

## TERMS OF REFERENCE Design & Build Services

Project Title: Design and Build of Five (5) Storey Medicine Building

### I. INTRODUCTION

#### A. Background and Rationale:

The Department of Health is the national agency spearheading the implementation of the Health Facility Enhancement Program (HFEP): achieving Universal Health Care for all Filipinos, which shall be directed towards achieving the health system goals of better health outcomes, sustained health financing and responsive health system by ensuring that all Filipinos, especially the poor, have equitable access to affordable health care. This program shall be achieved by pursuing three thrusts, one of which is improved access to quality hospitals and health care facilities where government owned and operated hospitals will be upgraded to expand capacity and provide quality services to help attain health related Millennium Development Goals (MDGs), attend to traumatic injuries and other types of emergencies, and manage non communicable diseases and their complications.

Specific guidelines for improved access to quality hospitals and other health care facilities include a targeted Health Facility Enhancement Program (HFEP) that shall leverage funds for improved facility preparedness to adequately manage the most common causes of mortality and morbidity, including trauma. For the year 2011 as well as 2010, the HFEP prioritized the Repair, Renovation and Expansion and Equipping of barangay health stations/main health centers and level 1 and level 2 hospitals to enable them to render Basic and Comprehensive Emergency Obstetrics and neonatal care (BEmONC and CEmONC) respectively, to ensure attainment of health related MDGs – reducing maternal and infant mortality.

#### B. Objectives

The Construction of Five (5) Storey Medicine Building are being pursued to support one of the DOH's strategic approaches to improve the delivery of basic, essential, as well as specialized health services through the rationalization and critical upgrading of health facilities.

The 2022 Hospital Upgrading Projects of Region 02 Trauma and Medical Center will achieve the following major objectives:

1. To develop R2TMC to meet the ever changing and increasing demands of quality health care delivery;
2. To upgrade R2TMC to fulfill its role as end-referral and training hospital especially for maternal and child health care and trauma cases.
3. To upgrade R2TMC to meet the standards for fire safety and protection

4. The hospital conducts training in Health Emergencies, Obstetrical and Newborn Care, and Complementary Medicine. Participants not only come from Nueva Vizcaya but also from neighboring provinces.

## **II. PROJECT REQUIREMENTS**

- A. Preliminary Information/Studies for Design and Construction.

## **III. PROJECT COMPONENTS**

Site and space planning were governed by the standards, rules and regulations on the design of Level 3 hospitals as prescribed by the Department of Health and other concerned agencies. Building design shall conform to the provisions of the National Building Code of the Philippines (PD 1096), Accessibility Law (BP 344), National Structural Code of the Philippines, Electrical Engineering Law (RA 7920), Mechanical Engineering Law (RA 5336), Plumbing Code (RA 1378, 1993-1994 Revisions), Fire Code (RA 9514) and other laws and regulations covering environmental concerns and local ordinances and regulations.

### **A. Pre-Detailed Design**

#### **1. Engineering Surveys and Investigations**

Surveys and investigations of the site includes boundaries of the property, elevations and contours (at 0.5m interval), location, dimension, floor elevations and other pertinent data on existing buildings and improvements (roads, parking areas, mature trees) and existing utility lines (e.g. water, power, internet cable telephone).

#### **2. Design Development Drawings**

- 2.1 Preparation of the following drawings for design development based on the schematic plans prepared by the DOH/R2TMC
  - i. Perspective View
  - ii. Floor plans, two (2) sections and four (4) elevations, including complete space allocation.

### **B. Detailed Design**

1. Preparation of the following Detailed Design Drawings (see Checklist of Drawings Requirements) based on the Design Development Drawings and Design Parameters/criteria made and approved by the end-user including any revisions and refinements as approved and required by the DOH/R2TMC
  - a. Detailed Architectural Plans (refer to Checklist of Drawings Requirements and Design Parameters).
  - b. Detailed Structural Plans (refer to Checklist of Drawings Requirements and Design Parameters).
  - c. Detailed Electrical Plans (refer to Checklist of Drawings Requirements and Design Parameters).
  - d. Detailed Storm Drain, Sanitary and Plumbing Plans (refer to Checklist of Drawings Requirements and Design Parameters).
  - e. Detailed Mechanical Plans (refer to Checklist of Drawings Requirements and Design Parameters).

- f. Structural Computations, using Soil Boring Test Results and Seismic Analysis and Electrical Design Computations.
- g. General Notes and Technical Specifications describing type and quality of materials and equipment to be used, manner of construction and the general conditions under which the project is to be constructed.
- h. Bill of Qualities, Detailed Estimates including a summary sheet indicating the unit prices of construction materials, labor rates and equipment rentals.
- i. Summary of Works

C. Construction

As a rule, contract implementation guidelines for procurement of infrastructure projects shall comply with Annex "E" and guidelines for the implementation of contracts for DESIGN AND BUILD infrastructure projects shall comply with Annex "G" of IRR, RA 9184. The following provisions shall supplement these procedures:

1. No works shall commence unless the contractor has submitted the prescribed documentary requirements and the DOH/R2TMC has given written approval. Work execution shall be in accordance with reviewed and approved documents.
2. The contractor shall be responsible for obtaining all necessary information as to risks, contingencies and other circumstances which may affect the works and shall prepare and submit all necessary documents specified by the concerned Building Officials to meet all regulatory approvals as specified in the contract documents.
3. The contractor shall submit a detailed program of works within fourteen (14) calendar days after the issuance of the Notice to Commence for approval by the procuring entity that shall include, among others:
  - a. The order in which it intends to carry out the work including anticipated timing for each stage of design/detailed engineering and construction;
  - b. Periods for review of specific outputs and any other submissions and approvals;
  - c. Sequence of timing for inspection and tests;
  - d. General description of the design and construction methods to be adopted;
  - e. Number and names of personnel to be assigned for each stage of the work;
  - f. List of equipment required on site for each stage of the work; and
  - g. Description of the quality control system to be utilized for the project.
4. Any errors, omissions, inconsistencies, inadequacies or failure submitted by the contractor that do not comply with the requirements shall be rectified, resubmitted and reviewed at the contractor's cost. If the contractor wishes to modify and design or document which has been previously submitted, reviewed and approved, the contractor shall notify the DOH/R2TMC within a reasonable period of time and shall shoulder the cost of such changes.

5. As a rule, changes in design and construction requirements shall be limited only to those that have not been anticipated in the contract documents prior to contract signing and approval. The following guidelines shall govern approval for change or variation orders:
- a. Change Orders resulting from design errors, omissions or non-conformance with the performance specifications and parameters and the contract documents by the contractor shall be implemented by the contractor at no additional cost to the DOH/R2TMC
  - b. Provided that the contractor suffers delay and/or incurs costs due to changes or errors in the DOH/R2TMC performance specifications and parameters, the contractor shall be entitled to either one of the following:
    1. An extension of time for any such delays under Section 10 of Annex "E" of IRR (RA 9184); or
    2. Payment for such costs as specified in the contract documents, provided, that the cumulative amount of the variation order does not exceed ten percent (10%) of the original project cost.
  - c. The contract documents shall include the manner and schedule of payment specifying the estimated contract amount and installments in which the contract will be paid.
  - d. The contractor shall be entitled to advance payment subject to the provisions of Section 4 of Annex "E", IRR (RA 9184).
  - e. The DOH/R2TMC shall define the quality control procedures for the design and construction in accordance with the DOH/R2TMC guidelines and shall issue the proper certificates of acceptance for sections of the works or whole of the works as provided for in the contract documents.
  - f. The contractor shall provide all necessary equipment, personnel, instruments, documents and others to carry out specified tests.
  - g. This design and build projects shall have a minimum Defects Liability Period of one (1) year after contract completion or as provided for in the contract documents. This is without prejudice to the liabilities imposed upon the engineer/architect who drew up the plans and specification for building sanctioned under Section 1723 of the New Civil Code of the Philippines.
  - h. The contractor shall be held liable for design and structural defects and/or failure of the completed project within the warranty period of 15 years for permanent structures/buildings as specified in Section 62.2.3.2 of the IRR (RA 9184)

#### **IV. IMPLEMENTATION ARRANGEMENT**

- A. Reporting Protocol

## Contact Person

- i. Medical Center Chief II: RAY P. SUANDING, MD, MHA, FPCP, FPCCP  
Region 02 Trauma and Medical Center  
Nueva Vizcaya
- ii. Regional Director: GRACE V. SANTIAGO, MD, MHA, MPM, PHSAE, CESE  
Director IV  
Center for Health Development 02  
Carig Sur, Tuguegarao City, Cagayan
- iii. DOH HFDB Director: MA. THERESA G. VERA, MD, MSC, MHA, CESO III  
Director IV  
3/F, Bldg. No. 4 DOH Compound Rizal Avenue,  
Sta. Cruz, Manila

## V. ELIGIBILITY REQUIREMENTS:

### A. Basic

1. The eligibility requirements for Design and Build Scheme shall comply with the applicable provisions of Sections 23 – 24 of IRR of RA 9184. and
2. A modified set of requirements integrating eligibility documents and criteria for infrastructure projects and consulting services shall be adopted in accordance with Annex G - Guidelines for the Procurement and Implementation of Contracts for Design and Build Infrastructure Projects Annex “G” of IRR of RA 9184
2. The Design and Build Contractor must have completed projects in the amount of at least fifty percent (50%) per project package in the last ten (10) years and must have the network and resources in place preferably per region, to mobilize the contemplated nationwide Design and Build Services.

### B. Specialized

1. For the Pre-Detailed Design and Detailed Design portion of the contract, the Bidder is required to enter into a joint venture agreement with an architectural firm that will design the project with the minimum number of professionals as shown below:
  - a. Project Coordinator
    - i. Licensed Architect or Engineer
    - ii. At least 10 years’ experience in overall project management
    - iii. Superb oral and written communication skills, organization skills and excellent administrative abilities.
  - b. Hospital Architectural Consultant
    - i. Licensed Architect

- ii. Must have an experience as Architectural Consultant for at least five (5) years in hospital and hospital related projects.
  - iii. Proficient in Autocad software
- c. Architect
  - i. Licensed Architect
  - ii. Preferably at least 5 years' experience in hospital and hospital-related projects
  - iii. Proficient in Autocad software
- d. Structural Engineer and Civil Engineer
  - i. Licensed Structural/Civil Engineer
  - ii. Preferably at least 5 years' experience in hospital and hospital-related projects
  - iii. Proficient in Autocad software
- e. Professional Electrical Engineer
  - i. Licensed Professional Electrical Engineer
  - ii. Preferably at least 5 years' experience in hospital and hospital-related projects
  - iii. Proficient in Autocad software
- f. Professional Mechanical Engineer
  - i. Licensed Professional Mechanical Engineer
  - ii. Preferably at least 5 years' experience in hospital and hospital-related projects
  - iii. Proficient in Autocad software
- g. Sanitary Engineer
  - i. Licensed Sanitary Engineer
  - ii. Preferably at least 5 years' experience in hospital and hospital-related projects
  - iii. Proficient in Autocad software
- h. Professional Electronic and Communication Engineer
  - i. Licensed Professional Electronic and Communication Engineer
  - ii. Preferably at least five (5) years of experience in hospital and hospital related projects
  - iii. Proficient in Autocad software
- i. CADD Operator
  - i. At least Bachelor's Degree in Architecture or Engineering
  - ii. Proficient in Autocadd software

- j. Electronic and Communication Engineer
  - i. License Electronic and Communication Engineer
  - ii. Preferably at least 5 years' experience in hospital and hospital related projects
  - iii. Proficient in Autocad Softwares

**VI. APPROVED BUDGET COST**

The approved budget cost for the Design and Build of Five (5) Storey Medicine Building is Three Hundred Ninety Nine Million Two Hundred Twenty Five Thousand Pesos Only (Php 399,225,000.00).

**VII. TIME FRAME**

The Design and Build Contractor is required to complete the Project within an indicative period as shown below, to start upon the contractor’s receipt and signing of Notice to Proceed. The time frame to be followed for the project is as follows:

**Design and Construction Schedule:**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>ACTIVITY</b>												
<b>Pre-Design</b>	→											
<b>Detailed Design</b>	→											
<b>Application and Issuance of Building Permit and other applicable licenses</b>	→											
<b>Construction</b>	→											

Note: 1 unit = Four (4) Months

**VIII. MINIMUM REQUIREMENTS FOR CONSTRUCTION SAFETY AND HEALTH**

**A. General Requirements**

No Contractor or subcontractor shall require any employee to work in surroundings or under working conditions that are unsanitary, hazardous, or dangerous to his health or safety.

In order to meet this general requirement, the contractor must:

1. Initiate and maintain programs to comply with this general requirement.
2. Provide frequent and regular inspections of the job sites by competent persons
  - Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to prompt corrective measures to eliminate them.



3. Prohibit the use of any machinery, tool, material, or equipment that is not in compliance with applicable requirements.
4. Permit only those employees adequately trained to operate machinery or equipment.
5. Provide training for all employees in:
  - Recognition and avoidance of unsafe conditions
  - Workplace safety and health requirements
  - Applicable hazards, safe handling, and personal protective equipment necessary for handling poisons, caustics, flammables, and other harmful substances relevant to their job duties.
  - Specific hazards and procedures for entering confined spaces if applicable
6. Provide provisions for medical care and first aid.
7. Develop an effective fire protection and prevention plan.
8. Insure appropriate housekeeping measures including clear walkways and removal of combustible scrap and debris.
9. Require the wearing of appropriate personal protective equipment such as hard hats, safety glasses, steel toe shoes, or other appropriate protective equipment in all operations where there is an exposure to hazardous conditions.
10. Develop an emergency action plan covering designated actions employers and employees must take to ensure employees safety from fire and other emergency.
  - Plan must be in writing for employers with greater than 10 employees
  - All employees must be trained upon initial assignment on the parts of the plan the employee needs to know in the event of an emergency.
11. Provide access to hand washing facilities, toilets, and an adequate supply of drinking water.
12. Provide safety and health signs that are clearly visible to construction workers and public.
13. Conduct regular safety meetings.



**SUBJECT : ARCHITECTURAL DESIGN PARAMETERS**

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**i. Codes and Standards**

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

**• Laws and Codes:**

1. National Building Code of the Philippines and its Latest and Amended IRR
2. RA 9266 or Architecture Law and its Latest and Amended IRR
3. RA 4226 or Hospital Licensing Act and its Latest and Amended IRR
4. BP 344 or Accessibility Law and its Latest and Amended IRR
5. AO 35, s. 1994 or AO Pertaining to the Control of Radiation Hazards
6. RA 9514 Fire Code of the Philippines
7. Existing Local Codes and Ordinances.
8. And other Laws that applies to the projects
9. Green and Safe Health Facilities Manual
10. Green Building Code

**• Standards:**

1. Bureau of Product Standards (BPS)
2. Underwriters Laboratory (UL)
3. DOH Technical Guidelines for Hospital & Health Facilities Planning and Design

**ii. General Drawing Guidelines**

*1. General*

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

## 2. *Site Plans*

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

## 3. *Floor Plans*

- All plans shall be 1: 100 meters. The same scale shall be used for the rest of the architectural, structural, sanitary, plumbing, electrical and mechanical plans, except for each trade's site plan, detailed plans and spot details.
- Elevation callouts shall be indicated on the floor plans and shall be consistent with the elevation drawing.
- Section line callouts on the floor plans shall be consistent with the section drawing.
- Floor plans shall be indicated with boxed room callout numbers, including the callout for floor finishes and wall finishes.
- Floor elevations shall be indicated in the floor plans. This shall be in reference to the natural grade line or the established finished floor lines of the adjoining existing buildings.
- The location of mechanical equipment, e.g. air conditioning shall be indicated in the floor plans. This shall be consistent with the mechanical and electrical plans.
- Door callouts shall be circles with the proper numbering, e.g. D-01.
- Window callouts shall be hexagons with the proper numbering, e.g. W-01.

## 4. *Elevations and Sections*

- Finish floor lines and top of truss lines shall be consistent in all the elevations, sections and structural plans and details.

## 5. *Reflected Ceiling Plans*

- Reflected ceiling plans shall be indicated with boxed room callout numbers, including the callout for ceiling finishes and lighting fixtures.
- Ceiling height relative and in reference to the finish floor line shall be indicated in the reflected ceiling plans in each room with boxed dimensions. This is to ensure that the ceiling heights of all rooms are established whether or not reflected in the sections.
- The description and location of the fixtures, e.g. lighting, smoke detectors, air-condition vents, exhaust fans, in the reflected ceiling plans shall be consistent with the electrical and mechanical plans.

## 6. *Roof Plans*

- Location of all downspouts shall be indicated in the roof plans

#### 7. *Doors and Windows*

- Door and window schedules shall indicate the type of door or window, the number of sets, the location/s of the door or window, the materials and accessories included and other special specifications, e.g. color or finish.

#### 8. *Details*

- Provide a minimum of one (1) bay section of a scale not smaller than 1 : 50 meters for each major building preferably cut along the area with special construction design.
- Provide spot detail plans, elevations and sections of a scale not smaller than 1:10 meters for special designs with aesthetic treatment and ornamentation.
- Provide detail plans of a scale not smaller than 1 : 50 for all areas needing tile pattern, e.g. lobby, corridor, entrance walk, showing the position and pattern of tiles.
- Centerline location of plumbing fixtures shall be indicated in detail plans with lines of reference and its corresponding dimensions. This is to indicate the exact locations of the plumbing/sanitary roughing-ins.

### **iii. Site Works**

- The Master Site Development Plan of the Hospital shall include the following:
  - a. Contour and survey of the lot, including bearing and distance of the property line
  - b. Road network and curbs and sidewalks
  - c. Parking spaces
  - d. Reference location of existing trees
  - e. Reference location and footprint of existing buildings, with the corresponding building names and dimensions, including distances between adjacent buildings, and distances between buildings and the nearest property line
  - f. Reference location of utilities, e.g. water reservoirs, septic tank, wastewater treatment plant, powerhouse, transformers, waste storage area, security outposts
- There shall be a separate road network and entry/exit for the public and the service vehicles, e.g. ambulance, waste collection vans, delivery trucks.
- In limited lot areas, buildings should at least be spaced four (4) meters apart to allow natural light and ventilation.
- Covered walkways shall be provided for access and connection to all the buildings.
- Ramps shall be provided in all main entrances of the buildings and other access openings to walkways leading to other buildings.

#### iv. Building Architectural Works

##### 1. *Floor Plans*

- The structural, sanitary, plumbing, electrical and mechanical designs are required to refer to the architectural plans and specifications in case of discrepancies. If an engineering design will have any possible conflict or interference on the architectural design, the latter may be adjusted provided that the aesthetic value will not be compromised.
- The architectural and engineering plans shall be consistent all throughout in terms of dimensions and locations of columns, beams, walls, roof line, conduits, ducts, pipes, and fixtures, among others. Column and beam grid lines shall also be consistent in all the architectural and engineering plans.
- Verify and coordinate floor plans with the mechanical, electrical and sanitary design with regard to the requirements for mechanical rooms, AHU rooms, electrical rooms, pipe chase, and other engineering requirements.
- Public toilets shall have provisions and fixtures for persons with disability as required by BP 344. If enough space allows, toilets specially made and designated for persons with disability is preferable.

##### 2. *Walls*

- Exterior walls shall be 200mm. thick, while interior walls shall be 150mm. thick. This is indicative of the finished wall thickness including the plastering and tile works.
- Toilet wall tiles shall be 200mm. X 250mm. for areas of six (6) square meters or below. Toilet wall tiles shall be 300mm. X 300mm. for areas above six (6) square meters.
- Layout and work on wall and floor tiles must be aligned, plumb, level, and square.
- All toilets wall tiles shall be from floor to ceiling.
- All edges, corners and intersections of tiles, including the top-most tile not reaching the ceiling shall be provided with polyvinyl chloride tile trims.
- Tile color and design shall be approved first before installation.

##### 3. *Floors*

- If floor tiles in two adjacent rooms with different material, color or design meet at the door opening, the cut shall be located middle of the door thickness when in a closed position. Provide details in the floor pattern design.
- Floors at the openings of toilets for persons with disability shall be sloping. Indicate in the plans and sections.

- The size of the toilet floor tiles shall be 200mm. X 200mm. for areas of six (6) square meters or below. Toilet floor tiles shall be 300mm. X 300mm. for areas above six (6) square meters. Indicate the tile pattern.
- The size of the kitchen floor tiles shall be 300mm. X 300mm. Indicate the tile pattern.
- The size of the floor tiles of all rooms shall be 600mm. X 600mm, or bigger depending on the proportion to the size of the room. Use granite tile and indicate the tile pattern.
- The size of the floor tiles of the lobby and corridor shall not be less than 600mm. X 600mm. Use granite tile and indicate the tile pattern.
- Layout and work on wall and floor tiles must be aligned, plumb, level, and square.
- All edges, corners and intersections of toilet tiles, shall be provided with polyvinyl chloride tile trims.
- Tile color and design shall be approved first before installation.

#### 4. *Ceiling Works*

The following rooms shall have a minimum ceiling height:

- a. Kitchen – 3000mm. or no ceiling if below a concrete slab
  - b. Rooms – 3000mm., to provide better natural ventilation
- Ceiling height for areas with special aesthetic treatment, e.g. lobby, major conference room, auditorium, executive office, shall be proportional to the area or room or as required by the designer. However, this shall not be lower than 3000mm. Provide details.
  - If acoustic boards on aluminum T-runners would be used for the ceiling, layout should be on center and avoiding cut pieces. If the remaining perimeter of the ceiling is less than 600mm. wide, it shall be designed complimentary with fiber cement boards on light gauge metal furrings. Likewise, with acoustic boards in big areas, e.g. offices, and wards, shall be designed in a way to break the redundancy. Provide details.
  - Soffit of exterior beams and slabs shall have drip moulds to prevent damage due to water sipping into the eaves or ceiling. Section details shall be required to show the drip mould.

#### 5. *Doors and Windows*

- Major rooms that require security shall have sturdy doors e.g. wood panel, and metal.
- Minor rooms that do not require security shall be wood panel.
- Toilets and other wet areas shall have sturdy PVC Doors.

- Heavy-use doors, as specified by end-user/Hospital Engineers, should be provided with stainless steel kick or push plates and door closers.
- Fire escape doors, should be provided with panic hardware and door closers, and shall conform with the requirements of the Fire Code of the Philippines.
- Aluminum frames of glass doors shall be powder-coated.
- Door finish and color shall be approved first before application.
- Window sills shall be slightly sloped outwards to prevent damage to windows and paint due to water sippage. Section details shall be required to show this slope.
- All doors of a high-occupancy room shall swing outwards and as required by the Fire Code of the Philippines.
- Door jambs with no moulding/casing installed on concrete walls shall have construction grooves all around. Provide details.
- All doors and windows shall have reinforced concrete lintel beams. Provide details.

#### 6. *Stairs, Ramps, Pedestrian Bridge and Corridors*

- Ramps for persons with disability shall have a slope not higher than 1 : 12. Handrails and clearances shall conform with the requirements of BP 344.
- Regular stairs shall have risers at 150mm. high and treads at 300mm. wide. Fire stairs could have a maximum riser at 200mm. and tread at 250mm. Handrails shall be 1100mm. high. Clearances shall conform with the requirements of the Fire Code of the Philippines.
- All perimeter beams of staircase shall be flush with the inside surface of wall of all regular stairs.
- Corridors shall have a minimum unobstructed width of 2450mm. This shall be measured clear from the surface of the finished wall and not on-center of the rough CHB wall.
- Corridors shall not be areas for temporary or permanent storage of stretchers, wheelchairs, trolleys, food carts, oxygen tanks or other movable hospital equipment. Storage or parking spaces shall be provided for these at specific location in corridors provided the minimum unobstructed width of 2450mm is met.
- Corridors and exit doors shall conform with the requirements of the Fire Code of the Philippines.

#### 7. *Fixtures and Accessories*

- Three-way electrical light switches shall be provided at the foot and the top of the stairs per floor. Likewise at both ends of a long corridor.

- Electrical light switches shall be located by the knob side of the door.
- Electrical switches and outlets shall be installed plumb and level.
- Public toilets shall always be provided with heavy-duty soap dispensers and electric hand dryers.
- Public toilets shall always be provided with stainless steel handrails in conformity to the requirements of BP 344.
- A drainage line shall be provided for window-type airconditioners. Likewise, split-type airconditioners located in the interior part of the building shall be so located adjacent to areas with drainage lines, e.g. toilets, downspouts, balconies.

#### 8. *Roofing Works*

- The section of the roof gutters shall be designed, in case of a clogged downspout, so that the overflow of water will be directed outside of the building and not towards the eaves or interior ceiling to prevent any damage. Provide details.
- Avoid valley or inside gutters in roof design. But in cases required in aesthetic design, valley or inside gutters shall be in stainless steel or concrete gutters with membrane-type waterproofing, and the section shall be designed with a capacity for big volume to prevent any damage due to overflow. Provide details.
- Parapets, designed as a roof protection from the winds, must be designed to satisfy the preceding parameters. Provide details.
- The slope of the roof shall not be less than 30 degrees.
- Use 0.7mm thick long span rib type roofing

#### 9. *Painting*

- Painted ceiling shall be in flat latex finish, while cornices and mouldings shall be in gloss enamel finish.
- Painted interior wall shall be at least in semi-gloss anti-bac latex paint finish for ordinary rooms, e.g. offices, unless specified to a higher type of paint.
- Patient-related rooms shall be in anti-bacterial and odor-absorbent paint finish.
- Painted exterior wall shall be at least in moisture-resistant/water-repellant solvent-based paint finish, textured or smooth, unless otherwise specified.
- Paint color and shade shall be approved first before application.
- Use earth color scheme (interior and exterior)

#### v. **Specific Requirements**

- **Provide spot detail plans and sections of the following:**



1. Gutter, eaves, and parapet
  2. Ceiling - cove/light, special connections and design, mouldings, valances
  3. Stairs - handrail, and baluster design
  4. Ramps - handrail design and floor pattern
  5. Doors, windows and gates - grille works,
  6. Special Architectural Treatment and Design, e.g. façade design, special window and door, counter/nurse station counter
  7. Special Carpentry Works, e.g. partitions, cabinetry, nurse station counter
  8. Other details as may be required
  9. Water proofing of all wet areas.
- **Provide Room Data Sheets, including detail floor plan, ceiling plan and sections of the following rooms, in coordination with the requirements of the electrical, sanitary and mechanical designs:**

1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
  4. \_\_\_\_\_
  5. \_\_\_\_\_
  6. \_\_\_\_\_
  7. \_\_\_\_\_
  8. \_\_\_\_\_
- (All blanks shall be filled as required by or applicable to the project.)

**vi. Summary of Materials**

- Materials to be used shall be fire-resistant, non-toxic, moisture-resistant and termite-resistant, e.g. fiber cement board, light-gauge steel frame, polyvinyl chloride ceiling panels.
- Wet areas, e.g. toilets, and kitchen shall use non-skid/non-slip vitrified ceramic floor tiles.
- Heavy traffic areas, e.g. lobby, and corridor shall use heavy-duty seamless granite floor tiles or a higher type of floor material.
- Ramps and stairs shall use non-skid/non-slip floor tiles, materials as specified.
- Aluminum T-runners shall be powder coated.
- Metal rod hangers with adjustable clips, and not galvanized iron wires, shall be used to support and suspend the aluminum T-runners and light gauge metal furrings.
- Roofing sheets shall be Ga.# 24 aluminum-coated, pre-painted, longspan, and pre-formed.

Others:

- Provision of pantries in locations specified by the end-users
- Provision of plant boxes at the exterior face of the building
- Provision of ramps in all entrance/doors at the ground floor
- Provision of slop sink in all common toilet and janitor's closet
- Provision of towel holder, cloth holder and single face mirror for office toilet and wide face mirror for common toilets
- Provision of PWD Toilet every floor based on the approved design/layout
- Provision of cabinets and counters in locations specified by the end-users
- Provision of one (1) manhole for every 25 sq. m. of ceiling
- Provision of waterproofing for all wet areas and any concrete slab that is exposed to weather. Such slab shall be sloped to floor drain
- Provision of stainless grab bar in all staircase, hallways, corridors and pedestrian bridge (both sides)
- Provision of directional signages (acrylic), room labels (rooms, wards, toilet, nurse station, etc.) and directory every floor
- Provision of lighted R2TMC Concrete Logo
- Provision of visible building name and bearing the Region II Trauma and Medical Center, with landscape, (build-up green painted g.i. sheet letters) to be located at the ground floor
- Provision of Garbage Chute every floor and closed garbage collection area at ground floor
- Provision of 10mx20m canopy (cladding)

vii. **Drawing Requirements:** See attached DOH checklist of drawings.

---End of Scheme---



Republic of the Philippines  
Department of Health  
NATIONAL CENTER FOR HEALTH FACILITY DEVELOPMENT  
Bldg. No. 4, San Lazaro Compound, Rizal Avenue, Sta. Cruz, Manila 1003  
Tel. Nos. 743-83-01 loc. 1453 and 1454



**SUBJECT: DESIGN PARAMETERS (STRUCTURAL/CIVIL WORKS)**

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I. Codes and Standards

The Civil/Structural Design shall be in accordance with the following Codes and Standards

- Codes
  1. National Structural Code of the Philippines (NSCP) 2010
  2. National Building Code of the Philippines and its revised IRR
  3. Accessibility Law
  4. Local Codes and Ordinances
- Standards
  1. Bureau of Product Standards (BPS)
  2. Philippine National Standards (PNS)
  3. DPWH Blue Book
  4. American Concrete Institute (ACI)
  5. American Society for Testing Materials (ASTM)
  6. American Welding Society (AWS)

II. Site Works

Based on Master Site Development Plan of the Hospital, provide where applicable complete design and details of hospital road (concrete with curb and gutter, including drainage) network, walkways parking areas and fencing.

1. The main entrance of the road shall be capable of two way traffic (at least 6.10mts. width) with a minimum thickness of 200mm (10 inches). Concrete strength should be at least 3000psi. Interior road (leading to support facilities) shall be so designed to accommodate delivery vehicles, and fire trucks in case of emergency.
2. Walkway should be at least 100mm thk with concrete strength of 2500psi. Ramps should be provided, instead of steps, for any change in elevations.
3. Parking area slabs should be at least 150mm thk with concrete strength of 3000psi.

III. Buildings

1. The Five (5) Storey Medicine Building should be designed using seismic importance factor of 1.25 for immediate occupancy category. Buildings should be designed in accordance with NSCP 2010 Requirements up to Magnitude 7 for those near seismic source Type A.
2. The Five (5) Storey Medicine Building should be designed also using wind importance factor of 1.15 (especially for design of trusses/roofing system). Concrete gutters and parapet walls should be provided as additional protection to the roofing system during strong typhoons.
3. The structural designer should verify with Philippine Volcanology and Seismology (PHIVOLCS) the distance of the proposed Five (5) Storey Medicine Building to nearest active fault lines and with the DENR for geo-hazard mapping.
4. The structural designer is encouraged to use fire-resistive and non-toxic materials.
5. All structural analysis should be submitted in five (5) printed copies and one (1) electronic copy.
6. Structures near the site of the Five (5) Storey Medicine Building shall be considered during the structural analysis and design including its protection during the construction.

IV. Details – the following shall be provided:

1. Connection details of beams and columns following the requirements of NSCP 2010 on confined areas.
2. Connection of trusses to beams and columns
3. Splicing details of reinforcing bars on columns and beams and the required bar cut-off points.

V. Summary of Materials

1. Concrete shall be Portland cement and conforming to ASTM Specification C150, Type I to Type II
2. Coarse Aggregates shall consist of washed gravel, crushed stone or rock or a combination thereof conforming to ASTM C33
3. Concrete Hollow Blocks shall be a standard product of recognized manufacturer conforming to PNS 16 with at least 350psi strength.
4. Reinforcing Bars shall conform with PNS Grade 60 for 16mm dia. and above and PNS Grade 40 for 12mm dia and below.
5. Structural steel shall conform with ASTM A36/A6M
6. Bolts and Studs shall conform with ASTM A 325
7. Welding electrodes shall be E60 or E 70 and conform with AWS

VI. Others.

1. Construction of tube type ramp from medicine building to trauma building
2. Construction of tube type pedestrian bridge from OPD Building to trauma building
3. Construction of Helipad with ramp at the top most floor
4. Connecting bridge from Training Building to Medicine Building



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VII. Drawing Requirements: See attached checklist

---End of Scheme---

**SUBJECT : SANITARY/PLUMBING DESIGN PARAMETERS**

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**I. Codes and Standards**

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

● **Codes:**

1. National Building Code of the Philippines and Its New IRR
2. Fire Code of the Philippines
3. National Plumbing Code of the Philippines (NPCP)
4. Sanitation Code of the Philippines
5. Existing Local Codes and Ordinances.

● **Standards:**

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

**II. Site Works**

- Based on the Master Site Development of the Hospital, the Site Works shall provide complete layout of the following:

1. Storm Drainage Network, indicating Drainage Manholes and Pipe Culvert;

2. Sewerage Pipe Network, indicating Sewage Manholes, Sewage pipes and the location of the proposed Sewage Treatment Plant; and
- The Storm Drainage Network shall accommodate the magnitude of peak rates of surface run-off including drainage coming from the buildings. The system shall be capable of handling the design flows routing to the designated outfall; For rainfall calculation and sizing of drainage pipes, refer to Table-D2, Appendix-D, National Plumbing Code of the Philippines and current rainfall record from PAGASA.
  - The Sewerage Pipe Network design shall accommodate all sewage coming from all the facilities, conveyed by gravitational flow leading to the existing Sewage Treatment Plant;  
Per capita wastewater demand: 60-100 gal/capita/day per occupant
  - The Water Supply Network shall include the provision of Fire Hydrants, accessible Drinking Fountain that will serve as testing point for safe and potable water supply;  
Per capita water demand: 80-120 gal/capita/day per occupant

### **III. Building Facilities Sanitary/Plumbing System**

1. Sewerline and Vent System
  - Provide complete Sewerline and Vent System from all (Domestic) plumbing fixtures and floor drains, laid by gravity flow leading to the Sewage Treatment Plant (STP);
  - For Demand Weight of Fixtures in Fixture Units; refer to Appendix A, Table A-2, NPCP
2. Wastewater line and Vent System
  - For all Areas dealing with Laboratory activities and generating infectious wastes, provide separate Wasteline and Vent System routing into a proposed Neutralization Tank prior to discharge to the Sewage Treatment Plant;
  - For all Wash Areas dealing and generating with oil/grease at the Pantries/Kitchen and Canteen, provide separate Wasteline and Vent System and solely tap to the proposed Grease Trap and then connect its effluent to the Sewage Treatment Plant.
  - For Estimated Demand Weight of Fixtures in Fixture Units; refer to Appendix A, Table A-2, NPCP
3. Waterline System
  - Provide complete cold water supply pipes to all plumbing fixtures. From the main water source.
  - Provide complete Hot water system with portable water heaters for selected Areas as required and or specified by the Hospital Engineers.
  - Provide separate Water line for collected rainwater towards water closets and urinals
4. Storm Drainage System

- Complete Storm Drainage System shall be provided for all roofs, canopies, concrete ledges and balconies including condensate drains laid for gravity flow connected to a leader/pipe line leading to the natural ground level storm drainage network.
- 5. Construction of Concrete Rain Harvester Tank, 6mX12mX3m (height), including the provision of its pump house, submersible pump (5HP), water lines connected to water closets of the building, and necessary electrical system to energize the pumphouse
- 6. Construction of 6mX18mx3m water tank including the provision of necessary waterlines towards the building (for location, refer to Hospital Engineers)

#### **IV. Specific Requirements**

- Provide details of the following:
  1. Grease Trap (for Pantries/Kitchen)
  2. Neutralization Tank

#### **V. Summary of Materials**

- Sewer and Vent pipes; Unplasticized Polyvinyl Chloride (uPVC) extra series 1000 (Conforming to ISO 3633 ASTM D2729 including Trims and Fittings)
- Storm Drainage pipes; Downspouts, Unplasticized Polyvinyl Chloride (uPVC) extra series 1000( Conforming to ISO 3633 ASTM D2729 including Trims and Fittings , BPS Certified)
- Drainage Pipes; 250mm dia. and below, Non-Reinforced Concrete Pipe (NRCDP) 300mm dia. and above, Reinforced Concrete Pipe (RCDP)
- Drainage Manholes; Street Inlet, Curb Inlet, Traffic Type Reinforced Concrete Area drain/Catch Basin, Reinforced Load Bearing CHB
- Sewage Manholes; Traffic Type Reinforced Concrete with Standard Steel Brass Cover
- Wastewater pipeline; Extra Heavy (XH) Single Hub, Hubless Cast Iron Pipes and Fittings (CIP) conforming to ASTM Standard 888
- Cleanouts; Cast Iron Brass with counter sunk plug (BPS Certified)
- Floor Drains/Deck Drains; Cast Iron Brass (BPS Certified)
- Gutter Drains; Cast Iron Dome Type Brass (BPS Certified)
- Cold Waterline pipes; for buildings, Polypropylene Pn10 Fusion Weld Pipes including Trims and Fittings (BPS Certified)
- Hot Waterline System; for buildings, Polypropylene Pn20 Fusion Weld Pipes including Trims and Fittings (BPS Certified)

- Trench Grating; Galvanized/Stainless Steel Iron grates
- Plumbing Fixtures including Trims, Fittings and accessories; (BPS Certified)
  - a) Water Closet-Tank Type push button flush
  - b) Lavatory-(Pedestal/Counter Type) with C-spout spray faucet
  - c) Kitchen Sink-Ga#16 Stainless Steel seamless bowl with gooseneck faucet
  - d) Urinal-Wall hung Flush valve type

Others:

- Construction of Septic Vault (4mX7mX2.50m(height), effluent to tap to the nearest sewage pipe leading to the Existing Waste Water Treatment Plant
- Provision of isolation valves of water for every floor, every ward and every office
- Provision of two (2) sewage collecting pipe for every floor

**VI. Drawing Requirements:** See attached DOH checklist standards based on Revised IRR of the National Building Code of the Philippines (PD 1096)



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---End of Scheme---

**SUBJECT : MECHANICAL WORKS DESIGN PARAMETERS**

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**I. Codes and Standards**

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

- **Codes:**
  1. National Building Code of the Philippines and Its New IRR
  2. Fire Code of the Philippines
  3. Mechanical Engineering Code of the Philippines (ME Code)
  4. Existing Local Government Codes and Ordinances.
- **Standards:**
  1. Bureau of Product Standards (BPS)
  2. Philippine National Standards (PNS)
  3. Underwriters Laboratory (UL) and Factory Mutual (FM)
  4. International Electrotechnical Commission (IEC) 1988
  5. National Fire Protection Association (NFPA)
  6. National Fire Protection Association (NFPA) 99 Standard for Health Care Facilities.
  7. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).



8. Center for Disease Control and Prevention (CDC) Manual.

## **II. Automatic Fire Sprinkler System**

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

1. Site Development Plan and Vicinity Map, indicating the location of the buildings, firewater reserve tank, firewater line, yard loop and private fire hydrant.
2. General Notes, Legends and Symbols including Schematic Diagram of the Fire Sprinkler System and Schematic Diagram of Alarm Monitoring System.
3. Floor Layout and Isometric Layout of the Automatic Fire Sprinkler System indicating pipe sizes and the location of the pipes, valves, sprinkler heads, riser nipples, fire hose cabinets, sprinkler main riser, drain pipes, cross mains, branchlines, inspector's test connections, hangers and sway braces.
  - An automatic fire sprinkler shall be provided in all rooms of the Five (5) Storey Medicine Building.
  - Hazard Classification shall be Light Hazard Occupancy.
  - Area of coverage shall be 146 square meters and water density shall be 4.07 lps/sq. m.
  - Protection area per sprinkler head shall be 20 square meters at 2.2 meters minimum distance between sprinklers and 4.2 meters maximum spacing.
  - All floor control valves shall be equipped with supervisory switch, water flow detector and drain system.

## **III. Ventilation and Air Conditioning System**

The ventilation and air conditioning system shall be composed of complete plans and drawings of the following:

1. General Notes, Legends and Symbols including Schematic Diagram of the Ventilation and Air Conditioning System.
2. Floor Layout of the Ventilation and Air Conditioning System indicating the capacity and location of the air conditioners and fans.
3. Duct layout indicating duct sizes, route and location of the dampers, diffusers, return air register, hangers and sway braces.
4. Refrigerant piping layout indicating pipe sizes, location of valves, hangers and sway braces.
5. Equipment Schedule and Details drawings of Air Conditioners and Ventilating System.
  - Air conditioning system shall be provided in rooms of the Five (5) Storey Medicine Building and other areas where conditioned air is necessary.
  - Cooling Load calculations report shall be manual or computer generated, hourly analysis program which includes heat transmission coefficients, solar heat gain factors and corrected cooling load temperature difference calculations.
  - Split type air conditioners will be used at areas with larger capacities.
  - Window type air conditioners shall be used in areas with exterior wall exposure.
  - Centralized air conditioning will be used only if feasible.
  - Design of all critical areas shall be laminar or positive pressure, wherein the supply air is 10% more than exhaust air.

- Maintain an air change rate greater than or equal to 12 air changes per hour or 145 liters per second per patient.
- Ceiling cassette type exhaust fans with integral air diffuser shall be provided in all toilets.
- Ceiling fans, orbit type with 360° oscillation shall be provided in all rooms like work areas.

#### **IV. Elevator System**

The elevator system shall be composed of complete plans and drawings of the following:

1. General Notes, Legends and Symbols including Schematic Diagram.
2. Floor Layout, Elevator Shaft Plan and Machine Room Plan.
3. Equipment Schedule, Detail drawings and Equipment layout.
4. Architectural, Structural, Electrical and Plumbing drawings of the Elevator System.
  - Passenger type elevator shall be provided in all multi-storey hospital buildings.
  - The minimum car size shall be 1,500mm wide and 2,150mm long.
  - The car door opening shall be not less than 1,100mm and 2,100mm high.

Others:

- Provision of Two (2) units Passenger Type Elevator and Two (2) units Patient Type Elevator

#### **V. Specific Requirements**

Provide details of the following:

1. Cistern Tanks, Elevated Water Tanks and Rain Harvester Tank

#### **VI. Summary of Materials**

1. **AUTOMATIC FIRE SPRINKLER SYSTEM**
  - Sprinkler head shall be UL Listed/FM Approved, pendant, upright or sidewall unit, 83 LPM flow capacity per head and temperature fusing at 57.5° C to 74°C.
  - The alarm assembly shall be UL Listed/FM Approved, constructed and installed that any flow of water from the sprinkler system equal to or greater than that from the single automatic head shall result in an audible and visual signed in the vicinity of the building.
  - Alarm and supervision system of the automatic water sprinkler shall include the monitoring water flow switch at each floor of the building, fire pump and jockey pump running condition and power supplies, level of water in the reservoir and control valves.
  - Pipes shall be B.I. Schedule 40. Screw fittings shall be used for inside piping.
2. **AIR CONDITIONING AND REFRIGERATION SYSTEM**
  - Refrigerant pipes shall be copper tubing, type L or K black steel pipe, Schedule 40 for size of 100mm diameter and smaller. Pipe over 100mm shall be black steel pipe Schedule 40.



- Black steel pipes shall be standard seamless, lap-welded, or electric resistant welded for size of 50mm diameter and larger, screw type for size 38mm diameter and smaller, fittings for copper tubing shall be cast bronze fitting designed expressly for brazing.
- Pipe insulation shall be performed fiberglass or its equivalent. The insulating materials shall be covered with 100mm x. 13mm thick polythelene film, which shall be overlapped not less than 50mm.
- Ducts shall be galvanized sheet steel of standard gauges.
- Ductwork insulation materials shall be rigid board made of styropor or equivalent 25mm thick for ground and top floor, 13mm thick for intermediate floor.

### 3. ELEVATOR SYSTEM

- The passenger elevator shall machine roomless, or traction type only.
- The elevator system shall be UL Listed/FM Approved.

**VII. Drawing Requirements:** See attached DOH Standard Checklists based on Revised IRR of the National Building Code of the Philippines (PD 1096)

---End of Scheme---

## **SUBJECT: ELECTRICAL DESIGN PARAMETERS**

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### I. Codes and Standards

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

- **Codes:**
  1. Philippine Electrical Code
  2. National Electrical Code
  3. Fire Code of the Philippines
  4. National Building Code of the Philippines and Its New IRR
  5. Existing Local Codes and Ordinances
- **Standards:**
  1. Bureau of Product Standards (BPS)
  2. Underwriters Laboratory (UL)
  3. National Fire Protection Association
  4. International Electrotechnical Commission (IEC)

5. Illumination Engineering Society (IES)
6. National Electrical Manufacturer's Association (NEMA)
7. DOH Manual on Technical Guidelines for Hospital and Health Facilities Planning and Design

## II. Site Works

Based on the Master Site Development of the Hospital, the Site Works shall provide complete Electrical layout of the following:

1. Panelboard Layout
2. Electrical Metering Devices
3. Service Conductors and Conduit Layout
4. Grounding System
5. Street and Perimeter Lighting System

## III. Building Facilities Electrical System

1. Lighting System
  - Provide and install adequate normal branch circuits for Lighting System to all areas using the standard Lighting Design Analysis. Utilize the standard Illumination requirements per area of concern using the preferred particular type of luminaires.
2. Power System
  - Provide and install adequate normal branch circuits for the Power System. Three (3) phase system with ground.
3. Auxiliary System
  - Provide and install the following Auxiliary System:
    - a) Communication System
      - Telephone System
      - Local Area Network System
      - Public Address Paging System
      - Private Branch Exchange (PABX)
      - Master or Cable Antenna Television
    - b) Fire Detection and Alarm System (FDAS)
    - c) Security System.
    - d) Close Circuit Television System (CCTV)
    - e) Nurses Call System
4. Lightning Protection System
  - The building lightning protection system shall include roof-mounted air terminals grounding conductors, ground rods, conduits, clamps, and auxiliary equipment as required for a complete and operational lightning protection system.
5. Emergency System
  - Provide and install adequate emergency lights in all areas which provide sufficient illumination in case of power outages.
  - Provide and install directional exit lights, stairway lights and emergency exits.
6. Electrical Room
  - Provide electrical room which houses panel board for every room with enough space for storage cabinet for electrical supplies
7. Maintenance Access Duct

- Provide and install an access hanger duct with a minimum vertical clearance of 500mm. the access hanger duct is intended for electrical and plumbing maintenance.
- Provide a minimum of three (3) holes of three (3) inches diameter block out for every partition. The block out will be use for future installation of wires, cables and plumbing materials.

**V. Provide Details of the following:**

1. Lighting Fixtures/Luminaires
2. Panelboard and Circuit Breakers
3. Switchgear and other Metering Devices
4. Electrical and Hospital Equipment
5. Installation and Termination of Auxiliary and other Special Devices and Equipment
6. Power and Telephone Handholes (as may be required)
7. Pedestal and Service Entrance to Bldg.
8. Grounding System Layout
9. Others as may be required.

**V. Summary of Materials**

1. General Lighting Luminaires: Fixtures type shall be as indicated on the Lighting Layout Plan.
  - Fluorescent Lamp shall be Linear or circular or LED
  - Fluorescent lamps shall be daylight and lampholders shall be made of thermosetting plastic.
  - LED
  - Fluorescent Fixture housing shall be steel sheet with high reflectance powder coat paint finish.
  - Downlights and Pinlights shall be of heavy gauge spun aluminum equipped with lamp as indicated on the drawings and with LED Bulbs
  - Other Special Lighting requirements shall be as approved by the implementing agency.
2. Wiring Devices: Wiring devices shall be non-automatic control devices, the contact is guaranteed by the pressure of the special spiral springs.
  - Switches shall be of 20A, 250V or 300V except as otherwise noted and approved. Terminals shall be screw-type or quick-connected type.
  - General use receptacle shall be 20A, 240V grounding type unless otherwise indicated on the drawings.
  - Special purpose receptacles shall be as called for on the drawings. Matching plugs shall be supplied.
  - Convenience outlet spacing shall not exceed two (2) meters
  - Convenience outlet shall be universal, three (3) prong
  - Convenience outlet for ICU, emergency rooms and operating rooms shall be explosion proof type, intended for such type of rooms.
  - Switches for orbit fans and ward exhaust fans should be centralized or installed at nurse stations.
3. Panel boards and Circuit Breakers: The Panel board and Circuit Breakers shall be equipped with molded-case circuit breakers and shall be the type as indicated in the panel board schedule and details.

- Provide molded-case circuit breakers of frame, trip rating and interrupting capacity as shown on the drawings. The circuit breakers shall be quick-make, quick break, thermal-magnetic, trip-indicating and shall have common trip on all multiple breakers with internal trip mechanism.
  - All current-carrying parts of the panel boards shall be plated. Provide solid neutral (S/N) assembly when required. The assembly shall be isolated from the enclosure.
  - Every panel board shall have at least 6 windows spare for each electrical accessibility of the building
4. Electrical Conduits, Boxes and Fittings: All conduits, boxes and fittings shall be standard rigid steel, zinc coated or galvanized.
- Rigid Steel Conduits (RSC)
  - Rigid Metal Conduits (RMC)
  - Intermediate Metal Conduits (IMC)
  - Electrical Metallic Tubing (EMT)
  - Unplasticized Polyvinyl Chloride (uPVC) if required shall be thick wall
5. Conductors: Wires and cables shall be of the approved type and unless specified or indicated otherwise, all power and lighting conductors shall be insulated for 600 volts.
- The conductors used in the wiring system shall be of soft-annealed copper having a conductivity of not less than 98% of that of pure copper and insulated for 90 °C Temperatures.
  - All conduits of convenience outlets and wire ways for lighting branch circuit homeruns shall be wired with a minimum of 3.5 mm square in size.
6. Nurse Call System:
- The Nurse Call System shall have the following control panel, bed head panel, ancillary call and annunciating equipment.
  - Wiring shall consist of data cable and 24V supply to each bed head unit.
  - Two levels of call will be provided by the system:
    - a) Patient to Nurse. A patient to Nurse shall be actuated by means of the wall-mounted or handset mounted call push button of bed head panel.
    - b) Nurse to Nurse. Call of nurse to nurse shall be considered, as emergency call and shall be instigated by operation of the Emergency Pull/Push Switch mounted on call units of bed head panel.
    - c) Bedhead panel shall be of different type depending on the patient bedroom class and as may be required. Multiplexed bedhead panel shall be available to operate sound distribution system.
    - d) Bathroom shall be provided with pull cord unit and reset unit.
    - e) Room indicator lamp shall be installed above the door of each patient's bedroom along the corridor.
    - f) Nurse stations shall be equipped with indicator unit to provide indication (audible and visual) of the zone and type of call.
    - g) Emergency indication shall be included in some acute areas but arranged "for staff use only" in the event of urgent assistance being required.
    - h) The system shall be of solid state switching with all items connected to internal printed circuit boards readily interchangeable for maintenance purpose.
7. Master Antenna Television (MATV) and Cable Television (CATV) System:

- Two sources of TV signals shall be provided to the building. One (1) shall be from a master antenna installed at the roof or within a suitable area of the building and the other will be from a commercial cable television service.
  - The master antenna system shall consist of FM, VHF and UHF antennas, combiner, distribution amplifier, coaxial cables, splitters, tap-offs and TV outlets.
  - There shall be individual trunking for master antenna and cable television rising in the building.
8. Structured Cabling & Telephone System:
- A minimum provision for estimated 500 mixed PABX extension and direct telephone lines shall be required for tertiary hospitals.
  - Final details of the system shall follow specific requirements, quantity and type of service.
9. Fire Detection and Alarm System:
- The Fire Detection and Alarm System shall be of multiplex, microprocessor-controlled addressable or zonal conventional fire detection, alarm and communication system.
  - The system shall consist of full integration to automatic fire sprinkler system, voice alarm communication and fire fighters telephone system.
  - The system shall consist of control station, mimic panel initiating and indicating devices, control modules and system of wirings.
  - Actuation of the protective signaling system shall occur by manual pull station, automatic smoke or heat detector, sprinkler flow switch and tamper switch.
  - The system shall be able to monitors the status of flow switches and supervisory switches installed at the Sprinkler System risers. These monitoring points are also addressable or the conventional zonal in the same way as the detectors are making them easily recognizable at the control panel.
  - Occupant notification shall be accomplished automatically. Notification will be general, audible alarm type complying with appropriate section of NFPA.
  - The system shall be installed with provisions for future connection to the nearest fire services station in the locality.
10. Security System:
- The Security system shall include intrusion detection and alarm, CCTV, access control or as may be required.
11. Relocation of affected existing power lines
- Relocate secondary main lines that may be affected by the construction of the building. Any additional electrical materials including pole shall be shouldered by the contractor.
12. Electrical System
- Provide and install sufficient rating of three (3) units single phase transformers
  - Provide two (2) units prime emergency supply of electricity which supplies 100% of the electricity demand of the building. The emergency supply is equipped with an automatic transfer switch with a programmable logic controller.
  - Transformers, generators, and automatic transfer switch should be installed at the Power House of the Hospital. All secondary lines from power house should be installed underground.

- If the total rating of the transformers is 300KVA or above, the constructor should provide and install instrument transformers and primary metering accessories.

Others:

- Provision of Streetlights around the building
- Data switch room – at least 1.5m by 1.5m room area; power outlets, 3 prong, 220-240V; with access door and window for ventilation; room lighting; four (4) floors location; emergency lights; 2 category 6 UTP cables going to server room (main/backup)
- Server Room – at least 4m by 4m room area; power outlets, 3 prong, 220-240V; power sources, 2 circuit breakers (one (1) from panel A and one (1) from panel B) of electrical rooms; room lighting; door and window; one (1) floor location; emergency lights; two (2) units ACU (am/pm) running for 24/7
- Category 6 UTP Cable – placed/enclosed/cased inside upvc pipe for safeguarding; total number of LAN connections should depend on the number of working stations or nodes; All working stations cables will be directed/consolidated to data switch room per floor; all data switch rooms main lines will be directed/consolidated to server room (two (2) per floor); one (1) gang face plate rj-45 port for every node or working stations.
- Provide intercoms to all to areas as specified by the end user

**VII. Drawing Requirements:** See attached DOH Standard Checklists based on Revised IRR of the National Building Code of the Philippines (PD 1096)

---End of Scheme--

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

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

Project : \_\_\_\_\_

Location : \_\_\_\_\_

SHEET NUMBER	SHEET CONTENTS	REMARKS *
	<b>ARCHITECTURAL DRAWINGS</b> (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 partitions, cabinets, etc. and accessible design features	
A – 10 (a...n)	Detail of typical bay section from ground to roof (scale 1:50 m)	
A – 11 (a...n)	Details of special rooms (1:50 m) in the form of plans, elevations/section	
A – 12 (a...n)	Schedule of doors, gates, emergency exits, etc. (scale 1:50 m), including specifications for materials and hardware	
A – 13 (a...n)	Schedule of windows (scale 1:50 m), including specifications for materials and hardware	
A – 14 (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: _____		
		Page 1 of 6

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

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

Project : \_\_\_\_\_

Location : \_\_\_\_\_

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	<b>ARCHITECTURAL INTERIOR DESIGN DRAWINGS</b> (as applicable)	
AID – 1 (a...n)	Floor Plans showing layout of floor finishes (scale 1:100m minimum)	
AID – 2 (a...n)	Floor Plans showing layout of furniture/finishing partitions, cabinets, etc. (scale 1:100m minimum)	
AID – 3 (a...n)	Interior Elevations and Sections showing wall patterns, ceiling sections, etc. (scale 1:100m minimum)	
AID – 4 (a...n)	Details of Partitions, Cabinets, Furniture, Ceiling and other Interior Design Features (scale 1:100m minimum)	
AID – 5 (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: \_\_\_\_\_



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

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

Project : \_\_\_\_\_

Location : \_\_\_\_\_

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	<b>STRUCTURAL DRAWINGS</b> (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 and Columns	
S – 7 (a...n)	Schedule and Detail of 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 (for 2 storey building and higher)	
	Boring and Land Test Results (for 3 storey building and higher)	
	Seismic Analysis	
	Structural Technical Specifications	
	Structural Scope of Works	
	Structural Bill of Quantities	
<p>* <i>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)</i></p>		
Evaluated by: _____		Page 3 of 6



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

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

Project : \_\_\_\_\_

Location : \_\_\_\_\_

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	<b>ELECTRICAL DRAWINGS</b> (as applicable)	
E – 1 (a...n)	General Notes and Legends	
E – 2 (a...n)	Location and Site Plan	
E – 3 (a...n)	Lighting Layout (scale 1:100m minimum) including details	
E – 4 (a...n)	Power Layout (scale 1:100m minimum) including details	
E – 5 (a...n)	Auxiliary System Layout (scale 1:100m minimum) including details	
E – 6 (a...n)	Schedule and Detail of Loads	
E – 7 (a...n)	Riser Diagram	
E – 8 (a...n)	Other Detail	
	Electrical Computation	
	Design Analysis	
	Electrical Technical Specifications	
	Electrical Scope of Works	
	Electrical Bill of Quantities	
<p>* <i>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)</i></p>		
<p>Evaluated by: _____</p>		

**AUXILIARY SYSTEM INCLUDES THE FF:**

1. Telephone System
2. Paging System
3. LAN System
4. Fire Alarm System



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

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

Project : \_\_\_\_\_

Location : \_\_\_\_\_

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	<b>PLUMBING/SANITARY DRAWINGS</b> (as applicable)	
P – 1 (a...n)	General Notes and Legends	
P – 2 (a...n)	Location and Site Plan	
P – 3 (a...n)	Storm Drainage Layout (scale 1:100m minimum) including actual length of tapping line to Main Drainage Line	
P – 4 (a...n)	Waterline Layout (scale 1:100m minimum) including actual length of tapping line from main water source when applicable	
P – 5 (a...n)	Sewerline Layout (scale 1:100m minimum) including actual length of tapping line to septic tank or existing sewerline	
P – 6 (a...n)	Isometric Layout, showing waterline, sewerline and drainage line	
P – 7 (a...n)	Detail of connections, catch basins, downspouts, etc.	
P – 8 (a...n)	Detail of Septic Tank/Sewer Treatment Plant	
	Design Analysis	
	Sanitary Technical Specifications	
	Sanitary Scope of Works	
	Sanitary Bill of Quantities	
<p>* <i>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)</i></p>		
<p>Evaluated by: _____</p>		



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

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

Project : \_\_\_\_\_

Location : \_\_\_\_\_

SHEET NUMBER	SHEET CONTENTS	REMARKS*
	<b>MECHANICAL DRAWINGS</b> (as applicable)	
M – 1 (a...n)	General Notes and Legends, Site Development Plan, Location Plans	
M – 2 (a...n)	Floor Plans/Isometric Drawings (scale 1:100m minimum) showing Ventilation and Air Conditioning Systems and other installations	
M – 3 (a...n)	Floor Plans/Isometric Drawings (scale 1:100m minimum) of Medical Gaspipeline System and Details	
M – 4 (a...n)	Floor Plans/Isometric Drawings (scale 1:100m minimum) of Air-conditioning Systems and Details	
M – 5 (a...n)	Floor Plans/Isometric Drawings (scale 1:100m minimum) of Fire Suppression Systems, fire sprinkler system, wet stand pipe, dry standpipe and other installation	
M – 6 (a...n)	Details Water Tank, Flow Diagram (scale 1:50m)	
M – 7 (a...n)	Details of Firewater Supply Sytem (scale 1:50m)	
M – 8 (a...n)	Detail of Elevators, Escalators, Dumbwaiters, etc. (scale 1:50m)	
M – 9 (a...n)	Detail of Other Machinery/Equipment (scale 1:50)	
M – 10 (a...n)	Longitudinal and Transverse Section of Building (scale 1:100m) showing manner of support of machines/equipment	
	Mechanical Technical Specifications	
	Mechanical Scope of Works	
	Mechanical Bill of Quantities	
<p>* <i>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)</i></p>		
<p>Evaluated by: _____</p>		

## ***Section VII. Drawings***

- **Attached here are Project Descriptions and Schematic Plan**

## ANNEX A

Name of Hospital : Region 02 Trauma and Medical Center  
Location : Bayombong, Nueva Vizcaya  
Project Title : Design and Build of Five (5) Storey Medicine Building  
Project Description : Design of Five (5) Storey Medicine Building with a 1,710 sq. m. every floor area, based on the approved schematic plan, terms of reference and other applicable parameters

Scope of Works : Provision of preliminaries including pre-detailed and detailed design (Detailed Architectural and Engineering Design, Technical Specifications, Detailed Estimates and Structural Analysis), general requirements (building permit application and amendment of existing Environmental Compliance Certificate (ECC) and other applicable licenses, mobilization/demobilization of manpower, materials and equipment, temporary facilities (office with meeting room and toilet, bunkhouse for selected construction workers, material storage room, perimeter fence with main entrance and emergency exit, guardhouse), standard project billboard, safety and health program, and water and power supply for the entire duration of the project); demolition/disassembling of the existing structures (pavement, water tank, fire pump room and opd/training powerhouse); cutting of affected trees and sizing; construction of fully complete and functional five (5) floor with active medical oxygen system and provision of vacuum line, fire sprinkler system with appropriate firepump, elevators, ramp (tube type), pedestrian bridge (tube type) and reinstatement including transferring of affected utilities and facilities (powerhouse, transformers, poles, cables, fire pump and pump room, water tank for fire) and others specified in the Terms of Reference (TOR) and End-user's preferences

Year 1 : Completion of Foundation and Construction of Fully Functional Ground Floor

Year 2 : Construction of Fully Functional Second (2<sup>nd</sup>) Floor

Year 3 : Construction of Fully Functional Third (3<sup>rd</sup>) Floor

Year 4: Construction of Fully Functional Two (2) Floors, 4<sup>th</sup> and 5<sup>th</sup>

Design Objectives : To accommodate the functions & services of the Hospital

\*See schematic floor plans

Design Considerations:

1. Materials: Use of quality low maintenance building finishes particularly those that are durable, non slippery, washable, non-corrosive, sound absorbent, non toxic, fire resistive, acid-resistant, non mercury and anti static.
2. Accessibility: Conformance with the requirements of the Accessibility Law.
3. Environment: Application of green building design features that contribute to a healing ambience-quiet, regular, comfortable, non stressful, green, maximizing natural light and ventilation.



4. Safety and Security: Provision of architecture and engineering design solutions, details ornaments, appurtenances etc. that will keep patients, staff, and visitors protected from hazards and lower risks which they may encounter in a hospital setting.

Approved Budget for the Contract : **Php 399,225,000.00**

**Contact Persons:**

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Medical Center Chief II  
Region 02 Trauma and Medical Center  
Bayombong, Nueva Vizcaya

Regional Health Director : **GRACE V. SANTIAGO, MD, MHA, MPM, PHSAE, CESE**  
**Director IV**  
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