



PROJECT TITLE : PROPOSED RENOVATION OF COMMON TOILETS OF THE
CENTURY OLD RIZAL HALL
College of Arts and Science, University of the Philippines Manila

SUBJECT : SCOPE OF WORK AND TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL

01 00 00 General Requirements

- 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.
- All Contractors submitting proposals 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.
- The Contractor shall coordinate his work with all parties to ensure proper phasing or comply with the approved 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.
- A logbook shall be available at the site. It shall contain the daily activities in the site, including but not limited to weather conditions, delivery, manpower and other matters pertaining to the condition of the project. It will also serve as data for Contractor and the Project Inspector and shall be surrendered to the CPDMO at the end of the project.
- Identification Cards of construction workers and engineer/representative shall be supplied by CPDMO. 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. The contractor shall coordinate with the mobilization requirements during the pre-construction meeting for the issuance of the IDs.
- 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.
- The contractor shall submit at least three (3) options per item for approval. Complete specifications with product samples 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.
- Regular coordination meetings shall be conducted with CPDMO, Contractor and End-user for proper project monitoring.
- Existing conditions of the work site shall be documented by the contractor and photos shall be taken before commencing of work to ensure such status. Any damage to the areas due to the contractor's on-going work shall be refurbished at his expense.

- 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 an A3 sheet for checking and approval of Project Architect/Engineer. Final "As built plans" shall be submitted in 20" x 30" tracing sheets, 3 blueprints with signature of project engineer, and an electronic AutoCAD drawing file. A copy of the technical documents and warranties of the items shall also be submitted in soft and hard copies.
- 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.
- All materials removed from the unit shall be properly documented prior to turn-over to the End-user for proper safe keeping. The turn-over document shall be attached to the contractor's final billing.
- The contractor shall submit the monthly progress report with attached highlighted plans for the completed works to the CPDMO. This shall be evaluated by the project architect/engineer and will be the basis of the progress billing.

01 30 00 Administrative Requirements

Submittals (Shop Drawings, Product Data and Samples)

- The contractor shall submit to the CPDMO shop drawings, product data and /or samples of all materials for review. Submit at least three (3) options per material for approval.
- The CPDMO's review shall be limited to the 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 commence 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 based on the signed and approved sample materials.
- All submittals shall be channeled from General Contractor to CPDMO, Planning and Development Department, 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. The Contractor will make all corrections noted on check sets, if necessary, and return for review as required by CPDMO.
- No submittal shall be received by the CPDMO without a transmittal letter.
- Samples must have the Manufacturer's Data Sheet/Specification and must come together with a transmittal sheet with a section for approval/disapproval and recommendation of CPDMO and/or END USER.

01 40 00 Quality Requirements

Quality Control

- Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality. Perform quality control procedures and inspections during installation.

- Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate. Comply with manufacturers' tolerances.
- For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- Site monitoring is 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 meetings shall be done between the contractor or its representative and the Project Architect/Engineer concerned at CPDMO.

01 50 00 Temporary Facilities

- Provide Temporary GI sheets or Board enclosures on all areas for building protection. Such coverings shall be adequate enough to cover all building facilities within the working area throughout the span of the project.
- Charges for restoration or replacement of any damaged facility, equipment, material, and the like shall be from the contractor due to his negligence in providing suitable temporary covering.
- Provide 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 part of their basic equipment.
- Provision of electric and water submeters shall be included in the quotation to be charged to the contractor's overhead. All utility consumption in the provided meters shall be computed based on approved rates by UP Manila. Payment of bills shall be made thru the Cashier's Office monthly as attachments to progress billings

01 74 00 Cleaning and Waste Management

- 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.
- Conduct cleaning daily after work and disposal of debris weekly.

DIVISION 2 – EXISTING CONDITION

02 20 00 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.

02 23 00 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.

02 29 00 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.

DIVISION 8 – OPENINGS

08 00 00 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

Location: GF-3F Toilets

- (D-1) 0.80 m (L) x 2.10 m (H)
Single-leaf single action swing 50 mm thk solid kd tanguile, ducco painted finish.
Panel: 50 mm thk solid kd tanguile, ducco painted finish
Jamb: 50 mm x 100 mm gauge # 16 galvanized iron (g.i) jamb andheader, single rabbet
Fire Rate: fire rating 1.5 hours 30-35 sound transmission class(stc)
Hardware:
a. 4 pairs 5 knuckle, ball bearing, full mortise standard weight stainless steel hinge w/ stainless steel pin.
b. 1 set privacy lock lever lockset (4000 series and up)
c. 1 set heavy duty cast iron cylinder surface mounted door closer aluminum finish. (60 kg-weight cap.) iso9002.
d. threshold with door bottom sweep/seal.

Location: 3F Gender Comfort Room & 3F Access to Roof

- (D-2) 0.70 m (L) x 2.10 m (H)
Single-leaf single action swing 50 mm thk solid kd tanguile, ducco painted finish.

Panel: 50 mm thk solid kd tanguile, ducco painted finish

Jamb: 50 mm x 100 mm gauge # 16 galvanized iron (g.i) jamb and header, single rabbet

Fire Rate: fire rating 1.5 hours 30-35 sound transmission class(stc)

Hardware:

- a. 4 pairs 5 knuckle, ball bearing, full mortise standard weight stainless steel hinge w/ stainless steel pin.
- b. 1 set privacy lock lever lockset (4000 series and up)
- c. 1 set heavy duty cast iron cylinder surface mounted door closer aluminum finish. (60 kg-weight cap.) iso9002.
- d. threshold with door bottom sweep/seal.

08 06 50 Window Schedule

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.

Location: 2F – Lab Male CR

- (W-1) 1.96 m (w) x 2.40 m (h) fixed, awning, and casement type window with 6mm thk tempered clear glass with 8 mil security film on aluminum powder coated frame, 3m diffuser film to match pantone, complete with acc's & installation.

Location: 2F – Male Faculty Toilet

- (W-2) 1.50 m (w) x 2.40 m (h) fixed and casement type window with 6mm thk tempered clear glass with 8 mil security film on aluminum powder coated frame, 3m diffuser film to match pantone, black out window sticker complete with acc's & installation.

Location: 2F – Female Common & Faculty Toilet

- (W-3) 1.50 m (w) x 2.40 m (h) fixed and casement type window with 6mm thk tempered clear glass with 8 mil security film on aluminum powder coated frame, 3m diffuser film to match pantone, black out sticker for privacy complete with acc's & installation.

Location: 3F – Male and Female Faculty Toilet

- (W-4) 1.50 m (w) x 1.85 m (h) fixed and casement type window with 6mm thk tempered clear glass with 8 mil security film on aluminum powder coated frame, 3m diffuser film to match pantone, black out sticker for privacy complete with acc's & installation.

Location: 3F – Male and Female Faculty Toilet

- (W-5) 1.50 m (w) x 1.85 m (h) fixed and casement type window with 6mm thk tempered clear glass with 8 mil security film on aluminum powder coated frame, 3m diffuser film to match pantone, black out sticker for privacy complete with acc's & installation.

DIVISION 3 – CONCRETE

03 10 00 Concrete Forming

- The Contractor shall be responsible for the design, erection and adjustment of all formwork and false work in accordance with Section 5.06, "National Structural Code for Buildings".
- All materials used in construction and support of formwork shall be of timber. Alternative materials shall only be used with the Project Engineer's approval.
- It shall be the Contractor's responsibility to ensure that the forms are placed to the shape, lines and dimensions as indicated on the drawings, and they shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete. The Contractor shall ensure that the forms are maintained rigidly in position and be sufficiently tight to prevent excessive leakage of mortar.
- All debris particularly chipping, shavings and sawdust, shall be removed from the interior of the forms before the concrete is placed. All form surfaces shall be cleaned and thoroughly wetted before pouring of concrete.
- Before the placement of any concrete, the Project Engineer shall inspect the formwork and may, at his discretion, reject any materials or forms that do not conform to this specification.
- The deflection of forms between joints and/or studs shall not exceed one five-hundredth (1/500) of the joints or stud spacing.
- The recommended minimum stripping for horizontal slabs shall be twenty-four (24) hours after the approval of the Project Engineer prior to the removal of any forms.

03 11 00 Cast-in-Place Concrete

Basic Materials & Methods

- The work to which this refers includes all operations necessary for the supply and delivery of all materials, labor, equipment and all associated activities. This shall conform in the recommendations of the "National Structural Code for Buildings" published by the Association of the Structural Engineers of the Philippines, together with the latest editions including all revisions of the following standards:
 - ASTM C-31 Method of making and Curing Concrete Compression and Flexure Test Specimen in the Field.
 - ASTM C-33 Concrete Aggregate
 - ASTM C- 39 Method of the test for Compressive Strength of Molded Concrete Cylinders.
 - ASTM C- 94 Ready Mixed Concrete
 - ASTM C-143 Test of Slump for Portland cement Concrete.
 - ASTM C-140 Portland cement
 - ASTM A-615 Deformed and Plain Steel Bars for Concrete Reinforcement.

Material Requirements:

Lavatory Counter Slab and Support

Concrete Design Mix : 3000 PSI

Slab

- 75mm thk Concrete Slab for lavatory counters
- Location: 2F – 3F Male and Female Common & Faculty Toilets
- Follow plans for details

Beam Support

- L (varies – lavatory plan) x 300mm (H) x 150 mm thk beam support
- Location: 2F – 3F Male and Female Common & Faculty Toilets
- Follow plans for details

Column Support

- 150mm x 150mm concrete column support
- Location: 2F – 3F Male and Female Common & Faculty Toilets
- Follow plans for details

Quality of Concrete:

- The quality of concrete shall comply with Section 5.04 of the National Structural Code of the Buildings and with the specific requirements outlined in the various sections of these specifications
- Testing of samples from concrete pours shall be as required by Section 5.05 of the National Structural Code of Buildings
- Test of specimen shall be deemed acceptable provided they meet the requirements of Section by 5.04 clauses (e) of the National Structural Code of Buildings
- Should further testing of the finished concrete be necessary due to non-compliance of test specimens, as required by the Project Engineer, it shall be carried out in accordance with the approved procedures laid down in National Structural Code of Buildings. Section 5.04 clause (e)
- Hardened concrete that is deemed not to comply with the specifications above, but which the Project Engineer permits to be further tested, shall be tested for compressive strength
- Any concrete will be rejected under the specifications above if the results fail to meet the requirements Section 5.03 of National Structural Code of Buildings.
- Hardened concrete may also be rejected for any one of the following conditions:
 - a. It is porous, segregated or honeycombed.
 - b. Its placing has been so interrupted that there is a construction or similar joint not in accordance with Section 5.03, clause (d) of the National Structural Code of Buildings.
 - c. The reinforcing steel it incorporates has been displaced,
 - d. Construction tolerances have not been met.
 - e. The required surface finish has not been met.
 - f. The concrete can be shown to be otherwise defective.

When the above things happened, the Project Engineer has the option to let the Contractor to demolish the rejected portion.

Scope of Works / Method of Activities

- Concrete shall not be placed until all formworks, installation of reinforcement, embedded parts and the preparation of surfaces have been approved. Prior to concreting, the contractor shall submit a proposed pouring schedule for the various stages of the work. No concrete shall be poured prior to the approval. Subsequently, the contractor shall give the RE twenty-four (24) hour notice of his intention to proceed with the stage of the work.

- All batches of mortar or concrete shall be adjusted as to within the capacity of the mixer. When cement is delivered in bags, the batch shall be so proportioned as to use of only full bag batches.
- Hand mixing will not be permitted except by written permission from Project Engineer and only in such manner as he may direct.
- All mortar and concrete shall be used while fresh and before there is evidence of initial set. No re-tempering of mortar or concrete shall be undertaken.
- Ready mixed concrete (i.e., off-site transit mixed concrete) shall comply with ASTM C-94 and the requirements herein.
- Batch deliveries shall not exceed the rated capacity specified for the mixer by its manufacturer. The Contractor shall submit affidavits for the approval of the Project Engineer from the ready-mix concrete suppliers, certifying that the proposed mix to be supplied shall satisfy the requirements of this specification.
- All concrete shall be ready mixed unless approved otherwise by the Project Engineer in writing. Concrete not ready mixed shall comply with the National Structural Code for Buildings.
- The surfaces of measuring, mixing, and transporting equipment that will be in contact with concrete shall be clean at the commencement of the mixing operation.
- The accuracy of weighing equipment and the accuracy of batching shall comply with the applicable requirements of ASTM C-94 and its reference standards. The materials shall be as measured as to give the required mixed proportions.
- Cements and aggregates shall be measured by weighing or any method approved by the Resident Engineer.
- The device employed to measure and discharge the amount of water for the mixture shall be capable of adjustment and checking.
- Water carried by aggregate, in excess of those giving saturated surface-dry conditions shall be considered as part of the required mixing water.
- Mixing shall be done in mixer of approved type.
- Concrete shall be mixed until the material are uniformly distributed and shall be discharged completely before the mixer is recharged.
- The time of mixing shall not be less than one and one half (1 ½) minutes after all ingredients are in the mixer, unless it is shown that the uniformity requirements of the appropriate reference standards are met by an alternative time that shall be agreed to by the Resident Engineer and confirmed in writing.
- No concrete shall be placed until the depth and character of the foundation materials, the forms and false work and the placement of the steel reinforcement had been inspected and approved by the Resident Engineer. Before depositing concrete, all debris, foreign matter, dirt and water shall be removed from the forms, and the surface of any concrete previously placed shall be cleaned and brushed with cement paste.
- No concrete shall be placed on filled ground until the Resident Engineer has approved the standard of compaction of the sub-grade.
- All concrete shall be placed in daylight or under such lighting condition that may be approved by the Resident Engineer.
- The method and manner of placing concrete shall be such as to avoid the possibility to segregation of the concrete materials or the displacements of the reinforcement. Where troughs or chutes are used in placing concretes, their angle of inclination with respect to the horizontal shall not exceed thirty (30) degrees. When a pipe is used, it shall be kept full of concrete with its discharged and submerged.
- Concrete shall not be allowed to drop into place from a height exceeding one (1) meter.

- The placing of concrete shall be evenly regulated to avoid the depositing of a large quantity at any one point. Concrete in horizontal layers shall be deposited as near practicable to its final position in the forms.
- Concrete shall be deposited in a continuous operation as far as it is practicable to do so and shall avoid initial set starting in any part of the work before fresh concrete can be placed against it.
- Compaction of concrete shall be by approved immersion type vibrators. Vibration shall be limited to the time necessary to produce thorough compaction of the concrete without segregation. Under no circumstances shall vibrators be used to move concrete laterally, nor shall it be allowed to penetrate concrete in the prior lift.
- During placing and until curing as specified is completed all new concrete shall be protected against the harmful effects of exposure to the elements and to running water either as specified or as directed by the Resident Engineer.
- When concrete hardens sufficiently it shall be covered with damp, close-woven burlap or similar material, or clean sand, which shall be kept thoroughly saturated over a period of ten to fourteen days. Where wood forms are used, they shall be kept wet for the same period to prevent openings at the joints and drying out of the concrete.
- Precautions shall be taken to avoid premature stiffening of the fresh mix and to reduce water absorption and evaporation losses.
- If the temperature of the surrounding air is higher than 32 C, the following shall be applied unless otherwise documented by the Resident Engineer.
- The formwork shall be continually sprayed with cold water in advance of the concreting and excess water shall be removed from the inside of the forms immediately prior to the placement of concrete.
- The reinforcement and the formwork if metal forms are used shall be protected from the effects of hot winds and direct sunlight.
- Suitable barriers shall be provided to protect the freshly placed concrete from wind, until the concrete is hardened sufficiently to allow it to be covered,
- The concrete shall be held to a temperature of 32 C when being poured.
- The concrete shall be mixed, transported, placed and compacted as rapidly as possible and shall be then covered with an impervious membrane and shall kept wet for curing.

Finishing in Concrete

- Allowable deviations from plumb or level and from the alignment, profile grades and dimensions shown on the drawings are defined as "tolerances" and are to be distinguished from irregularities in finish. Surface irregularities are classified as abrupt or gradual. Off-sets caused by displaced or misplaced from sheeting, from lining, form section, loose knots or otherwise defective form timber will be considered as abrupt irregularities and will be tested either by a straight edge or its equivalent for curved surfaces.
- Immediately after removal of forms all pins and loose materials shall be removed. "Honey-combing" aggregate pockets, voids and holes shall be cut back to solid concrete. All repair of imperfection in concrete shall be completed within twenty-four (24) hours after removal of forms.
- Dry pack concrete shall be used for filling holes having at least one surface dimension, little if any, greater than the hole depth and for narrow slots out for repair or cracks.
- Mortar filling shall be used for repairing defects which are too wide for dry pack filling, too shallow for concrete filling and too deeper than the far side of the reinforcement that is nearest to the surface.

- Concrete filling shall be used for holes extending entirely through concrete sections for holes that are greater in area than 0.1 square meters and deeper than 100 mm and for holes in reinforced concrete which are greater in area than 0.1 square meter and which extend beyond the reinforcement.
- Surfaces of work carried out in accordance with this specification above shall be prepared by thoroughly roughening and cleaning so that all loose or soft material, free water, foreign matter and laitance are removed. At the time of placement of the fresh concrete, the joint surfaces of the hardened concrete shall be damped but there shall be no water.

03 20 00 Concrete Reinforcing

- All steel bars to be used during construction should be in accordance with the guidelines of National Structural Code for Buildings.
- The support and tolerance in placing of reinforcement shall comply with section 5.07 of National Structural Code of Buildings.
- Lap splicing and or welding of reinforcement shall comply with section 5.07 "National Structural Code of Buildings".
- Welding of reinforcement shall not be carried out unless shown on the drawings, specified, or otherwise approved by the Resident Engineer.
- Welding if approved shall not be carried out within 75mm of a bend having internal diameters, or any part of a bar that has been bent in reverse direction or straighten.

Requirements:

Lavatory Counter Slab and Support

Slab

- 10mmØ @ 200mm for reinforcing bars both ways with standards hooks and anchorage.
- Follow plans for details

Beam Support

- 16mmØ RSB for top and bottom bars tied with standards hooks and anchorage.
- 10mmØ RSB for beam stirrups spaced at 150mm.
- Follow plans for details

Column Support

- 4 – 12mmØ RSB for Vertical Main Bars with standard hooks and anchorage.
- 10mmØ RSB for column lateral ties with spacing 3 @ 50mm, rest @ 150 mm.
- Follow plans for details

DIVISION 9 – FINISHES

09 30 00 Floor Finishes

Scope of Work

- The work covered by this item shall consists of furnishing all floor 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 repair and retouching of affected existing floor finish.

Material Requirements

- Code: AWC610 same with existing tiles from previous renovation at 3F.
- Location: Laboratory Toilets Male & Female
- Submit sample and tile layout for approval of CPDMO Project Architect/Engineer and End-users.

Construction Requirements

- Provide all the necessary surface preparation of for new floor finishes.
- Provide all the necessary accessories and materials for proper installation.
- Ensure proper leveling in all surface
- Restore all affected areas.

09 50 00 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 include replacement of affected ceiling by ventilation system, ceiling to be repaired.

Material Requirements

- (CF-01) Use 0.60m x 0.60m x 4.50mm thick fiber cement board ceiling tile on T-runner complete with hangers and supports in paint finish.
- Replace and repair the affected ceiling by newly installed ventilation system.
- 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.
- Rubbing down between coats is to be done with fine abrasive paper.

09 70 00 Wall Finishes

Scope of Works

- 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.

Materials Requirements

- 0.60 x 0.60 m Porcelain wall tiles (polished) rest painted finish for new lavatory counter supports. To match existing toilet wall tiles and restore affected portions.
 - Location: 2F-3F Lavatory counter concrete supports

- Installation of board-up 9mm thk. ficem board on metal frame with painted finish at existing windows.
 - Location: 2F-3F Male and Female Laboratory Toilets
- 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 wall finishes.
- Materials shall be subjected to the approval of the supervising CPDMO's Project Architect / Engineers / Inspectors.

09 60 00 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

- 0.60 m x 0.60 m x 10 mm thk. Homogenous Porcelain unglazed floor tiles with expansion joints and to match existing toilet floor tiles. (For completion works at 2F – 3F Male and Female Laboratory Toilets)
- Submit sample and layout of tiles for approval of CPDMO Project Architect/Engineer and End-users.

Application

- Existing floor shall be prepared to level the floor finish with the hallway flooring or subject to particular instruction and approval of the Project Engineer/Architect.
- Tile gap must be uniform.
- 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.

DIVISION 10 – SPECIALTIES

10 60 00 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 accordance with applicable drawings, details and these Specifications.

Material Requirement:**Location: 2F & 3F Male and Female Common and Faculty Toilets**

- Additional laminated phenolic board to cover remaining gap between existing and toilet cubicle.
 - ¼"thk Laminated Phenolic board
 - Provide all the necessary accessories for the proper installation.
 - Match height and finish to existing toilet partitions.
- Follow plan for details.

Final Touch-Up

- Upon completion, finish work shall be touched-up and restored where damaged and left in good condition.

09 99 90 Paints Restoration

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

DIVISION 12 – FURNISHING**12 30 00 Casework****Scope of Work**

- The work covered by this item shall consists of furnishing all lavatory carcass and solid surface, equipped with fixing accessories including materials, labor, tools equipment and in accordance with Plan and/or shop drawings and as herein specified.

Material Requirements

- Wall-mounted lavatory counter 12mm thk solid surface, 100mm splashboard. Includes surface preparation, surface adhesive, silicon sealant and top surface refurbishing.
 - Location: 2F - 3F Male and Female Common & Faculty Toilets

Final Touch-Up

- Upon completion, finish work shall be touched-up and restored where damaged and left in good condition.

12 40 00 Furnishing and Accessories**Scope of Work**

- The work covered by this item shall consists of furnishing all toilet accessories, equipped with fixing accessories including materials, labor, tools equipment and in accordance with Plan and/or shop drawings and as herein specified.

Material Requirements

- Wall mounted soap dispenser
 - Location: 2F - 3F Male and Female Common & Faculty Toilets, Male and Female Laboratory Toilets, Gender CR, and PWD
- 0.30m x 0.30m Toilet Signage Vinyl stickers with 3mm thk. Acrylic clear, laser cut-out Acrylic black 3mm, Acrylic letter and symbol for 2F – GF Male & Female Common and Faculty,

Laboratory , PWD & Gender Toilets.

- Follow plan for details.

Final Touch-Up

- Upon completion, finish work shall be touched-up and restored where damaged and left in good condition.

DIVISION 15 – MECHANICAL

15 70 00 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 Contractor 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

- 1) 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.
- 2) 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.
- 3) 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.

- 4) 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 placed 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, plasters, 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.

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

- 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. 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

2. 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.

3. 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 Distribution System

1. 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.

DIVISION 22 – PLUMBING

22 05 00 Common Work Results for Plumbing

Scope of Work

- This item shall consist of supply of all plumbing system as indicated in the plan with complete 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.
- Pump House (Ground Floor – near entrance gate)
 - Installation of 2 Set of Transfer Pump, 1 Alternate Control Panel and Float Switch at roof deck with complete set of Valves, Accessories and Supports.
- Ground Floor
 - Continuity of Soil Stack Riser, ground floor above ceiling to basement level.
 - Tapping of Soil Stack Riser to Septic Tank
 - Plugging of all unused pipe stub-out.
 - Piping of Sewer Collector Line including pipe stub-out for common toilets.
 - Piping of Waterline (branch line) including stub-outs for toilets.
 - Water Pipe Riser from basement to roof deck (elevated water tank).
- Second Floor (Functional of Common Toilets)
 - Installation of Countertop Lavatory with complete set of Faucet & Accessories
 - Supply and installation of 2-way angle valve and Bidet for installed Water Closet.
 - Installation of Kitchen Sink
 - Supply & installation of grease trap including piping works (tapping)
 - Plugging of unused pipe stub-out.
 - Application of Sealant for all plumbing fixtures.

- Functionality test for all plumbing fixtures.
- Third Floor (Functional of Common Toilet)
- Tapping of Waterline supply at Roof Deck to Elevated Water Tank
- Installation of Countertop Lavatory with complete set of Faucet & Accessories
- Supply and installation of 2-way angle valve and Bidet for installed Water Closet.
- Installation of Kitchen Sink
- Supply and installation of grease trap including piping works (tapping)
- Plugging of unused pipe stub-out.
- Application of Sealant for all plumbing fixtures.
- Functionality test for all plumbing fixtures.
- Roof Deck (Waterline System)
- Supply and installation of water meter with complete set of gate valve and check valve
- Tapping of waterline for common toilet (male & female)
- Waterline piping going to laboratory wing for laboratory common toilet

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

Sanitary Lines / Sanitary Sewer / Vent Line

- Use Polyvinyl Chloride (PVC) Series 1000 pipes and fittings for sanitary lines (sewer, vent and waste pipes), conforming to ASTM 2729 with Izod impact test of joules (minimum) and tensile strength of 48MPa (minimum). Pipes shall be made of virgin PVC resin and compound with cell #12454D. Fittings shall conform to ASTM 3311. Pipe and fittings shall be lead free. Jointing shall be by solvent cement.

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.

Jointing

- PVC Pipes and Fittings - PVC cement or as per the Manufacturer's recommendations.

Supports

- Horizontal lines shall be supported by well secured length heavy duty strap hangers or floor chairs as required. Vertical lines shall be secured strongly by hooks to the building frame and suitable bracket or chairs shall be provided at the floors from which they start.

Cleanouts

- Cleanout shall Cast Iron body and Brass Type Cover and to be of the same size as the pipe, the location of which is extended to an easily accessible place.

Floor Drain

- Floor drain shall Cast Iron body and Brass Type Cover and to be of the same size as the pipe.

Restoration Works

- All the necessary restoration works in all affected areas in the implementation of the project shall be the Contractors liability.

Plumbing Equipment, Toilet Fixtures, and Accessories

- Two (2) set of Transfer Pump, Horizontal End Suction, complete with pump control panel, drivers, VFD and accessories. 5 HP, 75GPM, 110 FT.TDH (Runs Alternating, 1 Duty, 1 Stand-by)
- Motor Control Panel (Alternate Control) 5 HP, 230V, 3-Phase complete with 2 - MAGNETIC CONTACTOR LC1-D32, 2 - OVERLOAD RELAY LRD-32, 2 - PUSH BUTTON GREEN, 2 - PUSH BUTTON RED, 2 - PILOT LIGHT GREEN, 2 - PILOT LIGHT RED, 2 - PILOT LIGHT YELLOW, 1 - SELECTOR SWITCH 3 POSITION, 2 - TERMINAL BLOCK
- Gate Valve - Threaded Brass Type
- Check Valve - Threaded Brass Type
- Water Meter Jet - 1½" Ø Water Meter Jet, Cast Iron complete with tailpiece, cover & other accessories (Materials approved by Maynilad/ Maynila Water/ Authorized Distributor)
- Grease Trap - Stainless Steel Grease Trap Interceptor, 7GPM, 2 Chamber with Stainless Steel Strainer, Side Inlet with Catch Clamp/Clip
- Spray hand bidet - Abs plastic with polished finish; Wall installation
- Single bowl undermount stainless steel satin finish kitchen sink
- Stainless steel satin finish deck mount kitchen faucet

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.

DIVISION 26 - ELECTRICAL

26 05 00 Common Work Result for 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 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.

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.

Hangers and Support

- 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.

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 no additional cost to the end user.

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 and other electrical component in toilets areas.
- Chipping and restoration of all affected areas due to project implementation including repainting
- Use Existing panelboards. Tap to spare circuit breakers
- Splicing box shall provide by the contractor (refer to detailed plans)
- Testing and commissioning

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.

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 simplex-type, duplex-type, universal & flush-type with fire-resistant non-absorptive bases, minimum rating of 16 amperes at 250 volts wide series.
- 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, single flush type convenience outlet universal grounding type.
- Supply and installation of 300mm x 300mm metal square pull box and

Lighting Fixtures:

Supply and Installation of the following lighting fixtures:

- 18W LED Bulb, Daylight
- Recessed Mounted LED Downlight, Daylight, 18W with Vertical Downlight Recessed Type Mount
- Wall mounted LED Light, 9W, Warmwhite
- Battery Pack Emergency Light with 2x3W LED lamp, Nickel Cadmium, 3 hours
- Battery Pack Emergency Light with 1x8W LED Lamp, Nickel Cadmium, 3hrs duration
- Dismantling of all existing electrical components to give way for the new electrical devices and wirings.
- Confer to Project Engineer the brand and approved equivalent.
- Provide sample material for approval.

26 20 00 Low-Voltage Electrical Distribution

Scope of Works

- Supply and Installation of Switchboards, Panelboards and Enclosed Circuit Breakers for Ground to Third floor. The enclosure shall be galvanized steel of code thickness, powdered coated enamel finish and shall be installed plumb and symmetrical with the surrounding devices.
- Dismantling of all existing panelboards and other electrical components.
- PVC with fittings and complete accessories
- 2" x 4", 4" x 4" PVC utility and junction boxes and 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.
- Submit for approval shop drawings for switchboards, panelboards, and enclosed circuit breakers.

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 COMMON TOILETS OF THE CENTURY OLD RIZAL HALL at the College of Arts and Science, 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. The contractor shall replace and repair items to the satisfaction of the Project Architect / Engineer and/or to the Chief of CPDMO on any part or portion of the work which may fail within a period of one (1) year after the final acceptance of the project.

COMPLETION PERIOD

The Contractor is given additional **NINETY (90) calendar days** to execute the works including the installation of all system requirements. The Contractor shall coordinate to the CPDMO Inspector and End-users for the schedule of testing of systems and other related jobs.

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