

GUIDELINE

GOVERNMENT BUILDING SCHEDULED MAINTENANCE GUIDELINES (GBSMG)

GARIS PANDUAN PENYENGGARAAN
BERJADUAL BANGUNAN KERAJAAN

EDITION
2019





KETUA PENGARAH KERJA RAYA

DIRECTOR-GENERAL OF PUBLIC WORKS

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Tarikh : 1 Jun 2019

Semua Pengarah Kanan/ Pengarah Cawangan Ibu Pejabat JKR
Semua Pengarah Kerja Raya Negeri
Semua Pengarah Kerja Raya Wilayah Persekutuan
Semua Pengarah/ Pengurus Pembinaan
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Pengarah JKR KETENGAH
Semua Jurutera Daerah

SURAT ARAHAN KPKR BIL. 17 / 2019

PEMAKAIAN DOKUMEN *GOVERNMENT BUILDING SCHEDULED MAINTENANCE GUIDELINES* (GBSMG) GARIS PANDUAN PENYENGGARAAN BERJADUAL BANGUNAN KERAJAAN (GPPBBK)

1.0 TUJUAN

1.1 Surat Arahan ini bertujuan untuk menyeragamkan pemakaian dokumen *Government Building Scheduled Maintenance Guidelines* (GBSMG)/ Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan (GPPBBK) sebagai rujukan jabatan-jabatan Kerajaan dalam merancang, mengurus dan mengawalselia penyenggaraan bangunan-bangunan Kerajaan.

2.0 LATAR BELAKANG

2.1 *Government Building Scheduled Maintenance Guidelines* (GBSMG)/ Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan (GPPBBK) merupakan penambahbaikan kepada Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan (Versi 2008) sedia ada. Ia mengambil kira kesemua keperluan operasi dan penyenggaraan bangunan Kerajaan serta perubahan teknologi pembinaan dan sistem dalam bangunan.

1/5

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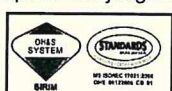
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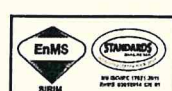
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2.2 Dokumen *Government Building Scheduled Maintenance Guidelines* (GBSMG)/ Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan (GPPBBK) ini telah dibentangkan dan diluluskan dalam Mesyuarat Pengurusan Tertinggi (MPT) JKR Malaysia Bil. 2/2019 pada 12 April 2019.

2.3 Antara matlamat penambahbaikan yang telah dibuat di dalam dokumen *Government Building Scheduled Maintenance Guidelines* (GBSMG)/ Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan (GPPBBK) adalah seperti berikut:

2.4.1 Menyediakan satu (1) set jadual aktiviti operasi dan penyenggaraan secara komprehensif;

2.4.2 Memastikan operasi dan penyenggaraan bangunan-bangunan Kerajaan dilaksanakan dengan lebih sistematik dan teratur; dan

2.4.3 mengekalkan aset Kerajaan dalam keadaan yang lebih baik melalui penyenggaraan berjadual/ berkala, pembaikan dan penggantian berdasarkan keadaan semasa aset.

3.0 SKOP PENGGUNAAN

3.1 Dokumen *Government Building Scheduled Maintenance Guidelines* (GBSMG)/ Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan (GPPBBK) ini menerangkan jadual penyenggaraan bagi lapan (8) skop kerja seperti berikut:

3.1.1 Penyenggaraan Berjadual Perkhidmatan Sivil, Struktur dan Senibina;

3.1.2 Penyenggaraan Berjadual Perkhidmatan Pembersihan Bangunan (*Housekeeping*);

3.1.3 Penyenggaraan Berjadual Perkhidmatan Dobi (*Laundry*);

3.1.4 Penyenggaraan Berjadual Perkhidmatan Kawalan Mahluk Perosak (*Pest Control*);

3.1.5 Penyenggaraan Berjadual Perkhidmatan Landskap;

3.1.6 Penyenggaraan Berjadual Perkhidmatan Mekanikal;

3.1.7 Penyenggaraan Berjadual Perkhidmatan Elektrikal; dan

3.1.8 Penyenggaraan Berjadual Perkhidmatan Sistem Cekap Tenaga

4.0 PEMAKAIAN DOKUMEN

4.1 Dokumen *Government Building Scheduled Maintenance Guidelines* (GBSMG)/ Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan (GPPBBK) akan diguna pakai sebagai:

4.1.1 Rujukan dalam penyediaan skop kerja dan jadual penyenggaraan oleh jabatan-jabatan Kerajaan;

4.1.2 Rujukan kepada Jurutera Fasiliti/ Pegawai Operasi Fasiliti dalam merancang dan menyediakan bajet operasi dan penyenggaraan;

4.1.3 Rujukan kepada Penyelia Penyenggaraan dalam pemantauan kerja operasi dan penyenggaraan; dan

4.1.4 Rujukan dalam penyediaan senarai semak pengauditan penyenggaraan.

4.2 Dokumen *Government Building Scheduled Maintenance Guidelines* (GBSMG)/ Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan (GPPBBK) ini boleh diguna pakai oleh semua jabatan Kerajaan sebagai lampiran kepada Kontrak Pengurusan Penyenggaraan atau Pengurusan Fasiliti sedia ada.

4.3 Sebarang pertanyaan berhubung Dokumen *Government Building Scheduled Maintenance Guidelines* (GBSMG)/ Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan (GPPBBK) boleh dirujuk kepada:

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Bahagian Perundingan Pengurusan Aset)

Rujukan : JKR.KPKR:121.010/05 Jld. 17 (4)

Tarikh : 27 Jun 2019

5.0 KUAT KUASA

- 5.1 Dengan berkuatkuasanya arahan ini, Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan (Versi 2008) yang diguna pakai tanpa melalui Surat Arahan KPKR adalah DIBATALKAN.
- 5.2 Surat Arahan ini berkuat kuasa pada tarikh ia ditandatangani dan akan disemak sekiranya terdapat arahan dasar terkini atau perkembangan baru yang memerlukan dikaji semula dan dikemas kini.

Sekian, terima kasih.

“BERKHIDMAT UNTUK NEGARA”



(DATO' Ir. Dr. MEOR ABDUL AZIZ B. HJ OSMAN)

Rujukan : JKR.KPKR:121.010/05 Jld. 17 (4)

Tarikh : 21 Jun 2019

s.k.

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CHECKLIST OF VERSION

No. Of Revision	Date	Review Information
Rev. 00	2010	Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan
Rev. 01	11 February 2019	a) This document will be replaced the Rev. 00 version and known as Government Building Scheduled Maintenance Guidelines (GBSMG). b) Acronyms, glossary, introduction and scheduled of maintenance.

CONTENT

ACRONYMS.....	i
GLOSSARY.....	iii

PART A

1.0	INTRODUCTION.....	1
2.0	PURPOSE.....	1
3.0	OBJECTIVE.....	2
4.0	SCOPE.....	2
5.0	LEGAL COMPLIANCES OF RULES, REGULATION AND STANDARDS.....	4

PART B

1.0	CIVIL, STRUCTURAL AND ARCHITECTURAL SERVICES	
	1.0 Roofing.....	CS/1
	2.0 Rainwater Goods.....	CS/1
	3.0 Ceiling.....	CS/2
	4.0 Walls.....	CS/2
	5.0 Floor and Raised Floor.....	CS/4
	6.0 Door.....	CS/5
	7.0 Window.....	CS/5
	8.0 Built In Furniture.....	CS/5
	9.0 Handrail and Grille.....	CS/6
	10.0 Plumbing, Flushing and Sanitary System.....	CS/6
	11.0 Cold Water Tank (All Types).....	CS/6
	12.0 Signages (Internal and External).....	CS/7
	13.0 Reinforced Concrete Structures.....	CS/7
	14.0 Timber Structures/ Finishes (Column, Roof Truss, Floor Finishes, etc).....	CS/8
	15.0 Steel Structures and Space Frame.....	CS/8
	16.0 Sewer Line and Manholes.....	CS/8
	17.0 Slopes and Retaining Structures.....	CS/9
	18.0 Road, Hard Standing and Road Furniture.....	CS/9
	19.0 Drainage.....	CS/10
	20.0 Fencing and Gates.....	CS/10
	21.0 Grease Trap and Interceptor.....	CS/10
	22.0 Shelter (Pergola, Gazebo and etc.).....	CS/11
	23.0 Sealant.....	CS/11

CONTENT

PART B

2.0	HOUSEKEEPING SERVICES	
	1.0 Public Area.....	HK/1
	2.0 Stairwell/ Elevator/ Escalator/ Travelator.....	HK/3
	3.0 Restroom (Including Cafeteria's Toilet).....	HK/4
	4.0 Tenant Spaces/ Office Spaces.....	HK/5
	5.0 Hostel Room.....	HK/8
	6.0 Cafeteria (Internal).....	HK/9
	7.0 Cafeteria (External).....	HK/12
	8.0 Artificial Plant.....	HK/12
	9.0 Car Park.....	HK/12
	10.0 Passageway/ Canopy Glass and Covered Walkway.....	HK/12
	11.0 Signages and Signboards.....	HK/13
	12.0 Exterior Cleaning.....	HK/13
	13.0 Refuse Bin Centre.....	HK/13
	14.0 Miscellaneous.....	HK/14
	15.0 Hygienic Services.....	HK/14
	16.0 Waste Disposal Services.....	HK/14
3.0	LAUNDRY SERVICES	LS/1
4.0	PEST CONTROL SERVICES	
	1.0 Pest Control Services.....	PC/1
	2.0 Ultrasonic Bird Deterrent System.....	PC/2
5.0	LANDSCAPING	
	1.0 Softscape.....	LD/1
	2.0 Hardscape.....	LD/7
6.0	MECHANICAL SERVICES	
	1.0 Air-Conditioning and Mechanical Ventilation System.....	M/1
	2.0 Fire Fighting System.....	M/25
	3.0 Lift.....	M/41
	4.0 Escalator.....	M/48
	5.0 Cold Water Supply and Booster Pump.....	M/55
	6.0 Natural Gas.....	M/61
	7.0 Gondola.....	M/63
	8.0 Inspection of Mechanical Services Above Ceiling.....	M/65

CONTENT

PART B

9.0 Pool and Fountain.....	M/66
10.0 Irrigation System and Landscape.....	M/69
11.0 Kitchen Equipment.....	M/72
12.0 Laundry Equipment.....	M/78
13.0 Centralized Vacuum System.....	M/79
14.0 Waste Collection Compactor.....	M/80
15.0 Centralized Air Purifier, Assessment and Control.....	M/81
16.0 Sewage Treatment Plan (STP) and Pumping Station.....	M/82
17.0 Dental Surgery Equipment.....	M/89
18.0 Medical Gas System.....	M/ 94
19.0 Medical Equipment.....	M/95
20.0 Other Mechanical Equipment System.....	M/99
7.0 ELECTRICAL SERVICES.....	
1.0 Medium Voltage System.....	E/1
2.0 Low Voltage Distribution System.....	E/9
3.0 Luminaries, Outdoor Lightings and Other Appliances.....	E/16
4.0 Electrical Testing.....	E/21
5.0 Uninterruptible Power Supply (UPS).....	E/22
6.0 Standby Generator Set.....	E/25
7.0 Lightning Protection System.....	E/30
8.0 Telecommunication System (Voice Communication).....	E/31
9.0 Extra Low Voltage (ELV).....	E/33
10.0 Structured Cabling System.....	E/43
11.0 Traffic Light.....	E/44
12.0 Inspection Of Electrical Services Above Ceiling.....	E/48
8.0 ENERGY EFFICIENCY FEATURES.....	
1.0 Architectural Energy Efficient Features.....	EE/1
2.0 Mechanical Energy Efficient Features.....	EE/2
3.0 Electrical Energy Efficient Features.....	EE/7

END OF DOCUMENT

ACRONYMS

A.C.	- Alternating Current
ACB	- Air Circuit Breaker
ACMV	- Air Conditioning and Mechanical Ventilation
AHU	- Air Handling Unit
AMF	- Automatic Mains Failure
ARD	- Automatic Rescue Device
AVR	- Automatic Voltage Regulator
BMS	- Building Management System
BSC	- Building System Controls
CAMS	- Card Access Management System
CO ₂	- Carbon Dioxide
CP	- Competent Person
CPU	- Central Processing Unit
DB	- Distribution Board
dB	- decibel
D.C.	- Direct Current
DOSH	- Department of Safety and Health
DPM	- Digital Power Meter
EAF	- Electronic Air Filters
EBOPS	- Emergency Battery Operated Power Supply
ECG	- Electrocardiogram
ELV	- Extra Low Voltage
EMS	Energy Management System
FCU	- Fan Coil Unit
F.S.O	- Facility Superintending Officer
GRC	- Glass Reinforced Concrete
GRFC	- Glass-Fibre Reinforced Concrete
HFU	- High Fusing Unit
H.T	- High Tension
IDMT	- Inverse Definite Minimum Time
JBPM	- <i>Jabatan Bomba dan Penyelamat Malaysia</i>
KeTHHA	- <i>Kementerian Tenaga, Teknologi Hijau dan Air Malaysia</i>
kV	- kiloVolt

LED	- Light Emitting Diode
LV	- Low Voltage
MCCB	- Moulded Case Circuit Breaker
MDF	- Medium-Density Fibreboard
MFAP	- Main Fire Alarm Panel
MSB	- Main Switch Board
M.V	- Medium Voltage
NCU	- Network Control Unit
OLU	- Oil Link Unit
PABX	- Private Automatic Branch Exchange
p.f	- Power factor
PIDS	- Perimeter Intrusion Detection System
PIR	- Passive Infrared Receiver
PWD	- Public Work Department
RCD	- Residual Current Device
SF6 Circuit Breaker	- Sulphur Hexafluoride Circuit Breaker
S.G.	- Specific Gravity
S.O.	- Superintending Officer
SPD	- Surge Protection Device
SPKA	- Sistem Pengawasan Kebakaran Automatik
SSB	- Sub-Switch Board
SSO	- Switch Socket Outlet
STP	- Sewerage Treatment Plant
TV	- Television
UPS	- Uninterruptible Power Supply
UV	- Ultraviolet
UVSS	- Under Vehicle Screening System
VAV	- Variable Air Volumes
VCB	- Vacuum Circuit Breaker
VOC	- Volatile Organic Compounds
VRF	- Variable Refrigerant Flow
WC	- Water Closet
WCPU	- Water Cooled Package Unit
XLPE	- Cross-linked Polyethylene

GLOSSARY

- Air Conditioning and Mechanical Ventilation System (ACMV) : A cooling system designed to give proper ventilation to a specific environment. ACMV System is a customized air conditioning system installed in any industrial, commercial or household setup.
- Air-Handling Unit : A device used to regulate and circulate air as part of a heating, ventilating and air-conditioning system. An air handler is usually a large metal box containing a blower, heating or cooling elements filter racks or chambers, sound attenuators and dampers.
- Asset : All asset to enable the Contractor/ care taker to provide the services, including but not limited to:
- a. Any land or buildings and infrastructure;
 - b. Plants and machineries;
 - c. Equipment and system (together with any warranties in respect of asset being transferred);
 - d. Drawings and technical data;
 - e. Any books, reports and records which including all operating and maintenance manuals; and
 - f. Any spare parts, tools and other asset (together with any warranties in respect of asset being transferred);

- Autoclave : A strong heated container used for chemical reactions and other processes using high pressures and temperatures for sterilizing.
- Automatic Rescue Device (ARD) : A battery powered automatic rescue device used in elevator systems to rescue people during power failures.
- BOMBA Link (SPKA) : A designated building's fire alarm warning signal that is linked to JBPM's (BOMBA) 24 hours a day emergency response system.
- Building Management System (BMS) : Automatic centralized control of a building's heating, ventilation and air conditioning, lighting and other systems.
- Central Direct Expansion System (DX) : In the direct expansion or DX types of air central conditioning plants the air used for cooling space is directly chilled by the refrigerant in the cooling coil of the air handling unit.
- Centralized Air Purifier : A system which removes contaminants from the air in rooms, homes and buildings.
- Centralized Vacuum System : A type of vacuum cleaner appliance installed into a building as a semi-permanent fixture. Central vacuum systems are designed to remove dirt and debris from homes and buildings, sending dirt particles through tubing installed inside the walls to a collection container in a remote utility space.

- Check** : Examine to determine the accuracy, quality, condition or to detect the presence of something by doing testing or verification.
- Chilled Water System** : In a chilled-water system, the entire air conditioner is installed on the roof or behind the building. It cools water and piped throughout the building also connected to air handlers.
- Chiller (Kitchen)** : A machine for cooling something, especially a cold cabinet or refrigerator for keeping stored food at a few degrees above freezing point.
- Clean** : Remove dirt, marks or stains from.
- Client** : Asset owner or user/ customer's representative who can make decision regarding the Asset and Facility.
- Curtain Wall** : An outer covering of a building in which the outer walls are non-structural, utilized to keep the weather out and the occupants in. It can be made of lightweight materials such as aluminum-framed wall, containing in-fills of glass, metal panels or thin stone.
- Damp Mop** : To clean with a mop that has been slightly moistened or soaked in water and wrung out.
- Dental Chair** : Chair in which a patient sits and a clinician can operate or treat the patient by looking into his/ her mouth easily. It comprises of an electrically operated, retractable patient seating chair to which compressed

air, water line, micromotor, spittoon bowl and an attached overhead light.

- Dental Surgery Equipment : Tools that dental professionals use to provide dental treatment. It includes tools to examine, manipulate, treat, restore and remove teeth and surrounding oral structures.
- Electrical Switchboard/ Control Panel : A device to control mechanical equipment. Each one is designed for a specific equipment arrangement and includes devices that allow an operator to control specified equipment.
- Electronic Air Filters (EAFs) : An electronic device that filter out large particles and contaminants from indoor air and electrically charges and traps the tiny particles (such as viruses and bacteria) in a collector plate to prevent them from being released back into the space air. Electronic Air Cleaners can be attached to most heating and cooling systems.
- Energy Management System (EMS) : An energy management system is a system of computer-aided tools used by operators of electric utility grids to monitor, control and optimize the performance of the transmission system.
- Escalator : A vertical transportation in the form of a moving staircase which carries people between floors of a building.

- Facility : Collection of Asset which is built, installed or established to serve an entity's needs.
- Facility Superintending Officer (FSO) : Facility Superintending Officer and his successor in office as appointed by the Government under Clause 23 in PWD Facilities Management & Maintenance Form (2016) to act on behalf of the Government for matters stipulated in this Contract.
- Fan-Coil Unit : A simple device consisting of a heating and/ or cooling heat exchanger or coil and fan. It is part of an HVAC system found in residential, commercial and industrial buildings.
- Fire Detection and Alarm System : Several devices working together to detect and warn people through visual and audio appliances when smoke, fire, carbon monoxide or other emergencies are present.
- Fireman Intercom System : A two-way emergency voice communication system. It provides communication between remote telephone hand-sets located within the building and the master telephone hand-set at the fire command center.
- Fire Roller Shutter : A type of door or window shutter consisting of many horizontal slats hinged together. The door is raised to open it and lowered to close it. On large doors, the action may be motorized. It provides protection against vandalism, burglary attempts, wind and rain. It will also automatically close when activated to

prevent the fire from spreading into the adjacent area.

- Fire Suppression Systems : Fire suppression systems are used to extinguish or prevent the spread of fire in a building. Suppression systems use a combination of dry chemicals and/ or wet agents to suppress equipment fires. It controls and extinguish fires without human intervention.
- Gondola : A cable transport and type of aerial lift which is supported and propelled by cables from above. Usually it is used for building cleaning as well as painting and repairing.
- Hand Dryer : An electrical device, typically in a public toilet, for drying a person's hands by blowing warm air over them.
- Heart Start Defibrillator : A device that restore a normal heartbeat by sending an electric pulse or shock to the heart. It's been used to prevent or correct an arrhythmia, a heartbeat that is uneven or that is too slow or too fast. Defibrillator can also restore the heart's beating if the heart suddenly stops.
- Heat Exchanger : A device designed to efficiently transfer or exchange heat from one matter to another. When a fluid is used to transfer heat, the fluid could be a liquid, such as water or oil, or could be moving air.

- Hose Reel : A cylindrical spindle made of metal, fiberglass or plastic and is used for storing a hose.
- Hydrant System : A connection point by which firefighters can tap into a water supply. It is a component of active fire protection.
- Ice Cubed/ Ice Machine : A consumer device for making ice, found inside a home freezer; a stand-alone appliance for making ice or an industrial machine for making ice on a large scale.
- Insect Killer : An electronic device works by attracting flying insects with its high-intensity UV light. As insects fly towards the light, they pass through a vertical rod electrified grid and are killed quickly and cleanly.
- Inspection : The act of looking at something carefully/ closely/ thoroughly or an examination of something by specially trained person.
- Internal Partition : Non loading bearing wall to separate spaces in building using materials such as plasterboard, glass panel, wood panel, etc.
- Inverter : An electronic device or circuitry that changes direct current (DC) to alternating current (AC).
- Irrigation System : A system to control amounts of water to plants at needed intervals. Irrigation helps to grow agricultural crops, maintain landscapes and vegetate disturbed

soils in dry areas and during periods of less than average rainfall.

Island Exhaust Hood : A device containing a mechanical fan that hangs above the stove or cook top in the kitchen.

Landing Valves (Fire System) : A manual stop valve giving complete control over firefighting system.

Lift : A vertical transportation that moves people or goods between floors (levels, decks) of a building, vessel, or other structure.

Low VOC : To describe a product with volatile organic compounds (VOC) content at or below 150 g/L. Low VOC products typically have little or no odor. Low VOC is not harmful to the environment and humans. It mostly refers to paints and other products that have a very low or zero VOC, e.g. sealants, adhesives and cleaners.

Maintenance : Involves functional checks, servicing, repairing or replacing of necessary devices, equipment, machinery, building infrastructure and supporting utilities in industrial, business, governmental and residential installations.

Mechanical Screw Conveyor : A conveyor consisting of a helical screw that rotates upon a single shaft within a stationary trough or casing and which can move bulk material along a horizontal, inclined or vertical plane.

- Medical Gas System : A system used to supply specialized gases and mixtures to various parts of the facility.
- Natural Gas : A naturally occurring hydrocarbon gas mixture consisting primarily of methane, but commonly including varying amounts of other higher alkenes, and sometimes a small percentage of carbon dioxide, nitrogen, hydrogen sulfide or helium.
- Non-Ducted Fan : Generally very simple in design and work by moving air/ steam from a room to the roof space above it. Non-ducted fans often do not have the ability to be ducted in any way such as wall fan, ceiling fan, exhaust fan, etc.
- Open Burner Range : A burner with an open space around the area of the flame and allows for better oxygen flow and for a higher power/ BTU output.
- Package Unit : A package unit is the all-in-one heating and cooling system for space that don't have a lot of room indoors for either a furnace and coil, or an air handler. Package units will contain all their parts in one outdoor unit that sits on either the roof or to the side of a building.

- Photovoltaic (PV) System : A power system designed to supply usable solar power by means of photovoltaic. It consists of an arrangement of several components, including solar panels to absorb and convert sunlight into electricity, a solar inverter to change the electric current from DC to AC, as well as mounting, cabling and other electrical accessories to set up a working system.
- Portable Fire Extinguishers : A portable or wheeled apparatus for putting out small fires by ejecting extinguishing chemicals.
- Pressure Vessel : A container designed to hold gases or liquids at a pressure substantially different from the ambient pressure.
- Preventive Maintenance : A work/ repair/ servicing and testing carried out at pre-determined intervals period to prescribed criteria, intended to reduce failure, environmental damage or the performance degradation of an item to prolong the life expectancy of the equipment.
- Pumping Station : A facility including pumps and equipment for pumping fluids from one place to another.
- Sewage Treatment Plant : A facility to process of removing contaminants from municipal wastewater, containing mainly household sewage plus some industrial wastewater.
- Spot Clean : Clean the visible spot or stain by hand without subjecting the garment to any dry cleaning, wet cleaning, hand-washing or restoration process.

- Sprinkler System** : An active fire protection method, consisting of a water supply system, providing adequate pressure and flow rate to a water distribution piping system, onto which fire sprinklers are connected.
- Submersible Pumps** : A device which has a hermetically sealed motor close-coupled to the pump body. The whole assembly is submerged in the fluid to be pumped.
- Sun Shading Devices** : All types of shading devices (horizontal, vertical or combination of horizontal and vertical) and material (aluminium, glass, concrete, concrete foam, etc.). It is function as reflectors, called light shelves, which bounce natural light for daylighting deep into building interiors.
- Superintending Officer (SO)** : Superintending Officer and his successor in office as appointed by the Government under Clause 3.3(a) in PWD Form 203A (Rev. 1/2010) to act on behalf of the Government for matters stipulated in this Contract.
- Tenant Space** : Occupied space by one who has the occupation or temporary possession of lands or tenements of another specifically such as office space, meeting room, etc.
- UV Disinfection Unit** : A device that uses short-wavelength ultraviolet (UV-C) light to kill or inactivate microorganisms by destroying nucleic acids and disrupting their DNA.

- Variable Air Volumes (VAVs) System : A type of heating, ventilating and/ or air-conditioning (HVAC) system. Unlike constant air volume (CAV) systems, which supply a constant airflow at a variable temperature, VAV systems vary the airflow at a constant temperature.
- Variable Refrigerant Volume (VRV) : A multi-split type air conditioner for commercial buildings that uses variable refrigerant flow control. VRFs use refrigerant as the cooling and heating medium. This refrigerant is conditioned by a single outdoor condensing unit and is circulated within the building to multiple indoor units.
- Variable Speed Drives (VSD) : A type of motor controller that drives an electric motor by varying the frequency and voltage supplied to the electric motor.
- Vestibule : An arctic entry/ an anteroom (antechamber)/ small foyer leading into a larger space such as a lobby, entrance hall, passage, etc., for the purpose of waiting, withholding the larger space view, reducing heat loss, providing space for outwear, etc.
- Waste Collection Compactor : A machine used to reduce the size of material such as waste material or bio mass through compaction.
- Wet Chemical System : A type of Fire Suppression System which can be from dry or wet chemical. It is used to extinguish fires and usually fixed under kitchen hood.

Wet Riser : A supply system intended to distribute water to multiple levels or compartments of a building, as a component of its firefighting systems.

PART A
INTRODUCTION

1.0 INTRODUCTION

The Government Building Scheduled Maintenance Guidelines/ *Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan* is a supporting document towards the process of sustaining the performance of a building in accordance with the documented design intent and the owner's operational needs.

This process involves a set of activities that help maintain a building's profitability and sustains reliability. Operation refers to activities such as equipment scheduling and optimizing energy. Maintenance activities involve caring for equipment to assure reliability and decrease the possibility of premature failure. The goals of a best practice of operation and maintenance activities include the following:

- a) Reduce capital repairs;
- b) Reduce unscheduled shutdowns and repairs;
- c) Extend equipment life, thereby extending facility life;
- d) Realize life-cycle cost savings, and
- e) Provide safe, functional systems and facilities that meet the design intent.

2.0 PURPOSE

The Government Building Scheduled Maintenance Guidelines/ *Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan* is purposely developed as a reference by Government's departments in planning, managing and monitoring the maintenance of Government buildings placed under their administration.

The Government Building Scheduled Maintenance Guidelines/ *Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan* (2019 Edition) will be replaced the previous version of *Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan* (2008 Edition).

3.0 OBJECTIVE

The objectives of Government Building Scheduled Maintenance Guidelines/ *Garis Panduan Penyenggaraan Berjadual Bangunan Kerajaan* are:

- a) To ensure the operation and maintenance of Government building is implemented more systematically and organized.
- b) To retain the Government asset in a satisfactory operating condition through periodic inspections, lubrication, calibration, replacements and overhauls.

4.0 SCOPE

This guideline contains of maintenance schedules and frequency for eight (8) maintenance services as stated below:

- a) Civil, Structural and Architectural Services
- b) Housekeeping Services
- c) Laundry Services
- d) Pest Control Services
- e) Landscaping
- f) Mechanical Services
- g) Electrical Services
- h) Energy Efficient Features

This guideline will be used as the following below:

- a) As a reference to prepare the scope of work and maintenance schedule by respective departments.
- b) As a reference by Facility Engineer (*Jurutera Fasiliti*)/ Facility Operation Officer (*Pegawai Operasi Fasiliti*) to plan and prepare the maintenance budget and allocation.
- c) As a reference by maintenance supervisor in monitoring the maintenance works/ activities.
- d) As a reference to prepare the maintenance work auditing checklist.

The maintenance schedule and frequency laid in this guideline is a minimum guide to the respective component/ system/ asset/ premise. The frequency/ method of work execution can be decided/ adjusted/ subjected to FSO's/ SO's/ Owner's acceptance depends on the documented design intent and the owner's operational needs. The inspection, repair and replacement record shall be verified and submitted to the FSO/ SO/ Owner of the building.

The FSO/ SO/ Owner of the building shall ensure the technical staff/ contractor who will perform the maintenance works/ activities are appropriately knowledgeable, experienced, competent and qualified to undertake the specific duties to operate and maintain the asset/ facility.

The FSO/ SO/ Owner of the building shall put in place and manage professionally, corrective maintenance, proactive maintenance, planned preventive maintenance, testing, verification, inspection and certification regimes, utilizing trend analysis, condition based systems and predictive techniques, for the site, its buildings and sites, and all installed asset, machinery, equipment, fixtures, fittings, furnishings, finishes, and the like, necessary as a minimum to:

- a) Meet the requirements and recommendations of the manufacturers, including all warranty conditions.
- b) Comply with all legislations, regulations, by-laws and codes of practice.
- c) Maintain optimum operation, efficiency and availability.
- d) Maintain operations and maintenance manuals, asset registers, maintenance records and statutory documentation.
- e) Protect Government assets.
- f) Ensure the safety of all user/ customer and members of the public.
- g) Ensure the business of the user/ customer is not unduly interrupted or disturbed.

The Government Building Scheduled Maintenance Guidelines/ *Garis Panduan Penyelenggaraan Berjadual Bangunan Kerajaan* is not absolute and will be updated from time to time based on technological innovation changes.

5.0 LEGAL COMPLIANCES OF RULES, REGULATIONS AND STANDARDS

All work performed including personnel, materials and equipment shall comply with the latest requirements, rules and regulations of but not limited to the following:

- a) Energy Commission/ Suruhanjaya Tenaga (ST),
- b) Tenaga Nasional Berhad (TNB),
- c) Malaysian Communications and Multimedia Commission (MCMC)/ Suruhanjaya Komunikasi dan Multimedia (SKMM),
- d) Telekom Malaysia Berhad (TM),

- e) Department of Safety and Health (DOSH)/ Jabatan Keselamatan dan Kesihatan Pekerjaan (JKKP),
- f) National Water Services Commission (NWSC)/ Suruhanjaya Perkhidmatan Air Negara (SPAN),
- g) Department of Water Supply/ Jabatan Bekalan Air (JBA),
- h) Fire and Rescue Department of Malaysia/ Jabatan Bomba dan Penyelamat Malaysia,
- i) Department of Environment/ Jabatan Alam Sekitar (JAS),
- j) Public Work Department (PWD)/ Jabatan Kerja Raya (JKR),
- k) Department of Civil Aviation (DCA)/ Jabatan Penerbangan Awam,
- l) Atomic Energy Licensing Board (AELB)/ Lembaga Perlesenan Tenaga Atom,
- m) Pesticide Board/ Lembaga Racun MakhluK Perosak,
- n) Local Authorities/ Pihak Berkuasa atau Kerajaan Tempatan,
- o) National Landscape Department/ Jabatan Lanskap Negara,
- p) National Poison Centre/ Pusat Racun Negara,
- q) Department of Chemistry Malaysia/ Jabatan Kimia Malaysia,
- r) Scientific and Industrial Research Institute of Malaysia (SIRIM)
- s) Chief Government Security Office (CGSO)/ Pejabat Ketua Pegawai Keselamatan Kerajaan and
- t) Other Government Departments, utility authorities/ local authorities, licensees and companies having jurisdiction over the services and facilities.

In addition, the following regulations/ standards shall be complied with any current amendments of acts/ regulations/ standards by Government, utility authorities / local authorities, licensees and companies having jurisdiction over the services and facilities in accordance with and subject to S.O.'s/ F.S.O.'s approval but not limited to:

- a) The Electricity Supply Act 1990 (Act 447),
- b) The Electricity Regulations 1994,
- c) MS IEC 60364 or BS 7671,
- d) Uniform Building By-Laws 1984 (UBBL 1984),
- e) Factories and Machinery Act 1967 (Act 139),
- f) Occupational Safety and Health Act 1994 (Act 514),
- g) Fire Services Act 1998 (Act 341),
- h) Strata Management Act 2013 (Act 757),
- i) Pesticides Act 1974 (Act 149),
- j) Water Services Industry Act 2006 (Act 655)
- k) Environmental Quality Act 1974 (Act 127)
- l) JKR Technical Specifications,
- m) The related Malaysian Standards and/or IEC Standards (latest version) and other related Government Regulations.

PART B
SCHEDULE MAINTENANCE

MAINTENANCE FREQUENCY LETTER CODES

D	_	Daily	Y	_	Yearly
W	_	Weekly	2Y	_	Every Two Years
M	_	Monthly	5Y	_	Every Five Years
2M	_	Every Two Months	2✓	_	Twice
3M	_	Every Three Months	3✓	_	Thrice
6M	_	Every Six Months			

Note: ✓ – Marking

For Mechanical & Electrical Schedules :-

1. The maintenance schedule shall be read in conjunction with the manufacturer's recommended maintenance schedule, with the more stringent requirements/ portions taking precedence. Any manufacturer's requirements not listed in this schedule shall be complied with.
2. All tests and measurements shall be recorded whether or not the word 'record' is indicated.
3. The battery and battery charger maintenance schedule shall be complied with for all batteries and battery chargers.
4. The work for the Y, 2Y and 5Y maintenance schedule shall be carried out at the 6th, 18th and 60th month respectively.

**CIVIL, STRUCTURAL
& ARCHITECTURAL
SERVICES**

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>The preventive maintenance schedule herein is the indicative minimum requirement. The Contractor shall monitor the condition of the system and respond to any complaint with regards to daily operation.</p>								
1.0	ROOFING								
	a. Inspect the integrity of roof structures and repair to ensure the functionality.						✓		
	b. Inspect roof finishes for defects, cracks and leaks. Repair or make good to ensure the functionality.					✓			
	c. Inspect water proof and vapour barrier for leaks and tear. Repair or make good to ensure the functionality.					✓			
	d. Inspect the concrete flat roof to detect any deformities, delaminations , cracks and water ponding .Repair or make good to ensure the functionality.					✓			
	e. Inspect and remove unwanted plants/ moulds/ moss, etc.			✓					
2.0	RAINWATER GOODS (INCLUSIVE OF GUTTER)								
	a. Inspect the integrity of members including hangers and brackets. Repair or make good to ensure the functionality.					✓			
	b. Inspect rainwater goods for leakage. Repair or make good to ensure the functionality.				✓				
	c. Inspect and clear the blockage.				✓				
	d. Inspect gutter and scupper drain including accessories to detect any deformities, delaminations and cracks and current status of screedings. Repair or make good to ensure the functionality.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
3.0	CEILING								
	a. Inspect ceiling structures. Repair or make good to ensure the functionality.				✓				
	b. Inspect ceiling finishes inclusive of cornices, etc., repaint, repair or make good to ensure the functionality.					✓			
	c. Inspect ceiling boards for watermark, deflection, sagging, stains, etc. Repaint or replace to ensure the functionality.			✓					
	d. Inspect for hangers and fixtures to soffit of slab. Repair or make good to ensure the functionality.					✓			
	e. Inspect for fungus, algae, clean and rectify.			✓					
	Note : <i>All defect to be reported immediately to FSO/ SO/ Owner or report every 3 months of any condition together with proposal of remedial</i>								
4.0	WALLS								
4.1	Wall structure								
	a. Inspect for cracks, defects, deflection or damage and seepages. Repair or make good to ensure the functionality.			✓					
	b. Inspect water proof and vapour barrier for leaks and tear. Repair or make good to ensure the functionality.			✓					
4.2	External wall finishes								
	Note : <i>Repainting of the building is recommended every 5 years subject to Local Authority's approval using low VOC material.</i>								**

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>a. Inspect for defective or damage finishes (paint, spray tiles, spray paint, spray granite, GRFC, GRC, concrete foam, wall tiles, stone finishes, facade bricks, masonry, timber finishes, cladding and etc.) Repair, painting touch-up (maximum area 50 m²/ month) or make good to ensure the functionality using low VOC material.</p> <p>b. Inspect for defect of sealant at every finishes. Replace the damage sealant to ensure the functionality using low VOC material. (Maximum length 20m/ month)</p> <p>c. Inspect integrity of sun shading devices members and fittings. Repair or make good to ensure the functionality.</p>			✓					
4.3	Internal Wall								
	<p>a. Inspect for defective or damage finishes (paint, spray tiles, spray paint, spray granite, concrete foam, wall papers, wall tiles, stone finishes, timber finishes, decorative panel, MDF panel and etc.) Repair, painting touch-up (maximum area 50 m²/ month) or make good to ensure the functionality using low VOC material.</p> <p>b. Inspect for defective or damage acoustic panel. Repair or replace to ensure the functionality. (Maximum 10 panels/ year)</p> <p>c. Inspect components, accessories, fixtures for internal partition members including finishes. Repair or make good to ensure the functionality.</p>				✓				
4.4	Curtain Wall, Glazing and Wall Opening								
	<p>a. Inspect for defect, wear and tear, cracks and leakage. Repair or make good to ensure the functionality.</p>				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>b. Inspect accessories, connections and fixtures. Repair or make good to ensure the functionality.</p> <p>c. Inspect for corrosion. Repair or make good to ensure the functionality.</p> <p>d. Inspect for defect of sealant at every opening. Replace the damage sealant to ensure the functionality using low VOC material. (Maximum length 20m/ month)</p> <p>e. Inspect for defect of gasket at every curtain wall, windows, glazing, wall opening and any gasket joints on the building. Repair or make good to ensure the functionality.</p> <p>f. Inspect for tinted element. Replace if damage.</p>				✓				
5.0	FLOOR & RAISED FLOOR (Including Server Room)								
	a. Inspect for cracks. Repair or make good to ensure the functionality.				✓				
	b. Inspect water proof and vapour barrier for leaks and tear. Repair or make good to ensure the functionality.			✓					
	c. Inspect for defective finishes including permanent stain. Repair or make good to ensure the functionality.				✓				
	d. Inspect for leakages and repair immediately if necessary. Repair or make good to ensure the functionality.			✓					
	e. Inspect for settlement, deflection and seepages. Repair or make good to ensure the functionality.				✓				
	f. Inspect integrity of raised floor members and fitting. Repair or make good to ensure the functionality.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	g. Inspect carpet surfaces for defects. Repair or make good to ensure the functionality.				✓				
6.0	DOOR (Including Fire Rated Door)								
	a. Inspect accessories and fixtures. Repair or make good to ensure the functionality. Replace if necessary.				✓				
	b. Maintain door finishes in good condition. Carry out varnish or repainting work using low VOC material.						✓		
	c. Inspect the defects and alignment of door frame. Repair or make good to ensure the functionality.						✓		
	d. Inspect accessories and fixtures. Repair or replace to ensure functionality.				✓				
7.0	WINDOW								
	a. Inspect accessories and fixtures. Repair or make good to ensure the functionality. Replace if necessary.				✓				
	b. Maintain window finishes in good condition. Carry out varnish or repainting work using low VOC material.						✓		
	c. Inspect the defects and alignment of window frame. Repair or make good to ensure the functionality.						✓		
	d. Inspect accessories and fixtures. Repair or replace to ensure functionality.				✓				
8.0	BUILT IN FURNITURE								
	a. Inspect integrity of members, accessories, finishes and fixtures. Repair or replace (faulty accessories) to ensure the functionality.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Inspect for termite, borers, beetles and fungus and report to FSO/ SO/ Owner immediately.				✓				
9.0	HANDRAIL AND GRILLE								
	a. Inspect members for defective finishes. Repair or make good to ensure the functionality.					✓			
	b. Inspect for corrosion. Repaint, repair or make good to ensure the functionality.					✓			
	c. Inspect for support of handrail and grille especially at higher level. Repair or make good to ensure the functionality.					✓			
10.0	PLUMBING, FLUSHING AND SANITARY SYSTEM								
	a. Inspect floor trap, bottle trap, etc for blockage and damages. Clear any blockage, repair and replace the damage component.			✓					
	b. Inspect sanitary fittings such as taps, WC, urinal, flushing system, ball valve, wash basin, hand bidet and etc. Repair or make good to ensure the functionality. Replace if necessary.		✓						
	c. Inspect piping for leakage. Repair or replace if necessary.		✓						
	d. Inspect sanitary accessories such as soap dispenser, toilet paper roller, hand towel dispenser, mirror and etc. Repair or make good to ensure the functionality.		✓						
11.0	COLD WATER TANK (All Types)								
	a. Inspect for integrity of structures. Repair or make good to ensure the functionality.						✓		
	b. Inspect for corrosion. Repair, repaint or make good to ensure the functionality.						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>c. Inspect for sediment or sludge. Scour to ensure the functionality.</p> <p>d. Inspect for leakage. Repair or make good to ensure the functionality.</p> <p>e. Inspect water tank support (joist, I-beams, concrete beams) for structural integrity and cracks. Repaint and repair or make good to ensure the functionality.</p> <p>f. Inspect piping and accessories for leakage. (Piping line shall start from the local authority pipe tapping point, up to suction tank and all the distribution pipe line from the water tank). Repair or make good to ensure the functionality.</p>			✓			✓		
12.0	SIGNAGES (Internal & External)								
	a. Inspect all signages. Repair or replace if damage to ensure the functionality.			✓					
13.0	REINFORCED CONCRETE STRUCTURES <i>As per JKR's Handbook for Building Condition Inspection</i>								
	a. Inspect for active cracks and to do defect mapping.				✓				
	b. Inspect for spalling of cover.				✓				
	c. Inspect for corrosion of reinforcement.				✓				
	d. Inspect for settlement and foundation failures.				✓				
	e. Inspect for construction joint.					✓			
	<p>Note : All defect to be reported immediately to FSO/ SO/ Owner or report every 3 months of any condition together with proposal of remedial</p>								

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
14.0	TIMBER STRUCTURES/ FINISHES (COLUMN, ROOF TRUSS, FLOOR FINISHES, etc.)								
	a. Inspect for termite, fungi, borers and beetles. Carry out treatment, repair and make good for functionality.				✓				
	b. Inspect members, accessories, fixtures and finishes. Repair or make good to ensure the functionality.				✓				
	c. Inspect and restore decorative and carving elements, wall fixtures and sculptures.						✓		
	d. Repaint structural members.								✓
15.0	STEEL STRUCTURES AND SPACE FRAME								
	a. Inspect for corrosion to members and welding joints. Carry out remedial work to function and serviceable.				✓				
	b. Inspect for missing, loose connection and joints. Carry out remedial work to function and serviceable.				✓				
	c. Repaint structural members.								✓
	Note : <i>All defect to be reported immediately to FSO/ SO/ Owner or report every 3 months of any condition together with proposal of remedial works.</i>								
16.0	SEWER LINE AND MANHOLES								
	a. Inspect for blockages and leakage. Clear any blockage repair or make good to ensure the functionality.		✓						
	b. Inspect for missing or damage covers. Repair or replace to ensure the functionality.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
17.0	<p>SLOPES AND RETAINING STRUCTURES</p> <p>a. Inspect all slopes for cracks, erosion and slips. Execute preventive measures for damage area.</p> <p>b. Inspect earth retaining structures for movement and crack. Execute preventive measures for damage area.</p> <p>c. Inspect weep holes, interceptor drain and cascade drain. Repair or make good to ensure the functionality.</p> <p>d. Inspect for water seepage.</p> <p>Note : <i>All defect to be reported immediately to FSO/ SO/ Owner or report every 3 months of any condition together with proposal of remedial works.</i></p>				✓				
18.0	<p>ROAD, HARD STANDING AND ROAD FURNITURE</p> <p>a. Inspect all bituminous or asphalt surface for cracks, potholes and damages. Repair or make good to ensure the functionality.</p> <p>b. Inspect all road line, dividers and parking lots painting work. Repainting for faded lines as per Standard JKR Road Specifications (thermoplastic type).</p> <p>c. Inspect all curb, gratings, dividers, drain cover, scupper drains and etc. Repair or make good to ensure the functionality.</p> <p>d. Inspect all road furniture. Repair or make good to ensure the functionality.</p> <p>e. Inspect interlocking tiles and concrete imprint. Repair or make good to ensure the functionality.</p>					✓	✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
19.0	DRAINAGE (Including Drain, Berm Drain, Cascade Drain, Sumps, Grating and Culvert)								
	a. Inspect integrity of structures. Repair or make good to ensure the functionality.						✓		
	b. Inspect flow condition, clear the blockages and unwanted plant.			✓					
	c. Inspect for missing or damage gratings. Replace, repair or make good to ensure the functionality.			✓					
20.0	FENCING AND GATES								
	a. Inspect integrity of structures and cracks. Repair or make good to ensure the functionality.					✓			
	b. Inspect finishes and accessories. Repair, repaint or make good to ensure the functionality.					✓			
	c. Inspect for corrosion. Repair, repaint or make good to ensure the functionality.					✓			
21.0	GREASE TRAP AND INTERCEPTER (Excluding Portable Grease Trap If Manage By Others)								
	a. Inspect grease trap and interceptor. Remove and dispose grease using proper method and chemical to ensure the functionality.		✓						
	b. Inspect the supply, discharge and vent piping to the trap. Repair or make good to ensure the functionality.		✓						
	c. Inspect the condition of perforated basket, etc. Repair or make good to ensure the functionality.		✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
22.0	SHELTER (Pergola, Gazebo and etc.)								
	a. Inspect and maintain the wood/ steel structure of shelter. Repair or replace if necessary.				✓				
	b. Inspect for roof and accessories for leakage. Repair or make good to ensure the functionality.					✓			
	c. Repaint faded or corroded components.					✓			
23.0	SEALANT								
	a. Inspect for defect of sealant at every structural joint at roof top, window, door and every building element. Replace the damage sealant to ensure the functionality using low VOC material. (Maximum length 20m/ month)					✓			

HOUSEKEEPING SERVICES

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.0	PUBLIC AREA								
	a. Sweep, wash and buff all lobby floor, covered ways, etc. areas to ensure the maintaining of a high luster and the highest quality floor.	✓							
	b. Clean all metal trim work to remove fingerprints, smudges, water and other marks. Care will be taken to prevent the scratching or damaging of metal finishes. Metal scratches will be reported immediately to FSO/ SO/ Owner.	✓							
	c. Remove, sweep and damp mop all resilient floor such as gum and tar adhered to the floor.	✓							
	d. Vacuum all carpeted areas, remove stains with carpet stain remover and any gum or tar should be removed. Carpets should be spot cleaned and shampooed (affected area) to maintain a clean and attractive floor. (All carpeted area should be inspected daily to ensure in good condition at all time) <i>*Twice a week</i>		2X*						
	e. Clean all skirting, skirting ledges, mouldings and window frames.	✓							
	f. Clean all doors, door frames, door handles, walls and light switches to remove fingerprints, spills and other markings.	✓							
	g. Clean and polish all entrance door thresholds, including entrances to tenant areas which have thresholds.	✓							
h. Empty all waste bin and replace with new biodegradable plastic bags. Plastic bags are to fit waste bin in such a manner as to not overhang the top by more than two (2") inches.	✓								

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	i. Clean the lobby planter boxes.	✓							
	j. Wipe all revolving doors and other entrance doors to remove hand and fingerprints. This includes all entryway glass areas (floor to ceiling) and bottom panel of lobby glass.	✓							
	k. Wipe all elevator call buttons on each floor.	✓							
	l. Clean with treated cloth all doors and ventilating louvers.		✓						
	m. Wet mop and spray buff all non lobby tile floors.		✓						
	n. Ensure janitor's closets will be left clean, orderly stocked and contain only cleaning supplies and equipment.		✓						
	o. Edge vacuum all carpeted areas of			✓					
	p. Clean kick plates on doors.			✓					
	q. Wash all interior lobby glass windows.			✓					
	r. Strip and refinish lobby floors using a buffable non slip floor finish.			✓					
	s. Wipe all doors and door frame.			✓					
	t. Wipe off all horizontal and vertical surfaces not reached in nightly cleaning, such as lighting fixtures, door, picture frames, etc.			✓					
	u. Wash vertical tiles and granite surfaces.				✓				
	v. Shampoo carpet at corridors and any other carpeted areas using a steam shampoo. Care will be taken to remove all excess moisture from carpet fibres.				✓				
	w. Vacuum upholstered furniture.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	x. Damp wash diffusers, vent grilles and other such surfaces including surrounding wall and ceiling areas that are soiled.			✓					
	y. Clean all wall at lobby.			✓					
	z. Vacuum and clean acoustical wall and ceiling tiles to remove all discolouration, marks and dirt.				✓				
	aa. Wipe all unpainted metal surfaces.				✓				
	ab. Wash, vacuum or clean where appropriate, all corridor, lobby and vestibule walls.			✓					
	ac. Clean all vertical surfaces not attended to in nightly, weekly, quarterly or semi annual cleaning specifications.					✓			
	ad. Open all light fixtures and wipe interior and exterior.					✓			
2.0	STAIRWELL / ELEVATOR/ ESCALATOR/ TRAVELATOR								
	a. Check all stairwells and remove debris and trash.	✓							
	b. Sweep and damp mop all stair areas, dust all hand railings and spot clean all walls.	✓							
	c. Wipe and clean light fixtures.			✓					
	d. Clean wall at stairwells.					✓			
	e. Clean the elevator doors to remove fingerprints, etc.	✓							
	f. Lobby and garage elevator cabs to be swept, damp mopped and spray buffed nightly. Both freight elevator cabs will be swept and damp mopped nightly as well. This includes the washing of these elevator cabs to remove debris, dirt and foreign matter not originally a part of the cabs.	✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	g. Clean and polish all elevator door	✓							
	h. Clean all elevator wall and wipe all buttons on the interior.	✓							
	i. Clean all metal trim work to remove fingerprints, smudges, water and other marks. Care will be taken to prevent the scratching and damaging to metal finishes. Metal scratches will be reported immediately to FSO/ SO/ Owner.	✓							
	j. Wash freight elevator walls and wipe lobby and garage elevator walls with treated cloth.		✓						
	k. Strip and wax all elevator flooring.		✓						
	l. Wipe elevator light fixture and lenses.			✓					
	m. Wipe all mirror work on ceiling of elevators.			✓					
3.0	RESTROOM (Including Cafeteria's Toilet)								
	a. Clean with a detergent, disinfectant, all sink, vanity counter, toilet, water closets, urinals and other restroom fixtures/ accessories.	✓							
	b. Touch-up cleaning inside toilet including replacement of tissues. <i>*Three times a day</i>								3X*
	c. Damp wipe all ledges, toilet cubical and doors.	✓							
	d. Clean light switches, doors, partition and walls to remove fingerprints, spills and other markings.	✓							
	e. Sweep and scrub with a germicide for all floor areas. Mop with clear and dry buff to eliminate mop streaks. Blower must be used at public area rest rooms.	✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	f. Furnish and refill sanitary napkins dispensers and trash bags for all bins, including sanitary bins. Refill soap dispensers and check operation. Repair or replace for any malfunction or missing items.	✓							
	g. Empty and clean paper towel and sanitary napkins disposal bins. Replace plastic bags.	✓							
	h. Clean all skirting with a germicidal detergent.	✓							
	i. Clean urinal screens to remove foreign matter.	✓							
	j. Wash diffusers, grilles, toilet cubical, doors and tiled walls with disinfectant/ detergent.			✓					
	k. Remove scale from all fixtures using an appropriate acid.			✓					
	l. Wipe tiled walls and scrub floor tile grout to maintain its colour, reseal to ensure functionality.			✓					
	m. Clean light fixtures, diffusers (if any) and exhaust fan.			✓					
	n. Clean ceiling to remove all discolourations, mark and dirt.				✓				
4.0	TENANT SPACES/ OFFICE SPACES								
	a. Empty all waste bin and replace with new biodegradable plastic bags. Plastic bags are to fit waste bin in such a manner as to not overhang the top by more than two (2") inches. <i>*Twice a day</i>	2X*							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>b. Vacuum all carpeted areas, remove stains with carpet stain remover and any gum or tar should be removed. Carpets should be spot cleaned and shampooed (affected area) to maintain a clean and attractive floor. (All carpeted area should be inspected daily to ensure in good condition at all time) <i>*Twice a week</i></p>		2X*						
	<p>c. Clean all horizontal surfaces free of paper, etc. with treated dust cloth, including furniture, files partition, equipment (i.e: T.V etc), curtains, blinds, windowsills, mouldings, skirting, coat racks and louvers that can be reached without a ladder.</p>	✓							
	<p>d. Damp wipe all telephones, using disinfectant/detergent.</p>	✓							
	<p>e. Wash to remove smudges, marks and fingerprints from areas such as glass furniture tops, walls, equipment, doors, partitions and light fixtures within reach.</p>	✓							
	<p>f. Wash and wipe dry all wash basins and break room tables and chairs.</p>	✓							
	<p>g. Clean all baseboards skirting and damp mop all non-carpeted floors with resilient floor covering and dry mop to remove streaks. Remove matter such as gum and tar which has adhered to surface.</p>	✓							
	<p>h. Clean all grilles work within to reach.</p>	✓							
	<p>i. Clean and polish all metal door thresholds.</p>	✓							
	<p>j. Clean doors, door frames, walls and switch plated to remove fingerprints, spills and other markings.</p>	✓							
	<p>k. Clean all interior partition, glass, windows and glass entrance doors.</p>	✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	l. Clean all metal trimwork, removing fingerprints, smudges and other marks.	✓							
	m. Wet mop and buff all tiled floors. Wipe all skirting and furniture legs clean after moping.		✓						
	n. Clean all vertical surfaces of office furniture including chair legs and rungs.		✓						
	o. Edge vacuum all carpeted areas using hose vacuum, take special care not to scritch furniture or wooden skirting.		✓						
	p. Damp wipe all windowsills.		✓						
	q. Move all plastic carpet protectors and thoroughly vacuum under and around desks and office furniture.		✓						
	r. Scrub, strip and wax all tiled floor areas using a buffable non – slip type floor finish.			✓					
	s. Vacuum all ceiling, wall air supply and exhaust diffusers on air grilles.			✓					
	t. Wipe all interior glass, both sides.		✓						
	u. Clean all kick plates on doors.			✓					
	v. Clean all high reach areas including but not limited to tops of door frames structural and furniture ledges, skirting door louvers, wood paneling, mouldings, wall hanging, etc.			✓					
	w. Damp wash diffusers, vents, grilles and other such items including surrounding wall or ceiling areas that are soiled.				✓				
	x. Strip and refinish all the tiled floors. Wipe all skirting and furniture legs, clean after refinishing floor.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	y. Clean all storage areas, including shelves and content, such as supply and stock closets and damp mop floor areas.					✓			
	z. Wipe light fixtures, including reflectors, globes, diffusers and trim. Method to confirm to manufacturer's specification.					✓			
	aa. Wash all solar shade with water and dry as per manufacturer's recommendations.					✓			
	ab. Clean all vertical surfaces not attended to in daily, weekly, quarterly or semi annual schedule.					✓			
	ac. Clean all general office area lightings with a properly fitted duster.					✓			
	ad. Clean dirty curtain as per schedule and when required.					✓			
5.0	HOSTEL ROOM								
	Cleaning services for hostel rooms shall be the same as others except for items below;								
	a. Replace used bedsheet with a clean bedsheet and to ensure the cleanliness of the bed as per schedule and when required. <i>*Twice a week if the room is unoccupied</i>	✓*							
	b. Replace used pillow case and bolster case (if any) with a clean and unused case as per schedule and when required. <i>*Twice a week if the room is unoccupied</i>	✓*							
	c. Replace used and dirty blanket with a clean blanket as per schedule and when required. <i>*Twice a week if the room is unoccupied</i>	✓*							
	d. Replace used and dirty towel with a clean towel as per schedule and when required. <i>*Monthly if the room is unoccupied</i>	✓*							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	e. Replace used and dirty curtain with a clean curtain as per schedule and when required.					✓			
6.0	CAFETERIA (Internal)								
6.1	Main Entrance								
	a. Vacuum welcoming carpet/ dust trap mat.	✓							
	b. Wipe clean signage's/ directories.	✓							
	c. To keep main entrance litter free at all times.	✓							
6.2	Floor								
	a. Spot mopping when required.	✓							
	b. Sweep floor and remove litter when required.	✓							
	c. To scrub with low speed rotary machine and disinfectant.		✓						
6.3	Door/ Door Frame								
	a. Wipe clean smudges, dirt and dust.		✓						
6.4	Wall/ Ceiling								
	a. Thorough cleaning of wall and fittings.			✓					
	b. Remove dust/ cobwebs from ceiling and grills.			✓					
6.5	Chairs and Table								
	a. Clear the table of trays, cup, cutlery and crockery when required.	✓							
	b. Arrangement of chair and table in orderly manner when required.	✓							
	c. Wipe dry and remove litter.	✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Wipe dry and remove litter.	✓							
	d. Damp wipe and disinfect when required.	✓							
	e. Spot cleaning when required.	✓							
6.6	Crockery and Cutlery								
	a. Collect all used trays, sups, crockery and cutlery when required.	✓							
	b. Stack on trays provided, rinse before putting them into the dishwashing machine for washing when required.	✓							
	c. Wipe and sorted to respective stall when required.	✓							
6.7	Hand Basin								
	a. Scrub dry with disinfectant when required.	✓							
	b. Replenish hand soap/ sanitizer when required.	✓							
	c. To clean mirror when required.	✓							
	d. Refill hand tissue when required.	✓							
6.8	Diswashing Area								
6.8.1	Floors/ Traps/ Flooring								
	a. Remove litter from traps.	✓							
	b. Mop spillage's.	✓							
	c. Sweep litters.	✓							
6.8.2	Steel Racks/ Basin								
	a. Wipe clean smudges, dirt & dust.	✓							
6.9	Wash Basin								
	a. Remove litter and replace plastic bag when required.		✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Wash bin with disinfectant when required.		✓						
6.10	Ceiling Light, Diffusers Air-Conditioner, Ventilation Grills and Non-Ducted Fans								
	a. Remove litter cobweb, dust and wipe clean grill, diffuser and vent when required.				✓				
6.11	Wall, Pillar and Fittings								
	a. Remove dust cobweb and graffiti when required.				✓				
6.12	Signage and Decorative Structure								
	a. Wipe clean, remove dust and cobweb when required.		✓						
6.13	Waste Collection								
	a. To collect waste generated by tenants from all designated areas to the building bin centre when required.		✓						
	b. All waste to be placed in polythene bag before deposited at building bin centre when required.		✓						
	c. To also remove refuse such as carton boxes and deposited at the building bin centre when required.		✓						
6.14	Railing								
	a. Wipe clean, remove dust and cobweb.		✓						
	b. Stainless steel polish.		✓						
6.15	Glass Partition/ Wall								
	a. Wipe clean glass appropriate chemicals.		✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
7.0	CAFETERIA (External)								
7.1	Tent								
	a. Remove cobweb.		✓						
	b. Thorough wipe stand.		✓						
	c. Cleaning of top and skirting when required.		✓						
8.0	ARTIFICIAL PLANT								
	a. Wipe clean, remove dust and cobweb.		✓						
	b. Manually clean the components from algae, moss, and fungi using non-abrasive method (e.g. soft bristle/ sponge) and mild detergent then rinse and dry well.		✓						
9.0	CAR PARK								
	a. Clean to remove grease/ oil spillage using degreaser.	✓							
	b. Thorough sweeping using sweeper machines.			✓					
	c. Sweep and keep litter free water ponding including drains.	✓							
	d. Wipe off cobwebs, foreign materials and dirt to walls, columns, grilles, doors, ducts, piping, conduits, trunking, etc.			✓					
	e. Wipe with damp cloth to remove dust accumulation, clean with approved chemicals.			✓					
10.0	PASSAGEWAY/ CANOPY GLASS AND COVERED WALKWAY								
	a. Sweep and damp mop all areas, spot clean all walls.	✓							
	b. Dusting to remove cobwebs, foreign materials and dirt to all areas.		✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Remove all debris/ litters from roof and gutter.		✓						
	d. Wash all glass and tempered glass for roof or walls, both sides.			✓					
11.0	SIGNAGES AND SIGNBOARDS								
	a. Damp wipe clean.		✓						
12.0	EXTERIOR CLEANING								
	a. Clean and removal of wall stains, dust accumulation, cobwebs and fungus with approved methods, chemicals and water to wall, columns, etc.	✓							
	b. Sweep, remove unwanted plant and water ponding to all areas including roads, driveways, footpath and drains.	✓							
	c. Manual scrubbing, washing and cleaning using approved chemicals and spraying with high pressure water jet to walls, columns, parapet, etc.				✓				
	d. Clean curtain wall, windows and glazing using appropriate method, gadgets, equipment with safe and good quality cleaning materials.				✓				
	e. Other necessary cleaning works and services for all spaces and surfaces outside the building and the surrounding area associated with the building which include assets, gadgets, fittings, fixtures, equipment and installation situated in the areas mentioned which require cleaning works and services. <i>*For special buildings or buildings higher</i>				✓*				
13.0	REFUSE BIN CENTRE								
	a. Sweeping to keep area free from litter and spillage.	✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>b. Scrubbing, washing and spraying water to keep room clean from dirt, stubborn stain and gum. Use approved chemical where permissible.</p> <p>c. Wipe wall to remove dirt, stain and foreign materials using approved chemical where permissible.</p>			✓					
14.0	MISCELLANEOUS								
	<p>a. Other necessary cleaning as and when required from time to time. <i>**As and when necessary/ required</i></p>	**							
15.0	HYGENIC SERVICES								
15.1	Supply and Replenishment of Consumables								
	<p>a. Automatic air freshener for each tenant/ office spaces, public area and restroom. Anticeptic for each cubicle and urinal bowl.</p> <p>b. Furnish and refill all toilet tissues, c-fold paper towels, hand sanitiser and soap</p> <p>c. Supply of sanitary bins for female toilets with bacterial vapors action to disinfects the sanitary dressings disposal in every cubicle for female toilets. <i>*Twice a month</i></p>			✓					
		✓							
				2X*					
16.0	WASTE DISPOSAL SERVICES								
	<p>a. Collect and dispose all general wastes from the building to a waste disposal centre designated inside the building compound.</p> <p>b. Collect and dispose all general wastes from all spaces and surfaces outside the building and the surrounding area associated with the building to a waste disposal centre designated in the building compound.</p>	✓							
		✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Ensure all collected wastes at the disposal centre/recycle bins were unloaded and transported to a public waste disposal/recycle centre allocated by The Local Authority.	✓							
	d. Keep in perfect condition, maintain and clean garbage/ recycle bins and waste disposal centre such that no bad odour, insect and rodent are present.	✓							
	e. Other necessary collection and waste disposal work as instructed by the Government Representative in compliance with the Standards and Regulations specification for waste disposal from time to time.	✓							

LAUNDRY SERVICES

No.	Description	Maintenance Frequency								
		D	W	M	3M	6M	Y	2Y	5Y	
1.0	LAUNDRY SERVICES									
	a. Wash used bedsheet as per schedule and when required.	**								
	b. Wash used pillow case and bolster case (if any) as per schedule and when required.	**								
	c. Wash used and dirty blanket as per schedule and when required.	**								
	d. Wash used and dirty towel as per schedule and when required.	**								
	e. Wash used and dirty curtain as per schedule and when required.					✓				
	<i>**As and when necessary/ required</i>									

PEST CONTROL SERVICES

No.	Description	Maintenance Frequency								
		D	W	M	3M	6M	Y	2Y	5Y	
1.0	PEST CONTROL SERVICES									
	a. Thermal fogging for external area of building (Include basement area).			✓						
	b. Place rat baits.			✓						
	c. Spraying and baits for ants and cockroaches.			✓						
	d. Larvaciding using Abate 500E or equivalent.				✓					
	e. Termite inspection and reporting using scientific equipment (Thermal Imaging Camera, etc) for internal and external area of buildings (including the trees surrounding the buildings).								✓	
	f. Anti termite treatment for infested building area and landscape areas.	**								
	g. Pest control for bees and hive.	**								
	h. Pest control for hornets, wasps and nest.	**								
	i. Other roddents and mammals control.	**								
	j. Birds control/ birds repellent.	**								
	k. Reptiles control (using baits, glue board and cage trap).	**								
	l. Pest control for wood borers, weevils, beetles, silverfish and etc.	**								
	m. Misting for internal area of building	**								
	n. All kind of insects control and treatment.	**								
	<i>**As and when necessary/ required.</i>									

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.0	ULTRASONIC BIRD DETERRENT SYSTEM								
	a. Check equipment rack for proper ventilation and clean the fan. Ensure power supplies secured.	✓							
	b. Check the program software is up to date and upgrade the program when necessary.			✓					
	c. Check for full operation of the system and send complete report to FSO/ SO/ Owner.			✓					
	d. Check the speaker output to match with the specification stipulated in the contract.			✓					
	e. Check and ensure all the Ultrasonic Generator are in good condition.			✓					
	f. Check and ensure all the decoder are in good condition.			✓					
	g. Check and ensure all the cable terminations and labelling in good condition.			✓					

LANDSCAPE

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.0	SOFTSCAPE								
1.1	BONSAI TREE								
	a. Only water the bonsai when soil is dry (do not water on routine). Keep watering until water runs out of the drainage holes and repeat the process a few minutes later.	✓							
	b. Apply specific Bonsai fertilizer according to the manufacturer's instruction.			✓					
	c. Assess the root and carry repotting works if circle of root mass is present. Apply correct method and soil mixture to FSO/ SO/ Owner approval.								✓
	d. Carry out structural pruning to reduce the length of the trunk or removing unnecessary branches. Treat the severed ends after pruning with cut paste or adhesive aluminium tape to protect them from microorganisms and insects.					✓			
	e. Carry out replacement pruning to make the bonsai's form more compact.				✓				
	f. Carry out maintenance/ light pruning to get back the shape that has been lost through the new growth.		✓						
	g. Inspect the traces of pest and report to FSO/ SO/ Owner immediately.		✓						
1.2	TOPIARY TREE								
	a. Watering shall be carried out early morning and evening as other trees.	✓							
	b. Apart from routine maintenance as other trees, carry out maintenance pruning to get back the shape that has been lost through the new growth.		✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Inspect for damages of the support/ shape components and repair or make good to its functionality.		✓						
	d. Inspect the traces of pest and report to FSO/ SO/ Owner immediately.		✓						
1.3	TREES/ PALM/ BAMBOO								
1.3.1	Watering								
	a. Watering shall be carried out early morning and evening. Note:- i) Watering is not required during rainy day. ii) Watering is not allowed between 12 p.m. until 3.30 p.m. and after 6.30 p.m. (*Twice a day)	2X*							
1.3.2	Fertilizing								
	Apply fertilizer to the tree. Type of fertilizer :- Chemical and Organic								
	a. Trees								
	i. For all types of trees :- Chemical Fertilizer NPK15:15:15				✓				
	ii. Flower and fruit trees:- Chemical Fertilizer NPK 13:13:20:2+TE				✓				
	iii. New Trees Chemical Fertilizer NPK15:15:15			✓					
	b. Palms								
	i. Existing Palms :- Chemical Fertilizer NPK 15:15:15				✓				
	ii. New Palms :- Chemical Fertilizer NPK 15:15:15			✓					
	c. Bamboo								
	i. Existing Bamboo :- Chemical Fertilizer NPK 15:15:15				✓				
	ii. New Bamboo :- Chemical Fertilizer NPK 15:15:15			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	Organic fertilizer Note:- <i>Spread 200gm of the fertilizer at the base of the tree/ palm/ bamboo and lightly fork into soil. Then water the plants.</i>				✓				
1.3.3	Mulching i) Inspect the plant and carry out mulching. Material used shall be organic compost, oil palm husks or approve mix. ii) Cocoa peat must be mixed in a proportion of 50:50 with another mulching materials free from soluble salts and resistant to rapid decay. a. Trees/ Palm - 50mm thick of mulching.					✓			
1.3.4	Restoration Of Trees Stakes And Ties a. Firming up and adjusting of stakes/ ties shall be carried out monthly. The use of wire is not allowed unless covered in rubber hose. Remove or re-adjust ties that rubbing the bark to avoid injury to the plants.			✓					
1.3.5	Weeding a. Manually keep plants base free of weed. b. After weeding, loosen the soil surface using garden fork. Any area with excessive weed growth, shall be re-cultivated and returf. c. For slope area using herbicides or other approved agents.			✓ ✓			✓		
1.3.6	Pest And Desease Control a. Inspect all plants materials and locate desease or pest infestation and remove infected branches or spray insecticide/ fungicide immediately.			2X*					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>Note :- All defect to be reported immediately to FSO/ SO/ Owner or report every 3 months of any condition together with proposal of remedial</p>								
1.3.7	<p>Erosion Control</p> <p>a. Inspect for soil erosion and carry out protection works.</p> <p>b. Identify eroded and bare areas to be planted with grass and pegging.</p>		✓						
1.3.8	<p>Trees Replacement</p> <p>a. Inspect for dead trees, unfertile, vandalizes by human, animal, safety or other reasons and replace. (*Twice a month)</p> <p>b. Install tree stakes for new planting as per latest version of JKR Standard Specifications for Building Works. (**As and when necessary/ required)</p>			2X*					
1.3.9	<p>Clearing and Pruning</p> <p>a. Clearing of fell trees and branches.</p> <p>b. Tree shall be pruned if dead rotten or crossed branches are presents.</p> <p>Note:- Report or liaise with local authority if pruning of tree outside boundary is needed.</p>		✓			✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.4	SHRUBS, GROUNDCOVER AND POT PLANT								
1.4.1	Watering								
	a. Watering shall be carried out early morning and evening. Note:- i) Watering is not required during rainy day. ii) Watering is not allowed between 12 p.m. until 3.30 p.m. and after 6.30 p.m. (*Twice a day)	2X*							
1.4.2	Fertilizing								
	Apply fertilizer to the tree.								
	a. Shrubs and ground covers:- 50 gm of NPK 15:15:15			✓					
	b. Shrubs with fruits and flowers:- 50 gm of NPK 13:13:20:2+TE				✓				
	c. Turf:- Spread NPK 15:15:15 and water evenly.				✓				
	Organic fertilizer				✓				
1.4.3	Mulching								
	i) Inspect the plant and carry out mulching. Material used shall be organic compost, oil palm husks or approve mix.				✓				
	ii) Cocoa peat must be mixed in a proportion of 50:50 with another mulching materials free from soluble salts and resistant to rapid decay.								
	a. Shrubs/ ground covers - 25 mm thick of mulching								
1.4.4	Weeding								
	a. Manually keep plants base free of weed.			✓					
	b. After weeding, loosen the soil surface using garden fork. Any area with excessive weed growth, shall be re-cultivated and returf.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.4.5	Pest and Disease Control a. Inspect all plants materials and locate disease or pest infestation. (*Twice a month)			2X*					
1.4.6	Erosion Control a. Inspect for soil erosion and carry out protection works. b. Identify eroded and bare areas to be planted with grass and pegging.	✓	✓						
1.4.7	Replacement a. Inspect for dead trees, unfertile, vandalizes by human, animal, safety or other reasons and replace.		✓						
1.4.8	Clearing a. Clearing of dead leaves and branches for fell tree branches and must always be cleared from site.	✓							
1.4.9	Annuals (Flowering Plants) a. Changes of flower plant as and when necessary depending on the flowering cycle of such plants.			✓					
1.5	GRASS CUTTING AND PRUNING THE HEDGES a. Ensure grass cutting and cleaning to be carried out the administrative and residential areas. (*Twice a month) b. Ensure the hedges pruning works to be carried out the administrative and residential areas.			2X*					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Prune flowering hedges at three month interval to ensure the plants achieve the flowering cycle.				✓				
1.6	TOP DRESSING								
	a. Inspect and apply top dressing of sieved river sand on turf area to avoid water ponding/ uneven ground level.				✓				
2.0	HARDSCAPE								
2.1	WALKWAY AREA								
	a. Inspect and ensure walkway area is clean.	✓							
	b. Inspect and ensure walkway area is free from algae by manual scrubbing or using a high pressured water jet.		✓						
2.2	SIGNBOARD/ SIGNAGES								
	a. Inspect and ensure signboard/ signages is clean from dust, dirt and no blocking from plants.		✓						
	b. Inspect for damages and repair/ make good to ensure the functionality. Replace if missing/ non-repairable.		✓						
2.3	GARDEN FURNITURE								
	a. Inspect and ensure metal furniture is cleaned by using chemical to avoid dirt and rust.		✓						
	b. Inspect and ensure masonry/ wooden/ composite material furniture is cleaned by using high pressured water jet or manual rubbing.			✓					
	c. Inspect for faded furniture paint and varnish or paint.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.4	d. Inspect for damages and repair or make good to ensure the functionality.				✓				
	RUBBISH BIN								
2.5	a. Ensure rubbish in bins collected/ emptied and bins is cleaned.	✓							
	b. Inspect for faded/ damaged and restore/ replace to ensure the functionality.			✓					
GARDEN LIGHTING									
2.6	a. Inspect and ensure all decorative lightings always be cleaned using damp cloth to remove dusts, dirt, etc.		✓						
	VASE								
2.7	a. Inspect and ensure rubbish in the vase must be cleared.		✓						
	b. Vase must always be cleaned and cleared from algae/ dirt.			✓					
	c. Inspect for damages and repair or replace if necessary.			✓					
BOLLARD									
2.8	a. Bollard must always be cleaned and cleared from algae, rust or dirt.		✓						
	b. Inspect for damage and make good to ensure the functionality.			✓					
PLAYGROUND									
2.8	a. Inspect for damages of the playstructure, components, rubber mat and make good to ensure the functionality.		✓						
	b. Repaint faded components using non-toxic paint.						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Carry out weeding and cleaning of the site from debris, dead branches, rubbish etc.		✓						
	d. Manually clean the components from algae and fungus using non-abrasive method and non-chemical agents approved by FSO/ SO/ Owner.		✓						
2.9	WATER FEATURES								
	a. Inspect for damages of the physical components and make good to ensure the functionality.		✓						
	b. Clean all water fountains and ponds with germicidal cleanser and wipe dry.			✓					
	c. Scrub the wall and floor of water features to dislodge slime.			✓					
	d. Remove algae and fungi at water features with brush and mixture of water and white vinegar (50:50). Rinse well.			✓					
	e. Remove the water pump cover and take out any leaves or debris. Also remove inside mineral deposits and algae then rinse the pump with water.			✓					
2.10	SHELTER (Wakaf/ Gazebo etc.)								
	a. Manually clean the components from algae, moss and fungi using non-abrasive method.		✓						
	b. Inspect the traces of pest and report to FSO/ SO/ Owner immediately.		✓						
2.11	SCULPTURE (Masonry/ Metal/ Resin/ Wood etc.)								
	a. Inspect for damages of the components and propose the method of repair according to the existing material for FSO/ SO/ Owner approval.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>b. Manually clean the components from algae, moss and fungi using non-abrasive method (e.g.soft bristle/ sponge) and mild detergent then rinse well.</p> <p>c. Carry out weeding and cleaning of the site from debris, dead branches, rubbish etc.</p> <p>d. Inspect the sign of termites at wooden sculpture and report to FSO/ SO/ Owner immediately.</p>			✓					
2.12	ARTIFICIAL SOFTSCAPES								
	<p>a. Inspect for damages of the components and make good to ensure the functionality.</p> <p>b. Carry out testing of electrical functioning and repair immediately.</p> <p>c. Manually clean the components from algae, moss and fungi using non-abrasive method (e.g.soft bristle/ sponge) and mild detergent then rinse well.</p>		✓						
2.13	POOLS (Swimming/ Wading Pools)								
	<p>a. Inspect for damages of the finishes and make good to ensure the functionality.</p> <p>b. Skim off leaves and debris in the pool (surface and bottom).</p> <p>c. Brush to remove dirt on the sides and bottom of the pool. Then, brush sediment toward the main drain and vacuum off.</p> <p>d. Test pool water and add chemicals according to the manufacturers' recommendation. Follow manufacturer's recommendation for shock treatments for algae bacteria, dirt and any other organic matter.</p>		✓						
			✓						
				✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.14	FLAGPOSTS								
	<ul style="list-style-type: none"> a. Inspect for damages and make good to ensure the functionality. b. Manually clean the flagpost and its base from algae, moss and fungi using brush and rinse well. 		✓						
2.15	PLANTER BOX								
	<ul style="list-style-type: none"> a. Inspect for damages and make good to ensure the functionality. b. Manually clean the planter box from algae, moss and fungi using brush and rinse well. c. Inspect the traces of termites at wooden planter box and report to FSO/ SO/ Owner immediately. d. Ensure the functionality of subsoil/ drainage systems. 		✓						
			✓						
				✓					

MECHANICAL SERVICES

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.0	<p>AIR - CONDITIONING AND MECHANICAL VENTILATION SYSTEM</p> <p>a. Operation</p> <p>Operation of ACMV will be done and monitored through Building Automation System (BMS). The Contractors Operator will man the BMS room and response to any complaint with regards to daily operation of Air-Condition and Mechanical Ventilation System. The equipment shall be monitored, inspected, checked, cleaned and etc.</p> <p>The Contractor shall ensure that the readings in BMS/BSC are corresponding to the actual reading at site using sling or digital thermometer.</p> <p>Please refer KeTHHA :BT18/2 Jld.2 () bertarikh 19 Oktober 2011 Garis Panduan Penjimatan Tenaga Melalui Penetapan Suhu Pada Tahap Minimum 24°C Di Bangunan Kerajaan.</p> <p>b. Maintenance</p> <p>The maintenance of ACMV will be carried out in accordance with the manufacturer's schedule. The contractor shall maintain Air-Condition and Mechanical Ventilation equipment and system and shall generally carry out the following but not limited to :-</p>								

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.1	Chilled Water System								
1.1.1	Plant Room								
	i. General								
	a. Inspect plant room cleanliness. Clean as necessary.		✓						
	b. Inspect for correct labelling. Do labelling as necessary.					✓			
	c. Inspect emergency light. Repair or replace as necessary.		✓						
	d. Inspect ventilation system. Repair as necessary.		✓						
	e. Inspect condition of door. Repair or replace as necessary.		✓						
	f. Inspect light intensity. Repair or replace as necessary.		✓						
	g. Inspect floor trap/ drain to ensure good water flow. Repair as necessary.			✓					
	h. Inspect pump circuit diagram (laminated & framed) are up to date. Replace as necessary.			✓					
	i. Inspect pump layout diagram (laminated & framed) are up to date. Replace as necessary.			✓					
	j. Inspect portable fire extinguisher (CO2). Replace as necessary.			✓					
	k. Inspect chemical dosing pumps for condenser water system. Check the correct chemical used. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	ii. Chillers								
	a. Inspect chillers general condition. If abnormal, trace the faults and rectify as necessary.	✓							
	b. Take reading of current, voltage, pressure, temperature, etc. Compare with design readings. If abnormal, trace the faults and rectify as necessary.	✓							
	c. Inspect all seals, gaskets and pipes if leaks. Replace as necessary.			✓					
	d. Inspect oil pressure. If abnormal, trace the faults and rectify as necessary.			✓					
	e. Inspect crankcase heater. Repair/ replace as necessary.			✓					
	f. Inspect chilled water pressure drop across chillers and condenser. If abnormal, trace the faults and rectify as necessary.			✓					
	g. Inspect the operation of all safety devices. Clean, adjust, lubricate, repair or replace as necessary.			✓					
	h. Inspect purge unit operation.			✓					
	i. Inspect the suction and discharge pressures of all refrigerant compressors. If abnormal, trace the faults and rectify as necessary.			✓					
	j. Drain and flush purge unit. Replace oil.						✓		
	k. Inspect all refrigerant and oil levels. Charge refrigerant and oil into the refrigerant system as necessary.			✓					
	l. Clean condenser tubes.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	m. Service chillers including changing of compressor oil, filter, leak test and topping up refrigerant.					✓			
	iii. Pumps								
	a. Inspect condition of pumps. (Cleanliness/appearance/ noise).			✓					
	b. Inspect all pump bearings for excessive noise, vibration and wear. Lubricate with oil or grease and replace as necessary.			✓					
	c. Inspect all motor bearings, lubricate with grease and replace as necessary.			✓					
	d. Inspect carbon brushes and slip rings of all motors. Clean, repair or replace as necessary.			✓					
	e. Inspect safety devices fitted to all motors. Clean, adjust, lubricate, repair or replace as necessary.			✓					
	f. Inspect all seals for leakages. Repair or replace as necessary.			✓					
	g. Adjust, repack and replace pump glands as necessary.			✓					
	h. Inspect each pump/ motor alignment, mountings and correct rotation. Adjust or replace as necessary.			✓					
	i. Inspect all rubber couplings between pumps and drive motor. Replace as necessary.			✓					
	j. Inspect all belt drives. Adjust and retension. Replace as necessary.			✓					
	k. Inspect and tighten all bolts and nuts. Replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	h. Inspect all electrical contactors relays. Clean and retighten all loose connections.			✓					
	i. Clean or replace electrical contactors relays as necessary.			✓					
	j. Inspect electric fuses. Replace as necessary.			✓					
	k. Inspect the condition of the conduits, supports and wires. Replace as necessary.			✓					
1.1.2	Heat Exchanger Plant Room								
	a. Inspect plant room cleanliness.			✓					
	b. Inspect for correct labelling.				✓				
	c. Inspect emergency light.			✓					
	d. Inspect condition of door.			✓					
	e. Inspect light intensity.			✓					
	f. Inspect heat exchanger in a good condition. If abnormal, trace the faults and report to utilities provider.			✓					
1.1.3	Cooling Towers								
	a. Inspect all water cooling towers in a good condition. If abnormal, trace the faults and rectify as necessary.	✓							
	b. Inspect all fan and fan bearings. Lubricate with grease. Replace as necessary.			✓					
	c. Inspect all belt drives. Adjust and retention. Replace as necessary.			✓					
	d. Inspect and clean all water screens.			✓					
	e. Inspect the operation of all cooling tower sprinkler head. Replace if necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	f. Inspect the operation of all spray nozzles and clean. Replace if necessary.			✓					
	g. Drain, clean and flush cooling tower basin and honey-comb in-fills.			✓					
	h. Inspect and clean float valve. Adjust water level. Replace if necessary.			✓					
	i. Inspect and service motors and controllers. Replace as necessary.			✓					
1.1.4	Chilled Water Storage and Expansion Tanks								
	a. Inspect all chilled water storage and expansion tanks, chilled water pipes, valves, etc. Clean, service and flush as necessary.			✓					
	b. Inspect pipe insulation and pipe supports. Replace as necessary.						✓		
	c. Inspect all measuring devices for correct operation. Repair or replace as necessary.		✓						
	d. Conduct chilled water quality test.						✓		
1.1.5	Air-Handling Units and Fan-Coils								
	a. Inspect all air-handling units and fan-coils. If abnormal, trace the faults and rectify as necessary.			✓					
	b. Inspect all air filters. Clean or replace as necessary.			✓					
	c. Replace all :								
	i. Primary filters.					✓			
	ii. Secondary filters. (If available)						✓		
	d. Inspect all chilled water coils, seals and pipe lines for leaks. Rectify as necessary.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	e. Inspect all fans and fan bearings. Lubricate with grease. Replace as necessary.				✓				
	f. Inspect the routine operation of all automatic temperature control gears and relay.			✓					
	g. Inspect all bearings, pivots and other moving parts. Clean, adjust, lubricate and replace as necessary.			✓					
	h. Inspect all belt drives. Adjust and retension. Replace as necessary.			✓					
	i. Inspect the operation of all automatic water regulating valves. Clean, adjust, lubricate and replace as necessary.			✓					
	j. Inspect the operation of all automatic multi-blade face and by-pass damper. Clean, adjust and lubricate as necessary.			✓					
	k. Inspect operation of thermostat. Replace as necessary.			✓					
	l. Inspect and clean strainers. Repair or replace as necessary.					✓			
	m. Clean cooling coil with high pressure water jet and alkaline cleaning chemicals.						✓		
	n. Inspect insulation. Repair or replace as necessary.					✓			
	o. Inspect and clean all electric motors. Repair or replace as necessary.			✓					
	p. Inspect all motor bearings and lubricate with grease. Replace as necessary.			✓					
	q. Inspect safety devices fitted to motors. Clean, adjust, lubricate, repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	r. Inspect leaks at joints, fittings and piping. Repair as necessary.			✓					
	s. Inspect leakage or clogging at drain pan and drain line. Clean, flush, repair or replace as necessary.			✓					
	t. Manually turn blower(s) wheel. It should run smoothly there should be no excessive noise.			✓					
	u. Inspect all heater elements and other accessories. Repair or replace as necessary.			✓					
	v. Inspect the operation of CO2 probe and detector and damper (if available). Clean, adjust, repair or replace as necessary.			✓					
1.1.6	Ducting, Grilles and Dampers								
	a. Inspect all grilles, dampers including shutters if available are working correctly. Clean, adjust, repair or replace as necessary.					✓			
	b. Measure air flow. Adjust and balance air flow as necessary.					✓			
	c. Inspect ductwork for leaks, damage or corrosion. Repair or replace as necessary.					✓			
	d. Inspect for moisture and condensation. Repair or replace insulation as necessary.					✓			
	e. Inspect duct insulation for tears and air leaks. Patch or replace as necessary.					✓			
	f. Inspect the internal of ducting to determine dust built up. Repair or clean as necessary.								✓
	g. Inspect internal insulation supply duct after AHU. (If applicable)			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.1.7	<p>The Performance of The Complete Ventilation, Pressurization, Exhaust and Smoke Spill System</p> <p>a. Inspect the function of the complete ventilation, pressurization, exhaust and smoke spill system. Repair or replace as necessary.</p> <p>b. Adjust air volume control dampers as necessary.</p> <p>c. Inspect the operation of all fans and motors. Repair or replace as necessary.</p> <p>d. Test operation of system under simulated fire condition. Repair as necessary.</p>			✓					
1.2	Central Direct Expansion System (DX) (Water Cooled System)								
1.2.1	Plant Room								
	a. Inspect plant room cleanliness. Clean as necessary.		✓						
	b. Inspect for correct labelling. Do labelling as necessary.					✓			
	c. Inspect emergency light. Repair or replace as necessary.		✓						
	d. Inspect condition of door. Repair or replace as necessary.		✓						
	e. Inspect light intensity. Repair or replace as necessary.		✓						
	f. Inspect floor trap or drain to ensure good water flow. Repair as necessary.			✓					
	g. Inspect pump circuit and layout diagram (laminated & framed) are up to date. Replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>h. Inspect portable fire extinguisher (CO2). Replace as necessary.</p> <p>i. Inspect chemical dosing pumps for condenser water system. Check the correct chemical used. Repair or replace as necessary.</p>			✓					
1.2.2	Water Cooled Package Unit (WCP)								
	a. Inspect WCP for any abnormalities. Trace the faults and rectify as necessary.	✓							
	b. Take reading of current, voltage, pressure, temperature, etc. Compare with design readings. If abnormal, trace the faults and rectify as necessary.	✓							
	c. Inspect all seals, gaskets and pipes for leaks. Replace as necessary.			✓					
	d. Inspect crankcase heater if available. Repair or replace as necessary.			✓					
	e. Inspect the operation of all safety devices. Clean, adjust, lubricate, repair or replace as necessary.			✓					
	f. Inspect the suction and discharge pressures of all refrigerant compressors. If abnormal, trace the faults and rectify as necessary.			✓					
	g. Inspect all refrigerant and oils levels. Charge refrigerant and oil into the refrigerant system as necessary.			✓					
	h. Inspect all air filters. Clean or replace as necessary.			✓					
	i. Inspect all bearings, pivots and other moving parts. Clean, adjust, lubricate and replace as necessary.			✓					
	j. Inspect all belt drives. Adjust and retension. Replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	k. Inspect operation of thermostat. Replace as necessary.			✓					
	l. Clean cooling coil with high pressure water jet and alkaline cleaning chemicals.						✓		
	m. Inspect insulation. Repair or replace as necessary.			✓					
	n. Inspect and clean condenser as necessary.			✓					
	o. Inspect all motor bearings, lubricate with grease. Replace as necessary.			✓					
	p. Inspect leakage or clogging at drain pan and drain line. Clean, flush, repair or replace as necessary.			✓					
	q. Clean cooling coil with high pressure water jet and alkaline cleaning chemicals.						✓		
1.2.3	Pumps								
	a. Inspect condition of pumps. (Cleanliness/ Appearance/ Noise). Clean, repair or replace as necessary.			✓					
	b. Inspect all pump bearings for excessive noise, vibration and wear. Lubricate with oil or grease and replace as necessary.			✓					
	c. Inspect all motor bearings, lubricate with grease and replace as necessary.			✓					
	d. Inspect carbon brushes and slip rings of all motors. Clean, repair or replace as necessary.			✓					
	e. Inspect safety devices fitted to all motors. Clean, adjust, lubricate, repair or replace as necessary.			✓					
	f. Inspect all seals including mechanical seals including mechanical seals for leakages. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	g. Adjust, repack and replace pump glands as necessary.			✓					
	h. Inspect each pump or motor alignment, mountings and correct rotation. Adjust or replace as necessary.			✓					
	i. Inspect all rubber couplings between pumps and drive motor. Replace as necessary.			✓					
	j. Inspect all belt drives. Adjust and retension. Replace as necessary.			✓					
	k. Inspect and tighten all bolts and nuts. Replace as necessary.			✓					
	l. Inspect and test pressure switches and gauges. Repair or replace as necessary.			✓					
1.2.4	Electric Motors								
	a. Inspect and clean all electric motors. Repair or replace as necessary.			✓					
	b. Inspect all motor bearings, lubricate with grease. Replace as necessary.			✓					
	c. Inspect safety devices fitted to motors. Clean, adjust, lubricate, repair or replace as necessary.			✓					
1.2.5	Electrical Switchboard/ Control Panel								
	a. Inspect the condition of the panel and its housing. Repair or replace as necessary.			✓					
	b. Inspect and test the control wiring and circuitry. Retighten, repair or replace as necessary.			✓					
	c. Inspect the operation of selector switches. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	d. Inspect the operation of auto-manual selector switches. Repair or replace as necessary.			✓					
	e. Inspect the operation of stop-start buttons. Repair or replace as necessary.			✓					
	f. Inspect or replace indicating bulbs and covers.			✓					
	g. Inspect the routine operation of all electrical starters, electrical control gears and ancillary electrical apparatus. Repair or replace as necessary.			✓					
	h. Inspect all electrical contactors, relays. Clean and retighten all loose connections.			✓					
	i. Clean or replace electrical contactors, relays as necessary.			✓					
	j. Inspect electric fuses. Replace as necessary.			✓					
	k. Inspect the condition of the conduits, supports and wires. Replace as necessary.			✓					
1.2.6	Cooling Towers								
	a. Inspect all water cooling towers in a good condition. If abnormal, trace the faults and rectify as necessary.	✓							
	b. Inspect all fan and fan bearings. Lubricate with grease. Replace as necessary.			✓					
	c. Inspect all belt drives. Adjust and retention. Replace as necessary.			✓					
	d. Inspect and clean all water screens.			✓					
	e. Inspect the operation of all cooling tower sprinkler head. Replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	f. Inspect the operation of all spray nozzles and clean. Replace as necessary.			✓					
	g. Drain, clean and flush cooling tower basin and honey-comb in-fills.			✓					
	h. Inspect and clean float valve. Adjust water level. Replace as necessary.			✓					
	i. Inspect and service motors and controllers. Replace as necessary.			✓					
1.2.7	Ducting, Grilles and Dampers								
	a. Inspect all grilles, dampers including shutters if available are working correctly. Clean, adjust, repair or replace as necessary.					✓			
	b. Measure air flow. Adjust and balance air flow as necessary.					✓			
	c. Inspect ductwork for leaks, damage or corrosion. Repair or replace as necessary.					✓			
	d. Inspect for moisture and condensation. Repair or replace insulation as necessary.					✓			
	e. Inspect duct insulation for tears and air leaks. Patch or replace as necessary.					✓			
	f. Inspect the internal of ducting to determine dust built up. Clean or repair as necessary.								✓
	g. Inspect internal insulation supply duct after AHU. (If applicable). Repair or replace as necessary.			✓					
1.3	Central Direct Expansion System (DX) (Air Cooled System) - Air Cooled Split Ducted Unit								
1.3.1	Plant Room								
	a. Inspect plant room cleanliness. Clean as necessary.		✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Inspect for correct labelling. Do labelling as necessary.					✓			
	c. Inspect emergency light. Repair or replace as necessary.		✓						
	d. Inspect condition of door. Repair or replace as necessary.		✓						
	e. Inspect light intensity. Repair or replace as necessary.		✓						
	f. Inspect floor trap or drain to ensure good water flow. Repair or replace as necessary.			✓					
	g. Inspect pump circuit and layout diagram (laminated & framed) are up to date. Replace as necessary.			✓					
	h. Inspect portable fire extinguisher (CO2). Replace as necessary.			✓					
	i. Inspect chemical dosing pumps for condenser water system. Check the correct chemical used. Repair or replace as necessary.			✓					
1.3.2	Air Handling Unit								
	a. Inspect unit for any abnormalities. Trace the faults and rectify as necessary.	✓							
	b. Take reading of current, voltage, pressure, temperature, etc. Compare with design readings. If abnormal, trace the faults and rectify as necessary.	✓							
	c. Inspect the operation of all safety devices. Clean, adjust, lubricate, repair or replace as necessary.			✓					
	d. Inspect and clean all air filters. Clean or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	e. Inspect all bearings, pivots and other moving parts. Clean, adjust, lubricate and replace as necessary.			✓					
	f. Inspect all belt drives. Adjust and retention. Replace as necessary.			✓					
	g. Inspect operation of thermostat. Replace as necessary.			✓					
	h. Clean cooling coil with high pressure water jet and alkaline cleaning chemicals.						✓		
	i. Inspect insulation. Repair or replace as -----					✓			
	j. Inspect condenser. Repair or replace as -----					✓			
	k. Inspect all motor bearings, lubricate with grease. Replace as necessary.			✓					
	l. Inspect refrigerant leaks at joints, fittings and piping. Repair and top up refrigerant as necessary.			✓					
	m. Inspect leakage or clogging at drain pan and drain line. Clean, flush, repair or replace as necessary.			✓					
1.3.3	Condenser								
	a. Inspect crankcase heater. Repair or replace as necessary.			✓					
	b. Inspect the suction and discharge pressures of all refrigerant compressors. If abnormal, trace the faults and rectify as necessary.			✓					
	c. Inspect all refrigerant and oils levels. Charge refrigerant and oil into the refrigerant system as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	d. Inspect refrigerant leaks at joints, fittings, piping and compressors. Repair or replace as necessary.			✓					
	e. Replace filter dryer.						✓		
	f. Inspect all fans and motors as necessary. Repair or replace as necessary.			✓					
	g. Inspect condensing coil. Repair or replace as necessary. Clean coil and comb the fins as necessary.						✓		
	h. Inspect all motor bearings, lubricate with grease. Replace as necessary.			✓					
	i. Inspect compressor units. Replace as necessary.			✓					
	j. Inspect isolating spring or rubber padding. Replace as necessary.						✓		
	k. Clean cooling coil with high pressure water jet and alkaline cleaning chemicals.						✓		
1.3.4	Electric Motors								
	a. Inspect and clean all electric motors. Repair or replace as necessary.			✓					
	b. Inspect all motor bearings, lubricate with grease. Replace as necessary.			✓					
	c. Inspect safety devices fitted to motors. Clean, adjust, lubricate. Repair or replace as necessary.			✓					
1.3.5	Electrical Switchboard/ Control Panel								
	a. Inspect the condition of the panel and its housing. Repair or replace as necessary.			✓					
	b. Inspect and test the control wiring and circuitry. Retighten, repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Inspect the operation of selector switches. Repair or replace as necessary.			✓					
	d. Inspect the operation of auto-manual selector switches. Repair or replace as necessary.			✓					
	e. Inspect the operation of stop-start buttons. Repair or replace as necessary.			✓					
	f. Inspect or replace indicating bulbs and covers.			✓					
	g. Inspect the routine operation of all electrical starters, electrical control gears and ancillary electrical apparatus. Repair or replace as necessary.			✓					
	h. Inspect all electrical contactors, relays. Clean or retighten all loose connections.			✓					
	i. Clean or replace electrical contactors, relays as necessary.			✓					
	j. Inspect electric fuses. Replace as necessary.			✓					
	k. Inspect the condition of the conduits, supports and wires. Replace as necessary.			✓					
1.3.6	Ducting, Grilles and Dampers								
	a. Inspect all grilles, dampers including shutters if available are working correctly. Clean, adjust, repair or replace as necessary.					✓			
	b. Measure air flow. Adjust and balance air flow as necessary.					✓			
	c. Inspect ductwork for leaks, damage or corrosion. Repair or replace as necessary.					✓			
	d. Inspect for moisture and condensation. Repair or replace insulation as necessary.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	e. Inspect duct insulation for tears and air leaks. Patch or replace as necessary.					✓			
	f. Inspect the internal of ducting to determine dust built up.								✓
	g. Inspect internal insulation supply duct after AHU. (If applicable).					✓			
1.4	Air Cooled Split Unit/ VRF								
1.4.1	Evaporator (Cooling Unit)								
	a. Inspect unit for any abnormalities. Trace the faults and rectify as necessary.	✓							
	b. Inspect and clean all air filters.			✓					
	c. Inspect leakage or clogging at drain pan and drain line. Clean, flush, repair or replace as necessary.			✓					
	d. Clean cooling coil with high pressure water jet and alkaline cleaning chemicals.						✓		
	e. Inspect refrigerant piping, joints, fittings and insulation for leaks or damages. Repair and top up refrigerant as necessary.			✓					
1.4.2	Condenser								
	a. Inspect the suction and discharge pressures of all refrigerant compressors. If abnormal, trace the faults and rectify as necessary.			✓					
	b. Inspect refrigerant leaks at joints, fittings, piping and compressors. Repair or replace as necessary.			✓					
	c. Inspect all fans and motors as necessary. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	d. Inspect condensing coil. Repair or replace as necessary. Clean coil and comb the fins as necessary.			✓					
	e. Inspect filter dryer. Replace as necessary.			✓					
	f. Inspect compressor units. Replace as necessary.			✓					
	g. Inspect rubber padding. Replace as necessary.						✓		
	h. Clean cooling coil with high pressure water jet and alkaline cleaning chemicals.						✓		
	i. Inspect bracket or hanger. Repair or replace as necessary.			✓					
1.4.3	Electrical Switchboard / Control Panel								
	a. Inspect the condition of the panel and its housing. Repair or replace as necessary.			✓					
	b. Inspect and test the control wiring and circuitry. Retighten, repair or replace as necessary.			✓					
	c. Inspect the operation of selector switches. Repair or replace as necessary.			✓					
	d. Inspect the operation of auto-manual selector switches. Repair or replace as necessary.			✓					
	e. Inspect the operation of stop-start buttons. Repair or replace as necessary.			✓					
	f. Inspect or replace indicating bulbs and covers.			✓					
	g. Inspect the routine operation of all electrical starters, electrical control gears and ancillary electrical apparatus. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	h. Inspect all electrical contactors, relays. Clean and retighten all loose connections.			✓					
	i. Clean or replace electrical contactors, relays as necessary.			✓					
	j. Inspect electric fuses. Replace as necessary.			✓					
	k. Inspect the condition of the conduits, supports and wires. Replace as necessary.			✓					
	l. Check for error code using manufacturer software. Repair and troubleshoot error.			✓					
1.5	Precision Air Conditioning								
1.5.1	Evaporator/ Condensor								
	a. Inspect and clean all air filters			✓					
	b. Inspect leakage or clogging at drain pan and drain line. Clean, flush, repair or replace as necessary.			✓					
	c. Inspect refrigerant piping, joints, fittings and insulation for leaks or damages. Repair and top up refrigerant as necessary.			✓					
	d. Inspect remote control. Replace as necessary.			✓					
	e. Clean cooling coil with suitable cleaning method.						✓		
	f. Inspect the suction and discharge pressures of all refrigerant compressors. If abnormal, trace the faults and rectify as necessary.			✓					
	g. Inspect refrigerant leaks at joints, fittings, piping and compressors. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	h. Inspect all fans and motors as necessary. Repair or replace as necessary.			✓					
	i. Inspect condensing coil. Repair as necessary. Clean coil and comb the fins as necessary.			✓					
	j. Inspect filter dryer. Replace as necessary.			✓					
	k. Inspect compressor units. Replace as necessary.			✓					
	l. Inspect bracket/ hanger. Repair or replace as necessary.			✓					
	m. Inspect rubber padding. Replace as necessary.						✓		
1.5.3	Electrical Switchboard / Control Panel								
	a. Inspect the condition of the panel and its housing. Repair or replace as necessary.			✓					
	b. Inspect and test the control wiring and circuitry. Retighten, repair or replace as necessary.			✓					
	c. Inspect the operation of selector switches. Repair or replace as necessary.			✓					
	d. Inspect the operation of auto-manual selector switches. Repair or replace as necessary.			✓					
	e. Inspect the operation of stop-start buttons. Repair or replace as necessary.			✓					
	f. Inspect or replace indicating bulbs and covers.			✓					
	g. Inspect the routine operation of all electrical starters, electrical control gears and ancillary electrical apparatus. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	h. Inspect all electrical contactors, relays. Clean and retighten all loose connections.			✓					
	i. Clean/ replace electrical contactors, relays as necessary.			✓					
	j. Inspect electric fuses. Replace as necessary.			✓					
	k. Inspect the condition of the conduits, supports and wires. Replace as necessary.			✓					
	l. Check for error code using manufacturer software. Repair and troubleshoot error.			✓					
1.6	Piping and Fittings (Expose and Accessable)								
	a. Inspect the condition of every pipe. Repair or replace as necessary.			✓					
	b. Inspect the condition of the pipe supports, brackets, pipe sleeves and piping joints. Repair or replace as necessary.			✓					
	c. Inspect the condition of every valve and fitting. Repair or replace as necessary.			✓					
	d. Inspect and clean strainers. Repair or replace as necessary.					✓			
	e. Inspect for correct labeling. Clean and relabeling as necessary.					✓			
	f. Inspect chilled water pipe insulation. Repair or replace as necessary.			✓					
	g. Inspect painting anti-rust coating. Repaint as necessary					✓			
1.7	Painting								
	a. Clean rust and paint with appropriate one layer of anti-rust paint and finished with existing coloured paint.						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.8	Other Components or Equipments of The Air-Conditioning System b. Redo all arrow and labeling.						✓		
		As per manufacturer's schedule							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.0	FIRE FIGHTING SYSTEM								
2.1	General								
	Manage and supervise the Fire Detection and Alarm, Fire Monitoring and Fire Fighting System operation which shall include:-								
	a. Control and monitoring of all fire systems.	✓							
	b. Man the fire control room during and after office hours.	✓							
	c. Inspect, repair or replace and test the operation of the complete fire fighting system, including the interface and operation of other systems such as lift, ventilation, smoke spill, pressurization, etc.					✓			
	d. Test run fire fighting system and simulate fire alarm to ensure all systems are in good working order. Ensure the BOMBA link is operating.					✓			
	e. Attend to any complaint, urgent request or complaints raised by the FSO/ SO/ Owner with regards to daily operation.	✓							
	f. Conduct fire drill with Jabatan Bomba dan Penyelamat Malaysia (JBPM) for each block/ complex.						✓		
2.1.1	Maintenance								
	The maintenance of Fire Detection and Alarm, Fire monitoring and Fire Fighting System, will be carried out in accordance with the manufacturer's schedule and the schedule below (whichever more stringent) :-								

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.2	Wet Riser, Hose Reel and Sprinkler System								
2.2.1	Pump Room								
	a. Inspect plant room cleanliness. Clean as necessary.		✓						
	b. Inspect for correct labelling. Do labelling as necessary.					✓			
	c. Inspect emergency light. Repair or replace as necessary.		✓						
	d. Inspect ventilation system. Repair or replace as necessary.		✓						
	e. Inspect condition of door. Repair or replace as necessary.		✓						
	f. Inspect light intensity. Repair or replace as necessary.			✓					
	g. Inspect floor trap or drain to ensure good water flow. Repair or replace as necessary.			✓					
	h. Inspect pump circuit and layout diagram (laminated & framed) are up to date. Replace as necessary.			✓					
	i. Inspect portable fire extinguisher (CO2). Replace as necessary.			✓					
2.2.2	Tank								
	a. Inspect and report for integrity of structure. Rectify as necessary.						✓		
	b. Inspect for leaks. Repair or replace as necessary.			✓					
	c. Inspect for rust. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	d. Inspect operation of ball valve. Repair or replace as necessary.			✓					
	e. Inspect water tank level indicator. Repair or replace as necessary.			✓					
	f. Inspect electrode and clean. Repair or replace as necessary (if equipped).					✓			
	g. Inspect for sediment or sludge. Flush and clean.						✓		
	h. Inspect internal and external cat ladder. Repair or replace as necessary.						✓		
2.2.3	Pumps								
	i. General								
	a. Inspect condition of pumps. (Cleanliness/ appearance/ noise). Clean or repair as necessary.			✓					
	b. Test run each pump on automatic and manual mode. Repair as necessary.			✓					
	c. Inspect the correct cut-in or cut-out auto mode operation of the pressure switch. Check pressures. Repair as necessary.			✓					
	d. Inspect all motor bearings, lubricate with grease and replace as necessary.			✓					
	e. Inspect all pump bearings for excessive noise, vibration and wear. Lubricate with oil or grease and replace as necessary.			✓					
	f. Inspect carbon brushes and slip rings of all motors. Clean, repair or replace as necessary.			✓					
	g. Inspect safety devices fitted to all motors. Clean, adjust, lubricate, repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	h. Inspect all seals including mechanical seals for leakages. Repair or replace as necessary.			✓					
	i. Adjust, repack and replace pump glands as necessary.			✓					
	j. Inspect each pump or motor alignment, mountings and correct rotation. Adjust or replace as necessary.			✓					
	k. Inspect all rubber couplings between pumps and drive motor. Replace as necessary.			✓					
	l. Inspect all belt drives. Adjust and retension. Replace as necessary.			✓					
	m. Inspect and tighten all bolts and nuts. Replace as necessary.			✓					
	n. Inspect and test pressure switches and gauges. Repair or replace as necessary.			✓					
	ii. Control Panel								
	a. Inspect the condition of the panel and its housing. Repair or replace as necessary.			✓					
	b. Inspect and test the control wiring and circuitry. Retighten, repair or replace as necessary.			✓					
	c. Inspect electric pump starter operation, ensure that the starting sequence is correct. Repair or replace as necessary.			✓					
	d. Inspect the operation of selector switches. Repair or replace as necessary.			✓					
	e. Inspect the operation of auto-manual selector switches. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	f. Inspect the operation of stop-start buttons. Repair or replace as necessary.			✓					
	g. Inspect indicating light for trip and run. Replace as necessary.			✓					
	h. Inspect indicating light for pump on auto and pump manual. Replace as necessary.			✓					
	i. Inspect ammeter and voltmeter. Replace as necessary.			✓					
	j. Inspect and retighten all loose connection of all electrical contactors relays as necessary.			✓					
	k. Clean and replace electrical contactors relays as necessary.			✓					
	l. Replace electrical fuses as necessary.			✓					
	m. Inspect the condition of the conduits, supports and wires. Replace as necessary.			✓					
	n. Inspect or replace indicating bulbs and covers.			✓					
2.2.4	Piping and Fittings (Expose and Accessable)								
	a. Inspect the condition of every pipe. Repair or replace as necessary.			✓					
	b. Inspect the condition of the pipe supports, brackets, pipe sleeves and piping joints (mechanical coupling/ welded coupling/ threaded coupling/ etc.). Repair or replace as necessary.			✓					
	c. Inspect the condition of every valve and fitting. Repair or replace as necessary.			✓					
	d. Inspect and clean strainers. Repair or replace as necessary.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>e. Inspect for correct labeling. Clean and relabeling as necessary.</p> <p>f. Inspect chilled water pipe insulation. Repair or replace as necessary.</p> <p>g. Inspect painting. Ensure pipes coating of anti rust and standard colour paint are clean and in good condition. Replace as necessary.</p>					✓			
2.2.5	Landing Valves, Hose Reel Drums, Cradles, Hoses, Nozzles, etc								
	a. Inspect that the landing valve, canvas hose and hose reel are obstruction free.			✓					
	b. Inspect any missing, damaged or deteriorated parts on the landing valve, canvas hose, diffuser nozzle, cradle, hose reel drum and hose reel. Repair or replace as necessary.			✓					
	c. Inspect the ease of operation and swing of each cradle and hose reel drum. Adjust, repair or replace as necessary.			✓					
	d. Inspect for any leaks or drips at the landing valves, drum goose neck and gate valve. Repair or replace as necessary.			✓					
	e. Ensure that each of the landing valves is complete with the blank cap, chain and the hand wheel. Repair or replace as necessary.			✓					
	f. Ensure that the diffuser nozzle & landing valve hand wheel can be operated freely. Repair or replace as necessary.			✓					
	g. Ensure the hose is not twisted or curled.			✓					
	h. Test hose reel and canvas hose for leakage. Replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.2.6 Sprinkler System	i. Inspect and test system for leaks. Repair or replace as necessary.			✓					
	a. Inspect that the sprinkler heads are obstruction free. Repair or replace as necessary.			✓					
	b. Inspect that the sprinkler heads are free of foreign matter and suspended object. Repair or replace as necessary.			✓					
	c. Inspect any missing, damaged or deteriorated parts on the sprinkler head. Repair or replace as necessary.			✓					
	d. Inspect for any leaks or drips at the sprinkler heads. Repair or replace as necessary.			✓					
	e. Inspect for leaks within the system by reading on the pressure gauges. Repair as necessary.			✓					
	f. Inspect and ensure the proper operation of water alarm gongs/ buzzer/ siren. Repair or replace as necessary.			✓					
	g. Inspect the flow switches and its signal indication. Repair or replace as necessary.			✓					
	h. Inspect the Jabatan Bomba dan Penyelamat Malaysia (JBPM) breaching inlet and its access. Repair or replace as necessary.			✓					
2.2.7 Breaching Inlet									
a. Inspect the condition of breaching box, door and lock. Repair or replace as necessary.			✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Inspect the condition of male couplings, back pressure valves, blank caps (secured with chain). Repair or replace as necessary.			✓					
	c. Inspect the condition of the wired glass and letters " <i>Injap pancur basah</i> "/ "Wet Riser". Repair or replace as necessary.			✓					
2.3	Fire Detection and Alarm System								
	a. Inspect fire detection and alarm system. Trace the faults and rectify as necessary.	✓							
	b. Inspect and test all main power supply and earthing. Adjust, retighten, repair or replace as necessary.			✓					
	c. Inspect and test all battery charger units. Repair or replace as necessary.			✓					
	d. Inspect all battery. Replace to ensure functionality.			✓					
	e. Inspect and test illumination lamps and LEDs. Repair or replace as necessary.			✓					
	f. Inspect and test the functionality of break-glass unit or manual call point. Repair or replace as necessary.			✓					
	g. Test zone rotary switch for functionality. Repair or replace as necessary.			✓					
	h. Inspect and test the functionality of detectors. Repair or replace as necessary.			✓					
	i. Inspect and test system wiring. Repair or replace as necessary.			✓					
	j. Test bell or buzzer and isolation button. Repair or replace as necessary.			✓					
	k. Test alarm and evacuation switch. Repair or replace as necessary.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>l. Test AHU, lift, smoke spill fan and staircase pressurization tripping mechanism. Ensure all mechanism function effectively. Repair or replace as necessary.</p> <p>m. Print out the previous month detection and alarm history. Analyze and take appropriate actions.</p> <p>n. Inspect or replace indicating bulb and covers.</p>			✓					
2.4	Fireman Intercom System								
2.4.1	Panel								
	a. Inspect the condition of the panel and its housing. Repair or replace as necessary.			✓					
	b. Ensure that the panel is in a normal-ready condition. Repair as necessary.			✓					
	d. Inspect condition of battery charger. Repair or replace as necessary.			✓					
2.4.2	Battery								
	a. Inspect the condition of the battery and its terminal. Replace as necessary.			✓					
	b. Inspect voltage and ammeter reading. Repair or replace as necessary.			✓					
	c. Inspect and test all battery charger units. Repair or replace as necessary.			✓					
2.4.3	Automatic Control								
	a. Inspect and test the control wiring and circuitry. Random test of the call, talk and fault mode. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>b. Inspect the correct operation of the master and remote handset. Establish conference calls on auto and manual mode. Test disconnect call on auto and manual mode. Repair or replace as necessary.</p> <p>c. Inspect and test the correct operation of remote status panel. Repair or replace as necessary.</p>			✓					
2.4.4	Electrical								
	<p>a. Check the operation of the emergency change over in case of power failure. Repair or replace as necessary.</p> <p>b. Check the wiring connection terminals. Repair or replace as necessary.</p> <p>c. Check the condition of the conduits, wires and supports. Repair or replace as necessary.</p>			✓					
2.4.5	Handsets								
	<p>a. Inspect the condition of the master hand set. Repair or replace as necessary.</p> <p>b. Inspect the condition of the remote handset box. Repair or replace as necessary.</p> <p>c. Inspect any missing, damaged or deteriorated parts on the remote handset and accessories. Repair or replace as necessary.</p>			✓					
2.4.6	General								
	<p>a. Keep remote handsets clean and tidy.</p> <p>b. Keep access to panel free from obstructions.</p>			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.5	Fire Suppression Systems								
2.5.1	Cylinders, Hoses, Canister etc.								
	a. Inspect gas cylinder and canister. Repair or replace as necessary.			✓					
	b. Inspect the pressure gauge reading of each cylinder. Refill or replace as necessary.			✓					
	c. Inspect any missing, damaged or deteriorated parts on the cylinders, hoses, etc. Repair or replace to ensure functionality.			✓					
	d. Inspect the condition of the discharge valve and the tamper seal. Repair or replace to ensure functionality.			✓					
2.5.2	Pilot Cylinder								
	a. Inspect and test gas discharge abort switch. Repair or replace as necessary.			✓					
2.5.3	Panel								
	a. Inspect and test control panel. Repair or replace as necessary.			✓					
	b. Visually inspect condition of components, resistors wires, zone cards, etc. Repair or replace as necessary.			✓					
	c. Inspect and test AC & DC supply, conduct current voltage continuity and earthing test. Repair as necessary.			✓					
	d. Inspect and test of change over switch. Repair or replace as necessary.			✓					
	e. Inspect and test indicator bulbs. Repair or replace as necessary.			✓					
	f. Inspect condition of battery chargers. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.5.4	g. Inspect the condition of the battery and its terminal. Replace as necessary.			✓					
	Devices								
	a. Inspect and test the control wiring and circuitry. Retighten, repair or replace as necessary.			✓					
	b. Ensure that the detectors are free from obstructions, dust, dirt and cobwebs. Clean as necessary.			✓					
	c. Inspect the condition of the manual key switch/ pull handle. Repair or replace as necessary.				✓				
	d. Conduct simulation test (minus gas discharge).					✓			
	e. Inspect and adjust to ensure that the time delay for the CO2 discharge is within 25 – 30 seconds. Repair or replace as necessary.					✓			
	f. Inspect and test the correct operation of interface trip and fire curtain. Repair or replace as necessary.					✓			
2.5.7	g. Inspect and test the correct operation of the bell and warning light. Repair or replace as necessary.					✓			
	Aerohub								
	h. Inspect the condition of the manual key switch or pull handle. Replace glass as necessary.			✓					
	a. Check all electrical connections to ensure operation of the system in the event of a fire. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>b. Make a general visual inspection of all aerosol generators for damage or missing parts. Repair or replace as necessary.</p> <p>c. Inspect condensed aerosol generators for physical damage, such as cracks, dents, distortion or corrosion. Repair or replace as necessary.</p> <p>d. Inspect mounting brackets, straps and associated hardware for loose, damage or broken parts. Replace damage part and tighten all loose hardware.</p> <p>e. Inspect all electrical control equipments for cracks, broken or cracked glass plate, dirt or distortion. Clean and repair or replace as necessary.</p> <p>f. Inspect all electrical connection and run electrical continuity test using Ohmmeter. Repair and replace as necessary.</p>			✓					
2.6	Portable Fire Extinguishers								
	a. Obtain Bomba certification upon expiry date.							✓	
	b. Inspect any missing, damaged or deteriorated parts on the cylinder, pressure gauge, hose connector, discharge valve, handle, cylinder safety pin, seal and cylinder holder. Repair or replace as necessary.			✓					
	Note:- <i>Replace Portable Fire Extinguishers cylinder after ten (10) years.</i>								
	c. Inspect fire extinguisher cabinet. Repair or replace as necessary.			✓					
	d. Inspect the condition of the content. Refill or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.7	BOMBA link (SPKA)								
	a. Inspect equipment functionality and others part related.			✓					
	b. Replace any missing or damaged component of parts.			✓					
	c. Check control panel, telephone line or mobile service provider, ability to receive SMS, network and other related are in good condition. Repair or replace to ensure functionality.			✓					
	d. Test the equipment and record.			✓					
2.8	Hydrant System								
2.8.1	General								
	a. Examine structural elements for corrosion and damage. Repair as necessary.			✓					
	b. Perform general housekeeping.			✓					
	c. Inspect for rusty parts and replace if damages.			✓					
	d. Painting distribution pipe, equipment and control panel.						✓		
	e. Inspect hose and cabinet. Replace if damages.			✓					
2.7.2	Pump Room								
	a. Inspect floor trap or drain ensure good water flow. Repair or replace as necessary.			✓					
	b. Inspect pump circuit diagram or pump layout diagram are up to date. Replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.8.3	c. Inspect portable fire extinguisher (CO ₂). Replace as necessary.			✓					
	Tank								
	a. Inspect for leak and rust. Repair or replace as necessary.			✓					
	b. Inspect operation of ball valve. Repair or replace as necessary.			✓					
	c. Inspect water tank level indicator. Repair or replace as necessary.			✓					
	d. Inspect electrode and clean. Repair or replace as necessary.				✓				
	e. Inspect for sediment or sludge. Flush and clean.					✓			
	f. Inspect internal and external cat ladder. Repair or replace as necessary.					✓			
2.8.4	g. Internal cleaning water tank (as necessary or directed).						✓		
	Piping and Fitting								
	a. Inspect the condition of every pipe. Repair or replace as necessary.			✓					
	b. Inspect the condition of the pipe support, brackets, pipe sleeve and piping joint. Repair or replace as necessary.			✓					
	c. Inspect the condition every valve and fitting. Repair or replace as necessary.			✓					
d. Inspect plumbing pipe works & fitting and pipe support. Repair or replace as necessary.			✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.8.5 Pump & Motor	a. Inspect condition (cleanliness/ appearance) of pumps or motor. Clean as necessary.			✓					
	b. Inspect all bearings for excessive noise, vibration and wear. Repair or replace as necessary.			✓					
	c. Inspect all motor bearing. Lubricate with grease and replace if necessary.			✓					
	d. Inspect carbon brushes and slip ring all motors. Repair or replace as necessary.			✓					
	e. Inspect all seals leakages. Repair or replace is necessary.			✓					
	f. Adjust repack and replace pump glands as necessary.			✓					
	g. Inspect pump or motor alignment, mountings and correct rotation. Repair or replace as necessary.			✓					
	h. Inspect all rubber coupling between pump and drive motor. Replace as necessary.			✓					
	i. Inspect all belt drive. Adjust and retention.			✓					
	j. Inspect and retighten all bolts and nuts.			✓					
	k. Inspect all pressure switch and gauge. Repair or replace as necessary.			✓					
2.8.6 Electrical Switch Board	a. Inspect the condition of the panel and its housing. Repair or replace as necessary.			✓					
	b. Inspect and test the control wiring and circuitry. Retighten, repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Inspect the operation selector switches. Retighten, repair or replace as necessary.			✓					
	d. Inspect the operation of stop-start buttons. Repair or replace as necessary.			✓					
	e. Inspect and replace indicator light.			✓					
	f. Inspect the routine operation of all electrical starters, electrical control gears and ancillary electrical apparatus. Repair or replace as necessary.			✓					
	g. Inspect all electrical contactors and electric fuses. Clean or replace if necessary.			✓					
	h. Inspect the condition of the conduits, supports and wires. Replace if necessary.			✓					
2.9	Painting								
	a. Inspect condition of painting, ensure the system (equipment, control panel and piping) are painted with anti rust and coated with red gloss paint. Repaint or recoat as necessary.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
3.0	<p>LIFT</p> <p>The Contractor shall ensure proper operation of lifts and escalators and shall monitor the operation of the lift and escalator using the Building Management System (BMS) and Elevator Management System. The Contractor's personnel shall man the BMS control room and respond to any complaint with regards day to day operation and carry out rescue operation to any person trapped in the lift and on the escalator.</p>								
3.1	<p>Motor Room</p> <p>The approved Competent Person (CP) by Department Occupational of Safety and Health (DOSH) and Public Work Department (PWD) shall thoroughly examine the lift and escalator systems and cause them to be serviced and adjusted once in every month. The maintenance of lifts and escalators and its related system shall be carried out in accordance with Part III (maintenance) of the Factories and Machinery's Act Passenger and Goods Lift) Regulations, 1970, the manufacturers schedule and the schedule below:-</p> <p>a. Inspect motor room cleanliness. Clean as necessary.</p> <p>b. Inspect for correct labelling. Do labelling as necessary.</p> <p>c. Inspect emergency light. Repair or replace as necessary.</p> <p>d. Inspect ventilation system. Repair or replace as necessary.</p> <p>e. Inspect condition of door. Repair or replace as necessary.</p> <p>f. Inspect light intensity. Repair or replace as necessary.</p> <p>g. Inspect circuit and layout diagram (laminated & framed) are up to date. Replace as necessary.</p>			✓					
				✓					
				✓					
				✓					
				✓					
				✓					
				✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	h. Inspect portable fire extinguisher (CO2). Replace as necessary.			✓					
	i. Inspect for abnormal noise and vibration. Determine source, adjust, repair or service as necessary.			✓					
	j. Inspect gearbox oil level, condition, leaks, play and backlash. Adjust, repair or service as necessary.			✓					
	k. Inspect and lubricate bushes or bearings. Replace as necessary.			✓					
	l. Inspect leakage from traction machine cover gaskets, oil seals. Repair or replace as necessary.			✓					
	m. Inspect brake action and adjust as necessary.			✓					
	n. Inspect brake lining and brake spring. Replace as necessary.			✓					
	o. Inspect main sheaves and beam pulley. Repair or replace as necessary.			✓					
	p. Inspect over speed governor for abnormal noise and vibration. Clean, repair or replace as necessary.			✓					
	q. Inspect function of recall control switch operation. Reset or replace as necessary.			✓					
	r. Inspect controller cooling fan operation. Replace as necessary.			✓					
	s. Inspect condition of fans, relays, contactors and contacts inside the controller. Clean, repair or replace as necessary.			✓					
	t. Inspect fuses and tighten terminal wires. Repair and replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	u. Inspect the operation of inverter. Inspect operation of system, repair or replace as necessary.			✓					
	v. Inspect EBOPS – battery or condition and emergency light or fan operation. Replace as necessary.			✓					
	w. Clean governor machine.			✓					
	x. Clean traction machine.			✓					
	y. Clean lift controller.			✓					
3.2	Hoist Way								
	a. Inspect cleanliness of car top. Clean as necessary.			✓					
	b. Inspect control switches and lighting. Repair or replace as necessary.			✓					
	c. Inspect tightness of electrical connection in terminal box. Retighten as necessary.			✓					
	d. Inspect and adjust car top safety gear linkage.			✓					
	e. Inspect and lubricate car top pulley as necessary.			✓					
	f. Inspect condition and clean ventilator fan. Repair or replace as necessary.			✓					
	g. Inspect and adjust door panel (door self closer). Repair as necessary.			✓					
	h. Inspect anti crime device. Repair as necessary.			✓					
	i. Inspect hoist way limit and safety switches or sensors. Adjust, repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	j. Inspect operation of load compensating device. Adjust, repair or replace as necessary.			✓					
	k. Inspect operation of overload device or buzzer. Repair or replace as necessary.			✓					
	l. Inspect car guide shoes or rollers oil level and flow of automatic lubricators. Top-up as necessary.			✓					
	m. Inspect counter weights guide shoes or rollers oil level and flow of automatic lubricators. Top-up as necessary.			✓					
	n. Inspect wear on linings for car guide shoes or rollers and counter weights guide shoes or rollers. Replace as necessary.			✓					
	o. Inspect for abnormal noise. Determine source, adjust, repair or replace as necessary.			✓					
	p. Inspect wire ropes, governor ropes condition and tension. Retension or lubricate as necessary.			✓					
	q. Inspect conditions of guide rails. Repair as necessary.			✓					
	r. Inspect traveling cable alignment. Adjust or replace as necessary.			✓					
	s. Inspect and tighten all hoist way bolts and nuts.			✓					
	t. Inspect and clean smoke detectors. Repair or replace as necessary.			✓					
3.3	Lift Car								
	a. Inspect riding comfort, abnormal noise, vibration and leveling. Adjust as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Inspect alarm bell/ intercom/ voice synthesizer. Repair and replace as necessary.			✓					
	c. Inspect buttons, Braille features, switches and indicators condition. Repair and replace as necessary.			✓					
	d. Inspect emergency light and fan. Repair and replace as necessary.			✓					
	e. Inspect floor height measurement (clearance). Adjust as necessary.			✓					
	f. Inspect condition of suspension roller, track and doors. Repair and replace as necessary.			✓					
	g. Inspect door sill and sliding shoes. Repair and replace as necessary. Check clearance.			✓					
	h. Inspect door contact and check alignment. Adjust as necessary.			✓					
	i. Inspect function of car door safety device (safety edge/ photocell/ full height sensor). Repair and replace as necessary.			✓					
	j. Inspect tiling or wall panel, repair and replace as necessary.			✓					
	k. Recalibrate and testing of overloading device for lift system.								✓
3.4	Entrance								
	a. Inspect landing door contact and check alignment. Repair and replace as necessary.			✓					
	b. Inspect landing door lock switch. Repair and replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Inspect suspension rollers and track. Repair and replace as necessary.			✓					
	d. Inspect landing sill & shoes. Repair and replace as necessary. Check clearance.			✓					
	e. Inspect indicators, hall lanterns, call buttons and Braille features. Repair and replace as necessary.			✓					
3.5	Lift Pit								
	a. Inspect pit cleanliness and lighting. Clean, repair or replace as necessary.			✓					
	b. Ensure lift pit is in dry condition. Rectify as necessary.			✓					
	c. Inspect oil and spring buffer. Top-up, repair and replace as necessary.			✓					
	d. Inspect alignment of buffer strike plates. Repair and replace as necessary.			✓					
	e. Inspect, adjust and lubricate/ grease tension pulley.			✓					
	f. Inspect safety catch or stop switches. Adjust, repair or replace as necessary.			✓					
	g. Inspect clearance compensating pulley. Adjust as necessary.			✓					
	h. Inspect oil compensating pulley and compensating ropes/ chain. Top-up as necessary.			✓					
	i. Inspect plunger and buffer casing. Clean as necessary.			✓					
3.6	Automatic Rescue Device (ARD)								
	a. Inspect ARD operation. Rectify as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Inspect battery electrolyte level, top up as necessary.			✓					
	c. Inspect battery, grease terminals. Repair and replace as necessary.			✓					
	d. Inspect equalizing charge. Replace if defective.			✓					
3.7	Building Control Room								
	a. Inspect operation of master intercom. Repair and replace as necessary.			✓					
	b. Inspect operation of key switches. Repair and replace as necessary.			✓					
	c. Inspect operation of indicators. Repair and replace as necessary.			✓					
	d. Inspect operation of TV monitor, CPU and keyboard. Repair and replace as necessary.			✓					
	e. Inspect operation of system. Repair and replace as necessary.			✓					
	f. Arrange and attend to Department of Occupational Safety and Health (DOSH) inspections, mandatory checks, tests and paying the necessary fees.	As required							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
4.0 ESCALATOR	<p>The Contractor shall ensure proper operation of lifts and escalators and shall monitor the operation of the lift and escalator using the Building Management System (BMS) and Elevator Management System. The Contractor's personnel shall man the BMS control room and respond to any complaint with regards day to day operation and carry out rescue operation to any person trapped in the lift and on the escalator.</p>								
4.1 General	<p>The approved Competent Person (CP) by Department Occupational of Safety and Health (DOSH) and Public Work Department (PWD) shall thoroughly examine the lift and escalator systems and cause them to be serviced and adjusted once in every month. The maintenance of lifts and escalators and its related system shall be carried out in accordance with Part III (maintenance) of the Factories and Machinery's Act Passenger and Goods Lift) Regulations, 1970, the manufacturers schedule and the schedule below:-</p> <p>a. Inspect and clean motor compartment upper and bottom, track surface, handrail and step. Repair or replace as necessary.</p> <p>b. Inspect and clean track surface and steps.</p> <p>c. Inspect stop buttons/ key switch and soft stop. Repair or replace as necessary.</p> <p>d. Inspect balustrade lighting. Repair or replace as necessary.</p> <p>e. Inspect skirting/ comb plate/ step gap lighting. Adjust, repair or replace as necessary.</p> <p>f. Inspect for abnormal noise and vibration. Determine source, adjust, repair or replace as necessary.</p>			✓					
		✓							
			✓						
				✓					
				✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	g. Clean traction machine, control panel, landing, step, pit and motor room.			✓					
	h. Inspect brake action. Adjust as necessary.			✓					
	i. Inspect brake slip distance and riding comfort. Adjust as necessary.			✓					
	j. Inspect riding comfort and leveling. Adjust as necessary.			✓					
	k. Clean and inspect operation key switch. Adjust as necessary.			✓					
	l. Clean all outer decking.			✓					
	m. Clean all relays and contactors. Replace as necessary.			✓					
	n. Clean gap between step and skirt panel.			✓					
	o. Clean up motor room and pit.			✓					
	p. Inspect the pit equipment. Adjust as necessary.			✓					
	q. Inspect and clean safety brush/ skirt deflector brushes. Repair, re-cladding or replace as necessary.			✓					
	r. Inspect the anti-climb device. Repair or replace as necessary.			✓					
4.2	Comb Plate								
	a. Inspect the condition of comb plate. Clean and replace as necessary.			✓					
	b. Inspect the contact, movability and setting of comb plate. Adjust as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
4.3	Steps								
	a. Inspect function of maintenance operating panel. Reset and adjust as necessary.			✓					
	b. Inspect correct setting step guides. Adjust as necessary.			✓					
	c. Inspect function of water level switch. Repair or replace as necessary.			✓					
	d. Inspect and clean yellow side frame at step. Replace as necessary.			✓					
	e. Inspect the alignment of steps. Adjust as necessary.			✓					
	f. Inspect the condition of step wheel. Adjust as necessary.			✓					
4.4	Step Chains								
	a. Inspect step chain tension. Adjust as necessary.			✓					
	b. Inspect setting and function of step chain monitoring contact. Adjust, repair or replace as necessary.			✓					
	c. Inspect condition of tangential rails. Adjust, repair or replace as necessary.			✓					
	d. Lubricate step chains.			✓					
	e. Inspect operation for broken step chain device. Adjust as necessary.			✓					
	f. Inspect spring setting for step chain tensioning device. Adjust as necessary.			✓					
	g. Inspect the elongation and even tension for step chain. Adjust as necessary.			✓					
	h. Grease main sprocket for step chain.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	i. Inspect the condition of step chain wheel. Repair or replace as necessary.			✓					
	j. Lubricate brake pins as necessary.			✓					
	k. Clean brake wheel and shoe.			✓					
	l. Inspect brake linings for wear. Replace as necessary.			✓					
4.5	Handrail Drive Chain								
	a. Inspect handrail drive chain. Adjust, retension, lubricate, repair or replace as necessary.			✓					
4.6	Drive Chain								
	a. Inspect drive chain. Lubricate, repair or replace as necessary.			✓					
4.7	Handrail								
	a. Inspect handrail entrance switches at upper and lower landing. Adjust as necessary.			✓					
	b. Check and clean handrail surface.			✓					
	c. Clean inside of handrail and handrail profile.			✓					
	d. Inspect handrail speed and temperature. Adjust as necessary.			✓					
	e. Inspect the tension of handrail. Adjust as necessary.			✓					
4.8	Truss								
	a. Remove the dust inside the truss.			✓					
	b. Check and tighten the track fastening.			✓					
	c. Wash tracks.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
4.9 Drive Unit	a. Inspect oil level of gear. Top-up or change as necessary.			✓					
	b. Inspect all motor bearings, lubricate with grease. Replace as necessary.			✓					
	c. Inspect carbon brushes and slip rings of all motors. Clean, repair or replace as necessary.			✓					
	d. Inspect safety devices fitted to all motors. Clean, adjust, lubricate, repair or replace as necessary.			✓					
4.10 Main Drive Shaft	a. Inspect the main drive shaft for normal operation. Adjust, repair or replace as necessary.			✓					
4.11 Handrail Drive Shaft	a. Inspect spring setting for handrail drive. Adjust as necessary.			✓					
	b. Inspect the drive shaft for normal operation. Adjust, repair or replace as necessary.			✓					
	c. Lubricate bearings.			✓					
4.12 Safety Switches	a. Inspect handrail safety contact. Adjust or replace as necessary.			✓					
	b. Inspect skirt switches. Adjust or replace as necessary.			✓					
	c. Inspect broken steps contacts. Adjust or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	d. Combing contact. Adjust or replace as necessary.			✓					
	e. Step sag contact. Adjust or replace as necessary.			✓					
4.13	Automatic Lubrication System								
	a. Inspect lubrication system (if fitted). Top up as necessary.			✓					
4.14	Monitoring Devices								
	a. Inspect overspeed and underspeed devices. Replace as necessary.			✓					
	b. Inspect step monitor. Replace as necessary.			✓					
	c. Check the control system of the escalator. Replace as necessary.			✓					
	d. Clean the connection boxes. Tighten all screws and check the condition of cables.			✓					
	e. Inspect rectifier's voltage. Replace as necessary.			✓					
	f. Test all safety devices. Adjust as necessary.			✓					
	g. Carry out electrical insulation test and earth continuity test for all electrical equipment. Repair or replace as necessary.			✓					
	h. Test the contract speed of the escalator. Adjust as necessary.			✓					
4.15	Building Control Room								
	a. Inspect operation of key switches. Repair or replace as necessary.			✓					
	b. Inspect operation of indicators. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Inspect operation of TV monitor, CPU and keyboard, repair or replace as necessary.			✓					
	d. Inspect operation of system, repair or replace as necessary.			✓					
	e. Arrange and attend to Department of Occupational Safety and Health (DOSH) inspections, mandatory checks, tests and paying the necessary fees.	As required							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
5.0	COLD WATER SUPPLY AND BOOSTER PUMP a. The Contractor shall ensure proper operation of cold water booster pumping system and shall monitor and check the system. This shall include works such as monitoring of water tank level, pump status, etc. and respond to any complaint with regards daily operation. b. The Maintenance of cold water and its related system, will be carried out in accordance with the manufacturers schedule and the schedule below :-								
5.1	Pump Room a. Inspect pump room cleanliness. Clean as necessary. b. Inspect for correct labelling. Do labelling as necessary. c. Inspect emergency light. Repair or replace as necessary. d. Inspect condition of door. Repair or replace as necessary. e. Inspect light intensity. Replace as necessary. f. Inspect floor trap/ drain to ensure good water flow. Clean or repair as necessary. g. Inspect pump circuit diagram (laminated & framed) are up to date. Replace as necessary. h. Inspect pump layout diagram (laminated & framed) are up to date. Replace as necessary. i. Inspect portable fire extinguisher (CO2). Replace as necessary.		✓			✓			

No.	Description	Maintenance Frequency								
		D	W	M	3M	6M	Y	2Y	5Y	
5.2 Tanks (Suction & Storage)	a. Inspect for integrity of structure. Repair as necessary.			✓						
	b. Inspect for leaks. Repair or replace as necessary.			✓						
	c. Inspect for rust. Repair or replace as necessary.			✓						
	d. Inspect operation of ball valve. Repair or replace as necessary.			✓						
	e. Inspect water tank level indicator. Repair or replace as necessary.			✓						
	f. Inspect electrode and clean. Repair or replace as necessary (if equipped).			✓						
	g. Inspect for sediment. Clean and flush. Do water sampling.						✓			
	h. Inspect internal and external cat ladder. Repair or replace as necessary.						✓			
5.3 Pumps	i. General									
	a. Inspect condition (cleanliness or appearance) of pumps or motor.			✓						
	b. Test run each pump on automatic and manual mode.			✓						
	c. Inspect the correct cut-in/ cut-out auto mode operation of the pressure switch. Check pressures.			✓						
	d. Inspect all pump bearings for excessive noise, vibration and wear. Lubricate with oil or grease. Replace as necessary.			✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	e. Inspect all motor bearings and lubricate with grease. Replace as necessary.			✓					
	f. Inspect carbon brushes and slip rings of all motors. Clean, repair or replace as necessary.			✓					
	g. Inspect safety devices fitted to all motors. Clean, adjust, lubricate, repair or replace as necessary.			✓					
	h. Inspect all seals for leakage. Repair or replace as necessary.			✓					
	i. Adjust and re-pack and replace pump glands as necessary.			✓					
	j. Inspect each pump/ motor alignment, mountings and correct rotation. Adjust or replace as necessary.			✓					
	k. Inspect all rubber couplings between pumps and drive motor. Replace as necessary.			✓					
	l. Inspect all belt drives. Adjust and retension. Replace as necessary.			✓					
	m. Inspect and tighten all bolts and nuts. Replace as necessary.			✓					
	n. Inspect and test pressure switches and gauges. Repair or replace as necessary.			✓					
	ii. Control Panel								
	a. Inspect the condition of the panel and its housing. Repair or replace as necessary.			✓					
	b. Inspect and test the control wiring and circuitry. Retighten, repair or replace as necessary.			✓					
	c. Inspect electric pump starter operation, ensure that the starting sequence is correct. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	d. Inspect the operation of selector switches. Repair or replace as necessary.			✓					
	e. Inspect the operation of auto-manual selector switches. Repair or replace as necessary.			✓					
	f. Inspect the operation of stop-start buttons. Repair or replace as necessary.			✓					
	g. Inspect indicating light for trip and run. Replace as necessary.			✓					
	h. Inspect indicating light for pump on auto and pump manual. Replace as necessary.			✓					
	i. Inspect ammeter and voltmeter. Replace as necessary.			✓					
	j. Inspect and retighten all loose connection of all electrical contactors.			✓					
	k. Clean and replace electrical contactors as necessary.			✓					
	l. Replace electric fuses as necessary.			✓					
	m. Inspect the condition of the conduits, wires and supports.			✓					
	n. Inspect or replace indicating bulbs and covers.			✓					
	o. Inspect and ensure tank level and pump operations are correctly registered in the Building Management System (BMS).			✓					
5.4	Piping and Fittings								
	a. Inspect the condition of every pipe. Repair or replace as necessary.			✓					
	b. Inspect the condition of the pipe supports, brackets, pipe sleeves and piping joints. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Inspect the condition of every valves and fittings. Repair or replace as necessary.			✓					
	d. Inspect and clean strainers. Repair or replace as necessary.					✓			
	e. Inspect for correct labeling. Clean, repair or replace as necessary.					✓			
	f. Inspect plumbing, pipe-works & fittings and pipe supports. Repair or replace as necessary.			✓					
	g. Brush pipes to be cleaned from accumulated dust.					✓			
5.5	Pressure Vessel								
	a. Inspect and test pressure vessel/ hydro-pneumatic vessel for leaks. Replace diaphragm as necessary.			✓					
	b. Inspect and test system pressure. Adjust as necessary.			✓					
5.6	Submersible Pumps								
	a. Inspect electrical termination for tightness.			✓					
	b. Inspect all seals for leakage. Replace as necessary.			✓					
	c. Inspect pump and motor bearings for excessive noise, vibration & wear. Replace as necessary.			✓					
	d. Inspect for correct rotation.			✓					
	e. Inspect condition of one way valve. Replace as necessary.			✓					
	f. Inspect float sensors for correct indication. Adjust, repair or replace as necessary.		✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	g. Inspect impeller for blockage. Clean, repair or replace as necessary.		✓						
	h. Inspect and test run each pump on auto and manual mode under load condition.		✓						
	i. Inspect the pump suction. Clean pump pit, repair or replace as necessary.		✓						
5.7	Painting								
	a. Inspect painting, ensure the system (equipment and piping) are painted with anti rust and coated with correct colour paint. Repaint or recoat as necessary.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
6.0	NATURAL GAS								
	a. General inspection for sign of leakage - check for hissing noise, smell, white cloud, bubbles from underground pipe. Repair as necessary.			✓					
	b. Inspect and test Emergency Shut Off Valve. Repair or replace as necessary.			✓					
	c. Inspect that there is no unauthorized changes to the approved installation. Report to FSO/SO/ Owner. Repair or replace as necessary.			✓					
	d. Inspect leaks at all flanges, threaded and welded connection of all piping and fittings. Repair or replace as necessary.			✓					
	e. Inspect for corrosion or damage at support, pipeline and fittings. Repair or replace as necessary.			✓					
	f. Inspect painting, ensure the system (equipment and piping) are painted with anti rust and coated with correct colour paint. Repaint or recoat as necessary.						✓		
	g. Ensure no condensation or sweating at regulators and piping. Repair or replace as necessary.			✓					
	h. Inspect the connections to equipment, ensure the fittings and hoses are in good working condition. Repair or replace as necessary.			✓					
	i. Perform general housekeeping in main riser.			✓					
	j. Inspect all signages are in good condition. Repair or replace as necessary.			✓					
	k. Perform functional test on Emergency shut off valve.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	I. Obtain renewal permit for ATO (approval to operate) from relevant authority (Energy Commission/ <i>Suruhanjaya Tenaga</i>)						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
7.0	<p>GONDOLA The Contractor shall ensure proper operation of all Gondola System and equipment and shall monitor and check the system. This shall include works such as visual checking, monitoring cleaning, etc. and respond to any complaint with regards day to day operation.</p>								
7.1	<p>Maintenance The approved Competent Person (CP) by Department Occupational of Safety and Health (DOSH) and Public Work Department (PWD) shall thoroughly examine the gondola and cause them to be serviced and adjusted once in every month. The maintenance of gondola and its related system shall be carried out in accordance with related regulations and guidelines by DOSH, the manufacturers schedules and the following but not limited to :-</p> <p>a. Inspect motor bearing and other related parts. Repair or replace any parts as necessary.</p> <p>b. Observe for any leakage of hydraulic oil. Repair, replace or refill as necessary.</p> <p>c. Inspect for any missing or damaged component or parts. Repair or replace as necessary.</p> <p>d. Inspect safety catch device, emergency brake, limit switch and other related parts. Repair or replace as necessary.</p> <p>e. Inspect main switch, power cable, panel, supply and emergency stop button. Repair or replace as necessary.</p> <p>f. Inspect and test buzzer or alarm. Repair or replace as necessary.</p> <p>g. Test run unit to ensure good operating condition. Repair as necessary.</p>			✓					
				✓					
				✓					
				✓					
				✓					
				✓					
				✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	h. Check and report wire ropes for damage or any defect.			✓					
	i. Arrange and attend to Department of Occupational Safety and Health (DOSH) inspections, mandatory checks, tests and paying the necessary fees.	As per latest DOSH requirement.							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
8.0	<p>INSPECTION OF MECHANICAL SERVICES ABOVE CEILING</p> <p>a. Inspect for proper anchorage of all mechanical services. Repair or replace as necessary.</p> <p>b. Inspect for leaks at ducting, piping and insulation. Repair or replace as necessary.</p> <p>c. Ensure the spaces are free from debris. Remove all rubbish and wastes.</p>					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
9.0	POOL AND FOUNTAIN								
9.1	Water Pump								
	a. Inspect all motor bearings and lubricate with grease. Replace as necessary.			✓					
	b. Check coupling and alignment. Repair or replace as necessary.			✓					
	c. Check all hold-down bolts and nuts. Tighten and replace as necessary.			✓					
	d. Check connections of flexible joints. Repair or replace as necessary.			✓					
	e. Check flow switch and pressure switch. Repair or replace as necessary.				✓				
	f. Clean pipe line filter and remove blockage. Replace as necessary.				✓				
	g. Open up pump to inspect for wear. Repair or replace any parts as necessary.						✓		
9.2	Electrical Motor								
	a. Inspect and clean carbon brushes. Replace as necessary.			✓					
	b. Check brushes tension. Repair or replace as necessary.			✓					
	c. Check for running ampere and voltage.			✓					
	d. Check slip rings for smooth contact. Repair or replace as necessary.				✓				
	e. Check and lubricate bearings. Repair or replace as necessary.					✓			
	f. Check alignment and coupling. Repair or replace as necessary.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	g. Check motor terminals and tightness. Repair or replace as necessary.					✓			
	h. Check for winding insulation resistance by means of megaohm meter. Repair or replace as necessary.					✓			
9.3	Electrical Switchgear/ Switchboard								
	a. Isolate the incoming power and check for panel control circuit operation.			✓					
	b. Inspect starter coil condition. Repair or replace as necessary.			✓					
	c. Inspect auxiliary contact, timer and other switch gear. Repair or replace as necessary.			✓					
	d. Clean and adjust contacts.			✓					
	e. Check tightness of starters connection. Repair as necessary.			✓					
	f. Check for incoming voltage and running ampere.			✓					
	g. Check thermal overload and relays. Repair or replace as necessary.					✓			
	h. Check cut-out fuses. Replace as necessary.					✓			
9.4	Piping								
	a. Check for any leakage at valves and connection of fittings. Rectify the problems as necessary.			✓					
	b. Check any leakage at the connection of equipment.			✓					
	c. Clean strainer.			✓					
	d. Remove sludge blockage at aeration nozzle.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	e. Check the flow rate of water during system operation. Record the reading.			✓					
9.5	Filter								
	a. Check the filter media capacity. Replace as manufacturer recommendation.			✓					
	b. Check flow rate.			✓					
	c. Check the blower operation. Repair or replace as necessary.				✓				
	d. Check the function of multi-port valve and back wash system.				✓				
	e. Check connections of valve. Repair or replace as necessary.				✓				
	f. Check all hold-down bolts and nuts. Tighten or replace as necessary.				✓				
	g. Clean pipe line and remove blockage.				✓				
9.6	UV Disinfection Unit								
	a. Check pipe fittings. Repair or replace as necessary.				✓				
	b. Check water flow rate.				✓				
	c. Clean body and UV bulb. Replace as necessary.					✓			
	d. Change the bulb.						✓		
9.7	Skimmer & Bottom Drain								
	a. Remove the debris and sludge blockage.			✓					
	b. Check pipe fittings and filter media. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
10.0	IRRIGATION SYSTEM AND LANDSCAPE								
10.1	Water Pump								
	a. Inspect all bearings and lubricate with grease. Replace as necessary.			✓					
	b. Check coupling and alignment. Repair or replace as necessary.			✓					
	c. Check all hold-down bolts and nuts. Tighten and replace as necessary.			✓					
	d. Check connections of flexible joints. Repair or replace as necessary.			✓					
	e. Check flow switch and pressure switch. Repair or replace as necessary.				✓				
	f. Clean pipe line filter and remove blockage. Replace as necessary.				✓				
	g. Open up pump to inspect for wear. Repair or replace any parts as necessary.						✓		
10.2	Electrical Motor								
	a. Inspect and clean carbon brushes. Replace as necessary.			✓					
	b. Check brushes tension. Repair or replace as necessary.			✓					
	c. Check for running ampere and voltage.			✓					
	d. Check slip rings for smooth contact. Repair or replace as necessary.				✓				
	e. Check and lubricate bearings. Repair or replace as necessary.					✓			
	f. Check alignment and coupling. Repair or replace as necessary.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	g. Check motor terminals and tightness. Repair or replace as necessary.					✓			
	h. Check for winding insulation resistance by means of megaohm meter. Repair or replace as necessary.					✓			
10.3	Electrical Switchboard/ Control Panel								
	a. Isolate the incoming power and check for panel control circuit operation.			✓					
	b. Inspect starter coil condition. Repair or replace as necessary.			✓					
	c. Inspect auxiliary contact, timer and other switch gear. Repair or replace as necessary.			✓					
	d. Clean and adjust contacts.			✓					
	e. Check tightness of starters connection. Repair as necessary.			✓					
	f. Check for incoming voltage and running ampere.			✓					
	g. Check thermal overload and relays. Repair or replace as necessary.					✓			
	h. Check cut-out fuses. Replace as necessary.					✓			
10.4	Piping								
	a. Check for any leakage at valves and connection of fittings. Rectify the problems as necessary.			✓					
	b. Check any leakage at the connection of equipment.			✓					
	c. Clean strainer.			✓					
	d. Remove sludge blockage at aeration nozzle.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
10.5	e. Check the flow rate of water during system operation. Record the reading. Adjust as necessary.			✓					
	Filter								
	a. Clean the filter media. Repair or replace as necessary.			✓					
10.6	b. Check pipe fittings. Repair or replace as necessary.			✓					
	Skimmer								
	a. Remove the debris and sludge blockage.			✓					
	b. Check pipe fittings and filter media. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
11.0	KITCHEN EQUIPMENT								
11.1	Insect Killer								
	a. Check its function. Repair or replace as necessary.		✓						
	b. Change the UV tubes.						✓		
	c. Clean from dirt, dust and insect debris.			✓					
11.2	Cold Room and Chiller								
	a. Check motor and fan blade. Repair or replace as necessary.			✓					
	b. Check the control panel for loose terminal and contact. Tighten, repair or replace as necessary.			✓					
	c. Check door hinges and gasket for damages. Replace as necessary.				✓				
	d. Check compressor running ampere. Repair as necessary.				✓				
	e. Clean and service condenser coil.				✓				
	f. Check piping for leakage. Repair or replace as necessary.				✓				
	g. Check temperature sensor. Repair as necessary.				✓				
	h. Check for door air tightness. Repair as necessary.				✓				
	i. Check curtain. Replace as necessary.				✓				
	j. Check refrigerant pressure. Top-up refrigerant, repair or replace as necessary.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
11.3 Ice Cubed/ Ice Machine	a. Check piping for leakage. Repair or replace as necessary.			✓					
	b. Check switch function and contact. Repair or replace as necessary.				✓				
	c. Check compressor running ampere. Repair or replace as necessary.				✓				
	d. Clean and service condenser coil. Repair or replace as necessary.				✓				
	e. Check motor and fan blade. Repair or replace as necessary.				✓				
11.4 Island Exhaust Hood	a. Check and replace faulty lighting bulb when necessary.				✓				
11.5 Open Burner Range	a. Check nozzle for blockage. Repair or replace as necessary.			✓					
	b. Check gas valve for leakage. Repair or replace as necessary.				✓				
	c. Check manifold for leakage, tighten all joints. Repair or replace as necessary.				✓				
	d. Clean and adjust angle of thermocouple.				✓				
11.6 Oven	a. Check switches for function. Repair or replace as necessary.			✓					
	b. Check wiring and tighten all loose terminal. Replace as necessary.				✓				
	c. Check door latch and gasket for damage. Repair or replace as necessary.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
11.7	Hobs a. Check gas valve for leakage. Repair or replace as necessary.			✓					
11.8	Food Warmer a. Check switch function and loose contact. Repair or replace as necessary. b. Check thermostat on temperature setting. Repair or replace as necessary.			✓		✓			
11.9	Dishwasher a. Check and tighten all loose contacts in control panel. b. Check functional of all switches. Repair or replace as necessary. c. Check door latch and gasket, replace as necessary. d. Check thermostat and pump. Repair or replace as necessary.			✓					
11.11	Microwave Oven a. Check wiring and tighten all loose terminals. b. Check all switches for individual function. Repair or replace as necessary. c. Check door latch and gasket for damage. Repair or replace as necessary.			✓					
11.12	Refrigerator a. Check compressor running ampere. Repair or replace as necessary. b. Check blower fan and motor. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
11.13	c. Check gas pressure. Top-up refrigerant, Repair or replace as necessary.			✓					
	Kitchen Hood								
	a. Clean kitchen hood (interior and exterior).		✓						
	b. Inspect and align motor, mounts and pulley.			✓					
	c. Grease bearings.			✓					
	d. Balance fan blades.			✓					
	e. Inspect and replace belts.			✓					
	f. Inspect and adjust conduit, switches and housing.			✓					
	g. Inspect and adjust grease box, overflow and containment area.			✓					
h. Replace and install filters, lights, globes and blow-off caps.			✓						
11.14	Kitchen Exhaust Fan								
	a. Inspect the function of the complete exhaust system.			✓					
	b. Adjust air volume control dampers to ensure functionality.					✓			
	c. Inspect the operation of all fans and motors.			✓					
	d. Clean the fan blade from dirt, grease, oil and etc.			✓					
	e. Test operation of system under simulated fire condition.			✓					
	f. Measure air flow. Adjust and balance air flow to ensure functionality.						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
11.15 Kitchen Fresh Air Fan	a. Inspect the function of the complete fresh air system.			✓					
	b. Adjust air volume control dampers to ensure functionality.					✓			
	c. Inspect the operation of all fans and motors.			✓					
	d. Clean the fan blade from dirt, grease, oil and etc.			✓					
	e. Test operation of system under simulated fire condition.			✓					
	f. Measure air flow. Adjust and balance air flow to ensure functionality.					✓			
11.16 Wet Chemical System	a. Inspect gas cylinder and pressure gauge. Refill, repair or replace as necessary.			✓					
	b. Check cylinder weight.			✓					
	c. Inspect any missing, damaged or deteriorated parts on the cylinders, hoses and fittings. Repair or replace as necessary.			✓					
	d. Inspect and test control panel. Repair or replace as necessary.			✓					
	e. Inspect and test AC & DC supply. Repair or replace as necessary.			✓					
	f. Inspect and test indicator bulbs. Repair or replace as necessary.			✓					
	g. Inspect condition of battery, battery terminal and battery chargers. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	h. Inspect and test detectors including all wirings and its functionality. Repair or replace as necessary.			✓					
	l. Inspect break glass for manual switch/ pull handle. Repair or replace as necessary.			✓					
	j. Inspect the condition of the manual key switch/ pull handle. Repair or replace as necessary.			✓					
	k. Check and ensure air-conditioning and fan trip when system operated. Repair or replace as necessary.			✓					
	l. Check and ensure fire curtain function when gas discharge. Repair or replace as necessary.			✓					
	m. Ensure the detectors are free from obstruction, dust, dirt and cobweb. Clean, repair or replace as necessary.			✓					
	n. Painting distribution pipe, equipment and control panel.						✓		
	o. Inspect for rusty parts and replace if damages.			✓					
	p. Conduct simulation test (minus gas discharge).					✓			
	q. Ensure time delay for discharge is within 25 - 30 seconds.					✓			
	r. Inspect and test the correct operation of the bell and warning light. Repair or replace as necessary.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
12.0	LAUNDRY EQUIPMENT								
12.1	Washer								
	a. Inspect back panel and check the overflow hose and drain hose for leaks. Repair or replace as necessary.			✓					
	b. Unlock hinged lid and check the supply dispenser hose and hose connections. Repair or replace as necessary.			✓					
	c. Check inlet hose filter screen and replace the filter screen if it is worn out or damaged.			✓					
	d. Check tightness of the motor spring and motor pulley. Repair or replace as necessary.			✓					
	e. Clean the lint from the motor.			✓					
	f. Remove any moisture and dust from all electrical components.			✓					
	g. Check the V-belt(s) for uneven wear and frayed edges. Replace as necessary.				✓				
	h. Check bearings and seals, and apply greasing, repair or replace as necessary.				✓				
12.2	Vacuum Ironing Board and Flat work Ironer								
	a. Test power supply by ON and OFF unit.			✓					
	b. Clean and spray the flatwork ironer surface from uneven stains.			✓					
	c. Check the cable ironer and make sure no cable tear off. Replace as necessary.			✓					
12.3	Undershelf								
	a. Clean and wash sink.			✓					
	b. Clean and spray under shelf.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
13.0	CENTRALIZED VACUUM SYSTEM								
13.1	Changing the dust bag								
	a. Changing or emptying of the dust bag or container.			✓					
	b. Replace new dust bag and place it into the canister.			✓					
	c. Check the tightness of the lid on the dust canister.			✓					
13.2	Wall Outlet								
	a. Check every wall outlet. Clean, repair or replace as necessary.			✓					
13.3	Vaccum Hose								
	a. Check for any obstructions in the hose. Clean, repair or replace as necessary.			✓					
13.4	Vacuum Unit								
	a. Check suction, pressure, rotation and any abnormal on functional and performance. Repair or replace as necessary.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
14.0	WASTE COLLECTION COMPACTOR								
	a. Inspect switches and connection of electrical control panel in proper operation. Repair or replace as necessary.			✓					
	b. Inspect and adjust safety and limit switches. Repair or replace as necessary.			✓					
	c. Inspect warning lights, pressure gauge, key switches and emergency stop in proper operation. Repair or replace as necessary.			✓					
	d. Inspect lubrication for door hinges, door handles, paddle latches, turnbuckles, access gates, motor, motor coupling, ram track and guides. Repair or replace as necessary.			✓					
	e. Check hydraulic system. Condition of hoses and fittings, oil levels, cylinder shaft wear and leakage. Check operating pressure. Repair or replace as necessary.			✓					
	f. Inspect for rusty parts and replace if damages			✓					
	g. Inspect physical appearance, wear points, ground anchors, wiper blade and follower plate. Repair or replace as necessary.			✓					
	h. Check physical conditions of rollers, door hinges and latching mechanisms. Repair or replace as necessary.			✓					
	i. Perform oil change.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
15.0	<p>CENTRALIZED AIR PURIFIER, ASSESSMENT & CONTROL</p> <p>a. Perform general cleaning of the product body by using suitable material or product as recommended by manufacturer.</p> <p>b. Perform cleaning the air inlet and outlet vent as well as pollution sensor with a soft brush or vacuum cleaner.</p> <p>c. Perform filter cleaning. Replace all filters including pre-filter as manufacturers recommendation.</p>			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
16.0	<p>SEWAGE TREATMENT PLANT (STP) AND PUMPING STATION</p> <p>a. The Contractor/ Operator must comply with Akta Industri Perkhidmatan Air 2006. The Contractor shall ensure proper operation of Sewerage Treatment Plant, Pumping Station and Septic Tank. This shall include works such as monitoring of all mechanical equipment status, condition of all tanks, odor emission, quality of effluent, cleanliness and safety of the plants and stations, etc. and respond to any complaint with regards daily operation.</p> <p>b. The Contractor also shall ensure sewer network and all manholes are in good condition with no obstruction near the manholes cover.</p> <p>c. The Maintenance of Sewerage Treatment Plant, Pumping Station and its related system, will be carried out in accordance with the manufacturer's schedule and the schedule below :-</p>								
16.1	<p>Manually Cleaned Bar Screen</p> <p>a. Ensure no rubbish blockage at the screen. Clean the screen.</p> <p>b. Inspect the condition. Ensure no damage or fracture at the bar. Repair or replace as necessary.</p> <p>c. Inspect all hold-down bolts, nuts, steel base and its concrete. Tighten, repair and replace as necessary.</p>		✓						
16.2	<p>Mechanically Cleaned Bar Screen</p> <p>a. Inspect physical condition i.e. cracks, corrosion or damaged. Repair or replace any faulty parts as necessary.</p>			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Ensure smooth operation/ rotation with excessive noise and vibration. Repair or replace any part as necessary.			✓					
	c. Ensure no rubbish blockage. Clean the screen including wastage storage/ bin.		✓						
	d. Inspect all hold-down bolts, nuts, steel base and its concrete. Tighten, repair and replace as necessary.			✓					
	e. Inspect all bearings and gears i.e. excessive noise, leakage, cracks or damaged. Repair or replace any faulty parts or as necessary.			✓					
	f. Inspect wiring insulation of all phases. Repair or replace as necessary.			✓					
	g. Inspect all hold-down bolts, nuts, steel base and its concrete. Tighten, repair and replace as necessary.			✓					
	h. Inspect all belt drives. Adjust and retension. Replace as necessary.			✓					
	i. Change gear oil.						✓		
16.3	Mechanical Screw Conveyor								
	i. General								
	a. Inspect condition of the screw shaft conveyor. Report to FSO/ SO/ Owner if found any damages or cracks at the shaft.			✓					
	b. Test the screw conveyor automatic and manually. Repair or lubricate as necessary.			✓					
	c. Do overall cleaning including the wastage storage.		✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>ii. Motor</p> <p>d. Inspect bearing motor. Repair, replace or lubricate as necessary.</p> <p>e. Inspect wiring insulation of all phases. Repair or replace as necessary.</p> <p>f. Inspect physical condition of motor i.e. crack or damaged. Repair or replace any faulty parts or as necessary.</p> <p>g. Ensure motor can achieve full performance in 30s after start.</p> <p>iii. Gear Box</p> <p>h. Inspect all bearings and gears i.e. excessive noise, leakage, cracks or damaged. Repair or replace any faulty parts or as necessary.</p> <p>i. Check coupling and alignment. Repair or replace as necessary.</p> <p>j. Inspect all hold-down bolts, nuts, steel base and its concrete. Tighten, repair and replace as necessary.</p> <p>k. Inspect all belt drives. Adjust and retension. Replace as necessary.</p> <p>l. Inspect gear oil level. Top-up as necessary.</p> <p>m. Change gear oil.</p>			✓					
16.4	<p>Submersible Pump</p> <p>i. General</p> <p>a. Inspect condition (cleanliness/ appearance) of pumps or motor.</p>			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Inspect all pump bearings for excessive noise, vibration & wear. Lubricate with oil or grease. Replace as necessary.			✓					
	c. Inspect carbon brushes and slip rings of all motors. Clean, Repair or replace as necessary. Repair or replace as necessary.			✓					
	d. Inspect all seals for leakage. Repair or replace as necessary.			✓					
	e. Inspect electrical termination for tightness.			✓					
	f. Inspect for correct rotation.			✓					
	g. Inspect condition of one way valve. Replace as necessary.			✓					
	h. Inspect float sensors for correct indication. Adjust, Repair or replace as necessary.		✓						
	i. Inspect impeller for blockage. Clean, repair or replace as necessary.		✓						
	j. Inspect and test run each pump on auto and manual mode under load condition.		✓						
	k. Inspect the pump suction and clean pump pit. Repair or replace any parts as necessary.		✓						
	l. Inspect and tighten all bolts and nuts. Replace as necessary.			✓					
	ii. Piping and Fittings								
	a. Inspect the condition of every pipe. Repair or replace as necessary.			✓					
	b. Inspect the condition of the pipe supports, brackets, pipe sleeves and piping joints. Repair or replace as necessary.			✓					
	c. Inspect the condition of every valves and fittings. Repair or replace as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>e. Inspect for correct labeling. Clean, repair or replace as necessary.</p> <p>f. Inspect plumbing, pipe-works & fittings and pipe supports. Repair or replace as necessary.</p> <p>g. Brush pipes to be cleaned from accumulated dust.</p> <p>iii. Pressure Vessel</p> <p>a. Inspect and test pressure vessel/ hydro-pneumatic vessel for leaks. Replace diaphragm as necessary.</p> <p>b. Inspect and test system pressure. Adjust as necessary.</p>			✓		✓			
16.5	Aerator			✓					
	<p>a. Inspect physical condition i.e. cracks, corrosion, excessive noise, vibration or damaged. Repair or replace any faulty parts or as necessary.</p> <p>b. Inspect bearing motor. Repair, replace or lubricate as necessary.</p> <p>c. Check coupling and alignment for propellers and shafts. Repair or replace as necessary.</p> <p>d. Ensure pontoon are in a good condition. Repair or replace as necessary.</p> <p>e. Inspect mooring cable, clip and clean junction boxes. Repair or replace as necessary.</p>			✓					
16.6	Control Panel			✓					
	<p>a. Inspect the condition of the panel and its housing. Repair or replace as necessary.</p>			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Inspect and test the control wiring and circuitry of all equipment. Retighten, repair or replace as necessary.			✓					
	c. Inspect electric pump starter operation, ensure that the starting sequence is correct. Repair or replace as necessary.			✓					
	d. Inspect the operation of selector switches. Repair or replace as necessary.			✓					
	Inspect the condition of isolator. Repair or replace as necessary.								
	e. Inspect the operation of auto-manual selector switches. Repair or replace as necessary.			✓					
	f. Inspect the operation of stop-start buttons. Repair or replace as necessary.			✓					
	g. Inspect condition of overload relay. Repair or replace as necessary.			✓					
	h. Inspect condition of auto transformer. Tighten the terminals as necessary.			✓					
	i. Inspect condition of timer relays. Repair or replace as necessary.			✓					
	j. Inspect indicating light for trip and run. Replace as necessary.			✓					
	k. Inspect indicating light for pump on auto and pump manual. Replace as necessary.			✓					
	l. Inspect ammeter, voltmeter, coil transformer meter and all indicating bulbs with covers. Replace as necessary.			✓					
	m. Inspect and retighten all loose connection of all electrical contactors.			✓					
	n. Clean and replace electrical contactors as necessary.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	o. Replace electric fuses as necessary.			✓					
	p. Clean the control panel room/ pump room/ blower room.			✓					
16.7	Effluent Sampling for STP								
	a. Carry out effluent sampling by accredited lab in accordance with the requirement of MS 1228:1991 or approved equivalent standards. The report shall be submitted to FSO/ SO/ Owner which consist of the following parameters but not limited to: 1) pH value 2) BOD-5Days@20 degree Celcius 3) Chemical Oxygen Demand (COD) 4) Suspended Solid 5) Oil & Grease FM Contractor shall take action to ensure the quality of effluent to be complied with the Environmental Quality (Sewage and Industrial Effluents) Regulation, 1979.			✓					
16.8	Painting								
	a. Inspect condition of painting, ensure the system (equipment, control panel and piping) are painted with anti rust and coated with approved color scheme. Repaint or recoat as necessary.					✓			
16.9	Safety and Security								
	a. Inspect condition of fences/ brick walls. Repair or replace as necessary.			✓					
	b. Report to FSO/ SO/ Owner of any break-in to the compartment in whether incur loss or not.		✓						
16.10	Housekeeping								
	a. Cleaning the area of STP includes cutting the tree's branches from entering the sewage, grass cutting and etc.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
17.0	DENTAL SURGERY EQUIPMENT								
17.1	Suction Motor								
	a. Check for cracks of the whole unit. Repair or replace any parts as necessary.				✓				
	b. Clean-up the filter located at inlet area. Replace as necessary.				✓				
	c. Check inlet tubing and drain connected properly. Repair or replace as necessary.				✓				
	d. Check all the tubing and hose are no leakage. Repair or replace as necessary.				✓				
	e. Clean the whole unit.				✓				
	f. Check that all the wiring connection is tight. Tighten as necessary.				✓				
	g. Check and service condensation remover.				✓				
	h. Check and service the float sensor in the Orotol container. Repair or replace as necessary.				✓				
	i. Check and service exhaust system non-returning valve of V-Clinic Suction unit. Repair or replace as necessary.				✓				
	j. Tighten vibration reducers.				✓				
	k. Check vacuum efficiency. Repair or replace as necessary.				✓				
	l. Check the volume flow of large suction hose:250 – 350 l/min.				✓				
	m. Check function of min vacuum pressure.				✓				
	n. Check number of operational hours.				✓				
	o. Check the mechanism of air bleed opening.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
17.2	X- ray								
	a. Check for cracks of the whole unit. Repair or replace any parts as necessary.				✓				
	b. Ensure the unit is well-attached to the wall. Repair as necessary.				✓				
	c. Movement smooth and without noise, but remains immobile once release.				✓				
	d. Able to hold the tube head once release.				✓				
	e. Check for oil leaking and correctly tighten.				✓				
	f. Able to run self-test without error.				✓				
	g. Able to function well and LED is lit when button is pressed. Repair or replace as necessary.				✓				
17.3	Dental Chair								
	a. Checks cracks, rusty parts of the whole unit and unit balance on the ground. Repair or replace any parts as necessary.				✓				
	b. Ensure the chair movement is smooth and without noise.				✓				
	c. Operating Light and Sensor able to ON and OFF using sensor or manual. Repair or replace as necessary.				✓				
	d. Doctor's and assistant touch pad function without error. Repair or replace as necessary.				✓				
	e. Check Foot Control/ Foot Pedal able to function without error. Repair or replace as necessary.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	f. Check for headpieces drive air pressure, water and air spray. Check for water leakage. Repair or replace any parts as necessary.				✓				
	g. Check built-in electric motor function with power control and water spray. Repair or replace any parts as necessary.				✓				
	h. Check built-in scaler function with power control and water spray. Repair or replace any parts as necessary.				✓				
	i. Check 3-Way syringes any sign of blockage and leakage. Repair or replace any parts as necessary.				✓				
	j. Empty the oil mist collector in doctor's table.				✓				
	k. Clean the spittoon filter.				✓				
	l. Clean and empty the solid collector filter.				✓				
	m. Check for leakage, blockage and broken part. Ensure tubing is not block.				✓				
	n. Ensure upholstery no stain or crack. Repair or replace any parts as necessary.				✓				
	o. Ensure fil viewer function without error.				✓				
	p. Water fill & flush, and stop automatically. Water drain smoothly from bowl.				✓				
	q. Ensure water, air, suction and drain piping well connected with no leakage. Repair or replace any parts as necessary.				✓				
	r. Ensure all electrical connections are in good condition. Repair or replace any parts as necessary.				✓				
	s. Clean and polish the whole unit.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
17.4	Compressor				✓				
	t. Clean and disinfect the suction and drain line using Orotol Plus solution.				✓				
	a. Check for cracks of the whole unit. Repair or replace as necessary.				✓				
	b. Proper levelling with front higher than rear.				✓				
	c. Able to start up without error messages.				✓				
	d. Checks condition of door gasket/seal. Change if necessary or numbers of cycle over the manufacturer recommended limit.				✓				
	e. Check the door lock mechanism able to lock the door properly. Repair or replace as necessary.				✓				
	f. Ensure the door is tightening when close fit to the chamber. Repair or replace as necessary.				✓				
	g. Change maintenance kit if numbers of cycle exceed the manufacturer recommended limit.				✓				
	h. Check functionality of all components.				✓				
	i. Clean all the filters.				✓				
	j. Ensure touch pad able to function well. Repair or replace as necessary.				✓				
	k. Ensure all electrical connections are in good condition and well tighten.				✓				
l. Ensure all the tubing are not bend, leak and well connected. Repair or replace as necessary.				✓					
m. Clean the chamber and ensure no cracks or leakage.				✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	n. Ensure all covers are well fixed.				✓				
	o. Clean the whole unit include water tank and chamber.				✓				
	p. Run universal program for 1 complete cycle.				✓				
	q. Reset maintenance counter if applicable.				✓				
17.5	Autoclave								
	a. Check for cracks of the whole unit. Repair or replace as necessary.				✓				
	b. Clean and change filter as necessary.				✓				
	c. Check the fuction of regulator. Repair or replace as necessary.				✓				
	d. Check all the tubes and hoses are not leak. Repair or replace as necessary.				✓				
	e. Check cut in/ cut out automatically by compressor. Repair as necessary.				✓				
	f. Check drain valve able to release and no leaking. Repair or replace as necessary.				✓				
	g. Ensure all electrical connections are in good condition and well tighten.				✓				
	h. Clean the whole unit.				✓				
	i. Run for 1 complete cycle.				✓				
	j. Safety feature well-functioning.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
18.0	MEDICAL GAS SYSTEM								
18.1	a. Check and record pressure at standby bank regulator.				✓				
	b. Test for leakage at joints and tailpipes. Repair or replace as necessary.				✓				
	c. Check condition and replace 'O' rings for tailpipes.				✓				
	d. Check non-return valve and correct operation, replace as required.				✓				
	e. Record right bank and left bank contain pressure.				✓				
	f. Check auto changeover function and pressure.				✓				
	g. Visual inspect of pressure relief valves conditions. Repair or replace as necessary.				✓				
	h. Turn ON cylinders on both banks to regain normal supply.				✓				
	i. Ensure all area alarm panel are in good working condition. Repair or replace as necessary.				✓				
	j. Test all alarm condition at manifold room. Repair as necessary.				✓				
	k. Check and record line pressure. Repair or replace any parts as necessary.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
19.0	MEDICAL EQUIPMENT								
19.1	Heart start Defibrillator/Monitor								
	a. Perform visual inspection. Repair or replace any faulty parts or as necessary.				✓				
	b. Power on self-test.				✓				
	c. Defibrillator test-AC power.				✓				
	d. Defibrillator battery power.				✓				
	e. Perform cleaning and general checking. Refer specialist/ manufacturer for complete services.				✓				
19.2	Mobile Examination Light								
	a. Check physical condition i.e. scratch, crack or damaged. Repair or replace any faulty parts or as necessary.				✓				
	b. Check power supply. Test ON and OFF.				✓				
	c. Check functionality of asset i.e. spring arm, extension arm, ceiling mounting, wall bearing, stative base, lighting data, UPS system, halogen lamp and focus lamp. Repair or replace as necessary.				✓				
	d. Perform maintenance i.e. adjust the spring force, greasing the securing segment. Repair or replace as necessary.				✓				
	e. Perform cleaning and general checking. Refer specialist/manufacturer for complete services.				✓				
19.3	Procedure Trolley								
	a. Check physical condition i.e. scratch, crack or damaged. Repair or replace any faulty parts or as necessary.				✓				
	b. Check power supply. Test ON and OFF.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
19.4	<p>c. Check functionality i.e. column- high and low, knee up and down, down-head section, tilting left and right, displacement transverse, longitudinal forwards and backwards, touch panel, remote control, brakes, motors and hydraulics, etc. Repair or replace or as necessary.</p> <p>d. Perform cleaning and general checking. Refer specialist/ manufacturer for complete services.</p>				✓				
	<p>ECG</p> <p>a. Perform visual inspection. Check if casing of the unit is undamaged, identification is unreadable, cable is not well fixed or damaged, display readings and identifications light not function. Repair or replace any faulty parts or as necessary.</p> <p>b. Perform test i.e. battery charge, power-on self-test, general operation test. Repair or replace any parts as necessary.</p> <p>c. Check program system i.e. QRS volume control, ECG operation. Repair or replace any faulty parts or as necessary.</p> <p>d. Test print. Repair or replace any faulty parts or as necessary.</p> <p>e. Perform cleaning and general checking. Refer specialist/ manufacturer for complete services.</p>				✓				
19.5	<p>Motorized and Manual Bed</p> <p>a. Check physical condition ie scratch, crack or damaged. Repair or replace any faulty parts or as necessary.</p> <p>b. Check power supply. Test ON and OFF.</p>				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>c. Check functionality i.e. hi, low, knee up and down, back up and down, foot and head board, handheld control, mattress stopper, central locking pedal, brake locking system, side rail, main frame, emergency handle and control box, etc. Repair or replace any faulty parts or as necessary.</p> <p>d. Perform cleaning and general checking. Refer specialist/ manufacturer for complete services.</p>				✓				
19.6	Transfer Trolley								
	<p>a. Check physical condition i.e. scratch, crack or damaged. Repair or replace any faulty parts or as necessary.</p> <p>b. Check functionality i.e. hi, low, knee up and down, back up and down, foot and head board, central locking pedal, brake locking system, side rail, main frame, emergency handle and control box, etc. Repair or replace any faulty parts or as necessary.</p> <p>c. Perform cleaning and general checking. Refer specialist/ manufacturer for complete services.</p>				✓				
19.7	X-RAY Panel								
	<p>a. Perform visual inspection. Check if casing of the unit is damaged, identification is not well readable, cable not well fixed or damaged, display readings and identifications light not function. Repair or replace any faulty parts or as necessary.</p> <p>b. Check functionality i.e. successful at power on, control and switches. Repair or replace any faulty parts or as necessary.</p> <p>c. Perform cleaning and general checking. Refer specialist/manufacturer for complete services.</p>				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
19.8	Couch Manipulation								
	a. Check physical condition i.e. scratch, crack or damaged. Repair or replace any faulty parts or as necessary.				✓				
	b. Check power supply. Test ON and OFF.				✓				
19.9	c. Check functionality i.e. hi, low, back up and down, central locking pedal, mattress stopper, brake locking system, main frame, emergency handle and control box, etc. Repair or replace any faulty parts or as necessary.				✓				
	Weighing Scale								
	a. Check general outlook of unit is undamaged.				✓				
	b. Test power ON and OFF.				✓				
	c. Check display. Repair or replace any faulty parts or as necessary.				✓				
	d. Check keypad. Repair or replace as necessary.				✓				
	e. Inspect weighing base. Repair or replace any faulty parts or as necessary.				✓				
f. Inspect measuring scale. Repair or replace any faulty parts or as necessary.				✓					
	g. Test weights.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
20.0	<p>OTHER MECHANICAL EQUIPMENT SYSTEM</p> <p>a. Operation</p> <p>The Contractor shall ensure proper operation of all other mechanical systems and equipment and shall monitor and check the systems. This shall include works such as visual checking, monitoring, cleaning, etc. and respond to any complaints with regards day to day operation.</p> <p>b. Maintenance</p> <p>The Contractor shall maintain all the mechanical equipment and systems and shall generally carry out the following but not limited to :-</p> <p>a. Inspect general condition of equipment and plant rooms. Ensure the equipment and plant rooms are kept free from dust, debris and dry at all time.</p> <p>b. Test systems/ equipment for manual and automatic operation.</p> <p>c. Inspect, detect and rectify leakages.</p> <p>d. Inspect all bearings, moving parts, etc. Lubricate with oil/ grease. Replace as necessary.</p> <p>e. Inspect for abnormal noise/ vibration and rectify as necessary.</p> <p>f. Inspect all bolts and nuts and tighten as necessary.</p> <p>g. Inspect level control electrodes.</p> <p>H. Inspect instrumentation, pressure switches and gauges in working order. Repair or replace as necessary.</p> <p>I. Inspect valves operation . Lubricate, repair or replace as necessary.</p>	✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>j. Inspect all electric motors, fans, pump, etc. Repair or replace as necessary.</p> <p>k. Inspect and test electrical control panel, starters, protection devices, etc. Repair or replace as necessary.</p>			✓					
20.1	Roller Shutter/ Fire Roller Shutter								
	i. General								
	a. Ensure the curtain, hood (coil casing), hand chain, flashing light, sounder, guides, endplates, locking, etc are in good condition. Repair and replace to ensure functionality.			✓					
	b. Test the door/ roller shutter manually. It should run smoothly and there should be no excessive noise. Repair and replace to ensure functionality.			✓					
	c. Ensure the link to MFAP are in good condition. Repair and replace to ensure functionality.			✓					
	d. Inspect safety devices fitted to motors. Clean, adjust, lubricate, repair or replace to ensure functionality.			✓					
	ii. Electric Motors								
	a. Inspect and clean all electric motors. Repair or replace to ensure functionality.			✓					
	b. Inspect all motor bearings, lubricate with grease. Replace to ensure functionality.			✓					
	c. Inspect safety devices fitted to motors. Clean, adjust, lubricate, repair or replace to ensure functionality.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>iii. Electrical Switchboard/ Control Panel</p> <p>a. Inspect the condition of the panel and its housing. Repair or replace to ensure functionality.</p> <p>b. Inspect and test the control wiring and circuitry. Retighten, repair or replace to ensure functionality.</p> <p>c. Inspect the operation of selector switches. Repair or replace to ensure functionality.</p> <p>d. Inspect the operation of auto-manual selector switches. Repair or replace to ensure functionality.</p> <p>e. Inspect the operation of stop-start buttons. Repair / replace to ensure functionality.</p> <p>f. Inspect or replace indicating bulbs and covers.</p> <p>g. Inspect the routine operation of all electrical starters, electrical control gears and ancillary electrical apparatus. Repair or replace to ensure functionality.</p> <p>h. Inspect all electrical contactors. Clean and retighten all loose connections.</p> <p>i. Clean or replace electrical contactors to ensure functionality.</p> <p>j. Inspect electric fuses. Replace to ensure functionality.</p> <p>k. Inspect the condition of the conduits, supports and wires. Replace to ensure functionality.</p>			✓					
20.2	Hand Dryer								
	<p>a. Inspect condition of hand dryer. Repair or replace as necessary.</p>		✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Test run each hand dryer. Repair or replace as necessary.			✓					

ELECTRICAL SERVICES

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.0	MEDIUM VOLTAGE SYSTEM (11kV to 33 kV) The preventive maintenance schedule herein is the indicative minimum requirement. The Contractor shall ascertain the actual requirement from the equipment manufacturer. The Contractor shall monitor the condition of the system and respond to any complaint with regards daily operation.								
1.1	MEDIUM VOLTAGE SWITCHGEAR								
	a. Measurement of the resistance of the main circuit (contact resistance). Record the result.						✓		
	b. To ensure all connections, conductors, busbars, switch contacts, fuse contacts, etc. is in good condition and working properly-tighten.						✓		
	c. To ensure all cable boxes are in good condition.						✓		
	d. Clean and vacuum inside metal-enclosed switchgear.						✓		
	e. Heaters operation test and record the result.						✓		
1.2	VACCUM CIRCUIT BREAKER (VCB)								
	a. Inspect and clean VCB for contamination, moisture and corrosion.						✓		
	b. Inspect the spring operating mechanism, condition of the lubrication on rotating and sliding bearing surfaces.						✓		
	c. Test the breaker pole with vacuum interrupter for any suspected damage.						✓		
	d. To ensure auxiliary switch, shunt releases or blocking magnets, charging motor and D.C. rectifier in functional order.						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.3	OIL CIRCUIT BREAKER								
	a. Inspect oil leakage and oil level (refill to required level) and record.						✓		
	b. Recondition contacts, wipe and operating mechanism, record closing and opening times of each pole to verify correct adjustment.						✓		
	c. Check condition of tension rod & turbulator pod and flush breaker components and tank with clean oil.						✓		
	d. Lubricate auxiliary contacts with copper grease and test conductivity of contacts, record results.						✓		
	e. Check and adjust trip operations, interlock integral earthing.						✓		
	f. Test acidity, moisture and insulating oil for dielectric strength until it passes test of 30kV at 4mm gap for one minute or equivalent approved standard.						✓		
g. Change insulating oil if necessary.						✓			
1.4	SF6 CIRCUIT BREAKER								
	a. Check pressure and moisture indication. Record the readings.			✓					
	b. Check, test auxiliary and solid-state relay circuits.						✓		
	c. Inspect and clean external surface. Report for any defect.						✓		
	d. Check all connections and cable boxes condition and report.						✓		
	e. Check and adjust, if necessary all operation and interlocks against inadvertent erroneous switching and report.						✓		
f. Check geared motor operating condition.						✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.5	RING MAIN UNIT (Oil Type)								
	a. Inspect oil leakage and oil level (refill to required level) and clean external surface. Inspect and clean external surface. Report and record the readings. Repair if leakage or faulty.				✓				
	b. Check all connections and cable boxes condition and report. Retighten or repair if necessary.						✓		
	c. Inspect Ring Main Unit (HFU switch fuse, OLU oil switch, Busbar & Isolator). Measure insulation at 5kVdc and record.						✓		
	d. Check and adjust, if necessary all operation and interlocks against inadvertent erroneous switching and report.						✓		
	e. Test insulating oil for dielectric strength until it passes test of 30kV at 4mm gap for one minute or equivalent approved standard.						✓		
	f. Change insulating oil (if necessary).						✓		
1.6	RING MAIN UNIT (SF6 Type)								
	a. Check pressure and moisture indication. Record the readings.			✓					
	b. Inspect and clean external surface. Report for any defect.			✓					
	c. Check, test auxiliary and relay circuits.						✓		
	d. Check and adjust, if necessary all operation and interlocks against inadvertent erroneous switching.						✓		
	e. Check all connections and cable boxes condition. Retighten or repair if necessary.						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.7	METERING (Voltmeter and Ammeter)								
	a. To ensure Analog/ Digital meters in good condition inclusive of glass covers. Repair or replace if faulty.		✓						
	b. To ensure that the reading indicated by the meters is correct. Recalibrate if in accurate.		✓						
	c. Record voltmeter and ammeter maximum readings to ensure correct readings and no occurrence of overload.		✓						
1.8	PROTECTION RELAYS								
	a. Recalibration of over current and earth fault relays.							✓	
	b. Recalibration of transformer protection and temperature control devices.							✓	
	c. To ensure protection relays in good condition.		✓						
1.9	DIRECT CURRENT (D.C) SUPPLY								
	a. Record voltage output of each cell.		✓						
	b. To ensure batteries electrolyte level is as per required level. Top up if below level.		✓						
	c. Measure S.G of electrolyte (if lead acid type).		✓						
	d. Clean terminal from acid corrosion.		✓						
	e. Maintain cleanliness of cells.			✓					
	f. Clean, retighten vent plug.		✓						
g. To ensure connection between cells for cleanliness and lubricate with petroleum jelly.			✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>h. Remeasure and record cell output voltage after maintenance.</p> <p>i. To ensure ventilation in battery room.</p> <p>j. To ensure all meters functional.</p> <p>k. For nickel cadmium batteries release air bubbles trapped in the batteries to prolong battery life time.</p>		✓						
1.10	TRANSFORMER (Oil-Filled Type)								
	<p>a. External surface to be cleaned and to touch up with paint if necessary, oil leakage to be arrested, if necessary.</p> <p>b. Check oil level, maximum temperature, silica gel condition to be recorded. Top up oil and replaced silica gel if necessary.</p> <p>c. Check all connection and cable boxes condition. Retighten or repair if necessary.</p> <p>d. Test acidity and insulating oil for dielectric strength until it passes test of 30kV at 4mm gap for one minute or equivalent. Refilter or change when necessary.</p>			✓			✓		
1.11	TRANSFORMER (Dry Type)								
	<p>a. Verify the winding temperature and instrumentation circuits within operational range.</p> <p>b. To ensure the cooling fan is operational.</p> <p>c. Conduct visual inspection of coils, wiring and monitoring equipment for any suspected damage.</p> <p>d. To ensure all connections for correct degree of tightness.</p> <p>e. Test and measure insulation resistance. Record all readings.</p>			✓			✓		✓

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	f. Measurement of winding resistance.						✓		
	g. Clean and vacuum dust/ contamination from transformer.						✓		
	h. Observe for any abnormally high temperature/ noise level and rectify.			✓					
	i. External surface to be cleaned and to touch up with paint if corroded.						✓		
1.12	MEDIUM VOLTAGE CABLE								
	a. Inspect condition of cables for any abnormal condition. Repair/ make good if necessary.						✓		
	b. Check cable termination and jointing. Retighten if necessary.						✓		
	c. To ensure cable insulator in good condition and working properly.						✓		
	d. Test cable continuity and insulation resistance in good condition. Record all readings.						✓		
	e. Phasing out test. Record all reading.						✓		
	f. Inspect cable and retighten all connection, terminations, etc.						✓		
	g. Inspect all cable route markers. Replace if found missing or damaged.						✓		
	h. Inspect labelling.						✓		
1.13	EARTHING SYSTEM								
	a. Retighten all connections, terminations and earthing.						✓		
	b. Retighten all earth electrode terminations and connections to ensure corrosion free (if applicable).						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Test and measure earth electrode resistance reading.						✓		
	d. To ensure marking and tagging of earth electrode properly in intelligible. Replace if missing or broken.						✓		
1.14	SWITCH ROOM								
	a. To ensure cleaning of switch room, riser rooms and all equipments.		✓						
	b. To ensure and cleaning of cable trench or condition of cable trench (clean, water free and slab cover in good condition).		✓						
	c. To ensure and inspect doors, locks and repainting (as required).								✓
	d. To ensure that "No Smoking", "No Admittance" & "Danger Signs", "Treatment Shock Card" & Schematic Drawing are in good condition and are visible or readable. Replaced if damage.			✓					
	e. To ensure fire-extinguisher and Fire Suppression System are in good working condition and not exceed the expiry date.			✓					
	f. To ensure no moisture underneath rubber mat in front of the main switch board. Replace if damaged.			✓					
	g. To ensure anti vermin wire mesh is in good condition. Repair if damaged.			✓					
	h. To ensure and inspect the roof/ floor above no leakage or damaged.			✓					
	i. To ensure no water flowing into Switch Room or Riser room.	✓							
	j. To ensure wiring and electrical fittings, power points, light fittings and exhaust fans working properly. Repair or replace if faulty.		✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>k. To ensure fire barrier or duct seals is in good condition. Repair if damage.</p> <p>l. Record all activities and readings in the relevant room's log book.</p>		✓				✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.0	LOW VOLTAGE DISTRIBUTION SYSTEM The preventive maintenance schedule herein is the indicative minimum requirement. The Contractor shall ascertain the actual requirement from the equipment manufacturer. The Contractor shall monitor the condition of the system and respond to any complaint with regards daily operation.								
2.1	SWITCH ROOM INCLUDING RISER ROOM								
	a. To ensure cleanliness of the switch room and all equipments.		✓						
	b. To ensure cleanliness and water free of cable trench and slabs cover are in good condition.		✓						
	c. To ensure that "No Smoking", No Admittance" & "Danger Signs". Treatment Shock Card" & Schematic Drawing are in good condition and are visible/ readable. Replace if damaged.			✓					
	d. To ensure rubber mat in good condition and no moisture underneath it. Replace if damaged.		✓						
	e. To ensure antivermin wire mesh is in good condition. Repaint or repair or replace if damaged.		✓						
	f. To ensure the roof or floor above free from leakages.		✓						
	g. To ensure no water flowing into Switch Room or Riser room.		✓						
	h. To ensure wiring and electrical fittings, power points, light fittings, and exhaust fans are working properly. Repair, make good and replace if faulty.		✓						
	i. To ensure fire barriers or duct seals is in good condition. Repair if damaged.			✓					

No.	Description	Maintenance Frequency								
		D	W	M	3M	6M	Y	2Y	5Y	
	j. To ensure no holes or entry point for rodents into switch room.			✓						
	k. Record all activities and readings in the relevant room's log book.		✓							
2.2	MAIN SWITCH BOARD (MSB)/ SUB-SWITCH BOARDS (SSB)/ CAPACITOR BANK BOARDS									
	a. To ensure all indicator lights, selector switches, heaters and thermostats, voltmeters, ammeters, power factor (p.f) meters, digital power meters (DPM) and binary regulators are working properly. Replace if faulty.		✓							
	b. To ensure power factor (p.f) reading is higher than 0.85 lagging.		✓							
	c. Verify and retighten all screws, contactors, termination etc.		✓							
	d. Inspect and verify the condition of cables for burn marks, insulation leakage and other abnormal conditions.		✓							
	e. Record readings for maximum current, voltage, frequency reading, etc into log book.		✓							
	f. To ensure wiring and electrical fittings, power points, light fittings, and exhaust fans are working properly. Repair, make good and replace if faulty.								✓	
	g. Testing, calibration & resetting, all earth fault relay, Earth Leakage Relay (ELR) and over current relay.								✓	
	h. Check copper bus bars for irregularity (discolouration, oxidization) to ensure that is in good condition.			✓						
	i. Perform load balancing balance to <30% between the phases.							✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	j. To ensure component in power factor correction board or capacitor bank (contactor, circuit breaker, wiring and fan) is in good working condition. Replace or repair if damaged.		✓						
	k. To ensure component in power factor correction board or capacitor bank (power factor regulator, capacitor and reactor) is in good working condition.		✓						
	l. Check tightness of contactors, reactors, and capacitors connections.						✓		
2.3	AIR CIRCUIT BREAKERS (ACB)								
	a. Clean arc chute and arc contacts and replace if worn out.						✓		
	b. Clean all insulating parts.						✓		
	c. Conduct imprint test on auxiliary and main contacts.						✓		
	d. Grease all moving contacts and related components.						✓		
	e. Test tripping mechanism to ensure that it is in good working condition.						✓		
	f. Inspect and retighten all control wiring and connections inclusive of sliding contacts.						✓		
	g. Test and ensure functionality of charging motor, closing coil and shunt trip coil.						✓		
	h. Conduct insulation test between phases/ continuity test.						✓		
	i. Test functionality of mechanical/ electrical interlocking, under voltage relay inclusive of castle key if any (to be done during gen-set load test).			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
2.4	RESIDUAL CURRENT CIRCUIT BREAKER (RCCB)								
	a. Retighten all connections, termination etc. To ensure all electrical connection working perfectly.						✓		
	b. Verify functionality by pressing the test button. Replace if faulty.			✓					
	c. Test the RCCB functionality by using a RCD tester. Replace if faulty.						✓		
2.5	MOULDED CASE CIRCUIT BREAKER (MCCB)								
	a. To ensure the usability of switch toggle/handle and ensure that it operate. Replace if faulty.				✓				
	b. Retighten all connections, terminations etc. to ensure electrically working.						✓		
	c. To ensure shunt trip coil function properly. Replace if faulty.			✓					
	d. Measure the voltage drop across breaker incoming and outgoing terminals. The value shall be <100mV.						✓		
2.6	DISTRIBUTION BOARDS (DB)								
	a. To ensure all distribution boards components are in good working condition. Replace if faulty.				✓				
	b. To ensure the 'DANGER' sign, labelling, schematic and layout diagram are available and readable or visible.				✓				
	c. Inspect and ensure spares ways available in the distribution board.				✓				
	d. To ensure fiber perspective or metal cover intact. Replace if missing.						✓		
	e. Retighten all connections, terminations etc. to ensure all electrically secured.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	f. Clean internal part of the distribution board.					✓			
	g. To ensure tagging all final circuit properly and updated.						✓		
2.7	SURGE PROTECTION DEVICES (SPD/ ESPD)								
	a. To ensure all SPD function properly. Replace if faulty.			✓					
2.8	LOW VOLTAGE SYSTEM								
2.8.1	Paper or XLPE or PVC Insulated Armoured Underground Cables								
	a. To ensure cable insulator in good condition and working properly.						✓		
	b. Test cable continuity and insulation resistance in good condition.								✓
	d. Inspect cable and retighten all connection, terminations, etc.						✓		
	e. Inspect all cable route markers. Replace if found missing or damaged.			✓					
	f. Inspect labeling.						✓		
2.8.2	Bus Duct and Sub Main Risers In Trunking/ Cable Tray								
	a. Inspect and to ensure that trunking is clean and in dry condition.			✓					
	b. Test for cables insulation and continuity.								✓
	c. To ensure busbars support in good condition. Replace as required.						✓		
	d. To ensure fire barriers working properly. Replace if damaged or faulty.						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>e. To ensure all electrical connection working properly. Retighten all electrical connections, terminations, etc.</p> <p>f. To ensure that trunking is mounted properly and safely. Repair if damage.</p> <p>g. To ensure trunking covers intact. Replace or repair if damage.</p>			✓			✓		
2.8.3	XLPE/ PVC/ Fire Rated Cable Insulated Type Cable On Cable Tray			✓					
	<p>a. Inspect the condition and ensure the cable tray is clean in dry condition.</p> <p>b. Test cable continuity and insulation resistance in good condition.</p> <p>c. To ensure cable tray earth copper tape is in good condition. Replace if damage.</p> <p>d. To ensure cable supports in good condition. Replace if damaged.</p> <p>e. Check the fire barriers. Ensure the fire barriers in good condition and working properly. Replace if damage.</p> <p>f. Ensure all electrical connectors working properly by retighten all connections, terminations, etc.</p>			✓			✓		✓
2.8.4	Feeder Pillars			✓					
	<p>a. Measure and record incoming supply voltage and operation current.</p> <p>b. Check the functionality of circuit breaker, time switch, contactor fuse, MCB, MCCB, bypass auto/ manual selector, etc. Replace if faulty.</p> <p>c. Check anti-vermin/ insect netting. Repair and replace if damaged.</p>		✓	✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	d. Check, clean and test all equipment/ accessories/ components at the feeder pillar and restore in good working condition.				✓				
	e. Check and retighten all connections, terminations and cable lug. Repair and make good if faulty.				✓				
	f. Check for rust, damage, leakage. Repair, make good and repaint if necessary.				✓				
	g. Apply lubricating grease for hinges and locks.				✓				
	h. Keep clean of all grass/ shrubs/ rubbish for an area around 1m of feeder pillar.				✓				
	i. To ensure no destructive pest and use chemical repellent for necessary.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
3.0	LUMINARIES, OUTDOOR LIGHTINGS AND OTHER APPLIANCES The preventive maintenance schedule herein is the indicative minimum requirement. The Contractor shall ascertain the actual requirement from the equipment manufacturer. The Contractor shall monitor the condition of the system and respond to any complaint with regards daily operation.								
3.1	LUMINARIES a. To ensure that all luminaries are in good working condition. Replace components of faulty light fittings i.e cable, lamp holder, lamp tube, LED driver, control gear, capacitor, ballast, starter, switch etc. b. To ensure “KELUAR” sign and emergency light is in good working condition. Repair or replace if faulty. c. Inspect and replace if burnt marks appear at ends of the lamp tube. d. To ensure all electrical connections working properly by retighten all connections terminations etc. e. Check the battery for “KELUAR” sign & emergency light, for any sign indication immediate failure. Follow the manufacturers recommended life hours and replace if faulty.		✓						
				✓					
				✓					
							✓		
									✓
3.2	OUTDOOR LIGHTINGS (Compound and Façade, Building Flood Lighting and Security Lighting) a. To ensure all light fittings functional. Replace if faulty or damage.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. To ensure by visual inspection to monitor the condition of poles and light fitting, lamp cover, control switch gear, etc. Repair or replace if damage.			✓					
	c. Inspect control components and retighten all connections and termination.						✓		
	d. To ensure time switch/ photocell working perfectly. Replace if faulty.		✓						
	e. To ensure contactor and isolator is in good condition. Replace if faulty.		✓						
	f. To ensure condition of cable is in good condition.					✓			
	g. To ensure mounting and support is in good condition. Repair or replace if damage or missing.		✓						
	h. Inspect and clean light fittings as required.		✓						
	i. Inspect for paint works/ rust and corrosion. Repair or repaint if defective.						✓		
3.3	STREET LIGHTINGS								
	a. To ensure the correct operation time for all street lightings.		✓						
3.3.1	Lamps								
	a. Repair or replace defect and faulty lamps including housing, lamp gears and accessories .		✓						
	b. Clean light fitting enclosure housing and glass cover (bowl).					✓			
	c. To ensure lamp holder condition and associated supports/ brackets. Repair if necessary.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
3.3.2	Poles								
	a. Straighten all slanting or fallen pole.		✓						
	b. Clean light fitting enclosure housing and glass cover (bowl).					✓			
	c. To ensure lamp holder condition and associated supports/ brackets. Repair if necessary.				✓				
	d. Check, clean and retighten cable terminations.				✓				
	e. Check connection for rust/ crack at arm bracket and base plate. To ensure devoid of rust and repaint (touch-up) if necessary.					✓			
	f. Check for rust at bolt/ nut and tighten if necessary.				✓				
	g. Check and maintain labeling for all poles. To ensure they are in good condition and readable.				✓				
	h. To ensure no destructive pest and use chemical repellent if necessary.				✓				
	i. Keep clean of all grass/ shrubs/ rubbish near pole for an area of 1m around the pole.				✓				
3.3.3	Cable and Wiring								
	a. Check and retighten all connections, cable terminations and wirings.				✓				
	b. To ensure all cables labeling are in good conditions.				✓				
	c. Check all underground cable markers in accordance to the actual cable route. Replace if found missing or damage.					✓			
	d. Check condition of cable insulation from brittle or damage. Replace if brittle or damage.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
3.4	CHANDELIER LIGHTING								
	a. Test system functionality.	✓							
	b. To ensure that all the bulbs are in good condition. Replace if faulty.	✓							
	c. To ensure the whole luminaries are in good condition. Replace faulty parts.			✓					
	d. Manufacturer's recommendation to be complied with all items including cleaning.								
3.5	OTHER APPLIANCES								
3.5.1	Switches and Switch Socket Outlet (S/S/O)								
	a. Inspect the condition of S/S/O by visual inspection to check for fault indication on switches, socket outlets, light points, light fittings etc. Repair and make good or replace if required.			✓					
	b. To ensure all S/S/O are functioning. Replace/			✓					
3.5.2	Fan (All Types of Fan)								
	a. Check and clean the fan.				✓				
	b. To ensure continuous rotation and functionality. Replace or repair and make good if faulty.		✓						
	c. To ensure no noise being generated. Repair			✓					
	d. Inspect safety wire rope and wire tape to ensure in good condition.						✓		
	e. To ensure that there is no object blocking the exhaust fan.						✓		
	f. To ensure that all bolts and nuts, connections, suspension rods, rubber mountings are in good condition. Replace if faulty.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	g. To ensure fan regulator function perfectly without noisy sound. Replace if faulty.					✓			
	h. To ensure auto louvers in working and good condition.			✓					
	i. Test for insulation and earthing.			✓					
3.5.3	Instant Water Heater								
	a. To ensure all electrical connections working properly.			✓					
	b. To ensure R.C.D. function properly.			✓					
3.5.4	Fireman's Switch								
	a. Inspect & test fireman switch. Replace if faulty.			✓					
	b. Record all activities & reading in the relevant room's log book.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
4.0	ELECTRICAL TESTING (TO ENSURE COMPLIANCE WITH LATEST EDITION MS.IEC 60364)								
4.1	Final Circuit Continuity and Protection Circuit Tests								
	a. To ensure the protective conductor is in good condition.								✓
	b. To ensure all the wiring installation is in good condition and capable to working properly or function perfectly.								✓
	c. To ensure copper tape/ copper bridge for trunking is in good condition.								✓
	d. Check and test protection system for conduits. To ensure the condition of the protection system is working properly.								✓
	e. To ensure final circuit continuity and insulation in good condition (for sub-main only).								✓
4.2	Earthing System								
	a. Test & record for earth conductor continuity.								✓
	b. Retighten connections, terminations for earth electrode and to ensure corrosion free.								✓
	c. To ensure that earth chamber for earth electrode in good condition. Repair, make good or replace if necessary.								✓
	d. Test, measure and record earth electrode impedance and To ensure that the overall earth impedance is 3Ω below. Improve the reading by additional electrodes if reading is below the required range. (All report shall be endorsed by competent person).								✓

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
5.0	UNINTERRUPTIBLE POWER SUPPLY (UPS) The preventive maintenance schedule herein is the indicative minimum requirement. The Contractor shall ascertain the actual requirement from the equipment manufacturer. The Contractor shall monitor the condition of the system and respond to any complaint with regards daily operation.								
5.1	Batteries								
	a. Conduct load test using external load bank to ensure battery capacity and performance.						✓		
	b. Inspect for leakage of acid. Replace cell if leaking.		✓						
	c. Record individual battery voltage.			✓					
	d. Clean terminal from acid corrosion, if any.		✓						
	e. Record individual battery impedance (5-20 milliohm).			✓					
	f. Inspect connections between cells are secure clean and lubricate with petroleum jelly.			✓					
	g. Remeasure and record cell output voltage after maintenance in battery log sheet.			✓					
	h. To ensure that UPS operation room temperature in the range 20°C ±1.	✓							
	i. Inspect for deformity of battery and replace if faulty.	✓							
	j. Record battery discharge curve.			✓					
5.2	Battery Charger								
	a. Record the incoming voltage and current reading into log book.	✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>b. Record the battery voltage and current reading into log book.</p> <p>c. Calibrate accuracy of all meters to ensure all meters working perfectly. (To comply Manufacturer's recommendations)</p> <p>d. To ensure cleanliness at cubicles.</p> <p>e. Tighten all connections.</p> <p>f. To ensure indicators for protection system working perfectly for thyristor fuse, battery fuse, current control limit, thyristor choking fan failure, power failure, battery voltage low, earth fault and others if any.</p> <p>g. Clean all heat sink, capacitor and P.C.B's (using dry brush or vacuum cleaner).</p>	✓						✓	
5.3	Inverter								
	<p>a. Record voltage and frequency reading.</p> <p>b. To ensure the cleanliness of cubicles.</p> <p>c. Check operation of all meters.</p> <p>d. Calibrate accuracy of all meters to ensure all meters working perfectly. (To Manufacturer's recommendations)</p> <p>e. To ensure all electrical connections are connecting perfectly.</p> <p>f. To ensure protection system is working perfectly for current control, fan failure, voltage abnormal, high current, over current and others if any.</p>	✓		✓			✓		✓
5.4	Static Transfer Switch								
	<p>a. To ensure control circuit working perfectly.</p> <p>b. Inspect completeness of switch functions.</p>			✓					
				✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
5.5	Maintenance By-Pass Switch								
	a. Record harmonic spectrum and distortions.			✓					
	b. Record downstream neutral earth voltage.			✓					
	c. Observe abnormal noise from UPS. Repair and make good if necessary.	✓							
	d. Mandatory inspection of ventilation fan. Repair or replace and make good if faulty.	✓							
	e. Conduct mandatory power failure simulation test for UPS (to be done concurrently with gen-set test).			✓					
	f. Inspect condition for leaks deformation on A.C & D.C capacitors.		✓						
	g. To ensure no seepage or leak from room ceiling.	✓							
	h. Inspect for hot spot areas.	✓							
	i. Inspect completeness of switch functions. Repair or replace and make good if necessary.		✓						
	Record and Log Book								
a. Record all activities and readings in the relevant room's log book.	✓								

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
6.0	STANDBY GENERATOR SET The preventive maintenance schedule herein is the indicative minimum requirement. The Contractor shall ascertain the actual requirement from the equipment manufacturer. The Contractor shall monitor the condition of the system and respond to any complaint with regards daily operation.								
6.1	Lubrication System								
	a. Check engine lubrication oil level, replenishes required.			✓					
	b. Change engine oil base on operational hours recorded (250hrs) or 6 monthly which ever occurs first.					✓			
	c. Change oil filter and bypass filters.					✓			
	d. Inspect hydraulic governor oil, replenish if necessary.		✓						
	e. Change hydraulic governor oil 1500 hrs or one year which ever occurs first.						✓		
	f. Lubricate tachometer drive and throttle control mechanism.			✓					
	g. Inspect and rectify external leaks.		✓						
6.2	Fuel System								
	a. Check fuel system.						✓		
	b. Service and recalibrate fuel pump, injectors and valve.						✓		
	c. Drain water and sediment from fuel tank, tighten all fuel line connection.				✓				
	d. Change fuel filter 6 monthly or 250 hrs whichever occurs first.					✓			
	e. Change air intake filter.						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	f. Inspect and rectify external leaks. Repair if necessary.	✓							
6.3	Cooling System								
	a. Top up cooling water system level as required.				✓				
	b. Clean water filter. Replace as required.				✓				
	c. Inspect and adjust water pump belts tension as required. Inspect completeness of switch functions.				✓				
	d. Adjust fan belts tension as required.				✓				
	e. Service water pump fan hub and idler pulley assembly and the associated bearings.								✓
	f. Inspect and rectify deterioration for radiator hoses.		✓						
	g. Inspect and rectify external leaks. Repair if necessary.	✓							
	h. Clean radiator fans and blower screen. Replace if damage.		✓						
	i. Inspect and top up coolant to maximum level. Flush and change as required.					✓			
	j. Inspect fan belt condition. Change or replace fan belt as per manufacturer recommended if faulty.								✓
	k. Inspect and verify that engine is running in the range of 88°C – 100°C. Check water temperature. Replace thermostat if faulty.			✓					
6.4	Air System								
	a. Clean air cleaner element wet or dry. Replace as required.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Clean crankcase breather element. Repair or replace if damage.			✓					
	c. Tighten all air hose connections from Air Filter to Air Manifold.					✓			
	d. Inspect and clean turbo charger (if any).					✓			
	e. Adjust valves tapped clearance as required.						✓		
6.5	Electrical System (To Comply with 5.1 & 5.2)								
	a. Check and replenish the battery electrolyte level and check S.G (if lead acid type).			✓					
	b. To ensure battery charger function properly. Repair if faulty.			✓					
	c. Retighten all electrical connections working perfectly. Repair, make good and repair if damage.			✓					
	d. Clean battery, starter, terminal and lubricate with petroleum jelly.		✓						
	e. To ensure Automatic Voltage Regulator (AVR) function properly. Repair if faulty.			✓					
6.6	Alternator								
	a. To ensure the alternator operating frequency at 50hz. Repair if faulty.			✓					
	b. Inspect alternator, clean and blow out dust.			✓					
	c. Grease all bearing as required.					✓			
	d. Insulation check on main stator, main rotor and exciter stator and exciter rotor.						✓		
	e. Retighten drive coupling bolts.					✓			
	f. Change all carbon brushes (if applicable).					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
6.7	Generator Set Control Panel								
	a. Inspect and service generator set control panel (AMF) including all relays wiring connections etc. and automatic changeover contactor located in the Main Service Board.			✓					
	b. To ensure and rectify safety indicating and alarm devices for normal functioning of over-speed, over temp, oil pressure, overload, low fuel, etc.			✓					
6.8	Operation Testing and General Servicing								
	a. Test running condition (with no load) for 30 minutes.			✓					
	b. Test running condition (with load) for 30 minutes.			✓					
	c. Simulate power failure. On the essential Switch Board by switching off mains supply and conduct load test for minimum 30 min. to be done at appropriate time and not to interrupt the electrical supply for office operation.			✓					
	d. To ensure genset engine function perfectly. Tuning up as required.						✓		
	e. Inspect acoustic system (air intake, outlets, attenuators, acoustic & measure and record noise level.				✓				
	f. Record phase to phase voltage RY/ YB / BR (415) +5% - 10 % (monthly).			✓					
	g Clean genset room (internal & external).			✓					
	h. To ensure emergency stop button works. Replace if faulty.			✓					
	i. To ensure verify and adjust the engine speed (1500rpm or 50 Hz).			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	j. Record generator set operational hours (engine hour run) and indicate future schedule.			✓					
6.9	Record and Log Book								
	a. Record all activities and readings in the relevant room's log book.	✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
7.0	<p>LIGHTNING PROTECTION SYSTEM</p> <p>The preventive maintenance schedule herein is the indicative minimum requirement. The Contractor shall ascertain the actual requirement from the equipment manufacturer. The Contractor shall monitor the condition of the system and respond to any complaint with regards daily operation.</p> <p>a. Visual inspection of all components of lightning protection system e.g. air termination, down conductor, connections, test connections, etc. To ensure that they are in good working condition. Replace or repair if missing or damage. Proprietary type lightning protection systems included.</p> <p>b. To ensure that all air terminal or copper tape in good condition. Repair or replace if damage.</p> <p>c. To ensure structural support for system & check support saddles for copper tape. To ensure securely fixed.</p> <p>d. To ensure all connections termination points to down conductors are in good condition. Repair or replace if damage.</p> <p>e. Check down conductors from test joints to earth chambers. To ensure present and secured in place.</p> <p>f. Test conductors for earth continuity and to ensure that the overall earth resistance does not exceed (10 ohms).</p> <p>g. Record counter device reading.</p>						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
8.0	TELECOMMUNICATION SYSTEM (VOICE COMMUNICATION) The preventive maintenance schedule herein is the indicative minimum requirement. The Contractor shall ascertain the actual requirement from the equipment manufacturer. The Contractor shall monitor the condition of the system and respond to any complaint with regards daily operation.								
8.1	Telephone / PABX System								
	a. To ensure PABX system is functional.	✓							
	b. To ensure telephone sets/ system is functional.		✓						
	c. Visually inspect telephone cabling/ wiring system. To ensure cabling/ wiring in good condition and proper arrangement. Repair or replace and make good if necessary.			✓					
	d. Inspect telephone DP– Boxes and terminals. Repair or replace to ensure functionality of system.			✓					
	e. Inspect telephone riser cables securely clamped. Repair and make good if necessary.			✓					
	f. To ensure SDF, MDF & IDF systems are functional. Repair or replace to ensure functionality of system.			✓					
	g. To ensure lightning/ surge arrestors are functional. Repair or replace to ensure functionality of system.		✓						
	h. To ensure battery system/ charger (as per 5.1 & 5.2) are functional. Repair or replace to ensure functionality of system.		✓						
	i. To ensure telephone earthing system connection/ termination/ inspection chambers in good condition.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	j. Test conductors for earth continuity and to ensure that the overall earth impedance is 3Ω below. Improve the reading by additional electrodes if reading is below the required range.					✓			
	k. To ensure Operator's system is functional.	✓							
	l. Record all activities and reading in the relevant room's log book.	✓							
	m. Active internet connection, fax and telephone as well as ensuring telephone set is functioning. Repair and make good in necessary.	✓							
	n. Inspect and to ensure the cable connection from the telco room to port users through trunking in good condition. Repair and make good if necessary.	✓							
	o. Changing the status line (mobile phone, local, intercom, etc)	✓							
	p. Transfer line according to customer requirement for the same level or other level.	✓							
	q. Repair and make good port line.	✓							
	r. Make additional wiring when necessary.	✓							
	s. Execute commands for a specific work order according to customers requirement. - Diverting calls - Connect network (intercom) - Activate voice mail - Activate hunting group - Activate hunting group - Activate call forwarding - Activate and monitor conection between blocks (interlink)	✓							
	t. To ensure temperature in PABX room is between 20°C - 25°C.	✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
9.0	<p>EXTRA LOW VOLTAGE (ELV)</p> <p>The preventive maintenance schedule herein is the indicative minimum requirement. The Contractor shall ascertain the actual requirement from the equipment manufacturer. The Contractor shall monitor the condition of the system and respond to any complaint with regards daily operation.</p>								
9.1	<p>PUBLIC ADDRESS (PA) SYSTEM</p> <p>a. Check equipment rack for proper ventilation and clean the fan. Ensure power supplies are secured.</p> <p>b. Check all equipment especially amplifiers for signs of damaged, stressed or heated components.</p> <p>c. Check for full operation of the system.</p> <p>d. Check, (under full connected load), the audio quality for any discernible distortion, undesirable noise or hum, and do adjustments if necessary.</p> <p>e. Check function of zone selection unit or speaker selection.</p> <p>f. Check and ensure cable terminations at equipment rack are secured.</p> <p>g. Check speakers (sampling if necessary) for full operation and adjust volume controller (if applicable) to indicate functionality.</p> <p>h. Check status of back-up battery and charging equipment.</p> <p>i. To ensure no water flowing into Switch Room/ Riser room.</p>				✓				
				✓					
				✓					
				✓					
				✓					
				✓					
				✓					
		✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
9.2	SOUND REINFORCEMENT SYSTEM								
	a. Check equipment rack for proper ventilation and clean the fan. Ensure power supplies are secured.				✓				
	b. Check all equipment especially amplifiers for signs of damaged, stressed or heated components.			✓					
	c. Check for full operation of the system.			✓					
	d. Check, (under full connected load), the audio quality for any discernible distortion, undesirable noise or hum, and do adjustments if necessary.			✓					
	e. Check and ensure cable terminations at equipment rack are secured.			✓					
	f. Check speakers for full operation.			✓					
9.3	VISUAL PROJECTION SYSTEM								
	a. Check equipment rack for proper ventilation and clean the fan. Ensure power supplies are secured.				✓				
	b. Check for full operation of the system.			✓					
	c. Check cable terminations especially connectors for loose connections.			✓					
	d. Check the quality of the projected image for any sign of distortion.			✓					
	e. Clean the projector of any dust especially the lense.					✓			
	f. Check the projector bulb for any sign indicating immediate failure. Follow the manufacturer recommended life hours.					✓			
g. Check that the pantograph system functions properly.			✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
9.4 INTEGRATED CONTROL FOR AUDIO & VISUAL SYSTEM	h. Check that the motorised screens are performing correctly.			✓					
	a. Check that the controller is functioning. Ensure all cable terminations are secured.			✓					
	b. Check that all wall control and touch screen panel are in good working condition.			✓					
	c. Verify control by operating the audio and visual systems.			✓					
9.5 SATELLITE/ MASTER ANTENNA SYSTEM (SMATV)	a. Check the head-end equipment rack for proper ventilation and clean them. Ensure power supplies are secured.				✓				
	b. Check indicator lights for proper operation of all the head-end equipment.				✓				
	c. Check and ensure no loose connection at interconnecting cables.				✓				
	d. Measure and record signal level at the output of amplifiers, and at each outlet.				✓				
	e. Check the picture quality of the signal at each outlet in the installation on all available channels using a portable television receiver. Check for discernible cross-modulation, intermodulation, ringing, noise or other distortion.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
9.6	CLOSED CIRCUIT TELEVISION SYSTEM (CCTV)								
	a. Ensure that the network switch, recording console, fibre receiver/ transmitter and equipment rack in good condition, has proper ventilation and ensure power supplies are secured.			✓					
	b. Check and ensure no loose connections at data cable terminations or connectors (at control room end).			✓					
	c. Ensure all external CCTV service box and its associated equipments are in good working condition.			✓					
	d. Check power supply and data/ video cable connection to external camera are secured.			✓					
	e. Check that all camera are in good operational condition by viewing the display screen. Verify operation of camera such as pan, tilt and zoom.	✓							
	f. Clean domes, lenses & housing windows and interior of camera housings.					✓			
	g. Ensure that the recording equipment system is functioning properly.	✓							
9.7	CARD ACCESS MANAGEMENT SYSTEM (CAMS), TIME ATTENDANCE MANAGEMENT SYSTEM (TAMS) AND GUARD TOUR SYSTEM								
	a. Check the status of readers on the access management software.	✓							
	h. Review the management software for any sign of lacking, verify system integrity and update if necessary.						✓		

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	b. Check the status of all controllers, power supply module and interfaces and ensure there are in good condition.			✓					
	c. Visually check the reader, door contact, magnetic lock and other accessories for any sign of damage and verify its operational status.			✓					
	d. Ensure that all events (door ajar, valid/invalid entry, forced open etc) transaction are recorded.		✓						
	e. Ensure that all guards check in events are recorded.	✓							
	f. Review the management software for any sign of lacking, verify system integrity and update if necessary.						✓		
	g. Perform database housekeeping, such as archiving, back up and save the latest database. Inform CGSO/ security/ client's admin to update database in the system.			✓					
	h. Check and record individual backup battery voltage.			✓					
	i. Ensure that doors are release upon receiving signal from the fire alarm management.		✓						
	j. Record all activities and reading in the relevant room's log book.	✓							
9.8	VISITOR MANAGEMENT SYSTEM								
	a. To ensure the functionality of identification readers. Repair if faulty.			✓					
	b. Verify that the visitor information has been stored to the access management database.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
9.9 BOLLARDS SYSTEM	a. Check and ensure that the bollards cabinet internal/ external are clean.				✓				
	b. Check and ensure that the bollard controller is in the right configuration. Ensure no fault light indicated.				✓				
	c. Ensure all cables connection to controller are tight and secure.				✓				
	d. Check and ensure that all pumps are working properly.				✓				
	e. Check and ensure that all hydraulic hoses termination are in good condition. Ensure hydraulic oil level within specified values.				✓				
	f. Check and ensure that the bollards drainage system is clean and clear from any debris which can disrupt operation.			✓					
	g. Check and ensure push button console is working properly.		✓						
	h. Verify that all automatic bollards are able to freely move up and down. Check that flange around bollard is secured.		✓						
	i. Verify that the safety loop controller and traffic light are working properly.		✓						
	j. Ensure that all bollards reflective strip are clean and secure.				✓				
9.10 PERIMETER INTRUSION DETECTION SYSTEM (PIDS)	a. Check all exposed detection cables and visually for any sign of tampering, vandalisme and damages.			✓					
	b. Carry out planned random simulated intrusion. Verify that intrusion has been detected and notification posted at control room. Verify that floodlights (for integrated system) at the affected area lit up.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
9.11	c. Verify resetting process.			✓					
	d. Review system setting and sensitivity to suit operations. Update if necessary.						✓		
	UNDER VEHICLE SCREENING SYSTEM (UVSS)								
	a. Visually inspect the UVSS pit for any clogged debris, trapped water etc.			✓					
	b. Check the physical condition of the lighting and camera unit for any sign of damage.			✓					
	c. Check that the Screening Software is online and functions properly.			✓					
	d. Trigger the loop detector and check that the lighting unit lights up.			✓					
	e. Check that the underside of the vehicle is captured by the camera after the loop detector is deactivated.			✓					
	f. Ensure that the image captured is clear.			✓					
9.12	g. Verify that the image together with details of the vehicle has been stored by the software.			✓					
	h. Clean or service the lighting and camera units. Ensure all cable connections are secured.				✓				
	STAGE LIGHTING AND RIGGING SYSTEM								
	a. Inspect for functionality of the system.			✓					
	b. Ensure that the dimmer pack and the lighting controller is working properly.			✓					
	c. Ensure that the motorised lighting barrel (if applicable) is working properly.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	d. Ensure that all cable termination at the fixtures are tight and secured.					✓			
	e. Check all equipment function properly. Repair or replace if faulty.			✓					
	f. Check equipment suspension bracket for any sign of material weakness. Repair and make good if necessary.						✓		
	g. Clean the light fixtures.				✓				
	e. Check the condition of the light filter for any sign of damaged or tear.					✓			
	f. Clean the light fixtures.						✓		
9.13	MOTORIZED STAGE CURTAIN SYSTEM								
	a. Check the condition of all curtains.			✓					
	b. Ensure that motors are working properly.			✓					
9.14	CONFERENCE SYSTEMS								
	a. Check equipment rack for proper ventilation and clean the fan. Ensure power supplies are secured.			✓					
	b. Check for full operation of the system.			✓					
	c. Check cable terminations and labeling.			✓					
9.14	CONFERENCE SYSTEMS								
	a. Check equipment rack for proper ventilation and clean the fan. Ensure power supplies are secured.			✓					
	b. Check for full operation of the system.			✓					
	c. Check cable terminations and labeling.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
9.15	BROADCAST TIE LINE SYSTEM								
	a. Check that the main broadcast panel is in good condition.			✓					
	b. Check all connectors at the faceplate are secured properly.			✓					
	c. Using simple continuity test verify that all audio, video and triax cables are in good condition.				✓				
	d. Check equipment rack for proper ventilation and clean the fan to ensure power supplies secured.			✓					
	e. Check for full operation of the system and send complete report to S.O.			✓					
	f. Check and ensure all the cable terminations and labelling in good condition.			✓					
9.16	BOOMGATE								
	a. To ensure functionality of boomgate system and connection with CAMS. Repair and make good if faulty.			✓					
	b. Check entry and exit card reader functionality. Repair or replace if faulty.	✓							
9.17	MASTER CLOCK SYSTEM								
	a. Check equipment rack for proper ventilation and clean the fan. Ensure power supplies secured.			✓					
	b. Check the programme software is up to date and upgrade the program when necessary.			✓					
	c. Record all activities & reading in the relevant room's log book.	✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	c. Check for full operation of the system and send complete report to S.O./ FSO./ Client.			✓					
	d. Check and ensure the time display to match current local time.	✓							
	e. Check cleanliness of the clock and clean it when dirty.			✓					
	f. Check and ensure all the cable terminations and labelling in good condition.			✓					
9.18	INTEGRATED DIMMING SYSTEM								
	a. Inspect for functionality of the system to ensure in good condition.	✓							
	b. Check all equipment function properly.	✓							
	c. Other items:- (Manufacturer's recommendation to be complied with - all item's)	✓							

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
10.0	STRUCTURED CABLING SYSTEM								
	a. Inspect closets of structured cabling system and telecommunications systems to ensure in good condition and arrangement.		✓						
	b. To ensure all cables are functioning. Replace if faulty.						✓		
	c. Check and to ensure all connector at the faceplate are functioning.			✓					
	d. Maintain dB loss for fiber optic cable not less than 10dB.			✓					
	e. Other items:- (Manufacturer's recommendation to comply with)								

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
11.0	TRAFFIC LIGHTS The preventive maintenance schedule herein is the indicative minimum requirement. The Contractor shall monitor the condition of the system and respond to any complaint with regards daily operation.								
11.1	Routine Inspections								
	a. Carry out scheduled routine inspection for all traffic lights and to ascertain the number of defective lights.	✓							
	b. Record the operation time of traffic light in accordance with the traffic flow for each phase (if necessary). <i>**As and when necessary/ required</i>	**							
	c. Take photo of damaged pole resulted from accident/ whatever type of damages caused by others (if necessary). <i>**As and when necessary/ required</i>	**							
11.2	Lamps (Ordinary/ Overhead Aspects)								
	a. Check and maintain the aspects, hinges, clips and gasket. Repairs if necessary.					✓			
	b. Replace all faulty lamps.	✓							
	c. Check and realign all aspects if necessary.					✓			
	d. Check and clean lenses, sign of direction and reflectors.					✓			
	e. Check aspects waterproofing condition.					✓			
	f. Check for cracks/ disappearance of aspects. Replace if necessary.					✓			
11.3	Detectors/ Loop Sensors								
	a. Check for damage or potholes on road surface which may expose sensor cable.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
11.4	b. Check sensor feeder cable and all cable terminations.					✓			
	c. Check and retighten all connections.					✓			
	d. Check and clean panel/ concrete chamber for cable terminations.					✓			
	Poles								
	a. Straighten all slanting or fallen poles. (Refer to item 11.1 (a) if necessary).	✓							
	b. Maintain service door, service door lock and hinges for all poles to ensure in good condition.					✓			
	c. Check and maintain electrical components at service compartment such as earthing terminal, etc.					✓			
	d. Check, clean and retighten cable terminations.					✓			
	e. Check connection for rust/ crack at arm bracket and base plate. Ensure devoid of rust and repaint (touch-up) if necessary.					✓			
	f. Check for rust at bolt/ nut and tighten if necessary.					✓			
g. Check and maintain labeling for all poles. Ensure they are in good condition and readable.					✓				
h. Ensure no destructive pest and use suitable chemical repellent if necessary.					✓				
i. Keep clean of all grass/ shrubs/ rubbish near pole for an area of 1m around the pole.					✓				
11.5	Controller								
	a. Measure and record incoming supply voltage and current operation.		✓						

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
	<p>b. Check functionality of interface cards and electronics switch panel. Notes : <i>Maintain in accordance to manufacturer's requirement.</i></p>		✓						
	<p>c. Check functionality/ operation of circuit breaker (MCB, MCCB), time switch, contactor, fuse, RCCB, ELR, bypass auto/manual selector.</p>			✓					
	<p>d. Check moisture level and take necessary actions.</p>		✓						
	<p>e. Check anti-vermin/ insect netting and repair if necessary.</p>					✓			
	<p>f. Check, clean and test all equipments/ accessories/ components at the controller and restore in working condition if necessary.</p>					✓			
	<p>g. Check and retighten all connections, terminations and cable lug. Repair if necessary.</p>					✓			
	<p>h. Check for rust, damage, leakage and repaint if necessary.</p>					✓			
	<p>i. Apply lubricating grease for hinges and locks.</p>					✓			
	<p>j. Check functionality/ operation of padlock. Change if necessary.</p>								
	<p>k. Keep clean of all grass/ shrubs/ rubbish for an area around 1m of controller.</p>					✓			
	<p>l. Ensure no destructive pest and use suitable chemical repellent if necessary.</p>					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
11.6	<p>Cable and Wiring</p> <p>a. Check and retighten all connections, cable terminations and wirings.</p> <p>b. Ensure all cables labeling are in good conditions.</p> <p>c. Check all underground cable markers in accordance to the actual cable route. Replaces if found missing or damage.</p> <p>d. Test insulation for every underground cable and wiring at lamp. Record and certify the result.</p>					✓			
						✓			
						✓			
						✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
12.0	<p>INSPECTION OF ELECTRICAL SERVICES ABOVE CEILING</p> <p>The preventive maintenance schedule herein is the indicative minimum requirement. The Contractor shall monitor the condition of the system and respond to any complaint with regards daily operation.</p> <p>a. Inspect for proper electrical installation and wiring.</p> <p>b. Inspect for conduit, trunking and cable tray are hanged or fixed to the floor in good condition and properly covered where applicable.</p> <p>c. To ensure all luminaires, ceiling speaker or other electrical fittings must be separately hang to the soffit slab.</p> <p>d. To ensure all unused electrical fittings/ installation must be cleared or removed.</p>						✓		

ENERGY EFFICIENCY SYSTEM

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y	2Y	5Y
1.0	ARCHITECTURAL ENERGY EFFICIENT								
1.1	“Punch Hole” Windows								
	a. Maintain and clean the upper surface of the horizontal shade (which was painted with light colour) from dust and dirt. These will allow maximum daylight reflected deeper into the building.					✓			
1.2	Double Glazing Window								
	a. Inspect and maintain the exposed metal frame parts, wheather seals and gaskets by removing dusts and grits to ensure the functionality.			✓					
	b. Inspect and remove moisture or condensation from glass panels. If there are a large amounts of condensation, report to FSO immediately together with proposal of remedial works.			✓					
1.3	Atrium – Automatic Shading System								
	a. Check and maintain the system works according to the operations logic schedules.			✓					
	b. Inspect and maintain the motor devices and photo sensors according to manufacturer’s maintenance recommendation.				✓				
1.4	Atrium – “Thermal Flue Stack” System								
	a. Clean the glazing and the motorized louvers including rain water leakages inspection.					✓			
	b. Inspect and maintain the system works according to the operations logic schedules.			✓					
	c. Inspect and maintain the actuator devices and sensors to ensure smooth modulating of the louvers.			✓					
	d. Inspect and maintain the back-up ventilation fan system including the fan motors and modulating dampers.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y		2Y
1.5	Atrium – “Spray Mist Cooling” System								
	a. Monitor the routine maintenance of the system.				✓				
	b. Check & maintain the system works according to the operations logic schedules.			✓					
1.6	Atrium – “Water Wall Feature” System								
	a. Inspect and maintain the overall water wall pumping system, including the pumps, valves, electronic power meters and power supply to the system.				✓				
	b. Clean the water wall surface from algae to ensure smooth trickling water pass through the surface.				✓				
	c. Inspect the system works according to the operations logic schedules.			✓					
2.0	MECHANICAL ENERGY EFFICIENT FEATURES								
2.1	Air Conditioning System – AHUs, FCUs & Pump								
	a. Inspect and maintain the system works according to the operations logic schedules.					✓			
	b. Inspect and maintain the actuator devices, flow meters, pressure sensors and temperature sensors to ensure smooth control of the system. The off coil temperature sensors readings shall be within ± 2 OC of the set points.					✓			
2.2	Air Conditioning System – Variable Speed Drives (Inverters)								
	a. Inspect and maintain the inverters according to manufacturer’s maintenance recommendation.	✓							
	b. Inspect and clean the air duct pressure sensors according to manufacturer’s maintenance recommendation.					✓			

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y		2Y
	c. Inspect the system works according to the operations logic schedules. The pressure readings shall be within the 10% of the set point.		✓						
2.3	Air Conditioning System – CO2 Fresh Air Control System								
	a. Inspect and maintain the CO2 controllers/ sensors according to manufacturer’s maintenance recommendation.				✓				
	b. Inspect and clean the CO2 sensors from dust accumulation according to manufacturer’s maintenance recommendation.			✓					
	c. Inspect & maintain the system works according to the operations logic schedules. The CO2 concentration readings shall be within the 10% of the set point.	✓							
	d. Inspect and maintain the actuator devices and dampers including cleaning the dust accumulation on the dampers.			✓					
	e. Inspect, calibrate and ensure accurate read out from the sensors.						✓		
2.4	Air Conditioning System – Heat Recovery Wheel System								
	a. Lubricant the gearboxes as recommended by manufacturer if any.			✓					
	b. Adjust the drive belts as recommended by the manufacturer.			✓					
	c. Inspect and clean the honeycomb or media from dust accumulation according to manufacturer’s maintenance recommendation.						✓		
	d. Inspect & maintain the system works according to the operations logic schedules.			✓					
	e. Maintain the pre-filters/ screens of the system in good condition.			✓					

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y		2Y
2.5	Air Conditioning System – Electronic Air Filters (EAFs)								
	a. Clean the EAF cells and the prefilters according to the manufacturer's maintenance			✓					
	b. Inspect the filters appearance and inspect any contaminated sign due to uneven air intake distribution.			✓					
	c. Inspect onsite & maintain the EAFs system works according to the operations logic schedules.		✓						
2.6	Car Park Ventilation – CO Exhaust Air Control System								
	a. Inspect and clean the CO sensors from dust accumulation according to manufacturer's maintenance recommendation.						✓		
	b. Inspect and maintain the system works according to the operations logic schedules.			✓					
	c. Inspect and calibrate the trig values of the sensors.						✓		
2.7	Building Control System/ Energy Management System (BCS/ EMS)								
	a. General cleaning of the Central Equipment and field equipment.			✓					
	b. Inspection of any loose wiring connection and sign of overheating at Central and Digital Controller. Rectify as necessary.					✓			
	c. Perform functional test on all the associated equipment controllers. Repair or replace as necessary.				✓				
	i. Inspect the readings are within the normal operational range. Repair as necessary.				✓				
	ii. Inspect the systems by performing step response test. Repair as necessary.				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y		2Y
	<p><i>iii.</i> Override test to all dampers and values from 0% - 100% - 0% open.</p> <p><i>iv.</i> Manual stop/ start of all motors/ equipment.</p> <p><i>v.</i> Force/ false alarm conditions and check system response.</p> <p><i>vi.</i> OFF power and check power backup response/ procedure.</p> <p><i>d.</i> Verification of input and output points. The list of input/ output is listed in the summary of BCS equipment.</p> <p><i>e.</i> Perform communication test within NCU/ NIC and all Digital Controller.</p> <p><i>f.</i> Report on the condition of the equipment and providing consultation for system expansion. Repair or replace as necessary.</p> <p><i>g.</i> Review, repair or replace as necessary of the job site system event log and a discussion with the system operators and Building Energy Manager with the following summaries to be printed :</p> <p><i>i.</i> System Overall Input/ Output report.</p> <p><i>ii.</i> Exception Alarm Report.</p> <p><i>iii.</i> User Override report.</p> <p><i>iv.</i> Alarm (Normal & Critical) report.</p> <p><i>v.</i> Communication Off-line report.</p> <p><i>vi.</i> Database Maintenance report.</p> <p><i>vii.</i> Energy Management reports and strategies to optimize the building energy performance.</p>				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y		2Y
	h. Central Equipment maintenance:								
	i. System Units. Repair or replace as necessary.				✓				
	ii. Keyboards. Repair or replace as necessary.				✓				
	iii. Printers (with papers and ink colour). Repair or replace as necessary.	✓							
	i. Inspect, repair or replace as necessary of field equipment maintenance NCUs / NICs:								
	i. LED indications of proper DC power levels, appropriate transmit and receive activity on the trunks, and possible error code indications shall				✓				
	ii. Power to NCU/ NIC shall be forced to initiate self-diagnostic.				✓				
	iii. Verify correct operation of network terminals.				✓				
	iv. Panels shall be visually inspected for sign of corrosion and security of components and				✓				
	v. Heat sink fins shall be clean to maintain their heat dissipation qualities.				✓				
	vi. NCU batteries shall be checked and replaced if necessary.				✓				
	vii. Exterior of each piece of equipment and the transparent window panels of enclosure doors shall be cleaned.				✓				
	j. Field Equipment maintenance for Digital Controllers.				✓				
	k. Field Equipment maintenance for sensors and actuators (under the service scope of works).				✓				
	l. Input and Output verification. (Including the Energy Efficient Features and Energy Management System).				✓				

No.	Description	Maintenance Frequency							
		D	W	M	3M	6M	Y		2Y
	m. Critical Point Verification.				✓				
	n. Check and synchronize all the power meters with BCS / EMS.					✓			
3.0	ELECTRICAL ENERGY EFFICIENT FEATURES								
3.1	Innovative Lighting System								
	a. Inspect and maintain the system works according to the operations logic schedules.			✓					
	b. Inspect, clean and maintain all the Photo sensors/ Occupancy sensors according to the manufacturer recommendation. Replace if faulty.						✓		
	c. Inspect, test and re-configure the system according to the specified daylight level.								✓
3.2	Grid Connected Photovoltaic (PV) System								
	a. Inspect the solar array mounting structure from corrosion and loose components. Repair or replace as necessary.					✓			
	b. Inspect and clean all the PV panel surface from dirt due to dust accumulation, which can reduce the system efficiency.				✓				
	c. Inspect the cable connection of the PV arrays and the field junction boxes. Repair or replace as necessary.						✓		
	d. Inspect the Grid Connected Inverters according to the manufacturer's maintenance				✓				
	e. Inspect the Protection Devices and Cabling system within the essential main switchboard, including the electronic power meters. Repair or replace as necessary.					✓			
	f. Inspect and maintain the system works according to the operations logic schedules.		✓						

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