

Book 4
Scope of Work

**Provision of Facilities Management Services
– JAZAN Airport**

Appendix B
Airport Services

TENDER NO. WP25007

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1. Introduction

The Service Provider is to develop an organization structure that delivers the requirements of contract whilst implementing synergies of roles across the airport within the scope of services.

All requirements of the organization structure group in managing the requirements of the airports and should be read in conjunction with the requirements of **Book 4 Appendix C Hard Services** and **Book 4 Appendix D Soft Services**.

All requirements contained herein shall be read, understood, and enacted in conjunction with **Book 4, Volume 1 Facilities Management Services**, with all applicable management, Facility Delivery, and reporting requirements outlined, applying to the Scope of Work as set out in this document.

the airport within this contract generally consists of three areas: Aerodrome, Terminal, and Utilities and Campus. This document gives the specific scopes for these areas and overall airport specific requirements.

A listing of facilities and assets are shown in Book 4 Appendix F-Schedule of Buildings and Assets.

2. ITC Services

2.1 ITC Infrastructure Services

- 2.1.1** The Service Provider shall maintain all low current cabling, network infrastructure throughout the airport campus.
- 2.1.2** The service Provider shall be responsible for the repair or the replacement of the co-axial, CAT6/7 cable, control cables of all categories, fiber optic cables, connectors and power cables for any kind of damage, deterioration, or loose contact.
- 2.1.3** The service Provide shall ensure that CAT6/7 installations meet the required IT standards.

2.2 Closed Circuit TV (CCTV) System, Distribution and Network

- 2.2.1** The Service Provider shall maintain CCTV Systems including the IP CCTV security system installed in buildings. CCTV systems include but not limited to the following elements:
 - 1 indoor and outdoor cameras/dome cameras with pan and tilt modules,
 - 2 control panels,
 - 3 keyboard console,
 - 4 monitors,
 - 5 housing with fans/heaters,
 - 6 power adaptors,
 - 7 UPS,
 - 8 NVR (Network Video Recorder),
 - 9 DVRs (Digital Video Recorders),
 - 10 HDs (Hard Disc),
 - 11 control module at camera,
 - 12 computer with CCTV application software if interfaced with system and
 - 13 interconnecting and power cables including associated computers,
 - 14 server,
 - 15 switches,
 - 16 routers,
 - 17 multiplexers,
 - 18 work stations,
 - 19 patch panels and all
 - 20 related auxillary items and accessories associated with the CCTV system.
- 2.2.2** The Service Provider shall, in coordination with security personnel, conduct a regular preventive maintenance program for the monitor and control equipment. The security personnel may want to relocate some of the cameras at times. The Service Provider shall cooperate with security personnel and perform this work at no additional cost.
- 2.2.3** The Service Provider shall ensure each camera output for picture clarity and contrast of video image on all monitor screens.
- 2.2.4** The remote operation of the following camera controls should be performed for the proper operation of the following and their associated circuitry:
 - 1 Brightness

- 2 Contrast
- 3 Focus (in/out)
- 4 Zoom (in/out)
- 5 Pan/tilt function
- 6 Iris control (manual/auto)
- 7 Aperture control (manual/auto)

- 2.2.5** The Service Provider shall be responsible for the repair or the replacement of the co-axial/CAT6 cable, control cables all categories, fiber optic cables, switches connectors and power cables for any kind of damage, deterioration, loose contact, etc.
- 2.2.6** The Service Provider shall ensure proper operation of the control on monitors. If any controls are malfunctioning and proper spares parts are not available the Service Provider shall replace the monitor with same size and better specification monitor with prior approval from Cluster2.
- 2.2.7** The Service Provider shall maintain the backup software on other Computer configured and readily available for emergency purpose for the Computer based CCTV system so as to avoid long shut down due to problem in Computer or software.
- 2.2.8** The Service Provider shall be responsible for upgrading the software with latest version releases by the manufacturer from time to time. The Service Provider shall perform this task as part of maintenance SOW responsibility.
- 2.2.9** The Service Provider shall relocate cameras within the office vicinity if requested by Cluster2.
- 2.2.10** The Service Provider shall maintain the NVRs (Network Video Recorders) and ancillairay equipment including UPS (Uninterruptible Power Supply), and archive the pictures in a separate storage device/DVD writer or hard disc and provide the DVD writer as and when required as part of maintenance SOW responsibility.
- 2.2.11** The Service Provider shall provide hardware, software and other necessary equipment to keep recording of all cameras for the period of 3 months at all airports under the Group including configuration.
- 2.2.12** Existing NVR of capacity 4TB to be upgraded from 1-month recording capacity to 3 months recording capacity of 12TB.
- 2.2.13** The Service Provider is responsible to keep recording of all cameras for the duration of 3 months in a separate storage device/DVD writer or hard disc, whenever asked to, and provide the storage device at all airports as part of maintenance SOW responsibility. Recorded material will be played or retrieved thru any media, and an external hard desk of capacity – 8TB for DVR including configuration at each airport will be kept.
- 2.2.14** The Service Provider is responsible for the upgrading of the software from time to time as and when new versions are released by the manufacturer as part of maintenance SOW responsibility.
- 2.2.15** The Service Provider is responsible to ensure that any software of any CCTV system that gets corrupted due to any reason whatsoever will be replaced, so that there is no interruption in the operation of the system.
- 2.2.16** In case The Service Provider's personnel are not adequately experienced in performing the operations, preventive and corrective maintenance, then the services of a specialized outside Company will be utilized.
- 2.2.17** The Service Provider is responsible to reformat the hardware related to Closed Circuit TV (CCTV) system, distribution & network and any auxiliary items, other discs whose software gets corrupted due

to any reason or any virus, reprogram the corrupted hard disc and replace the corrupted software with original software including installation of latest antivirus software at any time.

- 2.2.18** The Service Provider is responsible to ensure protection of the hardware from all types of viruses, by constantly checking and monitoring their performance and updating them with latest antivirus software at anytime as per the situation, to prevent, detect and protect the systems.
- 2.2.19** The Service Provider is responsible for the renewal of licenses for the cameras and also for the payment of the fees/costs related to the renewal of the licenses as part of SOW maintenance responsibility.
- 2.2.20** The Service Provider is responsible for the replacement of any damaged hard disk drive of any of the servers related to system irrespective of whatever the cause is or otherwise, with a similar or higher capacity new hard disk drive. The replacement of new hard disk drive has to be approved by Cluster2 prior to replacement The Service Provider is also responsible to retrieve the data from the damaged hard disk and transfer the data on to the replaced new hard disk.

2.3 Telephone Exchange

- 2.3.1** The Service Provider is responsible for the Telephone exchange (including communication reticulation system, data transmission lines key system, intercom, hot lines and all types of communication equipment).
- 2.3.2** The Service Provider shall maintain the telephone exchange equipments and related software's, including main telephone exchange, IP Telephone Exchanges and the software, intercoms, station telephone sets (analog, IP and digital), building telephone sets, IP Technology, IP Telephone System, IP Telephone Sets, all IP related communication devises, switching equipment, IVRs, auto attendant, voice mail system, billing system, MCT/CNI system, voice recording system, battery charger, standby batteries, UPS systems, rectifiers, power and communication reticulation wiring, operator consoles, overhead communication cables, surface mounted cables, underground cables, junction boxes, distribution panels, splitter boxes, regulators, cell phones charging units, routers, modems, network & all other switches, remote access units, backup batteries, digital / analogue units, all UPS < 5 kva will be under the responsibility of Electronic & Communication Section, as well as data transmission lines and equipment and other miscellaneous auxillary item related to communications and any relocation works & services of any of these items as part of SOW responsibility. This section also includes data transmission lines for the computer network and the associated computers, printers and accessories.
- 2.3.3** The Service Provider shall operate the telephone system on 24-hour basis. All the telephone operators will be Saudi Nationals. For the convenience of the public and proper operations of the airport, it is imperative that the telephone system remain fully operational at all times. In case of failure of any component of the system the Service Provider shall rectify immediately.
- 2.3.4** The Service Provider is responsible to update the software of the PABX's at the airports with the latest version release as and when the new version is released by the manufacturers.
- 2.3.5** The Service Provider shall also provide Software Evolution Service (SES) and Software Maintenance Service (SMS) including IP multimedia embedded open touch-new platform, TDM and modular application for unified communications.
- 2.3.6** The Service Provider shall have Central telephone exchanges operators available on 24 hours basis at the site. During declared emergency situation (3) telephones operators will remain on duty for the whole period of the emergency.
- 2.3.7** The Service Provider shall be responsible for all internal telephone systems including distribution boards, telephone sets, cabling, intercom system and cabling external to the building. This also

includes any intercom equipment door phone (Audio, video) which are not associated with the PABX system.

- 2.3.8** The Service Provider is responsible to perform DB loss test for all the communication network at the airport/site on an annual basis. In case the results are unsatisfactory or below the required standards, necessary rectification and corrective action has to be taken by The Service Provider to improve the network condition.
- 2.3.9** The Service Provider shall respond to malfunctions within thirty (30) minutes after initial notification. Work will commence at once and continue until the system is operational. This includes emergency requirements resulting from accident, lightning, storm or other abnormal circumstances which may be temporarily repaired using a by-pass system of connection but must be done in a permanent fashion as soon as the emergency has been resolved.
- 2.3.10** Any disruption in normal communication service whether for maintenance or for other reasons will be notified to the Airport Director and to the Contracting Authority representative by The Service Provider within 24 hrs. of the failure.
- 2.3.11** If the Contracting Authority is not satisfied with the service of The Service Provider, the Contracting Authority will hire the services of manufacturer's representative without returning to The Service Provider at his cost or deduct the corresponding amounts from The Service Provider 's monthly payment.
- 2.3.12** The Service Provider shall maintain the MCT / CNI voice recording system connected with the PABX, including the main / backup software/hardware and sustainable power units (UPS), etc. The Service Provider shall also secure a DVD to record and store the data.
- 2.3.13** The Service Provider shall replace the DVD with a new DVD on a monthly basis, and the replaced DVD with the recordings will be handed over to the airport director for record keeping.
- 2.3.14** The Service Provider is responsible for the maintenance of data network including control cabinets, routers, Wi-Fi router, Wi-Fi access points, switches, PT links, hubs, patch panels, patch cords, servers (back-up server, rack server & accessories) work station with PC, UPS, external hard disk, repeaters, multi-layer switch, bridges, modems (DSL & cable modems), network adaptor, fiber optic distribution boxes, optical splitter distribution boxes, optical fiber junction boxes, fiber optic cables, network cables (CAT6), etc. at the site, as part of the maintenance SOW responsibility.
- 2.3.15** The Service Provider is responsible for the upgrading of the software from time to time as and when new versions are released by the manufacturer as part of maintenance SOW responsibility.
- 2.3.16** The Service Provider is responsible to ensure that any software of any of the PABX System that gets corrupted due to any reason whatsoever should be replaced, so that there is no interruption in the operation of the system.
- 2.3.17** The Service Provider is responsible to reformat the hardware related to PABX and any auxillary items, other discs whose software gets corrupted due to any reason or any virus, and reprogram the corrupted hard disc and replace the corrupted software with original software including installation of latest antivirus software at any time.
- 2.3.18** The Service Provider is responsible to ensure protection of the hardware from all types of viruses, by constantly checking and monitoring their performance and updating them with latest antivirus software at any time as per the situation, to prevent, detect and protect the systems.
- 2.3.19** In case The Service Provider's personnel are not adequately experienced in performing the operations, and the preventive and corrective maintenance, then the services of a specialized outside Company will be utilized.

2.4 Master Clock System and Network

- 2.4.1** The Master Clock System includes GPS (Global Positioning System) receiver, DTS (Distributed Time System) time server, patch panels, switches, master and slave clocks, UPS, back-up batteries and all related hardware and software, etc.
- 2.4.2** The Service Provider shall maintain master clock system equipment, including hardware, software, DTS time server, GPS receiver, patch panels, switches, back-up power, UPS and digital and analog slave clocks inside the building. The Service Provider shall maintain passive cabling, fiber optic cables, junction boxes, UPS, back-up power and all related accessories and network.
- 2.4.3** The Service Provider shall also maintain ordinary electric/battery operated clocks. The Service Provider should ensure the proper operation of the master clock system and other ordinary electric/battery operated clocks.
- 2.4.4** The Service Provider shall replace any defective network cable if damaged accidentally or due to age factor. The new cable will be of proper specification and laid properly as per Cluster2's acceptable standards.
- 2.4.5** The Service Provider shall be responsible for software upgrading version time to time releases by the manufacturer. The Service Provider shall perform this task as part of their responsibility.
- 2.4.6** The Service Provider shall relocate slave clocks within the building vicinity if requested by the Contracting Authority.
- 2.4.7** The Service Provider is responsible for the upgrading of the software from time to time as and when new versions are released by the manufacturer as part of maintenance SOW responsibility.
- 2.4.8** The Service Provider is responsible to ensure that any software of any Master Clock System that gets corrupted due to any reason whatsoever will be replaced, so that there is no interruption in the operation of the system.
- 2.4.9** In case The Service Provider's personnel are not adequately experienced in performing the operations, preventive and corrective maintenance, then the services of a specialized outside Company will be utilized.
- 2.4.10** The Service Provider is responsible to reformat the hardware related to Master Clock system and any auxillary items, other discs whose software gets corrupted due to any reason or any virus, reprogram the corrupted hard disc and replace the corrupted software with original software including installation of latest antivirus software at any time.
- 2.4.11** The Service Provider is responsible to ensure protection of the hardware from all types of viruses, by constantly checking and monitoring their performance and updating them with latest antivirus software at any time as per the situation, to prevent, detect and protect the systems.

2.5 Voice Recording System

- 2.5.1** The system is designed to automatically record emergency Fire and Rescue Services (FRS) voice communication transmitted over the radios system, the emergency fire reporting telephone lines and hot lines, etc.
- 2.5.2** The Service Provider shall maintain the voice recording system including software/hardware of main and standby unit and the backup supply (UPS), cooling fans including the associated computers, printers and accessories, including all other associated accessories etc. The Service Provider shall provide and supply the CD's and DVD's for recording and data storage as and when required as part of the maintenance SOW responsibility.
- 2.5.3** The Service Provider shall ensure proper operation and maintenance of main and standby voice recorder for all the functions and connections of input devices for proper recording.

- 2.5.4** The Service Provider shall ensure the proper operation of the voice recorder by adjusting the sensitivity of input devices for the good sound quality. If any distortion is observed in the recording due to problem in the network cable, The Service Provider shall replace the cable or rectify the defect as required as part of his SOW responsibility.
- 2.5.5** The Service Provider should ensure that the recording is running, when radios, hotlines and telephone lines are in use, UPS and power supply is operational, digital lights are functioning satisfactorily and playback gives satisfactory sound quality. The radio channels and all visual indicators must be active and operational and the voice recorder time is synchronized with GMT (Greenwich Mean Time).
- 2.5.6** Ensure availability of DVDs in both DVD drive units and ensure auto transfer to 2nd DVD when 1st reaches to the maximum limit.
- 2.5.7** The Service Provider shall relocate and rearrange equipment including the necessary changes to electrical and channel input connections, as required by Cluster2 and to meet operational requirements of the users.
- 2.5.8** The Service Provider shall respond to malfunctions within thirty (30) minutes after initial notification. Work will commence at once and continue until the system is in 100% operational condition, with the least time possible.
- 2.5.9** The Service Provider is responsible for the upgrading of the software from time to time as and when new versions are released by the manufacturer as part of maintenance SOW responsibility.
- 2.5.10** The Service Provider is responsible to ensure that any software of any Voice Recording System that gets corrupted due to any reason whatsoever will be replaced, so that there is no interruption in the operation of the system.
- 2.5.11** The Service Provider is responsible to reformat the hardware related to Voice Recording System and any auxiliary items, other discs whose software gets corrupted due to any reason or any virus, reprogram the corrupted hard disc and replace the corrupted software with original software including installation of latest antivirus software at any time.
- 2.5.12** The Service Provider is responsible to ensure protection of the hardware from all types of viruses, by constantly checking and monitoring their performance and updating them with latest antivirus software at any time as per the situation, to prevent, detect and protect the systems.
- 2.5.13** The Service Provider is responsible for complying with the following and completing the check list form available with the digital voice recorder.
- 1 Complete daily form attached with voice digital recorder.
 - 2 Technician will daily check and clean the equipment and documented in log book.
 - 3 Technician will adjust the equipment with GMT.
 - 4 Technician will check efficiency of recording to CD and DVD.
 - 5 Voice records will be kept for sixty (60) days with Airport Director, after expiry of the sixty period data will be erased as per concerned authority.
 - 6 Preparing monthly report about the equipment and keeping the report at the site for review by a safety inspector.
 - 7 Ensure availability of DVDs in both DVD drive units and ensure auto transfer to 2nd DVD when 1st DVD reaches the maximum limit.

2.6 Radios & Communications Equipment

- 2.6.1** Cluster2 uses a wide range of radios for FRS (Fire Rescue Services department), control tower, airport management and for maintenance functions. These radios include base stations, mobile, handheld radios, repeaters and duplexers using ground control frequency and maintenance frequency.
- 2.6.2** These radios are essential for safety, and security, airport operations and communications. The Service Provider shall keep the radios in operation and ensure that the signal out is compatible to the original design of the radios. It will be noted that some of the radio may be of older models and hence difficult to procure the spare parts. This will not be accepted as an excuse for radios being out of service or for restricted performance.
- 2.6.3** This item includes but not limited to the maintenance of base station radios, mobile radios, handheld (portable radios), GPS navigation system, remote control radio stations, filters, repeaters, station antennas, equipment antenna, receiver units, transmitter units, driver units, masts and voice recorders for CFR recording including system intercabling and punch blocks, battery chargers (base or wall mount) and including all associated auxillary items.
- 2.6.4** It includes the provision of specialized tools, test equipments and maintenance personnel to keep all the equipment in fully operational condition. All necessary spare parts including spare CD's and DVD's for the voice recorder and the replacement of weak batteries for the handheld radios are included. Test instrument to measure the signal strength must be available at each airport.
- 2.6.5** This item includes power supplies, UPS, back to outlet sockets and all back up batteries, back up battery chargers, base station antenna/aerials, mobile antenna, any other special support and foundations as well as base lightning protection systems for radios and including all associated auxillary items.
- 2.6.6** The Service Provider is responsible for the proper operation and calibration of the base station radios to ensure clear communication from the aircraft to CFR tower or vice versa from a distance of at least of 100 miles and good transmission on channels for applicable frequency (121.9, 133.5 MHZ).
- 2.6.7** The Service Provider shall be responsible to eliminate any interference caused by close radio frequencies used in the area. The Service Provider shall use the necessary filters to eliminate such interference as SOW responsibility.
- 2.6.8** The Service Provider is responsible for proper operation and calibration of mobile and handheld radios so as to ensure distortion free communication in and around the airport premises and ensure automatic changeover during mains failure on backup power / UPS.
- 2.6.9** The Service Provider shall relocate and rearrange mobile radios, base radios or any associated equipment including the necessary changes to electrical connections, as required by Cluster2 and to meet operational requirements of the user agencies.
- 2.6.10** The Service Provider is responsible to calibrate and realign base radios on an annual basis, from supplier's laboratory or any approved laboratory. The Service Provider shall submit the results and certificate to Cluster2. Cluster2 will ensure correct operation after calibration and realignment of these radios. In case the results are unsatisfactory or below the required standards, necessary rectification and corrective action to be taken by The Service Provider.
- 2.6.11** The Service Provider shall ensure the following measurements are within the specified limit as per manufacturer's recommendations:
- 1 Forward power (Output power).
 - 2 Reflected power.
 - 3 Modulation.
 - 4 Sensitivity of receiver.

- 2.6.12** The Service Provider is responsible for the maintenance of the base chargers, wall chargers and multiple chargers for handheld radios.
- 2.6.13** The Service Provider is responsible for the upgrading of the software from time to time as and when new versions are released by the manufacturer as part of maintenance SOW responsibility.
- 2.6.14** The Service Provider is responsible to ensure that any software of any Radios & Communication Equipment that gets corrupted due to any reason whatsoever will be replaced, so that there is no interruption in the operation of the system.
- 2.6.15** The Service Provider is responsible to reformat the hardware related to Radios & Communications Equipments and any auxiliary items, other discs whose software gets corrupted due to any reason or any virus, reprogram the corrupted hard disc and replace the corrupted software with original software including installation of latest antivirus software at any time.
- 2.6.16** The Service Provider is responsible to ensure protection of the hardware from all types of viruses, by constantly checking and monitoring their performance and updating them with latest antivirus software at any time as per the situation, to prevent, detect and protect the systems.

2.7 Public Address System

- 2.7.1** The service Provider shall maintain the public address (PA) system in the terminal building, fire station, royal lounges, VIP lounges, mosques and other buildings where PA system is installed. The PA system includes the following general equipments, amplifiers, speakers, microphones, pre amplifiers, tuners deck, CD players, MP3 players, cassette players, Intercom, Recorders, Sirens, DVD Players, Controllers, Protectors, Routers, batteries, telephone coupler module, zone selector module, interface module for Flight Information Display System (FIDS), fire alarm module for siren, auxiliary interface for Azan from Azan clock to terminal building, UPS, IVR, all related hardware and software and all interconnecting equipment and wiring and power wiring, etc.
- 2.7.2** The service Provider shall ensure the proper operation of the “AZAN” being heard in the terminals and other area, live from airport mosque or “AZAN” clock thru the PA system, and tuning of amplifiers, preamplifiers and related accessories and ensure good sound quality is achieved at each and every location where PA speakers are installed. In case sound quality is not loud and clear in terminal or any vicinity, the service Provider shall investigate the cause and rectify the discrepancy. In this regards, the Service Provider is responsible to conduct acoustical survey for proper installation of speakers or other equipment.
- 2.7.3** The Service Provider shall ensure the proper operation of microphone zone selectors, zone selector module, all speakers in the zone, all the network cables/terminations and electrical grounding of the equipment.
- 2.7.4** The Service Provider is responsible for the proper operation of the related controls, switches and auxiliaries for proper function, including but not limited:
 - 1 Paging.
 - 2 Alarm operation (with proper approval from concerned authorities).
 - 3 Zone indicators and zone switches.
 - 4 Announcement through PABX extension if interfaced with PA system.
 - 5 Live Azan from mosque to terminal building.
 - 6 Interface with Flight Information Display System ((FIDS).
 - 7 Azan clock including mixer amplifier and other related accessories.

- 8 Interactive Voice Response (IVR) equipment.
- 9 All types of audio players in the PA system.

- 2.7.5** The Service Provider shall be responsible for relocation of the speakers and any of the general equipment, and its wirings if required within that building. If new wiring is required for relocation, the Service Provider is responsible for provision and installation of the cables up to 2500m during the Contract period.
- 2.7.6** The Service Provider shall replace the defective (PA) system network cables if damaged accidentally or due to age factor. The network cable replacement is also applicable for any auxiliary connection network from any other building. The new cable should be of proper specification and laid properly as per international or Cluster 2 Airports Company's acceptable standard.
- 2.7.7** The Service Provider is responsible for the upgrading of the software from time to time as and when new versions are released by the manufacturer as part of maintenance SOW responsibility.
- 2.7.8** The Service Provider is responsible to ensure that any software of any PA system that gets corrupted due to any reason whatsoever will be replaced, so that there is no interruption in the operation of the system.
- 2.7.9** The Service Provider is responsible to reformat the hardware related to Public Address System and any auxiliary items, other discs whose software gets corrupted due to any reason or any virus, reprogram the corrupted hard disc and replace the corrupted software with original software including installation of latest antivirus software at any time.
- 2.7.10** The Service Provider is responsible to ensure protection of the hardware from all types of viruses, by constantly checking and monitoring their performance and updating them with latest antivirus software at any time as per the situation, to prevent, detect and protect the systems.
- 2.7.11** In case the Service Provider personnel are not adequately experienced in performing the operations, preventive and corrective maintenance, then the services of a specialized outside Company will be utilized.
- 2.7.12** The Service Provider is fully responsible to ensure that the voice quality from the speakers and microphones is very clearly audible. In case the voice quality is not clearly audible, then the Service Provider shall carry out an acoustical survey and will replace those defective speakers and microphones with speakers that are appropriate db output according to the location and vicinity and relocate the speakers in accordance with the acoustical survey recommendations, as part of maintenance scope of work responsibility.

3. Airport Critical Systems and Services

3.1 Elevators and Escalators

- 3.1.1** The Service Provider shall ensure 24/365(6) connected services for all Elevators, Escalators and Travelators contained within all campus buildings, should be listed as following:
- 3.1.2** The Service Provider shall carry out maintenance, examinations, testing, inspections, calibrations, and repairs as recommended by the Manufactures Guidelines and all statutory regulations, local by-laws, KSA Government requirements and in conformity with the latest relevant Codes of Practice. Works shall comply with the requirements of the latest versions of EN81 series for elevators and EN115 for escalators and travelators.
- 3.1.3** The Service Provider shall carry out maintenance examinations, tests, and inspections at the prescribed time limits and, within the required time scale and on completion the Service Provider shall issue a certificate of compliance to the Contracting Authority.
- 3.1.4** The Service Provider shall provide a detailed works schedule showing dates when routine maintenance visits and planned repairs will take place. This schedule will cover a full 12-month period from Contract commencement and take due consideration of the maintenance program completed as part of the previous service contracts. The schedule shall be presented to the Contracting Authority for review and approval prior to the Service Provider uploading onto the CAFM system for planning and scheduling purposes.
- 3.1.5** The Service Provider shall provide materials fit for purpose and sourced from the OEM. Where alternative sources of materials are considered, the Service Provider shall provide an equivalent or superior performance alternative, approvals must be sought in writing from the Contracting Authority prior to purchase.
- 3.1.6** The Service Provider shall provide an emergency response team 24/365(6) connected services to conduct elevator entrapment releases in line with the service level response times (P1). Repairs shall commence immediately and continue until the hazard or risk of further entrapments has been eliminated.
- 3.1.7** For all maintenance routines that require a service outage, the Service Provider shall schedule these out of operationally sensitive hours and the service outage shall be coordinated in full of key airport stakeholders and notified to the Contracting Authorities or their representatives in advance.
- 3.1.8** The Service Provider shall provide all method statements related to elevator, escalator, and travelator maintenance activities are to be submitted in advance to the Contracting Authority for their approval.
- 3.1.9** The Service Provider shall respond to the Contracting Authority's requests 24/365(6) of connected services for production of standard/custom reports, programming of new system interfaces and software features and updates, including but not limited to; VSS, BMS, BEMS, and FAS.
- 3.1.10** The Service Provider shall provide certifications for all regulated items by third party approved by the Contracting Authority.
- 3.1.11** The Service Provider shall provide staff to cover 24/365(6) connected services of all areas mentioned in the scope of services.
- 3.1.12** The service provider shall perform operational inspections once each hour and reset any unit that has a malfunction.
- 3.1.13** The Service Provider shall for the duration of the Contracted Services maintain a quality control process, which has been agreed by the Contracting Authority.
- 3.1.14** The Contracting Authority may reject any aspect of the Service at Monthly KPI Meetings which it feels fails to comply with the requirements of The Contract, or its quality system at any time.

- 3.1.15** The Service Provider shall monitor its own performance against criteria and benchmarks identified in this document and shall provide reports when reasonably required by the Contracting Authority.
- 3.1.16** The Service Provider shall provide software for the management and control of the contract service delivery and have the capability of providing KPI's and the delivery of continuous improvement and analysis tools for the optimization, compliance to standards, evaluating and conducting engineering feasibility studies, responding to the Contracting Authority requests upgrading of system, programming for new interfaces and integrations features upgrades.
- 3.1.17** The software shall also provide failure analysis of high failure/alarm incidents that impacts the operational safety, security, and efficiency of Cluster2 services and assist in resolving them.
- 3.1.18** The Service Provider and its representatives will take all reasonable and proper safety precautions to prevent death or injury to any person or damage to any property in or near the Sites and in particular all equipment used, maintained, and stored to prevent unauthorized use or theft, therefore minimizing the danger of accident, death, injury, loss, or damage arising from inappropriate use of the equipment.
- 3.1.19** The Service Provider shall:
 - 3.1.19.1** ensure that its and its subcontractors' personnel are adequately trained and instructed in the safe and correct use, handling and operation of material and equipment relevant to the Services.
 - 3.1.19.2** Ensure that all staff have the necessary Personal Protective Equipment to undertake the tasks and that records are kept up to date and stored on Site.
 - 3.1.19.3** Ensure that all relevant personnel have completed necessary training programs such as Incident reporting, Fire Prevention, Customer Service, Complaint handling, Health and Safety, Equipment associated with the undertaking of their role and knowledge of all areas within the site; training is Supervisor/VHTS specific.
- 3.1.20** The Service Provider shall ensure that all works on the equipment are carried out by fully certified, from the manufacturer, contractor and operatives.
- 3.1.21** The Service Provider shall ensure that approximately 6 months of critical spares are available, in line with the requirements for Spare Parts.

3.2 Security Screening Equipment

- 3.2.1.1** The Service Provider shall carry out maintenance, specialist cleaning, examinations, testing, inspections, calibrations, and repairs as recommended by the Manufactures Guidelines all statutory regulations, local byelaws, KSA Government requirements and in conformity with the latest relevant Codes of Practice.
- 3.2.1.2** The Service Provider shall maintain all equipment license requirements, records, logs, radiation test results, equipment data sheets, valid test meter certificates, calibration documents and a site drawing for locations of all radiation sources, for any internal, or external auditing by a third party.
- 3.2.1.3** All works carried out shall be carried out by a manufacturer certified company and certified technicians.
- 3.2.1.4** The Service Provider shall, as required, and on instruction from the Contracting Authority or their representatives, relocate or rearrange equipment including, electrical cable adjustments necessary changes to electrical connections to meet operational requirements. After any relocations the Service Provider shall update the Site map to accurately reflect the change. The Service Provider shall ensure that a radiation survey is carried out annually or as, and when, assets are moved or relocated.
- 3.2.1.5** The Service Provider shall provide all the necessary operator training requirements to ensure safe, secure, and compliant operation of all passenger security screening equipment. A training plan shall be submitted to the Contracting Authority for their approval.

- 3.2.1.6 The Service Provider shall carry out maintenance examinations, tests, and inspections at the prescribed time limits and, within the required time scale and on completion, the Service Provider shall issue a certificate of compliance to the Contracting Authority.
- 3.2.1.7 The Service Provider shall provide a detailed works schedule showing dates when routine maintenance visits and planned repairs will take place. This schedule will cover a full 12-month period from Contract Commencement and take due consideration of the maintenance program completed as part of the previous service contracts.
- 3.2.1.8 The schedule is to be presented in a table format in such a way that it can be easily interpreted prior to the Service Provider uploading into the contracting Authorities CAFM system for planning and scheduling purposes
- 3.2.1.9 Materials shall be fit for purpose and sourced from the OEM, where alternative sources of materials are considered, the Service Provider shall provide an equivalent or superior performance alternative, approvals must be sought in writing from the Contracting Authority prior to purchase.
- 3.2.1.10 All maintenance routines that require a service outage should be scheduled out of operationally sensitive hours and be coordinated in full with key airport stakeholders and notified to the Contracting Authorities or their representatives.
- 3.2.1.11 The following security screening equipment is included, as a minimum, within the Services:-
- 1 Passenger Search X-Ray Machines
 - 2 Standalone HBS X-Ray Machines
 - 3 Walk Through Metal Detectors (WTMD)
 - 4 Handheld Metal Detectors (HHDs)
 - 5 Explosive and Trace Detection Equipment
 - 6 Baggage Tray Return Solutions
 - 7 Vehicle Mounted X-Ray Machines
 - 8 I-Lane Solution
 - 9 Gamma Scanners
 - 10 Roller Conveyor
 - 11 Mobile X-Ray System Solutions
 - 12 All Test Equipment
 - 13 Test Bags
- 3.2.1.12 The Service Provider shall perform the following tasks on all in scope equipment:
- 1 Daily condition monitoring and witness testing on all screening equipment in service.
 - 2 Daily inspections and operational function testing of equipment not in use to ensure equipment availability.
 - 3 Daily inspections and custodial service on equipment awaiting repairs and maintenance.
 - 4 Clean all internal and external optics and sensors.
 - 5 Performance testing routines, adjustment, and calibration.
 - 6 Inspections and Preventative maintenance on all component parts to determine any wear and tear.
 - 7 Check all external wiring looms for condition, unsightly cables to be dressed and reconfigured.
 - 8 Ensure equipment is secure and stable.

- 9 Provide the necessary consumables for operation including, but not limited to, swabs, handheld units (wands)
- 3.2.1.13 Specifically for X-ray equipment, the Service Provider shall, as a minimum:
 - 1 Ensure that, under no circumstances, the x-ray equipment is operated with torn or missing tunnel lead curtain straps.
 - 2 Ensure that the X-ray equipment is serviced and maintained by a competent service engineer as required and when necessary. Preventative maintenance and a dose rate survey is undertaken on all equipment at least once every 6 months. All service reports and radiation surveys / safety checks are maintained on file by a nominated technical expert and will be available on request by the relevant governing authorities, the Contracting Authority or their representatives.
 - 3 Ensure that, no-one is permitted to use the X-ray equipment without having undertaken basic training in the use of the equipment to include radiation safety controls and precautions. All X-ray users must demonstrate adequate competence in the use of the equipment and an adequate understanding of the safety features of the equipment before being permitted to use the X-ray equipment.
 - 4 Check and adjust security search tables, all rollers and tray return equipment, ensure they are sound, secure and pose no risk to operators, staff, or passengers.
 - 5 Check all safety rollers are in place and functioning as designed, free to move and pose no trap hazards.
 - 6 Check infeed tunnel lead curtains are in good condition and not unsightly.
 - 7 Complete tunnel inspections to remove any debris, bag tags.
 - 8 Perform radiation leakage tests in line with OEM specifications and routine.
 - 9 Ensure all operator screens and keyboards are secure, and that all fixings are in place.
 - 10 Set the correct screen resolutions.
 - 11 Check consul condition, all controls for wear and tear, joystick assemblies are stable, and keyboards operational push buttons and indicators are operational.
 - 12 Check conveyor belting condition for any damage, rips or tears, check tension and adjust as required.
 - 13 Check conveyor belt zippers are intact, with no rips or tears.
 - 14 Check and ensure the security equipment is connected to the correct power source.
- 3.2.1.14 Specifically for Walk Through Metal Detectors (WTMD), the Service Provider shall, as a minimum:-
 - 1 Ensure archways are operating in the correct operational mode and setting.
 - 2 Ensure that power supply cables are protected and pose no tripping hazard.

4. Aerodrome

4.1 Overview

- 4.1.1** The requirements below shall be applied to each airport designated within the contract.
- 4.1.2** The Aerodrome is a defined area, bounded by a security perimeter fence with several manned security access points located around its perimeter.
- 4.1.3** The aerodrome maintenance programme is primarily designed around meeting the recommendations and requirements as set out in the acceptable means of compliance, guidance material and certification specifications of GACAR 139. Information in this specification does not limit the Service Provider maintenance obligations under GACAR 139.
- 4.1.4** Maintenance programs are developed based on a number of factors, namely, the needs and criticality of the different assets, in accordance with the manufacturer's recommendations, and industry good/best practice.
- 4.1.5** The Service Provider shall plan for major maintenance of the runway to conduct maintenance on all systems. Each shutdown will consist of all required planned and corrective maintenance. The Service Provider must ensure that they have sufficient staff to carry this out during the short time of the closure and as directed by the Contracting Authority.
- 4.1.6** Aerodrome Facilities Management Services include, without limitation, maintenance on the following items:
 - 4.1.6.1** Airfield Pavements and related items:
 - 1 Runway
 - 2 Taxiways
 - 3 Aprons
 - 4 Stands (remote and contact)
 - 5 Ground support equipment parking areas
 - 4.1.6.2** Roads and grounds:
 - 1 All airfield service and perimeter roads within the airfield boundary including BHS levels.
 - 2 Airfield head of stand roads
 - 3 Airfield emergency roads
 - 4 Softscape, un-landscaped, landscape and hardscape areas
 - 5 Drainage including ditches, drainage rip-rap, culverts.
 - 6 Signage
 - 7 Concrete foundations and bases
 - 8 Manholes, pit structures and covers
 - 9 **Note:** In addition to the above, all roads (whether they are present, newly constructed, or completed during the Contract period) located within the perimeter of the airfield boundaries are included in the facilities maintenance scope of work.
 - 10 Security Items:
 - a) Airfield perimeter security fence
 - b) Security gates in the airfield
 - c) Crash gates.
 - d) Airfield checkpoints

- e) Security/Guard posts / buildings
- f) Equipment protection (Fixed Barriers/Bollards)

The Contracting Authority has the right, from time to time, depending on security and other considerations, to increase the number of security gates and intrusion gates. Likewise, security gates and fences may be modified according to requirements. These will be maintained by the Service Provider at no additional cost to the Contracting Authority, and there will be no payment separately for the gates or fences that have been increased or modified.

4.1.6.3 Aerodrome lighting and associated supporting infrastructure.

All lighting systems and their support equipment within the aerodrome shall be considered in-scope and includes the following:

- 1 Runway lighting
- 2 Precise Approach Path Indications (PAPI)
- 3 Approach lighting and Sequenced Flash Lighting
- 4 All aerodrome signage lighting
- 5 Runway Distance Marker Lighting
- 6 Taxiway lighting
- 7 Aprons and stand lighting.
- 8 Windsock lighting
- 9 Parking areas
- 10 Floodlighting
- 11 Obstruction lighting
- 12 Airport Beacon Lights
- 13 External building/Pedestrian lighting
- 14 Service yard lighting
- 15 Perimeter security fence lighting
- 16 All other road and general lighting
- 17 all related substations, Control and Monitoring System, CCRs, generators, UPS, power supplies, Auto-Transfer Switches (ATS), cables and their connections, fixtures and deep cans, transformers, equipment, circuit upgrade, deep cans and grounding in lighting towers for each of the airfield lighting systems.

4.1.6.4 All building maintenance within Aerodrome includes, but is not limited to:

- 1 Mechanical services
- 2 Electrical service
- 3 Plumbing services
- 4 Heating, ventilation, air conditioning services
- 5 Architectural and civil works

4.1.6.5 Waste Management

4.1.6.6 Networks

4.1.6.7 FOD Management

4.1.6.8 Landscape and open area management

4.1.7 Standards

All works to be compliant with the Aerodrome manual, Cluster2 Airports SOPs and ICAO standards, GACAR 139 and ISO standards as well as any other international and local standards related to the scope.

Note: Airfield Maintenance to be in compliance with Aerodrome License and work carried out to appropriate standards and requirements (i.e., EASA, FAA, ICAO Annex 14 & GACAR 139).

- 4.1.8** The Service Provider shall ensure that the maintenance programme specifies the aerodrome facilities, systems, installations, and equipment subject to maintenance and contains the necessary information for its timely and correct implementation, including but not limited to:
- 4.1.8.1** the type of inspections / checks to be carried out (e.g., visual inspection, cleaning of equipment, equipment stability/alignment, calibration, etc.) for each facility, system, installation, and equipment, taking also into account factors such as their location and meteorological phenomena,
 - 4.1.8.2** the frequency of inspections/checks for each facility, system, installation, and equipment,
 - 4.1.8.3** the tools and equipment required for each type of inspection/check, and
 - 4.1.8.4** the periodic replacement of parts and consumables that may be required in accordance with the maintenance instructions of the manufacturer of the respective facility, system, installation, and equipment, as appropriate.
- 4.1.9** The Service Provider shall ensure that arrangements are in place for timely corrective and reactive maintenance actions. Such arrangements should cover the cases of maintenance needs that are:
- 4.1.9.1** identified either during preventive maintenance activities.
 - 4.1.9.2** raised at any other time (e.g., due to equipment malfunction or failure, weather event or sub-standard services).
- 4.1.10** The maintenance programme also includes maintenance of communication equipment and alerting systems.
- 4.1.11** The Service Provider shall ensure that the maintenance programme for Soft Services specifies the aerodrome facilities, systems, installations, buildings, and areas subject to Soft FM Services and details the frequency and schedule of:
- 4.1.11.1** sweeping, washing, waste management and pest control
 - 4.1.11.2** Aerodrome FOD Control Programme
- 4.1.12** The Service Provider shall provide full house keeping and cleaning services to all Aerodrome facilities including but not limit to all technical & control rooms, workshops & motor pool workshops, stores, roads, bridges, drainage structures, ditches, drainage rip-rap liners, open channels, catch basin, pounds and culverts, utility tunnel, District colling facilities, and buildings or part thereof.

4.2 Aerodrome Inspection, and Monitoring and Analysis Services

- 4.2.1** Inspection
- 4.2.1.1** The Service Provider shall perform regular inspections of the areas, facilities, equipment, and installations outlined below to identify and record faults and shortcomings. In addition, the Contracting Authority inspection reports shall be made available to the Service Provider to assist in auditing and to set priorities and actions necessary to address them.
 - 4.2.1.2** The Service Provider must accurately record the registration of all maintenance work that was performed as a result of these inspections in the CAFM System and must ensure that all such recorded information has been transferred at the latest by the end of the proceeding shift with evidence of completion including photographs and reports.

4.2.1.3 Details and outcomes of inspections should be recorded electronically, with content in a searchable format.

4.2.1.4 The inspection program shall include, but not limited to, the following requirements:

- 1 All airfield paved areas, including but not limited to, Runways, Taxiways, Aprons and Stands, will be inspected daily, weekly, and monthly as per ICAO regulations. Other paved and concrete assets to be inspected as per best practice including sub-corridors, aircraft parking lots, fuel pits, roads, road structures, paving shoulders, barrier, and separation walls, bridges, and bridge slopes.
- 2 All airfield drainage elements, which include, but are not limited to, drainage channels, ponds, underpasses, depressions, underground drainage channels, entry openings, sewerage basins, covers and grille covers for entry openings, should be inspected weekly.
- 3 All airfield signs of paved areas, light reflective and non-reflecting road signs, bumpy traffic bars, and traffic layouts should be inspected weekly.
- 4 All airfield fence lines, poles, gates, and guard ways should be inspected weekly.
- 5 All areas of the airfield that are subject to soil erosion as a result of natural factors or the storming of jet aircraft machinery.
- 6 All exterior barriers, poles, and protective bars.
- 7 All airfield external waste containers and compressors, whether stationary or mobile.
- 8 And all other open airfield areas.
- 9 Electrical systems, will be inspected daily, weekly and monthly in compliance with ICAO Annex 14 & GACAR 139 standards and good practice to ensure the operational performance of all airfield lighting systems and the readiness of emergency back-up generators.
- 10 All fence lighting should be inspected daily.
- 11 All Apron Stand Lighting should be inspected daily.

4.2.1.5 Tier 2 (FMS Management) Inspections to review the effectiveness of general inspection and maintenance programs.

4.2.1.6 Participation in Tier 3 Inspections, managed by Cluster2 Aerodrome Operations and Aerodrome Safety.

4.2.2 Monitoring and Analysis

Dissemination of reports and data shall be only to the contracting authority or its representative. Test reports and data are the property of the Contracting Authority and are confidential. Summary and detailed raw data for the testing shall be maintained in a database. Schema for the database is to be agreed to by the Contracting Authority. Detailed raw data shall be referenced back to GPS locations to enable accurate analysis of the data. Reports and raw data shall be maintained and be available for the duration of the contract. All data and reports are to be handed over at the end of the contract or whenever requested by the contract authority. Tests are to be carried out by certified operators and equipment. The Certified Report should be accompanied by an analysis of the data by the Service Provider with action plans for any non-compliance or indication of trending towards non-compliance.

Monitoring and analysis shall include, but not limited to:

4.2.2.1 Pavement Friction Testing and Analysis

Certified Friction Test Reports shall be submitted to the Contract Authority within 3 working days of the test carried out. If tests indicate non-compliance or sections require maintenance as per standards, then corrective actions must be enacted. Non-compliance in the touchdown zones shall initiate de-rubbing of the full touch down zone. If tests indicate that any non-compliance within the

'100 metre zones' shall initiate de-rubbing of the zone. After de-rubbing or any activity aimed at improving the friction of the runways or part thereof, a friction test should be carried out for the entire runway. If after de-rubbing there are still areas of non-compliance or requirement for maintenance, the Service Provider is to provide solutions for improving the friction of the runways.

4.2.2.2 Photometric Testing

Certified Photometric Test Reports shall be submitted to the Contract Authority within 3 working days of the test carried out. Where any non-compliance occurs, the Service Provider is to provide immediate corrective actions to ensure compliance with the lighting systems. Once corrective actions are complete, a follow up Photometric Test should be carried out. Raw data should also be related to fittings and locations. Photometric Testing should be carried out as per regulation requirements.

Workbench photometric tests should be carried out on all new and repaired fittings. Fittings shall pass workbench photometric tests. Use of fittings that have not passed workbench photometric test will only be by Contracting Authority approval.

4.2.2.3 HML LUX Testing

Certified LUX Test Reports shall be submitted to the Contract Authority within 3 working days of the test carried out. LUX tests are related to aircraft parking stands rather than specific fittings. Raw data should be related to these fittings.

4.2.2.4 PCI

Certified PCI Test reports shall be submitted to the Contract Authority. Raw data should be compatible with GIS. Tests and reports shall conform to the requirements of the Regulations.

4.2.2.5 Pavement Overload

Pavement overload reports shall be provided on a per incident basis where an aircraft movement has resulted in pavements loaded above their rating. The report should include the qualitative assessment of the potential damage that has occurred to the pavement. Raw data of the incident shall be recorded in a database for future reference. The report shall meet all the requirements of the regulations.

4.2.2.6 Visual Flight Check

Regulatory test and validation flights for PAPI's performance as per ICAO Part 9 Airport Maintenance Practice shall be carried out and reports and data shall be submitted to the Contract Authority. Tests and reports shall conform to the requirements of the regulations.

4.3 Aerodrome Coordination and Oversight Services

4.3.1 Adverse Weather Operations and Equipment

4.3.1.1 The Service Provider shall ensure that means and procedures are established and implemented to ensure the safety of aerodrome operations in adverse weather conditions in accordance with the Contracting Authority's Adverse Weather procedures.

4.3.1.2 The Service Provider shall, in consultation with the Service Provider Aerodrome Operations, the air traffic services, and other relevant parties operating at the aerodrome, establish and implement procedures required to mitigate the risk of their operation of the aerodrome under adverse weather conditions such as, but not limited to, strong winds, heavy rain, sandstorms, and thunderstorms, including the suspension of their operations if deemed necessary.

4.3.1.3 The Service Provider shall provide the necessary resources to facilitate a timely re-initiation of normal operations post suspension.

4.3.1.4 The Service Provider is expected to have all the necessary equipment to deal with any weather event that may occur at Cluster2 Airports.

4.3.1.5 Weather Warning Protocol

4.3.1.6 The Service Provider is to approved procedures in place in the event of a weather warning to ensure the readiness of the airport for potential Adverse Weather Operations.

4.3.1.7 Low Visibility Operations

In the event of Cat I/II operations being implemented, the Service Provider shall have sufficient staff on duty to carry out the maintenance and operation functions required, which shall include, but not be limited to:

- 1 Checking generators for each of the substations when requested at the start of LVP (Initiation)
- 2 Carrying out hourly checks on all generators to ensure that there is sufficient fuel.
- 3 Filling the generators with fuel if required.
- 4 Attending to any issues that may arise during these periods as notified by Aerodrome Operations or ATC.
- 5 Having technicians available and always deployed during Low Visibility Operations.
- 6 ensuring that shift handover periods do not affect availability and deployment.

4.3.2 Aerodrome Works, Projects, and Maintenance Works Coordination

4.3.2.1 Third Party activities are continually occurring within the aerodrome. The Service Provider is to utilize and coordinate with third parties works NOTAMS and shutdowns to minimize the overall effect of works throughout the contract.

4.3.2.2 Daily, weekly, and monthly coordination meetings between all stakeholders shall be held at the discretion of the Contracting Authority. The Service Provider shall propose amendments to planned and corrective maintenance outlining the risks and opportunities of the amendments.

4.4 Electrical Infrastructure (including AGL Items) Services

4.4.1 Visual Aids and associated Electrical Infrastructure

The primary objective of the visual aid systems is to aid in the safe operation of aircraft operations into and out of Cluster2 airports. All maintenance carried out on the visual aids is carried out in accordance with ICAO Aerodrome Services Manual Part 6 and Part 9.

4.4.1.1 The Service Provider shall be responsible for the operation, maintenance, and mandatory inspections, audits, and reports of all AGL and electrical circuits and components. Electrical systems, especially (AGL) Airfield lighting Systems and emergency backup generators, will be inspected daily, weekly and monthly in compliance with ICAO Annex 14, Aerodrome Services Manuals Part 6 and Part 9 & GACAR 138 and 139 standards. The AGL cover the movement area of Cluster2 Airports airside, including runways, (taxiways, aprons, and remote stands. It also includes, but not limited to:

- control modules and lighting vaults.
- Power supply and power generation, including substations.
- UPS and stand-by power generation.
- Conditioning, monitoring, controlling, and related equipment.
- Regulators and circuit selectors.
- Switch-over circuitry and controls.
- Transformers
- Cables, connectors, lugs, and all related accessories

- Duct bank systems and associated vaults, conduits, pull pits, earth pits, trays, tunnels, and other pathways and access points.
 - Elevated and inset approach lights and sequenced flashers.
 - Elevated and inset runway/taxiway lights
 - PAPI Systems
 - Flood Lights
 - Signage and Marker Lights
 - Surface lights
 - Wind Direction Indicators
 - Airfield Lighting Control and Monitoring System (ALCMS)
 - Emergency lighting
 - Obstacle lighting
- 4.4.1.2** All works carried out shall be carried out by a manufacturer certified company and certified technicians.
- 4.4.1.3** The Service Provider shall establish and implement a preventive, corrective, reactive/remedial and condition-based maintenance programme to ensure the serviceability of the electrical systems and the availability of power supply to all the necessary facilities of the aerodrome, in a manner that ensures the safety, regularity, compliance and efficiency of air navigation.
- 4.4.1.4** For a precision approach runway Category II, the system of Preventive Maintenance shall have as its objective that, during any period of Category II operations, all approach and runway lights are serviceable and that, in any event, at least the lights are serviceable to the GACAR 139 requirements in each of the following elements:
- 1 precision approach Category I/II, the inner 450 m,
 - 2 runway center line,
 - 3 runway threshold,
 - 4 runway edge,
 - 5 touchdown zone,
 - 6 approach beyond 450 meters .
 - 7 runway-end lights.
- 4.4.1.5** The Service Provider shall ensure that for AGL:
- 1 The lights that may be unserviceable in accordance with Section 4.4.1.6 shall not alter the basic pattern of the lighting system.
 - 2 An unserviceable light shall not be permitted adjacent to another unserviceable light, except in a barrette or a crossbar where two adjacent unserviceable lights may be permitted, as prescribed in GACAR 139.
 - 3 For a stop bar that is provided at a runway-holding position and is used in conjunction with a runway intended for operations in runway visual range conditions less than a value of 550 m, the system of preventive maintenance shall have the following objectives:
 - a) no more than two lights shall remain unserviceable, and
 - b) two adjacent lights shall not remain unserviceable unless the light spacing is significantly less than that required.

- 4 For a taxiway intended for use in runway visual range conditions less than a value of 550 m, the system of Preventive Maintenance shall have as its objective that no two adjacent taxiway centre line lights be unserviceable.
- 4.4.1.6 For the purposes of this Contract, a light shall be deemed to be unserviceable if:
 - 1 the main beam average intensity is less than 50% of the value specified in the certification specifications issued by the Agency. For light units where the designed main beam average intensity is above the value specified in the certification specifications, the 50% value shall be related to that design value;
 - 2 the color filter associated with the light is missing, damaged, or the light does not produce the correct color light beam.
- 4.4.1.7 The Service Provider shall establish and implement a preventive and corrective maintenance programme to ensure the serviceability and reliability of the system of markings and signs of the aerodrome, in a manner that ensures continuity of guidance to, and control of, aircraft and vehicles.
- 4.4.1.8 Construction or maintenance activities shall not take place in the proximity of aerodrome electrical systems when low-visibility procedures are in effect at the aerodrome.
- 4.4.1.9 The Service Provider shall ensure that:
 - 1 the preventive maintenance programs referred to in this section include appropriate inspections and checks of the individual elements of each system, and of the system itself, which are conducted in accordance with established procedures, and at defined intervals, appropriate to the intended operation and system, and
 - 2 appropriate corrective actions are taken to rectify any identified defects.
- 4.4.1.10 The Service Provider shall maintain records of the relevant maintenance activities. Records must identify fitting, location, time and date, consumables and parts used, and technician ID. The Service Provider shall carry out preventative maintenance for Visual Aids and other lighting systems as follows:

Frequency	Maintenance Description
Daily	➤ Field lighting checks: a visual check of all AGL circuits / lights replacing any found faulty and record any repairs carry out. ➤ Precision approach system (inner 450m) ➤ Runway center line lights ➤ Runway threshold lights ➤ Runway edge lights ➤ Touchdown zone lights ➤ Precision approach system (beyond 450m) ➤ Runway end lights ➤ Sequence flasher ➤ Runway no entry bar/stop bar lights ➤ Runway guard lights ➤ Taxiway centerline lights ➤ Intermediate taxiway holding position lights ➤ Pairs, or greater than pairs of taxiway centerline lights unserviceable ➤ Taxiway edge lights ➤ Obstacle lights ➤ Wind direction indicator lights and wind-sock condition ➤ Generator availability and status of the ATS ➤ Illuminated signage ➤ Recording of all CCR SCADA Alarms ➤ Generator testing and maintenance for LVP operations ➤ PAPI serviceability
Weekly	➤ PAPIs: checking light output, cleaning the lens, and checking for damage to filters etc. ➤ MALMS Photometric testing and cleaning of Runway AGL systems. ➤ Recording of Earth Fault Leakage Levels displayed on CRR's for the critical circuits on the Runway and Low Vis routes. ➤ Sub-station Generator checks, Confirm readiness for automatic operation of each unit, at all stations. ➤ Checking the torque on all runway fittings and adjusting accordingly.
Monthly	➤ Insulation resistance testing of field circuits – all circuits to be tested monthly ➤ Sub-station Generator: Perform main power failure test and confirm the "Switch-Over-Time" between main and stand-by power source, ensure conformity with GACAR-139 specification and ICAO document ADM Part-9. Observe all necessary precautions and information / coordination with ATC. Record test data. Take corrective action/s as necessary. ➤ Thermal imaging of PFUs, cable joints distribution boards and CCRs. ➤ PAPIs: Check alignment of PAPI lighting. Check the unit for structural and operational integrity. Inspect housing and closure system, lamps, electrical connection, filters and protective glass for damage, breakage, or warpage. Complete any maintenance work necessary. Check unit mounting. ➤ Crash equipment: visual inspection of fittings, operational inspection of mobile tower lights checking fuel levels for generators, checking spares trailer and replacing missing stock. ➤ Undertake lamp replacement to Approach lighting systems on all Runway ➤ Undertake lamp replacement of apron lighting where necessary.

Frequency	Maintenance Description
Bimonthly (8 weeks)	➤ Checking the torque on all Approach, runway and taxiway fittings and adjusting accordingly. ➤ PAPIs: Remove the PAPI unit cover and check the angle of the PAPI unit using the PAPI checking instrument making adjustment where necessary to correct the angle.
Quarterly	➤ AGL control and monitoring systems, visual checks on control panels, inspection of as built drawings and downloading log files to check alarm files. ➤ PAPIs: checking the levels on the PAPI units with the Alidade. ➤ Mains Failure Testing on airfield standby Generators coordinated with ATC ➤ Lux level tests completed as per plan including all stands.

4.4.2 Mobile Airfield Light System Requirements

10.1 Mobile Airfield Light Monitoring System (MALMS), a mobile airfield lighting photometric testing system shall be used at Jazan Airport to measure airfield lighting performance against the criteria for beam intensity and orientation as per the schedule in the table above. This shall be supplied and maintained by the Service Provider at its own expense.

10.2 The cause for the loss in light output can be contaminants outside and inside the light unit, and degradation of the lamp and optical system due to aging. The light can, and should be, restored to its original condition by cleaning or replacing the lamp and any parts which have apparently become degraded. It is essential to establish a comprehensive routine maintenance system for servicing lights and other equipment so that the installation complies with the specified requirements. Its usefulness is dependent on its serviceability, which in turn depends on the effectiveness of the maintenance work carried out.

10.3 The frequency at which routine inspection cleaning and servicing are to be performed will vary according to the type of equipment, its location, usage, and the maintenance requirement on the AGL system varies from season to season.

10.4 The maintenance procedure commonly used comprises four steps:

- 4.4.2.1 Removal of defective lights and immediate replacement by new or repaired ones as part of daily check and action work order.
- 4.4.2.2 Photometric testing of light output, from results carry out targeted cleaning of any light fittings that fall below 70% and replacement of any fitting that falls below 50% standard.
- 4.4.2.3 Servicing and overhaul of deficient lights in the workshop where all required tools, measuring and adjusting equipment are available.
- 4.4.2.4 Photometric testing of all light fittings repaired and new prior to being installed in the airfield.
- 4.4.2.5 Relocation of lights to satisfy GACAR 139 requirements regarding consecutive lights outages/non-compliance.
- 4.4.2.6 In-situ replacement or repair of lights irrespective of weather.

4.4.3 Power Supplies and Other Electrical Systems

4.4.3.1 Compliance requirements

When performing maintenance services related to the lighting of the airfield, the Service Provider is obligated to do without limitation the maintenance of all power supplies, related substations, CCR's, generators, UPS, cables and their connections, fixtures, transformers, equipment, and grounding in lighting towers for each of the following airfield lighting systems:

- 1 Airfield Sub-stations
 - 2 Back-up supply, ATS, and generator maintenance
 - 3 Aeronautical Ground Lighting
 - 4 Approach Lighting
 - 5 Contact area and runway threshold lighting
 - 6 Lighting in the center of the runway
 - 7 Lighting of the runway end
 - 8 Medium and sub-corridor lighting
 - 9 Lighting the end of the aircraft parking yard
 - 10 Airline parking lines
 - 11 Taxiway lighting
 - 12 Flashing light signals
 - 13 Airport Beacon Light
 - 14 Precise approach path indications
 - 15 Indicative plates signage
 - 16 Floodlighting and Obstruction Lighting, Apron, Passenger Terminals, Royal Terminal, Air Cargo Terminal
 - 17 External building/Pedestrian lighting
 - 18 Roadway and fencing lighting inside the airfield
 - 19 Landscape lighting inside the airfield
- 4.4.3.2 If the prescribed Lux levels are not sufficient in any area, then the Service Provider shall be committed to install temporary surface lighting to maintain the level of terminal lighting to ensure the safety of the aircraft during the lighting periods for long periods of time.
- 4.4.3.3 The Service Provider is committed during selected periods, determined by the airport operations department, to perform a night inspection of all airfield lighting systems and to perform maintenance or register the defect sites in the maintenance management system for corrective maintenance at a later time.
- 4.4.3.4 The Service Provider is committed to maintain the provision of electrical supplies for navigational aids.
- 4.4.3.5 The Service Provider shall be obligated to maintain and operate the sub-station for airfield lighting including all secondary facilities and equipment.
- 4.4.3.6 The Service Provider shall maintain the provision of electrical supply to the runway, taxiway, sub-corridor, signs, and High Mast Lighting and floodlights in the aircraft parking yard.
- 4.4.3.7 The Service Provider shall be committed to maintain all floor sockets in the aircraft parking yard.
- 4.4.3.8 The Service Provider shall repair/replace all degraded or corroded deep cans to include the shallow base.
- 4.4.3.9 The Service Provider shall provide a scheduled program for airfield lighting cleaning and torquing (All runway fittings to be tested Weekly).
- 4.4.3.10 The Service Provider shall provide a scheduled program for monitoring the integrity of airfield electrical circuits (All circuits to be tested at a minimum monthly).
- 4.4.3.11 Maintenance, by the Service Provider shall include scheduled checking and, if necessary, taking the indicated corrective action, as follows:

1 Power Cables and distributors in field

Frequency	Maintenance Description
Monthly	➤ Recording of Earth Fault Leakage Levels displayed on CCR's for the critical circuits on the Runway, the approach, Low Vis routes, taxiway and signage circuits.
Yearly (progressive program)	➤ Measuring of earth fault leakage on all critical circuits using 5000V insulation resistance testers complying with ICAO doc ADM Part-5 Electrical Systems chapter 5 and taking necessary corrective actions ➤ Thermal imaging recording of primary cables where they're connected by submarine joints both within substations and in pits. Carrying out any necessary corrective actions with a view to a programme to relocate all submarine joints into manholes. ➤ Inspection of manholes for condition of the interior; pumping-out, drying up or cleaning. Grease manhole lids.
Unscheduled	➤ When carrying out remedial works to check condition of all circuits in manhole and cleanliness of manhole or as required by the Contracting Authority.

2 AGL Control Systems

Frequency	Maintenance Description
Quarterly	➤ Function control inspections of all AGL systems, checking each brightness level and operation of lighting circuits. ➤ Functions of the SCADA systems Inspect control panels for cleanliness and condition; cleaning and repairing or replacing.
6 Monthly	➤ Check UPS batteries and components for excessive heat and discolouration, replace if necessary ➤ System components for loose connections; tightening, repairing, or replacing; in each substation, contingency tower, and control tower.
Annually	➤ Review of as built drawings by Electrical Team and Support Service Provider to validate and update for any alterations inputted and request replacement as built from supplier as required. ➤ Check UPS monitoring system and repair if necessary and replace any faulty lamps in conjunction with Support Contractor.
Every 2/3 Years	➤ Replace PLC power supply back up batteries ➤ Replace UPS power supply back up batteries for 48volt power supplies.
Unscheduled	➤ Replacement of touch screens and pc's when required. ➤ Response to ATC controllers operational requests.

In the event of a failure of the Control System the Service Provider shall make available technicians to manually control the switching of power for AGL components at the request of ATC or Aerodrome Operations.

3 Secondary Power Supplies (Generators)

The Service Provider shall carry out maintenance of secondary power including weekly, monthly, and quarterly test runs and biannual servicing of the diesel engines checking and, if necessary, taking the indicated corrective action, as follows:

Frequency	Maintenance Description
Daily	➤ Visual check of generator and the ATS for its readiness for operation in conjunction with LVP operations. ➤ Fuel level control and alarm monitoring. Including top ups as required

Frequency	Maintenance Description
Weekly	➤ Visual Inspection for damage to generators and ATS ➤ Oil level, ➤ Coolant levels, ➤ Batteries checked. ➤ Inspecting batteries, sump pump, heaters etc. ➤ Function test on the generator off load.
Monthly	➤ Function test of the generator on load checked in conjunction with ATC.
Quarterly	➤ Mains failure test in substations to check that generators change over within 15 seconds.
Bi-annually	➤ Carry out inspection service on generator sets and carry out any repairs.
Annually	➤ Carry out full service on generator sets. ➤ Service Provider Team to complete mechanical service to generators, replace oil, coolant filters etc., and carry out any repairs. Test diesel for contaminants. ➤ Thermal imaging of PFU's, cable joints distribution boards.
Unscheduled	➤ Mechanical repairs to generators based on weekly inspections. ➤ Batteries changed at minimum every 2 years ➤ In advance of extended period of LVP, overall fuel levels checked, and fuel reordered based on forecast

4.4.3.12 The Service Provider shall keep spare parts such as AGL Lighting, CCRs and cable to ensure a response within the agreed time.

4.4.3.13 All lighting shall be maintained to ICAO Annex 14 & GACAR-139 standards. The Service Provider shall inspect, test, and calibrate AGL Lighting as per PM/Inspection Schedule or based on the Contracting Authority's request.

4.4.4 Airfield Lighting Control and Monitoring System (ALCMS)

4.4.4.1 The control system parts of the ALCMS are managed and maintained by the Service Provider. The Service Provider shall be required to interface with IT when required.

4.4.4.2 This equipment shall be operational 24 hours a day, 365(6) days a year. Priority response should be made by the Service Provider to deal with faults that occur during the twenty-four (24) hours period. The response period must not exceed fifteen (15) minutes from notification, and the system must be available 99.9% of the times. The Service Provider shall provide competent, qualified staff, materials, and consumables for the maintenance of the hardware elements of the system including all associated electrical infrastructure. This will include regular inspections and system verification tests on all components essential for the sustainment of the required functionality and reliability.

4.4.4.3 For the purpose of the Services, it shall be the responsibility of the Service Provider to engage with the Contracting Authority's ICT team on all matters including system integration and interfaces and provide as a first line response to all ICT systems to ensure continued and safe availability of ALCMS and associated infrastructure up to the natural demarcation point i.e., local panel, transformer, or junction box.

4.4.4.4 The Service Provider is responsible for applying licenses, software patches/updates via prescribed ITIL management policies, cybersecurity requirements and repairing system outages, and repair/replacement and maintenance of the associated hardware components.

4.4.4.5 The Service Provider shall respond to the Contracting Authority requests for production of standard/custom reports, programming of new system interfaces and software features and updates.

- 4.4.4.6 The ALCMS provides the air traffic controllers at the Cluster2 Airports Air Traffic Control Tower (ATCT) with an integrated, computerized system to monitor, manage and control the Airfield Lighting System. It also integrates the Gate Operating System (GOS) for gate assignment information and the Integrated Control Monitoring System (ICMS) for weather, NAVAIDS, and approach information. The system encompasses airfield lighting, control functions in the control tower, substations, engineering offices and the maintenance workshop.
- 4.4.4.7 The ALCMS provides the following major functions not limited to:
- 1 Gives air traffic controllers a tool to manage and control ground traffic,
 - 2 Monitors airfield lighting and reports warnings and alarms as it detects lighting changes or failures,
 - 3 Controls airfield lighting to allow flexible use of runways, taxiways and aircraft stands during defined CAT I/II/III operations and scenarios
 - 4 Provides a graphical user interface to cover the taxiways/aprons and vaults
 - 5 Provides duplicate equipment and full operations capabilities to the ATCT.
- 4.4.4.8 The systems feature redundant central server system and associated software, the lighting vault harsh environment network switches, and ALCMS operator's consoles in multiple locations throughout the airport.
- 4.4.4.9 The Service Provider is responsible for the safe, continuous, and reliable availability of the ALCMS at all times within compliance with all civil aviation regulations and requirements. The services include but not limited to:
- 1 Regular inspections and tests as required by ICAO and GACA regulations and Cluster2 SOPs
 - 2 Cleaning of all ALCMS equipment, cabinets, and associated systems and items
 - 3 Maintenance of the dual, redundant central server systems and associated software
 - 4 Lighting vault harsh environment network switches.
 - 5 ALCMS operator consoles in multiple locations throughout the airport.
 - 6 Consumables (light bulbs, cables, etc.)
 - 7 Spare and service parts
- 4.4.4.10 All information, data, and interventions will be documented in the AOMS/CAFM, and the required reports shall be produced and distributed in a timely manner to the relevant authorities and users.
- 4.4.4.11 Emergency repair and troubleshooting services shall also be provided in line with civil aviation regulations, the Service Level Agreements, and the Contracting Authority's requirements.
- 4.4.4.12 In the event of a failure of the ALCMS, either partial or fully, the Service Provider is to provide personnel to manually control elements of the AGL at the direction of the ATC.
- 4.4.5 High Mast Lighting (HML)**
- 4.4.5.1 High Mast Lighting / Apron Floodlighting must be available at all times on the apron and on a designated isolated aircraft parking position intended to be used at night.
- 4.4.5.2 The Service Provider must locate HML so as to provide adequate illumination on all apron service areas, with a minimum of glare to pilots of aircraft in flight and on the ground, aerodrome and apron controllers, and personnel on the apron. The arrangement and aiming of floodlights must be such that an aircraft stand receives light from two or more directions to minimize shadows.
- 4.4.5.3 The Service Provider must ensure that the spectral distribution of HML must be such that the colors used for aircraft marking connected with routine servicing, and for surface and obstacle marking, can be correctly identified.
- 4.4.5.4 The average illuminance must be at least the following:

- 1 Aircraft stand:
 - a) Horizontal illuminance — 20 lux with a uniformity ratio (average to minimum) of not more than 4 to 1; and
 - b) Vertical illuminance — 20 lux at a height of 2 m above the apron in relevant directions.
- 2 Other apron areas:
 - a) horizontal illuminance — 50 per cent of the average illuminance on the aircraft stands with a uniformity ratio (average to minimum) of not more than 4 to 1.

4.4.5.5 When performing maintenance services for high lighting poles, the Service Provider shall undertake, without limitation, high luminaire maintenance, monitoring and inspection including wires, fixtures, columns, base and bolts, control switches, hydraulic system, timers and associated devices. This includes the Lowering Head Frame Masts, their lifting and raising equipment, poles, and cables

- 1 Ensure statutory checks on all array lifting and lowering equipment.
- 2 Maintenance of all protection barrier lights, including wires, fixtures, and control switches.
- 3 Maintenance of the electrical supply for all wind direction indicators.
- 4 Carry out quarterly testing of Aircraft Parking Stand lux readings to ensure minimum compliance and complete realignment and corrective maintenance repairs as required

4.4.5.6 The Service Provider shall provide assistance to other airport departments requesting the use of high lift equipment.

4.4.6 Lighting the Road Network and the Security Fence inside the Airfield

When performing maintenance services for lighting the road network and security fence, the Service Provider is committed to do the following without limitation:

- 4.4.6.1** Maintenance of lighting of the road network (including the electrical components, cables, and civil structures) and security fence inside the Airfield.
- 4.4.6.2** Maintenance of road lighting and security fence, including transformers and control panels.
- 4.4.6.3** Maintenance of outdoor afforestation lighting (in the airfield) including poles, immersive lighting, secondary transformers, and lighting panels (mobile lighting poles maintained by others).

4.4.7 Electrical Repair Workshop

The Service Provider is obliged to set up an airside repair facility to enable all repairs and maintenance to equipment in scope. All costs associated with the set-up is at the Service Provider's expense. The Service Provider shall repair all electrical items installed at the airport, to component.

The Service Provider also undertakes to do the following in his own workshop:

- 4.4.7.1** Repair of AGL light fittings
- 4.4.7.2** Rewinding of motors up to 22 kW.
- 4.4.7.3** Re-winding generators up to 100 kW.
- 4.4.7.4** Testing of AGL fittings using controlled bench testing/light tunnel equipment and associated software

4.4.8 Signage

- 4.4.8.1** Signage forms a critical part of the aerodrome infrastructure and give pilots the necessary mandatory and directional information required for holding and taxiing in conjunction with line markings. Maintenance shall be carried out by the Service Provider to ensure integrity and perfect legibility of the information provided by the signs. The design and construction of signs varies considerably but the Service Provider shall carry out the following general checks for each sign:

Frequency	Maintenance Description
Daily/ Weekly	➤ Lighting: Inspection of all signage, replacing burnt-out lamps and control gears as required. ➤ Inscriptions for legibility and absence of obstruction; repairing and the removing obstructions. ➤ Cleaning of units as required ➤ Wind Direction Indicator ➤ Wind Direction Indicator lighting ➤ Civil Works around the signs
Annually	➤ Inspection of sign and mounting. ➤ Internal inspection of illuminated sign. ➤ External and internal cleaning, repairing, or replacing.
Unscheduled	➤ After sandstorm for legibility; removing obstructions / cleaning ➤ After severe rainstorms; re-positioning tumbled signs and repairing damaged signs. ➤ Blanking out of signs when not in use.

4.4.8.2 Temporary Signs

The Service Provider shall provide any temporary signage that may be required for works on the aerodrome. This includes traffic management, all warning signage and information signage required to close off areas whilst under maintenance or repair, or as requested by the Contracting Authority.

4.4.9 Wind Direction Indicator

4.4.9.1 An aerodrome should be equipped with a sufficient number of wind direction indicators in order to provide wind information to the pilot during approach and take-off and the Service Provider shall be responsible for the maintenance of this equipment, including replacement of the indicator itself and also maintenance on the electrical and lighting of these units.

4.4.9.2 Each wind direction indicator should be located so that at least one wind direction indicator is visible from aircraft in flight, during approach or on the movement area before take-off, and in such a way as to be free from the effects of air disturbances caused by nearby objects.

4.4.9.3 Wind direction indicator Characteristics:

- 1 Each wind direction indicator should be in the form of a truncated cone made of fabric and should have a length of not less than 3.6 m and a diameter, at the larger end, of not less than 0.9 m.
- 2 It should be constructed so that it gives a clear indication of the direction of the surface wind and a general indication of the wind speed.
- 3 The colour or colours should be so selected as to make the wind direction indicator clearly visible and understandable from a height of at least 300 m. Having regard to background:
 - a) where practicable, a single colour should be used; and
 - b) where a combination of two colours is required to give adequate conspicuity against changing backgrounds, they should preferably be orange and white, red, and white, or black and white, and should be arranged in five alternate bands, the first and last bands being the darker colour.
 - c) Replacement wind direction indicators should be approved by the Contracting Authority

4.4.9.4 The FM Service Provider shall make provision for illuminating the wind indicators at an Aerodrome intended for use at night.

4.4.9.5 The Service Provider shall be responsible for the maintenance of this equipment, including replacement of the indicator itself and maintenance on the electrical and lighting of these units.

4.4.10 Information Communication and Technology (ICT)

- 4.4.10.1** The Service Provider is responsible for the monitoring, maintenance, instrumentation, inspections, and operational testing according to manufacturer recommendations or best practices of all Air Traffic Control Systems, include it but not limited to:
- 1 APRON Radio Control and Management System (RCMS).
 - 2 Time Distribution System (TDS).
 - 3 VHF/UHF Radio Systems
 - 4 Back-up (Radio)
 - 5 APRON Recording and Playback System (RAPS).
 - 6 APRON Main Voice Communication Control System (VCCS).
 - 7 Display Server.
 - 8 Digital Automatic Terminal Information Service (D-ATIS).
 - 9 Operation console.
 - 10 ANS RAPS
 - 11 Low Visibility Procedures (LVP).
 - 12 SIMULATOR.
 - 13 Operation Displays.
 - 14 Integrated Control and Monitoring System (ICMS).
 - 15 Advanced Surface Movement and Control System (A-SMGCS)
- 4.4.10.2** The Service Provider is responsible for the monitoring, maintenance, instrumentation, inspections, and operational testing according to manufacturer recommendations or best practices of all Metrological Instrumentation (MI) systems, include it but not limited to:
- 1 Weather Surveillance Radar System
 - 2 Meteorological Message Switching System
 - 3 Meteosat Imagery Reception System (Satellite)
 - 4 Low Level Wind Shear Alert System/ Wind Profiler System
 - 5 Wind Measurement System (Back Up)
 - 6 Upper Air Observation System
 - 7 Ambient Air Quality Monitoring System
 - 8 Noise Monitoring System
 - 9 Forecasting Facility: MOB +MET Garden
 - 10 Surface Observing Instrument System
 - 11 Briefing Stations
- 4.4.10.3** The Service Provider shall ensure all the low current systems and their associated components, interfaces and integrations are safe, compliant, reliable, and/ meet all applicable regulations, codes, standards, and manufacturer-recommended maintenance practices and that they operate in accordance with internal health and safety, environment, and quality management systems.
- 4.4.10.4** The Service Provider shall carry out regular PPMs and routine testing on all low current systems and their associated components, interfaces and integrations.
- 4.4.10.5** For the purpose of the Services, it shall be the responsibility of the Service Provider to engage with the Contracting Authorities ICT team on all matters and provide a first line response to all ICT systems to ensure continued, safe and stability of the systems.

- 4.4.10.6 The Service Provider shall respond to Cluster2 requests for production of standard/custom reports, programming of new system interfaces/applying licenses and software features and updates via prescribed ITIL management policies, cybersecurity requirements and repairing system outages, and repair/replacement and maintenance of the associated hardware components.

4.5 Aircraft Pavement and Related Infrastructure Services

- 10.5 The objectives for airfield pavements that the Service Provider is required to achieve are that the surfaces of all movement areas including pavements (runways, taxiways, aprons, and adjacent areas) shall be inspected and their conditions monitored regularly as part of an aerodrome preventive and corrective maintenance programme, avoiding and eliminating any loose stones or other objects and surface irregularities that might cause damage to aircraft structures or engines or impair the operation of aircraft systems and maintaining or prolonging the life of the pavements.

4.5.1 General Pavement and Associated Infrastructure Works

The Service Provider shall ensure the following:

- 4.5.1.1 Mud, dust, sand, hydrocarbons, rubber deposits, and other pollutants are removed, as rapidly and completely as possible, to minimise accumulation.
- 4.5.1.2 Taxiways and aprons are kept clear of pollutants to the extent necessary to enable aircraft to be taxed to and from an operational runway.
- 4.5.1.3 Drainage systems and storm water collection systems are periodically checked, at a minimum quarterly, where necessary cleaned or maintained, to ensure efficient water run-off. A seasonal inspection and cleaning program shall be adapted for periods of expected rain.
- 4.5.1.4 The surface of a paved area including runway are evaluated when constructed or resurfaced to determine that the surface friction characteristics achieve the design objectives. The Service Provider shall verify compliance as part of the handover and acceptance procedure.
- 4.5.1.5 When a taxiway is used by turbine-engine aeroplanes, the surface of the taxiway shoulders must be maintained so as to be free of any loose stones or other objects that could be ingested by the aeroplane engines.

4.5.2 Runway

- 4.5.2.1 The surface of a runway must be maintained in a condition such as to prevent formation of harmful irregularities.
- 4.5.2.2 When there is reason to believe that the drainage characteristics of a runway, or portions thereof, are poor due to slopes or depressions, then the runway surface friction characteristics must be assessed under natural or simulated conditions that are representative of local rain and corrective maintenance action must be taken as necessary.
- 4.5.2.3 Runway Surface Unevenness must be maintained to the requirements of the regulations, with remedial actions taken when necessary.

- 1 The operation of aircraft and differential settlement of surface foundations will eventually lead to increases in surface irregularities. Small deviations in the above tolerances will not seriously hamper aircraft operations. In general, isolated irregularities of the order of 2.5 cm to 3 cm over a 45 m-distance are acceptable, as shown in Figure 1. Although maximum acceptable deviations vary with the type and speed of an aircraft, the limits of acceptable surface irregularities can be estimated to a reasonable extent. The following table describes acceptable, tolerable, and excessive limits.

Surface Irregularity	Length of irregularity (m)								
	3	6	9	12	15	20	30	45	60
Acceptable surface irregularity height (cm)	2.9	3.8	4.5	5	5.4	5.9	6.5	8.5	10
Tolerable surface irregularity height (cm)	3.9	5.5	6.8	7.8	8.6	9.6	11	13.6	16
Excessive surface irregularity height (cm)	5.8	7.6	9.1	10	10.8	11.9	13.9	17	20

- a) If the surface irregularities exceed the heights defined by the acceptable limit curve but are less than the heights defined by the tolerable limit curve, at the specified minimum acceptable length, herein noted by the tolerable region, then maintenance action should be planned. The runway may remain in service. This region is the start of possible passenger and pilot discomfort.
 - b) If the surface irregularities exceed the heights defined by the tolerable limit curve but are less than the heights defined by the excessive limit curve, at the specified minimum acceptable length, herein noted by the excessive region, the maintenance corrective action is mandatory to restore the condition to the acceptable region. The runway may remain in service but should be repaired within a reasonable period. This region could lead to the risk of possible aircraft structural damage due to a single event or fatigue failure over time.
 - c) If the surface irregularities exceed the heights defined by the excessive limit curve, at the specified minimum acceptable length, herein noted by the unacceptable region, then the area of the runway where the roughness has been identified warrants closure. Repairs are required to restore the condition within the acceptable limit region and the aircraft operators may be advised accordingly. This region runs the extreme risk of a structural failure and must be addressed immediately.
- 2 The term 'surface irregularity' is defined herein to mean isolated surface elevation deviations that do not lie along a uniform slope through any given section of a runway. For the purposes of this concern, a 'section of a runway' is defined herein to mean a segment of a runway throughout which a continuing general uphill, downhill, or flat slope is prevalent. The length of this section is generally between 30 and 60 m, and can be greater, depending on the longitudinal profile and the condition of the pavement.
- 3 The maximum tolerable step-type bump, such as that which could exist between adjacent slabs, is simply the bump height corresponding to zero bump length at the upper end of the tolerable region of the roughness criteria of table above
- 4 Deformation of the runway with time may also increase the possibility of the formation of water pools. Pools as shallow as approximately 3 mm in depth, particularly if they are located where they are likely to be encountered at high speed by landing aeroplanes, can induce aquaplaning which can then be sustained on a wet runway by a much shallower depth of water. Improved guidance regarding the significant length and depth of pools relative to aquaplaning is the subject

of further research. It is, of course, especially necessary to prevent pools from forming whenever there is a possibility that they might become frozen.

- 5 Macrotexture and micro texture are taken into consideration to provide the required surface friction characteristics. This will require the Service Provider to carry out some form of special surface treatment.

4.5.2.4 Runway Friction characteristics.

- 1 Runway friction characteristics for maintenance purposes must be periodically measured with a continuous friction measuring device using self-wetting features and be documented. The frequency of these measurements must be sufficient to determine the trend of the surface friction characteristics of the runway. Mu Meter Douglas Equipment or Skiddometer are the two prescribed manufacturers of equipment for use by the Service Provider at Cluster2 Airports. They must have sufficient water capacity to carry out two (2) full runs without refilling. It is the Service Provider responsibility to provide the equipment, its calibration, spare parts and testing by third party annually or as required.
- 2 Corrective maintenance action must be taken to prevent the runway surface friction characteristics for either the entire runway or a portion thereof from failing below a minimum friction level specified by GACAR 139.
- 3 The Service Provider shall ensure runway pavements comply with friction levels typically above the Maintenance Planning level, but always above the minimum friction level. When friction measuring devices are used in order to evaluate the condition of the runway surface for maintenance purposes, the maintenance planning and minimum friction levels should be according to the following table or as per GACA requirements:

Test equipment	Test tire		Test speed (km/h)	Test water depth (mm)	Design objective for new surface	Maintenance planning level	Minimum friction level
	Type	Pressure (kPa)					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
Mu-meter Trailer	A	70	65	1.0	0.72	0.52	0.42
	A	70	95	1.0	0.66	0.38	0.26
Skiddometer Trailer	B	210	65	1.0	0.82	0.60	0.50
	B	210	95	1.0	0.74	0.47	0.34

- 4 Measurements at or below the maintenance planning level trigger a complete survey of the texture, contaminant, and drainage state of the affected runway third.
- 5 A complete survey by the Service Provider should ensure that the runway surface is able to create enough grip by the aeroplane tyre to ensure adequate aeroplane stopping and crosswind capability for the desired operation on a wet runway. This is achieved by ensuring that:
 - a) exposed texture can indent the tyre rubber; and
 - b) water drains from the runway pavement.
- 6 In order to achieve the objectives, a monthly inspection of the surface friction characteristics by the Service Provider should, as a minimum, ensure:
 - a) the presence of exposed micro texture by touching the aggregates, if the polished or rubber coated extends to 100 m in the zone used by aeroplanes;
 - b) the presence of macrotexture;
 - c) that grooves, if present, are open and within set limits according to their design;

- d) that porous friction course, if present, drains according to its design; and
- e) that slopes are above minimum design specifications.
- 7 Periodic Assessments of Runway Surface Friction Characteristics
The Service Provider, when establishing a plan of periodic assessments of runway surface friction characteristics, should take into consideration the number of jet aircraft movements per runway end, the weight of the aircraft, the type and age of the surface of the runway as well as climatic conditions.
- 8 Trend Monitoring of Runway Surface Friction Characteristics
The Service Provider shall monitor the trend of degradation of runway surface friction characteristics that is caused by:
 - a) rubber deposits.
 - b) surface polishing; and
 - c) poor drainage.
- 9 Functional Friction Evaluation with Continuous Friction Measuring Devices
The Service Provider, when conducting functional friction evaluations with continuous friction measuring device, shall:
 - a) for friction evaluations on runways at 65 km/h, begin recording the data 150 m from the threshold end to allow for adequate acceleration distance and terminate approximately 150 m from the opposite end of the runway to allow for adequate distance to safely decelerate the vehicle;
 - b) for friction evaluations on runways at 95 km/h, begin recording the data 300 m from the threshold end to allow for adequate acceleration distance and terminate approximately 300 m from the opposite end of the runway to allow for adequate distance to safely decelerate the vehicle; and
 - c) conduct the surveys at a distance from the runway center line that is representative of the wheel span of the airplanes operating on the runway. Nominally these will be 3 and 6 meters from the centerline.
 - d) The aerodrome layout or other circumstances may dictate other distances in order to ensure the personal safety of the operator of the friction measuring device.

4.5.3 Management of Aircraft Pavement

A pavement management system must be implemented by the Service Provider to ensure the surfaces of aircraft routings such as runways, taxiways, aprons, and stands are structurally sound, free from surface stresses and cracks and free from the risk of creating FOD. In the case of the runways, it is imperative for aircraft safety that the friction levels meet the requirements set out in ICAO Annex 14.

4.5.3.1 Evaluation of Airfield paving

The Service Provider shall implement the pavement management system so that the following criteria, as a minimum, are monitored and acted upon where necessary:

- 1 Friction on the surface of the runway paved areas (slip resistance test)
- 2 Friction must be above minimum 0.4 as per the Mu-Meter (take action 0.6-0.45) at all times
- 3 This must be monitored and trended every four weeks and the planning of rubber removal will be based on these readings.
- 4 Tests must be done by an approved friction machine, under simulated wet conditions.
- 5 Tests must be completed after de-rubbing or other rehabilitation works of the runways.

4.5.3.2 Pavement Condition

The FM Service Provider shall:

- 1 Establish and maintain Pavement Condition Index (PCI)(Visual).
- 2 Act on over band sealing cracks and other repairs as required to keep the surfaces safe and integral. Only use approved materials.
- 3 Establish Pavement Condition Number (PCN) (Structural strength), every 2 years or following pavement rehabilitation or newly constructed pavement. PCN value for associated pavements must be obtained by the Service Provider as part of the handover of rehabilitated or new infrastructure or PCR (Pavement Condition Rating).
- 4 Monitor Aircraft Classification Number using pavement and determine areas of pavement overload (ACN). This will define where more regular inspections and maintenance are required
- 5 Identify specific quality of paved areas tolerance (smoothness / roughness test) Macro and Micro qualities of the pavement
- 6 Establish situation of the construction of paved areas (non-destructive inspection FWD / HWD)
- 7 Joint rehabilitation programme to be carried out in all areas by the Service Provider following end of life of jointing material, typically 7/8 years or as guided by manufacturers recommendations.
- 8 The provision of aforementioned values must be provided by an accredited and fully certified service provider.
- 9 Inspection and review services when pavements are overloaded.
- 10 Provide and implement overload procedures, inspections and reports where required.

4.5.4 Evaluation of Current State of Airfield pavements

The Service Provider, using the above methodologies, will determine the quality of the existing pavements and formulate the condition onto a RAG Map, (red meaning rehabilitation in years 1-5, amber meaning planning for next 5-year period and green meaning good for ten years plus). The Service Provider shall then carry out a risk-based prioritization of works required to rehabilitate the red areas into a recommended project plan for investment purposes to be put forward and approved by the Contracting Authority.

4.5.5 Surface quality of paved areas: types of defects to be treated

Many types of different defects can occur on aircraft paved areas that will each need differing forms of treatment. These are some of the more common types:

- 4.5.5.1 In the first instance cracks can be over banded and sealed which will be carried out by the Service Provider within the scope of the Contract.
- 4.5.5.2 Potholes and break up can be repaired with approved cold materials which will be carried out by the Service Provider within the scope of the Contract. This will be considered a quick fix and should be planned to be replaced by HMA. This is within the scope of the contract.
- 4.5.5.3 Concrete slabs may fully fail and need to be replaced or under pumped if the sub layers have subsided. This will be out of scope of the Contract and pricing will be determined using the agreed schedule of rates.
- 4.5.5.4 It is important that a slab joint replacement programme is in place to protect the main asset and prevent FOD.
- 4.5.5.5 Pavement irregularities as defined in GACAR 139 should be repaired as applicable.
- 4.5.5.6 Major areas of surface may need an asphalt inlay if the sub layers are sound to reinstate the surface. Inlays less than 100m² will be deemed within the scope of the Contract. Areas larger than this will be considered out of scope and pricing will be determined using the agreed schedule of rates.

- 4.5.5.7 If a full structural overlay is required, works will be out of scope for the Service Provider and will be covered under capital projects by tender.

4.5.6 Paved Areas

When performing maintenance of paved areas, the Service Provider shall comply with the following, without limitation:

- 4.5.6.1 Repair and maintenance of all areas paved with concrete and asphalt (including epoxy layers), expansion joints, roads, side edges, midway roads, side walkways, parking areas, bridges, road intersections, surround of draining areas, protective bars, border walls and associated retaining walls as required. The construction of new berths is part of the normal scope of work for this Contract, and there will be no separate payment for this.
- 4.5.6.2 Carry out all planning and renewal work, paint marks and renew them for all paved areas in the airfield, including flight runways, sub-corridors, aircraft parking lots, and (Pads) on the basis of three times each year as the least estimate, while ensuring their suitability for international conditions with regard to the degree of reflection.
- 4.5.6.3 Implementation of all the planning work, renewal planning, make signs and renew them for all road pavements in the airfield road areas, while ensuring their suitability for international conditions with regard to the degree of reflection.
- 4.5.6.4 Implement sweeping and washing of all runways, taxiways, sub-corridors, aircraft parking aprons, platforms, paved roads, open parking lots and sides of paved areas, to maintain surfaces in accordance with the highest standards of safety and hygiene.
- 4.5.6.5 Carry out the work of smoothing, levelling, and paving for a tape that is five (5) meters wide on the inside and outside of the security fence of the airfield once every year. Smoothing, levelling, and paving of other areas as directed by the Contracting Authority.
- 4.5.6.6 Provide a weed control program to obtain the Contracting Authority's approval and implement it in all regions of the airfield. The weed control program should be limited to those areas and places where the uncontrolled growth of plants hinders the operation or utilization of airport facilities. Chemical weed spraying should take place to incorporate dye to identify, monitor and control treated areas.
- 4.5.6.7 Carry out all excavation and backfilling work required for repairs and / or adjustments to the airport drainage networks, including sand removal, cleanliness of the drilling channels, and erosion monitoring of lined and unlined channels, basins, and underpasses, including security net barriers.
- 4.5.6.8 Removing all residues of rubber, oil stains, paint, excess water or any materials or other things from runway surfaces, sub-corridors, aircraft parking aprons, platforms, paved roads, or parking areas, twice a year (or as required) to maintain such surfaces above Safety and hygiene standards, with an emphasis on ensuring that these areas comply with international standards in this regard, provided that the most recent methods are used to remove the accumulation of rubber, and chemicals. It is important that the Service Provider ensures that any work programmes have minimal impact on airport operations and work effectively and efficiency within the time constraints of a busy airport operations schedule, particularly flight/movement schedules.
- 4.5.6.9 Maintain (daily, weekly, monthly, quarterly, semi-annual, and annual) records of all work that is performed and submit these records to the Contracting Authority periodically or upon request.
- 4.5.6.10 Inspecting, cleaning, repairing, replacing, and raising the efficiency and installation of all airport signs outside the buildings, including related poles, bases, and foundations.
- 4.5.6.11 Inspecting, cleaning, repairing, repainting, replacement and installation of side edges, poles, side edges and reflective road signs of any nature.
- 4.5.6.12 Obtain any subterranean samples as directed by the Contracting Authority.

- 4.5.6.13 Loading, transporting, delivering, and spreading gravel or other material as directed by the Contracting Authority or as specifically stipulated within the scope of Services.
- 4.5.6.14 Placing and re-aligning the removable concrete edges and side edges
- 4.5.6.15 Providing a heavy lifting service to other airport departments as directed by the Contracting Authority
- 4.5.6.16 Provides temporary lighting to areas using mobile lighting devices and generators when requested by other airport managements and / or as directed by the Contracting Authority
- 4.5.6.17 Inspecting daily (FOD), weekly, monthly, quarterly, and yearly the Aircraft Pavement Network
- 4.5.6.18 The Service Provider is responsible for the integrity of all paved surfaces, including maintenance of fuel-hydrant lids, drain covers, manholes and electrical pit lids. The Service Provider shall be responsible for full manhole maintenance and reinstatement where necessary. The Service Provider shall be responsible to barricade any requested area at the airfield and follow the requirements for that.

4.5.7 Markings

All markings on the paved areas at Cluster2 airports should be inspected on a weekly basis and repainting work is scheduled based on the conditional report received.

Frequency	Maintenance Description
Conditional assessment Weekly / Monthly	➤ Centerline markings on all runways, particularly in Touchdown area. ➤ Centerline marking to all taxiways. ➤ Road holding position markings. ➤ Other markings as required following assessment. ➤ Paint lead in lines, numbers, hammer heads & alignment bars as well as: ➤ Paint wing tip clearance and roadway markings, all at least quarterly. ➤ Apron Markings
BI-Annually	➤ Paint runway edge marking, aiming point markings, TDZ markings, designator, and threshold markings at least yearly to all runways. ➤ Paint taxiway centerline and edge markings. ➤ Service road, curbs, manholes twice a year
Unscheduled	➤ As required following stakeholder feedback.

Markings which are faded or discolored by soil shall be repainted. When rubber deposits have been removed from the pavement all defaced markings shall be painted as soon as practicable.

- 4.5.7.1 Paint removal is included within the scope of the Contract. The Service Provider needs to have the necessary equipment and trained staff to remove markings due to either paint failure or at the request of the Contracting Authority to ensure compliance with GACA / ICAO standards. The Service Provider shall adapt paint removal methods for the various surfaces, and method trials shall be carried out to ensure pavement surface integrity is not compromised. When refreshing existing markings, the Service Provider shall remove remnants of old markings as much as practical to minimize FOD and ensure marking quality. The Contracting Authority may require alterations to paint marking designs. Where there is no demonstrative change in the quantity of line markings, the Service Provider shall carry out the alterations.
- 4.5.7.2 The Service Provider shall have scope for new paint markings set out as in the schedule of rates, price per linear meter in white, black, yellow, red, green, and blue. This shall not include paint markings that have had to be removed and then reinstated in a compliant way or because of safety/compliance issues.
- 4.5.7.3 The Service Provider shall include an In-house ACAD Operator with Airport line marking design experience to update line marking drawings as required.

4.5.7.4 The Service Provider shall provide temporary taxiway/roadway closure markings and any other temporary markings as may be required from time to time.

4.5.7.5 The Service Provider shall provide Surveying Services to be used to ensure compliance of markings with approved designed and for updating drawings as required.

4.5.8 Aircraft Pavement Cleaning

This section is to be read in conjunction with section 4.7.24.7.2, FOD Prevention.

4.5.8.1 Sweeping/Cleaning

The Service Provider is to fulfil and deliver the below requirements:

- 1 Provide multiple levels of cleaning to cater for area availability and size constraints. This would range from vehicle-based cleaning solutions (high speed FOD Management solution, heavy duty pavement sweepers) to manual cleaning.
- 2 Develop and implement set patterns of sweeping for aprons, stands, and gates to ensure uniformity, consistency, and auditability of cleaning.
- 3 Provide a routine maintenance plan to ensure the regular cleaning of aprons and stands. The Service Provider shall have the capacity to clean the aircraft pavement every week.
- 4 Ensure teams are available to ensure delivery of routine and reactive pavement cleaning on a 24 hour basis.
- 5 Implement a reporting system which identifies and tracks cleaning execution.

4.5.8.2 Spills Containment and cleaning/removal

- 1 Integrate cleaning and removal of spills within the heavy-duty pavement sweeper solution for large sensitive areas. Provide an alternative semi-manual/manual process for small or not sensitive areas.
- 2 Provide spill containment kits to ensure minimal contamination of ground water systems and environment. Spill kits should be readily available and quickly deployed.

4.6 Other Civil Infrastructure Services

4.6.1 Airfield Security Perimeter Fences

The Service Provider, when performing maintenance works on fences and gates, shall do the following, without limitation:

- 4.6.1.1 perform maintenance services for all aerodrome fences to include, but not be limited to; lighting, fence posts, chain linked fencing, signs affixed to the fence, corner braces, gates, gate posts, gate hinges locking devices, sliding door, drop arm, the hydraulic gates, hasps, out riggers, barbed wire, tension wires, tension bars, concrete bases, and tie wires.
- 4.6.1.2 develop a fence inspection and repair plan which shall be submitted for the Contracting Authority's approval. The plan shall include, but not be limited to, security fence, perimeter fence, blast fence, boundary fence, breakaway fence section, etc.
- 4.6.1.3 Provide service 24 hours, 365(6) days a year, to fix all faults/violations in the airport security fence. The response time for repairs to be prioritized as Priority 2 (P2), an urgent response.
- 4.6.1.4 Install and relocate, as directed, all signs, concrete blocks, barrels, barricades, and fences.
- 4.6.1.5 Maintain and repair all airfield fixed scan points.
- 4.6.1.6 provide sufficient manpower for emergency fence repairs due to, but not limited to, accidents or incidents, breeches of security, weather related events, natural phenomena and any other accidents or as directed by the Contracting Authority.

- 4.6.1.7 perform routine maintenance during normal working hours. Urgent repairs shall start immediately upon notification and continue until the issue has been resolved.

4.6.2 Culverts and Drainage

- 4.6.2.1 Pooled water on the aerodrome shall be removed as part of the Wildlife Management Plan and for aircraft safety.
- 4.6.2.2 Culverts and drains shall be cleaned regularly and prior to expected rain periods to minimize the incidence of pooling. This shall form part of a surface water prevention program.
- 4.6.2.3 Removal of pooled water on paved areas shall be removed as fast as practical.
- 4.6.2.4 Areas on the aerodrome that exhibit pooling of water or seem susceptible to water pooling shall be rehabilitated to the requirement of the aerodrome drainage plan.

4.6.3 Roads and Pavements

- 4.6.3.1 Roads and ramps associated with BHS halls are the responsibility of the Service Provider. This includes delivery roads into the terminals and related tunnels.
- 4.6.3.2 The Service Provider shall provide facility management service (namely, routine, periodic and emergency) to Roads and Pavements to include, but not limited to: (Inspections, Preventive Maintenance, Corrective Maintenance and Test) to road and street (road structures, base, sub-base, road markings, reflectors, traffic buttons, curbs, guardrails, signs and handrails), bridges, tunnels, cracks repair, barriers, spilling of pavement surface (potholes, subsidence/settlement, erosion and cracks repair), and any other area or elements as directed by the Contracting Authority.
- 4.6.3.3 The Service Provider shall inventory and manage and supply all types of barriers, submit to the Contracting Authority a comprehensive inspection and maintenance schedule, ensure that all items are in serviceable, clean, and aesthetic condition. Movable items will be ready to deploy, transfer and relocate, and the Service Provider shall manage their movements and deployment based on Contracting Authority's requirements.
- 4.6.3.4 The Service Provider shall repair the damaged or worn-out guard rails and handrails reflectors, and traffic buttons. In addition, the Service Provider shall replace those elements that cannot be repaired.
- 4.6.3.5 An Annual Pavements Maintenance Plan shall be developed by the Service Provider. The Plan shall be submitted to the Contracting Authority for approval not later than forty-five (45) days after the Commencement of the Services and bi-annually thereafter, and shall include, but not limited to, pavement inspections, maintenance, and repairs such as pavement markings, pavement, and crack sealing, replacement of spalled, scaled, broken and any other deteriorated or subsided areas.
- 4.6.3.6 The Service Provider shall perform all types of inspections for example weekly inspections of all roads, bridges, streets, tunnels to include, but not limited to, pavement surfaces, guard rails, handrails, road markings, traffic reflectors and buttons, and wheel stops, and prepare work orders and correct all discrepancies and any other items to be corrected as directed by the Contracting Authority. All inspections must be documented, and inspection reports must be submitted to the Contracting Authority. The Service Provider shall correct all discrepancies utilizing the CAFM System.
- 4.6.3.7 Routine pavement maintenance or any similar maintenance shall be performed in accordance with the Annual Maintenance Plan and emergency repairs shall start immediately to eliminate any emergency situation, and to restore it to a safe and operational condition. Such as All pavement repairs shall restore the pavement to the original design specifications. The re-striping shall be accomplished on a planned basis as determined by the Contracting Authority and in conformity with drawings made available for use.

- 4.6.3.8 The Service Provider shall be responsible for civil works on all Structures related to or owned by Cluster2 and across all areas of the aerodrome. Civil works include, but are not limited to:
- 1 Monitoring of all structures to ensure their structural integrity, eliminate any risks due to unsecured structures or components, functionality, and general appearance and state of repair.
 - 2 Water proofing systems. This includes but not limited to any temporary sheathing or protections where applicable. Also included is the water and thermal proofing.
 - 3 General Ironmonger, carpentry, painting, and masonry work where required and as directed by the Contracting Authority.
 - 4 Cleaning of manholes, inspection chambers, storm water drains, water supply, sewage pipes.
- 4.6.3.9 The Service Provider shall inventory all general civil works items and will submit to the Contracting Authority a comprehensive inspection and maintenance schedule with equipment replacement based on state of wear, age, and technology. Specific services shall be planned and executed by the Service Provider to ensure that all reinforced concrete and steel structures are in a structurally sound state of repair and that there are no risks or hazards due to concrete breakage or steel degradation.
- 4.6.3.10 Concrete and steel structures shall be regularly inspected to look for defects, breakage, corrosion, sinking, poor foundations or unstable footings, and all other deficiencies. An inspection plan shall be presented to the Contracting Authority for review and approval, and regular progress reports shall be produced and reviewed with the Contracting Authority to determine remedial steps. All protective measures shall be taken in case of identification of risks and hazards and shall be reported for immediate action and remediation.
- 4.6.3.11 Maintenance and corrective tasks will include, but will not be limited to:
- 1 Concrete inspections, test, and repair.
 - 2 Rebar inspections. tests and repairs
 - 3 Steel structure inspections and tests Concrete injection, as applicable
 - 4 Repair, patching, welding, and other remediation tasks
 - 5 Application of protective substances of all types (e.g. antioxidants, coatings)
- 4.6.3.12 The Service Provider shall develop a Pavements and similar work Cleaning Plan to be submitted to the Contracting Authority for approval prior to the commencement of the Services. The plan shall include, but not limited to, sweeping, vacuum, removing and transfer rough waste, left over, and electro-magnetic cleaning of the roads, bridges, tunnels, passenger and staff parking areas, and the cleaning up of all leftover and spills caused by road traffic accidents (RTA) or natural phenomenon.
- 4.6.3.13 The Service Provider shall clean and clear all main Streets, roads, bridges, tunnels, and roadways once a day, perform sweeping during periods of low usage or more frequently as required by the Contracting Authority.
- 4.6.3.14 The Service Provider shall, during period of increased traffic movement or periods of inclement weather conditions, clean all roads once every four to eight (4 to 8) hours or more frequently as required by the Contracting Authority. and shall inspect all overpasses after periods of high winds, sandstorms and any other phenomena or emergency, etc. and sweep areas and return it to its origin condition. All requirements shall be performed as required or requested by the Contracting Authority.
- 4.6.3.15 The Service Provider shall sweep and clean all roads without damaging any furniture/elements include, but not limited to the pavement, buttons, signs and reflectors.
- 4.6.3.16 The Service Provider shall use proper acceptable equipment and qualified operators and manpower.
- 4.6.3.17 The Service Provider shall keep all equipment and vehicles visually clean.

- 4.6.3.18 The Service Provider shall be available 24/365(6) with sufficient manpower and equipment to attend to any accidents or any emergency and clean and clear up all debris, liquids, or spillage, etc from vehicles, ground equipment, or cargo, etc, then Scrub the affected areas and return it to its origin state.
- 4.6.3.19 The Service Provider shall maintain any future projects or work inside the airport executed by another contract. After the work has been completed by a 3rd Party, the Service Provider shall participate in the handing over to the Contracting Authority.
- 4.6.3.20 This document shall be read in conjunction with the following Documents from the Kingdom of Saudi Arabia Ministry of Communications.

Kingdom of Saudi Arabia Ministry of Communications.

General Specifications for Road and Bridge Construction 1998

Part 1	General
Part 2	Earthwork
Part 3	Aggregate Sub-base and Base Courses
Part 4	Bituminous Construction
	Addendum to the November 1998 Ministry of Communications General Specifications Part 4.
Part 4	Bituminous Construction
Part 5	Concrete, Steel and Structures
Part 6	Incidental Construction
Part 7	Roadway Lighting and Traffic Signals
Part 8	Landscaping and Irrigation
Part 9	Traffic Control Devices and Work Zones
	Supplemental Specifications for the Construction of Agricultural Roads November 1998
	Master List of Pay Items, Numbers, Descriptions and Units, New Construction Pay Items, November 1998

General Specifications for Road and Bridge Construction

- 4.6.4** Pedestrian Paved Sidewalks and Passages
- The maintenance services will include regular inspections, repairs and test of all paved surfaces so that they are functional and safe, free of dangerous hazards or risks, and in a good state of repair and aesthetic appearance. This includes, minimally, the following items:
- 4.6.4.1 All paved sidewalks, including all berms and dividers.
- 4.6.4.2 All paths connect buildings, parking, and gates.
- 4.6.4.3 All pedestrian areas on bridges
- 4.6.5** The Service Provider shall be responsible for regularly inspecting and cleaning of all paved surfaces (water, sludge, sand, and debris). This also includes reactive services in case of reported incidents and/or other events.
- 4.6.6** The Service Provider shall carry out a full inventory during the mobilization period and will submit a maintenance schedule for review and approval by The Service Provider Authority. This will include regular inspection reports, as well as planned maintenance activities.

- 4.6.7** The Service Provider shall provide a cleaning and maintenance schedule to The Service Provider Authority for approval and inspection purposes in addition to emergency repair services.

4.7 FOD Management

4.7.1 General Requirements

- 4.7.1.1** The Service Provider shall establish and implement a Foreign Object Debris (FOD) control programme and shall require their staff and any sub-contractors providing services at the aerodrome to participate in the FOD control programme.
- 4.7.1.2** As part of the FOD control programme, the Service Provider shall:
- 1 ensure staff awareness and participation, and that such staff have successfully completed relevant training and demonstrated their competence,
 - 2 establish and implement measures to prevent generation of FOD,
 - 3 establish and implement procedures to:
 - a) detect FOD, including the monitoring and inspection of the movement area or adjacent areas in accordance with an inspection schedule and whenever such an inspection is required due to activities, weather phenomena, or occurrences that may have led to the generation of FOD,
 - b) promptly remove, contain, and dispose of FOD, and provide all relevant means necessary,
 - c) notify, as soon as possible, the Contracting Authority Aerodrome operations in the case of identified aircraft parts,
 - d) collect and analyse data and information to identify FOD sources and trends, and implement corrective or preventive measures, or both, to improve the effectiveness of the programme.
 - 4 provide, deploy and FOD bins throughout the aerodrome.
 - 5 Provide large sweepers with appropriate FOD controls
 - 6 Provide small sweepers with appropriate FOD controls
 - 7 Establish a team for ensuring the apron areas are free from FOD.

4.7.2 FOD Prevention

4.7.2.1 Staff Awareness

Service Provider staff should be kept aware through appropriate activities of the existence of the FOD control programme and shall be actively encouraged to identify and report potential FOD hazards, act to remove observed FOD, and propose solutions to mitigate related safety risks.

4.7.2.2 Staff Training

The Service Provider FOD training programme shall aim at increasing the staff awareness of the causes and effects of FOD damage and to promote their active participation in eliminating FOD during the performance of daily work routines.

- 1 The theoretical part of the Service Provider initial FOD training programme shall cover, but not be limited to, the following areas:
 - a) safety of aircraft, staff, and passengers as they relate to FOD;
 - b) overview of the FOD control programme in place at the aerodrome.
 - c) causes and principal contributing factors of FOD creation.
 - d) the consequences of ignoring FOD, and/or the incentives for preventing FOD.
 - e) practising 'clean-as-you-go' work habits and the general cleanliness and inspection standards of work areas.
 - f) FOD detection procedures, including the proper use of detection technologies (if applicable).

- g) requirements and procedures for the regular inspection and cleaning of movement areas.
 - h) FOD removal procedures.
 - i) proper care, use, and stowage of material and component or equipment items used around aircraft while in servicing, maintenance or on aerodrome surfaces.
 - j) control of debris in the performance of work assignments.
 - k) control over personal items and equipment.
 - l) proper control/accountability and care of tools and hardware.
 - m) how to report FOD incidents or potential incidents.
 - n) continuous vigilance for potential sources of FOD.
- 2 Following the successful completion of the theoretical training, the practical part of the training to be provided by the Service Provider should consider the individual needs of the trainees, according to the responsibilities/tasks of the staff, and, as a minimum, should include familiarisation with the tools/equipment used for the removal/containment/prevention of FOD, and the implementation of the relevant aerodrome operating procedures related to the programme. Following the completion of the practical training, a competency assessment should take place for all staff.

4.7.3 FOD – Prevention Measures

- 4.7.3.1 The Service Provider shall identify activities that may be associated with the generation of FOD, as well as measures that should be taken in order to prevent this from happening. A record of the analysis made should be maintained.
- 4.7.3.2 FOD may be produced by many activities and may be generated by staff, passengers, aerodrome infrastructure (pavements, lights, and signs), the environment (e.g., wind, heavy rain), aircraft, vehicles, or other equipment operating at the aerodrome. The elements below have also the potential to become sources of FOD on an aerodrome.
- 4.7.3.3 Apron and adjacent areas
- Due to the activities around the apron areas, FOD is a major issue and requires proactive measures to ensure the safety of aircraft. The Service Provider shall assess the FOD generation in this area and develop a cleaning team of appropriate size to manage the FOD in this area.
- 4.7.3.4 Construction Activities
- 1 During construction activities, several materials (rocks, tools, vehicle parts, etc.) have the potential to become FOD if transferred by vehicles, weather phenomena, etc. on the movement area or other operational areas. For this reason, specific FOD prevention procedures need to be established and employed for each construction project. These procedures would be based on the proximity of the construction activities to the movement area and other operational areas, but in general would stress containment and regular cleaning of construction debris.
 - 2 Aerodrome pre-construction planning would include means for controlling and containing FOD generated by the construction. This is especially true in high-wind environments where debris is more likely to become airborne.
 - 3 The designated routes of construction vehicles on the movement area need to be planned so as to avoid or minimise crossing in critical areas of aircraft operations. If high-risk crossings cannot be avoided, subsequent provisions such as an increased frequency of FOD inspections could be implemented.
 - 4 Service Providers need to understand and comply with the requirements regarding the control and removal of FOD. To facilitate compliance with these requirements, the aerodrome operator

may consider drafting FOD control guidance for all construction projects taking place within the movement area or nearby areas. Standard and project specific FOD measures include, but are not limited to:

- a) requiring contractors to cover all loads.
- b) requiring contractors to secure any loose items that could easily blow away or control dust through spraying of water;
- c) ensuring the proper functioning of storm drains throughout the construction.
- d) specifying whether any mechanical FOD removal devices will be required.
- e) specifying how monitoring for FOD hazards will be accomplished.
- f) requirements for inspecting and removing FOD from tyres prior to traversing operational areas.

4.7.3.5 Aerodrome Maintenance Operations

- 1 Maintenance operations routinely disturb the vegetation and soil in areas adjacent to those travelled by aircraft. Therefore, procedures to remove this debris, such as the use of an assigned aerodrome sweepers or staff on foot using shovels to repair vegetation and soil, need to be implemented.
- 2 Aerodrome lighting, pavement, and marking maintenance operations may generate concrete/asphalt debris as well as increase the potential for dropped repair parts, tools, and other items stored on the maintenance vehicles. Corrective procedures may include the use of aerodrome sweepers and the inspection of the worksite after maintenance is completed.

4.7.3.6 Pavements and other aerodrome surfaces may be prone to generating FOD

- 1 Deteriorating pavements can exhibit spalling or cracks. For example, pieces of concrete can break loose from pavements or FOD can develop from fatigue corner cracks.
- 2 The service roads that cross taxiways may generate FOD from the vehicles using them, especially in the case of construction operations.
- 3 Special attention should be paid to the cleaning of cracks and pavement joints.
- 4 Asphalt and concrete pavements may be the most common source of FOD on an aerodrome; therefore, effective pavement maintenance practices are important for the prevention of FOD.
- 5 Open areas, grass areas and ditches may collect and hold large amounts of light debris such as paper, cardboard, plastic, and various containers that can originate from terminal aprons, cargo ramps and hangar ramps. This debris can blow back into areas used by aircraft unless collected in a timely manner. The Service Provider is responsible for the collection and the removal of the debris.
- 6 Unpaved areas adjacent to pavements may require stabilisation, as appropriate, to prevent FOD from jet wash.
- 7 FOD fences may collect debris on windy days. This FOD would be collected before the wind increases or changes direction and the debris blows back on to areas used by aircraft.
- 8 The area between the two security fences hold large amounts of light debris such as paper, cardboard, plastic, and various containers. The Service Provider is responsible for the collection and the removal of the debris between the fences

4.7.3.7 Vehicle operational activities

Vehicles used for operational reasons, e.g., preventive maintenance, wildlife management, and which may need to frequently move on surfaces that contain material that could be FOD in the movement area. Thus, procedural (e.g., inspection/cleaning of tyres) or technical (development of

surfaces at predetermined points that help the removal of FOD from tyres) measures may be taken to address this potential FOD source.

4.7.4 FOD Analysis – Continuous Improvement

- 4.7.4.1 All FOD identified and collected on the aerodrome should be recorded, analysed, and evaluated by the Service Provider. To record the location of the FODs, a grid map of the aerodrome should be used. When needed, an investigation should be carried out to identify the source of the FOD. The sources of FOD, including their location and the activities generating FOD on the aerodrome, should be identified, recorded, and analysed to identify trends and problem areas as well as to focus the efforts of the FOD control programme. Relevant records, including of the actions taken, should be maintained.
- 4.7.4.2 The Service Provider FOD control programme should be periodically reviewed to assess and continually improve its effectiveness. The programme should be updated based on the feedback received, data analysis results and trends identified through the evaluation of FOD collected at the aerodrome.
- 4.7.4.3 The Service Provider shall supply and manage all FOD bins as required by the GACAR 139 standards to ensure proper control of FOD within the aerodrome. These shall be approved by the Contracting Authority.

4.8 Wildlife Management

4.8.1 General

- 4.8.1.1 The Service Provider shall:
 - 1 establish procedures to record and report to the appropriate authority wildlife strikes to aircraft occurred at the aerodrome, in close cooperation with organization's operating, or providing services at the aerodrome;
 - 2 ensure that wildlife hazard assessments are made by competent staff; and
 - 3 establish, implement, and maintain a wildlife risk management programme.
- 4.8.1.2 The Service Provider must take action to eliminate, or to prevent ,the establishment of garbage disposal dumps or any other source which may attract wildlife to the aerodrome, or its vicinity, unless an appropriate wildlife assessment indicates that they are unlikely to create conditions conducive to a bird hazard problem Where the elimination of existing sites is not possible, the appropriate authority must ensure that any risk to aircraft posed by these sites is assessed and reduced to as low as reasonably practicable.

4.8.2 Wildlife Risk Assessment

- 4.8.2.1 The Service Provider is expected to work with the Contracting Authority Aerodrome Management to, as a minimum:
 - 1 conduct a risk assessment using strike data for each species, as well as information on the presence of species, the number of individuals, and their biology, and update regularly;
 - 2 take into account the number of strikes for each species and the severity of damage arising from those strikes; and
 - 3 target actions on those species which are present with the highest frequency and create the greatest damage.
- 4.8.2.2 Wildlife risk assessments should be made by appropriately qualified staff.

4.8.3 Wildlife Risk Management Programme

The wildlife risk management programme should include, as a minimum, but not be limited to, the following elements:

4.8.3.1 assignment of staff:

- 1 a person who is accountable for developing and implementing the wildlife risk program
- 2 a person who oversees the daily wildlife control activities, and analyses the collected data and carries out risk assessments in order to develop and implement the wildlife risk management programme; and
- 3 trained and qualified staff who detect and record the birds/wildlife, and assess the bird/wildlife hazard, and expel hazardous birds/wildlife,
- 4 training to be to ACI standard.

4.8.3.2 a process to report, collect, and record data of struck and living birds/wildlife,

4.8.3.3 a process to analyse the data and to assess the bird/wildlife hazard to develop mitigation, proactive, and reactive measures. This should include a risk assessment methodology,

4.8.3.4 a process of habitat and land management both on, and in its surroundings, whenever possible, in order to reduce the attractiveness of the area to birds/wildlife,

4.8.3.5 a process to remove hazardous birds/wildlife,

4.8.3.6 a process for liaison with non-aerodrome agencies and local landowners, etc. to ensure the aerodrome is aware of developments that may contribute to creating additional bird hazards within the surrounding of the aerodrome's infrastructure, vegetation, land use and activities (for example crop harvesting, seed planting, ploughing, establishment of land or water features, hunting, etc. that might attract birds/wildlife).

4.8.4 Training of Wildlife Control

The Service Provider shall ensure, but not be limited to, the following:

4.8.4.1 Aerodrome wildlife control staff receive formal training prior to their initial engagement as wildlife controllers.

4.8.4.2 Training for aerodrome wildlife control is documented and records of it are retained and available for inspection and to satisfy periodic reviews, audits, and competence checks.

4.8.4.3 Training of aerodrome wildlife control staff is conducted by qualified aerodrome wildlife control staff, or specialists with proven experience in this field,

4.8.4.4 Wildlife control initial training should, as a minimum, but not limited to, address the following general areas,

- 1 an understanding of the nature and extent of the aviation wildlife management problem, and local hazard identification.
- 2 an understanding of the national and local regulations, standards, and guidance material related to aerodrome wildlife management programs (use of best-practice models),
- 3 appreciation of the local wildlife ecology and biology, including (where applicable) the importance of good airfield grass management policies, and the benefits they can deliver to wildlife control,
- 4 the importance of accurate wildlife identification and observations, including the use of field guides.
- 5 local and national laws and regulations relating to rare and endangered species, and species of special concern, and the aerodrome operators' policies relating to them;
- 6 wildlife strike remains collection, and identification policies and procedures.

- 7 long-term (passive) control measures, including on and off aerodrome habitat management, including identification of wildlife attractions, vegetation policies, air navigation aids protection, and drainage system, and water body management practicalities.
- 8 short-term (active) tactical measures, using well established effective wildlife removal, dispersal, and control techniques,
- 9 documentation of wildlife activities and control measures, and reporting procedures (the aerodrome wildlife management plan);
- 10 firearms and field safety, including the use of personal protective equipment; and
- 11 wildlife strike risk assessment and risk management principles, and how these programs integrate with the aerodrome's safety management system.

4.8.4.5 Wildlife control staff should be fully aware of the conditions and terms of the operations of the aerodrome environment. Where this is not relevant, the wildlife control staff should receive appropriate training as per the Service Providers training plan, which shall include, but not be limited to:

- 1 aerodrome airside driver training, including aerodrome familiarization, air traffic control communications, signs and marking, navigational aids, aerodrome operations, and safety and other matters the aerodrome operator deems appropriate; and
- 2 aircraft familiarization, including aircraft identification, aircraft engine design, and impact of wildlife strikes on aircraft systems.

4.8.4.6 The Service Provider shall ensure that wildlife control staff maintain competence in the role. This could be achieved either by regular refresher training or another system of monitoring, acceptable to the appropriate authority. The maintenance of competence should include the areas in **Sections 4.8.4.4 and 4.8.4.5** above, and include, but not be limited to:

- 1 reviewing firearms safety,
- 2 changes in the local environment
- 3 changes in risk management policy
- 4 recent wildlife events at the aerodrome
- 5 improvements in active and passive measures
- 6 any other matters the aerodrome operator deems appropriate.

4.8.5 Wildlife Management Measures

The Service Provider shall implement proactive measures for the control of wildlife. Such measures shall include, where approved, and not limited to:

- 4.8.5.1** Netting of ponding or potential standing water areas
- 4.8.5.2** Use of noise producing apparatus
- 4.8.5.3** Visual items like kites mimicking birds of prey.

4.8.6 Recording and Reporting of Captured Wildlife, Wildlife Strikes and Observed Wildlife

4.8.6.1 It is necessary for the Service Provider to maintain a record of all wildlife activity or 'bird/wildlife log'. The log should include, as a minimum the following information:

- 1 numbers, species, and location (GPS) of birds/wildlife observed
- 2 actions taken to disperse birds/wildlife.
- 3 the results of these actions.

4.8.6.2 The log should be completed at regular intervals by the wildlife control staff.

- 4.8.6.3 The log should be analysed to identify which species represent a hazard, at which times of day or year, or under which weather conditions, etc.
- 4.8.6.4 The aerodrome Service Provider should work with Cluster2 Aerodrome Operations to put in place a system to collect bird/wildlife strike reports in close cooperation with data owners, like aircraft operators, air navigation service providers, aircraft engine maintenance departments.

4.9 Waste Management and Cleaning

- 10.6 This section must be read in conjunction with Section 4.7.2, FOD Management.
- 10.7 An airport-wide waste management strategy is not available for any of the airports. There is no separation of waste streams or recycling requirement; bulk waste (non-hazardous) shall be deposited at a municipal landfill site.
- 10.8 Removal of waste from the aerodrome (primarily from aircraft, ground services, and buildings, offices, and facilities), is the responsibility of the Service Provider.

4.9.1 Solid Waste Collection and Disposal

- 4.9.1.1 To implement solid waste collection and disposal, the Service Provider is committed to do the following, without limitation:
 - 1 Operate and maintain of the solid waste collection system according to the terms and conditions and as per the Contracting Authority's Waste Management Document.
 - 2 Transport and dispose of all solid waste to the municipal landfill site or to or by alternative as approved by the Contracting Authority.
 - 3 Transport and place empty containers at designated locations within the aerodrome, as requested by the Contracting Authority, securing these containers from movement to ensure they do not cause aircraft or vehicular damage during adverse weather.
 - 4 Ensuring waste transportation and removal services are available 24 hours a day for the term of the contract.
 - 5 Provide of waste containers of closed type, foot operated lids and with lockable wheels (compliant with Contracting Authority requirements and relevant standards)
 - 6 Provide FOD bins (compliant with Contracting Authority requirements and relevant standards)
 - 7 Clean, repair and paint all storage containers on a regular basis and keep the containers in good condition and fit for purpose.
 - 8 Provide compactor trucks to collect this waste.
 - 9 Maintain compactor trucks to ensure they are free of leaks and fit for purpose.
 - 10 The Service Provider shall be responsible for cleaning and disinfecting the surrounding areas of waste containers on a routine basis.
 - 11 The Service Provider shall be responsible for collecting Municipal Solid Waste (MSW) both compactable and non-compactable (for example; bulky waste- wooden pallets, construction debris, vegetation waste, furniture) waste from Cluster2 airports.
- 4.9.1.2 The Service Provider shall provide waste collection with minimum frequencies as directed by the Contracting Authority.

4.9.2 Collection and Transport of Waste

- 4.9.2.1 The Service Provider is committed, when carrying out the work of collecting and transporting waste, to do the following, without limitation:

- 1 Considering the exceptions specified below, inspecting all areas of the airport, transporting, and removing all waste from airside and disposing of it.
- 2 organize its staff to ensure the presence of a sufficient number on site to carry out the collection and transport of waste 24 hours a day, 365(6) days per year.
- 3 assign that staff assigned solely to carry out waste collection and transportation.
- 4 contact the Contracting Authority to obtain access to the areas requiring escorts to carry out the transport and collection of waste.

4.9.2.2 The Service Provider shall have the necessary equipment, compactors, and bins.

4.9.2.3 The Service Provider shall have a minimum of 1 compactor waste collection vehicles at domestic airports, a minimum of 2 at international airports. It is the responsibility of the Service Provider to ensure that there are enough compactor waste collection vehicles to deliver the performance requirements for each airport.

4.9.2.4 The Service Provider shall provide FOD compliant bins to replace all existing non-FOD Compliant Aerodrome bins.

4.9.3 Cleaning and litter collection

4.9.3.1 The Service Provider shall provide cleaning services of buildings and facilities within the aerodromes.

4.9.3.2 Service Provider cleaning services shall include internal and external cleaning of buildings and facilities, see Appendix D Soft Services .

4.9.3.3 The Service Provider is responsible for external area cleaning and litter collection within the Aerodrome areas.

4.10 Additional Airfield Services

10.9 The Service Provider shall comply with ICAO Annex 14 & GACAR 139 standards and the Contracting Authority's direction in conducting the following additional airfield services.

4.10.1 Hazardous Waste Control

4.10.1.1 Hazardous waste collection, temporary storage and disposal must be under the scope of the source generator i.e., Service Provider scope of work and not to be charged to the Contracting Authority.

4.10.1.2 The Service Provider is to provide a proposal for biohazard waste management which will be utilized by the Service Provider in the case of any pandemic outbreak - these services should be provided through certified third-party vendors who are specialized in biohazard waste management.

4.10.1.3 The disposal of aircraft sanitary waste, used oils, batteries, tyres etc. are the responsibility of airside stakeholders and airlines operators.

4.10.1.4 The Service Provider shall be responsible for the disposal of hazardous waste associated with spill clean up executed by the Service Provider

4.10.2 Erosion and Weed Control

4.10.2.1 The Service Provider shall, when carrying out erosion control works, do the following, without limitation:

- 1 Implement a programme to control weeds, including spraying and removal.
- 2 Repair all cases of soil erosion on the non-paved areas of the airfield, including, without limitation, dirt dams, protrusions, canals, slope edges to runways, sub-corridors, aircraft parking lots and roads.
- 3 Implement a program for erosion control to identify and prevent recurring erosion problems in the above-mentioned areas.

- 4 Maintain separate groups in the airfield to fix all problems related to soil erosion.
- 5 Contact and liaise with the Contracting Authority regarding soil erosion problems that require the closure of any of the airfield areas.
- 6 Control of erosion by laying the stone pieces manually:
 - a) The Service Provider is responsible for protecting the dirt barrier slopes, preventing soil erosion from the side slopes of all bridges, and collecting / evaporating ponds, underpasses, drainage channels, and basins by maintenance and repair, and if necessary, the construction of hand-laid stone beds filled with cement.
 - b) Control and maintain natural or wild vegetation within the airfield boundary.

4.10.2.2 The Service Provider shall consider the utilization of mechanical or chemical stabilization.

4.10.3 Transportation and Moving Services

4.10.3.1 Transportation of Temporary Facilities at the Airport

The Service Provider shall provide assistance to the Contracting Authority upon request to transport the temporary facilities in the airfield. He must also provide manpower, tools, and equipment, including trucks / other cars and consumables, upon request, and every request begins with the issuance of a maintenance request from the Contracting Authority to the Service Provider. There will be no separate payment for the transfer of temporary facilities at the airport.

4.10.3.2 Transportation and moving assistance within the aerodrome

The Service Provider shall provide assistance at the request of the Contracting Authority to transport items within, onto and off the aerodrome. The Service Provider must also provide manpower, tools, and equipment, including trucks / other cars and consumables, upon request, and every request begins with the issuance of a maintenance request from the Contracting Authority to the Service Provider. Payment for this service will be at the discretion of the Contracting Authority.

4.10.4 Sewage Removal

The Service Provider shall provide sewage removal services from the aerodrome where required.

4.10.5 Maintenance and certification of Cluster2 equipment

The Service Provider shall provide maintenance and certification services to Cluster2 equipment which includes but not limited to:

- Runway Friction Tester
- Photometric Tester

4.10.6 Barrier and "X" Marker

4.10.6.1 The Service Provider is responsible for the provision, deployment, removal, and maintenance of "X" markers on closed runways as instructed by the Contract Authority.

4.10.6.2 The Service Provider is responsible for the provision, deployment, removal, and maintenance of approved barriers for closing of movement areas of the aerodrome as instructed by the Contracting Authority.

4.10.6.3 The Service Provider is responsible for the provision, deployment, removal, and maintenance of approved barriers for closing of service roads on the aerodrome as instructed by the Contracting Authority.

4.10.6.4 Barriers shall be compliant with relevant regulations and relevant industry practice and approved by the Contracting Authority.

4.10.6.5 The Service Provider shall provide a Safety Barrier Management and deployment Plan outlining the requirements for the deployment of barriers for all relevant situations on the aerodrome, such as, but not limited to:

- 1 Taxiway and taxilane closure.
- 2 Stand closure.
- 3 Service Road closure.
- 4 Works adjacent to movement areas.
- 5 Runway Closures.

4.11 Interaction with ‘The Service Delivery Plan’

- 4.11.1** The Applicant has a responsibility to ensure that sufficient numbers of skilled, experienced, and qualified resources and continuously available 24/365(6) to ensure efficient and effective completion of the works in line with the performance requirements and SLAs.
- 4.11.2** The Service Provider shall establish multiple teams per shift who shall be suitably equipped to respond to maintenance of civil, lighting, electrical, mechanical assets, or cleaning events. The number of teams will be such so as to be sufficient to carry out planned and unplanned maintenance, inspections, audits, tests, and fulfil LVO requirements.
- 4.11.3** The Service Provider shall provide a dedicated single point of contact (SPOC) to liaise directly with the Aerodrome Operations via daily scheduled meetings. The meetings shall address the coordination of all planned and unplanned activities and ensure the requisite level of service is provided including response and resolution times to all work requests.
- 4.11.4** If work is performed in an unsatisfactory manner due to insufficient workforce, skill, experience, or qualification, the Contracting Authority has the right to direct The Service Provider to mobilize additional or alternative labour in accordance with the case, without incurring any additional costs by the Contracting Authority. All such resources must be preapproved by the Contracting Authority.
- 4.11.5** The Service Provider shall submit minimum manpower plan levels to deliver the requested services both in number and skill levels ranging from management supervisory, engineers, trades, and operatives for each airport. The Service Provider must also demonstrate appropriate minimum shift cover.
- 4.11.6** The Service Provider shall provide a detailed skilled resource manpower plan for review and approval by the Contracting Authority, to include, but not be limited to:
- 4.11.6.1** Detailed organisation structure, clearly defining shift and non-shift positions.
 - 4.11.6.2** Role descriptions and key responsibilities including minimum technical criteria for each role.
 - 4.11.6.3** Skills and proficiencies associated with all functional roles.
 - 4.11.6.4** Experience of each role with particular emphasis on leadership, management, and supervisory roles
- 4.11.7** The Service Provider shall ensure all airfield staff are fully trained in accordance with EASA ADR Part-OR.D or approved equivalent. This will require a training needs analysis (TNA) being undertaken which will result in staff undergoing, initial, recurrent, refresher and specialised training. Competency assessments will be undertaken following training and a full hard copy and electronic copy of staff training by name will be kept up to date for audit purposes.
- The Training needs assessment at its core will ensure staff members work in an “open & just” environment where all non-compliances to GACAR 139 and near misses are reported through the supervisor to a SPOC and onto the Contracting Authority. The training needs assessment will ensure all aspects of airside operational safety, health and safety, and safe working procedures are covered to the standard.

4.12 Calibration of Tools and Equipment

- 4.12.1** The Service Provider shall maintain and calibrate all equipment, devices and testing instruments, the specialized tools, detection, and diagnostic devices whether fixed or mobile. Calibration must be done, in accordance set by the Saudi Standards, Metrology and Quality organization and other specialized international bodies and factories or by accredited third party.
- 4.12.2** Calibration certificates must be provided to the Contracting Authority. Calibration for each item should be done a minimum of once a year or more frequent as required.
- 4.12.3** Calibration and service records for all equipment shall be maintained by the Service Provider in hard copy and recorded on the CAFM system.

4.13 Aerodrome Equipment and Vehicles

4.13.1 General

- 4.13.1.1** For equipment and vehicles which are necessary for the safe operation of the aerodrome, the Service Provider is responsible for ensuring that they and their staff are familiar with, trained in, where necessary, and competent in all aspects. The Service Provider must ensure and enforce, that both themselves, their agents and all staff covered under the Contract including sub-contractors are compliant with all regulations of the Contracting Authority and GACAR 139.
- 4.13.1.2** The Service Provider shall ensure that they keep and maintain detailed and decipherable records of all documentation which shall be made available to the Contracting Authority or the Contracting Authority's representative on request.

4.13.2 Aerodrome Vehicle Operations

- 4.13.2.1** The driving of a vehicle on any part of the movement area or other operational areas of an aerodrome shall require a driving authorisation issued to the driver by the operator of that aerodrome. It is the Service Providers responsibility to ensure that any staff that are required to drive in the aerodrome obtain the necessary training from the Contracting Authority at the Service Provider's expense. The operator of the aerodrome shall only issue driving authorisation to a person who:
 - 1 is allocated tasks that involve driving in such areas.
 - 2 holds a valid driving licence, and any other license required for the operation of specialised vehicles,
 - 3 has successfully completed a relevant driving training programme and demonstrated his or her competence in accordance with Paragraph 14.2.1-2, including, but not limited to, completion of the Contracting Authority's Airside Driving Course,
 - 4 has demonstrated language proficiency in accordance with the Contracting Authority requirements – English Level 4 - if that person intends to drive a vehicle on the maneuvering area,
 - 5 has received training by the Service Provider on the use of the vehicle intended to operate at the aerodrome.
- 4.13.2.2** A vehicle must be operated:
 - 1 On a maneuvering area only as authorized by the aerodrome control tower, and
 - 2 On an apron only as authorized by the appropriate designated authority.
- 4.13.2.3** The driver of a vehicle on the movement area must comply with all mandatory instructions conveyed by markings and signs unless otherwise authorized by:
 - 1 The aerodrome control tower when on the maneuvering area; or
 - 2 The appropriate designated authority when on the apron.

4.13.2.4 The driver of a vehicle on the movement area must be appropriately trained for the tasks to be performed and must comply with the instructions issued by:

- 1 The aerodrome control tower, when on the maneuvering area; and
- 2 The appropriate designated authority, when on the apron.

4.13.2.5 The driver of a radio-equipped vehicle must establish satisfactory two-way radio communication with the aerodrome control tower before entering the maneuvering area and with the appropriate designated authority before entering the apron. The driver must maintain a continuous listening watch on the assigned frequency when on the movement area.

4.13.3 Vehicle Standards

The Service Provider shall ensure that all vehicles are fully compliant in relation to the following:

- 4.13.3.1 condition and maintenance standards.
- 4.13.3.2 the requirement to display obstruction lights and company insignia compliant with GACAR 139 / the Contracting Authority
- 4.13.3.3 the requirement for, and content of, daily vehicle inspections.
- 4.13.3.4 vehicle fault reporting and rectification.
- 4.13.3.5 requirements for the issue and display of vehicle authorizations.
- 4.13.3.6 serviceability of all essential communication systems with air traffic services and base operations.
- 4.13.3.7 maintaining the vehicle's cabin free of loose and distracting articles/items, as per the 'sterile cab' concept.
- 4.13.3.8 Vehicle should be covered or have closed boxes as part of FOD prevention programme.

4.13.4 Aerodrome Rules and Procedures:

The Service Provider and all their staff need to be aware of, and trained to a sufficient standard, as per the Service Providers training plan, which shall include, but not be limited to, the following:

- 4.13.4.1 rules of the air, and air traffic services procedures applicable to aerodromes as they relate to vehicles, particularly rights of way,
- 4.13.4.2 aerodrome regulations, procedures and instructions pertaining to vehicle operations,
- 4.13.4.3 definition of movement areas, maneuvering areas, and aprons,
- 4.13.4.4 methods used to disseminate general information and instructions to drivers,
- 4.13.4.5 methods used to disseminate information regarding works in progress, and
- 4.13.4.6 reporting of occurrences, the driver is involved in or witnesses.

4.13.5 General Aerodrome Layout

The Service Provider and all their staff need to be aware of and trained to a sufficient standard as per the Service Providers training plan, which shall include, but not be limited to, the following:

- 4.13.5.1 the general geography of the aerodrome.
- 4.13.5.2 aviation terminology used such as runway, taxiway, apron, roads, crossings, runway-holding points.
- 4.13.5.3 all aerodrome signs, markings and lighting for vehicles and aircraft, including their meaning.
- 4.13.5.4 specific reference to signs, markings and lighting used to guard runways and critical areas.
- 4.13.5.5 specific reference to any controlled/uncontrolled taxiway crossing procedures.

4.13.6 Hazards of General Movement Area Driving

The Service Provider needs to ensure that all staff have been given training as per the Service Providers training plan, including, but not limited to, the following aviation hazards:

- 4.13.6.1 speed limits, prohibited areas, and no parking requirements.

- 4.13.6.2 the danger zones around aircraft.
- 4.13.6.3 engine suction/ingestion and blast, propellers, and helicopters.
- 4.13.6.4 aircraft refueling.
- 4.13.6.5 FOD and spillages.
- 4.13.6.6 vehicle reversing.
- 4.13.6.7 staff and passengers walking across aprons.
- 4.13.6.8 air bridges and other services such as fixed electrical ground power.
- 4.13.6.9 the general aircraft turnaround process.
- 4.13.6.10 aircraft emergency stop and fuel cut-off procedures
- 4.13.6.11 hazardous cargo.
- 4.13.6.12 vehicle-towing requirements and procedures.
- 4.13.6.13 driving at night.
- 4.13.6.14 driving in adverse weather conditions, particularly low visibility.

4.13.7 Human Performance

The Service Provider and all their staff need to be aware of, and trained to a sufficient standard, as per the Service Providers training plan, which shall include, but not be limited to, the following:

- 4.13.7.1 basic concepts of human factors.
- 4.13.7.2 basic aviation psychology, including:
 - 1 attention and vigilance.
 - 2 Perception.
 - 3 Memory.
 - 4 human error.
 - 5 decision making.
 - 6 avoiding and managing errors.
 - 7 human behaviour.
 - 8 human overload and underload.

4.13.8 Emergency Procedures

The Service Provider and all their staff need to be trained as per the Service Providers training plan, including, but not limited to, achieving competence in the following:

- 4.13.8.1 actions and responsibilities in a crisis situation (any accident or serious incident occurring on the aerodrome);
- 4.13.8.2 action in the event of a vehicle accident.
- 4.13.8.3 specific action in the event of a vehicle striking an aircraft.
- 4.13.8.4 action in the event of fire.
- 4.13.8.5 action in the event of an aircraft accident/incident.
- 4.13.8.6 action in the event of personal injury.

4.13.9 Communications

The Service Provider and their relevant staff need to be trained, as per the Service Providers training plan, including, but not limited to, achieving competence in the following:

- 4.13.9.1 radio procedures and phraseologies to be used (other than with air traffic services);
- 4.13.9.2 light signals used by air traffic services;

- 4.13.9.3 procedures to be used by vehicle drivers if lost or uncertain of their position;
- 4.13.9.4 local emergency telephone numbers;
- 4.13.9.5 how to contact the local aerodrome unit;
- 4.13.9.6 portable radio, including, but not limited to:
 - 1 correct use of radios;
 - 2 effective range and battery life;
 - 3 screening/shielding effects on the aerodrome;
 - 4 use of correct call signs, as applicable; and
 - 5 safety while using radios, including procedures and instructions regarding the use of portable radios and hand-held microphones while driving a vehicle.

4.13.10 Language Proficiency for Drivers

- 4.13.10.1 Service Provider staff required to drive airside need to demonstrate language proficiency. They shall demonstrate this proficiency, at least at an operational level, both in the use of phraseologies and in plain language, in accordance with the following clause, in the English language. Minimum requirement is Level 4 English – Operational as per EASA standard or equivalent.
- 4.13.10.2 The Service Provider staff shall demonstrate the ability to:
 - 1 communicate effectively in voice-only and in face-to-face situations;
 - 2 communicate on common and work-related topics with accuracy and clarity;
 - 3 use appropriate communicative strategies to exchange messages and to recognise and resolve misunderstandings in a general or work-related context;
 - 4 handle successfully the linguistic challenges presented by a complication or unexpected turn of events which occurs within the context of a routine work situation or communicative task with which they are otherwise familiar;
 - 5 use a dialect or accent which is intelligible to the aeronautical community.
- 4.13.10.3 Language proficiency shall be demonstrated by a certificate issued by the organization that conducted the assessment, attesting the language or languages, the level or levels of proficiency, and the date of the assessment.
- 4.13.10.4 Except for persons who have demonstrated language proficiency at an expert level, the language proficiency shall be re-assessed every:
 - 1 four years from the date of the assessment, if the level demonstrated is operational level;
 - 2 six years from the date of the assessment if the level demonstrated is extended level.
- 4.13.10.5 The demonstration of language proficiency shall be done through a method of assessment, which shall contain, but not be limited to:
 - 1 the process by which an assessment is done;
 - 2 the qualifications of the assessors conducting assessments of language proficiency;

4.13.11 Vehicle Authorization

- 4.13.11.1 The Service Provider needs to be aware that the operation of a vehicle on the movement area or other operational areas shall require an authorization issued by the aerodrome operator. It is the Service Providers' responsibility to get such authorizations from the Contracting Authority. The authorization may be issued if the vehicle is used in activities related to the operation of the aerodrome and:
 - 1 is serviceable and fit for the intended operation.

- 2 complies with the marking and lighting requirements of the Contracting Authority, is equipped with a radio allowing two-way communication on the appropriate air traffic services frequency and any other frequency necessary, if it is intended to be operated on either of the following areas:
 - a) the manoeuvring area, or
 - b) other operational areas where communication with the air traffic services unit or other operational units of the aerodrome is necessary.

4.13.11.2 Vacating Areas after Approval

4.13.11.3 The Service Provider shall take all precautions not to dirty the existing runway and taxiways and pavement markings.

4.13.11.4 The Service Provider shall make good all the affected areas and conduct a FOD inspection of the work area at the end of each day's work.

4.13.11.5 The Service Provider shall check the entire length of the runway to ensure that the runway is free of FOD, tools and equipment before vacating the runway.

4.13.11.6 The Service Provider and his work party can only leave the area upon confirmation by the Contracting Authority's Duty Officer that the area is handed back to ATC for operations. Failing which, the Contracting Authority will engage other Service Provider(s) to reinstate the affected works. **All the costs incurred shall be deducted from any monies due or to become due to the Service Provider.**

4.13.11.7 The Service Provider must ensure that danger warning signs are used for all plant and vehicles that are parked within the approved area overnight. The amber revolving lights of all plant must be always operational and on.

4.13.11.8 The Service Provider shall ensure that all road safety requirements are properly complied with.

4.13.12 Airfield Services Mobile Equipment, Vehicles, Specialist Tools & Test Equipment Standards

4.13.12.1 The mobile equipment and cars should be new, or model built within two years from the date of awarding the Contract to the Service Provider and it must be in good condition.

4.13.12.2 The ownership of all mobile equipment and vehicles remains the property of the Service Provider and should be withdrawn from Cluster2 Airports upon the expiry of the Contract.

4.13.12.3 The delivery of all mobile equipment / cars to the Contracting Authority coincides with the mobilization schedule for the Service Provider, and all mobile equipment / cars must be present at the site with identification of their identities as required and operational readiness with the commencement of services.

4.13.12.4 The service provider shall ensure they have the capability to tow disabled vehicles off the aerodrome to a designated landside garage for repair.

4.13.12.5 The table below is a list of specialist equipment the Service Provider may require in fulfilling the Services. The Service Provider shall submit a complete list of equipment, Mobile Equipment, Vehicles, Specialist Tools & Test Equipment required to fulfil this Contract. The Service Provider must demonstrate that this list is sufficient to meet the performance requirements. The following list is to help guide the Service Providers with the tender returns and is **NOT** an exhaustive list of requirements. All vehicles for the airfield are to be compliant with airside regulations having the appropriate markings, lighting systems and radio communication systems.

4.13.12.6 Capabilities of equipment must comply with the requirements set out in the work specification (eg rubber removal, photometric tests, friction tests),

4.13.12.7 Equipment must be kept in a fit for purpose and fully functional condition.

4.13.12.8 Where applicable equipment must be certified to the relevant standard. Certification should not affect equipment availability.

4.13.13 Indicative list of Mobile Equipment, Vehicles, Specialist Tools & Test Equipment

Below is the list of indicative equipment. This is not exhaustive.

Item #	The type of the Vehicle
1	4x4 crew cabs and pick ups
2	Crew minibuses
3	Aerodrome large FOD sweepers complete with magnets
4	Aerodrome small FOD sweepers complete with magnets
5	Trailers and equipment for closure of aircraft movement areas including barriers, and lit crosses. (minimum combined length of
6	High-capacity Rubber removal vehicles with high pressure water no chemicals
7	Approved Friction measuring equipment as per section 2.11.4.1 (available 24/365(6)
8	AGL mechanized cleaning equipment (automatic/semi-automatic).
9	MALMs AGL lux measuring equipment (photometric)
10	Malms benchtop photometric light testing equipment for repaired light testing.
11	All electrical equipment for testing, fault-finding and repairs
12	All mechanical equipment for testing fault-finding and repairs
13	Torque wrenches (minimum one per AGL team)
14	Calibration equipment
15	Line painting equipment for runways & aircraft ground movement areas
16	Line painting removal system
17	Expansion joint replacement equipment
18	Pavement repair equipment including rigs for hot and cold repairs, concrete saws etc
19	Overbanding and crack sealing equipment
20	Concrete bay replacement equipment
21	Ground repair and grading equipment and drain clearing equipment
22	Pumps
23	Emergency lighting suitable for temporary replacement of High Mast Lights
24	Emergency Lighting suitable for night work
25	Small cranes, teleporters, high lifts, tow truck
26	Spraying equipment
27	"Luxometer" for measuring light levels on Stands
28	Spill kits
29	Waste Compactor Trucks
30	FOD Bins

4.13.14 Airfield Services Key Performance Indicators and Service Level Agreements

- 4.13.14.1 SLAs and KPIs shall be met by the Service Provider to support the Services Delivery as outlined in **Appendix 5 - Performance Management System**
- 4.13.14.2 Failure to meet required performance will result in the Service Provider proposing a rectification plan.
- 4.13.14.3 Failure to achieve agreed standards or meet rectification plan without reasonable due cause shall result in the application of penalties.

5. Terminals

5.1 Overview

- 5.1.1** The Service Provider shall work collaboratively across a range of internal and external stakeholders to enhance service levels, cost certainty and risk management solutions while consistently demonstrating compliance, with statutory obligations, regulatory requirements, codes, best practice and international standards.
- 5.1.2** The Service Provider shall respond immediately to all terminal outages including complete and partial outages and the work shall continue until the service has been restored equivalently and the cause of the outage is corrected unless otherwise agreed by the Contracting Authority to ensure continuity of the business plan.
- 5.1.3** The Service Provider shall respond immediately to all emergency terminals outages including complete and partial outages and provide alternative solutions to maintain the business continuity and inclusion these solutions in the mitigation plan.
- 5.1.4** It is imperative that the security of these facilities is a priority, access control for all personnel shall be a fundamental requirement and the security shall be paramount. All maintenance routines and attendance shall be itemized and logged at each terminal. The Service provider should provide all maintenance activities that include but are not limited to PM, CM, inspections, monitoring, controlling, repairing, deficiencies rectification, calibration, tests, required supplies, and all activities that properly maintain the system operating condition. The Service provider should review the current maintenance PPM activities and ensure that these activities are both in line with the manufacturer's guidelines and with respect to the critical equipment and will ensure that this equipment is always available for operation.
- 5.1.5** In respect of all Terminals, the Service Provider must ensure compliance with safety precautions, design standards and meet all applicable regulations, codes, standards, and manufacturer-recommended maintenance practices, ensuring all assets are maintained and operate in accordance with internal health and safety, environment, and quality management systems.
- 5.1.6** The Service Provider shall provide cleaning services to all Terminals technical areas including but not limit to all technical & control rooms, workshops, stores, drainage structures, ditches, drainage rip-rap liners, open channels, catch basin, pounds and culverts, tunnels.
- 5.1.7** The Service Provider shall apply the relevant ISO quality and asset management standards, as well as the GACA SQS.
- 5.1.8** The Service Provider shall implement Asset Availability measures for key equipment, infrastructure, and systems.
- 5.1.9** The Service Provider shall provide a study of the systems lifetime & provide suitable plan of repair or replacement.
- 5.1.10** The Service Provider shall provide contingency plan approved by Contracting Authority.
- 5.1.11** The Service Provider shall provide all required special tools in order to maintain, diagnose & troubleshooting the systems
- 5.1.12** The Service Provider shall provide full safe and reliable environment.
- 5.1.13** Service Provider shall provide oversee and supervise all activities and supply all heavy equipment whenever is requested by the Contracting Authority.
- 5.1.14** The Service Provider is responsible for tunnels and walkways within the facilities of terminals unless explicitly excluded.
- 5.1.15** The Service Provider is responsible for ALL Elevators, Escalators and Travellators.

- 5.1.16** The Service Provider shall be responsible of the coordination and cooperations with all relevant parties regarding all external/internal fit out activities.

5.2 International and National Benchmarking

- 5.2.1** As a leading airport operator, Cluster2 will continue to work with independent, national, and international organizations that develop and define standards to ensure the quality, safety, and efficiency of products, services, and systems. Cluster2 recognizes the value of working with service providers, stakeholder and partners that share a common focus on systematic and measurable performance standards. Among the standards and benchmarking and accreditation programs used by Cluster2 are Skytrax World Airport Star Rating, Airports Council International Airport Service Quality (ACI ASQ), GACA Service Quality Standards (SQS) framework, as well as International Standards Organization (ISO).
- 5.2.2** Skytrax World Airline and Airport Star Rating programme is a leading international rating system that classifies airports by the quality of product and staff service standards. Skytrax Airport Star Rating applies quality assessment across all customer-facing items of product and service that an airport provides. The system measures frontline product and service delivery quality performance from the customer experience across the passenger journey. This includes online facilities prior to arriving at the airport, and from the point of arrival at the Terminals facilities to the departure across a range of customer contact points. Service assessment looks at efficiency, consistency, staff attitudes, service hospitality / friendliness and language skills. Ratings are based on the front-line customer experience on the end-to-end journey through an airport. Skytrax apply ratings between 1-Star and 5-Star for up to 800 customer-facing areas of airport product and service, and this spans 30 different customer contact points. The rating methodology is unified and consistent for the industry, and all airports from largest hubs to small regional facilities are assessed using the same base criteria.
- 5.2.3** Some of these most important contact points rely heavily on the standard of service delivery from the Service Provider and their staff. The maintenance and cleanliness of the Terminals and its environs plays a key role in achieving consistently high standards, with particular focus on front of house public facing areas. Ratings which are heavily reliant on the performance of the Service Provider include, air temperature, décor and condition, cleanliness and condition of washrooms and public areas including seats / seating areas, as well as reliable asset base and comfortable environments. As all employees and staff of the airport are ambassadors for the reputation of the Cluster2 airports, customer service, staff attitude, curtesy and service assistance are of particular importance and are reflected in the ratings. There is also a Skytrax COVID-19 Airport Safety Rating which investigates and evaluates over 175 safety protocols introduced by airports during COVID-19 to enhance customer and staff safety, and evaluates the airport's implementation of health, hygiene, and safety measures.
- 5.2.4** Cluster2's ambition is to ultimately work towards improving the standard across its airports. This shall be achieved by combining excellent airport facilities with high quality staff and customer service levels to deliver an outstanding customer experience.
- 5.2.5** ACI ASQ is among the world's leading airport passenger service and benchmarking programme. ACI's Airport Service Quality (ASQ) is a world-renowned and globally established benchmarking programme measuring passengers' satisfaction whilst they are travelling through an airport. The ASQ program provides the research tools and management information to understand passengers' views and what they want from an airport's products and services.
- 5.2.6** ACI ASQ program covers a range of key facility management and passenger experience elements. It allows the Contracting Authority to measure and assess the performance of your targets set for service providers. Goals and incentives can be established to motivate service providers and their respective specialist teams. Developed and implemented by ACI, ASQ is a survey programme that provides key

passenger research and insight, as well as essential management information. ASQ benchmarks are designed for airports seeking more effective, efficient and profitable ways to serve their passengers.

5.2.7 GACA Quality and Customer Protection department is mandated to improve passenger experience while travelling through the air in the Kingdom of Saudi Arabia as part of Vision 2030. The primary goal is to improve the level of passenger service quality by providing unique experiences that contribute to raising the passenger satisfaction through service quality standards that enable the Kingdom to compete globally in the aviation sector GACA is committed to developing a collaborative approach with all the stakeholders, resolving main issues of each passenger's airport experience.

5.2.8 GACA Service Quality Standards (SQS) framework is the mechanism used to raise the Kingdom's airport standards, and to ensure enhanced passenger services are met. With this SQS standard, the Authority sets out the basic requirements for each service element - such as asset availability, processing facilities, passenger experiences and other key areas across each passenger touchpoint of the traveller's journey. For each indicator a number of service quality standards have been defined to be measured and monitored by the airports, including Asset Availability and Passenger Experience, among other key areas of measurement. Minimum required standards are defined for critical passenger touchpoints with standardized methods for measuring, monitoring, and reporting standards.

5.3 Fire Alarm System

5.3.1 Overview

5.3.1.1 This Section is to be read in conjunction with **Section 3.6.2** of the **Appendix 2 General Hard Services Requirements**.

5.3.1.2 The fire Alarm System in general comprises of but not limited to,

- 1 a main fire alarm panel,
- 2 local fire alarm panel,
- 3 transponders,
- 4 smoke detectors,
- 5 flame detectors,
- 6 beam detectors,
- 7 heat detectors,
- 8 duct detectors,
- 9 relays,
- 10 optical detectors,
- 11 speakers wall mount,
- 12 all types of panels and modules,
- 13 Fire Monitor Module interface to mechanical (FMM),
- 14 smash glass,
- 15 pull station,
- 16 fire bells,
- 17 fire flasher,
- 18 horn strobe,
- 19 fire reticulation interconnecting cables,
- 20 auto dialers,
- 21 GPC (Graphic PC)

- 22 fire relay module interface to AHU,
- 23 printer (internal or external) and associated equipments,
- 24 UPS back-up batteries
- 25 all related hardware and software.

5.3.2 Responsibility

- 5.3.2.1 The Service Provider shall ensure that all works on the FAS are carried out by a fully certified, from the manufacturer, contractor and operatives.
- 5.3.2.2 The Service Provider shall ensure all systems and their associated components and interfaces and integrations are safe, compliant, reliable, and/ meet all applicable regulations, codes, standards, and manufacturer-recommended maintenance practices and that they operate in accordance with internal health and safety, environment, and quality management systems.
- 5.3.2.3 The Service Provider shall carry out regular PPMs and routine testing on all Fire detection and controlling systems and their associated components and interfaces and integrations to ensure systems are safe, compliant, reliable, and meet all applicable regulations, codes, standards, and manufacturer-recommended maintenance practices.
- 5.3.2.4 The Service Provide shall be responsible for the operation, monitoring, maintenance, inspection, licenses, and certifications and shall include all electronic control, detection, and field devices required for the detection and annunciation of fire life safety events.
- 5.3.2.5 The Service Provider shall provide Isolation Services as required and approved through the Contracting Authority's Work Permit System. Services include coordination between all concerned parties, prior to isolation, isolation, monitoring of situation during isolation, ensuring return to service after isolation.
- 5.3.2.6 The Service Provider shall monitor the FAS 24/365(6) for system and device faults. The Service Provider shall provide troubleshooting assistance across the total FAS. The Service Provider shall report all faults immediately to relevant parties.
- 5.3.2.7 The Service Provider shall coordinate will Cluster2 FRS and the Contracting Authority during times of extended outages to ensure Insurance exposure is managed.
- 5.3.2.8 The Service Provider is to oversee and coordinate with projects, tenancies and commercial 3rd Parties installation, integration, interfacing, maintenance and certification of their localised fire systems.
- 5.3.2.9 The Service Provider shall provide specialized reports as requested by the Contracting Authority.
- 5.3.2.10 The Service Provider is responsible for the upgrading of the software when approved by the Contracting Authority.
- 5.3.2.11 The Service Provider is responsible to ensure IT cybersecurity at all times as per the requirements of Cluster2 IT requirements.

5.4 Elevators/Escalators and Travelators

The services provider shall ensure 24/365(6) connected services for all Elevators, Escalators and Travelators contained within all buildings, should be listed as following:

- 5.4.1 The Service Provider shall carry out maintenance, examinations, testing, inspections, calibrations, and repairs as recommended by the Manufactures Guidelines and all statutory regulations, local by-laws, KSA Government requirements and in conformity with the latest relevant Codes of Practice. Works shall comply with the requirements of the latest versions of EN81 series for elevators and EN115 for escalators and travelators.

- 5.4.2** The service Provider is responsible for all aspects of the elevator/escalator/travelator (moving walkway) systems.
- 5.4.3** The Service Provider shall carry out maintenance examinations, tests, and inspections at the prescribed time limits and, within the required time scale and on completion the Service Provider shall issue a certificate of compliance to the Contracting Authority.
- 5.4.4** The Service Provider shall provide a detailed works schedule showing dates when routine maintenance visits and planned repairs will take place. This schedule will cover a full 12-month period from Contract commencement and take due consideration of the maintenance program completed as part of the previous service contracts. The schedule shall be presented to the Contracting Authority for review and approval prior to the Service Provider uploading onto the CAFM system for planning and scheduling purposes.
- 5.4.5** The Service Provider shall provide materials fit for purpose and sourced from the OEM. Where alternative sources of materials are considered, the Service Provider shall provide an equivalent or superior performance alternative, approvals must be sought in writing from the Contracting Authority prior to purchase.
- 5.4.6** The Service Provider shall provide an emergency response team 24/365(6) connected services to conduct elevator entrapment releases in line with the service level response times (P1). Repairs shall commence immediately and continue until the hazard or risk of further entrapments has been eliminated. The emergency response team must be trained on entrapments by an OEM authorized agent. Refresher training must be carried out yearly.
- 5.4.7** For all maintenance routines that require a service outage, the Service Provider shall schedule these out of operationally sensitive hours and the service outage shall be coordinated in full of key airport stakeholders and notified to the Contracting Authorities or their representatives in advance.
- 5.4.8** The Service Provider shall provide all method statements related to elevator, escalator, and travelator maintenance activities that are to be submitted in advance to the Contracting Authority for their approval.
- 5.4.9** The Service Provider shall respond to the Contracting Authority's requests 24/365(6) of connected services for production of standard/custom reports, programming of new system interfaces and software features and updates, including but not limited to; VSS, BMS, BEMS, and FAS.
- 5.4.10** The service provider shall provide certifications for all regulated items by third party approved by the Contracting Authority.
- 5.4.11** The Service Provider shall provide certified staff to cover 24/365(6) connected services of all areas mentioned in the scope of services.
- 5.4.12** The service provider shall perform operational inspections once each hour and reset any unit that has a malfunction.
- 5.4.13** The Service Provider shall for the duration of the Contracted Services maintain a quality control process, which has been agreed by the Contracting Authority.
- 5.4.14** The Contracting Authority may reject any aspect of the Service at Monthly KPI Meetings which it feels fails to comply with the requirements of The Contract, or its quality system at any time.
- 5.4.15** The Service Provider shall monitor its own performance against criteria and Benchmarks identified in this document and shall provide reports when reasonably required by the Contracting Authority.
- 5.4.16** The Service Provider shall provide software for the management and control of the contract service delivery and have the capability of providing KPI's and the delivery of continuous improvement and analysis tools for the optimization, compliance to standards, evaluating and conducting engineering

feasibility studies, responding to the Contracting Authority requests upgrading of system, programming for new interfaces and integrations features upgrades.

- 5.4.17** The software shall also provide failure analysis of high failure/alarm incidents that impacts the operational safety, security, and efficiency of Cluster2 services and assist in resolving them.
- 5.4.18** The Service Provider and its representatives will take all reasonable and proper safety precautions to prevent death or injury to any person or damage to any property in or near the Site and in particular all equipment used maintained and stored to prevent unauthorized use or theft, therefore minimizing the danger of accident, death, injury, loss, or damage arising from inappropriate use of the equipment.
- 5.4.19** The Service Provider shall:
 - 5.4.19.1** ensure that its and its subcontractors' personnel are adequately trained and instructed in the safe and correct use, handling and operation of material and equipment relevant to the Services.
 - 5.4.19.2** Ensure that all staff have the necessary Personal Protective Equipment to undertake the tasks and that records are kept up to date and stored on Site.
 - 5.4.19.3** Ensure that all relevant personnel have completed necessary training programs such as Incident reporting, Fire Prevention, Customer Service, Complaint handling, Health and Safety, Equipment associated with the undertaking of their role and knowledge of all areas within the site; training is Supervisor/VHTS specific.
- 5.4.20** The Service Provider shall ensure that all works on the equipment are carried out by fully certified personnel, approved by the OEM or authorized agent.
- 5.4.21** All works carried out on the equipment must be performed by a Manufacturer approved and authorized company and personnel.

5.5 Baggage Conveyor (BHS) Systems/Hold Baggage Screening (HBS) System

- 5.5.1** The BHS shall mean all equipment, structures, mechanical, electrical and ICT equipment and their respective components, associated with the point to point conveying of aircraft hold passenger baggage.
- 5.5.2** The HBS system shall mean the specific equipment and the associated integrated components that make up the complete solution to scan and validate aircraft hold passenger baggage securely, safely, and efficiently.
- 5.5.3** The Service Provider is responsible for the point to point departures and arrivals bag conveying process (check-in to make up and inbound conveyors to arrival carousels), including but not limited to, self-service check-in, check-in start and stop function, passenger display and weigh conveyor function, carry on weigh scales, tag station operation, dispatch conveyors, collector conveyors, associated security and fire doors and hatches, transport conveyors, all components that make up the sorting solutions (Verti-sorts, tilting trays), chutes, carousels, out of gauge conveyors, manual encoding stations, problem docks and dump shoots and make up devices, high-speed pushers, diverters, bag tag scanners (portable, hand held, automatic), totes and tubs, RFID tag scanning, including any baggage lifting equipment and all functional integration with HBS equipment.
- 5.5.4** All CCTV dedicated to operating the BHS system, BHS fire and security doors, all associated control panels, field control devices (e.g., photocells, limit switches, emergency stops, sensors, control stations/devices, audio/visual alarms etc.), drive motors and VSD Controls, BHS Servers, Operator terminals, PLCs, UPS and Battery Back-Up Systems, Supervisory Control and Data Acquisition (SCADA), Sorter Allocation Control (SAC), Baggage Reconciliation System (BRS), associated controls, both hardware, software and firmware, complete with management and support services on Site/remote required to operate and maintain the specific baggage handling system.

5.5.5 The Service Provider is responsible for ensuring that the complete HBS System is available for 3rd Party operation in line with BHS, KPI/SLA contractual agreements and that the equipment maintains its design criteria in line with the manufacturers specifications and factory acceptance testing. The Service Provider shall carry out daily BHS/HBS function testing to ensure the system is fully functional, safe, and fit for operation. The Service Provider shall keep and maintain all the supporting testing documentation, which shall be made available to the Contracting Authority, as and when required and for auditing purposes.

5.5.6 The Service Provider is responsible for HBS security scanning equipment, appropriate testing kits, remote operator terminals (Level 2, Level 3 and Level 4 stations), rejection bags manual transfer, Supervisory Management Stations, any integrated Threat Image Projection Systems, associated printers, Fibre/Copper networks, distribution equipment, any integrated AC/Cooling systems and back up UPS Systems. The daily HBS security screening routines, manufacture specific testing routine, shall be completed and recorded for review or auditing at a future date.

- 1 It shall remain the responsibility of the Service Provide or their agents (BHS/HBS service providers) to satisfy themselves that the HBS system functionality is acceptable for daily operational use.
- 2 It shall remain the responsibility of the airline handling agents to ensure that inbound and out bound baggage is handled from the apron to and from the respective carousels and transfer systems.
- 3 It shall remain the responsibility of the relevant airline/handling agent to follow BHS, Terminal Operations and Airline check in procedures, maximising the effectiveness and efficiency of the BHS system performance.

5.5.7 General Scope of Requirements

5.5.7.1 The Service Provider is required to provide a dedicated 24/365(6) days a year BHS/HBS management and support team who are required to proactively respond to all operational and baggage user requirements. The Service Provider shall deliver a customer centric service ethos at the foundation of all interactions with airport passengers and key stakeholders. The Service Provider shall support the airports' management team by providing world class services with a commitment to taking full ownership over baggage system performance through the provision of a fully comprehensive Operations and Maintenance (O&M) service provision and act as a single point of contact, subject matter expert (SME) for all BHS/HBS related issues.

5.5.7.2 The Service Provider shall have a dedicated team including, but not limited to, the following roles: managers and, shift-leaders, supervisors, HSEQ officers, skilled resources (appropriately certified technical and operational staff), and labourers to meet the performance requirements defined in the KPI's, SLA's. The Service Provider shall be responsible for meeting all the performance requirements and standards as defined in the KPI's and SLA's including but not limiting to :

- 1 -System Monitoring,
- 2 -System Testing,
- 3 -Troubleshooting of all systems and subsystems equipment and components to identify and correct any system faults or component failures.

5.5.7.3 The Service Provider shall be responsible for the supply of all of the materials, tools, consumables, equipment and transportation associated with the baggage handling process.

5.5.7.4 The Service Provider's dedicated team shall carry out all preventative maintenance and all reactive/remedial maintenance activities in line with the manufacturers recommendations and in order to guarantee an efficient and reliable BHS and HBS systems. This will be achieved with the minimum down time and in-system design time for delivery of all baggage transported by the system.

This objective will be supported by an Operational and Maintenance management team and a reporting regime appropriate for the complete baggage handling system.

- 5.5.7.5 As a result of the findings in the Asset Condition Assessment (See Facilities Management Requirements, section 16.3) the Service Provider shall develop and implement a Baggage Handling Systems Asset Life Cycle Plan. The Baggage Handling System Life Cycle Plan shall include, but not limited to, the upgrade of any sub-systems or component to include, without limitation, the upgrade of IT Solutions, hardware and/or software that will exceed its lifecycle time during the period of the contract.
- 5.5.7.6 The Service Provider shall provide regular system reporting which will be continuously reviewed and amended to ensure it meets the Contracting Authorities requirements. Reporting shall be aligned to Cluster2 style, design and format and objectively quantify the efficiency and accuracy of the entire BHS/HBS process. The Service Provider shall ensure that the regular reporting includes, but is not limited to;
- 1 BHS/HBS health and safety,
 - 2 key operational efficiencies (SLA/KPI's),
 - 3 incidents,
 - 4 stoppages and
 - 5 trends
- that are required to support operational and maintenance decision making.
- 5.5.7.7 The operation and maintenance Services shall be provided in accordance with best industry standards, and equipment manufactures requirements thus ensuring a safe, secure, efficient, reliable operations and maintenance programme, adhering to the design intent and in accordance with a predefined Key Performance Indicators (KPI's) and Service Level Agreements (SLA's).
- 5.5.7.8 The Service Provider shall include all necessary labour, spare parts, consumables, materials, tools, instruments, and equipment associated with the complete baggage handling process and all necessary supervision required by the team to meet the performance defined in the KPI's and SLA's. This includes, but is not limited to, system monitoring, inspections, condition monitoring, function testing, troubleshooting of all systems equipment and components to identify and correct any system faults or component failures.
- 5.5.7.9 The Service Provider shall provide fully comprehensive maintenance; Operate, Maintain and Repair all X-Ray, and HBS equipment and servers without limitation.
- 5.5.7.10 The Service Provider shall generate and maintain an efficient spare parts inventory management system and an effective supply chain management system for the BHS/HBS systems, implementing all maintenance workflow processes on CAFM/CMMS (requests, approvals, escalation, etc.). This includes, but is not limited to, the documenting and reporting of all parts consumed on a daily, weekly, and monthly basis inclusive of cost, and ensuring replenishment of the same in a timely manner, at all times ensuring an adequate inventory of parts is maintained. The Service Provider shall engage with the Contracting Authorities CAFM system for implementing all maintenance workflow processes, spare parts and consumables (requests, approvals, escalation, etc.).
- 5.5.7.11 The Service Provider shall supply all the required and necessary spare parts as per the spare parts process of Section and ensure their availability during the Contract Period, including but not limited to, the following:
- 1 BHS Electrical and Mechanical spare parts.
 - 2 HBS Electrical and Mechanical spare parts
 - 3 ATR Electrical and Mechanical spare parts.

- 4 All system consumable spare parts.
- 5 Subsystems (BHS CCTV, Self-Check in counters, etc.)

5.5.7.12 The Service Provider shall have sole accountabilities for all direct staff and specialist vendor subcontracts, including but not limited to, the following: appointment, employment, qualifications, training, performance management, security and access approvals, transportation, housing, visa's, payroll, insurances etc.

5.5.7.13 The Service Provider shall ensure adequate resourcing to manually remove all system baggage, if necessary, bag jams and or obstructions to a seamless point to point delivery of baggage from check-in through to make-up in a timely manner, ensuring continuity of system operational performance.

5.5.7.14 The primary objective of the BHS and HBS Systems is to provide safe, secure, reliable uninterrupted point to point baggage handling services to airlines, handling agents and passengers in order to achieve an excellent level of customer service through operational excellence, where all bags are delivered on a timely basis to enable loading on the intended flight.

5.5.8 Performance

The Service Provider shall deliver, but not be limited to, the following:

- 5.5.8.1** A comprehensive operation and maintenance service provision through a single point of contact.
- 5.5.8.2** Achievement of maximum system availability (as per KPIs) measured on a daily, weekly, monthly, and annual basis.
- 5.5.8.3** Systematic recording of all planned and unplanned system downtime in the Contracting Authorities system of record CAFM system
- 5.5.8.4** Efficient responses and reinstatement times to Terminal Operations or directly as BHS single point of contact, for all system failures and operational requests whilst providing the required solutions effectively and efficiently within agreed timelines.

- 1 Appropriate and timely reporting on maintenance and repair activities, including
- 2 incident reporting,
- 3 root cause analysis,
- 4 safely freeing operational bag jams and the appropriate action to mitigate any repeat incidents.
- 5 Exception reporting for the activities not accomplished to include but not limited to;
- 6 Equipment down time,
- 7 malfunctions or inoperative or need of replacement of Equipment.
- 8 Operational issues with equipment; and issues with Service Provider, Sub-contractors, passengers, tenants, and other Stakeholders.
- 9 Any third-party damage, vandalism or malicious damage discovered.
- 10 Incident reports within 24 hours.
- 11 Health, Safety, Quality and Environment reports.

5.5.8.5 The upkeep and cleaning of all baggage handling areas, check-in, reclaim, under all BHS/HBS related plant such as maintenance platforms, sorters, conveyors, bag stores, stillage areas and carousels. For the purpose of this scope, the definition of clean shall mean, the absence of dirt, dust, litter, debris, bag tags, zips, straps, surface marks, spills, oils, grime, film, stains, streaks, spots, blemishes, chemical residue, and/or any other foreign matter which is associated with the overall BHS/HBS installed base.

- 5.5.8.6 Establishment and implementation of a quality control program and work-flow management procedure (identify, plan, schedule, execute, complete, analysis), providing continuous system improvement – from a safety, performance, and financial perspective.
- 5.5.8.7 Effective communication of the operational status and functional performance of the system in real time with timely escalation to the Contracting Authority or the Contracting Authorities representative of any outages that will impact on operational services.
- 5.5.8.8 Provision of intuitive BHS system specific business intelligence information from the integrated BHS/HBS data platforms, providing real-time dashboard operational statistics, highlighting any delays/stoppages, system performance metrics, throughput figures, processing parameters, system utilisation, energy usage and health status of the BHS/HBS process. Such performance related metrics shall be made available to the Contracting Authority and operational control and monitoring centres as appropriate and as required by the Contracting Authority.
- 5.5.8.9 The Services shall include the operation of incoming and outgoing baggage allocations, real time system monitoring, accurate reporting of system performance and equipment activity, a comprehensive maintenance and repair service, an appropriately robust planned proactive maintenance regime and continuous improvement activities focused on reliability and performance.
- 5.5.8.10 Monitoring, maintenance, and licensing of all the low-level system dedicated hardware and software, compliance with all licensing and registration procedures for custody and operations of radiation sources (Xray, and any other equipment), including, but not limited to, PLC's, visual displays, alarms, weighing equipment, monitoring and IT interfacing with ICT structured wiring where applicable.
- 5.5.8.11 24/7 365 days, system monitoring and reporting, including the robust and objective demonstration of SLA and KPI compliance, highlighting any deviations from same on a daily, weekly, monthly, and annual basis.
- 5.5.8.12 Development and implementation of start-up and ongoing quarterly refresher training and familiarisation programme for all users, including airlines, handling agents and staff, on best practice procedures and processes to ensure safe and efficient user operation of the BHS. The training will be based on train-the-trainer and not be required to be delivered to every member of a third party's cohort. While health and safety of the operators is of optimum concern, key elements of the training should ensure that the operators fully understand the bag limitations of the baggage handling system to ensure that the operational flow of the system is continually maintained. The Service Provider is responsible for providing clear check-in desk operational information, posted at each desk. Operational information should clearly identify acceptable bag dimensions, types and options for alternative check-in method: as in out of gauge or not acceptable for the BHS.

5.5.9 Primary responsibilities:

- 5.5.9.1 The Service Provider shall be responsible for the operation, maintenance, and monitoring of the baggage handling systems in its entirety, in a manner consistent with the requirements set out in the BHS/HBS supplier's operation and maintenance recommended guidelines.
- 5.5.9.2 The Service Provider shall provide adequate maintenance to ensure vendor, including "3rd party equipment" warranties are maintained, and the operational risk, cost and performance of the plant and the equipment life is optimised.
- 5.5.9.3 The Service Provider shall make themselves aware of the Cluster2 sustainability policy & ensure the system is continually optimised to always warrant the baggage handling system as energy and operationally efficient as possible.
- 5.5.9.4 The Service Provider shall ensure that the baggage handling system is operated and maintained at a minimum, fully compliant with all applicable local, in-country and relevant international laws, codes, industry safety standards, airport by-laws and industry best practices.

- 5.5.9.5 The Service Provider shall develop and maintain a safety management system linked to the Contracting Authority, ensuring it is implemented and adhered to by all staff who operate, maintain, or have direct or indirect access to the BHS/HBS systems and associated interfaces.
- 5.5.9.6 The Service Provider is responsible for providing a comprehensive risk based proactive preventative maintenance programme of works, to minimise unplanned system outages and equipment downtime.
- 5.5.9.7 The Service Provider shall utilise the integrated BHS system intelligence to support predictive maintenance activities, optimising planned preventative regimes based on insight on system load behaviour, hours run analysis, criticality, and historical fault trending. PPM to include the testing of full system Start up and Shut Down process, compliance testing of weighing conveyors and scanning equipment (X-Rays and CT Machines equipment) and validate full function operation of the integration for BHS/HBS.
- 5.5.9.8 The Service Provider shall provide predictive maintenance technology to implement predictive maintenance activities and Condition Based Maintenance.
- 5.5.9.9 The Service Provider shall be responsible for providing robust asset fault historical trending and analysis to inform and implement a continuous improvement programme of works.
- 5.5.9.10 The Service Provider shall be responsible for the BHS/HBS operations, and the optimum staffing required to monitor the automated sortation process and manual encoding operation (baggage not automatically read by the inline bag tag readers).
- 5.5.9.11 The Service Provider shall ensure the optimum resourcing to attend to all system stoppages, bag jams or obstructions, to support a seamless point to point delivery of baggage from check-in through to make-up in a minimum system in-time, ensuring an overall system operational performance.
- 5.5.9.12 The Service Provider shall be responsible for the even distribution of baggage to inbound and out bound carousels, adopting the most efficient utilisation of the conveying system to minimise baggage in-system times, and maximising the life of the system.
- 5.5.9.13 The Service Provider shall be responsible for the provision of all tools, instruments, materials, equipment, consumables, at no additional costs, as required to achieve the system performance as defined in the BHS/HBS KPI's.
- 5.5.9.14 The Service Provider shall be responsible for the provision of spare parts as required to achieve the system performance as defined in the BHS/HBS KPIs.
- 5.5.9.15 The Service Provider shall ensure availability of consumables, fast moving items and six months stock of critical spare parts.
- 5.5.9.16 Following the approval by the Contracting Authority the Service Provider shall have full accountabilities for all direct staff and specialist vendor subcontracts, for example specialist OEM, calibration and HBS support, including selection, appointment, employment, qualifications, training, performance management, security and access approvals, transportation, housing, visa's, payroll, insurances etc.
- 5.5.9.17 The Service Provider shall include for the provision, procurement, and administration of specialist vendor subcontract support as required, including coordinating attendances, validating works, scheduling, and permitting work activities and all the relevant documentation, access/security passes and record keeping. This includes all regulatory testing, insurance inspections, certifications, and calibrating of all assets and systems within scope.
- 5.5.9.18 The Service Provider shall attend and participate in meetings for the purpose of coordinating with all relevant parties to ensure the continuous smooth operation of the baggage system.
- 5.5.9.19 The Service Provider shall develop, in conjunction with the relevant parties (the Contracting Authority maintenance, terminal operations, airlines and their agents), appropriate fall-back procedures,

operational contingency plans and business continuity plans to maintain baggage operations in the event of a major event or system interruption.

- 5.5.9.20 The Service Provider shall actively develop, test, and communicate the BHS and HBS business continuity plans for all BHS system related failures, collaboratively engaging with the operators, passengers, airlines, and their agents to ensure an efficient response in the event of a system related failure.
- 5.5.9.21 The Service Provider shall be responsible for liaising, coordinating and cooperation with all airport stakeholders including terminal operations, airlines, handling agents, passengers, and owners to ensure seamless baggage handling operations and at all times avoid interrupting normal operations.
- 5.5.9.22 The Service Provider shall participate in and support the trialling and testing of the contingency plans and baggage system procedures and processes established for continued system operation.
- 5.5.9.23 All maintenance planned and unplanned activities shall be coordinated and approved with the Contracting Authority maintenance, terminal operations and scheduled around the daily flight schedules with a view to minimising any impact on operations, and the requirements of the primary stakeholders, airlines, security, operations, and their representatives.
- 5.5.9.24 The Service Provider shall be responsible for the provision of, certification of, and maintenance of all vehicles and lifting equipment, including access for maintenance equipment such as, but not limited to, mobile and static elevated working platforms, forklifts, trolleys or similar pertaining to the efficient operation and maintenance of the baggage handling operations. This shall be included in the Service Providers' Service Delivery Plan
- 5.5.9.25 The Service Provider shall be responsible for all assets required for their efficient and effective communications, such as cellular mobile phones, two-way radios, handheld technology devices. However, the Contracting Authority will require the Service Provider to operate a Cluster2 Airport-wide radio frequency network, trunked system, with all costs associated with the device to be at the Service Provider or end user's expense. Mobile phone usage is restricted in sensitive areas on the airport Site.
- 5.5.9.26 The Service Provider shall utilise the Contracting Authorities computerised maintenance management system (CMMS/CAFM) for the purpose of maintaining robust maintenance records, historical analysis, reporting of system availability, demonstrating compliance, inventory management, planning and scheduling work activities and generating work orders.
- 5.5.9.27 The Service Provider shall be responsible for storing and maintaining an adequate supply of spare parts, materials, and consumables to support the efficient and effective maintenance of the system.
- 5.5.9.28 The Service Provider shall maintain an appropriate level of manufacturers recommended spare stock, including tubs, including min/max levels as required or as deemed appropriate to satisfy the system availability requirements outlined in the KPI and SLA documents. Any replaced defective parts must be returned for inspection by the Contracting Authority or the Contracting Authorities representative in line with government compliance.
- 5.5.9.29 The Service Provider shall provide adequate resources necessary to conduct manual encoding, attend to and resolve and remove bag jams, search, and report on lost, missing or problem bags, transport and manage tubs, transfers, and in-house early baggage store (EBS) facilities.
- 5.5.9.30 The Service Provider shall proactively engage with and support the airlines and handling agents to locate lost or missing baggage.
- 5.5.9.31 The Service Provider shall provide the system tracking information to support each case. For the avoidance of doubt, the Service Provider shall not be held accountable for lost or mishandled bags not attributed to the non-conformance of the point-to-point BHS conveying process.

- 5.5.9.32 The Service Provider shall provide appropriate staffing of the baggage system control room, satellite workstations and any specific areas of concern (check-in) required to support 24/7 365 days a year baggage operation.
- 5.5.9.33 The Service Provider staff shall be responsible for monitoring and responding to operational concerns for the baggage handling system and the inline security hold baggage screening equipment.
- 5.5.9.34 The Service Provider staff shall provide communication and escalation measures in conjunction with the wider airport operational team on concerns of system or potential system interruptions or failures.
- 5.5.9.35 The Service Provider shall have qualified baggage conveyor operators for smooth operation and transfer of baggage to avoid baggage back log at each flight.
- 5.5.9.36 The Service Provider shall supply daily/weekly/monthly and quarterly reports based on data supplied from SCADA, SAC, ATR's and any relevant system data (CMMS) which can quantify automatically and objectively, system availability, downtime, baggage process rates (inbound/outbound), bags checked in per desk, bags processed per x-ray clear/unclear, in system time, handling agent performance recording (pick rates, first bag – last bag timings, check-in processing rates, check-in usage, dieback, no BSM's, cancelled BSM's, to support 3rd party user performance evaluation for training purposes.
- 5.5.9.37 It is the responsibility of the Service Provider to proactively identify single points of failure on the BHS/HBS systems, providing solution focused recommendations to increase system resilience and protection, to prevent or eliminate interruption to performance and operational risks.
- 5.5.9.38 The Service Provider shall liaise with, facilitate, and support all 3rd party FM Service Providers, facilitating them in undertaking their core duties in the upkeep and maintenance of terminal building services and architectural system, specifically in locations in the vicinity of or interfacing with the baggage hall operation or baggage handling systems.
- 5.5.9.39 The Service Provider shall be responsible for the maintenance of CCTV dedicated to the baggage handling system and must comply with all the relevant requirements under GDPR provisions.
- 5.5.9.40 In the event of any unauthorised handling of in-system baggage or operational misuse, the BHS operator will stop the relative line and immediately advise terminal operations of the specific activity. The Service Provider shall record all actions, report them to Terminal Operations and include them in routine reports. The Service Provider shall save all supporting system information for the appropriate departments.
- 5.5.9.41 All carousels and conveyors are to be clearly labelled, by the Service Provider, for their designations to enable 3rd party operators to effectively dispatch baggage.
- 5.5.9.42 The Service Provider is responsible for the upgrading of the related and associated software from time to time as and when new versions are released by the manufacturer to ensure that any related and associated software that gets corrupted due to any reason whatsoever will be replaced, so that there is no interruption in the operation of the systems and equipment.
- 5.5.9.43 The Service Provider shall back up software and related configurations of equipment and software to ensure Business Recovery in the event of any failures.
- 5.5.9.44 The Service Provider is responsible to ensure protection of the related and associated hardware from all types of viruses, by constantly checking and monitoring their performance and updating them with latest antivirus software at any time as per the situation, to prevent, detect and protect the systems.
- 5.5.10 Baggage Hall Floor Cleaning**
 - 5.5.10.1 The Service Provider BHS operator is responsible for the systematic cleaning routines necessary to ensure that the baggage hall floor condition is maintained.

- 5.5.10.2 Cleaning scope limited to the BHS/HBS equipment, the floors, and adjacent areas where the System is located ("Technical Areas").
- 5.5.10.3 The Service Provider shall provide cleaning routines aligned to operational usage of the baggage hall BHS must be deployed to ensure an efficient use of labour and resources.
- 5.5.10.4 The Service Provider shall provide weekly inspections and planned maintenance cleaning routines as per Maximo schedules of Baggage Hall floor drains and gullies.
- 5.5.10.5 The Service Provider shall provide nonaggressive chemicals to be used in line with the Contracting Authorities Hazardous Chemical policies.
- 5.5.10.6 The Service Provider shall conduct daily inspections to ensure that the most effective cleaning routines are deployed.
- 5.5.10.7 The Service Provider shall wash and vacuum the equipment to remove stains, dust, and litter across the whole surface on a daily basis.
- 5.5.10.8 The Service Provider shall clean around equipment supports, floor edges and bases using appropriate hand tools and cleaning liquids to prevent any accumulation of dirt or debris in order to prevent any unwanted pests.
- 5.5.10.9 Immediate attendance to spillages to eliminate risks to operator and staff safety; of slips, trips or falls.
- 5.5.10.10 All relevant safety signage is in place prior to service commencement.

5.5.11 Baggage Hall Waste Bin Strategy

- 5.5.11.1 The baggage hall operator must implement an effective waste bin strategy.
- 5.5.11.2 All waste bins must have a sealed lid, be positioned on pedestrian routes, close to entry and exit points and in all restrooms to support a clean bag hall strategy.
- 5.5.11.3 Bins must be removed daily and must not be allowed to fill over 75%.
- 5.5.11.4 Weekly cleaning meetings to report on and to promote the strategy.
- 5.5.11.5 Clear signage and information notices to inform users of good housekeeping practices, including type of waste acceptable and unacceptable.
- 5.5.11.6 Information notices to be posted at each bin position.
- 5.5.11.7 Notices and signage to be validated by the client or his agent.
- 5.5.11.8 Immediate reporting of any misuse of the bag hall areas.

5.5.12 Exclusions

- 5.5.12.1 Airport specific IT systems and equipment.
- 5.5.12.2 Airline specific systems and equipment.
- 5.5.12.3 3rd Party operator's specific equipment not limited to baggage trucks, chargers, containers, ULD's, trollies.

5.5.13 Additional Responsibilities

- 5.5.13.1 The Service Provider through their Radiation Protection Officer (RPO) is required to engage with all parties on all or any compliance and regulatory obligations and associated reporting mechanism to robustly demonstrate compliance with same.
- 5.5.13.2 Throughout installation periods the Service Provider shall remain committed to supporting all warranty obligations on behalf of the Contracting Authority, however, and for the avoidance of doubt, during this warranty period the specialist system provider shall remain liable for their relevant system performance and availability in line with their existing contract and warranty obligations. It shall remain the Service Providers responsibility to proactively engage with the relevant systems providers

during these periods and always demonstrate best endeavours to mitigate system outages and or operational impacts.

- 5.5.13.3 Notwithstanding the completion of a planned maintenance regime on the HBS equipment by a third party or the original equipment manufacturer, and following the completion of the testing, and validating the HBS equipment, the Service Provider shall be responsible for the compliance with all relevant legislation for hold baggage screening (HBS) equipment all levels, including all compliance and regulatory obligations and associated reporting mechanism to robustly demonstrate compliance with same.

5.6 Miscellaneous Services

5.6.1 Advanced Restroom Services

- 5.6.1.1 The Service Provider shall provide an appropriately skilled reactive restroom service team for each of Terminals at the airports during operating hours. The teams shall be on-site and be responsible for, but not limited to, plumbing, doors, and door furniture, flusher and tap sensors, hand drying units, and cubicles. The teams shall have access to spares, consumables and tools that may be required at all times.
- 5.6.1.2 The Service Provider shall have available appropriate barriers and signage, as approved by the Contracting Authority, whilst carrying out work in public areas.

5.6.2 Auto-Doors Services

- 5.6.2.1 This Section to be read in conjunction with the **Section 3.37 Automatic Doors of Appendix 2 General Hard Services Requirements**.
- 5.6.2.2 The Service Provider is to have 24/365(6) Manufacturer recognized certified automatic door technicians available.
- 5.6.2.3 Only Manufacturer recognized certified automatic door technicians will carry out all maintenance, planned and unplanned, of the Automatic Doors.
- 5.6.2.4 The Service Provider shall have available appropriate barriers and signage, as approved by the Contracting Authority, whilst carrying out work in public areas.

5.6.3 Works Hoarding and Barricades

- 5.6.3.1 The Service Provider is responsible for providing hoarding and barricades within the terminals as requested by the Contracting Authority. The hoarding and barricades design is to be approved by the Contracting Authority.
- 5.6.3.2 The Hoarding and barricade service is to be available 24/365(6).

5.6.4 Building Maintenance Unit and Roof Anchor Points

Where a Building Maintenance Unit (BMU) is available for use for cleaning and maintenance of the sides of buildings:

- 5.6.4.1 The Service Provider is responsible for the BMU, all equipment and accessories related to the BMU.
- 5.6.4.2 The Service Provider is responsible for maintenance and cleaning of the BMU
- 5.6.4.3 The Service Provider is responsible for the Statutory Certification by Legally recognized 3rd Party Certifier of the Building Maintenance Unit.
- 5.6.4.4 The Service Provider shall have a certified operator available for the BMU.
- 5.6.4.5 The Service Provider is responsible for the maintenance of Anchor Points.
- 5.6.4.6 The Service Provider is responsible for the Statutory Certification by Legally recognized 3rd Party Certifier of the Anchor Points.

5.6.5 Key Control

- 5.6.5.1 The services provider shall ensure 24/7 connected services for all key systems and associated equipment within ALL buildings, should be listed as following:
- 5.6.5.2 The Service Provider is responsible for the key provision, mastering, controlling, cutting, management, supervisory, risk management solutions and registering.
- 5.6.5.3 The Service Provider shall provide additional keys as requested by the Contracting Authority for any service provider including 3rd party. Only the Contracting Authority is authorised to approve additional keys.
- 5.6.5.4 The Service Provider shall provide a detailed works schedule showing dates when routine maintenance visits and planned repairs will take place.
- 5.6.5.5 The Service Provider shall report any lost keys or non-returned keys to the Contracting Authority.
- 5.6.5.6 The Service Provider shall repair and/or replace locks as required and authorized by the Contracting Authority.

5.6.6 Audits and Inspections

5.6.6.1 Annual Audit Report

During the third quarter of each Contract year, the Service Provider shall submit an annual audit report to the Contracting Authority outlining the following details for the airport, as a minimum:

- 1 Health, Safety & Welfare improvements required to meet current legislation and standards.
- 2 Risk Assessment of each installation in accordance with the standards, the second and fourth year may be accepted on the basis of a certificate confirming "No Change" to the first- and third-year assessment where this applies. The Third and fifth year is to be a "Full Risk Assessment".
- 3 Details of any outstanding repairs and a program listing the anticipated completion date and downtime involved.
- 4 Details of Safety Inspections completed and dates when the inspections are due.
- 5 Suggested improvements to provide improved reliability, energy saving and/or performance.
- 6 12-month annual planner detailing each proposed maintenance visit and type of visit, inclusive of any major repairs requiring downtime exceeding 1 hour.
- 7 A site log card clearly identifying each event and its relevant report. This card shall identify each unit with the unique asset number listed in the Contracting Authorities CAFM system.
- 8 The approved annual planned maintenance and major repair schedule as applicable to each unit.
- 9 Copies of all Site visit reports separated into maintenance visits, planned, reactive, corrective and service call out reports. At each maintenance visit a check list of the servicing work completed shall be issued and signed off by the Service Providers Representative.
- 10 Copies of valid Certificates and Statutory Inspection Reports.

5.6.7 Monthly Report

Each month the Service Provider shall submit a report to the Contracting Authority or their representative outlining the following details for each airport, as a minimum:

- 5.6.7.1 A matrix of all units, including those units which have failed to meet the breakdown performance standards and unit back to service. The matrix shall be cumulative showing each calendar month and the total for the portion of a rolling and calendar year.
- 5.6.7.2 Matrix of all units, detailing due date and confirming date of all inspections.
- 5.6.7.3 Schedule and status of all quotations including dates of orders received, works carried out and works completed and signed off.
- 5.6.7.4 Analysis schedule of equipment failures with actions taken and dates.

- 5.6.7.5 Where misuse/abuse reports have been made, these should be supported with the inclusion of digital photo(s) with a copy of the Service Providers report, to verify details.
- 5.6.7.6 Breakdown matrix of all hours expended, consumables and materials used.

5.7 Passenger Boarding Bridges (PBB)



Figure 5.7 shows the overview of PBB in Jazan airport

- 5.7.1 This scope aims to define the preventive and corrective maintenance requirements for Passenger Boarding Bridges (PBB) to ensure their reliability, functionality, and safety at all times, in compliance with internationally recognized standards. Moreover, The Service Provider shall be responsible for the maintenance, and performance of all Passenger Boarding Bridges (PBB) and their associated subsystems and components, including but not limited to:

1. Rotunda Unit:

- Maintenance of horizontal and vertical rotation axes.
- Inspection and lubrication of bearings and seals.
- Alignment verification and torque adjustment of rotating columns.

2. Tunnel Section:

- Inspection of structural steel elements, welds, and possible cracks.
- Maintenance of walking surfaces, sliding systems, panels, and rubber seals.
- Repainting and corrosion protection according to the maintenance schedule.

3. Traversing System:

- Inspection of drive motors, gearboxes, position sensors, and wheel assemblies.
- Testing of brakes and safety systems under both manual and automatic operation.
- Periodic calibration of height and speed sensors.

4. Vertical Column / Lift System:

- Inspection of electric and hydraulic drive motors.
- Calibration of upper and lower limit switches.
- Testing of backup and emergency systems during power failure.

5. Cabin Section:

- Inspection of door interface mechanisms and locking systems with aircraft doors.
- Adjustment of pressure sensors and interlocks.
- Comprehensive cleaning and verification of lighting and ventilation systems.

6. Hydraulic and Electronic Systems:

- Maintenance of pumps, valves, piping, and reservoirs.
- Testing of PLC controls, operation panels, and safety interlocks.
- Software updates as per Original Equipment Manufacturer (OEM) specifications.

7. GPU – Ground Power Unit:

- Daily/Weekly Inspections: Visual checks for cable wear, connector integrity, and signs of corrosion or water intrusion.
- Monthly Maintenance: Functional testing, cleaning, and checking insulation resistance.
- Quarterly Load Testing: Ensures the unit delivers consistent and safe power under load.
- Annual Overhaul: Comprehensive inspection, replacement of worn components, calibration, and performance testing.
- Documentation: Maintenance logs, fault records, and service history must be maintained.
- Only certified GSE technicians should perform tasks, using appropriate PPE.

8. PCA – Pre-Conditioned Air System

- Routine Inspections: Check hoses, connectors, and air delivery performance.
- Filter Replacement: Periodic replacement of air filters to maintain air quality.
- System Calibration: Ensure temperature and airflow meet aircraft requirements.
- Preventive Maintenance: Based on OEM schedules, including diagnostics and fault alerts.

9. VDGS – Visual Docking Guidance System

- Visual Inspection: Check displays, sensors, and mounting structures.
- Functional Testing: Ensure accurate aircraft guidance and system responsiveness.
- Firmware Updates: Keep software current for optimal performance.
- Cleaning: Remove debris from sensors and lenses.
- Electrical Checks: Inspect wiring and connectors.
- Calibration: Adjust sensors and cameras for precision docking.

5.7.2 Service Provider Responsibilities

1. Execute all preventive and corrective maintenance activities in accordance with OEM Maintenance Schedules.
2. Prepare periodic reports for each PBB covering performance, malfunctions, corrective actions, and spare parts used.
3. Maintain cleanliness of all PBB components, inside and outside
4. Provide qualified and OEM-certified technicians for PBB maintenance.
5. Record all maintenance activities in the computer-Aided Facility Management (CAFM) system.
6. Comply with all safety procedures (LOTO, PPE, Work at Height, confined space, etc.).
7. Coordinate closely with airport operations to avoid flight disruptions.
8. Respond to emergency breakdowns.
9. Annual maintenance plan for each PBB.
10. Monthly reports summarizing KPIs, performance, and bridge status.
11. Calibration and safety inspection records

6. Utilities and Campus

6.1 Overview

- 6.1.1** The Service Provider shall respond immediately to all utility outages including complete and partial outages and the work shall continue until the service has been restored equivalently and the cause of the outage is corrected unless otherwise agreed by the Contracting Authority to ensure continuity of the business plan.
- 6.1.2** The service provider shall respond immediately to all emergency utility outages including complete and partial outages and provide alternative solutions to maintain the business continuity and inclusion these solutions in the mitigation plan.
- 6.1.3** It is imperative that the security of these facilities is a priority, access control for all personnel shall be a fundamental requirement and the security shall be paramount. All maintenance routines and attendance shall be itemised and logged at each utility facility. The Service Provider shall provide all maintenance activities that include but are not limited to PM, CM, inspections, monitoring, controlling, repairing, deficiencies rectification, calibration, tests, required supplies, and all activities that properly maintain the system operating condition.
- 6.1.4** The Service Provider shall review the current maintenance PPM activities and ensure that these activities are both in line with the manufacturer's guidelines and with respect to the critical equipment and will ensure that this equipment is always available for operation. Any changes to activities must be approved by the Contracting Authority.
- 6.1.5** In respect of all utilities the Service Provider must ensure compliance with safety precautions, design standards and meet all applicable regulations, codes, standards, and manufacturer-recommended maintenance practices. The Service Provider is to ensure all assets are maintained and operate in accordance with internal health and safety, environment, and quality management systems.
- 6.1.6** The Service Provider shall provide full house keeping and cleaning services to all utilities & campus hard services include but not limit to all technical & control rooms, workshops & motor pool workshops, stores, roads, bridges, drainage structures, ditches, drainage rip-rap liners, open channels, catch basin, pounds and culverts, utility tunnel, and District colling facilities.

6.2 Related Scope

- 6.2.1** Lands, Roads, Pavements, Grounds, and Carparks
It is the responsibility of the Service Provider to provide Facilities Management Services across each airport campus.
- 6.2.2** Utilities
It is the responsibility of the Service Provider to provide Facilities Management Services for airport wide primary utilities services including the generation and distribution of all MV/LV Electrical Services, Potable, Fire, irrigation & Grey Water, Storm Water & Sewage, Chilled Water systems, HVAC systems and Smoke management system (Life Safety System)
- 6.2.3** Ancillary Services
The Service Provider shall be responsible for the provision of several additional ancillary services which includes but not limited to the provision of a Flexible Support CMMS, Workshops Waste Disposal, Transportation of Liquids-water-fuel-waste, vehicle & equipment maintenance, fuel station and transportation.
- 6.2.4** Specific Hard Services

The Service Provider shall provide operation, asset monitoring and comprehensive maintenance Services. The scope of the Hard FM Services will include both non-specialist and specialist mechanical, electrical, plumbing, civils, and architectural maintenance.

6.3 Landside Roads, Pavements, Grounds and Carparks

6.3.1 General Scope

6.3.1.1 The Service Provider shall provide Facility Management Service to Landside Roads, Pavements, Grounds and Carparks, that service shall include but not limited to namely, routine, periodic and emergency maintenance, inspection, reporting, cleaning, repairer, technical support, to the area in the scope of The Service Provider to be include but not limited to:

- 1 Landside Roads and Pavements.
- 2 Pedestrian Paved Sidewalks and Passages.
- 3 Landside Drainage, Culverts and water surface management
- 4 Fences.
- 5 Landside Lighting.
- 6 Landside Tunnels, Ramps, bridges, and Access Points.
- 7 Landside Signage.
- 8 Carparks.
- 9 Landside Grounds and landfill area
- 10 Groundwork Equipment Operations.
- 11 Periodic Inspection and Repair.
- 12 Inspection, Repair and Maintenance Schedule.
- 13 Marking, Re-Marking Activities
- 14 Cleaning Services (landside).

6.3.1.2 The Service Provider shall carry out a full inventory and facilities conditions report for lands and roads scope of work during the mobilization period and will submit a maintenance schedule for review and approval by the Contracting Authority. This will include regular inspection reports, as well as planned maintenance activities.

6.3.2 Landside Fencing

6.3.2.1 The Service Provider shall provide maintenance services to include, but not limited to, Inspections, Preventive Maintenance, Corrective Maintenance and Test to all perimeter and security fences or any other fence required and requested by the Contracting Authority.

6.3.2.2 The Service Provider shall perform maintenance services for all fences within scope to include, but not limited to, fence posts, chain linked fencing, signs affixed to the fence, corner braces, gates, gate posts, gate hinges locking devices, hasps, out riggers, barbed wire, tension wires, tension bars, concrete bases, tie wires or any elements that affect, stick, connect, or part of the fence. The Service Provider shall develop a fence inspection and repair or replace plan which shall be submitted to the Contracting Authority for approval not later than thirty (30) days prior to the commencement of the Services. The plan shall include, but not be limited to, security fence, perimeter fence, blast fence, boundary fence, breakaway fence section, etc.

6.3.2.3 The Service Provider shall provide sufficient manpower and equipment for emergency fence repairs 24/365(6) due to, but not limited to, vehicle accidents, breeches of security, natural phenomena or any other incidents, removing, replacing, relocating etc. as directed or requested by the Contracting Authority.

- 6.3.2.4 The Service Provider shall perform routine maintenance during normal working hours. Emergency repairs shall start immediately upon notification and continue until the emergency has been corrected.
- 6.3.2.5 The Service Provider shall perform monthly inspections as scheduled or more frequently as required or requested by the Contracting Authority. Using CAFM or any other system assigned by the Contracting Authority; work orders shall be prepared for each discrepancy and the discrepancy corrected.
- 6.3.2.6 The Service Provider shall provide repair crew and equipment (qualified and skilled) to provide crafts capability of operating cutting torch, gas, and electric welding and any work need it to restore the fence to origin.
- 6.3.2.7 The Service Provider shall remove drifted sand from fence lines. Sand shall not be allowed to accumulate deeper than 500mm from the bottom of the fence before removal. Sand shall be cleared three to five (3 to 5) meters from the fence line or at a greater distance determined by the Government according to the situation or as required or requested by the Contracting Authority. The Service Provider must be sure that the fence is secured and no cut or gaps exist especially between ground and fence (no space) all the time.
- 6.3.2.8 The Service Provider shall repair all fences and all components, to the original design specifications, both in workmanship and materials.
- 6.3.2.9 The Service Provider shall be responsible for the inspection and maintenance of all non-aviation-regulated fences. These fences include all fences that do not control access to regulated airside locations, and which are owned by Cluster2. Fences include both permanently anchored fencing as well as movable fencing. Fences will be inspected and cleaned along their entire length minimum every three (3) months or as required or requested by the Contracting Authority. The Service Provider shall inventory and manage all fences and will submit to the Contracting Authority a comprehensive inspection and maintenance schedule and will ensure that all items are in serviceable, clean, and aesthetic condition. Movable items will be ready to deploy, and the Service Provider shall manage their movements and deployment based on the Contracting Authority's requirements.

6.3.3 Landside Lighting

- 6.3.3.1 The Service Provider shall be responsible for all planned, corrective, and reactive/remedial maintenance on all airport main roads and service road lighting systems, passenger and staff parking areas, external footpaths, service yards, public areas, lighting on the main inbound road advertising panels and landscaping and architectural display lighting including all infrastructure and associated controls devices, cables, and fittings.
- 6.3.3.2 The Service Provider is responsible for, but not limited to:
 - 1 Maintenance and operation of all traffic lights and Traffic Signals
 - 2 Road lighting maintenance including transformers and control panels.
 - 3 Maintenance of external afforestation lighting including poles, immersive lighting, secondary transformers, and lighting panels (portable lighting poles maintained by others).

6.3.4 Tunnels, Ramps, Bridges, and Access Points

- 6.3.4.1 The Service Provider shall be responsible for the operation and management of all tunnels, and access points and associated equipment such as, but not limited to: Tunnels, Bridges, Viaducts, Overpass (including areas beneath), Ramps and other access points, Other vehicle areas such as pull-offs, bus stops, and other areas, Fixed barriers, chicanes, speed control humps, and other restraints, Mobile, powered, and automated barriers, including all infrastructure, motors, actuators,

cabling, and control devices) and Manually operated barriers including all infrastructure, components, and mechanisms.

6.3.4.2 The Service Provider shall be responsible for regularly inspecting and cleaning of all paved surfaces (water, sludge, sand, and debris). This also includes reactive services in case of reported incidents and/or other events. Additional inspections and interventions will be provided after adverse weather events and any other events that may affect the safety of people and vehicles.

6.3.4.3 The Service Provider shall provide a cleaning and maintenance schedule to the Contracting Authority for approval and inspection purposes. Emergency repair services. For all types of maintenance activities, emergency signage and other precautionary measures will be provided. In the case of tunnels, the Service Providers shall comply with specific tunnel safety and inspection requirements applicable in the Kingdom of Saudi Arabia. He shall be responsible for the mandatory safety and structural inspections and certifications, and he shall maintain in good and safe operating state all mandatory safety systems. This shall include any signage and weight restriction enforcements, as applicable

6.3.4.4 The Service Provider shall inspect and manage all type maintenance, repairing and test including but not limited to expansion joint, epoxy, hinge, water proofing, etc.

6.3.4.5 Maintenance and corrective tasks will include, but will not be limited to: Concrete inspections, Rebar inspections and test, Repair, patching, welding, and other remediation tasks and Application of protective substances of all types (antioxidants, coatings, etc.).

6.3.5 Landside Signage

6.3.5.1 The Service Provider shall be responsible for all roadside vertical and horizontal signage across airports' campuses. This includes, but is not limited to:

- 1 Roads network signage, including supports and posts and Ground signage (painted lines, crosswalks, dividers, arrows, etc.) in conformity with KSA national road and transport regulations and Cluster2's signage policies. This includes any lighting or other dynamic displays.
- 2 Pathway and other directional signage destined to pedestrian traffic, including all posts, supports, and other fasteners. This includes any lighting or other dynamic displays.
- 3 Ground signage for pedestrian traffic on pedestrian pathways.

6.3.5.2 The Service Provider shall be responsible for regularly inspecting and cleaning all signage so that they are maintained in a clean, legible, and aesthetic state always. Liquid streaks, graffiti, visible rust, sand, and debris marks, peeling paint or decals, and other visible contamination shall not be acceptable and shall be removed or remediated.

6.3.5.3 The Service Provider shall provide a cleaning and maintenance schedule to the Contracting Authority for approval and inspection purposes.

6.3.5.4 The Service Provider shall maintain all roadways and street signs include, but not limited to warning sign, gantry and cantilever, traffic sign, etc. The maintenance service shall include, but not limited to, repair of the damaged or worn-out signs, signposts, and concrete bases and any elements that will be included in the sign. Signposts and concrete bases or any elements that cannot be repaired shall be replaced. In addition, the Service Provider shall relocate, replace, remove, change information, reflection, of existing signs and install new signs.

6.3.5.5 The Service Provider shall supply and install new signs as required by the Contracting Authority. The material required for the repair, relocation and replacement of signs shall be procured through "Service Provider Purchase Materials (Ceiling Price)"

6.3.5.6 The Service Provider shall clean all street and roadway signs minimum once every month or as required. After cleaning, the signs shall be free of all dirt, dust, and marks.

6.3.5.7 The Service Provider is responsible for emergency repair services.

6.3.5.8 The Service Provider is responsible for reactive services in case of reported incidents and/or other events.

6.3.6 Car Parks

6.3.6.1 The Service Provider facilities management services for car park areas and facilities furniture/elements including Services across all car parks including but not limited to:

- 1 Shading Structures and Other Protective Structures. The Service Provider shall be responsible for the maintenance and upkeep of all shading and other protective structures in across the entire campus. This will include, but will not be limited to:
 - a) Car shading structures and all supports, poles, structures, and anchoring
 - b) Shaded walkways and all support, poles, structures, and anchoring
 - c) Awnings and sails and all their fastening systems and structures
 - d) Porches, galleries, and similar structures and all their fastening systems and structures
- 2 roadways and parking surfaces (road structures, base, sub-base, markings, reflectors, traffic buttons, curbs, handrails),
- 3 car stopper,
- 4 emergency exit gates,
- 5 fences,
- 6 barriers,
- 7 spilling of pavement surface (potholes, subsidence/settlement, erosion and cracks repair),
- 8 dedicated walkways,
- 9 expansion and construction joints,
- 10 Drains (gutters, drainage ditches, catch basin),
- 11 Signage (directional, warning), and
- 12 any related elements as directed by the Contracting Authority.

6.3.6.2 The Service Provider shall carry out a full inventory during the mobilization period and will submit a maintenance schedule for review and approval by the Contracting Authority. This will include regular inspection reports, as well as planned maintenance activities. In case of non-functional equipment, temporary measures will be put in place until final repairs can be completed.

6.3.7 Landside Grounds and Landfill Area

6.3.7.1 The Service Provider shall maintain all Campus grounds furniture/elements as described to include, but not to be limited to, erosion control, levelling and compacting, repairs to the grounds and road shoulders, and litter and debris picking, remove and transfer any rough or left materials, or any visual distortions inspect and repair of manholes or any elements inside the area that could damage or affect the area.

6.3.7.2 The Service Provider shall remove all vegetation in all forms around Cluster2 Airports campus. All time the campus should be clean and clear to include, but not limited to hard surfaces that impairs equipment operations or could present blockage of run-off water or around the shoulder and fence etc. especially during periods of rain and heavy winds.

6.3.7.3 The Service Provider shall repair, including the use of erosion preventing chemicals. All soil erosion includes, but not be limited to, grounds, shoulders of roadways, bridges, tunnels, curve, streets and vehicle parking areas etc.

- 6.3.7.4 The Service Provider shall repair all grounds to the original design specifications including slope and compaction or any other methods need it as directed by the Contracting Authority.
- 6.3.7.5 The Service Provider shall litter pick along highway shoulders and islands, roadway curbs, and security fences by using safety and proper way such as three - wheel motorcycles on a daily basis or as directed by the Contracting Authority.
- 6.3.7.6 The Service Provider shall maintain all Cluster2 Airports campus by sweeping and patrol schedules and provide copies of inspections to the Contracting Authority when requested. Schedules shall show the frequency of services for each particular road, area, etc. Covered.
- 6.3.7.7 The Service Provider shall attend to cleaning of all debris, liquids, litter pick or removal of vegetation, repair of soil erosions, pick up of litter, etc. And any needed work requested and required by the Contracting Authority to keep and return the area to original state.
- 6.3.7.8 The Service Provider shall handle All types of visual distortion around the Cluster2 Airports campus Removing, Transfer, Cleaning, Levelling, Compacting, etc. In addition to Unpaved Area and Landfill to be Organized, Covered, etc
- 6.3.8 Groundwork Equipment Operations**
 - 6.3.8.1 The Service Provider shall provide qualified and well-trained equipment operators to operate all Roads and Grounds equipment.
 - 6.3.8.2 The Service Provider shall develop a training program to be submitted to the Contracting Authority, not later than thirty (30) days prior to the commencement of the Services, to train operators on the equipment to be operated to include, but not be limited to, the following elements.
 - 6.3.8.3 Develop a program of classroom and on-the-job instructions, for each type of equipment, to provide operator proficiency.
 - 6.3.8.4 Schedule instruction for all operators as necessary to insure proper prior qualification for assigned duties and responsibilities. In addition, Conduct the training program according to the schedule.
 - 6.3.8.5 Testing operator periodically during the training program and ensure that each operator has acquired the necessary skills and knowledge of the equipment.
 - 6.3.8.6 Certify to the Contracting Authority that each operator is fully qualified to operate each type of equipment before being assigned to operate that equipment.
 - 6.3.8.7 The Service Provider shall assure that no Operator will be allowed to operate any equipment if he is not holding a valid Saudi Arabian Operator license for the specific Equipment and a training certificate, issued by an authorized training organization or equipment manufacturer, certifying that the operator is fully trained to operate the equipment.
 - 6.3.8.8 The Service Provider shall conduct a weekly Safety Meeting to familiarize staff & operators regarding the Contracting Authority Safety Rules and Regulations.
 - 6.3.8.9 It shall be the Service Provider's responsibility to assure that all equipment operators are professionally trained, qualified and licensed, and responsible to check the assigned equipment before and after the operation, and report any deficiencies found for corrective action.
 - 6.3.8.10 In the event the Service Provider determines that any operator is, by virtue of prior experience or training, qualified to operate the assigned equipment without additional training, the operator shall be exempted from participation in the training program of qualification provided the Service Provider actually tests each operator and certifies that said operator is proficient to operate that equipment and has been issued a certificate, and has obtained a Saudi Arabian license for the specific equipment.
 - 6.3.8.11 The Service Provider shall submit all the documents related to all equipment using by their operators or using in Cluster2 Airports and must be in very good condition and frequently check and clean with

good place to store and maintain. And the availability of the equipment and their operators all the time.

- 6.3.8.12 The Service Provider shall provide assistance at the request of the Contracting Authority to transport items within, onto and off the Cluster2 facilities. The Service Provider must also provide manpower, tools, and equipment, including trucks / other cars and consumables, upon request, and every request begins with the issuance of a maintenance request from the Contracting Authority to the Service Provider. Payment for this service will be at the discretion of the Contracting Authority.

6.3.9 Periodic Inspection and Repair

- 6.3.9.1 The Service Provider shall undertake the Safety Inspections, Safety Patrols, Detailed Inspections, and all kinds of inspections and tests to deliver a complete and professional work. All road inspection personnel shall have passed a road/highway inspection course approved by the UK Highway Inspectors Board (or equivalent) subject to the approval of the Contracting Authority's Representative and be fully familiar with inspection procedures and safety requirements.
- 6.3.9.2 The Service Provider shall submit for the approval of the Contracting Authority's Representative a Standard Operating Procedure (SOP) for the execution of all inspections and patrols in accordance with the Certification Procedure. The Service Provider shall document procedures for correction, making safe or otherwise protecting hazards found during any patrol or inspection and submit it to the contract authority. And make study and record the repeated incident or issues. In result, make the required modification to eliminate or minimize future incidents.
- 6.3.9.3 The Service Provider shall carry out an inspection, report and repair recommendations on Civil Structures, Fabric and Infrastructure on Airports' Campus (the "Civil Building Structure, Fabric & Infrastructure) under this section (Campus as applicable) and includes, but is not limited, the items in the tables below.
- 6.3.9.4 The Service Provider shall categorize issues found during Safety Inspections, Detailed Inspections, Safety Patrols, and all kind of inspection in the Cluster2 Airports' campus or following other reports and complaints, as one of the following:
- 1 Category 1 Issues (which include, but are not limited to, those issues listed in Table 1),
 - 2 Category 2 Issues (which include, but are not limited to, those issues listed in Table 2)
 - 3 Category 3 Issues (all issues other than Category 1 or Category 2 Issues.).

Category 1 Issues shall include but not be limited to those shown below:

Table 1: Category 1 Issues

Asset	Defect	Definition
Carriageway	Pothole	Greater than 35mm deep or larger than 150mm x 150mm.
	Difference in level	Difference in level between the carriageway and any trench, repair, or ironwork greater than 40mm.
	Edge Damage	Road edge breaking and falling away so as leave a drop greater than 40mm. Overrun of average is not a Category 1 defect.
	Rutting	Wheel track rutting of 20mm or greater which extends for a length greater than 20m.
	Flooding	Where standing water projects into carriageway by 1.0m (measured from carriageway edge line) or there is excessive flow of water across the carriageway.
	Debris	Debris on the carriageway that could damage a vehicle or cause road users to take avoiding action.

Asset	Defect	Definition
Pedestrian Plaza	Fire Damage	Any damage to the pavement arising from a vehicle or other fire, accidental or otherwise.
	Illegal objects	Illegal objects which reduce the carriageway width.
	Pothole	25mm deep or greater and larger than 75mm x 75mm.
	Difference in level	Difference in level between the surface's, tiles, marble, granite, concrete, interlocking tiles, block and any trench, repair, or ironwork greater than 20mm.
	Missing/rocking/uneven slabs	Rocking, uneven, or missing slabs resulting in a trip/fall hazard of 25mm or greater.
Footways	Standing water	Where standing water, deeper than 50mm, obstructs the cycle facility to such an extent that cyclists try to avoid.
	Pothole	20mm deep or greater regardless of size.
	Difference in level	Difference in level between the footway and any trench, repair, or ironwork greater than 20mm.
	Missing/rocking/uneven slabs	Rocking, uneven, or missing slabs resulting in a trip hazard of 20mm or greater.
	Standing water	Where standing water, deeper than 50mm, obstructs the footway to such an extent that pedestrians are likely to step off the footway to pass.
Covers, gratings frames and boxes	Broken or missing	Missing, broken or damaged covers in the carriageway or footway.
	Difference in level	Difference in level of 20mm or more on footways, cycle tracks or carriageways.
	Smooth surface	Smooth surface (visual assessment) on manhole covers in footways or carriageway, especially those areas where skidding resistance is important i.e., approach to junctions, traffic signals or tight radii.
Kerbs edgings and pre-formed channels	Parallel grating	Incorrectly fitted gratings where the water bars are parallel to the direction of traffic flow.
	Dislodged/ misaligned	Dislodged or misaligned kerbs that project into carriageway or hard shoulder by 60mm or more or will impede water flow.
Filter material	Missing	Any missing kerbs if adjacent to carriageway.
	Displaced material	Filter material displaced onto the carriageway that could damage a vehicle or cause road users to take avoiding action.
Culverts	Flooding	Indications that flooding of the road or any private property is imminent.
Balancing Ponds/ ditch	Pollution	Visual evidence of any pollution.
	Flooding	Indications that flooding of the road or any private property is imminent.
Geotechnical assets	Slippage	Any earth slip that threatens to obstruct any part of the carriageway or footway or endanger lighting.
Road Restraint Systems	Collision Damage	Two posts or more bent or disconnected from the rails of the road restraint system.
		Single bent post if facing oncoming traffic. Rails encroaching into carriageway or footway.

Asset	Defect	Definition
Road Markings	Structural condition	Corrosion or other serious defect likely to affect the structural integrity of the road restraint system. Note: This should normally be identified and dealt with as a Category 2 defect.
	Missing/worn	Missing markings or markings worn to such an extent that less one third of the line remains. Note: worn road markings should normally be identified and dealt with as a Category 2 defect or dealt with as programmed work.
Road Studs	Loose	“Halifax” type road studs, which appear to be loose in their rebates.
	Missing	25% loss on straight or large radius curves or 10% loss on bends. Note: missing road studs should normally be identified and dealt with as a Category 2 defect or dealt with as programmed work.
Road Traffic Signs	Missing	Missing regulatory or warning signs. All other signs.
	Sign causing obstruction	Sign face within 450mm of the edge of the carriageway.
	Collision Damage	Sign or post projecting into carriageway or footway. Damaged post or partly detached sign face that may fall onto the carriageway, footway, or private land. Any damage to delineators, bollards, musoirs (nosing markers) or pencil cones
	Structural condition	Corrosion of the posts likely to cause the sign to collapse.
	Legibility	Graffiti, posters, or other defect, which reduces the legibility of any Traffic Sign.
	Obscured	Traffic Signs obscured by growth or any other obstacle.
	Damage (regardless of cause)	Damage to any sign with any of the following criteria supporting pole(s) diameter is less than 90mm; or the size of the sign is less than two square metres: or the sign is not protected by a road restraint system except in the case of signs supported by frangible posts
	Misaligned	Any Traffic Sign misaligned to the direction of traffic for whatever reason.
	Column	Total column failure.
	Electrical	Exposed, live electrical equipment. Component failure resulting in a high safety risk.
Road Lighting	Performance	Any column outage of any type including but not limited to those with the following criteria: lamp failure, outage due to the failure of another component, for example: ballast failure, ignitor failure, capacitor failure, fuse link failure, fuse cut out failure, MCB failure, distribution board failure, etc.
Fences Walls & Environmental Noise Barriers	Structural condition	Corrosion, rot, or other serious defect likely to affect the structural integrity of the fence.

Asset	Defect	Definition
Hedges & trees	Dead/leaning	Trees or hedges that appear dead or have dead or damaged limbs that could fall onto the road or project into the carriageway or footway.
	Lateral clearance	Trees with girth 175mm measured at 1m above the ground within the clear zone of the carriageway unless protected by a road restraint system.
	Headroom clearance	Trees where the clearance over the carriageway is less than 5.2m or over the footway/cycle facility is less than 2.5m.
	Obscure visibility	Where trees or hedges encroach into sight splays or obstructs the visibility of any Traffic Sign.
Grassed Areas	Obscure visibility	Where grass or other growth obscures sight splays or the visibility of any Traffic Sign.
Structures	Parapet damage	Parapet damaged such that the parapet fails to serve its primary purpose.
	Joint failure	Carriageway surface joint failure which causes a hazard to Network users.

Table 2: Category 2 Issues

Asset	Defect	Definition
Carriageway	Pothole	Any pothole which is not a Category 1 issue
	Difference in level	Any difference in level between the carriageway and any trench, repair or ironwork which is not a Category 1 issue.
	Edge Damage	Any Road edge breaking and falling away which is not a Category 1 issue. Overrun of verge is not a Category 2 issue.
	Rutting	Wheel track rutting which is not a Category 1 issue.
	Flooding	Where standing water projects into the carriageway but is not a Category 1 issue.
	Debris	Debris on the carriageway which is not a Category 1 issue.
	Illegal objects	Illegal objects which do not form a Category 1 issue.
Pedestrian Plaza	Pothole	Any pothole which is not a Category 1 issue.
	Difference in level	Any difference in level between the surface's, tiles, marble, granite, concrete, interlocking tiles, block and any trench, repair or ironwork which is not a Category 1 issue.
	Missing/ rocking/ uneven slabs	Rocking, uneven, or missing slabs, tiles, marble, granite, concrete, interlocking tiles, block resulting in a trip/fall hazard which is not a Category 1 issue.
	Standing water	Where standing water, obstructs the cycle facility which is not a Category 1 issue.
Footways	Pothole	Any pothole which is not a Category 1 issue.
	Difference in level	Difference in level between the footway and any trench, repair or ironwork which is not a Category 1 issue.
	Missing/rocking/ uneven slabs	Rocking, uneven, or missing slabs resulting in a trip hazard which is not a Category 1 issue.
	Standing water	Where standing water, obstructs the footway which is not a Category 1 issue.
Covers, gratings frames and boxes	Difference in level	Difference in level on footways, cycle tracks or carriageways which is not a Category 1 issue.

Asset	Defect	Definition
Kerbs edgings and pre-formed channels	Dislodged/ misaligned	Dislodged or misaligned kerbs that project into carriageway or hard shoulder and are not a Category 1 issue.
Filter material	Displaced material	Filter material displaced onto the carriageway that is not a Category 1 issue.
Geotechnical assets	Slippage	Any earth slip that is not a Category 1 issue.
Road Restraint Systems	Collision Damage	Any collision damage which is not a Category 1 issue.
	Structural condition	Corrosion or other serious defects which is not a Category 1 issue.
Road Markings	Missing/worn	Missing markings or markings worn which are not Category 1 issue.
Road Studs	Missing	Loss which is not a Category 1 issue.
Road Traffic Signs	Collision Damage	Collision damage which is not a Category 1 Defect.
	Structural Condition	Corrosion of the posts which is not a Category 1 Defect.
	Legibility	Graffiti, posters, or other defects, which is not a Category 1 Defect.
Road Lighting	Electrical	Any damage to any of the lighting or related infrastructure which is not a Category 1 Defect.
Fences Walls & Environmental Noise Barriers	Structural condition	Corrosion, rot, or other serious defects which is not a Category 1 Defect.
Structures	Parapet damage	Parapet damaged which is not a Category 1 Defect.
	Joint failure	Carriageway surface joint failure which is not a Category 1 Defect.

6.3.10 Issues shall be entered into the CMMS/CAFM, noting that Category 1 Issues shall be entered on the CMMS/CAFM within 24 hours of the issue being identified.

6.3.11 Where the Contracting Authority's Representative disagrees with the category given to an issue, the Contracting Authority's Representative may at any time re-classify the category of an issue.

6.3.12 Quarterly Inspections as a minimum frequency with technical check list report per the above categories shall be conducted.

6.4 Inspection, Repair and Maintenance Schedule

6.4.1 The Service Provider shall carry out landside pavement & infrastructure inspection, repair and maintenance as per Table 3 below.

Table 3: Inspection Frequency

Pavement	1	Asphalt	check for asphalt settlement and Cracks	Daily
			Cleaning the Asphalt	Weekly
	2	Road Marking	check for road marking thickness	Quarterly
			check for reflection of road marking	

	3	Curb- Stone	check for curb stone alignment check for curb stone finishing check for curb stone damages	Weekly
Finishing	4	Bridges anti-carbonation paint	check for damages check for cracks Check for painting	Half Year
Hard-Scape	5	Inter-lock	remove the damaged inter-lock clean the surface of inter-lock re-pairing works for curb-stone around inter-lock	Weekly
Barriers	6	Handrail	check for alignment repair the damaged clean the dirty rails	Weekly
	7	Jersey & Concrete Barriers	check for alignment check and clean drainage opening clean the surface re-paint the damaged barriers Replace it if needed Relocate if need it	Quarterly
	8	Bifurcated Barriers	repair the damaged parts repair the reflective stickers/Paint re-paint the damaged parts	Half Year
	9	Pollard	check for the scratched and damaged pollard repairing works re-paint the damaged one	Monthly
	10	Guardrail	check for alignment repair the damaged clean the dirty rails	Weekly
Bridges	11	Checker Plate Columns and main frame Expansion and construction joint	check about Plate check for damages check for cracks Check for painting Check the condition Check the flexibility Check alignment	Half Year Quarterly
Signage	12	Traffic Sign, Warning sign, etc.	check for steel poles check for breakaway and anchors check for the writing on the face check for the color and reflection check for verticality of pole	Quarterly

			check around the concrete footing	
	13	Gantry & Cantilever	check for steel poles check for plates and anchor check for the writing on the face check for the color and reflection	
drainage	14	Catch basin points (street, bridge, etc.)	clean all obstructions inside check for drainage pipes inside using flash water if need it	Monthly
	15	Open channel	cleaning the box culvert remove all obstacles inside check for damages check for cracks	Quarterly
		Ponds	check for damages check for cracks check for leak	
Security	16	Fence	check for any gap or breach check for steel poles check for alignment	Monthly
Grounds	17	Island, empty area, etc.	Check Leveling Check cleaning and remove, transfer Check Manholes	Monthly

6.4.2 The Service Provider's scope of service include, but are not limited to all required civil maintenance and repair activities including the required accompanying services & inspections at roadway, footways, paved surfaces, unpaved area DELETHALIZATION, existing signage, boundary walls, service road, infrastructure manholes, foundations, and structure, storm water and drainage system, AOA fence & gates, cold mixed asphalt repair or concrete slab repair & deep and shallow patches, crack repair in concrete and asphalt, and joints sealant repair and replacement, compaction for the unpaved area, among others other required repair and maintenance, for all the concrete, metal and steel structure & foundations, etc.

6.4.3 The Service Provider shall adhere with the Cluster2 Airports' protocols and guidelines.

6.4.4 Marking, Re-Marking Activities

- 6.4.4.1 The Service Provider is responsible for all related marking and re-marking activities as and when required, including but not limited to road markings, bridges furniture/elements, barriers, pavement.
- 6.4.4.2 The Service Provider shall be responsible for regularly maintenance services and will include all kinds of inspections, maintenance, and tests to maintain the integrity of the markings.
- 6.4.4.3 Paint specifications, manufacture, brand, and type shall be approved by the Contracting Authority representative prior to the commencement of painting works.
- 6.4.4.4 Glass beads conform either to BS6088:1981 (withdrawn 02.08.13) and/or EN1423:2012. to be added to increase the reflectivity of paints on the road, which in turn significantly improves their visibility and consequently driver and pedestrian safety.
- 6.4.4.5 Pavement Marking Equipment and process Monitoring Equipment shall be available at all the times.

6.4.4.6 Safety Barriers and traffic management procedures must be used during activities.

6.4.5 Cleaning Services (Landside)

6.4.5.1 The Service Provider shall be responsible for regularly scheduled cleaning services of all items. The services include general cleaning services, as well as remedial and temporary measures to ensure the safety, security, and comfort of all Cluster2 airports' users.

6.4.5.2 All roads network and grounds will be always kept in a clean and aesthetic state. The cleaning services also include all utility access holes, handholes, grates, ducts, and other items directly built into the Ground and Road Network.

6.4.5.3 Emergency cleaning services shall be managed immediately by the Service Provider. This also includes reactive services in case of reported incidents and/or other events.

6.4.5.4 The above measures include the provision and installation of temporary barriers and guardrails, safety nets, hoardings, and other items to protect or isolate an area that is being treated, especially when using machinery, water jets or any dangerous chemicals.

6.4.5.5 The Service Provider shall provide a cleaning and maintenance schedule to the Contracting Authority for approval and inspection purposes.

6.5 Utilities

6.5.1 Electrical Systems and Network Distribution

The Service Provider shall take full responsibility for the ownership of the MV network on behalf of the Contracting Authority. The Service Provider shall be the single point of contact for all switching exercises and the interface for all new additions and retirements of network plant and infrastructure.

6.5.2 MV Electrical Distribution Service

6.5.2.1 The Service Provider shall keep the Contracting Authority up to date with all operational, reliability, expansion/retirement issues relating to the network. The Service Provider shall take full ownership of the network status, and this shall be displayed in the form of a hard single line schematic diagram.

6.5.2.2 The Service Provider is responsible for the operation, maintenance, and inspection of all electrical systems wiring, distribution and all related equipment throughout Cluster2 airports and connected in the network any connection related to the network 24/365(6). These include, but are not limited to MV&LV Voltage Electrical Distribution Sub-stations (DSS), panels and enclosures, switchgear, transformers, distribution boards, MV/LV MCC's (Motor Control Centre) , inverters, VSDs (Variable Speed Drives) , motors, PFC (Power Factor Correction) , surge protection, change over devices, power protection, metering, batteries, general services, harmonic filters, internal/external/obstruction lighting, all Backup power (Generator, DRUPS (Diesel Rotary Uninterruptible Power Supply) and DC systems) and portable appliance testing all associated distribution infrastructure wires, cables, containment, grounding, switches, controls, e-stop, cathode protection, lightening protection, and general protection devices. instrumentation and automation, Control and monitoring systems and all other associated equipment including interfaces and integrations.

6.5.2.3 The Service Provider shall routinely inspect and test all components to ensure that they are always in full operational readiness and that they meet KSA and international codes and standards and best practices.

6.5.2.4 The Service Provider shall inventory all electrical supply and associated equipment and will submit to the Contracting Authority a comprehensive inspection and maintenance schedule with equipment replacement based on state of wear, age, and reliability.

6.5.2.5 The Service Provider shall carryout regular PPMs to ensure systems are safe, stable, and high-quality provision, compliant, reliable, and meet all applicable regulations, codes, standards and

manufacturer-recommended maintenance best practices and Contracting Authority requests including all testing for all electrical systems.

- 1 Ensure all electrical systems are clearly labelled, managed, and maintained in a clean (free from dust/dirt/contaminants), dry, noncorrosive environment.
 - 2 Conduct ambient temperature checks to ensure the environment is suitable for all components and all electrical systems are mechanically secure.
 - 3 Ensure all electrical systems are only accessible to authorized staff and that the construction of the enclosures deters tampering. The Service Provider shall also shut down, clean, intrusively inspect and test each electrical system according to manufacturer recommendations. Oil quality testing should be conducted periodically by a certified laboratory).
 - 4 The Service Provider shall ensure that there is no evidence of over-heating or loose terminations on electrical assets and infra-red thermographic inspections shall be carried out on electrical systems including distribution equipment.
 - 5 Where deviation from the above performance criteria exist, the Service Provider shall perform the necessary adjustments, repairs, replacements, and plans required to maintain optimum asset performance. Additionally, the services provider shall look for rebar corrosion, concrete breakage, and degradation of structures and accessories. The inspections also include cables, cable joints and connections. All repairs will be made using approved methods.
 - 6 The Service Provider shall carry out portable appliance testing (PAT) on all portable plug-in equipment. The Service Provider shall complete a risk-based approach/assessment to determine the periodicity of the test based on best practices.
 - 7 The Service Provider shall monitor and maintain meter and gauges of all power distribution equipment from equipment's and controlling system such as SCADA to ensure a safe, stable, and high-quality provision of electrical power and collect and analyze all data needed for metering, stats, energy consumption and data analysis and to be accessible and recorded all time to Cluster2 and all its stakeholders.
 - 8 Ground-level and below-ground items, such as manholes, tunnels, corridors, ducts, etc. must be kept in a good state of repair and serviceability and must be clear of water, sand, any other debris, or contaminants. Regular inspections will be carried out, and whenever adverse weather or other conditions and incidents dictate such as, but not limited to:
 - a) Large storms (sand or water)
 - b) Flooding
 - c) Leaks and other accidental releases
 - d) Other incidents and accidents affecting the ground-level and below-ground systems.
- 6.5.2.6 The Service Provider shall ensure that all MV/LV Network Distributions including cables and wires, are checked for tightness. MV/LV cables shall always remain in tension to ensure availability of cables when required throughout the Cluster2 airports.
- 6.5.2.7 The Service Provider shall always be in control of all external substations / lighting transformer during times of switching procedures and substation room safety. A risk assessment of the works been carried out and the people carrying out these works shall be controlled and authorized by the Service Provider and provided to the Contract Authority.
- 6.5.2.8 The Service Provider shall conduct non-Intrusive visual & thermographic imaging inspections of all MDB's. If hot spots, abnormalities, or any causes for concern are identified, the Service Provider shall report immediately, make recommendations for repair and progress the required remedial

actions. Only when issues arise regarding abnormalities will report detail be required. Works can be facilitated for this survey during normal working hours where applicable.

6.5.3 Medium Voltage (MV) systems.

6.5.3.1 The Service Provider shall ensure that all Electrical systems availability for the operation, maintenance, and inspection of all electrical wiring and distribution and related equipment throughout Cluster2 airports and connected in any way to the network as follow, but not limited to:

- 1 Mains Power supplied to the airport 13.8 kV medium voltage network supplied from SEC Substations to Cluster2 substations located at various utilities plant buildings and load centers to 8 Load Centers on site
- 2 Various types of transformers in different locations and sizes including but not limited to oil, dry, and auxiliary
- 3 MV, DBs including switchgears, MCCB, MCB, Isolators and all components and accessories.
- 4 MV Cables including but not limited to the load centers, substations and external to the buildings (Cluster2 Airports wide network) in tunnel, cable ducts, cable trays, etc.
- 5 Power factor improvement capacitor panels
- 6 Transient voltage stabilizers
- 7 Protective, lightening, and neutral earthing system
- 8 All systems in tunnels, including racks, brackets, trays, braces, risers, etc.
- 9 Test instruments
- 10 Other protection systems
- 11 External Substations (circa 45) / Lighting transformer (circa 30) / feeder pillars (circa 90).

6.5.3.2 The Service Provider is responsible for the operation, maintenance, and inspection of all Indoor/outdoor electrical distribution which include, but are not limited to:

- 1 Wiring and distribution equipment
- 2 Meterage equipment
- 3 Safety equipment including fuse boxes, shunts, overload protection, transient fluctuation protection, power conditioning.

6.5.4 Medium Voltage Generators (MV) and Standby Power backup systems.

There are several types of backup power supplies such as, but not limited to, MV generators, Diesel Rotary Uninterruptible Power Supply (DRUPS), mobile generators.

Power Distribution throughout the Cluster2 airports and in the relevant facilities is made by cabling through the Tunnel, corridors, manholes, handhole, duct banks and follows the principle of full redundancy with physical separation. Likewise, cable risers are used where applicable following the principle of full redundancy and physical separation.

6.5.4.1 The Service Provider shall carryout regular PPMs and routine testing on all standby power generation and backup systems and their associated components and interfaces including, but not limited to:

- 1 Ensuring all standby power generation and backup systems are operating in the appropriate mode/setting such that, in the event of mains power failure or interruption, the standby assets shall operate as per their design specification.
- 2 All Supporting equipment, systems and services including batteries, exhaust pipe, extractor fans, and engine radiator.
- 3 Testing and maintaining these systems must prevent unscheduled outages by exercising extreme caution.

- 6.5.4.2 Scheduled testing by the Service Provider shall be coordinated to provide minimum disruption to facility operations, all such activities must be overseen by competent persons. A successful test is one in which all operating parameters are in line with expected ranges, and are operating to their design intent, including response times, capacities and run durations.
- 6.5.4.3 The Service Provider is responsible for the maintenance, inspections and operational testing according to manufacturer recommendations or best practises of all standby MV power generation and backup systems and their associated components of all systems, cabling, duct banks, and other routing infrastructure, including all brackets, supports, trays, and related equipment.
- 6.5.4.4 Ensuring all systems and their associated components and interfaces are safe, compliant, reliable, and/ meet all applicable regulations, codes, standards, and manufacturer-recommended maintenance practices and that they operate in accordance with internal health and safety, environment, and quality management systems. There are several types of MV standby Power Generation and backup systems Sources for example but not limited to:
- 1 All MV generators, located in a variety of locations across the airports and its associated components and systems.
 - 2 Diesel Rotary Uninterruptible Power Supply (DRUPS) and its associated components and systems.
 - 3 Automatic transfer switching equipment for back-up power (ATS)
 - 4 DC Battery System
- 6.5.4.5 The Service Provider shall also routinely test the various circuits and devices, especially the generators and back-up power supplies to ensure that they are always in full operational readiness.
- 6.5.4.6 The Service Provider shall inventory all standby power generation and backup systems and associated equipment and will submit to Contracting Authority a comprehensive inspection and maintenance schedule with rotational equipment replacement based on state of wear, age, and reliability.
- 6.5.4.7 Live load testing shall be implemented as per manufacturer recommendation, ideally every 3 months, however, if this is not possible, load banks are to be used to proof test the backup systems, particularly for sets that do not synchronise with mains. Sets that can synchronise, should be tested on load for 2 hours every month.
- 6.5.4.8 The Service Provider shall also routinely ensure that all related systems such as but not limited to the Diesel fuel storage tanks (main/daily) diesel fuelling transfer system for backup power systems, coolant systems, fuel pumps, life and safety systems, protection and controlling systems, filters, lines, louvers and associated equipment are in good condition, safe, ready whenever the operation need it.

6.5.5 Medium Voltage Generators

- 6.5.5.1 The Service Provider shall ensure all systems and their associated components and interfaces are safe, compliant, reliable, and/ meet all applicable regulations, codes, standards, and manufacturer-recommended maintenance practices and that they operate in accordance with internal health and safety, environment, and quality management systems.
- 6.5.5.2 The maintenance, inspections and operational testing shall include, but not be limited to:
- 1 Recording and trending all results in CMMS or any Cluster2 authorised system, including but not limited to:
 - 2 Generator data, date, test time, run time, control settings, run and stand-by temperatures, output voltages and current.

- 3 Pressure, noise, any alarms, battery charging circuit condition, fuel and coolant pipes condition assessment, coolant levels, filter condition, panel indicators and recommendations.
- 4 Following test, the fuel and oil level should be recorded, and fuel and oil quality testing should be conducted by certified laboratory.
- 5 Testing of the standby MV power generators shall include 'no load' and 'load' testing in line with the manufacturer's recommendations. Testing shall be completed as full load test at a minimum of 3 times per year.
- 6 Battery replacement shall be completed in line with the manufacturer's recommendations or as needed, and signage with an expiry date and is required to reflect this replacement and details of when the next replacement is required.
- 7 Perform at a minimum one full service per year, along with one inspection visit from specialist contractor and carryout all coordination with all stakeholders.

6.5.6 Diesel Rotary Uninterruptable Power Supply (DRUPS)

- 6.5.6.1 The Service Provider shall ensure that the systems are in a good condition 24/365(6) and specifically for the subsystems, but not limited to filters, stator & engine condition, fans, oil, fuel system, belt, batteries, distribution boards and all associated equipment.
- 6.5.6.2 The Service Provider shall conduct weekly inspections of all DRUPS Systems and their associated components. These inspections shall include, as a minimum, but not be limited to recording and trending of all results in CMMS or any Cluster2 authorised system including but not limited to, details of date, time, control settings, temperatures, any alarms conditions, available power, battery charging circuit condition, indicators, and recommendations.
- 6.5.6.3 Testing of all DRUPS Systems and associated components shall be in line with the manufacturer's recommendations and carried out coordination with all stakeholders.
- 6.5.6.4 The Service Provider shall ensure successful full service each year along with one inspection visit from specialist service contractor.
- 6.5.6.5 Battery replacement shall be completed according to manufacturer's recommendations or as needed, battery condition and signage with an expiry date and is required to reflect this replacement and details of when the next replacement is required.

6.5.7 DC Battery System

The Service Provider shall carry out regular PPMs and routine testing on all DC batteries and their associated components and interfaces. This includes, but is not limited to:

- 6.5.7.1 battery systems are operating in the appropriate mode/setting such that in the event of main power failure or interruption the batteries.
- 6.5.7.2 Conduct regular maintenance, inspections and operational testing of the DC system and associated components. Testing shall as a minimum include system operational verification tests, visual checks, load tests and voltage checks.
- 6.5.7.3 Carry out visual checks to ensure all elements are sound, secure, appropriately labelled and batteries are clean and free from deformation, corrosion, odours, leaks specifically at termination points, verify correct operation of changeover devices and all operating controls and components are properly set and functioning as intended.
- 6.5.7.4 Verify battery voltages, record ambient temperatures around battery cases, check for audio/visual alarms. Record and trend results in CMMS or any Cluster2 authorised system including, but not limited to, temperatures, settings, voltages, charging current, alarms, and panel indicators.

6.5.7.5 Battery replacement shall be completed according to manufacturer's recommendations or as needed, battery condition and signage with an expiry date and is required to reflect this replacement and details of when the next replacement is required.

6.5.8 Earthing, Grounding and Lightning Protection

6.5.8.1 The Service Provide shall ensure all systems and their associated components and interfaces are safe, compliant, reliable, and/ meet all applicable regulations, codes, standards, and manufacturer-recommended maintenance practices and that they operate in accordance with internal health and safety, environment, and quality management systems.

6.5.8.2 The Service Provider shall conduct routinely inspections of the Systems and their associated components. These inspections shall include, as a minimum, but not be limited to:

- 1 Recording and trending all results in CMMS or any Cluster2 authorized system, including but not limited to: date, time, control settings, temperatures, any alarms conditions, available power, battery charging circuit condition, indicators, and recommendations.
- 2 The testing of all earthing and grounding systems shall be in line with the manufacturer's recommendations. The Service Provider shall ensure successful full service per year along with one inspection visit from a specialist service contractor.
- 3 Inspection, checking and testing at the appropriate locations to ensure that grounding pits, lightning rods, air terminal system and other conductors are as designed, electrically sound, free of damage and corrosion. Checking that all conductor connections are secure and validate that the conductivity at the appropriate test point is within acceptable limits (less than design criteria), using a calibrated earth ground tester.
- 4 Checking all components are in good condition and capable of performing their design intent.

6.5.9 Traffic Lights

6.5.9.1 The Service Provider shall ensure all systems and their associated components and interfaces are safe, compliant, reliable, and/ meet all applicable regulations, codes, standards, and manufacturer-recommended maintenance practices and that they operate in accordance with internal health and safety, environment, and quality management systems.

6.5.9.2 The Service Provider is responsible for the maintenance, inspections and operational testing according to manufacturer recommendations or best practises of all Traffic Lights. The Service Provider shall operate and maintain all traffic lights within the Cluster2 Airports. Traffic lights must be functional 24/365(6). This includes but not limited to:

- 1 Management of traffic lights
- 2 Monitoring of traffic lights and their behaviour and configuration/programming (abnormal cycles, special events, etc.)
- 3 Regular inspections
- 4 Maintenance of all components
- 5 Regularly scheduled cleaning to ensure that all traffic signals are clear and visible
- 6 Repair any damages or replacement in case of accidents or degradation of the equipment.

6.5.9.3 If traffic lights cease to operate for any reason, the Service Provider shall promptly inform the Contracting Authority of any issues and take the appropriate temporary measures to direct and organize road and pedestrian traffic in the affected area. This includes sending a traffic warden or signal person on site in coordination with, and to assist the security and road police until the equipment has returned to a functional state. Temporary signage and other measures shall also be put in place for the duration of the outage. For all types of maintenance activities, emergency signage and other precautionary measures will be provided.

6.5.10 Low Current Systems (Automation and Instrumentations)

6.5.10.1 Low Current Systems include but are not limited to:

1 SCADA Power Systems

The primary function of this system is to control and monitor the entire power distribution network over the Load Centers and the associated Secondary Substations. It also covers electricity and water metering, emergency power supply management and load shedding. An additional function of the SCADA System is to provide subsystem control including the Chiller Management System (CMS), Chilled Water Network, Generator Control System (GCS), Water Utilities facilities and the Diesel Fuel Bulk Storage.

The SCADA System will provide status and maintenance information, control and warnings to the Load Centre operators and service engineers via the operator terminals. It will interface with the I2BS to enable data transfer between the two systems. I2BS is the system which provides a means of integrating the airport Building Services Systems and the Aviation Systems with a common operator interface to enable a centralised management capability.

2 Other SCADA Systems

Monitoring and/or Control System that utilizes a central computer for storing information, and onsite/remote hardware to monitor facilities and processes. Control may be automatic or manual and may occur at the remote units or the central computer. Except for: Baggage Handling (BHS) SCADA, Passenger Boarding Bridges (PBB) SCADA and the Automated People Mover (APM) SCADA.

It also provides monitoring and control functions to the other SCADA systems such as the following:

- Chiller Management System (CMS)
- Generator Control System (GCS)
- Water Utility
- Diesel Fuel Bulk Storage
- Energy Metering/Measurement

3 BMS – Building Management System

A building management system (BMS) is a control system that can be used to monitor and manage the mechanical, electrical and electromechanical services in all Cluster2 Airports such as the HVAC system, Booster Pumps, Submersible Pumps, Lifting pits, MCC incoming & outgoing, BMS systems have stand-alone controllers that are specifically designed to collect data from these devices. The installed system will be full interoperability between the BMS and the I2BS. Each RTR is connected through the BACnet (BACnet Network) cable to all BACnet controllers which are spread across the building levels in panels that we refer to as the Distributed Control Panel (DCP). These BACnet controllers in turn are connected to the different sensors and volt free contacts that contains the core of the information the BMS system is monitoring and controlling.

4 BEMS – Building Energy Management System

A building energy management system is an advanced method to monitor and control the building's energy needs. Also, the system can control and monitor a large variety of other aspects of the building regardless of whether it is residential or commercial. For example, but not limited to: power, heating, ventilation, air-conditioning, physical access control, pumping stations, elevators and lights.

6.5.10.2 The Service Provider shall ensure all systems and their associated components, interfaces and integrations are safe, compliant, reliable, and/ meet all applicable regulations, codes, standards, and manufacturer-recommended maintenance practices and that they operate in accordance with internal health and safety, environment, and quality management systems.

- 6.5.10.3 The Service Provider is responsible for the maintenance, inspections, and operational testing according to manufacturer recommendations or best practises of all low current systems.
- 6.5.10.4 The Service Provider shall carryout regular PPMs and routine testing on all low current systems and their associated components, interfaces and integrations
- 6.5.10.5 The Service Provider shall be responsible for the operation, monitoring and maintenance of all automation, instrumentation, low current systems and all specialist and general building systems including but not limited to; SCADA system and BEMS, However, Baggage Handling system (BHS) SCADA, Passenger Boarding Bridges (PBB) SCADA and Automatic People Mover (APM) SCADA are out of scope.
- 6.5.10.6 For the purpose of the Services, it shall be the responsibility of the Service Provider to engage with the Contracting Authorities ICT team on all matters including system integration and interfaces and provide as a first line response to all ICT systems to ensure continued and safe availability of electrical supplies and associated infrastructure up to the natural demarcation point i.e., local panel, transformer, or junction box.
- 6.5.10.7 The Service Provider is responsible for applying licences, software patches/updates via prescribed ITIL management policies, cybersecurity requirements and repairing system outages, and repair/replacement and maintenance of the associated hardware components.
- 6.5.10.8 The Service Provider shall respond to Cluster2 requests for production of standard/custom reports, programming of new system interfaces and software features and updates. Hard services cover a wide array of systems, with many of which that include varying levels of automation and logic-based controls.

6.6 Water Systems

6.6.1 Chilled Water System

- 6.6.1.1 The responsibility of the Service Provider includes but not limited to:
 - 1 Ensure, the integrity of the system and the quality of the chilled water, is always maintained, through regular inspection and testing, flushing, monitoring and planned maintenance routines.
 - 2 To operate and maintain the chilled water system on a 24/7 basis, included but not limit to supplying chilled water to all facilities, controlling the chemical injection, and monitoring the required operational pressure, temperate, and flow.
 - 3 Maintain all equipment and infrastructure related to the chilled water distribution system, including but not limited to:
 - a) All pipework, headers, fixtures, and fittings.
 - b) Pressurization units (pressure vessels) and chiller pumps.
 - c) Isolation valves.
 - d) Filter systems.
 - e) Motorization and non-motorized valves.
 - f) Gauges and meters.
- 6.6.1.2 The Service Provider is responsible for the operation and maintenance of the equipment, including but not limited to water-cooled chillers, cooling towers and their accessories, primary pumps, condenser water pumps, secondary pumps, chemical dosing systems, all electrical units and their accessories such as panels and cables for the mentioned equipment, the building management system and all its accessories, controllers, measuring instruments, various speed controllers and their accessories.

6.6.1.3 The Service Provider shall provide full housekeeping and cleaning service to all District cooling facilities within scope.

6.6.1.4 The Service Provider shall conduct regular monitoring, testing and inspections to:

- 1 Ensure no loss of water through leaking joints, seals, and glands.
- 2 Attend to all leaks immediately and initiated repairs.
- 3 Ensure the integrity of the refrigerant systems and attend to all leaks immediately.
- 4 Conduct annual performance test of the pumps.
- 5 Conduct vibration and sound tests on monthly basis.
- 6 Conduct full performance analysis with its results for each load center on an annual basis.
- 7 Periodic instrumentation calibration as per the manufacturer's recommendation.

6.6.2 Potable Water System

6.6.2.1 RO Water Treatment Plant

- 1 The Service Provider shall operate and maintain the Reverse Osmosis plant. This specialized system and the associated equipment with technical complexity consists of the following, but not limited to:
 - a) Multimedia sand and carbon filters,
 - b) micron cartridge filters,
 - c) high pressure pumps,
 - d) filter feed,
 - e) high pressure pump, backwash and membranes flushing pumps,
 - f) permeator membranes,
 - g) product water booster pumps and reservoirs,
 - h) all types of pumps & valves,
 - i) tanks, water treated tank, RO Unit chemical water tanks
 - j) meters and control panels
 - k) cooling towers,
 - l) air blowers,
 - m) chemical treatment dosing systems,
 - n) water piping,
 - o) degasifier system,
 - p) electrical power supply and control panels,
 - q) gauges and level switches and auto controls and all associated and auxillary items associated with the R.O system.
- 2 A reverse osmosis (RO) plant is used to remove sufficient dissolved solids from brackish or sea water so as to deliver product water with a total dissolved solids content which meets the Saudi standards for drinking water.
- 3 The permeator membranes require internal chemical cleaning from time to time. The Service Provider has to provide a permeator membranes cleaning apparatus.
- 4 The Service Provider shall monitor the raw water for the presence of residual chlorine, and the plant will shut down immediately if it is detected and the Contracting Authority will be informed of the status.

- 5 The Service Provider is responsible for the operation and maintenance of the ORP installed in the R.O. plant system. This includes calibration and certification as required.
 - 6 The Service Provider shall be responsible for proper operation and maintenance of Reverse Osmosis water treatment plant and its related components as mentioned in Maintenance Manual, Annex IV and operation and maintenance manual of R.O. plant from the manufacturer.
 - a) Refer to the manufacturer's detailed instructions for each plant. The operating data to be recorded "R.O. Plant operating Log" sheet. It is important that the plant be equipped with accurate gauges to enable the operator to make valid readings.
 - b) The TDS meter, pH meter and chlorination test meter/kit in the plant must be kept properly calibrated at all times. The plant operator must have a portable meter to calibrate the fixed meter, of a range suitable for the water being tested. It must be kept in first class operating condition.
 - c) The calibration of the flowmeters is to be checked monthly since improper flow can affect the quality and quantity of the product water and also the condition of permeators. Testing can be easily done by directing the flow to a container of known volume and measuring the time to fill it with a stop watch.
 - 7 The Service Provider is required to daily analyze treated product water and keep its record for review and inspection whenever required.
 - 8 The Service Provide shall provide a monthly laboratory test report of the product water to Cluster2, for information and review.
 - 9 Beside scheduled preventive maintenance The Service Provider shall be responsible for necessary day to day corrective maintenance to keep the R.O. plant in a reliable and up-to-date condition.
 - 10 Chemical dosing includes prechlorination, dechlorination, post chlorination, pH adjustment acid dozing and antisealant dozing.
 - 11 The Service Provider is responsible to keep always sufficient stock of all the required chemicals for operation and water analysis.
 - 12 The Service Provider is responsible for the upgrading of the related and associated software from time to time as and when new versions are released by the manufacturer to ensure that any related and associated software that gets corrupted due to any reason whatsoever will be replaced, so that there is no interruption in the operation of the systems and equipments as part of the maintenance SOW responsibility.
 - 13 The Service Provider is responsible to reformat the related and associated hardware and other discs whose software gets corrupted due to any reason or any virus, reprogram the corrupted hard disc and replace the corrupted software with original software including installation of latest antivirus software at any time.
 - 14 The Service Provider is responsible to ensure protection of the related and associated hardware from all types of viruses, by constantly checking and monitoring their performance and updating them with latest antivirus software at any time as per the situation, to prevent, detect and protect the systems.
- 6.6.2.2 Potable Water Pumping and Storage Stations**
- 1 **Airport Potable Water Pumping stations and Storage Tanks**

At each potable water pumping station, the supply system consists of but not limit to the following components:

 - Set of pumps (jockey, transfer, circulation)

- Strategic tanks
 - Chlorination system
 - Electric and control panel
 - Chemical treatment injection
- 2 It is imperative that the security of these facilities is a priority, access control for all personnel shall be a fundamental requirement and the security of reservoirs shall be paramount. All maintenance routines and attendance shall be itemized and logged at each station. Tools specific to each station, building or facility shall not be removed. The Service Provider should review the current maintenance PPM activities and ensure that these activities are both in line with the manufacturer's guidelines and with respect to the critical distribution equipment and will ensure that this equipment is always available for operation.
- 3 The Service Provider should provide all maintenance activities that include but are not limited to PM, CM, inspections, monitoring, controlling, repairing, deficiencies rectification, calibration, tests, required supplies, and all activities that properly maintain the system operating condition.
- 4 In respect of the water systems, the Service Provider must ensure compliance with safety precautions, design standards and meet all applicable regulations, codes, standards, and manufacturer-recommended maintenance practices. Ensure all assets are maintained and operate in accordance with internal health and safety, environment, and quality management systems.
- 5 The responsibility of the Service Provider is included but not limited to:
- a) Ensure, the integrity of the system and the quality of the water, is always maintained, through regular inspection and testing, flushing, monitoring and planned maintenance routines.
 - b) To operate and maintain the potable water system on a 24/7 basis, included but not limit to transfer and filling the tanks, controlling the chemical injection, and monitoring the required operational pressure.
 - c) Maintain all equipment and infrastructure related to the potable water distribution system, including but not limited to:
 - (i) All pipework, fixtures, and fittings.
 - (ii) Storage tanks.
 - (iii) Pressurization units (pressure vessel).
 - (iv) Isolation valves.
 - (v) circulation Systems.
 - (vi) Chlorine Injection System.
 - (vii) Filter systems.
 - (viii) Motorization Valves.
 - d) The Service Provider shall conduct regular monitoring, testing and inspections, in line with the Contracting Authority's CAFM system to:
 - (ix) Ensure no loss of water through leaking joints, seals, and glands
 - (x) Attend to all leaks immediately and initiated repairs.
 - (xi) Conduct annual performance test of the potable pumps
 - (xii) Conduct vibration test in monthly bases
 - (xiii) Conduct full performance analysis with its resulted for each pump station in annual bases.
 - (xiv) Periodic instrumentation calibration as per the manufacturer's recommendation.

6.6.3 Water Testing

- 6.6.3.1** The sampling of the water systems shall be completed in accordance with the requirements set out in BS7592: 2008 and ISO 11731-2:2004 Section 8 and analysed at a UKAS/INAB accredited laboratory with respect SASO & WHO standard. Laboratory certification and schedule of accreditation shall be submitted with the tender documents.
- 6.6.3.2** The Service Provider shall be accredited to the Legionella Control Association (LCA) and demonstrate the competence of the company in the area of Legionella control, specifically with respect to sampling and analysis. Evidence of the Tenderer's registration in the Legionella Control Association (LCA), must be submitted as part of the Tender submission.
- 6.6.3.3** The Service Provider shall continually demonstrate strict compliance with the conditions as set out in the Legionella Control Association Conditions of Compliance including:
- 1 Clear agreement of services being provided.
 - 2 Demonstration of experience and competency.
 - 3 Continuous recommendations to meet the guidance documents.
 - 4 Demonstrate proactive approach to communication and reporting.
 - 5 Adequate monitoring and record keeping.
 - 6 Review performance measures.
 - 7 Formal internal auditing process.
 - 8 Ensure that any sub-contracted company is competent prior to works commencement.
 - 9 Issue on an annual basis copies of LCA Certification, or equivalent.
- 6.6.3.4** The Service Provider is responsible for all elements of the domestic water systems from the incoming source water supply onwards, including:
- 1 Cold Water System, Cold Water Storage Tanks, distribution pipework, and all Cold Water outlets (showers heads and hoses / taps / sinks / wash hand basins etc.);
 - 2 Hot Water System, including Hot Water Storage Tanks / Calorifiers, distribution flow and return pipework, and all Hot Water outlets, (shower heads and hoses / taps / sinks / wash hand basins etc.)
 - 3 Potable/Drinking Water System, including distribution pipework including all draw off points including drinking water fountains, aircraft fill points, safety showers, eye wash station.
 - 4 Other miscellaneous water systems as identified by risk assessment.
- 6.6.3.5** Sampling Procedure
- 6.6.3.6** All samples shall be stored and transported in ambient temperatures and received by the analysis laboratory within the same working day of collection.
- 6.6.3.7** Sampling points have been assigned within all sites. Where for any reason a sample point location cannot be accessed the Service Provider shall contact the dedicated area specific System Manager to obtain access or agree a representative alternative sample point.
- 6.6.3.8** Sampling of each point shall take place monthly, or as requested by the Contract Authority.
- 6.6.3.9** The Service Provider shall conduct the following parameters while conducting water test, these include but limit:

Chemical Properties

pH

TDS

Free Chlorine
Conductivity
Total Iron
Turbidity
LSI
Chloride
Silica
Phosphate
Total Suspended Solids
Cadmium
Biological – Micro-organisms
Total Bacteria Count
Coliform Count
Legionella
Heavy Metals
Total Magnesium
Total Zinc
Total Copper
Total Chromium
Total Nickle
TSE Samples Mes
TSS
BOD
COD

6.7 Firefighting Water System

10.10 The fire water pumping stations taking the water from the firefighting water tanks and increasing the pressure in the network to maintain it at a certain pressure. The fire water pumping station maintain the pressure by a numbers of electrical pumps (jockey, electric), and diesel engine pumps including control systems, and storage tanks.

6.7.1 Firefighting Water Pumping and Storage Stations Each fire pumping station includes, but is not limited:

- 1 Set of pumps (Electrical motor pumps (jockey, electric), and Diesel engine pump)
- 2 Storage tank.
- 3 Electric and control panels.

6.7.2 The Service Provider is responsible for the distribution of Firefighting water and the infrastructure, plant and equipment required to deliver a safe, secure, and quality water service for all airport users.

6.7.3 The Service Provider is responsible for the inspection, monitoring, and maintenance of firefighting system and must follow the manufacturer recommendations for each equipment.

6.7.4 The Service Provider shall conduct regular monitoring, testing, inspections, and preventive maintenance activities in line with the CAFM system to include but limit to:

- 6.7.4.1 Conduct vibration and sound tests on a monthly basis of all fire water pumps. Fire pumps shall be operated as per industry and regulatory requirements and as per design requirements.
- 6.7.4.2 System pressure tests to initiate pump operation.

- 6.7.4.3 Conduct performance analysis of fire pumps in annual basis.
- 6.7.4.4 Periodic instrumentation calibration as per the manufacturer's recommendation.
- 6.7.4.5 Operate & maintain all control system, BMS, control panel, pumps, instrumentation, etc.
- 6.7.4.6 If any fire water service is impaired, to issue an initial withdrawal of service notice to the appropriate departments outlining the areas impacted, any valves isolated and the dates and times to affect a permanent repair. The notice will be completed on the restoration of the services impacted.

6.7.5 The Service Provider shall be responsible for the operation, maintenance, inspection and certification, and operational readiness of all fire systems always. This shall be done in compliance with national KSA and NFPA fire regulations. Given the size and age of Cluster2's buildings, there are various firefighting technologies in service on the Campus, all of which are in the scope of this RFP except for non Cluster2-occupied facilities.

7. Ancillary Services

7.1 Overview

The Service Provider shall operate and maintain the following activities and their infrastructure in an efficient and effective manner ensuring they are available 24/7, meet all KSA compliance and regulations related to each of the services. The Service Provider shall ensure only competent and certified staff are deployed for each of the services within scope.

- Vehicles and Equipment
- Fuel stations and Transportation of fuel.
- Workshops Waste Disposal.

7.2 Emergency Call-out Service

7.2.1 The Service Provider shall provide an emergency call-out service for incidents and operational emergencies. An “operational emergency” is an emergency where the circumstances place the lives, security or safety of the Affected Property, staff, and members of the public at risk. The following is a non-exhaustive list of examples of incidents that fall within this category:

- 7.2.1.1 major leak that leads to severe damage to the fabric or render services unsafe and unusable.
- 7.2.1.2 Major electrical fault or failure.
- 7.2.1.3 Failure of a critical safety systems
- 7.2.1.4 Emergency call-out service will fall as Priority 1

7.2.2 In addition to the above the Service Provider shall:

- 7.2.2.1 a comprehensive escalation and notification process for emergency requests must be presented to Contracting Authority as part of mobilization and strictly followed through the duration of the agreement. This should align with Cluster2's procedure.
- 7.2.2.2 submit a documented report to Contracting Authority following each reactive call-out; and a summary included within each monthly report.

7.2.3 In the case where call center communication is not possible, or the Services Provider is unable to make the necessary contact to notify Contracting Authority of the issue and the type of call-out. the Services Provider will make the necessary arrangements to have the call-out service readily available on site.

7.2.4 If the Services Provider attends to the call priority it will be the responsibility of the Services Provider to communicate the reports to the call center at the earliest time.

- 7.2.4.1 Provide justification approved by Contracting Authority in case the Service Provider is unable to rectify the incident/ Failure within agreed SLAs table.
- 7.2.4.2 receive and respond to Cluster2's calls and repair requests, as well as report all failures, breakdowns, and incidents to Cluster2's call centre, to ensure all incidents, events and failures are registered and properly communicated with both parties.
- 7.2.4.3 Develop an escalation process between the Services Provider and Contracting Authority during the mobilization, such that communications and responsibility is managed correctly and in an efficient manner, based on the severity of the priority.
- 7.2.4.4 In the event that unscheduled maintenance or corrective action is required because of a proven evidence of user negligence, misuse or damage, shall respond and make good the repair. The unscheduled maintenance log shall be annotated accordingly. This should be highlighted on the

monthly report so that the costs may be recouped from the individual or relevant company (as appropriate).

- 7.2.4.5 Except for repairs involving the replacement of PPM consumables and light replacements (e.g., fuses and light bulbs/tubes), warrant its repairs for a minimum of 12 months.
- 7.2.4.6 use the original spare parts from the manufacturer for all PPM and reactive maintenance activities, unless otherwise approved by the Contracting Authority.
- 7.2.4.7 submit audit reports monthly along with the monthly report, or as the Contracting Authority may require.
- 7.2.4.8 facilitate a 24/7 on-site contact/role who will be able to manage reactive calls.

7.3 Vehicles and Equipment

7.3.1 General

- 7.3.1.1 The Service Provider shall provide trained, qualified, and skilled manpower to staff all existing Contracting Authority's motor pool workshops to carry out maintenance of approved vehicles.
- 7.3.1.2 The Service Provider shall provide continuous repairs and maintenance services within the scope of the contract to include, but not limited to:
 - 1 Preventive maintenance (PM).
 - 2 Corrective maintenance (CM).
 - 3 Emergency road-side repairs and services.
 - 4 Vehicle towing and lifting services.
 - 5 Cleaning of vehicles
- 7.3.1.3 The Service Provider shall maintain the Security Vehicles Fleet at motor pool workshops on a continuous basis.
- 7.3.1.4 The Service Provider shall maintain the Cluster2 Vehicles Fleet at motor pool workshops on a continuous basis.
- 7.3.1.5 On the agreement with the Contracting Authority other contractors' vehicles can be maintained at this facility in (cost plus model) however priority is given to Cluster2 and Security Vehicles.
- 7.3.1.6 The Service Provider must at their own expense provide dedicated vehicles and equipment including, services vehicles, heavy & light equipment, emergency, towing, & lifting equipment to carry out the duties & service provision required with appropriate signage in line with Cluster2 requirement and ensure all aerodrome permits are always maintained valid.
- 7.3.1.7 It is the responsibility of the Service Provider to maintain the vehicles as per manufacturers guidelines and keep the vehicles and equipment in a road worthy condition for the duration of the contract.
- 7.3.1.8 Where it is evident that the Service Provider do not have enough vehicles to perform their duties efficiently and effectively the Contracting Authority can instruct the Service Provider to procure more vehicles.
- 7.3.1.9 The Service Provider shall provide full services for Emergency roadside, including but not limited to placing all warning signs during the service provision process, flat tires repair, battery jump start, and towing service if needed.

7.3.2 Cluster2 Special Purpose Equipment

- 7.3.2.1 Cluster2 special purpose equipment are shown in **Appendix F, Schedule of Buildings and Assets**, with the following System codes.

System Code	Description
2403	TRUCK-All Types
2405	R/W, Road Sweeper
2406	Forklift
2407	Bulldozer
2408	Crane
2409	Backhoe Loader, Compactor
2410	Tractor
2411	Grader
2416	Aerial Basket, Floodlight
2417	Mu-Meter, Mu-Mtr Veh, Tester
2418	Asphalt Batch Plant

System Code	Description
2419	Derubberizing Machine
2420	Slurry Seal Machine
2421	Target Grooving Machine
2422	Paint Remover
2423	Concrete Mixer, Dumper, Saw
2424	Welding Machine, Compressors, Breathing Comprsr, Large Garbage Container , CFR Medical Trailer
2425	Floor Scrubber, Floor Polisher, Vacuum Cleaner, Lawn Mower and Steam Cleaner

7.3.2.2 The Service Provider will operate and maintain all the special purpose equipment as defined here.

7.3.2.3 The Service Provider will use genuine and new replacement parts in the repair and overhauls of Cluster 2 Airports Company and the Contractor's owned vehicles/equipment. This includes the body repair and repainting of Cluster 2 Airports Company's vehicles and equipment that will be identified by Cluster 2 Airports Company as and when required.

7.3.2.4 The Contractor will have to renew the ownership papers and license plates of the relevant vehicles that will include the obligatory yearly MVPI and all necessary fees of the above will be paid by the Contractor as part of the maintenance SOW responsibility.

7.3.3 C2 GENERAL PURPOSE VEHICLES AND EQUIPMENT

7.3.3.1 The Service Provider will maintain all of the vehicles and equipment in this classification in operational status all the time. Some of the vehicles (Sedan, Station Wagons and Jeeps etc.) will be issued to Cluster 2 Airports Company's personnel for their use. Other vehicle and equipment (water trucks and buses, etc.) will be operated by the Service Provider personnel.

7.3.3.2 Cluster2 General purpose equipment are shown in **Appendix F, Schedule of Buildings and Assets**, with the following System codes

System Code	Description
2401	Sedan, Station Wagon
2402	Pick-Up, Mini Bus, Ambulance
2403	TRUCK-All Types
2404	Jeep, Dodge Ramcharger

7.3.3.3 The Contractor will provide qualified operators for the Contractor's operated equipment.

7.3.3.4 All the repairs necessitated by accidents will be performed by the Service Provider or any third party, the repairs and any compensation will be in accordance with Insurance Coverage Article # 3.4 under the Special Condition, regardless of any reason the accident took place.

- 7.3.3.5 The Service Provider will carry out the periodic Preventive Maintenance (PM) work schedule of these vehicles/equipment on time as per manufacturer's standard and as per Cluster 2 Airports Company's maintenance schedule in **Appendix K . C2AC Maintenance Manual**.
- 7.3.3.6 The Service Provider is responsible in arranging with the users the availability of these vehicles/equipment for the monthly PM schedule.
- 7.3.3.7 The Service Provider will have to renew the ownership papers and license plates of these vehicles that will include the obligatory yearly MVPI and all necessary fees of the above will be paid by the Service Provider as part of the maintenance SOW responsibility.

7.3.4 CLUSTER 2 AIRPORTS COMPANY'S OWNED GENERAL PURPOSE VEHICLES ASSIGNED TO THE PRESIDENT'S OFFICES PERSONNEL

- 7.3.4.1 The Service Provider will maintain all of the vehicles and equipment in this classification to 100% operational status all the time.
- 7.3.4.2 Preventive and Corrective Maintenance of these vehicles/equipment will be carried out only at/by authorized dealers with the comprehensive scope of works & services agreed upon and the Service Provider will ensure that genuine and new replacement parts are used in the PM and CM activities.
- 7.3.4.3 The Service Provider will carry out the routine daily check/inspection of these vehicles/equipments and to keep them clean all the time.
- 7.3.4.4 The Service Provider has to coordinate and schedule ahead of time all the regular maintenance or PMs with the authorized representative/user.
- 7.3.4.5 The Service Provider must provide a rental vehicle of similar type and acceptable to the user, for the whole period that Cluster 2 Airports Company's vehicle is being under maintenance and not available for use by the user.
- 7.3.4.6 The Service Provider is responsible to ensure that all the required maintenance or repair works & services of Cluster 2 Airports Company's vehicles are performed at the respective manufacturer's authorized agency's workshops as part of maintenance SOW responsibilities.
- 7.3.4.7 All the repairs necessitated by accidents shall be performed only at the authorized agency's workshops without unnecessary delay, regardless of any reason the accident took place, as part of the Service Provider 's scope of work responsibility.
- 7.3.4.8 The Service Provider will have to renew the ownership papers and license plates of these vehicles that will include the obligatory yearly MVPI and all necessary fees of the above will be paid by the Service Provider as part of the maintenance SOW responsibility.

7.4 Fuel Stations and Transportation of Fuel

- 7.4.1 The Service Provider shall be fully responsible of all fuel stations including but not limited to:
 - 7.4.1.1 Performing preventive and corrective maintenance on a continuous basis for all fuel stations facilities such as tanks, floors, lights, pipes, dispensers, and safety systems.
 - 7.4.1.2 operating all fuel stations and ensuring the availability of operators 24/7 and maintain a log record.
 - 7.4.1.3 transporting fuel to stations and ensuring that there are no shortages in tanks affecting the operation.
 - 7.4.1.4 To implement transportation services of fuel by trucks, it is possible to contract with a subcontractor supplying fuel to all fuel stations under the responsibility of the service provider,
- 7.4.2 The Service Provider shall be responsible for, but not limited to:
 - 7.4.2.1 Delivery of diesel fuel to diesel Fuel station.
 - 7.4.2.2 Delivery of gasoline fuel to gasoline Fuel station.
 - 7.4.2.3 Daily fuel delivery, consumption, usage, and levels reports.

- 7.4.2.4 Certification and license requirements of Fuel Station equipment as per all local and government regulations, rules, and standards.
- 7.4.2.5 providing all safety equipment required for spills.
- 7.4.2.6 for cleaning of spills.
- 7.4.2.7 to invoice the Contracting Authority on a monthly basis with invoices itemised to the vehicle, department, company or contractor as authorised by the Contracting Authority.
- 7.4.2.8 Managing and controlling the use of the fuel station to the Contract Authority's authorised vehicles only.
- 7.4.3 The Service Provider must provide a detailed itemised invoice as set out in 7.3.2.7 to ensure payment.
- 7.4.4 The Service Provider is to monitor, record and track fuel dispensing on a vehicle and company basis, with fuel only being dispensed to authorised users and vehicles.
- 7.4.5 The Service Provider is responsible for the cost of fuel supplied to non-authorised users.
The service provider shall not provide fuel to non-authorised users/vehicles
- 7.4.6 The Service Provider is responsible for the cost of fuel for its or its subcontractors use.
- 7.4.7 The Service Provider shall include the Fuel Station and transportation services into its Environmental Management Plan.
- 7.4.8 The Service Provider shall provide rates for the provision for the provision of each fuel type including associated costs.

7.5 Workshops and Waste Collection & Disposal

- 7.5.1 The workshops classified into:
 - 1 Motor pool
 - 2 Vehicle operation
 - 3 Heavy equipment
 - 4 Body shop services
- 7.5.2 The Service Provider shall, including but not limited to:
 - 7.5.2.1 Operate and maintain the Vehicle and Equipment Maintenance Workshops and associated areas on a continuous basis, the workshops should be operated 24/7.
 - 7.5.2.2 Provide the workshops with the following, but not limited to, tools, machines, tire shop equipment, cranes, air composers, welding machine and stock of consumable and spare parts.
 - 7.5.2.3 Dispose of solid and liquid waste in a proper manner and place the appropriate containers for that, then transport all waste off Cluster2 sites, to be disposed in an environmentally friendly manner.
 - 7.5.2.4 Maintain the general appearance and cleanliness of the workshops.
 - 7.5.2.5 Clean, repair and paint all workshops storage containers on a regular basis and keep the containers in good condition.
 - 7.5.2.6 During waste collection /removal, protective clothing and other safety measures shall be used having regard to up-to-date Health and Safety Legislation & Regulations. Care shall be taken during collection, removal, and disposal of the waste, such as glass, sharp metal and, maybe mixed within general rubbish which could result in injury to personnel should they inadvertently encounter with this material.
 - 7.5.2.7 The following hazardous waste material may also be found from time to time generally consists of the following materials: truck batteries, oil, lubricant & fuel empty cans and drums, car engine parts and tires.

- 7.5.2.8 Body work should only be carried out with an approved insurance claim/incident report.
- 7.5.2.9 It is strictly prohibited to dispose of hazardous materials and/or dangerous goods, including waste oil and fuels, chemicals of any type, and materials of risk to health (regardless of the quantity) into any drain, storm systems and sewers, rivers, streams, waterways or on the ground.

8. General

8.1 Maintenance Programs

- 8.1.1** The Service Provider shall ensure that the maintenance programme specifies the facilities, systems, installations, and equipment subject to maintenance and contains the necessary information for its timely and correct implementation including, but not limited to:
- 8.1.1.1** The type of inspections/checks to be carried out (e.g., visual inspection, cleaning of equipment, equipment stability/alignment, calibration.) for each facility, system, installation, and equipment, taking also into account factors such as their location, criticality, and operating environment
 - 8.1.1.2** The frequency of inspections/checks for each facility, system, installation, and equipment.
 - 8.1.1.3** The consumables, tools and equipment required for each type of inspection/check; and the periodic replacement of items that may be required in accordance with the maintenance instructions of the manufacturer of the respective facility, system, installation, and equipment, as appropriate.
- 8.1.2** The Service Provider shall ensure that arrangements are in place for timely corrective maintenance actions. Such arrangements should cover the cases of maintenance needs that are:
- 8.1.2.1** Identified either during preventive maintenance activities; or raised at any other time (e.g., due to equipment malfunction or failure, weather event or sub-standard services).
 - 8.1.2.2** The maintenance programme also includes maintenance of alarms and alerting systems.

8.2 Inspections

- 8.2.1** The Service Provider shall perform rigorous oversight through regular inspections of the areas, facilities, equipment, and installations outlined below to identify, record faults and shortcomings in a timely manner. In addition, the Contracting Authority inspection reports shall be made available to the Service Provider to assist in auditing and to set priorities and actions necessary to address them.
- 8.2.2** The Service Provider must accurately record the registration of all maintenance work that was performed as a result of these inspections in the CMMS/CAFM System and must ensure that all such recorded information has been transferred at the latest by the end of the proceeding shift.
- 8.2.3** The Service Provider shall provide maintenance reports contain a detailed document that covers any routine or emergency maintenance services performed on a specific vehicle, piece of equipment, or machine. It serves as a guide outlining the proper care of the equipment in your workplace and can help your company avoid duplicate service requests.

8.3 Changing and Replacing Vehicles and Equipment

- 8.3.1** Cluster 2 Airports Company reserves the right to change or replace any of the vehicles and equipment in lieu of any of the contractor vehicles and equipment listed in the contractor owned vehicles and equipment tables, that will be more suitable to the airports' operations and in the best interest of airports operations and in the performance and execution of the Service Providers responsibility.
- 8.3.2** The Cluster 2 Airports Company proposed change or replacement of any vehicle and or equipment in lieu of any of the listed contractor vehicles and equipment shall not exceed the contractor quoted costs. This change or replacement approval by Cluster 2 Airports Company shall only be affected before the procurement of the subject vehicle and or equipment by the contractor, that are recommended to be changed or replaced, and at the time of the mandatorily required Cluster 2 Airports Company approval process.
- 8.3.3** The contractor shall be notified by Cluster 2 Airports Company concerning the proposed change or replacement of the contractor vehicle and or equipment and the vehicle and or equipment shall be

clearly identified by Cluster 2 Airports Company, that Cluster 2 Airports Company proposes to be changed or replaced in lieu of the contractor vehicle and or equipment with comparative cost information, prior to the procurement process.

9. Security Operations Centre (SOC)

Most airports are being updated with a Security Operations Centre. The Centres will be transferred to FMS Contract. It is anticipated that the SOC's will be transferred in Year 2 of the FMS Contract. The BOQ for the SOC's is provided in Appendix L.

The Service Provider will take full responsibility for these buildings when they are transferred to this contract. The Contracting Authority shall provide 3 months' notice, for mobilization and transfer of when the SOC's will be incorporated.

The requirements for Facility Management, Hard and Soft Services apply to the SOC.

9.1 General Overview of the SOC Scope Of Works

The primary requirements for the SOC's are:

9.1.1 Integrated Systems and IT

The Scope of the required services shall include, but not limited to, voice, video and data communications (computers, servers, storage) running over a network backbone of fiber optic cabling and horizontal and vertical copper cabling and supporting infrastructure.

9.1.2 Perimeter Intrusion Detection System (PIDS)

The Scope of the required services shall include, but not limited to, ground surveillance Radar (GSR) coupled to day-night and thermal imaging cameras.

9.1.3 Physical Access Control System (PACS)

The Scope of the required services shall include, but not limited to:

9.1.3.1 Automatic License Plate Recognition System (ALPRS)

9.1.3.2 Gate Road Blockers and Bollards

9.1.3.3 ID Management Software (IDMS)

9.1.4 Visual Surveillance System (VSS)

The Scope of the required services shall include, but not limited to:

9.1.4.1 Video Management System (VMS)

9.1.4.2 Physical Security Information Management System (PSIM) if detailed engineering determines that the preferred solution, extended VMS software, is unable to perform the required functions.

9.1.4.3 Intelligent Video Analytics System (IVAS)

9.1.4.4 Fixed and PTZ IP cameras.

9.1.4.5 APLR Cameras (ALPR)

9.1.4.6 Facial Recognition (FR) Software

9.1.4.7 Vehicle Tracking Software

9.1.5 Security Operations Center

The Scope of the required services shall include, but not limited to, operating and maintaining the full Suite of ICT solutions designed to assist the Security Operator to manage the security operations effectively.

Systems include, but not limited to, operator consoles or workstations with multiple monitors, a video wall if called out in the airport BOQ, and system software.

9.2 Scope of Services Outline

- 9.2.1** The scope of services included under this package covers the Service and maintenance of equipment and systems related to the Physical Security Systems (PSS).
- 9.2.2** The services for the Physical security system equipment includes all mechanical, electrical, and other services necessary. The PSS systems include, but not limited to:
- 9.2.2.1** Perimeter Intrusion Detection Systems (PIDS) including Ground Surveillance Radar, Fenceline sensors, and thermal imaging cameras.
 - 9.2.2.2** Physical Access Control Systems (PACS), including Automatic License Plate Recognition (ALPRS, road blockers and bollards, and IDMS
 - 9.2.2.3** Video Surveillance Systems (VSS), including Video Management System and CCTV cameras, Intelligent Video Analytics, Facial Recognitions (FR) software, Vehicle Tracking software, and either extended VMS software or Physical Security Information Management software.
 - 9.2.2.4** Security Operations Centers (SOCs) for managing all security system elements and event responses, and for interfacing with a National Aviation Command Center (NACC) at the C2AC Headquarters in Riyadh, Saudi Arabia, when it is available. The Service and maintenance of the PSS.
 - 9.2.2.5** Information & Communications Technology (ICT) systems, including network equipment, backbone and horizontal cabling and infrastructure systems, including equipment rooms and their fit-out. Electrical and mechanical support for ICT Systems, including HVAC and prime and backup electrical power. IT work and services necessary to support, interconnect, operate, manage, administer, and maintain ASSSP Security Systems.
 - 9.2.2.6** The Service Provider is responsible for any movement of PSS equipment and all associated components, systems, and sub-systems.
 - 9.2.2.7** The services for all the systems listed above include the provision of consumables for their operation, utilities, as well as any supplies and spare parts required for the maintenance services.

9.3 Maintenance Manuals

The maintenance manuals are required for all elements of the Physical security systems equipment. These manuals shall detail procedures and reference data for performing all required maintenance tasks. The text and detail of these manuals shall be consistent with the required maintenance personnel skill levels, facilities, and equipment. The manuals shall include instructions for assembly and disassembly and expanded assembly diagrams as required. The maintenance manuals shall, at a minimum, contain the following items:

- Preventive maintenance and overhaul schedules for all system components.
- Descriptions of maintenance procedures for all system components.
- Description of system operations, including interactions among major subsystems elements.
- Detailed technical descriptions of individual subsystems, assemblies, and circuits, including clearances, tolerances, circuit operations, test point voltages, and waveforms as required for maintenance; these descriptions shall refer to system drawings as needed.
- Descriptions of components, including drawings and other information as necessary for maintenance.
- Detailed descriptions of system-specific test equipment operation and procedures for its correct use in equipment maintenance.
- Troubleshooting guides at the system, subsystem, and subassembly level to aid in diagnosis of common failure modes.
- Safety warnings as appropriate for equipment and procedures.

- An illustrated parts breakdown, including a description of replacement parts and associated part numbers.
- Special requirements and qualifications for maintenance personnel.

9.4 Specific Inspection Systems Maintenance Services

9.4.1 Physical Security Systems (All Locations)

- 9.4.1.1 The Service Provider shall maintain and repair all Physical security systems equipment without limitation.
- 9.4.1.2 These systems are critical to CLUSTER 2's operations, certification, safety, and security. The Service Provider shall provide specialized and professional work force to perform the scope of services.
- 9.4.1.3 The Service Provider shall provide the required engineering workforce and technical capability to conduct the engineering scope of services of these systems and may subcontract out certain specialist parts as required to fulfil the scope of work and service delivery.
- 9.4.1.4 The Service Provider shall closely monitor the performance trends of systems and equipment to anticipate faults and breakdowns and where the performance trend shows relative degradation of service, the Service Provider shall analyze, correct, calibrate, and replace the module, assembly, or component, until the problem is resolved, and the trend is corrected back to normal. Where the trend continuously shows degradation of serviceability, despite the corrective actions taken by the Service Provider, the Service Provider shall conduct engineering studies and analysis and propose suitable solutions to the Contracting Authority supported with concept design and detailed cost estimates.
- 9.4.1.5 The Contractor shall ensure optimum utilization of personnel so that field works, and workshop works are planned and completed with quality supervision and engineering assistance as needed.
- 9.4.1.6 Any repair or modification or relocation required shall be undertaken by the Service Provider and is included in the Scope of Work.

9.4.2 Perimeter Intrusion Detection System (PIDS)

9.4.3 The primary component of the IDS shall be the Perimeter Detection System (PIDS), which will monitor and control the fence line boundary, including vehicle gates. The PIDS system will interface to the VMS or PSIM software, as further described herein and in the VSS Scope of Work.

9.4.4 The Contractor shall provide maintenance services for Perimeter Intrusion Detection Systems equipment, their accessories, associated components, and attachments, as follows, but not limited to:

- 9.4.4.1 Ground Surveillance Radar (GSR) units
- 9.4.4.2 Fiber-optic Fence Mounted Systems
- 9.4.4.3 Thermal cameras
- 9.4.4.4 PTZ Cameras
- 9.4.4.5 Towers for sensor cluster mountings
- 9.4.4.6 Tower mounting pads

9.4.5 The service items shall include, but not limited to:

- 9.4.5.1 The maintenance services shall include, but not limited to, power supplies, electrical wirings, servers, switches, workstations, peripherals, security equipment, software and functionality that is fully capable of state-of-the-art technology and are fit for purpose, electronic boards, keyboards, cables, and fault pads.
- 9.4.5.2 The Contractor shall carry out inspections for all Checked perimeter intrusion detection system equipment at agreed time frequency as required by CLUSTER 2's Representative including

performance testing, adjustment and calibration, tests to ensure compliance with the manufacturer's recommendations and to the satisfaction of CLUSTER 2's Representative.

9.4.5.3 The Contractor shall assure that all repairs to the equipment including, but not limited to, GSR units, Fiber Optic mounted system, thermal cameras and PTZ shall be in accordance with manufacturer's recommended operating standards.

9.4.5.4 The Contractor shall also replace all damaged or worn-out parts, components, assemblies etc., to restore all perimeter intrusion detection system in operational condition.

9.4.5.5 The Contractor shall install, relocate, and rearrange equipment including all necessary changes to electrical and data connections, as required by CLUSTER 2's Representative and to meet operational requirements of the user agency or entity.

9.4.6 Physical Access Control Systems (PACS)

9.4.6.1 The Service Provider shall provide management and maintenance services for all physical access control systems equipment, their accessories, and attachments, including, but not limited to:

- 1 Field control units.
- 2 Card Readers.
- 3 Door position indicators and status switches.
- 4 Alarm indicator devices mounted adjusted to PACS controlled/ Mounted doors, portals and openings.
- 5 Door locking/ securing devices: electro magnetic locks, electric trim, electric strikes and electro-magnetic hold opens.
- 6 Duress alarms.
- 7 Tamper switches.

9.4.6.2 The services include, but are not limited to:

The maintenance services shall include, but not limited to, power supplies, electrical wirings, operator workstations and administrative workstations necessary to monitor, controls archways, consoles, video monitors, electronic boards, joystick assemblies, keyboards, cables, and fault pads.

- 1 The Contractor shall carry out inspections for all physical access control systems equipment at such frequency as required by CLUSTER 2 Representative including performance testing, adjustment and calibration to ensure compliance with the manufacturer's recommendations and to the satisfaction of CLUSTER 2.
- 2 The Contractor shall ensure that all repairs to the equipment including, but not limited to, Field control units and card readers, door position indicator and switch devices, Alarm indicator devices, Door locks, Duress alarms, Tamper switches shall be in accordance with manufacturer's recommended operating standards.
- 3 The Contractor shall also replace all damaged or worn-out parts, components, assemblies etc., to put all physical access control systems in operational condition.
- 4 The Contractor shall install, relocate, and rearrange equipment, including all necessary changes to electrical and data connections, as required by CLUSTER 2 and to meet operational requirements of the user agencies or entities.

9.4.7 Visual Surveillance Systems (VSS)

9.4.7.1 The Service Provider shall provide management and maintenance services for all visual surveillance systems equipment, their accessories, and attachments, including, but not limited to:

- 1 VSS core system, with operator workstations, to be in the Security Operations Center (SOC).

- 2 CCTV cameras installed in field location, including:
 - a) Interior grade fixed cameras
 - b) Interior grade PTZ cameras
 - c) Exterior grade fixed cameras
 - d) Exterior grade PTZ cameras
 - e) Thermal and IR Cameras
 - f) Camera enclosures and housings, including fans, active cooling systems, heaters, wipers, sunshades, and other items required to ensure full and correct operation.
 - g) Camera mounts, including pendant arms, wall-mount arms, pole mounts and poles, roof mounts, and all connectors, foundations, footings, hardware and ancillary items required.
 - h) Camera equipment enclosures, as required for power supplies, network connections (both copper and fiber based)
 - 3 VSS-specific power supplies as required for any camera not served with PoE power.
 - 4 Connection and interconnection cabling and wiring, including network connections, both copper and fiber-based, from cameras to the Data Network System
- 9.4.7.2** The services include, but are not limited to:
- 1 The maintenance services shall include, but not limited to, power supplies, electrical wirings, operator workstations and administrative workstations necessary to monitor, controls archways, consoles, video monitors, electronic boards, joystick assemblies, keyboards, cables, and fault pads.
 - 2 The Service Provider shall carry out inspections for all visual surveillance systems equipment at such frequency as required by the Contracting Authority including performance testing, adjustment and calibration to ensure compliance with the manufacturer's recommendations and to the satisfaction of the Contracting Authority
 - 3 The Service Provider shall ensure that all repairs to the equipment including, but not limited to, fixed cameras, PTZ cameras, Thermal and IR cameras, VSS core system, operator workstation shall be in accordance with manufacturer's recommended operating standards.
 - 4 The Service Provider shall also replace all damaged or worn-out parts, components, assemblies etc., to put all visual surveillance systems in operational condition.
 - 5 The Service Provider shall install, relocate, and rearrange equipment, including all necessary changes to electrical and data connections, as required by the Contracting Authority and to meet operational requirements of the user agencies or entities.

9.5 General services

9.5.1 Redundancy for Control Systems and ICT

- 9.5.1.1 It is the responsibility of the Service Provider to outline in detail its process, tools, and performance criteria to ensure the continuity of service of the control and ICT systems.
- 9.5.1.2 In case of service outage, the Contracting Authority requires that a fully redundant solution be in place to ensure rapid restoration of the main services of the control, monitoring, server, and storage systems.
- 9.5.1.3 The solution must incorporate redundant controllers and servers with an automated fail-over mechanism that will automatically switch the services from the primary controllers and server(s) to the secondary controllers and server(s). Once the service has been restored, the switch-over mechanism will automatically switch back operations from the secondary controllers and server(s) to

the primary controllers and server(s). Clear and identifiable alerts and messages will be sent to system administrators.

- 9.5.1.4 In case of multiple-tier architectures (services, data, etc.), all components will behave in the same manner and will be documented in the Service Provider's answers.
- 9.5.1.5 These mechanisms, switch-over protocols, and methods shall be detailed in the Contractor s' answers. Only controller manufacturer approved, and industry-standard tools shall be acceptable to ensure these functions.
- 9.5.1.6 Diagnostics information will be sent and stored in a central location, ready to be accessed, consulted, and analyzed using industry-standard tools to do so, such as SQL queries and external analysis and reporting tools such as Crystal Reports, or similar. Proprietary solutions, inaccessible data, and non-index or prioritized data access, reporting, or manipulations will not be acceptable. This is in addition to the connectors and interfaces detailed in the previous section.
- 9.5.1.7 The Service Provider will document in their answers the full list of available diagnostics and performance data.
- 9.5.1.8 The lists will include all information derived from connected third-party systems through the various connectors, APIs, SDKs, and other exchange tools.
- 9.5.1.9 The Service Provider's will list in table format, the level of criticality of the various components of the control and ICT systems, their contents, services, and connectors.

9.5.2 Vulnerability Assessment and Management (SPOF)

- 9.5.2.1 The Service Provider shall also evaluate and report on the system's overall architecture and vulnerabilities. This will require a systematic analysis of all components, systems, and routines to identify potential vulnerabilities based on a Single Point of Failure (SPOF) grid.
- 9.5.2.2 For each SPOF, the Service Provider will propose remedial strategies and, if required, upgrades and improvements for consideration by the Contracting Authority. The SPOF items and initiatives will be listed based on their priority level. These items will be listed in the CAPEX section of this document.
- 9.5.2.3 The Service Provider will propose a formal report and improvement plan with budgets for review and discussion with the Contracting Authority.

9.5.3 Cybersecurity

- 9.5.3.1 The Service Provider shall provide technical support to the cybersecurity services team. This will include providing, among others:
 - 1 Technical assistance and support
 - 2 Implementation of CLUSTER 2 cybersecurity policies, tools, systems, and requirements
 - 3 Complying with CLUSTER 2 Cybersecurity policies, tools, systems, and covering all configurations \ support requirements.
 - 4 Maintenance, updates, and monitoring, as needed, of cybersecurity policies, tools, systems, and requirements.
 - 5 Compliance to NCA and other frameworks required cybersecurity standards, rules, and regulations (e.g., NCA ECC, NCA CSCC, NIST, ISO 27001, ENISA, ISF, etc.).
 - 6 Implement and maintain assets security hardening, vulnerability discovery, security patching and assets upgrading.
 - 7 Deploy Anti-Virus solutions (Enable Windows Defender) and ensure their ongoing updates.
- 9.5.3.2 The Service Provider shall provide a detailed response regarding cybersecurity measures and how they will be implemented in the systems that are in the scope of this document.
- 9.5.3.3 The responses will be organized by the following main categories, as applicable:

- 1 Overview of cybersecurity approach
- 2 Server, client and other service-level tiers
- 3 describe as a minimum protection tools and mechanisms, security updates and patch management and comply with any future cyber security configurations will be implemented.
- 4 Virus protection and encryption software used to protect desktop systems and servers.
- 5 User management tools
- 6 security tools for enrollment, deprovisioning, purging, and user DB maintenance
- 7 External and third-party tool usage and compliance with any future cyber security configurations will be implemented.
- 8 list of external tools used, protection tools and mechanisms, security updates and patch management.
- 9 Client-level tier
- 10 main protection tools and mechanisms. This includes logon and authentication, data exchanges and encryption levels.
- 11 Cloud tools -if used and accessed as part of the solution and comply with any future cyber security configurations will be implemented.
- 12 External data exchanges
- 13 including all connectors, APIs, SDKs, and other messaging. As a minimum, describe periodic or cyclic authentication methodologies, spoofing protection and ACK verification mechanisms, encryption (end-to-end or partial) and standards used (AES, DES, etc.)
- 14 Lock-down tools and protocol when an attack is detected, what tools and protocols are in place, how and by whom are they used, and how quickly can the LAN system be isolated and sanitized, clear IRP Incident response plan for any attack, mitigate risk plan.

9.5.3.4 In addition to the points above, and as part of their services offer, the Service Provider will carry out, in conjunction with the ICT Networks, Infrastructure, Unified Communications, and Storage Systems Contractor, regular tests and assessment which will be complying with NCA requirements and national standards to ensure that the cybersecurity measures and vulnerabilities are tested on a regular and periodic basis. Using industry-standard best practices and frameworks (see Standards section 3.5 below), the Contractor will conduct periodic joint tests and will report the results to the Contracting Authority.

9.5.3.5 Periodic cybersecurity meetings with Cluster 2 will be held to discuss these tests and results. Should any vulnerabilities, deficiencies, or anomalies be found, a Corrective Action Plan (CAP) will be produced by the Contractor and discussed during the cybersecurity meetings. Progress towards the completion of the CAP and its items will be tracked during these meetings.

9.5.3.6 The Service Provider will explain how and at what frequency it proposes to carry out these activities.

9.5.4 Client and Web Application Security

Some applications will be implemented through web clients and applications, including mobile services. As a minimal requirement, CLUSTER 2 dictates that Open Web Application Security Project (OWASP) core principles be applied to all types of clients, mobile or not, including, but not limited to:

9.5.4.1 Injection risks

As a minimum, explain how SQL injections are handled and sanitized.

9.5.4.2 Authentication

Describe as a minimum the login control parameters (password management, criteria, renewal, and recovery, etc.), as well as rate limiting tools and more secure authentication such as dual factor techniques.

9.5.4.3 Sensitive data exposure

Describe, as a minimum, what measures are in place for the encryption of sensitive data and how data caching and deprovisioning are implemented.

9.5.4.4 XML external entities

Describe what types of data, and their level of complexity, are accepted and controlled to prevent attacks.

9.5.4.5 Access control

As a minimum by describing how token generation and controls are implemented

9.5.4.6 Security misconfiguration

As a minimum, by describing how error messaging and details are managed to avoid over- exposure.

9.5.4.7 Cross-site scripting

Describe what means are in place to prevent custom code insertion. As a minimum, how is avoidance of untrusted HTTP requests, validation and sanitation of user-generated data effected and what web development tools are used to protect against attacks, such as ReactJS or Ruby on Rails

9.5.4.8 Insecure deserialization

As a minimum, describe the mechanisms for monitoring deserialization, implementing type checks, and interdicting access to untrusted data sources.

9.5.4.9 Using components with known vulnerabilities

Modern software packages use many third-party components. A full list of these components, their age and security history (e.g., patches and updates) must be accessible (reports and alerts) and managed by means of periodic and automatic verifications and updates must be included.

9.5.4.10 Logging and monitoring

Describe the different ways and tools used to log and monitor access to the applications and systems to facilitate and accelerate breach resolution and tracking.

9.5.5 The Service Provider is encouraged to provide additional security measures as they deem fit and to detail them in their offers.

9.6 Management Services

The Service Provider will be taking over the operations and management activities and responsibilities from an existing Service Provider.

The Service Provider shall provide all management services and systems required for the management of the Physical security systems to achieve the performance goals documented in the Detailed Performance Requirements section.

This section describes the management services to be provided to manage and track all the services in scope.

9.6.1 Condition Survey

9.6.1.1 The Services Provider shall carry out a condition survey of agreed percentages the fixed plant & equipment/systems related to this agreement and produce CLUSTER 2 its evaluation survey report. The percentages will be agreed during the mobilization period but will not exceed more than 5% of individual asset types.

9.6.1.2 During this survey the Services Provider agrees to collate an inventory as per the below section. The condition survey report shall include the following (where available):

- 1 Location, sub-location
- 2 Asset type
- 3 Asset tag no.
- 4 Operational Status
- 5 Ranking
- 6 Pictorial Evidence
- 7 Comments with recommendation the ranking will follow the below standard.

Rank	Definition
Rank 1 – Good	Asset appears as installed in proper way, need to compare with the general comments in the snags list, also detailed review of manufacturer installation recommendation and general standards to be considered. We inspected the accessible parts only, didn't open for the internal condition of the asset.
Rank 2 – No Longer Good	The Asset cannot be considered as good, but it is better than satisfactory. Minor issues comparable to missing of some tagging and labelling found which mentioned in the snag list, resolving these issues could return the asset to "1" rating
Rank 3 – Satisfactory	The Asset can be considered as satisfactory only. The concerns may be minor health and safety issues, not followed properly manufacturer installation recommendation or general standards, no tagging or labelling for identification,
Rank 4 – No Longer Satisfactory	The asset may be functional or not, but there may be major health and safety concerns, equipment may not have installed as per manufacturer recommendations or as per general standards, operating the asset in this gradually may lead to failure of equipment.
Rank 5 – Poor	The asset is not functional to the extent that it can no longer be used.

9.6.2 National Security Program

9.6.2.1 The Service Provider shall be responsible for the management and implementation of the requirements of the National Security Program as issued by Kingdom of Saudi Arabia security and other official agencies, as well as CLUSTER 2 requirements.

9.6.2.2 This shall include, but not limited to:

- 1 Implementing all changes in a timely manner
- 2 Log and track any changes made including all details.
- 3 Maintaining logs and systems so that they may be reviewed and audited at all times.
- 4 Any other required activities

9.6.3 User and Password Management

The Service Provider shall be responsible for all user access and password management for all systems. This shall include, but not limited to:

- 1 User profile creation, management, and deprovisioning
- 2 Logs of all current and past users, and reports
- 3 Regular analytical reports to identify discrepancies and manage and purge user and permission lists
- 4 Password renewal management
- 5 Maintenance and management of all national security rules and requirements, including password changes and updates.

9.6.4 Inventories

- 9.6.4.1 CLUSTER 2 will provide to the Service Provider all inventories, counts, reports, and any other pertinent documents it currently has in its possession to ensure that the Service Provider has the data and information necessary for the execution of the O&M services. All these documents will be provided on an as-is basis and may not be complete or up to date.
- 9.6.4.2 It will be the responsibility of the Service Provider to carry out his own O&M facilities and systems inventory and to enrich it with the pertinent O&M information that will be needed for the execution of the services.
- 9.6.4.3 This inventory will be shared with the Contracting Authority and will be integrated into the Contracting Authority's Computerized Facilities and Maintenance Management System (CFMMS). during the term of the services contract.
- 9.6.4.4 The Service Provider will co-ordinate with CLUSTER 2 to ensure that the data shared will be compatible with the CMMS.
- 9.6.4.5 The Service Provider and the Contracting Authority will review and merge their inventories to develop a comprehensive and up-to- date snapshot of the airport's facilities and systems. The combined final inventory will constitute the Point of Reference inventory that will drive the rest of the service contract during its term. to adjust the Fee and Price Breakdown to reflect the real perimeter and scope of the airport's facilities and service. The variance in cost may not exceed more than five (5) percent of the submitted cost and be fully justified with support calculations and rationale, which must be approved by the Client.

9.6.5 Other services as requested by CLUSTER 2

The Contracting Authority may make ad hoc service requests from time to time to the Service Provider such as, among others, facilities visits, demonstrations, special interventions, and other services. The Contracting Authority will provide advance notice of such service requests.

9.6.5.1 Manual of Operating Procedures

The Manual of Operating Procedures will provide detailed operating instructions for the system, each component, and/or subsystem. The manual shall, at a minimum, provide operating procedures for:

- 1 Startup
- 2 Shutdown
- 3 Modes of operation
- 4 Failure management
- 5 Emergency responses
- 6 Service restoration.
- 7 Power distribution system management
- 8 General rules for staff
- 9 Contingency plan
- 10 Risk assessment.

9.6.5.2 Reporting, Documentation, and Records

- 1 As the Service Provider takes over the services, he will take over existing reports, schedules, and analytical documents.
- 2 The Service Provider shall detail in his offer and during the term of the contract any improvements or modifications he may want to implement on the existing reports schedules, and analytical documents.

- 3 All the reports, schedules, and analytical documents will be used to execute the services during the term of the contract and will be maintained throughout the term. They will be handed over at the end of the term of the contract, ready to be used by the next Service Provider.
- 4 All SOPs, manuals, and other technical documents of all types shall be stored, maintained, and kept current by the Service Provider so that they can be easily accessed by Cluster 2 and designated parties. Current and updated copies of all documents, electronic and physical, shall be sent to Cluster 2's ICT Managed Services who will store them in both formats in Cluster 2's Technical Library.

9.6.5.3 Records, Documents, and Drawings.

Throughout the Contract period, the Contractor shall continuously update all As-built Documents, Operations Plan and Manuals, Maintenance Plan and Manuals, Management Plan, and the Rule Book as any changes or improvements are implemented, including updating of the copies maintained by Cluster 2.

The Service Provider shall maintain a complete set of the Project Record Documents. Updates to the documents shall be provided to Cluster 2 within four months of their inception.

9.6.5.4 Document and Drawing Control

The Service Provider shall implement a Cluster 2-approved Document Control System. This system will allow rapid identification of the latest approved version of any drawing, sketch, manual page, drawing or procedure and shall provide for distribution to assure that such latest approved materials are in fact in the documents being used by operations, maintenance, and management personnel.

9.6.5.5 Licenses, Certificate, and Permits

The Service Provider shall be responsible for completing or cause to be completed all regulatory inspections and testing necessary for the licenses, certificates and permits and shall maintain and make available to Cluster 2 on request.

9.6.6 Facilities & Buildings

The Service Provider is responsible for the Hard and Soft Services of all facilities / building as listed in Appendix L which includes the following:

- Security Operations Center Building
- Guard Houses Building.
- Car Parkings and Roads Pavements.
- Fencing & sliding Gate etc.
- Leakage Detection System
- Cooling system for Data Center etc.

9.6.6.1 Car Parking & Roads Pavement Surface

- 1 The Maintenance Services required to be performed by the Service Provider for the Car Parking Pavement areas are kept clean and free of debris, paint and repaint the Car Parking markings. The cleaning should be on a daily basis including trash collection and removal to storage containers.
- 2 The Service Provider is fully responsible for the proper draining and discharging of the accumulated water on the car parking pavements due to heavy rainfall, inclement weather, flooding or for any other reason, as part of the maintenance SOW responsibility.
- 3 The Service Provider is responsible for the maintenance of the Car Parking Pavement Surface in accordance with the required standards acceptable to C2AC.

- 4 Painting and repainting of the car parking pavement markings should be performed on a regular basis and as an when directed by C2AC. The Service Provider shall also be responsible to completely remove accumulated painting layers and to repair pavement surface before applying new painting.

9.6.6.2 Fencing

- 1 The Service Provider is responsible for the maintenance including cleaning and painting of fencing and sliding steel gates.
- 2 The Service Provider will remove and dispose of, in an approved manner, all rubbish and sand that accumulate against the fences inside and outside.
- 3 The Service Provider must ensure the continuity of the fencing system and will replace and/or repair fencing and gates that have been damaged whether by tempest, vandalism, aircraft emergency or any other cause.
- 4 Rust protection of ferrous components of fencing is essential. The Service Provider will provide all necessary measures and materials to inhibit the rust once a year as part of maintenance SOW responsibility.
- 5 Fence and all the associated components (e.g. gates, posts, fabric, extension arms, turnstiles, connectors, fasteners etc.) are left to the ravages of the corrosive environment, or atmospheric environment, soil corrosively, ultraviolet exposure, solar radiation, biological or other factors causing deterioration of materials and corrosion. Corrosion is most often associated with rust and oxidation .
- 6 The Service Provider is completely responsible for the corrosion prevention, protection and control of the chain link fence and all the associated components in accordance with the relevant ASTM or other Cluster 2 Airports Company approval standard .
- 7 The galvanized steel chain-link and PVC coated fence can severely corrode due to others sever weather condition etc. The corrosion damaged fence should be repaired or replaced in accordance with Cluster 2 Airports Company specification and instructions .
- 8 Fence posts / line posts are normally encased in concrete base and subject to concrete permeability and also rain gets down inside the post or water becomes trapped, causing internal corrosion and deterioration, thereby weakening the fence post / line post, which requires restoration or replacement by the Service Provider as part of maintenance SOW responsibility.
- 9 The Service Provider actor shall when required by Cluster 2 Airports Company, to carry out Zinc coating to extend the service life of galvanized steel fencing and PVC coated and aluminum alloys are a better choice in salt laden environments or highly corrosive environments .
- 10 The Service Provider is responsible for all types of sliding steel gates and will provide Maintenance and performs preventive maintenance to prevent breakdown and failure before it occurs, thus preserve and enhance reliability.

9.6.6.3 Road Blocker, Arm Barriers and Sliding doors

- 1 4.2.04.1 The Contractor is responsible for all types of motorized and mechanical gates, all types of sliding steel gates, road blockers and boom gate barriers (Mechanical/Electrical), etc. The Contractor will provide maintenance to include but not limited to, maintaining and repairing of hydraulic road blockers, electrical boom barriers and sliding gates at the airports. The services include repair and replacement of damaged parts, repair of boom barriers and sliding gates, check of power supply- /cables, brakes, control circuit breakers, motors, other hazards associated with opening and closing of the gate such as opening edge, gaps in the gate where fixed structures are being passed, and at the drive mechanism, etc.

- 2 4.2.04.2 The Contractor will plan preventive maintenance to prevent breakdown and failure of vital equipment before it occurs, thus preserve and enhance reliability by replacing worn components before they wear out. All safety devices and features should be checked on a regular basis and in accordance with the manufacturer's instructions to ensure they continue to function as designed to ensure that safety is maintained. This should be specified in a planned preventive maintenance schedule agreed by persons responsible for the gate's management and the manufacturer's nominated maintenance company. Without planned preventive maintenance, higher cost of repair and the liabilities of unsecured sites leaving personnel and property at risk at the airports.

9.6.6.4 Digital Telephone system and Communication Reticulation system / Lines

- 1 The Service Provider will maintain the Digital Telephone System including Data Network System, IP Telephones, intercom system, UPS systems, power and communication reticulation wiring, communication cables, function boxes, distribution panels, routers, modems, all types of switches, and all other miscellaneous auxiliary items related to communications.
- 2 Telephones: Maintenance of all internal telephone systems including distribution boards, telephone sets, cabling, intercom system and cabling external to the building. It also includes any intercom equipment door phone (Audio, video) which are not associated with the PABX system.
- 3 The Service Provider is responsible to perform DB loss test for all the communication network at the airports/sites on an annual basis. In case the results are unsatisfactory or below the required standards, necessary rectification and corrective action must be taken by the Service Provider to improve the network condition.
- 4 Work will commence at once and continue until the system is operational. This includes emergency requirements resulting from accident, lightning, storm or other abnormal circumstances which may be temporarily repaired using a by-pass system of connection but must be done in a permanent fashion as soon as the emergency has been resolved.
- 5 Any disruption in normal communication service whether for maintenance or for other reasons will be notified to the Airport Director and to Cluster 2 Airports Company by the Service Provider within 24 hrs. of the failure.
- 6 The Service Provider will prepare and maintain comprehensive maintenance historical records which will be compiled and retained at all locations.
- 7 If the Contracting Authority is not satisfied with the maintenance service of the Contractor, Cluster 2 Airports Company will hire the services of manufacturer's representative without returning to the Contractor at his cost or deduct the corresponding amounts from the Contractor 's monthly payment.

9.6.6.5 Electrical Equipment & systems

The Service Provider is responsible for the operations and maintenance of all electrical equipment such as, but not limited to:

- 1 Electrical Transformers
- 2 Substations
- 3 Ring Main Units (RMU)
- 4 Auto Transfer Switches (ATS)
- 5 Grounding Aerial System
- 6 Lightning Protection systems and grounding systems
- 7 UPS, DC Power Supply Batteries

- 8 Emergency Lights and all associated Items
- 9 Security Lighting system etc. etc. etc.
Including all associated items and accessories and cabling.

9.6.6.6 UPS Functionality Testing and Calibration

The Service Provider is responsible to perform annual maintenance test on all types, and on all different capacity of UPS installed with any of the systems / equipments etc. at any of the facilities, along with its associated batteries to ensure its functionality because the possibility of faults accruing in user installations remains unpredictable. The IT hardware installations are particularly sensitive to power supply fluctuations and distortions and rely on an UPS to mitigate the effects. The following are the recommended tests to be performed as applicable and comply with the manufacturers recommendation and adhere to NFPA requirements during UPS testing with appropriate UPS testing tools.

- 1 UPS functionality & alarms testing
- 2 UPS burn-in test
- 3 UPS step load & bypass loss transient tests
- 4 UPS full load battery discharge test
- 5 UPS loss & return of mains tests.
- 6 UPS loss & return of battery test.
- 7 UPS load transfer test
- 8 UPS transfer to bypass and back test
- 9 UPS battery-rundown test.

Any UPS or the battery that fails the test must be replaced immediately as part of SOW responsibility.

9.7 Security Surveillance Systems (SSS)

- 9.7.1** Airports are equipped with Security Surveillance System SSS system. The Contractor will maintain these systems and all related equipments on 24 hours basis. Any service or repair, which result in shutdown of the systems, will be expedited to minimize the out-of-service period. Whenever possible, such repairs period will be scheduled during minimum aircraft activity periods. The Contractor will furnish competent staff for 24 hours operation.
- 9.7.2** The following are the basic Systems, sub-systems and devices etc related to the security surveillance system – SSS but not limited to:
- 9.7.3** Airport Security Surveillance System inclusive of several type HD or other fixed and Zoom Cameras, i.e; CCTV Type, Face Recognition, Thermal & Infrared etc., with integrated Radar system connected to main Surveillance Wall Display Control System, Wall Display Type Large LED Screen (wall size), other Large LED or other Screen / Monitors Touch Screens, Main Servers, Computer Work Stations, Joystick Controllers, VTS-Vehicle Tracking System, GEMS-Gatekeeper Enterprise Management System consisting of Face & Vehicles Plate Detection Cameras, Intelligent Vehicle Undercarriage Scanner, Data Network System, Dispenser Switch, Distributor Switch, I.T. Connection Board, IDF Cabinet, Fence Detection system, Network Switches, Infrared and other Sensors, Alarm Monitoring & Control System. Intrusion detection System, Fiber Optic Sensing, Recorders, Access Control, Networking and accessories, Network Video Recorder, Controllers, Readers, Programmers, Cards, Video analytics, Digital Data Storage, Remote Access, Remote Viewing Software, all related auxiliaries

and accessories but not limited to cables, network cable, power & protection, wireless & cellular Switches, junction boxes, monitors, video extenders & splitters, connectors etc.

9.7.4 The Operations and Maintenance scope of Works and Services for the Airport security surveillance Systems which are Identified and classified in accordance with their Operational Serviceability and functionality include some of the following items as set forth in the BOQ and Schedule of Facilities.

- INTEGRATED SYSTEMS AND IT.
- PERIMETER INTRUSION DETECTION SYSTEM (PIDS).
- PHYSICAL ACCESS CONTROL SYSTEM (PACS).
- VISUAL SURVEILLANCE SYSTEM (VSS).
- SECURITY OPERATIONS CENTER (SOC).

9.7.5 The Scope of the Works and Services includes, but not limited to operations & Maintenance responsibility, is also designed to assist the Security Operator to manage the Security operations effectively and efficiently in compliance & coordination with NPISPA.

9.7.6 The services for the Airport security Surveillance system equipment includes all mechanical, electrical, and other services necessary to Maintain the systems and solutions required by the Employer to meet the objectives of the ASSS Project. The PSS SOW includes:

- 1 Perimeter Intrusion Detection Systems (PIDS) including Ground Surveillance Radar, Fenceline sensors, and thermal imaging cameras.
- 2 Physical Access Control Systems (PACS), including Automatic License Plate Recognition (ALPRS, road blockers and bollards, and IDMS
- 3 Video Surveillance Systems (VSS), including Video Management System and CCTV cameras, Intelligent Video Analytics, Facial Recognitions (FR) software, Vehicle Tracking software, and either extended VMS software or Physical Security Information Management software.
- 4 Security Operations Centers (SOCs) for managing all security system elements and event responses, and for interfacing with a National Aviation Command Center (NACC) at the C2AC Headquarters in Riyadh, Saudi Arabia, when it is available. The Service and maintenance of the PSS.
- 5 Information & Communications Technology (ICT) systems, including network equipment, backbone and horizontal cabling and infrastructure systems, including equipment rooms and their fit-out. Electrical and mechanical support for ICT Systems, including HVAC and prime and backup electrical power. IT work and services necessary to support, interconnect, operate, manage, administer, and maintain ASSSP Security Systems.

9.7.7 The primary purpose of the airports security surveillance system is to ensure smooth and continuous safe operations of the airports with reliable and secure detection and surveillance systems to mitigate operational risks.

9.7.8 It is important to properly secure the airports assets and this starts at the perimeter and perimeters fence of the airports, to deploy robust, reliable and secure detection strategies to mitigate operational risk. Fiber optic technology provides a reliable solution with significantly reliable and secure detection, with reliable performance in harsh environment to mitigate operational risks.

9.7.9 The Service Provider is responsible for the proper operations and functioning of the SSS to accomplish the purpose of the Airport Security Surveillance System which is to make the airports safe, with cameras, data rates, encoders, monitors and software working together add up to the safety net with distributed network architecture. Its flexible to add any number of cameras and work stations and any old analog cameras will migrate to IP and work with the HD cameras. Integrate other HD camera, security systems, access control, communication systems, perimeter detection etc. When everything

is connected and designed to work together, so as to control and monitor security related movement and activities and enabling the security and safety of the airport's operations.

- 9.7.10** The Service Provider must ensure the proper functioning of the Artificial Intelligence (AI) technology and the acoustics which enables the distinction between genuine security risks and extraneous environmental voice. The infrared rays sends encoded signal to the controller and if recognized the alarm event will be generated and location identified and reflect back to the controller with the advanced signal processing technology which enables fast and accurate identification of the specific location.
- 9.7.11** The Service Provider must ensure the proper functioning of the flexible distributed network architecture enables which the integration of additional HD cameras, workstations, access control units, communication system, perimeter fence detection equipment etc, and monitored from the control center. The security surveillance system is a reliable safety network of cameras, encoders, radars, and monitors with central monitoring and controlling unit to keep the airports safe.
- 9.7.12** The Service Provider must ensure the proper functioning of the video recording system helps monitor and record hundreds of airports security cameras for the airport security with maximum information collected thru the airport surveillance system. Advanced signal processing enables fast and accurate identification of the specific location of a potential threat.
- 9.7.13** Prompt and highly accurate location information of a would-be intruder ensures a fast and appropriate response to minimize any loss. Ensuring that the perimeter intrusion detection system is fully integrated into the security solution, provides real time data with the ability to track and respond to intruders.
- 9.7.14** The Service Provider must ensure the proper functioning of the airport perimeter security systems with infrared rays and radars etc which helps to detect any intrusion. The high security fence detection smart sensors and radars etc reliably pinpoint the cut in the fence or otherwise or climb attempts. The sensors are flexible, reliable links and transceivers for protection of gates, entry points and rooftop and locate intruders. Infrared dual tech sensors are such performance standalone active / passive infrared and motion sensors for outdoor intrusion detection.
- 9.7.15** The airport security surveillance system is for the protection of critical infrastructure and high value assets and the contractor must ensure that the hardware associated performs reliably in harsh environments. Alarm monitoring & control systems having a complete range of accessories to support the perimeter security systems monitor, display and control a facility's perimeter security program.
- 9.7.16** The Service Provider should maintain the backup software on other Computer configured and readily available for emergency purpose for the computer based SSS system so as to avoid long shut down due to problem in Computer or software.
- 9.7.17** 4. 2.15.12Video surveillance is used for various applications in airport operations; from public zones for passengers and guests, and the security area, to outdoor facilities such as the apron, taxiways, runways and parking facilities etc. and the Service Provider to ensure its proper functioning.
- 9.7.18** The access areas, waiting areas, and the boarding points in the airport buildings themselves are monitored. The camera technology helps to accelerate the various processes. Video surveillance also provides support for security personnel with automated processes at security checkpoints contractor must ensure that the monitoring functioning.
- 9.7.19** SSS installations of devices for central monitoring is particularly important and monitoring the site, the fences, and the perimeter are therefore essential for operations, that influence flight operations or areas that could endanger flight safety are time-critical. Areas that are critical include the apron and maneuvering areas, taxiways and feeders, and the runway etc. the Service Provider must ensure its proper functioning.

- 9.7.20** The Service Provider must ensure the proper functioning of the Smart Camera that integrates the functions of conventional connection devices equipped with compact housing. Those cameras that are not accessible for maintenance work in regular operation, can be restarted via reboot function from the control center. The Smart Camera is equipped with managed switches and can therefore be integrated actively into the control system monitoring the status of the camera network and the other devices etc. components in the widely distributed areas are protected against overvoltage.
- 9.7.21** These SSS systems are installed at the airport to scan significant areas for any covert action. The Concerned Security Office will operate and monitor the installed systems, and the Service Provider shall service and maintain the system to assure dependable operation.
- 9.7.22** Main and standby servers are vital for the Security Surveillance System. The problem in the server will lead to shut down of whole SSS system. The Service Provider will ensure proper operation of hardware and software of main as well as backup server. The necessary anti-virus program will be installed to safeguard the system after Cluster 2 Airports Company's approval.
- 9.7.23** The Service Provider is responsible for the renewal of Systems Software licenses where ever applicable, but not limited for to all types of Cameras, and Monitors, Tracking System, IP Telephones, any other system hardware or software etc. and also for the payment of the fees/costs related to the renewal of the licenses as part of SOW maintenance responsibility.
- 9.7.24** The Service Provider is responsible for the replacement of any damaged Storage devise / system of any of the servers and programmable control units etc., related to system irrespective of whatever the cause is or otherwise, with a similar or higher capacity Storage devise / system. The replacement of new Storage devise / system has to be approved by Cluster 2 Airports Company prior to replacement The Contractor is also responsible to retrieve the data from the damaged Storage devise / system and transfer the data on to the replaced Storage devise / system.
- 9.7.25** The Service Provider is responsible to ensure protection of the hardware from all types of viruses, by constantly checking and monitoring their performance and updating them with latest antivirus software at any time as per the situation, to prevent, detect and protect the systems.
- 9.7.26** The Service Provider is responsible to reformat / upgrade the hardware related to SSS systems and any auxiliary items, as and when required. Other Discs or Storage devise whose software gets corrupted due to any reason or any virus, reprogram the corrupted Discs or Storage devise and replace the corrupted / outdated software with original software including installation of latest antivirus software at any time.
- 9.7.27** The Service Provider is responsible for the upgrading of the software from time to time as and when new versions are released by the manufacturer as part of maintenance SOW responsibility.
- 9.7.28** The Service Provider is responsible to ensure that any software of any SSS System that gets corrupted due to any reason whatsoever should be replaced, so that there is no interruption in the operation of the system.
- 9.7.29** The software's that are installed in the Security Surveillance Systems are critical for the reliable operation of all the Systems efficiently and effectively. The following are the type and list software's for information & guidelines.
- 1 PSIM – CNL
 - 2 IDMS - HID Safe
 - 3 Analytics – Ipsotek
 - 4 VMS – Milestone
 - 5 PACS – Lenel
 - 6 Cameleon – Flir

- 7 Gatekeeper – Gatekeeper
- 8 Servers – Dell
- 9 Network – Cisco
- 10 Windows server – Microsoft
- 11 SQL servers – Microsoft

9.7.30 In case the Contractor's personnel are not adequately experienced in performing the operations, preventive and corrective maintenance, then the services of a specialized outside Company will be utilized.

9.8 Computers, Servers, Data Network and Consumables Supplies

9.8.1 The Service Provider is responsible for the maintenance of office equipments including but not limited to

- Computers
 - Monitors
 - Printers and scanners
 - Servers of all types
 - Data network systems
- Including all associated accessories etc. etc. etc.

9.8.2 The accessories such as voltage stabilizers, etc. will be considered part of the equipment. Other office equipment like slide projectors, overhead projectors, megaphone, video players, televisions, badging machines, shredders, electric desk calculators, electric pencil sharpeners and electric stapling machine, etc. will also be maintained by the Contractor but no direct payment will be made for maintenance of such items.

9.8.3 As part of maintenance, the Contractor will provide all consumables for the equipment identified in Clause and listed in BOQ. These consumables include toners, papers of all different sizes and types, inks, ribbons, disks, etc. Cluster 2 Airports Company will determine the quantities of consumables. The Contractor will use original consumable recommended by manufacturer. Nonstandard and low-quality consumables will not be allowed.

9.8.4 If Cluster 2 Airports Company is not satisfied with the maintenance service of the Contractor, Cluster 2 Airports Company will hire the services of respective manufacturer's representatives without returning to the Contractor and deduct the corresponding amounts from the Contractor's monthly payment to pay to the manufacturer's representative. Cluster 2 Airports Company will disregard any difference in the unit rates of the Contractor and the manufacturer's representatives and deduct the whole amount from the Contractor's payment. The Contractor will be obligated to provide the consumable even though the maintenance of the equipment may be done by the manufacturer's representative because of Cluster 2 Airports Company directive .

9.8.5 The Contractor will respond to malfunctions within reasonable time period after initial notification. Work will commence at once and continue until the equipment is operational.

9.8.6 The Contractor will respond to malfunctions within 2 Hours' time period after initial notification. Work shall commence at once and continue until the equipment is operational.

9.8.7 The Contractor will relocate and rearrange equipment including the necessary changes to electrical connections, as required by Cluster 2 Airports Company and to meet operational requirements of the user, as part of the maintenance SOW responsibility.

9.8.8 The Contractor will ensure that any equipment rendered dead lined will be brought to service within a reasonable time period that Cluster 2 Airports Company will determine, to avoid any disruption to office work.

- 9.8.9** The Contractor is responsible for the maintenance of data network including control cabinets, routers, Wi-Fi router, Wi-Fi access points, switches, PT links, hubs, patch panels, patch cords, servers (back-up server, rack server & accessories) work station with PC, UPS, external hard disk, repeaters, multi-layer switch, bridges, modems (DSL & cable modems), network adaptor, fiber optic distribution boxes, optical splitter distribution boxes, optical fiber junction boxes, fiber optic cables, network cables (CAT6), etc. at each airport/site in the group, as part of the maintenance SOW responsibility.
- 9.8.10** The Contractor is responsible for the upgrading of the software from time to time as and when new versions are released by the manufacturer for all the existing software and new software acquired during the Contract period including any technical support, as part of maintenance SOW responsibility.
- 9.8.11** The Contractor is responsible to ensure that any software of any Office Equipments, Office Systems Data Network and Office Requirements & Supplies that gets corrupted due to any reason whatsoever will be replaced, so that there is no interruption in the operation of the system .
- 9.8.12** The Contractor is responsible to reformat the hardware disc whose software gets corrupted due to any reason or any virus, reprogram the corrupted hard disc and replace the corrupted software with original software including installation of latest antivirus software at any time.
- 9.8.13** The Contractor is responsible to ensure protection of the hardware from all types of viruses, by constantly checking and monitoring their performance and updating them with latest antivirus software at any time as per the situation, to prevent, detect and protect the systems.
- 9.8.14** The Contractor is responsible for the replacement of any damaged hard disk drive of any of the servers related to system irrespective of whatever the cause is or otherwise, with a similar or higher capacity new hard disk drive. The replacement of new hard disk drive has to be approved by Cluster 2 Airports Company prior to replacement The Contractor is also responsible to retrieve the data from the damaged hard disk and transfer the data on to the replaced new hard disk.

9.9 Cyber Security Obligations and Requirements

- 9.9.1** The Service Provider contractor should be aware that the airports operations, Safety and Security, encompasses a diverse range of risks and requires a focused monitoring and mitigation plan, for the Constant assessment and effective management of the Airports security Surveillance Systems, as it is part of the National Project for Integrated Security and Protection and National cyber Security, Contractor is obligated to have an effective planning and risk management to ensure operational reliability and optimum functionality even in case of unexpected situation and circumstances.
- 9.9.2** The Service Provider has the Contractual Obligation and responsibility to Comply and implement the following Cyber Security Recommendations and requirement, in the best interest of airports operations, safety and security.
- 1 **Encryption**: CCTV system must support encryption for data transmission and storage, as per national security standards (NCS-1 :2020).
 - 2 **Access control**: A robust role-based access control should be defined and implemented, which considers different levels of access based on user roles and responsibilities, as per C2 Cybersecurity Policy.
 - 3 **Authentication**: CCTV system should support strong authentication mechanisms, as per C2 Cybersecurity Policy.
 - 4 **Password policies**: Secure password complexity, expiration, and lockout mechanisms, as per C2 Cybersecurity Policy

- 5 **System updates and patching**: CCTV system contractor regularly releases security updates and patches to address vulnerabilities. These updates and patches should be installed in timely manner and its contractor 's responsibility providing them, as per C2 Cybersecurity Policy.
- 6 **Event logging and auditing**: CCTV system must have robust logging capabilities to record system events and user activities.
- 7 **Network security**: Network security measures, such as firewalls, intrusion detection systems, and virtual private networks (VPNs) to secure network connections associated with the CCTV system.
- 8 **Secure storage**: Secure storage of video footage, including encryption of stored data and access controls. Also, consider regulation for retained storage.
- 9 **Physical security**: Physical security measures, such as securing the CCTV system's physical components, including cameras, recording devices, and network equipment.
- 10 **Contractor security practices**: Contractor cybersecurity practices, including security certifications, vulnerability management processes, and incident response procedures.
- 11 **Secure remote access**: If remote access to the CCTV system is allowed, it should be done through secure methods.
- 12 **Data privacy and compliance**: Will CCTV system stores or processes personally identifiable information (PII). Contractor should comply with relevant data protection regulations, such as NCA DCC and NDMO.
- 13 **Secure configuration**: CCTV system should be configured securely and hardened based on best security practices. Also, securing and hardening operating systems and its components .
- 14 **Incident Response Plan**: Contractor should adhere to C2 incident response plans and procedures.
- 15 **Vulnerability management**: Contractor 's vulnerability management practices and patch management process.
- 16 **Security assessments**: Regular penetration testing or security assessments of CCTV system.
- 17 **Integration with existing security infrastructure**: If needed, CCTV system needs to integrate with other security systems or infrastructure, a secure integration must be considered.
- 18 **Data backup and recovery**: CCTV regular data backups and a robust disaster recovery plan, as per NCA regulations.
- 19 **Staff training and awareness**: Contractor should provide training on CCTV systems and awareness about cybersecurity threats.
- 20 **Compliance documentation**: Contractor is to provide documentation and evidence of compliance with relevant security standards.
- 21 **Security Operation Center**: 24/7/365 security monitoring for all events and intrusion detection and response. (to be discussed with the Project owner).

10. Crash, Fire and Rescue (CFR) Vehicles and Equipment

10.1 General Overview of the CFR Scope of Works

- a. The Scope of Works in general defines the requirements and responsibilities. It describes the various types of Maintenance of Airports CFR Vehicles and Equipment, their sub-systems, auxiliary systems, associated items, major components. for which The Service Provider is obligated and responsible in the performance, like carrying out and executing the operations and maintenance functions / responsibilities, maintenance engineering services, risk mitigation measures etc. according to the required standards, specifications and requirements.
- b. The mission of Contracting Authority is to maintain airports with optimized resources and manage them with qualified manpower to ensure safety, security and satisfaction of their users and accomplish the vision of ideal commercial airports network.
- c. The Contracting Authority is continuously making efforts to enhance and stabilize the state of operational reliability of the CFR Vehicles and Equipment in the airport, through qualified Service Provider to fulfill operational efficiency & reliability requirements and its overall vision.

10.2 CFR Vehicles and Equipment

Contracting Authority airports Staff use various types and from different manufacturers kinds of CFR Vehicles and Equipment. Moreover, The Service Provider shall ensure all types of maintenance services and carrying out no limited to the following vehicles and equipment:

- CFR (MAJOR) FOAM TENDER 6*6.
- CFR RESCUE (HAZMAT)
- CFR LIGHT RESCUE PUMPER
- CFR BREATHING COMPRESSOR
- CFR FLOODLIGHT MOBILE (TOW TYPE)
- CFR FLOODLIGHT MOBILE
- CFR STRUCTURAL PUMPER
- CFR MINI PUMPER
- CFR JEEP (COMMAND VEH)
- CFR PORTABLE FIRE PUMP
- CFR TRUCK WATER
- CFR TRUCK PICKUP
- CFR AMBULANCE
- ESCAPE LADDER

10.3 Scope of Work Responsibilities

- 10.3.1 All the requirements concerning the maintenance required to be performed, carried out, and undertaken include, but not limited to, are stated in this section and maintenance manufacture manual and will also follow, implement and comply with the latest version / edition and any amendments made or new editions of ICAO Annex 14 and ICAO manuals and GACAR (Regulation) 139. These works & services are required to be carried out or performed / provided by The Service Provider as part of the maintenance scope of work responsibility. The Service Provider should make the necessary allowances in the unit rate of the corresponding Maintenance of Airports CFR Vehicles and Equipment, etc. for such defined works & services in this section and GACAR Regulation #139 at no additional cost, and the provided requirements/items by The Service Provider will become the property of Contracting Authority.
- 10.3.2 Preventative Maintenance (PM), Corrective Maintenance (CM) and other maintenance requirements and activities, will be carried out in accordance with the Manufacturer recommendations and specifications.

The Service Provider will only use genuine replacement parts, or parts which are approved by the manufacturer during PM and CM works to ensure smooth operation of CFR Vehicles and Equipment.

- 10.3.3 Delaying any maintenance work beyond the given intervals as specified by the manufacturer's recommendations or the Contracting Authority instructions will result in imposing a financial penalty.
- 10.3.4 Manufacturers' procedures with respect to the safe and efficient operation of the Facilities will be followed at all times by the Service Provider. The Service Provider will prepare and maintain an approved set of operating instructions and maintenance schedules in accordance with these manufacturers' procedures.
- 10.3.5 The Service Provider is responsible for developing planned preventive maintenance schedules in accordance with the manufacturer's manuals and recommendations, for all CFR Vehicles and Equipment, including any new CFR Vehicles and equipment provided by Contracting Authority during the Contract period. The Service Provider will include them in CMMS/CAFM, implement and follow these PM schedules as part of maintenance responsibilities and obligations after review and approval by Contracting Authority.
- 10.3.6 The Service Provider will be responsible for the provision unconditionally, of all the required manpower, spares, materials, tools, equipment, and consumables for CFR vehicle to fulfill all the scope of work requirements, responsibilities and obligations. Provision of Fuel and foam will have separate remuneration or cost reimbursements.
- 10.3.7 The Service Provider must be aware that during the Contract period there will be international flights as well as increase in air traffic at the airports, due to the new policy of open skies, inviting other airlines to operate within the Country during the Contract period. The airports will also be operating on a 24-hour bases, therefore The Service Provider will schedule the personnel accordingly in three shifts to perform and carry out the maintenance and cleaning scope of work responsibilities.
- 10.3.8 During the contract period the Contracting Authority has the right to request technical reports on demands from the manufactural for CFR vehicles & equipment.
- 10.3.9 The Service Provider should recognize and be fully knowledgeable of the Changing situation of the airports operations due to increase in air traffic and passenger flow. The Service Provider is obligated and responsible for providing adequate manpower, materials and supplies, in accordance with the recommendations of Contracting Authority, to carry out the works and services in accordance with the SOW responsibilities and Contracting Authority required standards and consequently the related cost must be covered under the unit rates in the remuneration base bid cost, as there will be no additional remuneration.
- 10.3.10 The Service Provider is fully responsible for the maintenance of all the associated items and accessories either indicated or not indicated in the SOW and the quoted unit rates will be considered to include all the associated items and accessories either indicated or not indicated, under each CFR Vehicles and Equipment in the SOW.
- 10.3.11 The Contracting Authority has provided information as guidelines in the SOW relating to most of the CFR Vehicles and Equipment sub-systems. There may still be some sub-systems. And associated items under CFR Vehicles and Equipment that are not listed in the SOW but still considered to be part of the CFR Vehicles and Equipment and must be maintained by The Service Provider as part of the

maintenance SOW responsibility and there will be no direct or separate remuneration and without any additional remuneration.

- 10.3.12 The unit rate is for the CFR Vehicles and Equipment including the sub-systems and auxiliary items that Contracting Authority has their quantitative information and are associated with the relevant CFR Vehicles and Equipment, have been listed in the remuneration format under the CFR Vehicles and Equipment for which The Service Provider is required to quote the unit rate.
- 10.3.13 The Service Provider is mandatorily required to procure and utilize only new genuine spare parts in the maintenance of the CFR vehicles and Equipment at the airports. Procurement of non-genuine spare parts and their utilization in the maintenance of CFR Vehicles and Equipment at the airports shall result in the imposition of financial penalty on a case-by-case basis.
- 10.3.14 The Service Provider shall comply with applicable safety standards & codes including all safety regulations of the Contracting Authority and International Civil Aviation Organization (ICAO) and (GACARs). The Service Provider shall cooperate and coordinate with other Services providers on safety matters and shall promptly comply with any specific instructions or directions given to The Service Provider by Contracting Authority.
- 10.3.15 The Service Provider is responsible for providing and maintaining the required quantities of foam per airport as per standards and regulations. Provision of foam will have separate remuneration or cost reimbursements.
- 10.3.16 Service provider is responsible to change the paint color, logos or theme when necessary. Service Provider shall replace with new, the faded and worn-out logos or provide new appropriate size Contracting Authority logo and call sign stickers for these vehicles and mobile plants as per Contracting Authority standard as part of the maintenance SOW responsibility, and when required or directed by Contracting Authority with no additional cost.
- 10.3.17 The Contracting Authority logo and call sign should be reflective or sticker type and paint the Contracting Authority logo on certain type of vehicles/equipment that will be identified by Contracting Authority.
- 10.3.18 The Service Provider is required to maintain a comprehensive logbook documenting all daily activities. This logbook must always be accessible on-site for inspection and review by the Contracting Authority.
- 10.3.19 The Service Provider will provide all sufficient quantities of fuels for training firefighting personnel, which includes the fuel for training on vehicles, fuel for mockup fires as well as fuel for special exercises as per Contracting Authority instructions. The fuel for the training of CFR personnel will be diesel, gasoline and liquid pressure gas. There will be separate remuneration or cost reimbursements for this activity.
- 10.3.20 The Service Provider is required as part of maintenance responsibility to comply with the international standards as Montreal Protocol and any subsequent amendments or constraints relating to the use of Chlorofluorocarbons (CFCs), Hydrochloric-fluorocarbons (HCFs) and Hydrofluorocarbons (HFCs). Effective start of year 2016 the use of CFCs, HCFs & HFCs will be discontinued and instead use the recommended chemical "NOVEC 1230". This change and recommendation to use "NOVEC 1230" may

need some simple modifications in the system such as changing the nozzles, cylinders and any related item, as part of the maintenance SOW responsibility.

10.3.21 The Service Provider will provide all necessary lubricants and Additives to support all CFR vehicles and equipment operations as per Contracting Authority instructions without any additional cost.

10.3.22 The service provider is responsible for maintaining and cleaning fire training mockups as part of SOW.

10.3.23 Cleaning of CFR vehicles, Support Services vehicles and equipment will be performed by the Service Provider under supervision of the Contracting Authority representatives. Additionally, Service Provider will provide cleaning supplies in sufficient quantities and appropriate quality to clean and maintain.

10.3.24 The Service Provider shall maintain all the equipment in this classification in operational status all the time.

10.3.25 The Service Provider will carry out the periodic Preventive Maintenance (PM) work schedule of all the CFR equipment on time as per manufacturer's standard and as per Contracting Authority's instructions. The Service Provider is responsible for arranging with the users the availability of these equipment for the monthly PM schedule.

10.3.26 The systems and equipment mounted on the CFR vehicles include, but not limited to, the following:

- Portable electrical generators, lights and power tools.
- Portable hydraulic rescue tools, hydraulic and electric powered "Jaws of life".
- Acetylene and oxygen cylinders.
- Pumps.
- Ladders.
- Water rescue equipment.
- Outboard motors.
- Portable air compressors.
- Exhaust extraction fans/motors.
- Medical Oxygen system.
- Fire extinguishers.
- Electronic PA/Siren system.
- Stretchers.
- Hand lamps, flashlights.
- Medical suction units.
- Rescue lifting air bags, air control regulators/gauges and air cylinders.
- Fire hoses.
- SCBA sets.
- SCBA air cylinders.
- Dry chemical and nitrogen firefighting agents.
- Rescue boats and accessories.

10.3.27 The Service Provider will maintain and repair the Self-Contained Breathing Apparatus (SCBA), breathing air compressor, breathing air cascade system and related components and equipment strictly in accordance with the manufacturer's recommendations. Service Provider will perform the daily routine

operational inspections, cleaning and sanitizing of the SCBA units. Expired air filters will be replaced immediately for fireman's safety.

- 10.3.28 The Service Provider will maintain all medical oxygen equipment and bottles. The Service Provider will recharge oxygen bottles and accomplish all required hydrostatic tests when due. All work performed on medical oxygen equipment will be qualified and certified technicians or certified third party.
- 10.3.29 The Service Provider shall provide the required training to certify the SCBA specialist concerned, to inspect, test, service and repair. The Service Provider will maintain and sanitize the SCBA and accurate records of all service and maintenance actions performed on all SCBA equipment.
- 10.3.30 The Service Provider shall ensure that the breathing air compressor specialists have received manufacturers training and certification.
- 10.3.31 The Service Provider will test the air quality from the breathing air compressor and cascade system quarterly by submitting air samples to a recognized air quality testing external laboratory to certify whether air is safe for breathing or not. Breathing air testing and quality will be in accordance with requirements of the Commodity Specification for Air (CGA G7.1) grad D. Air quality failing to meet the standards set down requires The Service Provider to carry out immediate Corrective Maintenance action on the compressor and cascade system.
- 10.3.32 The air cylinders of all SCBA will be filled as manufacture recommendations. The Service Provider shall hydrostatically test all SCBA and cascade storage cylinders when instructed by Contracting Authority under SOW responsibility. Details of the tests shall be recorded in accordance with the Contracting Authority requirements. The Service Provider will maintain a comprehensive inventory list of the total SCBA sets and SCBA air cylinders in all airport that shows data of manufacturer name, serial numbers and the last hydrotesting date.
- 10.3.33 The Service Provider will maintain all firefighting equipment including SCBA units on the vehicles to 100% operational status at all times in accordance with the manufacturer's recommendations. Only new genuine spare parts supplied by or approved by the manufacturer will be used to service and maintain this critical equipment. The Service Provider shall expedite the repair critical equipment of the Fire Fighting vehicles to ensure maximum reliability, availability and operating efficiency. And the Services provider is responsible for maintaining all medical items related to ambulance vehicles inside the trailer.
- 10.3.34 The Service Provider is responsible and will carry out refilling of the firefighting expellant nitrogen cylinders on vehicles as well as for the fire extinguishers for each CFR vehicle as and when required to replenish the used quantity.
- 10.3.35 The Service Provider will maintain and refill all portable hand-held fire extinguishers for all CFR vehicles and equipment.
- 10.3.36 The Service Provider will maintain all fire hoses using the hose binding machine, wire binding materials, gaskets, expansion or compression rings, and hose couplings as necessary to repair all fire hoses. The Service Provider will replace all damaged and defective CFR fire hoses and binding machine, etc.
- 10.3.37 The Service Provider will perform an annual inspection and testing of all fire hoses using a suitable hydrostatic fire hose testing machine. However, fire vehicles will not be used for testing the fire hoses. Service Provider shall maintain a comprehensive record of all maintenance and testing performed on all

fire hoses. Service Provider will also maintain an inventory list of all fire hoses in all airports that shows data of the size and length of the fire hoses.

- 10.3.38 The Service Provider shall maintain all fire hose storage rack(s) located at CFR trucks to store reserve fire hoses and replace any existing racks that may be damaged with no additional cost.
- 10.3.39 The Service Provider will hydrostatically test all CFR equipment, dry chemical and nitrogen storage tanks as directed by Contracting Authority.
- 10.3.40 The Service Provider will maintain and annually calibrate all flowmeters, tachometers, pitot gauges, pressure gauges and associated testing equipment used to measure water flow output and discharge pressure tests on CFR vehicles, fire hoses. Copies of the calibration certificates will be forwarded to Contracting Authority within one (1) month of the work being performed.
- 10.3.41 Cleaning of systems and equipment mounted on the CFR vehicles will be performed by the Service Providers under supervision of Contracting Authority representatives. Additionally, Service Provider will provide cleaning supplies in sufficient quantities and appropriate quality to clean and maintain the systems and equipment mounted on the CFR vehicles.
- 10.3.42 The Service Provider's staff will be responsible for the daily check/inspection and service as required of all systems and equipment mounted on the CFR vehicles. Moreover, The Service Provider shall submit inspection form to Contracting Authority for approval.