TERMS OF REFERENCE

FOR THE PROCUREMENT AND IMPLEMENTATION OF THE DESIGN AND BUILD SCHEME INFRASTRACTURE PROJECT FOR THE **CONSTRUCTION OF TWO – STOREY DATA CENTER** OF ROMBLON STATE UNIVERSITY-MAIN CAMPUS, LIWANAG, ODIONGAN, ROMBLON.

I. BACKGROUND

The Romblon State University through the approved allocation for Capital Outlay 164 under Fiscal Year 2022 General Appropriation Act intends to apply the sum of Fifteen Million Pesos (Php 15,000,000.00) being the approved budget for the procurement and implementation of the project **"Construction of Two–Storey Data Center"** utilizing the Design and Build Scheme with the project duration of **104 calendar days.**

II. PROJECT DESCRIPTION AND LOCATION

The project will involve the Design and Build Scheme leading to the proposed Construction of Two-Storey Data Center of Romblon State University, Odiongan, Romblon pursuant to the technical specifications indicated in this Terms of Reference, and the RSU System Building Standards and Specifications, enclosed herein.

The building will be located within the Romblon State University – Main Campus compound particularly at the upper part of the campus. (Please refer to the TOR drawings and Site Development Plan)

The project will have an Approved Budget for the Contract (ABC) of Fifteen Million Pesos (Php 15,000,000.00) including all taxes and applicable permits, licenses, and clearances, for the project mentioned above.

III. CONCEPTUAL DESIGN

A. The Construction Project- Design and Build Scheme

Construction of Two–Storey Data Center

The building design shall conform to the provisions of the National Building Code of the Philippines (PD 1096), Accessibility Law (BP 344), National Structural Code of the Philippines, Electrical Engineering Law (RA 7920), Mechanical Engineering Law (RA 5336), Plumbing Code (RA 1378, 1993-1994 Revisions), Fire Code (RA 9514) and other laws and regulations covering environmental concerns and local ordinances and regulations.

Site Development

The proposed building shall include provision for two-lane access roads based on the Standards of the NBCP and DPWH, stone masonry embankment, stormwater drainage canal. **(Please refer to the attach Site Development Plan map on Annex D)**

Proposed Building

The proposed Data Center shall be a highly-secured facility that will house the university-wide data server and has provision for 3rd floor level (for phase II).

The Proposed Data Center must be finished and functional. Its design must be minimalist modern. There should be a provision for the separated support structure for powerhouse in the rear side of the proposed Data Center. The structural layout should have a provision for Roof Slab. (Please refer to the architectural design concept)

Ground Floor Spaces

The Entrance Walk will be located at the rightmost part of the front façade with a 3500 mm set back from the front side of the Building Footprint. The flooring will be set by 600mm x 600mm concrete-like matt finish tiles.

The Lobby will be located inside the building adjacent to the **Receptionist**. The flooring will be set by 600mm x 600mm concrete-like matt finish tiles. (Please refer to the architectural design)

The Receptionist will be located before entering the Network Operation Center. There will be a reception desk counter with 1100mm height with a semi-gloss concrete texture. The space will have a direct access to the **Staff Pantry** through the seamless door within the backdrop made of wood texture matt finish. (Please refer to the architectural design)

The Staff Pantry with Common toilet will be located at the rear side of the building. The pantry will have a kitchen sink/ counter with 1200 mm length x 600 mm width and 850 mm height. The space will also have a **Common Toilet** with a clear dimension of 1500 mm width x 2300 mm length exclusively for the Staff within the building with provision conforming to BP 344 (Accessibility Law). (Please refer to the architectural design)

The Common Toilet will be located at the rear of the **Staff Common Toilet** inside the **Staff Pantry** with a clear dimension of 1500 mm width x 2300 mm length with provision conforming to BP 344 (Accessibility Law). The flooring will be 300 mm x 300 mm grayish-tone matt tiles with slip-resistant property while the walls will be set in a semi-gloss 300 mm x 300 mm white tiles. There will be an exhaust- ventilation 600 mm x 1200 mm awning window. (Please refer to the architectural design)

The Network Operation Center (NOC) will be accessible only through the entering the **Receptionist.** The space will be isolated with tinted glass wall and installed with 300 mm height luminated room tag "2F" AND 150 mm height "DATA CENTER NOC**".** The main staircase going to the third floor will be located inside the **NOC.** The structure of the staircase will concrete and set with 600 mm x 600 mm concrete-like matt finish tiles with built – in slip resistant and 1100 mm height glass railings. (Please refer to the architectural design)

Second Floor Spaces

The Working Station will be openly accessible from the landing. There will be an emergency exit door with built-in panic hardware located at the rear part of the area. The flooring will be set by 600 mm x 600 mm concrete – like matt finish tiles. (Please refer to the architectural design)

The Control Room will be adjacent to the **Working Station** with a full-length tinted glass wall partition**.** The Control Room will be the only access towards the **Server Room.** The flooring will be set by 600 mm x 600 mm concrete – like matt finish tiles. (Please refer to the architectural design.

The Server Room will be highly secured space. There will be no openings other than the main door and fixed see-through window from the **Control Room.** It will have its raised floor system, all utility wiring such as electrical wiring, data and telecoms wiring, security wiring and HVAC/air conditioning system will be hidden in the under-floor space. **Floor System will be set with perforated panels** to easily provide an air ventilation system. The room will be protected from any water-carrying lines. No water should enter the **Server Room**.

Separate Structure for Powerhouse

The Powerhouse will be located at the rear side of the proposed Data Center building. It will house the Gen Set, Airconditioning Unit and other utility control. The entrance is secured with 2 door louver type with enough working / maintenance space for switchgears, generator and transformer. With appropriate ventilation and illumination level. Dry type fire protection must also be present.

Space	Quantity	Floor Area (sqm)	Total Floor Area (sqm)
Ground Floor Level			

PWD Ramp	1	19.5	19.5
Entrance Walk	1	17.375	17.375
Lobby	1	35.55	35.55
Receptionist	1	25.075	25.075
Public Common Toilet Room	1	3.6432	3.6432
Pantry	1	12.10618	12.10618
Staff Common Toilet Room	1	5.02205	5.02205
Network Operation Center with Main Staircase (1st to roof slab)	1	27.85	27.85
Void (under the Emergency Exit Stairs)	1	13.40388	13.40388
Total Area: 159.5			
Second Floor Level			
Working Station	1	52.10163	
Control Room	1	19.325	
Server Room	1	41.76563	
Emergency Exit Staircase (1st to roof slab)	1	13.40388	52.10163
Total Area: 126.6			
Separated Powerhouse			
Power House	1	36	13.40388
Total Building Floor Area: 322.1 sqm			

General and Specific Objective:

- To house and secure the main server equipment and services of the Data Center.
- To accommodate the technical staff and its working duties within the parameter of the functions of the Data Center.
- To establish a base ground location for the centralization of function of the Data Center

B. DETAILED DESIGN

Preparation of the following Detailed Design Drawings (see RSU Checklist of Drawings Requirements) based on the approved Design Development Drawings and Design Parameters including any revisions and refinements as approved and required by RSU.

a. Detailed Architectural Plans (refer to Checklist of Drawings Requirements and Design Parameters). **Note: The Architectural Design provided by the procuring entity must not be altered.**

b. Detailed Structural Plans (refer to Checklist of Drawings Requirements and Design Parameters).

c. Detailed Electrical Plans (refer to Checklist of Drawings Requirements and Design Parameters).

d. Detailed Audio/system Plans (refer to Checklist of Drawings Requirements and Design Parameters).

e. Detailed Storm Drain, Sanitary and Plumbing Plans, Grease Trap (refer to Checklist of Drawings Requirements and Design Parameters). Sanitary and plumbing plans must integrate with the sewage system to be built as specified in the TOR of Project C, SITE DEVELOPMENT PHASE II (SEWAGE TREATMENT PLANT, PRIMARY SEWER LINES, AND SLOPE PROTECTION).

f. Detailed Mechanical Plans (refer to Checklist of Drawings Requirements and Design Parameters).

g. Structural Computations, including Soil Boring Test Results and Seismic Analysis and Electrical Design Computations.

h. General Notes and Technical Specifications describing type and quality of materials and equipment to be used, manner of construction and the general conditions under which the project is to be constructed.

i. Detailed Bill of Quantities, Cost Estimates including a summary sheet indicating the unit prices of construction materials, labor rates and equipment rentals.

j. Summary of Works

Note: The detailed design will be submitted by the winning bidder.

IV. SELECTION OF DESIGN AND BUILD CONTRACTOR

The procurement and implementation of the project using the "Design and Build" scheme shall be under the provision of RA 9184; specifically; its **ANNEX G**. Bidding process shall be conducted by the Bids and Awards Committee (BAC) to be assisted by the TWG. The Romblon State University Administration shall create the Design and Build Committee (DBC) composed of highly technical personnel in architecture and engineering/construction. The DBC and TWG shall prepare the design brief and performance specifications and parameters, review the detailed engineering design, and assist the BAC in evaluating technical and financial proposals according to the criteria set.

A. Eligibility Requirements

The eligibility requirements in the Design and Build for infrastructure projects shall comply with the applicable provisions of Section 23-24 of the IRR of RA 9184.

a. Eligibility Documents

Class "A" Documents

- *Legal Documents*
  - i. PhilGEPs Certificate of Registration and Membership as per Section 8.5.2 of the IRR of RA 9184.
  - ii. Registration from the Securities and Exchange Commission (SEC), Department of Trade and Industry (DTI) for a sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives;
  - iii. Mayor's permit issued by the city or municipally where the principal of business of the prospective bidders is located;
- *Technical Documents*

iv. Statement of all its ongoing and completed government and private contracts within ten (10) years from the submission of bids
v. CPES rating or
vi. Certificate of Completion
vii. Single Largest Completed Contract (SLCC)
viii. PCAB licenses and registration for the type and cost of the contract for this project (Small B – License Category C & D) and contractor's registration certificate from DPWH'

- *Financial Document*
  ix. Audited financial statement, stamped "received" by the BIR for the preceding calendar year;
  x. Tax Clearance
  xi. Net Financial Contracting Capacity (NFCC) computation.

Class "B" Documents

a. Joint Venture Agreement, if applicable

Each joint venture partner shall submit their respective PhilGEPS Certificates of Registration per Section 8.5.2 od RA 9184. The submission of the technical and financial eligibility documents by any joint venture partners constitutes compliance: Provided, that the partner is responsible for submitting the NFCC shall likewise submit the statement of allot its ongoing contracts and Audited Financial Statements.

- *Technical Documents*
  i. Bid Security (in any form)
  ii. Project Requirements
    - Design and Construction Method
    - Value engineering analysis of design and construction methods. Prospective bidders shall prepare a value engineering analysis report of their proposed design and construction method to be applied for the PROJECT. Importance shall be made on the following criteria:
    - Cost – saving measured on a per square meter average figure
    - Time – saving in design and construction duration was measured using the project's HOPE – approved PERT CPM.
    - The operational efficiency of the natural lighting and ventilation in some areas and toilets
    - Organizational Chart
    - List of Contactor's Personnel with complete qualification and experience data
    - List of Contactor's Equipment units, owned, leased, and under purchase agreements, supported by a certification of equipment available from the equipment lessor/vendor for the project's duration
    - Manpower Schedule
    - Equipment Utilization Schedule
    - Bar Chart and S -Curve
    - Construction Safety and Health Program
    - PERT – CPM
    - Omnibus Sworn Statement

Financial Component

i. Financial Bid Form
ii. Bill of Quantities
iii. Detailed Cost Estimates

iv. Summary Sheet indicating the unit prices of materials, labor rates, and equipment rental
v. Payment Schedule

Additional Requirements

An Authorized Representative must present;

i. Authorized letter/Special Power of Attorney
ii. Letter of Intent

B. Eligibility Criteria

a) The eligibility of design and build contractors shall be based on the legal, technical, and financial requirements above – mentioned. As included in the technical specifications, the design and build contractor (as solo or in joint venture/ consortia) should comply with the experience requirements under the IRR of RA 9184. One of the parties (in a joint/consortium) should have at least one similar project, both in design and construction, with at least 50% of the Approved Budget for the Contract (ABC) in the last five (5) years.
b) If the bidder has no experience designing and building projects on its own, it may enter into joint ventures with design or engineering firm for the design portion of the contract.
c) It shall observe the relevant provision under Section 23.5.2 of the IRR of RA 9184 on eligibility requirements.

V. FOR DESIGN PERSONNEL

For the Pre-Detailed Design and Detailed Design Portion of the contract, the bidder is required to provide the minimum number if professionals as shown below:

1. **Design/Principal Architect**
   a. Licensed Architect
   b. Preferably at least five (5) years of experience in the design of residential, academic or institutional facilities, and shall preferable be knowledgeable in applying Green Design Technology in school construction. Proficient in AutoCAD software
2. **Structural/Civil Engineer**
   a. Licensed Structural/Civil Engineer
   b. Preferably at least five (5) years of experience in structural design and shall be knowledgeable in applying Green Design Technology in school construction.
   c. Proficient in Design and AutoCAD software
3. **Electrical Engineer**
   a. Licensed Professional Electrical Engineer (PEE)
   b. Preferably at least five (5) years of experience in lighting design power distribution, preferably knowledgeable in emergent, alternative lighting technologies and energy management developments.
   c. Proficient in Design and AutoCAD software
4. **Mechanical Engineer**
   a. Licensed Professional Mechanical Engineer (PME)
   b. Preferably at least five (5) years of experience in HVAC and fire protection system and preferably knowledgeable in emergent, alternative energy – efficient HVAC technologies
   c. Proficient in Design and AutoCAD software
5. **Sanitary Engineer**
   a. Licensed Sanitary Engineer
   b. Preferably at least five (5) years of experience in the design of building water supply and distribution, plumbing, and preferably knowledgeable in wastewater

management/treatment, and emergent, alternative effluent collection and treatment systems, and DENR AO 36 s. 2004 (DAO 92-29 "Hazardous Waste Management).

c. Proficient in Design and AutoCAD software

6. **Electronics Engineer**
   a. Licensed Professional Electronics Engineer (PERE)
   b. Preferably at least five (5) years of experience in design of the network and structured cabling systems, Fire Detection and Alarm System (FDAS), and Closed Circuit Television (CCTV) System.
   c. Proficient in Design and AutoCAD software
7. **CADD Operator** (preferably one for Architecture and one for each engineering specialty)
   a. At least Bachelor's Degree in Architecture or Engineering
   b. Proficient in Design and AutoCAD software
8. Other personnel as required for the project

   The key professionals listed are required. The Design and Build Contractor may as needed and its own expense, add additional professionals and/or support personnel for the optimal performance of all Architectural and Engineering Design Services, as stipulated in these Terms of Reference for the PROJECT. Prospective bidders shall attach each individual's resume and PRC license of the (professional) staff.

VI. CONSTRUCTION PERSONNEL

I. CONSTRUCTION PERSONNEL

The key professionals and the respective qualification of the CONSTRUCTION PERSONNEL, shall be as follows:

A. Project Manager
   a. Licensed architect or engineer
   b. Preferably at least five (5) years relevant experience on similar and comparable projects in different locations
   c. Proven record of managerial capability through the directing/managing of major civil engineering works, including projects of a similar magnitude.

C. Project Engineer/ Architect
   a. Licensed architect or engineer
   b. Preferably at least five (5) years of experience on similar and comparable projects
   c. Knowledgeable in the application of rapid construction technologies.

D. Materials Engineer
   a. Duly accredited Material Engineer
   b. Preferably at least five (5) years of experience on similar and comparable projects
   c. Knowledgeable in the application of rapid construction technologies.

E. Electrical Engineer
   a. Registered Electrical Engineer
   b. Preferably at least five (5) years of experience in lighting design, power distribution
   c. Knowledgeable in development in emergent efficient lighting technologies and energy management.

F. Mechanical Engineer
   a. Duly – license Mechanical Engineer
   b. Preferably at least five (5) years of experience in similar and comparable projects in installing HVAC and fire protection

G. Sanitary Engineer
   a. Duly – license Sanitary Engineer

b. Preferably at least five (5) years of experience in similar and comparable projects in installing water supply, distribution, and plumbing.

H. Electronics Engineer
   a. Registered Electronics Engineer
   b. Preferably at least five (5) years of experience installing network cabling systems and structured cabling, FDAS, and CCTV systems.

I. Foreman
   a. Preferably at least five (5) years of experience in similar and comparable projects and preferably knowledgeable in applying Green Building technologies.

J. Safety Officer
   a. Accredited safety practitioner by the Department of Labor and Employment (DOLE) has undergone the prescribed 40-hour Construction Safety and Health Training (COSH).

K. First Aider
   a. Must completed the (4) four-day Occupational First Aid Training with BLS CPR AED in compliance to DOLE Requirements DO No. 198-18 and Do No. 235-22

L. Welder
   b. Preferably at least five (5) years of experience in similar and comparable projects and preferably knowledgeable in applying Green Building technologies.
   c. Certified NCII, SMAW or TIG Welder

The above key personnel listed are required. The DESIGN & BUILD CONTRACTOR may, as needed and at its own expense, add additional professionals and/or support personnel for the optimal performance of all Construction Services, as stipulated in these Terms of Reference, for the Project. Prospective bidders shall attach each individual's resume and PRC license of the (professional) staff, proof of qualifications, and related documents as necessary.

Note: Please seek signed approval to the Procuring Entity for changes in key personnel.

VII. PRELIMINARY DESIGN AND CONSTRUCTION STUDIES

The bidder shall represent that:

1. He has thoroughly review and understand all the bid documents, and his bid will be in accordance there with.
2. His bid is based upon the conditions and requirements of the bid documents without exception.
3. He has visited and inspected the Site of Works and its surroundings. Satisfied himself as to all matters on the project, including the following: location and the nature of the work; climatic conditions; the nature and condition of the terrain; geological condition at the sites; transportation and communication facilities; the requirement and the availability of materials, labor, water, electric power and roads; the location and extent of aggregate sources, and other factors that may affect the cost, duration, and execution of the work; that he has determined the general characteristics of the project and the conditions indicated above. (*Please Refer to **ANNEX D**: PRELIMINARY SURVEY AND MAPPING and **ANNEX F**: UTILITY LOCATIONS).*
4. Utilize the existing geotechnical/soil investigation report as the basis for the computation of structural analysis of the building. *(Please Refer to **ANNEX E**: PRELIMINARY INVESTIGATION – Foundation Design and Recommendations)*
5. He familiarized himself with all the conditions that may affect the contract work's implementation of estimated available and needed facilities for the project. Where required, design components shall be designed in coordination with the agencies concerned (e.g.,

coordinate with the electric company for power lines and the concerned company/agency for water and sewage lines).

6. He is aware that Romblon State University shall not assume any responsibility regarding erroneous interpretations from any data furnished by the University.
7. He familiarized himself with all laws, decrees, and regulations of the Philippines, RSU, and the local government where the campus is located, which affect or apply to the operations and activities of the Designer.
8. He is aware that the design period of the project shall be the first fourteen (14) calendar days reckoned from the date of the NOTICED TO PROCEED, excluding the days spent for the approval of the detailed architectural and engineering design, and the design and construction period shall be 104 calendar days.
9. No bidding and award of Design and Building contracts shall be made unless the required preliminary design and construction studies have been sufficiently carried out and duly approved by the Head of the Procuring Entity that shall include, among others, the following:
    - **Project Description** – included in ITEM II: Project Description and Location
    - **Conceptual Design** – attached in ANNEX A
    - **Performance Specifications and Parameters** – attached in ANNEX C
    - **Preliminary Survey and Mapping** – Attached in ANNEX D
    - **Preliminary Investigations** – Attached in ANNEX E
    - **Utility Location** – Attached in ANNEX F
    - **Approved Budget for the Contact** – included in ITEM XV
    - **Proposed Design and Construction Schedule** -Attached in ANNEX G
    - **Minimum requirements for a Construction Safety and Health Program for the project** – Refer to ANNEX F
    - **Tender/Bidding Documents**, including Instructions to Bidders and Condition of Contract

10. The Contractor shall submit a detailed program of work within fourteen (14) calendar days after the issuance of the Notice to proceed for approval by the Procuring entity that shall include, among others:
    - The order in which it intends to carry out the work including anticipated timing for each stage of design /detailed engineering and construction
    - Periods for review of specific outputs and any other submissions and approvals
    - The sequence of timing for inspection and test;
    - General description of the design and construction methods to be adopted;
    - Number and names of personnel to be assigned for each stage of the work;
    - List of equipment required on – site for each stage of the work; and
    - The descriptions of the Quality Control System to be used for the proposed project.

The above data are for reference only. The procuring entity does not guarantee that these data are fully correct, up to date, and applicable to the project at hand. The contractor is responsible for the accuracy and applicability of all data, including the above, that it will use in its design and build proposal and services.

The acquisition of right-of-way and the conduct of eminent domain proceedings shall still be the responsibility of the procuring entity, which shall include a preliminary budget for this purpose.

VIII. DETAILED ENGINEERING REQUIREMENT

- Upon awarding the design and build, the winning bidder shall be responsible for preparing and submitting all necessary detailed engineering investigations, surveys, and method according to the Term of Reference.

- The procuring entity shall include all the necessary schedules concerning the detailed engineering design's submission, confirmation, and approval. It shall consist of the details of the construction methods in the contract documents.
- The procuring entity shall review, order rectification, and approve or disapprove for implementation only – the submitted plans within these schedules. All instructions for rectification shall be in writing, stating the reasons for such rectification. The design and build contractor shall be solely responsible for the integrity of the detailed engineering design and the performance of the structure irrespective of the approval/confirmation by the procuring entity.

IX. SCOPE OF WORKS AND PROJECT IMPLEMENTATION

A. DESIGN

1) From the approved schematic design document, the contractor must prepare the following: prepare the complete construction drawings and detailed technical specifications; detailed engineering estimates and the bill of quantities; setting forth in detail the work required for the architectural, structural, civil, landscape architecture, electrical, plumbing/sanitary, mechanical and other service – connected equipment; utilities; site planning aspects and related works; electronic and communications and the site development plan of the PROJECT's immediate environs.

2) Prepare layouts, specifications, and estimates of all furniture and equipment required for the fit out of the building.

3) Prepare the scope of work for construction based on the prepared bill of quantities and cost estimate while fitting the approved budget.

4) Provide value engineering analysis on all prepared construction documents.

5) Prepare Material specifications to be used in the PROJECT

B. PRE – CONSTRUCTION

1. Secure all necessary building permit prior to construction. It shall include all incident fees in the cost estimate of the building.

2. Prepares PERT – CPM for the construction phase.

3. Provides all other necessary documents that D&B Committee shall require.

C. CONSTRUCTION PHASE

a. Implements all works indicated in the approved construction drawing and document. All revisions and deviations from the approved plans, significantly impacting the project's overall cost, shall be subject to approval.

b. In response to the results of soil and materials testing, the contractor must provide soil filling, grading and other soil protection measures of the building and other elements of the site,

c. Constructs the building, complete with utilities and finishes, resulting in operable and usable structures.

d. The contractor must provide protection or relocation of existing trees indigenous to the area and properly remove and replace all introduced trees and vegetable affected by the construction.

e. The contractor must provide layouts, piping, conduits, manhole, boxes and other lines for utilities, including tapping to existing utility lines. Facilitate the connection of all utilities (power, water, sewer, structured cabling, and telephone) with their corresponding utility companies.

f. The contractor must install fire protection system and fixtures, fire extinguishers, emergency lights, and lighted fire exit signs.

g. The contractor must prepare shop drawing for approval.

h. Coordinates with the D & B Committee regarding the scheduling of delivery and installation of all owner-furnished materials and equipment during construction.
i. Conducts all necessary tests (required by the D & B Committee) and issues results reports.
j. The contractor must submit materials, products, specifications, and sample for approval using material submittal form as the build and design committee requires.
k. Rectifies punch – listing works to be inspected and issued by the D & B Committee and/or the End- user.
l. Complies with DOLE – OSH requirements and submits periodic reports concerning occupational safety and health. (Please Refer to ANNEX F: MINIMUM REQUIREMENTS FOR A CONSTRUCTION SAFETY AND HEALTH PROGRAM)
m. Provides all other necessary documents that the D & B Committee shall require.
n. The contractor must submit Bill Certificates of all reinforcement steel bars to be used and Concrete Cylindrical Test Reports of all concrete structural components.

D. POST CONTRUCTION PHASE

a) Prepares as built plans
b) Turn overs of all manuals, certificates, and warranties of installed items.
c) Secures building certificate of occupancies and fire safety inspection certificate
d) Site Clearing – upon completion of the works, immediately clear the site and remove all plans, supplies, materials, rubbish, and temporary facilities.
e) Turn overs of all material purchases catalogs.

F. DEFECTS AND LIABILITY

a) These design and build projects shall have a minimum Defects Liability Period of one (1) year after contract completion or as provided for in the contract documents. This statement is without prejudice to the liabilities imposed upon the engineer/architect who drew up the plans specifications for buildings sanctioned under Section 1723 of the New Civil Code of the Philippines.
b) In accordance with Section 62.2.3.2 of the IRR (RA 9184), the contractor shall be held liable for design, structural defects, and/or failure of the completed projects within the warranty period of 15 years (permanent structures/buildings)

X. OVERALL PROJECT TIME SCHEDULE

The DESIGN & BUILD CONTRACTOR shall propose the most reasonable time schedule for the completion of the project. It is expected that this period will not exceed 360 calendar days from the date of the issuance of the Notice to Proceed (NTP): Fourteen (14) calendar days for the Design Phase and Ninety (90) calendar days for the Construction Phase.

XI. THE IMPLEMENTING AGENCY'S GENERAL RESPONSIBILITY

The implementing agency for the project is the University President with final approval for all decisions and actions through the Design and Build Committee. The D&B Committee shall:

a) Prepare the design brief for the project in accordance with the conditions and design criteria enumerated in the Terms of Reference.

b) Coordinate with DESIGN & BUILD CONTRACTOR, and the University President with regards to the design and implementation of the project.

c) Assist in the coordination of the DESIGN & BUILD CONTRACTOR with various utility agencies during the detailed design and implementation phases of the project.

d) Conduct regular coordination meetings between the DESIGN & BUILD CONTRACTOR and Romblon State University to facilitate the implementation of the project.

XII. THE DESIGN & BUILD CONTRACTOR'S GENERAL RESPONSIBILITY

i The DESIGN & BUILD CONTRACTOR shall certify that he has, at his own expense, inspected and examined the proposed project site, its surroundings and existing infrastructure and facilities related to the execution of the work and has obtained all the pieces of information that are considered necessary for the proper execution of the work covered under these Terms of Reference.

ii The DESIGN & BUILD CONTRACTOR shall ensure that all works at the stages of design, construction, restoration of affected areas, and testing and commissioning shall be carried out efficiently and effectively.

iii The DESIGN & BUILD CONTRACTOR shall provide Romblon State University with complete reports such as technical analysis, maps and details regarding the existing conditions and proposed improvements within the site.

iv The DESIGN & BUILD CONTRACTOR shall consider the academic calendar and critical dates and occasions within Romblon State University, in order to align his work schedule with the academic calendar of the school to avoid unnecessary disruption of school activities due to construction activities such as closure of water and power supply and non-usage of the existing roads.

v The DESIGN & BUILD CONTRACTOR shall inform Romblon State University of critical events during construction, especially when such events can potentially disrupt school activities.

vi The DESIGN & BUILD CONTRACTOR shall be PCAB accredited and shall have a Construction Safety and Health Program approved by DOLE and designed specifically for the proposed Construction of Two-Storey Data Center.

vii The DESIGN & BUILD CONTRACTOR will be held accountable for accidents that might occur during the execution of the project. The DESIGN & BUILD CONTRACTOR is required to install warning signs and barriers for the safety of the general public and the avoidance of any accidents and provide appropriate and approved type personal protective equipment for their construction personnel.

viii The DESIGN & BUILD CONTRACTOR shall be professionally liable for the design and shall submit a signed and sealed copy of the approved construction documents to form part of the Contract Documents.

ix Only the plans approved by the Head of Procuring Entity (HOPE) shall be signed and sealed by the DESIGN & BUILD CONTRACTOR, and thereafter shall be the plans used for construction.

x All works designed and constructed should be guaranteed to seamlessly fit into the overall system general design standards of Romblon State University.

XIII. PROJECTED SUBMITTALS DURING THE PROJECT

The following submittals and accomplished documents shall be duly completed and turned-over by the DESIGN & BUILD CONTRACTOR for the project:

A. FOR THE DESIGN PHASE

Detailed Design Phase including review and approval by the Design and Build Committee (DBC), which should be completed within the first 30 Calendar Days from receipt of Notice to proceed which shall include the submission of the following:

a) Construction plans (signed and sealed) that include Architectural, Civil, Structural, Electrical, Structural Cabling, Mechanical, Fire Protection and Plumbing programs (9 sets hard copy and soft copy) – please refer ANNEX B: CHECKLIST OF DRAWING REQUIREMENTS
   - Detailed Architectural Plans (refer to ANNEX – B Checklist of Drawing Requirements & ANNEX C: Performance Specification and Parameters)
   - Detailed Structural Plans (refer to ANNEX – B Checklist of Drawing Requirements & ANNEX C: Performance Specification and Parameters)
   - Detailed Electrical Plans (refer to ANNEX – B Checklist of Drawing Requirements & ANNEX C: Performance Specification and Parameters)
   - Detailed Storm Drain, Sanitary, and Plumbing Plans (refer to ANNEX – B Checklist of Drawing Requirements & ANNEX C: Performance Specification and Parameters)
   - Detailed Mechanical Plans (refer to ANNEX – B Checklist of Drawing Requirements & ANNEX C: Performance Specification and Parameters)
   - Detailed Material Specification

b) Structural Computations, including Soil Boring Test Result and Seismic Analysis and Electrical Design Computation.

c) General Notes and Technical Specifications describe the type and quality of materials and equipment used, the manner of construction, and the general conditions under which the project is to be constructed. (9 sets hard copy and soft copy)

d) Detailed Bill of Quantities, Cost Estimates including a summary sheet indicating the unit prices of construction materials, labor rates, and equipment rentals (9 sets hard and soft copy)
   - Site survey, topographic survey, survey of existing trees, and all other pertinent data related to the conditions of the project site
   - Documents required for securing the Building Permit
   - Drawings and reports that the D & B Committee may require periodic updates concerning the status of the design phase.
   - Summary of Works.

Note: The Prospective bidder must present their Design based on the concept of the Procuring Entity. The Design of the Procuring Entity is for reference purposes only. Non – compliance with all the requirements indicated in this Terms of Reference will be subject to the failure or disqualification of the Prospective bidder.

B. FOR THE CONSTRUCTION PHASE (9 copies each)
- All necessary permits (including fees)
- Shop drawings (hard and soft copy)
- PERT – CPM
- Test results
- Guarantees, warranties, and other certificates
- Fire and Life Safety Assessment Report 2 and 3 (FALAR 2 and 3)

C. FOR THE POST – CONSTRUCTION PHASE (9 copies each)
- As built plans (hard and soft copy)
- Certificate of Occupancy

- Fire Safety Inspection Certificate
- All other necessary documents to be required by D & B Committee

All drawing included in the contract documents should be drawn using CAD software and plotted on 20”x30” sheets and A3 size. All other textual submittals shall be printed, and ring bound on A4 sized sheets.

XIV. CODES AND STANDARDS

The project shall be designed, engineered, installed, tested, commissioned and handed over inconformity with the Building and Design Standards of the PSHS System and with the latest editions of the National Building Code of the Philippines, the National Structural Code of the Philippines, the Philippine Electrical Code, Philippine Mechanical Code, the National Plumbing Code of the Philippines, National Fire Code of the Philippines and other relevant codes and standards.

XV. INSTALLATION AND WORKMANSHIP

The Design and Build Contractor personnel should be specialists highly skilled in their respective trades, performing all labor according to first – class standards. A full – time Project Engineer/Architect and Construction Safety Engineer shall be assigned by the Design & Build Contractor at the job site during the project’s construction.

Tapping for utilities (e.g., power supply, water supply, and sewage drainage) shall be coordinated with their respective utilities/service provider. Also, all works involved, including access to utility tapping points, excavation, removal of obstructions, concrete breaking, backfilling, and restoration of affected areas, shall be coordinated and included in the project’s scope of work and cost.

XVI. MATERIALS

All materials and equipment shall be standard products of manufacturers engaged in producing such materials and equipment and shall be the manufacturer’s latest standard design. The materials shall be delivered and turn-over in good condition and complete.

All materials shall include conformance with the latest standards and with inspection and approval from the D & B Committee. The contractor shall submit a sample of materials and its catalog for approval.

XVII. MODE OF PAYMENT

A. The Romblon State University shall pay the winning DESIGN & BUILD CONTRACTOR progress payments based on billings for actual works accomplished, as certified by D & B Committee of the RSU System. In no case shall progress billing be made more than once every thirty (30) calendar days. Materials or equipment delivered on the site but not completely put in place or used in the project shall not be included for payment.

B. Progress payments are subject to retention of ten percent (10%) referred to as the "retention money." Such retention shall be based on the total amount due to the contractor prior to any deduction and shall be retained from every progress payment until fifty percent (50%) of the value of works, as determined by the procuring entity, are completed. If, after fifty percent (50%) completion, the work is satisfactorily done and on schedule, no additional retention shall be made; otherwise, the ten percent (10%) retention shall be imposed.

C. The DESIGN & BUILD CONTRACTOR may request in writing which must be submitted to form part of the Contract Documents, for an advanced payment equivalent to fifteen percent (15%) of the total Contract Price. The advance payment shall be made once the DESIGN & BUILD CONTRACTOR issues its irrevocable standby letter of credit from a reputable bank acceptable to the RSU System, or GSIS Surety Bond of equivalent value, within fifteen (15) days from the signing of the Contract Agreement to cover said advanced payment.

First Payment/Billing shall have a accomplishment of at least 20% of the construction phase.

The following documents must be submitted to the Design and Build Committee before processing of payments to the DESIGN & BUILD CONTRACTOR can be made:

- Progress Billing
- Detailed Statement of Work Accomplished (SWA)
- Request for payment by the DESIGN & BUILD CONTRACTOR
- Pictures/photographs of original site conditions (for First Billing only)
- Pictures/photographs of work accomplished
- Payment of utilities (power and water consumption)
- DESIGN & BUILD CONTRACTOR's affidavit (if accomplishment is more than 60%)
- Mill certificate and test report on cylindrical concrete sample.

*Note: Please refer to **ANNEX "E"** OF THE 2016 IMPLEMENTING RULES AND REGULATIONS (IRR) OF REPUBLIC ACT (RA) NO. 9184 AND THE PHILIPPINE BIDDING DOCUMENTS FOR INFRASTRUCTURE PROJECTS.*

XVIII. APPROVED BUDGET COST

The total budget for the project involving the Design and Build Scheme for the proposed Construction of Two–Storey Data Center is Fifteen Million Pesos (Php 15,000,000.00)

Prepared by:

Mr. Zaldy F. Montoya
Chairman, Design and Build Committee

Ms. Hannah Faith P. Morta
Member, Design and Build Committee

Engr. Noel M. Tianga, Jr.
Member, Design and Build Committee

Engr. Alvin John D. Brecia
Member, Design and Build Committee

Engr. Bliven U. Garcia
Member, Design and Build Committee

Engr. Julie F. Fallaria
End User

Noted by:

Atty. Glenn Niño M. Sartillo
Chairman, Bids and Awards Committee

Approved by:

Merian P. Catajay-Mani, Ed.D, CESE
University President

ANNEX B - CHECKLIST OF DRAWINGS REQUIREMENTS AND DESIGN PARAMETERS

A. ARCHITECTURAL DESIGN PARAMETERS

I. Codes and Standards

The Architectural Works shall be in accordance with the following Philippine laws, Codes and Standards.

- Laws and Codes:
  1. National Building Code of the Philippines and its Latest and Amended IRR
  2. RA 9266 or Architectural Law and its Latest and Amended IRR
  3. BP 344 or Accessibility Law and its Latest and amended IRR
  4. AO 35,s. 1994 or, AO Pertaining to the Control of Radiation Hazards
  5. RA 9514 New Fire Code of the Philippines
  6. Existing Local Codes and Ordinances.
  7. And other Laws that applies to the projects
- Standards:
  1. Bureau of Product Standards (BPS)
  2. Underwriters Laboratory (UL)

II. Proposal should include the following:

- Perspective, Site Development Plan, Vicinity Map/Location Plan
- Floor Plans (scale 1:100 minimum) including proposed furniture layout
- Roof Plan/s showing downspouts (scale 1:100 minimum), including detail of gutter downspout, etc.
- Reflected ceiling plan/s (scale 1:100 minimum), including details
- Details of Stairs, fire escapes/exits, accessible ramps etc., in the forms of plans evaluation/section
- Details of Toilets (1:50m) including accessible toilets in the form of plans, evaluation/section
- Details of specialized design features (scale 1:50m) such as partitions cabinets, etc. and accessible design features (if applicable)
- Detail of typical bay section from ground to roof (scale 1:50m)
- Details of rooms (1:50m) in the form from floor to roof (scale 1:50m)
- Schedule of doors, gates emergency exits, etc., (scale 1:50m), including specifications for materials and hardware
- Schedule of windows (scale 1:50m) including specifications for materials and hardware
- Schedule of finishes for interior and exterior floors, walls ceilings
- Architectural Interior Design Technical Specifications
- Architectural Interior Design Scope of Works
- Architectural Interior Design Bill of Quantities
- Cost Analysis

B. STRUCTURAL/CIVIL WORKS DESIGN PARAMETERS

I. Codes and Standards

The Civil/Structural Design shall be in accordance with the following Philippine laws, Codes and Standards.

- Codes
  1. National Structural Code the Philippines (NSCP) 2015
  2. National Building Code of the Philippines and its Latest and Amended IRR
  3. Civil Engineering Law R.A. 544
  4. RA 9514 New Fire Code of the Philippines
  5. Accessibility Law
  6. Local Codes and Ordinances
  7. And other Laws that applies to the projects
- Standards
  1. Bureau of Product Standards (BPS)
  2. Philippine National Standards (PNS)
  3. DPWH Blue Book
  4. American Concrete Institute (ACI)
  5. American Society for Testing Materials (ASTM)
  6. American Welding Society (AWS)
  7. American Institute of Steel Construction (AISC)

II. Proposal should include the following:

- General Notes and construction Standards
- Site Development Plan
- Foundation Plan/s (scale 1:100m minimum)
- Floor Framing Plan/s (scale 1:100m minimum)
- Roof Framing Plan/s (scale 1:100m minimum)
- Schedule and Detail of Footings and Columns
- Schedule and Detail of Beams and Floor Slabs
- Details of Connections
- Details of Trusses
- Details of Stairs, Ramps, Fire Exits
- Other Spot Details
- Structural Analysis and Design (for 2 storey building and higher)
- Seismic Analysis
- Geotechnical Analysis
- Structural and technical specifications
- Structural Scope of Works
- Structural Bill of Quantities
- Cost Analysis

C. SANITARY/PLUMBING DESIGN

I. Codes and Standards

The Sanitary/Plumbing Design shall be in accordance with the following Philippine laws, Codes and Standards.

- Codes:
  1. National Building Code of the Philippines and its Latest and Amended IRR
  2. RA 9514 New Fire Code of the Philippines
  3. National Plumbing Code of the Philippines (NPCP)
  4. Sanitation Code of the Philippines
  5. Existing Local Codes and Ordinances
  6. And other Laws that applies to the projects
- Standards:

1. Bureau of Product Standards (BPS)
2. Philippine National Standards for Drinking-Water
3. Underwriters Laboratory (UL)
4. DOH National/Laboratory (NRL)
5. DOH Health Care Waste Management Manual
6. National Water Resources Board (NWRB)
7. National Plumbers Association of the Philippines (NAMPAP)
8. Philippine Society of Sanitary Engineers, Inc., (PSSE)

II. Proposal should include the following:

- General Notes and Legends
- Location and Site Plan
- Storm Drainage Layout (scale 1:100m minimum) including actual length of tapping line to Main Drainage line
- Water line Layout (scale 1:100m minimum) including actual length of tapping line from main water source when applicable
- Sewer line Layout (scale 1:100m minimum) including actual length of tapping line to septic tank or existing sewer line
- Isometric Layout, showing waterline, sewer line and drainage line
- Details Water Tank, Flow Diagram (scale 1:50m)
- Details of connections catch basins, downspouts, etc.
- Details of Septic Tank/Sewer Treatment Plant
- Design Analysis
- Sanitary Technical Specifications
- Sanitary Scope of Works
- Sanitary Bill of Quantities
- Cost Analysis

D. MECHANICAL WORKS DESIGN

I. Codes and Standards

The Mechanical Design shall be in accordance with the following Philippine laws, Codes and Standards.

- Codes:
  1. National Building Code of the Philippines and its Latest and Amended IRR
  2. RA 9514 New Fire Code of the Philippines
  3. Mechanical Engineering Code of the Philippines (ME Code)
  4. Existing Local Government Codes and Ordinances
  5. And other Laws that applies to the projects

- Standards:
  1. Bureau of Product Standards (BPS)
  2. Philippine National Standards (PNS)
  3. Underwriters Laboratory (UL) and Factory Mutual (FM)
  4. International Electro-Technical Commission (IEC) 1988
  5. National Fire Protection Association (NFPA)
  6. National Fire Protection Association (NFPA) 99 Standard for Health Care Facilities.
  7. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).
  8. Center for Disease Control and Prevention (CDC) Manual.

II. Proposal should include the following:

- General Notes and Legends, Site Development Plan, Location Plans
- Floor Plans/Isometric Drawings (scale 1:100n minimum) showing Ventilation and Air Conditioning Systems and other installations
- Floor Plan/s Isometric Drawings (scale 1:100m minimum) of Air Conditioning Systems and details
- Floor Plans/Isometric Drawings (scale 1:100m minimum) of Fire Suppression Systems, fire sprinkler system, wet standpipe, dry standpipe and other installation
- Details Water Tank, Flow Diagram (scale 1:50m) (Should be in Plumbing)
- Details of Firewater Supply System (scale 1:50m) (Confirm if water or CO2 sprinkling system)
- Technical Specification
- Mechanical Scope of Works
- Mechanical Bill of Quantities
- Cost Analysis

E. ELECTRICAL & AUXILLARY DESIGN PARAMETERS

I. Codes and Standards

The Electrical System Design Parameters shall be in accordance with the following Philippine laws, Codes and Standards.

- Codes:
  1. Philippine Electrical Code
  2. National Electrical Code
  3. RA 9514 New Fire Code of the Philippines
  4. National Building Code of the Philippines and its Latest and Amended IRR
  5. Existing Local Codes and Ordinances
  6. And other Laws that applies to the projects

- Standards:
  1. Bureau of Product Standards (BPS)
  2. Underwriters Laboratory (UL)
  3. National Fire Protection Association
  4. International Electro Technical Commission (IEC)
  5. Illumination Engineering Society (IES)
  6. National Electrical Manufacturer's Association (NEMA)

II. Proposal should include the following:

- General Notes and Legends
- Location and Site Plan
- Lighting Layout (scale 1:100m minimum) including details
- Power Layout (scale 1:100m minimum) including details
- Auxiliary System Layout (scale 1:100m minimum) including details (Telephone System with Intercom, WAN and LAN System, Fire Alarm System, Audio, Video and others)
- Schedule and Details of Loads
- Riser Diagram
- Other Detail
- Electrical Computation
- Design Analysis

- Electrical Technical Specifications
- Electrical Scope of Works
- Electrical Bill of Quantities
- Cost Analysis

F. FIRE PROTECTION DESIGN PARAMETERS

The Fire Protection System Design Parameters shall be in accordance with the following Philippine laws, Codes and Standards.

III. Proposal should include the following:

- General Notes and Legends
- Location and Site Plan
- Fire Protection Layout (scale 1:100m minimum) including details

ANNEX C – PERFORMANCE AND SPECIFICATIONS PARAMETERS

A. CONSTRUCTION REQUIREMENTS

General Requirements

Buildings proposed for construction shall comply with all the regulations and specifications herein, governing quality, characteristics and properties of materials, methods of design and construction, type of occupancy, and classification.

All other matters relative to the structural design of all buildings and other structures not provided shall conform with the provisions of the National Structural Code of Buildings, as adopted and promulgated by the Board of Civil Engineering pursuant to RA 544, as amended, otherwise known as the "Civil Engineering Law".

Construction Type

Type IV – The building shall be steel, iron, concrete, or masonry construction. The walls, ceilings, and permanent partitions shall be incombustible **2-fire – resistive construction**. *Except* for that, permanent non-bearing partitions of one-hour fire-resistive construction may use fire-retardant-treated wood within the framing assembly.

Category of Construction

Category 1 Essential Facilities – Public School Building.

Changes in Types

No revision in the type of construction shall be made. This revision would place the building in a different sub-type or type of construction unless such structure is made to comply with such sub-type of construction requirements. Except for that, the Building Official approves the changes upon showing that the new or proposed construction is less hazardous, based on the life and fire risk than the existing construction.

Construction Method

1. Technical personnel assigned to the project should be knowledgeable and responsible enough.
2. Shall establish the Project Supervision and hierarchy first.
3. Shall do Construction methods for each work indicated in the design.
4. The material shall pass the required specification.
5. Should do quality control on all work items as construction progresses.
6. Shall use Proper equipment for each work item.
7. Materials quantity shall be well provided. Scarcity of one material can be the basis of delay for each work that may affect other items' schedules.

Quality Control

Quality control works consist of all work elements carried out by the manager or those in his organization, which contribute to the quality of the organization's output. Quality Control procedures include:

Selection of Materials. Information regarding the source of the materials to the incorporated into the work may be represented by the following:

- Raw materials such as soil, sand, and bank or river gravel (with little or no processing)
- Materials that are processed without changing their properties, such as washed/manufactured sand, crushed rock, gravel, etc.
- Combination of materials that may be partly or totally manufactured (e.g., Bituminous and Portland cement concrete)

Handling and Storage of Materials. Materials should be placed in a safe place protected from contamination or the action of water to avoid damages. Protection of materials is significant and should be accessible to the project site.

Sampling Testing of Materials. All material for testing requires proper sampling. These are indicated in AASHTO and ASTM. Quality control also required proper testing, construction method, and workmanship.

Contractor's Material Engineer

Department Order 11 Series of 2017 requires the Contractor to provide minimum testing equipment in the technical component of the bid. The Materials Engineer must secure this, and his Contractor shall provide it.

Department Order 13, Series of 1987 states that the Material Engineer shall be in-charge in sampling the testing of the materials. He shall accompany him in the actual testing by the Government Materials Engineer or a representative of the implementing office who will witness their assurance.

Department Order 213, Series of 2004 states that the materials shall be tested prior to incorporating the works. The materials engineer shall ensure that the materials conform to the specifications and requirements of DPWH and should be used.

Primary Duties and Responsibilities of Contractor's Material Engineer

1. Responsible for the sampling, testing inspection, and submission of quality control report data.
2. Prepare design mixes for concrete.
3. Accomplish, update, and keep the test report records such as materials logbook.
4. Ensure that the samples are properly cured according to standard procedures.
5. Ensure that the field tests are adequately equipped so that the process of work will not be impeded by laboratory testing, and non-performance of the test should not be the cause of delay in project implementation.
6. Recommended whether the quality of materials used in the project is acceptable and passes the requirement of DPWH standard Specifications (Volumes 2 and 3).
7. Recommended corrective and remedial measures to improve the quality and correct the unsatisfactory condition of materials.
8. Recommended corrective measures to improve the quality of completed works.
9. Recommend the acceptance of the completed works as well as advise the Project Engineer (Government or Contractor's side)

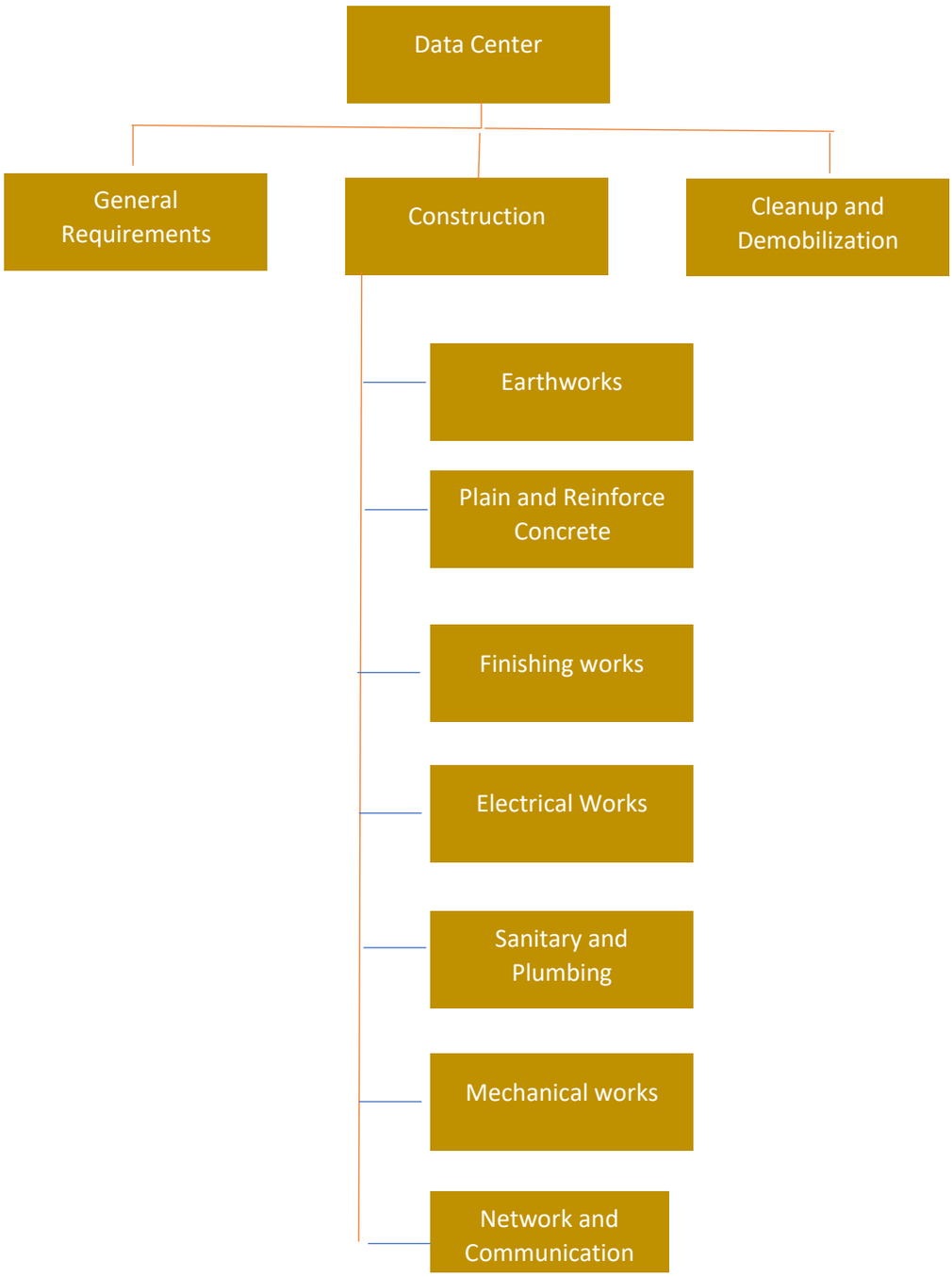
Fire – Resistive Requirements in Construction

All materials of construction and assemblies or combinations therefor shall be classified according to their fire-retardant or flame-spread ratings as determined by generally accepted testing methods.

Fire – resistive time rating is the length of time a material can withstand burning: one hour; two – hours, three hours, four hours, etc.

All materials need to submit a fire testing certificate.

Work Breakdown Structure



Part 1 General Requirements

1. *Mobilization/Demobilization, (including Bonds, Permits, (Fine) & Clearances.* Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site, including the disassembly, removal, and site cleanup of offices, building, and other facilities assembled on the site specifically for this contract.
2. *Temporary Facilities, Warehouse, Boards.* The temporary buildings for housing workers or the erection of tents or other forms of protection will be permitted only at such places as the owner shall designated. If no particular area is selected, the contractor may use his discretion in determining such areas in consultation with the owner. The sanitary condition of the project site shall always be maintained in a manner satisfactory to the owner.
3. *PPE.* The equipment worn to minimize hazards that cause serious workplace injuries and illnesses.
4. *Signages.* Workplace safety signage is a requirement on all construction sites. Highly visible safety signs can help prevent injuries and ensure that all staff and visitors are aware of any dangerous hazards.
5. *Fences.* These shall be built of an approved material, not less than 2.40 meters in height above grade, and placed on the side of the walkway nearest to the building site. Fences shall enclose the building site entirely. Openings in such barriers shall be provided with doors and kept closed at all times.
6. *Canopies.* The protective canopy shall have a clear height of 2.40 meters above the railway and shall be structurally safe. Every canopy shall have a solid fence build along its entire length on the construction site. If materials are stored, or work is done on top of the canopy, the edge along the street shall be protected by a tight curb board not less than 30 millimeters high. The entire structure shall be designed to carry the loads imposed upon it. Provided that the live load shall be not less than 600 kilograms per square meter.
7. *Maintenance and Removal of Protective Devices.* All protective devices shall be adequately maintained in placed and kept in good order for the entire length of time pedestrians may be endangered.
8. *Removal.* Every protective fence or canopy shall be removed within 30 days after the protection is no longer required as determined by the Building official.
9. *Minimum Testing Requirements.* Quantity stated in the program of works is the basis of the minimum testing requirements for each project. The requirements specify the kind and number of tests for each item and size; this would indicate only the minimum and shall not be the basis of several trials. When a government representative inspected a project, and there is a doubt in the test, he can do another testing immediately.

Part II: Civil, Electrical, Sanitary/Plumbing, & Mechanical Works

1. Earthworks
2. Site Preparation Works, Demolition/Clearing
3. Excavation Works.
   - **a.** Excavation or fills for building or structures shall be constructed or protected not to endanger life or property.
   - **b.** When the excavation would affect the stability of the lateral and subjacent support of the adjoining property or existing structure, the person undertaking or causing the excavation shall be responsible for the expense of underpinning or extending the foundation or footing of the property, as mentioned earlier.
   - **c.** Excavation and other similar disturbances made on public property shall, unless otherwise excluded by the Building Official, be restored immediately to its former condition within 48 hours from the start of such excavation and disturbances by whosoever caused such excavation or disturbance.
     - *Backfilling Works, ABC*
     - *Boulders 6*
     - *Gravel Bedding, G1*
     - *Soil Poisoning*
     - *Plain and Reinforced Concrete Works (Class A, 28 days)*
     - *Steel Reinforcement Works (Grade 40 & 60)*
     - *Steel Decking Works (Gauge 50)*
     - *Forms & Scaffolding Works*
     - *Finishing Works*
     - *Masonry Works*
     - *Plastering Works*
     - *Carpentry Works, Ceiling, CR Ceiling & Phenolic boards CR Partition*
     - *Welding Works, Stair handrail & Fire exit ladder all levels two sides*
     - *Mill Works (Doors and Windows) with a complete glass and glazing hinges & locksets*
     - *Tiles work, beads, and moldings on all levels, including corridors*
     - *Painting works, preparation, treatment, and surface correction up to complete coatings*
     - *Water Proofing Works, all wet areas with concrete toppings 2 thick.*
     - *Ceiling all levels, Gypsum board, T runner*
     - *Electrical Works, pipes, wires, and fixtures*
     - *Sanitary/Plumbing Works, pipes to fixture*
     - *Elevated Water S/S 3200 liters w/pipelines from deep well w/pressure tank & motor*
     - *Deep Well Drilling Works, 5 O B1 Pipes with motor 1.5 HP & pipelines from well up to elevated tanks*
     - *Septic Tank & Cistern Tank, 2m x 7m x 2m depth*
     - *Fire Protection: Dry stand pipelines, firehose on cabinets, fire extinguisher, fire alarm bell, the smoke detector on all levels, Jockey Pumps, Booster pump, and Sprinkler system.*

4. *The enclosure of Vertical Openings*

General. Vertical openings shall be enclosed be depending upon the fire resistive requirements of a particular type of construction as outlined in this Code.

Part III General Requirements, Cleanup, and Demobilization

B. DESIGN PARAMETERS

ARCHITECTURAL DESIGN PARAMETERS

- Shall provide accessibility for the disabled in the design of the building.
- The design of the building shall incorporate provision to maximize energy efficiency and conservation (natural lighting).
- The building shall be oriented appropriately considering sun, wind, site water run down, and specifically typhoon wind direction.
- The building shall be in an open area beside the Main Library
- The building shall adhere to architectural principles of beauty, strength, and utility.
- The building shall be designed considering the ease of maintenance, including durability, function.
- Must include the provision for fire escape in the design of the building under the new fire code of the Philippines.
- Shall observe the design requirements of the national building code of the Philippines (PD 1096), B.P. 344 Accessibility Law, Fire Code of the Philippines.
- Building design should follow the Latest NSCP requirements, up to magnitude 8.4 for those near the seismic source type A.
- Other considerations shall be access road, lighting provision, and building information.
- Consider HGDG Standards.

1.1 General

- All drawings shall be computer – drafted. These shall be submitted both in printed and electronic copies.
- Keep the same orientation for all plans. It shall indicate the north orientation in all architectural floor plans. The orientation of the architectural plans shall be consistent with all the engineering plans.
- Existing buildings and new works shall be indicated and labeled in the site plans.
- Detailed plans shall have a scale not smaller than 1:50 meters.
- Spot detailed plans, elevations, and sections shall have a scale not smaller than 1:10 meters.
- Avoid notes such as “see architectural detail” or “see structural”. Always refer with a callout to the specific detail drawing and number.

1.2 Site Plans

- The site plans shall have a scale not smaller than 1:400 meters.

1.3 Floor Plans

- All plans shall have a scale not smaller than 1:200 meters. The contractor shall use the same scale for the rest of the architectural, structural, sanitary, plumbing, electrical, and mechanical plans, except for each trade’s site plan, detailed plans, and spot details.

- He shall indicate the elevation callouts on the floor plans and be consistent with the elevation drawing.
- Section line callouts on the floor plans shall be consistent with the section drawing.
- Floor plans shall be indicated with boxed room callout numbers, including the callout for floor finishes and wall finishes.
- He shall indicate the floor elevations in the floor plans. The elevation shall be in reference to the natural grade line or the established finished floor lines of the adjoining existing buildings.
- He shall indicate the location of mechanical equipment, e.g., air conditioning, in the floor plans. It shall be consistent with the mechanical and electrical plans.
- Door callouts shall be in circles with the proper numbering, e.g., D-01.
- Windows callouts shall be hexagons with the proper numbering. e.g., W-01.
- Indicate the column grid lines in the plan.

1.4 Elevations and Sections

- Finish floor lines and roof lines shall be consistent in all the elevations, sections, structural plans, and details.
- Architectural annotation or exterior finishes proper label in the drawing.

1.5 Reflected Ceiling Plans

- Reflected ceiling plans shall be indicated with boxed room callout numbers, including the callout for ceiling finishes and lighting fixtures.
- The Contractor shall include the Ceiling height relative to the finish floor line in the reflected ceiling plans in each room with boxed dimensions.
- The description and locations of the fixtures, e.g., lighting, smoke detectors, air conditioning vents, exhaust fans, in the reflected ceiling plans shall be consistent with the electrical and mechanical plans.
- Indicate the drawing a point used for setting out the ceiling.

1.6 Doors and Windows

- Door and window schedules shall indicate the type of door or window, the number of sets, the location/s of the door and window, the materials and accessories included, and other special specifications, e.g., color or finish.
- Provide the dimension of the doors and windows and the height of the window sill from the finish floor level. (PLEASE INDICATE DETAILED SPECS FOR MECH DOOR FOR SERVER ROOM)

1.7 Details

- Provide a minimum of one (1) bay section of a scale not smaller than 1:50 meters for each major building, preferably cut along the area with a special construction design.
- Provide spot detail plans, elevations, and sections of a scale not smaller than 1:10 meters for special designs with aesthetic treatment and ornamentation.
- Provide spot detailed plans of a scale not smaller than 1:50 for all areas needing tile pattern, e.g., corridor, entrance walk, showing the position and pattern of tiles.

- The Contractor shall indicate the centerline location of plumbing fixtures in detailed plans with lines of reference and its corresponding dimensions to show the exact areas of the plumbing/sanitary roughing-ins.

1.8 Building Architectural Works

Floor Plans

1. The structural, sanitary, plumbing, electrical, and mechanical designs must refer to the architectural plans and specifications in case of discrepancies.
2. The architectural and engineering plans shall be consistent throughput in terms of dimensions and locations of columns, beams, walls, roofline, conduits, ducts, pipes, and fixtures, among others. Column and beam gridlines shall also be consistent in all the architectural and engineering plans.
3. Verify and coordinate floor plans with the mechanical, electrical, and sanitary design concerning mechanical rooms, electrical rooms, pipe chase, and other engineering requirements.
4. Public toilets shall have provisions and fixtures for person with disability as required by BP 344. If enough space allows toilets specially made and designated for persons with disabilities are preferable.

Walls

1. Exterior walls shall be 200 mm thick, while interior walls shall be 150 mm thick. The finished wall thickness includes plastering and tile works.
2. All wall tiles' layout and work must be aligned, plumb, level, and square.
3. All toilet tiles' edges, corners, and intersections, including topmost tile not reaching ceiling, shall be provided with polyvinyl chloride tile trims.
4. All concrete-finished walls are painted with appropriate colors. The color and design shall be approved first before installation.
5. Plaster works shall be finished level, plumb, square and true to line within the tolerance of 3mm in 3.0 meters. Plaster walls are without cracks, waves, blisters, pits, discoloration projections, and other imperfections.

Floors

1. Suppose floor tiles in two adjacent rooms with different materials, colors, or designs meet at the door opening. In that case, the contractor can use a threshold at the door to have a good termination between different materials. Provide floor pattern design showing the tile setting out point.
2. Floor to floor elevation shall be 3.80 m.
3. Floor at the openings of toilets for PWD shall be sloping. Indicate the plans and sections.
4. The size of the toilet floor tiles shall be 300 mm x 300 mm. Indicate the pattern. Submit material approval providing sample or product description.
5. The size of floor tiles of the offices shall be 600mm x 600mm, or more considerable depending on the proportion to the size of the room. Indicate the tile pattern. Submit material approval providing sample or product description.
6. The size of the floor tiles of the lobby and receptionist shall be 600mm x 600mm, Indicate the pattern. Submit material approval providing sample or product description.

7. The size of the floor tiles outdoor entrance walk shall be 600mm x 600mm. Indicate the pattern. Submit material approval providing sample or product description.
8. All exterior tiles are in matt finish and provide a setting out plan for approval.
9. All stairway steps are provided with anti-slip nosing, tiles with built- in anti-slip features, aluminum or brass metal nosing.
10. The layout and work on the wall and floor tiles must be aligned, plumb, level and square.
11. Tile color and design shall be approved first before installation.

Doors and Windows

1. Server room that requires security shall have sturdy doors, e.g., Solid Mechanical Door.
2. Main entrance door, Network Operation Center access door shall be see-through, e.g., Glass Door.
3. Toilet Doors shall be wood door.
4. Pantry Door shall be wood and seamless through the wall design of the receptionist.
5. Fire escape door should be provided with panic hardware and door closers and shall conform to the requirements of the Fire Code of the Philippines.
6. The door finish and color shall be approved first before application.
7. Toilet window sills shall be slightly sloped outwards to prevent damage to windows and paint due to water seepage. Section details shall be required to show this slope.
8. Main entrance door shall swing outwards and as required by the Fire Code of the Philippines.
9. All door jamb width is same as the width of the plastered wall and encases with an architrave on both sides. Provide details.
10. All Doors and windows shall have reinforced concrete lintel beams. Provide details.

Stair and Ramps

1. Ramps for persons with disabilities shall have a slope not higher than 1:12. Stainless Steel Handrails and clearances shall conform to the requirements of BP 344.
2. Regular stairs have risers at 180mm high and thread at 300 mm wide. Fire exit stairs could have minimum riser at 150mm high and thread at 300mm. handrails shall be 1100mm high.
3. Clearance shall conform to the requirements of the Fire Code of the Philippines.
4. Exit door shall conform to the requirements of the Fire Code of the Philippines.

Fixtures and Accessories

1. Three-way electrical light switches shall be provided at the foot and the top of the stairs per floor.
2. Electrical light switches shall be located by the knob side of the door.
3. Electrical switches and outlets shall be installed plumb and level.
4. Public toilet shall always be provided with stainless handrails in conformity to the requirements of BP 344. All plumbing fixtures must be submitted for approval.

Roofing Works

1. Provide membrane-type waterproofing for the roof deck, toilets, and other wet areas. Submit details of water-proofing. Submit material sample or product supplier and on-site mock-up for approval if required.

2. Parapets, designed for roof protection from winds, must be designed to satisfy the preceding parameters.
3. Submit material sample or product supplier and on on-site mock-up for approval if required.

Painting

1. The painted ceiling shall be flat latex.
2. Painted interior walls shall be in semi-gloss finish.
3. Painted exterior walls shall be in moisture-resistant/water-repellent solvent-based paint finish, textured or smooth unless otherwise specified.
4. Paint color and shade shall be approved first before application.
5. Submit a schedule of rooms for painting applications, including walls and ceilings. Start with surface preparation to finish the application. Need a material approval submission.

1.9 Specific Requirements

Provide spot detail plans and sections of the following:

1. Eaves and parapet
2. Ceiling cover light, special connections, design, mouldings.
3. Stairs-handrail, and baluster design.
4. Ramps – handrail design and floor pattern
5. Doors, windows and gates – grille works,
6. Special architectural treatment and design, e.g., façade design, special window, and door.
7. Special Carpentry Works, e.g., partitions, cabinet
8. Details of roof drain
9. Other information as may be required.

1.10 Summary of Materials

- Materials to be used shall be fire-resistant, non-toxic, moisture-resistant, and termite-resistant, e.g., fiber cement board, light-gauge steel frame, polyvinyl chloride ceiling panels, metal spar.
- Wet areas, e.g., toilets, and kitchens, shall use non-skid/ non-slip vitrified ceramic floor tiles.
- Ramps and stairs shall use non-skid/non-slip floor tiles materials as specified.
- Aluminum T-runners shall be powder coated.
- Metal rod hangers with adjustable clips and not galvanized iron wires shall support and suspend the aluminum T-runners and light gauge metal furrings.

Structural Design

- The Designer shall prepare the necessary structural analysis/calculation and design of the structural members (Foundation, Columns, Girders, Beams, Slabs, and others) under the National Building Code of the Philippines with its referral code such as the National Structural Code of the Philippines. The Designer must design the roof slab considering the loads for future office use. The Design of the structure shall take into account, among other things, the seismic requirements of the area to determine the optimum safety of the whole structure and to minimize possible earthquake damage. The Design must consider the occurrence of flooding in the site and the Typhoon strength for the MIMAROPA Region.

- The Designer shall perform Site Investigations, topographical/engineering, soil investigation, a survey of existing site conditions, the seismic requirements of the area, and other investigation required to obtain the data necessary to ensure safety of the structure.
- The seismicity of the location belongs to zone 4. The Two (2) Storey Data Center with Roof Slab (considering loads for 3rd floor area for future office use) should be design using seismic importance factor of 1.5 for the occupancy Category I (Essential Facilities) – Public School). Buildings should be designated in accordance with the NSCP requirements up to Magnitude 8.4 for those near seismic source Type A. Seismic gaps between buildings (old and new) should be appropriately observe. Its structural system or Lateral – Resisting System Description shall be based on Special – Moment Resisting Frame (SMRF)
- The structural Designer must verify the distance of the proposed Two (2) Storey Data Center with Roof Slab to the nearest active fault lines from the PHILVOLCS and DENR geo-hazard mapping.
- The Building should also be design using a wind importance factor of 1.0, a basic wind speed of 300kph, and at Exposure B.
- All Structural Steel works shall be according with latest AISC specifications in so far as they do not conflict with local building requirement.
- It is required that the interpretation and evaluation of the results of the foundation investigation upon completion shall be made by the registered civil engineer, experienced and knowledgeable in the field of geotechnical engineering. Soil classification shall be based on observation and any necessary tests of the materials disclosed by borings or excavation made in appropriate location. Allowable Bearing Capacity shall be found on the Boring Test at the building site. (Refer to ***ANNEX E: PRELIMINARY INVESTIGATIONS (FOUNDATION DESIGN AND RECOMMENDATIONS)***)
- The structural designer is encouraged to use fire-resistive and non-toxic materials.
- The Dead Loads to be considered in the design must conform to the Section 204 of NSCP 2015 and must include the equipment to be installed in the building.
- The live loads to be considered in the design must conform to Section 205 of NSCP 2015 that are not limited to the following:
  i) Ground Floor – Office use, Exit facilities, Rest Rooms
  ii) Second Floor – (5 racks) data cabinets with estimated weight of 1000kg per rack, control room
  iii) Roof Slab with Bituminous Water Proofing Membrane and future provision of office use
- During construction the contractor shall poured first a **lean concrete** equal to the thickness of the concrete cover of the foundation prior to fabrication of steel reinforcement of all reinforced structural concrete that will rest in the ground.

2.1 Details – the following shall provided:

- Connection details of foundations, columns and beams following the requirements of NSCP on confined areas.
- Detailing Requirements in seismic Zone 4 shall include the provision of confinement/hoops proportioned to resist earthquake-induced shear force.
- All welds types, sizes lengths and strengths.
- All bolt sizes, locations, quantities and grades.
- All plate and angle sizes, thicknesses, dimensions and grades.
- All work point locations and related information.

2.2 Summary of Materials

- All Concrete shall use Portland cement and conform to ASTM Specifications C150, Type I to Type II and shall develop a minimum compressive strength at 28 days of 4000Psi.

- Coarse Aggregates shall consist of washed gravel, crashed stone and rock, or a combination thereof to ASTM C33.
- Concrete Hallow blocks shall be a standard product of recognized manufacturers conforming to PNS 16 with 400Psi minimum compressive strength for non-load bearing while 750Psi minimum compressive strength for load bearing blocks.
- Reinforcing Steel bar shall conform to ASTM 615 Grade 60 for 16mm diameter and above and Grade 40 for 12mm diameter and below. Mill Certificate of the reinforcement shall be submitted for review of the structural engineer.
- Structural steel shall conform with ASTM A36/A36M
- Bolt and Studs shall conform with ASTM A325
- All welding of reinforcement shall be conformed to the provisions of the structural Welding code reinforcing steel AWS and electrodes shall be E60 or E70.
- Columns and Beams shall use I-beams/H beams as steel reinforcement with ties and poured with concrete conforming to the standards. (composite Columns and Beams)
- Slab shall design using steel decking with reinforcement steel bar.

Sanitary and Plumbing Works Design

- The designer shall carry out a detailed design for the building's water supply, drainage, and sewer system. The design should based in the results of the hydrological study and the drainage survey taking into consideration the general and problems such as the source and the volume of water supply, water consumption, piping network, drainage discharge area, and conveyance and treatment of sewer flow, in accordance with the applicable laws, rules, and regulations governing health safety and sanitation.
- All Plumbing Works included shall be executed according to the provision of The National Plumbing Code of the Philippines and Local Rules and Regulation.
- All vertical piping shall be supported at every one (1) meter interval
- All horizontal piping shall be supported by stiff metal backing hangers in its entire length for small size tubing up to 38mm diameter and without backing but with spaced metal hangers at approved for larger-size tubing.
- Plumbing fixtures shall be manufactured of dense, durable, non- sorbent materials and have smooth, impervious surfaces, free from unnecessary concealed fouling surfaces, except as permitted elsewhere in this code, all fixtures shall conform in quality and national recognized applicable standards.
- Water supply will be sourced from the University or Local Water sources.
- Water outlets should be provided in convenient locations for the cleaning / flushing.
- All valves which are concealed and or installed in the ceiling shall be provided with access manhole.
- Main water tapping point is clearly identified on the plan. (gate valve, y-strainer, water meter, check valve)

3.1 Building facilities Sanitary/Plumbing System

Sewer line and Vent System

- Provide complete Sewer line and vent System from all plumbing fixtures and floor drains; laid by gravity flow leading to the Septic Tank.
- Waste water lines shall use Unplasticized Polyvinyl Chloride (UPVC) Series 1000 brown/orange pipes and fittings.
- All ACCU units located at the right side of the Powerhouse shall be provided with sufficient drains.
- All FCU drains are tapped at storm/drain pipes.
- Change in direction of drainage piping shall be made by the appropriate use of approved fittings.
- For Drainage Fixtures Units, refer to Chapter 7, Table &-2, NPCP.
- Septic tank shall be made of 200mm thick reinforce concrete wall with water proofing and covered of reinforced concrete slab with manhole provision.
- The septic tank dimensions shall be design based on computation stated in the NPCP.
- The septic tank shall be composed of (3) three chambers such as (1) digestive chambers with concrete flooring, (1) leaching chamber with rubbles flooring, (1) cleansing chamber with charcoal

flooring. The septic tank cover and outlet pipes shall be elevated from the finish floor line minimum of 1 ft.

Water line System

- Provide complete cold water supply pipes to all plumbing fixtures. From the main water source and the water shall be stored in a concrete base tank and shall pumped by electric water pump to the stainless water tank located roof deck and conveyed to the fixtures by a gravity system.
- Water Supply lines shall use Polypropylene random Co-Polymer Type 3 Pipes, gate valves and fittings.
- Water tank shall be made of 200mm thick reinforce concrete wall with water proofing and covered of reinforced concrete slab with manhole provision.
- Water storage tanks size shall be calculated based on the standards.

Storm Drainage System

- Complete Storm Drainage System shall be provided for the roof deck, canopies, and balconies, including drains laid for gravity flow connected to a leader/pipeline leading to the natural Ground level storm drainage network.
- Provision shall be made for the future installation of rainwater collection systems in compliance with R.A. No. 6716.

Water line System

Provide complete cold water supply pipes to all plumbing fixtures. From the main water source and the water shall be stored in a concrete base tank and shall pumped by electric water pump to the located roof deck and conveyed to the fixtures.

Storm Drainage System

Complete Storm Drainage System shall be provided for the roof deck, canopies, and balconies, including drains laid for gravity flow connected to a leader/pipeline leading to the natural Ground level storm drainage network.

Provision shall be made for the future installation of rainwater collection systems in compliance with R.A. No. 6716.

Electrical Works Design

- The Designer shall prepare a design for the building's electrical and power supply system following the Philippine Electrical Code, Fire Code of the Philippines, and the National Building Code of the Philippines
- The Designer shall prepare a design for the electrical and power supply system considering ease of maintenance and preventing illegal connections.
- The Designer shall Private Poles and shall be tapped in the existing TIELCO primary line 3 phase 13.kV, 60Hz
- Private pole must have a Load Break Switch, Power Fuses, Lighting Arrester, CT's, PT's for metering system with complete pole accessories.
- The Main Transformer shall be fed by underground cable via concrete pedestal and duct bank.
- The main transformer shall be 250kVA, 3 phase, 13.2kV/400V (wye secondary), 60Hz pad mounted and must be placed inside the Power House
- Generating unit, Changeover switch are excluded (by others) see drawings details
- Supply and installation of cables and raceway from transformer to changeover switch are included.
- The secondary system voltage shall be 3-phase 4 wire, 400V, 60Hz
- Neutral Side must be bonded in the grounding system.

- The Electrical System must have grounding system with the earth resistance below 5 Ohms
- Office room illumination and ventilation shall pass the illumination and ventilation standards/requirements
- Provisions for emergency lighting systems

Mechanical Works Design

- The Designer shall prepare a design for the Automatic Fire Sprinkler System, Ventilation, Air Conditioning System and Temperature Monitoring System inside the Server Room in accordance with the National Building Code of the Philippines and its new IRR, Fire Code of the Philippines, and Mechanical Engineering Code of the Philippines (ME Code) and Design Standards of a Data Center.

5.1 Fire Detection

- The Fire Detection and Alarm System shall be composed of multiplex, microprocessor-controlled addressable or semi-addressable, zonal conventional fire detection, alarm, and communication systems.
- The alarm system shall be on every floor level.
- The system shall consist of full integration automatic fire detection, voice alarm communication, and a fire-fighter's telephone system.
- The system shall monitor the status of flow switches and supervisory switches installed at the sprinkler system risers. These monitoring points are also addressable or the conventional zone in the same way the detectors make them easily recognizable at the control panel.
- Occupant notification shall be accomplished automatically. Notification is a general, audible alarm type complying with the appropriate sectioned NFPA – Standard for Portable Fire Extinguishers (1 unit of portable fire extinguishers per room/office).
- The system shall be installed with provisions for future connection to the nearest fire service station in the locality.
- Installation of Class III Fire Cabinet and Cistern tank with pump.

5.2 Automatic Fire Sprinkler System

- The Fire Sprinkler System for all of the spaces except the Server and Control room shall be Firewater system.
- The Fire Sprinkler System for the Server Room and Control Room shall be CO2 fire suppression system.

The automatic fire sprinkler system shall be composed of complete plans and drawings of the following:

- Site Development Plan and Vicinity Map (e.g., location of the buildings, firewater reserved tank, firewater line, yard loop, and private fire hydrant)
- General Notes, Legends, and Symbols including Schematic Diagram of the Fire Sprinkler System and Schematic Diagram of Alarm Monitoring System.
- Floor Layout and Isometric Layout of the Automatic Fire Sprinkler System (e.g., pipe sizes, location of the pipes, valves, sprinkler heads, riser nipples, fire hose cabinets, main

sprinkler riser, drainpipes, cross mains, branch lines, inspector's test connections, hangers, and sway braces)

- Equipment Schedule
- Detail drawings (Architectural, Structural, Electrical, and Plumbing drawings of the Firewater Tank and Pump House)
  - o An automatic fire sprinkler shall be provided.
  - o Hazard Classification shall be Light Hazard Occupancy.
  - o The protection area per sprinkler head shall be 20 square meters at 2.2 meters minimum distance between sprinklers and 4.2 meters maximum spacing.
  - o All floor control valves shall be equipped with a supervisory switch, water flow detector, and drain system.
  - o Minimum number of fire pump and jockey pump must be 2.
  - o Provide sequence of operation for FP1 and FP2.
  - o Show the location of fire pump and jockey pump control panel at fire pump room.
  - o Fire pump with concrete accessories. (Vertical turbine for negative suction or horizontal split-case for positive suction.)
  - o Controller shall monitor pump running, loss of phase or line power, low reservoir, level alarms shall be individually displayed in front of panel by lighting of visual lamps.
  - o Jockey pump with complete accessories. (Submersible jockey pump for negative suction of vertical multi-stage pump for positive suction.)
  - o Firewater reserve tanks shall be ground-level monolithic concrete tank size for a minimum of 1 hour.
  - o Hydraulic calculations report shall be based on NFPA-13 format.

5.3 Ventilation and Air Conditioning System

- The ventilation and air conditioning system shall be composed of complete plans and drawings of the following:
- General Notes, Legends, and Symbols including Schematic Diagram of the Ventilation and Air Conditioning System.
- The floor layout of the ventilation and air-conditioning system indicates the capacity and location of the air conditioners and fans.
- Refrigerant piping layout (e.g., pipe sizes, location of valves, hangers, and sway braces)
- Equipment Schedule and Details drawings of Air conditioners and Ventilating Systems.
- Cooling Load Calculations report shall be a manual or computer-generated, hourly analysis program that includes heat transmission coefficients, solar heat gain factors, and corrected cooling load temperature different calculations.
- Split-type air conditioners shall be used in areas with exterior wall exposures.
- Ceiling cassette-type exhaust fans with integral air diffusers shall be provided in all toilets.
- Air conditioning systems shall be Inverter Type Spit-Type in the offices spaces.
- VRF Systems should use R-410A refrigerant or any approved equal as the heat transfer fluid and the working fluid to achieve minimum energy efficiency ratio (EER) of 13.

Network and Communication Works Design Parameters

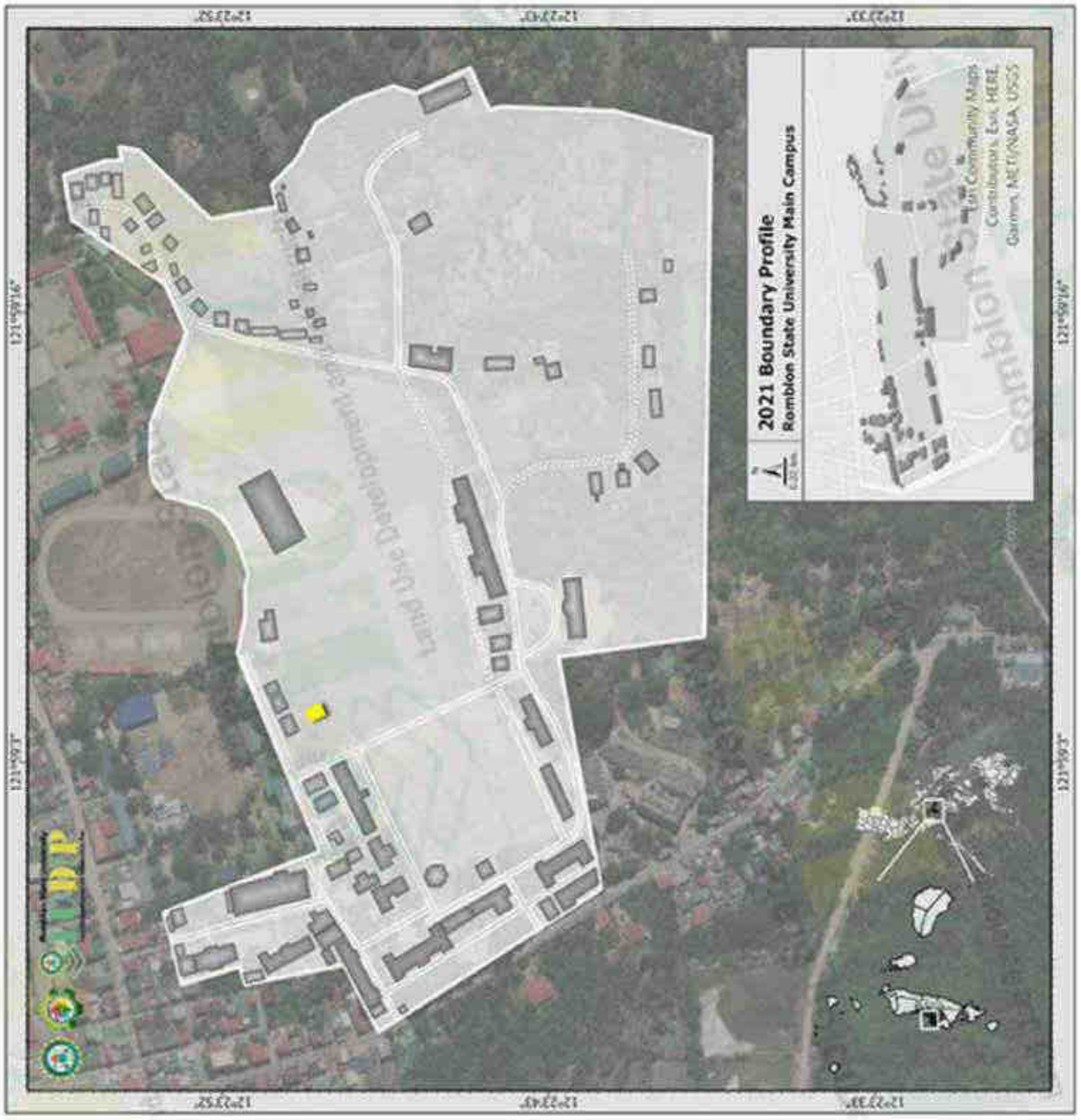
The Designer shall design the entire building's network cabling system, FDAS, and CCTV system.

The design shall be composed of complete plans and drawings like

- General Notes, Legends, and Symbols, including Schematic Diagrams.
- Floor Layout of the System indicating the capacity and location.

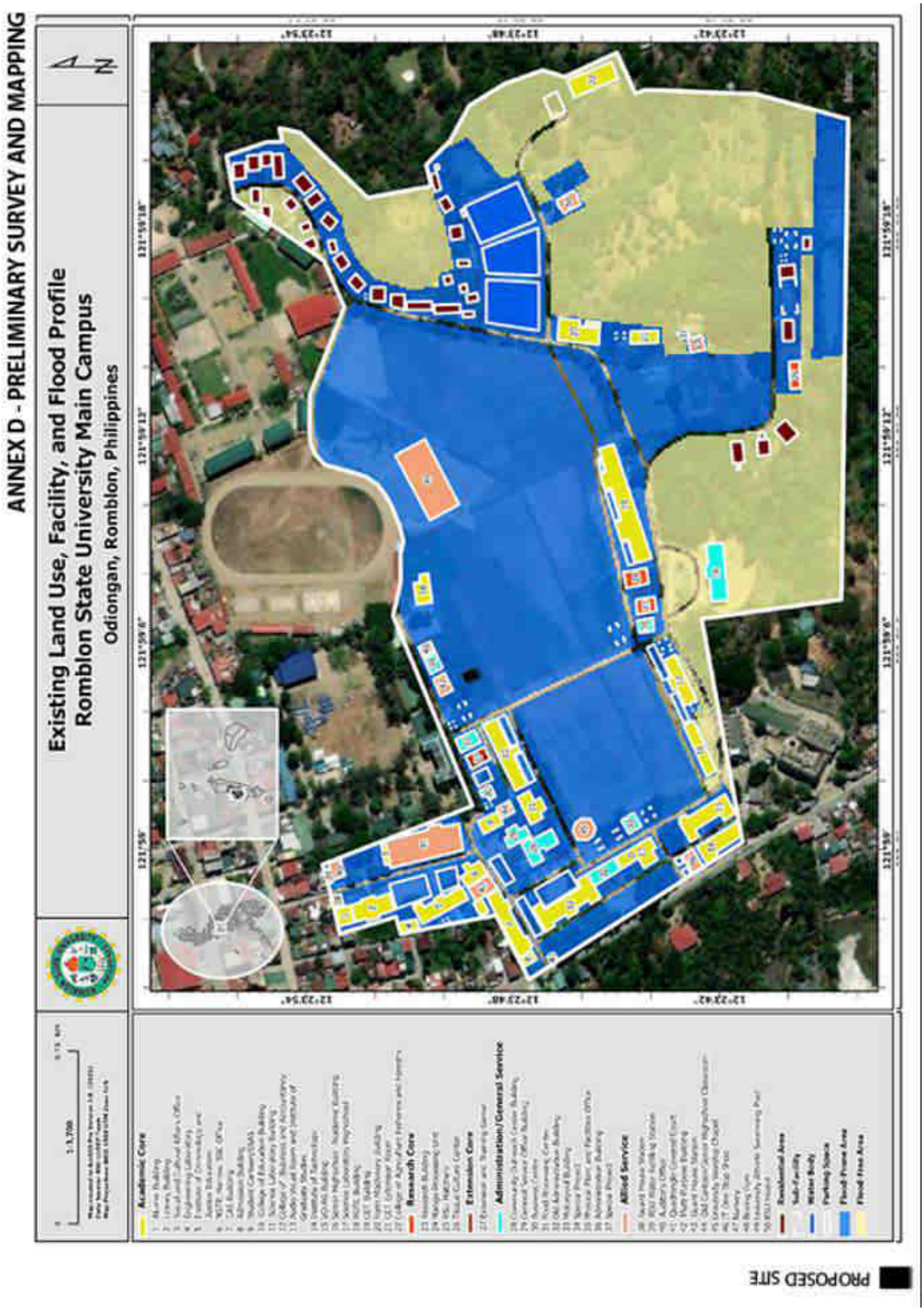
ANNEX D – PRELIMINARY SURVEY AND MAPPING

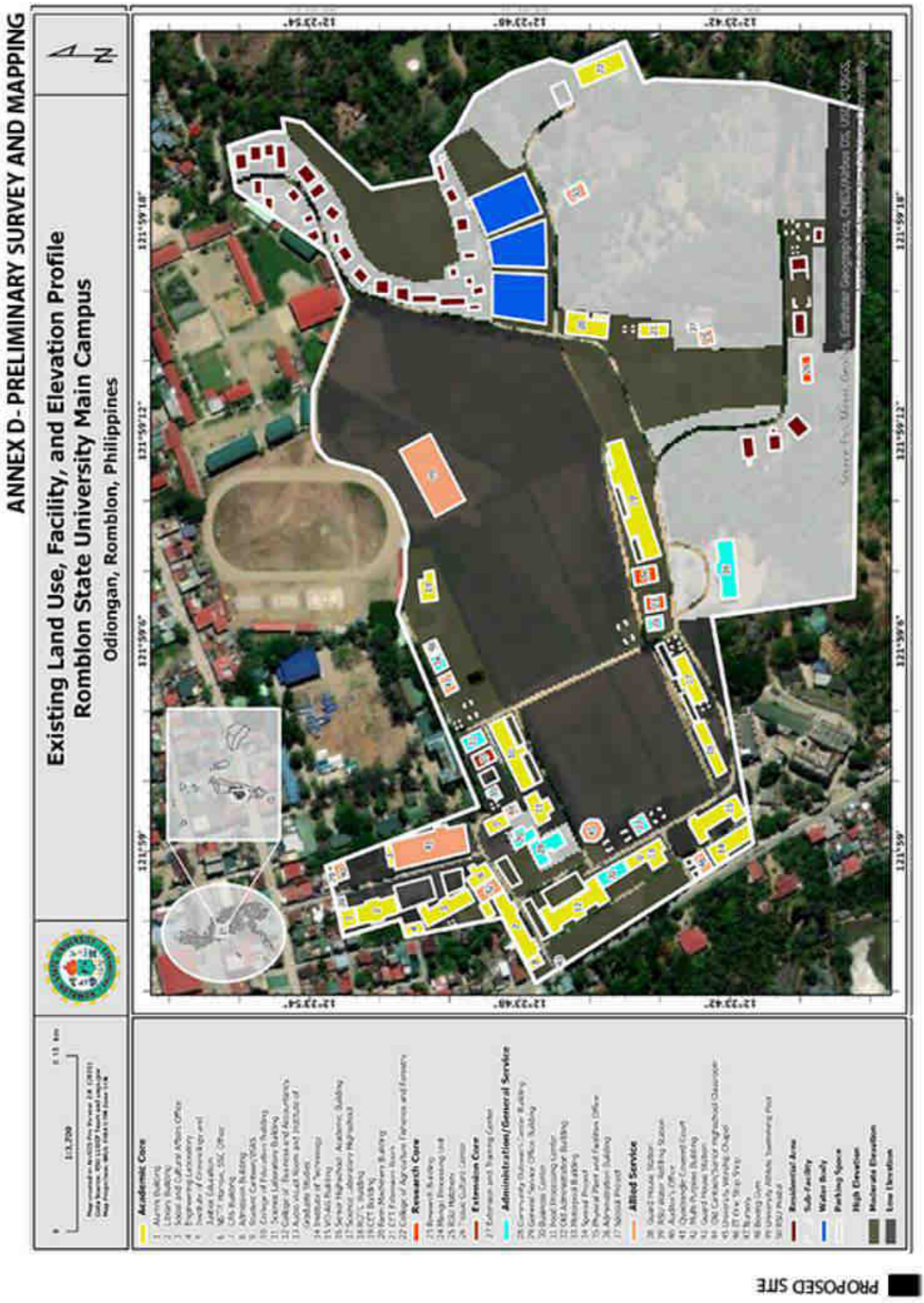
ANNEX D - PRELIMINARY SURVEY AND MAPPING

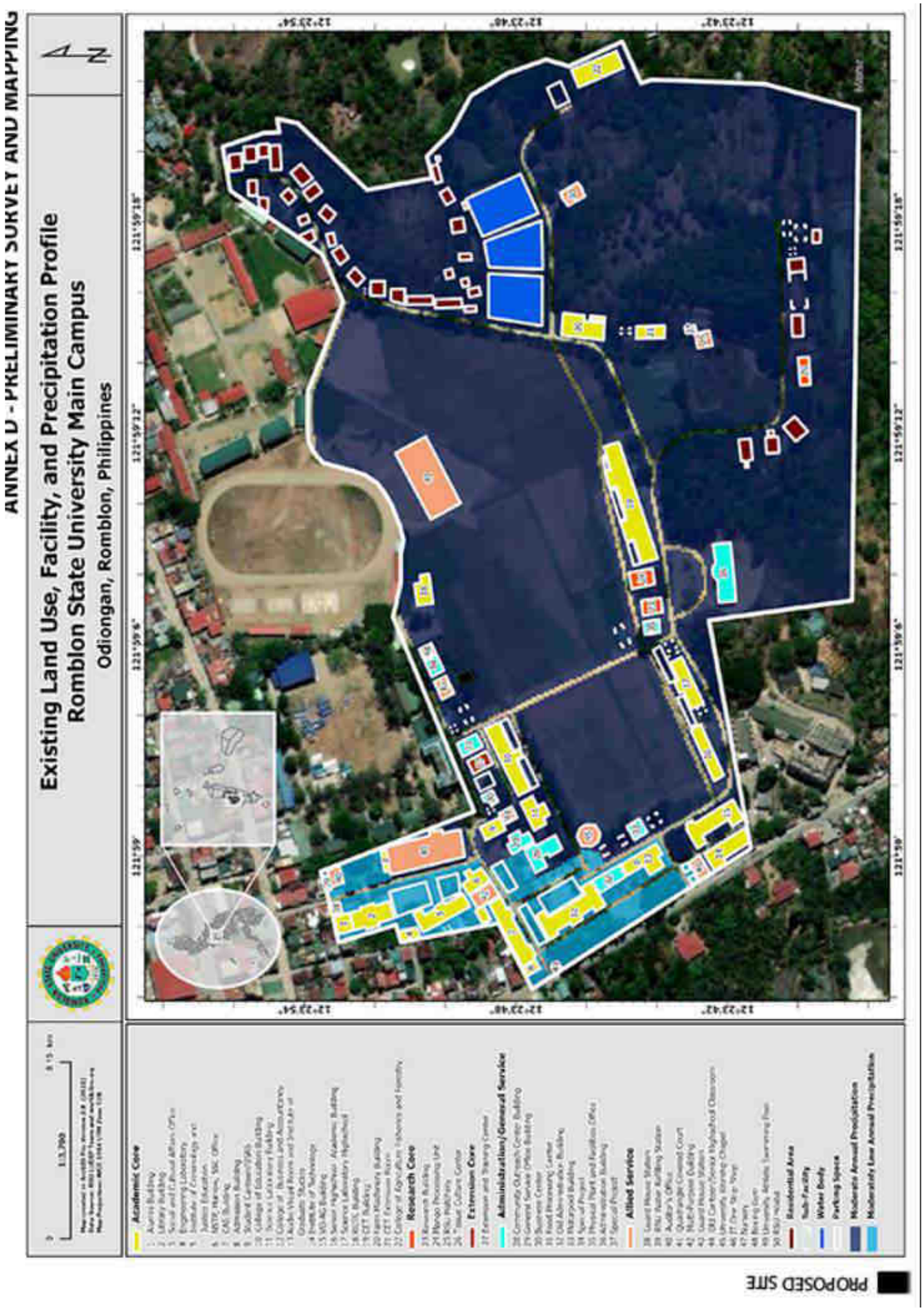


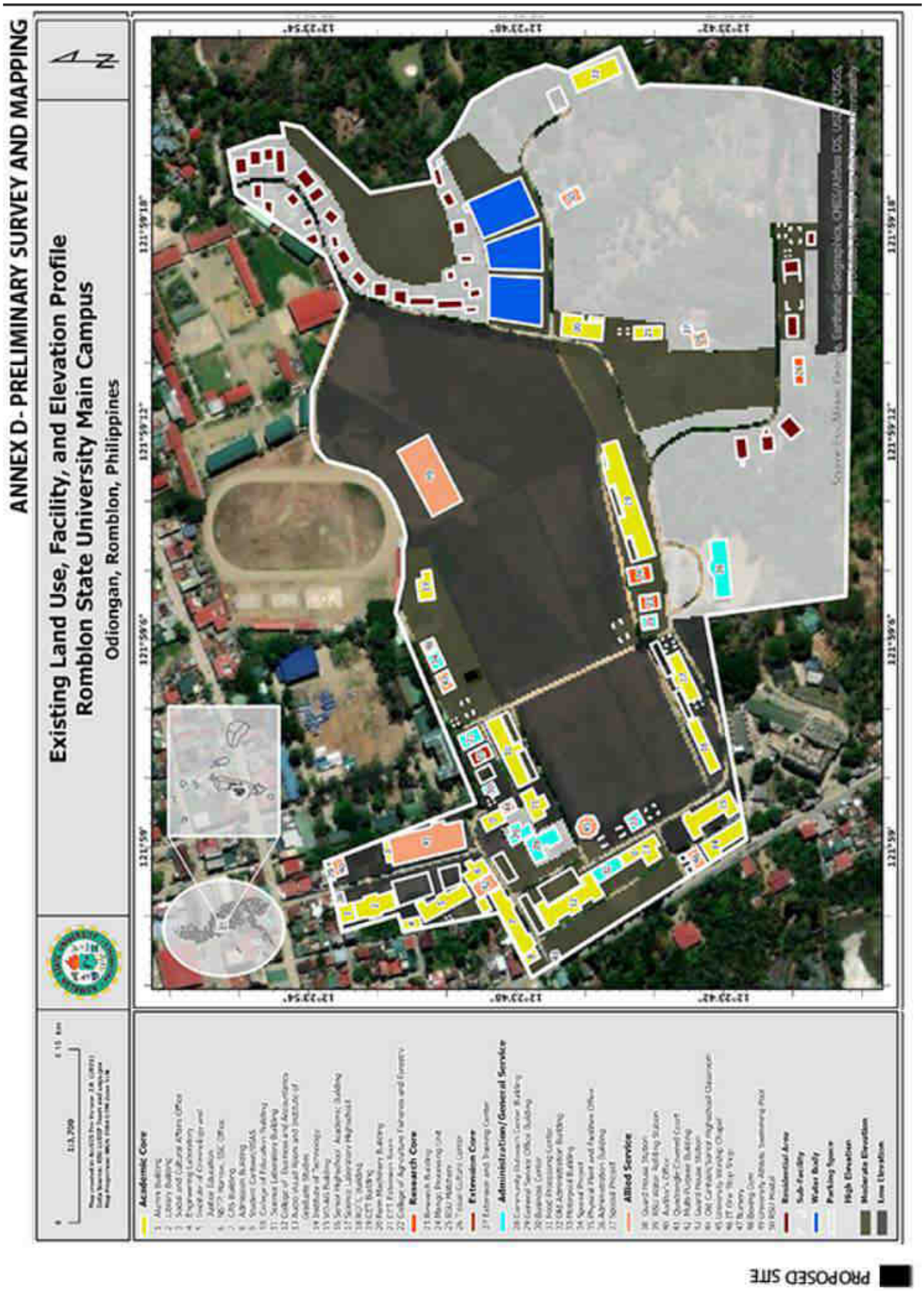
A. BOUNDARY PROFILE

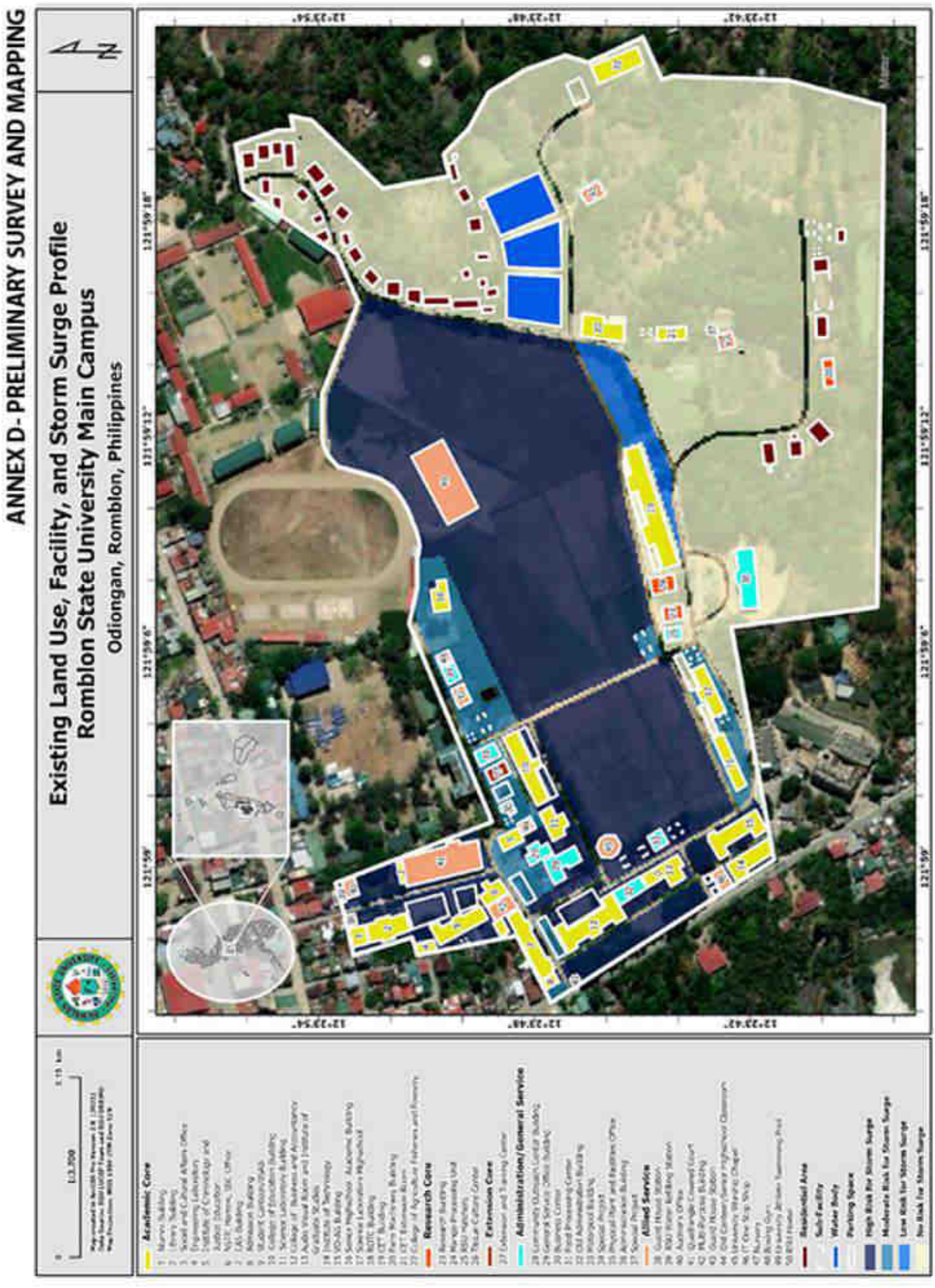
PROPOSED SITE

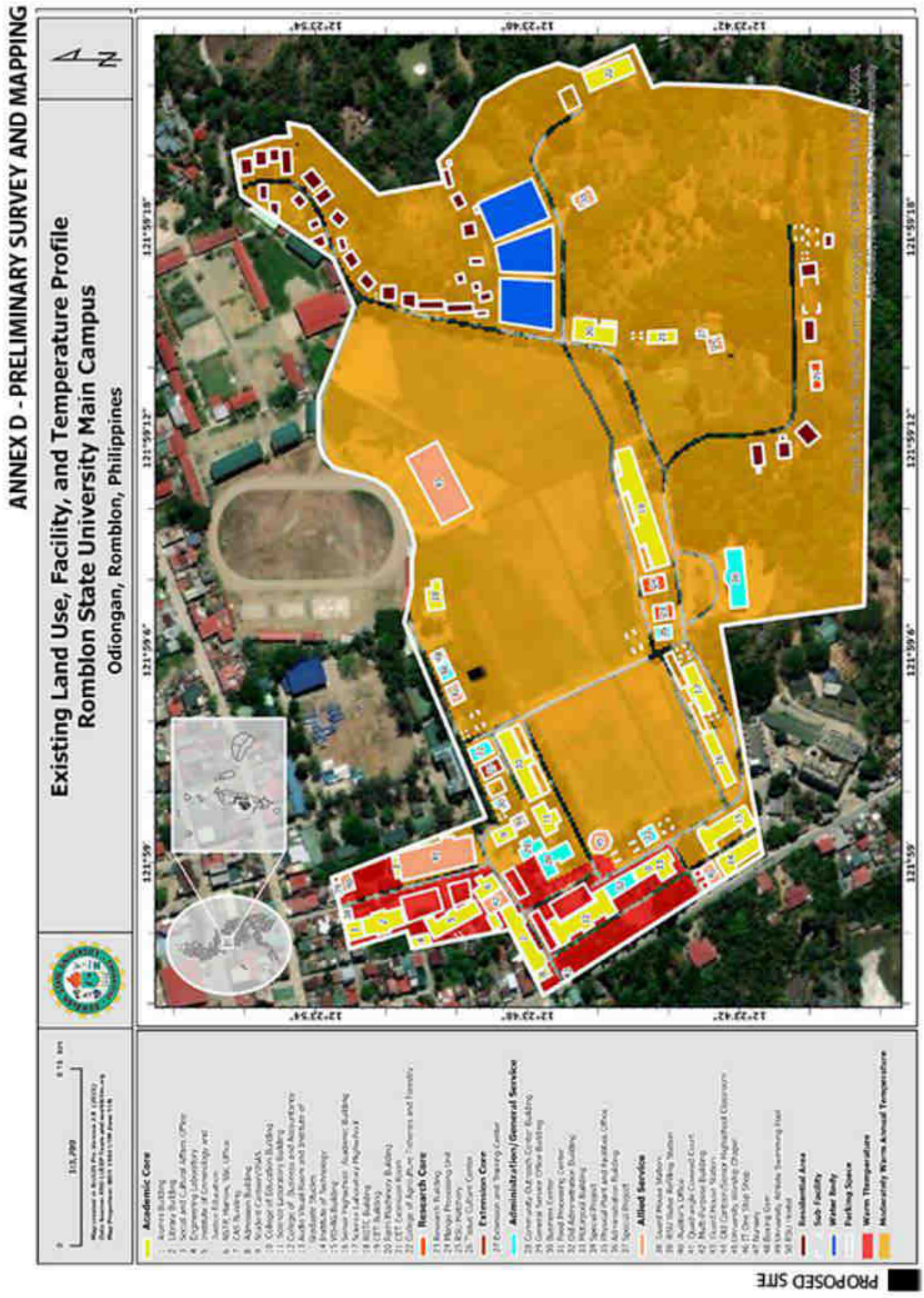

ANNEX D - PRELIMINARY SURVEY AND MAPPING
Existing Land Use, Facility, and Flood Profile
Romblon State University Main Campus
Odiongan, Romblon, Philippines
N
Academic Core
Research Core
Extension Core
Administration/General Service
Allied Service
Residential Area
Sub-Facility
Water Body
Parking Space
Flood Prone Area
Flood Free Area
PROPOSED SITE


ANNEX D- PRELIMINARY SURVEY AND MAPPING
Existing Land Use, Facility, and Elevation Profile
Romblon State University Main Campus
Odiongan, Romblon, Philippines
PROPOSED SITE

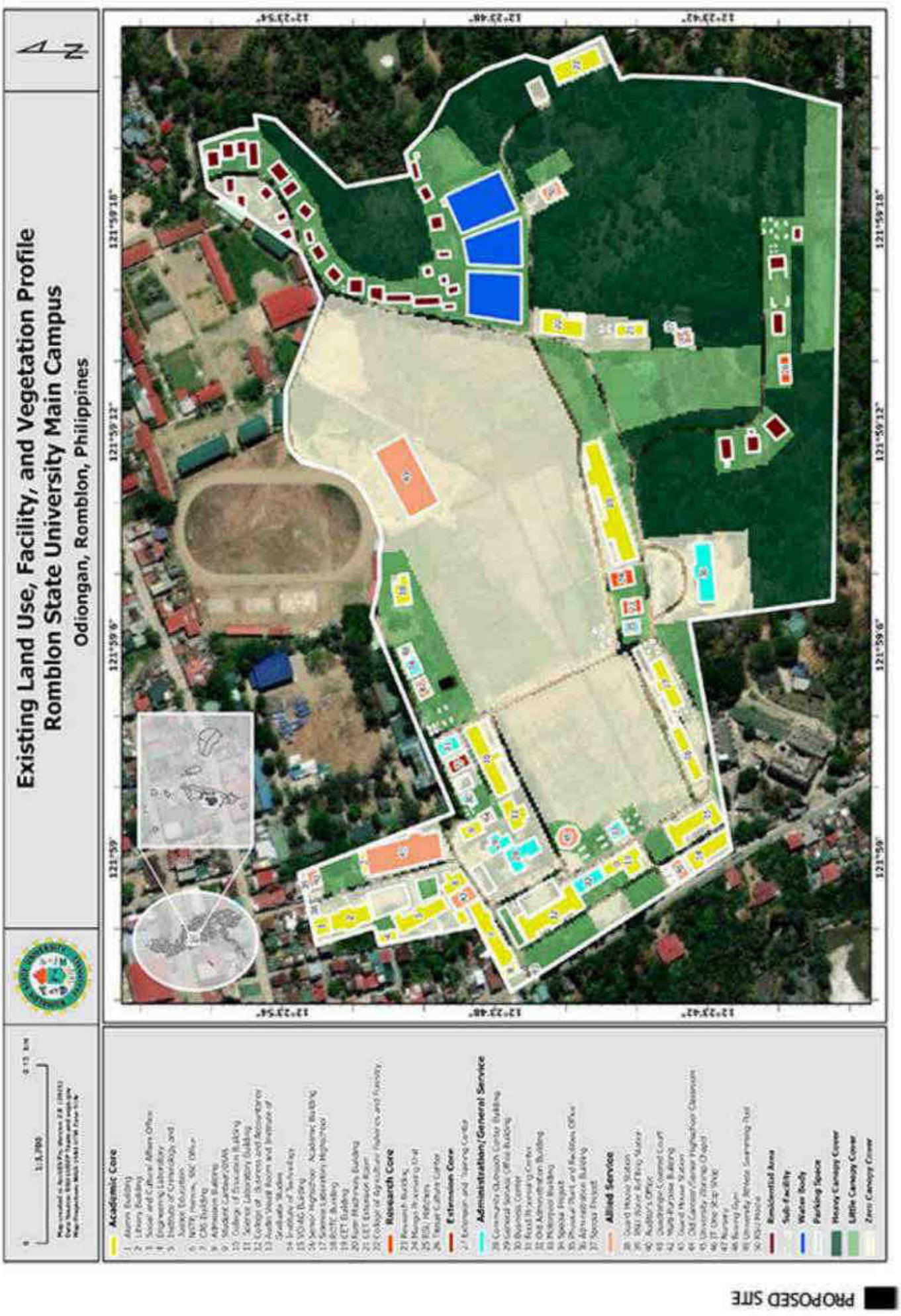

ANNEX D - PRELIMINARY SURVEY AND MAPPING
Existing Land Use, Facility, and Precipitation Profile
Romblon State University Main Campus
Odiongan, Romblon, Philippines
PROPOSED SITE


ANNEX D- PRELIMINARY SURVEY AND MAPPING
Existing Land Use, Facility, and Elevation Profile
Romblon State University Main Campus
Odiongan, Romblon, Philippines
N
Academic Core
Research Core
Extension Core
Administration/General Service
Allied Service
Residential Area
Sub-Facility
Water Body
Parking Space
High Elevation
Moderate Elevation
Low Elevation
PROPOSED SITE


ANNEX D- PRELIMINARY SURVEY AND MAPPING
Existing Land Use, Facility, and Storm Surge Profile
Romblon State University Main Campus
Odiongan, Romblon, Philippines
N
Academic Core
Research Core
Extension Core
Administration/General Service
Allied Service
Residential Area
Sub-Facility
Water Body
Parking Space
High Risk for Storm Surge
Moderate Risk for Storm Surge
Low Risk for Storm Surge
No Risk for Storm Surge
PROPOSED SITE


ANNEX D - PRELIMINARY SURVEY AND MAPPING
Existing Land Use, Facility, and Temperature Profile
Romblon State University Main Campus
Odiongan, Romblon, Philippines
N
Academic Core
Research Care
Extension Care
Administration/General Service
Allied Service
Residential Area
Sub Facility
Water Body
Parking Space
Warm Temperature
Moderately Warm Annual Temperature
PROPOSED SITE

ANNEX D - PRELIMINARY SURVEY AND MAPPING



ANNEX E – PRELIMINARY SURVEY

SOIL SUB-SURFACE INVESTIGATION
(Standard Penetration Test)

YTURRALDE
Engineering &
Consultancy
Services

PROJECT : REHABILITATION AND FURNISHING OF OLD/ EXISTING UNIVERSITY LIBRARY

LOCATION : RSU COMPUND, LIWANAG, ODIONGAN, ROMBLON

OWNER : ROMBLON STATE UNIVERSITY (RSU)

YTURRALDE ENGINEERING AND CONSULTANCY SERVICES
Engineers ♀ Designers ♀ Planners ♀ Consultancy
Lot 6 Blk. 19 NHA II Mandurriao Iloilo City Telefax. # (033) 333-3059 Cellfone No. (0918)-991-1051
Satellite office – Bonifacio St., Oton, Iloilo Tel. Num (033) 510-8485

1-1 FOUNDATIONS--- THEIR IMPORTANCE AND PURPOSE

All engineered construction resting on the earth must be carried by a foundation. The foundation is the part of the engineered system, which transmits to, and into, the underlying soil or rock the loads supported by a foundation and its self- weight. The resulting soil stresses, except at the ground surface, are in addition to those presently existing in the earth mass from the material self- weight and geological history.

1-2 FOUNDATIONS: GENERAL REQUIREMENTS

1. Determining the building purpose, probably service- life loading, type of framing, soil profile, construction methods, and construction costs.

2. Determine the client's/owner's needs.

3. Make the design but ensuring that it does not excessively degrade the environment and with a margin of safety which produces a tolerable risk level to all parties: the public, the owner; and the engineer.

1-3 FOUNDATIONS: ADDITIONAL CONSIDERATIONS

1. Depth must be adequate to avoid lateral squeezing of material from beneath the foundation for footings and mats. Similarly excavation for the foundation must take into account that this can happen to existing footings on adjacent sites and protection may be required for adjacent buildings.

2. Depth of foundation must be below the zone of seasonal volume changes caused by freezing, thawing, and plant growth. Most local building codes will contain minimum depth requirements.

3. The foundation scheme may have to consider expansive soil conditions. Here the building tends to capture soil moisture in the interior zone and allow normal evaporation around the perimeter. The soil in distressingly large number of geographical areas tends to swell in the presence of substantial moisture and carry the foundation up with it.

4. In addition to compressive strength considerations, the foundation system must be safe against overturning, sliding, and any uplift (flotation).
5. System must be safe against corrosion and deterioration due to harmful materials present in the soil. This is a particular concern in reclaiming sanitary landfills but has application for marine and other applications where chemical agents present can corrode metal piling, destroy wood

sheeting/piling cause adverse reactions in portland cement in concrete footings or piles, etc.

6. Foundation system must be adequate to sustain some later changes in site or construction geometry and be easily modified should changes in the superstructure and loading become necessary.

7. The foundation should be buildable with available construction personnel.

8. The foundation and site development must meet local environmental standards.

While not all of the above are applicable to a given project, it is readily apparent that those that are tend to introduce additional uncertainty into the system making the application of engineering judgment an even more important ingredient in the design process.

1-4 SEISMIC CONDITION

The Proposed Three Storey RSU Library Building, Located at RSU Compound, Liwanag, Odiongan, Romblon, Philippines, as such a Zone Factor of 0.40 will be used as stipulated in the National Structural Code of the Philippines 2015 edition. The structure is a Standard Occupancy structure, therefore an importance factor of 1.00 be used. Nearest earthquake generator is the Southern Mindoro Fault with a distance from the source approximately 80 kilometers. Seismic source type is A, soil profile type is S_c with near source factors $N_a = 1.0$ and $N_v = 1.0$.

The Standard Penetration Test (SPT) Method

Standard Penetration Test (ASTM D 1586). A split barrel sampler attached to the drill rod is installed on the hole bottom then driven into the soil with a 140 pound (63.5 kg) hammer falling 30 inches (76 centimeters). The N-value, which is representation of the penetration resistance of the soil, is recorded as the sum of the number of blows required dropping the sampler over the depth interval of 6 to 18 inches (150 to 450 millimeters) (Terzhagi's equation was used on computing for the soil bearing capacities).

TEST RESULTS

Project: Proposed 3 Storey RSU Library Building
Location: RSU Compound,Liwanag Odiongan, Romblon
Owner: Romblon State University (RSU)
Method Used: Standard Penetration Test (SPT)
Engineer: Malvev Eric L. Yturralde

Borehole No: One (1)
Date Performed: February 02, 2021
Time Performed: 8:00 - 9:00 A.M.
Ground Water Elevation:
Ground Surface Elevation: 100.00 M.

SPT Depth (m.)	Field Blows (Nf)	Correction Factor (Cf)	Corrected Blows (Nc)	Soil Condition
1.50	6	0.90	5	Medium
3.00	15	0.90	14	Medium
4.50	56	0.90	50	Dense
6.00	87	0.70	61	Dense
7.50	148	0.45	67	Dense
Average	**62**		**39**	

TEST RESULTS

Project: Proposed 3 Storey RSU Library Building
Location: RSU Compound,Liwanag Odiongan, Romblon
Owner: Romblon State University (RSU)
Method Used: Standard Penetration Test (SPT)
Engineer: Makev Eric L. Yturralde

Borehole No: Two (2)
Date Performed: February 02, 2021
Time Performed: 9:00 - 10:00 A.M.
Ground Water Elevation:
Ground Surface Elevation: 100.00 M.

SPT Depth (m.)	Field Blows (Nf)	Correction Factor (Cf)	Corrected Blows (Nc)	Soil Condition
1.50	17	0.90	15	Medium
3.00	33	0.90	30	Medium
4.50	71	0.85	60	Dense
6.00	98	0.70	69	Dense
7.50	173	0.45	78	Dense
Average	**78**		**50**	

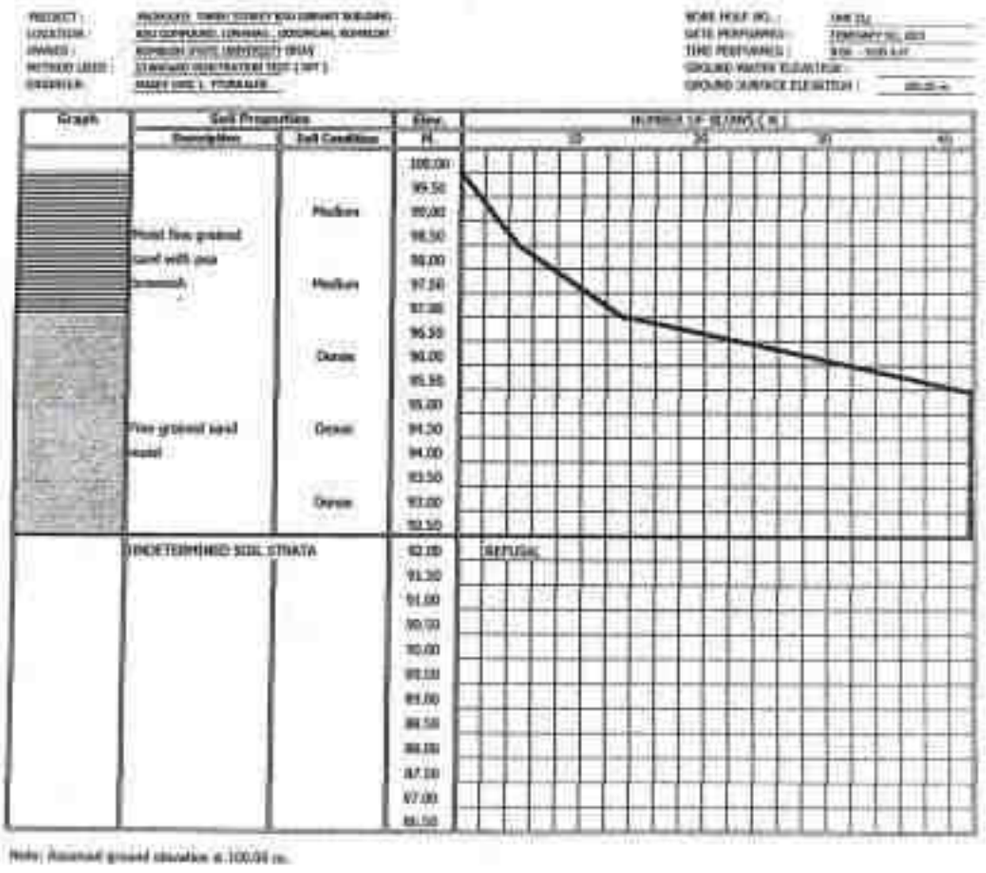
TEST RESULTS

Project: Proposed 3 Storey RSU Library Building
Location: RSU Compound,Liwanag Odiongan, Romblon
Owner: Romblon State University (RSU)
Method Used: Standard Penetration Test (SPT)
Engineer: Maliev Eric L. Yturralde

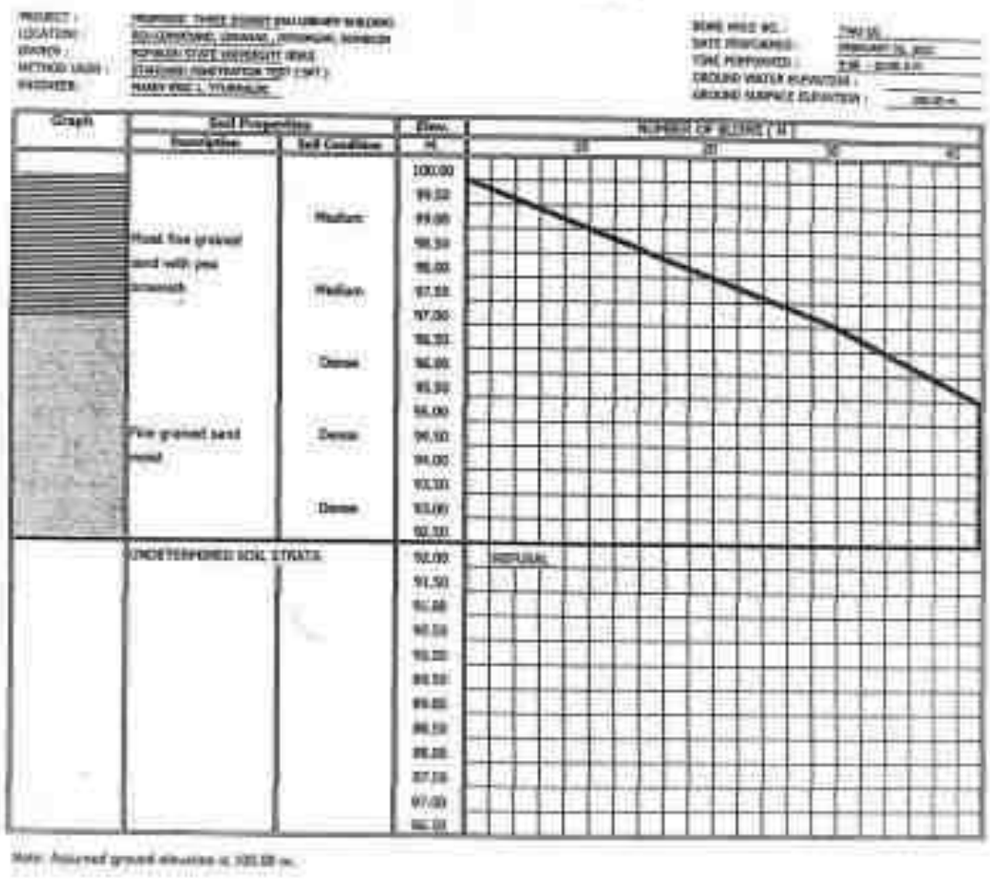
Borehole No: Three (3)
Date Performed: February 02, 2021
Time Performed: 10:00 - 11:00 A.M.
Ground Water Elevation:
Ground Surface Elevation: 100.00 M.

SPT Depth (m.)	Field Blows (Nf)	Correction Factor (Cf)	Corrected Blows (Nc)	Soil Condition
1.50	9	0.90	8	Medium
3.00	24	0.90	22	Medium
4.50	76	0.85	65	Dense
6.00	93	0.70	65	Dense
7.50	161	0.45	72	Dense
Average	**73**		**46**	

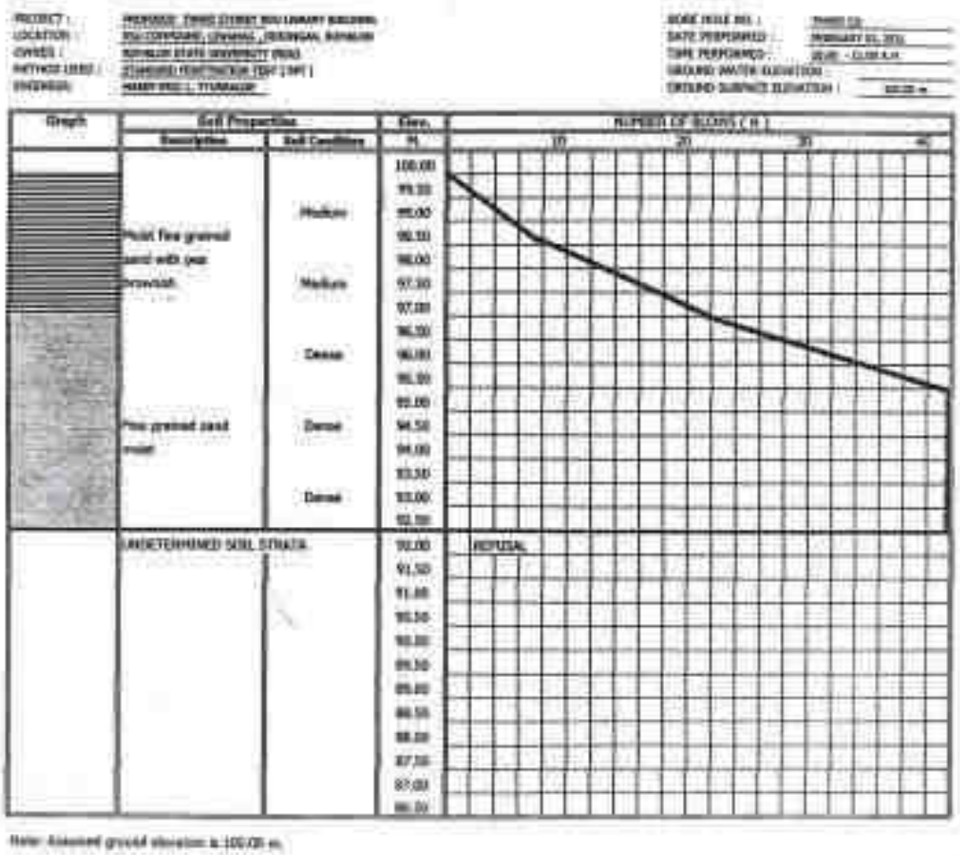
SOIL TEST
SUBSURFACE LOG



SOIL TEST
SUBSURFACE LOG



SOIL TEST
SUBSURFACE LOG



SOIL BEARING CAPACITY TABLE

PROJECT : PROPOSED 3 STOREY RSU LIBRARY BUILDING
LOCATION : RSU COMP., LIWANAG, ODIONGAN, ROMBLON
OWNER : ROMBLON STATE UNIVERSITY (RSU)
METHOD USED: STANDARD PENETRATION TEST (SPT)
ENGINEER : MAKEV ERIC L. YTURRALDE

BORE HOLE: ONE (1)
DATE PERFORMED: 02 FEBRUARY 2021
TIME PERFORMED: 8:00 - 9:00 A.M.
GROUND WATER ELEVATION:
GROUND SURFACE ELEVATION: 100.00 M.

BH-1

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	5.00	1.200	25.00	100.015	33.338
3.00	14.00	1.200	30.00	183.364	61.121
4.50	50.00	1.200	38.00	1574.815	524.938
6.00	61.00	1.200	38.00	2307.711	769.237
7.50	67.00	1.200	38.00	2769.249	923.083
Average	39			1387	462

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	5.00	1.500	25.00	93.246	31.082
3.00	14.00	1.500	30.00	184.947	61.649
4.50	50.00	1.500	38.00	1579.760	526.587
6.00	61.00	1.500	38.00	2313.313	771.104
7.50	67.00	1.500	38.00	2775.402	925.134
Average	39			1389	463

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	5.00	1.800	25.00	86.476	28.825
3.00	14.00	1.800	30.00	186.529	62.176
4.50	50.00	1.800	38.00	1584.705	528.235
6.00	61.00	1.800	38.00	2318.915	772.972
7.50	67.00	1.800	38.00	2781.555	927.185
Average	39			1392	464

SOIL BEARING CAPACITY TABLE

PROJECT : PROPOSED 3 STOREY RSU LIBRARY BUILDING
LOCATION : RSU COMP., LIWANAG, ODIONGAN, ROMBLON
OWNER : ROMBLON STATE UNIVERSITY (RSU)
METHOD USED: STANDARD PENETRATION TEST (SPT)
ENGINEER : MAKEV ERIC L. YTURRALDE

BOREHOLE: ONE (1)
DATE PERFORMED: 02 FEBRUARY 2021
TIME PERFORMED: 8:00 - 9:00 A.M.
GROUND WATER ELEVATION:
GROUND SURFACE ELEVATION: 100.00 M.

BH-1

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	5.00	2.400	25.00	87.889	29.296
3.00	14.00	2.400	30.00	189.694	63.231
4.50	50.00	2.400	38.00	1594.595	531.532
6.00	61.00	2.400	38.00	2330.120	776.707
7.50	67.00	2.400	38.00	2793.861	931.287
Average	39			1399	466

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	5.00	3.000	25.00	89.302	29.767
3.00	14.00	3.000	30.00	192.859	64.286
4.50	50.00	3.000	38.00	1604.486	534.829
6.00	61.00	3.000	38.00	2341.324	780.441
7.50	67.00	3.000	38.00	2806.167	935.389
Average	39			1407	469

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	5.00	3.600	25.00	90.715	30.238
3.00	14.00	3.600	30.00	196.024	65.341
4.50	50.00	3.600	38.00	1614.376	538.125
6.00	61.00	3.600	38.00	2352.528	784.176
7.50	67.00	3.600	38.00	2818.473	939.491
Average	39			1414	471

SOIL BEARING CAPACITY TABLE

PROJECT : PROPOSED 3 STOREY RSU LIBRARY BUILDING
LOCATION : RSU COMP., LIWANAG, ODIONGAN, ROMBLON
OWNER : ROMBLON STATE UNIVERSITY (RSU)
METHOD USED: STANDARD PENETRATION TEST (SPT)
ENGINEER : MAKEV ERIC L. YTURRALDE

BOREHOLE: ONE (1)
DATE PERFORMED: 02 FEBRUARY 2021
TIME PERFORMED: 8:00 - 9:00 A.M.
GROUND WATER ELEVATION:
GROUND SURFACE ELEVATION: 100.00 M.

BH-1

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	5.00	4.800	25.00	93.540	31.180
3.00	14.00	4.800	30.00	202.354	67.451
4.50	50.00	4.800	38.00	1634.156	544.719
6.00	61.00	4.800	38.00	2374.936	791.645
7.50	67.00	4.800	38.00	2843.086	947.695
Average	39			1430	477

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	5.00	5.400	25.00	87.477	29.159
3.00	14.00	5.400	30.00	205.518	68.506
4.50	50.00	5.400	38.00	1644.046	548.015
6.00	61.00	5.400	38.00	2386.140	795.380
7.50	67.00	5.400	38.00	2855.392	951.797
Average	39			1436	479

SOIL BEARING CAPACITY TABLE

PROJECT : PROPOSED 3 STOREY RSU LIBRARY BUILDING
LOCATION : RSU COMP., LIWANAG, CIDIONGAN, ROMBLON
OWNER : ROMBLON STATE UNIVERSITY (RSU)
METHOD USED: STANDARD PENETRATION TEST (SPT)
ENGINEER : MAKEV ERIC L. YTURRALDE

BOREHOLE: TWO (2)
DATE PERFORMED: 02 FEBRUARY 2021
TIME PERFORMED: 9:00 - 10:00 A.M.
GROUND WATER ELEVATION:
GROUND SURFACE ELEVATION: 100.00 M.

BH-2

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	15.00	1.200	25.00	261.170	87.057
3.00	30.00	1.200	30.00	611.654	203.885
4.50	60.00	1.200	38.00	2236.670	745.557
6.00	69.00	1.200	38.00	2932.664	977.555
7.50	78.00	1.200	38.00	3727.243	1242.414
Average	50			1954	651

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	15.00	1.500	25.00	243.852	81.284
3.00	30.00	1.500	30.00	615.045	205.015
4.50	60.00	1.500	38.00	2242.605	747.535
6.00	69.00	1.500	38.00	2939.001	979.667
7.50	78.00	1.500	38.00	3734.407	1244.802
Average	50			1955	652

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	15.00	1.800	25.00	226.533	75.511
3.00	30.00	1.800	30.00	618.436	206.145
4.50	60.00	1.800	38.00	2248.539	749.513
6.00	69.00	1.800	38.00	2945.337	981.779
7.50	78.00	1.800	38.00	3741.570	1247.190
Average	50			1956	652

SOIL BEARING CAPACITY TABLE

PROJECT : PROPOSED 3 STOREY RSU LIBRARY BUILDING
LOCATION : RSU COMP., LIWANAG, ODIONGAN, ROMBLON
OWNER : ROMBLON STATE UNIVERSITY (RSU)
METHOD USED: STANDARD PENETRATION TEST (SPT)
ENGINEER : MAKEV ERIC L. YTURRALDE

BOREHOLE: TWO (2)
DATE PERFORMED: 02 FEBRUARY 2021
TIME PERFORMED: 9:00 - 10:00 A.M.
GROUND WATER ELEVATION:
GROUND SURFACE ELEVATION: 100.00 M.

BH-2

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	15.00	2.400	25.00	230.772	76.924
3.00	30.00	2.400	30.00	625.218	208.406
4.50	60.00	2.400	38.00	2260.407	753.469
6.00	69.00	2.400	38.00	2958.011	986.004
7.50	78.00	2.400	38.00	3755.897	1251.966
Average	50			1966	655

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	15.00	3.000	25.00	235.010	78.337
3.00	30.00	3.000	30.00	631.999	210.666
4.50	60.00	3.000	38.00	2272.275	757.425
6.00	69.00	3.000	38.00	2970.685	990.228
7.50	78.00	3.000	38.00	3770.223	1256.741
Average	50			1976	659

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	15.00	3.600	25.00	239.249	79.750
3.00	30.00	3.600	30.00	638.781	212.927
4.50	60.00	3.600	38.00	2284.143	761.381
6.00	69.00	3.600	38.00	2983.358	994.453
7.50	78.00	3.600	38.00	3784.550	1261.517
Average	50			1986	662

SOIL BEARING CAPACITY TABLE

PROJECT : PROPOSED 3 STOREY RSU LIBRARY BUILDING
LOCATION : RSU COMP., LIWANAG, ODIONGAN, ROMBLON
OWNER : ROMBLON STATE UNIVERSITY (RSU)
METHOD USED: STANDARD PENETRATION TEST (SPT)
ENGINEER : MAKEV ERIC L. YTURRALDE

BOREHOLE: TWO (2)
DATE PERFORMED: 02 FEBRUARY 2021
TIME PERFORMED: 9:00 - 10:00 A.M.
GROUND WATER ELEVATION:
GROUND SURFACE ELEVATION: 100.00 M.

BH-2

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	15.00	4.800	25.00	247.726	82.575
3.00	30.00	4.800	30.00	652.345	217.448
4.50	60.00	4.800	38.00	2307.880	769.293
6.00	69.00	4.800	38.00	3008.705	1002.902
7.50	78.00	4.800	38.00	3813.203	1271.068
Average	50			2006	669

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	15.00	5.400	25.00	232.527	77.509
3.00	30.00	5.400	30.00	659.127	219.709
4.50	60.00	5.400	38.00	2319.748	773.249
6.00	69.00	5.400	38.00	3021.379	1007.126
7.50	78.00	5.400	38.00	3827.530	1275.843
Average	50			2012	671

SOIL BEARING CAPACITY TABLE

PROJECT : PROPOSED 3 STOREY RSU LIBRARY BUILDING
LOCATION : RSU COMP., LIWANAG, ODIONGAN, ROMBLON
OWNER : ROMBLON STATE UNIVERSITY (RSU)
METHOD USED: STANDARD PENETRATION TEST (SPT)
ENGINEER : MAKEV ERIC L. YTURRALDE

BOREHOLE: THREE (3)
DATE PERFORMED: 02 FEBRUARY 2021
TIME PERFORMED: 10:00 - 11:00 A.M.
GROUND WATER ELEVATION:
GROUND SURFACE ELEVATION: 100.00 M.

BH-3

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	8.00	1.200	25.00	132.034	44.011
3.00	22.00	1.200	30.00	359.231	119.744
4.50	65.00	1.200	38.00	2612.455	870.818
6.00	65.00	1.200	38.00	2610.618	870.206
7.50	72.00	1.200	38.00	3186.758	1062.253
Average	46			1780	593

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	8.00	1.500	25.00	123.356	41.119
3.00	22.00	1.500	30.00	361.718	120.573
4.50	65.00	1.500	38.00	2618.883	872.961
6.00	65.00	1.500	38.00	2616.588	872.196
7.50	72.00	1.500	38.00	3193.370	1064.457
Average	46			1783	594

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	8.00	1.800	25.00	114.677	38.226
3.00	22.00	1.800	30.00	364.205	121.402
4.50	65.00	1.800	38.00	2625.312	875.104
6.00	65.00	1.800	38.00	2622.557	874.186
7.50	72.00	1.800	38.00	3199.983	1066.661
Average	46			1785	595

SOIL BEARING CAPACITY TABLE

PROJECT : PROPOSED 3 STOREY RSU LIBRARY BUILDING
LOCATION : RSU COMP., LIWANAG, ODIONGAN, ROMBLON
OWNER : ROMBLON STATE UNIVERSITY (RSU)
METHOD USED: STANDARD PENETRATION TEST (SPT)
ENGINEER : MAKEV ERIC L. YTURRALDE

BOREHOLE: THREE (3)
DATE PERFORMED: 02 FEBRUARY 2021
TIME PERFORMED: 10:00 - 11:00 A.M.
GROUND WATER ELEVATION:
GROUND SURFACE ELEVATION: 100.00 M.

BH-3

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	8.00	2.400	25.00	116.935	38.979
3.00	22.00	2.400	30.00	369.178	123.059
4.50	65.00	2.400	38.00	2638.169	879.390
6.00	65.00	2.400	38.00	2634.496	878.165
7.50	72.00	2.400	38.00	3213.207	1071.069
Average	46			1794	598

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	8.00	3.000	25.00	119.199	39.733
3.00	22.00	3.000	30.00	374.151	124.717
4.50	65.00	3.000	38.00	2651.027	883.676
6.00	65.00	3.000	38.00	2646.435	882.145
7.50	72.00	3.000	38.00	3226.432	1075.477
Average	46			1803	601

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	8.00	3.600	25.00	121.459	40.486
3.00	22.00	3.600	30.00	379.125	126.375
4.50	65.00	3.600	38.00	2663.884	887.961
6.00	65.00	3.600	38.00	2658.373	886.124
7.50	72.00	3.600	38.00	3239.656	1079.885
Average	46			1812	604

SOIL BEARING CAPACITY TABLE

PROJECT : PROPOSED 3 STOREY RSU LIBRARY BUILDING
LOCATION : RSU COMP., LIWANAG, ODIONGAN, ROMBLON
OWNER : ROMBLON STATE UNIVERSITY (RSU)
METHOD USED: STANDARD PENETRATION TEST (SPT)
ENGINEER : MAKEV ERIC L. YTURRALDE

BOREHOLE: THREE (3)
DATE PERFORMED: 02 FEBRUARY 2021
TIME PERFORMED: 10:00 - 11:00 A.M.
GROUND WATER ELEVATION:
GROUND SURFACE ELEVATION: 100.00 M.

BH-3

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	8.00	4.800	25.00	125.980	41.993
3.00	22.00	4.800	30.00	389.071	129.690
4.50	65.00	4.800	38.00	2689.598	896.533
6.00	65.00	4.800	38.00	2682.251	894.084
7.50	72.00	4.800	38.00	3266.106	1088.702
Average	46			1831	610

SPT DEPTH (Meter)	CORRECTED BLOWS (Nc)	FOOTING BASE (B in M.)	ANGLE OF INTERNAL FRICTION	USBP Ultimate (Qu in KPa)	SBPA Allowable (Qa in KPa)
1.50	8.00	5.400	25.00	118.432	39.477
3.00	22.00	5.400	30.00	394.045	131.348
4.50	65.00	5.400	38.00	2702.455	900.818
6.00	65.00	5.400	38.00	2694.190	898.063
7.50	72.00	5.400	38.00	3279.330	1093.110
Average	46			1838	613

RECOMMENDATIONS:

1. If possible footings should be established at depths of 1.80 m and below the existing ground elevations. Since it is at these elevations that the soil bearing capacity increases. No footing should be established on fill.

2. For Soil Bearing Capacity of the test site refer to the soil bearing capacity table based on the base of footing, at corresponding depths. As per result of the samples taken during the field test, the soil is made up of fine grained sand, moist on the first upper layers brownish with pea and moist fine grained sand below it with pea.

3. It is recommended that a bearing capacity of 30 KPa. at elevations 0.00 to 1.80 meters below the existing ground elevation be used, and below that a bearing capacity of 130.00 Kpa. be used then. A stratification test be conducted to a depth of 60 feet before construction starts if deep foundation will be used. The results / recommendations are specifically for the boreholes that were conducted.

4. Garbage materials and other organic materials should be removed from the area.

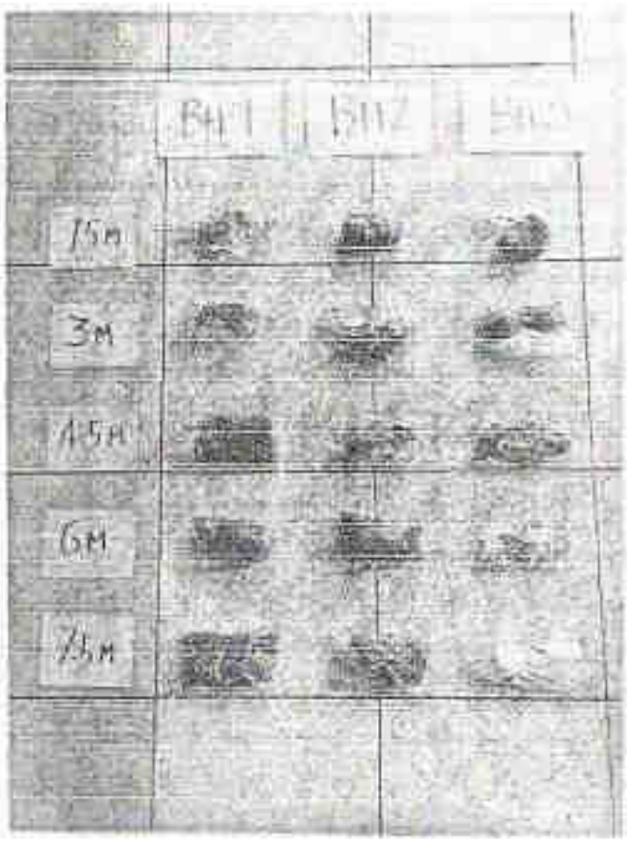
5. The footing / foundation design should be checked in relation to the recommended bearing capacity table given corresponding to the depths indicated. The said table / results assume a maximum settlement of 25.00 mm.

6. If there are questions regarding the interpretation of the data presented it is recommended to consult the undersigned. It should be noted that the analysis done were based on the samples and data provided by the client.

Submitted by:

Engr. Makev Eric L. Yturralde
Civil / Structural Engineer PICE / MASEP/ISSEP CStruct5 No. 031
PICE Accredited Specialist in Structural Engineering-member certificate number SE 163

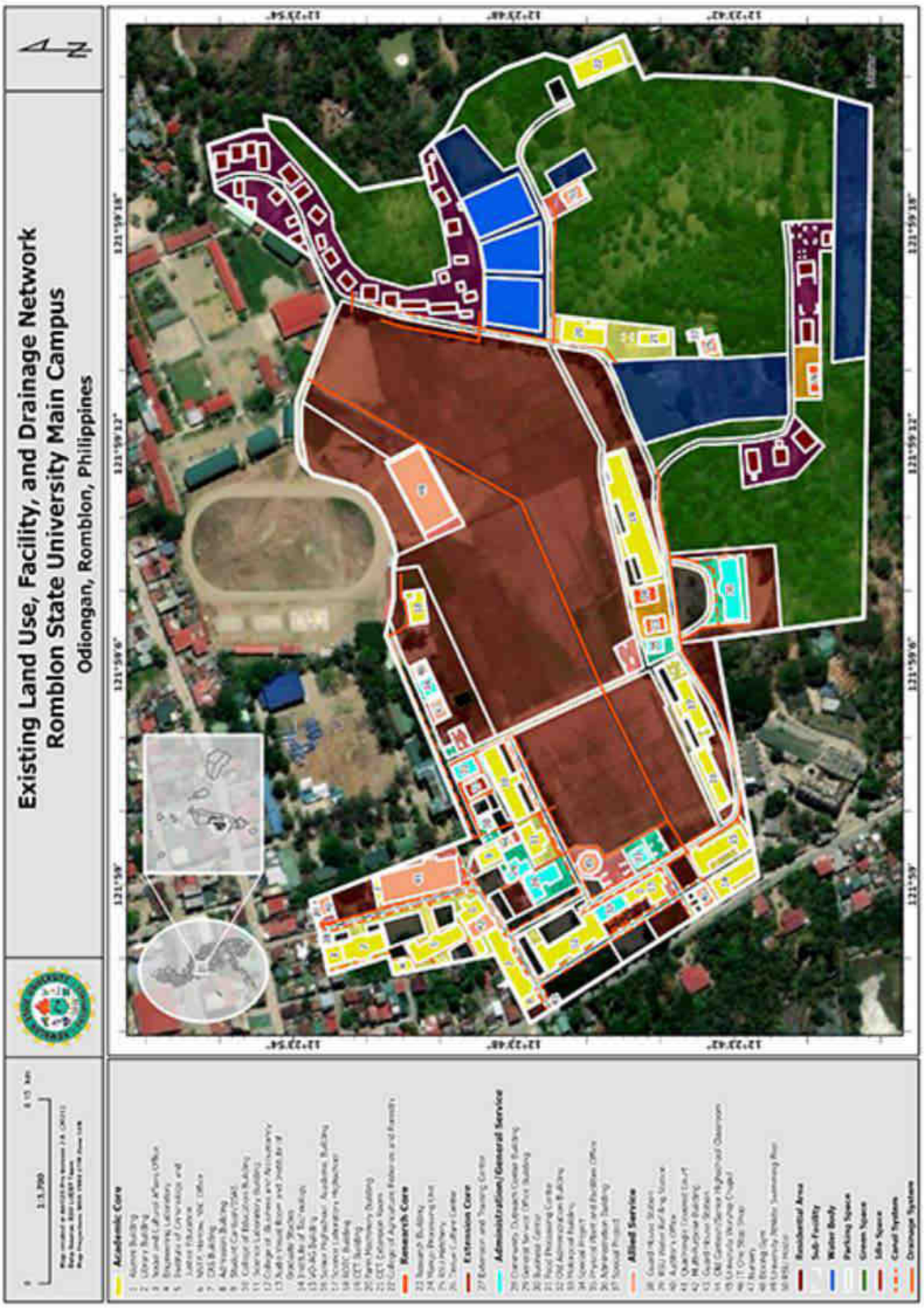
Site & Sample Pictures

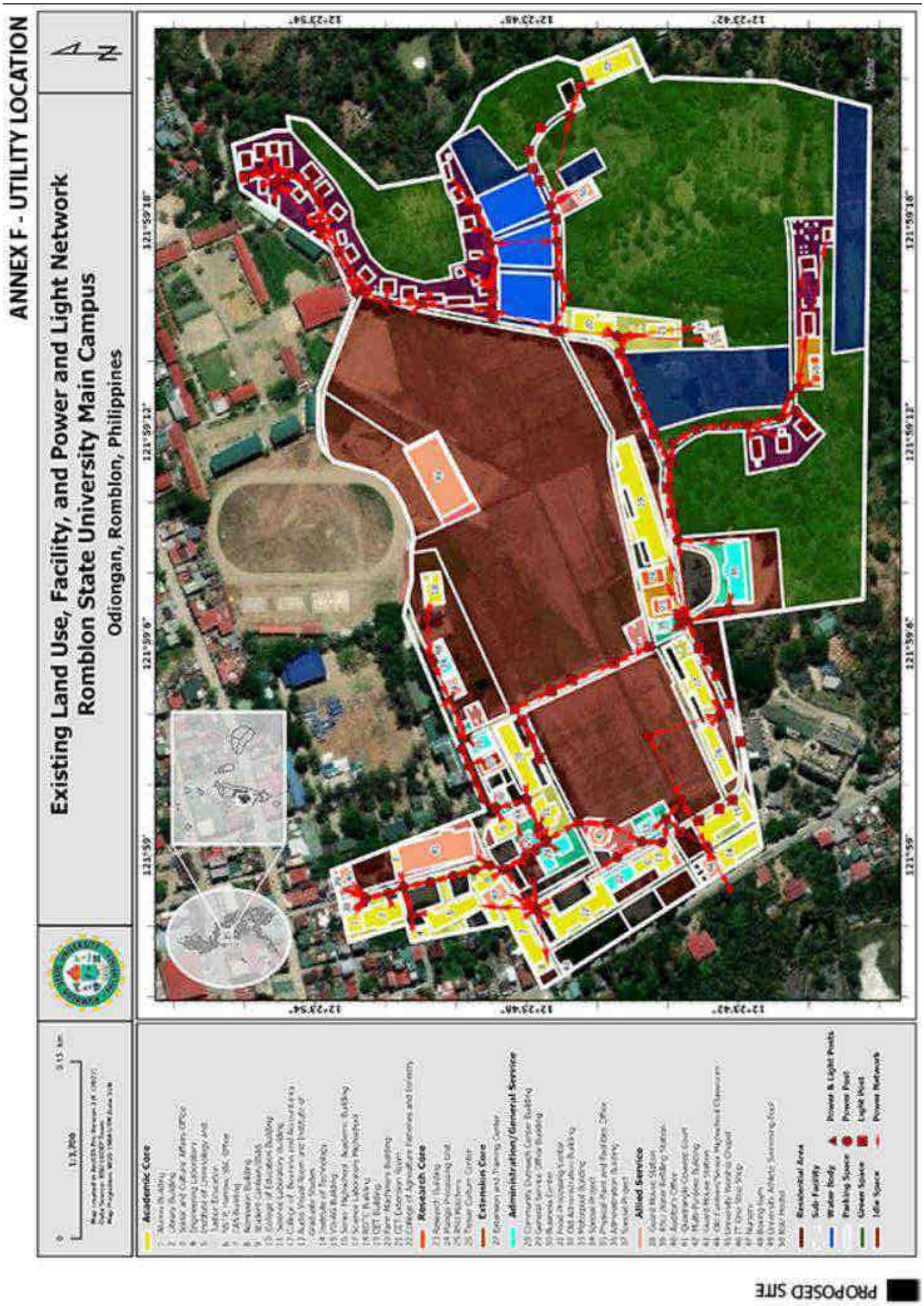


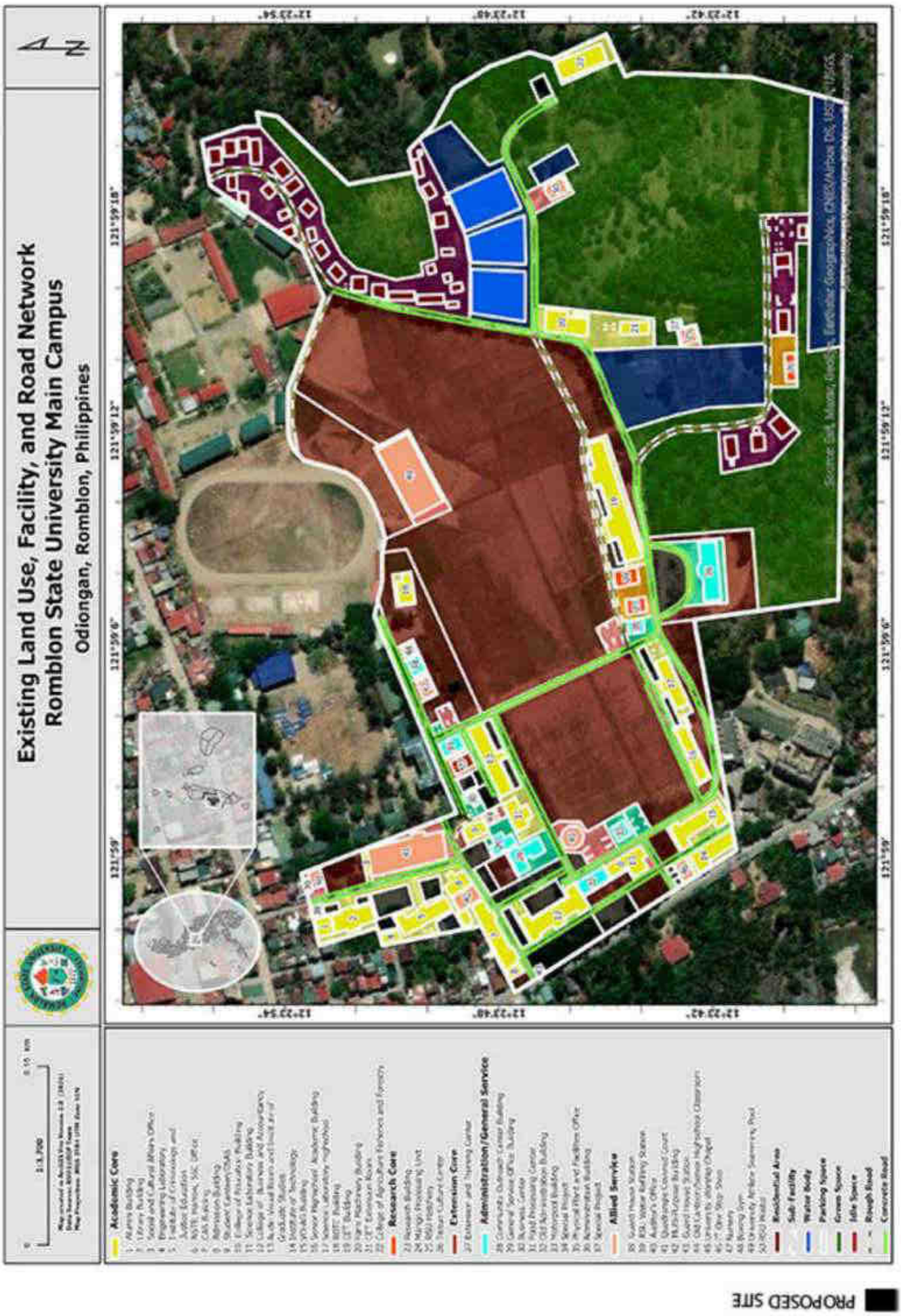
YTURRALDE
Engineering &
Consultancy
Services

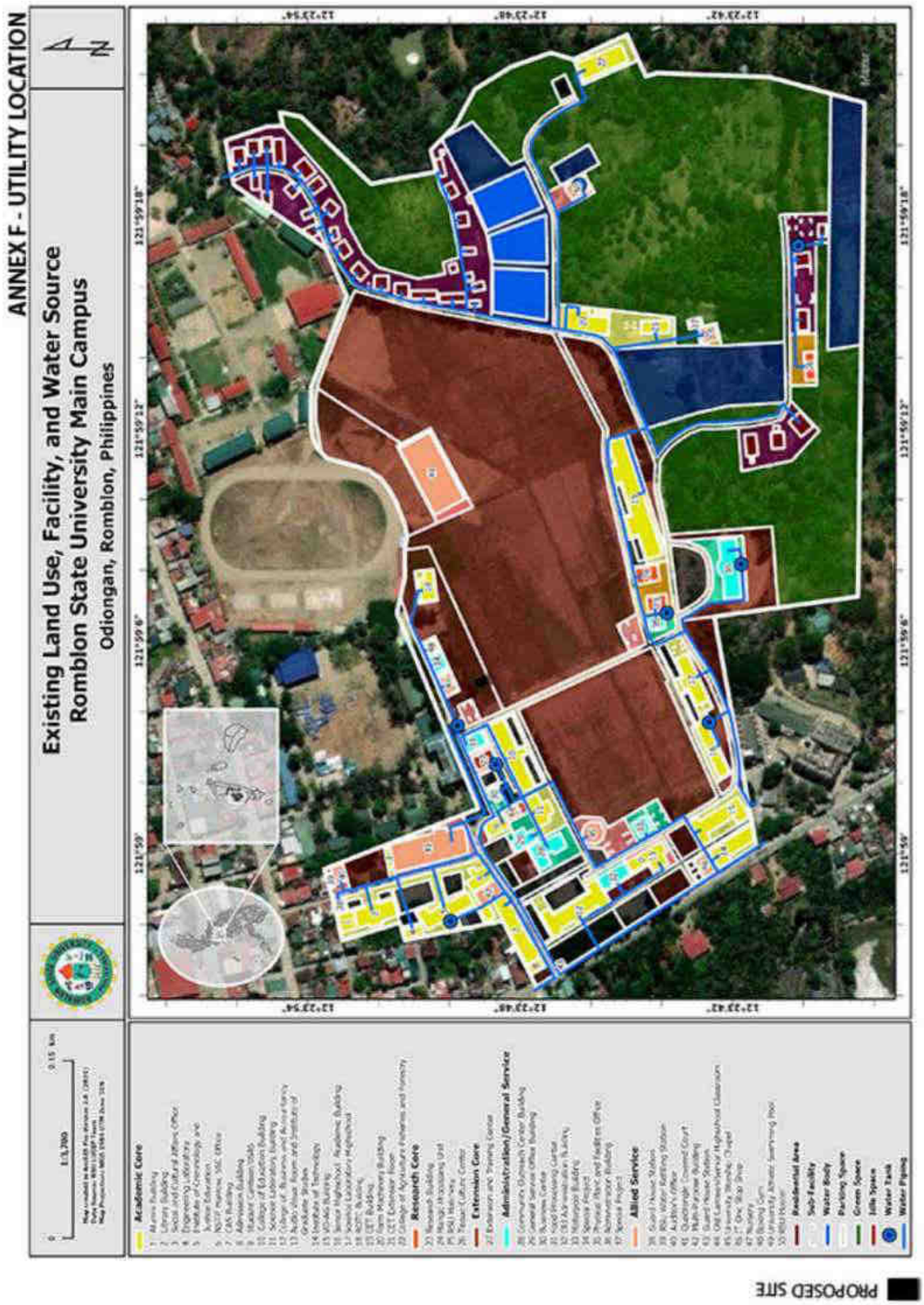
ANNEX F – UTILITY LOCATION

ANNEX F - UTILITY LOCATION




ANNEX F - UTILITY LOCATION
Existing Land Use, Facility, and Power and Light Network
Romblon State University Main Campus
Odiongan, Romblon, Philippines
Academic Core
Research Core
Extension Core
Administration/Gimmarial Service
Allied Service
Residential Area
Sub Facility
Water Body
Parking Space
Green Space
Idle Space
Power & Light Posts
Power Post
Light Post
Power Network
PROPOSED SITE


ANNEX F - UTILITY LOCATION
Existing Land Use, Facility, and Road Network
Romblon State University Main Campus
Odiongan, Romblon, Philippines
N
1:3,700
Academic Core
Research Core
Extension Core
Administration/General Service
Allied Service
Residential Area
Sub-Facility
Water Body
Parking Space
Green Space
Idle Space
Rough Road
Concrete Road
PROPOSED SITE


ANNEX F - UTILITY LOCATION
Existing Land Use, Facility, and Water Source
Romblon State University Main Campus
Odiongan, Romblon, Philippines
Academic Core
Research Core
Extension Core
Administration/General Service
Allied Service
Residential Area
Sub-Facility
Water Body
Parking Space
Green Space
Jolo Space
Water Tank
Water Piping
PROPOSED SITE

ANNEX G - PROPOSED DESIGN AND CONSTRUCTION SCHEDULE

ACTIVITY	FIRST MONTH																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
I. Design Phase																		
I.a. Soil Bearing Analysis																		
I.b. Design Analysis																		
I.c. Set of Plan Preparation and Sign & Seal																		
I.d. others																		
II. Construction Phase																		
I.a. Permits Application																		
I.b. Mobilization																		
I.c. Building Construction																		
I.d. Demobilization																		
I.e. Occupancy Permit Application																		
I.e. Others																		
Manpower Schedule																		
Engineer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Safety Officer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
First Aider	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Foreman															1	1	1	1
Skilled Worker															5	5	5	5
Laborer															5	5	5	10

T

RSU Main Can

GANTT CHART, MANPOWER S(

SEC

19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	5	5	5	5	5	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
10	10	10	10	10	10	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

PROPOSED DATA CENTER

npus, Brgy Liwanag, Odiongan, Romblon, Philippines, 5505

CHEDULE AND S-CURVE BASED ON EARLY START

OND MONTH																									
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

THIRD MONTH																				FOU					
11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	10	10	10	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
20	20	20	20	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	10	10	10	10	10

10	15	1	1	1	1													7
10	15	1	1	1	1													8
10	10	1	1	1	1													9
10	10	1	1	1	1													10
10	10	1	1	1	1													11
10	10	1	1	1	1													12
10	10	1	1	1	1													13
10	10	1	1	1	1													14

JRTH MONTH

ANNEX H – MINIMUM REQUIREMENYS FOR A CONSTRUCTION SAFETY AND HEALTH PROGRAM

1. The DESIGNER – BUILDER, shall undertake specific safety policies to observe and maintain its construction site, including the frequency and persons responsible for conducting toolbox and gang meetings.
2. The DESIGNER – BUILDER shall ensure that the Construction Safety and Health Program is executed and verified by the Construction Project Manager. The contractor must submit the said program to the Bureau of Working Conditions (BWC), which may approve, disapprove or modify the same according to existing laws, rules, regulation, and other issues by the DOLE.
3. The DESIGNER – BUILDER shall include the cost of implementing the Construction Safety and Health Program and integrate it into the project's construction cost. The said cost shall be a separate pay item, duly quantified and stated in the project's tender and construction contract documents.
4. The DESIGNER – BUILDER shall provide adequate and approved types of protective equipment. Work within the construction project site shall be required to always wear the necessary Personal Protective Equipment (PPE). The DESIGNER – BUILDER shall see to it that:
    - The construction workers working from unguarded surfaces six (6) meters or more above water or ground, temporary or permanent floor platform, scaffold, or where they are exposed to the possibility of falls hazardous to life or limb, must be provided with the safety harness and lifelines.
    - Specialty construction workers must be provided with special protective equipment, such as goggles or respirators for welders and painters or paint applicators.
    - All persons authorized or allowed to be at a construction site shall wear appropriate PPE.
5. The DESIGNER – BUILDER must provide for a full – time officer, who shall be assigned as the general construction safety and health officer to oversee the overall management of the Construction Safety and Health Program. The general construction safety and health perform the following duties:
    - Frequently monitor and inspect any health and safety aspects of the construction work.
    - Assist government inspector in conducting safety and health inspection whenever work is being performed or during the accident investigation.
6. The DESIGNER – BUILDER must provide one (1) Construction Safety and Health Officer for every ten (10) units of heavy equipment assigned to the project site. This program will ensure effective compliance with the Construction Safety and Health Program regarding heavy utilization and maintenance at the construction project site.