

## TERMS OF REFERENCE (02 October 2023)

### Procurement of Systems Integration Services for the NEA Digital Dashboard Command Center (DDCC) Pilot Phase

Promoting good governance, competency and transparency to achieve a fully electrified Philippines in 2028. This being the vision of NEA, and given the rapidly evolving technologies globally today, the foundation of “good governance, competent and transparent NEA” must be full-scale digitalization, starting with a NEA **Digital Dashboard Command Center (DDCC)**.

The NEA DDCC shall serve as the central point of monitoring and coordinating the various aspects of the ECs’ operational, financial, institutional, electrification, and technical performance as well as major power outages and other alerts through a dashboard created specifically for that purpose. The platform will collect relevant information from existing EC Supervisory Control and Data Acquisition (SCADA) Systems, EC Geographical Information Systems (GIS) Maps/Data, NEA BIT (Business Information Technology), NEA enhanced Integrated Computerized Planning Model (eICPM), other NEA Departmental Systems (databases/files), EC NEA BIT Data Entry Forms (DETs), and EC computerized financial/other systems, external GIS Maps/Data, and external Environmental Data. The collected information will be shown as insights or data analytics, presented in a simple, straight-forward manner that will enable the users to immediately manage incidents and provide situational awareness across the 121 ECs.

The Project is envisioned to enable NEA to

1. Provide an overview of the current power situation and the affected stakeholders, allowing NEA and the ECs to respond quickly and efficiently.
2. Monitor the health and performance of overall EC operations such as revenues, expenses, profits, and cash flows.
3. Monitor and manage the progress of the ECs’ energization plans in their respective franchise areas, among others.

#### A. OBJECTIVES

1. To provide NEA management with a tool for making timely, data-driven decisions by presenting key financial, operational and other information on ECs in a visually appealing and effective manner.
2. To provide updated information on EC performance covering Financial, Technical, Operational, Institutional and Electrification/Projects sourced from EC SCADA systems (where available), the NEA BIT system and internal NEA departmental systems.
3. To serve as a digital, central hub for monitoring the after-effects on the electricity distribution system of the ECs in times of natural and man-made disasters and calamities and taking timely and appropriate actions to mitigate these effects.
4. To integrate multiple data sources into a single platform, allowing NEA management to access critical information quickly and efficiently and to provide an overview of the organization's key performance indicators (KPIs), which can be used to measure progress towards strategic goals with drill down capability to the EC level.

**B. APPROVED BUDGET FOR THE CONTRACT**

The approved budget for the Contract (ABC) is **P 20 Million**, inclusive of all applicable taxes, and will be sourced from the NEA 2023 Corporate Operating Budget (COB).

As per the Approved 2023 Annual Procurement Plan, and DICT-approved Information Systems Strategic Plan (ISSP 2023-2025) of the agency, the NEA aims to establish the base infrastructure and system for the DDCC pilot phase.

Itemized/detailed costing/breakdown of the cost components of the project proposal must be submitted/included in the financial bid proposal.

**C. TERMS/PROJECT DURATION**

Six (6) months duration of the Contract which will commence within seven (7) calendar days upon issuance of the Notice to Proceed (NTP). The timelines and milestones are depicted in the GANTT Chart below:

NEA DIGITAL DASHBOARD COMMAND CENTER (DDCC) PROJECT TIMELINE																									
Project Activity / Task	Week # Days	Month 1				Month 2				Month 3				Month 4				Month 5				Month 6			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
<b>Detailed System Design &amp; Project Plan</b>																									
NEA DDCC Detailed Design	5																								
NEA-IDS Detailed Specs Definition	10																								
NEA DDCC Project Mgt Plan	10																								
<b>NEA DDCC Build</b>																									
Demolition of existing walls, & ceilings	5																								
Build of glass walls & partitions.	10																								
Electrical Works, Structured Cabling	15																								
Ventilation & Air Conditioning	10																								
Surveillance & Door Access Control Systems	5																								
Furniture & Fixtures Delivery & Installation	5																								
HW, SW, Network, Eqpt Delivery/Installation	20																								
VideoWall Delivery & Installation	10																								
Micro Data Center Delivery & Installation	10																								
HW, SW, Network, Eqpt Config & Testing	20																								
<b>PILOT EC DEPLOYMENT</b>																									
Server & Firewall Delivery	5																								
Server & Firewall Config & Testing	10																								
SCADA Interface Specs Definition	10																								
SCADA Interface Test Installation & Config	20																								
SCADA Interface Installation & Configuration	10																								
SCADA interface Testing	10																								
<b>NEA IDS DEVELOPMENT</b>																									
Requirements Confirmation	10																								
Detailed Design	10																								
Programming & Systems Testing	20																								
Systems Integration (DC & EC) Testing	20																								
User Acceptance Testing	10																								
User Training	5																								
Installation and Deployment	5																								
Implementation Support	40																								

The activities and corresponding timelines can be subjected to acceleration by the winning bidder but delays shall be subject to liquidated damages as outlined in Section S.

**D. QUALIFICATIONS OF BIDDER**

The Bidder must have a minimum of five (5) years proven experience as a systems integrator that has completed projects covering the supply, delivery, installation and maintenance of software, computer hardware, and services.

Must have a physical office located in the Philippines operating for more than five (5) years supporting similar IT-based projects.

## E. DEFINITIONS

1. **Client:** NEA is the primary client.
2. **IT Systems Integrator:** Is a company that brings various computer hardware, software programs, equipment and network infrastructure for component sub-systems from multiple suppliers together into a whole integrated system, ensuring that those subsystems are able to interface and work together to deliver specified system features and functions.

## F. SCOPE OF WORK

1. Supply, delivery, installation, configuration and systems integration of required computer resources, networking hardware and software as well as infrastructure and other equipment required for the pilot phase of the NEA DDCC is on a **full, turnkey** basis to ensure synchronization and seamless compatibility of project components. This pilot phase of the NEA DDCC Project shall cover extraction of EC performance data from the NEA BIT system; and operational data from the SCADA system of two (2) ECs, the Benguet Electric Cooperative, Inc. (BENECO) and the Cebu III Electric Cooperative, Inc. (CEBECO III). Hardware required provisions are indicated in Section(s) 14, 15, 16 (EC Side) for BENECO, while CEBECO III will be provided the required equipment for data integration currently available at NEA head office. In addition, the winning vendor must be flexible to engage with other data extraction demands of the DDCC, such as, but not limited to, the Warehouse Inventory Management Systems of ECs/Regional Procurement Hubs.
2. Provision of the NEA Integrated Dashboard (Software) Solution (Pilot Phase) – from requirements confirmation, system design, development, and integration to implementation, maintenance and support. The functional requirements of the NEA Integrated Dashboard (Software) Solution (Pilot Phase) are outlined in Section G. 23.
3. The NEA Integrated Dashboard (Software) Solution shall encompass the following:
  - a. Collection of EC Performance Data and Key Performance Indicators (KPIs) from NEA and EC information systems and data sources covering the following areas: Financial, Technical, Institutional, Operational, Electrification/Projects as depicted in (but not limited to) Section U. Exhibit A - Proposed Dashboard Contents)
  - b. Consolidation, Summarization and Analytical Processing of EC Performance Data.
  - c. Graphic, GIS-based and numerical presentation of summary EC performance data, with data drill down to individual EC data level.
  - d. Provision of an EC Performance Management database for recording and reporting of summary periodic historical data.
  - e. Provision of GIS maps (but not limited to) needed for integration
    - Map of Electrification Status
    - Power Situation/Status of Restoration during Typhoons
    - Map showing EC Parameters. Ex: System Loss
    - Map of Renewable Energy Potential
    - EC Critical Assets/Facilities
    - Others

4. Establishment of network-hardware and software for connection to and interfacing with NEA and EC computer/SCADA systems for collection of EC performance data needed for the NEA Integrated Dashboard Solution. Provision of Virtual Private Network (VPN) connectivity from the NEA Command Center to the EC, utilizing existing NEA and EC ISP services.
5. Civil Works, Electrical Works, Ventilation, Fire Suppression and Air Conditioning (HVAC) (Refer to Section V, Exhibit B for DDCC Room Layout)
  - a. Civil works inclusive of demolition of existing walls and ceilings, as well as build of glass and drywall doors and partitions.
  - b. Electrical works for all components in the Command Center.
  - c. Ventilation and air conditioning for the Command Center.
  - d. Mobilization, demobilization and power interruption.
  - e. Testing and commissioning.
  - f. Securing applicable civil work permits.
6. Structured Cabling, Video Wall, Workstations, Surveillance and Door Access.
  - a. CAT6 UTP Cable from data cabinet to respective end terminals/ nodes.
  - b. 42U data cabinet with vertical POU.
  - c. Required patch panel and horizontal cable manager.
  - d. Videowall System.
  - e. CCTV System.
  - f. Door Access Control System.
  - g. Workstations.
7. Systems Integration, Project Management, and Implementation Support Services for the NEA DDCC.

**G. MINIMUM HARDWARE, SOFTWARE, NETWORK EQUIPMENT & OTHER REQUIREMENTS**

Based on project evaluation, below are the minimum required specifications to build the DDCC. Since the bidder is providing a complete solution, the quantity and hardware capacity will depend on each solution/application offer. During the acceptance testing, the overall performance of the system and each of its applications will be assessed in terms of meeting reasonable processing turnaround and system response time.

Item No.	Technical Specification	Minimum Requirement	QTY
<b>1.</b>	<b>COMMAND CENTER   Micro Data Center</b>		<b>1 Lot</b>
<b>1.1.</b>	<b>Cooling Specification</b>		
1.1.1.	Cooling capacity	900 W~3500W	
1.1.2.	Noise Level	Indoor 68dBA/Outdoor 55dBA	
1.1.3.	Net Weight (Base unit)	410kgs (w/ packing) & 360kgs (w/o packing)	
1.1.4.	Rack Mount Cooling Unit	5U	
1.1.5.	System Capacity	3 kW @ 45°C Ambient	
1.1.6.	Refrigerant	R410A	
1.1.7.	Outdoor Unit for Air conditioner	Split	

1.1.8.	Cooling Unit supported by UPS	Yes (by field UPS)	
1.1.9.	Emergency Fan	Two, one at bottom front and one at top rear	
<b>1.2.</b>	<b>COMMAND CENTER   Micro Data Center – Monitoring</b>		
1.2.1.	Monitored Subsystems.	UPS, Cooling, NetBotz, Energy Meter	
1.2.2.	Temperature Humidity Sensor		
1.2.3.	Temperature Sensor		
1.2.4.	Water Leak Detection	Spot fluid detection	
<b>1.3.</b>	<b>COMMAND CENTER   Micro Data Center – Power</b>		
1.3.1.	System IT load capacity	3 kW	
1.3.2.	System Input Requirement	50 A, Single Phase 220/230/240 V	
1.3.3.	System Frequency	Compatible with 50 Hz and 60 Hz	
1.3.4.	Input/output power panel	Rack Mounted, 0U	
1.3.5.	Rack Power Distribution Units (PDU)	Compatible with all 32A single phase rPDU	
<b>1.4.</b>	<b>COMMAND CENTER   Micro Data Center – Rack</b>		
1.4.1.	Cabinet Dimension (H×W×D)	2180×800×1200 (mm) Includes top of emergency fan cooling unit	
1.4.2.	Usable RU space	34 RU	
1.4.3.	Built in cable manager Front	Expandable high density half height	
1.4.4.	Built in cable manager Rear	Full height single line	
1.4.5.	Area (incl. service space)	9.5 m <sup>2</sup>	
1.4.6.	Color	Black	
1.4.7.	HMI Display Panel	7" Touch Panel LCD	
1.4.8.	Display Languages	English	
1.4.9.	Enclosure Lighting	Front & Rear LED light with door switch	
1.4.10	System Luminance	150 lux/ 1M	
<b>1.5.</b>	<b>COMMAND CENTER   Micro Data Center - Security</b>		
1.5.1.	Door Status Sensor		2 units
1.5.2.	Door Lock System	Keyed Swing Handle standard / optional HID/MIFARE card access lock	
<b>1.6.</b>	<b>COMMAND CENTER   Micro Data Center - Standards</b>		
1.6.1.	Safety Standards	IEC60950-1 Ed 2.2 2013-05, IEC62368-1	

		2018: Information technology equipment – Safety	
1.6.2.	EMC Standards	EN 55032, CISPR 32 EN 55024, CISPR 24 EN 61000-3-11 EN 61000-3-12	
<b>2.</b>	<b>COMMAND CENTER   Automatic Transfer Switch</b>		<b>2 Units</b>
2.1.	Colour	Black	
2.2.	Height	4.4 cm	
2.3.	Width	43.2 cm	
2.4.	Depth	23.6 cm	
2.5.	Product weight	3.74 kg	
2.6.	Mounting location	Front	
2.7.	Mounting preference	No preference	
2.8.	Mounting mode	Rack-mounted	
2.9.	Mounting position	Horizontal	
2.10.	Network frequency	50/60 Hz	
2.11.	[In] rated current	20 A	
2.12.	Permissible voltage	207...253 V	
2.13.	Max line current	20 A	
2.14.	Input current limits	20 A	
2.15.	Load capacity	3700 VA	
2.16.	Number of power socket outlets	8 IEC 60320 C13 10 A 2P + E 1 IEC 60320 C19 16 A 2P + E	
2.17.	Protection type	Without circuit breaker	
2.18.	Power cable length	2.44 m	
2.19.	Product certifications	cUL listed, CE, UL listed	
2.20.	Standards	EN 55022 class A, FCC part 15 class A	
2.21.	Ambient air temperature for operation	-5...45 °C	
2.22.	Relative humidity	5...95 %	
2.23.	Operating altitude	0...10000 ft	
2.24.	Ambient air temperature for storage	-25...65 °C	
2.25.	Storage Relative Humidity	5...95 %	
2.26.	Storage altitude	0...15240 m	
<b>3.</b>	<b>COMMAND CENTER   Rack Fire Suppression –</b>		<b>1 Lot</b>
3.1.	<b>Extinguishing Generator</b>		
3.1.1.	Fire Suppression Technology	Condensed Aerosol	
3.1.2.	Method of Fire Suppression	Chemical Reaction inhibiting flame free radicals on a molecular level from	

		interacting with Oxygen without reducing oxygen levels	
3.1.3.	Activation Method	Electrical, Thermal	
3.1.4.	Weight (Gross)	1,370g (excluding bracket)	
3.1.5.	Mass of FPC compound	100 g	
3.1.6.	Operational Discharge Time	5 - 10 seconds	
3.1.7.	Dimensions	84mm x 155 mm	
3.1.8.	Fire Class	EN 2: A, B, C, F - NFPA 10: A, B, C	
3.1.9.	Certifications	UL, NFPA, ISO	
3.2.	<b>Protection Panel</b>		
3.2.1.	Detection Mode	Linear Heat Detection or automatic smoke detectors	
3.2.2.	No. of Outputs	4	
3.2.3.	Overall size	188mm x 132mm x 47mm	
3.2.4.	Construction	1/2mm sheet steel	
3.2.5.	Finish	Epoxy powder coat	
3.2.6.	Colour	Light grey textured	
3.2.7.	Operating voltage	19 to 30 Volts DC	
3.2.8.	Standby current	18 milliamps	
3.2.9.	Maximum current	3 Amps	
3.2.10	Fault monitoring	Detection and actuator circuits (open circuit monitored only)	
3.2.11	Cable entries	20mm knockouts	
3.2.12	Terminal capacity	2.52mm maximum	
3.3.	<b>Heat Detection Cable</b>		
3.3.1.	External Diameter	0.138 inch (3.5 mm)	
3.3.2.	Dielectric Withstand	500VDC	
3.3.3.	Conductors	Tin plated copper coated steel	
3.3.4.	Electrical Rating	30VAC (42.4VDC) 10 A	
3.3.5.	Conductor Resistance	Min: 88.1 ohms per 1000m Max: 92.1 ohms max per 1000m	
3.3.6.	Conductor Extrusion	Temperature Sensitive Polymer	
3.3.7.	External Sheath	Color coded polymer / Lead & Cadmium free / UV resistant	
3.3.8.	Tensile Strength	1,700 min (N/mm <sup>2</sup> )	
3.3.9.	Capacitance	88pF/m	
3.3.10	Inductance	1060nH/m	
3.3.11	Impedance	110 ohms	
3.3.12	Min. Bend Radius	4.0 inch (100 mm)	
4.	<b>COMMAND CENTER   Video Wall Controller</b>		<b>1 Unit</b>
4.1.	Functional Requirement	<ul style="list-style-type: none"> <li>• Shall serve as the primary visual display of the Command Center.</li> <li>• Must fit the existing design of the Monitoring Room of the Command Center;</li> <li>• The workstations are the primary video</li> </ul>	

		<p>source;</p> <ul style="list-style-type: none"> <li>• Other video source as a source of video input (cable tv, media player etc.)</li> <li>• Mirroring Functionality for the television at the war room;</li> <li>• Appropriate software for integrating/splitting the images</li> </ul>	
4.2.	System structure	Pure hardware FPGA architecture	
4.3.	Start up	<15s	
4.4.	Operating system	No CPU and operating system	
4.5.	Board type	Pure hardware pluggable, hot- swappable structure	
4.6.	Input type	VGA,DVI,HDMI,DP,CVBS,SDI,HDBaseT,IP-Video,Fiber	
4.7.	Input channel	1080P up to 320 channel, 4K up to 160 channel	
4.8.	Output type	VGA, DVI, HDMI, CVBS, SDI,HDBaseT,Fiber	
4.9.	Output channel	1080P up to 320 channels, 4K up to 160 channels	
4.10.	Display mode	Roaming, overlay, zoom in/out, multi-windowing, scene switch, PIP, full screen and combination screen	
4.11.	Input resolution	Single channel 4K: dual link DVI/HDMI/DP	
4.12.	Scene/Signal switching time	Millisecond-level switching	
4.13.	Number of signal copy	More than the number of output ports	
4.14.	Max input/ output resolution	Input : 3840*2160@60Hz    Output : 3840*2160@30Hz	
4.15.	Single-screen window	At least 8 windows on each two screens	
4.16.	Hot-swappable	Support	
4.17.	Power supply configuration	N+1 redundant power supply structure	
4.18.	Signal preview	Support	
4.19.	Control structure	Software /Hardware	
4.20.	Maximum scenes	255	
4.21.	Control method	RS232/Network/Touch screen/Keypad and compatible with third party control system	
4.22.	Management mode	B/S, C/S, Mobile	
4.23.	Matrix control	Supports digital /analog matrix linkage control	
4.24.	Safety	Hardware structure, no virus interference	
4.25.	MTBF	50000h	
4.26.	Continuity	365 days, 7x24 hours operation	
4.27.	Operating temperature	- 15~60°C	



4.28.	Storage temperature	-300 ~750 C	
4.29.	Operating humidity	10 to 90% without condensation	
4.30.	Storage humidity	5 ~95% without condensation	
5.	<b>COMMAND CENTER   Video Wall Monitor</b>		<b>8 Units</b>
5.1.	Screen Size	55"	
5.2.	Panel Technology	IPS	
5.3.	Back Light Type	Direct	
5.4.	Aspect Ratio	16:09	
5.5.	Native Resolution	1,920 x 1,080 (FHD)	
5.6.	Refresh Rate	60Hz	
5.7.	Brightness(Typ., nit)	500	
5.8.	Contrast Ratio	1,000:1	
5.9.	Dynamic CR	500,000:1	
5.10.	Color Gamut	NTSC 72%	
5.11.	Viewing Angle(H x V)	178 x 178	
5.12.	Color Depth	10bit, 1.07Billion colors	
5.13.	Response Time	8 ms (G to G)	
5.14.	Surface Treatment(Haze)	28%	
5.15.	Life time	60,000Hrs (Typ.) / 50,000Hrs (Min.)	
5.16.	Operation Hours (Hours/Day)	24/7	
5.17.	Portrait / Landscape	Yes / Yes	
5.18.	Input	HDMI 2 (HDCP 2.2), DP (HDCP 2.2), DVI-D (HDCP 1.4), Audio In, RS-232C In, RJ45 (LAN), IR In, USB 2.0 Type A	
5.19.	Output	DP Out (Input : HDMI / DVI / DP), Audio Out, RS-232C Out, RJ45 (LAN)	
5.20.	Bezel Color	Black	
5.21.	Bezel Width	B2B : 1.74mm (Panel Bezel to Panel Bezel), 1.3mm(T/L), 0.44mm(B/R) A2A : 2.49mm (Active area to Active area), 1.75mm(T/L), 0.74mm(B/R)	
5.22.	Weight(Head)	18.8 Kg	
5.23.	Packed Weight	31.0 Kg (when individual pallet applied)	
5.24.	Monitor Dimension(W x H x D)	1,212.2 × 683.0 × 86.9 mm	
5.25.	Carton Dimensions(W x H x D) (Box outer size)	1,353 x 855 x 263 mm	
5.26.	Handle	Yes	
5.27.	VESA™ Standard Mount Interface	600 x 400	
5.28.	Internal Memory	8 GB	

5.29.	Sensor	(Temperature Sensor, BLU Sensor, Acceleration(Gyro) Sensor), Local Key Operation	
5.30.	Software Compatibility	webOS 4.1, Embedded CMS (Local Contents Scheduling, Group Manager), USB Plug & Play, Fail Over, Background Image (No Signal Image), Sync Mode (RS-232C Sync, Local Network Sync), Video Tag (4), Play via URL, Rotation (Screen Rotation, External Input Rotation), Gapless Playback, Tile Mode Setting (Max. 15 × 15), Setting Data Cloning, SNMP, ISM Method, Auto Set ID, Status Mailing, Control Manager, 3rd Party Compatibility (Crestron Connected@2)), Power (Smart Energy Saving, PM Mode, Wake on LAN, Network Ready), HDMI-CEC3), SI Server Setting, webRTC, Pro:Idiom, W/B Setting by Grey Scale, Scan Inversion	
5.31.	Operation Temperature	0 °C to 40 °C	
5.32.	Operation Humidity	10% to 80%	
5.33.	Power Supply	AC 100-240V~, 50/60Hz	
5.34.	Power Type	Built-In Power	
5.35.	Typ	200 W	
5.36.	Max.	250 W	
5.37.	BTU (British Thermal Unit)	682 BTU/Hr(Typ.), 853 BTU/Hr(Max)	
5.38.	Smart Energy Saving	105 W	
5.39.	DPM	0.5W	
5.40.	Power off	0.5 W	
5.41.	Safety	CB / NRTL	
5.42.	EMC	FCC Class "B" / CE / KC	
5.43.	ErP	Yes (Energy Star 8.0 (EU Only))	
5.44.	OSD	English, French, German, Spanish, Italian, Korean , Chinese(Simplified), Chinese(Original), Portuguese(Brazil), Swedish, Finnish, Norwegian, Danish, Japanese, Russian, Portugues(Europe), Dutch, Czech, Greek, Turkish, Arabic	
5.45.	ACCESSORY	Remote Controller(include battery 2ea), Power Cord, RS232C cable, Lan cable, DP cable, IR Receiver, Guide Bracket, Screws, Manual	
5.46.	IP Rating	IP5X tested	
5.47.	Videowall Bracket	<ul style="list-style-type: none"> <li>• Push in Pop-out slim wall mount bracket</li> <li>• 6 points micro adjustment function</li> <li>• Material :2mm SPCC</li> <li>• With safe lock system</li> </ul>	
6.	<b>COMMAND CENTER   Workstation</b>		<b>5 Units</b>

6.1.	Functional Description	<ul style="list-style-type: none"> <li>Workstations shall serve as the primary source of the video wall.</li> <li>Workstation shall be capable of running the multiple dashboard solutions.</li> <li>Workstations shall be capable of display mirroring</li> <li>One workstation shall be allocated for videowall admin</li> </ul>	
6.2.	<b>CPU Specifications</b>		<b>5 Units</b>
6.2.1.	Form Factor	Tower	
6.2.2.	Processor	Core i7-12700 12C 2.10G 65W	
6.2.3.	GPU	T1000 4GB 4mDP GFX	
6.2.4.	RAM	32GB (2x16GB) DDR5 4800 UDIMM NECC Mem	
6.2.5.	Operating System	Win 11 Pro 64 DG106	
6.2.6.	Adapter	Mini DP-to-HDMI	
6.2.7.	Keyboard	USB	
6.2.8.	Mouse	USB	
6.2.9.	Storage	1TB PCIe 2280 TLC M.2 SSD	
6.2.10	Warranty	3/3/3 Warranty	
6.3.	<b>Monitor Specifications</b>		<b>5 Units</b>
6.3.1.	Display size	23.8"	
6.3.2.	Display type	IPS	
6.3.3.	Panel active area(inches)	20.75 x 11.67 in	
6.3.4.	Panel active area(cms)	52.7 x 29.65 cm	
6.3.5.	Brightness	300 nits	
6.3.6.	Pixel Pitch	0.275 mm	
6.3.7.	Input connector	1 VGA; 1 HDMI 1.4 (with HDCP support)	
7.	<b>Desktop UPS</b>		<b>5 Units</b>
7.1.	Functional Description	<ul style="list-style-type: none"> <li>UPS shall provide power to the workstations in the event of power power for protection against power surges of ICT equipment.</li> </ul>	
7.2.	Technical Specification	<ul style="list-style-type: none"> <li>Branded and Brand New</li> <li>At least 650VA voltage rating</li> <li>Transfer time: Typical 2--6ms, 1 Oms max</li> <li>Input <ul style="list-style-type: none"> <li>Voltage range: 162-290VAC, Single phase</li> <li>Frequency range: 50Hz/60Hz automatic identification</li> </ul> </li> <li>Output <ul style="list-style-type: none"> <li>Voltage tolerance (Batt. Mode): Simulated sine wave at nominal voltage <math>\pm 10\%</math></li> <li>Frequency range (Batt. Mode): 50Hz/60Hz automatic identification</li> </ul> </li> <li>System Features</li> </ul>	

		<ul style="list-style-type: none"> <li>○ Indicators: <ul style="list-style-type: none"> <li>▪ AC Mode: LED lighting</li> <li>▪ Battery Mode: LED lighting</li> <li>▪ Fault Solid: LED lighting</li> </ul> </li> <li>○ Protection: <ul style="list-style-type: none"> <li>▪ Discharge</li> <li>▪ Overload</li> <li>▪ Overcharge protection</li> <li>▪ Fuse Protection: YES</li> </ul> </li> <li>○ At least two (2) years warranty on parts and service</li> <li>○ Brand should be at least twenty (20) years on the market</li> </ul>	
<b>8.</b>	<b>Workstation Chairs</b>		<b>4 Units</b>
8.1.	Specification	<ul style="list-style-type: none"> <li>● High-back Mesh Office Chair</li> <li>● 360° swivel</li> <li>● Chrome plated star-base</li> </ul>	
<b>9.</b>	<b>COMMAND CENTER   Core Switch</b>		<b>2 Units</b>
9.1.	No. of Ports	Switch shall have 48 nos. full PoE+ (12 mGig ports up to 10G, 36 ports up to 1G) and additional 4 nos. 1/10G SFP+ uplinks ports.	
9.2.	Hot Swap Power Supply	Switch should support internal hot-swappable redundant power supply and fans from day 1. Switch should support full 48 ports of 30W, 1440W PoE power budget in total.	
9.3.	Switch throughput	Switch shall have minimum 392 Gbps of switching fabric and 291.66 Mpps of forwarding rate.	
9.4.	Stacking Capability	Switch should have dedicated slot for modular stacking, in addition to asked uplink ports. Should support for minimum 80 Gbps of stacking throughput with 8 switches in single stack.	
9.5.	POE Support	Switch must support powering connected PoE devices without waiting for IOS to boot up.	
9.6.	POE Support while booting	Switch must support uninterrupted power to connected PoE devices even when the switch is reloading and booting up.	
9.7.	MACSec-128 Support	Switch must support MACSec-128 on both access and uplink ports.	
9.8.	RFID Tagging	Switch must have embedded RFID tag which facilitates easy asset/inventory management using commercial RFID readers	
9.9.	System OS Signature verification on boot	During system boots, the system's software signatures should be checked for integrity. System should be capable to understand that system OS are authentic and unmodified, it should have cryptographically signed images to provide assurance that the firmware & BIOS are authentic. Public	

		document must be provided.	
9.10.	Deep Packet inspection on wired ports	Switch must support configuration of application aware classification using deep packet inspection techniques on wired ports	
9.11.	Application visibility support	Switch must support application visibility for custom applications	
9.12.	Application flow analysis and export	Switch must support Full Application flow analysis and export	
9.13.	Compliance to Safety requirements of Information Technology Equipment	Switch shall conform to UL 60950-1/62368-1, CAN/CSA-C22.2 No. 60950-1/62368-1, EN 60950-1/62368-1, IEC 60950-1/62368-1, AS/NZS 60950.1, AS/NZS 62368.1 for Safety requirements of Information Technology Equipment.	
9.14.	Compliance to Standards for EMC (Electro Magnetic Compatibility) requirements	Switch shall conform to 47 CFR Part 15, CISPR 32 Class A, CNS 13438, EN 55032 Class A, EN61000-3-2, EN61000-3-3, ICES-003 Class A, KN 32, TCVN 7189 Class A, V-3 Class A, CISPR 35, EN 55035, KN 35, and TCVN 7317 Standards for EMC (Electro Magnetic Compatibility) requirements.	
9.15.	Listed as Gartner Leader Quadrant for Wired and Wireless	OEM should be listed in Gartner Leader Quadrant for Wired and Wireless LAN Infrastructure from last 3 years before releasing this ITB.	
10.	<b>COMMAND CENTER   Wireless LAN Controller</b>		<b>2 Units</b>
10.1.	Deployment flexibility feature	The Controller shall support deployment flexibility without compromising any features	
10.2.	Supported access points per single VM instance	The controller shall support 3K access points or more per single VM instance; 32K clients per single VM instance.	
10.3.	Controller HW resource requirement	The controller shall have optimal VM HW resource requirement and shall be fully supported with 2 vCPU, 8GB Memory 8GB Disk space	
10.4.	Hot software patching for both controller and AP	The controller shall support hot WLC software patching and hot AP software patching for fixing bugs	
10.5.	Staggered AP upgrading	The Controller shall support APs to be upgraded in a staggered manner, while still being connected to the same controller.	
10.6.	Sync of Redundant controller	The redundant Controller shall sync Access Point and Client Status, including DHCP IP lease status	
10.7.	Support for PSK keys	The controller shall support multiple PSK keys	
10.8.	Encryption support for control plane	The system shall support control plane encryption on both IPv4 and IPv6	
10.9.	Detection and containment of Rogue access	The controller shall be able to detect employee device connection to Rogue Access Point and contain it automatically	

	points		
10.10.	Support of new application signatures	The controller shall support new application signatures without upgrading controller software	
10.11.	System OS Signature verification on boot	During system boots, the system's software signatures should be checked for integrity. System should capable to understand that system OS are authentic and unmodified, it should have cryptographically signed images to provide assurance that the firmware & BIOS are authentic. Public document must be provided.	
10.12.	Compliance to Safety requirements of Information Technology Equipment	Controller shall conform to UL/CSA 60950-1, IEC/EN 60950-1, AS/NZS 60950.1, and CAN/CSA-C22.2 No. 60950-1 for Safety requirements of Information Technology Equipment.	
10.13.	Compliance to Standards for EMC (Electro Magnetic Compatibility) requirements	Controller shall conform to FCC 47CFR15, AS/NZS CISPR 22, CISPR 22, EN55022/EN55032 (EMI-1), ICES-003, VCCI, KN 32 (EMI-2), CNS-13438, EN61000-3-2, EN61000-3-3, IEC/EN61000-4-2, IEC/EN61000-4-3, IEC/EN61000-4-4, IEC/EN61000-4-5, IEC/EN61000-4-6, IEC/EN61000-4-8, IEC/EN61000-4-11, K35, EN 300 386, EN55022, EN55024/CISPR 24, EN50082-1/EN61000-6-1 Standards for EMC (Electro Magnetic Compatibility) requirements.	
10.14.	Uniform OS to core, distribution, access switches	Wireless LAN Controller shall have the same OS as the campus core, distribution, and access switches.	
10.15.	Listed as Gartner Leader Quadrant for Wired and Wireless	OEM should be listed in Gartner Leader Quadrant for Wired and Wireless LAN Infrastructure from last 3 years before releasing this ITB.	
<b>11.</b>	<b>COMMAND CENTER   Wireless Access Point</b>		<b>2 units</b>
11.1.	WiFi6 throughput	Access Point shall support WiFi6 with up to 5.38 Gbps throughput	
11.2.	Support for MU-MIMO	Access Point shall support 4x4 MU-MIMO with four spatial streams on both 2.4 GHz and 5 GHz radio interfaces	
11.3.	5-Ghz serving mode	Access Point shall support dual 5-GHz client serving mode	
11.4.	DRAM	Access Point shall contain 2GB or higher-sized DRAM for capacity and scalability	
11.5.	POE powered	Access Point shall be able to power up using PoE (.af)	
11.6.	Support for Application visibility	Access Point shall support application visibility and control	
11.7.	Encrypted traffic visibility	Access Point shall support encrypted traffic visibility	

11.8.	Support for BLE5 radio	Access Point shall support integrated BLE5 radio	
11.9.	Support for USB 2.0	Access Point shall support USB 2.0 @ 4.5W	
11.10.	Mounting bracket inclusion	Access Point shall ship with metal-based mounting bracket for durability and reliability.	
11.11.	IoT container hosting	Access Point shall be able to offer IoT container hosting	
11.12.	Support for Offchannel RRM	Access Point shall support Offchannel RRM using dedicated radio without compromising client serving radios	
11.13.	Able to leverage Apple and Samsung analytics	Access Point shall be able to leverage partnerships for Apple and Samsung Analytics	
11.14.	Uniform OS to core, distribution, access switches	Access Point shall have the same OS as the campus core, distribution, and access switches.	
11.15.	Listed as Gartner Leader Quadrant for Wired and Wireless	OEM should be listed in Gartner Leader Quadrant for Wired and Wireless LAN Infrastructure from last 3 years before releasing this ITB.	
<b>12.</b>	<b>COMMAND CENTER   Perimeter Firewall</b>		<b>1 unit</b>
12.1.	Appliance based services	The appliance-based security platform should provide Firewall, Application Visibility and Control, Advance Malware Protection and IPS functionality in a single appliance from day one.	
12.2.	Support for Active-Passive mode	The proposed solution should be capable to do Active-Passive mode.	
12.3.	No. of Ports	The appliance should have at least 8 * 1G RJ45 Gigabit ports	
12.4.	Support for Open Architecture	Proposed Firewall should not be proprietary ASIC based in nature & should be open architecture based on multi-core cpus to protect & scale against dynamic latest security threats.	
12.5.	Required throughput	Firewall should support 880 Mps of NGFW (FW, AVC and IPS) throughput.	
12.6.	Concurrent sessions supported	Firewall should support at least 100,000 concurrent sessions with application visibility turned on	
12.7.	New connections supported	Firewall should support at least 6,000 new connections per second with application visibility turned on	
12.8.	Support for Access-rules for IPv4, IP v6	Firewall should support creating access-rules with IPv4 & IPv6 objects, user/groups, application, geolocation, url, zones, vlan, etc.	
12.9.	Support for multiple Nat functionalities	Firewall should support Nat66 (IPv6-to-IPv6), Nat 64 (IPv6-to-IPv4) & Nat46 (IPv4-to-IPv6) functionality	

12.10.	Trending capability for traffic and performance	Should have the capability of passively gathering information about virtual machine traffic, network hosts and their activities, such as operating system, services, open ports, client applications, and vulnerabilities, to assist with multiple activities, such as intrusion event data correlation, elimination of false positives, and policy compliance.	
12.11.	IDS/IPS tuning	Should be capable of dynamically tuning IDS/IPS sensors (e.g., selecting rules, configuring policies, updating policies, etc.) with minimal human intervention.	
12.12.	Automatic inspection for non-standard ports	Should be capable of automatically providing the appropriate inspections and protections for traffic sent over non-standard communications ports.	
12.13.	Support for end point quarantine integration	Should support the capability to quarantine end point by integrating with other security solution like Network Admission Control	
12.14.	Support for NBA Capability	Solution should support full-featured NBA capability to detect threats emerging from inside the network. This includes the ability to establish “normal” traffic baselines through flow analysis techniques (e.g., NetFlow) and the ability to detect deviations from normal baselines.	
12.15.	IP reputation feed provision	The solution must provide IP reputation feed that comprised of several regularly updated collections of poor reputation of IP addresses determined by the proposed security vendor	
12.16.	DNP3 and IEC60873 detectors	The solution should have application detectors for DNP3 and IEC 60870.	
12.17.	Preprocessor for Modbus and DNP3	The solution should provide preprocessors for the Modbus and Distributed Network Protocol (DNP3) SCADA protocols that you can configure.	
12.18.	Anomaly detection, decoding for DNP3 traffic	The DNP3 preprocessor should be able to detect anomalies in DNP3 traffic and decode the DNP3 protocol for processing by the rules engine. It should be able to validate the checksums contained in DNP3 link layer frames.	
12.19.	Support for SHA-256 malware detection	Should support the capability of providing network-based detection of malware by checking the disposition of unknown files using SHA-256 file-hash or signature as they transit the network and capability to do dynamic analysis	
12.20.	Web-based interface	The management platform must be accessible via a web-based interface and ideally with no need for additional client software	



12.21.	Branch set management	The management platform must be able to manage the branch set of Firewalls as well.	
13.	<b>COMMAND CENTER   Consolidation Server</b>		<b>1 unit</b>
13.1.	Processor	single processor 4th Gen Xeon Scalable CPU with at least 2.9Ghz, 8C, 22.5MB Cache, DDR5-4800	
13.2.	Memory	16 GB RAM with support up to at least 4TB	
13.3.	Storage	3x 2.4TB 12G SAS 10K RPM	
13.4.	Disk Controller	RAID 0, 1, 10, 5 or 50	
13.5.	Network ports	dual port 10Gb RJ45	
13.6.	Power Supply	Must have Dual Redundant 1200W Titanium Power Supply	
13.7.	Hypervisor	Virtualization Software	
13.8.	Windows Server 2022	Standard CAL 16 Core License Pack + 10 CALS (For EC SCADA Interface Output)	
13.9.	Microsoft SQL Server	Standard Edition - 1 server (For EC SCADA Interface Output)	
13.10.	Microsoft SQL Server CAL	Standard Edition - 10 Client Access License (For EC SCADA Interface Output)	
13.11.	Management	Must include a SAAS-based infrastructure management solution that supports 3rd party x 86 servers	
13.12.	Warranty	Onsite and Remote services (60 months)	
14.	<b>EC Side   Access Switch</b>		<b>1 unit</b>
14.1.	No. of Ports	Switch shall have 24 nos. 10/100/1000M PoE+ ports, 1 and additional 4 nos. 1/10G SFP+ uplinks ports.	
14.2.	Hot Swap Power Supply	Switch should support internal hot-swappable redundant power supply and fans from day 1. Switch should support full 24 ports of 30W, 740W PoE power budget in total.	
14.3.	Switch throughput	Switch shall have minimum 128 Gbps of switching fabric and 95.23 Mpps of forwarding rate.	
14.4.	Stacking Capability	Switch should have dedicated slot for modular stacking, in addition to asked uplink ports. Should support for minimum 80 Gbps of stacking throughput with 8 switches in single stack.	
14.5.	POE Support	Switch must support powering connected PoE devices without waiting for IOS to boot up.	
14.6.	POE Support while booting	Switch must support uninterrupted power to connected PoE devices even when the switch is reloading and booting up.	
14.7.	MACSec-128 Support	Switch must support MACSec-128 on both access and uplink ports.	
14.8.	RFID Tagging	Switch must have embedded RFID tag which facilitates easy asset/inventory management using commercial RFID readers	
14.9.	System OS	During system boots, the system's software	

	Signature verification on boot	signatures should be checked for integrity. System should capable to understand that system OS are authentic and unmodified, it should have cryptographically signed images to provide assurance that the firmware & BIOS are authentic. Public document must be provided.	
14.10.	Deep Packet inspection on wired ports	Switch must support configuration of application aware classification using deep packet inspection techniques on wired ports	
14.11.	Application visibility support	Switch must support application visibility for custom applications	
14.12.	Application flow analysis and export	Switch must support Full Application flow analysis and export	
14.13.	Compliance to Safety requirements of Information Technology Equipment	Switch shall conform to UL 60950-1/62368-1, CAN/CSA-C22.2 No. 60950-1/62368-1, EN 60950-1/62368-1, IEC 60950-1/62368-1, AS/NZS 60950.1, AS/NZS 62368.1 for Safety requirements of Information Technology Equipment.	
14.14.	Compliance to Standards for EMC (Electro Magnetic Compatibility) requirements	Switch shall conform to 47 CFR Part 15, CISPR 32 Class A, CNS 13438, EN 55032 Class A, EN61000-3-2, EN61000-3-3, ICES-003 Class A, KN 32, TCVN 7189 Class A, V-3 Class A, CISPR 35, EN 55035, KN 35, and TCVN 7317 Standards for EMC (Electro Magnetic Compatibility) requirements.	
14.15.	Listed as Gartner Leader Quadrant for Wired and Wireless	OEM should be listed in Gartner Leader Quadrant for Wired and Wireless LAN Infrastructure from last 3 years before releasing this ITB.	
15.	<b>EC Side   Perimeter Firewall</b>		<b>1 unit</b>
15.1.	Appliance based services	The appliance-based security platform should provide Firewall, Application Visibility and Control, Advance Malware Protection and IPS functionality in a single appliance from day one.	
15.2.	Support for Active-Passive mode	The proposed solution should be capable to do Active-Passive mode.	
15.3.	No. of Ports	The appliance should have at least 8 * 1G RJ45 Gigabit ports	
15.4.	Support for Open Architecture	Proposed Firewall should not be proprietary ASIC based in nature & should be open architecture based on multi-core CPUs to protect & scale against dynamic latest security threats.	
15.5.	Required throughput	Firewall should support 880 Mps of NGFW (FW, AVC and IPS) throughput.	
15.6.	Concurrent sessions supported	Firewall should support at least 100,000 concurrent sessions with application visibility turned on	

15.7.	New connections supported	Firewall should support at least 6,000 new connections per second with application visibility turned on	
15.8.	Support for Access-rules for IPv4, IP v6	Firewall should support creating access-rules with IPv4 & IPv6 objects, user/groups, application, geolocation, url, zones, vlan, etc	
15.9.	Support for multiple Nat functionalities	Firewall should support Nat66 (IPv6-to-IPv6), Nat 64 (IPv6-to-IPv4) & Nat46 (IPv4-to-IPv6) functionality	
15.10.	Trending capability for traffic and performance	Should have the capability of passively gathering information about virtual machine traffic, network hosts and their activities, such as operating system, services, open ports, client applications, and vulnerabilities, to assist with multiple activities, such as intrusion event data correlation, elimination of false positives, and policy compliance.	
15.11.	IDS/IPS tuning	Should be capable of dynamically tuning IDS/IPS sensors (e.g., selecting rules, configuring policies, updating policies, etc.) with minimal human intervention.	
15.12.	Automatic inspection for non-standard ports	Should be capable of automatically providing the appropriate inspections and protections for traffic sent over non-standard communications ports.	
15.13.	Support for end point quarantine integration	Should support the capability to quarantine end point by integrating with other security solution like Network Admission Control	
15.14.	Support for NBA Capability	Solution should support full-featured NBA capability to detect threats emerging from inside the network. This includes the ability to establish “normal” traffic baselines through flow analysis techniques (e.g., NetFlow) and the ability to detect deviations from normal baselines.	
15.15.	IP reputation feed provision	The solution must provide IP reputation feed that comprised of several regularly updated collections of poor reputation of IP addresses determined by the proposed security vendor	
15.16.	DNP3 and IEC60873 detectors	The solution should have application detectors for DNP3 and IEC 60870.	
15.17.	Preprocessor for Modbus and DNP3	The solution should provide preprocessors for the Modbus and Distributed Network Protocol (DNP3) SCADA protocols that you can configure.	
15.18.	Anomaly detection, decoding for DNP3 traffic	The DNP3 preprocessor should be able to detect anomalies in DNP3 traffic and decode the DNP3 protocol for processing by the rules engine. It should be able to validate the checksums contained in DNP3 link layer frames.	

15.19.	Support for SHA-256 malware detection	Should support the capability of providing network-based detection of malware by checking the disposition of unknown files using SHA-256 file-hash or signature as they transit the network and capability to do dynamic analysis	
15.20.	Web-based interface	The management platform must be accessible via a web-based interface and ideally with no need for additional client software	
15.21.	Branch set management	The management platform must be able to manage the branch set of Firewalls as well.	
<b>16.</b>	<b>EC Side   Branch Server</b>		<b>1 unit</b>
16.1.	Processor	single processor 4th Gen Xeon Scalable CPU with at least 2.9Ghz, 8C, 22.5MB Cache, DDR5-4800	
16.2.	Memory	16 GB RAM with support up to at least 4TB	
16.3.	Storage	3x 2.4TB 12G SAS 10K RPM	
16.4.	Disk Controller	RAID 0, 1, 10, 5 or 50	
16.5.	Network ports	dual port 10Gb RJ45	
16.6.	Power Supply	Must have Dual Redundant 1200W Titanium Power Supply	
16.7.	Hypervisor	Virtualization Software	
16.8.	Windows Server 2022	Standard CAL 16 Core License Pack + 10 CALS (For EC SCADA Interface Output)	
16.9.	Microsoft SQL Server	Standard Edition - 1 server. (For EC SCADA Interface Output)	
16.10.	Microsoft SQL Server - CAL	Standard Edition - 5 Client Access License (For EC SCADA Interface Output)	
16.11.	Management	Must include a SAAS based infrastructure management solution that supports 3rd party x86 servers	
16.12.	Warranty	Onsite and Remote services (60 months)	
<b>17.</b>	<b>Civil Works</b>		<b>1 lot</b>
17.1.	Scope of Work	<ul style="list-style-type: none"> <li>• Mobilization, demobilization and power interruption.</li> <li>• Supply and installation/laying of electrical roughing-ins;</li> <li>• Supply and installation of conduit, pipes and cable trays;</li> <li>• Supply and installation of electrical lightings, fixtures and accessories;</li> <li>• Supply and installation of electrical switches and its accessories;</li> <li>• Supply and installation of receptacle outlets and its accessories;</li> <li>• Supply and installation of enclosures, panel boards and circuit breakers;</li> <li>• Supply and installation of electrical wires/cables, connectors, insulators and groundings;</li> </ul>	

		<ul style="list-style-type: none"> <li>• Supply and installation of outside electrical system including distribution transformer, wires/cables, concrete pole and accessories (if needed);</li> <li>• Supply and installation of air conditioner unit, cables/wires, groundings, rough-ins, insulator, connectors, fittings, Nema 3R Enclosures and accessories;</li> </ul>	
17.2.	Installation Details	<ul style="list-style-type: none"> <li>• War room and Command Center shall be separated by a 12mm thick tempered glass wall and swing/sliding glass door of double sided smart-tint tempered glass for quick viewing with complete fittings and accessories</li> <li>• Ceiling shall be metal framed and clad with 9mm thick gypsum board panel and finished with flat latex ceiling paint.</li> <li>• Existing windows shall be enclosed and clad with padded wall fabric to reduce intrusion of noise from outside.</li> <li>• All cables and electrical pipes shall be on falseworks or embedded on walls, ceilings and flooring.</li> <li>• The ceiling frame will be 0.6mm (6mm x 19mm x 50mm) for the double furring, 0.4mm (x 25.4mm x 25.4mm) for the wall angle and 0.8mm (x11 mmx37mm) for the carrying channel</li> <li>• The drywall frame will be 0.6mm (x33mmx75mm) for the metal track and 0.6mm (x7mmx33mmx7 4mm) for the metal stud</li> <li>• All civil works for improvement, modification and restoration shall cover the basic components of command center which includes the war room/data center partition, the workstations and the server room/equipment area.</li> </ul>	
17.3.	Installation Requirements	<ul style="list-style-type: none"> <li>• Site Survey - prior to placing any cable pathways or cable, the contractor shall survey the site to determine job conditions will not impose any obstructions that would interfere with the safe and satisfactory placement of the cables. The arrangements to remove any obstructions with the Project Manager need to be determined at that time.</li> </ul>	

		<ul style="list-style-type: none"> <li>• Physical Installation - all components of the SCS should be installed and mounted by an Authorized Installer verified by the manufacturer of the structured cabling components.</li> <li>• Cable Pathways       <ul style="list-style-type: none"> <li>○ Pathways shall be designed and installed to meet applicable local and national building and electrical codes or regulations;</li> <li>○ Pathways shall not have exposed sharp edges that may come into contact with telecommunications cables; and</li> <li>○ Shall be properly grounded to the Telecoms Grounding.</li> </ul> </li> <li>• Cable Tie Wraps       <ul style="list-style-type: none"> <li>○ Tie wraps shall be used at appropriate intervals to secure cable and to provide strain relief at termination points. These wraps shall not be over tightened to the point of deforming or crimping the cable sheath; and NOTE: Tie wraps shall not be used on patch/equipment cords.</li> <li>○ Hook and loop cable managers should be used in the closet where configuration of cables and terminations may be frequent.</li> </ul> </li> <li>• Administration and Documentation       <ul style="list-style-type: none"> <li>○ Horizontal cables shall be labeled at each end; and</li> <li>○ Should adhere to the TIA/EIA-606 administrative standard for the telecommunications infrastructure of buildings for the labeling of all cables, termination hardware, splices, pathways and spaces.</li> <li>○ Drawings - Three (3) copies of as-built drawings and soft copy shall be supplied by the contractor showing the locations of identifiers for all endpoints.</li> </ul> </li> <li>• Grounding       <ul style="list-style-type: none"> <li>○ All telecoms grounding/earthing and bonding shall be done to applicable codes and regulations;</li> </ul> </li> </ul>	
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<b>18.</b>	<b>Electrical Specifications</b>		<b>1 lot</b>
18.1.	Panel Boards	24 Branches Distribution Board, 300AF, 225AT Main CB, Bolt-On Center Main, 25KAIC, 3 Pole, 240 Volts, 60Hz with Grounding Lugs Branches: (2-60AT, 12-20AT, 10- 30AT, 2 Pole, 60Hz, 240Volts)	
18.2.	Lighting	2300 Lumens, LED Panel Light, 40W Max	
18.3.	Receptacles	Duplex convenience outlet with ground, 240 volts, 60HZ. universal	
18.4.	ACUs Circuit Breaker Enclosure	30AT, 100AF, 2Pole, 240Volts, 60Hz in NEMA 3R Enclosure	
18.5.	Conduit Pipe	Polyvinyl chloride (PVC)	
18.6.	Switches	240Volts, 60HZ	
18.7.	Cables/Wires	100mm <sup>2</sup> , 22 mm <sup>2</sup> (Gnd), 5.5 mm <sup>2</sup> , 3.5 mm <sup>2</sup> , THHN/THWN, 90 degrees C	
<b>19.</b>	<b>Convenience Air Conditioning Units Functional</b>		<b>2 units</b>

<b>Requirements</b>		
19.1.	Functional Requirement	<ul style="list-style-type: none"> <li>• 2HP Split Type Air Conditioner is comprised of two separate units, an outdoor unit and an indoor unit (Floor, Wall or Ceiling mounted design)</li> <li>• The split-type air conditioning system will remove heat and provide optimal cooling effect to a given size of room that remains relatively constant despite changes in external weather conditions or internal heat loads.</li> <li>• Likewise, it has a cooling capacity corresponding to the space/floor area that needs cooling. These shall operate quietly.</li> </ul>
19.2.	Technical Requirement	<ul style="list-style-type: none"> <li>• System: Evaporator and Condenser</li> <li>• Cooling Capacity: 18,000 BTU/h</li> <li>• Energy Efficiency Ratio (EER): 11.50 kJ/hr-W</li> <li>• Maximum Sound Level: 45dB</li> <li>• Power Supply: Philippine Standard</li> <li>• Phase: Single Phase</li> <li>• Frequency: Philippine Standard</li> </ul>
<b>20.</b>	<b>Door Access Control</b>	<b>1 lot</b>
20.1.	Functional Requirement	<ul style="list-style-type: none"> <li>• Must perform identification authentication and authorization of users;</li> <li>• Must be able to be temporarily unlocked during certain time periods without an access card;</li> <li>• Must be able to create several custom access levels;</li> <li>• Must be able to run custom reports based on certain parameters; and</li> <li>• Must have a lock down mode which disables all users from accessing one, few or all entrances</li> </ul>
20.2.	Technical Requirement	<ul style="list-style-type: none"> <li>• Electric Bolt for Fully Frameless Glass Door or its equivalent</li> <li>• Resettable emergency door release that is used with an access control system</li> <li>• Emergency Key Switch (Main Door)</li> <li>• Door Release Button w/ Back Box</li> <li>• UPS Access Control Power Supply 12V, 3A with Back-up Battery</li> <li>• Capable of IP camera integration</li> <li>• Access Card Reader or its equivalent</li> </ul>



		<ul style="list-style-type: none"> <li>• At least two (2) years warranty on parts and service</li> <li>• Access Card 50</li> <li>• Includes necessary cabling</li> <li>• At least two (2) years warranty on workmanship</li> </ul>	
<b>21.</b>	<b>CCTV Surveillance System</b>		
21.1.	Functional Requirement	<ul style="list-style-type: none"> <li>• Must be able to operate in a 24-hour basis of the video recording of all CCTV system;</li> </ul>	
21.2.	Technical Requirement - Camera	<ul style="list-style-type: none"> <li>• Camera Type: 2MP Dome Type Network Camera</li> <li>• Illumination</li> <li>• Color: 0.005 Lux</li> <li>• BW: Lux (IR LED on)</li> <li>• Image frame rate: Support 60fps @1920 x 1080</li> <li>• Image Compression: H.265+</li> <li>• IR Visibility: Up to 30m</li> <li>• Network Protocol: Support at least TCP/IP, ICMP, HTTP, HTTPS, FTP, SNMP</li> <li>• Protection Rating: IP67, IK10</li> <li>• Network Interface: 1x 10/100Base-T RJ45</li> <li>• Power Supply: 12 vdc PoE (IEEE 802.3af) Compliant</li> <li>• WDR: 120db</li> <li>• Application Programming Interface (API): Support ONVIF Profile S/G</li> <li>• Features: Face Detection and able to detect motion and will alarm once tampered, alarm when disconnected to network, IP address conflict, unauthorized log in, error in HOD and when Full.</li> </ul>	8 units
21.3.	Technical Requirement – 8 CH Network Video Recorder (NVR)	<ul style="list-style-type: none"> <li>• Number of Channel: 8 Channels</li> <li>• Video Compression: Support H.265+</li> <li>• Supported Resolution: Up to 4K (3840 X 2160)</li> <li>• HDD Capacity: Up to 8TB capacity of each HOD</li> <li>• USB Port: At least 1x USB 2.0 and 1x USB 3.0</li> <li>• Incoming Bandwidth: 160Mbps or better</li> <li>• Network Interface: 1 x RJ-45 10/100/1000 Mbps</li> </ul>	1 Unit

		<ul style="list-style-type: none"> <li>• POE: 16Port, RJ-45 10/100 Mbps Ethernet interface</li> <li>• Protocol Support: Support HTTPS, TCP/IP, DHCP, DNS, NTP, SMTP, UpnP</li> <li>• Power Supply: 100 to 240 VAC, 50/60 Hz</li> <li>• Weight: Manufacturer's standard</li> <li>• At least two (2) years warranty on parts and service</li> <li>• 8TB Hard Disk Drive (HOD)</li> <li>• Interface: SATA 6Gbps</li> <li>• Capacity: 8TB</li> <li>• Camera Supported: Up to 64</li> <li>• Transfer Rate: At least 210MB/s</li> <li>• Cache: At least 256MB</li> <li>• MTBF: At least 1,000,000hrs</li> <li>• At least two (2) years warranty on parts and service</li> </ul>	
<b>22.</b>	<b>Structured Cabling</b>		<b>1 lot</b>
<b>22.1.</b>	Functional Requirement	<ul style="list-style-type: none"> <li>• SCS shall be able to provide connectivity to the following:               <ul style="list-style-type: none"> <li>○ Workstations;</li> <li>○ CCTV System;</li> <li>○ Door Access Control;</li> <li>○ Video Wall;</li> <li>○ Wireless Access Points WAPs; and Other network equipment.</li> </ul> </li> <li>• Estimated Breakdown of Nodes               <ul style="list-style-type: none"> <li>○ Data 8</li> <li>○ Wireless Access Point 2</li> <li>○ Surveillance 4</li> <li>○ Access Control 2</li> </ul> </li> </ul>	
<b>22.2.</b>	Technical Requirement	<ul style="list-style-type: none"> <li>• Cable Manager               <ul style="list-style-type: none"> <li>○ The Horizontal Cable Management shall be mounted above and below each patch panel:</li> <li>○ Have 1, 2 or 4 rack mount space (RMS) versions available.</li> <li>○ Be available in both 4" or 6" Deep Versions</li> <li>○ Have a cover to conceal Equipment Patch Cords</li> <li>○ Have finger radius holes that allow for quick opening and closing of doors at a single point</li> </ul> </li> <li>• Copper Cable               <ul style="list-style-type: none"> <li>○ All Category 6 (CAT6) UTP cable shall conform to the following minimum performance standards:</li> <li>○ Provides significant headroom</li> </ul> </li> </ul>	

		<p>above all TIA and ISO/IEC CAT6 transmission performance specifications</p> <ul style="list-style-type: none"> <li>○ Have a round cable CMR jacket with a nominal cable outside diameter (OD) up to 0.25 inches</li> <li>○ Have a construction comprised of 4-pairs of 23 AWG solid bare copper conductors</li> <li>○ Utilize a center isolation member to maintain pair geometry for optimal performance</li> <li>○ Have a rip cord installed under the jacket for jacket removal</li> <li>○ Have reverse sequential measurement markings on jacket</li> </ul> <ul style="list-style-type: none"> <li>● Patch Panel           <ul style="list-style-type: none"> <li>○ All termination panels shall facilitate cross-connection and inter-connection using modular patch cords and shall conform to EIA standard, 19-inch relay rack mounting requirements:</li> <li>○ Be made of flame retardant thermoplastic available in 24-port configurations</li> <li>○ Exceed CAT6 connecting hardware specifications for all pair combinations up to 250 MHz</li> <li>○ Allow termination with a standard termination tool</li> <li>○ Be backwards compatible to allow lower performing categories of cables or connecting hardware to operate to their full capacity</li> <li>○ Support industry standards for T568A or T568B wiring options on each individual outlet</li> <li>○ Display category performance markings on front of panel</li> </ul> </li> <li>● Information Outlet (IO)           <ul style="list-style-type: none"> <li>○ All CAT6 Information outlets (10) designed for termination of 4-pair balanced twisted-pair CAT6 copper cables must possess the following characteristics at the minimum:</li> <li>○ Exceed CAT6 connecting hardware performance specifications</li> <li>○ Allow termination with a standard tool</li> <li>○ Be backwards compatible to allow lower performing categories of cables or connecting hardware</li> <li>○ Support industry standards for T568A or T568B wiring options on</li> </ul> </li> </ul>	
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		<ul style="list-style-type: none"> <li>○ each individual outlet</li> <li>○ Can be installed from either front or rear of faceplate</li> <li>○ Have colored icons provided for port identification</li> <li>○ Be UL listed</li> <li>● Faceplate       <ul style="list-style-type: none"> <li>○ Offers pressure-release designation label covers which eliminate the need for a probe-pic or screwdriver when installing faceplate labels</li> <li>○ Includes pressure-release designation label covers for quick, tool-less removal</li> <li>○ Flexible mounting tab on outlets allows installation from front or rear of faceplate</li> <li>○ Horizontal faceplates include designation label(s), clear label covers, and color-matching screw covers</li> <li>○ Must be available in 1,2,3,4 ports configuration</li> </ul> </li> <li>● Patch Cords       <ul style="list-style-type: none"> <li>○ All CAT6 patch cords shall conform to the following minimum performance standards:</li> <li>○ High performance CAT6 cable for optimal flexibility and transmission performance</li> <li>○ Be backwards compatible with lower performing categories</li> <li>○ Be equipped with identical modular 8-position plugs on both ends, wired straight through with standards compliant wiring</li> <li>○ Utilize patented metallic isolator shields pairs inside plug for optimum performance and a 360° crimp for providing excellent plug-to-cable strain relief without causing pair deformation</li> <li>○ Obtain the required performance without use of printed circuit board components</li> <li>○ Incorporate internal stranded cordage isolator within a round, flame-retardant jacket to provide extended flex life and maintain ideal pair geometry</li> <li>○ Have a boot that features an ultra slim design for high density applications and snag free operation.</li> <li>○ Use modular plugs which exceed</li> </ul> </li> </ul>	
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		<p>FCC CFR 47 part. 68 . subpart F and IEC 60603-7 specifications, have contact materials of copper alloy with contact plating of 50 micro inches gold or equivalent</p> <ul style="list-style-type: none"> <li>○ Be available in standard lengths with custom lengths available upon request</li> <li>○ Offer multiple cable colors (with ultra slim boots for high density applications) in standard colors for proper circuit identification</li> <li>○ Roughing-ins</li> <li>○ Includes all PVC conduits and all other necessary accessories</li> </ul>	
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<b>23.</b>	<b>NEA Integrated Dashboard (Software) Solution – Pilot Phase Functional Requirements</b>		<b>1 lot</b>
23.1.	Financial	<p>The financial component shall provide information on the financial health and performance of the ECs, including but not limited to the following metrics:</p> <ul style="list-style-type: none"> <li>a) Leverage                             <ul style="list-style-type: none"> <li>● Debt Service Coverage Ratio (DSCR)</li> <li>● Debt Ratio</li> </ul> </li> <li>b) Liquidity                             <ul style="list-style-type: none"> <li>● Quick Ratio</li> <li>● Working Capital Ratio</li> </ul> </li> <li>c) Efficiency                             <ul style="list-style-type: none"> <li>● Payments to Power Suppliers</li> <li>● Payments to Genco/Transco</li> <li>● Payments to NEA</li> <li>● Payments to Banks/Other Financing Institutions (Internal Silo Software)</li> <li>● Collection Efficiency (current to current)</li> <li>● Collection Efficiency-Average</li> </ul> </li> <li>d) Financial Results of Operations</li> </ul>	
23.2.	Technical	<p>The technical component of the NEA Dashboard shall provide information on the reliability and efficiency of the EC power distribution system, including, but not limited to timely visibility on the following performance metrics:</p> <ul style="list-style-type: none"> <li>a) Power Reliability                             <ul style="list-style-type: none"> <li>● SAIFI (System Average Interruption Frequency Index)</li> </ul> </li> </ul>	

		<p>SAIFI =Total No. of Sustained Customer Power Interruptions within a Given Period /Total No. of Customers Served within the Same Period</p> <ul style="list-style-type: none"> <li>SAIDI (System Average Interruption Duration Index) SAIDI=Total Duration of Sustained Customer Power Interruptions within a Given Period/ Total No. of Customers Served within the Same Period</li> <li>CAIDI (Consumer Average Interruption Duration Index) CAIDI=Total Duration of Sustained Customer Power Interruptions within a Given Period/ Total No. of Customer Interruptions within the Same Period</li> </ul> <p>b) System Efficiency</p> <ul style="list-style-type: none"> <li>System Loss=(Input Energy-Output Energy)/Input Energy x 100%</li> <li>Power Factor=Working Power/Apparent Power</li> </ul>	
23.3.	Operational	<p>The operational component of the Dashboard shall provide NEA management with a day-to-day view of ECs' operational status including power situations and extended power disruptions and other events and/or alerts including external/environmental events with impact on EC operational status. EC GIS location maps shall be geographically mapped against environmental and other external conditions, including, where available, national and private electric utility operational status data, weather conditions and other current local and national events with possible impact on EC operations.</p> <p>Examples of events or status alerts of particular interest would be multiple EC power outages, natural calamities (floods, earthquakes, landslides) as well as fires and military action in EC areas of operation.</p>	
23.4.	Institutional	<p>In contrast to the financial and technical aspects of the Dashboard, the institutional component shall graphically represent the institutional health status of individual ECs and an assessment of the performance ratings of their respective management teams based on the following key performance indicators:</p>	

		<p>a) Human Resource: Leadership and Management</p> <ul style="list-style-type: none"> <li>• Good Governance – EC management performance ratings</li> <li>• Capacity Building – EC employee training program assessments</li> </ul> <p>b) Stakeholders – Member-Consumers.</p> <ul style="list-style-type: none"> <li>• Customer Services/ Satisfaction</li> <li>• EC Member Participation in EC activities</li> </ul> <p>c) Formation of Member-Consumer-Owners Organization</p> <p>d) Action on Consumer Complaints/Requests</p> <p>e) Sanitation of EC Master list</p> <p>f) Customer Satisfaction Survey</p>	
23.5.	Electrification/ Projects	This fifth aspect of the NEA Dashboard should help NEA management track the level of Consumer Connections and in particular EC performance with respect to accomplishments versus set targets of their respective Sitio Electrification Program (SEP) and/or the Barangay Line Enhancement Program (BLEP)	
<b>24.</b>	<b>OTHER KEY REQUIREMENTS/ SPECIFICATIONS</b>		
24.1.	DDCC software development and production environment	Must be available on one (1) platform and able to integrate/interface with existing and future systems of NEA and the ECs.	
24.2.	Key software and hardware components	Must be of reputable brand and must not have been banned, nor currently banned in any country.	
24.3.	DDCC Working Prototype	A valid design and working prototype of the proposed NEA Integrated Dashboard Solution (software) – Pilot Phase based on Functional Requirements outlined in Sec. 22 G. of this document must be presented to NEA by the winning bidder within 30 calendar days from receipt of NTP.	
24.4.	Solutions architecture/ design capability to handle other data extraction requirements	The proposed solutions architecture/ design and NEA Integrated Dashboard Solution – Software, Pilot Phase, must have the flexibility and scalability to handle various data extraction requirements of NEA (internal operating units/ departments) and data from all 121 ECs (technical, financial & other databases) for the deployment of the NEA	

	of NEA and the ECs	Integrated Dashboard Solution beyond the pilot phase.	
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## H. SERVICE ORGANIZATION

The bidder must submit a profile of the Project Team that will be assigned to deliver and implement this project. The profile must include curriculum vitae of all project team members with work experience on systems integration relevant to the project scope of work.

The Project Team must include the following key lead team members (with respective roles, required experience profile and responsibilities).

Member – Role	Responsibilities	Required Experience Profile
Systems Integration Project Manager	Overall planning, management and control of the NEA-DDCC Project to meet project objectives and deliverables within agreed timelines.	Must have handled overall management of at least two large (over Php250M), systems integration (information technology) projects involving, custom software development, computer hardware and support services
Software development Team Lead	Management of the software development team to meet NEA IDS functional requirements	Must have handled software development projects with team size of at least ten members
Engineering Lead	Technical guidance to the team for the execution of the EC - SCADA interface	Licensed engineer with work experience in information technology and energy/ power related projects

## I. WARRANTY

All equipment, hardware and off-the-shelf software products supplied under this invitation to bid shall be covered by a comprehensive warranty. The warranty shall protect the buyer against defects in material, workmanship, and performance of the supplied products for a specified period.

1. **Warranty Period:** The minimum warranty period required for the supplied products shall be three (3) years from the date of delivery or acceptance, unless otherwise specified for individual items. The warranty period should commence from the date of installation or use, if different from the delivery or acceptance date.
2. **Scope of Warranty:** The warranty for products shall cover all parts, components, and subsystems of the supplied products. It shall include repair or replacement of defective parts, as well as any necessary labor and transportation costs associated with warranty service.
3. The customized application software program supplied shall likewise be covered by a comprehensive warranty. The warranty shall ensure that the software program functions according to the agreed-upon specifications and is free from defects in design, programming, and performance upon delivery and installation up to



acceptance of the customized application software program.

## **J. SOFTWARE MAINTENANCE SUPPORT SERVICES**

1. The customized application software development services for the NEA Integrated Dashboard Solution proposed shall include application software maintenance technical support, bug fixes, software updates, and enhancements to ensure the efficient and reliable operation of the software application for a period of 90 days following acceptance and/or live implementation of the software. The maintenance support services should cover all aspects necessary to maintain the software's functionality, performance, and security.
2. The service levels to be provided as part of the application software maintenance and support services should be specified, including response times, resolution times, and availability of support. The service levels should be appropriate to meet the criticality of the software and the needs of the NEA DDCC. A clear escalation process for addressing urgent or high-priority issues should also be provided.
3. Bug Fixes and Issue Resolution: Software issues reported by users under the application software maintenance and support services shall be promptly addressed and resolved. This includes identifying and fixing software bugs, errors, and malfunctions that affect the software's performance, stability, or functionality. The bidder should provide a systematic process for reporting and tracking issues, as well as a transparent communication channel for status updates and resolution progress.
4. Software Updates and Enhancements: Regular software updates and enhancements to improve the software's performance, security, and functionality shall be provided as part of the application software maintenance and support services. These updates should be compatible with NEA existing infrastructure and configurations. The frequency and methodology for delivering software updates and enhancements shall be clearly specified, ensuring minimal disruption to the NEA DDCC operations during the update process.
5. The bidder shall include proposed costing for a follow-on separate application software maintenance services contract option for the NEA Integrated Dashboard Solution beyond the 90-day period coverage provided as part of the cost for the DDCC.

## **K. ACCESSORIES**

The bidder shall provide modular tables, chairs, lighting fixtures, and all other furniture accessories designed to integrate with the electronic requirements operation of the NEA DDCC and all equipment included herein.

## **L. USER ACCEPTANCE TESTING & CRITERIA**

1. The customized application software supplied shall undergo a user acceptance testing process prior to acceptance by NEA. The acceptance testing shall cover the following aspects of the customized application software program:
  - a) Functionality: The software program shall perform all functions and features as outlined in the agreed-upon requirements and specifications
  - b) Performance: The software program shall meet the specified performance metrics and response times under normal operating conditions.
  - c) Compatibility: The software program shall be compatible with the designated hardware and operating systems as defined in the bid documents.
  - d) Defects: The software program shall be free from defects that may cause errors, crashes, or other malfunctions during normal usage.
2. Documentation: The documentation provided with the software program shall be

accurate, comprehensive, and up-to-date.

#### **M. HARDWARE & SYSTEM SOFTWARE MAINTENANCE SUPPORT SERVICES**

The bidder shall propose follow on maintenance support services to cover all installed hardware and system software beyond the warranty period. Maintenance includes both scheduled preventive maintenance and unscheduled troubleshooting and repair work. The bidder shall provide a comprehensive plan for a detailed schedule of maintenance of all hardware and software, which shall be included in the Maintenance and Support Plan.

#### **N. TRANSFER OF TECHNOLOGY**

The bidder shall conduct trainings for the management and staff of the procuring entity. Training areas should include, but shall not be limited to:

1. Technical Trainings for DDCC Project Manager/System Administrator/Engineer/ Developers and Supervisors (at least 10 personnel).
2. Installation, operation and trouble shooting and maintenance of system hardware, network, peripheral and ancillary devices and its related operating systems.
3. Operation, administration, maintenance and trouble-shooting of licensed software products and System.
4. Necessary training shall be provided by the bidder to all designated personnel who will operate the system. The training materials shall include training courses and presentations.
5. The bidder shall provide training manuals in hard copy and electronic (soft copy) in the English language.
6. The bidder shall submit a comprehensive training plan. The plan must list the proposed course content, timing and scheduling requirements, documentation, and other items required to ensure the proper and successful learning of NEA personnel on operations of the proposed system.
7. The bidder shall NEA a copy of the program source codes for the NEA Integrated Dashboard application software upon acceptance of the software by NEA.

#### **O. CONFIDENTIALITY OF DATA**

Documentation shall be provided on detailed procedures / techniques in identifying systems security risks and how such shall be handled.

The Database Record shall be held in strict confidence and shall not be reproduced, transcribed or disclosed without prior written approval from NEA.

#### **P. ESTABLISHED LOCAL SUPPORT**

The suppliers of the primary hardware and software products for the DDCC application software solution and hardware must have a branch office in the Philippines duly registered with the SEC, and should be actively operating for at least five (5) years.

#### **Q. SYSTEMS INTEGRATION EXPERIENCE**

The bidder should have successfully completed at least two (2) Systems Integration Projects with similar technical complexity within the last three (3) years.

#### **R. RESTRICTION ON TURNKEY SUBCONTRACTING**

As a turnkey project, the winning bidder shall not subcontract on a full turnkey basis the

entire project scope of work, or more than forty percent (40%) of the contract value to a single vendor/supplier, and shall retain full and single accountability for all deliverables.

**S. LIQUIDATED DAMAGES**

If the winning bidder, after having been given thirty (30) day written notice to comply, fails to substantially deliver the NEA DDCC in accordance with the requirements, specifications, terms and conditions provided for in this TOR or within the prescribed period, NEA shall deduct an amount equivalent to ONE-TENTH (1/10) of ONE PERCENT (1%) of the cost of the unperformed portion of every day of delay. "Unperformed portion" refers to any hardware, software or services that either remained undelivered or were delivered but did not meet or exceed required minimum requirements or specifications.

**T. PROJECT MANAGEMENT CONTROL PLAN/METHODOLOGY**

The project management methodology process to be applied for the NEA DDCC shall be specified, including the timing of project reviews and approvals. This shall include, but not limited to, the following:

1. Periodic review of project deliverables, progress, and status
2. Periodic review of the activities for managing the allocated requirements
3. Periodic review of the activities for project planning
4. Periodic review of the activities for project tracking and oversight
5. Periodic review of the Quality Assurance activities
6. Periodic review of the activities and work products of the project's Quality Assurance group by experts

The monitoring and control process, frequency of status reporting, and other tracking activities shall also be specified, including the organizational structure to be used on the project as well as the roles, responsibilities, and allocated efforts for each team member.

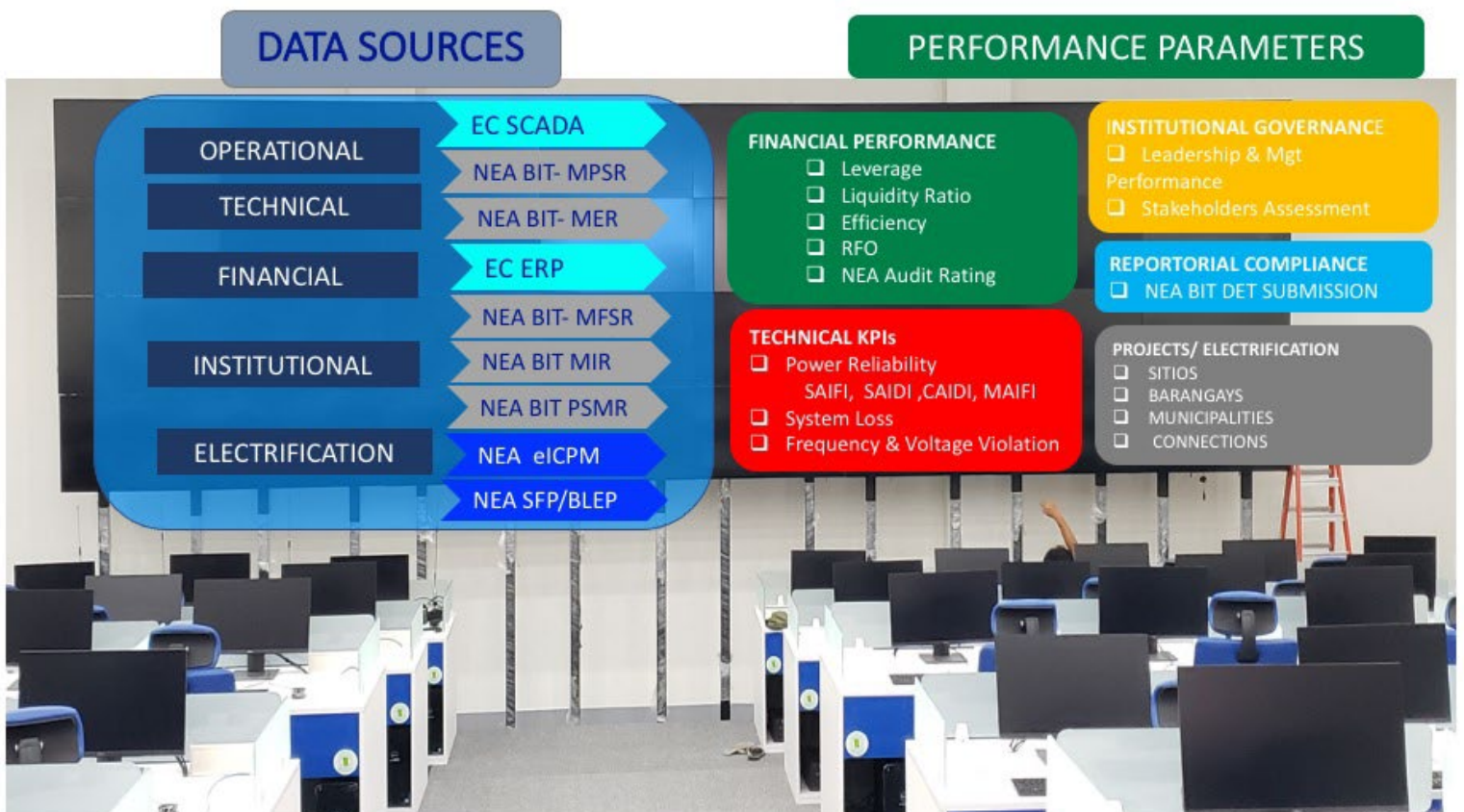
**U. PROJECT SCHEDULE/ PAYMENT MILESTONES**

The project shall be paid on the proposed schedule indicated below which shall not exceed the ceiling specified:

Sign-off on Detailed System Design, Project Implementation Plan and UAT Test Parameters	<b>15%</b>
Hardware and System Software Delivery and Installation of components	<b>35%</b>
Delivery of Solution Software and completion of User Acceptance Testing	<b>20%</b>
Completion of User Training	<b>10%</b>
Deployment and Implementation of the Dashboard Solution Software	<b>10%</b>
Retention	<b>10%</b>
<b>TOTAL</b>	<b>100%</b>

## V. EXHIBIT A – NEA INTEGRATED DASHBOARD

**EXHIBIT A 1**



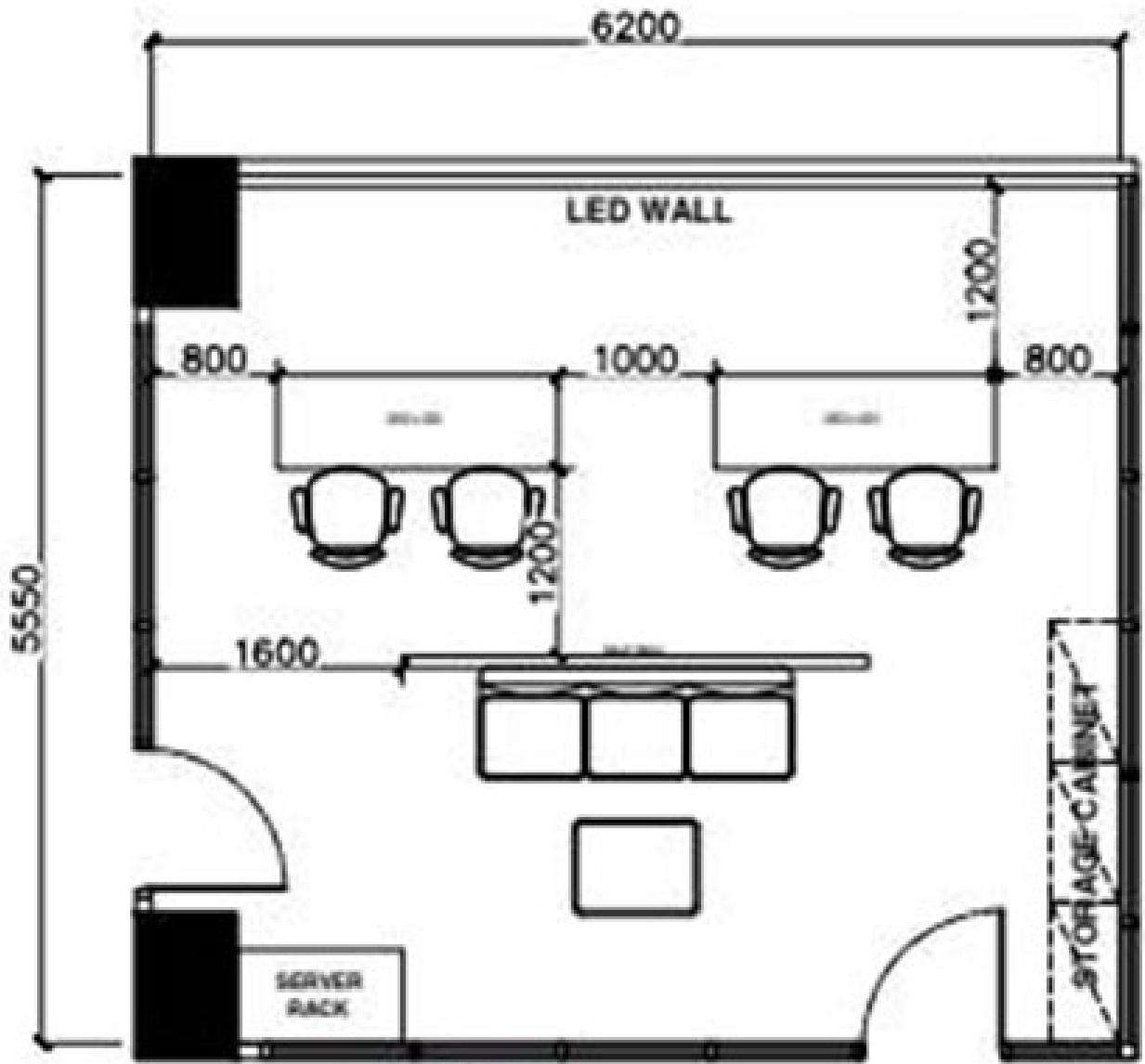
**EXHIBIT A 2**

# NEA Dashboard

## Performance Windows



**W. EXHIBIT B – NEA DDCC PROPOSED ROOM LAYOUT**



**OPTION 2**  
**1**  
**PROPOSED FLOOR PLAN**  
A/01 SCALE: 1:40 MTS

Terms of Reference for the Procurement of System Integration Services  
for the NEA Digital Dashboard Command Center (DDCC)

**SBAC - TECHNICAL WORKING GROUP (TWG)**

  
**MARCIANO C. ANOYA**  
Member

  
**REXON M. ARGANA**  
Member

  
**RAYMOND M. NAPILOT**  
Member

**RAINER NOEL P. RAMOS**  
Member

  
**LEILANI L. RICO**  
Member

  
**JUVEE GAIL D. SAGUN**  
Member

  
**TIBURCIO P. SANGALANG**  
Member

  
**MA. CHONA O. DELA CRUZ**  
Vice Chairperson

  
**ATTY. ALMIRA MONICA T. LUMBANG**  
Chairperson

Date : September 19, 2023