

PART III. CIVIL, MECHANICAL, ELECTRICAL, & PLUMBING/ SANITARY WORKS

PART A. EARTHWORKS

VI. Clearing and Grubbing

This item shall consist of clearing, grubbing, removing and disposing of 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 the 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. Except in areas to be excavated, stump holes and other holes from which obstructions are removed shall be backfilled with suitable material and compacted to the required density.
7. If perishable material is burned, it shall be burned under the constant care of component watchmen at such times and in such a manner that the surrounding vegetation, other adjacent property, or anything designated to remain will not be jeopardized. If permitted, burning shall be done in accordance with applicable laws, ordinances, and regulation.
8. Material and debris which cannot be burned and perishable materials may be disposed off by methods and at locations approved by the implementing agency, on or off the project site.
9. If disposal is by burying, the debris shall be placed in layers with the material so disturbed to avoid nesting. Each layer shall be covered or mixed with earth material by the land-fill method to fill all voids. The top layer of material buried shall be covered with at least 300mm (12 inches) of earth or other approved material and shall be graded, shaped and compacted to present a pleasing appearance.
10. This scope involves clearing and grubbing of the entire building footprint as well as site clearing where the septic tank will be located as per plan.
11. The construction site shall also be cleared and free from construction debris upon completion of the project. The cost involved in the disposal activities shall be included in the unit bid price.

VII. Removal of Existing Structures and Obstructions

This Item shall consist of the removal wholly or in part, and satisfactory disposal of buildings, fences, structures, old pavements, abandoned pipe lines, and any other obstruction which are not designated or permitted to remain, except for the obstructions to be removed and disposed of under other items in the Contract. It shall also include the salvaging of designated materials and backfilling the resulting trenches, holes, and pits.

1. All designated salvable material shall be removed, without unnecessary damage, in sections or in pieces which may be transported, and shall be stored by the Contractor at specified places on the project or as otherwise directed by the monitoring committee.

2. Basements or cavities left by the structure removal shall be filled with acceptable material to level of surrounding ground and, if within the prism of construction, shall be compacted to the required density.
3. Unless otherwise provided, all pipes shall be carefully removed and every precaution taken to avoid breakage or damage. Pipes to be relaid shall be removed and stored when necessary so that there will be no loss of damage before re-laying. The Contractor shall replace sections of lost from storage or damage by negligence, at his own expense.
4. All concrete pavement, base coarse, sidewalks, curbs, gutters, designated for removal, shall be:
 - a. Broken into pieces and used for riprap on the projects, or
 - b. Broken into pieces, the size of which shall not exceed 300mm (12 inches) in any dimension and stockpiled at designated location as directed by the monitoring committee.
 - c. Otherwise demolished and disposed off as directed by the Engineer. When specified, ballast, gravel, bituminous materials or other surfacing or pavement materials shall be removed and stockpiled as required, otherwise such materials shall be disposed off as directed.

VIII. Structure Excavation

This Item shall consist of the necessary excavation for the foundation of structural columns, tie beams, 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 shall be done in all kinds of soils.
2. This scope includes the excavation of column footing, tie beam, transformer pad and wall footing for masonry wall and removal of materials within the staked - out line of the building as well as excavation for septic tank and catch basin located as per plan.
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. The 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 works 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. The Contractor shall provide a working space allowance of 0.5 m each face of the structural element (for footing, wall footings and tie beams) for an excavation of 1.0 m depth and .8m for 2.0 m depth of excavation, respectively.

IX. Embankment (Incl. Backfilling and Gravel Bedding)

This Item shall consist of the construction of embankment per 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. 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 that may endanger the partly finished structure.

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3. Utilization of excavated material from column footing, transformer pad, 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 must be properly observed on-site and must have a minimum compacted thickness of 50mm.
6. The finished grade line of the structure must refer to 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 include backfilling and compaction works at 1.0m offset distance (outside) from the perimeter of the building at 90% MDD.

X. Soil Poisoning and Anti-Termite Treatment

This Item shall consist of furnishing and applying termite control chemicals, including the use of equipment and tools in performing such operations in accordance with this Specification.

Termite control chemicals or toxicants shall be able to immediately exterminate termites or create barriers to discourage entry of subterranean termites into the building areas.

Before any termite control work is started, thorough examination of the site shall be undertaken so that the appropriate method of soil poisoning can be applied. The Contractor shall coordinate with other related trades through the Engineer to avoid delay that may arise during the different phases of application of the termite control chemicals.

1. This scope includes soil poisoning of areas covered by the structure's slab on grade and ramps on grade as well as building landscape, planters and concrete pavement.
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.

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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

XI. 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 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, 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.