Design and Build
of the
NATIONAL INSTITUTES OF HEALTH BUILDING
UP Manila Campus, Manila

PROJECT MANUAL
Volume 2

TERMS OF REFERENCE
- Design and Build -

Approved during the 1289th meeting of the Board of Regents on 29 July 2013.

Office of Design and Planning Initiatives
OFFICE OF THE VICE PRESIDENT FOR DEVELOPMENT
UNIVERSITY OF THE PHILIPPINES

PROJECT MANUAL
VOLUME 2

TERMS OF REFERENCE

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Read and accepted as part of the Contract:

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PART I
GENERAL PROJECT INFORMATION

1.0 PROJECT DESCRIPTION

1.1 Project Title: Design and Build of the National Institutes of Health Building

1.2 General Description

The project shall cover the design and construction of the National Institutes of Health. The project site of approximately 3,750 square meters is within the University of the Philippines (UP) Manila campus.

The plans and designs shall be in accordance with the UP-approved Schematic Design Plans and the General Site Development and Building Design Specifications as prescribed in this Terms of Reference (TOR). The project shall have an Approved Budget for the Contract (ABC) of Nine Hundred Eighty Million Pesos (Php 980,000,000.00). Funding has been provided by Fiscal Year 2013 General Appropriations Act (RA 10352).

The site shall be developed to accommodate the standard requirements of a research laboratory of twelve-storey structure with a mechanical penthouse and two basement floors as prescribed by the National Building Code of the Philippines and other generally-accepted design standards for such facility.

1.3 Project Components

The project shall have the following basic components:

(a) Completed Architectural and Engineering (A&E) Plans, specifications and detailed designs for National Institutes of Health, including Site and Landscape Development, Buildings, Structures and Facilities.

Such plans, designs and specifications shall be subject to review and approval by the University. The Design Development (DD) and the Contract Documents (CD) phases of the design shall continue after the bid is awarded. It shall likewise be subject to review and approval by the University.

(b) Construction of a new building for the National Institutes of Health at UP Manila Campus Site Development, Buildings, including Structure and Site Facilities.

The bid shall be based on schematic design plans prepared by the Office of Design and Planning Initiatives (ODPI) which have been pre-approved by the University and supplemented by the issuance of Bid Bulletins from the date of original advertisement.

The design-build project shall provide for "shell and core" and fit-up of selected occupant areas. The following definitions apply to this project:
1) "Shell and Core" generally covers ONLY base building elements and are required.
2) "Shell" refers to overall structure and foundations, exterior walls, floors and roof,

completing with common areas, staircases, lift shafts, service ducts and fire services systems to local statutory requirements.

3) "Core" refers to fully-fitted public areas (like lobbies, corridors and lavatories) and mechanical and electrical main plant and up-feed, with tenant or occupant areas unfurnished.

4) "Full fit" areas should be complete with all elements that allow the occupied to be ready for operation, including ALL finishes, fittings and mechanical and electrical distributions.

(b1) The following spaces shall be full-fit (finished, furnished and equipped), unless indicated otherwise:

1) All Laboratory BSL-2 and support spaces (only laboratory equipment not included), except as identified under Item No. (b)
2) All offices and support spaces (furniture not included)
3) All conference rooms, meeting rooms and training rooms (furniture not included)
4) Auditorium and support spaces, including auditorium seats with writing desks and complete acoustic treatment (audio-video equipment not included)
5) All IT/Server rooms (furniture, telecommunications and data server equipment not included)
6) All shared amenities (furniture not included)
7) Clinical Trial Center (furniture and equipment not included)
8) Fitness Center (furniture and equipment not included)
9) All corridors, circulation spaces, stairs, ramps and elevators
10) All toilets and locker rooms
11) All storage rooms
12) Mechanical Penthouse (14F)
13) Fire Control Room, Generator room and electrical & Switchgear room
14) All mechanical/electrical rooms
15) All waste collection rooms
16) All utility shafts
17) All parking areas and ramps
18) All other spaces not enumerated under Item No. (b2)

(b2) All shell spaces shall have access to "Shell and Core" utilities and ready for occupant fit-up. The following shall be shell spaces (with smooth off-the-form rubbed ceiling finish, plastered walls with base coat paint, floors ready to receive finish, and all equipment not included):

1) Twelfth floor (Floor 12) – Animal Laboratory floor including Vivarium BSL-2, Vivarium BSL-3 and Laboratory BSL-3 and all support spaces
2) Tenth and eleventh floors (Floors 10 and 11) except for building core and shell.
3) Laboratory spaces of the Institute of Human Genetics (IHG), Institute of Molecular Biology and Biotechnology (IMBB) and Institute of Pharmaceutical Sciences (IPS).
4) All Technology Business Incubator (TBI) spaces
5) Speaker's lounges

** Drawings are attached to confirm the locations of areas to be full-fit or shelled. Bidder Proposals shall identify the areas that are to be full-fit or shelled and state the total area proposed that shall be full-fit or shelled.*

(b3) The "Shell and Core" construction shall provide products and systems included in specifications Divisions 3-16. Systems not mentioned below but in the Tender Document specifications are to be included.

1) Complete mechanical systems, including controls, ductwork and exhaust stacks
2) Complete electrical systems, including transformer, panel boards, and generator sets
3) Complete electrical auxiliary systems
4) Complete plumbing systems to floors served
5) Fire-rated partitions, slabs and shafts
6) Fire protection systems
7) Elevators
8) Pumps
9) Loading dock equipment, dock levelers, and bumpers
10) Laboratory casework per Division 12 in full fit-up laboratories, where required.
11) Laboratory equipment such as steam sterilizers (autoclaves), fume hoods, thimble-connected biosafety cabinets per Division 11 and the section "Contractor Furnished Equipment".

(b4) Correction of structural code requirements and other related documents: Follow strictly the requirements of the newest National Structural Code of the Philippines (NSCP).

(b5) Items in the Cost Estimate Form which will no longer be included in the Scope of Works due to the identified full fit, shell, and shell and core spaces enumerated above shall be labeled as "Not Applicable" or "NA". Should there be items that are required but are not found in the form, such items shall be included under "Others". Bidders shall make sure that no item on the Cost Estimate Form is left blank or unfilled.

(c) Aside from the A&E professional design fees, other incidental expenses that are also to the account of the winning bidder shall include the geodetic survey of the project lot, soil bearing and geotechnical tests and other required geologic and geomorphologic tests, and other design and construction requirements.

(d) Compliance with all applicable permits/licensing and documentary requirements.

(e) Project bidders should provide mechanical, electrical and plumbing systems sized for design loads at full occupancy. Ductwork, piping and electrical panels shall be provided at minimum to the cores and shafts for all floors. Terminal points at or near the building cores should be provided for future fit-up of shell spaces. When fit-up of spaces is required in future, the engineered services shall be extended from the building core to the laboratory or non-laboratory shell spaces.

Phase 1 will provide for the building core, fire rated shafts, stairways, and fit-up of selected spaces listed in this Bid Bulletin. Program spaces to become shell space are also listed. Phase 2 (not in contract) will be the fit-up of shell space and connection to

the main building systems. Bid submission should indicate where/how proposed engineered systems will be terminated at the building cores.

(f) Laboratory furniture is to be provided for laboratories to be fully fit-out. There will be about 1400 sq.m. of biosafety level 2 (BSL-2) fully fit-out laboratories and support spaces - Clinical Trials, Central Laboratory, Institute of Ophthalmology, Institute of Herbal Medicine and PNEI. All other laboratories and the vivarium will be shell space. Note that the plans also show five cold rooms which are to be provided as defined in Section 13030 - Controlled Environment Rooms.

2.0 BACKGROUND

2.1 Legal Basis

The University of the Philippines, through the Special Bids and Awards Committee (SBAC), intends to apply the sum of Nine Hundred Eighty Million Pesos (Php 980,000,000.00) being the Approved Budget for the Contract (ABC) to payments under the contract for the proposed Design and Build of the National Institutes of Health Building through the Design and Build project delivery approach. The Annual Budget which includes the allocation of fund for the NIH Building Project is on page 3287 of Republic Act (R.A.) Number 10352 otherwise known as the Fiscal Year 2013 General Appropriations Act (FY 2013 GAA).

3.0 PROCUREMENT OVERVIEW

3.1 The procurement of this project will be conducted through open and competitive bidding in adherence to the declared policies of Republic Act (RA) 9184, Section 2, Implementing Rules and Regulations (IRR-A).

3.2 Eligibility requirements shall be subject to Section 23 and Section 24, Rule VIII, RA 9184 and in compliance with the requirements enumerated under the Instruction to Bidders (**ITB**) and in the forms prescribed by the Government Procurement Policy Board **(GPPB)** for this type of procurement.

3.3 The determination of award to the winning bidder shall be subject to compliance with the minimum qualification requirements for this contract and through a series of pre-determined evaluation processes and procedures as enumerated under this Terms of Reference (TOR) and in accordance with the provisions of RA 9184 and other pertinent laws, circulars and orders.

3.4 UP shall accept the bid proposal determined to be most advantageous to the University and consider award of the contract on a best value for money basis.

3.5 UP reserves the right to accept or reject any bid, to annul the bidding process, and to reject all bids at any time prior to contract award without thereby incurring any liability to the affected party(ies).

4.0 PROCUREMENT MODE

4.1 The Design and Build scheme of procurement was recommended, endorsed and adopted pursuant to the guidelines provided in Annex "G" – *Guidelines for the Procurement and Implementation of Contracts for Design and Build Infrastructure Projects* of the IRR of RA 9184.

5.0 PROCUREMENT OBJECTIVES

5.1 To prepare complete A&E Plans and related studies/investigations that consider the following:

(a) Optimal benefits for all stakeholders, which include the procuring entity, the direct users and the UP community.
(b) Market, financial and economic viability balanced with social responsibility.
(c) Conform to relevant laws, design standards and legal procedures.
(d) Construct a building that can be occupied and operated after move-in.

5.2 To build a high-rise clinical and research laboratory facility that is consistent with the following principles:

(a) Sustainable building and development by using the rating system of the US Green Building Council for Leadership in Environmental Excellence and principles of resilient design in response to climate change. The project should be designed to meet the minimum level sustainable design or LEED certified. The University may decide to not enroll the project for certification but needs the project to benefit from energy savings and lower facility operation cost that sustainable design would provide. Please review the PBD and TOR requirements which underscore the importance of highlighting all the sustainable design features in submitted bids.

(b) Minimizing adverse impacts on the natural environment and occupied campus setting.

(c) Comprehensive A&E concepts including:
  (i) Energy savings through day lighting, night-time setbacks, and monitoring of power consumption
  (ii) Natural ventilation and thermal comfort concepts;
  (iii) Separate ventilation systems for non-laboratories, BSL-2 and BSL-3 laboratory areas, and ABSL-2 /ABSL-3 vivarium as recommended by the BMBL 5th edition. Ventilation for the future fit-out of shelled laboratories should only require re-routing of ductwork, and additional ductwork, ventilation controls and terminal units. Large mechanical equipment shall be in place.
  (iv) Separate plumbing systems for animal care and containment areas.
  (v) Addressing occupational hazards and environmental health concepts;
  (vi) Addressing increased risks in laboratories when staff will be working in BSL-3, ABSL-2 and ABSL-3 environments;

(d) Site development and building design that will be flexible and can accommodate changes in NIH organization and composition, and technological change.

5.3 To implement a turnover procedure in accordance with Part VIII Project Acceptance and Turnover.

6.0 GENERAL SCOPE OF WORK

6.1 Design Phase

(a) Geodetic Survey
(b) Soil Foundation Investigation
(c) Architecture & Engineering (A&E) Design Development Plans, Elevations and Sections
(d) Detailed Architectural Designs and Plans including exterior glass curtain wall details for energy savings, thermal and moisture protection.
(e) Detailed Architectural Interior Designs and Plans
(f) Detailed Laboratory Planning and Equipment Plans for BSL-2 spaces indicated in Schematic Design Plans prepared by the End User:
- Sheet series showing:
(i) Locations of special laboratories and animal research rooms for future fit-out which shall be provided with separate mechanical ventilation systems under this contract. Such systems shall be designed to avoid cross-contamination and will be fitted out in the future by the University to meet the standards of work in biosafety level 3 (BSL-3), animal biosafety level 2 and 3 (ABSL-2 and ABSL-3) containment.
(ii) Location of the animal care barrier designed to protect un-infected animals and breeding rooms.
(iii) Large laboratory equipment to be procured by the University and utilities provided and coordinated by the Contractor, including controlled environment rooms (cold rooms), and autoclaves which require depressed slabs, dedicated building utilities, and special design details
(iv) Details for penetrations in walls, ceilings and floors by lighting, plumbing, exhaust and decontamination devices.
(v) Sections through the fitted-out BSL-2 laboratories to show coordination with the work of other trades
(vi) Kit of parts and schedules of laboratory equipment and casework
(g) Detailed Furnishing Plans
- As allowed by the budget which indicate casework and base building equipment that shall be Contractor Furnished / Contractor Installed (CFCI)
(h) Detailed Site/Civil Landscape Architectural Designs and Plans
(i) Detailed Site and Building Engineering Designs and Plans
(i) Structural
(ii) Sanitary/Plumbing
(iii) Electrical
(iv) Electrical Auxiliaries
(v) Mechanical Ventilation, BMS/ BAS Systems
(vi) Public Address Systems
(vii) Conveying System: Elevators
(j) Detailed Estimates, Bill of Quantities
(k) Identify fully-fitted auditoriums, offices, amenity spaces, support space and laboratories included in the Scope of Works and acceptance of NIH project Technical Specifications
(l) Proposed Design and Construction Schedule

(m) Occupational Health and Safety Program for the Construction Phase

6.2 Construction Phase

(a) General Requirements
  (i) Permit to Construct
  (ii) Permits (Building Permit, Electrical Permit, Sanitary Permit, Mechanical Permit, Zoning Permit, Fire Safety Permit, etc.)
  (iii) Project Billboard
(b) Temporary Facilities and Facilities for the Engineer
(c) Earth Works
(d) Structural Works
(e) Architectural and Laboratory Furnishing Works
(f) Site and Landscape Architectural Works
(g) Sanitary/Plumbing Works
(h) Electrical Works
(i) Electrical Auxiliaries Works
(j) Architectural Interior Design Works
(k) Engineered Mechanical Building Utilities and Ventilation Systems
(l) Wayfinding, Laboratory Hazard and Room Signage Systems
(m) Quality Assurance: Mock-ups that represent the completely finished and furnished rooms or building components shall be constructed by the Contractor and approved by the End User (NIH) prior to starting all other work. Room areas to be presented shall be no larger than 6.00 square meters unless otherwise noted. Once the mock-up is accepted, the work can be considered part of the construction work.
  (i) Typical Lobby waiting area and entry
  (ii) Typical Institute Director's Office
  (iii) Typical Open Laboratory (20 square meters)
  (iv) Typical BSL-2 room (20 square meters)
  (v) Typical mechanical penthouse room
  (vi) Typical toilet room

7.0 APPROVED BUDGET AND PROJECT DURATION

7.1 The Approved Budget for the Contract (ABC) is Nine Hundred Eighty Million Pesos (Php980,000,000.00).

7.2 The Approved Period for the design and construction is Nine Hundred and Ten (910) calendar days starting seven (7) calendar days from the receipt by the Contractor of the Notice to Proceed.

END OF PART I

PART II
DETAILED PROJECT REFERENCE

1.0 ELIGIBILITY AND QUALIFICATION PROCESS

1.1 All submittals and attendances required for this bidding and enumerated in the Invitation to Bid must be strictly complied with, without exemption to the place, date and time unless otherwise modified with proper notification thru Bid Bulletin by UP. The eligibility requirements and qualification process shall be in accordance with the provisions of Annex "G" of the IRR of RA 9184.

(a) The eligibility requirements shall be in accordance with the provisions of Section 24.1 and Section 23.1 of the IRR of RA 9184 for the design phase and construction phase, respectively.

(b) The eligibility criteria shall be in accordance with the Section 24.3 and Section 23.5.2 of the IRR of RA 9184 for the design phase and construction phase, respectively.

2.0 CONCEPTUAL DESIGN

The proponent/bidder shall abide by these criteria and parameters for the Design of the New Building for the National Institutes of Health at UP Manila Campus

2.1 Classification

(a) Ownership : University of the Philippines Manila
(b) Type : Research Laboratory and Auditorium Facility

2.2 Background for Program

The proponent/bidder shall consider in their proposal the following space requirements for the offices, research and clinical laboratories, related support spaces and shared amenities to be designed in the intended new high-rise development:

See **Section 00600. Drawings** in **Project Manual Volume 1.**

The National Institutes of Health at the University of the Philippines Manila is composed of ten (10) institutes, three (3) reference centers, and twenty four (24) study groups.

- Institute of Molecular Biology and Biotechnology (IMBB)
- Institute of Child Health and Human Development (ICHHD)
- Institute of Clinical Epidemiology (ICE)
- Institute of Health Policy and Development Studies (IHPDS)
- Institute of Herbal Medicine (IHM)
- Institute of Human Genetics (IHG)
- Institute of Ophthalmology (IO)
- Institute of Pharmaceutical Sciences (IPS)
- Philippine National Ear Institute (PNEI)
- Institute of Aging (IA)
- Newborn Screening Reference Center (NSRC)
- National Telehealth Center (NTC)
- Newborn Hearing Screening Reference Center (NHSRC)

Interviews with representative End-Users were conducted by the UP Office of Development and Planning Initiatives (ODPI) from March-May 2013. The Schematic Design drawings developed indicate the desired adjacencies and locations for offices, laboratories, meeting rooms and auditorium. The technical criteria included in this document summarize laboratory design requirements as decided during a meeting on July 12, 2013. The document was developed without the participation of the Design and Build Contractor.

The preparation of the Detailed Architecture & Engineering Design drawings and specifications will be a phase in project development when the laboratory infrastructure is being designed. These technical criteria shall be revisited as the architects and engineers resolve the project's building code requirements and budget constraints. This document should be updated and reflect communication and planning between the Design and Build Contractor and the End Users.

Table 2.2.A – Space Program

SPACE	ALLOCATED AREA (sq.m.)	TOTAL AREA/ FLOOR (sq.m.)	Office	Laboratory BSL-2	Laboratory BSL-3	Vivarium ABSL-2	Vivarium ABSL-3	Shared Amenities	Parking	Shell TBI Space	Bldg Support & Circulation
LB		3,129.00									
Parking	2,751.15								2751.15		
Building Support & Circulation	377.85										377.85
UB		3,213.00									
Parking	2,889.15								2889.15		
Building Support & Circulation	323.85										323.85
GF		2,709.54									
Offices	297.70		297.70								
Building Support & Circulation	2,411.84										2411.84
2F		2,589.66									
Offices	815.25		815.25								
Concessions	549.00							549.00			
Fitness Center	117.00							117.00			
Building Support & Circulation	1,108.41										1108.41
3F		2,962.00									
Offices	896.05		896.05								
Technology Business Incubators (TBI)	567.50									567.50	
Laboratory BSL-2	291.50			291.50							
Building Support & Circulation	1,206.95										1206.95
4F		2,529.00									
Offices	439.00		439.00								
Clinical Trial Center	450.00		450.00								
Technology Business Incubators (TBI)	194.00									194.00	
Laboratory BSL-2	360.00			360.00							
Building Support & Circulation	1,086.00										1086.00
5F		2,548.80									
Offices	9.75		9.75								
Auditorium	624.00							624.00			
Lobby/Function Hall 1	276.00							276.00			
Break-out Rooms	947.30							947.30			
Building Support & Circulation	691.75										691.75
6F		2,120.27									
Offices	323.40		323.40								
Technology Business Incubators (TBI)	154.00									154.00	
Laboratory BSL-2	525.00			525.00							
Auditorium	284.27							284.27			
Lobby/Function Hall 2	171.00							171.00			
Building Support & Circulation	662.60										662.60
7F		2,574.00									
Offices	547.40		547.40								
Technology Business Incubators (TBI)	154.00							154.00			
Laboratory BSL-2	301.00			301.00							
Executive Dining Hall	147.00							147.00			
Lobby/Function Hall 3	213.00							213.00			
Roof Deck Garden	576.00							576.00			
Building Support & Circulation	635.60										635.60
8F		1,998.00									
Offices	606.40		606.40								
Laboratory BSL-2	756.00			756.00							
Building Support & Circulation	635.60										635.60
9F		1,584.00									
Offices	246.40		246.40								
Technology Business Incubators (TBI)	163.50									163.50	
Laboratory BSL-2	619.50			619.50							
Building Support & Circulation	554.60										554.60
10F		1,512.00									
Technology Business Incubators (TBI)	1,323.70									1323.70	
Building Support & Circulation	188.30										188.30
11F		1,512.00									
Technology Business Incubators (TBI)	1,323.70									1323.70	
Building Support & Circulation	188.30										188.30
12F		1,943.94									
Laboratory Support	238.70		238.70								
Vivarium BSL-2	450.70					450.70					
Vivarium BSL-3	110.00						110.00				
Laboratory BSL-3	92.50				92.50						
Building Support & Circulation	1,052.04										1052.04
14F		1,461.00									
Building Support & Circulation	1,461.00										1461.00
GROSS AREA		34,386.21	4,870.05	2,853.00	92.50	450.70	110.00	4,058.57	5,640.30	3,726.40	12,584.69

Read and accepted as part of the Contract:

Bidder/Contractor

2.3 EXTERIOR ELEMENTS

The proponent/bidder shall consider in their proposal the following supplemental physical requirements:

(a) Security
- (i) Gates and Locking Systems
- (ii) CCTV Security Systems
- (iii) Unit Door Lock, Chain Lock, Door Eye, and Biometric Door Lock

(b) Vehicular and Pedestrian Access System
- (i) Main Building Electronic Access System with Intercommunications System
- (ii) Entrance and Exit Access (Stairs, ramps, and the like)
- (iii) Parking Spaces

(c) Universal Design Access Systems
- (i) Ramps
- (ii) Clear accessible widths
- (iii) Universal design for toilet rooms and locker rooms
- (iv) Selection of signage and alarm systems that are accessible to persons who are visually and hearing impaired

2.4 SITE DEVELOPMENT PLAN

(a) Site components shall consist of buildings, driveways, ample parking, green areas and other landscape elements.

(b) The proponent/bidder shall fit in the above mentioned services (Items 2.1 to 2.5) in the Site Development Plan taking into consideration the functional design requirements and relationships with the proposed 13 hectare development and other services in the University of the Philippines Manila Campus Master Plan.

(c) Lot Occupancy, Building Shape and Orientation:
- (i) To allow for efficient traffic circulation between buildings and to provide adequate ventilation, individual building footprint shall not cover more than 20% of its allocated lot (building to block ratio).
- (ii) Minimum building setbacks shall be as specified in the recommended drawings and plans provided by the Office of Design and Planning Initiatives (ODPI) and PD 1096 or NBC and current amendments.
- (iii) Building shape shall be in accordance with **Section 00600 Drawings** or as required by building code officials.

(d) Circulation
- (i) Minimum number of entry points and total width shall follow the NBC and Fire Code provisions.
- (ii) Detailed designs shall provide for pedestrian and vehicular traffic for the projected user population. Circulation shall be provided in relation to the University of the Philippines Manila Campus Master Plan.

(iii) The circulation system shall identify emergency routes.

3.0 ARCHITECTURAL AND ENGINEERING DESIGN PARAMETERS

3.1 General A&E Design Parameters

(a) Use of Appropriate Building Design and Technology

(i) The architectural character of the building should appropriately project the image of a high-rise office, research laboratory and auditorium facility with mixed occupancies under the National Building Code of the Philippines.
   a. Office areas are Group E – Business and Mercantile, Division 2.
   b. Research Laboratories fall under Group G- Storage and Hazardous, Division 1 – Storage and Handling of hazardous and highly flammable material.
   c. Auditorium would be within Group H – Assembly Other than Group I, Division 1 – an assembly building with a stage and an occupant load of less than 1,000 in the building.

(ii) Building form shall be adapted to tropical climate conditions and the functional requirements of a research laboratory and auditorium facility.

(iii) Detailed design of interior spaces should accommodate the building program and laboratory planning and equipment requirements.

(iv) Building systems shall adopt energy-efficient and user-friendly technologies. Day lighting shall be interfaced with energy-efficient electric lighting. Passive cooling and thermal comfort systems and monitoring of power consumption shall be incorporated.

(v) Building envelope, materials and finishes shall be specified in accordance with green building principles. Use of renewable and recyclable materials should be maximized.

(vi) Separate ventilation systems for non-laboratories, BSL-2 and BSL-3 laboratory areas as recommended by the BMBL 5th edition.

(vii) Separate plumbing systems for animal care and containment areas.

(viii) Addressing occupational hazards and environmental health concepts;

(ix) Addressing increased risks in laboratories when staff are working in BSL-3, ABSL-2 and ABSL-3 environments;

(b) Compliance with Relevant Laws and Design Standards

(i) PD 1096 or National Building Code of the Philippines and its Latest and Amended IRR

(ii) BP 344 or Accessibility Law and its Latest and Amended IRR

(iii) RA 9514 or Fire Code of the Philippines and its Latest and Amended IRR

(iv) National Structural Code of the Philippines (NSCP) 2010

(v) National Plumbing Code of the Philippines (NPCP)

(vi) Sanitation Code of the Philippines

(vii) Mechanical Engineering Code of the Philippines

(viii) Philippine Electrical Code

(ix) National Electrical Code

(x) Biosafety for Microbiological and Biomedical Laboratories, BMBL 5th Edition, United States Centers for Disease Control and the National Institutes of Health (CDC/NIH).

(c) Incorporation of Waste Management Systems

(i) All liquid waste and sewage shall be treated and free from harmful elements prior to their disposal to the waste disposal system.

(ii) All solid waste shall be sorted and recycled.

(iii) All solid biohazards shall be bagged and autoclaved prior to pick-up by the Owner's third party contractor.

(d) Information Technology and Local Area Network (IT/LAN) Infrastructure

(i) The reference standard for the NIH shall be the Telecommunications Industry Association's TIA-942 Telecommunications Infrastructure Standard for Data Centers. Independent from the ANSI/TIA-942 standard, the Uptime Institute, a think tank and professional-services organization based in Santa Fe, New Mexico, has defined its own four levels for server reliability. The owner shall decide on the Tier Level for the NIH data servers during Design Development.

The levels describe the availability of data from the hardware at a location. The higher the tier, the greater the availability. The levels are:

Tier Level	Requirements
1	• Single non-redundant distribution path serving the IT equipment • Non-redundant capacity components • Basic site infrastructure with expected availability of 99.671%
2	• Meets or exceeds all Tier 1 requirements • Redundant site infrastructure capacity components with expected availability of 99.741%
3	• Meets or exceeds all Tier 1 and Tier 2 requirements • Multiple independent distribution paths serving the IT equipment • All IT equipment must be dual-powered and fully compatible with the topology of a site's architecture • Concurrently maintainable site infrastructure with expected availability of 99.982%
4	• Meets or exceeds all Tier 1, Tier 2 and Tier 3 requirements • All cooling equipment is independently dual-powered, including chillers and heating, ventilating and air-conditioning (HVAC) systems • Fault-tolerant site infrastructure with electrical power storage and distribution facilities with expected availability of 99.995%

(ii) Fiber connection between the University Library IT hub and the new NIH Building shall <u>not</u> be included in the scope of work.

(iii) Per Schematic Design plans, 55.80 square meter server room is adjacent to the 36.00 square meter NIH IT work room.
(iv) Server room ambient temperature to be cooled down to 18 degrees Celsius.
(v) Overhead cable tray system within NIH shall provide access for network connections and upgrades.
(vi) Server room shall be physically secured and datacentre shall be shielded.
(vii) Data center server racks shall have cooling fans on local Uninterruptable Power Supply (UPS). Server equipment shall be served by the building emergency generator.
(viii) Offices, conference rooms and laboratories will be hardwired. Wireless network access will be available in common areas.
(ix) The Auditorium and Conference Rooms shall have cable pathways for future secure video conference/seminar access and teleconferences.
(x) Security room may be located near the NIH server room for enhanced security
(xi) Servers from different institutes shall be installed in the data center and secured within the programs' own wire cages and/or data cabinets. The decision provides security for the IT assets of each institute.
(xii) A centralized IT department will be forthcoming and organized to maintain the IT assets as well as the network, access and security of the NIH IT facilities.
(xiii) IT standards are uncoordinated between UP Manila managed by the Information Management System office (IMS), the Philippine General Hospital (PGH) managed by the Information System Office (ISO), and the NIH (which may have a new IT group) and a new system architecture may benefit sharing data across the health center complex.
(xiv) Managed switches should be housed in data cabinets located in dedicated LAN rooms on each floor.
(xv) Data and phone ports will be located 8000mm apart from each other in laboratories. Each office desk should also have their own data and phone ports. Data ports should also be provided along the corridors for IP cameras (security cameras) and WiFi routers.
(xvi) Industrial-grade WiFi routers are desired over home and small office routers. These are more secure and can connect more than 100 simultaneous users without loss of quality
(xvii) NIH is considering acquiring separate internet connectivity from UP-Manila and PGH to upgrade service. Since research is the fundamental role of NIH, fast, reliable and secured access to the internet is needed.
(xviii) LAN/IT infrastructure design should plan for the installation of indoor picocells. These are small ceiling-mounted inverted cones which extend the mobile signal indoors.
(xix) In the laboratories to protect intellectual property, NIH may use GSM-only extenders which allow phone calls and SMS but not internet data to pass through. There is a need to prevent users from posting photos of researches and other restricted and confidential documents on social media sites.
(xx) Collaborations with scientists in other universities in different parts of the country and the world, may require the additional security of IP phones. While these require initial significant capital investment, increased communication with the world and savings on usage charges may justify the phone system technology upgrade.

(xxi) NIH may consider acquiring a software-based PABX and paging system. The initial design of pathways through overhead cable trays should consider the future changes being contemplated.

(e) Reliable Power – Emergency Generator and UPS
- (i) See Laboratory Technical Criteria - Electrical Section
- (ii) Quality of electrical power shall be consistent with power surges eliminated to protect equipment.
- (iii) Earthgrounding for the building will be provided with each floor having a wired connection to grounding plates.

(f) Lightning Protection
- (i) Building shall be provided with lightning protection.

3.2 LABORATORY FUNCTIONAL AND TECHNICAL CRITERIA

See TOR Part IX-B Annex for the complete Laboratory Functional and Technical Criteria.

3.3 FACILITY BIOSAFETY AND CONTAINMENT REQUIREMENTS

The following are the facility requirements for laboratory work at BSL-2, BSL-3, ABSL-2 and ABSL-3 from the reference BMBL 5th Ed., CDC-NIH, 2008. Enhancements may be required following a risk assessment by biosafety professionals.

(a) Biosafety Level 2 (BSL-2)

(i) Laboratory doors should be self-closing and have locks in accordance with the institutional policies.

(ii) Laboratories must have a sink for hand washing. The sink may be manually, hands-free, or automatically operated. It should be located near the exit door.

(iii) The laboratory should be designed so that it can be easily cleaned and decontaminated. Carpets and rugs in laboratories are not permitted.

(iv) Laboratory furniture must be capable of supporting anticipated loads and uses. Spaces between benches, cabinets, and equipment should be accessible for cleaning.

a. Bench tops must be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals.
b. Chairs used in laboratory work must be covered with a non-porous material that can be easily cleaned and decontaminated with appropriate disinfectant.

(v) Laboratory windows that open to the exterior are not recommended. However, if a laboratory does have windows that open to the exterior, they must be fitted with screens.

(vi) BSCs must be installed so that fluctuations of the room air supply and exhaust do not interfere with proper operations. BSCs should be located away from doors, windows that can be opened, heavily traveled laboratory areas, and other possible airflow disruptions.

(vii) Vacuum lines should be protected with liquid disinfectant traps.

(viii) An eyewash station must be readily available.

(ix) There are no specific requirements for ventilation systems. However, planning of new facilities should consider mechanical ventilation systems that provide an inward flow of air without recirculation to spaces outside of the laboratory.

(x) HEPA filtered exhaust air from a Class II BSC can be safely recirculation back into the laboratory environment if the cabinet is tested and certified at least annually and operated according to manufacturer's recommendations. BSCs can also be connected to the laboratory exhaust system by either a thimble (canopy) connection or directly exhausted to the outside through a hard connection. Provisions to assure proper safety cabinet performance and air system operation must be verified.

(xi) A method for decontaminating all laboratory wastes should be available in the facility (e.g., autoclave, chemical disinfection, incineration, or other validated decontamination method).

(b) Biosafety Level 3 (BSL-3)

(i) Laboratory doors must be self-closing and have locks in accordance with the institutional policies. The laboratory must be separated from areas that are open to unrestricted traffic flow within the building. Laboratory access is restricted. Access to the laboratory is through two self-closing doors. A clothing change room (anteroom) may be included in the passageway between the two self-closing doors.

(ii) Laboratories must have a sink for hand washing. The sink must be hands-free or automatically operated. It should be located near the exit door. If the laboratory is segregated into different laboratories, a sink must also be available for hand washing in each zone. Additional sinks may be required as determined by the risk assessment.

(iii) The laboratory must be designed so that it can be easily cleaned and decontaminated. Carpets and rugs are not permitted. Seams, floors, walls, and ceiling surfaces should be sealed. Spaces around doors and ventilation openings should be capable of being sealed to facilitate space decontamination.

a. Floors must be slip resistant, impervious to liquids, and resistant to chemicals. Consideration should be given to the installation of seamless, sealed, resilient or poured floors, with integral cove bases.
b. Walls should be constructed to produce a sealed smooth finish that can be easily cleaned and decontaminated.
c. Ceilings should be constructed, sealed, and finished in the same general manner as walls. Decontamination of the entire laboratory should be considered when there has been gross contamination of the space, significant changes in laboratory usage, for major renovations, or maintenance shut downs. Selection of the appropriate materials and methods used to decontaminate the laboratory must be based on the risk assessment.

(iv) Laboratory furniture must be capable of supporting anticipated loads and uses. Spaces between benches, cabinets, and equipment must be accessible for cleaning.

a. Bench tops must be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals.
b. Chairs used in laboratory work must be covered with a non-porous material that can be easily cleaned and decontaminated with appropriate disinfectant.

(v) All windows in the laboratory must be sealed.

(vi) BSCs must be installed so that fluctuations of the room air supply and exhaust do not interfere with proper operations. BSCs should be located away from doors, heavily travelled laboratory areas, and other possible airflow disruptions.

(vii) Vacuum lines must be protected with HEPA filters, or their equivalent. Filters must be replaced as needed. Liquid disinfectant traps may be required.

(viii) An eyewash station must be readily available in the laboratory.

(ix) A ducted air ventilation system is required. This system must provide sustained directional airflow by drawing air into the laboratory from “clean” areas toward “potentially contaminated” areas. The laboratory shall be designed such that under failure conditions the airflow will not be reversed.

a. Laboratory personnel must be able to verify directional airflow. A visual monitoring device, which confirms directional airflow, must be provided at the laboratory entry. Audible alarms should be considered to notify personnel of air flow disruption.
b. The laboratory exhaust air must not re-circulate to any other area of the building.
c. The laboratory building exhaust air should be dispersed away from occupied areas and from building air intake locations or the exhaust air must be HEPA filtered.

HEPA filter housings should have gas-tight isolation dampers, decontamination ports, and/or bag-in/bag-out (with appropriate decontamination procedures) capability. The HEPA filter housing should allow for leak testing of each filter and assembly. The filters and the housing should be certified at least annually.

(x) HEPA filtered exhaust air from a Class II BSC can be safely re-circulated into the laboratory environment if the cabinet is tested and certified at least annually and operated according to manufacturer's recommendations. BSCs can also be connected to the laboratory exhaust system by either a thimble (canopy) connection or directly exhausted to the outside through a hard connection. Provisions to assure proper safety cabinet performance and air system operation must be verified. BSCs should be certified at least annually to assure correct performance. Class III BSCs must be directly (hard) connected up through the second exhaust HEPA filter of the cabinet. Supply air must be provided in such a manner that prevents positive pressurization of the cabinet.

(xi) A method for decontaminating all laboratory wastes should be available in the facility, preferably within the laboratory (e.g., autoclave, chemical disinfection, or other validated decontamination method).

(xii) Equipment that may produce infectious aerosols must be contained in primary barrier devices that exhaust air through HEPA filtration or other equivalent technology before being discharged into the laboratory. These HEPA filters should be tested and/or replaced at least annually.

(xiii) Facility design consideration should be given to means of decontaminating large pieces of equipment before removal from the laboratory.

(xiv) Enhanced environmental and personal protection may be required by the agent summary statement, risk assessment, or applicable local, state, or federal regulations. These laboratory enhancements may include, for example, one or more of the following: an anteroom for clean storage of equipment and supplies with dress-in, shower-out capabilities; gas tight dampers to facilitate laboratory isolation; final HEPA filtration of the laboratory exhaust air; laboratory effluent decontamination; and advanced access control devices, such as biometrics.

(xv) The BSL-3 facility design, operational parameters, and procedures must be verified and documented prior to operation. Facilities must be re-verified and documented at least annually.

(c) <u>Animal Biosafety Level 2 (ABSL-2)</u>

(i) The animal facility is separated from areas that are open to unrestricted personnel traffic within the building. External facility doors are self-closing and self-locking.

Doors to areas where infectious materials and/or animals are housed, open inward, are self-closing, are kept closed when experimental animals are present, and should never be propped open. Doors to cubicles inside an animal room may open outward or slide horizontally or vertically.

(ii) A hand-washing sink is located at the exit of the areas where infectious materials and/or animals are housed or are manipulated. Additional sinks for hand washing should be located in other appropriate locations within the facility.

If the animal facility has segregated areas where infectious materials and/or animals are housed or manipulated, a sink must also be available for hand washing at the exit from each segregated area.

Sink traps are filled with water, and/or appropriate disinfectant to prevent the migration of vermin and gases.

(iii) The animal facility is designed, constructed, and maintained to facilitate cleaning and housekeeping. The interior surfaces (walls, floors and ceilings) are water resistant.

a. Penetrations in floors, walls and ceiling surfaces are sealed, including openings around ducts, doors and doorframes, to facilitate pest control and proper cleaning.
b. Floors must be slip-resistant, impervious to liquids, and resistant to chemicals.
a. Cabinets and bench tops must be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals. Spaces between benches, cabinets, and equipment should be accessible for cleaning.

(iv) Furniture should be minimized. Chairs used in animal area must be covered with a non-porous material that can be easily cleaned and decontaminated. Furniture must be capable of supporting anticipated loads and uses. Sharp edges and corners should be avoided.

(v) External windows are not recommended; if present, windows must be sealed and resistant to breakage. The presence of windows may impact facility security and therefore should be assessed by security personnel.

(vi) Ventilation should be provided in accordance with the *Guide for Care and Use of Laboratory Animals.*

a. The direction of airflow into the animal facility is inward; animal rooms maintain inward directional airflow compared to adjoining hallways. A ducted exhaust air ventilation system is provided. Exhaust air is discharged to the outside without being recirculated to other rooms.
b. Ventilation system design should consider the heat and high moisture load produced during the cleaning of animal rooms and the cage wash process.

(vii) Internal facility appurtenances, such as light fixtures, air ducts, and utility pipes, are arranged to minimize horizontal surface areas, to facilitate cleaning and minimize the accumulation of debris or fomites.

(viii) Floor drains must be maintained and filled with water, and/or appropriate disinfectant to prevent the migration of vermin and gases.

(ix) Cages should be autoclaved or otherwise decontaminated prior to washing. Mechanical cage washer should have a final rinse temperature of at least 180°F. The cage wash area should be designed to accommodate the use of high-pressure spray systems, humidity, strong chemical disinfectants and 180°F water temperatures during the cage/equipment cleaning process.

(x) Illumination is adequate for all activities, avoiding reflections and glare that could impede vision.

(xi) If BSCs are present, they must be installed so that fluctuations of the room air supply and exhaust do not interfere with proper operations. BSCs should be located away from doors, heavily travelled laboratory areas, and other possible airflow disruptions.

a. HEPA filtered exhaust air from a Class II BSC can be safely re-circulated back into the laboratory environment if the cabinet is tested and certified at least annually and operated according to manufacturer's recommendations. BSCs can also be connected to the laboratory exhaust system by either a thimble (canopy) connection or directly to the outside through an independent, hard connection. Provisions to assure proper safety cabinet performance and air system operation must be verified. BSCs should be recertified at least once a year to ensure correct performance.

b. All BSCs should be used according to manufacturer's specifications to protect the worker and avoid creating a hazardous environment from volatile chemicals and gases.

(xii) If vacuum service (i.e., central or local) is provided, each service connection should be fitted with liquid disinfectant traps and an in-line HEPA filter placed as near as practicable to each use point or service cock. Filters are installed to permit in-place decontamination and replacement.

(xiii) An autoclave should be present in the animal facility to facilitate decontamination of infectious materials and waste.

(xiv) Emergency eyewash and shower are readily available; location is determined by risk assessment.

(d) <u>Animal Biosafety Level 3 (ABSL-3)</u>

(i) The animal facility is separated from areas that are open to unrestricted personnel traffic within the building. External facility doors are self-closing and self-locking.

a. Access to the animal facility is restricted.
b. Doors to areas where infectious materials and/or animals are housed, open inward, are self-closing, are kept closed when experimental animals are present, and should never be propped open.
c. Entry into the containment area is via a double-door entry, which constitutes an anteroom/airlock and a change room. Showers may be considered based on risk assessment. An additional double-door access anteroom or double-doored autoclave may be provided for movement of supplies and wastes into and out of the facility.

(ii) A hand-washing sink is located at the exit of the areas where infectious materials and/or animals are housed or are manipulated. Additional sinks for hand washing should be located in other appropriate locations within the facility. The sink should be hands-free or automatically operated.

a. If the animal facility has multiple segregated areas where infectious materials and/or animals are housed or are manipulated, a sink must also be available for hand washing at the exit from each segregated area.
b. Sink traps are filled with water, and/or appropriate liquid to prevent the migration of vermin and gases.

(iii) The animal facility is designed, constructed, and maintained to facilitate cleaning, decontamination and housekeeping. The interior surfaces (walls, floors and ceilings) are water resistant.

a. Penetrations in floors, walls and ceiling surfaces are sealed, including openings around ducts and doorframes, to facilitate pest control, proper cleaning and decontamination. Walls, floors and ceilings should form a sealed and sanitizable surface.
b. Floors must be slip resistant, impervious to liquids, and resistant to chemicals. Flooring is seamless, sealed resilient or poured floors, with integral cove bases.
c. Decontamination of an entire animal room should be considered when there has been gross contamination of the space, significant changes in usage, for major renovations, or maintenance shut downs. Selection of the appropriate materials and methods used to decontaminate the animal room must be based on the risk assessment.

(iv) Cabinets and bench tops must be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals. Spaces between benches, cabinets, and equipment should be accessible for cleaning.

Furniture should be minimized. Chairs used in animal areas must be covered with a non-porous material that can be easily cleaned and decontaminated.

Furniture must be capable of supporting anticipated loads and uses. Equipment and furnishings with sharp edges and corners should be avoided.

(v) External windows are not recommended; if present, all windows must be sealed and must be resistant to breakage. The presence of windows may impact facility security and therefore should be assessed by security personnel.

(vi) Ventilation of the facility should be provided in accordance with the Guide for Care and Use of Laboratory Animals.(1) The direction of airflow into the animal facility is inward; animal rooms maintain inward directional airflow compared to adjoining hallways. A ducted exhaust air ventilation system is provided. Exhaust air is discharged to the outside without being recirculated to other rooms. This system creates directional airflow, which draws air into the animal room from "clean" areas and toward "contaminated" areas.

Ventilation system design should consider the heat and high moisture load produced during the cleaning of animal rooms and the cage wash process. HEPA filtration and other treatments of the exhaust air may not be required, but should be considered based on site requirements, specific agent manipulations and use conditions. The exhaust must be dispersed away from occupied areas and air intakes.

Personnel must verify that the direction of the airflow (into the animal areas) is proper. It is recommended that a visual monitoring device that indicates directional inward airflow be provided at the animal room entry. The ABSL-3 animal facility shall be designed such that under failure conditions the airflow will not be reversed. Alarms should be considered to notify personnel of ventilation and HVAC system failure.

(vii) Internal facility appurtenances, such as light fixtures, air ducts, and utility pipes, are arranged to minimize horizontal surface areas, to facilitate cleaning and minimize the accumulation of debris or fomites.

(viii) Floor drains must be maintained and filled with water, and/or appropriate disinfectant to prevent the migration of vermin and gases.

(ix) Cages are washed in a mechanical cage washer. The mechanical cage washer has a final rinse temperature of at least 180°F. Cages should be autoclaved or otherwise decontaminated prior to removal from ABSL-3 space. The cage wash facility should be designed and constructed to accommodate high-pressure spray systems, humidity, strong chemical disinfectants and 180°F water temperatures during the cage cleaning process.

(x) Illumination is adequate for all activities, avoiding reflections and glare that could impede vision.

(xi) BSCs (Class II, Class III) must be installed so that fluctuations of the room air supply and exhaust do not interfere with proper operations. Class II BSCs

should be located away from doors, heavily travelled laboratory areas, and other possible airflow disruptions.

HEPA filtered exhaust air from a Class II BSC can be safely re-circulated into the laboratory environment if the cabinet is tested and certified at least annually and operated according to manufacturer's recommendations. BSCs can also be connected to the laboratory exhaust system by either a thimble (canopy) connection or exhausted directly to the outside through a direct (hard) connection. Provisions to assure proper safety cabinet performance and air system operation must be verified. BSCs should be certified at least annually to assure correct performance.

Class III BSCs must supply air in such a manner that prevents positive pressurization of the cabinet or the laboratory room.

All BSCs should be used according to manufacturers' specifications.

When applicable, equipment that may produce infectious aerosols must be contained in devices that exhaust air through HEPA filtration or other equivalent technology before being discharged into the animal facility. These HEPA filters should be tested and/or replaced at least annually.

(xii) An autoclave is available which is convenient to the animal rooms where the biohazard is contained. The autoclave is utilized to decontaminate infectious materials and waste before moving it to the other areas of the facility. If not convenient to areas where infectious materials and/or animals are housed or are manipulated, special practices should be developed for transport of infectious materials to designated alternate location/s within the facility.

(xiii) Emergency eyewash and shower are readily available; location is determined by risk assessment.

(xiv) The ABSL-3 facility design and operational procedures must be documented. The facility must be tested to verify that the design and operational parameters have been met prior to use. Facilities should be re-verified at least annually against these procedures as modified by operational experience.

(xv) Additional environmental protection (e.g., personnel showers, HEPA filtration of exhaust air, containment of other piped services, and the provision of effluent decontamination) should be considered if recommended by the agent summary statement, as determined by risk assessment of the site conditions, or other applicable federal, state or local regulations

4.0 ACCEPTABLE ALTERNATE DESIGN OPTIONS

4.1 Alternate design options may be offered to keep bids below the APC as long as the net assignable areas do not decrease in size and all code requirements are met. The net assignable area is approximately 17,000 sq.m. and the building gross area is about 34,400 sq.m. Design options with increased space efficiency may decrease building gross area by no more than 5%.

The following are design changes which the bidders may consider:

a. Parking area may be above ground and/or a separate multi-story structure. New car elevator technologies can be included to decrease or eliminate ramps. Valet car parking is acceptable. Parking must comply with applicable building and life safety codes used by the permitting authorities.
b. Auditorium can be moved from Floors 5-6 to lower floors assuming program spaces retain adjacencies. Code requires exits from auditorium to the outdoors without passing through the building.
c. Excavation for new foundations and piles should not undermine the foundations of the adjacent buildings. Bidders are responsible for reviewing soil and geological conditions prior to bidding.
d. The size of area for vertical and horizontal circulation may decrease as long as code requirements and space adjacency requirements are met.
e. Fire Exit stairs that are completely enclosed in high-rises must be positively pressurized (air conditioned). Outdoor ventilation for fire exit stairs will eliminate the need for the separate air conditioning system.
f. Increase the size of mechanical, electrical, plumbing, fire protection (MEPF) and life safety program spaces as determined by code requirements
g. Additional mechanical, electrical, plumbing, and fire protection spaces are required but not shown in the bid documents. Engineered designs to show these in bid documents.
h. A service elevator and stairway must extend to the highest level where there is mechanical equipment for service, maintenance and future equipment replacement.
i. Exhaust stacks at the top of the building are required but not shown in the plan. Fixed aluminum louvers shall enclose the roof top equipment.
j. Building line must be held 5 meters away from the crown of the Dita tree shown in the plan. Assume the outline is representative of the existing tree crown. Contractor shall be responsible for replacing the Dita tree with a new one that can grow to the same size if roots are damaged during construction.

4.2 The architectural design of the building shall consider the historical context of UP Manila Campus. An example of an elevation restudy uses arches at the building podium to compliment the architectural style of other surrounding buildings. *See attached Drawings Set 2.*

4.3 MEP spatial requirements are noted on the current bid package drawings to clarify the spaces needed per code. Bidders are to consider the noted spaces and provide for the MEP systems represented. Space and shaft sizes and locations shall depend on the design concept that will be submitted. *See attached Drawings Set 3.*

4.4 High-Rise Building Areas of Rescue/Areas of Refuge: Attached is a brochure from a manufacturer for the two-way radio required in high-rise building exit stairs. The graphics

mention the Area of Rescue/Area of Refuge space requires reserving two wheel chair spaces to increase the size of landings on each floor of a high-rise. The point of the space is to allow people in wheelchairs or aged slower moving people to stand and wait in the fire exits without being trampled by others who are escaping. In addition, since wet pipe risers for fire protection are typically included in the stairways (and decrease the space), any plumbing located in the stair shaft should not decrease the required egress widths and spaces for Areas of Rescue/Areas of Refuge. *See attached Drawings Set 4.*

4.5 Building Project Life Safety Features:

a. Fire sprinklers - including laboratories and computer server room
b. Fire Extinguishers and Extinguisher Cabinets within 80 feet.
c. Wet Pipe System Fire Hose Valve all floors + outdoor siamese
d. Smoke and Heat detectors all rooms
e. Strobe light and bell alarm
f. Public Notification System - overhead
g. Emergency power for all life safety devices
h. Stand-by power for continuous operation of exhaust (fume hoods; freezers with high-value specimen and products, BSL-3 and vivarium)
i. Emergency showers in all wet laboratories with chemicals
j. Hand held eyewashes at all laboratory sinks (fit-up standard) - in specs already
k. Fume hood exhaust /room in every laboratory floor with stand-by power (no power outages).
l. Doors open in the direction of egress. No doors or equipment access less than 960 mm wide.
m. Egress stairs (fire exits) shall comply with requirements for high-rise new construction and provide Areas of Rescue / Areas of Refuge (2009 International Building Code)
n. Special isolated areas like PNEI hearing test rooms shall be fit-up with room-within-room emergency notification devices (combination vibration and strobe).
o. Controlled Environment Rooms (cold rooms) shall have panic buttons to request assistance and strobes for alarm notification.
p. Two-way communication noted in specs for phones inside elevators. Add two-way communication for Areas of Refuge as well.
q. Phone communication provided to mechanical areas for safer working conditions.
r. After move-in and laboratory risk assessments, oxygen depletion or toxic gas detection devices may be added by the University. Wall space should be reserved in all labs for this purpose.
s. Every laboratory floor with wet laboratories (BSL-2) shall have access to one steam sterilizer in accordance with CDC recommendations. Each will have an electrical steam generator. Although the University shall furnish the future equipment, sizing of building electrical service and equipment shall include the University's future equipment.
t. Lightning protection is to be provided by electrical.
u. Seismic restraints for equipment are to be provided per Mechanical Code.
v. Electrical design to provide earth grounding bars in laboratories for equipment, and arc flash studies for main electrical equipment.
w. If underground, parking garage will have natural ventilation to outdoors using shafts to avoid carbon monoxide poisoning. (National Building Code)
x. Signage to notify building occupants of laboratory and building hazards are included in the specifications.

4.6 NIH Building Project Security and Monitoring Features during Design:

a. Building Automation and Monitoring Systems (BAS/BMS) are in the specifications for adjusting energy consumption, receiving early notice of breakdowns and outages, and allowing shut-outs from spaces. The design can be finalized prior to contract award.
b. The BAS/BMS system included in the bids shall be a flexible system so that NIH can add more features and monitoring points in the future and allow for communication between BMS, IT/LAN, to centralize notification of the status of fans, freezers, doors, and other equipment in the building.
c. There is also data security for the NIH's future through special wall partition types for server and LAN/IT rooms that shield signals. The NIH Lab Information Management System (LIMS) may contain laboratory data which contain private patient information or proprietary research data. The security of data and server equipment is important to consider in during design.
d. Physical guard stations in the lobby shall control access to elevators and stairs.
e. Card key access control for lab and office doors, and in elevators for programmed access to lab floors.
f. In the event of a security event, fire emergency alarm pulls can be activated.

END OF PART II

Read and accepted as part of the Contract:

Bidder/Contractor

PART III
DETAILED ARCHITECTURAL AND ENGINEERING DESIGNS

1.0 DETAILED ARCHITECTURAL DESIGN PLANS AND SPECIFICATIONS

1.1 The Contractor shall prepare and submit a complete set of detailed architectural drawings/ plans and specifications of the building in accordance with the herein attached checklist of requirements of Annex 2 to 5.

1.2 Minimum Qualifications Required:

(a) The individual or the designated principal of the firm must be a licensed Architect with a long experience and solid background in Architecture and Engineering Design and Development of medium-to-high-rise research laboratory facility developments.

(b) The Designer(s) shall be an architect, an architectural firm of two or more associated individuals or a partnership with expertise in structures and facilities belonging to mixed occupancies under the National Building Code of the Philippines and latest amendments. Experience should include projects with mixed occupancies such as offices and research laboratories (Group G-Storage and Hazardous, Division 1- storage and handling of hazardous and flammable materials), and Auditorium (Group H- Assembly other than Group 1, Division 1- Any assembly building with a stage and an occupant load of less than 1000 in the building).

2.0 DETAILED ENGINEERING DESIGN PLANS AND SPECIFICATIONS

2.1 The Contractor shall prepare and submit a complete set of detailed engineering drawings/plans and specifications for the below cited engineering discipline in accordance with the checklist of requirements of the respective Annexes:

(a)	Structural Designs	- Annex 6
(b)	Sanitary/Plumbing Designs	- Annex 7
(c)	Electrical Designs	- Annex 8
(d)	Electrical Auxiliaries	- Annex 9
(e)	Mechanical	- Annex 10

END OF PART III

Read and accepted as part of the Contract:

Bidder/Contractor

PART IV
DETAILED ESTIMATES

1.0 PROJECT COST ESTIMATES

1.1 The bidder shall prepare and submit for the purpose of the Bill of Quantities (BOQ) in this contract, a detailed cost estimate in accordance with the limit of the available Approved Budget for the Contract and following the sequence of priorities below:

(a) Design Development Phase

The detailed costing for the design development phase is for the preparation, submittal and approval of the following:

(i) Preliminary Surveys/Studies, including:
- Geodetic Survey of the Lot
- Soil Foundation Investigation
- Location and Invert Elevations of Existing Utilities.

(ii) Architecture & Engineering (A&E) Site Design Development Plans and Sections

(iii) Detailed Architectural Plans, Elevations and Sections

(iv) Detailed Architectural Interior Designs, Finish Plans and Sample Boards

(v) Detailed Laboratory Planning and Equipment Plans for full-fit BSL-2 spaces

(vi) Detailed Furnishing Plans as allowed by the budget which indicate casework and base building equipment that shall be Contractor Furnished / Contractor Installed (CFCI)

(vii) Detailed Site/Civil Landscape Architectural Designs and Plans

(viii) Detailed Site and Building Engineering Designs and Plans
- Structural
- Sanitary/Plumbing/ Fire Protection
- Electrical
- Electrical Auxiliaries
- Mechanical Ventilation, BMS/ BAS Systems
- Public Address Systems

(ix) Detailed Estimates, Bill of Quantities

(x) Scope of Works and Technical Specifications

(xi) Proposed Design and Construction Schedule

(xii) Health and Safety Program for the Construction Phase

(b) Construction Phase

(i) Detailed A&E Fee <u>for construction administration and weekly meetings with the Construction Management Team and University Representatives for the duration of the project construction.</u>

(ii) General Requirements
- Permit to Construct (PTC)

- Permits (including Building Permit, Electrical Permit, Sanitary Permit, Mechanical Permit, Zoning Permit, Fire Safety Permit, etc.)
- Project Billboard

(iii) Temporary Facilities and Facilities for the Engineer Staff and Meeting Room
(iv) Earth Works
(v) Structural Works
(vi) Architectural Works and Finishes
(vii) Sanitary/Plumbing Works and Finishes
(viii) Electrical Works and Finishes
(ix) Electrical Auxiliaries Works and Finishes
(x) Mechanical Works and Finishes
(xi) Architectural Interior Works
(xii) Engineered Mechanical Building Utilities and Ventilation Systems
(xiii) Wayfinding, Laboratory Hazard and Room Signage Systems
(xiv) Site and Landscape Architectural Works
(xv) Quality Assurance

a. Full size Mock-ups of laboratory types, where approved work can become part of the completed contract
b. Finish mock-ups where approved sample applications can become part of the approved work

2.0 COST ESTIMATE GUIDELINES

2.1 In the preparation of all detailed cost estimates, the proponent/bidder shall be guided by the Cost Estimate Form (Section 00470) in Project Manual Volume 1 Philippine Bidding Documents.

2.2 The labor component of the cost estimates shall follow the ranges provided in the ordinance and the latest wage order of the Department of Labor and Employment (DOLE) of the National Capital Region (NCR).

3.0 UNIT PRICE ANALYSIS

3.1 The proponent/bidder shall draw up a unit price analysis for each of the pay items.

END OF PART IV

Read and accepted as part of the Contract:

Bidder/Contractor

PART V
CONSTRUCTION PHASE

1.0 PERMITS AND CLEARANCES

1.1 The contractor shall pay for any and all expenses necessary and incidental for UP to be able to secure the following:

(a) Permit to Construct (PTC);

(b) Environmental Clearance Certificate (ECC), including the corresponding Tree Cutting Permit from the concerned government agencies, if necessary;

(c) Building Permit, Zoning Permit, Electrical Permit, Fire Safety Permit.

1.2 The contractor shall, upon authorization by the City Government, make representation with the concerned government agencies to expedite the release of the same.

2.0 TEMPORARY STRUCTURES AND FACILITIES

2.1 The contractor shall provide and maintain the following:

(a) Temporary office and/or quarters with water, light, telephone and toilet facilities for the contractor's project team personnel.

(b) Temporary bunkhouses/quarters for the contractor's work force complete with toilet and bath facilities.

2.2 The contractor shall also prepare and implement a plan for egress upon completion of the project.

3.0 MOBILIZATION

The contractor shall mobilize all the required project team personnel, equipment, tools and manpower with the required skills and in sufficient number as may be necessary for his efficient undertaking of the project.

4.0 CONSTRUCTION SUPERVISION

The contractor shall execute all the works under the contract in strict accord with standard engineering methodology and procedures and shall be responsible for maintaining cleanliness and orderliness, health and safety of workers and general public in the project area throughout the duration of the contract.

5.0 ELECTRIFICATION

The contractor shall pay for expenses for the acquisition of the power connection to the local electric utility/cooperative for the temporary lighting of the work area and temporary facilities.

6.0 QUALITY CONTROL

The contractor shall adhere to the submitted and approved Minimum Material Testing Plan.

6.1 Special Inspection and Testing Requirements

Contractor shall provide quality assurance for the construction of the seismic force resistance system designed by the Structural Engineer of Record by recording periodic inspections and testing of structural components in a timely manner during construction. The system may include structural elements such as a steel intermediate moment resistance frame and concrete shear walls, and additional systems such as anchorage of equipment and exhaust ducts containing hazardous materials, anchorage of piping systems and mechanical units containing flammable, corrosive or toxic materials, anchorage or electrical equipment used for emergency and standby equipment.

See the section in Division 1 for a full description of the special tests that are required with no exception.

6.2 Full-Size Mock-Ups

Selected areas of the building will be identified for full scale mock-ups of limited size to ensure contractor and subcontractors understand and coordinate multiple components. The location of full-sized mock-ups shall be selected to allow the mock-up work to become part of the construction after acceptance by the Owner and Implementing Agency.

6.3 Building Commissioning

Contractor shall comply with commissioning requirements as documented in Division 1 specifications and coordinate requirements with the University / NIH Commissioning Agent.

6.4 Room Integrity Testing

Certain rooms such as the high-containment laboratories and vivarium shall be tested as specified in Division 1 of the Pre-Bid Documents.

7.0 PROPOSED DESIGN AND CONSTRUCTION SCHEDULE

The target number of days to complete the Project National Institutes of Health Building at UP Manila Campus is Nine Hundred Ten (910) calendar days, seven (7) calendar days upon receipt by the Contractor of the Notice to Proceed.

8.0 MINIMUM CONSTRUCTION SAFETY AND HEALTH PROGRAM

The contractor shall abide with the following minimum safety and health program:

8.1 SAFETY PROGRAM

(a) Contractor provides skull guards, raincoats, working shades, and boots to employees who are assigned to hazardous areas;

(b) Operators, drivers, and other employees who handle equipment must thoroughly check their equipment, lubricate and handle them properly and should be cautious, extra careful at all times to avoid accidents while on duty;

(c) Wires, nails, bolts and other pointed objects should be eradicated in the working areas to avoid possible injuries/accidents;

(d) Seat belts are provided in every truck/vehicle that is being used in the project site;

(e) Fire extinguishers are to be placed in equipment such as fuel truck; and

(f) Employees are advised on the use of cigarettes, candles and other flammable materials to avoid occurrence of fire.

8.2 HEALTH PROGRAM

(a) Upon entrance as construction site employees, the Contractor will provide that every construction employee automatically becomes a member of SSS and Phil Health Corporation;

(b) A cabinet which contains over the counter drugs and other first aid supplies are ready for use in case of sickness or accidents that occur. In case of serious incidence, they are immediately brought to the emergency room of the nearest hospital;

(c) Employees shall be lectured once in a while of personal hygiene, number of children one family would have to be able to provide the family's needs of food, clothing and shelter; and

(d) Strictly no drinking liquor during working hours to ensure safety and for health purposes.

(e) At the Contractor's and subcontractors' discretion, construction employees found to engage in unsafe construction site services shall receive two warnings and training prior to termination.

(f) The University has zero tolerance for unsafe behaviour that may cause harm to the workers and other members of the community.

9.0 AS-BUILT PLANS

The contractor shall prepare and submit as-built plans duly signed and sealed by a civil engineer in the same sheet size and scale as the original drawings in two (2) reproducible copies. Electronic copies of the as-built contract drawings shall also be submitted in native files for use with the Autodesk software Autocad and Revit. The *.PDF format files shall be delivered with the CAD or BIM files.

10.0 COORDINATION OF WORK WITH CONSTRUCTION MANAGEMENT TEAM

The Owner (the University of the Philippines Manila) and Implementing Agency (the National Institutes of Health) will contract a Construction Management Team and Commissioning Agent who will work with the contractor during design, construction, and post-construction.

END OF PART V

Read and accepted as part of the Contract:

Bidder/Contractor

PART VI
PROPONENT'S/BIDDER'S RESPONSIBILITIES

1.0 BIDDING

1.1 The prospective Bidder shall be responsible for taking the necessary steps to carefully examine all documents. It also rests upon the Bidder to acknowledge all conditions, local or otherwise, affecting the carrying out of the contract works, and arrive at an estimate of the facilities available and needed for the project. Failure to do so shall be at the proponent's/bidder's risk.

1.2 It shall be the sole responsibility of the Bidder to determine and suit himself by such means as he considers necessary or desirable as to all matters pertaining to the project, including the location and nature of work, climatic conditions, nature and condition of the terrain, geological conditions at the site; transportation and communication facilities, requirement and availability of materials, labor, water, electrical power and roads; location and extent of aggregate source; and other factors that may affect the cost, duration and execution of the work. The Proponent/Bidder, by the act of submitting his proposal, acknowledge that he has inspected the site and determined the general characteristics of the project and the conditions indicated above. UP requires an affidavit, duly notarized, of such site inspection from the Proponent/Bidder.

1.3 Prior to submittal of proposals, it is assumed that the Proponent/Bidder is already familiar with all existing laws, decrees, ordinances, acts and regulations of the Philippines, which may affect or apply to the operations and activities of the contractor. However, in the case where the cost of the awarded contract is affected by applicable new laws, decrees, ordinances, regulations and other acts of government promulgated after the date of submission of proposals, a contract price adjustment may be made or appropriate relief be applied on a no loss – no gain basis provided such is not covered by the provisions on price escalation hereof and subject further to the availability of funds.

2.0 PRELIMINARY SURVEYS AND STUDIES

The UP Manila Campus Planning, Development and Maintenance Office shall provide the bidders with storm drainage plans, sewer lines plan, and cold water supply line plan, and other utility plans only if available. The bidder shall include a line item that will cover the cost of completing geodetic site survey and soil investigation in the event that historical infrastructure plans are not available. The projected cost of preliminary surveys shall be submitted with bids.

3.0 PLANNING AND DESIGN PHASE

3.1 The proponent/bidder is expected to have visited the project site, familiarized themselves of the terrain, climatic conditions, availability of local manpower and construction materials, and local statutes that have direct bearing on the project.

3.2 The bidder is required to submit the proposed relocation map/plan of affected utilities.

3.3 The proponent/bidder is required to submit a Preliminary Conceptual Design in accordance with the degree of detail specified in this Terms of Reference (TOR). Prior to the award of the contract, the preliminary designs shall be rectified for errors in the interpretation of the specified conceptual design specifications and parameters.

END OF PART VI

Read and accepted as part of the Contract:

Bidder/Contractor

PART VII
RESPONSIBILITIES OF THE UNIVERSITY OF THE PHILIPPINES

1.0 RIGHT-OF-WAY

Being the Owner-Developer, the University of the Philippines Manila shall secure the necessary Right-of-Way and access to the site from the date of contract award until building construction and site work is completed.

2.0 ENVIRONMENTAL CLEARANCE CERTIFICATE

UP shall assist the contractor in securing the necessary Environmental Clearance Certificate (ECC). It shall be the responsibility of the contractor to pay for any and all expenses necessary in the preparation of Environmental Impact Statement and to secure such and to make representation and follow-ups to expedite the release of the same.

3.0 ELECTRICAL FACILITIES

UP shall assist in securing the electrical facilities in the project by filing the application with the local electric utility. It shall be the responsibility of the contractor to pay for any and all expenses necessary in the acquisition of the electrical facilities.

END OF PART VII

Read and accepted as part of the Contract:

Bidder/Contractor

PART VIII
PROJECT ACCEPTANCE AND TURNOVER

1.0 A Construction Management Team shall be created by UP Manila to ensure that completed work is

1.1 In accordance with the For Construction contract documents (plans and specifications) approved by the End User (NIH) and the Owner (University of the Philippines Manila).

1.2 Able to perform as expected and was constructed in a way to allow successful testing, commissioning, and certification.

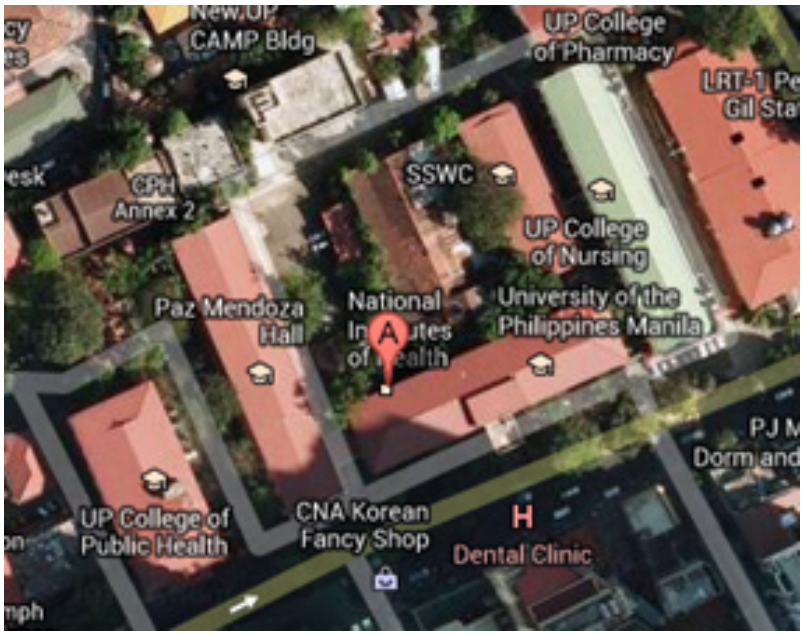
2.0 Should the Construction Management Team members notice minor defects after completing the punchlist, new items may be added to the list which the contractor shall correct prior to final acceptance.

3.0 Upon final acceptance of the project, the retention money for the project shall be released accordingly, upon the request and posting of the required one (1) year guarantee bond for the contract.

END OF PART VIII

PART IX - A
ANNEXES

1.0 ANNEX 1: VICINITY PLAN (PHOTO)



Aerial view (top) shows the project site in relation to the Health Sciences Center at Philippine General Hospital. The new NIH building will reclaim land from underused two-storey structures (SSWC and former Science Centrum) of no historical significance.

Enlarged aerial view (left) identifies the adjacent buildings. The proposed NIH building (highlighted in yellow) will be physically connected to the existing NIH building (highlighted in red) through a pedestrian walkway on ground level and a bridge on the second floor.

The schematic design preserves a large Dita tree (green marker) and provides for landscaped replanting of smaller trees at the base of the building.

Read and accepted as part of the Contract:

Bidder/Contractor

2.0 ANNEX 2: CHECKLIST OF REQUIREMENTS – DETAILED ARCHITECTURE DESIGN

Checklist of Drawing Requirements in the preparation/evaluation/approval of Detailed Architectural and Engineering Plans and other Documents for New Construction Project Implementation

Reference: Revised Implementing Rules and Regulations of the National Building Code of the Philippines (PD 1096)

Project : **NATIONAL INSTITTUTES OF HEALTH**

Location : **UP MANILA, 625 PEDRO GIL STREET, ERMITA, MANILA**

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	ARCHITECTURAL DRAWINGS (as applicable)	
A – 1 (a…n)	Perspective, Site Development Plan, Vicinity Map/Location Plan (2.00 Kms. Radius), Table of Contents	
A – 2 (a…n)	Floor Plans (scale 1:100m minimum) including furniture layout when necessary	
A – 3 (a…n)	Four (4) Elevations (scale 1:100m minimum)	
A – 4 (a…n)	Two (2) Sections (scale 1:100m minimum) including spot details when necessary	
A – 5 (a…n)	Roof Plan/s showing downspouts (scale 1:100m minimum), including detail of gutter, downspout, etc.	
A – 6 (a…n)	Reflected Ceiling Plan/s (scale 1:100m minimum), including details	
A – 7 (a…n)	Details of Stairs, fire escapes/exits, accessible ramps, etc. (scale 1:50m), including details of railings, treads, risers, etc., in the form of plans, elevation/section	
A – 8 (a…n)	Details of Toilets (1:50 m) including accessible toilets in the form of plans, elevation/section	
A – 9 (a…n)	Details of specialized design features (scale 1:50 m) such as exterior glass curtain walls, partitions, cabinets, etc. and accessible design features	
A – 10 (a…n)	Detailed plan and section of auditorium seating layout and stage (scale 1:50 m)	
A – 11 (a…n)	Detailed plan and section of roof deck construction (scale 1:50m)	
A – 12 (a…n)	Detail of typical bay section from lower basement to roof (scale 1:50 m)	
A – 13 (a…n)	Schedule of doors, gates, emergency exits, etc. (scale 1:50 m), including specifications for materials and hardware	
A – 14 (a…n)	Schedule of windows (scale 1:50 m), including specifications for materials and hardware	
A – 15 (a…n)	Schedule of finishes for interior and exterior floors, walls, ceilings	
Architectural Technical Specifications		
Architectural Scope of Works		
Architectural Bill of Quantities		

***** *To be marked as either Complying or Non Complying/Complete or Incomplete by the evaluator or to be filled with supporting comments (use additional sheets if necessary)*

Evaluated by:

_____
Architect

Read and accepted as part of the Contract:

_____
Bidder/Contractor

3.0 ANNEX 3: CHECKLIST OF REQUIREMENTS – DETAILED ARCHITECTURAL INTERIOR DESIGN

Checklist of Drawing Requirements in the preparation/evaluation/approval of Detailed Architectural and Engineering Plans and other Documents for New Construction Project Implementation

Reference: Revised Implementing Rules and Regulations of the National Building Code of the Philippines (PD 1096)

Project : **NATIONAL INSTITUTES OF HEALTH**

Location : **UP MANILA, 625 PEDRO GIL STREET, ERMITA, MANILA**

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	ARCHITECTURAL INTERIOR DRAWINGS (as applicable)	
AID – 1 (a…n)	Floor Plans showing layout of floor finishes (scale 1:100m minimum)	
AID – 2 (a…n)	Interior Elevations and Sections showing wall patterns, ceiling sections, etc. (scale 1:100m minimum)	
AID – 3 (a…n)	Schedule of Finishes and Details	
AID – 4 (a…n)	Details of Partitions, Cabinets, Furniture, Ceiling and other Interior Design Features (scale 1:100 minimum)	
AID – 5 (a…n)	Schedule of Fixed Furniture and Details	
AID – 6 (a…n)	Paint Color Swatch Combinations	
AID – 7 (a…n)	Architectural Interior Perspective/s	
Architectural Interior Design Technical Specifications		
Architectural Interior Design Scope of Works		
Architectural Interior Design Bill of Quantities		

***** *To be marked as either Complying or Non Complying/Complete or Incomplete by the evaluator or to be filled with supporting comments (use additional sheets if necessary)*

Evaluated by:

_____
Architect

Read and accepted as part of the Contract:

_____
Bidder/Contractor

4.0 ANNEX 4: CHECKLIST OF REQUIREMENTS – DETAILED LABORATORY DESIGN AND EQUIPMENT PLANNING

Checklist of Drawing Requirements in the preparation/evaluation/approval of Detailed Architectural and Engineering Plans and other Documents for New Construction Project Implementation

Reference: Revised Implementing Rules and Regulations of the National Building Code of the Philippines (PD 1096)

Project : **NATIONAL INSTITTUTES OF HEALTH**

Location : **UP MANILA, 625 PEDRO GIL STREET, ERMITA, MANILA**

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	ARCHITECTURAL DRAWINGS (as applicable)	
QL – 1 (a…n)	Interior Perspective of Typical Open Laboratory, Key Plans locating laboratory types in the building. Schedules and Kits of Parts.	
QL – 2 (a…n)	Laboratory Furnishing and Equipment Floor Plans (scale 1:100m minimum) including furniture layout when necessary	
QL – 3 (a…n)	Laboratory Elevations (scale 1:100m minimum)	
QL – 4 (a…n)	Laboratory Sections East-West and North-South all floors (scale 1:100m minimum) including spot details when necessary	
QL – 5 (a…n)	Details of Autoclaves, Cage Washers, Equipment Decontamination	
QL – 6 (a…n)	Details of Gas Cylinder racks and piping termination	
QL – 7 (a…n)	Typical Elevations for Laboratory Components and Signage System	
QL – 8 (a…n)	Typical plan and section details for penetrations in BSL-3, ABSL-2, ABSL-3	
QL – 9 (a…n)	Checklist of facility requirements for certifications as provided.	
QL – 10 (a…n)	Schedule of Laboratory Equipment shown on Plan, including dimensions, utility requirements, notes on equipment that is Contractor Furnished, Contractor Installed (CFCI); Owner Furnished, Contractor Installed (OFCI); and Owner Furnished, Owner Installed (OFOI).	
Laboratory and Equipment Planning Technical Specifications		
Laboratory and Equipment Planning Scope of Works		
Laboratory and Equipment Planning Bill of Quantities		

** To be marked as either Complying or Non Complying/Complete or Incomplete by the evaluator or to be filled with supporting comments (use additional sheets if necessary)*

Evaluated by: _____
Architect

Read and accepted as part of the Contract:

_____
Bidder/Contractor

5.0 ANNEX 5: CHECKLIST OF REQUIREMENTS – DETAILED LANDSCAPE ARCHITECTURE DESIGN

Checklist of Drawing Requirements in the preparation/evaluation/approval of Detailed Architectural and Engineering Plans and other Documents for New Construction Project Implementation

Reference: Revised Implementing Rules and Regulations of the National Building Code of the Philippines (PD 1096)

Project : **NATIONAL INSTITUTES OF HEALTH**

Location : **UP MANILA, 625 PEDRO GIL STREET, ERMITA, MANILA**

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	LANDSCAPE ARCHITECTURE DRAWINGS (as applicable)	
LA – 1 (a…n)	Site Development Staking Plan and Details	
LA – 2 (a…n)	Exterior Lighting Plan and Details	
LA – 3 (a…n)	Exterior Building Lighting and Details	
LA – 4 (a…n)	Detailed plan and sections of landscape design at main lobby garden showing hardscapes and softscapes around Dita tree	
LA – 5 (a…n)	Detailed plan and sections of landscape design at roof deck showing hardscapes, softscapes and moisture control, among others	
LA – 6 (a…n)	Schedule of Landscape Exterior Finishes and Details	
LA – 7 (a…n)	Other Spot details	
LA – 8 (a…n)	Landscape Architectural Perspective/s	
LA – 9 (a…n)	Planting Schedule and Plant Identification	
DLA series	Demolition Plans showing the Locations of Campus Site Utilities for connection to the New Building.	
Landscape Architecture Design Technical Specifications		
Landscape Architecture Design Scope of Works		
Landscape Architecture Design Bill of Quantities		

***** *To be marked as either Complying or Non Complying/Complete or Incomplete by the evaluator or to be filled with supporting comments (use additional sheets if necessary)*

Evaluated by:

_____
Landscape Architect

Read and accepted as part of the Contract:

_____
Bidder/Contractor

6.0 ANNEX 6: CHECKLIST OF REQUIREMENTS – STRUCTURAL DESIGN

Checklist of Drawing Requirements in the preparation/evaluation/approval of Detailed Architectural and Engineering Plans and other Documents for New Construction Project Implementation

Reference: Revised Implementing Rules and Regulations of the National Building Code of the Philippines (PD 1096)

Project : **NATIONAL INSTITUTES OF HEALTH**

Location : **UP MANILA, 625 PEDRO GIL STREET, ERMITA, MANILA**

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	STRUCTURAL DRAWINGS (as applicable)	
S – 1 (a…n)	General Notes and Construction Standards	
S – 2 (a…n)	Site Development Plan	
S – 3 (a…n)	Foundation Plan/s (scale 1:100m minimum)	
S – 4 (a…n)	Floor Framing Plan/s (scale 1:100m minimum)	
S – 5 (a…n)	Roof Framing Plan (scale 1:100m minimum)	
S – 6 (a…n)	Schedule and Detail of Footings, Columns and Shear Walls	
S – 7 (a…n)	Schedule and Detail of FTB's, Girders, Beams and Floor Slabs	
S – 8 (a…n)	Detail of Trusses	
S – 9 (a…n)	Details of Stairs, Ramps, Fire Exits	
S – 10 (a…n)	Other Spot details	
Structural Analysis and Design		
Boring and Land Test Results		
Seismic Analysis		
Structural Technical Specifications		
Structural Scope of Works		
Structural Bill of Quantities		

***** *To be marked as either Complying or Non Complying/Complete or Incomplete by the evaluator or to be filled with supporting comments (use additional sheets if necessary)*

Evaluated by:

_____
Civil Engineer

Read and accepted as part of the Contract:

_____
Bidder/Contractor

7.0 ANNEX 7: CHECKLIST OF REQUIREMENTS – SANITARY/PLUMBING DESIGN

Checklist of Drawing Requirements in the preparation/evaluation/approval of Detailed Architectural and Engineering Plans and other Documents for New Construction Project Implementation

Reference: Revised Implementing Rules and Regulations of the National Building Code of the Philippines (PD 1096)

Project : **NATIONAL INSTITUTES OF HEALTH**

Location : **UP MANILA, 625 PEDRO GIL STREET, ERMITA, MANILA**

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	PLUMBING/SANITARY DRAWINGS (as applicable)	
P – 1 (a…n)	General Notes and Legends	
P – 2 (a…n)	Location and Site Plan	
P – 3 (a…n)	Storm Water Drainage Layout (scale 1:100m minimum) including actual length of tapping line to Main Drainage Line	
P – 4 (a…n)	Water Line Layout (scale 1:100m minimum) including actual length of tapping line from main source when applicable	
P – 5 (a…n)	Sewer line and Vent line layout (scale 1:100m minimum) including actual length of tapping line to septic tank or existing sewer line	
P – 6 (a…n)	Isometric Layout, showing Waterline, sewer line and drainage line	
P – 7 (a…n)	Detail of connections, catch basins, downspouts, etc.	
P – 8 (a…n)	Detail of Cistern: Schedule of Pumps	
P – 9 (a…n)	Detail of Septic Tank/Sewer Treatment Plant	
P – 10 (a…n)	Details Water Tank (scale 1:50m)	
Design Analysis		
Sanitary Technical Specifications		
Sanitary Scope of Works		
Sanitary Bill of Quantities		

***** *To be marked as either Complying or Non Complying/Complete or Incomplete by the evaluator or to be filled with supporting comments (use additional sheets if necessary)*

Evaluated by: _____
Sanitary Engineer

Read and accepted as part of the Contract:

_____
Bidder/Contractor

8.0 ANNEX 8: CHECKLIST OF REQUIREMENTS – ELECTRICAL DESIGN

Checklist of Drawing Requirements in the preparation/evaluation/approval of Detailed Architectural and Engineering Plans and other Documents for New Construction Project Implementation

Reference: Revised Implementing Rules and Regulations of the National Building Code of the Philippines (PD 1096)

Project : **NATIONAL INSTUTES OF HEALTH**

Location : **UP MANILA, 625 PEDRO GIL STREET, ERMITA, MANILA**

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	ELECTRICAL DRAWINGS (as applicable)	
E – 1 (a…n)	General Notes and/or specifications	
	Legends or Symbols	
E – 2 (a…n)	Location and Site Plan	
E – 3 (a…n)	Lighting and Receptacle Outlets Layout (scale 1:100m minimum) and details including Schedule of Lighting Fixtures and Control Devices	
E – 4 (a…n)	Power Layout (scale 1:100m minimum) and details including Schedule of Panels	
E – 5 (a…n)	Fire Detection and Alarm Circuits Layout (scale 1:100m minimum) and details including Schedule of Equipment	
E – 6 (a…n)	Emergency alarm, lighting Layout for Exits and Hallways (scale 1:100m minimum) and details including Schedule of Emergency Lighting Fixtures and Signages	
E – 7 (a…n)	Schedules, Detail breakdown of Loads	
E – 8 (a…n)	One Line Diagrams	
E – 9 (a…n)	Other Details including and not restricted to wiring penetrations through fire-rated walls, section details of devices and wall plates located in exterior areas, containment areas, animal care areas, and office areas.	
Electrical Computations/ calculations		
Design Analysis		
Electrical Scope of Works		
Electrical Bill of Quantities		

***** *To be marked as either Complying or Non Complying/Complete or Incomplete by the evaluator or to be filled with supporting comments (use additional sheets if necessary)*

Evaluated by:

_____
Registered/Professional Electrical Engineer

Read and accepted as part of the Contract:

_____
Bidder/Contractor

9.0 ANNEX 9: CHECKLIST OF REQUIREMENTS – ELECTRICAL AUXILIARIES DESIGN

Checklist of Drawing Requirements in the preparation/evaluation/approval of Detailed Architectural and Engineering Plans and other Documents for New Construction Project Implementation

Reference: Revised Implementing Rules and Regulations of the National Building Code of the Philippines (PD 1096)

Project : **NATIONAL INSTITUTES OF HEALTH**

Location : **UP MANILA, 625 PEDRO GIL STREET, ERMITA, MANILA**

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	ELECTRICAL AUXILIARIES DRAWINGS (as applicable)	
EA – 1 (a…n)	General Notes and/or specifications	
	Legends or Symbols	
EA – 2 (a…n)	Location and Site Plan	
EA – 3 (a…n)	Telephone, Data and Wi-Fi Systems Layout, One Line Diagram (scale 1:100m minimum) and details including Schedule of Equipment	
EA – 4 (a…n)	Voice Over IP System Layout and Entrance Access System Layout (scale 1:100m minimum) and details including Schedule of Equipment	
EA – 5 (a…n)	Mass Notification System Layout, One Line Diagram (scale 1:100m minimum) and details including Schedule of Equipment	
EA – 6 (a…n)	Wi-Fi Layout, One Line Diagram (scale 1:100m minimum) and details including Schedule of Equipment	
EA – 7 (a…n)	Cable TV, Master Antenna TV and CCTV Layout, One Line Diagram (scale 1:100m minimum) and details including Schedule of Equipment	
EA – 8 (a…n)	Building section details showing cable tray and wiring pathways in relation to the work of other trades	
EA – 9 (a…n)	Other Details including and not restricted to wiring penetrations through fire-rated walls, section details for devices located in exterior areas, containment areas, animal care areas, and office areas.	
Electrical Auxiliaries Scope of Works		
Electrical Auxiliaries Bill of Quantities		

***** *To be marked as either Complying or Non Complying/Complete or Incomplete by the evaluator or to be filled with supporting comments (use additional sheets if necessary)*

Evaluated by:

_____
Registered/Professional Electrical Engineer

10.0 ANNEX 10: CHECKLIST OF REQUIREMENTS – MECHANICAL DESIGN

Checklist of Drawing Requirements in the preparation/evaluation/approval of Detailed Architectural and Engineering Plans and other Documents for New Construction Project Implementation

Reference: Revised Implementing Rules and Regulations of the National Building Code of the Philippines (PD 1096)

Project : **NATIONAL INSTITIUTES OF HEALTH**

Location : **UP MANILA, 625 PEDRO GIL STREET, ERMITA, MANILA**

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	MECHANICAL DRAWINGS (as applicable)	
M – 1 (a…n)	General Notes and Legends	
M – 2 (a…n)	Floor Plans/Isometric Drawings (scale 1:100m minimum) showing Fire Suppression Systems including sprinkler system, wet stand pipe, dry standpipe, fire pumps, and other installations	
M – 3 (a…n)	Floor Plan showing location of Fire Extinguishers (scale 1:100 minimum) and details including Complete Fire Hose Cabinet with fire fighting equipment	
M – 4 (a…n)	Floor Plans/Isometric Drawings (scale 1:100m minimum) of Room Exhaust Ventilation System and Details	
M – 5 (a…n)	Floor Plans/Isometric Drawings (scale 1:100m minimum) of Air Supply Systems and Details,	
M – 6 (a…n)	Floor Plans for Building Monitoring System (BMS) and Building Alarm System (BAS)	
M – 7 (a…n)	Detail Sections through Corridors serving laboratory and animal care floors showing ductwork and piping in relation to the work of other trades.	
M – 8 (a…n)	Detail of Other Machinery/Equipment (scale 1:50)	
M – 9 (a…n)	Longitudinal and Transverse Section of Building (scale 1:100m) showing manner of support of machines/equipment	
M – 10 (a…n)	Other Details including and not restricted to wiring penetrations through fire-rated walls, section details for devices located in exterior areas, containment areas, animal care areas, and office areas.	
M - 11 (a..n)	Schedules including valves, air handling units, chilled beams, fume hoods, exhaust extraction devices, air conditioning units, chillers, and other HVAC equipment for ventilation in laboratories and animal care areas.	
Mechanical Technical Specifications		
Mechanical Scope of Works		
Mechanical Bill of Quantities		

***** *To be marked as either Complying or Non Complying/Complete or Incomplete by the evaluator or to be filled with supporting comments (use additional sheets if necessary)*

Evaluated by:

_____
Mechanical Engineer

END OF PART IX-A

Read and accepted as part of the Contract:

_____
Bidder/Contractor

PART IX – B
LABORATORY FUNCTIONAL AND TECHNICAL CRITERIA

TABLE OF CONTENTS

ELECTRICAL

E1. Primary Voltage
E2. Service Distribution
E3. Emergency (Stand-By) Power
E4. UPS System
E5. Voice/Data System
E6. Artificial Lighting
E7. Special Wiring in Hazardous Areas
E8. BSL3 Suite Special Electrical Criteria

PIPED SERVICES

P1. General
P2. Domestic Cold Water System
P3. Domestic Hot Water System
P4. Tempered Potable Water
P5. Natural Gas
P6. Specialty Gases
P7. Compressed Air System
P8. Vacuum System
P9. Type III Reagent Grade Water System
P10. Type I Reagent Grade Water
P11. Steam
P12. Chilled/Process/Condenser Water
P13. Floor Drains
P14. Silver Recovery
P15. Wash Down
P16. Laboratory Waste (Drain) System
P17. Neutralization/Monitoring
P18. Sprinkler System
P19. BSL3 Suite Special Plumbing Criteria
P20. Sea Water

SAFETY

S1. General
S2. Safety Stations
S3. Eye/Face Wash / Safety Showers
S4. Fire Extinguishers
S5. Emergency Communications
S6. Signage
S7. Safety Closet or Emergency Response Team Room
S8. Emergency Electrical Shut-off
S9. Public Safety

LABORATORY FUNCTIONAL AND TECHNICAL CRITERIA

BACKGROUND:

The National Institutes of Health at the University of the Philippines Manila is composed of ten (10) institutes, three (3) reference centers, and twenty four (24) study groups.

- Institute of Molecular Biology and Biotechnology (IMBB)
- Institute of Child Health and Human Development (ICHHD)
- Institute of Clinical Epidemiology (ICE)
- Institute of Health Policy and Development Studies (IHPDS)
- Institute of Herbal Medicine (IHM)
- Institute of Human Genetics (IHG)
- Institute of Ophthalmology (IO)
- Institute of Pharmaceutical Sciences (IPS)
- Philippine National Ear Institute (PNEI)
- Newborn Screening Reference Center (NSRC)
- National Telehealth Center (NTC)
- Newborn Hearing Screening Reference Center (NHSRC)

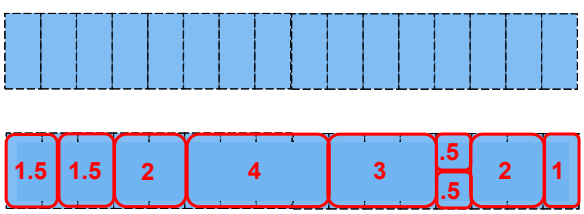
Interviews with representative End-Users were conducted by the UP Office of Development and Planning Initiatives (ODPI) from March-May 2013. The Schematic Design drawings developed indicate the desired adjacencies and locations for offices, laboratories, meeting rooms and auditorium. The technical criteria included in this document summarize laboratory design requirements as decided during a meeting on July 12, 2013. The document was developed without the participation of the Design and Build Contractor.

The preparation of the Detailed Architecture & Engineering Design drawings and specifications will be a phase in project development when the laboratory infrastructure is being designed. These technical criteria shall be revisited as the architects and engineers resolve the project's building code requirements and budget constraints. This document should be updated and reflect communication and planning between the Design and Build Contractor and the End Users.

FUNCTIONAL CRITERIA

F1. TYPICAL PLANNING MODULE. A typical laboratory planning module is the smallest practical laboratory environment and is the basis for all other laboratory sizes. Laboratory planning modules can be combined and/or subdivided to create the appropriate sized laboratory based on head count and/or function. The planning module for this project is dimensioned as follows (*: dimension inclusive of 150mm (6")nominal partition thickness):

Module Type	Width (O.C.)*	Depth (clear)
Laboratory Module	3352 mm	7000 mm



F2. CEILING HEIGHT. The recommended minimum clear obstruction height is 2743mm (9' – 0"). A hung ceiling is recommended for this facility to reduce HVAC loads (volume reduction) and dust accumulation (exposed pipes, ducts, pendant mounted lighting fixtures and spray-on fireproofing if required). A hung ceiling is not recommended in the Linear Equipment Room or Service Corridor in order to facilitate access to mechanical systems.

F3. FLOOR LOADING. The recommended live load capacity for the laboratory portion of the building is 500 kg/ sq. M (100 pounds per square foot (psf)). Laboratory Support modules and Linear Equipment Room shall have an assume floor loading of 600 kg/ sq. M (125 psf). For special circumstances, heavier live load may be required. Refer to room data sheets / room criteria sheets for specific information.

F4. ABOVE-CEILING LOADING. The following items are anticipated to be hung from the deck above the ceiling: overhead service carriers, optical table canopies, other. The recommended ceiling load for this facility is 25 psf.

F5. STRUCTURAL GRID. The structural grid should be coordinated with the laboratory planning module. The planning module should be offset from the structural grid to allow plumbing and electrical lines to pass through floors without impinging on floor beams. Plumbing chases, distribution and mechanical shafts will be coordinated with the structural grid during design development.

F6. CLEARANCES. For purposes of safe passage of occupants past people and equipment in aisles, as well as for an unobstructed wheelchair turning radius, the minimum recommended clearance between benches, or between a bench and a designated equipment area, is 1500mm (5'-0")in the laboratories. The recommended clear corridor width leading into a laboratory is 1800mm (6'-0") for research laboratories and 2438mm (8'-0") for teaching laboratories.

F7. PERSONNEL AND EQUIPMENT ACCESS. Provide a 1350mm (4'-6") wide door between corridor and laboratory, consisting of one 900mm (36") active door with a 450mm (18") wide inactive leaf to facilitate personnel and equipment access.

All laboratories will have at least two (2) means of egress unless the functional laboratory unit is sufficiently small (e.g.: Cold Room, Single Module Lab, etc.). Two means of egress is best practice for laboratories, especially those with fume hoods or other hazardous material usage. Applicable building codes and NFPA 45 should be consulted.

A clear path for the largest piece of anticipated equipment from the loading dock via elevator, including elevator door width and height, to any laboratory must be provided.

F8. ADA / ACCESSIBILITY REQUIREMENTS (ACCESS AND WORKSTATION). Access to and within all laboratory areas shall meet accessibility / ADA requirements.

Provide a specific number (5% or more) of ADA workstations. Workstation assembly shall be a mobile self-contained unit complete with sink, power and all available piped services. Workstation shall be capable of being located within the facility where required. Fume hood shall be capable of being modified to respond to ADA requirements.

Teaching Laboratories: Provide 5% (minimum one) ADA workstation in each teaching lab.

To meet the disabled workstation requirements, we recommend the following:

a. Counter top at standard low bench height of 31" (760mm) A.F.F.

b. Knee space at least 30" (810 mm) wide with a clear height of at least 27" (735 mm) to underside of nearest obstruction (typically front apron). Provide 6" (150mm) wide and 10" (250mm) high toe space on at least one side of workstation.

c. Service fixtures located maximum 18" (450mm) from front edge of counter top. Fixtures can be either standard or remote control type.

d. Sink drops shall occur at least 8" (200mm) from front edge of counter top and trap shall be minimum 9" (230mm) A.F.F.

e. Fume hoods modified to meet the above requirements.

F9. NOISE. Ambient noise level in the laboratories shall meet NC40 (Noise Criterion 40) in laboratories without fume hoods, not to exceed NC45 in laboratories with fume hoods. Prevent acoustic levels due to intermittent activity occurring outside the laboratory from exceeding ambient noise level by more than 5 dB. Special consideration must be given to facilities, such as clinics, clinical or human behavioral research which must meet HIPAA regulations.

SPECIAL LOW-NOISE LEVEL REQUIREMENT: The Philippine National Ear Institute (PNEI) requires construction of four STC 15 rooms for hearing tests using specialized equipment. Partitions and doors should be designed to have ante rooms and air gaps to decrease acoustic and physical vibration for ultra-quiet rooms. Wall construction to achieve the performance goals of STC 15 are “room-within-a-room” of double-wall construction. Attention shall be paid to the placement and specification of electrical devices, light fixtures and ventilation to be consistent with the requirement. There should be no noise emanating from light fixtures, air terminal units and exterior windows. Life safety equipment to alert occupants of the need to evacuate the building should have the ability to be switched to quiet mode in which strobe lights flash warnings during emergencies.

F10. ARCHITECTURAL FINISHES. The following is a list of recommended architectural finishes for typical laboratory areas. As a general rule, provide mold and moisture resistant gypsum wall board behind any sink assembly located against a wall.

a. Typical Laboratory

Floor:	Seamless resilient sheet product with heat welded seams equal to or better than Armstrong Medintech and sustainable rubber tile product with 4" (100mm) high resilient coved base.
Wall:	5/8" (15mm) Gypsum wall board (GWB) with water-based, washable, low-lusterlatex enamel paint, low volatile organic compounds.
Ceiling:	5/8" (15mm) acoustic lay-in tile laboratory and clean room grade.
Casework:	Powder coated steel with epoxy resin countertop in BSL-2 and BSL-3 laboratories Stainless steel with stainless steel countertops in animal areas and certain US Pharmacopeia (USP) 797-compliant sterile compounding laboratories.

b. Linear Equipment Corridor / Service Corridor

Floor: Seamless resilient sheet product with heat welded seams equal to or better than Armstrong Medintech and sustainable rubber tile product with 4" (100mm) high resilient coved base.

Wall: 5/8" (15mm) GWB with water-based, washable, low-luster latex enamel paint, corner protection

Ceiling: 5/8" (15mm) laboratory and cleanroom grade acoustic lay-in tile.

c. Teaching Laboratory for Surgery and Pathology

PNEI TEMPORAL BONE LABORATORY - Cadaver temporal bone is drilled and sunctioned and deep sink is required to clean instruments. Instructor and 40 students participate and observe procedures.

Floor: Epoxy resin system with 4" (100mm) integral epoxy resin coved base.

Wall: 5/8" (15mm) GWB with water-based, washable, low-luster latex enamel paint, corner protection and concealed painted metal electric panels / access panels.

Ceiling: 5/8" (15mm) laboratory and cleanroom grade acoustic lay-in tile.

d. Hearing Test Rooms

PNEI needs sound proof rooms for hearing tests at different sound pressure levels. Sound level of the walls, floor and ceiling should be 15 STC. Children and adult outpatients stay in the room from 30 to 45 minutes. Typical construction to achieve the level of quiet required has a room-within-a-room design. Room size is 1/4th laboratory module. There will be up to four rooms of this type. Equipment needs earth grounded power.

Instrument settings	Audible Frequency	Sound Pressure Level	Description
1	125 hertz	39 SPL	Rhythm frequencies
2	250 hertz	25 SPL	
3	500 hertz	21 SPL	
4	1000 hertz	26 SPL	
5	2000 hertz	34 SPL	
6	4000 hertz	37 SPL	
7	8000 hertz	37 SPL	

Floor:	Commercial, anti-microbial carpet tile with dense insulated back, with 4" (100mm) resilient coved base.
Wall:	5/8" (15mm) GWB with water-based, washable, low-luster latex enamel paint, corner protection and white marker boards (concealing electric panels). Provide STC 15 certified wall panel system with painted fiber board or fabric wrapped high density board.
Ceiling:	5/8" (15mm) laboratory and cleanroom grade acoustic lay-in tile, provide 25mm sound blanker insulation above ceiling tiles to increase sound separation.

e. Chemical Storage Room – to be part of Chemical Management Procedure

Floor:	Epoxy resin system with 4" (100mm) integral epoxy resin coved base.
Wall:	5/8" (15mm) GWB with water-based, washable, low-luster latex enamel paint, corner protection and concealed painted metal electric panels / access panels.
Ceiling:	None

e. Tissue Culture/Procedure Room/Microscopy – coordinate with decontamination procedures

Floor:	Seamless resilient product with heat welded seams equal to or better than Armstrong Medintech or Nora Linoleum with 4" (100mm) high vinyl coved base.
Wall:	5/8" (15mm) GWB with water-based, washable, low-luster latex enamel paint.
Ceiling:	5/8" (15mm) vinyl coated acoustic lay-in tile.
Casework:	Metal (powder coated steel) cabinets with gray epoxy resin counter top and sink.

g. Environmental Room (4° C)

These rooms will be prefabricated and will be specified as fixed laboratory equipment.

Floor:	Prefabricated 4" (100mm) thick metal clad insulated panels with seamless vinyl and integral 4" (100mm) high 'A" (12mm) radius coved base. Depress structural floor slab 4" (100mm) for recessed installation.
Wall:	Prefabricated 4" (100mm) thick metal clad insulated panels with baked-on white polyester finish on galvanized steel.
Ceiling:	Prefabricated 4" (100mm) thick metal clad insulated panels with baked-on white polyester finish on galvanized steel.
Casework:	Stainless steel counter top, sink and adjustable shelving. Shelving should be corrosion resistant wire to facilitate air flow.

h. Core Laboratory Facilities (Protein & Peptide Structure, Proteomics, Genomics, Flow Cytometry, Research Stockroom, Mass Spectrometry, Nucleic Acid)

Floor:	Seamless resilient sheet rubber, VCT 4" (100mm) high vinyl coved base.
Wall:	5/8" (15mm) GWB with water-based, washable, low-luster paint. Ceiling:5/8" (15mm) vinyl coated acoustic lay-in tile.
Ceiling:	5/8" (15mm) laboratory and cleanroom grade vinyl coated acoustic lay-in tile.
Casework:	Metal cabinets with gray epoxy resin counter top and sink.

F11. NATURAL LIGHT. Laboratories shall have direct access to natural light. Window treatment (shades) shall be provided where appropriate to vary the amount of natural light entering the laboratory or office. Darkrooms, Microscopy and Imaging Rooms, Behavioral Rooms, Cold Rooms and Warm Rooms shall avoid access to natural light.

F12. ARCHITECTURAL DETAILS.

A. The potential to add or remove partitions within the laboratory will require the following special architectural details to be developed:

1. Demountable partitions with modular structural casework solutions in biosafety level 2 laboratories.

2. Future Animal areas and containment space shall not have removable partitions.

B. Ceiling penetrations by exhaust devices and light fixtures

1. Details shall be provided for joints between acoustic ceiling types and ceiling mounted elements including exhaust devices (canopy hoods and fume extractors), fire sprinklers, and light fixtures.

2. Details shall be provided for wall and ceiling penetrations in the building cores that are adjacent to special areas such as the containment areas for biosafety level 3 (BSL-3) and animal biosafety level 3 (ABSL-3), and service access to hard ceilings adjacent to future animal biosafety level 2 (ABSL-2) areas.

F13. LABORATORY UNIT HAZARD CLASSIFICATION.

Laboratories will be Class C: Low Hazard as per the US standard National Fire Protection Association (NFPA) 45 and quantities of flammable or Liquid Class I, II and IIA combustible liquids shall not exceed 8 gallons (30 liters) per 100 square feet (9 sq meters) of laboratory unit or 400 gallons (1500 liters) in a sprinklered laboratory unit. A typical 36" (900mm) wide flammable storage cabinet located under fume hoods can hold up to 22 gallons (80 liters). According to NFPA 45, Class C laboratory doors do not have to swing in the direction of egress and laboratory partitions do not have to be fire rated.

F14. VIBRATION CRITERIA. Limit center bay vibration velocity to 2000 microinches / second (50 micrometers/second) due to building resonances and footfall induced vibration including slow (50 steps/minute) walking speed in workstation aisles, moderate (75 steps / minute in laboratory interior / ghost corridors, and fast (100 steps/ minute) walking speeds in adjacent corridors. Regions within 5 feet (2 meters) of columns shall be restricted to a vibration velocity of 600 microinches / second (15 micrometers/second) with inducer located at center of bay. This will provide a laboratory environment where approximately 45% of the lab is between 500 and 1000 microinches/ second (12-25 micrometers/second); approximately 10% is between 1000 and 1500 microinches/second (25 and 37.5 micrometers/second); and only 20% is between 1500 and 2000 microinches/second (37.5 and 50 micrometers/second).

For vibrations induced by mechanical equipment, structural slabs between lab and mechanical spaces shall be constructed to a minimum mass of 350 Kg/M2 in order to provide an appropriate base for equipment isolators to work against. The design approach will then provide equipment isolation to preclude vibrations from being transferred into the structure.

The following table is provided for reference.

Vibration Criteria: The following table should serve as a basis for deciding the appropriate vibration criteria for the building.

DESIGN CRITERIA FOR SENSITIVE INSTRUMENTATION AND EQUIPMENT NOT OTHERWISE VIBRATION-ISOLATED

Criterion Curve is the ISO nomenclature.
Max. Level (V_{rms}) is measured in *µin/s.*
Velocity Level is measure in *dB*with *Ref:1µin/s.*
Detail Size is measured in *µm.*

Workshop (ISO): 32,000 µin/s, 90dB, NA; Distinctly felt vibration. Appropriate to facility workshops and non-sensitive areas.
Office (ISO): 16,000 µin/s, 84dB, NA; Felt vibration. Appropriate to offices and non-sensitive areas.
Residential Day (ISO)8,000 µin/s, 78 dB, 75µm; Barely felt vibration. Sleep areas in most instances. Probably adequate for computer equipment, probe test equipment and low-power microscopes (to 20X). Adequate for animal facilities.
Op. Theatre (ISO): 4,000 µin/s, 72dB, 25µm; Vibration not felt. Suitable for sensitive sleeping areas. Suitable in most instances for microscopes to l00X and for other equipment of low sensitivity (this includes most inverted, fluorescence and confocal microscopes.
VC-A: 2,000 µin/s, 66dB, 8µm; General laboratory criteria in NIH 2008 guidelines. Adequate in most instances for optical microscopes to 100X, microbalances, optical balances, proximity and projection aligners, etc. Animal holding and rodent behavioral rooms.
VC-B: 1,000 µin/s, 60dB, 3µm; Optical microscopes up to 400x on benches and tables, and greater than 400x installed on isolation tables. Optical equipment on isolation tables, inspection and lithography equipment (including steppers) to 3 micron-meter line widths. Surgical spaces. Microscopy core (EM laser).
VC-C: 500 µin/s, 54dB, 1µm; Electron microscopes up to 30,000x. A good standard for most inspection equipment and lithography to 1 micron micron-meter detail size. Laser-based optical systems.
Detail Size column expresses the minimum width of fabrication details or size of research particles that could be handled at a specific criterion value.

The US National Institutes of Health Design Requirements Manual 2008 (DRM 2008) guidelines call for MRI, NMR, and "super microscopes" to be located on slab on grade.

F15. SEISMIC / HURRICANE DESIGN. Structural engineer to identify seismic / hurricane requirements. Provide shelving, cabinet and equipment and liquid nitrogen dewar restraints/tie downs as required.

F16. VALIDATION. Design team should be aware that this facility will be validated to meet cGMP requirements in the future and therefore P & I Drawings are required for all Engineering. IHM and IPS have this requirement. Validations for cGLP will be conducted for animal labs, IHM lab, IMPB molecular biology. Design to meet electrical and plumbing requirements for cGLP are required.

F17. FLOOD PREVENTION. Allow for water to flow down stair and elevator shafts by requiring all slab penetrations to have a 2" (50mm) above floor slab sealed sleeve and automatic sump pumps in elevator wells. Provide minimum 2" curbs at all shaft openings (except stairs and elevators) in laboratory floors, and in floors above laboratories (e.g. mechanical rooms and mechanical penthouse).

HEATING, VENTILATING AND AIR CONDITIONING

H1. GENERAL. The mechanical design shall be developed to meet the requirements of the United States Occupational Safety and Health Act (OSHA) Laboratory standards, American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE) guidelines for directional air flow and the use of pressure differential for control and the American National Standards Institute (ANSI) Laboratory Ventilation Standard *Z9.5. It should be noted that the National Building Code of the Philippines 2005 IRR contains ventilation standards which state normative values for room air changes per hour in offices, laboratories and assembly spaces. A review of the design requirements should be made and the more stringent requirements should be compared to address safety concerns and budgetary decisions.*

H2. SPACE TEMPERATURE AND HUMIDITY CRITERIA. The following inside design temperature (degrees Dry Bulb) and humidity (% Relative Humidity) conditions are recommended for all laboratory areas. Provide one thermostat per laboratory.

Room Type	Summer Temp	Summer Humidity		
Typical Laboratory	72° ±2 (22°C)	50% ±10	~~72° ±2 (22°C)~~	~~30% ±10~~
Linear Equipment Rm	72° ±2 (22°C)	50% ±10	~~72° ±2 (22°C)~~	~~30% ±10~~
Tissue Culture / Procedure Room	70° ±2 (21°C)	50% ±10	~~70° ±2 (21°C)~~	~~30% ±10~~
Core Lab	70° ±2 (21°C)	50% ±10	~~70° ±2 (21°C)~~	~~30% ±10~~
BSL3 Lab	70° ±2 (21°C)	50% ±10	~~70° ±2 (21°C)~~	~~30% ±10~~
Office / Amenity	72° ±2 (22°C)	50% ±10	~~72° ±2 (22°C)~~	~~30% ±10~~

H3. VENTILATION CRITERIA. One hundred percent of the air supplied to the laboratory areas shall be exhausted. There shall be no recirculating of laboratory air. Supply air quantities shall be based upon heat loads, minimum dilution/ventilation requirements, and/or required make-up air for exhaust systems, whichever is greatest.

H4. AIR CHANGE CRITERIA. While occupied, a minimum level of effective air changes per hour (ACPH) for dilution and/or removal of odors in laboratories shall be provided. Engineer shall calculate actual ACPH requirements based on exhaust device requirements and heat loads generated by equipment, people, lighting, and solar heat gain. While unoccupied, the minimum ACPH in laboratories can be reduced to 4 if acceptable environmental (temperature and humidity) parameters can be maintained.

H5. PRESSURIZATION CRITERIA. All laboratories shall be negative with respect to the corridor or adjacent space, unless otherwise noted, assuming that all doors are kept closed. The overall building shall be positive to atmosphere to avoid infiltration. The level of pressure differential shall be established by the Engineer.

H6. FILTRATION/ DEDICATED EXHAUST CRITERIA. All laboratory areas shall be supplied with air through 30% ASHRAE (atmospheric dust spot efficiency) efficient pre-filters and 95% ASHRAE efficient final filters. Laboratories or equipment which require dedicated and/or special filtration of supply or exhaust air are listed below. These shall be provided as part of the core and shell in the mechanical penthouse directly above.

a. Biosafety Level 3 (BSL-3) laboratories require dedicated high efficiency particulate exhaust (HEPA) and design for reliable ventilation that will not cause reversal of air flow during emergencies.

b. Animal biosafety level 2 (ABSL-2) rooms that require clean conditions (barrier) will be provided with dedicated HEPA filtered air supply and HEPA exhaust. Air locks shall be design to assist with the control of relative room pressurization.

H7. BUILDING OPERATING SCHEDULE. All laboratory M.E.P. systems shall be operable 24 hours, 7 days a week with varying degrees of occupancy in a 24 hour period. Some areas will be mainly 8-5 office hours. Building areas will be managed to have low use periods.

H8. FLEXIBILITY CRITERIA. Air distribution systems shall be designed to afford flexibility for future redesign, primarily by providing accessibility to the duct systems throughout the facilities and, where feasible, by applying a modular layout of air distribution devices and by providing symmetry and uniformity to the branch duct layout. Initial infrastructure should provide capacity for up to [25%] [50%][or other %]beyond initial capacity.

H9. WATTS/SQUARE FOOT.The HVAC system shall be sized to compensate for the followingequipment heat loads (not including lights or people):

Space	Watts/SF
a.Typical Laboratory	8
b.Equipment Room*	40*
c. Linear Eqmt Room	16
d.Tissue Culture / Procedure Room	16
e.Analytical Laboratory	40

(* this value has been verified by two different HVAC engineers)

Note: Any room exceeding these values will be serviced with a local chilled water fan coil unit that will recirculate and cool the room air.

H10. NOISE CRITERIA. Ambient noise level in the laboratories shall meet NC40 (Noise Criterion 40) in laboratories without fume hoods, not to exceed NC45 in laboratories with fume hoods. Special consideration must be given to facilities such as clinics, clinical or human behavioral research which must meet HIPAA regulations.

H11. HVAC CONCEPT. The following HVAC concept is proposed for this facility:

a. Supply Location. Supply air diffusers shall be located so as not to create drafts or turbulence at fume hoods or biological safety cabinets.

b. Exhaust Location. Each module shall be exhausted at a common location in the laboratory and can accommodate an initial or future 1200 mm fume hood, biological safety cabinet or room exhaust register rated for approximately 650 CFM.

c. Manifold System. All laboratory exhaust shall be exhausted through a common exhaust duct, also referred to as a manifold system. Only specialty hoods (radio-chemical, perchloric or Class II Type B2 biological safety cabinet) or equipment that requires direct venting will have a dedicated exhaust and fan.

d. Thimble Connection. Class II, Type A2 biological safety cabinets (30% exhaust) if noted to be ducted shall be connected to the manifold system with a thimble connection.

e. Exhaust Fan Redundancy. Manifolded exhaust system shall be on multiple fans, minimum two, each rated for 60-75% of the total load to compensate for maintenance or partial system failure.

f. Controls. All controls shall be DDC with electronic [or pneumatic] actuators. The potential to employ PLC's (programmable logic controllers) and industrial grade components (not commercial grade) should be evaluated.

g. Energy Conservation.

1. Low velocity / high performance fume hoods and/or horizontal/vertical restricted sash fume hoods shall be utilized to reduce overall building exhaust requirements and provide a safer work environment by reducing the sash opening (50% vs. 100%). Automatic sash positioners will be provided.

2. Heat Recovery. Heat recovery is encouraged and should be investigated.

h. Supply/Exhaust System.

1. [Option 1] Constant Volume. The supply and exhaust system shall be constant volume. No method of reducing volume during unoccupied periods will be provided.

2. [Option 2] Two-Position Constant Volume. The supply and exhaust system shall be constant volume with a reduced constant volume when the laboratory is unoccupied. For planning purposes the unoccupied reduced volume shall be 50% with thermostat override.The primary components of this system are two-position constant volume boxes on the supply and exhaust from the laboratory module and fans connected to the manifolded system that can respond to an infinitely variable air flow.

3. [Option 3] Variable Air Volume (VAV): The supply and exhaust system shall be variable air volume with minimum air change criteria established for occupied and unoccupied times. During occupied and unoccupied times, the air volume should be thermostat controlled and provide at least the minimum air change criteria. The primary components of this system are VAV boxes on the supply and exhaust from the laboratory module and fans connected to the manifolded system that can respond to an infinitely variable air flow.

Exhaust Fans. The exhaust fans should have a minimum exhaust stack discharge velocity of 3,000 fpm (15 meters /sec).

Fume Hood VAV/Alarm Control System. Fume hood through-the wall pressure sensing devices (hot wire technology) shall be employed, not sash tracking.

H12. FUME AND EXHAUST HOOD CRITERIA.

Chemical fume hoods shall typically be 4'-0" (1200mm) bench type with horizontal/vertical restricted sashes, one 36" (600mm) wide corrosive acid base cabinet and one 12" (300mm) wide base cabinet to conceal cup sink waste piping. Corrosives cabinets will be vented behind the fume hood baffle and 12"(300mm) above the counter top. Fume hoods shall have an average face velocity of 80 feet per minute (.5m/sec). Fume hoods and biological safety cabinets will be equipped with an airflow monitor/audible-visual alarm. The following criteria have been provided for mechanical system planning:

	Description	
a.	CFH72	4’ -0” (1800 mm) restricted sash bench hood
b.	IIA-6	6'-0" (1800mm) class II, type A2 (30% exhaust) biological safety cabinet
c.	IIA-4	4'-0" (1200mm) class II, type A2 (30% exhaust) biological safety cabinet
d.	X-1	Point Exhaust / Fume Extraction point: 1 indicates base size: typically 4” (100mm) 75 cfm. FX – 2 would denote a second type.
e.	CAN-x	Canopy Hood. Formula for calculations as follows: 30 liters/ minute
f.	DOWN	Downdraft surfaces: 100 cfm / sf (1100 cfm / sqM) downdraft velocity at table surface for 100% smoke capture at 12” (300 mm) above table.

H13. ACCESS TO MECHANICAL EQUIPMENT. If building design includes an elevator, provisions shall be made to include a stop at the location of MEP equipment.

H14. BSL3 SUITE SPECIAL HVAC CRITERIA. There are very specific criteria specific to this area; refer to the Containment Criteria Narrative.

H15. DEHUMIDIFICATION:

1. Provide central dehumidification in summer conditions if criteria warrants
2. Provide 25-30%RH, 55°F supply air to any environmental or cold room that requires mechanical ventilation to avoid condensation on the walls. Engineer to determine which method is appropriate for the application.

ELECTRICAL

E1. PRIMARY VOLTAGE. Laboratory areas will require 208/120 volt, 3-phase 220 volt, 50 cycle, 2 phase ,4 wire service for receptacles, small appliances and small (1/3 horsepower or less) motors. Elevators shall incorporate "Soft" starters to minimize any adverse effect on the power source.

E2. SERVICE DISTRIBUTION.

Each laboratory shall have an individual circuit breaker panel or panels as the size of the lab warrants. Each panel shall have at least 25% spare breaker capacity above initial requirements. Each 120V/20A (220 volt) circuit shall not exceed four (4) receptacles.

Alternate circuiting of adjacent duplex receptacles is recommended to minimize outages. It is recommended that electrical distribution be via surface mounted twin compartment (electrical and data; similar to Isoduct or Wiremold) raceways at wall benches and peninsula benches.

Duplex outlets shall be provided at a maximum of 2'-0" O.C. (600mm), unless otherwise noted.

Ground fault protection will be provided for outlets within 4'-0" (1200mm) (distance to be confirmed by electrical engineer based on local codes) of a sink edge.

Special attention shall be paid to the unusual number of dedicated circuits and outlets that will be required in specialized laboratories such as analytical laboratories.

E3. EMERGENCY (STAND-BY) POWER.

It is recommended that the following items be placed on emergency (stand-by) power, and this shall not be confused with Life Safety requirements:

a. Laboratory manifold exhaust system (at least one fan) to maintain relative negative pressure of labs, exhaust from fume hoods (sash shall be completely closed in a power outage), vented base cabinets (acid and flammable) under the hood and thimble exhaust above biological safety cabinets.

b. Fume hood and biological safety cabinet air flow monitor/audible-visual alarm.

c. Environmental rooms (Cold).

d. DDC panels

e. Air conditioning system including pumps and fans.

f. Computer servers in dedicated computer rooms.

g. Although specific laboratory equipment cannot be identified at this time, assume the following:

    1) Typical Laboratory: two (2) 120V (220v) duplex receptacles per module (one per benchside).

    2) Equipment Rooms: two (2) 120V (220v) duplex receptacles per module

    3) Tissue Culture Room: one (1) 120V (220v) duplex receptacle per room.

    4) Procedure Rooms: two (2)120V (220v) duplex receptacles per room

5) Linear Equipment Room: 120V, 20A (220v) duplex receptacle nominally 5'-0" (1500mm)on center on both sides of room

6) Outlets on standby power will be red. Where special outlets not available with red bodies are required, the cover plate will be red.

E4. UPS SYSTEM. A central UPS system is not recommended for this building. Users will be responsible to provide local UPS systems for equipment requiring this service. Emergency generator will accept load transfer within 10 seconds. Selected labs will need this.

E5. VOICE/DATA SYSTEM. Voice/data outlets shall be provided every 8'-0" (2000mm) O.C. in the twin compartment electrical raceway in laboratory and one outlet at each work station and lab office. Provide cable tray in central corridor and linear equipment room. The Analytical or Core Laboratories may require additional outlets. Provide phone jacks outside the doors of each laboratory suite for safety.

E6. ARTIFICIAL LIGHTING. The recommended illumination level to be achieved in all laboratory areas at the work surface (37" A.F.F (900mm)) is 80 foot-candles (800 lumens/ sq meter). Fluorescent lighting with T8 electronic ballasts and light emitting diodes (LED) will be acceptable in all laboratory areas as long as light levels are maintained. It is preferable to have dimmer capability in Computer Rooms. Direct/indirect lighting fixtures are preferred in the laboratories. Lighting design will consider energy efficiency, economy of construction and ease of maintenance. Combinations of lighting strategies where daylighting is available will be employed.

E7. SPECIAL WIRING IN HAZARDOUS AREAS. Hazardous areas and equipment shall be equipped with explosion-proof lighting fixtures, power outlets and switches as follows (provide grounding as necessary to prevent static build-up):

a. Chemical Solvent Storage Room.

b. Solvent dispensing fume hood located in Chemical Solvent Storage Room.

E8. BSL3 SUITE SPECIAL ELECTRICAL CRITERIA. There are very specific criteria specific to this area; refer to the Containment Criteria Narrative.

PIPED SERVICES

P1. GENERAL. Subject to review and consideration by the Plumbing Engineer, piped services shall be available for potential distribution to all individual laboratories through a perimeter distribution system located at the inside face of the exterior wall. Piped services shall be distributed within the lab via a horizontal service chase within the laboratory bench. This shall be furnished as part of the laboratory casework and shall be independent of the partitions. System sizing and diversity factor to be determined by Engineer. Vacuum breakers will be furnished on all domestic water fixtures including eye/face drench hose where potable water is used.

P2. COLD WATER SYSTEM. A potable cold water system shall be provided to laboratory sinks, cup sinks, safety stations (combination safety shower and eye/face wash), safety showers and eye/face wash stations. Capacity will be based on one sink outlet (3 gpm/35-40 psig (.2 liter/sec at 240-275 kPa)) and one cup sink outlet (1 gpm/35-40 psig (.2 liter/sec at 240-275 kPa))) per laboratory module. Usage factor (% of total demand): 20%.

P3. HOT WATER SYSTEM.

a. Unless noted otherwise, laboratory sinks and hose bibbs for washdown areas shall have hot water from a local electric instantaneous water heater.

b. Hot water heaters should be able to supply water temperature at 140 degree C for cGLP requirements.

P4. TEMPERED POTABLE WATER. A tempered potable water system is required to support the operation of the eye wash and safety showers.

P5. SPECIALTY GASES. Laboratory gases (i.e. N2, H2, He, Instrument Air, NO2, CO2, etc.) require all piping components (Copper tubing for nonflammable gases and stainless steel tubing for oxidizers and flammables is recommended). Outlet pressure shall be 150 psig (1380 kPa) with line pressure not to exceed 200 psig (1840 kPa). Gas cylinders shall be located outside the laboratories in convenient shared gas cylinder closets.

Laboratory gases anticipated on this project include:
AR: Argon
CO_2: Carbon Dioxide
N_2: Nitrogen
O_2: Oxygen

The list shall be updated prior to delivery of Design Development documents.

Fixtures to be: lubricated, cleaned, capped, protected, and delivered certified for "Oxygen" service and shall be supplied as follows:

a. BSL-3 and ABSL-2, ABSL-3 areas: gases delivered, handled and distributed from cylinders and manifolded to the point of use (fixture or equipment) on a local basis. Owner will furnish and install all piping, regulators, gauges, cylinders, alarms, control valves, etc.

b. BSL-2 areas: gases will be delivered from cylinders locally positioned in the laboratory. All components will be owner furnished. Cylinder restraints will be located in the laboratory as part of the casework system.

P7. COMPRESSED AIR SYSTEM. (TBD) local to fitted-out laboratories only

1. **CDA**–Clean Dry Air: for critical applications like cleanrooms (-100 to -40 °F dewpoint, less than 3 micron particulate, less than 0.1 PPM hydrocarbons)
2. **LA**–Laboratory Air: for general laboratory applications, including scientific instrumentation (-40 to +10 °F dewpoint, 3 micron particulate, less than 1 PPM hydrocarbons). Oil free, compressed air shall be available to each laboratory at 60 psig (415kPa). Capacity will be based on four (4) outlets per laboratory module (1 scfm/outlet). No special filtration is anticipated (filter on intake is standard). Usage factor (% of total demand): 20%
3. **CA**–Compressed Air: for shop or plant compressed air (above +10 °F dewpoint, greater than 3 micron particulate, more than 1 PPM hydrocarbons)

P8. VACUUM SYSTEM.

a. VAC: Local vacuum pumps shall be furnished and installed by Owner in vented vacuum pump cabinets provided as part of the laboratory casework

P9. TYPE III REAGENT GRADE WATER SYSTEM. A centralized water system with a continuous loop design to the tip of the faucet, capable of providing type III reagent grade water (CAP/NCCLS or ASTM), is recommended

for this facility. Capacity will be based on one outlet per laboratory (.5 gal per hour (2 liters per hour) /outlet at 25-60 psig (200-400 kPa)) plus specific equipment consumption rates (glassware washers and local water polishers). Polypropylene pipe with fused joints is recommended. Local in-laboratory polishing units will be utilized to increase the quality of the type III reagent grade water to type I. Fixtures that recirculate to the outlet will be specified to eliminate dead-legs. The diversity of consumption criteria shall be 50% for faucets and 100% for hard connected equipment Type III reagent grade water basic specifications:

Professional Association:	CAP/NCCLS	ASTM
Resistivity (megohms/cm):	0.1	1.0*
Conductivity (microhms/cm):	10.0	1.0
Silicate (microg/L):	1000	500
Total Organic Carbon (microg/L):	N/A	200
Sodium (microg/L)	100	
Chlorides (microg/L)		10

* We acknowledge that the current ASTM standard for Type III water is 4. However this lower criteria was established to minimize the equipment's life cycle cost.

P10. TYPE I REAGENT GRADE WATER. A type I reagent grade water system, centrally distributed as a building system, shall not be provided. Type I reagent grade water will be delivered via Owner furnished and installed local polishing units fed by the type III reagent grade water system. These units are typically located in shared areas for certain lab floors.

P11. STEAM.

a. Process Steam: A local electric steam generator shall be provided where required for autoclaves.

b. Clean steam. High pressure (60 PSI (420 kPa)) clean steam (generated with potable water and free of all boiler additives) shall be provided to cGLP or cGMP sterilizers through the use of a steam fired boiler. A local electric clean steam generator shall be required.

P12. CHILLED/PROCESS/CONDENSER WATER.

a. Chilled water required for all water-cooled Environmental Room condensing units and for specific laboratory equipment identified by owner, chilled water will be provided by local chillers and mechanical space for the footprint of these chillers will be considered in the design.

P13. FLOOR DRAINS. Floor drains at safety showers shall not be provided.

Floor drains shall not be provided in laboratory areas except in Glass Wash Rooms, and at specific equipment locations (i.e.: sterilizers, glassware washers, ice machines). Controlled Environmental Room condensate will drain into floor drain located exterior to room and easily accessible.

P14. LABORATORY WASTE (DRAIN) SYSTEM. Policy and procedure will be to segregate and dispose of any toxic, radioactive or high concentration wastes through local "in-lab" safety containers, without the use of a piped waste system. Polypropylene is recommended for all branches.

P15. NEUTRALIZATION/MONITORING.

Provide local neutralization capability at all laboratory sinks.

P16. SPRINKLER SYSTEM. All laboratory areas shall be provided with automatic wet sprinkler system protection. The system shall be designed with provisions that permit replacement of sprinkled areas with specialized local systems such as pre-action as warranted by special requirements. If a dry system is required, provide an FM 200 system.

P17. BSL3 SUITE SPECIAL PLUMBING CRITERIA. There are very specific criteria specific to this area; refer to the Containment Criteria Narrative.

SAFETY

S1. GENERAL. It is recommended that the following safety features be provided in or accessible to each laboratory and meet OSHA and/or ANSI requirements for configuration, operation and location.

S2. SAFETY STATIONS. Provide a minimum of two (2) safety stations, consisting of a deluge shower and eye/face wash, in each laboratory corridor within 10 seconds travel distance of any laboratory. The specific number should be driven by building configuration, code or owner's standard, whichever is more stringent. Eye/face wash to operate independently of deluge shower. Height of eye/face wash basin, deluge shower pull ring and deluge shower head should meet ADA and ANSI requirements.

S3. EYE/FACE WASH / SAFETY SHOWERS. A hand-held, counter top mounted eye, face and body wash/drench hose unit should be provided at every laboratory sink. All stand alone safety showers, eye washes, and combination eye wash/ safety showers shall be supported with a source of tempered potable water. The number of units and their specific location shall meet all national codes and local regulations or client standards whichever is more stringent.

S4. FIRE EXTINGUISHERS. Fire extinguisher cabinets should be located in corridor at laboratory doorway. Extinguishers shall be provided by Owner. The specific number should be driven either by code or owner's standard, whichever is more stringent.

S5. EMERGENCY COMMUNICATIONS. A telephone should be located in each laboratory to summon appropriate safety personnel or emergency aid.

S6. SIGNAGE. Appropriate signage indicating, but not limited to, Radioisotope, Flammable, Corrosive, Microwave or Biological Hazard, should be posted on each appropriate laboratory entry door. Signage to be furnished by Owner or accommodated in the wall mounted room name/occupants signage system.

S7. SAFETY CLOSET OR EMERGENCY RESPONSE TEAM ROOM.

Owner to determine whether a safety closet on each floor in each laboratory wing or a central Emergency Response Team (ERT) Room will be provided. Equipment will be furnished by Owner and typically consists of the following:

a. Decontamination Equipment
b. HEPA filtered, explosion proof, wet/ dry vacuum
c. Spill Control Equipment
d. Drawings and diagrams of the building and alarm systems

S8. EMERGENCY ELECTRICAL SHUT-OFF.

An emergency electrical shutoff shall be provided for laboratories. Local circuit breakers shall be provided wherever equipment manufacturers require.

S9. PUBLIC SAFETY ISSUES. The following security options shall be incorporated into project.

a. Entry card access
b. CATV coverage on building exterior
c. Solar powered exterior lighting
e. Communication links to building security / facility emergency monitoring station.

END OF PART IX-B