

8. The Contractor shall assign a one (1) fulltime Safety Officer/Safety Engineer and one (1) fulltime First Aider.
9. The full-time Safety Engineer/Officer assigned at the site who shall strictly monitor work activities. Said Safety Engineer/Officer shall ensure strict compliance with regard to the wearing of additional personal protective equipment (PPE) required such as, but not limited to, face masks, safety glasses/goggles, face shields, and long sleeve T-shirts, and other measures to contain the spread of COVID-19 in the workplace.
10. Work activities shall be strictly monitored daily by the Safety Officer on site to ensure compliance with safety standards and quarantine protocols.
11. Proper waste disposal shall be provided for infectious waste such as PPEs and other waste products coming from outside the construction premises.
12. Contractor shall submit a copy of the approved OSH Program to the Agency through PMC.
13. The Contractor shall strictly adhere to the provisions of this scope. Non-compliance of this requirement shall be a valid ground for suspension and/or termination of contract.

#### **IV. Mobilization/ Demobilization**

1. This Item includes the mobilization/ demobilization of materials and equipment, construction of Temporary Facilities, Bunkhouse, Warehouse storage & Project Site Office.
2. All materials used for billboards, signages, bunkhouses shall be new and be turned over to the implementing unit after the completion of the project.
3. This item includes demobilization of all construction debris from the site after all works has been completed.

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## **CIVIL, MECHANICAL, ELECTRICAL, & PLUMBING/ SANITARY WORKS**

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### **PART A. EARTHWORKS**

#### **V. Clearing and Grubbing**

This item shall consist of clearing, grubbing, removing and disposing all vegetation and debris as designated in the Contract, except those objects that are designated to remain in place or are to be removed in consonance with other provisions of this Specification. The work shall also include the preservation from injury or defacement of all objects designated to remain.

All surface objects and all trees, stumps, roots and other protruding obstructions, not designated to remain, shall be cleared and/or grubbed, including mowed as required, except as provided below:

1. Removal of undisturbed stumps and roots and nonperishable solid objects with a minimum depth of one (1) meter below subgrade or slope of embankment will not be required.
2. In areas outside of the grading limits of cut and embankment areas, stumps and nonperishable solid objects shall be cut off not more than 150 mm above the ground line or low water level.
3. In areas to be rounded at the top of cut slopes, stumps shall be cut off flush with or below the surface of the final slope line.
4. Grubbing of pits, channel changes, and ditches will be required only to the depth necessitated by the proposed excavation within such areas.
5. In areas covered by cogon/ talahib, wild grass and other vegetation, topsoil shall be cut to a maximum depth of 150 mm below the original ground surface or as designated by the Engineer and disposed outside the clearing and grubbing limits.
6. This scope involves cutting of trees within the location of the project and demolition of existing fence specified on plans.

## VI. Structure Excavation

This Item shall consist of the necessary excavation for the foundation of structural columns, and other structures not otherwise provided for in the Specifications. Except as otherwise provided for pipe culverts, the backfilling of completed structures and the disposal of all excavated surplus materials shall be in accordance with these specifications and in reasonably close conformity with the plans or as established by the Engineer.

All earthwork excavation shall be confined to the construction area as shown on the plans and shall be done in an approved manner with proper equipment. Excavation shall be suspended during rain and inclement weather, or when unsatisfactory field conditions are encountered unless otherwise directed by the ENGINEER. At all times during construction, the CONTRACTOR shall maintain proper drainage in the construction area and shall take all measures necessary for erosion and sediment control.

1. Excavation work will be done in all kinds of soils.
2. This scope includes the excavation of column footing and wall footing and removal of materials within the staked - out line of the Greenhouse.
3. The Contractor shall furnish all the necessary labor, place and maintain all support and shoring as maybe required for the excavation, including the removal/pumping of storm/waste water from the excavation.
4. Contractor shall take every precaution to protect existing utility services from damage during construction operations. If damage occurs, the institution shall be notified immediately and repairs shall be made promptly at the contractor's expense. All repair work shall be satisfactory to the engineer and the institution. When interruptions of existing utilities occur, temporary service shall be provided as approved by the engineer and owner of the utility.
5. Contractor must provide a working space allowance of 0.5 m each face of the structural element (for footing, wall footings) for an excavation of 1.0 m depth and .8m for 2.0 m depth of excavation, respectively.

## VII. Embankment (Incl. Backfilling and Gravel Bedding)

This Item shall consist of the construction of embankment in accordance with this specification and in conformity with the lines, grades and dimensions shown on the plans or established by the engineer.

1. Excavated areas around structures shall be backfilled with free draining granular material approved by the Engineer and placed in horizontal layers not over 150 mm in thickness, to the level of the original ground surface. Each layer shall be moistened or dried as required and thoroughly compacted with mechanical tampers at 90% MDD.
2. Utilization of Excavated Materials. All excavated materials, so far as suitable, shall be utilized as backfill or embankment. The surplus materials shall be disposed of in such a manner as not to obstruct the stream or otherwise impair the efficiency or appearance of the structure. No excavated materials shall be deposited at any time so as to endanger the partly finished structure.
3. Utilization of excavated material from column footing, tie beam and wall footing for embankment up to the Natural grade line and an additional volume of suitable backfilling materials.
4. The concrete strength of column and tie beams must be attained up to its considerable strength before backfilling and compaction is done on site.
5. Gravel bedding for Slab on Grade and Wall Footing, and other members that rests on compacted fill must be properly observed on site and must have a minimum compacted thickness of 100mm.
6. Finished grade line of the structure must refer from the finished roadway as per standard construction practice.
7. No footing shall rest on fill.
8. Contractor to provide for de-watering of excavations from either surface water, groundwater or seepage.
9. The Contractor shall conduct backfilling and compaction works for Column footing and wall footing at 90% MDD.

10. Additional embankment inside the greenhouse shall be provided by the implementing agency and the labor cost for embankment is included in the scope of works.

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

### **VIII. 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.

#### **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 Project Monitoring Office (PMO) approval before fabrication/ installation.
2. Submission of shop drawings to the PMO 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 1/2" thk. Marine Plywood – construction form for sidings.
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.
11. Re-shoring must be done on-site when necessary.

### **IX. Reinforcing Steel Bars (Grade 40)**

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 PMO approval prior to rebar fabrication and installation.
3. Submission of shop drawings/Rebar Cutting list for evaluation/approval shall be submitted 7 days prior to 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 must undergo testing for strength verification.
6. The contractor shall submit to the PMO 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. Cut-off of vertical reinforcement shall comply with the designer's requirement.
9. Standard hooks, Splicing and Development length must be observed on site.
10. All Hooks for stirrup/lateral ties and main reinforcement must be seismic hooks.
11. This scope includes reinforcing steel specified as per plan for all slab on ground including stair and ramp on fill; canopies, ledges, stiffener beams and columns; and all reinforcements from third floor level to roof deck and roof cover.
12. This scope further includes all reinforcing steel bars for footing and pedestal.
13. Tensile strength test result shall be attached to the request for form closure and concrete pouring to be submitted to the PMO and PMC for approval. Material sampling and testing shall be in accordance to the DPWH Standards.

#### **X. Structural Concrete (incl. Lean 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 of  $f_c' = 27.6 \text{ MPa}$  (4000 Psi) @ 28 days for Hostel Building (incl. Footing and pedestal).
2. Use clean fine aggregates & crushed gravel (maximum 19mmØ) as per plan and structural specification for Structural members. 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. Proper concrete curing must be observed on site.
6. Lean concrete must be provided for column footings with a minimum thickness of 50mm.
7. Proper concrete pouring methodology must be observed on site to avoid segregation of aggregates.
8. Structural Concrete shall attain its acceptable strength prior to Stripping/Dismantling of bottom forms.
9. This Scope includes additional canopies and ledges not included in the previous phase.
10. This also includes structural concrete specified as per plan for all slab on ground including stair and ramp on fill; canopies, ledges, stiffener beams and columns; and all reinforcements from ground floor level to roof deck and roof cover.
11. Compression test and quality test for aggregates (fine and coarse) results shall be attached to the request for form closure and concrete pouring to be submitted to the PMO and PMC for approval. Material sampling and testing shall be in accordance to the DPWH Standards.

### **PART C. ARCHITECTURAL FINISHES & OTHER CIVIL WORKS**

#### **XI. 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.