Republic of the Philippines
ROMBLON STATE UNIVERSITY
Odiongan, Romblon

Digital Resiliency Development Program

Solicitation No: RSU-2024-03-032
Source of Fund: 101
Total ABC: PhP1,600,000,000.00

Pre –Bid Conference	**:**	**01 April 2024 (10:00 AM)**
Submission of Bid Docs	**:**	**On or Before 15 April 2024 (10:00 AM)**
Opening of Bid Docs	**:**	**15 April 2024 (10:00 AM)**
Venue	**:**	**BAC Office, Community Outreach Center, Romblon State University, Liwanag, Odiongan, Romblon**

PHILIPPINE BIDDING DOCUMENTS
Procurement of GOODS
Government of the Republic of the Philippines

Sixth Edition
July 2020

Preface

These Philippine Bidding Documents (PBDs) for the procurement of Goods through Competitive Bidding have been prepared by the Government of the Philippines for use by any branch, constitutional commission or office, agency, department, bureau, office, or instrumentality of the Government of the Philippines, National Government Agencies, including Government-Owned and/or Controlled Corporations, Government Financing Institutions, State Universities and Colleges, and Local Government Unit. The procedures and practices presented in this document have been developed through broad experience, and are for mandatory use in projects that are financed in whole or in part by the Government of the Philippines or any foreign government/foreign or international financing institution in accordance with the provisions of the 2016 revised Implementing Rules and Regulations of Republic Act No. 9184.

The Bidding Documents shall clearly and adequately define, among others: (i) the objectives, scope, and expected outputs and/or results of the proposed contract or Framework Agreement, as the case may be; (ii) the eligibility requirements of Bidders; (iii) the expected contract or Framework Agreement duration, the estimated quantity in the case of procurement of goods, delivery schedule and/or time frame; and (iv) the obligations, duties, and/or functions of the winning bidder.

Care should be taken to check the relevance of the provisions of the PBDs against the requirements of the specific Goods to be procured. If duplication of a subject is inevitable in other sections of the document prepared by the Procuring Entity, care must be exercised to avoid contradictions between clauses dealing with the same matter.

Moreover, each section is prepared with notes intended only as information for the Procuring Entity or the person drafting the Bidding Documents. They shall not be included in the final documents. The following general directions should be observed when using the documents:

a. All the documents listed in the Table of Contents are normally required for the procurement of Goods. However, they should be adapted as necessary to the circumstances of the particular Procurement Project.

b. Specific details, such as the "*name of the Procuring Entity*" and "*address for bid submission*," should be furnished in the Instructions to Bidders, Bid Data Sheet, and Special Conditions of Contract. The final documents should contain neither blank spaces nor options.

c. This Preface and the footnotes or notes in italics included in the Invitation to Bid, Bid Data Sheet, General Conditions of Contract, Special Conditions of Contract, Schedule of Requirements, and Specifications are not part of the text of the final document, although they contain instructions that the Procuring Entity should strictly follow.

d. The cover should be modified as required to identify the Bidding Documents as to the Procurement Project, Project Identification Number, and Procuring Entity, in addition to the date of issue.

e. Modifications for specific Procurement Project details should be provided in the Special Conditions of Contract as amendments to the Conditions of Contract. For easy completion, whenever reference has to be made to specific clauses in the Bid Data Sheet or Special Conditions of Contract, these terms shall be printed in bold typeface on Sections I (Instructions to Bidders) and III (General Conditions of Contract), respectively.

f. For guidelines on the use of Bidding Forms and the procurement of Foreign-Assisted Projects, these will be covered by a separate issuance of the Government Procurement Policy Board.

Table of Contents

Glossary of Acronyms, Terms, and Abbreviations

ABC – Approved Budget for the Contract.

BAC – Bids and Awards Committee.

Bid – A signed offer or proposal to undertake a contract submitted by a bidder in response to and in consonance with the requirements of the bidding documents. Also referred to as *Proposal* and *Tender*. (2016 revised IRR, Section 5[c])

Bidder – Refers to a contractor, manufacturer, supplier, distributor and/or consultant who submits a bid in response to the requirements of the Bidding Documents. (2016 revised IRR, Section 5[d])

Bidding Documents – The documents issued by the Procuring Entity as the bases for bids, furnishing all information necessary for a prospective bidder to prepare a bid for the Goods, Infrastructure Projects, and/or Consulting Services required by the Procuring Entity. (2016 revised IRR, Section 5[e])

BIR – Bureau of Internal Revenue.

BSP – Bangko Sentral ng Pilipinas.

Consulting Services – Refer to services for Infrastructure Projects and other types of projects or activities of the GOP requiring adequate external technical and professional expertise that are beyond the capability and/or capacity of the GOP to undertake such as, but not limited to: (i) advisory and review services; (ii) pre-investment or feasibility studies; (iii) design; (iv) construction supervision; (v) management and related services; and (vi) other technical services or special studies. (2016 revised IRR, Section 5[i])

CDA - Cooperative Development Authority.

Contract – Refers to the agreement entered into between the Procuring Entity and the Supplier or Manufacturer or Distributor or Service Provider for procurement of Goods and Services; Contractor for Procurement of Infrastructure Projects; or Consultant or Consulting Firm for Procurement of Consulting Services; as the case may be, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

CIF – Cost Insurance and Freight.

CIP – Carriage and Insurance Paid.

CPI – Consumer Price Index.

DDP – Refers to the quoted price of the Goods, which means "delivered duty paid."

DTI – Department of Trade and Industry.

EXW – Ex works.

FCA – "Free Carrier" shipping point.

FOB – "Free on Board" shipping point.

Foreign-funded Procurement or Foreign-Assisted Project– Refers to procurement whose funding source is from a foreign government, foreign or international financing institution as specified in the Treaty or International or Executive Agreement. (2016 revised IRR, Section 5[b]).

Framework Agreement – Refers to a written agreement between a procuring entity and a supplier or service provider that identifies the terms and conditions, under which specific purchases, otherwise known as "Call-Offs," are made for the duration of the agreement. It is in the nature of an option contract between the procuring entity and the bidder(s) granting the procuring entity the option to either place an order for any of the goods or services identified in the Framework Agreement List or not buy at all, within a minimum period of one (1) year to a maximum period of three (3) years. (GPPB Resolution No. 27-2019)

GFI – Government Financial Institution.

GOCC – Government-owned and/or –controlled corporation.

Goods – Refer to all items, supplies, materials and general support services, except Consulting Services and Infrastructure Projects, which may be needed in the transaction of public businesses or in the pursuit of any government undertaking, project or activity, whether in the nature of equipment, furniture, stationery, materials for construction, or personal property of any kind, including non-personal or contractual services such as the repair and maintenance of equipment and furniture, as well as trucking, hauling, janitorial, security, and related or analogous services, as well as procurement of materials and supplies provided by the Procuring Entity for such services. The term "related" or "analogous services" shall include, but is not limited to, lease or purchase of office space, media advertisements, health maintenance services, and other services essential to the operation of the Procuring Entity. (2016 revised IRR, Section 5[r])

GOP – Government of the Philippines.

GPPB – Government Procurement Policy Board.

INCOTERMS – International Commercial Terms.

Infrastructure Projects – Include the construction, improvement, rehabilitation, demolition, repair, restoration or maintenance of roads and bridges, railways, airports, seaports, communication facilities, civil works components of information technology projects, irrigation, flood control and drainage, water supply, sanitation, sewerage and solid waste management systems, shore protection, energy/power and electrification facilities, national buildings, school buildings, hospital buildings, and other related construction projects of the government. Also referred to as *civil works or works*. (2016 revised IRR, Section 5[u])

LGUs – Local Government Units.

NFCC – Net Financial Contracting Capacity.

NGA – National Government Agency.

PhilGEPS - Philippine Government Electronic Procurement System.

Procurement Project – refers to a specific or identified procurement covering goods, infrastructure project or consulting services. A Procurement Project shall be described, detailed, and scheduled in the Project Procurement Management Plan prepared by the agency

which shall be consolidated in the procuring entity's Annual Procurement Plan. (GPPB Circular No. 06-2019 dated 17 July 2019)

PSA – Philippine Statistics Authority.

SEC – Securities and Exchange Commission.

SLCC – Single Largest Completed Contract.

Supplier – refers to a citizen, or any corporate body or commercial company duly organized and registered under the laws where it is established, habitually established in business and engaged in the manufacture or sale of the merchandise or performance of the general services covered by his bid. (Item 3.8 of GPPB Resolution No. 13-2019, dated 23 May 2019). Supplier as used in these Bidding Documents may likewise refer to a distributor, manufacturer, contractor, or consultant.

UN – United Nations.

Section I. Invitation to Bid

Notes on the Invitation to Bid

The Invitation to Bid (IB) provides information that enables potential Bidders to decide whether to participate in the procurement at hand. The IB shall be posted in accordance with Section 21.2 of the 2016 revised IRR of RA No. 9184.

Apart from the essential items listed in the Bidding Documents, the IB should also indicate the following:

a. The date of availability of the Bidding Documents, which shall be from the time the IB is first advertised/posted until the deadline for the submission and receipt of bids;

b. The place where the Bidding Documents may be acquired or the website where it may be downloaded;

c. The deadline for the submission and receipt of bids; and

d. Any important bid evaluation criteria (*e.g.*, the application of a margin of preference in bid evaluation).

The IB should be incorporated in the Bidding Documents. The information contained in the IB must conform to the Bidding Documents and in particular to the relevant information in the Bid Data Sheet.

ROMBLON STATE UNIVERSITY
BIDS AND AWARDS COMMITTEE
Community Outreach Center, RSU-Main Campus, Liwanag, Odiongan, Romblon 5505
Telephone: (042) 567-5952
Email: bac@rsu.edu.ph
Website: rsu.edu.ph

INVITATION TO BID FOR DIGITAL RESILIENCY DEVELOPMENT PROGRAM (ABC: PHP1,600,000,000.00)

1. The **Romblon State University**, through **the General Appropriations Act of 2024** intends to apply the sum of **One Billion, Six Hundred Million Pesos Only (PhP1,600,000,000.00)** being the ABC to payments under the contract for **RSU-2024-03-032**. Bids received in excess of the ABC shall be automatically rejected at bid opening.

2. The **Romblon State University** now invites bids for the above Procurement Project. Delivery of the Goods is required by **within three hundred thirty (330) calendar days from receipt of the Notice to Proceed**. Bidders should have completed, **within five (5) years** from the date of submission and receipt of bids, a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II (Instructions to Bidders).

3. Bidding will be conducted through open competitive bidding procedures using a non-discretionary "*pass/fail*" criterion as specified in the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.

   a. Bidding is restricted to Filipino citizens/sole proprietorships, partnerships, or organizations with at least sixty percent (60%) interest or outstanding capital stock belonging to citizens of the Philippines, and to citizens or organizations of a country the laws or regulations of which grant similar rights or privileges to Filipino citizens, pursuant to RA No. 5183.

4. Prospective Bidders may obtain further information from **Romblon State University** and inspect the Bidding Documents at the address given below during **Mondays to Fridays**, **8:00 AM** to **5:00 PM**, **except holidays**.

5. A complete set of Bidding Documents may be acquired by interested Bidders on **22 March 2024** until before the opening of bids from the given address and website(s) below *and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of* ***Seventy-Five Thousand Pesos Only (PhP75,000.00)***. The Procuring Entity shall allow the bidder to present its proof of payment for the fees *in person, by facsimile, or through electronic means.*

6. The **Romblon State University** will hold a Pre-Bid Conference on **10:00 AM, 01 April 2024** at the **BAC Office, Community Outreach Center, Romblon State University** and/or through video conferencing or webcasting *via* **Zoom Conference**, which shall be open to prospective bidders.

7. Bids must be duly received by the BAC Secretariat through manual submission at the office address indicated below on or before **10:00 AM, 15 April 2024**. Late bids shall not be accepted.

8. All Bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in **ITB** Clause 14.

9. Bid opening shall be on **10:00 AM, 15 April 2024** at the given address below *and*/or via **Zoom Conferencing**. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

   The bidder/s must submit one **(1) original hard copy**, and **three (3) true hard copies** of the bidding documents.

10. The **Romblon State University** reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35.6 and 41 of the 2016 revised IRR of RA No. 9184, without thereby incurring any liability to the affected bidder or bidders.

11. Pursuant to **Section 61 of RA 9184**, all bid prices shall be considered as fixed prices, and therefore not subject to price escalation during contract implementation, except under extraordinary circumstances and upon prior approval of the GPPB.

12. Further questions and/or clarifications may be directed to:

    MS. VEE F. FRANCISCO
    Head, BAC Secretariat
    Romblon State University, Odiongan, Romblon 5505
    Email Address: ***bacrsu2016@gmail.com***
    Cellphone No.: 09398173816
    Website: www.rsu.edu.ph

13. You may visit the following websites:

    For downloading of Bidding Documents:
    www.rsu.edu.ph
    https://notices.philgeps.gov.ph/

22 March 2024

(SGD) ATTY. GLENN NIÑO M. SARTILLO
BAC Chairperson

Section II. Instructions to Bidders

Notes on the Instructions to Bidders

This Section on the Instruction to Bidders (ITB) provides the information necessary for bidders to prepare responsive bids, in accordance with the requirements of the Procuring Entity. It also provides information on bid submission, eligibility check, opening and evaluation of bids, post-qualification, and on the award of contract.

1. Scope of Bid

The Procuring Entity, **Romblon State University** wishes to receive Bids for the **Digital Resiliency Development Program (ABC: PhP1,600,000,000.00)**, with identification number **RSU-2024-03-032**.

The Procurement Project (referred to herein as "Project") is composed of one (1) lot, the details of which are described in Section VII (Technical Specifications).

2. Funding Information

2.1. The GOP through the source of funding as indicated below for **Fiscal Year 2024** in the amount of **One Billion Six Hundred Million Pesos Only (PhP1,600,000,000.00).**

2.2. The source of funding is:

a. NGA, the General Appropriations Act or Special Appropriations.

3. Bidding Requirements

The Bidding for the Project shall be governed by all the provisions of RA No. 9184 and its 2016 revised IRR, including its Generic Procurement Manuals and associated policies, rules and regulations as the primary source thereof, while the herein clauses shall serve as the secondary source thereof.

Any amendments made to the IRR and other GPPB issuances shall be applicable only to the ongoing posting, advertisement, or **IB** by the BAC through the issuance of a supplemental or bid bulletin.

The Bidder, by the act of submitting its Bid, shall be deemed to have verified and accepted the general requirements of this Project, including other factors that may affect the cost, duration and execution or implementation of the contract, project, or work and examine all instructions, forms, terms, and project requirements in the Bidding Documents.

4. Corrupt, Fraudulent, Collusive, and Coercive Practices

The Procuring Entity, as well as the Bidders and Suppliers, shall observe the highest standard of ethics during the procurement and execution of the contract. They or through an agent shall not engage in corrupt, fraudulent, collusive, coercive, and obstructive practices defined under Annex "I" of the 2016 revised IRR of RA No. 9184 or other integrity violations in competing for the Project.

5. Eligible Bidders

5.1. Only Bids of Bidders found to be legally, technically, and financially capable will be evaluated.

5.2.

a. Foreign ownership exceeding those allowed under the rules may participate pursuant to:

i. When a Treaty or International or Executive Agreement as provided in Section 4 of the RA No. 9184 and its 2016 revised IRR allow foreign bidders to participate;

ii. Citizens, corporations, or associations of a country, included in the list issued by the GPPB, the laws or regulations of which grant reciprocal rights or privileges to citizens, corporations, or associations of the Philippines;

iii. When the Goods sought to be procured are not available from local suppliers; or

iv. When there is a need to prevent situations that defeat competition or restrain trade.

5.3. Pursuant to Section 23.4.1.3 of the 2016 revised IRR of RA No.9184, the Bidder shall have an SLCC that is at least one (1) contract similar to the Project the value of which, adjusted to current prices using the PSA's CPI, must be at least equivalent to:

a. For the procurement of Non-expendable Supplies and Services: The Bidder must have completed a single contract that is similar to this Project, equivalent to at least fifty percent (50%) of the ABC.

5.4. The Bidders shall comply with the eligibility criteria under Section 23.4.1 of the 2016 IRR of RA No. 9184.

6. Origin of Goods

There is no restriction on the origin of goods other than those prohibited by a decision of the UN Security Council taken under Chapter VII of the Charter of the UN, subject to Domestic Preference requirements under **ITB** Clause 18.

7. Subcontracts

7.1. The Bidder may subcontract portions of the Project to the extent allowed by the Procuring Entity as stated herein, but in no case more than twenty percent (20%) of the Project.

The Procuring Entity has prescribed that:

a. Subcontracting is not allowed.

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and either at its physical address **BAC Office, Community Outreach Center, Romblon State University** and/or through videoconferencing/webcasting as indicated in paragraph 6 of the **IB.**

9. Clarification and Amendment of Bidding Documents

Prospective bidders may request for clarification on and/or interpretation of any part of the Bidding Documents. Such requests must be in writing and received by the Procuring Entity, either at its given address or through electronic mail indicated in the

IB, at least ten (10) calendar days before the deadline set for the submission and receipt of Bids.

10. Documents comprising the Bid: Eligibility and Technical Components

10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Section VIII (Checklist of Technical and Financial Documents)**.

10.2. The Bidder's SLCC as indicated in **ITB** Clause 5.3 should have been completed within **five (5) years** prior to the deadline for the submission and receipt of bids.

10.3. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines. Similar to the required authentication above, for Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an apostille pursuant to GPPB Resolution No. 13-2019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.

11. Documents comprising the Bid: Financial Component

11.1. The second bid envelope shall contain the financial documents for the Bid as specified in **Section VIII (Checklist of Technical and Financial Documents)**.

11.2. If the Bidder claims preference as a Domestic Bidder or Domestic Entity, a certification issued by DTI shall be provided by the Bidder in accordance with Section 43.1.3 of the 2016 revised IRR of RA No. 9184.

11.3. Any bid exceeding the ABC indicated in paragraph 1 of the **IB** shall not be accepted.

11.4. For Foreign-funded Procurement, a ceiling may be applied to bid prices provided the conditions are met under Section 31.2 of the 2016 revised IRR of RA No. 9184.

12. Bid Prices

12.1. Prices indicated on the Price Schedule shall be entered separately in the following manner:

a. For Goods offered from within the Procuring Entity's country:

i. The price of the Goods quoted EXW (ex-works, ex-factory, ex-warehouse, ex-showroom, or off-the-shelf, as applicable);

ii. The cost of all customs duties and sales and other taxes already paid or payable;

iii. The cost of transportation, insurance, and other costs incidental to delivery of the Goods to their final destination; and

iv. The price of other (incidental) services, if any, listed in the **BDS.**

b. For Goods offered from abroad:

i. Unless otherwise stated in the **BDS**, the price of the Goods shall be quoted delivered duty paid (DDP) with the place of destination in the Philippines as specified in the **BDS**. In quoting the price, the Bidder shall be free to use transportation through carriers registered in any eligible country. Similarly, the Bidder may obtain insurance services from any eligible source country.

ii. The price of other (incidental) services, if any, as listed in the **BDS.**

13. Bid and Payment Currencies

13.1. For Goods that the Bidder will supply from outside the Philippines, the bid prices may be quoted in the local currency or tradeable currency accepted by the BSP at the discretion of the Bidder. However, for purposes of bid evaluation, Bids denominated in foreign currencies, shall be converted to Philippine currency based on the exchange rate as published in the BSP reference rate bulletin on the day of the bid opening.

13.2. Payment of the contract price shall be made in:

a. Philippine Pesos.

14. Bid Security

14.1. The Bidder shall submit a Bid Securing Declaration[1] or any form of Bid Security in the amount indicated in the **BDS**, which shall be not less than the percentage of the ABC in accordance with the schedule in the **BDS**.

14.2. The Bid and bid security shall be valid until **09 August 2024**. Any Bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

15. Sealing and Marking of Bids

Each Bidder shall submit one copy of the first and second components of its Bid.

The Procuring Entity may request additional hard copies and/or electronic copies of the Bid. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification.

If the Procuring Entity allows the submission of bids through online submission or any other electronic means, the Bidder shall submit an electronic copy of its Bid, which must be digitally signed. An electronic copy that cannot be opened or is corrupted shall be considered non-responsive and, thus, automatically disqualified.

16. Deadline for Submission of Bids

[1] In the case of Framework Agreement, the undertaking shall refer to entering into contract with the Procuring Entity and furnishing of the performance security or the performance securing declaration within ten (10) calendar days from receipt of Notice to Execute Framework Agreement.

16.1. The Bidders shall submit on the specified date and time and either at its physical address or through online submission as indicated in paragraph 7 of the **IB.**

17. Opening and Preliminary Examination of Bids

17.1. The BAC shall open the Bids in public at the time, on the date, and at the place specified in paragraph 9 of the **IB**. The Bidders' representatives who are present shall sign a register evidencing their attendance. In case videoconferencing, webcasting or other similar technologies will be used, attendance of participants shall likewise be recorded by the BAC Secretariat.

In case the Bids cannot be opened as scheduled due to justifiable reasons, the rescheduling requirements under Section 29 of the 2016 revised IRR of RA No. 9184 shall prevail.

17.2. The preliminary examination of bids shall be governed by Section 30 of the 2016 revised IRR of RA No. 9184.

18. Domestic Preference

18.1. The Procuring Entity will grant a margin of preference for the purpose of comparison of Bids in accordance with Section 43.1.2 of the 2016 revised IRR of RA No. 9184.

19. Detailed Evaluation and Comparison of Bids

19.1. The Procuring Entity's BAC shall immediately conduct a detailed evaluation of all Bids rated "*passed*," using non-discretionary pass/fail criteria. The BAC shall consider the conditions in the evaluation of Bids under Section 32.2 of the 2016 revised IRR of RA No. 9184.

19.2. If the Project allows partial bids, bidders may submit a proposal on any of the lots or items, and evaluation will be undertaken on a per lot or item basis, as the case maybe. In this case, the Bid Security as required by **ITB** Clause 14 shall be submitted for each lot or item separately.

19.3. The descriptions of the lots or items shall be indicated in **Section VII (Technical Specifications)**, although the ABCs of these lots or items are indicated in the **BDS** for purposes of the NFCC computation pursuant to Section 23.4.2.6 of the 2016 revised IRR of RA No. 9184. The NFCC must be sufficient for the total of the ABCs for all the lots or items participated in by the prospective Bidder.

19.4. The Project shall be awarded as follows:

Option 1 – One Project having several items that shall be awarded as one contract.

19.5. Except for bidders submitting a committed Line of Credit from a Universal or Commercial Bank in lieu of its NFCC computation, all Bids must include the NFCC computation pursuant to Section 23.4.1.4 of the 2016 revised IRR of RA No. 9184, which must be sufficient for the total of the ABCs for all the lots or items participated in by the prospective Bidder. For bidders submitting the committed Line of Credit, it must be at least equal to ten percent (10%) of the ABCs for all the lots or items participated in by the prospective Bidder.

20. Post-Qualification

20.2 Within a non-extendible period of five (5) calendar days from receipt by the Bidder of the notice from the BAC that it submitted the Lowest Calculated Bid.

21. Signing of the Contract

21.1. The documents required in Section 37.2 of the 2016 revised IRR of RA No. 9184 shall form part of the Contract. Additional Contract documents are indicated in the **BDS**.

Section III. Bid Data Sheet

Notes on the Bid Data Sheet

The Bid Data Sheet (BDS) consists of provisions that supplement, amend, or specify in detail, information, or requirements included in the ITB found in Section II, which are specific to each procurement.

This Section is intended to assist the Procuring Entity in providing the specific information in relation to corresponding clauses in the ITB and has to be prepared for each specific procurement.

The Procuring Entity should specify in the BDS information and requirements specific to the circumstances of the Procuring Entity, the processing of the procurement, and the bid evaluation criteria that will apply to the Bids. In preparing the BDS, the following aspects should be checked:

a. Information that specifies and complements provisions of the ITB must be incorporated.

b. Amendments and/or supplements, if any, to provisions of the ITB as necessitated by the circumstances of the specific procurement, must also be incorporated.

Bid Data Sheet

ITB Clause	
5.3	For this purpose, contracts similar to the Project shall be: a. involving delivery of any of the following: a) system applications, b) animation laboratory, c) security applications, d) hardware supply, e) micro data center facility, f) data center compute system, g) data center network, and h) professional services. b. completed within five (5) years prior to the deadline for the submission and receipt of bids.
7.1	Subcontracting is not allowed.
12	The price of the Goods shall be quoted DDP Romblon State University-Main Campus, Odiongan, Romblon or the applicable International Commercial Terms (INCOTERMS) for this Project.
14.1	The bid security shall be in the form of a Bid Securing Declaration, or any of the following forms and amounts: a. The amount of not less than PhP32,000,000.00, if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit; or b. The amount of not less than PhP80,000,000.00, if bid security is in Surety Bond.

Section IV. General Conditions of Contract

Notes on the General Conditions of Contract

The General Conditions of Contract (GCC) in this Section, read in conjunction with the Special Conditions of Contract in Section V and other documents listed therein, should be a complete document expressing all the rights and obligations of the parties.

Matters governing performance of the Supplier, payments under the contract, or matters affecting the risks, rights, and obligations of the parties under the contract are included in the GCC and Special Conditions of Contract.

Any complementary information, which may be needed, shall be introduced only through the Special Conditions of Contract.

1. Scope of Contract

This Contract shall include all such items, although not specifically mentioned, that can be reasonably inferred as being required for its completion as if such items were expressly mentioned herein. All the provisions of RA No. 9184 and its 2016 revised IRR, including the Generic Procurement Manual, and associated issuances, constitute the primary source for the terms and conditions of the Contract, and thus, applicable in contract implementation. Herein clauses shall serve as the secondary source for the terms and conditions of the Contract.

This is without prejudice to Sections 74.1 and 74.2 of the 2016 revised IRR of RA No. 9184 allowing the GPPB to amend the IRR, which shall be applied to all procurement activities, the advertisement, posting, or invitation of which were issued after the effectivity of the said amendment.

Additional requirements for the completion of this Contract shall be provided in the **Special Conditions of Contract** (**SCC).**

2. Advance Payment and Terms of Payment

2.1. Advance payment of the contract amount is provided under Annex "D" of the revised 2016 IRR of RA No. 9184.

2.2. The Procuring Entity is allowed to determine the terms of payment on the partial or staggered delivery of the Goods procured, provided such partial payment shall correspond to the value of the goods delivered and accepted in accordance with prevailing accounting and auditing rules and regulations. The terms of payment are indicated in the **SCC**.

3. Performance Security

Within ten (10) calendar days from receipt of the Notice of Award by the Bidder from the Procuring Entity but in no case later than the signing of the Contract by both parties, the successful Bidder shall furnish the performance security in any of the forms prescribed in Section 39 of the 2016 revised IRR of RA No. 9184.

4. Inspection and Tests

The Procuring Entity or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Project. In addition to tests in the **SCC**, **Section VII (Technical Specifications)** shall specify what inspections and/or tests the Procuring Entity requires, and where they are to be conducted. The Procuring Entity shall notify the Supplier in writing, in a timely manner, of the identity of any representatives retained for these purposes.

All reasonable facilities and assistance for the inspection and testing of Goods, including access to drawings and production data, shall be provided by the Supplier to the authorized inspectors at no charge to the Procuring Entity.

5. Warranty

5.1 In order to assure that manufacturing defects shall be corrected by the Supplier, a warranty shall be required from the Supplier as provided under Section 62.1 of the 2016 revised IRR of RA No. 9184.

5.2 The Procuring Entity shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall, repair or replace the defective Goods or parts thereof without cost to the Procuring Entity, pursuant to the Generic Procurement Manual.

6. Liability of the Supplier

The Supplier's liability under this Contract shall be as provided by the laws of the Republic of the Philippines.

If the Supplier is a joint venture, all partners to the joint venture shall be jointly and severally liable to the Procuring Entity.

Section V. Special Conditions of Contract

Notes on the Special Conditions of Contract

Similar to the BDS, the clauses in this Section are intended to assist the Procuring Entity in providing contract-specific information in relation to corresponding clauses in the GCC found in Section IV.

The Special Conditions of Contract (SCC) complement the GCC, specifying contractual requirements linked to the special circumstances of the Procuring Entity, the Procuring Entity's country, the sector, and the Goods purchased. In preparing this Section, the following aspects should be checked:

a. Information that complements provisions of the GCC must be incorporated.

b. Amendments and/or supplements to provisions of the GCC as necessitated by the circumstances of the specific purchase, must also be incorporated.

However, no special condition which defeats or negates the general intent and purpose of the provisions of the GCC should be incorporated herein.

Special Conditions of Contract

GCC Clause	
1	*[List here any additional requirements for the completion of this Contract. The following requirements and the corresponding provisions may be deleted, amended, or retained depending on its applicability to this Contract:]* 1.1. **As-Built Plans Development** 1.1.1. The winning bidder must develop and submit As-Built Plans for all works covered in this project such as the data center, cabling works and system deployments. The As-Built Plans must accurately reflect the actual installations, and other relevant works completed and duly signed off by the signing authority designated by RSU Agpudlos, as well as the respective trade engineers from the winning bidder's side. Mechanical and Electrical Load Schedules must form part of the As-Built plans. Submittal should be in the following form: 1.1.1.1. 3 Sets of Print Outs in A1 Sheet, (properly compiled and labeled accordingly) 1.1.1.2. Sets of Print Outs in A3 Sheets (properly compiled and labeled accordingly) 1.1.1.3. Soft Copies in pdf format, compiled and stored in a USB Drive • **Conceptual Design** 1. The winning bidder must submit a Conceptual Design of the data center facility-related works. • **Working Timeline** 1. For better appreciation, participating bidders are requested to include in their bid submission a high-level Gantt Chart that will illustrate the project implementation schedule per WBS. 2. A Delivery Schedule indicating a working timeline including the periods of design and manufacture, delivery, installation, training, site acceptance testing, and commissioning. • **Warranty** 3. The winning bidder must submit a Warranty Certificate indicating warranty coverage of at least one (1) year after the issuance of the Certificate of Acceptance by the Procuring Entity. 4. **Warranty Retention:** The obligations of the warranty shall be covered by either retention money in an amount equivalent to one percent (1%) of each payment, or special bank guarantee equivalent to one percent (1%) of the total contract price, or surety callable on demand equivalent to 10% of the total contract price. The said amounts shall only be released after the lapse of the warranty period. • **The terms of payment shall be as follows:**

1. Partial payment of the contract price will only be allowed if the contract provides/allows for partial or staggered delivery of goods procured, and such partial payment must correspond to the value of the goods delivered and accepted;

2. Payment must only be made after the appropriate inspection and acceptance procedures, as mandated by existing government rules and regulations, have been complied with by the Procuring Entity;

3. Payment must be made in accordance with prevailing accounting and auditing rules and regulations; and

4. Upon submission of an irrevocable letter of credit or bank guarantee issued by a Universal or Commercial Bank, advance payment not to exceed fifteen percent (15%) of the contract amount shall be allowed and paid within sixty (60) calendar days from signing of the contract. The irrevocable letter of credit or bank guarantee must be for an equivalent amount, shall remain valid until the goods are delivered, and accompanied by a claim for advance payment.

- **Professional Services**

1. The winning bidder shall create a Project Management Team committed to ensuring that information and communication technology projects are completed successfully. This involves overseeing the project team, creating project plans, tracking progress, identifying and managing risks, and communicating with stakeholders.

    1.1. Develop a clear understanding of the project goals and objectives, and ensure that all project team members have a shared understanding of these goals;
    1.2. Create a detailed project plan that includes timelines, milestones, and deliverables;
    1.3. Assign roles and responsibilities to the project team members and ensure that everyone understands their roles;
    1.4. Monitor project progress regularly and adjust the project plan as necessary;
    1.5. Identify potential risks and develop contingency plans to mitigate these risks;
    1.6. Communicate regularly with stakeholders, including sponsors, customers, and team members, to ensure that everyone is aware of project progress and any issues that arise;
    1.7. Ensure that project documentation is accurate and up-to-date, including project plans, progress reports, and risk assessments;
    1.8. Foster a positive team environment by encouraging collaboration, providing support, and recognizing team members' contributions; and
    1.9. Continuously evaluate project performance and identify opportunities for improvement.

	Delivery and Documents – For purposes of the Contract, "EXW," "FOB," "FCA," "CIF," "CIP," "DDP" and other trade terms used to describe the obligations of the parties shall have the meanings assigned to them by the current edition of INCOTERMS published by the International Chamber of Commerce, Paris. The Delivery terms of this Contract shall be as follows: The delivery terms applicable to this Contract are delivered to Romblon State University-Main Campus, Odiongan, Romblon. Risk and title will pass from the Supplier to the Procuring Entity upon receipt and final acceptance of the Goods at their final destination. Delivery of the Goods shall be made by the Supplier in accordance with the terms specified in Section VI (Schedule of Requirements). For purposes of this Clause the Procuring Entity's Representative at the Project Site is the Head of the Supply and Property Management Office. **Incidental Services –** The Supplier is required to provide all of the following services, including additional services, if any, specified in Section VI. Schedule of Requirements: b. performance or supervision of on-site assembly and/or start-up of the supplied Goods; c. furnishing of tools required for assembly and/or maintenance of the supplied Goods; d. furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods; e. performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Supplier of any warranty obligations under this Contract; and
	f. training of the Procuring Entity's personnel, at the Supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied Goods. The Contract price for the Goods shall include the prices charged by the Supplier for incidental services and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services. **Spare Parts –** 1. such spare parts as the Procuring Entity may elect to purchase from the Supplier, provided that this election shall not relieve the Supplier of any warranty obligations under this Contract; and 2. in the event of termination of production of the spare parts:

	ii. advance notification to the Procuring Entity of the pending termination, in sufficient time to permit the Procuring Entity to procure needed requirements; and iii. following such termination, furnishing at no cost to the Procuring Entity, the blueprints, drawings, and specifications of the spare parts, if requested. The spare parts and other components required are listed in **Section VI (Schedule of Requirements)** and the costs thereof are included in the contract price. The Supplier shall carry sufficient inventories to assure ex-stock supply of consumable spare parts or components for the Goods for a period of three (3) years. Spare parts or components shall be supplied as promptly as possible, but in any case, within one (1) month of placing the order.
	Packaging – The Supplier shall provide such packaging of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in this Contract. The packaging shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packaging case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit. The packaging, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified below, and in any subsequent instructions ordered by the Procuring Entity. The outer packaging must be clearly marked on at least four (4) sides as follows: Name of the Procuring Entity Name of the Supplier Contract Description Final Destination Gross weight Any special lifting instructions Any special handling instructions Any relevant HAZCHEM classifications
	A packaging list identifying the contents and quantities of the package is to be placed on an accessible point of the outer packaging if practical. If not practical the packaging list is to be placed inside the outer packaging but outside the secondary packaging. **Transportation –**

	Where the Supplier is required under Contract to deliver the Goods CIF, CIP, or DDP, transport of the Goods to the port of destination or such other named place of destination in the Philippines, as shall be specified in this Contract, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price. Where the Supplier is required under this Contract to transport the Goods to a specified place of destination within the Philippines, defined as the Project Site, transport to such place of destination in the Philippines, including insurance and storage, as shall be specified in this Contract, shall be arranged by the Supplier, and related costs shall be included in the contract price.
	Where the Supplier is required under Contract to deliver the Goods CIF, CIP or DDP, Goods are to be transported on carriers of Philippine registry. In the event that no carrier of Philippine registry is available, Goods may be shipped by a carrier which is not of Philippine registry provided that the Supplier obtains and presents to the Procuring Entity certification to this effect from the nearest Philippine consulate to the port of dispatch. In the event that carriers of Philippine registry are available but their schedule delays the Supplier in its performance of this Contract the period from when the Goods were first ready for shipment and the actual date of shipment the period of delay will be considered force majeure. The Procuring Entity accepts no liability for the damage of Goods during transit other than those prescribed by INCOTERMS for DDP deliveries. In the case of Goods supplied from within the Philippines or supplied by domestic Suppliers risk and title will not be deemed to have passed to the Procuring Entity until their receipt and final acceptance at the final destination. **Intellectual Property Rights –** The Supplier shall indemnify the Procuring Entity against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof.
4	The winning bidder shall be required to perform testing and commissioning. Minimum Scope of Services are as follows: a. The winning bidder shall submit the testing Methods of Procedures (MoP) to RSU PMT prior to actual testing; b. Perform actual testing as per Manufacturer prescribed testing methodologies; and c. Testing results must be documented and submitted to RSU PMT not later than 48 hours from completion of the testing activities; and Should there be failed testing, the winning bidder is given a maximum of 12 hours to troubleshoot or rectify the problem. Re-testing shall then be performed. After completion of the 2nd testing and such has failed anew, the winning bidder shall furnish RSU PMT with full report not more than 24 hours from the time failed testing has been declared and must replace the defective hardware and/or software not more than fourteen (14) days from the date of completion of the failed testing. In case of longer replacement period, the winning bidder must inform RSU PMT in writing, stating the reasons thereof and arrival date.

Section VI. Schedule of Requirements

The delivery schedule expressed as weeks/months stipulates hereafter a delivery date which is the date of delivery to the project site.

Item	Description	Qty	Delivered Weeks/Months
3.1	SMART AGRICULTURE SYSTEM	1 Lot	within 330 Calendar days
3.2	SMART AQUACULTURE SYSTEM	1 Lot	within 330 Calendar days
3.5	LEARNING MANAGEMENT SYSTEM	1 Lot	within 330 Calendar days
4.1	E-CLASSROOMS	1 Lot	within 330 Calendar days
5.1	ANIMATION LABORATORY	1 Lot	within 330 Calendar days
5.2	MOBILE GAMING AND APPLICATION DEVELOPMENT LABORATORY	1 Lot	within 330 Calendar days
5.3	ROBOTICS	1 Lot	within 330 Calendar days
5.4	LMS CONTENT CREATION LABORATORY	1 Lot	within 330 Calendar days
5.5	E-LIBRARY	1 Lot	within 330 Calendar days
6	COMMAND AND CONTROL CENTER	1 Lot	within 330 Calendar days
6.5	MICRO DATA CENTER FACILITY	1 Lot	within 330 Calendar days
7	DATA CENTER COMPUTE SYSTEM	1 Lot	within 330 Calendar days
7.2	DATA CENTER BLOCK STORAGE	1 Lot	within 330 Calendar days
7.3	DATA CENTER BACK-UP	1 Lot	within 330 Calendar days
9	NETWORK EQUIPMENT	1 Lot	within 330 Calendar days
9.2	CAMPUS NETWORK SWITCH	1 Lot	within 330 Calendar days
10.2	INTER-BUILDING FIBER OPTIC CONNECTION	1 Lot	within 330 Calendar days
10.3	IN-BUILDING STRUCTURED CABLING WORKS	1 Lot	within 330 Calendar days
11	LED DISPLAYS	1 Lot	within 330 Calendar days
12	UNIFIED DATABASE PLATFORM	1 Lot	within 330 Calendar days
13.1	CCTV CAMERAS	1 Lot	within 330 Calendar days

Section VII. Technical Specifications

Notes for Preparing the Technical Specifications

A set of precise and clear specifications is a prerequisite for Bidders to respond realistically and competitively to the requirements of the Procuring Entity without qualifying their Bids. In the context of Competitive Bidding, the specifications (*e.g.* production/delivery schedule, manpower requirements, and after-sales service/parts, descriptions of the lots or items) must be prepared to permit the widest possible competition and, at the same time, present a clear statement of the required standards of workmanship, materials, and performance of the goods and services to be procured. Only if this is done will the objectives of transparency, equity, efficiency, fairness, and economy in procurement be realized, responsiveness of bids be ensured, and the subsequent task of bid evaluation and post-qualification facilitated. The specifications should require that all items, materials and accessories to be included or incorporated in the goods be new, unused, and of the most recent or current models, and that they include or incorporate all recent improvements in design and materials unless otherwise provided in the Contract.

Samples of specifications from previous similar procurements are useful in this respect. The use of metric units is encouraged. Depending on the complexity of the goods and the repetitiveness of the type of procurement, it may be advantageous to standardize the General Technical Specifications and incorporate them in a separate subsection. The General Technical Specifications should cover all classes of workmanship, materials, and equipment commonly involved in manufacturing similar goods. Deletions or addenda should then adapt the General Technical Specifications to the particular procurement.

Care must be taken in drafting specifications to ensure that they are not restrictive. In the specification of standards for equipment, materials, and workmanship, recognized Philippine and international standards should be used as much as possible. Where other particular standards are used, whether national standards or other standards, the specifications should state that equipment, materials, and workmanship that meet other authoritative standards, and which ensure at least a substantially equal quality than the standards mentioned, will also be acceptable. The following clause may be inserted in the Special Conditions of Contract or the Technical Specifications.

Sample Clause: Equivalency of Standards and Codes

Wherever reference is made in the Technical Specifications to specific standards and codes to be met by the goods and materials to be furnished or tested, the provisions of the latest edition or revision of the relevant standards and codes shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national or relate to a particular country or region, other authoritative standards that ensure substantial equivalence to the standards and codes specified will be acceptable.

Reference to brand name and catalogue number should be avoided as far as possible; where unavoidable they should always be followed by the words "*or at least equivalent*." References to brand names cannot be used when the funding source is the GOP.

Where appropriate, drawings, including site plans as required, may be furnished by the Procuring Entity with the Bidding Documents. Similarly, the Supplier may be requested to provide drawings or samples either with its Bid or for prior review by the Procuring Entity during contract execution.

Bidders are also required, as part of the technical specifications, to complete their statement of compliance demonstrating how the items comply with the specification.

TECHNICAL SPECIFICATIONS

Solicitation No. RSU-2023-03-032
ABC: PhP1,600,000,000.00

Digital Resiliency Development Program

ITEM NO.	UNIT	ITEM DESCRIPTION	QTY	STATEMENT OF COMPLIANCE
1	Lot	**1. Project Summary** The Digital Resiliency Development Program envisions the creation of an advanced technological hub that is dedicated to innovation and advancement for RSU which includes, among others, agricultural advancement in San Andres Extramural Campus (Agpudlos), aqua-culture advancement in Santa Fe. Campus, and ICT modernization in other campuses. It will serve as the focal point for collaboration, experimentation, and education in the realm of technological advancement, and smart and precision agriculture and aqua-culture. **Key elements of the program:** 1. Technological Integration. The campus will be equipped with an array of sensors, IoT devices, and precision farming equipment that will enable real-time monitoring of crops, soil conditions, weather patterns, and more. These technologies will facilitate data-driven decision-making for optimizing resource allocation and enhancing production and harvest. 2. Data Analytics. Machine learning models will be developed for more efficient and sustainable agricultural practices. Advanced data analytics will play a pivotal role in transforming actionable insights for disease outbreak prediction, irrigation scheduling optimization, and personalized cultivation strategy recommendation. 3. Interdisciplinary Research. The campus will serve as a platform for collaboration between agronomists, engineers, data scientists, environmentalists, and other experts. Interdisciplinary research projects will explore innovative approaches to farm management, pest control, commodity improvement, and more, fostering a holistic understanding of agricultural and aqua-culture systems. 4. Sustainability and Resource Efficiency. Emphasis will be placed on sustainable practices that minimize negative impact on the environment. Research will focus on water management, minimizing chemical inputs, and exploring alternative energy sources to power the campus. The goal is to develop models that can be scaled and replicated on a larger scale to promote sustainable agriculture, and aqua-culture worldwide. **2. General Scope of Works**	1	

		2.1. **Requirement Analysis** 2.1.1. Network Backbone that will link multiple buildings within the campuses. 2.1.2. Modular Data Center to be located at the San Andres Extramural Campus (Agpudlos). 2.1.3. Networking task for all E-Classrooms, E-Laboratory, and Administration offices. 2.1.4. Core Network System which will serve as the primary network with higher throughput to serve the networking requirements of the campuses. 2.1.5. Campus Network that will provide connectivity for Access Points, IDFs, PoE switches and other essentials. 2.1.6. Conversion of traditional classrooms to be converted into modern and interactive smart classrooms. 2.1.7. Command Center to house various network and applications monitoring tools and entire security system and management. 2.1.8. Server & Storage IT Infrastructure that will host the applications, systems, and platforms. 2.1.9. Smart Security system equipped with analytics tools. 2.2. **Implementation Plan** 2.2.1. A comprehensive implementation plan will be developed that will detail the project's timeline, milestones, and resources required for successful execution. 2.3. **Infrastructure Setup** 2.3.1. The project team will install and set up the necessary digital infrastructure required for the project, including servers, routers, switches, and other hardware devices. 2.4. **Software Implementation** 2.4.1. Based on the planned design requirements, installation, customization and testing of all software and applications shall be performed to ensure full integration of all systems that form part of this project. 2.5. **Testing and Quality Assurance** 2.5.1. The project team will perform essential testing of various digital systems to ensure that these meet the		

		specified requirements and are free from defects and errors. 2.6. **Training** 2.6.1. Facilitate the delivery of knowledge transfer through technical briefings, orientations and/or training. **3. Platform and Application** 3.1. **Smart Agriculture System** The Smart Greenhouse System integrates contemporary technology with traditional farming practices, ensuring that plants are provided with the optimal growth environment under varying conditions, through IoT devices and sensors, and software, in a reliable and secure manner. Using sensors and cameras, real-time information about the greenhouse environment is collected. This data/information are sent to a cloud-based or on-prem platform for processing. Actuators and relays are also used to control components such as shading devices, heaters, water pumps, switches, and other applicable devices or gadgets to enable automatic adjustments based on monitoring data. The system issues alerts and notifications when certain conditions happen. The system also provides the users the ability to remotely monitor and control the system via mobile or web, allowing access from anywhere through internet connectivity. Components: 3.1.1. Devices/Sensors/Systems 3.1.1.1. Data collection and environment control through IoT sensors/devices/systems: 3.1.1.2. Temperature and Humidity Control - air temperature and humidity sensors, substrate temperature and humidity sensors, and liquid temperature sensors 3.1.1.3. Light Control - light intensity sensors, greenhouse film roll-up motors, shading film controllers, and a variety of plant grow lights 3.1.1.4. Water Control - water pumps, piping, water flow sensors, flow meters, electromagnetic valve controllers, water temperature sensors, and liquid level sensors 3.1.1.5. CO2 Control - carbon dioxide sensors, TVOC sensors, ammonia sensors, oxygen sensors, and carbon dioxide generators 3.1.1.6. Nutrient Control - EC sensors, pH sensors, and integrated fertigation systems		

		3.1.1.7. Capability to log and store the data locally on the devices/sensors or data logger 3.1.1.8. Reliable and secure data transmission from devices/sensors to the backend system with connectivity redundancy using LoRa, cellular, satellite 3.1.1.9. Capability to customize frequency of sending data - every 15 minutes or 1 hour or once a day, etc. 3.1.1.10. In case when there is no connectivity, capability to transmit unsent data when connectivity resumes 3.1.1.11. Capability to remotely control the operation of equipment/devices/gadgets such as heaters, pumps, etc. to maintain water quality conditions 3.1.2. Area of Agriculture and Orchard Farms 3.1.2.1. Area#1: approx. 30m x 10m 3.1.2.2. Area#2: approx. 30m x 10m 3.1.2.3. Area #3 is L-shape, with approx. 30m x 10m in length, 15m x 5m in width respectively 3.1.3. Camera System 3.1.3.1. High resolution 3.1.3.2. Wide angle of view 3.1.3.3. High dynamic range (HDR) 3.1.3.4. Powered by solar panel, controller, and rechargeable battery 3.1.3.5. With data storage for video files 3.1.3.6. With a powerful processor - at least Intel Core i9 13900H Processor, GeForce RTX 4070 Graphics card, 16GB RAM 3.1.4. IoT LoRa Gateway 3.1.4.1. Receives and transmits sensor data from devices/sensors in a secure manner, with a range of more than 50 kilometers (omni-directional), with or without satellite or cellular network connectivity 3.1.4.2. Uses Low Power Long-Range (LoRa) radio frequency running in sub-GHz band spectrum 3.1.4.3. Powered by rechargeable battery – recharged by solar panel and/or electrical outlet 3.1.4.4. Internet backhaul can use WiFi, Wired connection, SIM Card, or satellite connectivity module		

		3.1.4.5. One gateway can handle at least a hundred devices/sensors – expandable to handle additional devices/sensors 3.1.4.6. Can be remotely monitored and maintained 3.1.5. IoT Platform 3.1.5.1. Capability to add/delete/edit devices, sensors, equipment, gadgets - assign identification/serial numbers, record type/kind, other data 3.1.5.2. Capability for video capture and intelligence 3.1.5.3. Capability to represent devices, sensors, equipment, gadgets on the user interface with icons and colors 3.1.5.4. Capability to allow only authenticated/authorized devices/sensors to collect and transmit data in the system 3.1.5.5. Capability to customize frequency of sending data - every 15 minutes or 1 hour or once a day, etc. 3.1.5.6. Must secure data through end-to-end encryption 3.1.5.7. Capability to trigger alerts and notifications when user-defined conditions occur 3.1.5.8. Capability to send alerts and notifications on the system's user interface and through SMS and email 3.1.5.9. Capability to store data in a structured format for processing 3.1.5.10. Data could be saved, retrieved and exported to multiple formats such as csv, tsv, JSON, xml, etc. 3.1.5.11. Built-in support for data storage redundancy with archival support 3.1.5.12. Capability to store data in the cloud and physical hard drives 3.1.5.13. Capability to add/delete/edit users 3.1.5.14. Capability to add/delete/edit/define roles and permissions in using the system 3.1.5.15. Capability to assign users specific roles and permissions for managing devices and processing data		

		3.1.5.16. System's user interface, customized according to the requirements of the users, should be easy to navigate and use 3.1.5.17. Capability to create standard and customized dashboards using visual graphs, charts and reports, according to users' preferences 3.1.5.18. Capability for analytics and data summarization for identifying trends 3.1.5.19. Capability for machine learning and artificial intelligence - precision farming, irrigation, application of fertilizer and pesticides, anomaly detection, etc. 3.1.5.20. Capability to integrate with other systems through APIs 3.1.5.21. Capability for complete audit log management and reporting Data could be saved, retrieved and exported to multiple formats such as csv, tsv, JSON, xml, etc. 3.1.5.22. Built-in support for data storage redundancy with archival support 3.1.5.23. Capability to store data in the cloud and physical hard drives 3.1.5.24. Capability to add/delete/edit users 3.1.5.25. Capability to add/delete/edit/define roles and permissions in using the system 3.1.5.26. Capability to assign users specific roles and permissions for managing devices and processing data 3.1.5.27. System's user interface, customized according to the requirements of the users, should be easy to navigate and use 3.1.5.28. Capability to create standard and customized dashboards using visual graphs, charts and reports, according to users' preferences 3.1.5.29. Capability for analytics and data summarization for identifying trends 3.1.5.30. Capability for machine learning and artificial intelligence - precision farming, irrigation, application of fertilizer and pesticides, anomaly detection, etc.		

		3.1.5.31. Capability to integrate with other systems through APIs 3.1.5.32. Capability for complete audit log management and reporting 3.1.6. Supply of Drone for Smart Agriculture application, with two (2) extra sets of batteries, compliant with the following minimum requirements: 3.1.6.1. 90 kg maximum takeoff weight for spraying (at sea level) 3.1.6.2. 101 kg maximum takeoff weight for spreading (at sea level) 3.1.6.3. Hovering Accuracy Range: 3.1.6.3.1. Real-time Kinetic Positioning (RTK) enabled: ±10 cm horizontal, ±10 cm vertical 3.1.6.3.2. Real-time Kinetic Positioning (RTK) disabled: ±60 cm horizontal and ±30 cm vertical (radar enabled: ±10 cm) 3.1.6.4. Hovering Time: 3.1.6.4.1. Hovering without payload: 18 min (@30000 mAh & takeoff weight 50 kg) 3.1.6.4.2. Hovering and spraying with full payload: 7 min (@30000 mAh & takeoff weight 90 kg) 3.1.6.4.3. Hovering and spreading with full payload: 6 min (@30000 mAh & takeoff weight 101 kg) 3.1.6.5. Motor KV value of at least 48/RPM/ V 3.1.6.6. Motor power of at least 4000W/ rotor 3.1.6.7. Rotor quantity of at least eight (8) 3.1.6.8. Must be equipped with Dual Atomized Spraying System 3.1.6.8.1. with Operation Box: Capacity of 40 L (Full load) 3.1.6.8.2. Sprinkler Quantity: 2 3.1.6.8.3. with Magnetic Drive Impeller Pump 3.1.6.9. Must include an Intelligent Remote Controller compliant with the following, at a minimum: 3.1.6.9.1. Operating frequency of 2.4000 to 2.4835 GHz and 5.725 to 5.850 GHz 3.1.6.9.2. Signal Effective Distance of at least 4 kms. 3.1.6.9.3. WIFI 6 WiFi Protocol 3.1.6.9.4. WiFi Operating frequencies: 2.4000 to 2.4835 GHz; 5.150 to 5.250 GHz; 5.725 to 5.850 GHz 3.1.6.9.5. Equipped with Bluetooth 5.1. Bluetooth protocol		

		3.1.6.9.6. Bluetooth Operating Frequency of 2.4000-2.4835 GHz 3.1.6.9.7. Display screen of at least 7-inches touch LCD 3.1.6.9.8. Internal battery life of at least 3 hours 3.1.6.9.9. External battery life of at least 2.5 hours 3.1.7. Supply of drone for Immersive Site Survey applications, with two (2) extra sets of batteries, compliant with the following minimum requirements: 3.1.7.1. Equipped with Normalized Difference Vegetation Index (NDVI) imaging that indicates plant health. 3.1.7.2. Able to monitor field conditions and soil health. 3.1.7.3. Flight time duration of approximately 41 minutes on a single battery charge 3.1.7.4. Dual max ascent speed mode with 6ms and 8 ms respectively 3.1.7.5. Dual max descent speed mode with 6ms and 6 ms respectively 3.1.7.6. Triple max speed with 75 kph, 72 kph and 68kph respectively 3.1.7.7. Omnidirectional vision system 3.1.7.8. Vision altitude range of at least 0-30m 3.1.7.9. Equipped with Infrared Sensing System 3.1.7.10. Effective camera pixel of at least 20MP 3.1.7.11. Maximum video bit rate of 4K: 130Mbps, FHD: 70Mbps 3.1.7.12. Supported File System: exFAT 3.1.7.13. Support photos in JPEG, DNG (raw) and JPEG+DNG format. 3.1.7.14. Supports videos in MP4 (MPEG-4 AVC/H.264) format. 3.1.7.15. Must support microSD Cards. 3.1.7.16. Must have Mini HDMI port. 3.1.7.17. Smart Farming Experiment System (Experimental Group) 3.1.7.17.1. Soil Cultivation Experimental Device		

		3.1.7.17.2. Hydroponic Planting Experimental Device 3.1.7.18. Smart Farming Experiment System (Control Group) 3.1.7.18.1. Experimental Planting Scaffold 3.1.7.18.2. Control Platform 3.1.7.18.3. Sensor Unit 3.2. **Smart Aqua Culture System** The Smart Aquaculture System is used to continuously monitor important environmental and aquatic parameters through IoT devices and sensors, and software, in a reliable and secure manner. Using sensors and cameras, real-time information about the aquaculture environment are collected. This data/information are sent to a cloud-based platform for processing. Actuators and relays are also used to control components such as heaters, water pumps, feeders, and other applicable devices or gadgets to enable automatic adjustments based on monitoring data. The system issues alerts and notifications when certain conditions happen. The system also provides the users the ability to remotely monitor and control the system via mobile or web, allowing access from anywhere through internet connectivity. Capability to log the data locally before being transmitted across the network for backend processing. This is to bring data transmission resiliency and redundancy. 3.2.1. Water Quality Monitoring and Control 3.2.1.1. Data collection through wireless IoT sensors/devices for measuring water quality - temperature, dissolved oxygen, turbidity, PH, etc. 3.2.1.2. Capability to log and store the data locally on the devices/sensors or data logger. 3.2.1.3. Reliable and secure data transmission from devices/sensors to the backend system with connectivity redundancy using LoRa, cellular, satellite. 3.2.1.4. Capability to customize frequency of sending data - every 15 minutes or 1 hour or once a day, etc. 3.2.1.5. In case when there is no connectivity, capability to transmit unsent data when connectivity resumes.		

		3.2.1.6. Equipment, devices, gadgets such as heaters, pumps, shading devices, etc. for maintaining water level and quality. 3.2.1.7. Capability to remotely control the operation of equipment/devices/gadgets such as heaters, pumps, etc. to maintain water level and quality conditions. 3.2.2. Feeding System 3.2.2.1. Capability to control the feeding amount. 3.2.2.2. Capability to automatically feed the fish based upon its requirements. 3.2.3. Underwater Camera System 3.2.3.1. High resolution 3.2.3.2. Wide angle of view 3.2.3.3. Highly sensitive to low light 3.2.3.4. Powered by solar panel, controller, and rechargeable battery. 3.2.3.5. With data storage for video files 3.2.3.6. With a powerful processor - at least Intel Core i9 13900H Processor, GeForce RTX 4070 Graphics card, 16GB RAM 3.2.4. IoT LoRa Gateway 3.2.4.1. Receives and transmits sensor data from devices/sensors in a secure manner, with a range of more than 50 kilometers (omni-directional), with or without satellite or cellular network connectivity. 3.2.4.2. Uses Low Power Long-Range (LoRa) radio frequency running in sub-GHz band spectrum. 3.2.4.3. Powered by rechargeable battery – recharged by solar panel and/or electrical outlet. 3.2.4.4. Internet backhaul can use WiFi, Wired connection, SIM Card, or satellite connectivity module. 3.2.4.5. One gateway can handle at least a hundred devices/sensors – expandable to handle additional devices/sensors. 3.2.4.6. Can be remotely monitored and maintained. 3.2.5. IoT Platform		

			3.2.5.1. Capability to add/delete/edit devices, sensors, equipment, gadgets - assign identification/serial numbers, record type/kind, other data.		
			3.2.5.2. Capability for video capture and intelligence		
			3.2.5.3. Capability to represent devices, sensors, equipment, gadgets on the user interface with icons and colors.		
			3.2.5.4. Capability to allow only authenticated/authorized devices/sensors to collect and transmit data in the system.		
			3.2.5.5. Capability to customize frequency of sending data - every 15 minutes or 1 hour or once a day, etc.		
			3.2.5.6. Must secure data through end-to-end encryption.		
			3.2.5.7. Capability to trigger alerts and notifications when user-defined conditions occur.		
			3.2.5.8. Capability to send alerts and notifications on the system's user interface and through SMS and email.		
			3.2.5.9. Capability to store data in a structured format for processing.		
			3.2.5.10. Data could be saved, retrieved and exported to multiple formats such as csv, tsv, JSON, xml, etc.		
			3.2.5.11. Built-in support for data storage redundancy with archival support		
			3.2.5.12. Capability to store data in the cloud and physical hard drives.		
			3.2.5.13. Capability to add/delete/edit users.		
			3.2.5.14. Capability to add/delete/edit/define roles and permissions in using the system.		
			3.2.5.15. Capability to assign users specific roles and permissions for managing devices and processing data.		
			3.2.5.16. System's user interface, customized according to the requirements of the users, should be easy to navigate and use.		

		3.2.5.17. Capability to create standard and customized dashboards using visual graphs, charts and reports, according to users' preferences. 3.2.5.18. Capability for analytics and data summarization for identifying trends. 3.2.5.19. Capability for machine learning and artificial intelligence - fish counting, measuring fish size, classification and identification of fish, anomaly detection, etc. 3.2.5.20. Capability to integrate with other systems through APIs. 3.2.5.21. Capability for complete audit log management and reporting 3.2.6. Maritime Drone 3.2.6.1. The drone system aims to help the university's push for innovation and applied technology for the advancement of its aquaculture and maritime research. 3.2.6.2. The use cases include fish density mapping, coral and sea-life inventory, shipwreck and diving spots exploration, rivers and lakes vegetation mapping, fishponds health check, mining-pit surveying, among others. 3.2.6.3. Supply of one (1) a luggable, autonomous drone boat for search and mapping with side-scan sonar and drop camera, with two (2) extra sets of batteries. 3.2.6.4. The autonomous drone boat should have the minimum specifications: 3.2.6.4.1. Front camera 3.2.6.4.2. Wi-Fi antenna that communicates with its base station 3.2.6.4.3. Underwater camera 3.2.6.4.4. 2x electric brushed on-board motors 3.2.6.4.5. Side-scan sonar sensor 3.2.6.4.6. Base station 3.2.6.4.7. Battery capacity of 40Ah, 12V 3.2.6.4.8. Operating speed of 4km/h 3.2.6.4.9. Switch to autonomous and manual drive modes. 3.2.6.4.10. Data link range of 200m to base station 3.2.6.4.11. Directional antenna with automatic tracking system		

		3.2.6.5. The drone software should have at least the following features: 3.2.6.5.1. Define target area on the map for autonomous driving mode. 3.2.6.5.2. Playback captured camera video, sonar display, and side-scan down-scan sonar data. 3.2.6.5.3. Click anywhere on the drone route to see the data captured at that position. 3.2.6.5.4. Measure location, water depth and distances on the map. 3.2.6.5.5. Inspect point of interest with the drop camera 3.2.6.5.6. Export 3D-model of the scanned area. 3.3. **Internet Subscription** 3.3.1. Shall provide internet connection to all campuses (should there be no available fiber connection alternative option such as but not specific to Starlink Internet Service) for 2 years 3.3.1.1. San Andres Campus – 1 unit (200mbps) 3.3.1.2. Agpudlos Campus – 2 units (200mbps) 3.3.1.3. Calatrava Campus – 1 unit (200mbps) 3.3.1.4. Santa Maria Campus – 1 unit (200mbps) 3.3.1.5. Santa Fe Campus – 1 unit (200mbps) 3.3.1.6. Romblon Campus – 1 unit (200mbps) 3.3.1.7. Cajidiocan Campus – 1 unit (200mbps) 3.3.1.8. San Fernando Campus – 1 unit (200mbps) 3.4. **Learning Management System (LMS)** 3.4.1. **LMS Platform** 3.4.2. A software application that is designed to facilitate online learning and training by managing course content, tracking learner progress, and providing tools for communication and collaboration: Must supply the following modules and services: 3.4.3. **LMS Administration Module** 3.4.3.1. The solution must have a Database that is connected to a server that can be accessed at all times needed. 3.4.3.2. The solution must allow the migration of structured data such as Programs, Subjects, Teachers, Students, Subject code, and the likes.		

		3.4.3.3. All passwords created by the system must be Key sensitive. 3.4.3.4. The solution must allow Users to change their password and username upon the first login. 3.4.3.5. Allow Incoming Events and School Mission, Vision to be viewable on Newsfeed. 3.4.3.6. Capable of uploading a photo to serve as a profile picture per User. 3.4.3.7. Equipped with Live – Chat, and Messaging between Users. 3.4.4. **Professor Module** 3.4.4.1. Able to provide view access to Teachers for student attendance monitoring. 3.4.4.2. Capable of creating lesson plans and attaching or linking related files such as learning modules, PowerPoint files, excel, PDF, text, and word files with a maximum file size of 20Mb. 3.4.4.3. The solution must allow the addition of student/user activities such as Homework, Quizzes, and Examinations. 3.4.5. **Student Module** 3.4.5.1. Able to allow Teachers to set up time limits on testing and other output-based student activities. 3.4.5.2. The solution must allow the setting of date ranges for users to take the assigned activities. 3.4.5.3. Able to display activity Scores immediately viewable immediately upon activity completion. 3.4.5.4. Allow the list of created questions to be viewable and editable by the activity creator. 3.4.5.5. The solution must allow the creation of lessons and quizzes one at a time with the same subject description. 3.4.6. **Parents Module**		

		3.4.6.1. Provide Parents or Guardians with access to allow monitoring of activities and progress of the students under their direct care (e.g., children, personal scholars, etc.) 3.4.6.2. Able to support limitless addition of students within the parents or guardians' care 3.4.7. **400 units of iPad and 100 units of Smart Phone** 3.4.7.1. Must provide 400 units of iPads and 100 units of Smart Phones with the following specifications: 3.4.7.1.1. iPad 3.4.7.1.2. Screen: 10.9" 3.4.7.1.3. Display Resolution: 2.360 x 1.640pixels 3.4.7.1.4. Screen Technology: IPS 3.4.7.1.5. Pixel Density: 264ppi 3.4.7.1.6. Main Camera: 12MP; Video Resolution: 4K; Face Detection: Yes; HDR: HDR; Camera Lenses: Single Camera; Selfie Camera: 12MP 3.4.7.1.7. Weight: 481g, 477g; Dimensions (W x H x D): 248.6 x 179.5 x 7mm; Colour: Silver, Blue, Pink, Yellow 3.4.7.1.8. Battery Capacity: 7606mAh; Charging: Fast Charging; Battery Type: Li-Polymer 3.4.7.1.9. Processor: 6-core CPU; Chipset: Apple A14 Bionic; Processor Core: Hexa Core 3.4.7.1.10. Storage: 256GB, 64GB; RAM: 4GB 3.4.7.1.11. Keyboard Support: Yes; Pen Support: Yes; Mouse Support: Yes Fingerprint: Yes 3.4.7.1.12. Wi-Fi Standard: 802.11 a/b/g/n/ac/6 3.4.7.1.13. Cellular Network: 5G, None; SIM: Nano-SIM, None 3.4.7.1.14. Bluetooth: Yes; Navigation: Yes; Connector Port: USB-C 3.4.7.1.15. OS: iOS; OS Version: OS 16 3.4.7.2. Smart Phone 3.4.7.2.1. *Network:* Technology: GSM / CDMA / HSPA / CDMA2000 / LTE / 5G 3.4.7.2.2. *Body:* Dimensions: 152.8 x 71.5 x 8.2 mm or 8.3 mm 3.4.7.2.3. *Weight:* 188 g or 193 g (6.63 oz); Build: Glass front (Gorilla Glass Victus), glass back or silicone polymer back, aluminum frame 3.4.7.2.4. SIM: Nano-SIM and eSIM or Dual SIM (Nano-SIM, dual stand-by) 3.4.7.2.5. IP68 dust/water resistant (up to 1.5m for 30 min)		

			3.4.7.2.6. Display: Type: LTPO OLED, 68B colors, 120Hz, Dolby Vision, HDR10+, 1000 nits (typ), 3000 nits (peak); Size: 6.36 inches, 97.6 cm2 (~89.3% screen-to-body ratio) 3.4.7.2.7. Resolution: 1200 x 2670 pixels, 20:9 ratio (~460 ppi density) 3.4.7.2.8. Protection: Corning Gorilla Glass Victus 3.4.7.2.9. Platform: OS: Android 14, HyperOS 3.4.7.2.10. Chipset: Qualcomm SM8650-AB Snapdragon 8 Gen 3 (4 nm) 3.4.7.2.11. CPU: Octa-core (1x3.3 GHz Cortex-X4 & 3x3.2 GHz Cortex-A720 & 2x3.0 GHz Cortex-A720 & 2x2.3 GHz Cortex-A520) 3.4.7.2.12. GPU: Adreno 750 3.4.7.2.13. Memory: Card slot: No 3.4.7.2.14. Internal: 256GB 8GB RAM, 256GB 12GB RAM, 512GB 12GB RAM, 512GB 16GB RAM, 1TB 16GB RAM; UFS 4.0 3.4.7.2.15. *Main Camera:* Triple: 50 MP, f/1.6, 23mm (wide), 1/1.31", 1.2µm, dual pixel PDAF, Laser AF, OIS; 50 MP, f/2.0, 75mm (telephoto), PDAF (10cm - ∞), OIS, 3.2x optical zoom; 50 MP, f/2.2, 14mm, 115˚ (ultrawide) 3.4.7.2.16. Features: Leica lens, Dual-LED dual-tone flash, HDR, panorama 3.4.7.2.17. Video: 8K@24fps (HDR), 4K@24/30/60fps (HDR10+, 10-bit Dolby Vision HDR, 10-bit LOG), 1080p@30/60/120/240/960fps, 720p@1920fps, gyro-EIS 3.4.7.2.18. Selfie Camera: Single: 32 MP, f/2.0, 22mm (wide), 0.7µm 3.4.7.2.19. Features: HDR, panorama 3.4.7.2.20. Video: 4K@30/60fps, 1080p@30/60fps, gyro-EIS 3.4.7.2.21. Sound: Loudspeaker: Yes, with stereo speakers 3.4.7.2.22. 3.5mm jack: No 3.4.7.2.23. 24-bit/192kHz Hi-Res & Hi-Res wireless audio; Snapdragon Sound 3.4.7.2.24. Comms: WLAN: Wi-Fi 802.11 a/b/g/n/ac/6e/7, dual-band, Wi-Fi Direct 3.4.7.2.25. Bluetooth: 5.4, A2DP, LE, aptX HD, aptX Adaptive, LHDC 3.4.7.2.26. Positioning: GPS (L1+L5), GLONASS (G1), BDS (B1I+B1c+B2a), GALILEO (E1+E5a), QZSS (L1+L5), NavIC (L5) 3.4.7.2.27. NFC: Yes 3.4.7.2.28. Infrared port: Yes; Radio: No 3.4.7.2.29. USB: USB Type-C 3.2, OTG		

		3.4.7.2.30. Sensors: Fingerprint (under display, optical), accelerometer, proximity, gyro, compass, barometer, color spectrum 3.4.7.2.31. Type: Li-Po 4610 mAh, non-removable 3.4.7.2.32. Charging: 90W wired, PD3.0, QC4, 100% in 31 min (advertised); 50W wireless, 100% in 46 min (advertised); 10W reverse wireless 3.4.7.3. Provide means for faculty and staff in accessing (both downloading and uploading) of online learning materials in the Learning Management system (LMS) and Library Information Management System **4. E-Classroom and E-Laboratories** 4.1. **E-Classroom** Conversion of traditional classrooms to a digitally enhanced facility that will allow learners to access course contents online, deliver lectures remotely and host productivity tools among others. List of e-Classrooms to be converted are as follows: a.) Main Campus (8 Rooms) b.) Agpudlos Campus (2 Rooms) c.) Calatrava Campus (2 Rooms) d.) San Agustin Campus (2 Rooms) e.) Santa Maria Campus (2 Rooms) f.) Santa Fe Campus (2 Rooms) g.) Romblon Campus (3 Rooms) h.) Cajidiocan Campus (2 Rooms) i.) San Fernando Campus (1 Rooms) j.) San Andres Campus (2 Rooms) The list below are the components to be spread across the e-Classrooms: 4.1.1. Each e-Classroom should have the following scope of auxiliary works and services: 4.1.1.1. Lighting works 4.1.1.2. Wall finishing 4.1.1.3. Ceiling works 4.1.1.4. 2 Units 2.5 HP Air Conditioner Split Type 4.1.1.5. Electrical works 4.1.1.6. 2 units of Dome Camera, 4MP or higher MP 4.1.1.7. Supply of Access Point for Wi-Fi access 4.1.1.8. Provision of furnishing		

		4.1.2. Each e-Classroom must have 41 desktop tables and chairs for students and 1 set of table and chair for the faculty. 4.1.3. Interactive Boards for e-Classrooms. The interactive board should be able to deliver the minimum following features and specifications listed. 4.1.3.1. Must propose a total of 26 units 75" Interactive Board Display for all e-Classrooms: 4.1.3.1.1. Must have screen type resolution of 3,840 x 2,160 with 60Hz. 4.1.3.1.2. Must have brightness of 350cd/m2 (without glass) 4.1.3.1.3. Must have contrast ratio of 4000:1 (without glass) 4.1.3.1.4. Must have 8ms response time. 4.1.3.1.5. Must have the following speaker type: Built in Speaker (10W x 4CH); 4.1.3.1.6. Must have the following external Control: touch Input RS232C thru stereo jack, RJ45(For MDC) 4.1.3.1.7. Must have a number of drawing of 20 touch (internal/external) 4.1.3.1.8. Must have touch ten type - passive pen with magnet. 4.1.3.1.9. Must have an object recognition range 2mm/ 4mm / 8mm / 50mm. 4.1.3.1.10. Must have a touch response time of 6.7ms 4.1.3.1.11. Must have a drawing speed (touch latency) of 26ms. 4.1.3.1.12. Must have VESA Mount of 400 * 400. 4.1.3.1.13. Must be Wall Mounted 4.1.3.1.14. Must have the following hardware features Touch		

		Overlay(IR), Front Connectivity, OPS I/F Support (w/OPS Box); Built in Speaker(40W 4CH), WiFi/BT Module Embedded 4.1.4. **Must provide 41 units of Desktop Computers per e-Classroom (Total of 26 e-Classrooms):** 4.1.4.1. Intel i7 CPU 4.1.4.2. Memory 16GB 4.1.4.3. Storage 1TB SSD 4.1.4.4. 1x RJ45 Gigabit Ethernet 4.1.4.5. 1x HDMI 1.4 4.1.4.6. Power Supply 4.1.4.7. Wired Keyboard & Mouse (USB Port) 4.1.4.8. End Point Security License 4.1.4.9. Windows Operating System License 4.1.4.10. Office Productivity Perpetual License 4.1.4.11. Monitor 23 Inches **5. E-Laboratories** 5.1. **Animation Laboratory** The Animation laboratory shall be a dedicated facility equipped with tools, software, and resources for animators to develop and produce animated contents. In this facility, animators are able to explore various aspects of animation including character design, storyboarding, 2D or 3D animation techniques, special effects, and post-production editing. 5.1.1. Participating bidder must provide the following: 5.1.1.1. Perform essential works for the existing facility designated by RSU as its animation laboratory. It must include the following at a minimum: 5.1.1.1.1. Lighting works 5.1.1.1.2. Wall finishing 5.1.1.1.3. Ceiling works 5.1.1.1.4. 2 Units 2.5 HP Air Conditioner Split Type 5.1.1.1.5. Electrical works 5.1.1.1.6. 2 units of Dome Camera, 4MP or higher MP 5.1.1.1.7. Supply of Access Point for Wi-Fi access 5.1.1.1.8. Provision of furnishing 5.1.1.2. Supply and installation of the following hardware: 5.1.1.2.1. 60 Desktop computers with the following specifications: 5.1.1.2.1.1. Intel i7 CPU 5.1.1.2.1.2. Memory 16GB 5.1.1.2.1.3. Storage 1TB SSD 5.1.1.2.1.4. 1x RJ45 Gigabit Ethernet 5.1.1.2.1.5. 1x HDMI 1.4		

		5.1.1.2.1.6. Power Supply 5.1.1.2.1.7. Wired Keyboard & Mouse (USB Port) 5.1.1.2.1.8. End Point Security License 5.1.1.2.1.9. Windows Operating System License 5.1.1.2.1.10. Office Productivity Perpetual License 5.1.1.2.1.11. Monitor 23 Inches 5.1.1.3. Must provide 60 pcs Tables for Desktop Computers 5.1.1.4. Must provide 1 pc Table and 1 pc chair for Faculty 5.1.1.5. Must Provide 60 pcs Chairs. 5.1.1.6. Must provide 1 unit Interactive Board 5.1.1.7. Must provide 60 units Graphic Tablet 5.1.1.8. Product Size (W x H x D) 5.1.1.8.1. 10.0 x 16.7 x 0.8 in or 253 x 424 x 21 mm 5.1.1.9. Product Weight 5.1.1.9.1. 2.7 kg or 6.0 lbs 5.1.1.10. Display Size 5.1.1.10.1. 17.3 in or 43.9 cm 5.1.1.11. Active Area 5.1.1.11.1. 15.0 x 8.5 in or 382 x 215 mm 5.1.1.12. Display Resolution 5.1.1.12.1. 3840 x 2160 Pixels (Ultra HD) 5.1.1.13. Color Performance 5.1.1.13.1. Display colors: 1.07 billion (30 bit colors); Color gamut coverage ratio Adobe® RGB 88% (CIE1931)(typ), DCI-P3 99%(CIE1931)(typ), HDR gamma support, Pantone™ Validated and Pantone SkinTone™ Validated certifications 5.1.1.14. Viewing Angle 5.1.1.14.1. V 170° (85/85) H, (85/85) V (typ) 5.1.1.15. Contrast ratio/ Response rate 5.1.1.15.1. 1000:1 (typ) / 8ms (typ) 5.1.1.16. Aspect ratio/Brightness 5.1.1.16.1. 16:9 / 400 cd/m2 (typ) 5.1.1.17. Connectivity 5.1.1.17.1. USB-C (DP alt mode) x 1, USB-C x 1, HDMI x 1, Mini DisplayPort x 1 5.1.1.18. Graphics Input 5.1.1.18.1. USB-C port with DisplayPort Alternate Mode, or HDMI 2.1 or DisplayPort 1.4 port and USB-A port 5.1.1.19. Multi Touch		

		5.1.1.19.1. Physical switch to turn multi-touch on and off; pan, zoom and rotate gestures available in most applications including Adobe® Photoshop® and Illustrator® 5.1.1.20. Pen 5.1.1.20.1. Battery-free Wacom Pro Pen 3 with 3 customizable side switches, 8192 pressure levels and customizable grip size, weight & weight balance. 5.1.1.21. Supported Pen Tilt Angle 5.1.1.21.1. -60/60 degrees 5.1.1.22. Express Key 5.1.1.22.1. 8 easy to access and customizable, application-specific ExpressKeys placed on the ExpressKey grip at the rear of the display 5.1.1.23. Stand 5.1.1.23.1. Includes the Easy Stand for Wacom Cintiq Pro 17 that attaches by a standard 75 x 75 mm VESA mount. Optional Wacom Cintiq Pro 17 Stand that supports tilt, lift, and rotation; the stand attaches by a standard 75 x 75 mm VESA mount 5.1.1.24. Security 5.1.1.24.1. Kensington® MicroSaver 2.0 (lock to be purchased separately) 5.1.1.25. Productivity Boosters 5.1.1.25.1. Physical on/off switch for multi-touch; ExpressKeys, 3 pen side switches, and time-saving on screen shortcuts including Radial menus, Grid panels, and pen gestures 5.1.1.26. Ergonomics 5.1.1.26.1. Right or left-handed use; optional adjustable stand that supports tilt, lift, and rotation, VESA mount (75 x 75 mm) to attach third party arms or stands; Wacom Pro Pen 3 with comfortable, ergonomic grips in different sizes; detachable pen holder to be placed at either side of the display. 5.1.1.27. Compatibility or System requirements 5.1.1.27.1. Windows® 10 or later, macOS 11 or later; USB-C port with DisplayPort Alternate Mode or DisplayPort or HDMI and USB-A; internet access to download driver 5.1.1.28. Power Consumption		

		5.1.1.28.1. Maximum power consumption: 50 W or less, 1.5 W or less when asleep, 0.3 W or less when off. 5.1.1.29. Box Inclusions 5.1.1.29.1. Pen Display, Pro Pen 3 with 2 extra grips, 3 extra button plates, and a balance piece, a detachable pen holder with 10 replacement nibs (5 standard, 5 felt) and nib removal tool, PVC-free USB-C to USB-C cable (1.8 m), PVC-free AC adaptor, power cord (1.0 m), quick start guide, regulation sheet. Pen resolution 2540 lpi 5.1.1.30. Must provide 60 units Android Tablets 5.1.1.30.1. 10.9” Screen 5.1.1.30.2. 1440 x 2304 pixels 5.1.1.30.3. 128GB Storage 5.1.1.31. Three (3) units of streaming servers with the following minimum specifications or equivalent: 5.1.1.31.1. Single Socket P (LGA 3647) 5.1.1.31.2. Intel Xeon 12 Core CPU (Cascade Lake-W) 5.1.1.31.3. Graphics Card with the following specifications: 5.1.1.31.3.1. Single Precision Performance at 65.3 TFLOPS 5.1.1.31.3.2. RT Performance at 151.0 TFLOPS 5.1.1.31.3.3. Tensor Performance at 1,044 TFLOPS 5.1.1.31.3.4. 16GB RAM 5.1.1.31.4. 1U Rackmount 5.1.1.31.5. PCI-E Gen 3x16 Switch CPU-GPU Interconnect 5.1.1.31.6. 128 GB RAM 5.1.1.31.7. 1TB SSD 5.1.1.31.8. 2 – RJ45 10GBase – T ports 5.1.1.31.9. 1 – RJ45 Dedicated IPMI LAN port 5.1.1.32. Four (4) units of application servers with the following minimum specifications or equivalent: 5.1.1.32.1. Single Socket P (LGA-4677) 5.1.1.32.2. Intel Xeon 12 Core CPU (Cascade Lake-W) 5.1.1.32.3. 1U Rackmount 5.1.1.32.4. PCI-E Gen 3x16 Switch CPU-GPU Interconnect 5.1.1.32.5. 32 GB RAM 5.1.1.32.6. 1TB SSD 5.1.1.32.7. 2-RJ45 10GBase-T ports		

		5.1.1.32.8. 1-RJ45 Dedicated IPMI LAN port 5.1.1.33. Supply and installation of Animation Software: 5.1.1.33.1. 2D Animation Software to create two-dimensional animations. 5.1.1.33.2. 3D Animation Software to create three-dimensional animations. 5.1.1.33.3. Motion Graphics Software to create animated graphics and visual effects for videos, presentations, and other multimedia projects. 5.1.1.33.4. Web Animation Software for creating animations that can be displayed on websites and web applications. 5.1.1.34. Supply and installation of Streaming Platform Software: 5.1.1.34.1. Streaming platform to deliver immersive 2D and 3D content on the internet using thin clients such as PC, tablet, and mobile phones. (3-years license). 5.1.1.34.2. Training of Unity 3D Software for 2D and 3D content creation. 5.1.1.34.3. Ten (10)-days on-site and online training on the use Unity3D for thirty (30) select students participating in the program. 5.2. Mobile Gaming and Application Development Laboratory for 8 laboratories: 5.2.1. Participating bidder must provide the following: 5.2.1.1. Perform essential works for the existing facility designated by RSU as its Mobile Gaming and Application Development laboratory. There are 8 laboratories which must include the following: 5.2.1.1.1. Lighting works 5.2.1.1.2. Wall finishing 5.2.1.1.3. Ceiling works 5.2.1.1.4. 2 Units 2.5 HP Air Conditioner Split Type 5.2.1.1.5. Electrical works 5.2.1.1.6. 2 units of Dome Camera, 4MP or higher MP 5.2.1.1.7. Supply of Access Point for Wi-Fi access 5.2.1.1.8. Provision of furnishing 5.2.1.2. Supply and installation of 24 Desktop computers per laboratory with the following specifications: 5.2.1.2.1. Intel i7 CPU		

		5.2.1.2.2. Memory 16GB 5.2.1.2.3. Storage 1TB SSD 5.2.1.2.4. 1x RJ45 Gigabit Ethernet 5.2.1.2.5. 1x HDMI 1.4 5.2.1.2.6. Graphics card with the following specifications: 5.2.1.2.6.1. 2.51 Boost clock (ghz) 5.2.1.2.6.2. 2.21 Base clock (ghz) 5.2.1.2.6.3. 16GB Memory 5.2.1.2.6.4. 256 bit memory interface width 5.2.1.2.7. Power Supply 5.2.1.2.8. Wired Keyboard & Mouse (USB Port) 5.2.1.2.9. End Point Security License 5.2.1.2.10. Windows Operating System License 5.2.1.2.11. Office Productivity Perpetual License 5.2.1.2.12. Monitor 23 Inches 5.2.1.3. Must provide 1 table for faculty for each of the 8 laboratories. 5.2.1.4. Must provide 1 chair for faculty for each of the 8 laboratories. 5.2.1.5. Must provide 24 pcs chairs for each of the 8 laboratories. 5.2.1.6. Must provide 24 pcs computer table for each of the 8 laboratories. 5.2.1.7. Must provide 75” Interactive Board for each of the 8 laboratories. 5.2.1.8. Must provide 24 units Android Tablets per classroom (total of 8 classrooms) 5.2.1.8.1. 10.9” Screen 5.2.1.8.2. 1440 x 2304 pixels 5.2.1.8.3. 128GB Storage 5.3. **Robotics** 5.3.1. Supply and delivery of three (3) robots which can be configured to carry light-weight materials like books, magazines, light-tools, and the like. 5.3.2. The robot should be LIDAR-equipped (or equivalent technology) and programmable. 5.3.3. Supply of custom application that runs on Android at least, or any other smartphone. 5.3.4. Supply of three (3) Android tablets for the custom application. 5.3.5. Provide a development kit (SDK) for students and professors to be used in developing new applications for the robot. 5.3.5.1. General Parameters 5.3.5.2. Overall Size: 526 mm x 493 mm x 1,320 mm 5.3.5.3. Net Weight: 37 Kg 5.3.5.4. Color: Pearl White + Elegant Black		

		5.3.5.5. Body Material: Aviation aluminum; High Strength PC+ABS (Food Grade Plastic Material) 5.3.5.6. Screen Size: 10.1-inch; 1080P 5.3.5.7. Loading Capability 5.3.5.7.1. Loading Space: 3 tiers/4 tiers adjustable, the area of each tier is 0.18 m² 5.3.5.7.2. Single Tray Load: 10 Kg 5.3.5.7.3. Total Load: 40 Kg 5.3.5.7.4. Gradeability: 5 Degrees 5.3.5.8. Interactive Ability: Voice Interaction + Touch Screen Control 5.3.5.9. System Performance 5.3.5.9.1. Hardware Platform: Qualcomm 8-core chip + 32-bit Microchip 5.3.5.9.2. MCU+, RealSense depth sensor 5.3.5.9.3. Operating System: Deep customized Robot OS operating system Based on Android 9.0 5.3.5.10. Navigation System: Lidar + Visual 5.4. **LMS Content Creation Laboratory** 5.4.1. Supply and installation of software tools that will enable the creation of Inter-active video content and eBooks, at least with the following specifications: 5.4.2. With pre-built layout slides, which include text, images, scenarios, and questions. 5.4.3. Able to easily copy and paste selected attributes of different objects or components. 5.4.4. Able to select an object and choose to copy and paste either the interaction, or animation or appearance to a different object in an instant. 5.4.5. Equipped with intuitive interactions panel, with set of triggers, add conditions, and select from a comprehensive list of actions to assign to the trigger. 5.4.6. Able to create courses that meet accessibility standards by instantaneously adding closed captions for slide videos or audio content. 5.4.7. Able to create 'Demo', 'Training', and 'Assessment' modules by easily capturing on-screen keyboard activities, system audio, and mouse movements. 5.4.8. Able to record new videos or import existing online videos or Vimeo videos. Able to add informational slides or knowledge check questions as overlays at specific points in the video. Able to add bookmarks in the timeline to aid learner remediation. Feedback options for answers and interactions must be customizable. 5.4.9. Able to strategically place bookmarks on the slide or video timeline.		

		5.4.10. For the e-Books creation software, it must meet the following minimum requirements: 5.4.11. Able to precisely layout and style text, pictures, borders, calendars, and more 5.4.12. With wide range of pre-designed templates. 5.4.13. Able to consolidate text and pictures. 5.4.14. Able to render the final material in a non-editable format. 5.4.15. Must provide 5 units Desktop Computer with the following specifications: 5.4.15.1. Intel i7 CPU 5.4.15.2. Memory 16GB 5.4.15.3. Storage 1TB SSD 5.4.15.4. Power Supply 5.4.15.5. Wired Keyboard & Mouse (USB Port) 5.4.15.6. End Point Security License 5.4.15.7. Windows Operating System License 5.4.15.8. Office Productivity Perpetual License 5.4.15.9. Monitor 23 Inches 5.4.16. Must provide 5 Computer tables and 5 chairs 5.5. **E-Library** This will serve as the main online research facility for the students for them to access their digital textbooks and other online references. 5.5.1. **Auxiliary Works** 5.5.1.1.1. Lighting works 5.5.1.1.2. Wall finishing 5.5.1.1.3. Ceiling works 5.5.1.1.4. 2 Units 2.5 HP Air Conditioner Split Type 5.5.1.1.5. Electrical works 5.5.1.1.6. 2 units of Dome Camera, 4MP or higher MP 5.5.1.1.7. Supply of Access Point for Wi-Fi access 5.5.1.1.8. Provision of furnishing 5.5.2. **Must provide 60 Units Desktop Computers** 5.5.2.1. Intel i7 CPU 5.5.2.2. Memory 16GB 5.5.2.3. Storage 1TB SSD 5.5.2.4. Power Supply 5.5.2.5. Wired Keyboard & Mouse (USB Port) 5.5.2.6. End Point Security License 5.5.2.7. Windows Operating System License 5.5.2.8. Office Productivity Perpetual License 5.5.2.9. Monitor 23 Inches 5.5.3. **Must provide 60 Computers Tables and chairs** 5.6. **Library Information Management System (LIMS)**		

		5.6.1. Must have the capability to manage and store the database of the members. 5.6.2. Books must be issued with bar codes that contain the book's title, author, subject, and publication date. 5.6.3. Catalogue of books, journals and library databases must be accessible online. 5.6.4. Must have self-check-in and self-check-out books, and the members of digital libraries can log in, search for, choose, issue, and return books on their own. 5.6.5. Must have Dashboard for the librarians to maintain each member's account and collect membership payments. 5.6.6. The system must be capable of assessing and calculating penalties for late returns. 5.6.7. The system must enable the library staff to manage the inventory of library resources, including tracking the location and availability of resources. 5.6.8. The system must provide statistical reports and analysis of library usage and resources. The reports will include information such as the number of resources borrowed, the most popular resources, and the patron demographics. 5.6.9. The system must provide the librarian the information what books are out, due for return, and returned. 5.6.10. Must provide a seamless process of any book's whereabouts at any given time. 5.6.11. Must have analytics to show, but not limited to, frequently borrowed or delayed return books, users with good standing/bad standing, frequently not available, popular authors and topics. 5.6.12. Can be accessible through mobile apps for reservation, borrowing, scanning or searching for books. Mobile apps must also provide the capability to complain or make reports. 5.6.13. Must be open source, web-based applications with API to connect to a compatible Campus Management System. 5.6.14. Must support open-source databases such as Postgres. 5.6.15. Must include the provision of Four (4) units of barcode printers, Four (4) handheld scanners and consumables.		

		6. Command and Control Center Equipment Requirements 6.1. **Auxiliary Works and Services** 6.1.1. The winning bidder must provide all essential works to prepare the area nominated by RSU to be its Command and Control Center. At a minimum, it must include the following: 6.1.1.1. Wall, ceiling and floor finishes 6.1.1.2. Lighting works 6.1.1.3. Electrical works 6.1.1.4. 2 Units 2.5 HP Air Conditioner Split Type 6.1.1.5. Provision of network nodes 6.1.1.6. CCTV Camera 6.1.1.7. Door Access System 6.2. **Must provide 6 Units Desktop Computers** 6.2.1. CPU Intel i7 6.2.2. Memory 16GB 6.2.3. Storage 512GB SSD or higher 6.2.4. 1x RJ45 Gigabit Ethernet 6.2.5. 1x HDMI 1.4 6.2.6. Keyboard & Mouse 6.2.7. Wired Keyboard (USB) 6.2.8. Wired Optical mouse (USB) 6.2.9. Monitor 23 inches 6.3. **Security Surveillance System** 6.3.1. TCP/IP Based CCTV Cameras 6.3.2. Should support 12-24 VDC or 24 VAC 6.3.3. Should support 1920 x 1080 Resolution 6.3.4. Should support 25/30/50/60 fps 6.3.5. Should support Night Vision/IR for at least 50m 6.3.6. Should be at IP67 Ingress protection 6.3.7. CCTV System must consist of the following: 6.3.7.1. 106 Units Dome Camera, 4MP or higher MP 6.3.7.2. 71 Units Bullet Camera, 4MP or higher MP 6.3.7.3. Network Video Recorder (NVR) with the right-sized storage 6.3.7.4. CCTV software and analytics 6.3.8. Provision of furnishings and other fixtures necessary for a Command Center 6.3.9. Provision of 55” Display Monitor (Video Wall 3 x 2 Setup) 6.3.10. Shall perform powerhouse works to ensure power is generated safely and relayed from power stations and substations. 6.3.11. Electrical Works for connecting electricity supply wiring to electrical equipment.		

		6.3.12. Supply and installation of Generator Set, Transformer, Transmission Line, Electrical panel board, and Electrical wirings. 6.3.13. Six (6) Tables for Command Center 6.3.14. Six (6) Chairs 6.4. **Must provide 1 unit out of band switch for data center access:** 6.4.1. Must have 48 Ports x RJ45 RS-232 Serial Ports. 6.4.2. Must be LTE enabled. 6.4.3. Must have antenna extender. 6.5. **Micro Data Center Facility** Must be a modular and portable datacenter solution. Enclosure must be equivalent to a compact data center enclosure to house the data center racking system. 6.5.1. Master Rack (600mm x 1100mm x 200) 6.5.2. Metered PDU half rack (1250mm), 200/240v, 32A, (24)C13, (4)C19 6.5.3. EMS 2000 Gateway 6.5.4. EMS 1000 Sensor Temp & Hum 6.5.5. User interface IP65 10” touch screen IPC with Windows 10 pro 6.5.6. 8 PORT POE switch 6.5.7. Row Air Conditioner DXA 21.2KW 380V 60/50HZ with Humidity Control 6.5.8. 20KW(2u) 3 Phase On-Line UPS with 4 EBC 11.8min 6.5.9. Metered PDU 0U Half rack (1250mm,200/240V, 32A, (24)C13, (4)C19 6.5.10. Microdata center Added rack, 600mm x 1100mm x 2000 6.5.11. Microdata center added rack, 800mm x 1100mm x 2000 6.5.12. RT Series Rail Kit 6.5.13. MINI SNMP IPv6 CARD (SWAPPABLE) 6.5.14. RT 5-20 KVA External Battery Pack(3U), 1 string of 12V9Ah x 20pcs 6.5.15. CUBE Novec1230 Detection and Extinguishing up to 1.5m3 3U 6.5.16. SNMP Port for PACU 6.5.17. Water Leaking detection Kit for PACU 6.5.18. Water Pump Kit for PACU 6.5.19. Start-up Services for PACU 6.5.20. Start-up Services for UPS 6.5.21. Rack mounted Distribution Board 6.5.22. Start-up Services for DCIM/EMS 6.5.23. High availability 6.5.23.1. Support the highest Class-A availability level. Three national standard GB50174 A, B and C availability levels and provides N, N+1 or 2N configurations.		

		6.5.23.2. Highly reliable emergency Air Conditioner. The Air Conditioner system whenever messages such as over-temperature are detected. It should provide a highly reliable power supply system. 6.5.23.3. Distributed control to increase reliability for air-conditioning, UPS, environment and smart rack (temperature and humidity, lighting, PDU, door sensor, and more). The normal display and uploading of other equipment messages should not be affected even if one of the controllers' malfunctions. 7. **Infrastructure (Data Center Compute System)** 7.1. Compute Nodes consisting of Four (4) Rack mounted Servers (Linux Cluster), with minimum specifications as follows: 7.1.1. Servers 7.1.1.1. 2 x Intel Xeon 28 Core 7.1.1.2. 512GB Memory 7.1.1.3. 1 x Quad Port 10GbE 7.1.1.4. 2 x 480GB SSD 7.1.1.5. 4G RAID Controller 7.1.1.6. 256GB NVMe 0.3DWPD M.2 SSD 7.1.1.7. 1 x 2 Port 32Gbe FC HBA Card 7.1.1.8. Redundant Power Supply 7.1.2. Data Center and Virtualization Software Licenses for 4 Units Server Nodes with 2 CPU's each 7.1.3. Open source server operating system license enterprise class with unlimited virtual machine per licensed device. 7.2. **Data Center Block Storage** 7.2.1. **Enterprise Block Storage System Specifications:** 7.2.1.1. 12 x 7.8TB NVMe Drives RAID 5 (60TB Useable Capacity NVMe SSD Drives (Physical Capacity) 7.2.1.2. 8 x 32GB FC Ports with Transceivers 7.2.1.3. Must be future-proof and provide data-in-place upgrades within the same generation or next-generation of appliances or scale out of their existing environment with a second system equal to their current model. 7.2.1.4. Must have proactive monitoring tools for the storage solution. 7.2.1.5. Must include built-in management features to eliminate dozens of time-consuming tasks and decision points. 7.2.2. **SAN Switch Specifications:** 7.2.2.1. 2 units switch 24 ports 32GB FC. 7.2.2.2. 48 pcs 5m LC to LC Cables		

		7.2.2.3. 48 pcs 32GB FC SFP Transceivers 7.3. **Data Center Back-Up System** Requirements for Enterprise on-premise based back-up system: 7.3.1. **1 Unit Server:** 7.3.1.1. 2 x Intel Xeon Silver 4310 (12C, 2.1G, 120W) 7.3.1.2. 128GB Memory 7.3.1.3. 1 x Quad Port 10GbE 7.3.1.4. 2 x 480GB SSD 7.3.1.5. 1 x 2 Port 32Gbe FC HBA Card 7.3.1.6. Redundant Power Supply 7.3.2. **Software:** 7.3.2.1. Back-up for 40 Virtual Machines 7.3.2.2. Operating System for back-up software 7.3.3. **1 Unit Back-up External Storage:** 7.3.3.1. 32 x 14 TB NL SAS Drives RAID 6 12+2 (280TB Useable Capacity) 7.3.3.2. 8 x 32GB FC Port with Transceivers 7.3.3.3. 8 x FC LC-LC Cable 7.4. **Must Provide 4 units NGFW with the following specifications:** 7.4.1. Must perform stream-based, bi-directional traffic analysis, without proxying or buffering, to uncover intrusion attempts and malware and to identify application traffic regardless of port. 7.4.2. Must scan for threats in both inbound and outbound traffic simultaneously to ensure that the network is not used to distribute malware and does not become a launch platform for attacks in case an infected machine is brought inside. 7.4.3. Must have proxy-less and non-buffering inspection technology provides ultra-low latency performance for DPI of millions of simultaneous network streams without introducing file and stream size limitations, and can be applied on common protocols as well as raw TCP streams. 7.4.4. Must have a single-pass DPI architecture simultaneously scans for malware, intrusions and application identification, drastically reducing DPI latency and ensuring that all threat information is correlated in a single architecture. 7.4.5. Must have an engine with the multi-core architecture to provide high DPI throughput and extremely high		

		new session establishment rates to deal with traffic spikes in demanding networks. 7.4.6. Must identify and mitigate even the most insidious modern threats, including future Meltdown exploits. Detects and blocks malware that does not exhibit any malicious behavior and hides its weaponry via encryption. 7.4.7. Must prevent potentially malicious files from entering the network, files sent to the cloud for analysis can be held at the gateway until a verdict is determined. 7.4.8. Must have multi-engine sandbox platform, which includes virtualized sandboxing, full system emulation and hypervisor level analysis technology, executes suspicious code and analyzes behavior, providing comprehensive visibility to malicious activity. 7.4.9. Must have a Secure SD-WAN that enables distributed enterprise organizations to build, operate and manage secure, high-performance networks across remote sites for the purpose of sharing data, applications and services using readily-available, low-cost public Internet services without additional license cost. 7.4.10. Must supports Active/Passive (A/P) with state synchronization. The proposed solution should support Hardware redundancy using only single security license in both primary & secondary appliance 7.4.11. Must have block until verdict To prevent potentially malicious files from entering the network, files sent to the cloud for analysis can be held at the gateway until a verdict is determined. 7.4.12. Must have zero day protection to protect the network against zero-day attacks with constant updates against the latest exploit methods and techniques that cover thousands of individual exploits. 7.4.13. Must have Bi-directional raw TCP inspection that scans raw TCP streams on any port and bi-directionally to detect and prevent both inbound and outbound threats. 7.4.14. The Anti-Malware System must be capable of Stream-based malware scanning, Gateway anti-virus, Gateway anti-spyware, Bi-directional inspection, No file size limitation 7.4.15. Must be certified with ICSA labs Advance Threat Defense certified with 100% unknown threat detection for 7 consecutive quarters from Q1-Q4, 2021 & Q1-Q3, 2022.		

		7.4.16. "The system must have the minimum throughput requirements (or higher): 7.4.17. Firewall Inspection Throughput – 36 Gbps; 7.4.18. Threat Prevention throughput – 19 Gbps; 7.4.19. Application inspection throughput – 20 Gbps; 7.4.20. IPS throughput – 20 Gbps; 7.4.21. Anti-malware inspection throughput- 18.5 Gbps 7.4.22. TLS/SSL decryption and inspection throughput (DPI SSL) – 9 Gbps; 7.4.23. VPN throughput – 19 Gbps;" 7.4.24. "The system must be capable of handling: 7.4.25. Connections per second - 228,000/sec; 7.4.26. Maximum connections (SPI) – 8,000,000; 7.4.27. Max DPI-SSL Connections – 750,000; 7.4.28. Maximum connections (DPI) – 6,000,000 " 7.4.29. The system's interface must include: 7.4.29.1. 16 x 1-GbE Cu, 7.4.29.2. 2 x 40G QSFP+, 7.4.29.3. 8 x 25G, 7.4.29.4. 4 x 10G/5G/2.5G/1G SFP+, 7.4.29.5. 4 x 10G/5G/2.5G/1G Cu, 7.4.29.6. 2 x USB 3.0, 7.4.29.7. Management interfaces - 1 GbE, 1 Console 7.4.30. Storage: 256GB M.2 (expandable up to 1TB) **8. Must provide 1 unit out of band switch for data center access:** 8.1. Must have 48 Ports x RJ45 RS-232 Serial Ports. 8.2. Must be LTE enabled. 8.3. Must have antenna extender. **9. Network** 9.1. **Supply and Installation of 16 units campus DC Core Switch with the following specifications:** 9.1.1. Layer 3 switch with BGP, EVPN, VXLAN, VRF, and OSPF with robust security and QoS 9.1.2. High performance front plane stacking for up to 10 switches 9.1.3. High performance up to 1760 Gbps switching capacity, up to 1310 MPPS of throughput and up to 400 Gbps stacking bandwidth 9.1.4. Power-to-port switch bundle with back-to-front airflow ideal for data center 1GbE ToR and OOBM deployments 9.1.5. Intelligent monitoring, visibility, and remediation with Network Analytics Engine		

		9.1.6. Supports management via a single pane of glass across wired, wireless, and WAN 9.1.7. 24 x 1G/10G SFP+ ports 9.1.8. 4x 1G/10G/25G1/50G SFP ports 9.1.9. 1x USB-C Console Port, 1x OOBM port , 1x USB Type A Host port, 1x Bluetooth dongle to be used with Mobile App 9.1.10. 2 field-replaceable, hot-swappable power supply slots 9.1.11. Provides N+1 and N+N redundancy for high reliability in the event of power line or supply failures 9.1.12. Virtual Router Redundancy Protocol (VRRP)—Allows groups of two routers to dynamically back each other up to create highly available routed environments. 9.1.13. Unidirectional Link Detection (UDLD)—Monitors link connectivity and shuts down ports at both ends if unidirectional traffic is detected, preventing loops in STP-based networks. 9.1.14. IEEE 802.3ad LACP—Supports up to 54 link aggregation groups (LAGs), each with eight links per group with a user-selectable hashing algorithm. 9.1.15. Support for Microsoft Network Load Balancer (NLB) for server applications 9.1.16. Ethernet Ring Protection Switching (ERPS) supports rapid protection and recovery in a ring topology 9.1.17. IEEE 802.1s Multiple Spanning Tree provides high link availability in VLAN environments where multiple spanning trees are required; and legacy support for IEEE 802.1d and IEEE 802.1w 9.1.18. Jumbo frames allow for high-performance backups and disaster-recovery systems; provides a maximum frame size of 9198 bytes 9.1.19. Packet storm protection against broadcast and multicast storms with user-defined thresholds 9.1.20. Smart link enables simple, fast converging link redundancy and load balancing with dual uplinks avoiding Spanning Tree complexities		

		9.1.21. Address Resolution Protocol (ARP) determines the MAC address of another IP host in the same subnet; supports static ARPs 9.1.22. Domain Name System (DNS) provides a distributed database that translates domain names and IP addresses, which simplifies network design; supports client and server 9.1.23. Supports internal loopback testing for maintenance purposes and increased availability; loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per VLAN basis for added flexibility 9.1.24. Route maps provide more control during route redistribution; allow filtering and altering of route metrics 9.1.25. IGMP Snooping allows multiple VLANs to receive the same IPv4 multicast traffic, lessening network bandwidth demand by reducing multiple streams to each VLAN 9.1.26. Multicast Listener Discovery (MLD) enables discovery of IPv6 multicast listeners; support MLD v1 and v2 9.1.27. Protocol Independent Multicast (PIM) defines modes of IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Sparse Mode (SM) and Dense Mode (DM) for both IPv4 and IPv6 9.1.28. Internet Group Management Protocol (IGMP) utilizes Any-Source Multicast (ASM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3 9.2. **Supply and Installation of 16 units campus DC Distribution Switch with the following specifications:** 9.2.1. 48 x ports 10/100/1000BASE-T Ports, 4x 100M/1G/10G SFP ports. 9.2.2. 1x USB-C Console Port, 1x OOBM port, 1x USB Type A Host port, 1x Bluetooth dongle to be used with Mobile App 9.2.3. Jumbo frames allow for high-performance backups and disaster-recovery systems; provides a maximum frame size of 9198 bytes. 9.2.4. Support for ACLs, robust QoS and common protocols such as static and Access OSPF routing.		

		9.2.5. Support for up to 8 switches (or members) in a stack via chain or ring topology. 9.2.6. Capable of Intelligent monitoring, visibility, and troubleshooting with built-in tool 9.2.7. Single pane of glass management via cloud across wired, wireless, and WAN 9.2.8. Capable of one touch deployment using a mobile app 9.2.9. Support for automated configuration and verification via dedicated software. 9.2.10. Secure and simple access for users and IoT with Dynamic Segmentation. 9.2.11. Packet storm protection against broadcast and multicast storms with user-defined thresholds. 9.2.12. Smart link enables simple, fast converging link redundancy and load balancing with dual uplinks avoiding Spanning Tree complexities. 9.2.13. Loopback interface address defines an address in Open Shortest Path First (OSPF), improving diagnostic capability. 9.2.14. Address Resolution Protocol (ARP) determines the MAC address of another IP host in the same subnet; supports static ARPs; gratuitous ARP allows detection of duplicate IP addresses; proxy ARP allows normal ARP operation between subnets or when subnets are separated by a Layer 2 network. 9.2.15. Domain Name System (DNS) provides a distributed database that translates domain names and IP addresses, which simplifies network design; supports client and server 9.2.16. Supports internal loopback testing for maintenance purposes and increased availability; loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per-VLAN basis for added flexibility. 9.2.17. IGMP Snooping allows multiple VLANs to receive the same IPv4 multicast traffic, lessening network bandwidth demand by reducing multiple streams to each VLAN. 9.2.18. Multicast Listener Discovery (MLD) enables discovery of IPv6 multicast listeners; support MLD v1 and v2.		

		9.2.19. Protocol Independent Multicast (PIM) defines modes of IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Sparse Mode (SM) and Dense Mode (DM) for both IPv4 and IPv6 9.2.20. Internet Group Management Protocol (IGMP) utilizes Any-Source Multicast (ASM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3 9.2.21. Strict priority (SP) queuing and Deficit Weighted Round Robin (DWRR) 9.2.22. Traffic prioritization (IEEE 802.1p) for real-time classification into 8 priority levels that are mapped to 8 queues 9.2.23. Transmission rates of egressing frames can be limited on a per-queue basis using Egress Queue Shaping (EQS) 9.2.24. Class of Service (CoS) sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ 9.2.25. Rate limiting sets per-port ingress enforced maximums and per-port, per-queue minimums 9.2.26. Up to 176 Gbps in non-blocking bandwidth and up to 130.9 Mpps for forwarding 9.2.27. Selectable queue configurations that allow for increased performance by defining a number of queues and associated memory buffering to best meet the requirements of network applications 9.3. **Campus Network Access Switches:** 9.3.1. **Supply and Installation of 15 Units 48 Port Access Switch PoE+:** 9.3.1.1. Enterprise-class Layer 2 connectivity with support for ACLs, robust QoS and static routing 9.3.1.2. Convenient built-in 1/10GbE uplinks 9.3.1.3. Management flexibility with support for Cloud-management, easy-to-use Web GUI, and CLI 9.3.1.4. Software defined ready with REST APIs		

		9.3.1.5. Simple deployment with Zero Touch Provisioning 9.3.1.6. Up to 176 Gbps in non-blocking bandwidth and up to 98.6 Mpps for forwarding 9.3.1.7. Selectable queue configurations that allow for increased performance by defining a number of queues and associated memory buffering to best meet the requirements of network applications 9.3.1.8. 48x ports 10/100/1000BASE-T Ports 4x 1G/10G SFP ports 9.3.1.9. 1x USB-C Console Port , 1x USB Type A Host port 9.3.1.10. Jumbo frames allow for high-performance backups and disaster-recovery systems; provides a maximum frame size of 9198 bytes 9.3.1.11. Packet storm protection against broadcast and multicast storms with user-defined thresholds 9.3.1.12. Strict priority (SP) queuing and Deficit Weighted Round Robin (DWRR) 9.3.1.13. Traffic prioritization (IEEE 802.1p) for real-time classification 9.3.1.14. Class of Service (CoS) sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ 9.3.1.15. Rate limiting sets per-port ingress enforced maximums and per-port, per-queue minimums 9.3.1.16. Large buffers for graceful congestion management 9.3.1.17. IGMP Snooping allows multiple VLANs to receive the same IPv4 multicast traffic, lessening network bandwidth demand by reducing multiple streams to each VLAN 9.3.1.18. Multicast Listener Discovery (MLD) enables discovery of IPv6 multicast listeners; support MLD v1 and v2 9.3.1.19. Protocol Independent Multicast (PIM) defines modes of IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Sparse Mode		

		(SM) and Dense Mode (DM) for both IPv4 and IPv6 9.3.1.20. Internet Group Management Protocol (IGMP) utilizes Any-Source Multicast (ASM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3 9.3.1.21. Multicast Service Discovery Protocol (MSDP) efficiently routes multicast traffic through core networks 9.3.1.22. MSDP for Anycast RP is an intra-domain feature that provides redundancy and load-sharing capabilities 9.3.1.23. Address Resolution Protocol (ARP) determines the MAC address of another IP host in the same subnet; supports static ARPs 9.3.1.24. Domain Name System (DNS) provides a distributed database that translates domain names and IP addresses, which simplifies network design; supports client and server 9.3.1.25. Supports internal loopback testing for maintenance purposes and increased availability; loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per VLAN basis for added flexibility 9.3.2. **Supply and Installation of 16 units 12 port Access Switches PoE**+: 9.3.2.1. Enterprise-class Layer 2 connectivity with support for ACLs, robust QoS and static routing 9.3.2.2. Convenient built-in 1/10GbE uplinks 9.3.2.3. Management flexibility with support for Cloud-management, easy-to-use Web GUI, and CLI 9.3.2.4. Software defined ready with REST APIs 9.3.2.5. Simple deployment with Zero Touch Provisioning 9.3.2.6. Strict priority (SP) queuing and Deficit Weighted Round Robin (DWRR) 9.3.2.7. Traffic prioritization (IEEE 802.1p) for real-time classification		

		9.3.2.8. Class of Service (CoS) sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ 9.3.2.9. Rate limiting sets per-port ingress enforced maximums and per-port, per-queue minimums 9.3.2.10. Large buffers for graceful congestion management 9.3.2.11. IEEE 802.3ad LACP supports up to 8 LAGs, each with up to 8 links per LAG; and provides support for static or dynamic groups and a user-selectable hashing algorithm 9.3.2.12. IEEE 802.1s Multiple Spanning Tree provides high link availability in VLAN environments where multiple spanning trees are required; and legacy support for IEEE 802.1d and IEEE 802.1w 9.3.2.13. Up to 68 Gbps in non-blocking bandwidth and up to 45.1 Mpps for forwarding 9.3.2.14. Selectable queue configurations that allow for increased performance by defining a number of queues and associated memory buffering to best meet the requirements of network applications 9.3.2.15. Connectivity 9.3.2.16. 12x ports 10/100/1000BASE-T Ports 9.3.2.17. 2x 1G/10G SFP ports 9.3.2.18. 2x 10/100/1000BASE-T ports 9.3.2.19. Supports PoE Standards IEEE 802.3af, 802.3at 9.3.2.20. Jumbo frames allow for high-performance backups and disaster-recovery systems; provides a maximum frame size of 9198 bytes 9.3.2.21. Packet storm protection against broadcast and multicast storms with user-defined thresholds 9.3.2.22. VLAN support and tagging for IEEE 802.1Q (4094 VLAN IDs) 9.3.2.23. Jumbo packet support improves the performance of large data transfers; supports frame size of up to 9,220 bytes		

		9.3.2.24. Bridge Protocol Data Unit (BPDU) tunneling transmits STP BPDUs transparently, allowing correct tree 9.3.2.25. Rapid Per-VLAN Spanning Tree (RPVST+) allows each VLAN to build a separate spanning tree to improve link bandwidth usage; is compatible with PVST+ 9.3.2.26. MVRP allows automatic learning and dynamic assignment of VLANs 9.3.2.27. STP supports standard IEEE 802.1D STP, IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) for faster convergence, and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) 9.3.2.28. Internet Group Management Protocol (IGMP) Controls and manages the flooding of multicast packets in a Layer 2 network 9.3.2.29. Port mirroring duplicates port traffic (ingress and egress) to a monitoring port; supports 4 mirroring groups 9.3.2.30. Address Resolution Protocol (ARP) determines the MAC address of another IP host in the same subnet; supports static ARPs 9.3.2.31. Domain Name System (DNS) provides a distributed database that translates domain names and IP addresses, which simplifies network design; supports client and server 9.3.2.32. Supports internal loopback testing for maintenance purposes and increased availability; loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per VLAN basis for added flexibility 9.3.2.33. IGMP Snooping allows multiple VLANs to receive the same IPv4 multicast traffic, lessening network bandwidth demand by reducing multiple streams to each VLAN 9.3.2.34. Multicast Listener Discovery (MLD) enables discovery of IPv6 multicast listeners; support MLD v1 and v2 9.3.2.35. Protocol Independent Multicast (PIM) defines modes of IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Sparse Mode		

		(SM) and Dense Mode (DM) for both IPv4 and IPv6 9.3.2.36. Internet Group Management Protocol (IGMP) utilizes Any-Source Multicast (ASM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3 9.3.2.37. Multicast Service Discovery Protocol (MSDP) efficiently routes multicast traffic through core networks 9.3.2.38. MSDP for Anycast RP is an intra-domain feature that provides redundancy and load-sharing capabilities 9.3.3. **Must provide 41 units 24 port Access Switches PoE+ with the following configuration:** 9.3.3.1. Enterprise-class Layer 2 connectivity with support for ACLs, robust QoS and static routing 9.3.3.2. Convenient built-in 1/10GbE uplinks 9.3.3.3. Management flexibility with support for Cloud-management, easy-to-use Web GUI, and CLI 9.3.3.4. Software defined ready with REST APIs 9.3.3.5. Simple deployment with Zero Touch Provisioning 9.3.3.6. Up to 128 Gbps in non-blocking bandwidth and up to 95.2 Mpps for forwarding 9.3.3.7. Selectable queue configurations that allow for increased performance by defining a number of queues and associated memory buffering to best meet the requirements of network applications 9.3.3.8. 24x ports 10/100/1000BASE-T Ports 4x 1G/10G SFP ports 9.3.3.9. 1x USB-C Console Port , 1x USB Type A Host port 9.3.3.10. Jumbo frames allow for high-performance backups and disaster-recovery systems; provides a maximum frame size of 9198 bytes 9.3.3.11. Packet storm protection against broadcast and multicast storms with user-defined thresholds 9.3.3.12. Strict priority (SP) queuing and Deficit Weighted Round Robin (DWRR)		

		9.3.3.13. Traffic prioritization (IEEE 802.1p) for real-time classification 9.3.3.14. Class of Service (CoS) sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ 9.3.3.15. Rate limiting sets per-port ingress enforced maximums and per-port, per-queue minimums 9.3.3.16. Large buffers for graceful congestion management 9.3.3.17. IGMP Snooping allows multiple VLANs to receive the same IPv4 multicast traffic, lessening network bandwidth demand by reducing multiple streams to each VLAN 9.3.3.18. Multicast Listener Discovery (MLD) enables discovery of IPv6 multicast listeners; support MLD v1 and v2 9.3.3.19. Protocol Independent Multicast (PIM) defines modes of IPv4 and IPv6 multicasting to allow one-to-many and many-to-many transmission of information; supports PIM Sparse Mode (SM) and Dense Mode (DM) for both IPv4 and IPv6 9.3.3.20. Internet Group Management Protocol (IGMP) utilizes Any-Source Multicast (ASM) to manage IPv4 multicast networks; supports IGMPv1, v2, and v3 9.3.3.21. Multicast Service Discovery Protocol (MSDP) efficiently routes multicast traffic through core networks 9.3.3.22. MSDP for Anycast RP is an intra-domain feature that provides redundancy and load-sharing capabilities 9.3.3.23. Address Resolution Protocol (ARP) determines the MAC address of another IP host in the same subnet; supports static ARPs 9.3.3.24. Domain Name System (DNS) provides a distributed database that translates domain names and IP addresses, which simplifies network design; supports client and server 9.3.3.25. Supports internal loopback testing for maintenance purposes and increased availability; loopback detection protects against		

		incorrect cabling or network configurations and can be enabled on a per-port or per VLAN basis for added flexibility 9.3.4. **Must provide 16 units Wireless LAN Controller (2 units per campus)** 9.3.4.1. Cloud-managed and purpose-built for branch SDWAN requirements 9.3.4.2. Unified policy enforcement for wired and wireless traffic through Dynamic Segmentation 9.3.4.3. Visibility into over 3,000 applications with no added hardware 9.3.4.4. Integrated LTE option available 9.3.4.5. Policy Enforcement Firewall - includes a Layer 4-7 stateful firewall with PEF to deliver a consistent user, device, and application awareness across WLAN, LAN, and WAN. 9.3.4.6. Threat Defense with IDS/IPS - To improve security against a growing attack surface, gateways deployed in SD-WAN mode add role and identity-based intrusion detection and prevention capabilities (IDS/IPS) on top of existing security features. 9.3.4.7. Application visibility and control - Deep Packet Inspection (DPI) technology, which is a component of PEF, consistently evaluates and optimizes performance and usage policies for over 3,000 applications. This ensures the highest possible Quality of Service (QoS) – even for encrypted traffic 9.3.4.8. Unified Communications and Collaboration (UCC) - Visualize and troubleshoot networks based on call quality metrics such as MOS, latency jitter and packet loss. Supported applications include: Teams, Skype for Business, Wi-Fi Calling, FaceTime, SIP, Jabber, Spark and more. 9.3.4.9. Maximum campus or remote AP licenses: 32 9.3.4.10. Maximum concurrent users/devices: 2,048 9.3.4.11. Maximum clients: Up to 2,048 9.3.4.12. Maximum VLANs: 4,096 9.3.4.13. Active firewall sessions: 64K 9.3.4.14. Concurrent GRE tunnels: 544 9.3.4.15. Concurrent IPsec sessions: 2,048 9.3.4.16. Concurrent SSL sessions: 2,048 9.3.4.17. Firewall throughput (Gbps): 4 9.3.4.18. Wired Bridged Throughput (Gbps): 4 9.3.4.19. Encrypted throughput 3DES (Gbps): 4 9.3.4.20. Encrypted throughput AES-CBC-256 (Gbps): 4 9.3.4.21. Encrypted throughput AES-CCM (Gbps): 2.0 9.3.4.22. Encrypted throughput AES-GCM-256 (Gbps): 4 9.3.4.23. Form factor/footprint: Desktop/fanless 9.3.4.24. 10/100/1000BASE-T: 4 9.3.4.25. USB 2.0 interface: 1 9.3.4.26. Supports management/status LEDs		

		9.3.4.27. Supports Central connectivity status LED 9.3.4.28. Supports Cellular (LTE) status LED 9.3.4.29. Console port: micro USB, RJ45 9.3.4.30. Operates at 0° C to 40° C (32° C to 104° F) 9.3.4.31. Maximum power consumption of 25W (with USB) 9.3.4.32. Power Source: 12v DC, 2.5A AC-to-DC power adapter Indoor APs 9.3.4.33. Access Point shall support Wi-Fi6 9.3.4.34. Access Point shall support 4x4 MIMO with four spatial streams 9.3.4.35. Access Point shall support dual 5-GHz radio mode. 9.3.4.36. Access Point shall have integrated or external antenna SKUs. 9.3.4.37. Access Point shall contain 2GB or higher-sized DRAM for capacity and scalability. 9.3.4.38. Access Point shall support USB 2.0 @ 4.5W. 9.3.4.39. Access Point shall have a dedicated hardware chipset to offload performance of advanced RF spectrum analysis and security. 9.3.4.40. Access Point shall support Uplink/downlink OFDMA 9.3.4.41. Access Point shall support management console port (RJ-45) 9.3.4.42. Access Point shall support integrated BLE5 radio 9.3.4.43. Access Point shall be able to offer IoT container hosting 9.3.4.44. Access Point shall be able to leverage partnerships for Apple Analytics 9.3.4.45. OEM should be listed in Gartner Leader Quadrant for Wired and Wireless LAN Infrastructure from the last 5 years before releasing this RFP. 9.3.5. **Must propose 210 Indoor Access Points** 9.3.5.1. 1.49 Gbps maximum real-world speed (HE80/HE20) 9.3.5.2. WPA3 and Enhanced Open security 9.3.5.3. Built-in technology that resolves sticky client issue or Wi-Fi 6 and Wi-Fi 5 devices 9.3.5.4. OFDMA for enhanced multi-user efficiency. 9.3.5.5. IoT-ready Bluetooth 5 and Zigbee support. 9.3.5.6. Designed to optimize user experience by maximizing Wi-Fi efficiency and dramatically reducing airtime contention between clients. 9.3.5.7. Support Orthogonal frequency-division multiple access (OFDMA) 9.3.5.8. Supports cellular optimization. 9.3.5.9. Supports up to 2 spatial streams (2SS) and 80MHz channel bandwidth (HE80). 9.3.5.10. Supports handling multiple Wi-Fi 6capable clients on each channel simultaneously, regardless of device or traffic type.		

		9.3.5.11. Supports Channel utilization optimization by handling each transaction via smaller sub-carriers or resource units (RUs). 9.3.5.12. Supports controller-less mode and can provide SLA-grade performance by allocating radio resources, such as time, frequency, and spatial streams, to specific traffic types. 9.3.5.13. Supports Layer 7 deep packet inspection (DPI) to identify user roles and applications, the APs will dynamically allocate the bandwidth needed. 9.3.5.14. Supports elimination of sticky client issues by placing Wi-Fi 6 capable devices on the best available AP. 9.3.5.15. Supports Wi-Fi 6 aware client optimization by steering mobile devices to the best AP based on available bandwidth, types of applications being used and traffic type –even as users roam. 9.3.5.16. Supports Advanced Cellular Coexistence (ACC) uses built-in filtering to automatically minimize the impact of interference from cellular networks, distributed antenna systems (DAS), and commercial small cell or femtocell equipment. 9.3.5.17. Supports continuously monitor and report hardware energy consumption. can also be configured to enableor disable capabilities based on available PoE power 9.3.5.18. Supports integrated Bluetooth 5 and 802.15.4 radio (for Zigbee support) to simplify deploying and managing IoT-based location services 9.3.5.19. Supports Target Wake Time (TWT) by establishing a schedule for when clients need to communicate with an AP 9.3.5.20. Supports for stronger encryption and authentication is provided via the latest version of WPA for enterprise protected networks. 9.3.5.21. Supports WPA2-MPSK MPSK enables simpler passkey management for WPA2 devices 9.3.5.22. Supports VPN Tunnels can be used to establish a secure SSL/IPSec VPN tunnel to a VPN concentrator 9.3.5.23. Supports Trusted Platform Module (TPM) for secure storage of credentials and keys, and boot code 9.3.5.24. Supports flexible management platform either standalone, controller-less,controller-based, cloud-based and On-premise NMS using unifed OS 9.3.5.25. Supports zero touch provisioning 9.3.5.26. Supports Transmit beamforming (TxBF) Increased signal reliability and range 9.3.5.27. Supports Passpoint Wi-Fi (Release 2) (Hotspot 2.0) 9.3.5.28. Supports Seamless cellular-to-Wi-Fi carryover for guests		

		9.3.5.29. Supports Dynamic Frequency Selection (DFS) Optimized use of available RF spectrum 9.3.5.30. Supports Maximum Ratio Combining (MRC) Improved receiver performance 9.3.5.31. Support Cyclic Delay/Shift Diversity (CDD/CSD) Greater downlink RF performance 9.3.5.32. Support Space-Time Block Coding Increased range and improved reception 9.3.5.33. Support Low-Density Parity Check (LDPC) High-efficiency error correction Indoor, dual radio, 5GHz and 2.4GHz 802.11ax 2x2 MIMO 9.3.6. **Supply and Installation of 10 Outdoor Access Points:** 9.3.6.1. AP type: Outdoor Hardened, Wi-Fi 6 dual radio, 5 GHz 4x4 MIMO and 2.4 GHz 2x2 MIMO 9.3.6.2. Software-configurable dual radio supports 5 GHz (Radio 0) and 2.4 GHz (Radio 1) 9.3.6.3. Support for up to 512 associated client devices per radio, and up to 16 BSSIDs per radio 9.3.6.4. Available channels: Dependent on configured regulatory domain. 9.3.6.5. Dynamic frequency selection (DFS) optimizes the use of available RF spectrum. 9.3.6.6. 4x4:4SS MU-MIMO capability 9.3.6.7. With maximum aggregate on air data rates of 3 Gbps (HE80/HE40) 9.3.6.8. Uplink and Downlink Orthogonal Frequency Division Multiple Access (OFDMA), Downlink Multi-User MIMO (MU-MIMO) and cellular co-location. With up to 4 spatial stream and 160 MHz channel capability 9.3.6.9. AI powered technology ensures that all clients are attached to their best serving Access Point. Session metrics, network metrics, applications and client type are used to identify and maintain the best connection. 9.3.6.10. IoT-ready Bluetooth 5 and Zigbee support 9.3.6.11. High performance Dual Radio 802.11ax AP with OFDMA and Multi-User MIMO (MU-MIMO). 9.3.6.12. Includes Bluetooth Low Energy (BLE) and Zigbee radios for location and IOT use cases. 9.3.6.13. Multi user capability with uplink and downlink multi-user MIMO 9.3.6.14. Unified AP support—Flexibility to deploy in either controller-based, cloud-managed, or controller-less networks. 9.3.6.15. Up to 4.8 GBPS wireless data rate to individual 4SS HE160 Wi-Fi 6 client device 9.3.6.16. Up to 575 Mbps wireless data rate to individual 2SS HE40 Wi-Fi 6 client device 9.3.6.17. Advanced Cellular Coexistence (ACC) minimizes interference from cellular networks.		

		9.3.6.18. Maximum ratio combining (MRC) for improved receiver performance. 9.3.6.19. Cyclic delay/shift diversity (CDD/CSD) to enable the use of multiple transmit antennas 9.3.6.20. Short guard interval for 20-MHz, 40-MHz, 80-MHz and 160-MHz channels. 9.3.6.21. Space-time block coding (STBC) for increased range and improved reception. 9.3.6.22. Low-density parity check (LDPC) for high-efficiency error correction and increased throughput. 9.3.6.23. Transmit beam-forming (TxBF) for increased signal reliability and range. 9.3.6.24. Maximum (worst-case) power consumption: POE powered (dual ports): 32.0W, POE powered (single port, full function): 26.1W 9.3.7. **Custom Captive Portal Management System** 9.3.7.1. Centralized Wi-Fi management system that controls the access of users. 9.3.7.2. Built-in AAA components to handle authentication, authorization, and accounting. 9.3.7.3. Custom user journey for each SSID which can deliver video, banners, and surveys. 9.3.7.4. Dashboards and reports 9.3.8. **The winning bidder must provide 226 pcs SFP+ transceivers to be used for the switches of various campuses of this project.** **10. Structured Cabling Works:** 10.1. The winning bidder shall supply, install and test UTP and Fiber Optic Cables and all necessary materials essential for various network nodes as defined in this Terms of Reference 10.1.1. The winning bidder must provide a network node schedule that basically tabulates the various network nodes required. 10.1.2. The winning bidder shall include all necessary equipment and materials. 10.1.3. The winning bidder shall also include the IDFs with UPS power supply. 10.1.4. 3ft IDF 10.1.5. 4ft IDF 10.2. **Inter-Building Fiber Optic Connection** 10.2.1.1. The winning bidder shall supply, install and terminate the fiber optic cabling that will link the existing Network Switch Room to the new Data Center. 10.2.1.2. FOC installation shall be underground through either micro trenching or Horizontal Direct Drilling (HDD).		

		10.2.1.3. Supply and Installation of Fiber Termination Equipment and/or network switches. 10.3. **In-Building Structured Cabling works** 10.3.1.1. The winning bidder shall furnish all labor, materials, tools, and equipment, and perform all operations necessary to complete the supply, delivery, installation, termination, testing, and commissioning of Structured Cabling Works. 10.3.1.2. Supply, delivery, and pulling of Category 6 UTP cables and Fiber Optic Cables. The winning bidder shall perform proximity measurements and bandwidth requirements assessment to validate the FOC to be supplied whether Single-Mode, Multi-Mode, or a mix of both. 10.3.1.3. Supply and installation of Inter-Rack cabling at the Data Center Facility 10.3.1.4. Supply, Installation, and termination of data cables necessary for the interfacing of devices. 10.3.1.5. Supply and Installation of Cable Ladders, Cable trays, and fiber guides and perform harnessing with appropriate labeling. **11. LED Displays** 11.1. Supply and installation of five (5) sets of 9’ x 12’ and one (1) set of 12’ x 32’ Outdoor LED Displays for purposes of campus related advertisements, announcements, notifications and other communication purposes, complete with all peripherals to complete a working system. Ip Displays will be installed in: 11.1.1. Four (4) Units in Main Campus 11.1.2. One (1) Unit in San Andres Extramural Campus (Agpudlos) 11.1.3. One (1) Unit in San Agustin Campus **12. Unified Database Platform** The Unified Database Platform must meet the following specifications, at a minimum: 12.1. Must be cloud agnostic and cloud-native and can support deployments in bare metal, VMs, or Kubernetes both in on-premises infrastructure as well as cloud for at least the following options: 12.1.1. Baremetal 12.1.2. VMware vSphere 12.1.3. AWS 12.1.4. Google Cloud Platform 12.1.5. Microsoft Azure		

		12.2. It must support both the SQL and NoSQL APIs under a common storage substrate to address current and future use cases. 12.3. Capable of enabling client applications to auto-discover cluster nodes and cluster topology using an application-friendly library. 12.4. Able to support a single synchronous cluster stretched across multiple AZ's/regions/clouds and support multiple advanced replication architectures for the resiliency of the system. 12.5. Able to horizontally scale out/in/up/down with minimal to no business disruptions 12.6. Must offer a single user interface across various clouds with simplified database management and monitoring like DB upgrades, backups, security & on-demand scaling of nodes to simplify operation and management 12.7. The proposed solution shall support distributed ACID and transactions with strong data consistency. 12.8. The proposed solution must include at least 96 cores of database license subscription for production and 96 cores of database license for non-production 12.9. Must include 1 year Enterprise Support for production and non-production 12.10. Able to provide the ability to increase computing capacity linearly by adding new nodes to the existing database system with no downtime. 12.11. The proposed solution must support data replication between two isolated instances to support application-level active-active deployments. 12.12. Able to enhance the primary cluster capability with additional read-replica nodes to facilitate reads closer to the customer base. 12.13. Able to support data affinity to comply with country/region-specific regulatory/compliance requirements. 12.14. Must support encryption in transit and rest to have a strong security posture. 12.15. The proposed solution shall be able to provision and manage in a fully air-gapped environment. 12.16. Shall support region/zone/cloud affinity to define different data serving topologies to keep the data serving nodes closer to the user base		

		12.17. Capable of horizontally scaling with no downtime to support adhoc peak workloads or increase in sizing without interruption 12.18. The proposed solution must offer a single user interface across various clouds with simplified database management and monitoring like DB upgrades, backups, security & on-demand scaling of nodes to simplify operation and management 12.19. The proposed solution must have CDC capability to generate events on data change. 12.20. Must have API for management automation 12.21. The proposed solution must support advanced SQL features like stored procedure, foreign keys, triggers, json support (filtering, constraints and projections) to support current and future use cases. **13. Miscellaneous Requirements:** 13.1. **CCTV Cameras** 13.1.1. 106 Units Dome Type 13.1.2. 71 units bullet Type 13.2. **Must propose 1,500 Units laptops with the following specifications for faculty and student use:** 13.2.1. Intel i7 Processor CPU 13.2.2. 16GB Memory 13.2.3. 512GB SSD Storage 13.2.4. Windows operating System 13.2.5. Must have endpoint security. 13.2.6. Must include licensed (perpetual) office productivity software. 13.2.7. Must include power supply. 13.2.8. Must include carrying case (laptop bag) 13.3. **System and Hardware Installation** 13.3.1. Provision of essential services for installation of devices, software and systems supplied for this project. 13.4. **Operating System (OS) Hardening** The OS hardening service shall include the patching and application of advanced system security procedures to secure the server's OS. The OS hardening procedures must include the following, at a minimum: 13.4.1. If available, install service packs, firmware and/or patches to keep the OS up to date 13.4.2. Perform secure configuration by deleting unnecessary programs and/or drivers, apply restrictions to the network, files and applications,		

		assign groups and set the policies and use templates to manage and enforce security configurations 13.4.3. Install End-Point Protection 13.5. **Support Services** 13.5.1. The winning bidder must ensure that appropriate support services are in place within the active warranty period of all supplied devices and software. 13.6. **Knowledge Transfers** 13.6.1. Provide training for all users and IT Support of RSU. 13.6.2. Document handover: 13.6.2.1. Network Diagram 13.6.2.2. System Diagram 13.6.2.3. System Credentials 13.6.2.4. Network Topology and IP VLan 13.6.2.5. Application and system documentation 13.6.3. Prior to the project handover, the winning bidder must conduct a walk-through with university nominated personnel but limited to engineering and IT technical personnel. The intent primarily is to orient on the supplied equipment/devices, completed installations, equipment type, functionalities, basic operations & maintenance, and how these are integrated holistically. 13.7. **Testing and Commissioning Services** 13.7.1. The winning bidder shall be required to perform testing and commissioning. Minimum Scope of Services are as follows: 13.7.1.1. The winning bidder shall submit the testing Methods of Procedures (MoP) to RSU PMT prior to actual testing. 13.7.1.2. Perform actual testing as per Manufacturer prescribed testing methodologies. 13.7.1.3. Testing results must be documented and submitted to RSU PMT not later than 48 hours from completion of the testing activities. 13.7.1.4. Should there be failed testing, the winning bidder is given a maximum of 12 hours to troubleshoot or rectify the problem. Re-testing shall then be performed. After completion of the 2nd testing and such has failed anew, the winning bidder shall furnish RSU PMT with full report not more than 24		

		hours from the time failed testing has been declared, and must replace the defective hardware and/or software not more than fourteen (14) days from the date of completion of the failed testing. In case of longer replacement period, the winning bidder must inform RSU PMT in writing, stating the reasons thereof and arrival date. **14. Implementation Timeline** 14.1. Project implementation shall be within Three Hundred Thirty (330) calendar days from receipt of the Notice to Proceed (NTP). The winning bidder must complete and hand over the project within the prescribed implementation timeline. 14.2. Participating bidders are required to include in its bid submission a high-level Gantt Chart that will illustrate the project implementation schedule per WBS **15. Bidder Competency Requirements and Submittals** 15.1. The bid submission shall be in sufficient detail to show compliance with the Specification and shall include the following: 15.1.1. Statement of compliance, or otherwise, against the Specification for the System offered. 15.1.2. A detailed technical description of the proposed System, including all the equipment and software offered. 15.1.3.		
TOTAL			**1 Lot**	

Section VIII. Checklist of Technical and Financial Documents

Notes on the Checklist of Technical and Financial Documents

The prescribed documents in the checklist are mandatory to be submitted in the Bid, but shall be subject to the following:

a. GPPB Resolution No. 09-2020 on the efficient procurement measures during a State of Calamity or other similar issuances that shall allow the use of alternate documents in lieu of the mandated requirements; or

b. Any subsequent GPPB issuances adjusting the documentary requirements after the effectivity of the adoption of the PBDs.

The BAC shall be checking the submitted documents of each Bidder against this checklist to ascertain if they are all present, using a non-discretionary "pass/fail" criterion pursuant to Section 30 of the 2016 revised IRR of RA No. 9184.

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

(a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages) **in accordance with Section 8.5.2 of the IRR**;

Technical Documents

(b) Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid (present supporting documents such as notice of award and purchase order); **and**

(g) Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided for in Sections 23.4.1.3 and 23.4.2.4 of the 2016 revised IRR of RA No. 9184, within the relevant period as provided in the Bidding Documents (present supporting documents such as notice to proceed, acceptance and inspection report and delivery receipt); **and**

(h) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission **or** Original copy of Notarized Bid Securing Declaration; **and**

(i) Authority of signatory (if applicable); and

(j) Conformity with the Technical Specifications, which shall include production/delivery schedule, manpower requirements (which shall include deployment of certified computer engineers, at the minimum), and after-sales, parts, and services;

(k) Original duly signed Omnibus Sworn Statement (OSS) **and** if applicable, Original Notarized Secretary's Certificate in case of a corporation, partnership, or cooperative; or Original Special Power of Attorney of all members of the joint venture giving full power and authority to its officer to sign the OSS and do acts to represent the Bidder.

(l) Colored brochures of all equipment including racks and consoles.

(m) A Manufacturer's or Distributor's Certificate, or Authorization from the Manufacturer or Authorized Distributor of the Desktop, Network, and Server equipment, stating that the bidder is an authorized reseller, permitted to join the bidding and has validated the full solution of the project. The certification must also state that the manufacturer of the desktop, network and server is capable of providing support for the proposed solution which will be implemented in this particular project.

(n) A Manufacturer's or Distributor's Certification for the Servers, Storage, Networking, and Workstations.

(o) Certification that the bidder, manufacturer or distributor has a local spare parts warehouse in the Philippines.

(p) Certification from the Manufacturer or Authorized Distributor stating that the equipment supplied is not obsolete or shortly to be phased out of production.

(q) A working timeline including the periods of design and manufacture, delivery, installation, training, site acceptance testing, and commissioning.

(r) The participating bidder must include the following certifications in its bid submission:

r.1. Manufacturers or Distributor's Certificate or Authorization from the manufacturer or authorized distributor of the Desktop, Network, and Server equipment, stating that the bidder is an authorized reseller, permitted to join the bid and has validated the full solution of the project. The certification must also state that the manufacturer of the desktop, network and server is capable of providing support for the proposed solution which will be implemented in this particular project.

r.2. Manufacturers or Distributor's Certification for the Servers, Storage, Networking, and Workstations must:

r.3. Have local spare parts warehouse in Metro Manila

r.4. Have more than 10 years of business experience in the Philippines

r.5. The manufacturer and/or its authorized distributor must have certified engineers

r.6. Certification from the Manufacturer or Authorized Distributor stating that the equipment supplied is not obsolete or shortly to be phased out of production.

Financial Documents

☐ (s) Audited Financial Statements; and

(t) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC) **or A** Committed Line of Credit from a Universal or Commercial Bank in lieu of its NFCC computation.

Class "B" Documents

☐ (u) If applicable, a duly signed joint venture agreement (JVA) in case the joint venture is already in existence **or** duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.

II. FINANCIAL COMPONENT ENVELOPE

☐ (v) Original of duly signed and accomplished Financial Bid Form; **and**

☐ (w) Original of duly signed and accomplished Price Schedule(s).

Additional Requirement: Letter of Intent


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