

**UPGRADING OF SWIMMING POOL, DIVING POOL, WARM UP POOL AND CONSTRUCTION OF
NEW BLEACHER & JACUZZI (ULTRA PHILSPORTS)**

PHILSPORTS COMPLEX, PASIG CITY

TECHNICAL SPECIFICATIONS

I. OBJECTIVE

The basic objective of the project is to upgrade the Swimming Pool, Diving Pool, Warm Up Pool and construction of new bleacher and Jacuzzi located at Philsports Complex, Meralco Avenue, Pasig City.

II. BASIC INFORMATION

Project Name : Upgrading Of Swimming Pool, Diving Pool, Warm
Up Pool And Construction Of New Bleacher & Jacuzzi (Ultra
Philsports)
Location : Philsports Complex, Meralco Avenue, Pasig City

III. APPROVED BUDGET FOR THE CONTRACT

One Hundred Nineteen Million Seven Hundred Thirty Nine Thousand Eight
Hundred Ninety Five Pesos and 84/100 (₱ 119,739,895.84)

IV. QUALIFICATIONS

The Contractor must have valid PCAB license Category A with principal classification of General Engineering.

- The Contractor must have PCAB ARCC rating of Medium B for Building.
- The Contractor must be in sound financial standing with annual turnover/gross billings of at least 50% of the ABC.
- The Contractor must have complete construction of a structure with at least contract value of 50% of the ABC.
- The Contractor must have a licensed Civil Engineer, Electrical Engineer, Mechanical Engineer, Sanitary Engineer, Materials Engineer and Safety Officers.
- All engineers must have an experience in the construction/rehabilitation of structures such as sports facilities and the like.
- The Company must have at least ten (10) years of experience in rehabilitation works.
- The company must have a specialization in rehabilitation of swimming pool sports facility.

V. GENERAL SPECIFICATIONS

The work shall include the supply of labor, materials, tools, equipment and services necessary to complete the subject project per approved Scope of Work, approved Construction Plans/Drawings and these Technical Specifications, which are parts of the Contract of Services, Governing Codes: Republic Act No. 9184 and its Implementing Rules and Regulations, National Building Code of the Philippines (P.D. 1096), Philippine Electrical Code, Philippine Plumbing and Sanitary Code, Philippine Mechanical Code, and all related applicable local ordinances and regulations.

Necessary building permits, clearances or licenses including occupancy permits shall be provided by the Contractor.

The Contractor shall submit, prior to the execution of the specified works, his schedule of work expressed in PERT/CPM Network Diagram, indicating the computation of the contract time, all activities, their duration and projected percentage accomplishments/cash flow, for monitoring purposes.

For all new constructions, the Contractor shall provide new materials, fabricated products, and necessary equipment and services for all works.

For all repair or replacement works, use brand new materials, brands/models, measurements, and finishes. Major materials, products or work items, large volume or quantity items, or other expensive items that are not particularly mentioned in these specifications, shall require submission of samples, product tests, mock-up models, and selection, or approval prior to their installation or application in the project.

Sub-contracting shall only be limited to specialty work items, which require provision of special materials, methods, techniques and equipment and are subject to the approval of the Philippine Sports Commission.

The contractor shall provide full-time supervision of the works.

All materials and equipment shall be delivered to the site at designated locations within the project premises.

The Philippine Sports Commission or its authorized representative reserves the right to reject any materials or workmanship that may be found defective or not in conformity with the approved Construction Plans/Drawings and these Technical Specifications. In case where conflicts between the Construction Plans/Drawings and the Technical Specifications

arise, these should be immediately being brought to the attention of the Philippine Sports Commission or its authorized representative for appropriate action.

All billings shall be subject to submission of a Statement of Account by the Contractor, including his percentage accomplishment report and photographs for inspection/evaluation and acceptance by the Philippine Sports Commission. The Contractor shall provide access to the construction areas for the convenience of the inspection team during project inspection.

Change or additional works that are necessary but were not included in the scope of work shall be subject to variation order preparation upon request and notice by the Contractor.

Contractors/Supplier will supply of labor, tools, materials, consumables and Technical Supervision for the Upgrading of Swimming Pool, Diving Pool & Construction of New Bleacher, Warm Up Pool & Jacuzzi

Contractors must attach certification from the main supplier that it will supply directly to the contractor the imported equipment that are FINA Standard and FINA Approved.

VI. GENERAL REQUIREMENTS

- 1.0 Regulatory Requirements
 - 1.1 National Building Code of the Philippines
 - 1.2 National Plumbing and Sanitary Code of the Philippines
 - 1.3 Philippine Electrical Code
 - 1.4 Philippine Mechanical Code
- 2.0 Submittals
 - 2.1 Construction Schedules
 - 2.2 Shop Drawings, Product Data and Samples, Color Swatches
 - 2.3 Construction Photographs
 - 2.4 Permits (when necessary)

VII. OUTLINE TECHNICAL SPECIFICATIONS

1.0 Securing/Renewal of Building Permits:

Necessary building permits, clearances, or licenses including occupancy permit shall be provided by the Contractor. The Contractor shall pay all fees and other incidental expenses.

2.0 Dismantling of existing unwanted structures:

2.1 Demolition, Removal and Dismantling

1. Before commencing any demolition, removal, and/or dismantling work, all affected electrical lines and water supply lines shall be disconnected, or shut off except such as required for use in connection with the work on site.
2. Demolish selectively and remove or dismantle carefully all components of structures indicated in the drawings necessary to prepare for renovations. All reusable materials shall be coordinated with the agency architect/engineer for reuse.
3. Store reusable parts of the structures and materials within the area. All other materials retrieved from the site shall be turned over, supported with an inventory report on quantity and description of materials, to the Philippine Sports Commission, through the agency Property Officer. Only reusable materials shall stay in the construction area. On the other hand, all unused and destroyed materials shall be supported with a Report of Waste Materials.
4. Protect and maintain structures, materials, fixtures, and utilities that are to remain within the property.

3.0 Carpentry Works

3.1 General Scope

- a. Furnish materials and equipment and perform labor required to complete wooden framing and other related rough carpentry work as indicated in the drawings and/or specified herein.
- b. All materials to be delivered on site shall be approved first by the agency engineers and/or architects as well as for the materials that already have been delivered.
- c. All exposed woodwork shall be smoothly dressed and well sand papered.

3.2 Materials & Execution

- a. Metal Furring: made of hot-dipped zinc-coated commercial forming steel and level on one side or wherever in contact with paneling for 3/4" x 2" metal ceiling joists, nailers, and similar work.
- b. Ceiling: ½ inch thick gypsum board for ceiling with conceal fastenings as far as possible, where not possible, locates them in inconspicuous place. Where nailing is permitted through woodwork fence, conceal nail heads.
- c. Nailers shall be in accordance with detail drawings. Where not indicated on the drawings or mentioned herein, furring strips shall be 3/4" x 2" spaced at 16" on centers both ways. Fasten securely by black screw or other approved device at every 2 feet on center

- d. Make all exposed nails countersunk. Do scribing, mitering and joining accurately and neatly to conform to details.

4.0 Concrete Works

4.1 General Scope

- a. The work covered by this specification shall consist of furnishing all labor, materials, permits, and related miscellaneous work necessary to complete the work as specified herein or as shown on the drawings.
- b. The concrete work under this specification shall include all clearing and grubbing, preparation of subgrade, furnishing and placing concrete, shouldering, and construction of fills and embankments.
- c. It is the intent of these specifications that a sub-grade of uniform stability be obtained by a suitable construction method for placement of concrete.

4.2 Material

- a. Delivery, Storage, and Handling:

All materials shall be so delivered, stored, and handled as to prevent the inclusion of foreign materials and the damage of materials by water or breakage. Package materials shall be delivered and stored in original packages until ready to be used. Packages or materials showing evidence of water or other damage shall be rejected.

- b. Water:

Water for concrete construction shall be clean and free of oil, acids, salts, or other deleterious materials. All city water used by the Contractor shall be paid for by the Contractor.

- c. Portland Cement:

- i. Portland cement shall conform to ASTM Standard Specifications C 150 Type I or Type 1A latest edition.
- ii. High-Early strength Portland shall conform to ASTM Standard Specifications C 150 Type III or Type IIIA.
- iii. All cement poured under extreme heat conditions shall use ASTM Standard Specifications C-150 Type II.
- iv. White Portland Cement shall conform to U.S. Governmental Federal Specifications SS- C-181 latest edition.

- d. Sand (or Fine Aggregate):

- i. It shall be well graded from coarse to fine aggregate and not contain more than 1% clay or 1% coal or lignite when tested according ASTM methods.
- ii. All fine aggregate shall conform to the following requirements:

SIEVE SIZE	% PASSING
3/8 inch	100%
No. 4	95-100%
No. 16	45-80%
No. 50	5-30%
No. 100	0-10%

e. Coarse Aggregate:

- i. Coarse Aggregate shall be composed of hard, strong crystalline rock free from shale or other soft materials and free from any adherent coating or vegetable matter.
- ii. All crushed stone or gravel for concrete work shall be well graded and shall pass the following sieve analysis.

SIEVE SIZE	% PASSING
2 inch	100%
1-1/2 inch	90-100%
1 inch	20-55%
¾ inch	0-15%
3/8 inch	0-5%
No. 4	0%

f. Base:

Unless the plans show differently, the base under all concrete work shall be a minimum of 6 inches deep and shall be constructed of selected gravel or crushed stone of such size that 100% will pass a 2 inch sieve and 98% will be retained on a No. 200 sieve. All gravel shall be uniformly graded between these limits and rolled with a 3 to 5 ton roller until no yielding or creeping occurs under the roller.

g. Joint Sealing Materials:

For slabs or pavements exposed to the weather, asphalt filler shall be used conforming to the latest revision of AASHTO Specification M-18 Type A an approved master filler.

4.3 Forms

- i. Forms shall conform to the shape, lines grade and dimensions indicated on the drawings. They shall be substantial and sufficiently tight to prevent

leakage of mortar, and shall not deflect under the weight of the wet concrete or construction loads. They shall be properly braced or tied together so as to maintain position and shape, and insure the safety of workmen and passerby. All forms shall be cleaned and oiled each time they are used.

- ii. Temporary openings shall be provided to facilitate cleaning and inspection immediately before depositing concrete. Forms shall be assembled in such a manner as to facilitate their removal without damage to the concrete.
- iii. In the case of structures, unlined forms may be used for the face of all walls that are not exposed to view after the structure is completed. Suitable moldings, bevels, or chamfer strips shall be placed in angles. Or exposed edges of forms, to round or bevel corners or edges which may become chipped. The placement of such chamfer or bevel strips shall be directed by the Engineer.
- iv. Plywood panel forms or steel forms may be used with the approval of the Engineer.
- v. When the inside is erected and reinforcing is in place, the Engineer shall be notified and the outside form shall not be placed until work and reinforcing already done has been approved.
- vi. Forms shall not be disturbed until the concrete has hardened adequately to carry its own weight and other loads that may occur.

4.4 Form Ties

Form ties approved by the engineer shall be used. These ties shall be adjustable in length and of such types as to leave no metal closer than one and one-half inches of the concrete surface. Ties shall not be fitted with any lugs, cones, washers, or other devices to act as a spreader within the form which will leave a hole larger than seven-eighths inch in diameter. Wire ties will not be permitted unless the engineer gives a written order.

Ties that are to be pulled from the wall shall be coated with cup grease or other approved material to facilitate removal. Tie rod holes shall be properly plugged.

4.5 Oiling forms

The inside surface of wood forms shall be oiled before any concrete is placed. All forms shall be greased with an approved form oil or with a good grade cup grease thinned with kerosene. All excess grease shall be wiped off with rags to leave the surface of the forms just oily to the touch.

4.6 Removing Forms

All wall forms shall be removed when the concrete has thoroughly hardened, but in no case in less than 4 days except when High-Early-Strength cement is used, in which forms may be removed after 2 days. Other forms and shorings shall remain undisturbed until the concrete has attained sufficient strength to sustain its own weight in addition to any temporary or permanent load that may be placed on it during construction.

4.7 Proportioning

The proportions specified are based on surface dry aggregate, and Portland cement in standard unopened cloth or paper sacks as packed by the manufacturer considered as weighing 94 pounds per sack.

All measurements of cement fine and coarse aggregate shall be made separately. Measurements shall be based on the weight of actual dry loose weight per cubic foot of fine and coarse aggregates used. Weighing equipment shall be arranged to permit making compensation for changes in the weight of aggregates due to moisture. Weighing equipment shall be accurate within 1% and meet the approval of the Engineer.

Water shall be measured in an approved device capable of accurately measuring one pint plus or minus of the total amount of water required per batch.

All concrete shall be proportioned on the basis of water-cement ratio, which is defined as the ratio of the total quantity of water in the mixture, including moisture carried by the aggregate, to the quantity of cement. The ratio is expressed in U.S. gallons (8-1/3 pounds to the gallon) of water per 94 pounds each of cement.

The mix shall be as dry as possible to work the concrete. In no case shall there be more than 6-1/2 gallons of water per bag of cement used.

Moisture in the aggregate shall be measured by a method satisfactory to the Engineer, and will give results within one pound for each 100 pounds of aggregate.

The proportioning of fine and coarse aggregate shall be such that the ratio of coarse to fine shall be no less than 1 to 1 or more than 2 to 1. The aggregate shall be obtained from a source, which will insure uniform quality, gradation, and moisture content during any single days operation.

The proportioning of fine and coarse aggregate may be varied with the approval of the Engineer, but in no case shall the sum of their volumes exceed that called for nor shall the 28-day strength of the concrete fall below the following:

Type or Location of Construction	Min. Comp.	Min. Cement
Psi at 28	bags perDays	cubic yards
Foundations, columns, beams and slabs not Exposed to weather or freezing.		3000
5.0		
Foundation walls, exterior walls and other Concrete work exposed to weather or freezing		4000
6.0*		
Concrete floors and stairs subject to heavy foot traffic		4000
6.0* Driveways, walks, garage floors, porches, etc., Exposed to weathering or freezing		4000
6.0*		

**Air-entrained concrete only.

The air content of the concrete shall be 6% plus or minus 1% by volume based on measurements made on concrete immediately after discharge from the mixer in accordance with ASTM, C-138, C-173 or C-231.

4.8 Mixing

Concrete shall be mixed in a batch mixer for not less than 1-1/2 minutes after all the materials are in the mixer drum. Mixing shall continue until there is a uniform distribution of materials and the mass is homogenous in consistency and color. The mixer shall rotate at a peripheral speed of about 200 feet per minute. Mixer shall be equipped with a locked timing and locked water- measuring device.

No hand mixing or re-tempered concrete will be allowed.

A full size trial batch shall be made using the aggregates and correct proportions selected for the job. If the desired workability is not obtained, then the proportions of aggregates shall be adjusted until the mix meets the approval of the Engineer.

4.9 Central or Transit Mixed Concrete

Concrete from a central plant or mixed in transit mixer trucks may be used if it complies with these specifications. The Engineer will have free access to the batching plant and mixing plant at all times to sample all materials and inspect the work performed for this project. Concrete shall be delivered in

watertight containers, which will not permit segregation of materials. When delivered, the concrete shall be uniform throughout the mass.

Cement used in transit mixed concrete shall be the same brand and type throughout the project. If, in the opinion of the Engineer, the transit mix concrete has excessive amounts of lumpy concrete, it shall be removed from the site immediately. Transit mix concrete shall not be in the truck or hopper more than 60 minutes after batch is started.

4.10 Preparations for Placing

Before beginning a run of concrete, all water shall be removed from all trenches and foundations, all equipment and forms shall be cleaned and oiled, and reinforcement shall be cleaned of ice or other foreign coatings. Concrete shall not be placed until all reinforcement is securely and properly fastened in its correct position, no until all sleeves, hangers, pipes, conducts, bolts, or any other fixture required to be embedded therein has been placed and anchored by the Contractor. Concrete shall not be placed until the forms have been inspected and approved by the Engineer, and placed under the direct supervision of the Engineer.

4.11 Handling

Concrete shall be handled from the mixer to forms as rapidly as possible by methods, which shall prevent any separation or loss of ingredients while transporting the concrete. Concrete shall be handled from the mixer in carts, buggies, or conveyors and shall not be delivered by spout or trough or dumped with a free fall of more than 5 feet. Runway supports for buggies or delivery carts shall not bear upon reinforcing steel or fresh concrete.

4.12 Placing Concrete

Placing concrete before initial set has occurred, and in no event after it has contained its water content for more than one hour. Place all concrete on clean, damp surfaces, free from water, or upon properly consolidated fills, but never upon soft mud, dry porous earth, or frozen ground.

Deposit concrete continuously and as rapidly as practical until the unit of operation is completed. Consolidate all concrete by vibration so that the concrete is thoroughly worked around the

reinforcement, around imbedded items, and into corners of forms, eliminating all air or stone pockets which may cause honey-combing, pitting, or planes of weakness. Use mechanical vibrators with a minimum frequency of 7,000 revolutions per minute, operated by competent workmen. Use of vibrators at many points from 18 to 30 inches apart for a 5 to 10 second duration. Keep a spare vibrator on the job during all concrete placing operations.

Exercise care in placement of concrete for slabs or grade over a vapor barrier. Avoid puncturing or tearing vapor barrier during transportation and placement.

4.13 Construction Joints

The placing of concrete shall be carried on continuously between construction joints shown on the drawings. If for any reason it shall become necessary to stop the placing of concrete at places other than those indicated on the drawings, such places shall have the approval of the Engineer and the manner of making the joint shall be approved. Extra reinforcing may be required if additional construction joints are used.

The surface of the concrete shall be level whenever a run of concrete is stopped. To insure a level, straight joint on the exposed surface of the walls, a strip of 1" sheathing shall be tacked to the forms at the outside surface of the wall. The concrete shall be carried about ½" above the underside of the strip. About 1 hour after the concrete is placed, the strip shall be removed and any irregularities in the joint line shall be leveled off with a wood float and laitance shall be removed. Wherever horizontal construction joints are made, ties or bolts shall be provided 3 to 6 inches below the joint with which to tighten the forms against the hardened concrete.

Keys shall be provided between footings and foundations where shown on the plans or called for in the Special Specifications.

4.14 Depositing Against Other Concrete

Before depositing new concrete on or against concrete that has hardened, the forms shall be retightened, the surface of the hardened concrete shall be roughened as required, thoroughly cleaned of foreign matter, and moistened with water.

To insure sufficient mortar at the juncture of the hardened and the newly deposited concrete, the cleaned and moistened surface of the hardened concrete, including vertical and inclined surfaces, shall first be slushed with a

coating of neat cement grout against which the new concrete shall be placed before the grout has attained its initial set. Concrete for first 6 inches of the next layer shall consist of a mix having one-half the amount of coarse aggregate in the regular mix.

4.15 Protection and Curing

Provide adequate protection against rain before and during placement and finishing of concrete. Provide adequate protective measures to maintain the temperature of the concrete as specified.

Immediately after finishing operations have been completed, the entire surface of the concrete shall be sealed by spraying thereon an impervious membrane. The liquid curing compounds shall conform to the requirements of the Standard Specifications for Liquid Membrane-Forming Compounds for Curing Concrete, AASHTO Designation, M0148, Type 2, White Pigmented. Unless a greater rate of coverage is specified by the manufacturer, it shall be at 200 square feet per gallon of curing agent. Within 30 minutes after forms are removed, the concrete shall be coated with curing compound.

In lieu of curing compound above specified, the contractor may protect the concrete from premature drying by utilizing the following methods for a period of seven days: Ponding or continuous sprinkling, absorptive mats or fabrics kept continuously wet, or covering with a non-staining polyethylene film with all joints and edges weighted to prevent wind penetration.

If High-Early-Strength Cement is used, the curing period may be reduced to three days.

4.16 Defective Work

Any concrete work not formed as shown on the plans or for any reason is out of alignment or level or shows a defective surface shall be considered as not conforming with the intent of these specifications and shall be removed from the job by the Contractor at his expense unless the Engineer grants permission to patch the defective area which shall be done in accordance with the following procedure. Permission to patch any such area shall not be considered a waiver of the Engineer's right to require complete removal of the defective work if the patching does not, in his opinion, satisfactorily restore the quality and appearance of the surface.

Immediately after removing forms all concrete surfaces shall be inspected and any poor joints, voids, stone pockets, honeycomb, or other defective areas permitted by the Engineer to be patched and all the tie holes shall at once be patched before the concrete is thoroughly dry. Defective area shall be stripped away to a depth of not less than one inch with the edges perpendicular to the surface. The area to be patched and a space at least 6 inches wide entirely surrounding it shall be wetted to prevent absorption of water from the patching mortar. The patch shall be made of the same material and of the same proportion as used for the concrete except that the coarse aggregate shall be omitted and white cement shall be substituted for a part of the gray cement to match the color of the surrounding concrete. The amount of water used in mixing the mortar shall be as little as consistent with the requirements of handling and placing. The mortar shall be re-tempered without the addition of water by allowing it to stand for a period of one hour during which time it shall be mixed with a trowel to prevent setting.

The mortar shall be thoroughly compacted into place and screeded off so as to leave the patch slightly higher than the surrounding surface. It shall be left undisturbed for a period of 1 to 2 hours to permit initial shrinkage before being finally finished. The patch shall be finished in such a manner as to match the adjoining surface. On exposed surfaces where unlined forms have been used, the final finish shall be obtained by striking off the surface with a straight edge spanning the patch and held parallel to the direction of the form marks.

Tie holes left by withdrawal of rods or the holes left by removal of end of ties shall be filled solid with mortar. For holes passing entirely throughout the wall, a plunger type grease gun or other device shall be used to force the mortar through the wall starting at the back face. A piece of burlap or canvas shall be held over the hole on the outside and when the hole is completely filled, the excess mortar shall be struck off with the cloth flush with the surface. Holes not passing entirely through the wall shall be filled with a small tool that will permit packing the hole solid with mortar. Any excess mortar at the surface of the wall shall be struck off flush with a cloth.

4.17 Surface Finish of Concrete

General: After removal of forms, all metal devices used to tie forms together and hold them to correct alignment and location shall be removed in such a manner that no metal shall remain within less than 2 inches of the surface of the concrete. The method of removal of such ties shall be such as

not to cause excessive injury to the surface of the concrete by spalling. The Contractor shall not burn off rods, bolts, or other metal devices. After the removal of such ties, the opening shall be roughened and all concrete containing any oil removed. In cases where wire ties are used, all wires shall be cut back at least one inch from the surface of the face. Immediately after the removal of forms, all cavities produced by removal of form ties and all other holes, carefully pointed with a mixture of cement and fine aggregate mixed in the same proportions used in the concrete being treated and as of as dry a consistency as it is possible to use. Mortar used in pointing shall be not more than one hour old and shall be kept moist for a period of 24 hours after it is placed. Considerable pressure shall be applied in pointing to insure filling all voids. All joints in the completed work shall be carefully tooled and left free from mortar and concrete.

4.18 Floor Finish

The upper face of all floors shall be wood floated and twice steel troweled to a smooth hard surface while the concrete is still in a plastic condition after pouring. This surface shall be obtained insofar as possible by flushing the mortar in the concrete to the surface, although small quantities of mortar may be spread upon the concrete to assist in obtaining the proper surface finish. In all cases, the mortar and concrete shall be placed in one continuous operation in order to prevent separation of the mortar surface from the concrete. On walkways, subsequent to steel troweling, surfaces shall be slightly roughened by dragging burlap across the surface in a zigzag motion.

Ordinary Surface Finish: Except as otherwise specified, all formed surfaces shall have an ordinary surface finish. The surfaces of all concrete masonry shall be thoroughly worked during the placing of the concrete. After the forms are removed and pointing completed and after the concrete has hardened, all fins and irregularities shall be removed with a carborundum brick. Should defects appear in the final surface such that, in the judgement of the Engineer, a satisfactory surface has not been secured, the Engineer may order the Contractor to rub finish the surface of such sections as is necessary to produce a finished and workmanlike job.

Rubbed Surface Finish: All exposed concrete for structures shall have a rubbed surface finish. Rubbed surface finish shall be made by carefully rubbing the ordinary surface finish with a fine carborundum brick immediately after removing the forms. The first step in this process shall be to moisten the surface with water and then to immediately rub it with the carborundum brick, using light pressures and a circular motion. Rubbing shall be

continued until all air holes and small depressions are filled and an excess of mulch is on the surface. The mulch shall then be brushed out smooth with a long bristle paintbrush. After the concrete has been rubbed smooth and has set for a period of 5 to 8 days, it shall then be lightly moistened and again rubbed with a carborundum brick. Rubbing shall be continued until a smooth surface free from lumber marks and irregularities is obtained. On days when the sun is strong, rubbed surfaces shall be covered with canvas to keep the sun from drying out the surface too rapidly and thus causing checking. Before final acceptance on rubbed surfaces, all lather, powder, and dust on rubbed surfaces shall be removed by rubbing with canvas when the surface is dry.

Mechanical Finish: The concrete shall be struck off and consolidated by a self-propelled spreading and finishing machine equipped with a screen to consolidate the concrete by pressure. At least 3 inches of concrete shall be carried in front of the strike off screen. After the strike off, the surface shall have longitudinal floating with a 12 to 16 foot float. Each floated section shall overlap the previous section by 5 feet.

5.0 Masonry Works

5.1 General Scope

- a. The Contractor shall furnish all labor, materials, equipment and incidentals required to construct all concrete masonry walls as shown on the drawings and as specified herein.
- b. All materials to be delivered on site shall be approved first by the agency engineers and/or architects as well as for the materials that already have been delivered.
- c. The work under this section shall include but not limited to the following:
 1. Concrete hollow block walls
 2. Masonry reinforcing bars for concrete blocks
 3. Grouting
- d. All materials for the work of this section shall be delivered, stored, and handled so as to preclude damage of any nature. Manufactured materials, such as cement, shall be delivered and stored in their original containers, plainly marked with identification of material and maker. Materials in broken containers, or in packages showing water marks or other evidence of damage, shall not be used and shall be removed from the site.

5.2 Materials & Execution

- a. Concrete hollow blocks shall be manufactured with an average minimum compressive strength of 6.9Mpa having 40% maximum moisture content.
- b. Aggregate for concrete blocks shall consist of sand and evenly graded pea gravel conforming to ASTM C33.
- c. Masonry mortar for setting blocks shall be in proportion of 1 part cement to 3 parts sand or as otherwise approved by agency Architect/Engineer. Mortars shall be mixed with water in an amount compatible with workability. Ingredients shall be accurately measured by volume in boxes especially constructed for the purpose by the Contractor.
- d. Portland cement shall conform to ASTM C 150, Type I or PNS 07 of an approved brand.
- e. Sand shall be natural and shall be retained between No.50 and No. 100 sieves.
- f. Waterproofing shall be "SHELL FLINTKOTE" and "RECEGROUT SL10" brand or its approved equivalent.
- g. All masonry shall be laid plumb and true to lines and built to the thickness and bond required with courses level and joints and bond uniform. Masonry shall be carried up in a uniform manner. No one portion shall be raised more than one meter above adjacent portions, except with the approval of the agency Architect/Engineer.
 1. Each unit shall be placed and shoved against the previously laid block so as to produce a well compacted vertical mortar joint for the whole shell is

2. tied together with metal ties at 0.80 meter vertical spacing. Bends of tie and reinforcing bars shall be embedded in cells filled with mortar.
2. All horizontal and vertical reinforcing bars shall be anchored at a minimum of 20 bar diameter into the concrete walls, columns, slabs and girders.
 3. Joints made at the intersection of block walls with structural concrete and all door, window and louver frames and where indicated shall be filled with mortar grout and pointed.
 4. Unless otherwise shown on the Drawings, install all door, window and louver frames using screws and expansion shields, and set all frames tightly against the masonry walls.
- h. Concrete block walls which are to be plastered shall be laid in running bond. Joints are to left rough to assist in the bonding of plaster. Otherwise, concrete block masonry shall conform to the previous paragraph 2, Concrete Hollow Block. Control joints in plastered block walls shall be carried through the plaster. The joints shall not be plastered.
 - i. Concrete block walls to be tooled jointed as indicated on the Drawings shall be laid in stack bond with uniformly maintained joints not exceeding 13mm. All joints shall be tooled smooth to a stripped finish as soon as the mortar has set sufficiently. No cold-chiseling will be permitted. Finish shall be as indicated on the Drawings.
 - j. The Contractor shall build in all miscellaneous items specified in other sections to be set in masonry including frames, lintels, reinforcing steel, electrical boxes and fixtures, sleeves, grilles, anchors, and other miscellaneous items. All anchorage, attachments, and bonding devices shall be set so as to prevent slippage and shall be completely covered with mortar.
 - k. Grouting and cement mortar for setting structural columns, railings, frames in walls and where otherwise required shall be done with mortar of 1 part cement to 1 part sand. Before placing grout, thoroughly clean all surfaces. Grout shall be tamped into place with a blunt tool to fill the entire void. In the event space does not permit tamping, the Contractor shall build the necessary forms and place the grout by pouring from one side only. When grout is placed by pouring, a head of grout shall be maintained in the form. Grout shall be kept wet for three days and after the temporary supports or adjusting wedges are removed, the empty space shall be grouted and the surrounding grout pointed.
 - l. All exposed masonry work shall be thoroughly cleaned. Mortar smears and droppings on concrete block walls shall be dry before removal with a trowel. Masonry work may be cleaned using a mild muriatic acid solution.

6.0 Tile Works

6.1 General Scope

- a. The Contractor shall furnish all labor, materials, equipment and incidentals required to install ceramic wall and floor tiles and as shown on the drawing and as specified herein.
- b. All materials to be delivered on site shall be approved first by the agency engineers and/or architects as well as for the materials that already have been delivered.
- c. All materials for the work of this section shall be delivered, stored, and handled so as to preclude damage of any nature. Manufactured materials, such as tile adhesive and tile grout, shall be delivered and stored in their original containers, plainly marked with identification of material and maker. Materials in broken containers, or in packages showing water marks or other evidence of damage, shall not be used and shall be removed from the site.
- d. Protect all finishes work until turnover to the Owner.

6.2 Materials & Execution

- a. Ceramic Floor tiles: shall be 60cm x 60cm and 30cm x 60cm in dimension or approved equivalent.
- b. Ceramic Wall tiles: shall be 30cm x 60cm in dimensions or approved equivalent.
- c. The surface of Ceramic wall and floor tiles and components can be smooth, profiled, decorated or finished, glossy, matt or semi-matt as indicated.
- d. It shall be flat true to shape, sound and free from flaws and other manufacturing defects.
- e. Step Edge Guard: shall be 2" in dimension and made of brass or approved equivalent.
- f. All tiles shall be laid leveled and true to lines and built to the thickness and bond required with courses level and joints and bond uniform. Floor tiles shall be carried up in a uniform manner.
- g. Grouting for setting floor tiles shall be done as per manufacturer's specification.

7.0 Finish Hardware

7.1 General Scope

- a. Furnish materials, accessories and perform labor required to complete all works specified in this item. See drawings and details for location, and quantity of hardware accessory to be installed.
- b. All materials to be delivered on the site shall be approved first by the agency engineers and/or architects as well as for the materials that already have been delivered.
- c. The Contractor shall place his order for all hardware early in order to avoid delay in the job. No request for extension of time shall be determined by Owner or the Architect due to this delay. And no substitution of hardware shall be allowed due to negligence of the Contractor on this matter.

7.2 Materials & Execution

- a. Loose Pin Hinges for doors: heavy duty materials, 3" x 3" in size or approved equivalent.
- b. Door Locksets: heavy duty materials or approved equivalent.
- c. Loose pin hinges and door locksets shall be installed properly and as per manufacturer's specifications.
- d. Heavy Duty Door Closer and Panic Hardware shall be installed properly and as per manufacturer's specifications.
- e. Install hardware to fit details as shown in the drawings and as per manufacturer's specifications with screws to match the finish. Supply all necessary templates and instruction required.
- f. After hardware has been properly fitted, all exposed items such as knobs, plates, pulls, locks, etc. shall be removed until final coat of plaster's finish has been applied, and then hardware installed.
- g. All locks and latch strikes shall be installed in door frames at the same height from the floor. Door knobs shall be located so that the center of the knobs is 38 inches from the finished floor, and/or directed by the Architect.

8.0 Doors, Windows & Glasses

8.1 General Scope

- a. Furnish materials, accessories and equipment and perform labor conforming to manufacturer's specification required to complete:
 - Flush Door with Marine Plywood on Both Faces
 - 2" x 5" Door Jamb
 - PVC Flush Door
 - Fire Exit Steel Door
 - Fixed Glass Window
 - Sliding Glass Window
 - Operable Glass Window
 - Glass Mirror with Frame and Plywood Backing

See drawings and details for sizes, location extent and other requirements.

- b. All materials to be delivered on site shall be approved first by the agency engineers and/or architects as well as for the materials that already have been delivered.
- c. Protect all finishes work until turnover to the Owner.

8.2 Materials & Execution

- a. Flush Doors: 45mm in thickness with ¼" thick marine plywood on both faces and kiln dried lumber frame.
- b. Door jamb: should be 2" x 5" in size, kiln dried with 60cm x 110cm, 90cm x 210cm, 80cm x 210cm, 60cm x 180cm opening.
- c. PVC Flush Doors: should be with 2" x 5" jamb with 60cm x 210cm opening.

- d. Fire Exit Door: should be metal with metal jamb and hinges and panic device with heavy duty door closer.
- e. Fixed Glass Window: shall be 6mm thick glass fitted on powder coated white aluminum tubular frame.
- f. Sliding Glass Window: shall be 6mm thick glass fitted on powder coated white aluminum tubular frame.
- g. Glass mirror: should be ¼" thick with aluminum frame and ¼" thk marine plywood backing, all in accordance with the detailed drawings.
- h. Submit sample corner sections of wood doors and jambs, phenolic board partition, glass windows, and metal fire exit door for approval of the Architect/Engineer.
- i. Protect doors and partitions adequately from scratches, and other stains with heavy building paper until final turnover to the Owner.
- j. Assemble joints indoors with water-resistant glue: keep doors under pressure until glue has thoroughly set.
- k. Sand smooth finished doors. Provide doors with joints and clean cut moldings.
- l. Keep faces free from defects or machine marks that will show through the finish.
- m. Provide doors with cross bonding and edgings. Make face veneer first quality selected plywood as directed in the drawings or as specified herein. Provide lock blocks or size required for hardware used.
- n. Label each glass panel and do not remove from glass panel until final cleaning and after inspection and approval.
- o. Protect all glass from damage, breakage, staining, etching, differential aging, abrasion, scratches, and impacts during construction and until final acceptance of the contract work. Replace unless satisfactory corrective measures can be made at the job without moving the damaged glass, as directed by the Architect/Engineer.
- p. Deliver only as required and store in a safe location as directed. Unpack only when ready for use.
- q. Prevent glass from all contact with metal or any hard or sharp materials to prevent edge chips, cracks and other defects by use of resilient shims placed at quarter points.
- r. All glass shall be of uniform quality and free from excessive distortions.
- s. Glass breakage cause in executing the work or by fault installation shall be replaced by the Contractor at his own expense.
- t. Lost and damaged materials shall be replaced by the Contractor at his own expense.

9.0 Painting Works

9.1 General Scope

- a. Furnish materials and equipment and perform labor required to complete all painting works of areas covered under this contract. See drawings and details for location, quantity and extent of surfaces to receive paint.
- b. All materials to be delivered on site shall be approved first by the agency engineers and/or architects as well as for the materials that already have been delivered.
- c. The work includes but is not limited to the following items:
 - 1. Touch-up Painting: of miscellaneous metal, hollows metal and frames and all other materials which may have been shop coated as may be required where the shop coats have been damaged by welding or abrasion during the handling and erection operations, also all rivets, bolts and welds which are unpainted after assembly and erection.
 - 2. Finish Painting: including all exposed surfaces of miscellaneous metal, hollow metal work, ferrous sheet metal and other paintable metal work, paintable wood work not shop finished; shop fabricated mechanical equipment apparatus housing, electric meters, ferrous metal gratings and covers for floor and roof drains and manholes, exposed bars and insulation piping and finished area, electric panels, conduit boxes, and switched hear, all plastered surfaces, concrete and concrete block surfaces, except in areas to be excluded; primed hardware, and all items which generally require finish painting unless specifically excluded.
- d. Items not requiring protective painting or finishing:
 - 1. Aluminum, stainless steel and non-ferrous metal, glazed structural units, exposed aggregate wall panels, and blasted concrete marble, glass, resilient tiles, ceramic floor tiles, and plastic, laminate sprayed insulation and similar items which do not generally require painting.
 - 2. Shop Priming: unless otherwise noted or specified herein, the work shall not include priming or protective paint which is required to be performed at the factory or in the shop. In general, this includes the following items section of the specification; miscellaneous metal, shop fabrication or factory-built mechanical equipment, electrical equipment and accessories refer to their applicable sections of the specifications for information on these items.
 - 3. Factory Finished Work: unless otherwise noted of specified herein, the work shall not include finish painting of items having a factory applied finish as specified in other sections of the specifications. In general, this includes the following items; metal toilet enclosure, gate, factory finished mechanical equipment and special equipment. Refer to other applicable section of the specifications for information on these items.
- e. All colors are to be selected or approved by the Architect or his authorized representative and actual color shall be supplied to the Contractor for matching. All undercoats shall be tinted to approximate the finish coat color.

- f. All material shall be delivered to the job site in clean, sealed, original containers with all labels and other markings intact. Materials will be stored in the area designated and all storage areas will be kept neat, clean and locked.
- g. A room or rooms in the premises shall be assigned for the storage of painting tools and materials. Protect the floor with drop cloths or building paper. Place cloth and cotton waste in covered metal containers, or destroy them at the end of each work day.
- h. Every precaution will be taken by the contractor to prevent fires at the end of each day's work, all oil rags, empty containers and combustible material will be removed from the premises.
- i. The Contractor will protect his own area as well as adjacent areas and materials, lawns, shrubbery and other areas not to be painted with suitable covering.
- j. Works specified elsewhere such as for metal, wood, concrete and masonry.
- k. Use BOYSEN or DAVIES only for all painted works.

9.2 Materials & Execution

- a. Use materials of approved equal and shall be delivered on the site in the original containers with labels intact and seals unbroken.
- b. The use of other brand or equal or better quality will be subject to the Architect's approval. Use materials in accordance with the manufacturer's direction printed on the labels unless otherwise approved by the Architect.
- c. Use paint materials for wall and ceiling.
- d. The use of ready mixed paint may be allowed in the project provided, that such paint is in accordance with the Standard Specifications No. 13 of the Philippine Government.
- e. Painting Schedule: as specified hereunder or as per manufacturer's direction.

1. Interior & Exterior Metal Surfaces

1 st coat	-	Primer Enamel Paint
2 nd coat	-	Quick Dry Enamel Paint
3 rd coat	-	Quick Dry Enamel Paint

Omit first coat, except for touch-up, if metal has been shop primed.

Primer touch-up shall be of same composition as shop primer.

2. Concrete surface of walls, exposed ceiling and block walls.

1 st coat	-	Flat Latex Paint
2 nd coat	-	Semi-Gloss Latex Paint
3 rd coat	-	Semi-Gloss Latex Paint

All concealed surfaces shall be primed coated with concrete primer.

For concrete concealed ceilings, use finish paint with thermal insulation properties of approved quality.

3. Gypsum Board Ceiling

1 st coat	-	Flat Latex Paint and Sealer
2 nd coat	-	Flat Latex

3rd coat - Flat Latex

4. Dry Wall Partition

1st coat - Flat Wall Enamel

2nd coat - Semi-Gloss Enamel

3rd coat - Semi-Gloss Enamel

- f. Before the start of the painting work, the painting Contractor shall prepare paint a 4 feet by 4 feet area designated by the Architect or Engineer and same be used as standard workmanship for the entire work. Samples shall be made of surface preparation, primers, stains, fillers and finish coat applications.
- g. Remove all loose grit, mortar, dust, dirt, grease, oil and any other foreign matter. Treat new masonry neutralizer. Refer to manufacturer's specifications for mixing. Allow solution to dry overnight before rinsing with water to remove white residue. After surface is dried, apply concrete sealer.
- h. For masonry that is unpainted and exposed to the weather for 6 months or more efflorescence may appear. Remove efflorescence by any of these methods.
- i. Metal must be free from oil, grease, dust and rust. The most ideal surface preparation for rust metal is White Metal Blasting. This involves the removal of all visible rust, mill scale, paint and contaminants, leaving the metal uniformly white or gray in appearance. This blast cleaning can be achieved by sandblasting or power grinding. This metal surface preparation should be used where maximum performance or protective coatings is necessary due to exceptionally severe conditions such as constant immersion in water or liquid chemicals. These films of rust may be removed by wire-brushing, sanding or scraping. Thicker layers of rust can be removed with the use of etching solution. Metal surfaces cleared of rust must be immediately primed with metal primers. Do not allow bright metal to be exposed to the elements for prolonged periods as rust will set in fast. Clean with paint thinner where solder flux has been used.
- j. Clean thoroughly to remove dust, foreign matter; oil or grease by solvent. Light sand glossy finish of new galvanized iron; clean thoroughly and then apply direct Portland cement paint or 100% acrylic roof paint. Weathered surfaces showing thin films of rust shall be sanded or wire-brushed, cleaned; immediately thereafter, prime with red lead primer or zinc chromate primer yellow. Rust films that cannot be removed by wire-brushing or sanding will disintegrate with the use of metal etching solution; thereafter, clean surface and immediately apply metal primers as indicated above. Do not allow surfaces removed of rust exposed to the weather as rust will set in fast.
- k. Wood should be clean and dry, sand to remove excessive roughness and then brush off dust. Apply a coat of white exterior wood primer on knots and sappy streaks. Apply silver finish aluminum paint over stains from wood preservatives. Countersunk nail heads (rust free) before applying primer. After primer is dried, putty small openings and minor surface defects with white plasalux putty.

- l. Sand to smooth surface and then dust off. Correct minor surface imperfections. Apply applicable putties after first coat is dried. Sand lightly between coats of flat, semi-gloss paints, gloss enamels and varnished. Clean rooms of dust before applying top coats.
- m. Glossy Surfaces: sand and clean surfaces thoroughly. This method will provide a "tooth" for the following coats.
- n. Oil and Grease: remove oil and grease by paint thinner or wiping with rags. Change solvents and rags frequently.
- o. Dirt and Foreign Matter: remove loose dirt by bristly brushes, then blow clean with air pressure or steam cleaning.
- p. Employ only experienced, skilled craftsmen and apply as per manufacturer's written instructions.
- q. Paint shall be applied by a brush, roller or spray in accordance with the manufacturer's directions. All materials when brushed shall be evenly flowed on with brushed best suited for the type of materials being applied. When using roller, the covers shall be carpet velvet back of high pile sheep's wool best suited for materials and texture specified by the Architect. Sprayed paint shall be uniformly applied with suitable equipment.
- r. Exposed surfaces shall mean all areas visible when all permanent or built-in fixtures, grilles, etc., are in place in all areas specified or scheduled to be painted. Painted surfaces in back of movable equipment and furniture. Paint interior surfaces of ducts where visible thru grilles, and all inside metal and plastered surfaces visible through the above specified equipment covers.
- s. Access panels, electrical panels, air diffusing outlets, supply and exhaust grilles, louvers, exposed conduits, primed outlet covers, primed wall and ceiling plates and other primed items they occur unless otherwise specified in Painting Schedule. Paint the back sides of access panels, removable or hinged covers and the like. Do not paint nameplates on equipment.
- t. Do not apply exterior paint in damp, rainy weather. Do not apply interior paint when in the Architect's opinion, satisfactory results cannot be obtained due to high humidity and excessive temperature.
- u. Protect or remove all exposed finished hardware, lighting fixtures and accessories, glasses and the like so that these are not stayed during painting operations. Re-install them after completions of works. Tape and cover with craft paper or equal other surfaces which would be endangered by stains or paint marks. Repair any damage done. Refinish any work made necessary by defective workmanship for material or carelessness of other crafts.
- v. Mix paint with proper consistency in accordance with the manufacturer's printed instructions. Apply paints evenly and smoothly without runs, sags or other defects and brush efficiently to minimize brush marks. Make edges of paint adjoining other material or color sharp and clean without overlapping.

- w. Do not apply final coats until other trades whose operations would be detrimental to finish painting have finished with their work in the areas to be painted and the areas have been approved for painting. Test concrete and plaster surfaces for moisture, using moisture meter reading above 15 shall not be painted.
- x. Do necessary puttying on nail holes, cracks, etc. after the prime coats has been applied. Bring putty flush with adjoining surface in a neat, workmanlike manner.
- y. Tinting colors for oil paint shall be colors-in-oil, ground in pure linseed oil, and of the highest grade obtainable. Colors shall be non-fading.
- z. Color pigments shall be used to produce the exact shades of paint which shall conform to the approved color scheme of the building.
- aa. Except as otherwise noted, color of priming coat shall be lighter than body coat and the color of the body coat lighter than finish coat. The first coat shall be white.
- bb. Protect the work and adjacent work and materials at all times by a suitable covering or by other methods. Upon completion of the work, remove paint and varnish spots from floors, glass finish hardware, etc. so as to leave the premises in perfect condition, acceptable to the Owner.
- cc. Finished surfaces shall be solid, even color and finished texture, free from drops, runs, lumps, brush marks, discoloration or other defects.
- dd. Before final inspection, any work which has become damaged or discolored shall be touched up or refinished in satisfactory manner.

10.0 Electrical Works

WIRES AND CABLES

- a. All wire conductors to be used shall be branded.
- b. All wires shall be copper, soft-drawn and annealed shall be of 98% conductivity, shall be smooth and true and of a cylindrical form, and shall be within 1% of the actual size called for.
- c. All wires and cables shall comply with the requirements of the Underwriters Laboratory, the A.S.T.M. and the I.P.C.E.A. as they apply to the particular usage.
- d. Wires size larger than 2.0 sq. mm diameter should be stranded.
- e. Wires and cables for lighting and power systems shall be plastic insulated for 600 volts working pressure, type THHN or THWN unless otherwise noted on plans or specified below.

CONDUITS AND FITTINGS

- a. No conduit shall be used in any system smaller than 15 mm (½ inch) diameter electric trade size nor shall have more than four(4) 90-degree bends in any one run and where necessary, pull boxes shall be provided as directed.
- b. No wire shall be pulled into any conduit until the conduit system is completed in all details, in any case of concealed work until rough plastering or masonry has been completed and in the case exposed work until the conduit work has been completed in every detail.
- c. The ends of all conduits shall be tightly plugged to exclude plaster, dust and moisture while the building is in progress of construction. All conduits shall be reamed to remove all burrs.

OUTLETS, BOXES AND FITTINGS

- a. At all outlets of whatever kind, for all systems, there shall be provided a suitable fitting which shall be either a box or another device especially designed to receive the type of fitting to be mounted thereon.
- b. The Contractor shall consult the Engineers as to the nature of the various fittings to be used before installing the outlet, fittings, and shall conform strictly in the use of fittings, to the nature of the appliance to be mounted on them so that the work, when completed will be of finished design.
- c. At all outlets on concealed conduit work, provide galvanized pressed steel outlet boxes of Standard make. These boxes shall be in all cases standard.
- d. All utility boxes intended for outlet devices shall be especially designed to receive the particular type of device to be mounted and should be deep enough to accept and fit total number of conductors and device required as per drawing.

JUNCTION AND PULL BOXES

- a. Junction and pull boxes, of code gauge steel, galvanized shall be provided as indicated or as required for facilitating the pulling of wires and cables. Pull boxes in finished place shall be located and installed with the permission and to the satisfaction of the PSC representative.
- b. All junction and pull boxes on exposed circuit work shall be provided with hubs for threaded pipe entry and covers provided with neoprene gaskets.

WALL SWITCHES AND PLATES

- a. Wall switches shall be rated with ampere and voltage ratings as required. Switches shall be flush mounting type and of the quiet 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 Architect. Appropriate samples shall be submitted prior to the purchase of wall switches and faceplates.
- b. All utility boxes intended for receptacle outlet devices shall be especially designed to receive the particular type of receptacle outlet to be mounted and should be deep enough to accept and fit total number of conductors and device required as per drawing.
- c. All switches and receptacle plates shall be of plastic finish B.L. plate or as directed by the Architect/Engineer.

WALL RECEPTACLE AND PLATES

- a. Receptacle outlets in general shall be for flush mounting, duplex type rated at 16 amperes, 250 volts, 2-pole , 3-wire parallel slots, grounding type unless otherwise indicated on drawings. Type and color of receptacles outlets and plates shall be as selected by the Engineer or Architect. Appropriate samples of outlets and plates shall be submitted prior to purchase of devices. Receptacles shall be approved equal.
- b. All utility boxes intended for receptacle outlet devices shall be especially designed to receive the particular type of receptacle outlet to be mounted and should be deep enough to accept and fit total number of conductors and device required as per drawing.
- c. Receptacle with Ground Fault Circuit Interrupter (GFCI) Shall be rated 15A,2P 3wire grounding type, 240 V, Parallel slot with 15 milli-ampere current sensitivity.
- d. Duplex Universal Convenience Outlet w/ ground(16A / 250 V)

LIGHTING FIXTURES

- a. The Contractor shall submit samples of all type of lighting fixtures for the approval of the Architect and the Engineer.

CIRCUIT BREAKERS

- a. All individual circuit breakers to be used shall be branded.
- b. Provide individual circuit breakers, safety switches and disconnect switches where
Indicated on plans. Voltage ratings shall be suitable in each case of service application. Enclosures shall be General Purpose, NEMA type I, except where Specifically noted on plans or assembled on panel cabinets. All protective devices
Shall meet NEMA and Underwriter's Laboratories, Inc. specifications.
- c. Circuit breakers shall consist of a quick-make, quick-break type entirely trip-free operating mechanism with contacts, arc-interrupter, and thermal magnetic trip unit for each pole, all enclosed in a molded-phenolic case. The thermal-magnetic trip unit shall provide time-delayed overload protection, and in case of overload or short circuit current in any one pole. Circuit breaker shall be trip indicating, with the tripped position of breaker handle midway between "ON" and "OFF" positions. A common internal trip mechanism shall be provided to all pole tripped operation of circuit breakers. Tie handle of circuit breakers for common trip is not acceptable.

PANELBOARDS

- a. Standard panelboard as much as possible shall be used and properly assembled base on plans or load schedule. All panels shall be dead front construction, furnished with trims for flush or surface mounting as required.
- b. All panelboards shall be composed of only one brand of circuit breaker. .
- c. Panelboard main bus work shall be ampacity rated to equal or exceed overcurrent protective device immediately ahead of it. All bus work shall be properly secured to withstand available short circuit forces at the location.
- d. Distribution panels shall be equipped with two or three poles circuit breakers of sizes, voltages ratings and interrupting capacity as called for on plans.

11.0 Plumbing Works

11.1 General Scope

- a. The work under this division shall be subject to the requirements of the General Condition, which shall be included as a part of these Specification and which shall apply to all work performed under the Plumbing Work Division.
- b. All materials to be delivered on site shall be approved first by the agency engineers and/or architects as well as for the materials that already have been delivered.

- c. The Plumbing and Sanitary work is a Specialty Trade which shall be performed by a Specialty Trade Contractor referred to in this specification as Plumbing contractor.
- d. The scope of work and responsibility of the Plumbing Contractor is stipulated in these specifications and is treated separately from the function of the General Contractor and other Specialty Trade Contractor for the sole purpose of bidding.
- e. However, after the winning Bidder of the Plumbing Work is determined and assigned to the General Contractor, the Plumbing Contractor becomes a Sub-Contractor of the General Contractor and all responsibilities and functions of the Plumbing Contractor stipulated in these specifications shall be assumed by the General Contractor.
- f. There shall be no contractual relation between the Owner and the Plumbing Specialty Trade Contractor.
- g. Furnish all materials and equipment and perform all labor necessary for the complete installation, testing and operation of the plumbing system in accordance with the applicable drawings and this division of the specifications consisting of, but not limited to the following:
 - 1. Sanitary
 - 2. Soil, waste, and vent pipe systems within the building
 - 3. Water distribution and supply pipes and fitting
 - 4. Water service connection
 - 5. Plumbing fixtures, fittings, trims and accessories
 - 6. Any and all other work involved in providing the complete operation of the domestic water supply system, fire protection system, sanitary plumbing and for the above named project.
- h. Items by Others:
 - 1. General cutting and patching of openings except for pipe hangers and inserts.
 - 2. All concrete foundations or bases required for plumbing equipment.
 - 3. Concrete sumps and puts.
 - 4. Flashing of roof drains and pipes penetrating the roof.
 - 5. Water for construction and testing purposes will be supplied by the General Contractor.
- i. Refer to all electrical, structural, mechanical, and architectural plans and specifications and investigate all possible interference and conditions affecting the plumbing work. Proposed solutions to anticipated problems shall be submitted to the Architect/Engineer for approval at least one (1) week ahead of the construction schedule.
- j. It is not intended that the drawing shall show every pipe fittings, valve and appliances. All such items, whether specifically mentioned or not, or indicated on the drawings shall be furnished and installed if necessary to complete the system

in accordance with the best practice of the plumbing trade and to the satisfaction of the Owner.

- k. All dimensional locations of fixtures, equipment, floor and roof drains, riser and pipe phases shall be verified on the architectural drawings and manufacturer's catalogues.
- l. Execute the work in full accordance with the requirements of all governmental agencies having jurisdiction thereof as well as with requirements and/or recommendations of the National Plumbing Code of the Philippines, the Philippine Rating Bureau, the Underwriters, all applicable laws of the Republic of the Philippines and all codes and ordinances of the Municipality or locality.
- m. Obtain all necessary allowances, pay all royalties and the like in connection with the use of any patented devices or systems, and save the Owner harm from any claim or lawsuit arising from such use.
- n. After approval of the complete list of manufacturer's names of all materials he proposes to use, and before purchase of any material, the Plumbing Contractor shall submit to the Owner for approval six (6) complete sets of detailed information consisting of manufacturer's bulletins, shop drawings and part list of materials to be provided under this Contract. Submit names, sizes, catalogue number, shop drawing, and/or samples of the following equipment and materials for approval.
 - 1. Plumbing fixtures
 - 2. Toilet accessories
- o. The Plumbing Contractor shall furnish to the Owner a written guarantee covering the satisfactory operation of the plumbing installation in all its parts for a period of one (1) year after date of final acceptance. During this period, the Plumbing Contractor shall repair or replace any defective work and pay for any repair or replacement costs. Included with this guarantee certificate shall be the guarantee certificates of every material supplier employed by this trade.
- p. The Plumbing Contractor shall protect all his work and materials from loss, injury or defacement. Protection of fixtures and materials shall be provided by boards, papers, and/or cloth as required and any lost, damage, or defaced materials shall be replaced by the Plumbing Contractor at his own expenses.
- q. Cover and protect all openings left in floor or wall for passage of pipes. Protect pipes with suitable covering as soon as set. Close all open ends of pipes with a plug or cap fitting to prevent obstruction and damage.
- r. Seal all set traps.
- s. As soon as installed, cover all metal fixture trimmings with non-corrosive grease and maintain it until construction work is completed.
- t. Use any material, device, fixture or appurtenance not specified in these specifications may allowed, provided that such alternate has been approved, in writing, by the Owner to substantiate the Contractor's claims, the cost shall be borne by the Contractor.

- u. Tests shall be done by an agency approved by the Owner and in accordance with generally accepted standards. In the absence of such standards, the Owner may specify the test procedures.
- v. In any substitution, all health and safety requirement shall be observed.

11.2 Materials & Execution

1. Lavatory, Urinal, Water Closet, Faucets, Shower Bar, Bidet, and Floor Drain:
 - a. Material shall be of approved equivalent.
 - b. Floor Drains & Valves: shall be made of high grade-strong, tough and even grained metals. No floor drains and valves must be on the way of people who may step on them.
 - c. Water Closet: Manual Piston Type Flush Valve Toilet or approved Equivalent
 - d. Lavatory: 53cm x 44cm Porcelain Under Counter Lavatory or Approved Equivalent
 - e. Shower Head: Stainless steel Shower Head
 - f. Lavatory Faucet: Single-Hole Lavatory Faucet
2. Fixture & Equipment Supports and Fastening:
 - a. All fixtures and equipment shall be supported and fastened in a safe and satisfactory manner.
 - b. Insert shall be securely anchored and the anchors shall be properly flushed with mortar. Inserts shall be installed flush with the finished wall and shall be completely concealed when the fixtures installed.
 - c. Where through bolts are used, they shall be provided with plates or washers at the back and set so that heads, nuts, and washer will be concealed by plaster. Exposed bolts, nuts, cap nut, and screw heads shall be provided with chromium-plated brass washers.
 - d. All exposed metal surface shall be rid of grease, dirt or other foreign materials. Chrome or nickel-plated piping, fittings and trimmings shall be polished upon completion. All equipment pipes, valves and fittings shall be cleaned of grease and sludge which may have accumulated.

Any stoppage or dis-colorization or other damages to part of the building, or its finish of furnishing, due to the Contractor's failure to properly clean the piping system shall be repaired by the Contractor without additional cost to the Owner.

12.0 Waterproofing

12.1 General Scope

- a. This section shall include all labor, materials, equipment and the performance of all operations necessary for the completion of all waterproofing works as shown on drawings and this specification.
- b. Materials shall be delivered in original sealed containers clearly marked with supplier's name, brand name and type of materials. Handle products to avoid

damage to container. Do not store for long periods in direct sunlight. Materials stored in the jobsite shall be protected from weather, moisture, and extreme temperature changes.

Concrete surfaces shall have an open capillary system to provide tooth and suction and shall be clean, free from scale, excess form oil, laitance, curing compounds and any other foreign matter. Smooth surfaces, caused by steel forms, etc., or surfaces covered by excess form oil or other contaminants shall be washed, lightly sandblasted, water blasted, or acid-etched with muriatic acid, as required to provide a clean absorbent surface. Horizontal surfaces shall not be troweled or power-troweled, and shall be left with a rough float finish or (preferably) a broom finish. If power-troweling is required it shall be kept to a minimum. Vertical surfaces may have a sacked finish.

12.2 Materials & Execution

- a. The required waterproofing material shall be "SHELL FLINTKOTE" and "RECEGROUT SL10" brand or its approved equivalent. Test waterproofed area by twenty-four (24) hours and check for any seepages.
- b. Areas not stated above but requiring waterproofing by Procuring Entity shall be included in the scope of work. Thickness should be as per Manufacturers Specifications and Installation depending on the Areas to be applied with.

13.0 Architectural Works (Specialties)

13.1 General Scope

- a. This section includes all materials, labor, equipment and the performance of all operations necessary for the furnishing and installation of all cladding and toilet partitions complete with accessories and fasteners as indicated on drawings and specifications.
- b. Take field measurements prior to component fabrication to ensure proper fitting of work.
- c. Furnish inserts and anchorage that must be built into other work for installation of toilet partitions and related items.

13.2 Materials & Execution

- a. TOILET PARTITIONS: Use 12mm thick Cherry Compact Phenolic Board Toilet Partitions with Stainless Type Accessories or approved equivalent. Component material shall be High Pressure Laminates (HPL). All exposed edges shall be PVC with color matching face. Color as approved by the Architect.
- b. Submit sample corner sections of phenolic board partition for approval of the Architect/Engineer.

Upon delivery to job site, inspect for damages and irregularities. When damage is considerable, reject product and remove from site. Replace with new items at no extra cost to the Owner.

14.0 Mechanical Works

General Scope

- a. The design and construction of the fire protection system including but not limited to piping configuration, supports, controls, bracing, fasteners and anchors shall conform to applicable seismic construction and design requirements set out in NFPA 13 (Standard for the Installation of Sprinkler Systems).
- b. All pipings and fittings must be ductile iron, galvanized brass or stainless steel.
- c. The fire protection systems to be implemented includes the aboveground and underground piping, sectional valves, valve pit, supports and accessories.
- d. The fire protection system shall be provided with controls including all necessary items or accessories to run the system as per design intent.

Piping Requirements

FPS Pipe (Aboveground) – ASTM A53 ERW SCH40, black iron pipe and mechanical coupling (grooved) connection, complete with not limited to corrosion and cathodic protection or approved equivalent.

Pipe shall be painted by spray thru air compressor.

FPS Pipe (Underground) – ASTM A53 ERW SCH40, Galvanized iron pipe, and welded connection for all underground connection, complete with not limited to corrosion and cathodic protection or approved equivalent.

Pipes shall be new, designed for 10 bar working pressure, conforming to ASTM specifications and have the manufacturer's name or brand along with the applicable ASTM standard, marked on each length of pipe.

All ASTM A53 and ASTM A120 pipe and fire loop piping must be hydrostatically tested at the mill per the ASTM standard.

15.0 Specialty Works

15.1 Pool Filtration Equipment and Accessories

- a. Pool Filter: shall be Vertical Grid Diatomaceous Earth (D.E.) Filter, 72 sq.ft. filter area with monofilament polypropylene cover fitted over 8 curved or approved equivalent.
- b. Pool Pump: Centrifugal Pump & Motor, 3HP, single phase, 220 volts, 2x 2 1/2" pipe size
- c. Spring Board: Approved by FINA with fulcrum and a pair of short stand, 9/32" thickness, and 150 lbs. working tension per inch width or approved equivalent.
- d. Pool Fittings: Must be UV resistant, ABS body

16.0 Securing of Occupancy Permit

The Occupancy building permits, clearances or licenses (when necessary) shall be provided by the Contractor. The Contractor shall pay all fees and other incidental expenses. The Contractor shall provide as-built plans/drawings (if applicable), duly accomplished construction logbook, certifications and other necessary documents to secure the Occupancy Permit in favor of the Philippine Sports Commission.

17.0 Cleaning/Hauling of Wastes and Debris and Cleaning of Site

After final inspection of all the works undertaken, remove all paint stains, temporary structures, installation, unused/scrap materials, wastes and debris. Dispose of them properly.

18.0 GENERAL NOTES

The contractor shall be responsible in securing the necessary permits/ licenses (Building, Electrical, Mechanical, Sanitary/Plumbing, Electronics & Communication and Fire Safety) from the Local Government Units (LGU's) and other government agencies in connection with the implementation of the Upgrading Of Philsports Swimming Pool, Diving Pool, Warm Up Pool And Construction of New Bleacher & Jacuzzi.

Other materials and workmanship not included on the above list but found necessary to complete the work shall be for the account of the contractor.

Sub-contractor/ suppliers of major finishing materials (ceiling panel, tile, glass, waterproofing, paint, etc) shall be a local or multi-national company with wholly owned Philippine subsidiary and shall have a similar local project of supply and installation of the above stated materials.

Sub-contractor of major finishing materials (ceiling panel, ceramic tiles, etc.) shall be a ***member of association of specialists on cleaning and restoration.***

The contractor shall be responsible for the safety measures during the implementation of the project and ***must submit methodologies*** in every finishing materials required in the project.

Branded materials stated in the plans and specifications is the designer's reference of quality standards.

These products can be replaced provided that the replacement are approved of the same or higher quality.

Restoration of floors, walls, ceiling affected by the Mechanical, Electrical and Communication works outside the area shall be the sole responsibility of the contractor.

The contractor shall ***coordinate with PSC Project Architects, Engineers and Coordinators*** in connection with the implementation of the project so as not to hamper with PSC operations.

The contractor is required to have the necessary and appropriate tools, instruments and equipment for the proper implementation of the project.

The contractor shall submit the as built plans to PSC after the completion of the project. It is assumed that the bidder shall have full knowledge of the work and site condition, shall have reviewed the plans and specifications and bid documents, and thus warrants the availability of the work and materials upon submission of his bid proposal.

The contractor shall coordinate all aspects of the works in order to ensure a harmonious progress without interruptions, delays of modifications to work already completed. The prospective bidder/ contractor shall possess and submits with the eligibility documents a valid track record in undertaking related works.

All electrical (lighting systems, etc), mechanical (duct facilities, etc.) and electronics and communications facilities and other related facilities/ equipment not included in the program of works that will be affected during the implementation of the project should be restored to their original operating condition/s at no additional cost to PSC authority.

I. PREVENTION OF ACCIDENT AND PUBLIC NUISANCE

General

The Contractor shall formulate adequate control measures in accordance with the relevant local laws and regulations regarding prevention of accidents, fires and public nuisances during the execution of the work.

The Contractor shall ensure that his workmen are aware, and shall so instruct the workmen, of good and safe working practices.

The Contractor's safety plan shall take into account, among other items, working in Restricted

Areas, Contractor's Equipment; hand held power tools; percussion guns; air compressors and hoses; electrical equipment; fuels; use of dust masks, ear protectors, safety helmets and safety lines.

Prevention of Accidents

The Contractor shall formulate a safety plan for work at the Site to provide proper protection, especially at such places in the airfield Restricted Areas.

Pollution Control

The Contractor shall take all necessary steps to minimize noise, vibration, dust, soot, and other pollution resulting from the execution of the work.

II. PERIOD OF WORK

The Contractor shall complete the work within One Hundred Twenty (120) calendar days upon receipt of the Notice to Proceed. The contractor must work two shifts to finish the work on time.

III. WARRANTY PERIOD

The Contractor shall submit a surety bond for a warranty period of one (1) year on materials and workmanship.

Any item found to be defective within the aforementioned period, the contractor shall immediately replace the said item/s at their own expense and no cost to PSC.

Any damage to life and property caused by the contractor operation within the vicinity of the facility covered by the project shall be the sole responsibility of the contractor.

IV. CONTRACTORS RISK AND WARRANTY SECURITY

1. The Contractor shall assume full responsibility for the works from the time of construction commenced up to final acceptance by the Procuring Entity's Representative/s and shall be held responsible for any damage or destruction of the works except those occasioned by force majeure. The Contractor shall be fully responsible for the safety, protection, security and convenience of his personnel, third parties and public at large, as well as the works, equipments, fabrication and installation and the like to be affected by his construction works and deliveries.
2. The defects liability period shall be one (1) year from the contract completion. The certificate of acceptance shall be issued by PSC after all defects have been corrected.

V. ACCEPTANCE OF THE PROJECT

Certificate of Acceptance will be issued upon approval of the END USER and the Head of the Procuring Entity.