

General Requirements contain provisions and requirements essential to these specifications; and apply to this Section, whether or not referred to herein.

SCOPE OF WORK

The Contractor shall hire the services of an approved or accredited pesticide company to furnish all labor, materials, equipment, tools, plant, and services to complete the termite and "bukbok" proofing work hereinafter described.

EXAMINATION OF SITE

Inspect the site of work and examine the premises to fully understand existing conditions with respect to the work involved. Prior to soil stripping, excavation or filling all termite mounds within the area should be demolished, removed and treated.

MATERIAL REQUIREMENTS

CHEMICALS AND EQUIPMENT

For termite proofing, use Termiticide Concentrate acceptable to the PPA and should have license from Fertilizer and Pesticide Authority.

For "bukbok" proofing of kiln dried wood and for untreated wood, use chemical name accredited name/or acceptable to the PPA and should have valid license from Fertilizer and Pesticide Authority (FPA).

The pest control Contractor shall submit the specified chemicals in their original manufacturer sealed containers to the Project Inspector of inspection, sampling and safekeeping. Containers with broken seal shall not be accepted.

Dilution ratings (for Termicide Concentrate):

1 part Termicide Concentrate TC to 50 parts water

Pesticides - 1 : 100 concentration

Dilutions shall be done only at the jobsite in the presence of the Project Inspector. The strength of the mixture or solutions shall be made uniform by thorough stirring. All solutions prepared for termite proofing shall be used within 24 hours.

EXECUTION

CONTRACTOR LICENSE AND CERTIFICATION REQUIREMENT

The pesticide company should have a valid license from Fertilizer and Pesticide Authority of the Department of Agriculture.

All pesticide shall be applied by or under the direct supervision of a certified pesticide applicator.

ENVIRONMENTAL AND SAFETY CONDITIONS

Formulation, treatment, storage and disposal of pesticide shall be in accordance with label directions. Water for formulation shall be drawn only from site(s) designated by the Project Inspector, and the filling hose shall be fitted with a backflow preventor meeting local plumbing codes/standards. The filling operation shall be under the direct and continuous observation of the Project Inspector to prevent overflow.

APPLICATION

1. Termite Control

Application of solution shall be done by means of power sprayers fitted with flow meters for accurate monitoring of actual quantity used. At the time of soil treatment application, the soil shall be preferably in a friable condition with low moisture content to allow uniform distribution of the treatment solution throughout the soil. Do not apply pesticide during or immediately following heavy rains, or when conditions will cause runoff and create an environmental hazard. Cover treated area with waterproof sheeting if concrete is not poured on the same day as the soil treatment. Take precautions to prevent disturbance of the pesticide barrier. Before the placement of structural components, re-treatment where soil or fill is disturbed after treatment. Apply pesticide prior to placement of gravel base, vapor barrier or waterproof membrane.

a. Slab on Grade Construction

Establish a horizontal pesticide barrier over areas intended for covering by floors, porches, attached entryways, garages, carports and terraces. Apply treatment solution with a low pressure coarse spray at the rate of four (4) liters solution per square meter. Apply at the rate of seven (7) liters solution per square meter if the fill is washed gravel or other coarse material. Establish a continuous chemical barrier in the voids of hollow block foundation or voids of

masonry. Apply treatment at the rate of seven (7) liters per 3 linear meter. Make pesticide band at least 15 cm wide the pesticide evenly distributed throughout. Treat buildings constructed with basement slabs in the same manner.

b. Crawl Space Construction

Establish a vertical pesticide barrier inside of foundation walls, both sides of interior partition walls, around piers, plumbing, and rodding and utility conduits. Apply treatment solution by rodding or rodding and trenching the fill at the rate of 15 liters solution per 3 linear meter, and 30 cm deep from grade to bottom of foundation. Treat both sides of foundation and around all piers and pipes. Make treated barrier of fill at least 15 cm wide with the pesticide evenly distributed throughout.

c. Dry Pipes and Conduits

Establish pesticide barrier on various dry pipes and conduits such as electrical service entrance, raceways, pipe chase, vents. Use powder type termiticide by injecting it inside the pipe.

d. Termite Mounds

Demolish and treat all termite mounds within the property found after the construction.

2. "Bukbok" Proofing

Kiln-dried wood, plywood, tanguile, apitong, cabinets, dividers, and paneling shall be brushed generously with Pesticides before painting or varnishing.

3. Sun-Dried Wood Treatment

Sun-dried lumber to be used for ceiling joint runners, nailer, etc. shall be brushed with Pesticides before installation of plywood or ceiling panels.

ENGINEERS

The Contractor shall submit to the Engineer for approval, a copy of the pest control company's proposal and chemical application, method/procedure including the description of the equipment to be used before start of work.

INSPECTION AND TEST

Sampling shall be done only in the presence of the Project Inspector.

Amount of sample to be taken: 50 cc each.

CONTRACTOR'S GUARANTEE

Upon completion of work, and on a condition for final acceptance, the Contractor shall submit to PPA a written guarantee from the pesticide company which shall provide that:

1. The soil poisoning treatment shall prevent subterranean termites from attacking the building on its contents for a period of not less than five (5) years.
2. The Contractor shall thereby warrant all works in pest control that all materials and workmanship applied under the contract are of good quality in every respect and will remain as such for not less than five (5) years.

Should there be termite and "Bukbok" infestation within the one (1) year period the Contractor thereby agrees to do all necessary repairs on the damaged portions of the buildings caused by termite infestation to the satisfaction of PPA, at the Contractor's expense. Retreatment shall also be done by the Contractor after completion of the repairs and at his expense. Such repairs and corrective works shall be done within five days after a written notice from the Owner has been received by the Contractor.

Should there be infestation after the one (1) year period up until the five (5) year guarantee, the pesticide company agrees to do all the necessary repairs at their expense. The pesticide company shall conduct annual inspection of the building and surrounding to check any infestation during the guarantee period. Notice shall be given by the pesticide company to PPA in case there is presence of termites in the surroundings.

G. CONCRETE WATERPROOFING

GENERAL

General Requirements contain provisions and requirements essential to these specifications and apply to this Section, whether or not referred to herein.

SCOPE OF WORK

The work shall cover the waterproofing requirements for building as shown on the drawings.

The work shall consist of furnishing all labor, materials, equipment and other incidentals necessary for the integral waterproofing works where required as shown on the drawings

and in accordance with the requirements of these specifications as directed by the Project - In -Charged.

SUBMITTAL

1. Material description and physical properties, application details, and recommendations regarding shelf life, application procedures, and precautions on flammability and toxicity.
2. Samples for each waterproofing type.

DELIVERY AND STORAGE

Deliver manufactured waterproofing materials in manufacturer's original, unopened containers, with labels intact and legible. Containers of materials covered by referenced specification number shall bear the specification number, type, and class of the contents.

Store and protect materials in accordance with the manufacturer's instructions, and use within their indicated shelf life. Promptly remove from the site materials or incomplete work adversely affected by exposure to moisture. Use pallets and canvas tarpaulins to cover stored materials top to bottom.

PRODUCTS

I. *DEEP PENETRATING SEALER*

Deep Penetrating Sealer (DPS) is an environmentally friendly, non-toxic, odorless, clear, water-soluble liquid compound, which is safe and easy to use.

Deep Penetrating Sealer (DPS) penetrates below the surface and chemically reacts with the alkali and lime found in concrete. This reaction creates a silica gel membrane within the pores and capillaries of the concrete, permanently sealing it against the ingress of moisture yet allowing the concrete to breathe. Over a period of time, the silica gel membrane hydrates and solidifies into a crystalline structure, increasing the hardness and strength of both new and old concrete while reducing moisture vapor emissions and permanently stopping the penetration and flow of water and water-borne contaminants such as chlorides and acids, both on the positive or negative side forging a waterproofed and preserved concrete structure.

EXECUTION

- All existing dirt and other surface contaminants adhering on the surface must be thoroughly removed. Apply

Concrete Neutralizer using sufficient coats to completely neutralize the surface. Do not wash off. When sufficiently dry, dust lightly to remove crystalline deposits.

- Mix thoroughly the product mixture as per manufacturer's instruction. Any change from the recommended proportion will affect its quality. Scrape the bottoms, sides and corners of the container to ensure complete and full blending. Prepare only enough quantities that can be used within the pot-life period. Do not delay application. Apply DPS by brush or roller or by using an airless spray.
- Allow to cure overnight prior to application of topcoat.

II. FLEXIBLE MODIFIED CEMENTITIOUS

Flexible Modified Cementitious (FMC) is a two-component latex modified cementitious coating. It can be simply achieved by mixing the pre-packed dry-mixing powder with the formulated flexible latex admixture, and subsequent brushing the slurry on various substrates. It protects a wide range of buildings and structural concrete components with excellent resistance to water, aggressive chemicals, long-term weathering, and scratching. It is applicable for those structures subjected to long-term water immersion.

1. Free surfaces from dirt or foreign materials. For the waterproofing to work best, manufacturers recommend the surfaces be sand blasted, bush-hammered or acid-etched.
2. Apply 2 coats of the cementitious waterproofing. The first coat could include the manufacturer's materials only. The second coating will include a cement-sand mixture and also have chemical and metallic elements too. If supplementary waterproofing is required, then a third coat may be required. This typically includes sand and cement for that extra protection.

Methods of Application

Trowel

Application of the coating is done using the handheld trowel, by simply applying and spreading the coating using the trowel.

Spray

This method uses spraying equipment like the ones used in painting vehicles.

It is preferred due to its precise finish and efficiency. It is also faster to use the spray than the trowel method.

Brush

Use a typical brush similar to roll brushes that are used in painting houses. It also has a uniform finish and is faster to use compared to the trowel.

It is good to note that different surfaces will dictate the method of application.

H. MODULARS, TABLES AND CHAIRS OF VARIOUS TYPE INCLUDING ACCESSORIES.**GENERAL**

General Requirements contain provisions and requirements essential to these Specifications; and apply to this section, whether or not referred to herein.

SCOPE OF WORK

The work covered by this section consist of furnishing all labor, materials, equipment, tools and incidentals necessary to undertake, complete supply of gang chairs for the buildings as indicated on the drawings and as specified herein.

MODULARS/ FURNITURES

<i>Items</i>	<i>Unit</i>	<i>Quantity</i>
L- Shaped Panel Work Station	set	1.00
Executive Table Work Station	set	2.00
Single Work Station (1.20 M X 0.60 M)	set	1.00
8- Seater Conference Table	pc	1.00
6- Staff Bench Work Station	set	1.00
4- Staff Bench Work Station	set	1.00

<i>Chairs</i>	<i>Unit</i>	<i>Quantity</i>
Mid-back Office Chair	set	13.00
High Back Chair	set	8.00
Visitor's Chair	set	4.00

OTHERS

Mobile Pedestal Cabinet	set	14.00
3- Layers Filing Cabinet (0.90m X 0.45m)	set	4.00
Graphicote Glass Board (1.96m L X 1.20m H)	set	1.00
Equipment Rack (2.45 m X 0.45 m X 2.70 m)	set	2.00
Glass Mirror on 6mm marine plywood backing with aluminum frame (Typ) (0.80m W X 0.60m H)	set	1.00
Glass Mirror on 6mm marine plywood backing with aluminum frame (Typ) (1.0 m W X 0.75 m H)	set	1.00

Locations and details are shown in plans.

SUBMITTAL

1. Shop drawings for all gang chair for the building shall be submitted in advance to allow twenty eight days for review and approval. Shop drawings shall indicate materials and details of finishing works. The Contractor shall be responsible for all errors of detailing and fabrication, and for the correct finishing work items shown on the shop drawings.
2. The Contractor, before placing order for the supply shall submit to the Engineer for approval representative samples of finishing materials. No placing of orders for material for finishing works shall be made without his approval.

EXECUTION

All materials will be delivered and installed (if needed to be installed) on site.

I ELECTRICAL WORKS

SCOPE OF WORK

The work to be done shall consist of furnishing, delivering and installing electrical materials/fixtures completed in accordance with all the details of the electrical works as shown on the drawings including materials, labor, tools and equipment and all incidental works as found necessary.

Refer to electrical plans/drawings for location and extent of work involved.

GENERAL REQUIREMENTS

- a) All works shall be done in accordance with the requirements of the publications and agencies having jurisdiction, as well as the requirements of the approved standards.
1. National Fire Protection Association - (NFPA)
 2. National Electrical Manufacturer Association - (NEMA)
 3. Underwriter Laboratories, Inc. - (UL)
 4. Philippine Electrical Code - (PEC)
Philippine National Standard - (PNS)
 5. Federation Specification:
Circuit Breaker, Molded Case, Branch Circuit and Service
 6. American National Standard Institute - (ANSI)
 7. American Society for Testing and Materials - (ASTM)
 8. Illuminating Engineering Society - (IES)
 9. Light Emitting Diode - (LED)
- b) The electrical power will be connected to the existing supply. The supply voltages shall be 220 volt, three phase (3Ø), and 60 hertz.
- c) The Contractor shall employ a licensed Registered Electrical Engineer or Master electrician to perform or supervise for the conduct of continuous inspection of all electrical work.
- d) The Contractor shall first obtain approval from the Authority before procurement, fabrication or delivery of electrical materials to the site. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the Manufacturer's Name, Trade Name, Place of Manufacture, Catalog Model or Number, Nameplate Data, Size, Layout Dimensions, Capacity, Project Specification and Paragraph Reference, Technical Society Publication References and other information necessary to establish contract compliance of each item to be furnished.
- e) The materials and equipment to be furnished shall be standard products of reputable manufacturer engaged in the reproduction of such materials and equipment.

- f) All permits and electrical fees required for this work shall be obtained at the expense of the Contractor. The Contractor shall furnish the Engineer-in-Charge, the final Certificates of Inspections and approval from the proper government authorities after the completion of work. The Contractor shall prepare all as-built plans and all other paper works as required by the enforcing authorities.
- g) The Contractor shall furnish and install electrical materials as shown in the drawings. A Licensed Electrical Engineer or Master Electrician is required to implement the installation of the electrical system. A licensed electrical contractor shall oversee/conduct for the installation of main circuit breaker.
- h) Electrical installation shall conform to the requirements of Philippine Electrical Code (PEC) and the other approved standards.
- i) The contractor shall install all electrical works with the supervision of the qualified Registered Electrical Engineer (REE) or Master Electrician. All electrical installation applications regardless of capacity and voltage whether new, addition or revision shall be accompanied by electrical plans signed and sealed by a duly licensed Professional Electrical Engineer (PEE).

MATERIAL REQUIREMENTS

All materials shall be brand new for the approved type meeting for all the requirements of the Philippine Electrical Code and bearing the Philippine Standard Agency (PSA) mark.

PRODUCTS

WIRES AND CABLES

The conductor material to be furnished and installed shall be copper wire Heat-Resistant Thermoplastic (THHN/THWN-2). All conductors shall be rated 600 volts insulation and shall be standard for all sizes.

CONDUIT AND FITTINGS

Underground PVC conduit shall be polyvinyl chloride with concrete covered. It shall be manufactured to schedule 40 outside diameter. All fittings and bends shall be solvent bonded using manufacturers recommended product.

LED PANEL LIGHT, Recessed Mounted, 600mm x 600 mm or 2-18 watt T-8 grid fixture with electronic ballast with aluminum reflector louvre

VERTICAL DOWNLIGHT, Recessed Mounted type with glass cover 6" dia. lamp holder, 220V, E27, 6-11 watt LED bulb, warm white

Switches:

Wiring terminals shall be screw-type, side-wired. Switches shall be rated quiet-type AC only, 250 volts, with current rating and number of poles indicated

WALL SWITCHES AND PLATES

Wall switches in general shall be rated 10 amperes at 230 volts or with ampere and voltage ratings as required. Switches shall be flush mounting and of the rocker type, spring operated. The type of switches shall be tumbler operation and the color, plating and appearance of wall plates shall be as selected by the Engineer. Appropriate samples shall be submitted prior to purchase of wall switches and face plates.

WALL RECEPTACLE AND PLATES

Receptacle outlets shall be 15 ampere, 230 volts, 2 pole, 3 wire parallel slot, grounding type. Parallel slot outlet rated 15 amps, 125v grounded type shall be acceptable for use with 230v system. Locking type and other special purpose outlets shall be as indicated in the plans.

RECESS AND FLUSH MOUNTED FIXTURES

The Contractor shall provide type that can be re-lamped from the bottom. Trim for the exposed surface of flush-mounted fixtures shall be as indicated.

LED BULB

Recessed and surface mounted LED globe bulb, use for general lighting to replace the compact fluorescent lamp. It is used in commercial areas and homes for general purposes. Life span of LED is 35,000 to 50,000 hours. Provide 50% more efficient than CFL, reliable electronic power line, strong stability, direct replacement to CFL, energy efficient and environmental friendly and electricity savings

PANEL BOARD

Panel board shall conform to the schedule of panel board as shown on the approved plans with respect to supply characteristics, rating of main lugs or main circuit breaker, number and ratings and capacities of branch circuit breakers.

Panel board shall consist of a factory completed dead front assembly mounted in an enclosing NEMA-1 cabinet consisting of code gauge galvanized sheet steel box with trim and door.

Main and branch circuit breakers for panel board shall have the rating, capacity and number of poles as shown on the approved plans. Breakers shall be thermal magnetic type solid state-type with interrupting capacity of 10,000 amperes symmetrical minimum. Breaker terminal shall be UL listed as suitable for type of conductor provided. Breaker shall be the bolt-in type (that is, bolted to the current carrying bus). Plug-in circuit breakers are not acceptable

UNITARY AIR-CONDITIONING SYSTEMS - SPLIT TYPES

1. General

The air-conditioning systems shall be installed and tested in accordance with the Standard unitary air-conditioning equipment with capacities below 135,000 Btu's per hour and Standard unitary equipment with capacities of 135,000 Btu's per hour and greater. Units shall be certified. Units with capacities below 135,000 Btu's per hour shall be listed in the Directory of Certified Unitary Air-Conditioners.

2. Performance Rating

Cooling capacity of unit shall meet the sensible heat requirements and total requirements indicated. The unit size, make true allowance for "sensible to total heat ratio" to satisfy required sensible cooling capacity.

3. Compressors

Hermetic and semi-hermetic rotary, or screw type provided with all the minimum standard equipment and accessories listed therein. Compressor speed for compressors above 20 tons shall not exceed 1750 rpm. The compressors with automatic capacity reduction of at least 50 percent for units over 10 tons. Compressors shall start unloaded but each compressor with devices protects the compressor from short-cycling when shut-down by safety controls. The pump-down cycle of non-recycling start type compressor with 20 tons and over. Provide compressors with vibration isolators. Compressor motor shall be suitable for electric power characteristics as indicated. Motor shall conform to NEMA NG-1. Motor starters shall conform to NEMA ICS. Motors shall be constant speed, squirrel-cage induction, open type or hermetically sealed, low starting current, high-torque type, and shall be furnished with reduced voltage or

and magnetic across-the-line type motor starter with weather-resistant enclosures

EXECUTION

INSTALLATION

Application and installation of electrical materials including unitary air-conditioning system shall conform to the requirements of specified herein.

The installation of existing auxiliary system shall conform to the requirements specified in the plan.

WORKMANSHIP

The work throughout shall be executed in the best and most thorough manner under the direction of and at the satisfaction of the Registered Electrical Engineer or Master Electrician, who will interpret the intent meaning of the drawings and specification and shall have the power to reject any work and materials which in his judgment, are not in full accordance therewith.

TESTING OPERATIONS

When the electrical installation is completed, the Contractor shall test the installed electrical materials and equipment in the presence of Registered Electrical Engineer or Master Electrician. The system shall be free from any defects, shorts or grounds. The Contractor at no extra cost shall furnish all necessary instruments and personnel required for the testing.

GUARANTEE

Upon completion and before final acceptance of the work, the Contractor shall furnish the Engineer a written guarantee stating that all works executed are free from defects on materials and workmanship. The guarantee shall be for a period of one year from the date of the final acceptance. Any work that becomes defective during the said period shall be corrected / replaced by the Contractor at his own expense in a manner satisfactory to the Authority.

J. FIRE PROTECTION SYSTEM

GENERAL

The system comprises of Electrical, Mechanical and Civil works that includes installation of complex conduits and piping and other necessary works, testing and commissioning to

ensure the continuity of the existing and new fire sprinkler system.

The work includes installation of new sprinkler head including removal, relocation of existing units, testing and commissioning.

The design and workmanship shall be in accordance to the latest codes of standard and local building codes of respective engineering practices.

SCOPE OF WORK AND EXECUTION

1. The scope includes PPA submittals of necessary as-built plans and layouts to the contractor for the design of sprinkler system based on supplier's technology. The system should be inline with the approved plans of the contract.
2. All tapping source needed for the installation of additional system shall be available and predetermined.
3. Working area for any installation and construction shall be approved by PPA.
4. Any construction not indicated on the plans and deemed necessary shall be approved by the authority. All dimensions and methodology shall be included on the submittals of the contractor.
5. Suppliers' technical representative shall be present during implementation of work.
6. Removal and relocation of existing system components shall be made in accordance to high quality standard of work.
7. Removal and installation work shall be made in the manner that is not disturbing to the PPA employees during office hours.
8. Prior to commencement of the works, the supplier through the contractor shall provide product seminar and orientation and transfer of technology to PPA personnel's/end users.

FIELD QUALITY CONTROL

1. Preliminary Testing

Notify Engineer prior to performing preliminary testing. Contractor shall conduct the following tests during installation of wiring and system components. Any deficiency pertaining to these requirements shall be corrected by the Contractor prior

	<p>to final acceptance testing of the system. Record results of testing. Submit all test results to the Engineer.</p> <p>a. Operation of Entire System. Operate all initiating and indicating devices.</p> <p>b. Operation of Supervisory Systems: Operate all portions to demonstrate correctness of installation.</p> <p>2. Final Acceptance Testing</p> <p>The Contractor shall notify the Engineer when the system is ready for final acceptance testing. Request scheduling for final acceptance testing only after all necessary preliminary tests have been made and all deficiencies found have been corrected to the satisfaction of the equipment manufacturer's technical representative and the Engineer and written certification to this effect has been received by the Fire Protection Engineer. The system shall be in service at least 15 calendar days prior to final acceptance testing. The Contractor shall allow at least 15 calendar days between the dates final testing is requested and the date the final acceptance testing takes place. The Contractor shall furnish all equipment, instruments, devices and personnel for this test. The system shall be tested for approval in the presence of representatives of the manufacturer, the Engineer, and the Fire Protection Engineer. All necessary tests shall be made and any deficiency found shall be corrected and the system retested.</p> <p>3. Additional Tests</p> <p>When deficiencies, defects or malfunctions develop during the tests required, all further testing of the system shall be suspended until proper adjustments, corrections or revisions have been made to assure proper performance of the system. If these revisions require more than a nominal delay, the Engineer shall be notified when the additional work has been completed, to arrange a new inspection and test of the fire alarm system. All tests required shall be repeated prior to final acceptance, unless directed otherwise.</p> <p>WARRANTY</p> <p>Product should be free from function defects in materials for a period of one (1) year. The contractor shall issue warranty certificate upon acceptance of the work.</p>	
	<p>K. PLUMBING AND SANITARY WORKS</p> <p>SCOPE OF WORK</p> <p>The work covered for this section shall consist of furnishing all labor, tools, equipment, materials and incidentals</p>	

necessary for the complete installation, testing and operation of the plumbing and sanitary system within the buildings and premises in accordance with these Specifications and as shown on the drawings or as directed by the Engineer. The septic tank and their effluent and discharge pipelines shall be part of other section of these specifications.

MATERIAL REQUIREMENTS

SUBMITTAL

1. The Contractor shall submit his work method statement with necessary shop drawings to the Engineer for approval twenty eight (28) days before the start of the works.

Shop drawings shall be dated and shall contain the name of the project and location of the subject item in the shop drawing which is to be installed.

The Engineer will review and approve or return for correction all shop drawings with reasonable promptness. The Contractor shall make any corrections required and file with the Engineer three (3) corrected copies of the shop drawings.

2. The drawings shall indicate the general arrangement of all pipings, however, where actual conditions necessitate re-arrangement in opinion of the Contractor and/or the Engineer, the Contractor shall prepare and submit to the Engineer for approval, twenty eight (28) days before placing the order for materials, shop drawings of the proposed re-arrangement. Because of the small scale of the drawings, shop drawings to indicate all offsets, fittings and accessories shall be prepared. The Contractor shall carefully examine the drawings and shall carefully investigate actual structural and finish conditions affecting all his work.
3. The Contractor shall be responsible for the proper fitting of materials, equipment and accessories without substantial alteration and at no cost to the Employer.
4. The Contractor shall be responsible for the proper coordination of the work and shall provide all necessary clearance where necessary.

STANDARDS

Use of materials shall further be governed by other requirement imposed on other sections of these Specifications. Materials shall be subject to tests necessary to ascertain their fitness if the Engineer so requires. All works shall comply with the pertinent provisions of the Plumbing Code of the concerned city or town, the Code on Sanitation of the Philippines, and/or the National Plumbing Code of the

Philippines.

MATERIALS

1. Identification of Materials

Each length of pipe, fittings, traps, fixtures and devices used in the plumbing work shall have cast, stamped or indelibly marked on it, the approved manufacturer's trademark or name, the weight, type and class of product when so required by the standards mentioned above.

2. Alternative Materials

Use of any material not specified in this Specification may be allowed provided such alternate has been approved by the Engineer and provided further that a test, if required, shall be done by an approved agency in accordance with generally accepted standards.

3. Soil, Waste, Drain, Vent Pipes and Fittings

Soil, waste and vent pipes shall be unplasticized Polyvinyl Chloride (uPVC) pipes. Diameter shall be as indicated on the Drawings. It shall conform to ASTM D 1784 or ASTM D 2729.

Drainage pipes shall be reinforced concrete pipes (RCP), diameter shall be as indicated on the Drawings.

4. Jointing Material

The joint material for uPVC pipes shall be PVC solvent cement as recommended by the approved pipe manufacturer.

5. Water Supply Pipes

Water supply pipes shall be polypropylene random-80 (PPR-80) pipes PN 20 conforming to DIN Standards DIN 1988/DIN 8078, German made. Jointing shall be fusion welded.

6. Cleanouts, Plugs and Tee

Cleanouts shall be of the same material as the pipe to be fitted. Cleanouts installed in connection with uPVC hubs and spigot pipes shall consist of a long sweep quarter bend of $\frac{1}{4}$ as shown on the drawings.

7. Pipe Sleeves

Pipe sleeves shall be installed and properly secured in place at all points where pipes passes through masonry or

concrete. Pipe sleeves shall be uPVC pipe, Schedule 40.

8. Downspout

All downspout shall be unplasticized polyvinyl chloride (uPVC) pipe class DWV conforming to ASTM D2729 or ASTM D1784 for sanitary pipes, Series 1000.

9. Splash Block

Provide splash blocks at the outlet of downspout emptying at grade which shall be made of pre-cast concrete, with smooth finished counter sunk dishes sloped to drain away from the building. Dimensions as shown on the Drawings.

10. Roof Strainers

The Contractor shall provide fittings and install 100mm G.I. mesh wire strainers where shown or indicated on the drawings and/or where the Engineer directs. Each strainer shall fit the size of the corresponding downspout which is to be installed.

11. Shower, Floor and Urinal Drain

Shower and floor drains shall be made of stainless steel non-tilting grate, perforated or slotted. Urinal drains shall be cast iron dome type drain.

12. Pipe hangers, Inserts and Support

- a. Pipe hangers shall be wrought iron, malleable iron pipe hangers spaced not over 1.5 meters apart for uPVC pipes and 3.0 meters apart for iron pipes. Chain straps, perforated bars or wire hangers will not be permitted.

Hangers shall have short turnbuckles or other approved means of adjustment. Turnbuckles may be omitted on hangers where space does not permit their use. Trapeze hangers may be used in lieu of separate hangers for pipes running parallel to each other and close together.

- b. Inserts shall be of cast iron or cast steel and shall be of a type to receive a machine bolt head or nut after installation.
- c. Wrought iron clamps or collars shall be used to support vertical runs of pipes.

13. Unions

Union pipe 50mmØ and smaller shall be malleable

iron. Union on water piping 63mmØ and larger shall be flanged pattern and shall be of galvanized (zinc coated) cast iron. Gaskets for flange unions shall be of best quality fiber plastic or leather.

14. Valves

Valves shall be cast bronze or brass body. Chrome plated finish for all fixture taps and faucets and natural finish for all others, like hose bibbs, gate valves and which are not tapped directly to a plumbing fixture. Concrete valve boxes shall be installed where required and will be of sufficient size for operating the valve.

15. Fixtures

a. Water Closets

All water closets for toilets as shown on the drawings shall be TANK TYPE, white with complete fittings and mounting accessories.

b. Lavatories

b. 1. Lavatory (Wall Hung)

Shall be vitreous china, wall hung lavatory with rear overflow holes, fitting ledge suitable for single faucet holes on centers complete with faucet, standard fittings, trap and lavatory brackets and other accessories.

b. 2. Lavatory (Countertop Lavatory)

Shall be vitreous china, oval or round shaped countertop lavatory with front overflow hole, complete with faucet, supply valve and fittings with P-trap. Fitting ledge suitable for single hole on center.

c. Urinals

c. 1. Urinals for all comfort buildings shall be built-in urinal trough as shown on the drawings.

c. 2. Urinals shall be vitreous china, wall-hung washout urinal, flushing rim, integral trap, 19mm top and shall be provided with water saving flush system.

d. Service Sinks

Service sinks where indicated or shown on the Drawings shall be stainless steel, with single bowl and with complete U.S. or Japan imported fittings.

e. Slope Sinks

Slop sink shall be 24"x20" acid resisting enamel on Cast-Iron with concealed hanger and faucet.

Hose bibb shall be of brass finish.

f. Soap Holder

Soap holder and toilet paper holder shall be vitreous china, wall mounted. All toilet/bath rooms will be provided with soap holder, toilet paper holder and chrome plated towel racks.

g. Faucet for lavatory

Faucet for lavatory shall be in chrome-finish.

h. Bath and shower fitting

Bath and shower fitting shall be chrome-finish.

i. Towel Rail

Towel rail shall be tubular stainless steel, 2.7mmØ, and 0.54m long or as specified in the drawings.

j. Curtain rod

Curtain rod shall be tubular stainless steel, 19mmØ or as specified in the drawings.

k. Grab Bar

Grab bar shall be tubular stainless steel, 25mmØ or as specified in the drawings.

l. Bidet Spray Combination

Installed in every cubicle near on the water closet, colored white or its equivalent

16. Concrete, Reinforcing Steel, Pipe and Steel Plate

Materials for wash pits, catch basins and manholes shall conform to the requirements as follows:

a. Concrete materials shall conform with the requirements in "Concrete Works" and shall be Class C concrete with a 28-day minimum compressive strength of 21 MPa (3,000 psi).

b. Reinforcing steel shall be as shown on the drawings and shall conform with the requirements of reinforcing steel bars in

"Concrete Works."

- c. Pipes shall be as shown on the drawings and shall comply with the relevant item of the particular pipe.
- d. Steel plates shall be as shown on the Drawings and shall comply with Section "Steel and Metal Works".

17. Non-reinforced Concrete Pipe

Non-reinforced concrete pipe shall be as shown on the Drawings and shall conform with the requirements of non-reinforced concrete pipes AIC latest edition. Concrete shall be with a 28-day minimum compressive strength of 20.7 MPa.

18. Valve for Drinking Fountain

Valve where drinking fountain will be connected shall be polished brass pipe and shall have red enameled handle.

EXECUTION

All installation works shall be in conformity with the National Plumbing Code of the Philippines (NPCP).

EXCAVATION, TRENCHES AND BACKFILLING

1. Trenches for all underground pipelines shall be excavated to the required depth. The bottom of trenches shall be tamped hard and graded to secure the required fill. Bell holes shall be excavated so that pipes will rest on solid ground for their entire length.

Rocks where encountered, shall be excavated to a depth of 150mm below the bottom of the pipe and before the pipe is laid, the space between the bottom of the pipe and the rock shall be filled with sand. Sewer and water pipes shall be laid in separate trenches.

2. After pipelines have been tested, inspected and approved by the Engineer and prior to backfilling, all forms shall be removed and the excavation shall be cleaned of all trash and debris.

Materials for backfilling shall consist of acceptable excavated soil, borrow of sand, gravel or other materials approved by the Engineer and shall be free from trash, lumber or other debris. Backfilling shall be placed in horizontal layers not exceeding 150 mm in thickness and properly moistened to approximate optimum requirements. Each layer shall be compacted by hand or machine tamper or by other suitable equipment to a density that will prevent

excessive settlement or shrinkage.

Backfilling shall be brought to a suitable elevation above grade to provide for anticipated settlement and shrinkage thereof.

Water pipes shall have a sand cushion 150mm below and above the pipes.

INSTALLATION OF SOIL, WASTE DRAINS OR VENT PIPES

1. Horizontal Drainage Pipe and Vent Piping

Horizontal waste pipes 75mmØ and smaller shall have a minimum grade of 6.5mm per 0.30m and for 100mmØ and larger, 3.2mm per 0.30m. All main vertical soil and waste stacks shall be extended full size above the roof line as vents, except where otherwise specifically shown.

Where practicable, two (2) or more vent pipes shall be connected together and extended as one pipe through the roof. Vent pipes in roof spaces shall be run as close as possible to the underside of roof with horizontal piping pitched to stacks using fittings as required without forming traps in pipes.

Vertical pipe vents may be connected to a vent line carrying other fixtures. The connection shall be at least 1.20m above the floor on which the fixtures are located to prevent the use of vent lines as waste. Horizontal waste lines receiving the discharge from two (2) or more fixtures shall be provided with vents, unless separate venting of fixtures is noted.

2. Fittings

All changes in pipe sizes on soil waste lines shall be made with reducing fittings or recessed reducers. All changes in direction shall be made by the appropriate use of forty five (45) degree wyes. Long sweep quarter bends or elbows may be used in soil and waste lines where the change in direction of flow is from the horizontal to the vertical and on the discharge from water closets.

Where it becomes necessary to use short radius fittings in any location, the approval of the Engineer shall be obtained before they are installed.

3. Joints

a. PVC Soil Pipe

All joints in uPVC soils, waste and vent pipe shall be accomplished by the use of PVC solvent cement.

- b. All joints for uPVC shall be accomplished by applying the manufacturer's recommended solvent before connection to the pipe.

4. Cleanouts

Cleanouts at the bottom of each soil stack, waste stack and where else indicated shall be the same size as the pipe.

Cleanouts on floors shall be by uPVC plug adapter fit into the hub and fitted with uPVC screw plugged flush with the floor.

Cleanout shall be provided at every change in direction greater than 45 degrees.

5. Flashings

All pipes passing through the roof shall be provided with lead flashings. All flashings shall be built to 40 lbs. bituminous felts and shall extend up to the pipe and down-over to top of pipe at least 150mm and along the roof not less than 300mm and shall lap over flashing to make a weatherproof joint.

6. Traps

Each fixture and piece of equipment requiring connections to the drainage system, except fixtures with continuous waste shall be equipped with a trap. Traps shall be specified to be supplied with the fixtures. Each trap shall be placed as near to the fixtures as possible. Traps installed on threaded pipes shall be recessed drainage pattern.

7. Pipe Sleeves, Hangers and Supports

Pipe sleeves shall be installed and properly secured in place at all points where pipes pass through masonry or concrete except unframed floors on earth.

Pipes shall not be permitted to pass through footings or beams unless noted on the drawings.

Pipe sleeves in floors shall extend not less than 25mm and not more than 50mm above the finished floor. After installation of the pipe, the space around the pipe shall be packed with plastic material and made watertight. Flashing shields for sleeves passing through waterproofing membrane shall be thoroughly mopped into the membrane. The space between the pipe and sleeves shall be made watertight by inserting approved sealing and caulking materials.

INSTALLATION OF WATER PIPES, FITTINGS AND CONNECTIONS

1. Gate Valves and Outlets

Gate valves shall be installed close to the point of connection to the existing service line outside the building. The piping shall be extended to all fixture outlets and equipment from the gate valves. Outlets where indicated shall be capped or plugged and left ready for future connections.

2. Mains, Branches and Runouts

All runs of piping shall be installed as shown on the drawings. The piping shall be cut accurately to measurements, and installed at the building site by the Contractor and shall be worked into place without springing or forcing. Care shall be taken not to weaken the structural portions of the buildings.

All pipes above ground shall be run parallel with the lines of the building unless otherwise shown on the drawings. Branch pipes from service lines may be taken off on top of mains, bottom of mains or side of mains, using such cross over fittings as may be required by structural or installation conditions.

All service pipes, valves and fittings shall be kept at sufficient distance from the other work to permit finished covering not less than 6.5mm from such other work and not less than 13mm between finished covering on different services. No water piping shall be buried in floors unless specifically indicated on the drawings or approved. Changes in pipe sizes shall be made with reducing fittings.

The use of long screws and bushings is prohibited.

3. Joints

Joints and connections in the plumbing system shall be gas-tight and watertight for the pressures required by test.

After cutting and before threading all pipes shall be reamed and shall have burrs removed. All screwed joints shall be applied with an approved graphite compound or TEFLON tape to facilitate connections. Threads shall be full cut and not more than three threads on the pipe shall remain exposed.

Caulking of threaded joints or top to prevent leaks shall not be permitted.

Unions shall be provided where required for disconnection.

Threaded swing bolts shall be used for branch connections to risers and mains.

4. Unions

Where required unions shall not be concealed in walls, ceilings or partitions.

5. Tests

The following tests shall be conducted by the Contractor at his expense under the supervision of the Engineer.

a. Tests for Drainage and Venting System

The entire drainage and venting system shall have necessary openings plugged to permit the entire system to be filled with water to the level of the highest vent stack above the roof. The system shall hold the water for 30 minutes with a drop not greater than 100mm.

b. Sterilization

The entire water supply piping system shall be sterilized with a solution containing not less than fifty (50) parts per million of available chlorine, either liquid chlorine or a solution of sodium hypochlorite. The sterilizing solution shall remain in the system for a period of not less than 8 hours during which time all valves and faucets shall be opened and closed several times. After sterilization, the solution shall be flushed from the system with clean water until the residual chloride content is not more than 0.2 parts per million.

c. Pressure Test for Water Lines

1. After the pipe have been installed, the joints completed and with joints exposed for examination, all newly installed pipe or any valve section, thereof, shall be subjected to hydrostatic pressure one and one half (1½) the designed working pressure of the system or as specified by the Engineer.
2. The duration of each pressure test shall be at least 20 minutes unless otherwise specified by the Engineer.
3. Each section of pipeline shall be slowly filled with water and the specified test pressure, measured at the point of lowest elevation, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the

Engineer. During the filling of the pipe and before applying the test pressure, all air shall be expelled from the pipeline. To accomplish this, tap shall be made if necessary, at the highest point of the pipe under test and after completion of the test, the taps shall be tightly plugged unless otherwise specified. During the test, all exposed pipes, fittings, valves, joint and couplings will be carefully examined. If found to be cracked or defective, they shall be removed and replaced by the Contractor with sound materials at his expense. The test shall then be repeated until satisfactory results are obtained.

d. Leakage Test for Water Lines

1. Leakage test shall be conducted after satisfactory completion of the pressure test and shall consist of an examination of all exposed joints for leakage as well as an overall leakage test of the completed pipeline.
2. The pressure to be maintained during the test shall be the designed working pressure of the system.
3. Leakage test shall be made only after a minimum of 24 hours after the pipe to be tested has been filled with water.
4. The duration of each leakage test shall be two hours unless otherwise specified by the Engineer.
5. Each section of pipeline shall be slowly filled with water and the specified test pressure, measured at the point of lowest elevation shall be applied by means of a positive displacement type pump and reservoir connected to the pipe in a manner satisfactory to the Engineer.
6. Before starting the leakage test, all air shall be expelled from the pipe. All exposed pipes, fittings, valves and joints shall be examined for leakage during the test.
7. Allowable leakage rate per 100 joints per inch of Pipe Diameter at Pressure Stipulated.

PRESSURE		LEAKAGE RATE	
psi	kg/cm ²	liters/hr.	liters/2 hrs.
50	3.50	1.45	2.90
75	5.30	1.75	3.50
100	7.00	2.05	4.10
125	8.80	2.30	4.60
150	10.50	2.50	5.00
200	14.00	2.90	5.80

e. Defective Work

1. If the inspection or test shows any defect, such defective work or material shall be replaced and the test shall be repeated until satisfactory to the Engineer.
2. All repairs to piping shall be made with new materials at the expense of the Contractor.
3. No caulking of screwed joints or holes will be accepted.

ASSEMBLY, INSTALLATION AND CONNECTION OF FIXTURES

Fixtures shall be supported and fastened in a satisfactory manner. Where secured to concrete or masonry work walls, fixtures and equipment shall be fastened with brass bolts or machine screws in lead-sleeve type anchorage units or with brass expansion bolts. Expansion bolts shall enter 7.5 cm into solid concrete or masonry works and shall be fitted with loose tubing or sleeves of proper length to bring expansion sleeves into the solid concrete masonry walls.

Where wood screws are used, screws shall go into solid pieces set between studs. Where through-bolts are used, bolts shall be provided with plates or washers at back set, so that they will be concealed by plaster. Bolts and nuts shall be hexagonal and exposed nuts, cap nuts, and screw heads shall be provided with chromium plated brass washers.

PROTECTION OF FIXTURES

Pipe openings shall be closed with caps or plugs during installation. Fixtures shall be tightly covered and protected against dirt, water and chemical injury. At the completion of all works, all fixtures shall be thoroughly cleaned and delivered in a condition satisfactory to the Engineer.

FIXTURES AND FASTENING

	<p>All fixtures shall be supported and fastened in a satisfactory manner as follows:</p> <ol style="list-style-type: none"> 1. Where secured to concrete or concrete hollow block walls, they shall be fastened with one quarter inch brass bolts with twenty threads to the inch and of sufficient length to extend at least 7.5 cm into solid concrete or hollow block work, fitted with loose tubing or sleeve insert and shall be securely anchored and installed flush with the finished wall and shall be completely concealed when the fixtures are installed. 2. Where through-bolts are used, they shall be provided with plates or washers back set so that heads, nuts and washers will be concealed by plaster. Bolts and nuts shall be hexagonal. Exposed bolts, nuts, capnuts and screw heads shall be provided with chromium plated brass washers. <p>GUARANTEE</p> <p>Upon completion and before final acceptance of the equipment installation, the Contractor shall furnish the Engineer a written guarantee stating that all equipment installed under this Section free from defects. The guarantee shall be for a period of one (1) year from the date of final acceptance of the work. Any part of the equipment that becomes defective during the term of the guarantee shall be replaced, renewed and/or made good by the Contractor, at his own expense and in a manner satisfactory to the Engineer.</p> <p>Guarantees made by the approved manufacturers or suppliers beyond one year, shall be transferred to PPA without any expense on his part.</p> <p>CLEANING UP</p> <p>Upon completion of the work, all parts of the installation shall be thoroughly cleaned of grease, metal cuttings and sludge which may have accumulated during the testing operation.</p> <p>PLUMBING, FIXTURES AND TOILET ACCESSORIES INSTALLATION</p> <p>All installation works shall be as shown on the drawings and shall conform to the applicable standards set forth by the Philippine National Plumbing Code. All fixtures shall be fastened and/or supported in accordance with the given requirements.</p>	
	<p>WARRANTY</p> <ul style="list-style-type: none"> • One (1) year warranty on manufacturer defects from the date of receipt of the Acceptance. 	

	<ul style="list-style-type: none"> • Winning bidder shall provide free labor and replacement of parts within the said warranty period. • Within the warranty period, the supplier shall within seventy two (72) hours from notice, replace or repair the defective goods or parts thereof at no cost to PPA. 	
	All other provisions stated in the Terms of Reference not indicated herein.	

TERMS OF REFERENCE

RENOVATION OF THE CORPORATE COMMUNICATIONS STAFF OFFICE

1. OBJECTIVES

The Philippine Ports Authority seeks to renovate the Head Office particularly the Corporate Communications Staff Office to keep up with the times, boost productivity and provide a conducive workplace for the employees. Since 2007, this is the first time that PPA will be undergoing office renovations.

2. SCOPE OF WORK

One (1) lot comprises the following components:

- A. Selective Demolition, Removal, Disposal and Cleaning Works
- B. Masonry Works
- C. Finishes
- D. Painting
- E. Carpentry and Joinery Works
- F. Termite Proofing, Bukbok Proofing
- G. Concrete Waterproofing
- H. Modularity, Tables and Chairs of Various Type Including Accessories
- I. Electrical Works
- J. Fire Protection System
- K. Plumbing and Sanitary Works

3. APPROVED BUDGET FOR THE CONTRACT

The Approved Budget for the Contract is **Three Million Eight Hundred Twenty-One Thousand Eight Hundred Twenty-Three and 82/100 (P3,821,823.82) Pesos.**

4. PLANS/DRAWINGS, TECHNICAL SPECIFICATIONS AND BILL OF QUANTITIES (BOQ)

- A. Selective Demolition, Removal, Disposal and Cleaning Works (*See Annex A*)
- B. Masonry Works (*See Annex B*)
- C. Finishes (*See Annex C*)
- D. Painting (*See Annex D*)
- E. Carpentry and Joinery Works (*See Annex E*)
- F. Termite Proofing, Bukbok Proofing (*See Annex F*)
- G. Concrete Waterproofing (*See Annex G*)
- H. Modulars, Tables and Chairs of Various Type Including Accessories (*See Annex H*)
- I. Electrical Works (*See Annex I*)
- J. Fire Protection System (*See Annex J*)
- K. Plumbing and Sanitary Works (*See Annex K*)

5. DELIVERY

- Delivery to PPA Head Office must be within ninety (90) calendar days from the receipt of Notice to Proceed.

6. WARRANTY


- One (1) year warranty on manufacturer defects from the date of receipt of the Acceptance.
- Winning bidder shall provide free labor and replacement of parts within the said warranty period.
- Within the warranty period, the supplier shall within seventy two (72) hours from notice, replace or repair the defective goods or parts thereof at no cost to PPA.

7. PAYMENT

- 35% upon completion of the corresponding percentage of renovation works.
- 35% upon completion of another 35% of renovation works.
- 30% upon full completion of renovation works and delivery of furniture and fixtures. Certificate of Completion & Acceptance shall be provided by the procuring entity/end-user for purposes of payment.

8. OTHER REQUIREMENTS

Must have completed a single contract similar to the contract to be bid whose value must be at least equivalent to fifty percent (50%) of the ABC. For this purpose, a similar contract means contract for the Interior Renovation/Fit-out.

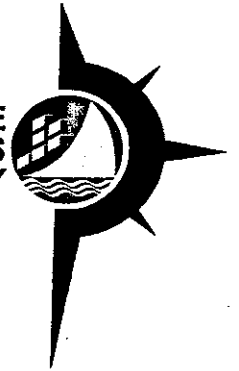


Eric E. Dimaculangan
Acting Manager
Administrative Services Department



Elvis R. Medalla
Acting Manager
Port Planning and Design Dept.





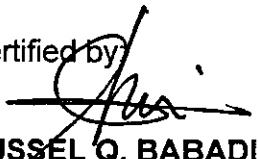
CAF No. 82-2021

Date Aug. 26, 2021

CERTIFICATE OF AVAILABILITY OF FUNDS

This is to certify that, in accordance with Sec. 86 of Presidential Decree (P.D.) 1445, funds in the amount of **FIVE MILLION PESOS (Php 5,000,000.00)** are available under the 2021 Corporate Operating Budget (COB) per Board Resolution No. 3038 to cover the **Repair and Maintenance of PPA Head Office - CCS Office with Conference Room** for the Philippine Ports Authority with APP Code No. BAC-PGCS-072-2021. Funds for this purpose are chargeable against the allocated budget to Administrative Services Department (ASD) under R&M - Building and Other Structures.

Certified by:


RUSSEL Q. BABADILLA
FCMSD-Manager

Noted by:


PRIMO ELVIN L. SIOSANA
Manager, Controllership Dept.

BILL OF QUANTITIES
RENOVATION OF CORPORATE COMMUNICATION OFFICE
 PPA Corporate Bldg. South Harbor, Port Area, Manila



NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO. 1	GENERAL EXPENSES				
1.01	Mobilization, demobilization and cleaning	lot	1		
1.02	Provide Construction Safety and Health Program in the execution of the project including stringent Covid-19 protocols per Engineering circular No. 01-2020, and Construction Guidelines for Project Implementation during the period of Public Health Emergency, approved by PDCB and CIAP (as indicated in the Bid Documents)	mos.	3		
TOTAL FOR BILL NO. 1					

Bidder's Authorized Signature

BILL OF QUANTITIES
RENOVATION OF CORPORATE COMMUNICATION OFFICE
PPA Corporate Bldg. South Harbor, Port Area, Manila



NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO. 2	REMOVAL, DISPOSAL & CORING WORKS				
2.01	Remove and dispose existing floor tiles including surface preparation	sq.m.	113		
2.02	Remove existing removable wall and its accessories	lot.	1		
2.03	Remove existing ceiling including electrical materials, and accessories	sq.m.	113		
2.04	Concrete coring works with scanning prior to the installation of pipes	lot..	1		
<p style="text-align: center;"><i>Note: All removed materials with value shall be turn-over to the Authority as directed and approved by the Engineer</i></p>					
TOTAL FOR BILL NO. 2					

Bidder's Authorized Signature

BILL OF QUANTITIES
RENOVATION OF CORPORATE COMMUNICATION OFFICE
PPA Corporate Bldg. South Harbor, Port Area, Manila



NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO. 3	RENOVATION OF CORPORATE COMMUNICATION OFFICE				
3.01	Construct CHB wall including reinforcement	sq.m.	15		
3.02	Supply and install dry wall partition using 12mm thk. Gypsum board on light metal frames including rockwood insulation and other accessories	sq.m.	71		
3.03	Supply and place 13mm thick cement Plaster finish	sq.m.	14		
3.04	Supply and apply flat latex paint for ceiling (2 coats)	sq.m.	6		
3.05	Supply and apply Eggshell paint (2 coats)	sq.m.	187		
3.06	Supply and apply water proofing	sq.m.	6		
3.07	Supply and install 0.30m x 0.30m Vinyl Tiles	sq.m.	67		
3.08	Supply and install 0.150m x 0.90m Vinyl Plank	sq.m.	32		
3.09	Supply and install 0.30m x 0.60m Ceramic floor tiles	sq.m.	3		
3.10	Supply and install 0.30m x 0.60m Ceramic wall tiles	sq.m.	13		

Bidder's Authorized Signature

BILL OF QUANTITIES
RENOVATION OF CORPORATE COMMUNICATION OFFICE
PPA Corporate Bldg. South Harbor, Port Area, Manila



NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
3.11	Supply and install 12mm thk. Moisture Resistant gypsum board in Flat latex Paint Finish on metal Furring at 0.40mm O.C (C1)	sq.m.	6		
3.12	Supply and install 0.60m x 0.60m Non-sag Acoustic Board on Powder Coated Aluminum T-Runners	sq.m.	97		
3.13	Supply and install fabricated Doors and windows including accessories	lot.	1		
3.14	Supply deliver and install 100mm Vinyl Baseboard	l.m.	66		
3.15	Supply and install Toilet Fixtures and accessories	lot.	1		
3.16	Supply and install Graphcote glass (1.96m x 1.20m)	set.	1		
3.17	Supply and install water line pipes and fittings including accessories.	lot.	1		
3.18	Supply and install sewerage pipes and fittings including accessories.	lot.	1		
3.19	Supply and deliver office furnitures	lot.	1		
3.20	Supply and install new sprinkler head including removal, relocation of existing units, testing, commissioning and other accessories	lot.	1		
3.21	Supply, deliver and install electrical materials and accessories	lot.	1		
TOTAL FOR BILL NO. 3					

Bidder's Authorized Signature

ITEM 01 : SELECTIVE DEMOLITION, REMOVAL, DISPOSAL AND CLEANING WORKS

DESCRIPTION

The work includes the furnishing of all labor, materials and equipment required to carry out the demolition, removal and cleaning of selected existing walls and floors, finishes and installed items as indicated on the plans and as directed by the Engineer.

The Contractor shall submit the proposed methodology or procedure of demolition/removal work with complete inventory of materials for removal, to the Engineer for approval, before the execution of the Works.

The Contractor shall keep the approved working area clean and safe and the disposal of debris and materials shall be as directed by the Engineer. All material with value that is not subject for reinstallation shall be turned-over to PPA-ASD.

GENERAL PROVISIONS

1. The Contractor shall be deemed to have satisfied himself of the site conditions, and to have included in his unit prices provision for all risks that may arise during or in connection with the work.
2. The demolition shall be carried out by approved methods and equipment as approved in writing by the Engineer and after obtaining the written permission of the concerned authorities.
3. The Contractor shall provide suitable equipment, skilled labor and appropriate temporary works such as scaffoldings to ensure safety in his demolition works as well as in the adjacent area and offices.
4. The Contractor shall avoid any loud/disturbing noise from any demolition scheme during office hours.
5. Common area outside the approved working area shall always be cleaned and safe for the benefits of other building users.
6. All materials with value shall be placed on the approved location by the authority while the construction debris shall be disposed in accordance to prevailing local safety standards and as directed by the Engineer.

INTERFERENCE WITH OFFICE OPERATIONS

During the execution of the work, the Contractor shall not interfere with office operation unless approved by the authority.

EXECUTION

Prior to the commencement of the demolition work, the Engineer shall submit to the Contractor a list in which all the materials to be salvaged and overhauled, as property of PPA, and the description of the location of their storage. Materials embedded in concrete units shall not be salvaged.

The Contractor shall separate materials to be salvaged from debris. Salvaged materials shall be loaded, transported and unloaded by the Contractor at the specified locations.

ANNEX A

The Contractor may dump debris on areas procured and prepared at his own expense. In this case, safety measures shall be undertaken in the transporting, unloading, covering and others as requested by the Engineer.

SAFETY

At the end of each day's work, the Contractor shall keep the workplace in safe condition and clean so that no part is in danger of falling or creating hazard to personnel or equipment.

ITEM 02 : MASONRY WORKS**GENERAL**

General Requirements contain provisions and requirements essential to these Specifications and apply to this Section, whether or not referred to herein.

SCOPE OF WORK

This Section includes the furnishing of all labor and materials to complete the work as shown on the drawings and specified herein. The works shall include but not necessarily be limited to the following:

1. Supply and installation of concrete hollow block (CHB) walls with reinforcement
2. Plastering
3. Installing temporary works like scaffolding, platforms, steps, etc.

GENERAL PROVISIONS

The following publications of the issues below but referred to thereafter by basic designation only form a part of these specifications to the extent indicated by the reference thereto:

American Society for Testing and Materials (ASTM) Publications:

A 615 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

A 33 Concrete Aggregates

C 129 Specification for Non-Load Bearing Concrete Masonry Units C

144 Specification for Aggregate for Masonry Mortar

C 270 Mortar for Unit Masonry

MATERIAL REQUIREMENTS

Materials shall conform to the respective specifications and other requirements specified below

CONCRETE HOLLOW BLOCKS (CHB)

CHB shall be of standard manufacture, machine vibrated with fine and even texture and well-defined edges and conforming with the requirements of ASTM C 129. Unless otherwise specified on the Drawings, It shall have a minimum compressive strength of 4.14 MPa (600 psi). CHB shall be non-load bearing uniform and essentially smooth as normally achieves by standard molding methods and shall be free from any cracks, flaws or other defects.

BEDDING MORTAR

Mortar shall be composed of 1 part of Portland cement, 3 parts of sand and ½ part of lime. It shall have a compressive strength of [14 MPa (2,000 psi)] at 28 days and shall comply with property specifications for type N mortar set forth in ASTM Specification C 270 and as modified herein, proportioned and tested in an approved laboratory at the expense of the Contractor. When tested for water retention, the mortar shall have a flow after suction, of 75 percent or more when mixed to an initial flow of 125 to 140 percent. When tested for compressive strength, mortar shall be mixed to a flow of 100 to 115 percent. Aggregate for mortar shall conform to ASTM C 144.

PLASTER

Plaster shall comply with the same specification as those for bedding mortar and will include the use of synthetic fibrous reinforcement of type and dosage recommended by the manufacturer.

REINFORCING STEEL BARS AND RODS

Minimum yield strength of reinforcement shall conform with the specifications in Section of Reinforced Concrete.

SAMPLES AND TESTING

1. The following shall be submitted for approval and in addition, representative samples shall be taken periodically from on-the-site stockpiles as required for testing or checking during the progress of the work.

Anchors and ties	:	Two of each type proposed for use
Concrete Hollow Blocks	:	Shapes, sizes and kinds in sufficient numbers to show full range of quality and texture.
2. Sampling and testing, unless otherwise specified, shall be performed by an approved independent commercial testing laboratory at the expense of the Contractor. Certified copies of laboratory test reports, including all test data, shall be submitted at least 10 days before delivery of the units or mortar materials represented by the tests to the project site.
3. Mortar shall be laboratory-proportioned and tested. Certified copies of approved laboratory-established proportions shall be submitted with the required test reports and test data. Approved laboratory-established proportions shall not be changed and materials with different physical or chemical characteristics shall not be used in mortar for the work unless additional evidence is furnished that the mortar meets the specified requirements.

EXECUTION**1. GENERAL**

No unit having a film of water on its surface shall be laid. Masonry shall be laid plumb, true to line, with level courses accurately spaced. Bond pattern shall be kept plumb throughout. Corners and reveals shall be plumb and true. Vertical joints shall be shoved tight. Each unit shall be adjusted to final position while mortar is still soft and plastic. Any unit that is disturbed after mortar has stiffened shall be removed and relaid with fresh mortar. Courses shall be so spaced that backing masonry will level off, flush with the face work at all joints where ties occur. Chases and rake-out joints shall be kept free from mortar or other debris.

2. Anchorage to concrete. Anchorage to abutting columns shall be provided only where indicated. Details shall be as indicated including anchorage to underside of beams and slabs.
3. Cutting and fitting, including that required to accommodate the work of others shall be done by masonry mechanics. Wherever possible, full units of the proper size shall be used in lieu of cut units. Cut edges shall be clean, true and sharp. Openings shall be carefully cut, formed or otherwise neatly made for recessed items and for electrical, plumbing, or other mechanical installations so that wall plates, cover plates, or escutcheons required by the installation will completely conceal the openings and will have bottoms in alignment with lower edge of masonry joints. Webs of hollow masonry units shall be cut to the minimum required for the installation. Reinforced masonry lintels shall be provided as indicated above openings over 300mm wide, for pipes, ducts and cable trays, unless steel sleeves are used.

4. Embedded Items

Spaces around built-in items shall be filled with mortar. Openings around flush-mounted electrical outlet boxes in wet locations shall be pointed flush with mortar including flush joints above the boxes. Anchors, ties, accessories, flashing, pipe sleeves and other items required to be built-in shall be built-in as the masonry work progresses. Anchors, ties, and joint reinforcement shall be fully embedded in mortar.

5. Unfinished work shall be stepped back for jointing with new work. Toothing may be resorted to only when specifically approved. Before laying new work, loose mortar shall be removed and the exposed joint shall be thoroughly cleaned.

6. Protection

Surfaces of masonry not being worked on shall be properly protected at all times. At the end of each workday period and when rain is imminent, the top of exposed masonry shall be covered with a strong non-staining waterproof membrane well secured in place and in a manner that will prevent moisture. Adequate provisions shall be made during construction to prevent damages by wind.

7. Mortar

Materials shall be accurately measured in laboratory-established proportions and mixed with as much water as may be necessary to produce the wettest workable consistency possible. Mortar shall be placed in final position within one hour after mixing. Mortar not used or that has started to set within this time interval shall be discarded.

8. Jointing

Joints in exposed-to-view except control joints, joints to be pointed or caulked or sealed, and openings around flush-mounted electrical outlet boxes in wet locations shall be tooled slightly concave with the mortar thoroughly compacted and pressed against the edges of the units. Tooling shall be done when the mortar has been thumbprint hard. The tooled joint shall be finished to uniformly straight and true lines and surfaces, smooth and free of tool marks.

9. Placing Reinforcing Steel

Prior to placing grout, all reinforcement shall be cleaned of loose, flaky rust, scale, grease, mortar, grout or other coating which might destroy or reduce its bond with grout. Details of reinforcement shall be as indicated in the drawings. Reinforcing shall not be bent or straightened in a manner injurious to the steel. Bars with kinks or bends not shown on the drawings shall not be used. Placement of reinforcement shall be inspected and approved prior to placing grout. One piece vertical bars extending from floor to floor or roof above shall be provided. Vertical bars shall be spliced only where indicated.

a. Positioning Bars

Vertical bars shall be positioned accurately at the centerline of the wall. A minimum clearance between the bars and masonry units of 12mm and between parallel bars of one diameter of the reinforcement shall be maintained. Vertical reinforcing shall be held in place using metal supports, centering clips, spacers, ties or caging devices located near the ends of each bar and at intermediate intervals of not more than 192 diameters of the reinforcement.

b. Splices

Splices shall be located only as indicated. Splices shall be staggered in adjacent bars at least 600mm. Bars shall be lapped a minimum of 40 diameters of the reinforcement.

PAINTING AND CLEANING

Mortar daubs or splashing, before setting or hardening, shall be completely removed from masonry unit surfaces that will be exposed or painted. Before completion of the work, all defects in joints or masonry to be exposed or painted shall be raked out as necessary, filled with mortar, and tooled to match existing joints. Masonry surfaces shall not be cleaned, other than removing excess surface mortar until mortar in joints has hardened. Masonry hardened surfaces shall be left clean, free of mortar daubs, dirt, stain and discoloration, including scum from cleaning operations and with tight mortar joints throughout. Metal tools and metal brushes shall not be used for cleaning.

CORPORATE COMMUNICATION STAFF OFFICE RENOVATION

ITEM 03 : FINISHES

General

General Requirements contain provisions and requirements essential to these Specifications; and apply to this section, whether or not referred to herein.

Scope of Work

The work covered by this section consist of furnishing all labor, materials, equipment, tools and incidentals necessary to undertake, complete all finishing works and painting for the buildings as indicated on the drawings and as specified herein.

Wall, floor, ceiling and other finishing works shall include but are not limited to the following:

3.01 WALL

Interior

- a. Plain cement finished painted with elastomeric paint.
- b. 300mm x 600mm Wall Tiles
- c. 12mm thick Fiber cement board on metal studs framing. Locations are shown in the plans and elevations.

Stud: 76 mm (3 inches)
3.00 meter length

Track: 76 mm (3 inches)
3.00 meter length

Board: 1.20 x 2.40 x 12mm fiber cement

Plain Cement Finish

- a. Surface Preparation

All surfaces shall be cleaned and projections, dust, loose particles and other materials, which would prevent good bond, shall be removed.

Plaster shall not be applied directly to concrete and masonry surfaces coated with bituminous compounds and surfaces previously painted or plastered.

All surfaces shall be thoroughly wetted before plastering.

b. Trial Mix

A trial mix of at least three (3) different water-cement ratios for a proposed mix shall be prepared under full scale conditions and adequate workability. The proportions by weight of cement to the weight of sand shall not be less than one part of Portland cement to two parts of sand.

The proportion of cement-sand and water necessary to produce the cement plaster of the required consistency shall be subject to the approval of the Engineer. Such approval may be withdrawn at any time and a change in proportions may be required. Based on the approved mix proportions, the Contractor shall prepare a list showing the number of kilograms of the various materials to be used in the cement plaster finish mix.

No cement plaster finish shall be started without an approved trial mix by the Engineer.

c. Cement Finish Application

A brown coat with sufficient pressure shall be applied to fill the gaps, and to secure a good bond. Moistened for 48 hours, each coat of cement plaster shall be kept after application and allow to dry.

A finish coat shall be applied after the brown coat has set. The brown coat shall be moistened before application of the finish coat. Finish coat shall be floated to plumb, even planes and surfaces.

Final plaster finishes shall be rubber sponged.

d. Tolerance

The Contractor shall finish plaster work plumb, level, square and true within tolerance of 3mm in 3 meters, without cracks and other imperfections.

e. Patching and Cleaning

Upon completion of the building, and when directed, all loose, cracked, damaged or defective plastering shall be cut out and re-plastered in a satisfactory and approved manner.

Fiber Cement Surfaces

SUBMITTALS

a. Manufacturer's product data for each type of product specified.

b. Samples

(1) 300 mm x 300 mm 2 sets of required mock up.

(2) Miscellaneous product samples such as joint tapes and compounds.

Application and Finishing

- a. Apply and finish fiber cement panels as per specifications by manufacturer for flush-jointed.
- b. Install fiber cement panels in manner which minimizes the number of end-butt joints or to avoid where possible.
- c. Install exposed fiber cement panel with face side out. Do not install imperfect, damages or damp boards. Bat boards together for slight contact at edges and ends with not more than 1.5 mm open space between boards. Do not force into place.
- d. Locate either edge or end joints over supports, except in horizontal applications where intermediate support is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
- e. Attach fiber cement panel for supplementary framing and blocking provided for additional support at openings and cutouts.
- f. Space fasteners in fiber cement boards in accordance with referenced application and finishing standard and manufacturer specifications

Methods Panel Application

- a. Follow specifications by manufacturer.
- b. Install fiber cement panel as follows, and as indicated on the drawings.
- c. Apply fiber cement panels to supports as follows:
Fasten to steel framing with adhesive and supplementary screws as per recommendation by manufacturer.

Finishing of Fiber Cement Boards

- a. Apply to joint treatment at fiber cement panels joints (both directions); penetrations; fasteners head, surface defects and elsewhere as required to prepare works for decoration.
- b. Finish fiber cement panels as per recommendation by manufacturer.

Protection

- a. Provide final protection and maintain conditions, in a manner suitable to installer that ensures, fiber cement panel construction being without damage or deterioration at time of substantial completion.

Painting Works

- a. Surface Preparation

Allow new masonry to dry for 14 days (for exterior surfaces) to 28 days (for interior surfaces) under normal conditions before painting. Surface to be painted should be clean and dry, free from oil, grease, dirt, dust, contaminants, and all loose grit and mortar.

Without mesh:

1st Coat: Latex Wall Covering Sealer

2nd and 3rd Coat: Latex on all Covering Basecoat

4th Coat: Egg Shell Paint Wall Covering Topcoat

With mesh:

1st Coat: Latex Wall Covering Sealer

2nd Coat: Latex Wall Covering Basecoat

Reinforcing Membrane: Fiberglass Matting

3rd and 4th Coat: Latex Wall Covering Basecoat

5th Coat: Egg Shell Paint Wall Covering Topcoat

Wall Tiles

- a. Wall tiles for Executive Toilet shall be 300mm X 600mm Ceramic Wall tiles or as per Architect's approval.
- b. Trimmers and moulding shall be lustrous, glazed with size and color corresponding to wall tiles.
- c. Portland cement, sand, bonding compound, lime and water shall conform with the requirements.

3.02 FLOORS

Supply and installation of the following floor finishes. Details and locations are shown in the plan.

1. **FF1** – 300mm X 300mm X 3mm Vinyl Tiles, (White Sand)
or approved equivalent
Locations are shown in the plan.
2. **FF2** - 300mm X 300mm X 3mm Vinyl Tiles, (Sterling Grey)
or approved equivalent
Locations are shown in the plan.
3. **FF3** - 300mm X 300mm X 3mm Vinyl Tiles, (Aquamarine)
or approved equivalent
Locations are shown in the plan.
4. **FF4** - 150mm X 900mm X 3mm Vinyl Planks,
or approved equivalent

5. FF5 - 300mm X 600mm Ceramic Floor Tiles
or approved equivalent

VINYL FLOORING

This specification covers the furnishing of materials and labor necessary to complete the installation of all vinyl flooring and base as shown in drawings and finish schedule and as specified herein.

Submit complete descriptive literature for each type of the following items:

- a. **Floor Tile** - 300mm X 300mm X 3mm thick
- b. **Planks** - 150mm X 900 mm X 3mm thick
- c. **Base Board** - 3mm thick X100mm H

Clearly mark data to indicate which type, size, model or item will be provided.

Manufacturer's Installation Procedures

Submit four (4) current copies of the flooring manufacturer's recommended standard installation procedure for each type of flooring material.

Colors and Patterns

One (1) sample of each color and pattern of each of the following items:

- a. Floor tile
- b. Base Board

Where colors and patterns are not indicated, submit samples of manufacturer's standard colors and patterns for selection by the Architect.

Manufacturer's Maintenance Data and Instructions

Upon completion and prior to acceptance of the work, submit current copies in triplicate of the flooring manufacturer's printed recommendations for maintenance methods and products for each type of flooring material.

DELIVERY AND STORAGE

Deliver materials to the job in the manufacturer's original unopened containers with the brands, names, and production runs clearly marked thereon. Handle materials carefully and store them in their original containers at not less than 21 degrees C for at least 48 hours before work is started. Do not open containers until inspected and accepted.

ENVIRONMENTAL CONDITIONS

Maintain spaces in which flooring work is to be performed at not less than 18 degrees C at the floor level for at least 48 hours prior to starting the work, during the time work is performed, and for at least 48 hours after the work is completed. Maintain

a minimum temperature of 12 degrees C thereafter. Provide adequate ventilation to remove moisture and fumes from the area.

MATERIALS

Shall conform to the respective specifications and standards and to the requirements specified herein.

Color and Pattern

The color and pattern of tile shall be uniformly distributed throughout the thickness of the tile. Vinyl flooring materials of the same type, pattern, and color shall be of the same production run and shall be so marked. Variations in shades and off-pattern matches between containers will not be acceptable. Flooring in any one continuous area or that used in replacement of damaged flooring in a continuous area shall be from the same lot and have the same shade and pattern.

Vinyl Composition Tile

a. Floor Tile

Shall be 3 mm min. gauge, 300 mm by 300 mm (12" x 12") asbestos free vinyl composition tile.

Color shall be selected by the Architect.

b. Base Board

Provide 3 mm ga. Cove Vinyl wall base adjacent to resilient flooring. Base shall be 100 high. Color shall be brown. Use flexible base to conform to irregularities in walls, partitions, and floors. Provide pre-molded corners in matching size, shape and color for all right-angle inside and outside corners with 3 mm (1/8") thick base.

Leveling compounds, underlayment, and patching compounds

As recommended or approved by flooring manufacturer.

Accessories

Shall be standard products of the flooring manufacturer.

EXECUTION

CONDITION OF SURFACES

The flooring shall not be installed on surfaces that are unsuitable and will prevent a proper installation. Floor surfaces that are to receive flooring shall be clean, thoroughly dry, smooth, firm and sound, and free from oil, paint, wax, dirt, and any other damaging material.

Preparation of Concrete Floor Surfaces

Grind all ridges and other uneven surfaces smooth. Concrete curing compounds, other than the type that does not adversely affect adhesive, shall be entirely removed

from the slabs. Cut out and fill cracks with 1.5mm wide and wider with a crack filler as specified for this application. Provide latex underlayment to fill the remaining holes, cracks, and depressions, and for smoothing, leveling, and feather edging the concrete. Remove loose particles, vacuum chalky, dusty surfaces and prime the cleaned surfaces if recommended by the flooring manufacturer.

Moisture Test for Concrete Floors

As recommended by the floor covering manufacturer.

APPLICATION

Install flooring after work of other trades that might damage flooring has been completed. Apply flooring and accessories in accordance with the manufacturer's installation procedure. Work shall be performed by workmen experienced in the application of such flooring. Detailed requirements are as follows:

Adhesives

Apply adhesives in accordance with the adhesive manufacture's printed directions, unless specified or directed otherwise. Smoking, the use of open flames and other immediate sources of ignition are strictly prohibited in the area where solvent-containing adhesives are being used or spread. Post conspicuous signs reading "NO SMOKING OR OPEN FLAME" in the area of spread adhesive.

Flooring

Apply tile flooring in the patterns indicated. Start in the center of the room or area, and work from the center towards the edges. Keep tile line and Joint Square, symmetrical, tight, and vent; and keep each floor in a true, level plans, except where indicated as sloped. Vary edge width as necessary to maintain full-size tiles in the field but no edge tile shall be less than one-half (1/2) the field tile size, except where irregular shaped rooms make it impossible.

Cutting

Cut flooring to and fit around all permanent fixtures, built-in furniture and cabinets, pipes ad outlets. Cut edges, fit, and scribed to walls and partitions after field flooring has been applied.

Edge Strips

Provide edging strips where flooring terminates at points higher than the contiguous finished flooring, except at doorways where the thresholds are provided. Secure plastic strips with adhesives.

Application of Vinyl-Composition Tile

Prime concrete slabs in contact with the ground with cut-back type primer if recommended by the flooring manufacturer. Work primer with a non-absorptive base completely into the surface. Allow primer to become roughly dry before applying adhesive. Apply only cut-back adhesive to primed concrete surfaces.

Application of Vinyl Wall Base

Apply wall base after flooring has been completed, and the wall surface to which the base is to be applied is thoroughly dry. Form inside and outside corners with base materials as specified herein.

CLEANING AND PROTECTION

- a. Remove all excessive adhesives from the surface of the flooring and the cove.
- b. Perform initial maintenance on the completed installation as recommended by the flooring manufacturer.
- c. Protect the flooring as recommended by the flooring manufacturer from damage by other trades and by the placement of fixtures and furnishings.

WARRANTY

Manufacturer shall warrant that its conductive vinyl tile is free from defects in materials and workmanship for a period of one year and that will meet the electrical resistance requirements of NFPA Standard 99 for a period of five (5) years.

MEASUREMENT

Vinyl flooring shall be measured by the number of square meters laid and accepted.

CERAMIC FLOOR TILES

- a. Floor tiles shall be color varies and as shown on the drawings or to be designated by the Architect.
- b. Portland Cement, sand, water and adhesive shall conform with the requirements.
- c. Floor tiles shall be delivered in the manufacturer's original unbroken packages or containers that are labeled plainly with the manufacturer's name and brand. Containers shall be grade scaled. Materials shall be stored in dry weathertight enclosures, and shall be handled in a manner that will prevent the inclusion of foreign materials and damage by water or dampness.

EXECUTION

- a. Mortar Preparation
Mortar mix proportion and preparation shall be in accordance with the requirements.
- b. Surface Preparation

Surfaces to receive the tiles shall be clean, free of dust, dirt, oil, grease, and other deleterious substances. Floor tile operations in spaces receiving wall tile shall not be started until wall tile installation has been completed. Before tile is applied with a dryset mortar bed, the structural floor shall be tested for levelness or uniformity of slope by flooding it with water. Areas where the water ponds shall be filled and leveled with mortar and shall be retested before the setting bed is applied.

c. Placing of Setting Beds and Floor Tile

Mortar setting beds shall have a minimum thickness of 20mm for floors. The structural concrete slab shall be soaked thoroughly with clean fresh water on the day before the setting bed is to be applied. Immediately preceding the application of the setting bed, the structural slab shall again be wetted thoroughly, but no free water shall be permitted to remain on the surface.

A skim coat of neat Portland cement mortar shall then be applied not more than 4mm thick. The mortar shall be spread until its surface is true and even and thoroughly compacted, either level or sloped uniformly for drainage, as the case requires. A setting bed, as large as can be covered with tile before the mortar has reached its initial set, shall be placed on one operation; but in the event that more setting mortar has been placed than can be covered, the unfinished portion shall be removed and cut back to a clean beveled edge.

All mounted tiles shall be soaked in clean water a minimum of one hour before they are set. Absorptive mounted tile shall be dampened by placing sheets on a wetted cloth in a shallow pan before setting. No free water shall remain on the tiles at the time of setting. Before the initial set has taken place in the setting bed, a skim coat of neat Portland cement mortar, 0.7mm to 1.6mm thick, shall be trowelled or brushed over the setting bed and/or the back of the tile, or a thin layer of Portland cement, 0.79mm to 2mm thick, may be hand-dusted uniformly over the setting bed and worked lightly with a trowel or brush until thoroughly damp.

The tiles shall then be pressed firmly upon the setting bed, and beaten into the mortar until true and even with the plane of the finished floor line. Beating and leveling shall be completed within one hour after placing tiles or sheets. Borders and defined lines shall be laid before the field or body of the floor. Where floor drains are provided, the floors shall be sloped to drain properly to the drains. Intersections and returns shall be formed accurately.

Cutting of tile, where necessary, shall be done along the outer edges of the floor. As far as practicable, no tiles of less than half size shall be used. Cutting and drilling of tiles shall be done neatly without marring the tile surfaces. The

cut edges of tile against trim, bases, thresholds, pipes, built-in fixtures, and similar surfaces shall be ground and jointed carefully. Tile shall fit closely and neatly at all plumbing fixtures and around electrical outlets, pipes and fittings so that cover plates or escutcheons will overlap the tiles properly. Tiles shall be secured firmly in place and loose tiles or tiles sounding hollow shall be removed and replaced. All lines shall be kept straight, parallel, and true, and all finished surfaces brought to true and even planes. The inner edges of borders shall be kept straight and, where practicable, shall form right angles at all returns. The paper and glue shall be removed from mounted tile, without using excess water, within one hour after installing the tiles.

Joints shall be parallel and uniform in width, plumb, level and in alignment. End joints in broken-joint work shall be made as far as practicable, on the center lines of adjoining tiles. Except in special arrangement and design, as indicated or specified, square tiles shall be set with straight joints, and oblong tiles shall be set with broken joints.

Joint widths shall be uniform and spaced to accommodate the tile in the given spaces with a minimum of cutting. Tiles shall be wetted, if they have become dry, before applying grout. Joints 3.2 mm or less in width shall be grouted with a neat Portland cement grout of the consistency of thick cream. Other joints shall be pointed with mortar consisting of one part Portland cement and two parts pointing sand.

The grout or mortar for joints on floors shall be white Portland cement or as specified by the Engineer. Grout pointing mortar shall be forced into joints by using trowel, brush or finger application. Before the grout or mortar sets, the joints of cushion edge tile shall be struck or tooled to the depth of the cushion, filling all skips or gaps, and the joints of square edged tiles shall be filled completely flush with their surface. Dark cement shall not be seen through grouted white joints.

All surplus mortar or grout shall be removed before it has set or hardened.

d. Cleaning and Curing

Floors shall be covered with waterproofed paper with all joints lapped at least 96 mm and allowed to damp cure for at least 72 hours before foot traffic is permitted thereon.

All completed tile work shall be thoroughly sponged and washed diagonally across joints, and finally polished with clean, dry cloth. Acid cleaning of unglazed tile, when necessary, shall not be done within ten days after setting the tile. All metal shall be covered with approved grease and the tile shall be

wetted with clean water, before tile is cleaned with 10% muriatic acid solution. After acid cleaning, the tile shall be flushed with clean water, and the grease coating on metal shall be removed.

Finished tile floors shall be covered with clean building paper before foot traffic is permitted on them. Board walkways shall be placed on floors that are to be continuously used as passage ways by workmen. Thresholds shall be covered with boards. Tiles vertical outside corners (external angles) shall be protected with board corners strips in areas used as passage by workmen.

3.03 CEILING

1. **C1** – 12mm thick Gypsum board painted on 0.40mm thick galvanized steel ceiling suspension system @ 0.40 meter on center (furring) 0.60 meter on center (Carrying channel) and 1.20 meters on center both ways (suspension rod)
 - To be painted with white Flat latex paint White finish

Locations are shown in the plan.

2. **C2** – 600mm x 600mm Non- Sag Acoustic Board on Powder Coated Aluminum T- Runners

SUBMITTAL

1. Shop drawings for all finishing and painting works for the building shall be submitted in advance to allow twenty-eight days for review and approval. Shop drawings shall indicate materials and details of finishing works. The Contractor shall be responsible for all errors of detailing and fabrication, and for the correct finishing work items shown on the shop drawings.
2. The Contractor, before placing order for the finishing materials shall submit to the Engineer for approval representative samples of finishing materials. No placing of orders for material for finishing works shall be made without his approval.
3. Samples of all walls finishes, measuring not less than 1000mm x 1000mm shall be submitted to the Engineer for approval as to its finish texture and workmanship.

INSTALLATION OF DOORS

1. Surface Preparation

Ensure surfaces to receive panels are structurally sound, even, smooth, clean, dry, and free from defects detrimental to work.

3.04 DOORS

D-1 - Frameless Glass Door using 12mm Thk. Clear Tempered Glass with Patch Fitting and Hardware; Provide 25mm 1200 L.S.S Handle (2.40m x 1.40m)

D-2 - 44mm Thk. Flush type Solid Core Door Plastic Laminate Finish on both sides with wooden liston on 25x100 Wooden Jamb, Provide 4 Hinges and Lever Type Lockset (0.90m x 2.40m)

D-3 - 44mm Thk. Flush type Solid Core Door Plastic Laminate Finish on both sides with wooden liston on 25x100 Wooden Jamb, Provide 4 Hinges and Lever Type Lockset (0.70m x 2.40m)

Locations and details are shown in the plan.

INSTALLATION OF WINDOWS

1. Surface Preparation

Ensure surfaces to receive panels are structurally sound, even, smooth, clean, dry, and free from defects detrimental to work.

3.05 WINDOWS

W - 1 - Fixed Windows using 12mm Thk. Clear Tempered Glass on 12mm Top & Bottom U-channel (2.40m x 0.55m)

W - 2 - Fixed Windows using 12mm Thk. Clear Tempered Glass on 12mm Top & Bottom U-channel (2.40m x 1.75m)

Locations and details are shown in the plan.