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CPDMO
U.P. MANILA

PROJECT TITLE : **INCREASE IN CARRYING CAPACITY FOR COLLEGE OF NURSING AND ALLIED HEALTH PROGRAMS**
2nd Floor, Sotejo Hall, College of Nursing
University of the Philippines Manila

SUBJECT : **SCOPE OF WORKS AND TECHNICAL SPECIFICATIONS**

DIVISION 1 - GENERAL

Section 01000 General Requirements

1. The Contractor shall furnish all materials, equipment, tools, apparatus, appliances, accessories, transportation, labor and supervision required for the complete construction of the subject project, as shown on the drawings and called for in these specifications, ready for use.
2. All Contractors submitting proposal for this project shall first examine the site. All proposals shall take into consideration all such conditions that may affect the work under this contract. The specifications and plans shall form part as one. Anything mentioned on plans and not mentioned on the scope of work and specifications and vice versa shall be properly consulted to the CPDMO Project Architect/Engineer for clarification. Any work or materials not in accordance with the drawings or specifications shall be replaced with new at the Contractor's expense.
3. The Contractor shall coordinate his work with all parties to ensure proper phasing or schedule of works. The Contractor shall engage under him, a registered Engineer or Architect to supervise his work. He shall remain at all times in the construction site.
4. A logbook shall be available at the site. It shall contain the daily activities in the site, including weather condition, delivery, manpower and other matter pertaining to the condition of the project. It will also serve as data for Contractor and the Project Inspector.
5. Identification Card of construction workers and engineer/representative shall be supplied by CPDMO with corresponding fees; it should be worn at all times while inside the building/campus premises. Those without IDs shall not be allowed to enter the premises for security purposes.
6. No alteration or additional work that will result in an additive or deductive cost change from the Contract shall be allowed without the approval of the chancellor.
7. Complete specifications with product sample shall be submitted by the contractor to CPDMO and end-user for evaluation. Inspection of the Project Architect/Engineer in-charge shall be required prior to installation of any item/material on the construction.
8. Regular coordination meeting shall be conducted with CPDMO, Contractor and End-user for proper project monitoring.
9. Existing condition of the work site shall be documented by the contractor and photos shall be taken before commence of work to ensure such status. Any damage on the areas due to the contractor's on-going work shall be refurbished at his expense.
10. The Contractor shall provide a complete copy of "As built plans" of the project/unit concerned which shall include all the civil, architectural, plumbing, electrical and other related layouts in 20" x 30" original sheets. It should be properly drawn indicating all the specifications, layouts, tables and necessary data. An initial layout should be submitted in a B4 sheet for checking and approval of Project Architect/Engineer. Final "As built plans" shall be submitted with soft and hard copies.

11. The Contractor shall promptly remove from the premises all rubbish, trash, debris, and all superfluous building materials weekly. After the completion of all works, restore all areas that were damaged as affected by the construction works and leave the site clean to the satisfaction of the Project Inspector or his representative and End-user.
12. All materials removed from the unit shall be properly documented prior to turn-over to the End-user for proper safe keeping.

Section 01300 Submittals

Shop Drawings, Product Data and Samples

- Submit to the CPDMO of shop drawings, product data and /or samples of all materials for review.
- The CPDMO's review shall be limited to quality and design intent. It shall be the Contractor's responsibility to verify quantities and sizes, and make corrections observed and noted by CPDMO on any returned submissions.
- No work requiring submissions or samples shall be commenced until submission has been reviewed by the End User and or CPDMO.
- Final Acceptance of colors and finishes will be made from samples applied on the job.
- Submit on all materials, products, and samples which area required by the work.
- All submittals shall be channeled from General Contractor to CPDMO, Physical Plant A-E Services, and back to the General Contractor. This procedure applies to original submittals as well as required resubmittals. Each organization shall keep its required number of copies and/or make necessary copies from the sepias. The Contractor will make all correction noted on check sets, if necessary, and return for review as required by CPDMO.

Section 01500 Temporary Facilities

- Provide Temporary GI sheets or Board enclosures on all areas for building protection. Such coverings shall be adequate enough to cover all the building facilities throughout the span of the project.
- Charges for restoration or replacement of any damaged facility, equipment, material and the like shall be made on the contractor due to his negligence in providing suitable temporary covering.
- Provide the appropriate scaffoldings, board ups, safety nets and related items to ensure proper installation of all framing systems and protection of the area, at the expense of the contractor as its basic equipment.

DIVISION 2 – SITE CONSTRUCTION

Section 02200 Site Preparation

Mobilization / Demobilization

- This work includes mobilization process, provision for warning signs, including barricades, temporary facilities, temporary fences, warning lights and similar safeguards shall be provided by the Contractor as they are required for protection of his manpower and others during the construction life of this project.
- Demobilization procedure shall include clearing of the affected areas from all rubbish, trash, debris, and all superfluous building materials and restore all areas that were damaged as affected by the works and leave the site clean to the satisfaction of the Project Inspector or his representative and End-user.

Section 02230 Site Clearing

- Clear the area from all obstructions or as affected by the construction works, except those structures indicated on the drawings or designated by the Project Architect/Engineer to be left standing. It shall be properly protected from incidental damage due to construction works by the erection of suitable barriers upon approval of the Project Architect/Engineer.

Section 02290 Site Monitoring

- Site monitoring shall be a must to the contractor for the effective implementation of the project. Any discrepancies on plans and actual site conditions shall be properly coordinated with the Project Architect/Engineer concerned for verification.
- Regular coordination meeting shall be done between the contractor or its representative and the Project Architect/Engineer concerned at CPDMO.

Section 02500 Utility Services

- Provision of electric and water meter shall be included in the quotation to be charged to the contractor's overhead. All utility consumption shall be provided with meters to limit the usage of such during working period. Payments of bills shall be made thru the Cashiers Office after the renovation period presenting the statement of account issued by Accounting upon recommendation of the Chief of CPDMO.

DIVISION 6 – WOOD AND PLASTICS

Section 06100 Rough Carpentry

Scaffoldings

- Provide sample for approval. Appropriate scaffoldings and related framing system shall be the contractor's account.

Section 06200 Finish Carpentry

Description

- Work of this Section, as shown or specified, shall be provided by the Contractor and shall be in accordance with the requirements of the Contract Documents and in accordance with the General Conditions of this Document.
- Works include coordination, Fabrication, and Installation of all Interior Exposed wood members shown on drawings and specified herein, including but not necessarily limited to the following:
    - Wood Shelving
    - Fabricated Cabinets
    - Claddings
    - Miscellaneous Items
- See approved plans for detail.

Material Requirements

- Counter Front Desk 1 (Room 207)
  Description: High pressure laminate (HPL) in 3/4" marine plywood
  with 12mm thick solid surface
  Dimension: 2.37m (L) x 0.64m (W) x 1.00m (H)

- Counter Front Desk 2 (Room 205)
  Description: High pressure laminate (HPL) in 3/4" plywood
  with 12mm thick solid surface
  Dimension: 2.34m (L) x 0.92m (W) x 1.00m (H)
- Cabinet 3 (Room 205)
  Description: ¾" thick marine plywood in high pressure laminate (HPL) finish with shelves and cabinet (with sliding door) combination complete with grab handles, concealed hinges, support and accessories
  Dimension: 2.00m (L) x 0.40m (W) x 2.35m (H)

Cabinets for Refurbishment:

- Cabinet 4 (Room 207)
  Description: Existing hanging cabinets and shelves to be refurbished & repainted in duco finish, including replacement of door handles, lockset and accessories.

- Cabinet 5 (Room 207)
  Description: Existing cabinets and shelves to be refurbished & repainted in duco finish, including replacement of door handles, lockset and accessories.
  Dimension: 6.10m (L) x 2.76m (H)

- Cabinet 6 (Room 201&202)
  Description: Existing cabinets and shelves to be refurbished & repainted in duco finish, including replacement of door handles, lockset and accessories.
  Dimension: hanging cabinet - 13.19m (L) x 0.66m (H)

Submittals

- All Submittals shall be made according to Section 1300 and as described herein.
- Submit all the following for each item of Finish Carpentry:
  - Shop Drawings, indicating fabrication and installation methods, to include plans and elevations at not less than (1:20) scale and details at not less than 1'-0" (1:5) scale. Indicate required anchorage and blocking, accessory items, field dimensions, materials and finishes. Indicate compliance with specification requirements. Indicate weight of any materials or systems to be suspended or which require support from structure.
  - Manufacturer's Product Data for all specialty items not manufactured by the carpentry fabricator.
  - Where required by the End user or Consultant the contractor shall provide full size mock-up of panel or wood assembly
  - Contractor shall submit to the Consultant three samples 20" (500m) minimum length of all mouldings or moulding assemblies to be used for the Project. These shall be full size and finished as specified in the Contract Documents.

Quality Assurance

- All work of this Section shall be performed by skilled mechanics of the trade and shall be of the highest quality. Comply with applicable Industry Standards for all work and materials as specified. Such Industry Standards are to include but not be limited to the applicable provisions or standards of the following:
  - American Society for Testing and Materials (ASTM)
  - PNS 196:2000
- The Contractor shall be responsible for obtaining and complying with all code and regulatory agency requirements for materials and methods.

- The Interior Contractor shall be responsible for accurately obtaining all field dimensions related to his work prior to fabrication. Where discrepancies are found, he shall notify the Consultant immediately in writing.
- All Finish Carpentry materials shall be stored in a dry ventilated place, protected from the weather and complying with the temperature and humidity.
- Protect sanded and finished surfaces from soiling and damages during handling and installation.

Products

- All woodwork materials shall be new and conform to premium grade requirements
- All solid wood elements shall be clear, straight-grain lumber of the best grade of specified species. Lumber shall be free of any defects which might impair serviceability, aesthetics, and/or finish. Solid wood elements shall also be according to the following, unless indicated otherwise on drawings and/or specifications.

Hardware and Accessories

- All required hardware and accessories shall be furnished and installed by Interior Contractor and shall be as indicated on drawings and specifications. Where specific products are not specified in the Contract Documents the Interior Contractor shall recommend hardware to provide the function or condition indicated in the Contract Documents. Hinges, screws, clips and other mounting, attachments or fasteners to be concealed unless otherwise noted on drawings.
- Contractor shall submit samples of each hardware item/type and accessory item/type to CPDMO for approval according to Section 01300.
- All Finish Carpentry hardware and accessories shall be installed in accordance with manufacturer's recommendations.

Other Materials

- Interior Contractor shall be responsible for providing and installing all items and materials as indicated on drawings and specifications comprising all or part of the Finish Carpentry shown. Such items and materials shall be fabricated and/or installed according to manufacturer's recommendations and comply with applicable AWI Quality Standards and industry Standards.
- All paint and other finish material shall be pure, unadulterated and best quality from specified manufacturer as indicated on the drawings and specifications.
- All finish materials shall be flame retardant or treated with flame-retardant process where required by local-code. Should flame-retardant process cause change in color and effect on finish material, the contractor shall notify the CPDMO.
- All transparent finishes shall be alcohol, water and burn resistant.

Execution

- The Contractor shall be responsible for examination of the substrate and the conditions under which the work under this section is to be performed, and notify CPDMO in writing of unsatisfactory conditions. Do not proceed with the work under this section until unsatisfactory conditions have been corrected.

Fabrication

- All the work be performed in such manner as to fulfill the intent of the drawings and specifications.
- Where necessary to fit at site provide ample allowance for cutting and fitting. Sufficient additional material shall be allowed to permit accurate scribing to walls, floors and related work; and due allowance made wherever possible for such shrinkage as may develop after installation. All single and sectional units shall be provided with adequate cleating, blocking, crating and other forms of protection as required to preclude damages thereto during shipping and handling and installation.

- Plastic Laminate edges or metal edges shall be square, self-edged, or post formed as indicated on drawings. Edges shall be neatly beveled; joints shall be minimized in quantity and be made to a smooth hairline and puttied. Appearance of unsightly or excessive joints will be cause for rejection.

Installation

- Installation at the Project shall be by skilled mechanics supervised by the Interior Contractor in accordance with accepted standards.
- Install all Finish Carpentry straight, plumb, level and in true alignment except where otherwise indicated. Fit all joints closely and fasten all pieces rigidly in place. Nails shall be finish or casing nails. Countersink nail heads and leave ready for putty. Joints shall be neatly matched and mitered. Fill exposed joints prior to jointing.
    - Finished size shall be indicated on the drawings
    - Surfaces shall be left free from hammer marks, free from warp, twist, open or other defects and shall be cleaned, scraped and sanded ready for finishing.

Cleaning and Protection

- Clean shop finished work, touch-up finish as required and remove and refinish damaged or soiled areas of finish.
- Protect installed Finish Carpentry from damage by work of others trades until End-user's acceptance of the work.

DIVISION 7 –THERMAL / MOISTURE

Section 07001 Waterproofing System

Scope of Work

- The work covered by this Item shall consists of supply and installation of waterproofing system at roof deck tank area including restoration works to affected items in accordance with Bill of Quantity, Plan and/or shop drawings and as herein specified.

Materials

- Waterproofing Compound Flexible Cementitious

Materials Specifications:

Tensile Strength	-	122.12kgf/mm²	(ASTM D-2370-98)
Recovery	-	247.46	
Viscosity	-	63.80 KU	(ASTM D562-81)
%Non-Volatile	-	33.34	(ASTM D2369-98)
Crack Bridging Ability	-	4.18mm	
Integrated Strength	-	101.242	
Accelerated Weathering Test	-	Gray Scale Rating (5)	
Maximum Force, N	-	30.7	
Median Tear Strength	-	14.1 kN/m	

Application

- Surfaces to which waterproofing compound are to be applied shall be free from foreign matter, clean and smooth, dry and free from holes and projections. The concrete contractor shall perform surface preparations. Immediately before application of waterproofing membrane, surfaces shall be cleaned. Application will not be permitted in wet weather.
- The Contractor shall submit to the Project Architect/Engineer samples of materials to be used for approval before any work shall start. Waterproofing materials shall be delivered to the site

in the original sealed containers or packages bearing manufacturer's name and brand designation.

- Waterproofing should be applied on wall base at least 300 mm height and/or higher. Only qualified Contractor trained and approved by the manufacturer shall perform all works under this Section.
- Provide additional coating or application as per recommendation to consolidate the substrate.
- Confer on manufacturer's specifications and details before applications and upon verifications with CPDMO Project Architect/Engineer and End-users.
- Follow manufacturer's specifications and allow only the skilled manpower to apply the necessary materials.
- A roller, brush or spray gun as per requirement should do application.
- Flood testing should be done at a minimum of twenty-four (24) hours.
- Testing result after 1 week as follows:
- Warranty period on product and application.
- All works to be done should be inspected and approved by the Project Architect/Engineer and End-users.
- Provide Concrete topping slope to drain at 1% to ensure leak proof areas.

DIVISION 8 – DOORS AND WINDOWS

Section 08000 Doors and Windows / Glass Structure

Doors

Scope of Work

- The work covered by this Item shall consists of supply and installation of all fabricated door and jambs, equipped with fixing accessories and locking devices including restoration of opening for fitting in accordance with Bill of Quantity, Plan and/or shop drawings and as herein specified.

Material Requirement

- (D-1) Refurbishing of existing double panel flush door and door jamb, including repainting; supply and installation of missing door hardware, lockset, handle and door closer.
- (D-2) Double Panel Glass Swing Type Door
  6.00mm thick tempered clear glass double swing door, with stainless handle and door accessories in 6.00mm thick tempered fixed glass partition, frosted finish with signage
  Door Dimension: 1.20m(W) x 2.10m (H)
  Location: Room 205 (Maternity and Child Nursing)

Windows

Scope of Work

- The work covered by this Item shall consists of supply and installation of all fabricated windows, including materials, labor, tools, restoration of openings for fitting and equipment required in undertaking the proper installation as shown on the Plans and in accordance with this Specifications.

Material Requirement

- (W-1) Casement Window
  6mm thk. tempered clear glass w/ 8 mil security film on 2"x 4" aluminum powder coated frame, complete with accessories and installation.
  Dimension: 2.23m (L) x 1.76m (H)

- (W-2) Casement Window
  6mm thk. tempered clear glass w/ 8 mil security film on 2"x 4" aluminum powder coated frame, complete with accessories and installation.
  Dimension: 1.17m (L) x 1.76m (H)

DIVISION 9 – FINISHES

Section 09500 Ceiling

Scope of Work

- The work covered by this Item shall consists of furnishing all ceiling finishes, equipped with fixing accessories including materials, labor, tools equipment and in accordance with Plan and/or shop drawings and as herein specified.
- This work also includes replacement of dilapidated ceiling board with 600mm x 600mm fiber cement board, ceiling frame to be repaired.

Material Requirements

- Use 0.60m x 0.60m x 9.00mm thick gypsum board ceiling tile on T-runner complete with hangers and supports in anti-bacterial paint finish
- Submit sample and ceiling layout for approval of CPDMO Project Architect/Engineer and End-users.

Construction Requirements

- Provide all the necessary preparation of ceiling.
- Hanger rod with adjustable clip shall be at 1.00 m maximum interval both ways but provide additional hanger and support on critical areas.
- Provide all the necessary accessories and framing for proper installation.
- Ensure adequate hanger and support to all the utilities on the area.
- Restore all affected areas.

Section 09700 Wall Finishes

Scope of Works

- The work to be done under this item consist of furnishing all required materials, fabricated woodwork, tools, equipment and labor and performing all operations necessary for the satisfactory completion of all carpentry and joinery works in strict accord with applicable drawings, details and these Specifications.

Materials Requirements

- (WF-02) 6mm thick fiber cement board on L.G. steel framing 0.40 m x 0.60 m spacing, laminated finish
- Submit sample and shop drawing for approval of CPDMO Project Architect/Engineer and End-users.

Construction Requirements

- Provide all the necessary accessories for proper installation.
- Follow plan for the design and layout of the partitions.
- Materials shall be subjected to the approval of the supervising CPDMO's Project Architect / Engineers / Inspectors.

Section 09910 Paints and Coatings

Scope of Works

- This Item shall consist of furnishing all paints, enamels, varnishes and other products to be used including labor, tools and equipment required as shown on the Plans and in accordance with this Specification.

Materials Requirements

- Semi-gloss anti-bacterial Paint (puttied and sanded)
- Specified item and/or its components shall be handled in such manner as to prevent damage. The same shall be properly protected from harmful elements or damage by other work prior to its incorporation into the Project.
- Store materials in a well-ventilated space designated for the storage and mixing of paint. Materials delivered to the site shall be properly stored as to minimize exposure to extremes of temperature.

Quality Assurance

- The University reserves the right to subject material samples to test at his expenses. If such material tests do not meet the specified standards, the cost will be charged to the Contractor.
- Number of coats, where specified, is minimum. Contractor shall apply as many as required to meet specifications for solid, uniform appearance. Where film thickness in mils is specified, spot checks will be made to determine compliance with specified thickness.

Submittals

- Submit 2 samples of each and every color or finish (including all coats). Where the same color or finish is to be applied over different materials, samples of each shall be submitted on different materials, where practical.
- Sample size shall be a minimum of 150 mm x 150 mm (6" x 6")

Protection

- Paint materials shall be properly protected from damage, providing for adequate storage space. Take all necessary precautions to prevent fire, such as keeping oily rags in U. L. approved metal containers or removing from building at the end of each day's work.
- All work fittings, furniture, etc., are to be suitably protected during execution of the work. Splashes on floors, walls, etc. are to be removed during progress of work and on the whole, left clean and perfect upon completion.
- No exterior or exposed painting shall be carried out under adverse weather conditions, such as extremes of temperature, during rain, fog, etc., or if there is excessive dust in the air.

Lead Content and Warning Labels

- The material manufacturer shall state the lead content on the label of any paint product container based on metal percentage of total solids.
- The label of any paint product exceeding 0.5% lead content shall include the following statement: "This paint contains more than 0.55 lead content and shall not be used on surfaces accessible to children."

Repair of Defective Work

- All defective or damaged work shall be restored to initial condition.
- All voids, cracks, nicks, etc., will be repaired with proper patching material and finished flush with surrounding surfaces.
- Marred or damaged shop coats on metal shall be spot-primed with appropriate metal primer.

- Defective or damaged items and/or components, which cannot be repaired or restored to initial conditions, shall be removed and replaced to the satisfaction of the Architect at no additional cost to the Owner.

Cleaning

- Upon completion of the building, the Painting Contractor shall remove all paint spots from all finished work, remove all empty cans and leave the entire premises free from rubbish or other debris caused by his work. He shall remove his equipment from the premises. He shall clean off all glass free from paint spots and smears and shall present the work clean and free from all types of blemishes

Products

- General:
    - Materials are specified to establish the standards of grade and quality desired for the work, principal pigments and vehicle types and minimum percentage of solids content by volume.
    - The products of Manufacturers not named may be submitted for use provided they are equal in quality and grade to the primers and finishes specified as approved by the Architect. If substitute paint products are desired, a statement shall be submitted to the Architect giving the Manufacturers name, proposed primer and finish for each paint system, analysis for each type of paint, and the use or uses intended. Failure to submit such statements will be cause for rejection.
    - In cases where the name of a brand or supplier is mentioned under a particular specification, only paint or primer of that manufacturer is acceptable and no substitution shall be permitted on the grounds that the brand specified is not available in the local market. Materials of one manufacturer shall not be applied over that of another, except in the case of shop primer coat.

- Color, Gloss and Texture:
    - Refer to Finish Schedule. All work is to be completed without deviation from these unless written approval is received from the Architect. No extra cost shall be allowed because of the color variety scheduled.

Execution

- General:
    - Work-in-place, on which specified work is to be applied, shall be examined to ensure that conditions are satisfactory for application of specified materials. Any defect, which may influence satisfactory completion of specified work, shall be report, in writing, to the Architect. Absence of such notification will be construed as acceptance of work-in-place.
    - Do not apply exterior paint in damp or rainy weather or until surfaces have thoroughly dried from the effects of such weather.
    - Before start of painting, remove finish hardware, accessories, plates, lighting fixtures, and similar Items, as approved by the Architect, except UL. Labels on Fire Door and Frames, which must not be removed. Use only workmen skilled in the applicable building trade for removal and reinstallation of finished item in-place.
    - The following items shall be masked or protected with suitable covering:
        - Sealing, caulking and glazing compounds (unless otherwise directed by the Architect)

- Glass.
- Gauges, thermometers and other recording devices.
- Moving parts of machinery and other mechanical equipment - such as: shafts, couplings, valve stems, and the like.
- Coated decorative sheet metal work.
- Sprinkler heads and the like.
- U.L. Labels

Surface Preparation as Applied to Various Substrate

- Wood

  New Surface:

  - Surface to be painted should be clean and dry, free from oil, grease, dust, dirt, contaminants and all loose girt or mortar; sand rough edges remaining, countersink nail heads for putty applications.
  - Dust off surfaces completely then wipe with a clean rag.

- Metal

  New Surface:

  - Surface to be painted should be clean and dry, free from oil, grease, dust, dirt, wax, solder flux, and other contaminants by wiping with mineral spirits or paint thinner.
  - Remove rust by wire brushing, sanding or scraping.
  - Where maximum performance of protective coatings is necessary (e.g. Industrial Plants), prepare surface by blast cleaning.

- Concrete:

  New Surface:

  - Surface to be painted should be clean and dry, free from oil, grease, dust, dirt, contaminants and all loose girt or mortar.
  - Treat with masonry neutralizer. Mix (1) liter of B-44 with (16) liters of water. Apply liberally by brush and let dry overnight.
  - Rinse with water to remove white crystals that form on the surface. Let dry.

Paint Application

- General: Specified work shall be done by skilled painters in a workmanlike manner. All spaces shall be broom-cleaned before painting is started. Surface to be painted shall be clean, dry, smooth and adequately protected from dampness. Each coat of paint shall be allowed to dry at least twenty-four (24) hours before succeeding coat is applied. Finish work shall be uniform, of approved color, smooth and free from runs, sags, defective coverage, clogging or excessive flooding. If surfaces are not adequately covered, as determined by the CPDMO Architect/Engineers/Inspectors, further coat shall be applied to the satisfaction of the CPDMO Technical Group. Edges of paint adjoining other materials or colors shall be sharp and clean without overlapping.
- Paint Mixing: Paint mixing and thinning shall be done only in accordance with directions of Manufacturer. Paint must be strained free from all skin and extraneous substances and shall be thoroughly mixed in a clean container during use.
- Methods of Application: Exterior first coats and Interior first coats shall be applied by brush, except on shop-primed surfaces, which shall be applied by brush or roller. All primer shall be applied by brush. Succeeding coats over field-primed surfaces and all coats over shop-primed surfaces may be applied by brush roller or spray. Distemper brushes are to be of approved type and less than 15 cm in width. Rollers for applying enamel shall have a short nap. Spray equipment shall be as recommended by the manufacturer of the paint used. Areas inaccessible to spray painting shall be coated by brushing or suitable method.

- Coating: Consecutive coats of paints are to be slightly differing tints except in the case white. Each coat shall be allowed to harden before the next Is applied. Rubbing down between coats is to be done with fine abrasive paper.
- Wood Finishing: Wood to have natural satin varnish finish shall be stained as required and sealed as soon as such Items are delivered to the job site. Seal all ends to exclude moisture. Knotting shall be carried out by using shellac dissolved in spirit or approved ready mixed compound.
- Woodwork and Metal Work: Primed or undercoated woodwork and metalwork shall not be left in an exposed or unsuitable situation for an undue period before completing the painting process. Stopping and filling shall be deemed to be included for all metal works, plaster works, and wood work specified to be used to produce a surface ready for priming and painting.
- Final Touch-Up: Upon completion, finish work shall be touched-up and restored where damaged and left in good condition.

Restrictions

- Color schemes and other paint material sample required by these specifications and/or by the Project Architect / Engineer and End-users shall be submitted subject for approval at the expense of the Contractor.
- After all work have been done, restore and repaint all affected areas due to the installation works or related works to the same color scheme of the building.

Section 09999 Paints Restoration

- Provide all the restoration works and rehabilitation on all affected areas to follow existing features and assembly.

DIVISION 10 – SPECIALTIES

Section 10600 Partitions

Scope of Works

- The work to be done under this item consist of furnishing all wall partitions including all required materials, woodwork (if any), tools, equipment and labor and performing all operations necessary for the satisfactory completion of installation of partitions in strict accord with applicable drawings, details and these Specifications.

Material Requirement

- (GP-01 to GP-10) Fixed Glass Panel
  6.00mm thick tempered clear glass with security film and frosted sticker on 2"x4" aluminum powder coated frame, complete with accessories and installation.
  Refer to drawings for dimensions of glass panels.

Section 10340 Prefabricated Exterior Specialties

Scope of Works

- The work to be done under this item consist of maintenance steel ladder with steel enclosure at 3rd floor to roof deck (if any), tools, equipment and labor and performing all operations necessary for the satisfactory completion of installation of steel ladder in strict accord with applicable drawings, details and these Specifications.

Material Requirement

- C4"x2" x ¼ steel bar
- C4"x2" x ¼ stringer
- 2" diameter G.I. pipe handrail

DIVISION 12 – FURNISHING & ACCESSORIES

Section 12400 Furnishing & Accessories

Scope of Work

- This item shall consist of supply & installation of all other required furnishings with accessories including labor, tools, equipment, and the satisfactory performance in undertaking the proper installation of the system as shown on the Plans and in accordance with this Specifications.

Material Requirement

- Supply and installation of hospital grade head board for oxygen (mock-up type)

Section 12500 Furniture

Scope of Work

- All loose and fixed furniture shall be of modern design and constructed and/or supplied in accordance with the best practices of the furniture industry. Items shall include all necessary fittings, furnishings, and accessories to completely supply the requirements. The contractor shall submit color swatches and sample finishes subject to approval of the CPDMO Project Architect prior to installation. Refer to approved plans for details.

Material Requirement

- Staff Chairs (Mid-back Chairs)
  - Height adjustable arm, Nylon base with castor in black, single lock mechanism, synchronize, fix seat, backrest in black mesh and seat in black fabric finish

- Hospital Bed
  - PE Headboards and punched steel plate surface can be installed and removed; Bed Frame to be welded by profile steel; The surface: treated with electrostatic plastic bed corners and equipped with anti-bump cushion devices.

DIVISION 15 – MECHANICAL

Section 15700 Heating, Ventilating and Air Conditioning Equipment

General Conditions and Provisions

- The work throughout shall be executed in the best and most thorough manner, under the direction of, and to the satisfaction of the Owner or the Owner's duly authorized representative and based on strict conformance with the contract plans and documents.
- The Contractor shall be responsible for his work until its completion and final acceptance and shall replace any of the same which may be damaged lost or stolen without additional cost to the Owner. He shall guard the building and its contents against damage by him, his employees or sub- contractors and shall make repair for any damage free of charge. This Contractor shall

indemnify and save harmless the Owner, Architect and Engineering Consultant from and against all liabilities for damages arising from injuries or disabilities to persons or damage to property occasioned by any act or omission of this Contractor or any of his subcontractors, including any and all expenses, legal or otherwise, which may be incurred by the legal or otherwise, which may be incurred by the Owner, the Architect, or the Consulting Engineer in the defense of any claim, action or suit.

- The Contractor shall put his work in place as fast as reasonably possible. He shall at all times keep a competent Engineer in charge of the work, and shall facilitate its inspection by the Owner, Architect and Engineer Consultant. He shall also remove any rubbish caused by his work as expeditiously as possible.
- A fixed sequence of operations is required to properly install the complete system. It shall be the responsibility of the Contractor to closely schedule his work in such a way that it shall be installed at the proper time and without delaying the completion of the entire project. The Contractor shall carefully check space requirement with other subcontractors to insure that his equipment and pipes can be installed in the space allotted for them. The Contractor, before commencing work, shall examine all adjoining work on which the work in any way dependent for perfect workmanship according to the intent of this specification, and shall report to the Project Manager or Owner's representatives, any conditions which prevent the Contractor from performing first-class work, no "waiver of responsibility" for defective adjoining work will be considered unless notice has been filed before the Contractor submits his proposal. The Contractor shall thoroughly acquaint himself with the work involved, and verify at the building all measurement necessary for the proper installation of his work, obtaining the same when necessary from the General Contractor or other Sub-Contractors. He shall also be prepared to promptly furnish to these Contractors any information relating to his own work necessary for the proper installation of their contracts and shall cooperate with them to secure the best progress of, and harmony between the work of the different trades, in the interest of the building as a whole. This Contractor shall confer with other Contractors of other trades for finish adjacent to his own work (such as grilles, escutcheons, etc.) fit in and harmonize with the finish, in a manner satisfactory to the Owner.
- It is specifically intended that all materials and labor which are necessary for the proper completion and best operation of the system shall be furnished as part of this contract without additional cost – whether or not shown in details on the drawings or described in detail in the Specifications. The provision is in consideration of the fact that, in many cases, the use of apparatus of different makes may be considered, which differ in detail from that described, although intended to fulfill the same functions.
- Equipment and piping arrangements shall provide adequate and acceptable clearances for entry, servicing, filter replacement and maintenance. Access panels shall be provided in the housings of air conditioning equipment and shall be the type that will permit servicing or replacement of the components of the units as installed.
- The contractor shall guarantee all work performed and materials installed by him to be free from inherent defects, and shall keep same in repair and replace any defective materials or workmanship, free of cost to the Owner, for a period of one (1) year, from date of acceptance upon notice from the Architect or the Owner's representative.
- The Contractor shall guarantee that the equipment, materials, accessories, methods of installation and workmanship supplied under this Specification will be of the best class, that it will be erected in a practical and first class manner, that it will be complete in operation, nothing omitted in the way of labor and shown or mentioned herein, and that it will be delivered in good working order, complete and perfect in every aspect.
- The Contactor shall supervise the installation of this apparatus and equipment, test or adjust them in repair for a stated period or render other similar services. The Contractor will be held responsible for the performance of the specified services under the actual conditions of installation. The same shall apply to cases where special adjustment or other services are necessary to insure the proper and efficient functioning of apparatus even though not specifically

hereinafter called for. It is intended that the entire plant, when finally delivered, shall be ready in every respect for satisfactory and efficient operation and the Contractor is hereby made responsible for the result.

Codes, Rules, Permits & Fees

- The Contractor shall give all necessary notices, obtain all permits and pay all government sales taxes, fees and other costs, including utility connections or extensions, in connection with his work; file all necessary plans, prepare all documents and obtain all necessary approvals of all governmental departments having jurisdiction; obtain required certificates of inspection for his work and deliver same to the Owner before request for acceptance and final payment for the work.
- The Contractor shall include in the work, without extra cost to the Owner, any labor, materials, services, apparatus, drawings in order to comply with all applicable laws, ordinances, rules and regulations, whether or not shown on drawings and/ or specified.
- The installations provided for and specified herein shall comply with the laws, ordinances and regulations of the Municipality where the jobsite is located, and the Bureau of Industrial Safety.
- The acceptability of all furnished equipment, materials, accessories, methods of installation and workmanship shall be based on complete adherence with applicable standards established by the following:
    1. PD 1096 National Building Code of the Philippines 2005 ed.
    2. RA 9514 Fire Code of the Philippines 2019 ed.
    3. Philippine Mechanical Code 2012 ed.
    4. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
    5. International Mechanical Code (IMC) 2018 ed.
    6. Philippine Green Building Code (PGBC) 2015 ed.
    7. Philippine Society of Ventilating, Air Conditioning and Refrigerating Engineers (PSVARE)

Intent

- It is the intention of this Specification and Drawing to call for finished work, tested and ready for operation. Wherever the word "provide" is used, it shall mean "furnish and install complete and ready for use".
- Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as herein specified or shown.
- It shall be understood that this Specification is written with certain items, equipment and materials specified by manufacturer's name, brand, number or trade name, as a means of establishing a standard of quality and performance. The use of these names to establish quality does not however prohibit use of other make of items, equipment or materials which may be considered to be equally efficient in both performance and quality of materials.

Surveys and Measurements

- The Contractor shall base all measurements, both horizontal and vertical from established bench marks. All work shall agree with these established lines and levels. Verify all measurements at site and check the correctness of same as related to the work
- The Contractor shall examine all drawings relating to his work and verify all governing conditions at the site and shall become fully informed as to the extent and character of the work required its relation to the other work in the area. No consideration will be granted for any alleged misunderstanding of the materials to be furnished or work to be done, it being understood that submission of a proposal is an agreement to all items and conditions

referred to herein or indicated on the accompanying drawings. Any exceptions, omission or substitution shall be presented in writing with the contractor's bid.

- Should the Contractor discover any discrepancy between actual measurements and those indicated, which prevents following good practice or the intent of the drawings and specifications, he shall notify the Project Manager and the Owner, and shall not proceed with his work until he has received instruction from the Owner/Project Manager.

Drawings

- Drawings are diagrammatic and indicate the general arrangement of systems and work included in the contract. Drawings are not to be scaled. The architectural drawings and details shall be examined for exact location of fixtures and equipment. Where they are not definitely located, this information shall be obtained from the Architect, or Owner/Project Manager.
- The Contractor shall follow drawings in laying out work and check drawings of other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions at all points, where headroom or space conditions appear inadequate, Project Manager or Owner shall be notified before proceeding with installation.
- Should the Contractor discover any discrepancy between actual measurements and those indicated, which prevents following good practice or the intent of the drawings and specifications, he shall notify the Project Manager and the Owner, and shall not proceed with his work until he has received instruction from the Owner/Project Manager.
- Should the Contractor discover any discrepancy between actual measurements and those indicated, which prevents following good practice or the intent of the drawings and specifications, he shall notify the Project Manager and the Owner, and shall not proceed with his work until he has received instruction from the Owner/Project Manager.

Equipment Deviations (Where Applicable)

- Where the Contractor proposes to use an item of equipment other than that specified or detailed on the drawings, which requires any redesign of the partition, structure, foundations, piping, wiring or any other part of the mechanical, electrical or architectural layout, all such redesign and all new drawings and detailing required therefore, shall be prepared by the Contractor at his own expenses and approved by the Project Manager/Owner.

Scaffolding, Rigging, Hoisting

- This contractor shall furnish all scaffolding, rigging, hoisting, and services necessary for erection and delivery into the premises of any equipment and apparatus furnished. Remove same from premises when no longer required.

Material and Workmanship

- All materials and apparatus required for the work, except as specifically specified otherwise, shall be new, of first class quality, and shall be furnished, delivered, erected, connected and finished in every detail, and shall be selected and arranged as to fit properly into the building spaces. Where no specific kind or quality of materials is given, a first class standard article as approved by the Owner or his designated representative.
- The contractor shall furnish the services of an experienced superintendent who shall be constantly in charge of the installation of the work, together with all skilled workmen, fitters, metal works, welders, helpers and labor required to unload, transfer, erect, connect-up, adjust, start, operate, and test each system.
- Unless otherwise specifically indicated on the plans or specifications, all equipment and materials shall be installed with the approval Owner in accordance with the

recommendations of the manufacturer. This includes the performance of such tests as the manufacturer's recommends.

Electrical Connections (Where Applicable)

- The Electrical Contractor shall furnish and install all wiring except; 1) temperature control wiring; 2) equipment control wiring and 3) interlock wiring. The Electrical contractor shall furnish and install power wiring complete from power source to the individual machine room, terminating in a circuit breaker or junction box.
- The mechanical contractor shall, regardless of voltage, furnish and install all temperature wiring, and all interlock wiring and equipment control wiring for the equipment that the owner furnishes. The mechanical contractor shall furnish the electrical power wiring from the circuit breakers or junction box installed by the Electrical Contractor, to all motor including the furnishing of all starters or combination starters not factory mounted on equipment. The mechanical contractor shall provide and be responsible for the heater in all starters that the Mechanical Contractor furnishes.
- After all circuits are energized and completed, the Electrical Contractor shall be responsible for all power wiring, while all control wiring shall be the responsibility of the mechanical contractor. Motors and equipment shall be provided for current characteristics as shown on the drawings.
- All cost of electricity due to testing and startup operation shall be for the contractor's account, (see applicable sections.)

Accessibility

- The contractor shall be responsible for the sufficiency of the size of shafts and chases, the adequate clearance in double partitions and hung ceiling for the proper installation of his work. He shall cooperate with the General Contractor and all other contractors whose work is in the same and shall advise the Owner Representatives of his requirements. Such spaces and clearances shall however, be kept to the minimum size required.
- The Contractor shall locate all equipment which must be serviced, operated, or maintained in fully accessible positions. Equipment shall include but not be limited to valves, traps, cleanouts, motors, controllers, switchgear, and drain points. If required for better accessibility, furnish access doors for this purpose. Minor deviations from drawings may be made to allow for better accessibility and any change shall be presented for approval prior to implementation.

Foundations, Supports, Piers & Attachments

- The Mechanical Contractor shall furnish approved shop drawings showing concrete bases required and shall provide the necessary foundation bolts for anchoring the machines, which shall be as shown on the drawings or as directed.
- The Mechanical Contractor shall provide approved anchor bolts with plates, sleeves, washers and double nuts for all apparatus set on concrete foundations. Also provide billets or plat, grouting, etc., as directed to properly distribute the weight of apparatus on foundations and set equipment perfectly level.
- The Mechanical Contractor shall furnish and install as shown or directed, all necessary supports for equipment furnished under this section of the Specifications. To meet varying conditions in each case, saddles, brackets, etc. as shown or directed. All such supports shall have substantial flanges bolted to floor construction. Hangers shall be supported from the structure as previously specified. Supports shall be properly located with reference to any supporting pads, legs, etc of the equipment carried and must be of such number and distributed so as not to throw any undue strains on shells or casing.

Cutting and Patching

- The Mechanical Contractor shall provide all cutting and patching necessary to install the work specified in this section. Patching shall match adjacent surfaces.
- No structural members shall be cut without the approval of the Owner Representatives, Architect and all such cutting shall be done in a manner directed by him.

Sleeves and Plates

- This Contractor shall provide and locate all sleeves and inserts required before the floors and walls are built, or shall be responsible for the cost of cutting and patching required for pipes where sleeves and inserts were not installed, or where incorrectly located. Each Contractor shall do all drilling required for the installation of his hangers.
- Sleeves shall be provided for all mechanical piping passing thru concrete floor slabs and concrete, masonry, tile and gypsum wall construction. Sleeves shall not be provided for piping running imbedded in concrete or insulating concrete slabs on grade.
- Where sleeves are place in exterior walls below grade, the space between pipes or conduit and the sleeves shall be packed with oakum and lead and made completely watertight.
- Sleeves shall be constructed of 24 gage galvanized sheet with lock seam joints for all sleeves set in concrete floor slabs terminating flush with the floor. All other sleeves shall be constructed of galvanized steel pipe unless otherwise indicated on the drawings.
- Fasten sleeves securely in the floors, walls, so that they will not become displaced when concrete is poured or when other construction is built around them. Take precautions to prevent concrete, platters, or other materials being forced into the space between pipe and sleeve during construction

Waterproofing

- Where any work pierces waterproofing including waterproof concrete, the method of installation shall be approved by the Owner's Representative or Architect before work is done. Contractor shall furnish all necessary sleeves, caulking and flashing required to make openings absolutely watertight.

Mechanical Maintenance

- Operation – The Mechanical Contractor shall receive calls for any and all problems experienced in the operation of the equipment provided under this Specification and shall take steps to immediately correct any deficiencies that may exist.

Air-Conditioning

Variable Refrigerant Volume/Flow System (VRV/VRF)

- General – Unit/s shall be air-cooled or water-cooled as specified or indicated in drawings, split type multi system air conditioner consisting of one outdoor unit and multiple indoor units, each having capability to cool independently room requirements. Different types and cooling capacity of indoor units can be connected to one refrigerant circuit and controlled individually. Compressor/s shall be equipped with inverter controller and capable of changing the rotating speed to satisfy variations in cooling load. The refrigerant to be utilized shall be environmentally friendly with zero ODP such as R410A or R407C.

- Outdoor Unit/s – Shall be a factory assembled unit housed in a sturdy weatherproof casing constructed from rust-proofed mild steel panels coated with a baked enamel finish. All outdoor units shall have multiple steps of capacity control to meet cooling variations.
    1) The outdoor unit of 8 and 10 HP shall have two scroll compressors and be able to operate even in case that one inverter compressor is out of order. The outdoor unit of 5 HP shall have one scroll compressor.

2) The connectable range of indoor units shall be from 0.80 to 10 HP
3) The compressor shall be of highly efficient scroll type and equipped with inverter control capable of changing the speed in accordance to the cooling load requirement.

- Indoor Unit/s – Shall be of the following models: ceiling cassette, ceiling suspended, wall mounted, ceiling concealed ducted and floor standing.
  1) The heat exchanger shall be constructed with copper tubes mechanically bonded to aluminum fins to form a cross fin coil and shall be covered by anti-corrosion resin film. It shall have electronic control valve which control refrigerant flow rate in respond to load variations of the room.
  2) The fan shall be statically and dynamically balanced to ensure low noise and vibration free operation.
  3) The address of the indoor unit shall be set automatically in case of individual and group control.
  4) In case of centralized control, it shall be set by liquid crystal remote controller.

- Control – Computerized PID control shall be used to maintain a correct room temperature. Unit/s shall be equipped with a self-diagnosis for easy and quick maintenance and service. The LCD (Liquid Crystal Display) remote controller shall memorize the latest malfunction code for easy maintenance.
  1) Local Remote Controller
  2) Central Remote Group Controller

- Fresh Air Processing Unit/s – Shall be of the ceiling concealed ducted type. Unit shall be complete with a coil, fan driven by AC induction motor, PMV (pulse modulating valve), piping connectors, electrical controls, microprocessor control system, integral temperature sensing and hanging brackets. Cabinet shall be constructed of zinc-coated steel and configured for rear return. The fan shall be of the multi-blade type with performance designed to match the coil performance. Motors shall be totally enclosed, permanently lubricated ball bearing with inherent overload protection.

- Refrigerant Circuit – Shall include liquid and gas shut-off valves, solenoid valves and accumulator as the system demands.
- Safety Devices – All necessary safety devices shall be provided to ensure safe operation of the system. The following safety devices shall be part of the outdoor unit: high pressure switch, fan drive overload protector/ fan motor safety thermostat, fusible plug, overload relay, etc.
- The unit/s shall deliver the design cooling capacity at the external ambient specified. The units are rated at 35°C and shall be suitable for continuous operation with reduced capacity at an external ambient temperature of 40°C.
- Provide supports and mounts in accordance with manufacturer's recommendations or as indicated on drawings.
- Condensate removal shall be by means of gravity drainage and/or condensate pump as necessary.
- Unit electrical power shall be 230V/1phase/60Hz or as indicated on the drawings.
- Evaporator and condenser coils shall be of copper tube construction with aluminum fins and additional anti-corrosion coating suitable for salty spray atmosphere.
- Filters shall be washable type, easily accessible, and shall cover the full unit area of re-circulated air.
- Refrigerant Piping and Fittings – Copper refrigerant tube, ASTM B280, cleaned, dehydrated and sealed, marked ACR on hard temper straight lengths.

- Refrigerant Insulation – Flexible closed cell elastomeric rubber insulation; ASTM C534, k = 0.033 W/m- °C, flame spread not over 25, smoke developed not over 50 for temperatures from -4°C (40°F) to 93°C (200°F). No jacket required except specified.

Ventilation

Statement of Work

- Intent – It is the intent of these specifications to furnish ventilation systems complete, fully adjusted and ready for use.
- Equipment – Equipment has been carefully selected for this project and the Contractor is expected to provide all items as closely as possible to the specifications and as called for on the drawings. Equipment specifications as per owner choice.
- Job Coordination – The Contractor for Ventilating and Air Conditioning shall plan his work in advance and shall coordinate all space requirements with other trades involved. Where conflicts occur, the Contractor shall request clarification thru the General Contractor.
- Workmanship – It is the intent of these specifications to provide the best workmanship available.
- Cleaning – It is the intent of these specifications that all work, including the inside of equipment be left in a clean condition. All construction dirt shall be removed from material and equipment.

Equipment

- Circulating Fan (ceiling flush mounted) – unit shall be equipped with a wireless controller for convenience and designed for use in standard drop grid systems. This fan will help keep the cool air flowing without raising noise levels. The rotating fan grille helps to distribute the air in all directions and can be turned off if desired.
- Ceiling Cassette Fan – exhaust fan shall be of the centrifugal direct drive type. The fan housing shall be constructed of heavy-gauge galvanized steel. The housing interior shall be lined with acoustical insulation. The outlet duct collar shall include a plastic backdraft damper. Outlet shall be adaptable for horizontal or vertical discharge. The access for wiring shall be external. The motor disconnect shall be internal and of the plug-in type. The motor shall be mounted on vibration isolators. The fan wheel shall be of the forward-curved centrifugal type and dynamically balanced.

Ductworks

1. **Low Velocity Ductwork (Flange Type)**
    - Duct Material – Shall be zinc-coated sheet steel or aluminum thickness of the metal and stiffeners as indicated in the schedule on the drawings.
    - Duct Workmanship – All ductwork shall be constructed and erected in a workmanlike manner. Ducts shall be straight and smooth on the inside with neatly finished joints, airtight, and shall be free from vibration under all conditions of operation. The internal ends of slip joints shall be made in the direction of air flow. The ducts shall be securely attached to the building construction in an approved manner. Changes in dimensions and shape of ducts shall be gradual. All duct sizes fall within limiting dimensions indicated on the drawings unless otherwise approved. Curved elbows, unless otherwise specified on the drawings, shall have a center line radius equal to 1-1/2 times the width of the duct. Air turns shall be installed in all abrupt elbows and shall consist of curved metal blades or vanes, arranged to permit the air to make the turns without appreciable turbulence. They shall be the manufacturer's standard product and shall be quiet when the system is in operation. Configuration of ducts shall be as shown by the detail on the drawings. Duct hangers shall be as shown by the detail on the drawings.

- Fire Dampers – Install fire dampers where shown on the drawing and as required by NFPA Pamphlet No. 90A or the local codes. Provide an access door for each fire damper.
- Flexible Connections – Wherever ductwork is connected to fans, air handling unit or other equipment that may cause vibration in the duct shall be connected to the equipment by means of a flexible connection constructed of fire resistant flexible canvas or other approved material. The connection shall be suitable for the pressures at the point of installation.
- Insulation Material – All ducts shall be insulated unless otherwise noted on the drawings. Ducts shall be insulated with 20 mm thick 25 kg/cu.m (3/4 in. 1.50 pcf) density polyolefin insulation with fire retardant aluminum foil. Flexible insulation shall be used in concealed spaces only. Ducts exposed to weather shall be provided with gauge 24 or gauge 26 G.I. sheet cladding with watertight joints. Duct insulation and covering shall have flame-spread rating of not over 25, smoke developed of 50, and fuel contributed of 50.
- Insulation Workmanship – Impale insulation over 12 gauge mechanical fasteners, such as weld pins on 300 mm to 450 mm centers tightly butting insulation. A minimum of two rows of fasteners per side shall be used. Seal protruding pin with fitting mastic. Secure insulation with white painted caps to pins. Apply joint sealing tape to all joints, firmly pressing to insure complete bond.

2. **PVC Exhaust Duct**
   - Material – Shall be PVC schedule 40 as follows:

3.1	Pipe	- ASTM D2729
3.2	Fittings	- ASTM D2729
3.3	Solvent cement	- ASTM D2564
3.4	Primer	- ASTM F656

3. **Manual Volume Dampers**
   - Type – Dampers shall be of the opposed blade, suitable for the static pressure shown on the drawings.
   - Capacity – The airflow thru the dampers shall be as shown on the drawings.
   - Frame – The damper frame shall be 14Ga zinc-coated steel and shall be provided with mounting holes. The frame shall be roll-formed, interlocked, and welded at corners. The frame shall be 100 mm in width.
   - Blades – Blades shall be constructed of 16 gauges roll-formed zinc coated steel not to exceed 150 mm in depth and shall be formed with double 90-degree bends to insure positive air lock and maximum strength. Blades shall be felt-tipped to insure tight closure and noiseless operation.
   - Sections – Damper and damper frame may be made in one section up to 1200 mm in width and 2500 mm in height. Larger sizes shall be made in sections.
   - Installation – The damper and damper frame shall be installed dead level in both directions. The blades shall not touch any adjacent material throughout the full travel of the blades. The damper and damper frame shall be installed so that there is no torsion or twist in the frame to prevent smooth operation of the damper.
   - When volume dampers are used in various branches of the ductwork in balancing the system, single blade dampers maybe used at each branch take-off.
   - Pressure Drop - Pressure drop thru the damper shall not exceed 0.20 inches w.g. (50 Pascal) at 500 feet per minute (2.5 MPS) velocity based on the face area.

- Damper Actuator – Direct quarter turn electric actuator, L. Bernard Brand (France), OAB type, 80Nm torque, 3 to 6 sec maximum operating time, 220VAC/1P/60Hz, 2 limit switch and complete with adapter.

4. **Non-Return / Gravity Backdraft Dampers**
   - General – Dampers shall be operated by gravity where pressure or velocity opens and closes the damper. These dampers are composed of a set of horizontally mounted blades, they are normally closed and are free to rotate about the horizontal axis. The blades are manufactured from lightweight aluminum sheets. Frame is manufactured from high quality aluminum as well as from galvanized steel.

   - Features:
     b.1 Casing frame is fully sealed robust and rigid assembly formed out of best quality aluminum sheets/ galvanized steel sheets of 1.20 mm thickness.
     b.2 Fully sealed low leakage blades are formed out of high quality lightweight aluminum sheets of 1.0 mm thickness.
     b.3 The bearings are made of PVC/ Nylon to give smooth and rattle free operation.
     b.4 The blades are fitted with galvanized steel connecting spindle to main casing/ frame for rigid and strong construction for rattle free and smooth operation due to variable air pressure.
     b.5 A galvanized/ aluminum angle is fitted internally to main frame to avoid over movement of blades.

Air Filters (As Applicable)

1. **Initial and/or Preliminary Filter (Metal Mesh)**
   - General – The filter shall be made of layers of aluminum screen wire, heavy duty, low resistance to airflow, easy to clean and should last up to several years.
   - Construction – Filters shall be washable and are designed to last a long time. These filters are made of multiple layers of pleated and flat aluminum screen wire that allows for easy capture of particulates.

   Housed in a sturdy metal frame, these filters are also designed with strength and durability for lasting a long time.
   a.1 Frame shall be galvanized steel with mitered corners and secured with rivets.
   a.2 Washable filter media shall be multiple layers of slit and expanded aluminum
   a.3 Media retainer shall be expanded, galvanized steel

2. **Final Filter (Hepa Filter)**
   a) Specification/s:
      a.1 Capacity: Refer to plans/drawings.
      a.2 Overall Dimension: Contractor to submit shop drawing for approval.
      a.3 Initial Pressure Drop: Not more than 25 mm (1 in.) of WG at rated airflow.
      a.4 Collection Efficiency: Not less than 99.97% for particles down to 0.30 micron when measured at rated airflow, by number count method employing size selective particle counter and hetero-disperse DOP test aerosol, having size distribution in which at least 50% of the cumulative count is between 0.30 and 0.50 micron.

   b) Construction:
      b.1 Filter Frame: CRCA carbon steel as per IS: 513 of 16 SWG with one coat of epoxy primer and two coats of chemical resistant epoxy paint on all exposed surfaces.

b.2 Filter Medium: Water repellent 100% micro glass fibre (borosilicate) filter medium having the following characteristics

b.2a	Basis weight :	80-90 gm/sq.m
b.2b	Thickness :	not less than 0.4 mm
b.2c	Airflow resistance at 2.50 m/sec :	not more than 25 mm (1 in.) WG
b.2d	Particulate removal efficiency	: not less than 99.98% for sub micron aerosol
b.2e	Water repellency :	zero penetration through the medium up to 762 mm of water head
b.2f	Tensile strength:	not less than 450 gm/cm width in both machine and cross directions
b.2g	Combustible content :	not less than 8%

b.3 Sealant: Sealant used for sealing the filter pack with the filter frame shall be oil resistant and shall be adequate to meet the temperature and humidity conditions specified, when set. The set sealant shall not show cracks or tendency to peel off from the filter frame.

b.4 Gasket: Soft, impermeable, closed pore neoprene rubber gaskets 6 mm (1/4 in.) thick and 19 mm (3/4 in.) wide. The gasket shall be a single square piece or with dovetail joints at four corners.

b.5 Face Guards: Filter shall be rigidly fitted with face guards on both sides of filter. No portion of face guards extending out of the overall dimension of the filter and shall be at least 2 mm inwards from the edges of the filter frame all around. The face guard shall be made of perforated metal with powder coating having maximum opening of 12.50 x 12.50 mm with suitable support frame to avoid sagging towards the filter pack.

Air Distribution System

1. **Grilles and Diffusers**

a) Type – The ceiling diffuser shall be of the square neck, use aluminum material, square outlet, and flush type. The ceiling diffuser shall be of the dimensions shown on the drawings and shall be provided with volume dampers. If diffuser will locate at 600 x 600 mm ceiling tiles, supply air diffuser shall have 600 x 600 extended frames. Grilles shall have double blade adjustable air swing. Wall louvers shall be fixed blade complete with insect screen.

b) Capacity – The capacity of grilles and diffusers shall be as shown on the drawings.

c) Finish – Grilles and diffusers shall be provided with a factory applied finish, applied over a rust inhibiting prime coat / powder coated. Color selection by Architect.

d) Connections to Ductwork – Grilles and diffusers shall be connected to the ductwork as follows:

- Fasten extension duct collar to the ductwork with sheet metal screws.
- Fasten duct ring to extension duct collar with sheet metal screws.
- After ceiling is installed, remove inner assembly diffuser cones and fasten outer cone to extension duct with sheet metal screws.
- Reinstall inner assembly cones to outer cone.

- Check to see if sponge rubber gasket is drawn up against ceiling forming an air tight seal. If not, reassemble and recheck.
- Balance and adjust air flow quantities shown on plans.
- Clean construction dirt from diffuser.

e) Mounting – This Contractor shall coordinate the location of the diffusers, ceiling light and any other ceiling outlets.

2. **Round Vent Caps**
   - Description – Round type vent cap complete with screen to keep out ingress of small particles.
     a.1 High strength stainless steel adopted.
     a.2 Coated with metallic silver paint to prevent oxidation of material.
     a.3 Three (3) pieces of spring clip to allow easy connection to pipe duct.

Section 15400 Plumbing System

Scope of Work

- This item shall consist of supply of all plumbing system with accessories including labor, tools, equipment, testing, and the satisfactory performance in undertaking the proper installation of the system as shown on the Plans and in accordance with this Specifications

Construction Notes

- All plumbing works included herein shall be executed in accordance to the provision of the Revised National Plumbing Code of the Philippines, 1999 Edition, The National Plumbing Code and Local Rules and Regulations of the Municipality.
- Coordinate the drawings with other related drawings and specifications. The Engineer and/or Architect shall be notified immediately of any discrepancy found herein.
- All pipes shall be installed as indicated, any relocation required for proper execution of the plumbing work shall be with prior approval of the Engineer and/or Architect.
- Proposed sanitary utilities shall conform to the actual location, depth and invert elevations of all existing pipes and structures as verified by the Contractor.
- All slopes for horizontal drainage shall maintain two percent (0.02) and one percent (0.01) minimum unless otherwise specified.
- Water supply pipe to fixture shall be sized in accordance with the manufacturer's recommendations and/or plumbing code.
- All branches of fixture or group of fixtures shall be provided with air chamber made of capped vertical extension pipe of 300mm min. to 450mm maximum.
- All water lines shall be hydrostatically tested at 100psi for a period of two (2) hours before buried or covered. Galvanized iron (G.I.) pipes directly in contact with soil shall be provided with two coats of coal tar and wrapped with jute sack and painted with coal tar.
- The Contractor shall verify all existing utilities at site and coordinate the work with the sewer and waterline service connecting/tapping point.
- All pipe sizes and other dimensions are in millimeter (mm) unless otherwise specified and are indicative of inside diameter.

Material Requirements

Waterline / Water Distribution

- Use Polypropylene (PPR) type system for cold and hot (as needed) waterline pipes and fittings jointing by socket fusion, conforming to ASTM F1335
- Confer to Project Architect the brand and approved equivalent.
- Provide sample for approval.

Sanitary Lines / Sanitary Sewerage

- Use Polyvinyl Chloride (PVC) Series 1000 pipes and fittings for sanitary lines (sewer, vent and waste pipes), conforming to ASTM 2729
- Confer to Project Architect the brand and approved equivalent
- Provide sample for approval.

Plumbing Fixtures and Accessories

- Elongated water closet with tank (18 ½" length), lever type complete with tank, toilet seat cover and other accessories including bidet spray
- Counter type ceramic lavatory complete with faucet complete with accessories
- Wall hung (semi-pedestal) lavatory with complete accessories
- Stainless surgical sink with complete accessories
- Floor drain: brass/stainless steel plate with slotted opening strainer complete with powder coated cast iron frame.
- Supply and installation of 12mm thick solid surface countertop with back splash for Room 201 and Room 202 including painting works of concrete frame.
- Confer to Project Architect the brand and approved equivalent
- Provide sample of all plumbing fixture for approval.

Plumbing Equipment and Accessories

- Supply & installation of Water Tank, 5000 gallons with metal stand and stainless ladder
- Supply & installation of centrifugal pump, 5.0HP, 3-phase complete with pipe fittings and accessories and pump controller.

Construction Requirements

- Make the necessary preparation works for the installation of water system and sanitary, on the specified area.
- Ensure proper installation of the system, tap to the nearest water distribution area, and to the nearest sewer area
- Ensure complete and proper installation of brackets and supports.
- Testing shall be done for the whole system and equipment's in the presence of the Engineer and Owner or his representative.
- All restoration and rehabilitation works shall be done on the affected areas to the same features with the existing or as per the required finish.
- Toilet partition to be removed and re-install including rehabilitation of damaged partitions.

DIVISION 16 - ELECTRICAL

Workmanship and Materials

- All works shall be done in accordance with the requirements of the latest edition of the Philippine Electrical Code and National Safety Code. Nothing contained in these specifications or shown on the plan shall conflict with the requirements of these Codes, any discrepancies should be consulted to the Project Inspector / Electrical Engineer.
- All materials and equipment to be used and installed hereunder shall be of the approved type bearing the stamp or approval of the proper authorities concerned. Locally made or constructed materials shall first be approved before installation.
- All works shall be done in workmanlike manner and should present a neat and mechanical appearance when completed.

Plans & Drawings

- The accompanying drawings shall indicate the general arrangement of the equipment, outlets and other works. When it is necessary to deviate from the arrangement indicated on plans in order to meet the structural conditions, such deviation shall be made at the expense of the Contractor and upon approval from the Project Inspector / Electrical Engineer.
- The outlets and circuit breakers shown on the plan are diagrammatic and approximately correct as to location. Minor changes shall be made through the Contractor at his own expense. The exact location of all outlets and switches shall be determined by the Project Inspector/Electrical Engineer and the same shall be located accordingly. The Contractor shall be responsible for the accurate location of all outlets with respect to doors, partitions, water pipes, cabinets and other facilities.

Section 16050 Basic Electrical Materials and Methods

Conduit System

- PVC is primarily required for this work. Conduit runs shall be well supported especially on ceiling and slab, concrete encased on soil. All conduits placed on walls and partition shall be embedded, exposed layout will not be allowed. Conduit ends shall be provided with an end bell or adapter with locknut and bushing. Conduit shall enter knockouts squarely. Locknuts and bushing shall be used at termination of conduits in outlets, pull or junction boxes, panels and cabinets. Locknuts shall be screwed tight. Bends and offsets shall be avoided if possible, but when necessary it shall be made with an approved Field bend or pipe / conduit bending machine. The use of pipe tee or vice bending conduits will not be permitted.

Restrictions

- Supply and installation of all material not shown in the drawing nor mentioned in this specification but necessary for the completion of the construction works shall be included. Coordination with CPDMO and Project Inspector should be done for proper installation of all wiring systems.

Section 16070 Hangers and Supports

- All electrical pipes and accessories shall be using appropriate hangers and support follow existing features, **GI Wires as support is not allowed**. Exposed layout on walls and partition inside offices shall not be allowed. Chipping works required.
- Hanger and support outside the building will be used and subject for painting and restoration (refer to plans)

Section 16080 Testing

- Complete testing of the system involved in operation and provision of all system apparatus for making test and guarantee for a period of one (1) year after acceptance of the project and shall agree to repair and make good at no additional cost to the end user.

Section 16120 Conductors and Cables

- Wires and cable for lights and power shall be type THHN/THW 600 volts insulation approved type building wire. No. 3.5 mm THHN shall be used from the panel board to the last outlet, and shall be the smallest wire that should be used, unless otherwise No. 8.0mm wires THNN and larger shall be stranded and be connected to the panel boards and equipment by solder less connectors sufficiently large to enclose all strands of the conductor and be securely fastened. They shall not get loose under vibration and normal strain. Wire splices shall be mechanically and electrically secured and soldered. Joints taps and splices in wires larger than No. 10 AWG shall be made with the use of solder less connectors. They shall be tapped with electrical tape to the thickness of the wire insulation.
- Wires and cables shall be continued from outlet, or outlet to pull boxes without splices. Conductors shall not be drawn in conduits until plaster is dry and the conduits are cleaned and free of moisture. Conductors of other systems shall not occupy the same conduit and boxes used for light and power.

Scope of Works

- Complete supply and installation of wires and cable shall be included in this scope of works.
- Tagging of all switches corresponding to the branch circuit number as indicated on the respective panel boards directory using tagging machine.
- Provide Directory in all Electrical Panels
- Balancing of loads
- Wires must be color coded using the standard color coding
- Dismantling of Existing Wires, Electrical Panel, motor control panel and other electrical component inside the pump room
- Chipping and restoration of all affected areas due to project implementation including repainting

Section 16130 Raceway and Boxes

- All conduit boxes and fittings shall be standard manufactured by reputable electrical manufacturers. All conduit boxes not over 100 cubic inches in size, if constructed of sheet metal, the metal shall not be less than No.14 US gauge and shall be set flush with the surface of the structure in which they are installed and where conduit runs are concealed. Care shall be exercised to line up all outlet boxes, 4" octagon type and 1-½" depth. When more than two conduits enter the outlet box, the 2-1/8" depth type box shall be removed. All outlet boxes indicated to be used for lighting fixtures shall be provided with standard flat metal covers.
- Horizontal or vertical gang boxes shall be installed as indicated or when required. All conduit boxes, junction boxes, and blank outlet boxes shall be fitted with standard flat metal conduit box covers.

Section 16140 Wiring Devices

- All wiring devices to be used hereunder shall be new and of approved type. All wall switches shall be top-action quiet-matic type, wide series, bases to be fire-resistant and non-absorptive

material. When more than one switches are indicated in the same location, they shall be mounted in gang under a common plate.

- Convenience outlet shall be duplex-type, universal & flush–type with fire-resistant non-absorptive bases, minimum rating of 16 amperes at 250 volts wide series.
- Suitable single pole and heavy-duty switches shall be installed where indicated on the plans. Sample of wiring devices shall be presented for approval. Minor relocations and re-circuiting shall be the liability of the Contractor.
- Following features shall be followed: one gang, one-way switch, 2 gang, one-way switch, 3 gang, one-way switch, one gang three-way switch, two gang three-way switch, three gang three-way switch, duplex flush type convenience outlet universal grounding type.
- Supply and installation of 500mm x 500mm metal square pull box
- Supply and installation of Duplex Universal Grounding type, Ground Fault Circuit Interrupter (GFCI)

Section 16580 Lighting Fixtures

Lighting Fixtures

- Supply and installation of 2x40watts; 1200mm x 300mm Surface Mounted in Louver Housing (contractor to verify the exact location of the lighting unit/s before installation)
- Supply and installation of double SURGICAL LIGHTING 220V, 60hz, single phase
- 600x600x30mm, 40watts, recessed mounted thin panel LED light
- 10watts, recessed round day light LED
- Single lighting switch with plate cover 16A wide series
- 2gang lighting switch with plate cover 16A wide series
- 3gang lighting switch with plate cover 16A wide series
- Confer to Project Engineer the brand and approved equivalent.
- Provide sample material for approval.

Section 16410 Panel Boards, Enclosed switches and Circuit Breakers

Supply and Installation of the following units:

- DP-AL Main @ 175AT, 3 pole, 25KAIC with 4 branch circuits @ 1-70AT 3 pole, 1-40AT 3 pole bolt-on type with grounding bus and 2 Space, 3 pole.
- LPP2F Main @ 70AT, 3 pole, 18KAIC with 20 branch circuits @ 20-20AT 2 pole bolt-on type with grounding bus.
- The enclosure shall be galvanized steel of code thickness, powdered coated enamel finish and shall be installed plumb and symmetrical with the surrounding devices.
- 9-20AT 2 pole, MCCB bolt-on type circuit breakers.
- Enclosed Circuit Breaker 1-125AT, 3-pole, Nema 3R.
- Enclosed Circuit Breaker 1-40AT, 3-pole, Nema 3R.
- Motor Control Panel (Alternate Control) 5hp, 3Ø, 230v, 60hz
- 20mmØPVC, 25mmØPVC, 32mmØPVC, 40mmØPVC & 50mmØPVC with fittings and complete accessories
- 2" x 4", 4" x 4" PVC utility and junction boxes Pull box with cover enamel coated finished with ½ and ¾ knock outs.
- Electrical tapes, rubber tapes, pull wires, mica tubes and assorted screws.
- Confer to Project Engineer the brand and approved equivalent.
- Provide sample material for approval.

NOTE

The foregoing list of items of works does not in any way limit the responsibility of the Contractor to perform all other works necessary for the completion of the project, **INCREASE IN CARRYING CAPACITY FOR COLLEGE OF NURSING AND ALLIED HEALTH PROGRAMS,** 2nd Floor, Sotejo Hall, College of Nursing, University of the Philippines, Manila.

GUARANTEE

The Contractor shall guarantee all works under this contract to be free from any technical, material, workmanship and/or factory defects and shall replace and repair to the satisfaction of the Project Architect / Engineer and/or to the Chief of CPDMO on any part or portion of the

COMPLETION PERIOD

The Contractor is given **One Hundred Eighty (180) calendar days** to execute the renovation works including the installation all system requirements. The Contractor shall coordinate to the CPDMO Inspector and End-users for the schedule of testing of systems and other related job.

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