CPDMO 1201697G

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CPDMO
U.P. MANILA

PROJECT TITLE : **PROPOSED RENOVATION OF ANIMAL LABORATORY**
National Institute of Health
University of the Philippines Manila

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

**Division 1 - General**

**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.

**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 3 – Concrete

### 03050 Basic Concrete Materials and Methods

*Construction Notes*

*Footings*

- Footings are designed to rest on pile with a bearing capacity of 100KN.
- No footing shall rest on fill.
- Minimum concrete protection for reinforcement shall be:
  0.7076m clear for concrete deposited against the ground
  0.051m clear for concrete deposited against the framework

*Concrete Mixes and Placings*

- Unless otherwise specified, the minimum 28-days cylinder compressive strength are as follows:

| | |
|---|---|
| Footings and Footing Tie Beam | 21.00 MPa |
| Columns | 28.00 MPa |
| Beams, Slabs, and Stairs | 28.00 MPa |
| Reinforced Concrete Wall | 28.00 MPa |
| Bedded Slabs, Catch Basins and Sidewalk | 17.50 MPa |

- All concrete must be deposited, vibrated and cured in accordance with ACI Standard
- Stripping of forms and shores shall be as follows:

| | |
|---|---|
| Foundations | 1 day |
| Columns and Walls | 3 days |
| Beams and Girder | 21 days |
| Slabs | 17 days |

- Concrete shall be deposited in its final position without segregation re-handling or flowing, placing shall be done preferably with buggies, buckets or wheel barrows, no chutes will be allowed except to transfer concrete from hoppers to buggies, wheel barrows or buckets in which case they shall not exceed 6.00m in aggregate length. No depositing of concrete shall be allowed without the use of vibrators unless authorized in writing by the designers and only for usual conditions. Where vibrators is extremely difficult to accomplish.

*Concrete Beams*

- Camber all beams and girders at least 6.20mm for every 3.00m of span.
- For two or more layers of reinforcing bars, used separators spaced 0.914m on center and in no case shall be less than two (2) separators.
- No splice shall be permitted on beam and girders where critical bending stresses occur. Tension splice so permitted shall be 48 dia. for plain bars and 40 dia. for deformed bars. Compression splice shall be 48 dia. for plain bars and 40 dia. for deformed bars. Lap splices shall be wired together splice top bars at midspan, bottom bars at support. Bend bars at bend points in super structure. Welded splices shall be developed in tension at least 125% of the specified yield strength of the bars not more than 50% of the bars at anyone section shall be permitted to be splice
- If reinforcement bars end in wall, the clear distance for the bars to the further face of the wall shall not be less than 0.051 embedment length shall be 40 diameters for compression bars.
- Minimum concrete protection of reinforcing bars or shapes shall be as shown on the plans.
- Unless otherwise noted in plan or in specifications, camber all beams and girders at least 6.2mm for every 3.00 span except cantilevers for which the cambers shall be as noted in plans or as ordered by the designer, but in no case less than 16.7mm of every 3.00m of free span.

*Concrete Slabs*

- All reinforcement shall be 0.019m clear minimum from top and bottom of slab.

- For two-way slab along the longer span shall be placed below those along the longer span at center and over the longer span bars near the support unless otherwise indicated or shown in details the spacing of the bars at the column strips can be approximately 1 1/3 of the middle strip in no case greater than 2 1/3 times the slab thickness.
- Unless otherwise detailed in conditioning slab having same reinforcement running in one direction, reinforcing shall be bend, extended or cut as shown on plans
- Temperature bars for slab shall be generally placed near the tension face and shall not be less than 0.025 BT.
- Unless otherwise noted, all bended slab be reinforced with 10mm dia. bar at 0.25m on center E.W. at center of slab. Construction joint for slab shall not be more than 3.00m apart.
- Provide extra reinforcement at corner slab(two adjacent discontinuous edges)as shown on plan.
- Provide supplementary reinforcement at small unframed openings in floor slabs as shown on the plans.

*Concrete Columns*

- Column ties shall be protected everywhere by a covering of concrete cast monolithically with the core of min. thickness of 0.0127m and not less than ½ times maximum size of coarse aggregate where columns change in size. Vertical reinforcement shall be offset at a slope of not more than 0.021. An extra 12mm dia. at 0.076mm on center shall be provide throughout the offset region.

*Mild Steel Reinforcement*

- All mild steel reinforcement shall conform to ASTMA-15-62-2T and deformation to A-305-56T latest revision
- Development length for all bars shall be a minimum of 40-bar diameter unless otherwise specified: For reinforcing bars $\leq 12$ ; Fy = 280.0 MPa
  For reinforcing bars $\geq 12$ ; Fy = 420.0 MPa
- All bars shall be weldable.

**03100 Concrete Forms and Accessories**

*Scope of Work*

- The work covered by this Item shall consist of furnishing all concrete requirements in accordance with Plan and/or standard detail and as herein specified.
- Materials and workmanship shall conform to the requirements of the following building codes: 1) ACI 318-97, 2) AISC 1998, 3) NSCP 2001

*Material Requirements*

- Use portland cement which conforms to the requirements as ASTM C-150 Type for normal Portland cement.
- Use fine aggregates, which shall be free from injurious, amount of clay loam and deleterious materials and shall conform to ASGM C-330.
- Gravel shall be river run gravel or broken stone. The maximum size shall be 1/5 of the nearest dimension between sides of forms of the concrete or ¾ of the minimum clear spacing between reinforcing bars or between rebars and forms whichever is smaller.
- # 16 Tie wire shall be used for reinforcement bars connections.

*Construction Requirements*

- Follow plan for dimensions and rebar details of beam, columns, slabs, footing, wall footing and related sections.
- Extra reinforcing bars shall be provided for the casted mouldings, verify with the installation requirements.
- Concrete mixture shall be class "A".

- Concrete for all columns, beams, footing, shall develop minimum 28-day cylinder strength of 28 MPa, unless otherwise specified on the plans. Contractor is required to submit the testing result at his expense.

## 03200 Concrete Reinforcement

*Scope of Work*

- The work covered by this Item shall consist of furnishing all concrete reinforcement requirements in accordance with Plan and/or standard detail and as herein specified.

*Material and Construction Requirements*

- All reinforcing bars unless otherwise shown on plan shall be billet steel "structural grade" in accordance with ASTM specifications designation A-15 with deformation conforming with ASTM Specification A-305.

  For 16mmØ bars and above (Grade 60) fy = 414 MPa (60,000psi)
  For 12mmØ bars and below (Grade 40) fy = 276 MPa (40,000psi)
- All reinforcing bars shall be cleaned of rust, grease or other materials which tend to impair bond.
- All reinforcing bars shall be accurately and securely placed before pouring concrete or applying mortar or grout.
- Lapped splices shall be staggered where possible.
- Unless indicated otherwise, splicing of reinforcement shall be in accordance with ACI-318-95.
- Unless shown otherwise on plans, splices shall be as follows:
  a. Beams and Footing Tie Beam: top and bottom bars shall not be spliced within the column or within a distance of twice the member depth from the face of the column; at least two extra stirrup – ties shall be provided at all splices. The splice length shall not be less than the length in item 2.9 below.
  b. Columns: splices when permitted shall be made within the center half of column height and lap splice shall not be less than 40 bar diameter. The use of approved mechanical devices may be permitted provided that not more than alternate bars are spliced at any level and the minimum vertical distance between two adjacent bar splices shall be 600mm.
  c. CMU Walls: Vertical bars shall be spliced at the top of wall footing or tie beam and at the bottom of RC lintel beam or beams. Splice lengths shall be 600mm min.
- Unless indicated otherwise all beams terminating at the column shall have top and bottom bars extending to the far face of the column, terminating in a standard 90° hook length of anchorage not less than 600mm.
- Shop drawing for bending and cutting of reinforcement shall be submitted for approval to the engineer prior to fabrication.
- Splice length of reinforcing bars shall be as follows:

| | |
|---|---|
| For 10mmØ bars | 360mm splice length |
| For 20mmØ bars | 720mm splice length |
| For 12mmØ bars | 480mm splice length |
| For 25mmØ bars | 1200mm splice length |
| For 16mmØ bars | 600mm splice length |

## Division 4 – Masonry

**Scope of Work**

- The work covered by this Item shall consist of furnishing all masonry work requirements in accordance with Plan and/or standard detail and as herein specified.

**Material Requirements**

- Use Portland cement which conforms to the requirements of ASTM C-150 Type for normal Portland cement.
- Use fine aggregates which shall be free from injurious amount of clay loam and deleterious materials and shall conform to ASTM C-33 or C-330.
- Concrete hollow blocks, 4"and 6", shall be standard manufacture, machine vibrated, and shall have fine and even texture, and well defined edges. Mortar, filler and plastering shall be Class "A" mixture.
- Deformed steel bars shall conform to ASTM A-305. It shall be clean and free from loose, rust, scales and any coatings that will reduce bond.
- #16 tie wire shall be used for reinforcing bars connections.

**Construction Requirements**

- Provide CHB wall with 10 mm dia. deformed round bars at 0.60 m on centers both ways. Verify actual location.
- All cells shall be solidly filled with grout.
- Concrete mixture shall be class "A".
- Provide the plastering at 16 mm thick using class "A" mixture.
- Follow plan for details.

## Division 5 – Metal and Steel

### 05120 Structural Steel

*Scope of Work*

- The work covered by this Item shall consist of furnishing all structural steel requirements for trusses and dumbwaiter in accordance with Plan and/or standard detail and as herein specified.

*Material Requirements*

- *Truss 1 (TR-1)*
  Top and Bottom Chords: 2LS 50 x 50 x 6mm
  Web Members: L 50 x 50 x 6mm
- C-Purlins, 2" x 4" x 20', Ga.16
- Base Plate: 12mm thick; 8"x8"x1/2"; 12"x12"x1/2"; 12"x16"x5/8"
- Gusset Plate: 1/4" x 4' x 8'
- 12 mm dia. x 20' Round bar, Sag Rod at max. spacing of 1.2 m
- Cross bracing with turn buckle: 16mmØ
- Expansion bolts, welding rod, fastening materials
- Provide angular support bars bolted/riveted on the trusses.
- W6 x 15
- W6 x 12
- 0.25 x 0.35 x 12mm Base plate

*Construction Requirements*

- All structural steel shall have a minimum yield strength, Fy = 252.00 MPa and shall conform to ASTM A36 specifications.

- All structural steel shall be fabricated and erected in accordance with the AISC Specifications (Latest Edition) and Code of Standard practice amended to date.
- No steel shall be fabricated or erected until shop drawings have been approved by the structural engineer.
- All shop and field welding shall be in accordance with AWS D.1.1-90 and performed by qualified welders.
- Unless indicated otherwise, welding electrodes shall be E70XX, minimum thickness of weld shall be 3mm.
- Unless otherwise indicated all anchor bolts shall conform to ASTM A307 specifications.
- Bolts for member connections shall be high strength bolts, conform to ASTM A325 friction type with washers.
- All steel sections shall be primed and painted two coat with final coating color.

**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.

**Material Requirements**

(D-1 refurbishing and repainting works of doors with provision door closer and replacement of complete door accessories

D-2 single panel steel flush door GA# 18 thk.; jamb; # 16 thk complete w/ stainless push & pull handle, stainless butterfly ball bearing hinges, honeycomb insulation door closer and mortise type flush bolt/tubular deadbolt lockset laminated finish metal door req'd. set: 2 set

D-3 single panel wooden flush door, painted, complete with door accessories.

D-4 single panel wooden flush door, painted, complete with door accessories.
Submit sample/brochure/shop drawing 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**

(W-1) 6mm thk. tempered tinted/ frosted glass, awning window in aluminum powder coated finish including all accessories labor and tools
Dimension: 2.30m (W) x 1.90m (H)

(W-2) 6mm thk. tempered tinted/ frosted glass, awning window in aluminum powder coated finish including all accessories labor and tools
Dimension: 1.50m (W) x 0.60m (H)

(W-3) 6mm thk. tempered tinted/ frosted glass, awning window in aluminum powder coated finish including all accessories labor and tools
Dimension: 1.18m (W) x 0.60m (H)

(W-4) 6mm thk. tempered tinted/ frosted glass, awning window in aluminum powder coated finish including all accessories labor and tools
Dimension: 0.76m (W) x 0.60m (H)

(W-5) 6mm thk. tempered tinted/ frosted glass, awning window in aluminum powder coated finish including all accessories labor and tools
Dimension: 0.48m (W) x 0.60m (H)

Submit sample/brochure/shop drawing and layout of doors for approval of CPDMO Project Architect/Engineer and End-users.

## Division 9- Finishes

### 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.

**Material Requirement**

- (CF-01) 4.5mm thick Fiber Cement Board on 600mm x 600mm o.c. metal furring w/ proper bracket, supports (@ 600mm spacing) and finish in anti-bacterial paint, provide manhole.

**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.

### 09600 Flooring

**Scope of Work**

- The work covered by this Item shall consists of furnishing all floor finishes, including all necessary surface preparations, floor leveling, materials, labor, tools equipment and in accordance with Plan and/or shop drawings and as herein specified.

**Material Requirement**

- 2mm thick rolled vinyl sheet with antibacterial property including all preparation, floor leveling, welding rod and all necessary accessories for proper termination and installation.
- 300mm x 300mm Ceramic Floor Tiles
- Submit sample and layout of tiles for approval of CPDMO Project Architect/Engineer and End-users.
- Provide transition strip.

**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.

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**

- Dirt Resisting Latex Paint (topcoat) semi-gloss
- Submit color scheme to the Project Engineer / Architect in-charge for approval.

**Application**

- 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 12 – Furnishings**

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 TABLE 1 3/4" marine plywood in high pressure laminated(HPL)
in 2"x2" tubular frame, painted
dimension info: 2400 mm(L) x 400 mm(W) x 850mm(H)

STAFF TABLE 2 3/4" marine plywood in high pressure laminated(HPL)
in 2"x2" tubular frame, painted
dimension info: 1200 mm(L) x 400 mm(W) x 850mm(H)

STAFF CHAIR height adjustable tilting headrest
seat: height adjustable arm: height adjustment armrest;
back: high; base: nylon base with castor in black finish
upholstery: backrest in black mesh & seat in black fabric finish

CENTER TABLE 16 mm thick, acid, heat, stain, scratch and chemical resistant solid phenolic resin counter top powder coated metal base frame and legs and two (2) unit mobile pedestal 1740mm(L) x 890mm(W) x 850mm(H)

SIDE TABLE WITH HANGING CABINET 16 mm thick, acid, heat, stain, scratch and chemical resistant solid phenolic resin counter top powder coated metal base frame and legs and two (2) unit mobile pedestal
hanging cabinet: glass swing door with highly pressurized laminated frame with adjustable shelves
dimension info: side table 2890(L) x 600mm(W) x 900mm(H); hanging cabinet 2590(L) x 520 mm(W) x 900mm(H)

COUNTER SINK 1 stainless counter w/ deep sink see sample and eyewash
dimension info: 1660 mm(L) x 600mm(W) x 900mm(H)

COUNTER SINK 2 stainless counter w/ deep sink see sample and eyewash
dimension info: 2030 mm(L) x 600mm(W) x 900mm(H)

Fire Safety Cabinet

## Division 14 – Conveying Systems

### 14100 Dumbwaiters

**Scope of Work**

- This item shall consist of supply and installation of dumbwaiter 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

## Division 15 – Mechanical

### 15700 Ventilating and Air-Conditioning System

**Scope of Work**

- This item shall consist of supply of all exhaust 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

**Material Requirements**

**Air-conditioning Units**

DX split type (inverter)
FCU/ACCU GF-1 ceiling concealed ducted type (3.0 HP)
FCU/ACCU 2F-1 ceiling concealed ducted type (3.0 HP)
FCU/ACCU 2F-2A & 2B ceiling concealed ducted type (2.0 HP)
Control Timer

**Exhaust Fan**

EF GF-1 (100 CFM @ 0.25" WG TSP)
SF 2F-1A & 1B (400 CFM @ 1.0" WG TSP)
EF 2F-1A & 1B (400 CFM @ 1.50" WG TSP)
Control Timer and Interlock

**Ceiling Cassette**

EF GF-2
EF 2F-2
EF 2F-3

**Vacuum Pump**

DZS65 Vacuum Pump with Element, gearbox and drive train all mounted on a common base frame
Canopy to reduce noise and to offer sleek clean exterior
Vibration reducing feet
Female threaded inlet and exhaust connection for easy piping up
Integrated exhaust silencer
Inlet non-return check lave
IE3 electric motor (inverter rated)
Motor coupling with integrated cooling fan
Vacuum relief valve
Robust material of construction with stainless steel claws and coated internals

G.I Sheet Metal Duct (incl. elbows, fittings, etc.) G.A. # 26 & G.A # 24 complete with plenums as shown on plans
PVC Duct
Air Filters
Grilles and Diffuser
Hanger and Support

## 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 Requirements:**

Use PPR pipes and fittings for waterline, in conformity with the existing lines.
Use PVC & HDPE combination pipes 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
Water closet
Floor drain, P-trap, and other related fixtures.
Phenolic board urinal partition
Submit samples for approval of CPDMO and End-Users

## 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**

- Recessed type LED Panel Daylight, 600x600mm, 35W, 230V
- Recessed type LED Panel Daylight, 150x150mm, 12W, 230V
- Emergency light 2-1.5W LED (22hrs)

- 220V AC Electronic Light Switch Weekly Programmable LCD Digital Timer Electronic Switch Relay (Lightings and Motors switch)
- Push Button Timer Switch Indicator
- Contactor for 0.5hp motor (Exhaust and Fresh air motor)

**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.
- PPLO Main @ 75AT, 3 pole, 250V, 22KAIC with 12 branch circuits @ 2-15AT, 2 pole, & 10-20AT, 2 pole bolt-on type.
- PB-VENT. Main @ 60AT, 3 pole, 250V, 18KAIC with 7 branch circuits @ 2-20AT, 2 pole, 2-30AT, 2 pole & 3-40AT, 2 pole bolt-on type.
- DP Main @ 200AT, 3 pole, 250V, 35KAIC with 4 branch circuits @ 1-50AT, 3 pole, 1-60AT, 3 pole, 1-75AT, 3 pole & 1-30AT, 3 pole bolt-on type.
- 40AT, 2 pole, NEMA 3R, ECB
- 30AT, 2 pole, NEMA 3R, ECB
- 200AT, 3 pole, NEMA 1 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 any way limit the responsibility of the Contractor to perform all other works necessary for the completion of the project, **PROPOSED RENOVATION OF ANIMAL LABORATORY**, National Institutes of Health, 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 Fifty (150) 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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