

# **Terms of Reference**

## **Rehabilitation and Modernization of the Fiber Optic Backbone and Network Infrastructure for Department of Agrarian Reform**

### **1. Project Background**

The Department of Agrarian Reform (DAR), a mandated agency that provides agrarian reform services, utilizes ICT infrastructure to serve its stakeholders. One of the challenges being encountered by DAR is the outdated ICT infrastructure that slows down processes and communication throughout the DAR Central Office (DAR-CO). This creates a gap between the Agency and its stakeholders - leading to longer delay in communication and processes.

This problem can be alleviated through the improvement of DAR-CO ICT Infrastructure. This solution aims to renovate and modernize existing DAR-CO ICT Infrastructure with updated and innovative ICT solutions. This project entails the full rehabilitation of the existing fiber optic backbone infrastructure at the Department of Agrarian Reform - Central Office (DAR-CO), including the supply, delivery, installation, testing, and commissioning of new network equipment. The goal is to enhance network reliability, performance, and coverage within the DAR Central Office.

### **2. Project Objectives**

The primary objective of this project is to rehabilitate and modernize the Department of Agrarian Reform's (DAR) network infrastructure through the restoration of its fiber optic backbone and the replacement of outdated network equipment. Specifically, the project aims to:

- 2.1.** Rehabilitate the existing fiber optic backbone to improve network reliability, speed, and signal integrity across the DAR Central Office.
- 2.2.** Replace legacy network equipment with modern distribution switches, PoE access switches, and high-performance indoor and outdoor access points.
- 2.3.** Enhance wired and wireless connectivity to support increasing bandwidth demands, seamless mobility, and uninterrupted access to DAR systems and applications.
- 2.4.** Ensure network security, scalability, and compliance with government ICT standards and best practices.
- 2.5.** Enable centralized network management, monitoring, and configuration for improved operational efficiency.
- 2.6.** Support DAR's digital transformation initiatives by providing a robust, scalable, and future-ready network infrastructure.
- 2.7.** Facilitate knowledge transfer and training for DAR personnel to ensure proper operation and maintenance of the upgraded network environment.

### **3. Project Components**

The project consists of the following major components:

#### **3.1. Fiber Optic Backbone Rehabilitation**

- Site assessment and validation of existing fiber routes.
- Removal and replacement of damaged or outdated fiber optic cables.
- Supply and installation of new single-mode/multi-mode fiber optic cables.

- Installation of fiber patch panels, enclosures, and termination equipment.
- Fiber splicing, labeling, and end-to-end OTDR testing.
- Testing of existing structured cabling infrastructure and replace/repair if necessary.

### **3.2. Network Equipment Upgrade**

- Supply, delivery, and installation of the following equipment:
  - Distribution Switch
  - PoE Access Switch
  - Indoor Access Points
  - Outdoor Access Points
  - Wireless Controller for Access Points
- Deployment of Power over Ethernet (PoE) Access Switches to support endpoint devices.
- Installation of high-performance Indoor Wireless Access Points for improved internal Wi-Fi coverage.
- Installation of ruggedized Outdoor Wireless Access Points for extended coverage in external areas.

### **3.3. Network Configuration and Integration**

- Design and implementation of VLANs, QoS, and security policies.
- Integration with existing systems and services.
- Testing and validation of network performance, failover, and redundancy.

## **4. Technical Specifications**

### **4.1. Fiber Optic Backbone Rehabilitation**

#### **4.1.1. Quantity – one (1) Lot**

#### **4.1.2. Components**

- Cabling & Accessories
- Network & Cabling Services

#### **4.1.3. Technical Specification – Cabling & Accessories**

The cabling and accessories supplied by the winning bidder must meet the following **minimum technical specifications** to ensure compliance with industry standards, system performance, and long-term reliability:

*Table 1. Cabling & Accessories Specification*

| <b>SPECIFICATION</b> | <b>REQUIREMENT</b>  |
|----------------------|---|
| UTP Cat6 Cable       | <ul style="list-style-type: none"> <li>• Conductors shall be solid, annealed and bare copper with a diameter of AWG23~24 and minimum acceptable diameter shall be 0/485mm</li> <li>• The insulation shall be uniform and shall not have any defects; and</li> <li>• The diameter over the insulation shall be maximum of 1.22m</li> </ul> |

|                    |   |
|--------------------|---|
| UTP Patch Panel    | <ul style="list-style-type: none"> <li>Patch panel must be in 24ports configuration</li> <li>Can be mounted on 19" standard rack and must be at least 1RU</li> <li>Easy handling by hinged wire management</li> <li>Must be RoHS compliant</li> <li>Must have Cat6 information outlets</li> </ul>   |
| UTP Patch Cord     | <ul style="list-style-type: none"> <li>Patch cords consist of 24AWG~26AWG wire, each four pair twisted at a different lay length</li> <li>Must be in T568A or T568B wiring</li> <li>Must be fully booted and have clip for protection for simple removal; and</li> <li>Must offer a high-performance alternative to satin modular line cords where crosstalk or distance may be considerations</li> </ul> |
| Faceplate          | <ul style="list-style-type: none"> <li>Must be single gang</li> <li>Must be ABS UL94V-0 material</li> </ul>   |
| Information Outlet | <ul style="list-style-type: none"> <li>180-degree slim Modular Jack</li> <li>RoHS compliant</li> <li>47 CFR part 68(RJ-45), ANSI/TIA-568-C.2(Category 6), ISO/IEC 11801 and EN50173 compliant</li> </ul>  |
| Single Mode Fiber  | <ul style="list-style-type: none"> <li>Must be at least 8 cores</li> <li>Loose tube material construction</li> <li>Must have water blocking tape</li> <li>Must have Steel wire strand and corrugated steel tape</li> <li>Must have an attenuation of 0.36/0.23 (db/km)</li> </ul>   |
| Multimode Fiber    | <ul style="list-style-type: none"> <li>Must be at least 4core</li> <li>Fiber must be indoor/outdoor rated</li> <li>Fiber must be water blocking yarn and ripcord</li> <li>Fiber optic cable must be RoHS compliant</li> <li>Both ends of the cable shall be sealed with a suitable plastic cap to prevent the entry of moisture during shipping, handling and storage</li> </ul>                          |
| Fiber Patch Panel  | <ul style="list-style-type: none"> <li>Patch panel must be in at least 12ports and 24ports configuration</li> <li>Can be mounted on 19" standard rack and must be 1RU</li> <li>Must include fiber tray, adapters and connectors</li> </ul>  |
| Fiber Patch Cord   | <ul style="list-style-type: none"> <li>Optimal optical performance through high quality ferrules</li> <li>100% factory tested for Insertion Loss &amp; Return Loss</li> <li>Must be RoHS compliant</li> <li>Insertion Loss and Return Loss is based on ANSI/TIA-568-C-3 requirements</li> </ul>   |

|                                 |   |
|---------------------------------|---|
| Intermediate Distribution Frame | <ul style="list-style-type: none"> <li>Dimension: 600mm W, 600mm D, 730mm H</li> <li>Front Door: Glass with key</li> <li>Detachable side panel with key</li> <li>Wall mount</li> <li>Must have 1-unit rackmount PDU</li> </ul>  |
| Uninterruptible Power Supply    | <ul style="list-style-type: none"> <li>Power rating: 2000va / 1.8kw</li> <li>Input power factor: &gt;0.99 (full load)</li> <li>Input frequency: 40-70Hz</li> <li>Output power factor: 0.9</li> <li>Recharge time: 3hrs @ 90%</li> <li>Display: LCD and LED indicators</li> <li><b>Interfaces:</b> <ul style="list-style-type: none"> <li>1 SMART Slot</li> <li>1 RS-232 Port</li> <li>1 USB Port</li> <li>1 REPO</li> </ul> </li> </ul> |

#### 4.1.4. Technical Specification – Network & Cabling Services

The network and cabling services to be provided by the winning bidder shall include the supply, installation, termination, testing, and documentation of both fiber optic backbone and structured copper cabling systems.

##### 4.1.4.1. Site Survey and Assessment

- Conduct a comprehensive site inspection of the existing fiber optic and structured cabling infrastructure.

##### 4.1.4.2. Dismantling and Removal

- Safely remove all outdated or damaged fiber optic cables, Access Point UTP cables, patch panels, enclosures, and related components.
- Ensure proper handling and disposal of dismantled materials in compliance with environmental and ICT policies.

##### 4.1.4.3. Supply and Installation of Fiber Optic Backbone

- Supply of single-mode or multi-mode fiber optic cables as required by design.
- Installation of new fiber optic cable runs between network distribution points, IDFs, and core switches.
- Installation of fiber enclosures and patch panels.
- Fusion splicing, termination, and labeling of fiber cores.
- Compliance with standard bend radius, grounding, and containment requirements.

##### 4.1.4.4. Structured Cabling Rehabilitation

- Installation of new CAT6/CAT6A UTP cabling to user workstations, WAPs, and network devices.
- Proper cable routing using trays, raceways, and conduits to ensure neat and secure layout.
- Installation of new patch panels, faceplates, and data outlets.

- Ensuring compliance with TIA/EIA standards for horizontal and backbone cabling.

#### **4.1.4.5. Cable Management and Labeling**

- Implementation of standard cable management practices inside cabinets, racks, and enclosures.
- Clear and durable labeling of all fiber and copper cables, patch panels, and outlets for identification and maintenance purpose.

#### **4.1.4.6. Testing and Certification**

- Perform Optical Time Domain Reflectometer (OTDR) or power meter testing for all fiber runs.
- Conduct Fluke testing for copper cabling to verify speed, continuity, and compliance.
- Submit test result certifications for all installed cabling systems.

#### **4.1.4.7. Documentation and Turnover**

- Submission of as-built diagrams indicating cable routes, endpoints, and labeling scheme.
- Final turnover of fiber and structured cabling maps, testing results, and maintenance documentation.
- Conduct briefing or orientation with DAR-CO IT personnel for familiarization and basic troubleshooting.

### **4.2. Network Equipment Upgrade**

#### **4.2.1. Quantity:**

*Table 2. Network Equipment Upgrade Quantity*

| EQUIPMENT                             | UNITS |
|---------------------------------------|-------|
| Distribution Switch                   | 8     |
| PoE Access Switch                     | 10    |
| Indoor Access Points                  | 150   |
| Outdoor Access Points                 | 4     |
| Wireless Controller for Access Points | 4     |

#### **4.2.2. Technical Specifications – Distribution Switch**

*Table 3. Distribution Switch Specification*

| SPECIFICATION       | REQUIREMENT  |
|---------------------|--|
| Switching Capacity  | <ul style="list-style-type: none"> <li>at least 880 Gbps</li> </ul>  |
| Throughput Capacity | <ul style="list-style-type: none"> <li>at least 650 Mbps</li> </ul>  |
| CPU                 | <ul style="list-style-type: none"> <li>at least 1.8 GHz</li> </ul>   |
| Memory              | <ul style="list-style-type: none"> <li>at least 8 GB DDR4</li> </ul>   |
| Flash Memory        | <ul style="list-style-type: none"> <li>at least 32 GB eMMC</li> </ul>  |
| Packet Buffer       | <ul style="list-style-type: none"> <li>at least 8 MB</li> </ul>  |
| Interfaces          | <ul style="list-style-type: none"> <li>At least 24x 1G/10G SFP+ ports</li> <li>At least 4x 1G/10G/25G/50G SFP ports</li> <li>At least 1x USB-C Console Port</li> </ul> |

|                            |   |
|----------------------------|---|
|                            | <ul style="list-style-type: none"> <li>• At least 1x USB Type A Host port</li> </ul>  |
| MAC Address                | <ul style="list-style-type: none"> <li>• at least 32K</li> </ul>  |
| IPv4 Unicast Routes        | <ul style="list-style-type: none"> <li>• at least 61k</li> </ul>  |
| IPv6 Unicast Routes        | <ul style="list-style-type: none"> <li>• at least 61k</li> </ul>  |
| Brand Affiliation          | <ul style="list-style-type: none"> <li>• Must be in the Five Eyes Alliance</li> </ul>   |
| Power Supply Slots         | <ul style="list-style-type: none"> <li>• Must have at least 2x field-replaceable and hot-swappable power supply slots</li> </ul>  |
| Fan trays                  | <ul style="list-style-type: none"> <li>• Must have at least 2x field-replaceable and hot-swappable fan trays</li> </ul>   |
| Must Support the Following | <ul style="list-style-type: none"> <li>• Advanced Layer 2/3 feature set includes BGP, OSPF, and VRF-Lite</li> <li>• Dual stack (IPv4 and IPv6) transitions from IPv4 to IPv6, supporting connectivity for both protocols</li> <li>• IEEE 802.1s Multiple Spanning Trees</li> <li>• IEEE 802.3ad Link Aggregation Control Protocol (LACP)</li> <li>• IEEE 802.1Q VLANs</li> <li>• Virtual Switching Framework (VSF)</li> <li>• REST APIs and Python scripting for fine-grained programmability of network tasks</li> <li>• Jumbo frames allow for high-performance backups and disaster-recovery systems; provides a minimum frame size of at least 9,000 bytes</li> <li>• Intelligent monitoring, visibility and remediation with Network Analytics Engine</li> </ul> |
| Additional Requirements    | <ul style="list-style-type: none"> <li>• Must have at least 32x 10G SFP+ LC SR 300m MMF Transceiver</li> <li>• Must have at least 4x 10G SFP+ to SFP+ 3m Direct Attach Copper Cable</li> </ul>  |

#### 4.2.3. Technical Specifications – PoE Access Switch

Table 4. PoE Access Switch Specification

| SPECIFICATION | REQUIREMENT   |
|---------------|---|
| Capacity      | <ul style="list-style-type: none"> <li>• at least 128 Gbps</li> </ul>   |
| Throughput    | <ul style="list-style-type: none"> <li>• at least 95 Mbps</li> </ul>  |
| CPU           | <ul style="list-style-type: none"> <li>• at least 800 MHz</li> </ul>  |
| Memory        | <ul style="list-style-type: none"> <li>• at least 512 MB SDRAM</li> </ul>   |
| Flash Memory  | <ul style="list-style-type: none"> <li>• at least 256 MB</li> </ul>   |
| Packet Buffer | <ul style="list-style-type: none"> <li>• at least 1.5MB</li> </ul>  |
| Interfaces    | <ul style="list-style-type: none"> <li>• At least 24x RJ-45 autosensing 10/100/1000 Class 4 PoE ports</li> <li>• At least 4x SFP+ 1/10GbE ports</li> </ul>                            |
| Performance   | <ul style="list-style-type: none"> <li>• 100 Mb Latency: &lt;5 microseconds</li> <li>• 1000 Mb Latency: &lt;3 microseconds</li> <li>• 10000 Mb Latency: &lt;2 microseconds</li> </ul> |
| Acoustics     | <ul style="list-style-type: none"> <li>• LWAd = at least 3.7 Bel</li> </ul>   |

|                            |  |
|----------------------------|--|
|                            | <ul style="list-style-type: none"> <li>• LpAm (Bystander) = at least 23 dB</li> </ul>  |
| Brand Affiliation          | <ul style="list-style-type: none"> <li>• Must be in the Five Eyes Alliance</li> </ul>  |
| Must Support the Following | <ul style="list-style-type: none"> <li>• IEEE 802.1s Multiple Spanning Trees</li> <li>• IEEE 802.3ad Link Aggregation Control Protocol (LACP)</li> <li>• IEEE 802.1Q VLANs</li> <li>• Remote monitoring (RMON)</li> <li>• SNMPv2c/v3</li> <li>• Secure and simple access for IoT and users</li> <li>• Two-Factor Authentication (2FA)</li> </ul> |
| Mobile Application         | <ul style="list-style-type: none"> <li>• Must have a mobile app or the cloud-based web portal that can quickly monitor, set-up, and manage the switch</li> </ul>   |
| Additional Requirements    | <ul style="list-style-type: none"> <li>• Must have at least 16x 10G SFP+ LC SR 300m MMF Transceiver</li> </ul>   |

#### 4.2.4. Technical Specifications – Indoor Access Points

Table 5. Indoor Access Points Specifications

| SPECIFICATION                             | REQUIREMENT  |
|---|--|
| Must Support the Following Radio Coverage | <ul style="list-style-type: none"> <li>• Dual/tri-radio</li> <li>• At least 5 GHz and 2.4 GHz 802.11ax 4x4 MIMO</li> </ul>   |
| Maximum Data Rate                         | <ul style="list-style-type: none"> <li>• at least 2.9 Gbps</li> </ul>  |
| Ports                                     | <ul style="list-style-type: none"> <li>• at least 1x USB 2.0 host interface (Type A connector)</li> </ul>  |
| Max Power Consumption                     | <ul style="list-style-type: none"> <li>• at least 26.4W (PoE), at least 23.3W (DC)</li> </ul>  |
| Antennas                                  | <ul style="list-style-type: none"> <li>• Four integrated dual-band downtilt omnidirectional antennas for 4x4 MIMO with a peak antenna gain of at least 3.5 dBi in 2.4 GHz and at least 5.4 dBi in 5 GHz.</li> </ul>  |
| Operating Temperature                     | <ul style="list-style-type: none"> <li>• 0C to +50C / +32F to +122F</li> </ul>   |
| Must Support the Following                | <ul style="list-style-type: none"> <li>• Up to 1,024 associated client devices and 16 BSSIDs per radio</li> <li>• WPA3 and Enhanced Open security</li> <li>• Embedded ranging technology for accurate indoor location measurements</li> <li>• Orthogonal Frequency Division Multiple Access (OFDMA)</li> <li>• Target Wake Time (TWT)</li> <li>• Multiuser, Multiple Input, Multiple Output (MU-MIMO)</li> <li>• Trusted Platform Module (TPM)</li> <li>• Advanced Cellular Coexistence (ACC)</li> <li>• Low Density Parity Check (LDPC)</li> <li>• Transmit Beamforming (TxBF)</li> </ul> |

#### 4.2.5. Technical Specifications – Outdoor Access Points

Table 5. Indoor Access Points Specifications

| SPECIFICATION                             | REQUIREMENT   |
|---|---|
| Must Support the Following Radio Coverage | <ul style="list-style-type: none"> <li>• Wi-Fi 6 dual radio</li> <li>• 2x2 5GHz MIMO</li> <li>• 2x2 2.4GHz MIMO</li> </ul>  |
| Maximum data rate                         | <ul style="list-style-type: none"> <li>• at least 1 Gbps</li> </ul>   |
| PoE-PD                                    | <ul style="list-style-type: none"> <li>• at least 48Vdc</li> </ul>  |
| Antennas                                  | <ul style="list-style-type: none"> <li>• Built-in 90°H x 90°V Directional Antennas with at least 5 GHz Antennas 6.8 dBi and at least 2.4 GHz Antennas 7.1 dBi</li> </ul>  |
| Operating temperature                     | <ul style="list-style-type: none"> <li>• -40° C to +65° C (-40° F to +131° F) with full solar loading</li> </ul>  |
| Must Support the Following                | <ul style="list-style-type: none"> <li>• Up to 256 associated client devices and 16 BSSIDs per radio</li> <li>• Orthogonal Frequency Division Multiple Access (OFDMA)</li> <li>• Target Wake Time (TWT)</li> <li>• Multiuser, Multiple Input, Multiple Output (MU-MIMO)</li> <li>• Trusted Platform Module (TPM)</li> <li>• Advanced Cellular Coexistence (ACC)</li> <li>• Transmit Beamforming (TxBF)</li> </ul> |

#### 4.3. Network Configuration and Integration

##### 4.3.1. Quantity – One (1) lot

##### 4.3.2. Technical Specifications

This component covers the configuration, integration, and commissioning of all network equipment provided under the project. The objective is to ensure a fully functional, secure, and optimized network environment that supports DAR-CO's operational requirements and future scalability.

The winning bidder shall perform the following:

###### 4.3.2.1. Network Design and Configuration

- Develop and implement a logical network design including:
  - IP addressing scheme (IPv4/IPv6 as required)
  - VLAN segmentation for different user groups and services
  - Quality of Service (QoS) configuration for prioritized traffic (e.g., voice, video, mission-critical apps)
- Configure core and distribution switches to support Layer 2 and Layer 3 switching, trunking, redundancy, and routing protocols as applicable (e.g., OSPF, static routes).
- Implement Spanning Tree Protocol (STP) or similar for loop prevention.

###### 4.3.2.2. Security Hardening

- Configure Access Control Lists (ACLs) and port security to restrict unauthorized access.
- Enable device-level security features (SSH, management VLANs, disable unused ports, etc.).
- Implement MAC address filtering and disable unused switch ports.
- Harden management interfaces with strong authentication and administrative controls.

#### **4.3.2.3. Wireless Access Point Configuration**

- Configure indoor and outdoor wireless access points with:
  - Centralized or cloud-based wireless controller (if applicable)
  - SSID broadcasting with WPA2/WPA3 encryption
  - Band steering, load balancing, and roaming optimization
  - Wireless VLAN mapping and traffic segregation
- Conduct wireless signal testing to validate coverage and optimize placement.

#### **4.3.2.4. Integration with Existing Network**

- Seamlessly integrate the new network equipment into DAR-CO's existing ICT infrastructure.
- Ensure compatibility with existing firewall, routers, monitoring systems, and internet service.
- Configure SNMP, Syslog, and NTP for integration with monitoring and alerting tools.

#### **4.3.2.5. Testing and Validation**

- Perform end-to-end connectivity tests across all devices and VLANs.
- Conduct bandwidth, latency, and failover testing to ensure network performance.
- Submit configuration backup and post-implementation documentation including logical diagrams and configurations.

### **5. Warranties of the Contractor**

The system should include support and maintenance for a period of **at least three (3) years** from the date of final acceptance. This shall cover:

- Full warranty for all supplied network equipment and cabling components.
- On-site and remote support for troubleshooting, repair, and configuration assistance.
- Replacement of defective parts or equipment at no additional cost.
- Software and firmware updates for all network devices and access points.
- Technical assistance through phone, email, or ticketing system during business hours.
- All support services must be clearly documented in the Service Level Agreement (SLA) to be provided by the winning bidder.

### **6. Project Timeline**

This project will run for one hundred eighty (180) calendar days from the issuance of the Notice to Proceed (NTP). with key milestones set as follows:

- Project Kick-off – Five (5) Days.
- Design / Layout Approval – Thirty (30) Days.
- Delivery of Items – Forty (40) Days.
- Construction & Implementation – Eighty (80) Days.
- Testing & Commissioning with DAR Personnel - Ten (10) Days
- Project Acceptance – Seven (7) Days.
- Training - Three (3) Days.
- Project Turnover – Five (5) Days.

## **7. Site Preparation and Facility Development Requirements**

The winning bidder shall be responsible for coordinating and executing the necessary site preparation and facility enhancements to ensure proper installation, integration, and long-term operation of the fiber optic backbone, structured cabling, and network equipment. These requirements include, but are not limited to, the following:

### **7.1. Physical Site Preparation**

- Conduct a detailed site survey to assess existing conditions and identify any constraints or obstructions.
- Clear identified cable pathways, network cabinet locations, and access point installation areas of debris, clutter, or equipment that may interfere with installation.
- Coordinate with DAR-CO personnel to ensure access to all installation areas, including ceilings, floors, conduits, and equipment rooms.

### **7.2. Cable Pathway Provisioning**

- Install appropriate cable management systems such as cable trays, raceways, conduits, and supports to accommodate fiber and copper cabling runs.
- Ensure all pathways meet safety, structural, and ventilation requirements, particularly for plenum and non-plenum rated areas.
- Use protective coverings or enclosures where required to prevent physical damage to cables.

### **7.3. Power and Grounding Requirements**

- Ensure that all equipment locations (network racks, switches, access points) are provided with clean, stable power via UPS or protected outlets.
- Provide proper grounding for all network cabinets, racks, and devices as per electrical code and ICT standards.
- Verify the availability and adequacy of electrical load capacity for new equipment.

### **7.4. Network Cabinet and Rack Installation**

- Provide and install network cabinets and racks with appropriate dimensions, ventilation, and load-bearing capacity.
- Ensure secure mounting of all equipment, including cable organizers, patch panels, and switches.
- Allow sufficient space and clearance for future expansion and maintenance access.

### **7.5. Environmental and Structural Considerations**

- Ensure that the installation environment meets manufacturer-recommended temperature and humidity levels.

- Implement dust and moisture protection in sensitive areas, especially for fiber termination points and network distribution rooms.
- Coordinate with facilities management for necessary ceiling or wall modifications (if applicable).

#### **7.6. Safety and Compliance**

- Follow all occupational safety and health standards during installation activities.
- Secure all equipment and cabling to avoid hazards or obstructions to personnel and operations.
- Ensure that all work is compliant with local building codes, ICT infrastructure standards, and government safety regulations.

### **8. Technical Support and Maintenance Requirements**

- The contractor shall provide comprehensive technical support, either through an on-site presence or via telephone, to resolve technical and related issues. Resolution may be delivered through phone assistance, electronic support, or on-site services, and must satisfy the DAR's requirements for problem resolution.
- The contractor must resolve hardware or network issues within the timeframe stipulated in the Service Level Agreement (SLA) as signed and approved by the DAR Project Management Team. The response time shall start once the issue has been reported by an authorized DAR representative from the main site via telephone, or email.
- Technical support must be available on-site, via telephone, and through email for 8 hours per day (8:00 AM to 5:00 PM), 5 days a week (Monday to Friday), to ensure timely problem resolution. The type of support provided will depend on the severity and priority of the issue. Response time shall be within one (1) hour for telephone and email support, and less than four (4) hours for on-site support.

### **9. Training and Knowledge Transfer**

The winning bidder shall conduct training and knowledge transfer sessions for at least five (5) DAR-CO IT personnel to ensure effective operation and maintenance of the upgraded network infrastructure.

#### **9.1. Objectives**

- Enable DAR-CO IT staff to manage network equipment, structured cabling, and wireless systems.
- Build competency in troubleshooting, configuration, and ongoing maintenance.

#### **9.2. Scope**

Training shall cover:

- Fiber optic and UTP cabling systems overview.
- Basic switch configuration, VLANs, and security.
- Wireless access point setup and management.
- Review of documentation and support processes.

#### **9.3. Methodology and Deliverables**

- Conduct instructor-led, hands-on sessions.
- Provide training materials and attendance sheets.

- Submit post-training reports with feedback and recommendations.

## **10. System Testing and Commissioning**

The winning bidder shall conduct a comprehensive system testing and commissioning process to verify the performance, integrity, and reliability of the entire network and cabling infrastructure prior to final acceptance.

### **10.1. Objectives**

- To ensure that all installed components meet design specifications, functional requirements, and performance standards.
- To confirm full operational readiness of the network system and cabling infrastructure.

### **10.2. Scope of Testing and Commissioning**

The following activities shall be performed:

#### **10.2.1. Fiber Optic Backbone Testing**

- Conduct OTDR or Power Meter testing on all fiber optic links.
- Verify continuity, signal loss, and splicing quality.

#### **10.2.2. Structured Cabling Testing**

- Perform 100% Fluke testing on all UTP links (CAT6/CAT6A) to validate speed, attenuation, and crosstalk compliance.
- Ensure proper labeling and patch panel termination.

#### **10.2.3. Network Equipment Testing**

- Configure and test distribution and access switches for VLAN, routing, and connectivity.
- Validate redundancy, failover, and uplink integrity.
- Confirm integration with existing DAR network infrastructure.

#### **10.2.4. Wireless Access Point Testing**

- Conduct wireless coverage tests for indoor and outdoor areas.
- Validate SSID broadcast, authentication, and connectivity.

#### **10.2.5. End-to-End Connectivity Testing**

- Test device-to-device communication across network segments.
- Validate IP assignment, DNS resolution, and internet access.

#### **10.2.6. Deliverables**

- Test result reports (fiber, copper, wireless).
- Final commissioning checklist signed by DAR-CO representative.
- Documentation of configurations, labels, and as-built diagrams.
- Declaration of system readiness for turnover and acceptance.

## **11. As-Built Plans, Infrastructure Design, and Project Documentation Requirements**

The winning bidder shall submit complete and accurate documentation to ensure proper turnover, operation, and maintenance of the network and cabling systems installed at DAR Central Office.

#### **11.1. As-Built Plans and Infrastructure Design**

- Submit detailed as-built plans, including final cable routes, rack elevations, device locations, and patch panel mappings.
- Provide updated architectural and engineering diagrams reflecting any modifications during implementation.
- Include network topology diagrams, IP addressing schemes, VLAN structure, and logical network layout.
- All drawings must be submitted in both printed and editable digital formats (e.g., AutoCAD, PDF, Visio).

#### **11.2. Documentation and Turnover Requirements**

- Submit all warranty certificates, including start and end dates.
- Deliver product manuals, user guides, and installation/configuration documents for network devices and components.
- Include network configuration files and system credentials.
- Provide a complete inventory list of all installed items (including serial numbers).
- Ensure turnover of all documentation to DAR-CO upon final project acceptance.

### **12. Manpower Requirements**

To ensure proper implementation, integration, and support for the project, the bidder shall assign qualified personnel with relevant expertise in network and infrastructure systems.

#### **Required Personnel Qualifications**

The bidder must submit the names, proof of employment, and résumés of full-time regular employees who have been employed for at least two (2) years, with the following minimum qualifications related to network and infrastructure systems:

- **At least one (1) Lead Project Manager with Project Management Professionals (PMP) Certification**
  - Responsible for overall managing the project timeline, resources, and stakeholder coordination.
- **At least one (1) Assistant Project Manager with Project Management Professionals (PMP) Certification**
  - Responsible for assisting in the overall management of project execution, including tracking timelines, coordinating resources, ensuring deliverables meet quality standards, and facilitating communication among stakeholders.
- **At least two (2) Certified Data Center Professionals (CDCP)**
  - Responsible for overseeing data center standards compliance, physical infrastructure integration, and structured cabling execution.
- **At least one (1) Certified Switching Professional**
  - Specialized in the configuration, deployment, and troubleshooting of switching infrastructure within the network solution.

- **At least one (1) Certified Mobility Associate**
  - Qualified in deploying and managing wireless access point installations, wireless LAN configurations, and connectivity optimization.
- **At least one (1) Certified Mobility Professional**
  - Focused on advanced wireless network design, security, and performance tuning across indoor and outdoor environments.

During Bid Opening, the bidder must submit a CV, certificate of regular employment and copies of proof of employment such as but not limited to: SSS, PAG-IBIG or Income Tax Return (ITR) of each personnel.

### **13. Bidder's Qualification**

- 13.1.** The bidder must be a legally established entity in the Philippines with at least ten (10) years of proven experience in the supply, delivery, and installation of Data Center & Network infrastructure and other related ICT systems.

This requirement ensures the bidder possesses the necessary technical expertise, operational stability, and industry knowledge to manage complex ICT projects, minimize implementation risks, and ensure the successful delivery and sustainability of the solution.

### **13.2. Single Largest Completed Contract**

- 13.2.1.** The Bidder must submit a Single Largest Completed Contract (SLCC) consisting of at least one (1) contract involving a similar project, or a component thereof under a multi-component contract. The value of the entire project, when adjusted to current prices using the Philippine Statistics Authority (PSA) Consumer Price Index (CPI), must be at least equivalent to:

The Bidder must have completed a single contract involving a similar project, or a component thereof under a multi-component contract, equivalent to at least fifty percent (50%) of the ABC.

- 13.2.2.** For the purpose of this bid, contracts similar to this Project shall refer to the following:

Supply, Delivery, Installation and Configuration of Structured Cabling Components and should have been completed within the last five (5) years prior to the deadline for the submission and receipt of bids.

### **14. Other Documentary Submission (to be submitted during bid opening)**

- a. **Manufacturer's Authorization Form (MAF)/Letter of Support** from the Manufacturer or its authorized Distributor for the following components:
  - Structured Cabling Systems
  - Network Equipment
  - Indoor and Outdoor Access Points
  - Wireless Controller for Access Points

**b. Project Proposal and Plan**

The winning bidder shall submit a comprehensive Project Proposal and Plan that includes the following key elements:

- **Timeline:** A detailed schedule outlining the phases of implementation, key milestones, and completion dates.
- **Implementation Plan:** A step-by-step strategy for executing the project, including resource allocation, methodologies and risk management.
- **Hardware:** A complete list of all hardware to be delivered, including specifications, quantities and warranties.
- **Services:** A breakdown of all services to be provided such as installation, configuration, technical support and maintenance.
- **Software Subscription:** Clear details on the software deliverables, subscription terms, and activation timelines, including provisions for open-source software support, where applicable

**c. Manpower Requirements for the project as listed in Item 12 "Bidder's Qualification".**

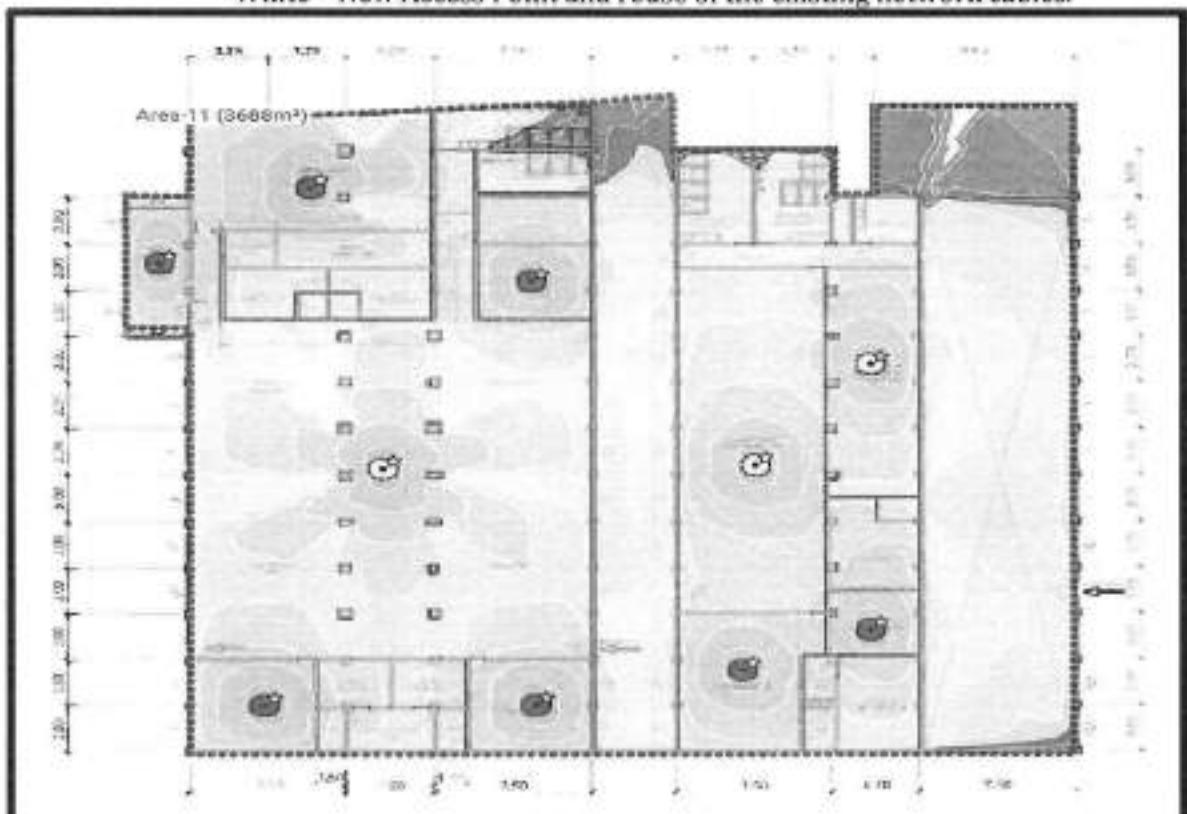
**15. Payment Schedule**

| Milestone | Particulars                              | Payment % | Document Required for Payments   |
|-----------|--|-----------|--|
| 1         | Mobilization/<br>Project Planning        | 15%       | Submission of Project Plan   |
| 2         | Network Equipment<br>Delivery            | 50%       | Delivery Receipts duly received by DAR   |
| 3         | System Configuration                     | 25%       | System Testing and Commissioning report  |
| 4         | Knowledge Transfer<br>& Final Acceptance | 10%       | Knowledge Transfer Certificates, Warranty<br>Certificates, Submission of As Built Plans and<br>Final Acceptance Report |

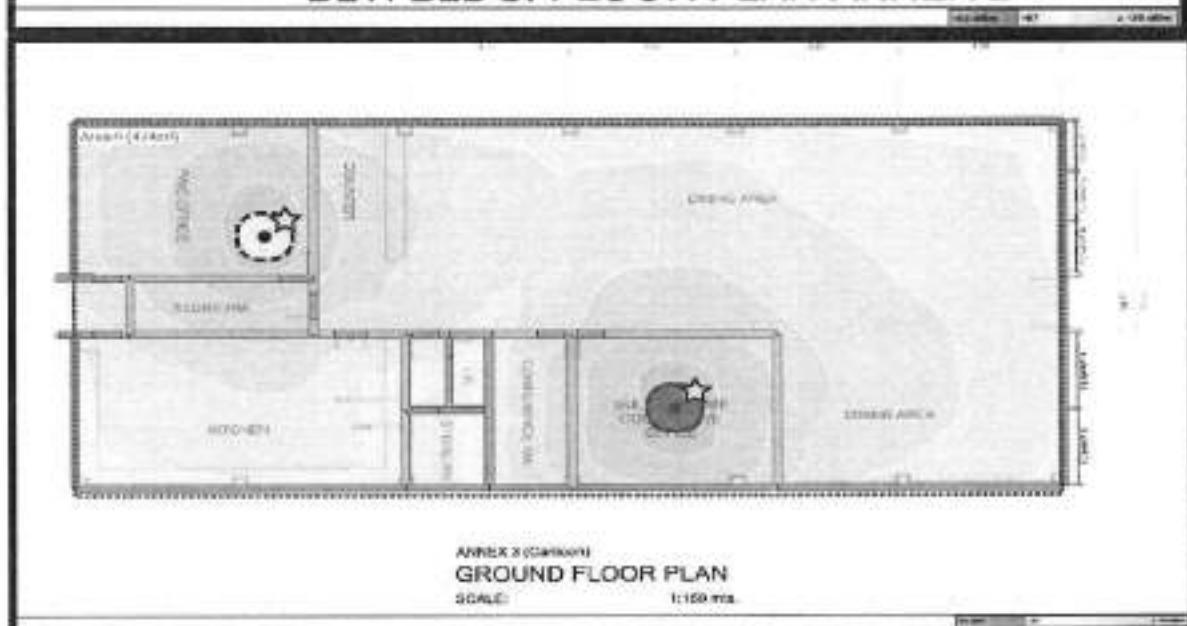
## Annex A – Access Point Heatmap

Blue – New Access Point and new network cable.

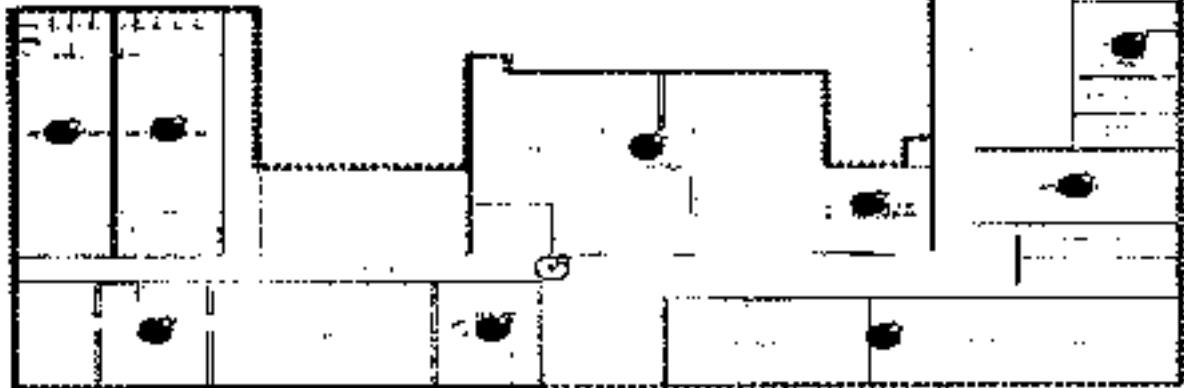
White – New Access Point and reuse of the existing network cables.



BLTI BLDG. FLOOR PLAN ANNEX 2

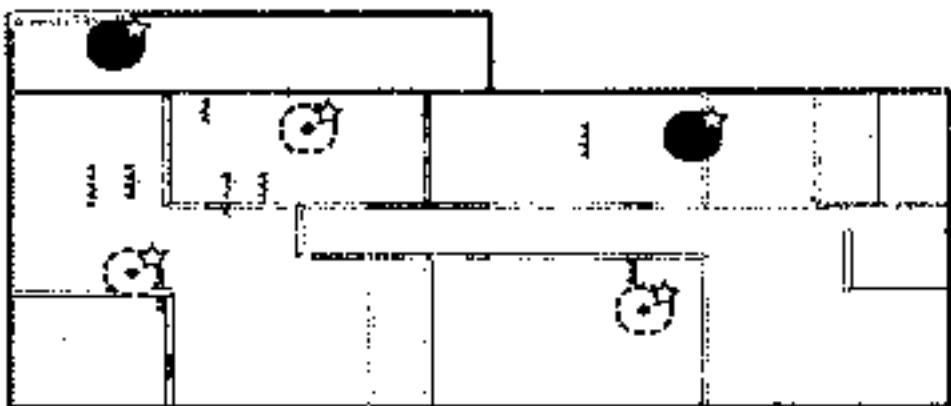


ANSWER



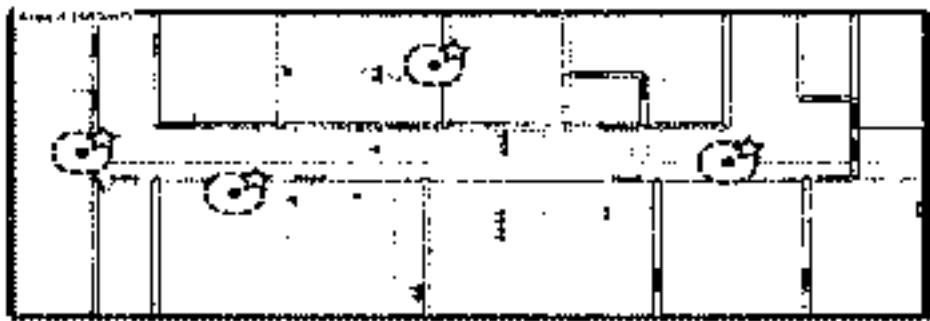
## **DARAB FLOOR PLAN ANNEX 1**

A-01 SCALE: 1:4000000



**GROUNDFLOOR PLAN**

Area A (440m<sup>2</sup>)  
Area B (440m<sup>2</sup>)  
Area C (440m<sup>2</sup>)



SECOND FLOOR PLAN

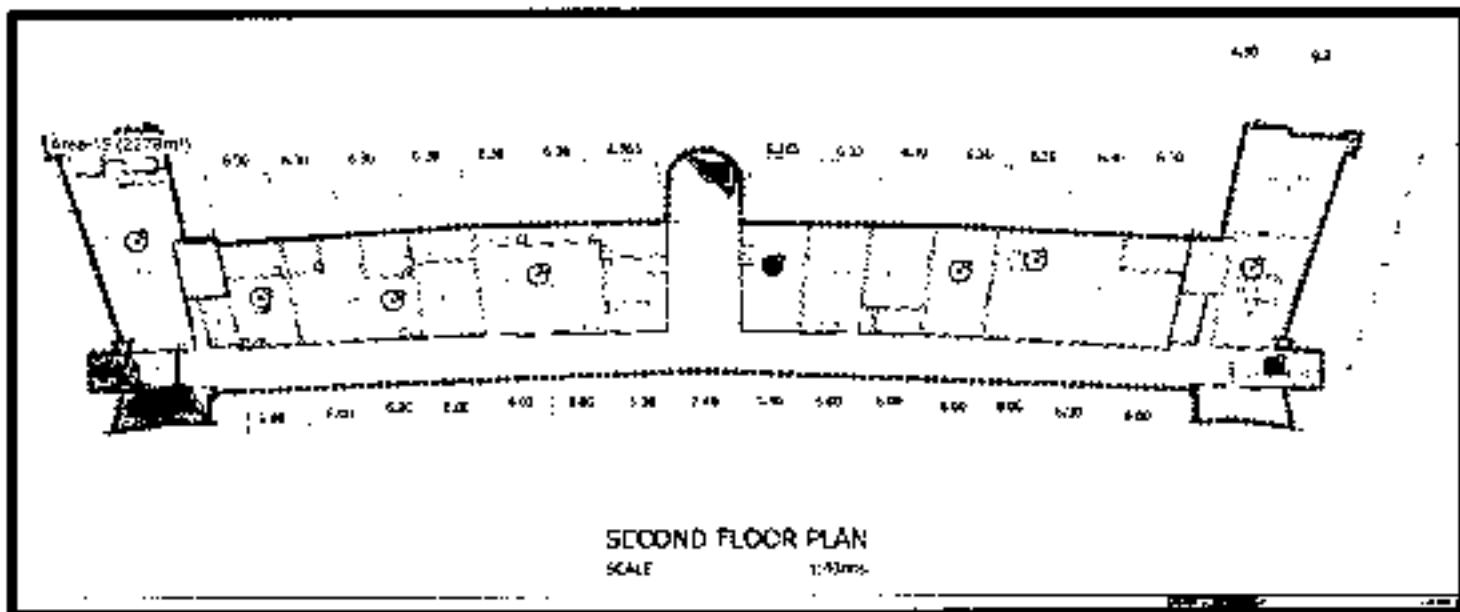
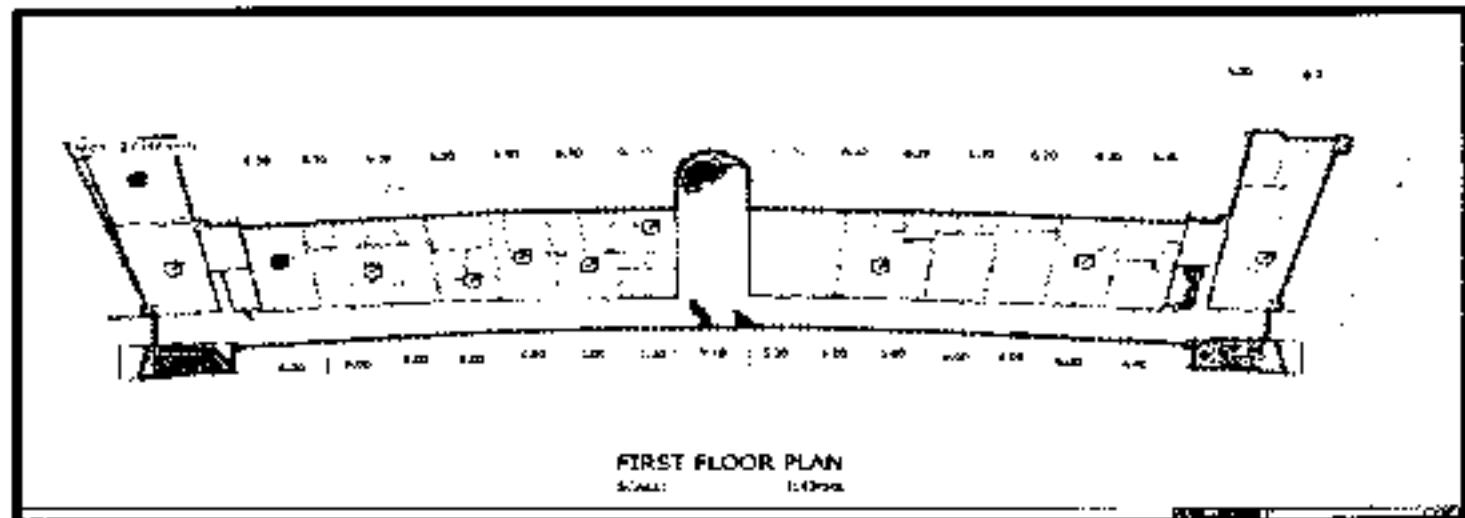
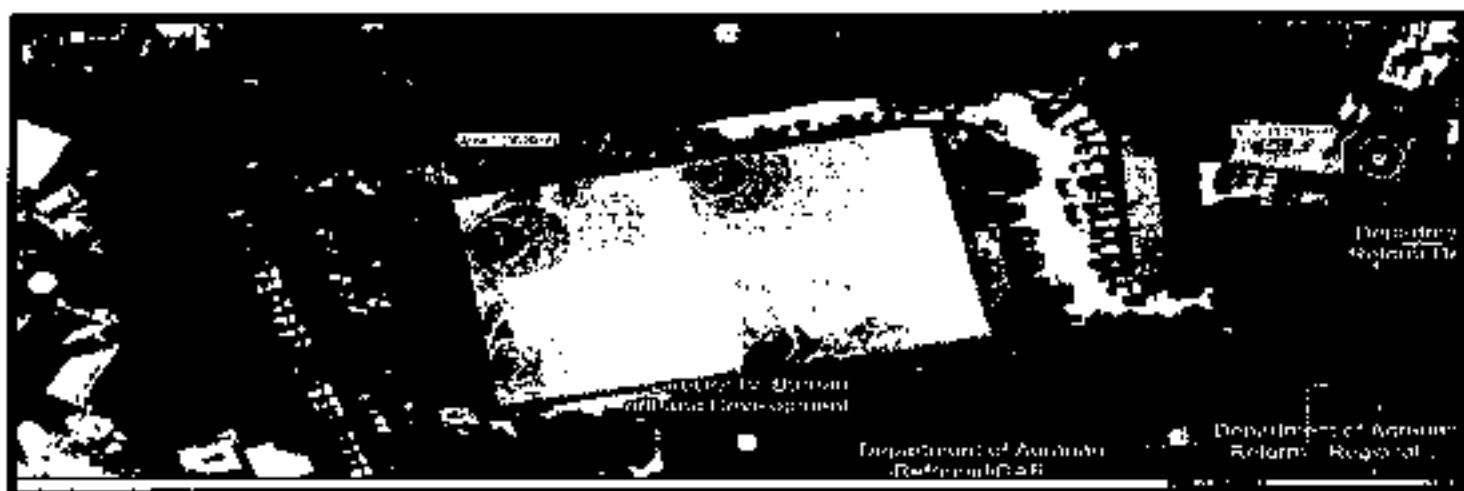
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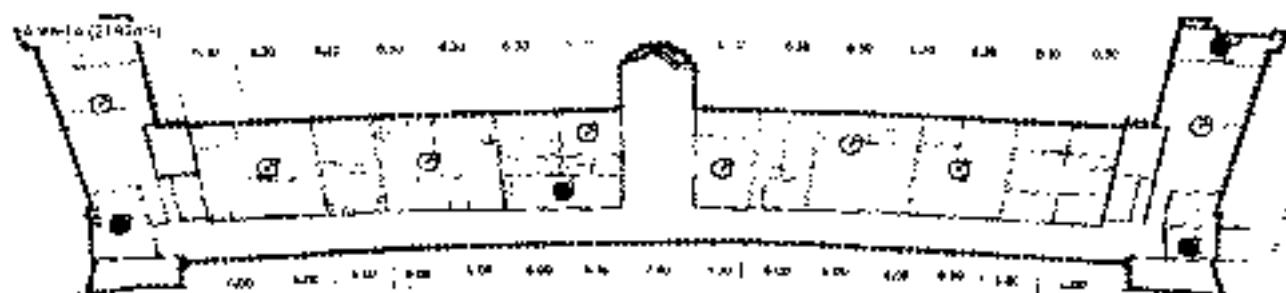


THIRD FLOOR PLAN

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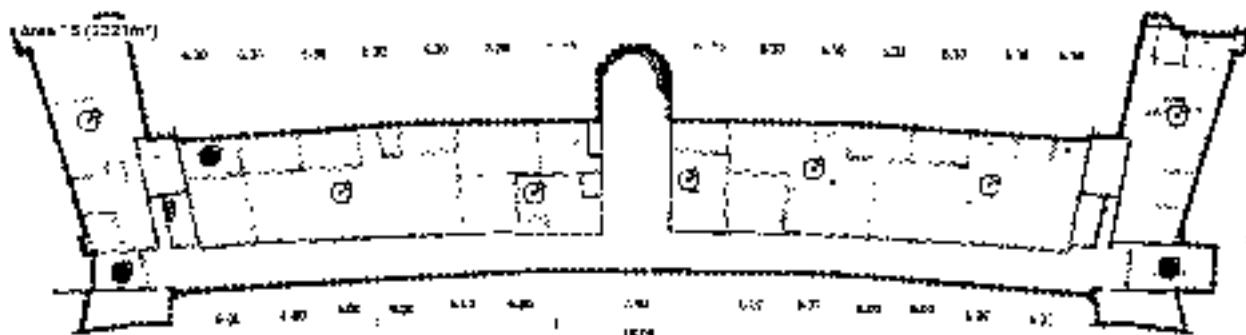
6.1 22



THIRD FLOOR PLAN

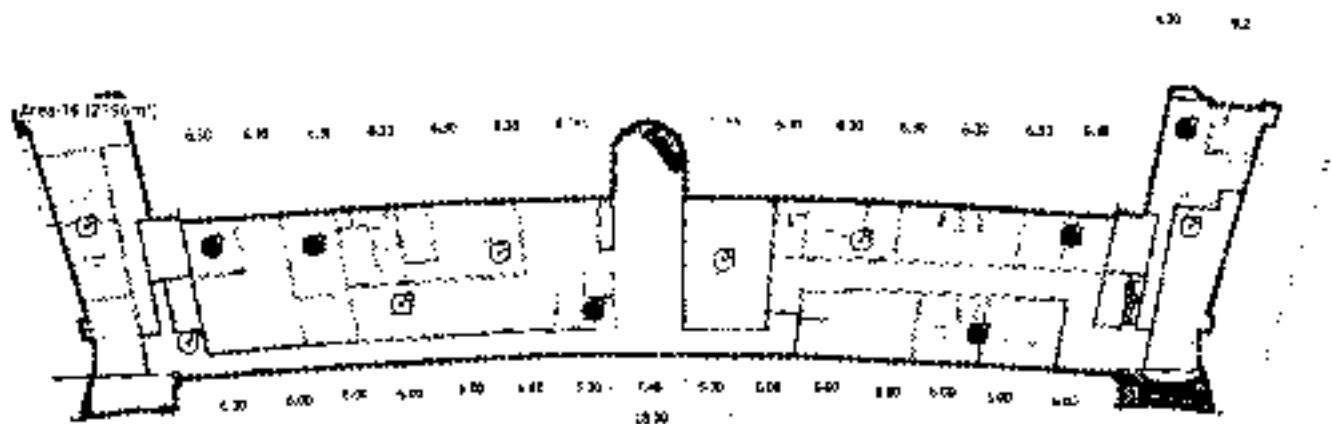
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4.20 12



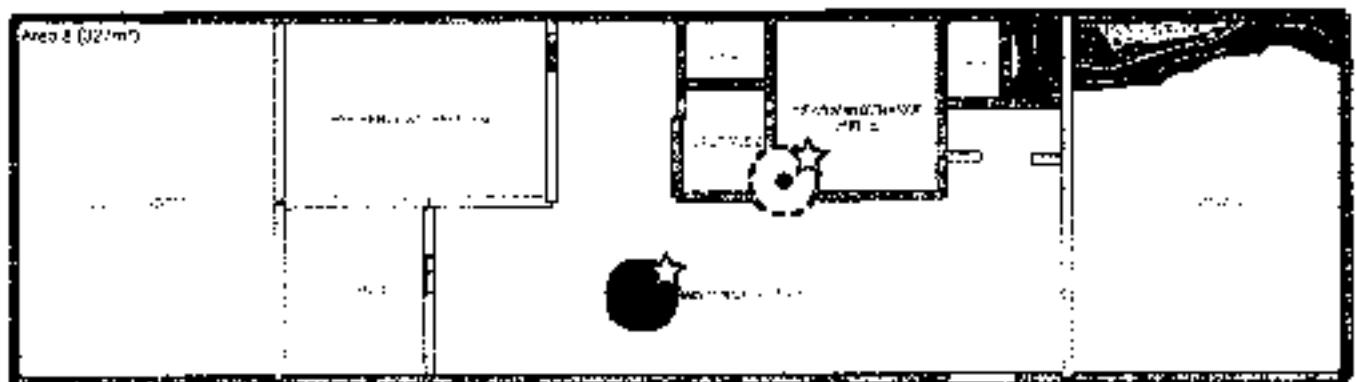
FOURTH FLOOR PLAN

SCALE 1:1000



FIFTH FLOOR PLAN

SCALE: 125m



EXISTING MAINTENANCE BLDG. FLOOR PLAN ANNEX 4

SCALE: 125m

## FIBER BACKBONE SLD

