Annexure-1

BHAGWAN BIRSA BIOLOGICAL PARK - ORMANJHI

General Requirements, Technical Specifications etc. for CCTV Systems

Part I - General Requirements

1. General Overview:

1.1 The conditions of the General Contract (General, Supplementary, Special and Other Conditions) and the General Requirements are hereby made a part of this section.

1.2 All bids shall be based on the equipment specified herein. It is the intention of Jharkhand Forest Department (herein after called Ranchi Zoo) to install CCTV System in the Zoo premises.

1.3 Jharkhand Zoo Authority would engage an 'Engineer/ Consultant' to oversee all aspects of the project.

1.4 No interpretations of the meaning of the bid documents or their contents will be made to any bidder orally. Each request for such interpretation shall be made to the Jharkhand Zoo Authority through mail which would be forwarded to Engineer/ Consultant. The Engineer/Consultant will issue interpretations and supplemental instructions to all bidders through mail.

1.5 All bidders must comply with the outline of functions and features listed under the Scope of Work. A compliance statement by the bidders is mandatory in respect of all technical specifications as well as functional parameters.

1.6 Jharkhand Zoo Authority will follow the procedure of Pre-qualification to assess the authenticity of the bidders in respect of manufacturer's representation, staff capabilities, experience in similar installations, infra-structure / resource availability & financial strength. All bidders must submit necessary documentation proving their bona fide credentials including certificates, staff CVs, references, work experience, infra-structure details, workshop facilities & last three years IT returns. The Zoo Authorities, at their discretion, shall have the authority to verify bidder credentials through visits to bidder premises. This is in addition to satisfactory compliance of all technical aspects of the desired system.

2. Scope of Work

2.1 Furnish and install all systems, equipment's, materials, accessories, labour, services and documentation in accordance with the specifications and drawings to provide a technologically advanced, complete and operating Integrated system to function as outlined herein.

2.2 The bidders are expected to submit their bids for **IP based Closed Circuit Television System**; which covers the turnkey project execution including detailed design, supply, installation, testing, commissioning, documentation of entire project for 'as-built' status, training of staff and warranty.

2.3 The bidder shall include all system software's, operation and maintenance manuals, as-built drawings & documents detailed in tender specifications.

2.4 The bid should include supply of all hardware, accessories, cables, connectors etc. The bid should also include all labour related to installation of systems and equipment's, lay & terminate over ground / underground cables and their terminations to equipment's; installation and commissioning of control room equipment's and consoles; power distribution including UPSs. The bid should also include all necessary erection jobs like add on fabrication of steel structures on existing engineering structures, erection of poles, pipes & racks.

2.5 A kick-off meeting shall be arranged after the formal award of contract to a successful bidder to discuss and finalize contractor proposed project execution schedule of various activities. The successful bidder shall submit PERT chart showing all activities and their schedule, including integration between CCTV and Network related installations, as well as integration of new equipment's with existing installed system

2.6 The CCTV system supplier / contractor / vendor shall be the manufacturer's authorized representative for the equipment's proposed for a minimum period of 3 years and shall have adequate experience with the equipment and possess certification from the equipment manufacturer. Bidders must submit an authorization and support letter from each of the manufacturers/principals (Indian or international) stating that bidder is authorized to sell all equipment's included in their bid and they will support to the products for at least 5 years years by way of providing spares. This applies to Hard Discs, network switches, panels, connectors, UPS's etc. also.

2.7 Bidders must have minimum experience of 5 years of installing similar CCTV systems. The bidder's staff must have an experience of 3 years in carrying out hands-on installation/configuration/commissioning of similar CCTV systems.

2.8 The bidders shall provide undertaking for downloadable free of cost future upgrades for all software used in this project.

2.9 All electronic components of the systems shall be UL approved.

3.0 Listed in Part II are the technical specifications of all products and functions that are required and, as a minimum, these functions must be included in the System. Independent system functions and integrated system functions shall be fully verified as part of system testing and commissioning. If more than one manufacturer is required to provide these functions, proof must be provided to the owner that they will function as one integrated system.

Part II – Technical Specifications

1 System General Requirements

1.1 All equipment and materials used shall be standard components that are regularly manufactured and used in the manufacturer's system.

1.2 All systems and components should have been thoroughly tested and proven in actual use.

1.3 The supplier shall provide all systems and components with comprehensive repair and spare parts replacements warranty for a period of 3 years. The manufacturer, on warranty and non-warranty items, shall guarantee the availability of spare parts and the repair for a minimum period of 5 years from the date of completion of the system installation.

1.4 The offered CCTV System shall be with an open protocol with IP network centric functions and management architecture aimed at providing high-speed manual/automatic operations for best performance.

1.5 The system shall use video signals from cameras installed at different locations, process them for viewing on workstations/monitors at local and remote-control rooms and simultaneously records all the video images after suitable compression. Mouse/keyboards/jockey shall be used for Pan, Tilt, Zoom and other functions of desired cameras.

1.6 The system shall have High-speed dome IP cameras with Pan, Tilt & Zoom capabilities (as per functional requirements of each location), fixed dome cameras with vari-focal lens, fixed dome cameras with wide angle and normal lenses, high performance NVR/video storage/streaming/management devices for monitoring, recording, related application software and PC workstations for administration/management/monitoring/maintenance etc. The system shall also have LED video monitors of different sizes (as mentioned here under) at multiple locations & for functional monitoring at local/remote control rooms.

1.7 All cameras shall be capable of low light operations as per the attached specifications.

1.8 The proposed system should be able to handle minimum 20% surplus capacity for video storage beyond what is required for the actual installed number of cameras. This will ensure future addition of cameras to the system. The master server(s) shall offer both video stream management and video stream storage management. Recording frame rate and resolution in respect of individual channel shall be programmable.

1.9 The entire camera recording shall have camera ID & location/area of recording as well as date/time stamp. All this data shall be programmable by the system administrator with user ID and password protection.

1.10 The system shall be triplex, i.e. it should provide facility of viewing, recording and replay simultaneously. The offered system shall have facility of search &export the desired portion of recorded images (from a desired date/time to a desired date/time) on USB supported external drive as well as to remote locations over FO cables/through internet.

1.11 System should ensure that once recorded, the video couldn't be altered/edited/deleted ensuring the audit trail is intact for evidence purpose.

1.12 System shall provide sufficient storage of recording all the cameras for a minimum period of 30 days (24 hours recording) or more with best possible resolution using H.264 or better compression technique and stream over the IP network.

1.13 The recording resolution and frame rates for each camera shall be user programmable.

1.14 NVR / Video Storage devices /management system for administration shall be provided in standard rack/console inside an Air-conditioned Control room. High performance quality PC workstations with monitors, keyboard and mouse for operations by respective operators, with dual graphic cards, video management software (including Windows Software License), will be positioned in pre-decided operations room(s) & one each similar workstation in two remote locations as per requirements of Ranchi Zoo. A similar workstation will be provided in the main control room for the maintenance & administration of the total system.

1.15 Wall mounted CCTV monitors shall be provided in main and remote-control rooms as per the specifications given. Each monitor shall be capable of receiving video images from preselected cameras through Video Management system and its auxiliary devices (mentioned in the specifications). The operators should be able to clearly view minimum 16 cameras in 4 x 4 configuration on each LED monitors selectively as well as call upon cameras on sequential basis.

1.15 The bidders will ensure inclusion of UPS in main control room to feed power to all CCTV & related systems and their components. None of the CCTV component shall operate without the power from UPS.

The bidder shall include one UPS for each location where rack with network/POE switches are positioned (providing connectivity between Control Room Equipment and cameras.

1.16 The Ranchi Zoo shall provide power source of 230 VAC +/- 10%, 50 Hz single phase power supply at each of the rack/control room locations. Wherever required, the

bidder will include UPSs of adequate capacities and voltage ratings along with their proposed components.

1.17 The system shall have provision of WAN connectivity for remote monitoring.

2. System Description & Architecture

2.1 It is proposed to install a state-of-the-art CCTV System to provide comprehensive coverage of all relevant areas of the ZOO. Weatherproof outdoor cameras with PAN, TILT & Zoom functions, weatherproof outdoor fixed cameras with vari-focal /fixed lens& indoor cameras shall be installed at prefixed locations. Cameras will be installed on poles, sides of the cage/enclosure walls& outdoor/indoor ceiling mounted. In some cases, the installations will be with the help of specially erected strong poles (with foundation).

2.2 This CCTV System installation is for the entire zoo area. All cameras in the area will be connected to a Main Control Room (MCR), which is planned to be made ready in the service area of the zoo. The recording of video images will be done on video storage devices placed in the MCR. This MCR will provide a feed to the Library building within zoo premises for demonstration/education of all events within the premises selectively (from all cameras installed). Through a dedicated internet connection, a monitoring facility will be provided to the main office building across the National Highway (selectively from all installed cameras).Both monitoring locations will have their individual workstations & a large display monitor with suitable size and configuration. The MCR shall be capable of controlling every camera connected to its Storage device. The remote monitoring locations shall be independently and simultaneously capable of monitoring every camera connected to the MCR.

2.3 Each and every component of the CCTV System in the control room (Operator/maintenance workstations, monitors, storage devices etc.) shall be powered by dedicated Un-interruptible Power Supply, which in turn is supported by power supply from Jharkhand Electricity Board. Dedicated UPS's will be installed (supported by power from Jharkhand Electricity Board) at suitable locations near each/group of cameras.

2.4 IP cameras' output will be connected to local network switch. Each network switch will be interconnected with adjacent switches through OFC and a dedicated LAN network will be created. This network will be connected to central monitoring station (MCR) through the OFC network in loop arrangement so that in case of any fault in one connection of the OFC, the system will continue to function through the loop. Dedicated Power supply cable will be laid and terminated to each camera wherever POE is not provided.

2.5 MCR &monitoring/demonstration stations are to be connected through an independent and sufficiently capable direct connection via dedicated internet/OFC connection.

2.6 Various networks, for MCR connection, should be designed in such a way that they can support minimum 20% extra camera video dual stream loads and capable of producing streams @ 25 fps for each camera for viewing on LAN and on monitors. It will also be capable for communicating the video streams for recording at the recording stations and back-up devices @ 25 fps or better, user selectable as per requirement, for each individual camera.

2.7 There shall be a control system with video control software to manage all the data & video signals. Database server shall keep track of all configurations and events in turn help in system administration.

2.8 Video stream from individual cameras shall be recorded on NVR/VRM server and subsequently archived to back-up device. System shall automatically over-write or replace the oldest data with the new data after the period of 30 days & necessary script/algorithm must be available in the applications.

2.9 All the PC workstations on the network should be with software to view and control the cameras, encodes and retrieve the recorded video image from NVR/VRM back-up devices seamlessly. Any operator on a workstation should be capable of calling any of his camera on the corresponding wall mounted monitor screen.

3A Important Installation details of CCTV System

3.1 Cameras, network switches and other accessories will be installed outdoors where conditions apply as per the Jharkhand/Ranchi Municipal Corporation site conditions. <u>All components of the system as per the Bills of materials or otherwise, shall be subject to inspection & quality check before the start of use on the site.</u>

3.2 The attached drawing “CCTV System Camera Layout” shows the approximate location of each camera and its type. The successful bidder/contractor, in consultation with The Engineer& Ranchi Zoo authorities, will pin-point exact location of each of the camera for most optimum performance from it.

3.3 The attached drawing “CCTV System Junction Box & Cable Trench Location” shows proposed routes of cable trenches for laying of Fibre Optic/Cat 6. Video transmission cables from equipment racks to individual cameras shall be Cat 6 cable, depending upon system supplier’s technical configuration. All cables will be secured in appropriate sizes of GI conduits wherever exposed and in PVC conduits where embedded in the walls. Wherever the cables being laid underground, these will be only armored type. None of the cables like power/fiber/data is permitted to be left without secured conditions. Cable entry to camera/housing will also be secured in flexible GI/PVC pipes. Over-head cables, wherever installed, shall be armored type only.

3.4 Lengths of interconnecting cables for power, video, data, LAN etc. including FO between power distribution boards, cameras, monitors, PC workstations, video management systems, NVR/recording and storage systems, printing units at field and control rooms should be carefully calculated. A few excel sheets are part of this tender document, providing connectivity of each camera to the Junction Boxes (JB nos 1 to 28). It has been ensured that the distance of each camera is not more than 90 meters from cabling point of view.

3.5 The lengths of various types of cables shown in Bills of Materials are approximate to the accuracy level of +/-10% error. The bidders are at liberty to choose the cabling architecture based on technical and financial considerations. However, the bidder has to ensure dual redundancy for LAN/WAN backbone, if he chooses ring connectivity architecture for each camera, to avoid video loss due to cable faults.

3.6 The laying of cables underground shall be in the scope of the bidder. All related civil works including digging of trenches of standard size and back filling, will also be in the scope of the bidder. It will be the responsibility of the bidder to ensure disturbance free activities by its team of workers and avoid stoppage of day to day usual visitor movement in its area of work. After laying of cable in the trench, the bidder will ensure adequate warning signs are put above the cable to avoid future damages while new diggings are done for any services. Most of the area is accessible for mechanized digging. However, some areas may need manual digging.

3.7 All manholes installed for underground cables shall be secured with heavy metal covers.

3.8 The excel sheets (enclosed) provide the bidders with information on type of mounting proposed for each and every camera. These guidelines have to be strictly adhered to, except for the part of the exact location. Locations will be decided in joint consultation with the Engineer & the Ranchi Zoo management. The grouting of the poles will be strong enough to withstand high velocity winds. The poles will be painted in Engineer approved PVC paints after a primer coating to avoid corrosion. The cables will be passed through these poles to avoid damage due to environmental conditions. Non-galvanized poles will not be accepted. Minimum diameter of,3 M high poles, will be 3” (75mm)&for 5or 6 M high poles, it will be 4” (100mm).The camera stability during high velocity, shall be responsibility of the installer.

3.9 In case of some cameras, poles of 8 M heights are mentioned in the excel sheet next to the camera locations. These cameras are pole mounted with suitable mounting accessories like brackets, adaptors etc.

3.10 All such poles are erected on a concrete foundation of size 75cm x 75cm x 100cm. The foundation will be below ground surface – its top on the same FFL of the surrounding area.

3.11 The thickness of the pole material will be 5.6mm and the diameter of the pole will be 200mm. Total height of the pole including the fixing pipe (2" dia.) for camera/accessories from ground level will be 8 M. The pole will be mounted on the foundation with the help of a pair of iron plates, one of which will be grouted in the concrete with 8 bolts (100cm each). The other plate of the pair will make the base of the pole. The bottom portion of the pole will also have 8 supporting ribs. The pole will be constructed from ERW-B type steel pipe.

3.12 The top of the pole will have a 2" diameter pipe all-round double welded into the pole for stability. Cameras and its accessories will be mounted on this pipe through clamps, adaptors and brackets. There will be an opening with secured cover at the base of the pole for positioning various transmission and power supply related accessories for the camera.

3.13 The poles will be galvanized after completion of fabrication. Alternatively, the poles will have primer applied to it in the fabrication workshop and then transported to the project site. After the erection, poles will have double coat of spray painting done at the site in the color agreed by the Engineer.

3.14 The proposed poles shall be fabricated & installed in accordance with design specifications of Tubular Fixed light duty model poles from ALTRON – UK (https://www.altron.co.uk/tubular_fixed_poles.html)

3.15 The network switches to be installed in field shall have spacious panel type junction box enclosures and designed for free air flow with fine net arrangement to avoid entry of insects and arrangement for protection of rainwater entry with suitable canopy. These enclosures shall be mounted on 4 no 2" diameter poles. The base of the enclosure shall be minimum 1 meter above the ground level (FFL). Each of the four poles shall be securely grouted to a concrete foundation. Also, each of the four poles will have facility to carry cables through them from inside the box to underground cable routing. Each enclosure will also be housing the UPS with batteries and can be connected to the Zoo authorities supplied 230 V power source.

3.16 For environmental site conditions, please take following considerations:

- Ambient temperature range: +0° C to +45° C
- Humidity: 95% condensing
- Wind speed: 150 Kms/hr. (need image stabilizer)
- Rain: installations shall withstand continuous downpour.

3.17 Please note that being a busy visitor area, normal working of the zoo cannot be disturbed at this site. Hence, all cable laying operations shall be planned only when the visitor have stopped or reduced to minimum. Days and hours of work shall be decided by Ranchi Zoo keeping in mind these factors.

4 CCTV System components

4.1 IP High Speed PTZ outdoor Box/Dome Camera with IR capability

These cameras have been shown on the drawings attached with the tender documents. These cameras are full function PTZ cameras with zoom ratio to ensure viewing distances and angles to view a 6" size object at a maximum distance of 5 meters to the nearest and at minimum distance of 100 meters at the farthest with the help of IR lights during night. The camera shall have Day (color) & Night (B/W) vision. The camera shall have weatherproof housing to IP66 standard. The camera will have in-built encoder capable of giving H.264 or better compressed output. The power to the camera will be supplied from the respective Communication Rack and can be over Ethernet.

Technical parameters – minimum required

I.	Sensor:	¼" or ½.8" type CCD/CMOS sensor or better
II.	Codec Streaming Capability:	Dual streaming H.264 or better
III.	Resolution:	2.0 Mega Pixels or better
IV.	Video format:	HD
V.	Iris:	Auto / manual
VI.	Video signal to noise:	>50dB
VII.	Aspect ratio:	4:3 or 16:9
VIII.	Image Readout:	Progressive scan
IX.	Day & Night operations:	Yes
X.	Sensitivity:	.01 Lux/day – .001 Lux/night
XI.	Zoom Ratio:	30x Optical, 16x Digital
XII.	Images per second:	50 fps for all resolutions
XIII.	Power over Ethernet [PoE]:	Yes
XIV.	AGC Control:	Auto/manual switch
XV.	Back Light Compensation:	On / Off switch
XVI.	Pan angle:	360° continuous
XVII.	Pan speed:	variable 200° per second
XVIII.	Tilt angle:	30° UP/ 90° DOWN
XIX.	Tilt speed:	variable 100° per second
XX.	Presets:	Minimum 100, Guard tour recording
XXI.	View Material:	Vandal resistant Polycarbonate
XXII.	IR Range	Minimum 100 M
XXIII.	Video Analytics	Optional feature
XXIV.	Motion Detection	Optional feature
XXV.	Memory card slot	Minimum 1
XXVI.	IR Facility	Built in mechanical switching
XXVII.	Intelligent processing	Optional feature
XXVIII.	Mounting Accessories	Pole/Wall mounting

4.2 IP Vari-focal lens outdoor Box/dome/bullet camera with IR facility

These cameras have been shown on the drawings attached with the tender documents. These cameras are fixed cameras with vari-focal lens to ensure viewing distances and angles to cover view a 6" size object at a maximum distance of 3 meters to the nearest and at minimum distance of 50 meters at the farthest. The camera shall have Day (color) & Night (B/W) vision. The camera shall have weatherproof housing to IP66 standard. The camera will have in-built encoder capable of giving H.264 or better compressed output. The power to the camera will be supplied from the respective communication racks and can be over Ethernet.

Technical parameters – minimum required

I.	Sensor:	¼" or 1/3" type CCD/CMOS sensor or better
II.	Codec Streaming Capability:	Dual streaming H.264 or better
III.	Resolution:	2.0 Mega Pixels or better
IV.	Video format:	HD
V.	Iris:	Auto / manual
VI.	Video signal to noise:	>50dB
VII.	Aspect ratio:	4:3 or 16:9
VIII.	Image Readout:	Progressive scan
IX.	Day & Night operations:	Yes
X.	Sensitivity:	.01 Lux/day – .001 Lux/night
XI.	Video Motion Detection:	Yes
XII.	Lens:	Vari-focal 3mm to 13mm; auto control from WS
XIII.	Images per second:	25 fps
XIV.	Power over Ethernet [PoE]:	Yes
XV.	AGC Control:	Auto/manual switch
XVI.	Back Light Compensation:	On / off switch
XVII	IR Facility	Minimum 50 M
XVIII.	View Material:	Vandal resistant Polycarbonate
XIX	Intelligent processing	Optional feature
XX	Mounting Accessories	Pole/Wall Mounting

4.3 IP Wide angle lens indoor dome/ camera with IR facility

These cameras have been shown on the drawings attached with the tender documents. These cameras are fixed cameras with 2.8 mm lens to ensure clear viewing of objects at a maximum distance of 1 meter to the nearest and at a minimum distance of 5 meters at the farthest. The camera shall have Day (color) & Night (B/W) vision. The camera shall have weatherproof housing to IP66 standard. The camera will have in-built encoder capable of giving H.264 or better compressed output. The power to the camera will be supplied from the respective communication racks and can be over Ethernet.

Technical parameters – minimum required

I.	Sensor:	¼" or 1/3" type CCD/CMOS sensor or better
II.	Codec Streaming Capability:	Dual streaming H.264 or better
III.	Resolution:	2.0 Mega Pixels or better
IV.	Video format:	HD
V.	Iris:	Auto / manual
VI.	Video signal to noise:	>50dB
VII.	Aspect ratio:	4:3 or 16:9
VIII.	Image Readout:	Progressive scan
IX.	Day & Night operations:	Yes
X.	Sensitivity:	.01 Lux/day – .001 Lux/night
XI.	Video Motion Detection:	Yes
XII.	Lens:	Fixed2.8mm
XIII.	Images per second:	25 fps
XIV.	Power over Ethernet [PoE]:	Yes
XV.	AGC Control:	Auto/manual switch
XVI.	Back Light Compensation:	On / off switch
XVII	IR Facility	Minimum 5 M
XVIII.	View Material:	Vandal resistant Polycarbonate
XIX.	Intelligent processing	Optional feature
XX	Mounting Accessories	Ceiling OR Wall/flush Mounting

4.4 IP Fixed lens outdoor Box/dome/bullet camera with IR facility

These cameras have been shown on the drawings attached with the tender documents. These cameras are fixed cameras with 12mm lens to ensure clear viewing of objects at a maximum distance of 1 meter to the nearest and at a minimum distance of 15 meters at the farthest. The camera shall have Day (color) & Night (B/W) vision. The camera shall have weatherproof housing to IP66 standard. The camera will have in-built encoder capable of giving H.264 or better compressed output. The power to the camera will be supplied from the respective communication racks and can be over Ethernet.

Technical parameters – minimum required

I.	Sensor:	¼" or 1/3" type CCD/CMOS sensor or better
II.	Codec Streaming Capability:	Dual streaming H.264 or better
III.	Resolution:	2.0 Mega Pixels or better
IV.	Video format:	HD
V.	Iris:	Auto / manual
VI.	Video signal to noise:	>50dB
VII.	Aspect ratio:	4:3 or 16:9
VIII.	Image Readout:	Progressive scan
IX.	Day & Night operations:	Yes
X.	Sensitivity:	.01 Lux/day – .001 Lux/night
XI.	Video Motion Detection:	Yes
XII.	Lens:	Fixed 12mm
XIII.	Images per second:	25 fps
XIV.	Power over Ethernet [PoE]:	Yes
XV.	AGC Control:	Auto/manual switch
XVI.	Back Light Compensation:	On / off switch
XVII	IR Facility	Minimum 15 M
XVIII.	View Material:	Vandal resistant Polycarbonate
XIX.	Intelligent processing	Optional feature
XX	Mounting Accessories	Pole/Wall Mounting

4.5 IP High Speed PTZ indoor Dome Camera with IR capability

These cameras have been shown on the drawings attached with the tender documents. These cameras are full function PTZ cameras with zoom ratio to ensure viewing distances and angles to view a 6" size object at a maximum distance of 2 meters to the nearest and at minimum distance of 20 meters at the farthest. The camera shall have Day (color) & Night (B/W) vision. The camera shall have weatherproof housing to IP66 standard. The camera will have in-built encoder capable of giving H.264 or better compressed output. The power to the camera will be supplied from the respective Communication Rack and can be over Ethernet.

Technical parameters – minimum required

I.	Sensor:	¼" or ½.8" type CCD/CMOS sensor or better

II.	Codec Streaming Capability:	Dual streaming H.264 or better
III.	Resolution:	2.0 Mega Pixels or better
IV.	Video format:	HD
V.	Iris:	Auto / manual
VI.	Video signal to noise:	>50dB
VII.	Aspect ratio:	4:3 or 16:9
VIII.	Image Readout:	Progressive scan
IX.	Day & Night operations:	Yes
X.	Sensitivity:	.01 Lux/day – .001 Lux/night
XI.	Zoom Ratio:	10x Optical, 6x Digital
XII.	Images per second:	50 fps for all resolutions
XIII.	Power over Ethernet [PoE]:	Yes
XIV.	AGC Control:	Auto/manual switch
XV.	Back Light Compensation:	On / Off switch
XVI.	Pan angle:	360° continuous
XVII.	Pan speed:	variable 200° per second
XVIII.	Tilt angle:	30° UP/ 90° DOWN
XIX.	Tilt speed:	variable 100° per second
XX.	Presets:	Minimum 100, Guard tour recording
XXI.	View Material:	Vandal resistant Polycarbonate
XXII.	IR Range	Minimum 30 M
XXIII.	Video Analytics	Optional feature
XXIV.	Motion Detection	Optional feature
XXV.	Memory card slot	Minimum 1
XXVI.	IR Facility	Built in mechanical switching
XXVII.	Intelligent processing	Optional feature
XXVIII.	Mounting Accessories	Ceilingflush mounting

Only following manufacturers are approved for items 4.1 to 4.5 for this project:

Pelco - USA, Bosch - Netherland, Axis – Sweden, Honeywell USA, Sony- Japan, Panasonic-Japan, Tyco-USA. Cameras mixed from the above different manufacturers are accepted.

4.6 Video operations, control, management, recording and processing software Technical parameters – minimum required

a. The system software will be highly scalable, enterprise level software solution. It must offer a complete Video Surveillance solution that will be scalable (as a minimum) from 1 to 192 cameras that can be added as and when required. It should allow for seamless integration of third-party security infrastructure. The system must be capable of working on Windows / LINUX Sever platforms.
b. The software must come as one unit and not multiple loadable units.
c. The manufacturer supplied management software pack should have a separate file player to authenticate and play exported files.
d. The software should allow for video to be streamed on a video mosaic wall.
e. The software shall provide the following:

- Automatic search and registration of components of proposed system on the network. They can be cameras, monitors, alarm panels, VRM servers.
- The software should allow for live view, playback, record and system configuration of the IP video system.
- The software should allow for creation of multiple users and user groups and assign tasks to each.
- Drag & Drop functions for most functions on the system and also for set up of connection between cameras and monitors.
- Several simultaneous live picture connections of camera in the network. It should be capable of showing video pane layouts including 2x2, 3x3, 4x4 various Hot Spots (1+5, 1+7) and custom layouts.
- The live view must be capable of highlighting motion as green rectangle overlays and displaying real time alarm information over-laid on the live feed.
- System setup for pre-defined surveillance tasks to be invoked at pre-defined times in the day.
- Programming of automatic recording events on NVR/storage device(s) may be based on events such as alarms and video analysis.
- It shall be possible to show text on screen display (OSD) when video is displayed on a receiver. The OSD must detail the camera name, number, date and time (in the time zone of the Video CODEC).
- Video lock-out facility where a super-user can prevent other users from viewing live video and divert recorded video to another NVR. The super-user shall also be able to release the lock-out and restore the system to its original state.
- Live display of Cameras, live display and execution of camera sequences and guard tours, control of PTZ cameras, Playback of archived video at speeds at various speeds, retrieval of archived video using normal playback, instant replay of live video, use of site maps, configuration of system settings, allocate selective cameras to client stations.
- For each camera setup bit rate, frame rate, and resolution shall be set independent of other cameras. Altering the setting of one shall not affect the settings of other cameras.
- Each Video CODEC and system software must be able to operate with all those protocols that can control cameras of afore mentioned manufacturers. Named pre-sets and custom commands must be supported per camera, invoked from the software.
- The system software should be capable of handling camera and alarm icon on area maps.
- The area map should be configurable to pop-up upon an alarm received from a video CODEC on the map or can be configurable to pop up by clicking the tab. This can be on the same or other monitors of the PC.
- The system software should allow direct connection of control keyboard to the PC workstation running the Video Management Software for Virtual Matrix operations.

- The software should be capable of monitoring the status of each and every camera on the network and should indicate fault by suitable red mark on the display of the monitors.
- The system should be able to carry-out a motion search on recorded video and highlight motion in the playback bar and also as motion event based thumbnails to navigate straight to that event recording.
- The software should be able to prepare logs and MIS report of all the activities happening on the system.
- Should have the facilities for play, fast forward, rewind, fast rewind for reviewing the recorded videos.

Only following manufacturers are approved for items 4.6 for this project:

Pelco- USA, Bosch-Netherland, Axis–USA, Honeywell–USA, Sony-Japan, Panasonic-Japan, Tyco-USA

4.7 Network Video Recorder (NVR) / Video (VRM) with storage device

Approved for NVR'S:
Pelco- USA, Bosch - Netherland, Axis – USA, Honeywell –USA, Sony, Panasonic, Tyco-USA

Approved for INDUSTRIAL RANGE SERVERS:
HP, Dell, IBM, Lenovo, Toshiba.

4.8 Network including switches for the entire CCTV System

1. The technical parameters and capabilities of NVR/VRM and storage devices are dependent upon CCTV System functionality and the technical parameters of its components/software. It also depends upon the network being laid for the system connectivity and its capabilities and is also true vice-a-versa. Hence the NVR/VRM and the storage device technical parameters and capacities shall be recommended by the bidder in consultation with CCTV System manufacturer as well as the network infrastructure provider.
2. **The bidders are required to assess the specifications/quantities as given in the Bills of Materials for the Infrastructure Network components. Depending upon the manufacturer requirements, the bidder should add/subtract/modify components/quantities to suit the functional compatibility with the required CCTV System.**
3. The Functionality from the IP CCTV system and its software are clearly outlined in the preceding paragraphs which will be the basis of developing and supplying appropriate NVR/VRM and storage device.
4. The bidder of the CCTV System shall develop the complete network infrastructure for this project based on functionalities, capabilities and capacity requirements from the CCTV System as mentioned above.

5. The bidder may do so with the help of specialist companies, which have been approved by Ranchi Zoo management and are listed below. The bidder of CCTV System shall take prior approval in writing from the Ranchi Zoo management for a selected specialist company or its authorized agent/partner for supply and installation of such a network infrastructure.
6. The bidder shall be wholly and completely responsible for the compatibility of technical parameters, functionality and durability of the CCTV system along with NVR/VRM, Storage device and network infrastructure in so much as the system requirements given above. However, it is the responsibility of the bidder to submit the technical data sheets of NVR/VRM, Storage devices and network infrastructure to the Zoo management and gets the approval before placing orders for procurement for this project.

Approved brands for 4.8 for this project:
Cisco-USA, Siemens-Germany, Wavesight-UK, Brovis-USA, Proxim – USA.

4.9 PC Workstations for monitoring and control; LED Monitors for general viewing

1. Dedicated PC workstations will be used for administration of the CCTV system from Main Control Room (MCR). The MCR shall have PC workstations dedicated for the CCTV system administration.
2. There will be 3 PC workstations required in MCR&1 PC Workstation each in two remote locations and are in the scope of this bid.
3. The PC workstation in LCR for Administration will come with PC monitors of 23” size.
4. Each PC workstation will come with Heavy duty mouse preferred for the operations of the system.
5. The workstations to be considered with specifications such that there should not be any congestion during large data flow of videos.
6. Original operating system Windows 10 or better and Windows’ Office software to be supplied with proper license along with each workstation.
7. Each PC workstations will come with 4 core i7-6700 @ 3.4 GHz or latest at the time of the dispatch.
8. Each PC workstations will come with 16 GB RAM, 8 MB Cache, 1 TB HDD or latest at the time of the dispatch.
9. Each PC workstations will have Blue Tooth, LAN,4-USB connectivity.
10. The Hard Drive configuration should be SATA, no Raid, single hard disk.
11. Each PC workstations will come with Graphic Card – 256 MB PCIe x 16 (DVI/VGA) nVidia Quadro FX 3450, Dual DVI or Dual VGA or DVI +VGA Graphic Card.
12. Each PC workstations will come with Enhanced USB Multimedia, midnight grey keyboard.
13. There will be four wall-mounted 55” LED CCTV monitors installed in MCR, connected to the system for viewing minimum 4 x 4number of cameras for general viewing to cover the entire area.
14. There will be one wall mounted 55” LED CCTV monitor installed in each remote monitoring location, connected to the system for viewing minimum 4 x 4 number of cameras for general viewing to cover the entire area.

15. The system should be capable of switching video images of any single camera, or a combination of multiple number of cameras on this monitor.

Manufacturer for item 4.9: Only Corsair, HP, Dell, Lenovo and Microsoft Surface Studio are approved for PC workstations for this project.

All reputed manufacturers of CCTV LED Monitors are approved for this project.

4.10 Un-Interrupted Power Supply

1. The CCTv system, in general will be supplied power from Jharkhand Electricity Board. There is Emergency Generator facility available to the system with automatic switch-over.
2. The MCR shall have UPS to power the CCTV components, NVR/VRM and network components installed within for the duration of switch over of electricity from Electricity department to Emergency Generator.
3. All field equipment racks to have individual UPSs with battery back-up facility to supply power to switches, cameras etc.
4. Technology - Microprocessor controlled True On-line Double conversion PWM Technology using IGBT as switching devices.
5. User Interface - Monitoring panel with LED display, to provide complete information for UPS on, Line on, Battery Operation and Bypass.
6. Power Rating - 10.0KVA / 7.0 KW with hot stand-bye.

4 Electrical Input –

- Rated input voltage - Single Phase 230 VAC
- Voltage Range - 176 VAC ~ 276 VAC at 100% load
- Frequency Range - 46Hz ~ 54Hz
- Power factor - 0.95 and better
- Overall Efficiency - >88%

5 Electrical Output -

- Voltage - Selectable 220, 230, 240 VAC
- Frequency - 50 Hz +/- 0.2Hz
- Power Factor - 0.7 or better
- Crest Factor - 3:01
- Voltage distortion - <=3% total Harmonic with 100% linear load
- Overload capacity - 105% for 1 minute / 125% for 30 seconds
- Bypass - Automatic (static)

6 Protections -

a) Input over / under Voltage
b) Overload at output
c) Battery short circuit
d) Over temperature

7 Alarms -

a) Mains fail
b) Low battery
c) Overload
d) Overheat

8 Batteries -

a) Sealed Valve Regulated Lead Acid (VRLA) battery, maintenance free with steel rack for battery housing
b) Back-up–30 minutes; The UPS should be operating at 240VAC.

9 Ambient Parameters

Operating Temperature - 0 to 45-degree C.
Humidity - 0 to 95%
Audible Noise - < 45 dB

10 Communication Interface & UPS monitoring software

It should be possible to transmit electrical parameters to the computer users through LAN

UPS monitoring software for "auto" shutdown feature to be provided and option for providing SNMP management feature should be provided.

11 Quality Standard

The UPS should conform to ISO Certification, safety & EMC certification as per IEC standards.

Only following manufacturers are approved for item 4.8 of this project:

Merlin Gerin, APC or equivalent internationally renowned quality manufacturer

4.11 CCTV Control Desk& furniture

3Security Control Desks (2 operators & 1 administration/maintenance) shall be positioned in the designated air- conditioned Main control room. One similar Security Control Desk will be installed in the Library auditorium. It should be constructed from maintenance free material (wood, Particle board, aluminum). It should have sufficient dimensions to incorporate all desk top equipment's, e.g. Control server / PC, management system monitor, CCTV System Keyboard and other allied equipment's. The desk and chair shall be ergonomically designed. The Main control room shall be created on raised floor to facilitate cabling under the floor and a clean atmosphere.

The manufacturer of this product can be any local and well known for quality.

4.12 Cables

1. The entire network infrastructure back bone shall be on Optical fiber cable (OFC). The OFC used shall be **Single-Mode** type only.
2. The number of cores (or pairs) shall be decided based on the system capacity requirements. However, at least 50% extra capacity will be considered while deciding the number of cores.
3. Wherever required, Cat 6 cable will be used if found necessary.
4. Wherever required 2x1.5-meter armored cable shall be used for power supply under outdoor. For indoor conditions un-armored cable shall be used,

Only following manufacturers are approved for item 4.12 of this project:
Polycabs, Sterlite, HFCL, Havells Inda, Finolex and Universal cables

4.13 Camera Poles

There are three different sizes of poles required for this project to mount cameras wherever necessary. If possible at some locations, the cameras may be installed on the side of the building walls.

1. 3 M high poles made from3" diameter GI pipes will be installed on the ground level with suitable foundation as described in Chapter 3.8 on Page 7.
2. 5 M high poles made from 4" diameter GI pipes for independent standing on grounds with suitable foundation as described in chapters 3.9 on Page 8.
3. 8 high poles for independent standing on grounds as described in chapters 3.9 – 3.14 on Page 8.

Part III – General Conditions

1. Submittals with tender quotations

The following information shall be included as part of the submittal.

1.1 An equipment list with compliance to requirements of scope of work &a brief description of how each feature of this specification shall be accomplished.

1.2 All bidders should include schematic drawings for the controlrooms showing all equipment's and model numbers and interconnecting cabling with size and type indications.

1.3 All bidders shall furnish a list summing up all deviations, if any, from the specifications given here-under, with reasons and justifications. If not provided such a list, it will be presumed that the scope and specifications are clearly understood and complied within the quoted prices.

1.4 Bidders must enclose relevant data sheets and product literature for each and every component of both CCTV and video network systems including system details. These should not be locally produced documents but should be original coloured presentations from the manufacturer. Colour printouts from manufacturer's web sites are acceptable.

1.5 The bidder will have to provide minimum three references of continued application of offered system and its components at an actual working site of similar type and outdoor environ conditions for a period not less than 2 years. This is applicable to all outdoor equipment's and accessories in this project. For indoor equipment's and accessory in this project, this period is not less than 3 years.

1.6 Working drawings (based on supplied drawings) showing equipment description, location, tag numbers and any integration necessary.

1.7 Letters from all manufacturers, especially those used in integration, stating that, interfaced together their products shall provide the features of the specifications. Please refer to Scope of work paragraph 2.6 on page 2.

2. Installation and Testing

2.1 The equipment shall be installed by qualified technicians who have been factory trained and certified by the manufacturer.

2.2 All wiring shall be color coded, uniform and in accordance with accepted codes, standards and instructions.

2.3 All equipment shall be mounted securely, plumb and level.

2.4 All cable runs at the control equipment and in all junction boxes shall be tagged and clearly identified.

2.5 All work shall be coordinated with other affected trades and contractors to avoid conflicts and to ensure orderly and efficient progress of the equipment installation.

2.6 All components of the Security Systems shall be turned on and adjustments made to hardware and software to meet the requirements of the specifications.

2.7 All components of the Security Systems shall be completely tested to assure that all components, stations, integrated equipment and accessories are functional in accordance with the specifications.

2.8 All components of the Security Systems shall be final tested in the presence of the owners or their appointed representative and their acceptance shall be provided in writing.

3. Service and Maintenance

3.1 The successful bidder shall provide a three-year warranty on the installed Systems against defects in material and workmanship. All, in-warranty labour and materials shall be provided at no expense to the owner during normal working hours. The warranty shall begin on the date of acceptance by the owner or their appointed representative. The warranty call response shall be completed within 24 hours.

3.2 The contractor shall, at the owner's request, make available a service contract offering continuing factory authorized service to the System after expiry of the warranty period. The manufacturer shall also make available to the owner, technical training for their staff to maintain the system.

3.4 The system manufacturer shall maintain engineering and service departments capable of rendering advice regarding installation and final adjustments to the System.

3.5 Original manufacturer of all components of the proposed systemmust have a service station in India.

4. Quality Assurance

4.1 The Security Systems components and related accessories shall be manufactured in accordance with International Quality Standards. All equipment items including wire and cable shall be designed or recommended by the manufacturer to function as a complete System and shall be accompanied by the manufacturers' complete service notes and drawings detailing all interconnections. Since the customer is buying a single integrated system from one supplier, after the warranty period, the customer needs to contact the manufacturer designated for support. The contractor shall supply the owner the names of the designated manufacturers who are taking the responsibility to support the Systems after the warranty period.

4.2 The installing contractor shall be an established electronic security systems contractor that currently maintains and has operated an electronic security & communications business for at least 5 years. The installing contractor shall submit a certificate that they have been trained in the installation and service of the specified equipment by each manufacturer that is being proposed.

4.3 The contractor shall show satisfactory evidence that it maintains a fully equipped service organization capable of furnishing adequate inspection and service to the systems. The contractor shall submit a letter from the manufacturer(s) being proposed, listing the required service and installation manuals, by date and version, and certify that the contractor possesses such manuals. The contractor shall maintain at its facility the necessary spare parts in the proper proportion as recommended by the manufacturer(s) to maintain and service the systems. The contractor must include a list of the spare parts that it has at its facility with its submittal.

5. In-Service Training

5.1 The contractor shall provide in-service training as required to the staff of the Park on the systems. Operators' Manuals and User Guides shall be provided at the time of this training. Each staff member shall be provided with a User's Guide.

5.2 The instruction shall be presented in an organized and professional manner by a person factory trained in the operation and maintenance of the equipment and who is also thoroughly familiar with the installation. The instruction shall cover the schedule of maintenance required by the system manufacturer.

5.3 The manufacturer shall conduct periodic training programs on the technical operation and programming of the system. These training programs shall be made available to the owner and their staff on a quarterly calendar basis.

6. Wiring

6.1 System's wiring and equipment installation shall be in accordance with good engineering practices. Wiring shall meet all state and local electrical codes. All wiring shall test free of all grounds and shorts. Wire type shall be installed to allow full flexibility of the system including the allowing of any future extensions to be added to the device termination board closest to the point of extension.

7. Protection

7.1 The contractor shall provide all necessary and adequate transient protection on the AC power feed and on all station lines leaving or entering the building.

7.2 The contractor shall note in its system's drawings the type and location of these protection devices as well as all wiring information.

8. Warranty

8.1 The contractor shall warranty all materials, installation and workmanship for three (3) years from date of acceptance or substantial completion, unless otherwise specified. A copy of the manufacturer's warranty shall be provided with close-out documentation and included with the operation and installation manuals.

8.2 The contractor shall maintain a service organization with adequate spare parts stock within 100 Km of the installation. Any defects that render the system inoperative shall be repaired within 24 hours of the owner notifying the contractor.

Part IV – Summary

The CCTV systems, duly integrated with NVR/VRM and network infrastructure, should provide surveillance of different segments of the Ranchi Zoo to ensure trouble free entertainment environment. The Zoo authorities would like to keep a close watch on the movements of the animals/birds/reptiles from their health point of view and also the movements of the visitors and staff. In the event of a suspicion of problem, immediate attention is required to be given to protect both the inmates& the visitors. In the event of the entry of troublemakers to any segment of the zoo, the visual images should be able to guide the system operators in tracking the intruder. The Control equipment should graphically show the operator the location of the intrusion zone. The CCTV system should then pop-up video images from the camera covering the intrusion zone on the monitor. The operator, then, should be able to monitor the movement of the intruder by controlling the camera in the direction of its path/area. The operator should then be able to guide the guards.