

**SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF CAMERA IN ASH POND OF OPGC**  
**TENDER SCHEDULE**

<b>S/N</b>	<b>DESCRIPTION OF ITEM</b>	<b>Material Code</b>	<b>QTY</b>
	<b>SUPPLY PART</b>		
1	High Speed PTZ Dome Camera 5 MP	195100170011	4.00
2	Verifocal Bullet Camera 5MP	195100170013	7.00
3	Network Video Recorder 16 Channel	195100070015	1.00
4	Hard Disk 10 TB	195100170059	1.00
5	LED MONITOR 24"	194120350057	1.00
6	PoE Switch Managed 24 Port	194300930019	1.00
7	CCTV, Wireless Bridge Cambium ePMP 200	194300930020	8.00
8	CCTV, Wireless Bridge Cambium PTP 550	194300930021	2.00
9	Surge Suppressor Cambium	194300930022	10.00
10	PoE Adapter	195200380020	4.00
11	CAT 6 STP Cable (305 Mtr Roll)	195100170024	2.00
12	OFF-GRID SOLAR PV SYSTEM	194300930024	4.00
13	Outdoor FRP IP 66 for Enclosure	194300930023	4.00
14	Network Rack 9 U	195200400013	1.00
15	Tripod Tower 10 Mtr	194300930025	4.00
16	Tripod Tower 20 Mtr	194300930026	1.00
17	High Speed PTZ Dome Camera 5 MP	195100170011	4.00
18	Verifocal Bullet Camera 5MP	195100170013	4.00
19	Network Video Recorder 16 Channel	195100070015	1.00
20	Hard Disk 10 TB	195100170059	1.00
21	LED MONITOR 24"	194120350057	1.00
22	PoE Switch Managed 8 Port	195100170053	1.00
23	CCTV, Wireless Bridge Cambium ePMP 200	194300930020	4.00
24	CCTV, Wireless Bridge Cambium PTP 550	194300930021	2.00
25	Surge Suppressor Cambium	194300930022	6.00
26	PoE Adapter	195200380020	4.00
27	CAT 6 STP Cable (305 Mtr Roll)	195100170024	2.00
28	OFF-GRID SOLAR PV SYSTEM	194300930024	2.00
29	Outdoor FRP IP 66 for Enclosure	194300930023	3.00
30	Network Rack 9 U	195200400013	1.00
31	Tripod Tower 10 Mtr	194300930025	2.00
32	Tripod Tower 20 Mtr	194300930026	1.00
33	LED Screen 32"	130110050159	1.00
34	NUC KIT PC	194300930027	1.00
35	CCTV, Wireless Bridge Cambium ePMP 300	194300930028	2.00
	<b>SERVICE PART</b>		
01	Installation of PTZ Type Camera		8.00
02	Installation of Fixed (Bullet) Camera		11.00
03	Installation of Outdoor Wireless Bridge		18.00
04	Installation of Tower 10Mtr/20 Mtr		8.00
05	Installation of Solar Power System		6.00

08	Installation and Commissioning of Network Components, Integration of Camera with NVR, Installation of LED Screen, NUC PC, Marking and Labling of Installed Components, Commissioning of all Supplied Components,Demo and Training		1.00
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**DETAILED TECHNICAL SPECIFICATION**

1 195100170011 - High Speed PTZ Dome Camera 5 MP			
S.No	Specification	Compliance (Yes/No)	Remarks
01	Image Sensor : 1/2.8" CMOS		
02	Number of Pixel : 2592 x 1944		
03	IR Distance : Smart IR Auto On/Off up to 150 Mtr or More		
04	S/n Ratio : >=50dB		
05	WDR : 120db		
06	Backlight Compensation : WDR,BLC,HLC		
07	Noise Reduction : 3d DNR		
08	Lens Type : Minimum 30x Optical Zoom , 16x Digital Zoom Auto Focus 5-150 mm or Better		
09	Electronic Image Stabilization : Offered Camera should support Electronic Image Stabilization		
12	Suported Video Compression : H.265 High Efficiency Video Coding/H.264/MJPEG, Smart Codec		
13	Supported Number Of Video Streams : 3 or more		
14	Frame Rate : 30FPS		
15	Audio : In/Out ; 2-Way, Full duplex		
16	Interoperability : ONVIF S/T/G		
17	Built-in Analytics :People Counter, Multi Loitering, Intrusion, Tampering, Smart Motion Detection (SMD), Motion Detection		
18	Operating Temperature : -20°C to +70°C		
19	Ingress Protection : IK10, IP 67		
20	Compliance, Certifications and Security : NDAA Compliant, User account and password protection, HTTPS, IP Filter, Digest authentication, TLS1.2 only, Stream encryption, AES128 / 256, SSH , CE, UL, FCC		
21	Warranty : 5 Years		
22	Apporved Make : Axis, Pelco, Sony, Panasonic, Honeywell, Bosch (Bidder will have to submit a Tender Specific Authorization Certificate for Offered Make)		
2 195100170013 - Verifocal Bullet Camera 5MP			
S.No	Specification	Compliance (Yes/No)	Remarks
01	Image Sensor : 1/2.8" CMOS		
02	Number of Pixel : 2592 x 1944		

03	IR Distance : Smart IR Auto On/Off up to 50 Mtr or More		
04	S/n Ratio : >=50dB		
05	WDR : 120db		
06	Backlight Compensation : WDR,BLC,HLC		
07	Noise Reduction : 3d DNR		
08	Lens Type : 2.7-13.5 mm, DC-Iris, F1.6-F3.3, Multi Functional Zoom		
09	Electronic Shutter Speed : 1/8 ~ 1/32,000		
10	Supported Video Compression : H.265 High Efficiency Video Coding/H.264/MJPEG, Smart Codec		
11	Supported Number Of Video Streams : 3 or more		
12	Frame Rate : 30FPS		
13	Audio : In/Out ; 2-Way, Full duplex		
14	Interoperability : ONVIF S/T/G		
15	Built-in Analytics :People Counter, Multi Loitering, Intrusion, Tampering, Smart Motion Detection (SMD), Motion Detection		
16	Operating Temperature : -20°C to +60°C		
17	Ingress Protection : IK10, IP 67		
18	Compliance, Certifications and Security : NDAA Compliant, User account and password protection, HTTPS, IP Filter, Digest authentication, TLS1.2 only, Stream encryption, AES128 / 256, SSH , CE, UL, FCC		
19	Warranty : 5 Years		
20	Apporved Make : Axis, Pelco, Sony, Panasonic, Honeywell, Bosch (Bidder will have to submit a Tender Specific Authorization Certificate for Offered Make)		
3	<b>195100070015 - Network Video Recorder 16 Channel</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Number of Vieo Input Channel : 16		
02	Embedded Operating System : Linux		
03	Security : Chipset and streaming encryption		
04	Supported Display Resolution : 3840 x 2160, 1920 x 1080, 1280 x 1024, 1024 x 768		
05	Supported Recording Resolution : Up to 3840 x 2160		
06	Suported Video Compression : H.265 High Efficiency Video Coding/H.264, Smart Codec		
07	VIDEO DETECTION/Built-in Analytics : Camera alarm in, motion detection, Video loss, Camera tamper, Intrusion, Multi loitering, Crowd detection, NVR alarm in/out, Disk failure, Disk full, IP address conflict, Network disconnect, Intrusion		
08	Number of Alarm Input : 06		
09	Number of Alarm Output : 01		

10	PTZ Operation : Direction control, Home, Iris, Preset, Patrol (group), Focus +/- Zoom +/-		
11	Audio Input/ Output : 3.5 mm Line in x1 ; 3.5 mm Line out x1, Full Duplex		
12	Storage : 2 SATA HDD Support, Each Port up to 10TB or More		
13	Interface : 10/100/1000Mbps Ethernet (RJ-45) x 2; 2 x USB; e SATA Port		
16	Operating Temperature : -20°C to +50°C		
17	Compliance, Certifications and Security : NDAA Compliant, User account and password protection, HTTPS, IP Filter, Digest authentication, TLS1.2 only, Stream encryption, AES128 / 256, SSH , CE, UL, FCC		
18	Warranty : 5 Years		
19	Apporved Make : Axis, Pelco, Sony, Panasonic, Honeywell, Bosch (Bidder will have to submit a Tender Specific Authorization Certificate for Offered Make)		
4	<b>195100170059 - Hard Disk 10 TB</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Type and Capacity : 10TB SATA 3.5"		
02	RPM : 5400 or Better		
03	Buffer : up to 256MB		
04	Operation Hours (Hours / Day) : 24/7		
05	Suitable for CCTV Surveillance		
06	Apporved Make : Seagate, WD, Toshiba, Samsung, Hitachi		
5	<b>194120350057 - LED SCREEN 24"</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Panel/Screen Size : 24" Diagnol or More		
02	Panel Type : IPS		
03	Resolution : 1920 x 1080 (FHD) or Better		
04	Brightness : 350nits or Higher		
05	Contrast Ratio : 1,100 : 1 or Similar		
06	Viewing Angle (H xV) : 178 x178		
07	Mounting Angle : Portrait and Landscape		
08	Input Ports : 1X HDMI, 1x VGA		
09	Mounting optition : Wall Mountable, VESA Mount, Desktop Mount		
10	Certification : FCC, Energy Star, RoHS		
11	Apporved Make : LG, Samsung, Dell, Lenovo, HP		
6	<b>194300930019 - PoE Switch Managed 24 Port</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Number of Ports : 24 x 10/100/1000Base-TX ports + 2 1000Base-X SFP ports		
02	PoE Power Budget: 140 Watt or More		

03	Switching Capacity : 24Gbps		
04	Management : Should Support WEB management system, Should Support Local/remote configuration via Telnet, Should Support System configuration with SNMP v1/v2/v3, Should Support Multi-user management		
05	Layer 2 Features : Switching capacity : 20G, MAC address table 8K, Support MAC address table management, MAC Address Binding Support, MAC Address Filtering Support, MAC Address Learning control Control number of port-based MAC address learning		
06	Other Features : Port Control, Port Isolation , Port Self-loop Detection, Port Mirroring Support , VLAN: VLAN Based on Protocol Support IP-Based /MAC-Based VLAN, VLAN Mapping : Support 1:1 mapping		
07	Security Features : Support for MAC-based 802.1X authentication, Support for AAA/RADIUS authentication, Support WEB/Telnet password protection Support Accessing privilege mode password protection, CPU Self-protection		
08	Apporved Make: Dlink, Digisol, Alcatel, Netgear		
7	<b>194300930020 - Point to Point Outdoor Wireless Bridge (For Connectivity of Camera in Ash Pond)</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Frequency Range : 5Ghz		
02	Channel Width : 5 / 10 / 20 / 40 Mhz		
03	Ethernet Interface : 10/100/1000MBPS		
04	Wireless Throughput : up to 150MBPS or More		
05	Physical Layer : 2x2 MIMO/OFDM		
06	Standard Protocol : Pv4/IPv6 (Dual Stack), UDP, TCP, ICMP, SNMPv2c, NTP, STP, IGMP, SSH		
07	Network Management : IPv4/IPv6, HTTPs, SNMPv2c, SSH		
08	Transmit Power Range : -15 to +30 dBm		
09	Wind Survival : 145 km/hour		
10	QoS :Three level priority (Voice, High, Low) with packet classification by DSCP, COS, VLAN ID, IP & MAC Address, Broadcast, Multicast and Station Priority		
11	Antenna Type : Inbuilt / External 5Ghz Must be Suitablae with Wireless Device		
12	Antenna Gain : 25 dBi or More		
13	Antenna Frequency Range : 5150 – 5970 MHz		
14	Ingress Protection : IP 55/ IP 66/ IP 67 or Better		
15	Encryption : 128-bit AES		

16	Certification : FCC - Z8H89FT0015 CE - EN 301 893 V2.1.1		
17	Device should be Supplied with Suitable with Surge Suppressor		
18	Approved Make :Extreme/Cambium/Ligo Wave/ Ubiquity/ HP/ Rucus/ Aruba// Engenus		
8	<b>194300930021 - Point to Point Outdoor Wireless Bridge (For Connectivity Between Plant and Ash Pond)</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Frequency Range : 5Ghz		
02	Channel Width : Dual Channel 5 / 20 / 40 / 80 Mhz		
03	Ethernet Interface : 10/100/1000MBPS		
04	Physical Layer : 4x4 MIMO/OFDM		
05	Wireless Throughput : up to 500MBPS or More		
06	Standard Protocol : Pv4/IPv6 (Dual Stack), UDP, TCP, ICMP, SNMPv2c, NTP, STP, IGMP, SSH		
07	Network Management : IPv4/IPv6, HTTPs, SNMPv2c, SSH		
08	Transmit Power Range : 26 dBm or Better		
09	Wind Survival : 145 km/hour		
10	QoS :Three level priority (Voice, High, Low) with packet classification by DSCP, COS, VLAN ID, IP & MAC Address, Broadcast, Multicast and Station Priority		
11	Antenna Type : Inbuilt / External 5Ghz Must be Suitable with Wireless Device		
12	Antenna Gain : 23 dBi or More		
13	Antenna Frequency Range : 5170 – 5980 MHz		
14	Ingress Protection : IP 55/ IP 66/ IP 67 or Better		
15	Encryption : 128-bit AES		
16	Certification : FCC - Z8H89FT0015 CE - EN 301 893 V2.1.1		
17	Device should be Supplied with Suitable with Surge Suppressor		
18	Approved Make :Extreme/Cambium/Ligo Wave/ Ubiquity/ HP/ Rucus/ Aruba// Engenus		
9	<b>194300930022 - Surge Suppressor</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Protection Mode: Line-to-line and line-to-ground		
02	Surge Arrestor: TVS Diodes (Transient Voltage Suppression for longer operational life)		
03	Surge Current: Rating, L-G, total 216A, 10/1000us		
04	Response time: 5 nanoseconds typical		
05	Nominal Voltage: 30V		
06	Connectors: Two x RJ-45		
07	Transfer Rate: 1000 Base T		

08	Mounting: Pole mount or wall mount		
09	Wind Survival: 200 mph (321 km/hour)		
10	Operating Temperature: -40° F (-40° C) to +140° F (+60° C) Humidity: 100% condensing		
11	Environmental Protection: IP54 (Dust and Water Intrusion Protection)		
10	<b>195200380020 - PoE Adapter for PTZ Camera</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	General Requirement : PoE Injector Should Complies with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab and IEEE802.3af/ IEEE802.3at Standards ; Transmits electrical power and data on the single Ethernet Cable. Output Power 30 watts or More. PoE Adpter should be Suitable for Supplied Camera		
11	<b>195100170024 - CAT 6 STP Cable Outdoor</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Conductor : 4 Pair, 23 AWG, Solid bare copper		
02	Insulation Material : High density polyethylene (HDPE)		
03	Shielding : Aluminium/Polyster Foil		
04	Overall Sheath : Tinned Copper Braiding		
05	Jacket : FRPVC/LSZH sheath		
06	Maximum Tensile Strength of Jacket (N/mm <sup>2</sup> ) : 13		
07	Pulling Force : 25 LBS		
08	Bending Radius : < 8X Cable Diameter at -20°C +/- 1°C		
09	Operating Temperature : -20°C to +70°C		
10	Impedance : 100 ± 15 Ω @ 100 Mhz		
11	Current Rating : 1.5 A Max.		
12	Operating Voltage : 72v		
13	Standard Length of Roll : 305 Mtr		
14	Standard/Certifications: UL Listed, ETL Verified to ANSI/TIA-568-C.2, ISO/IEC 11801, RoHS Compliant		
15	Apporved Make : Finolex, Polycab, Dlink, AMP, Digisol, Molex		
12	<b>194300930024 - Off Grid Solar System</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	System Capacity : 1 KVA		
02	Operating DC Voltage : 12V		
03	Nominal Output Range : 220V +/- 5%		
04	Nominal Output Ampere: 3Amp		
05	Output Waveform: SineWave		
06	Type of Battery Charger : MPPT		
07	Charging Efficiency : 90% or better		

08	Battery Charging Current in Solar: 10-40A		
09	Type of Battery : Lithium Ion		
10	Number of Battery and Capacity : 12V/100Ah, 2 Nos Solar Battery		
11	Solar PV Module (Watt) : 225 Watt, 12 V		
12	Number of Solar Module : 2		
13	Suitable size of Cables/Connectors Should be Supplied with Inverter		
14	Bidder will have to Fabricate or supply of Structure for PV Module		
15	Approved Make : Microtek, UTL Solar, Uniline, Watee, Jackson, TATA		
13	<b>194300930023 - Outdoor Junction Box</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	General Requirement : Junction Box Should be IP 55 or Better. Required Junction Box Must have sufficient Size to Accommodate Solar Inverter System and Camera Accessory. Junction Box Must have Cooling Fan for Proper Cooling and Ventilation. Junction Box should be designed for Mounting on Pole/Wall		
14	<b>195200400013 - Network Rack 9U</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Number of Unit Racks : 9U		
02	Rack Width : 19 inch		
03	Body Material : Welded		
04	Depth : 450mm		
05	Height : 480MM		
06	Load Capacity : 40 KG		
07	Door Type: Lockable Toughened Glass		
08	Finish Powder Coated		
09	Additional Features : Including of FAN, PDU and Cable Manager		
10	Approved Make : Dlink/I-BALL/NETRACK/WALL RACK/APC		
15	<b>194300930025 - Tripod MS Fabricated Tower 10 Mtr</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>



01	Type of Tower: Tripod Self Support, fabricated with High Quality MS Fabricated, 10 Mtr or More RF tower, divided in Section of 3 Mtr or Equal, Painted in Red and White, along with Lighting arrestor and grounding material, Grouting Base should be minimum 1.5 mtr bellow the ground. Design should be as per Industry Standard. Proper Arrangement for Installation of Wireless Device and Camera. Proper Arrangement of Installation of Outdoor Junction Box		
16	<b>194300930025 - Tripod MS Fabricated Tower 20 Mtr</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Type of Tower: Tripod Self Support, fabricated with High Quality MS Fabricated, 20 Mtr or More RF tower, divided in Section of 3 Mtr or Equal, Painted in Red and White, along with Lighting arrestor and grounding material, Grouting Base should be minimum 1.5 mtr bellow the ground. Design should be as per Industry Standard. Proper Arrangement for Installation of Wireless Device and Camera. Proper Arrangement of Installation of Outdoor Junction Box		
17	<b>195100170011 - High Speed PTZ Dome Camera 5 MP</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Image Sensor : 1/2.8" CMOS		
02	Number of Pixel : 2592 x 1944		
03	IR Distance : Smart IR Auto On/Off up to 150 Mtr or More		
04	S/n Ratio : >=50dB		
05	WDR : 120db		
06	Backlight Compensation : WDR,BLC,HLC		
07	Noise Reduction : 3d DNR		
08	Lens Type : Minimum 30x Optical Zoom , 16x Digital Zoom Auto Focus 5-150 mm or Better		
09	Electronic Image Stabilization : Offered Camera should support Electronic Image Stabilization		
12	Supported Video Compression : H.265 High Efficiency Video Coding/H.264/MJPEG, Smart Codec		
13	Supported Number Of Video Streams : 3 or more		
14	Frame Rate : 30FPS		
15	Audio : In/Out ; 2-Way, Full duplex		
16	Interoperability : ONVIF S/T/G		
17	Built-in Analytics :People Counter, Multi Loitering, Intrusion, Tampering, Smart Motion Detection (SMD), Motion Detection		

18	Operating Temperature : -20°C to +70°C		
19	Ingress Protection : IK10, IP 67		
20	Compliance, Certifications and Security : NDAA Compliant, User account and password protection, HTTPS, IP Filter, Digest authentication, TLS1.2 only, Stream encryption, AES128 / 256, SSH , CE, UL, FCC		
21	Warranty : 5 Years		
22	Apporved Make : Axis, Pelco, Sony, Panasonic, Honeywell, Bosch (Bidder will have to submit a Tender Specific Authorization Certificate for Offered Make)		
18	<b>195100170013 - Verifocal Bullet Camera 5MP</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Image Sensor : 1/2.8" CMOS		
02	Number of Pixel : 2592 x 1944		
03	IR Distance : Smart IR Auto On/Off up to 50 Mtr or More		
04	S/n Ratio : >=50dB		
05	WDR : 120db		
06	Backlight Compensation : WDR,BLC,HLC		
07	Noise Reduction : 3d DNR		
08	Lens Type : 2.7-13.5 mm, DC-Iris, F1.6-F3.3, Multi Functional Zoom		
09	Electronic Shutter Speed : 1/8 ~ 1/32,000		
10	Suported Video Compression : H.265 High Efficiency Video Coding/H.264/MJPEG, Smart Codec		
11	Supported Number Of Video Streams : 3 or more		
12	Frame Rate : 30FPS		
13	Audio : In/Out ; 2-Way, Full duplex		
14	Interoperability : ONVIF S/T/G		
15	Built-in Analytics :People Counter, Multi Loitering, Intrusion, Tampering, Smart Motion Detection (SMD), Motion Detection		
16	Operating Temperature : -20°C to +60°C		
17	Ingress Protection : IK10, IP 67		
18	Compliance, Certifications and Security : NDAA Compliant, User account and password protection, HTTPS, IP Filter, Digest authentication, TLS1.2 only, Stream encryption, AES128 / 256, SSH , CE, UL, FCC		
19	Warranty : 5 Years		
20	Apporved Make : Axis, Pelco, Sony, Panasonic, Honeywell, Bosch (Bidder will have to submit a Tender Specific Authorization Certificate for Offered Make)		
19	<b>195100070015 - Network Video Recorder 16 Channel</b>		

S.No	Specification	Compliance (Yes/No)	Remarks
01	Number of Vieo Input Channel : 16		
02	Embedded Operating System : Linux		
03	Security : Chipset and streaming encryption		
04	Supported Display Resolution : 3840 x 2160, 1920 x 1080, 1280 x 1024, 1024 x 768		
05	Supported Recording Resolution : Up to 3840 x 2160		
06	Suported Video Compression : H.265 High Efficiency Video Coding/H.264, Smart Codec		
07	VIDEO DETECTION/Built-in Analytics : Camera alarm in, motion detection, Video loss, Camera tamper, Intrusion, Multi loitering, Crowd detection, NVR alarm in/out, Disk failure, Disk full, IP address conflict, Network disconnect, Intrusion		
08	Number of Alarm Input : 06		
09	Number of Alarm Output : 01		
10	PTZ Operation : Direction control, Home, Iris, Preset, Patrol (group), Focus +/- Zoom +/-		
11	Audio Input/ Output : 3.5 mm Line in x1 ; 3.5 mm Line out x1, Full Duplex		
12	Storage : 2 SATA HDD Support, Each Port up to 10TB or More		
13	Interface : 10/100/1000Mbps Ethernet (RJ-45) x 2; 2 x USB; e SATA Port		
16	Operating Temperature : -20°C to +50°C		
17	Compliance, Certifications and Security : NDAA Compliant, User account and password protection, HTTPS, IP Filter, Digest authentication, TLS1.2 only, Stream encryption, AES128 / 256, SSH , CE, UL, FCC		
18	Warranty : 5 Years		
19	Apporved Make : Axis, Pelco, Sony, Panasonic, Honeywell, Bosch (Bidder will have to submit a Tender Specific Authorization Certificate for Offered Make)		
20	<b>195100170059 - Hard Disk 10 TB</b>		
S.No	Specification	Compliance (Yes/No)	Remarks
01	Type and Capacity : 10TB SATA 3.5"		
02	RPM : 5400 or Better		
03	Buffer : up to 256MB		
04	Operation Hours (Hours / Day) : 24/7		
05	Suitable for CCTV Surveillance		
06	Apporved Make : Seagate, WD, Toshiba, Samsung, Hitachi		
21	<b>194120350057 - LED SCREEN 24"</b>		

S.No	Specification	Compliance (Yes/No)	Remarks
01	Panel/Screen Size : 24" Diagnol or More		
02	Panel Type : IPS		
03	Resolution : 1920 x 1080 (FHD) or Better		
04	Brightness : 350nits or Higher		
05	Contrast Ratio : 1,100 : 1 or Similar		
06	Viewing Angle (H xV) : 178 x178		
07	Mounting Angle : Portrait and Landscape		
08	Input Ports : 1X HDMI, 1x VGA		
09	Mounting optition : Wall Mountable, VESA Mount, Desktop Mount		
10	Certification : FCC, Energy Star, RoHS		
11	Apporved Make : LG, Samsung, Dell, Lenovo, HP		
22	<b>195100170053 - PoE Switch Managed 8 Port</b>		
S.No	Specification	Compliance (Yes/No)	Remarks
01	Number of Ports : 8 x 10/100/1000Base-TX ports + 2 1000Base-X SFP ports	YES	
02	PoE Power Budget: 140 Watt	YES	
03	Switching Capacity : 24Gbps	YES	
04	Management : Should Support WEB management system, Should Support Local/remote configuration via Telnet, Should Support System configuration with SNMP v1/v2/v3, Should Support Multi-user management	YES	
05	Layer 2 Features : Switching capacity : 20G, MAC address table 8K, Support MAC address table management, MAC Address Binding Support, MAC Address Filtering Support, MAC Address Learning control Control number of port-based MAC address learning	YES	
06	Other Features : Port Control, Port Isolation , Port Self-loop Detection, Port Mirroring Support , VLAN: VLAN	YES	
07	Security Features : Support for MAC-based 802.1X authentication, Support for AAA/RADIUS authentication, Support WEB/Telnet password protection Support Accessing privilege mode password protection, CPU Self-protection	YES	
08	Apporved Make: Dlink, Digisol, Alcatel, Netgear	YES	DIGISOL DG-GS1512HP
23	<b>194300930020 - Point to Point Outdoor Wireless Bridge (For Connectivity of Camera in Ash Pond)</b>		
S.No	Specification	Compliance (Yes/No)	Remarks
01	Frequency Range : 5Ghz		
02	Channel Width : 5 / 10 / 20 / 40 Mhz		
03	Ethernet Interface : 10/100/1000MBPS		
04	Wireless Throughput : up to 150MBPS or More		
05	Physical Layer : 2x2 MIMO/OFDM		

06	Standard Protocol : Pv4/IPv6 (Dual Stack), UDP, TCP, ICMP, SNMPv2c, NTP, STP, IGMP, SSH		
07	Network Management : IPv4/IPv6, HTTPs, SNMPv2c, SSH		
08	Transmit Power Range : -15 to +30 dBm		
09	Wind Survival : 145 km/hour		
10	QoS :Three level priority (Voice, High, Low) with packet classification by DSCP, COS, VLAN ID, IP & MAC Address, Broadcast, Multicast and Station Priority		
11	Antenna Type : Inbuilt / External 5Ghz Must be Suitable with Wireless Device		
12	Antenna Gain : 25 dBi or More		
13	Antenna Frequency Range : 5150 – 5970 MHz		
14	Ingress Protection : IP 55/ IP 66/ IP 67 or Better		
15	Encryption : 128-bit AES		
16	Certification : FCC - Z8H89FT0015 CE - EN 301 893 V2.1.1		
17	Device should be Supplied with Suitable with Surge Suppressor		
18	Approved Make :Extreme/Cambium/Ligo Wave/ Ubiquity/ HP/ Rucus/ Aruba// Engenus		
24	<b>194300930021 - Point to Point Outdoor Wireless Bridge (For Connectivity Between Plant and Ash Pond)</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Frequency Range : 5Ghz		
02	Channel Width : Dual Channel 5 / 20 / 40 / 80 Mhz		
03	Ethernet Interface : 10/100/1000MBPS		
04	Physical Layer : 4x4 MIMO/OFDM		
05	Wireless Throughput : up to 500MBPS or More		
06	Standard Protocol : Pv4/IPv6 (Dual Stack), UDP, TCP, ICMP, SNMPv2c, NTP, STP, IGMP, SSH		
07	Network Management : IPv4/IPv6, HTTPs, SNMPv2c, SSH		
08	Transmit Power Range : 26 dBm or Better		
09	Wind Survival : 145 km/hour		
10	QoS :Three level priority (Voice, High, Low) with packet classification by DSCP, COS, VLAN ID, IP & MAC Address, Broadcast, Multicast and Station Priority		
11	Antenna Type : Inbuilt / External 5Ghz Must be Suitable with Wireless Device		
12	Antenna Gain : 23 dBi or More		
13	Antenna Frequency Range : 5170 – 5980 MHz		
14	Ingress Protection : IP 55/ IP 66/ IP 67 or Better		
15	Encryption : 128-bit AES		

16	Certification : FCC - Z8H89FT0015 CE - EN 301 893 V2.1.1		
17	Device should be Supplied with Suitable with Surge Suppressor		
18	Approved Make :Extreme/Cambium/Ligo Wave/ Ubiquity/ HP/ Rucus/ Aruba// Engenus		
25	<b>194300930022 - Surge Suppressor</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Protection Mode: Line-to-line and line-to-ground		
02	Surge Arrestor: TVS Diodes (Transient Voltage Suppression for longer operational life)		
03	Surge Current: Rating, L-G, total 216A, 10/1000us		
04	Response time: 5 nanoseconds typical		
05	Nominal Voltage: 30V		
06	Connectors: Two x RJ-45		
07	Transfer Rate: 1000 Base T		
08	Mounting: Pole mount or wall mount		
09	Wind Survival: 200 mph (321 km/hour)		
10	Operating Temperature: -40° F (-40° C) to +140° F (+60° C) Humidity: 100% condensing		
11	Environmental Protection: IP54 (Dust and Water Intrusion Protection)		
26	<b>195200380020 - PoE Adapter for PTZ Camera</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	General Requirement : PoE Injector Should Complies with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab and IEEE802.3af/ IEEE802.3at Standards ; Transmits electrical power and data on the single Ethernet Cable. Output Power 30 watts or More. PoE Adpter should be Suitable for Supplied Camera		
27	<b>195100170024 - CAT 6 STP Cable Outdoor</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Conductor : 4 Pair, 23 AWG, Solid bare copper		
02	Insulation Material : High density polyethylene (HDPE)		
03	Shielding : Aluminium/Polyster Foil		
04	Overall Sheath : Tinned Copper Braiding		
05	Jacket : FRPVC/LSZH sheath		
06	Maximum Tensile Strength of Jacket (N/mm <sup>2</sup> ) : 13		
07	Pulling Force : 25 LBS		
08	Bending Radius : < 8X Cable Diameter at -20°C +/- 1°C		
09	Operating Temperature : -20°C to +70°C		
10	Impedance : 100 ± 15 Ω @ 100 Mhz		

11	Current Rating : 1.5 A Max.		
12	Operating Voltage : 72v		
13	Standard Length of Roll : 305 Mtr		
14	Standard/Certifications: UL Listed, ETL Verified to ANSI/TIA-568-C.2, ISO/IEC 11801, RoHS Compliant		
15	Apporved Make : Finolex, Polycab, Dlink, AMP, Digisol, Molex		
28	<b>194300930024 - Off Grid Solar System</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	System Capacity : 1 KVA		
02	Operating DC Voltage : 12V		
03	Nominal Output Range : 220V +/- 5%		
04	Nominal Output Ampere: 3Amp		
05	Output Waveform: SineWave		
06	Type of Battery Charger : MPPT		
07	Charging Efficiency : 90% or better		
08	Battery Chargng Current in Solar: 10-40A		
09	Type of Bettery : Lithium Ion		
10	Number of Battery and Capacity : 12V/100Ah, 2 Nos Solar Battery		
11	Solar PV Moduel (Watt) : 225 Watt, 12 V		
12	Number of Solar Module : 2		
13	Suitable size of Cables/Connectors Should be Supplied with Invertar		
14	Bidder will have to Fabricate or supply of Structure for PV Module		
15	Approved Make : Microtek, UTL Solar, Uniline, Waree, Jackson, TATA		
29	<b>194300930023 - Outdoor Juntion Box</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	General Requirement : Junction Box Should be IP 55 or Better. Required Junction Box Must have sufficient Size to Accommodate Solar Invertar System and Camera Accessor. Junction Box Must have Cooling Fan for Proper Cooling and Ventilation. Junction Box shuld be designed for Mounting on Pole/Wall		
30	<b>195200400013 - Network Rack 9U</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Number of Unit Racks : 9U		
02	Rack Width : 19 inch		
03	Body Material : Welded		
04	Depth : 450mm		
05	Height : 480MM		
06	Load Capacity : 40 KG		
07	Door Type: Locable Toughfend Glass		

08	Finish Powder Coated		
09	Additional Features : Including of FAN, PDU and Cable Manager		
10	Approved Make : Dlink/I-BALL/NETRACK/WALL RACK/APC		
31	<b>194300930025 - Tripod MS Fabricated Tower 10 Mtr</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Type of Tower: Tripod Self Support, fabricated with High Quality MS Fabricated, 10 Mtr or More RF tower, divided in Section of 3 Mtr or Equal, Painted in Red and White, along with Lighting arrestor and grounding material, Grouting Base should be minimum 1.5 mtr bellow the ground. Design should be as per Industry Standard. Proper Arrangement for Installation of Wireless Device and Camera. Proper Arrangement of Installation of Outdoor Junction Box		
32	<b>194300930025 - Tripod MS Fabricated Tower 20 Mtr</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Type of Tower: Tripod Self Support, fabricated with High Quality MS Fabricated, 20 Mtr or More RF tower, divided in Section of 3 Mtr or Equal, Painted in Red and White, along with Lighting arrestor and grounding material, Grouting Base should be minimum 1.5 mtr bellow the ground. Design should be as per Industry Standard. Proper Arrangement for Installation of Wireless Device and Camera. Proper Arrangement of Installation of Outdoor Junction Box		
33	<b>LED Screen 32"</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Panel/Screen Size : 32" Diagnol or More		
02	Panel Type : IPS		
03	Resolution : 1920 x 1080 (FHD) or Better		
04	Brightness : 400nits or Higher		
05	Contrast Ratio : 1,100 : 1 or Higher		
06	Viewing Angle (H xV) : 178 x178		
07	Operation Hours (Hours / Day) : Offered Screen Must be designed for 24/7 opertional Hrs.		
08	Mounting Angle : Portrait and Landscape		
09	Input Ports : 1X HDMI, 1x VGA		



10	Mounting optition : Wall Mountable, VESA Mount, Desktop Mount		
11	Certification : FCC, Energy Star, RoHS		
12	Apporved Make : LG, Samsung, Sony, Delta Electronics, Panasonic		
34	<b>NUC Kit PC</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	General Requirement : Latest Generation of Intel Core i-5 Processor, 16GB RAM, 512GB SSD, 1x Giga Ethernet Port, 1 HDMI, 3xUSB, Wi-Fi, Bluetooth, Wireless Keyboard, Wireless Optical Mouse		
35	<b>Point to Point Outdoor Wireless Bridge (For Connectivity of Chimney-Service Building)</b>		
<b>S.No</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks</b>
01	Frequency Range : 5Ghz		
02	Channel Width : 5 / 10 / 20 / 40 Mhz		
03	Ethernet Interface : 10/100/1000MBPS		
04	Wireless Throughput : up to 250MBPS or More		
05	Physical Layer : 2x2 MIMO/OFDM		
06	Standard Protocol : Pv4/IPv6 (Dual Stack), UDP, TCP, ICMP, SNMPv2c, NTP, STP, IGMP, SSH		
07	Network Management : IPv4/IPv6, HTTPs, SNMPv2c, SSH		
08	Transmit Power Range : -15 to +30 dBm		
09	Wind Survival : 145 km/hour		
10	QoS :Three level priority (Voice, High, Low) with packet classification by DSCP, COS, VLAN ID, IP & MAC Address, Broadcast, Multicast and Station Priority		
11	Antenna Type : Inbuilt / External 5Ghz Must be Suitablae with Wireless Device		
12	Antenna Gain : 25 dBi or More		
13	Antenna Frequency Range : 5150 – 5970 MHz		
14	Ingress Protection : IP 55/ IP 66/ IP 67 or Better		
15	Encryption : 128-bit AES		
16	Certification : FCC - Z8H89FT0015 CE - EN 301 893 V2.1.1		
17	Device should be Supplied with Suitable with Surge Suppressor		
18	Approved Make :Extreme/Cambium/Ligo Wave/ Ubiquity/ HP/ Rucus/ Aruba// Engenus		



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