b>	PoE passthrough, (4) PoE, 50V DC, total 20W
<b>Button</b>	(1) Factory-reset
<b>Digital input</b>	Request to exit/request to enter/remote release/door position sensor
<b>Dry output relay</b>	Lock: 30V DC, 1A Aux: 30V DC, 1A
<b>Powered output relay</b>	Lock: 12V DC, 1A Aux: 12V DC, 0.33A 12V DC, 0.33A

<b>PoE cabling requirements</b>	The minimal conductor gauge permitted to connect between the PSE or power injector and the PD shall be 24 AWG (0.21 mm <sup>2</sup> ) for horizontal or riser cable.
<b>Mounting</b>	In wall, gang box
<b>Weatherproofing</b>	IP55
<b>Hardware</b>	
<b>Networking interface</b>	(1) 10/100 MbE RJ45 port
<b>Connectivity</b>	BLE 4.1
<b>Power method</b>	PoE UL 294 Power-limited Class 2 PSU UL 60950-1/62368-1 LPS/PS2 PSU
<b>Supported voltage range</b>	48V DC
<b>Max. power consumption</b>	5W
<b>ESD/EMP protection</b>	Air: ±15kV, contact: ±8kV
<b>Sensors</b>	Proximity sensor
<b>Speaker</b>	(1) 8 ohm, 0.7W
<b>LEDs</b>	R/G/B/W
<b>Button</b>	(1) Factory-reset
<b>NFC frequency</b>	13.56 MHz
<b>NFC read range</b>	< 30 mm
<b>NFC standards</b>	ISO 14443A, 14443B, 15693
<b>NFC technology</b>	NFC Tag 1,2,3,4,5 MIFARE Classic MIFAREPlus MIFARE Ultralight MIFARE DESFire
<b>Format</b>	ISO 7810 ID-1
<b>NFC frequency</b>	13.56 MHz
<b>NFC technology</b>	ISO/IEC 14443 Type A MIFARE DESFire

Additional Reader - Cold Storage 2	
<b>Enclosure material</b>	Polycarbonate, glass
<b>Mounting</b>	In wall, gang box
<b>Weatherproofing</b>	IP55
<b>Networking interface</b>	(1) 10/100 MbE RJ45 port
<b>Connectivity</b>	BLE 4.1
<b>Power method</b>	PoE UL 294 Power-limited Class 2 PSU UL 60950-1/62368-1 LPS/PS2 PSU
<b>Supported voltage range</b>	48V DC
<b>Max. power consumption</b>	5W
<b>ESD/EMP protection</b>	Air: ±15kV, contact: ±8kV
<b>Sensors</b>	Proximity sensor
<b>Speaker</b>	(1) 8 ohm, 0.7W
<b>Button</b>	(1) Factory-reset
<b>NFC frequency</b>	13.56 MHz
<b>NFC read range</b>	< 30 mm
<b>NFC technology</b>	NFC Tag 1,2,3,4,5 MIFARE Classic MIFAREPlus MIFARE Ultralight MIFARE DESFire
<b>Operating humidity</b>	5 to 90% noncondensing
<b>PoE cabling requirements</b>	Cable 5e cabling is the minimum performance category recommended. The performance category utilized should match the transmission speed required at the installation site. The minimal conductor gauge permitted to connect between the PSE or power injector and the PD shall be 26 AWG (0.13 mm <sup>2</sup> ) for patch cords; 24 AWG (0.21 mm <sup>2</sup> ) for horizontal or riser cable.

Door Access Control	
<b>Enclosure materials</b>	Lock body: zinc alloy Front plate/latches: stainless steel
<b>Voltage</b>	12VDC
<b>Current power</b>	400mA ±10%
<b>Wiring connection</b>	Connect the two screw terminal separately to powered lock relay on UA-Hub: NO, COM
<b>Lock type</b>	Fail secure lock Single door
<b>Lock holding force</b>	1,200 kg (2,645 lb)
<b>Suitability</b>	Wooden Steel Aluminum
<b>Screw terminal</b>	+ and -
<b>Operating temperature</b>	-10 to 45° C (14 to 113° F)
<b>Operating humidity</b>	5 - 90% noncondensing