CPDMO120043/5

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CPDMO
U.P. MANILA

PROJECT TITLE : **PROPOSED REPIPING OF SANITARY LINES & VARIOUS RENOVATION WORKS**
National Institutes of Health
University of the Philippines Manila

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

Division 1 - General

01000 General Requirements

3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. Regular coordination meeting shall be conducted with CPDMO, Contractor and End-user for proper project monitoring.
11. 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.
12. 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.

13. 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.
14. All materials removed from the unit shall be properly documented prior to turn-over to the End-user for proper safe keeping.

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.

Division 2 – Site Construction

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.

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.

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

06273 Hanging Cabinets, Cabinet and Counter Cabinets

Materials

- 3/4" thk. Marine Plywood
- 1/4"thk. Ordinary Plywood for backing.
- Wood frame solid wood edging
- Stainless accessories such as stainless handle, concealed hinges, cabinet lockset.
- All cabinet shall be of duco finish.
- Provide all necessary accessories for complete installation.
- Submit sample for approval and color scheme.

Application

- Use treated wood/lumber for all fabrication works
- Follow design/layout on plan for all fabrication works
- A receptions/counters/cabinets must have individual locking system. Submit sample for approval of features.
- Confer to CPDMO for the design and features.

Division 7 – Thermal / Moisture

Section 07001 Waterproofing System

Materials:

Waterproofing Compound Flexible Cementitious
Cement
Sand

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 & Windows

08100 Doors

Scope of Work

The work covered by this item shall consists of furnishing all fabricated doors and jambs, equipped with fixing accessories and locking devices in accordance with plan and/or shop drawings and as herein specified.

Door Installation (D-3, D-4, D-5)

- Supply and installation of 6mm thk. tempered glass frosted/tinted double swing, single panel door and sliding door in powdered coated frame.
- Provide locksets, push and pull handles, automatic door closer and other accessories.
- Submit sample and layout of doors for approval of CPDMO Project Architect/Engineer and End-users.

08500 Windows

Scope of Work

- The work covered by this item shall consists of furnishing all fabricated windows and jambs, equipped with fixing accessories and locking devices in accordance with plan and/or shop drawings and as herein specified.

Material Requirements

a. Windows Installation (W-1)

- Supply & Installation of 6mm thk tempered tinted/frosted glass casement window And fixed glass window in analok finish frame
- Supply & Installation of transaction window sliding type with 2inch thk wooden counter
- Provide locksets, push and pull handles, and other accessories.
  Submit sample and layout of doors for approval of CPDMO Project Architect/Engineer and End-users.

08590 Doors & Windows Restoration/Rehabilitation

a. Door Rehabilitation (D-1, D-2)
Scope of Work

- Refurbishing & repainting of existing single panel doors, solid doors.
- Provide locksets, push and pull handles, automatic door closer and other accessories.

b. Window Rehabilitation (W-2, W-3, W-4)
Scope of Work

- Rehabilitate and restore all existing fixed windows along corridor
- Replace all missing/broken glass panel/ accessories
- Repaint all windows and frames as per existing features
- Use approved methodology for window restoration.

c. Supply and Installation of transaction window in sliding type. With wooden counter.

Division 9- Finishes

09300 Tile

Scope of Work

- This item shall consist of furnishing all floor, counter tops, labor, tools, equipment and the satisfactory performance in undertaking the proper installation of tile as shown on the plans and in accordance with this specification.

Material Requirement

- 600 mm x 600 mm Porcelain tile non skid at balcony area
- 300 mm x 300mm x Porcelain tiles for floor(nonskid) counter top and wall @ toilet and bath
- 2mm thk Roll vinyl (anti-bacterial)

Application

- Existing floor shall be prepared to level the floor finish with the hallway flooring.
- Use floor self leveling compound for roll vinyl
- Provide tiles on the specified areas as per design of CPDMO and End-users.
- Confer to Project Architect all the floor layouts and features of tiles.
- Layout tiles after the surfaces have been prepared for the work. Tiles shall be free from lamination, serrated edges, chipped off corners, and other imperfections affecting their quality appearance and strength.
- Samples of all tiles shall be submitted to the project Architect/Engineer and End-users for approval as to color, texture quality.

09500 Ceiling

Scope of Work

- The work covered by this Item shall consists of furnishing all ceiling finishes, equipped with fixing accessories in accordance with Plan and/or shop drawings and as herein specified.

Material Requirements

- 4.5mm thick fiber cement board on 600mm x 600mm on center metal paint finish with fixed hanger support; puttied, sanded and ready to receive paint primer coating.
- Submit sample and layout of tiles 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.

09700 Wall Finishes

Scope of Work

- The work covered by this Item shall consists of furnishing all wall finishes, equipped with fixing accessories in accordance with Plan and/or shop drawings and as herein specified.

Material:

- Use 6mm thk. Fiber cement board on metal studs & tracks
- Fastening materials and accessories

Application:

- Secured them using suitable anchoring method.
- Follow plan for the design and layout of the partitions with boards at one face only , two faces with insulation, two faces with plastering and tiles
- Provide all the necessary accessories for proper installation.

09910 Paints and Coatings

Surface Preparation

- No painting works shall be done under conditions that may jeopardize the quality or appearance of the painting or finishing.
- All surface to receive paint should be cleaned and in proper condition. Wood works shall be sandpapered and dusted clean

Material Requirement

- All painting materials to be used shall be similar or approved equivalent
- Submit color scheme to the Project Engineer / Architect in-charge for approval.

Application

- Interior surfaces shall be gloss finish; all fabricated items shall be duco finish. All new areas shall be properly primed, existing areas shall be repainted in two coats providing all the necessary patching up of uneven areas.
- Top coat shall be of the approved color by CPDMO and End-users. Painting system may vary from two to three coats.
- Paints when applied by brush shall be non-fluid, thick enough to lay down an adequate film of wet paint. Brush marks shall flaw out after the application of paint.
- Paints prepared for application by roller must be similar to brushing paint. It must be non sticky when thinned to spraying viscosity to break up easily into droplets.
- Adequate workmanship shall be done on this part of the finishing works. Additional coatings shall be applied by the Contractor at his expense if the painted areas will not be satisfactory to the Project Architect/Engineer and End-users.

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.

09999 Paints Restoration

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

Division 10 – Specialties

Section 10100 Visual Display Board

Supply and Installation of Smart Board 62 (65") interactive Flat Panel with IO & smart learning.

- Smart Notebook Player
- Customizable home screen
- Web Browser
- Native Screen Sharing
- File and apps. Libraries
- Updrade option available
- with TV stand

Division 12 – Furnishings

Section 12500 Furniture

General

- All casework shall be of modern design and constructed in accordance with the best practices of the wood and computer furniture industry. Construction and design will result in "built-in" installations of computer chairs and tables that have the appearance of flush overlay construction without protuberances.
- Submit samples for approval of design of CPDMO and End-user

Standard Material Specifications

A. Staff Chair
   Arm: Height adjustable-Midback Chairs
   Back: Medium
   Base: Nylon base with castor in black finish
   Mechanism: Single Lock, synchronize, fix seat
   Upholstery: Backrest in Black mesh & seat in black fabric finish

B. Visitors Chair
   Seat: Fixed
   Back: Medium
   Base: Normal cantilever base in chrome finish
   Upholstery: Backrest in Black mesh & seat in black fabric finish

C. Safety Master Vault
   Size: 0.76m L x 0.64m W x 0.55m H
   Materials: Steel reinforced, combination lock, fire and drill resistive, lock plate, relocking devices, locking mechanism
   Dimension info: Table: 1.20m L x 0.70m W x 0.78, H (Main Desk)
   Dimension Info: 0.70m L x 0.60m W x 0.78m H (Side Desk)

D. Staff Table with partition & mobile pedestal
   Materials: MFC Table & bullnose edge
   Accessories: Grommet & Adjustable Glider,
   Mobile pedestal, flush handle, keyboard tray
   Dimension info: Table: 1.10m L x 0.56m W x 0.80 H
   Partition: Full Fabric or laminated Panel Partition (1800HT)
   Dimension Info: 0.90 L x 0.05 W x 1.20 H
   Extruded Aluminum Frame, powder coated end trim 60mm
   clear glass upper tile, Fabric middle and lower tile

E. Single Standing Staff Table with mobile pedestal
   Materials: MFC Table, bullnose edge, /Modesty Metal Panel (450mm)
   Accessories: Grommet & Adjustable Glider

keyboard tray, flush handle
Dimension info: Table: 1.10m L x 0.45m W x 0.80m H

F. Clinic Examination Table
Automated Extraction Bed
Materials: Stainless tube & stainless sheet
Metal Case base with drawers
Upholstery: Backrest and foot'
Dimensions (top): 1.53m L x 0.75m W
Length with foot extension: 1.84m L
Height: 1.12m H
Soft-Touch Top, Treatment pan

G. Reception Table
Customized Design
Materials: MFC Table, steel legs & bullnose edge
Dimension info: Table: 1.70m L x 0.50m W x 0.65 m H
Table top 10mm thk. clear glass (0.13m dist. from table
Accessories: Fixed drawers and cabinets, Key board tray, cove light, stainless steel plate

H. Visitor's Sofa

1. Customize L-shaped sofa
Seat: cushion on top of steel legs sofa, cushion of top of customize sofa cabinet
Dimension Info: 2.11m L x 0.45m W x 0.50m H (1st phase)
Dimension Info: 1.43m L x 0.45m W x 0. 50m H (2nd phase)
Frame: Stainless steel frame
Upholstery: Single line stitching in black bovine leather

2. Customize L-shaped sofa
Seat: cushion on top of steel legs sofa, cushion of top of customize sofa cabinet
Dimension Info: 1.54m L x 0.45m W x 0.50m H (1st phase)
Dimension Info: 1.03m L x 0.45m W x 0. 50m H (2nd phase)
Frame: Stainless steel frame
Upholstery: Single line stitching in black bovine leather

Division 15 – Mechanical

15700 Ventilating and Air-Conditioning System

A. Air-Conditioning System

Scope of Work

- This item shall consist of supply of all air-conditioning ready for use with complete metal flat form and support, complete piping system with accessories including labor, tools, equipment, testing, commissioning, and the satisfactory performance in undertaking the proper installation of the system as shown on the Plans and in accordance with this Specifications

Equipment Requirements

- 1.5 hp (11,020kj/hr) wall mount split type ACU inverter models R410A
- 2hp (19,900kj/hr) wall mount split type ACU inverter models R410A
- 2 .5hp (21,130 kj/hr) wall mount split type ACU super inverter models R410A
- 2.5 hp (21,130kj/hr) ceiling Cassette split type ACU super inverter models R410A
- Ceiling cassette type exhaust fan 10 " diameter, duct size 100mm 82CFM
- Ceiling type exhaust grill 30cm x 30cm duct size 100mm.

MECHANICAL MAINTENACE

1. 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.

2. Catwalk – Where spaces inside ceiling permit, contractor to provide catwalk around mechanical equipment for repair and maintenance.

EQUIPMENT

1. 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.

2. Compact Axial Fan – supply or exhaust fan shall be of the direct drive axial type with cast aluminum airfoil propellers. The casing shall be constructed of continuously welded steel and include integral punched inlet and outlet flanges to prevent air leakage. The casing and motor base shall be constructed from precision cut and formed members of heavy gauge steel to prevent vibration and rigidly support the motor. Motor support brackets shall be welded to fan casing for increased strength. Blades shall be airfoil design. Hub and blades shall be a high strength cast aluminum alloy. Rotors to be statically and dynamically balanced.

DUCTWORKS

1.0 LOW VELOCITY DUCTWORK (Flange Type):

a. Duct Material – Shall be zinc-coated sheet steel or aluminum thickness of the metal and stiffeners as indicated in the schedule on the drawings.

b. 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.

c. 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

d. 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.

e. Insulation Material – All air conditioning ducts shall be insulated except ventilating ducts and unless otherwise noted on the drawings. Ducts shall be insulated with 25 mm thick 48 kg/cu.m density fiberglass 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.

f. 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.

PVC EXHAUST DUCT:

a. Material – Shall be PVC schedule 40 as follows:

1. a.1 Pipe -
2. a.2 Fittings -
3. a.3 Solvent cement -
4. a.4 Primer -

MANUAL VOLUME DAMPERS:

a. Type – Dampers shall be of the opposed blade, suitable for the static pressure shown on the drawings.

1. Capacity – The airflow thru the dampers shall be as shown on the drawings.
2. Frame – The damper frame shall be 14 gauge 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.

AIR FILTERS

INITIAL and/or PRELIMINARY FILTER (METAL MESH)

1. 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.

2. 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.

    1. b.1 Frame shall be galvanized steel with mitered corners and secured with rivets.

    2. b.2 Washable filter media shall be multiple layers of slit and expanded aluminum

    3. b.3 Media retainer shall be expanded, galvanized steel

FINAL FILTER (HEPA FILTER)

1. Specification/s:

    1. a.1 Capacity : Refer to plans/drawings.

    2. a.2 Overall dimension : Contractor to submit shop drawing for approval.

    3. a.3 Initial pressure drop : Not more than 25 mm (1 in.) of WG at rated airflow.

    4. 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.

2. Construction:

    1. 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.

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

        1. b.2a Basis weight : 80-90 gm/sq.m

        2. b.2b Thickness : not less than 0.4 mm

    3. 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.

    4. 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.

    5. 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 wth 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 GRILLES and DIFFUSERS

1. 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.

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

3. 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.

4. Connections to Ductwork – Grilles and diffusers shall be connected to the ductwork as follows:

    1) Fasten extension duct collar to the ductwork with sheet metal screws.

    2) Fasten duct ring to extension duct collar with sheet metal screws.

    3) After ceiling is installed, remove inner assembly diffuser cones and fasten outer cone to extension duct with sheet metal screws.

    4) Reinstall inner assembly cones to outer cone.

    5) Check to see if sponge rubber gasket is drawn up against ceiling forming an air tight seal. If not, reassemble and recheck.

    6) Balance and adjust air flow quantities shown on plans.

    7) Clean construction dirt from diffuser.

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

ROUND VENT CAPS

a. Description – Round type vent cap complete with screen to keep out ingress of small particles.

1. High strength stainless steel adopted
2. Coated with metallic silver paint to prevent oxidation of material

3. Three (3) pieces of spring clip to allow easy connection to pipe duct

15400 Plumbing Fixtures & Equipment

Scope of Work

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

A. Sanitary Lines / Sanitary Sewerage

Material:

- Use HDPE and fittings for sanitary lines, in conformity with the existing lines.
- Use PVC and fittings for sanitary lines, in conformity with the existing lines.
- Provide proper hanger and supports.

Application:

- Make the necessary preparation works for the installation of sanitary system

on the specified area.
- Ensure proper installation of the system, tap to the nearest sewer area.
- Testing and commissioning shall be done in the presence of the Engineer and End-User or his representative.

Plumbing Fixtures and Accessories
- Kitchen sink with complete accessories
- Lavatory counter top with complete accessories
- Water closet
- Floor drain, P-trap, and other related fixtures.
- Phenolic board urinal partition
- Submit samples for approval of CPDMO and End-Users

Manhole and Manhole cover
- Construction of Manhole with manhole cover

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
- The accompanying drawings shall indicate the general arrangement of the equipments, 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.

16050 Basic Electrical Materials and Methods

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.
- Complete supply and installation of wires and cables shall be included in this scope of works.

Conduit System

- PVC electrical conduit pipes and accessories are primarily required for this work. Conduit runs shall be well supported especially on ceiling and slab. 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.

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 Project Inspector should be done for proper installation of all wiring systems.

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 is 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, all duplex 3-wire grounding type with paneled slots receptacles minimum rating of 10 amperes at 250 volts.
- Suitable single pole and heavy-duty switches shall be installed where indicated on the plans. Item shall be presented for approval. Minor relocations and re-circuiting shall be the liability of the Contractor.
- Following features shall be as follows: one gang one-way switch; two gang one way switch; three gang one way switch, two gang three way switch, duplex flush type convenience outlet universal type complete with plate cover and strap.

Boxes and Pull boxes

- All conduit boxes and fittings shall be PVC 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.

Lighting Fixtures

- Horizontal downlight 6" diameter, flush mounted with 18 watts CFL bulb, and mirrorized reflector with semi frosted glass cover

- Heavy duty twin head emergency lamp, with 2 x 8watts halogen 6V 10Ah
- Recessed type fluorescent lamp fixture, 2 bulb with mirrorized reflector/louver complete with LED bulb direct wired 220 volt 16 watts T3 1200mm (no ballast)

Circuit breakers, Panel Boards and Accessories

- The contractor shall furnish and install the required circuit protection as shown on the plans.
- The enclosure shall be galvanized steel of code thickness and shall be installed plumb and symmetrical with the surrounding devices.
- Panel Board PPG, with Main at 50AT/100AF, 3pole, 240 volts with 6 branch circuit at
  3-30AT/50AF, 2 pole 240 volts
  3-20AT/50AF, 2 pole 240 volts
  Bolt on type, circuit breaker in Semi flush type standard enclosure with panel lock
  enamel coated finish
  20AT/50AF 2 pole 240 volts Circuit breaker in NEMA 3R enclosure
  30AT/50AF 2 pole 240 volts Circuit breaker in NEMA 3R enclosure
  50AT/100AF 3 pole 240 volts Circuit breaker bolt on type

16070 Hangers and Supports

- All electrical pipes and accessories shall be using appropriate hangers and support follow existing features. Exposed layout on walls and partition inside offices shall not be allowed. Chipping works required.

16080 Testing of System

- 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 his expense.

16090 Restoration and Repair

- Restoration and repainting of damaged walls, windows, ceiling and exposed conduits shall be the Contractors liability.

NOTE

The foregoing list of items of works does not in anyway limit the responsibility of the Contractor to perform all other works necessary for the completion of the project, **PROPOSED RENOVATION OF CLINICAL ROOM & CENTRAL LAB T&B) & REPIPING OF SANITARY LINES NIH** 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 Twenty (120) 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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