



Republic of the Philippines  
Department of Agriculture  
Western Visayas  
Iloilo City

## INSTALLATION OF PLANT NURSERY FACILITY

# TECHNICAL SPECIFICATIONS

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## GENERAL REQUIREMENTS

### B.9 MOBILIZATION/ DEMOBILIZATION

The Contractor shall mobilize and move into the Project Site (in accordance with his approved Construction Program and Equipment Moving-in and Utilization Schedule) the required construction equipment needed for the successful completion of the Contract Work immediately after receipt of the approved Construction Program. Notwithstanding the approved Equipment Moving-in and Utilization Schedule, the initial equipment required to be mobilized by the Contractor to the Project Site within twenty (20) calendar days after date of receipt of the approved Construction Program are listed below:

#### MINIMUM EQUIPMENT REQUIREMENT FOR THE PROJECT:

Description	No. of Unit
1. Welding Machine	1 unit

### B.5 PROJECT SIGNBOARD, COA BILLBOARD, AND PROJECT MARKER

Project Marker made of concrete hollow blocks and reinforced with steel bars, plastered finished in a 0.88m x 1.4m dimension and with concrete foundation underneath, marker information sees on the approved plans / drawings.

Commission on Audit (COA) Billboard printed of white tarpaulin, 8 ft x 8 ft dimension; resolution 70 DPI; Font: Helvetica; Font Size: Main information – 3 inches; Sub. Information – 1 inches; and Font color: Black.

Department of Agriculture (DA) Billboard shall be on standard billboard measuring 1.2m x 2.4m (4ft x 8ft) using ½ inch plywood or Tarpaulin posted on 3/16-inch plywood. Billboard shall be installed in front of project site.

### B.7(2) OCCUPATIONAL SAFETY AND HEALTH PROGRAM

As compliance to the requirements of RA 11058 and DOLE Department Order 198-18 (its Implementing Rules and Regulations) and the applicable provisions of the Occupational Safety and Health Standards (OSHS).

The agency obligation and responsibilities is to provide appropriate funds for implementing this OSH program including orientation and training of its employees on OSH, provision and dissemination of IEC materials on safety and health, provision of Personal Protective Equipment (PPE) when necessary and other OSH related requirements and activities, to ensure the protection for our workers and employees against injuries, illnesses and death through safe and healthy working conditions and environment.

In line with the project implementation, the contractor shall conduct risk assessment as required to prevent workplace accidents as well as comply with other provisions of this OSH program. That they must also fully be aware of the penalties and sanctions for OSH violations as provided for in RA 11058 and its Implementing Rules and Regulations.

The following are the minimum labor and Personal Protective Equipment (PPE) that the contractor needs to provide on-site:

- Part-time Safety Practitioner/ First Aider
- First Aid Kit
- Safety Helmet
- Safety Shoes
- Safety Gloves
- Safety Vest
- Gas/Dust Mask



## **800(1) CLEARING AND LAY-OUT WORKS**

### **SCOPE AND DESCRIPTION**

The work under this item shall consist of the removal and disposal, in a manner approved by the Engineer, of all vegetation, trees, stumps, roots, brush, rubbish and all objectionable matters within the right-of-way for the Project Construction all in accordance with the Drawings and these specifications or as directed by the Engineer.

## **803(1)a EXCAVATION (Manual)**

### **SCOPE AND DESCRIPTION**

The work under this item shall consist of excavating, removal, hauling and disposal of all excavated materials; tamping and trimming foundation bed required for the construction of permanent structures with the use of suitable excavated materials as determined by the Engineer; hauling and disposing of all excess excavated materials to the designated waste disposal areas, all in accordance with the plans and specification or as ordered by the Engineer.

## **804(1)b BACKFILL**

In placing backfills or embankment, the material shall be placed simultaneously in so far as possible to approximately the same elevation on both sides of an abutment, pier, or wall. If conditions require placing backfill or embankment appreciably higher on one side than on the opposite side, the additional material on the higher side shall not be placed until the masonry has been in place for 14 days, or until tests made by the laboratory under the supervision of the Engineer establishes that the masonry has attained sufficient strength to withstand any pressure created by the methods used and materials placed without damage or strain beyond a safe factor.

Backfill or embankment shall not be placed behind the walls of concrete culverts or abutments or rigid frame structures until the top slab is placed and cured. Backfill and embankment behind abutments held at the top by the superstructure, and behind the sidewalls of culverts, shall be carried up simultaneously behind opposite abutments or sidewalls.

## **900 REINFORCED CONCRETE WORKS**

### **CONCRETE WORKS**

#### **GENERAL**

This item covers all the materials as cement, aggregates, water, admixtures and proportioning, mixing, transporting, placing, finishing, curing and protecting of concrete and including supplies, equipment, tools and all other incidentals necessary for concrete works.

## CONCRETE COMPOSITION

Concrete shall compose of cement, fine and coarse aggregates, water and if necessary admixtures or agents approved by the Agency. The design of concrete mixtures and consistency shall be as specified in this section.

### CEMENT

#### General

The cement shall conform to the requirements of the standard specifications for Portland Cement (ASTM: C150 Type 1). Concrete mixture used for foundation shall be Class A- 1:2:4 cement-sand-gravel ratio. Special cement may be used subject to the approval of the Engineer provided it meets the requirements with respect to strength, soundness and setting time.

### WATER

The water used in concrete, mortar and grout shall be free from objectionable quantities of slit organic matter, alkali, salts and other impurities.

### FINE AGGREGATES

#### General

The term "Fine Aggregates" is used to designate aggregates in which the maximum size of particles is 3/16 of an inch, (5 millimeters). Fine aggregates for concrete, mortar and grout shall be provided by the contractor and shall consist of natural sand, manufactured sand, or a combination of both.

As a means of providing moisture control, the Contractor may be required to stockpile the fine aggregates over porous drain excessive water and to stabilize the moisture content.

#### Quality

Fine aggregates shall conform to the requirements of ASTM C-33 and shall consist of hard, tough, durable uncoated rock particles. The Contractor shall exercise every possible precaution in the transporting, washing and screening operations to prevent the contamination of the sand particles. The fine aggregates shall conform to the following requirements:

#### a) Grading

It is assumed that the sand available in natural deposits will require processing to provide a suitable gradation. Regardless of the source, the fine aggregates shall be well graded from fine to coarse and the gradation as delivered to the mixers shall conform to the following requirements unless otherwise approved:



Sieve Designation US Standard Square M e s h	Percent by Weight Passing Individual S i z e s
3/8"	100
No. 4	95/100
No. 8	85-95
No. 16	60-85
No. 30	25-60
No. 50	10-30
No. 100	2-10
No. 200	0-5

In addition to the grading limit show above the fine aggregates as delivered to the mixer shall have the fineness modules of not less than 2.30 or more than 3.00. The grading of the fine aggregates also shall be controlled so that the fineness module of at least 9 to 10 test samples of fine aggregates as delivered to the mixer shall not vary more than 0.10 from the average fineness modules shall be determined by dividing by 100, the sum of the cumulative percentages retained to US Standard sieves No. 4, 8, 16, 30, 50 and 100. At the option of the Contractor fine aggregates may be separated

#### COARSE AGGREGATE

Coarse aggregate shall consist of gravel, crushed gravel, or rock, or a combination thereof. Coarse aggregate shall consist of hard, tough, durable, clean and uncoated particles. All foreign materials and dust shall be removed by adequate processing. The particle shape of the smallest size of crushed coarse aggregate shall be reasonable free from flat and elongated particles. A thin flat and elongated particle can be defined as a particle having a maximum dimension greater than five times the minimum dimension. The coarse aggregate shall be graded from fine to coarse; it shall be separated into size groups.

#### STEEL REINFORCING BARS

##### SCOPE OF WORK

All reinforcing steel bars required for the works as detailed in the Construction Drawings or as directed by the Engineer shall be furnished by the Contractor.

The work under this section includes the hauling of all reinforcing steel bars required for construction works from source of procurement to the Project Site, storing, cutting, bending and proper placing all in accordance with the drawing and these specifications.

All reinforcing steel bars shall be furnished by the Contractor in commercial standard lengths and the Contractor shall cut and bend the reinforcing steel bars to the details and dimensions shown on the drawings.

## MATERIALS

All steel reinforcing bars to be furnished by the Contractor shall be grade 40, deformed type, and conforming to the requirements of ASTM A-615. The nominal dimensions and unit weights of bar designation shall be in accordance with the following table:

<u>Bar Designation</u>	<u>Unit Weight Kg. /m</u>	<u>Nominal Section Area (mm<sup>2</sup>)</u>	<u>Perimeter (mm)</u>
10 (mm)	0.616	78.54	31.42
12 (mm)	0.888	113.10	37.70

The nominal diameter of a deformed bar is equivalent to the diameter of a plain bar having the same wt. per meter of the deformed bar.

### CUTTING AND BENDING

Cutting and bending jobs shall be done in a shop or at the job site. All bending works shall be in accordance with the latest standard practice and by approved machine methods. Radii for bends and hooks will be specified on the approved detailed reinforcement drawing in accordance with sound design procedures.

### PLACING

Reinforcement shall be laid, anchored and embedded in the concrete as shown on the drawings or as directed by the Engineer. Unless otherwise directed, the spacing of the reinforcement bars shall be measured along the center line of the bars. Reinforcement shall be inspected for compliance with requirements as to size, shape, length, slicing, position and number after placement based on the approved reinforcement drawings.

Before reinforcements are placed, the surfaced of the bars and the surfaces of any metal bar support shall be cleaned of heavy flaky rust, loose scales, dirt, grease or other foreign substance which in the opinion of the Engineer are objectionable. Heavy flaky rust that can be removed by firm rubbing with burlap or equivalent treatment is considered objectionable. After being placed, the reinforcing bars shall be maintained in a clean condition until completely embedded in concrete.

Reinforcing bars shall be accurately placed and secured in position so as to avoid displacement during the pouring of concrete. Special care shall be exercised to prevent any disturbance of any embedded reinforcement during the setting of concrete. Metal chairs, hangers, spacers or other support may be used by the Contractor for supporting reinforcing bars.

### RELATION OF BARS TO CONCRETE SURFACES

The minimum cover for all main reinforcement shall conform to the dimensions shown on the detailed reinforcement drawings in accordance with ACI-518 specifications.

### SPLICING



All splices in reinforcement shall be as shown on the drawings or as directed by the Engineer. The lapped ends of bars shall be either supported sufficiently to permit the embedment of the entire surface of each bar in concrete or shall be surely wired.

### **Foundation**

The foundation and footings shall be able to resist uplift, overturning and downward acting loads. Pedestal Foundations shall be of concrete material and shall extend to a depth of at least 0.50m. Post shall be made of 63.5mmØ G.I. Pipe, Sch. 40 with lateral dowel welded on bottom post and embedded on a concrete foundation.

### **Roof**

Roof and side wall coverings shall be made of fine net screen mesh, #16. It shall be incorporated with retractable shade nets (30% heat and light control, silver-colored) operated by pulley for protection against excessive heat from sunlight.

### **Framing Materials**

Materials shall be made of Galvanized Iron (G.I.) Pipe. Arc framing and bottom chord shall be 50mmØ in size, sch. 40. Purlins, truss and center girt shall be 38mmØ, sch. 40. Girt web member to be used shall be 25mmØ, sch. 40.

Steel shall be painted or galvanized to resist high moisture condition, needs more maintenance than aluminum and is heavier, requiring additional support. If galvanizing is done, it shall preferably be done after all cutting and welding has been performed. Those areas where bare metal is exposed by cutting or welding shall be painted. Tension rod (10mmØ) w/ turn buckle shall be provided to support nursery roof framing.

### **Roof Pitch**

Roof pitch shall have a height of at least 1.50m.

### **Fasteners**

Bolts and Nuts, eyebolts, texscrews shall be used.

### **Storage Tank**

200-liter capacity PE tanks shall be used as storage for irrigation system. It must be elevated 2.10 meters above the ground level. Electric driven motor pump, 3/4" hp w/ pressure tank shall be used to transport water from source to storage tank.

Elevated tank should be placed in areas of the site where soils can support the load associated with stored water. It should be water tight and sealed using a water-safe, non-toxic substance.

### **Irrigation System**

Irrigation system shall meet the specific crop requirements and be suited to soil. It should operate accurately at low pressures and capacities. Overhead stand shall be suspended with a height of 0.30 meters below the roof rafter framing.

Irrigation system shall be facilitated through gravity using a garden hose connected to the overhead water tank. Water supply to the water tank shall be supplied by a 1 hp electric driven motor pump, 25mmØ LDPE delivery Pipe.

Water quality should be tested on a regular basis. The recommended drainage rate is 30% - 50% of the water dose given to the plant. The drained water should be contained in a storage tank. Soil beds and benches are leveled with a slight slope of 0.8% - 1.0 % to drain the water dripping from the media containers.

### **Over Head Water Tank**

2- 200-liter capacity PE tanks shall be used as storage for irrigation system. It must be elevated 2.10 meters above the ground level. Electric driven motor pump, 3/4" hp w/ pressure tank shall be used to transport water from source to storage tank.

Elevated tank should be placed in areas of the site where soils can support the load associated with stored water. It should be water tight and sealed using a water-safe, non-toxic substance.