Philippine Economic Zone Authority

SCOPE OF WORKS

PROJECT : Proposed Installation of FK-5-1-12 Based Clean-Agent Fire Suppression System at MIS, EE, and Command Center Room

PROPONENT : Mactan Economic Zone
Philippine Economic Zone Authority

LOCATION : MEZ Admin Building, Brgy. Ibo, Lapu-lapu City

PART 1 - GENERAL

1.1 BACKGROUND

The Philippine Economic Zone Authority (PEZA), through the approved allocation fund for infrastructure projects for 2025, intends to utilize the sum of **TWO MILLION SEVEN HUNDRED THOUSAND PESOS (₱2,700,000.00)** as the approved budget for the contract (ABC) for the **procurement and implementation** of the project: **"Proposed Installation of FK-5-1-12-Based Clean-Agent Fire Suppression System at MIS, EE, and Command Center Room"** (AAI Compound, 2nd Avenue, Mactan Economic Zone 1, Ibo, Lapu-Lapu City).

1.2 SUMMARY

This section involves the supply, installation, testing, and commissioning necessary to complete the installation required for the items specified under this division, including but not limited to:

a) System Description and Operational Overview
b) System Requirements
c) System Design
d) System Installation
e) System Specification
f) System Testing and Commissioning
g) Submittals
h) Quality Assurance
i) Project Conditions
j) Payment Schedule
k) Project Duration

1.3 SYSTEM DESCRIPTION AND OPERATIONAL OVERVIEW

This system provides FK-5-1-12 based clean-agent fire suppression, ensuring the safety of critical electronic and electrical equipment and preventing operational downtime. This system is a pre-engineered fire suppression solution that utilizes **FK-5-1-12**, a clean agent with zero ozone depletion potential (ODP) and low global warming potential (GWP), making it an environmentally friendly choice for fire protection. The installation shall comply with NFPA 2001, ISO 9001, and relevant local fire codes.

1.4 SYSTEM REQUIREMENTS

The FK-5-1-12-based clean-agent fire suppression system must meet the following technical and operational requirements to ensure compliance with fire safety standards:

A. **Clean Agent Suppression** – The system must utilize FK-5-1-12 based as the suppression agent, meeting NFPA 2001 standards and providing effective fire extinguishment without damage to electronics.

B. **Cylinder and Valve Assembly** – The suppression agent must be contained within a **TPED seamless cylinder**, equipped with a **1.5" discharge valve** and a **pressure gauge with switch** to monitor cylinder pressure.

C. **Fire Detection and Activation** – The system must include a **conventional releasing panel**, **UL 7th Edition-compliant smoke detectors**, and both automatic and manual activation mechanisms such as an **electromagnetic actuator**, **manual actuator**, and **pull station**.

D. **Control and Notification Devices** – The system must feature an **abort switch**, **discharge pressure switch**, and **flashing evacuation signage** to ensure personnel awareness. Additionally, audio-visual alarms must include a **horn/strobe unit**, **motor bell**, and **entry/exit warning signs**.

E. **Integration with Building Systems** – The system must be capable to interface with air conditioning units for automatic shut-off. A door access integration module must ensure automatic unlocking of doors upon activation.

F. **Discharge Nozzles and Agent Distribution** – The system must include a 2-inch FK discharge nozzle designed to evenly disperse the agent within the protected area.

G. **Wiring and Power Supply** – Fire-rated cables must be used throughout the installation, with a backup battery (12VDC, 7AH) to ensure uninterrupted operation in case of power failure. **No exposed conduits or roughing-ins shall be allowed**. All conduit work must be **embedded** in walls, ceilings, or flooring for a seamless and aesthetic installation. Conduit shall be made of metal (EMT or RSC) and must comply with NFPA 70 (NEC) and local electrical codes.

H. **Regulatory Compliance and Testing** – All materials, devices, and equipment shall be UL Listed, FM Approved, and comply with all applicable NFPA, IEC, and ISO standards and relevant local fire safety codes. The installation must adhere to:

   a. NFPA 2001 – Clean Agent Fire Extinguishing Systems
   b. NFPA 13 – Piping & Support Guidelines
   c. NFPA 72 – Fire Alarm & Detection Systems
   d. NFPA 704 – Hazard Identification

e. NFPA 70 – National Electrical Code (NEC)
f. ISO 3864 – Safety Signage and Labels

Post-installation, a **room integrity test** and **full commissioning test** must be conducted to verify compliance and performance.

I. **Maintenance and Training** – A **one-year warranty** on equipment and installation must be provided, with scheduled preventive maintenance inspections. System training must be conducted to familiarize personnel with operational procedures and emergency protocols.

1.5 SYSTEM DESIGN

The contractor shall be responsible for the complete system design, ensuring compliance with Section 1.4 (H) System Requirements. The design must include:

A. **Fire Risk Assessment**
- Identifying the fire classification (Class A, B, or C)
- Determining the required minimum agent concentration based on NFPA 2001.
- Ensuring compliance with fire safety standards and environmental regulations.

B. **Agent Storage and Distribution**

The quantity of FK-5-1-12 clean agent for each protected space shall be calculated based on:
- The enclosed room volume,
- Hazard classification per **NFPA 2001: Standard on Clean Agent Fire Extinguishing Systems**, and
- The required minimum design concentration (typically **5.3% to 6.0% by volume** for Class A surface fires), including a safety factor in accordance with **NFPA 2001 Section 5.4**.

The clean agent flow calculations shall be derived using the **manufacturer's proprietary, UL-certified design software**, ensuring accuracy in:
- Cylinder sizing,
- Pipe network layout and nozzle selection, and
- Agent discharge time, flow rate, and nozzle pressures.

The following rooms shall be protected using FK-5-1-12:
- **MIS Room – 60.16 m^3**
- **Command Center – 22.24 m^3**
- **EE Room – 6.62 m^3**

To ensure consistency and a baseline for compliance, the minimum clean agent quantities must adhere to the reference values below:

Room	Volume (m^3)	Design Concentration	Agent Required (kg)
• **MIS Room**	60.16 m^3	6.0%	~50.9 kg
• **Command Center**	22.24 m^3	6.0%	~18.8 kg
• **EE Room**	6.62 m^3	6.0%	~5.6 kg

NOTE: Final agent quantity and cylinder configuration must be verified using manufacturer software and submitted with design documentation.

For preliminary verification, FK-5-1-12 (NOVEC 1230) agent typically requires:

- **0.85 kg/m³** at a 6.0% design concentration (with 20% safety margin).
- **Formula:** Required Agent (kg) = Volume (m^3) × 0.85 kg/m^3

This method supports validation of the contractor's calculations during review.

Based on these volumes, the suppression system shall be designed to:

- Comply with **NFPA 2001 total flooding system** requirements;
- Use **cylinders certified under TPED or DOT** specifications;
- Provide **pressure relief vents** and sealing provisions to pass a **door fan room integrity test** (per Annex C of NFPA 2001).

C. **Piping and Nozzle Layout**

- The distribution piping and nozzle placement shall be designed to ensure uniform discharge of the suppression agent.
- Piping shall be properly sized to maintain adequate pressure throughout the system.
- Nozzles shall be installed according to manufacturer guidelines and NFPA 2001.
- Flow Design: Engineered using manufacturer-approved calculation software

D. **Fire Detection and Control System**

- Install a fire alarm control panel with a releasing module to activate the suppression system.
- Provide conventional smoke detectors to detect early signs of fire.
- Include abort switches, manual pull stations, and warning signage to allow safe and controlled activation.

E. **Fire Suppression Sequence**

- The fire suppression system shall include a pre-discharge warning phase before the release of the FK-5-1-12 clean agent. This phase is designed to:
- Provide a clear audible and visual warning to occupants before agent discharge.
- Allow authorized personnel to abort or delay the release if the alarm is falsely triggered.
- Ensure activation of HVAC shutdown, door release, and other fire safety mechanisms before discharge.

F. **Fire Suppression Activation Sequence:**

- **Fire Detection:** The system detects fire via smoke/heat detectors.
- **Pre-Discharge Warning:** Horns, strobes, and voice alarms activate, allowing for safe evacuation.
- **Delay Timer (if configured):** A programmed delay (typically 10-30 seconds) allows verification or abort.
- **Agent Discharge:** If no abort is triggered, the FK-5-1-12 agent is released.

G. **Safety and Interlocks**

- Ensure automatic unlocking of doors upon fire detection to allow safe evacuation.
- Integrate the system with HVAC shutdown and dampers to prevent agent loss.
- Install warning devices such as horn/strobes, flashing signage, and evacuation alarms.
- Fire Suppression Activation Sequence:
- Fire Detection: The system detects fire via smoke/heat detectors.
- Pre-Discharge Warning: Horns, strobes, and voice alarms activate, allowing for safe evacuation.

- Delay Timer (if configured): A programmed delay (typically 10-30 seconds) allows verification or abort.
- Agent Discharge: If no abort is triggered, the FK-5-1-12 agent is released.

1.6 SYSTEM INSTALLATION

A. Material Inspection

- Inspect all components for defects or damages before installation
- Ensure compatibility of components with system design requirements.

B. Cylinder Installation

- Position the cylinders at the designated location (preferably a secure, well-ventilated area).
- Secure cylinders on a sturdy wall-mounted or floor-mounted bracket.
- Cylinders must be securely fastened in an **upright position** using seismic-rated brackets.
- Clearance must be maintained for **valve operation and servicing**.
- Ensure proper labeling and accessibility for maintenance and refilling.
- Discharge piping must be **kept as short as possible** to minimize agent loss.

C. Piping Installation

- Use appropriate schedule-rated pipes (e.g., Schedule 40 black steel or stainless steel) as per the design.
- Cut and thread the pipes according to the layout plan.
- Install piping from the cylinder manifold to the nozzle locations.
- Support pipes with appropriate brackets and clamps to prevent movement or sagging.
- Pressure-test the piping system to detect leaks before proceeding.
- Pipe supports must follow NFPA 13 guidelines for horizontal and vertical installations.

D. Nozzle Installation

- Install discharge nozzles at the designated locations based on the coverage area and design specifications.
- Ensure that the nozzle orifices are correctly aligned for optimal agent distribution.
- Securely fasten nozzles to prevent movement or blockage.
- Minimum **150mm (6 inches) clearance below the ceiling**.
- Minimum **0.3m (1ft) from walls** for sidewall-mounted nozzles.
- Nozzles must be spaced **3m to 5m (10ft to 16ft) apart**, depending on room volume.
- Nozzles must not be placed near exhaust vents to avoid agent loss.

E. Fire Detection, Alarm, and Control Panel Installation

- **Fire Alarm Control Panel**
  a. Mount the control panel in an accessible and secure location.
  b. Connect the control panel to smoke detectors, heat detectors, and manual release stations.
  c. Wire the solenoid valve to the panel for automatic activation of the FK-5-1-12 based clean-agent system release.
- **Manual Pull Station**
  a. Installed at a height of 1.0m to 1.2m (40-48 inches) above the finished floor level (per NFPA 72 and ADA guidelines).

b. Positioned near exit doors, stairwells, and high-risk areas for easy access.
c. The pull station must be protected by a clear acrylic cover with an audible alarm to prevent tampering.

- **Strobe Lights**
  a. Installed at a minimum height of 2.1m (7ft) above the finished floor.
  b. Strobe placement shall ensure visibility from all areas of the protected space.
- **Fire Alarm Bell**
  a. Installed at a height ensuring maximum sound propagation.
  b. Shall be synchronized with strobe lights for coordinated alarm activation.
  c. Wiring shall be fire-rated and properly labeled.
- **Evacuation Signage**
  a. Installed above exit doors, stairwells, and evacuation routes for clear visibility.
  b. LED signs shall be connected to backup power for operation during power failures.
- **Gas Discharge Warning Signage**
  a. Installed at the entrance of protected areas to indicate the presence of a clean-agent suppression system.
  b. Must have clear, bold lettering stating: "CLEAN AGENT PROTECTED AREA – GAS DISCHARGE WARNING."
  c. Shall be reflective and illuminated for visibility in low-light conditions.
- **Entrance Warning Signage**
  a. Placed at all access points to inform personnel that the area is protected by an FK-5-1-12 clean-agent system.
  b. Wording must indicate: "WARNING: THIS AREA IS PROTECTED BY A CLEAN-AGENT SUPPRESSION SYSTEM – ENTER WITH CAUTION."
- **Exit Warning Signage**
  a. Positioned at emergency exits leading out of the protected space.
  b. Should include instructions for safe evacuation, such as: "IN CASE OF ALARM, EVACUATE IMMEDIATELY – DO NOT RE-ENTER UNTIL CLEARED."
  c. Must be photoluminescent or have backup lighting to remain visible during power failure.

- **Abort Button Switch**
  a. Installed adjacent to the manual pull station and near exits.
  b. Clearly labeled for immediate identification.
  c. Wired to fire suppression control circuits to prevent accidental discharge.
  d. Must be protected by a clear acrylic cover

1.7 SYSTEM SPECIFICATIONS

A. **Cylinder Specifications**

- **Material:** High-strength alloy steel **(ASME / DOT approved)**
- **Pressure Rating:** 25 bar (360 psi) or per manufacturer's specifications
- **Valve System:** Equipped with discharge valve, pressure gauge, and safety relief device.
- **Activation Mechanism:** Both automatic and manual release.
- **Mounting:** Installed with seismic brackets for structural stability.
- **Labeling:** Must comply with **NFPA 704** for hazard identification

B. **Pipe Material & Specifications**

- Schedule 40 Black Steel Pipe (ASTM A106 or equivalent)

- **Fittings:** Welded or threaded (per NFPA 2001)
- **Cleaning Standard:** Internally cleaned to remove contaminants

C. **Nozzle Specifications**
- **Material:** Brass or Stainless Steel
- **Discharge Angle:** 360° (omnidirectional) or 180° (unidirectional)

D. **FACP Specifications**
- **Fire Alarm Control Panel (FACP)**
  a. **Type:** Conventional, **UL Listed, FM Approved**
  b. **Detection Zones:** Minimum **4 zones** (expandable)
  c. **HMI:** LCD Display with user-friendly interface.
  d. **Power Supply:** 120V/230V AC with 24-hour battery backup
  e. **Release Circuit:** Dedicated circuit for clean-agent discharge

  Activation Inputs:
  f. Smoke and heat detectors
  g. Manual pull stations
  h. Abort switch

  Output Functions:
  i. Alarm sounders & visual strobes
  j. HVAC shutdown relay
  k. Door release control
  l. Pre-discharge warning system

  Logging & Indications:
  m. Event history log with time-stamped records
  n. LED status indicators

E. **Manual Pull Station Specifications**
- Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box.
- Provides a single action, break glass initiating station. It is available with normally open (N.O.), normally closed (N.C.) or combination N.O./N.C. contacts.
- Attractive with streamline design.
- Less than 5lb pull force complies with ADA.
- Solid, die-cast metal construction.
- ***UL*** Listed.

F. **Conventional Smoke Detector Specifications**
- Photo-electric Type operating at 24-Vdc, nominal.
- Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to system wiring.
- ***UL*** Listed.
- The Conventional Smoke Detector shall have the following capabilities.
  - Reed switch testing
  - Drift sensitivity, suit to environment extensively
  - Removable innovative sensing chamber, easy for maintenance.
  - The fire LED allows 360°viewing.
  - Providing alarm output terminal connecting with remote

G. **Combinational Horn/Light Specifications**

- Operating Voltage is 16-33Vdc.
- High Performance LED Strobe Technology
  – Ultra low device current consumption
  – High efficiency optics
  – Selectable 15, 30, or 75 cd light output
- Efficient Audible Output
  – Selectable high or low dB horn output
  – Selectable temporal or steady horn output
  – Improved audio frequency range for better wall penetration
- Low-profile Design
  – Compact design
  – Single gang mounting
  – Ultra-slim protrudes about 1" from the mounting surface
  – Attractive appearance—no visible mounting

H. **Fire Alarm Bell Specifications**

- Type: Motor-driven or vibrating bell.
- Sound Level:
  a. Minimum 75 dB at 10 feet.
  b. Adjustable up to 95 dB as required.
- Power Supply: 24V DC (nominal).
- Diameter: 6 inches (152mm) or 10 inches (254mm), depending on area size.
- Mounting: Suitable for surface-mounted installation.
- Protection Rating:
  a. IP42 for indoor use.
  b. IP54 or higher for outdoor use.
- Compliance: UL 464, NFPA 72.

I. **Evacuation Signage Specifications**

- Rigid Photoluminescent (Glow-in-the-Dark) Plastic, Metal, or Acrylic
- Must be non-reflective with anti-glare finish.
- Minimum 8" x 10" (200mm x 250mm) or larger for visibility
- Background: **RED or YELLOW** (ISO 3864 compliant).
- Text: WHITE or BLACK (high contrast for readability).
- **Evacuation running man** symbol (ISO 7010-E001).
- Fire suppression warning triangle (ISO 3864).
- Gas discharge warning icon (NFPA 72 recommended).
- Should be **illuminated** or **self-glowing** for low-light conditions.

J. **Abort Button Switch Specifications**

- Normally Open (N.O.) momentary push button.
- **Activation Mechanism:** Press-and-hold to delay suppression discharge.
- **Reset Mechanism:** Automatic reset upon release.
- Red or yellow, labeled "ABORT".
- **Marking & Labeling:** "PRESS AND HOLD TO ABORT", per NFPA 2001.
- Heavy-duty plastic or metal for durability.
- **Protection Rating:** IP54 minimum for indoor use.
- **Electrical Contact Rating:** 24V DC.
- **Mounting:** Surface-mounted near exit doors.
- **Compliance:** NFPA 2001, UL 38.

1.8 SYSTEM TESTING AND COMMISSIONING

The contractor must perform **full system testing** before final acceptance.

A. **Pre-Testing Requirements**

a. Verify all devices are properly installed and labeled.
b. Check for **short circuits, open circuits, and ground faults.**
c. Conduct a **pressure test** on FK-5-1-12 piping and nozzles

B. **Functional Testing**

The contractor shall conduct a full functional test including:

- **Fire Alarm System Testing:**
  a. Verify detection and response time of smoke detectors.
  b. Test manual activation using manual pull stations.
  c. Confirm abort switch functionality
  d. Verify proper operation of audible and visual alarms

- **Clean Agent Suppression Testing**
  a. Ensure proper signal transmission from the fire panel to the suppression system
  b. Verify discharge sequence activation
  c. Test electromagnetic and manual actuators
  d. Confirm abort feature delays discharge and resets correctly.

- **Room Integrity Test (Door Fan Test)**
  a. Ensure sufficient agent retention time as per NFPA 2001.
  b. Verify sealing of doors, ducts, and penetrations to prevent leaks.

C. **System Handover and Acceptance**

- Final Inspection:
  a. Conducted in the presence of procuring entity representatives, the Project Engineer, and the end user.
  b. Ensure all system components are installed and tested as per contract requirements.

D. **Training**

- Conduct on-site training for facility personnel on:
  a. System operation
  b. Emergency procedures
  c. Maintenance requirements

E. **Maintenance Commitment**

- Submit a preventive maintenance schedule for regular inspections and servicing.
- Ensure the integrity of the system remains intact with routine servicing.

1.9 SUBMITTALS

A. **Initial Bid Compliance Documents (To be submitted during bidding period)**
Bidders must submit the following documents to demonstrate compliance with the project requirements:

a. **Product Data Sheets** - Specifications for all key system components, including the FK-5-1-12 agent, suppression cylinders, discharge nozzles, fire

alarm control panel (FACP), detection devices, notification appliances, and related accessories.

b. **Preliminary System Layout** – A conceptual single-line diagram illustrating the general system configuration, including:
   1) Suppression agent cylinder locations
   2) Basic piping layout
   3) Detection and activation devices
   4) Notification and evacuation devices
   5) Installation mounting details
   6) Control Panel & Interface
   7) Discharge Nozzle Locations
   8) Certified agent quantity and hydraulic calculation,

c. **Bill of Materials (BOM)** – A list of proposed equipment, including brand, model, specifications, and quantities.

d. **Compliance Certificates** – Documentation confirming that all proposed equipment and devices are **UL Listed**, **FM Approved**, and conforms to relevant NFPA and ISO standards.

e. **Technical Proposal** – A brief explanation of the approach for implementing the FK-5-1-12 fire suppression system, ensuring compliance with project specifications.

B. **Post-Award Submittals**

a. **Design Submittals**
   1) Upon contract award, the contractor must provide the following signed and sealed by a Professional Mechanical Engineer (PME) and a Professional Electronics Engineer (PECE), as applicable:
      a) Shop Drawings – Detailed drawings indicating:
      b) Piping layout, routing, and pipe sizes
      c) Locations of detection, suppression, and alarm devices
      d) Wiring diagrams with point-to-point interconnections
      e) Mounting details for all system components
      f) Sequence of operation for the suppression system
   2) Hydraulic Flow Calculations – Verifying the agent discharge time, distribution, and nozzle placement in compliance with NFPA 2001.
   3) Battery Load Calculations – Ensuring adequate backup power supply for the fire alarm and releasing system.

b. **Equipment & Compliance Submittals**
   1) Certificates of Conformance – Manufacturer issued documents confirming compliance with:
      a) NFPA 2001 – Clean Agent Fire Suppression Systems
      b) NFPA 72 – Fire Alarm Systems
      c) NFPA 70 – National Electrical Code
      d) ISO 14520 – Gaseous Fire Extinguishing Systems
   2) Material Safety Data Sheets (MSDS) – For the FK-5-1-12 based clean agent.
   3) Operation & Maintenance Manuals – Comprehensive manuals covering installation, testing, operation, and maintenance.

C. **Installation Phase Submittals (Pre- and Post-Completion)**

a. **Documentation & Testing Submittals**

1) The contractor shall secure the necessary permits from PEZA MEZ-OBO and the Bureau of Fire Protection for the pre- and post-installation phases. The secured permits shall then be submitted to the procuring entity.

2) The contractor is required to have a suitable **Construction Safety and Health Program,** which must be in accordance with **Occupation Safety and Health (OSH) Standard,** rules and issuances by the DOLE within five (5) calendar days upon receipt of Notice to Proceed. The program shall state the following:

   a) Composition of Construction Safety and Health Committee.
   b) Specific safety policies which the contractor shall observe at the area of construction which include but not limited to Fall Protection, Chemical Hazards, and Materials Handling and Storage.
   c) Penalties and sanctions for violations of the program.
   d) The manner of disposing waste arising from the construction.
   e) The safety program shall also include the appointment of a full-time safety officer-in-charge of the implementation of the said program.

3) Testing & Commissioning Reports
   The contractor shall submit detailed test results and certification for approval, including:

   a) Room Integrity Test (as per NFPA 2001)
   b) Full System Commissioning Test (agent discharge verification)
   c) Fire Alarm System Testing (in compliance with NFPA 72)

b. Provide a system manual including maintenance procedures and troubleshooting guidelines.

c. **As-Built Drawings**
   The contractor shall submit the as-built plans, including the following:

1) Final documentation reflecting any modifications made during installation.
2) Plans shall be signed and sealed by a Professional Mechanical Engineer and Professional Electronics Engineer, as applicable.

d. **Regulatory Compliance Certificates**
   Includes, but is not limited to:

- Certificate of Completion or Clearance for Electronics Permit to Operate (EPTO)
- The contractor shall issue a Certificate of Completion. This certificate must be signed and sealed by a Professional Mechanical Engineer and Professional Electronics Engineer.

Note: This is distinct from the Certificate of Final Completion issued by the Procuring Entity.

e. **Final Acceptance Certification** – To be signed upon successful system testing and commissioning.

1.10 QUALITY ASSURANCE

A. **Manufacturer's Qualifications:**

- The manufacturer must hold certifications from the following organizations:
  a. UL Listed (Underwriters Laboratories)
  b. FM Approved (Factory Mutual)
  c. ISO 9001:2015 (Quality Management System)
  d. ISO 14001 (Environmental Management System)
  e. NFPA Compliance (NFPA 2001 – Clean Agent Fire Extinguishing Systems)

B. **Contractor Qualifications:**

- **Certification from Manufacturer** for handling and installing FK-5-1-12 clean agent systems.
- **Technical Expertise & Key Personnel**
  a. To ensure proper implementation and compliance with relevant standards, the awarded contractor must engage the following consultants for the duration of the project:
     1) A Professional Electronics Engineer (PECE) to oversee the installation of the Fire Detection and Alarm System (FDAS) and its integration with the FK-5-1-12 clean agent fire suppression system.
     2) A Professional Mechanical Engineer (PME) to handle the design, installation, and commissioning of the FK-5-1-12 suppression system.
     3) The contractor must submit proof of engagement, such as a Memorandum of Agreement (MOA) or Certification of Engagement, to confirm the involvement of these consultants in the project.
  b. Installers and technicians must have the following:
     1) Certified FDAS (Fire Detection and Alarm System) Training issued by the Contractor
     2) Certified FK-5-1-12 System Training issued by the Contractor
  c. The contractor must assign a Safety Officer with valid DOLE-OSHC (Department of Labor and Employment – Occupational Safety & Health Center) Certification to oversee workplace safety during installation.

C. **Electrical Components, Devices, and Accessories:** Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.11 PROJECT CONDITIONS

- The Contractor shall inspect the job site and familiarize themselves with the conditions under which the work will be performed. Inspection of the building may be arranged by appointment with the Procuring Entity. Contractors are encouraged to conduct a site inspection prior to the Opening of Bids.
- The Contractor shall submit a detailed work schedule, including key milestones and completion dates.
- All work shall be coordinated with the Procuring Entity to minimize disruptions to building operations.
- Work in occupied areas shall be scheduled at times that cause the least inconvenience to occupants.
- The Contractor shall be responsible for the proper storage, security, and handling of materials and equipment.
- Designated storage areas within the project site may be assigned, subject to approval by the Procuring Entity.
- The contractor must coordinate with the Procuring Entity regarding the use of electricity, water, and other utilities during the project.

- The work area must be kept clean, and all waste materials must be properly disposed. The Contractor is responsible to clean up daily before departing.
- The Contractor shall take into consideration not to disrupt office activities during installation. The Contractor may schedule work after office hours, weekends, or holidays with the Procuring Entity's approval.
- The contractor must ensure that all installers wear company-branded uniforms on-site for professionalism, identification, and security.

1.12 PAYMENT SCHEDULE

- The PEZA shall, upon a written request by the Contractor, allow an advance payment/mobilization fee in the amount not to exceed fifteen percent (15%) of the total contract price. The fee shall be paid only upon the submission to and acceptance by the PEZA of an irrevocable standby letter of credit of equivalent value from an accredited financial institution or a surety bond callable upon demand, issued by a surety or insurance company duly licensed by the Insurance Commission and confirmed by the PEZA.
- The Contractor may submit a request for progress payment for every 50%, 75% and 100% work accomplishment. Progress payments maybe paid by the PEZA to the contractor upon Certification issued by the PEZA.
- Progress payment shall be adjusted by deducting the amount in the recoupment of the advance payment, and additional retention money amounting to 15% and 10 % of the progress billing respectively.
- The total "retention money" shall be due for release upon the request of the Contractor for the substitution of the retention money with an irrevocable letter of credit or surety bond callable on demand and upon issuance of the Certificate of Inspection and Acceptance by the PEZA.

1.13 PROJECT DURATION

A. The project duration covering the ***"Proposed Installation of FK-5-1-12 Based Clean-Agent Fire Suppression System at MIS, EE, and Command Center Room"*** shall be for a period of ninety (90) calendar days from the issuance of Notice to Proceed (NTP).

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