

2. All chemical materials utilized by this sub shall be handled by professionals trained in doing so. All material will be stored in and disbursed from proper containers with no unused materials left on site unless secured in an approved storage area.
3. The Contractor must provide all necessary materials for the safe performance of work, The Contractor must use the chemical that is standard to the industry for its intended use.
4. Remove all wooden pieces, concrete debris, plastic strips, tree stump roots, and deleterious materials, etc. shall be completed as well as soil shall be leveled and compacted before treatment starts.
5. All construction-related tests shall be approved by the PMC prior to treatment.
6. The application shall immediately begin by first preparing and mixing the solutions of Approved Anti-termite/ soil poisoning material diluted with water at a rate of 1:49 Liter water as per manufacturer's recommendation.
7. The solution of approved Anti-termite material diluted with water shall be sprayed with an application rate of 4 to 5 liter per square meter into the leveled and compacted backfilling material of the whole building footprint and shall extend 10 meters from the outside perimeter of the building.
8. For foundations and other excavation, treat the bottom and side of trenches until a height of 300mm from the base with the solution at a rate of 5 liters per square meter.
9. After the foundation/ grade beams/ wall footings are built, the backfill which is in immediate contact with the foundation shall be treated at a rate of 7.5 liters per square meter. Treating shall be done on each side of the vertical surface.
10. The top surface of the consolidated earth shall also be treated at a rate of 5 liters per square meter before the gravel bedding is laid. If the filled earth does not allow the emulsion to be absorbed, make holes of 50mm to 75mm deep and 150mm apart to facilitate saturation of the soil with the termiticide solution.
11. Wall and floor junction shall be treated on the inner wall surface from ground level at a rate of 7.5 liters of vertical wall or column surface to be used. Solution shall reach the soil at the bottom.
12. Application of termiticide solution shall be sprayed to all wooden surfaces with an application rate of 4 to 5 liter per square meter prior to painting works.
13. The treated area shall then be covered, it can be opened free until 2 hours, and then casting can be started. Casting must be completed by 2 to 24 hours after the Anti-termite application.
14. This Contractor must not treat soils in adverse weather conditions.
15. The work area must be cleaned up daily ensuring that chemical containers and rags or any other expended material items have been safely removed from the site.
16. The contractor shall guarantee the work for one (1) year after final acceptance.
17. The Contractor must employ accredited workmen who are trained in working with chemical compounds and pesticides and have a full understanding of handling and safety procedures and first aid emergency care.

## **PART B. PLAIN AND REINFORCED CONCRETE WORKS**

### **X. Forms and Falseworks**

This Item shall consist of designing, constructing, and removing forms and falsework to temporarily support, concrete, girders, and other structural elements until the structure is completed to the point it can support itself.

#### **Formwork**

The material used for smooth form finish shall be plywood, tempered concrete-form-grade hardboard, metal, plastic, paper, or other acceptable materials capable of producing the desired finish for form-facing material. Form-facing materials with raised grain, torn surfaces, worn edges, patches, dents, or other defects that will impair the texture of concrete surfaces shall not be permitted. No form-facing material shall be specified for rough form finish.

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### Falsework

The material to be used in the falsework construction shall be of the quantity and quality necessary to withstand the stresses imposed; it may be timber or steel or a combination of both. The workmanship shall be of such quality that the falsework will support the loads imposed on it without excessive settlement or take-up beyond as shown on the falsework drawings.

1. Shop drawings for forms and false works shall be submitted by the Contractor to the TPC approval before fabrication/ installation.
2. Submission of shop drawings to the TPC for evaluation/ approval shall be submitted 7 days before fabrication/ installation.
3. The Contractor shall submit a detailed calculation of scaffolds if it can withstand the imposed loads due to the self-weight of the structural element, construction loads, and impact loads.
4. Used formworks & scaffolds shall not be utilized in the construction to avoid surface imperfection in all concrete works.
5. Formworks shall be coated with non-staining mineral oil or non-staining form coating compound (form oil) in all contact surfaces with concrete before rebar installation and closure of forms.
6. Provide formworks with clean-out openings to permit inspection and removal of debris.
7. The Contractor shall remove debris before concrete casting.
8. Forms submerged in water shall be watertight.
9. Use 3/4" thk. Phenolic Board – construction form for beam runners, sidings, bleachers, columns and suspended slabs.
10. All forms and scaffolds used by the Contractor during construction, completion, or repair of the said project shall be turned over to the Administration after the construction except for the Personal Steel Forms and scaffolds (H-Frame).
11. Use of round wood as scaffoldings may be allowed upon recommendation and approval of the PMC in coordination with the Design Engineer.
12. Re-shoring must be done on-site when necessary.

### XI. Reinforcing Steel Bars

This item shall consist of furnishing, bending, fabricating, and placing of steel reinforcement of the type, size, shape, and grade required per standard specifications and in conformity with the requirements shown on the plans or as directed by the Engineer.

1. The Reinforcing Steel Bars shall conform to the latest specification of the ACI and the National Structural Code of the Philippines with a minimum grade equivalent to Grade 40 (276 MPa) unless otherwise specified or as directed by the Engineer.
2. Shop drawings/ Rebar cutting list shall be submitted by the Contractor for TPC approval before rebar fabrication and installation.
3. Submission of shop drawings/Rebar Cutting list for evaluation/approval shall be submitted 7 days before rebar fabrication.
4. All cut off points of RSB in all tie beams, suspended beams, and girder must be observed as specified on plans and as per approved design and as per standard construction practices and methodology.
5. Reinforcing Steel bars shall undergo material testing for strength verification.
6. The Contractor shall submit to the TPC and PMC a mill certificate of reinforcing steel bars for yield strength verification and its content.
7. Steel bars shall not be coated with form oil.

8. Standard hooks, Splicing, concrete cover and development length shall be observed on site.
9. All Hooks for stirrup/lateral ties and main reinforcement shall be seismic hooks.
10. This scope includes all reinforcing bars required for reinforced concrete works including other items where it is necessary as per plan and specifications.

## XII. Structural Concrete

This item shall consist of furnishing, placing, and finishing concrete in all structures except pavements per this Specification and conforming to the lines, grades, and dimensions shown on the plans. Concrete shall consist of a mixture of Portland cement, fine aggregate, coarse aggregate, admixture when specified, and water mixed in the proportions specified or approved by the Engineer.

1. Structural concrete must attain a minimum compressive strength  $f_c' = 21.0$  MPa (3000 Psi) at 28 days and as per structural specification.
2. Use clean washed sand & crushed gravel (maximum 19mmØ) as per plan and structural specification for Structural members. The use of uncrushed gravel is prohibited.
3. Concrete pouring of columns shall be terminated anywhere within the upper thirds of the column clear height.
4. Monolithic concrete pouring of slab on fill/suspended slab/girder and beams shall be observed.
5. This scope includes the concrete pouring of the framing system before masonry works.
6. Proper concrete sampling and testing shall be done on-site as per specifications.
7. Proper concrete curing must be observed on site.
8. Lean concrete must be provided for column footings with a minimum thickness of 50mm.
9. Proper concrete pouring methodology shall be observed on-site to avoid the segregation of aggregates.
10. Structural Concrete shall attain its acceptable strength before Stripping/Dismantling of bottom forms.
11. This scope also includes the construction of foundation, column footings, columns, tie beams, girders, beams, slab and ramps on grade, suspended and canopy slabs, concrete fascia, wall footing and retaining walls, and other items necessary as per plan and specifications.

## PART C. ARCHITECTURAL FINISHES & OTHER CIVIL WORKS

### XIII. Masonry Works

Contractor shall supply all the specified materials, expertise, supervision, labor, layout, equipment, tools, scaffold and miscellaneous items required for a complete masonry job in accordance with the drawings, plans and specifications as specified herein. All masonry works shall be performed by skilled craftsmen in a workmanlike manner throughout and shall be in accordance with all relevant codes, standards and regulations as deemed necessary.

1. Concrete Hollow Blocks (CHB) shall be applicable for non-load-bearing applications as specified in the drawings. CHB shall have fine, even texture, well defined edges and shall be sound and free from cracks and other defects.

2. Masonry units should be delivered and stored on wooden pallets to prevent moisture absorption from the soil and covered with water-repellent tarps or plastic covers to prevent wetting, staining, or discoloration.
3. Aggregates should be protected against contamination from rain and from blowing dust and soil during construction to prevent staining or reduced mortar bond strength.
4. Different aggregates should be stored in separate stockpiles and all aggregate stockpiles covered with a waterproof tarp or plastic covering when not in use.
5. CHB shall be laid with full mortar coverage on both horizontal and vertical shells. Requirements for the mortar are as follows:
  - Portland Cement: ASTM C150, Type 1
  - Sand: Clear, Sharp, graded from fine to coarse, ASTM C-144
  - Water: Clean and potable
  - Mixture: One (1) part cement, two (2) parts sand
6. If needed, provide a guide chord stretched out from end to end to establish desired CHB alignment.
7. After erecting 4 layers of CHB, observe 3 to 4 hours' interval before proceeding with the next layer of CHB.
8. A 20mm thick gap shall be provided in between walls and columns, walls and beams, walls and slab on top.
9. Provide 20mm thick Styropor as joint filler between walls and columns/ walls and beams/slab on top.
10. The contractor shall establish and ensure desired CHB alignment and plumbness. The Contractor shall reconstruct any inadequate work.
11. This includes all masonry works required for the completion of the building as well as parapet walls and other decorative masonry works.
12. CHB shall be piled on plank platforms in dry locations, and shall be protected with appropriate cover or other suitable material until laid in the wall. Reinforcement and other metal items shall be protected from the elements. All mortar materials shall be stored under cover in a dry place so that damage from moisture, freezing and other sources are prevented.

**XIII.A 5" thk. Masonry Wall (incl Reinforcing Steel Bars)**

- a. Use 5" non-load bearing concrete hollow blocks for exterior walls indicated in the plans.
- b. This item also includes reinforcing steel bars of concrete hollow blocks. Use 10mm diameter RSB spaced at 600mm for vertical reinforcement and 10mm diameter RSB at every three (3) layers of CHB for horizontal reinforcement.
- c. Use gauge no. 16 G.I. tire wire to secure the steel bars into its designated position.

**XIII.B 4" thk. Masonry Wall (incl Reinforcing Steel Bars)**

- a. Use 4" non-load bearing concrete hollow blocks mainly for interior walls indicated in the plans.
- b. This item also includes reinforcing steel bars of concrete hollow blocks. Use 10mm diameter RSB spaced at 600mm for vertical reinforcement and 10mm diameter RSB at every three (3) layers of CHB for horizontal reinforcement.
- c. Use gauge no. 16 G.I. tire wire to secure the steel bars into its designated position.

**XIV. Doors**

This Item shall consist of furnishing all panel door & hollow core door materials, labor, tools and equipment required in undertaking the proper installation as shown on the Plans and in accordance with this Specification.

1. This scope of work includes fabrication and installation of Doors including all items required to be fabricated like doorjamb and provision of complete accessories including heavy duty handle set and locking devices.
2. This scope of work includes provision of Doors and door frames conforming to the sizes, dimensions and designs as shown and specified in the schedule of doors or as per the bill of materials.
3. Contractor to ensure that all materials to be used shall be in accordance with the required specifications. All doors shall be provided with corresponding heavy-duty