PROJECT : CONSTRUCTION OF PERIMETER FENCE FOR RESERVED WATER TANK
SUBJECT : SCOPE OF WORKS AND SPECIFICATIONS
LOCATION : BOGUAINVILLA SUBDIVISION, BRGY.BAÑADERO, CALAMBA, LAGUNA
DATE : MAY 03, 2023

C. CIVIL WORKS

I. SCOPE OF WORKS

C.1 Earthworks

Excavation:

Except when specifically provided to the contrary, excavation shall include the removal of materials of whatever natured encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the work. The removal of said materials shall conform to the lines and grades shown or ordered. Unless otherwise provided, the entire construction site shall be stripped of all vegetation and debris, and such materials shall be removed from the site prior to performing any excavation or placing any fill. The Contractor shall furnish, place, and maintain all supports and shoring that may be required for the sides of the excavations, and all pumping, ditching, or other approved measures for the removal or exclusion of water, including taking care of storm water and waste water reaching the site of the work from any source so as to prevent damage to the work or adjoining property.

The walls and faces of all excavations in which workers are exposed to danger from unstable ground shall be guarded against by a shoring system, sloping of the excavation, or some other acceptable method. The contractor shall furnish, install, and maintain such sheeting, bracing, etc., as may be necessary to protect the workers and to prevent any movement of earth which could injure or delay the work or endanger adjacent structures. In excavations which workers may be required to enter, excavated or other materials shall be effectively stored and retained at least 600mm or more from the edge of the excavation. All excavation and trenching operations shall conform to any and all national, provincial and local safety requirements.

Excavation Beneath Proposed Structures. Except where otherwise specified for a particular structure or ordered by the Engineer, excavation shall be carried to the grade of the bottom of the footing or slab. Where shown and ordered, areas beneath proposed structures shall be over-excavated. When such over-excavation is shown on the drawings, both over-excavation and subsequent backfill to the required grade shall be performed by the Contractor at his own expense. When such over-excavation is not shown but is ordered by the Engineer, such over-excavation and any resulting backfill will be paid for under a separate unit price bid item if such bid item has been established; otherwise payment will be made in accordance with negotiated prices. After the required excavation or over-excavation has been completed, the exposed surface shall be scarified to a depth of 150 mm (6-in.) brought to optimum moisture content, and rolled with heavy compaction equipment to ninety-five percent (95%) of maximum density.

Excavation Beneath Areas to be Paved. Excavation under areas to be paved shall extend to the bottom of the aggregate base, if such base is called for; otherwise it shall extend to the bottom of paving. After the required excavation has been completed, the exposed surface shall be scarified, brought to optimum moisture content, and rolled with heavy compaction equipment to ninety percent (90%) of maximum.

C.2 Columns and CHB Wall

1. Preparation of Equipment: All equipment for mixing and transporting concrete shall be clean. Debris shall be removed from spaces to be occupied by concrete. Forms shall be properly coated. Masonry filler units that will be in contact with concrete shall be well drenched. Reinforcement shall be thoroughly clean of deleterious coatings. All laitance and other unsound material shall be removed before additional concrete is placed against hardened concrete.
2. Mixing, Placing and Curing of Concrete: All concrete shall be mixed until there is uniform distribution of materials and shall be discharged completely before mixer is recharged. Curing shall be maintained above 10ºC and in moist condition for at least the first 7 days after placement.
3. Formworks Design and Removal: Forms shall result in a final structure that conforms to shapes, lines, and dimensions of the members as required by the design drawings and specifications. It should be tight to prevent leakage of mortar, also it shall be properly braced or tied together to maintain position and shape. Forms shall be removed in such manner as not to impair safety and serviceability of the structure. All concrete to be exposed by form removal shall have sufficient strength not to damage thereby.
4. General Procedures: Placed CHB, steel reinforcements, concrete, ties and all other appurtenances as shown and as required to provide a complete and workable installation. Where steel reinforcement spacing details are shown, the reinforcement bars shall conform thereto and shall be placed as indicated; provided, that the reinforcement bars shall be complete and adequate regardless of whether or not these reinforcement bars are specifically shown.
5. Laying of CHB Wall: Excavated areas shall be in a reasonably dry condition when the reinforcement bars, concrete and CHB are laid. All inside spaces shall be filled with grout/mortar and shall encase fully the reinforcing steel. The minimum thickness for wall shall be 150 mm. The reinforcement shall be limited to a maximum spacing of 1200 mm on center. The minimum diameter shall be 10 mm. Horizontal reinforcement shall be provided in the top of the wall footing and at the top of the wall openings.
6. Column Fabrication: Excavated areas shall be the same as CHB wall laying. Shoring and scaffolding shall be undertaken properly and adequately so as to support or brace masonry units during construction and throughout the period of hardening its grout. Grouting shall be done in layers that will assure proper filling of all voids and keyed properly to prevent slippage of bond. The number of vertical reinforcement shall not be less than four (4), nor the diameter less than 10 mm. Lateral ties as shown shall enclose all longitudinal bars. Lateral ties shall be placed not less than 38 mm and not more than 125 mm from the surface of the column. Maximum tie spacing shall be 200 mm.
7. Reinforcement: At time concrete is placed steel reinforcements shall be free from coating that would destroy or reduce bond. Steel reinforcement shall be cut to its desired length as specified on the plan.
8. Testing: Testing of masonry materials shall be done by applicable government bodies or their authorized agencies, according to testing procedures and other relevant requirements needed for such tests. In the absence of the above, testing shall be done in accordance with ASTM C140-70, Method of Test for Concrete Masonry Units.

C.3 Backfill/Restoration

1. A newly laid CHB wall shall be backfilled at least 0.60 m to 0.80 m above the top of the footing at the end of each day with selected material obtained from the excavation. Materials used for backfill shall be selected, free from grass, roots, brush or other vegetation, or rocks having maximum dimensions larger than 150mm (6 in). If in opinion of the Engineer, said material is unsuitable for backfill purposes, borrow material having the sand equivalent value of not less than twenty (20) (ASTM – D2419) shall be used for this portion of the trench backfill. Selected material shall first be brought up to mid – height of the column post and CHB wall's dimension below natural ground level and then compacted; then the remainder of

the backfill to 150mm (6in) above the pipe maybe placed and compacted. Such material shall be compacted to ninety five percent (95%) of max. density where the trench is located under proposed structures and ninety percent (90%) of max. density elsewhere. Compaction shall be obtained by tamping it not more than 150mm (6in) layers or by using excess water and passing a concrete vibrator between the pipe and the side of the trench. Obtain and complete (IR) inspection request form prior to backfilling; the works may proceed upon approval of the Supervising Engineer. Remainder of the trench shall be backfilled not later than the following day.

Barricades and warning lights satisfactory to the Engineer shall be provided and maintain for all in which case of heavy steel plates, adequately braced bridges or other type of crossing capable of supporting vehicular traffic shall be furnished.

2. Concrete pavement shall be replaced with the same kind or better material in conformance with the latest specifications, rules and regulation, and subject to the inspection and approval of the agency having jurisdiction.

Steel Gate:

Doors and gate shall be fabricated and of sizes indicated on the drawings and shall be of the quantity and workmanship acceptable to the Engineer. The contractor shall guarantee the finished steel gate against defects due to fabrication and installation, for a period of sixty days (60) after the final acceptance of the building.

II. MATERIAL SPECIFICATIONS

A. Concrete Hollow Blocks

Size of concrete hollow blocks shall be 12.5cm (5") x 20cm x 40cm no deforms and dried as delivered.

B. Concrete

1. *Portland cement:* Cement shall conform to the Standard Specifications for READY MIXED CONCRETE, ASTM C-94 or on the Specification for Portland Cement, ASTM C 150 or PNS 07. An air-entraining admixture, conforming to ASTM C-260, shall be added to either Type I, Type II or Type III Portland Cement. Mixture shall be 1:3:6 or as suggested by the Engineer depending on type of cement. Use 40 kg bag of cement.

2. *Aggregates:* All aggregates used for concreting shall conform to ASTM C 33 or PNS 18 and shall be checked daily for any variances in moisture current. Said variances shall be corrected and/or taken into consideration for each batch.
   a. Coarse Aggregates: Shall be uniformly and evenly graded for each application in accordance A.C.I. Standard 318. Unless otherwise approved, aggregate shall be sound, crushed, angular grantic stone. Smooth or rounded stone (river rock) shall not be acceptable.
   b. Fine Aggregates: Shall consist of natural sand, manufactured sand or a combination thereof.

3. *Water:* Water used in mixing concrete shall be clean and free from injurious amounts of oils, acids, alkalis, slats, organic materials, or other substances that may be deleterious to concrete or reinforcement.

C. Metal Reinforcement

Reinforcing bars may be galvanized or epoxy coated in accordance with Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement, ASTM A 767 or

Specification for Epoxy-Coated Reinforcing Steel Bars ASTM A 775. Use minimum fy = 227 Mpa (grade 33).

D. ***Formworks:***

4. Use ordinary plywood with dimension 4' x 8' x 1/2 "dried as delivered.
5. Use coco lumber size 2" x 2" x 12' and 2" x 3" x 12' free from deformation and pests that could destroy its quality.

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