



Republic of the Philippines  
**Department of Agriculture**  
Western Visayas  
Iloilo City

# CONSTRUCTION OF FRUITS AND VEGETABLES PROCESSING FACILITY

## TECHNICAL SPECIFICATIONS

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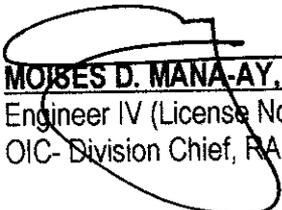
  
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## **GENERAL CONDITIONS and SCOPE OF WORKS**

The work to be executed under this contract shall include the furnishing of all materials, labor, tools, and equipment and everything listed, mentioned or as scheduled on the drawings herein specified at aforementioned location as per plans and specifications.

All works to be done shall be in the highest quality of workmanship to the fullest intent and meaning of the plans and specifications unless otherwise specified.

## **PLANS AND SPECIFICATIONS**

All drawings, small scale and detail drawings are intended to collaborate with the specifications and to form part thereof, where figures are given, they are to be followed in preference to measurement by scale. Anything shown in the drawings and not mentioned in the specifications or vice-versa or anything not expressly set forth in either but which is reasonably implied shall be furnished and installed as thought specifically shown in mentioned both.

### **I. GENERAL REQUIREMENTS**

#### **1.0 TEMPORARY FACILITY**

The contractor shall provide temporary facility to all contractor's employees in rental basis.

The Contractor shall furnish all materials, labor, equipment, tools and install such temporary works as are necessary for the successful completion of the Contract Work. Clearing, cleaning and removal of debris must be performed before and after the completion of the Contract Work. The Contractor shall negotiate the site for his construction camp, office and work areas.

Tenant's Contractor shall provide and pay for all temporary power, water, and other utility facilities as necessary and required in connection with the construction of the project from the date tenant is obligated to commence work until the completion of the project.

Facilities such as potable water supply, drainage, lighting, sewage disposal system, sanitation, and storage areas for materials, equipment, spare parts, fuel and oil must be present within the facility.

Storage of tenant's contractor's construction materials, tools and equipment shall be confined to the premises and any other areas which may be designated for such purposes.

#### **B.5 PROJECT SIGNBOARD, COA BILLBOARD, AND DA-WESTERN VISAYAS LOGO**

The project signboard design layout and dimension shall be on standard billboard measuring 1200mm x 2400mm (4ft x 8ft.) using 12 mm (1/2 inch) thick marine plywood or tarpaulin posted on 5mm (3/16 inch) marine plywood. The billboard shall be installed in front of the project site. Framing support shall be 2" x 2" x 8' good lumber. COA Billboard layout shall be 2400mm x 2400mm (8ft x 8ft) tarpaulin posted with 12 mm (1/2 inch) marine plywood and framed with 2" x 2"x8' good lumber support. Resolution used shall be 70 dpi with helvetica font name and black color as font design. Both project signboard and COA billboard shall be installed in front of project site to ensure transparency. DA- Western Visayas logo shall be **0.60m** in diameter made of stainless steel with laser engraved lettering.

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

To ensure that the construction safety and health program are observed and implemented at the project site, at the start of construction, each site shall have an established construction safety and health personnel including health officer and health personnel.

Personal Protective Equipment and Devices shall also be provided to the construction workers. All PPEs shall be in accordance with the requirement of the Occupational Safety and Health Standards (OSHS) and should pass the test conducted and/ or standards sets by the Occupational Safety and Health Center (OSHC). For general construction work, basic PPEs shall be provided including safety helmet, safety gloves, and safety shoes. Special PPEs shall be provided to workers in addition to or in lieu of the corresponding basic PPE as the work or activity requires.

## **B.9 MOBILIZATION/DEMobilIZATION**

The Contractor shall mobilize and move into the Project Site the required construction equipment needed for the successful completion of the Contract Work.

### **MINIMUM EQUIPMENT REQUIREMENT FOR FRUITS AND VEGETABLES PROCESSING FACILITY**

	<u>Equipment</u>	<u>Quantity</u>
1.	Concrete Mixer 1 bagger	1 unit
3.	Plate Compactor (5hp)	1 unit
4.	Concrete Vibrator	1 unit
5.	Welding Machine	1 unit
6.	Steel Cutter	1 unit

Demobilization shall include dismantling and removal from the site of Contractor's, materials, equipment and all temporary facilities with the exception of some facilities, which the Project Engineer shall consider remaining, and shall be handed over to DA-RAED. The time of demobilization shall also include clean-up of the site after completion of the Contract Work.

## **B.3 PERMITS AND OTHER LICENSES**

The contractor shall secure all permits and licenses before to proceed with the construction, installation, addition, alteration, renovation, conversion, repair, moving, demolition or other work activity of a specific project.

### **Basis of Payment**

The accepted quantities, measured as prescribed in Section s shall be paid for at the Contract unit price for each of the Pay Items that is included in the Bill of Quantities, which price and payment shall be full compensation for furnishing all permits and licenses, processing and incidentals necessary to complete the work prescribed in this Item.

## **II. SITE WORKS**

### **ITEM 800 –SITE CLEARING AND GRUBBING**

#### **Description**

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.

#### **Construction Requirements**

The Project Engineer will establish the limits of work and designate all trees, shrubs, plants and other things to remain. The Contractor shall preserve all objects designated to remain.

Clearing shall extend one (1) meter beyond the toe of the fill slopes or beyond rounding of cut slopes as the case maybe for the entire length of the project unless otherwise shown on the plans or as directed by the Engineer and provided it is within the right of way limits of the project, with the exception of trees under the jurisdiction of the Forest Management Bureau (FMB).

#### **Clearing and Grubbing**

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

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.

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 (6 inches) above the ground line or low water level.

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.

Grubbing of pits, channel changes and ditches will be required only to the depth necessitated by the proposed excavation within such areas.

In areas covered by cogon/talahib, wild grass and other vegetations, top soil 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 as indicated in the typical roadway section.

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.

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 on the right of way will not be jeopardized. If permitted, burning shall be done in accordance with applicable laws, ordinances, and regulation.

In the event that the Contractor is directed by the Engineer not to start burning operations or to suspend such operations because of hazardous weather conditions, material to be burned which interferes with subsequent construction operations shall be moved by the Contractor to temporary locations clear of construction operations and later, if directed by the Engineer, shall be placed on a designated spot and burned.

Materials and debris which cannot be burned and perishable materials may be disposed off by methods and at locations approved by the Engineer, on or off the project. 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 300 mm (12 inches) of earth or other approved material and shall be graded, shaped and compacted to present a pleasing appearance. If the disposal location is off the project, the Contractor shall make all necessary arrangements with property owners in writing for obtaining suitable disposal locations which are outside the limits of view from the project. The cost involved shall be included in the unit bid price. A copy of such agreement shall be furnished to the Engineer. The disposal areas shall be seeded, fertilized and mulched at the Contractor's expense.

Woody material may be disposed of by chipping. The wood chips may be used for mulch, slope erosion control or may be uniformly spread over selected areas as directed by the Engineer. Wood chips used as mulch for slope erosion control shall have a maximum thickness of 12 mm (1/2 inch) and faces not exceeding 3900 mm<sup>2</sup> (6 square inches) on any individual surface area. Wood chips not designated for use under other sections shall be spread over the designated areas in layers not to exceed 75 mm (3 inches) loose thickness. Diseased trees shall be buried or disposed of as directed by the Engineer.

All merchantable timber in the clearing area which has not been removed from the right of way prior to the beginning of construction shall become the property of the Contractor, unless otherwise provided.

Low hanging branches and unsound or unsightly branches on trees or shrubs designated to remain shall be trimmed as directed. Branches of trees extending over the roadbed shall be trimmed to give a clear height of 6 m (20 feet) above the roadbed surface. All trimming shall be done by skilled workmen and in accordance with good tree surgery practices.

Timber cut inside the area staked for clearing shall be felled within the area to be cleared.

#### **Individual Removal of Trees or Stumps**

Individual trees or stumps designated by the Engineer for removal and located in areas other than those established for clearing and grubbing and roadside cleanup shall be removed and disposed of as specified under Subsection 100.2.2 except trees removed shall be cut as nearly flush with the ground as practicable without removing stumps.

#### **Method of Measurement**

Measurement will be by one or more of the following alternate methods:

**Area Basis.** The work to be paid for shall be the number of hectares and fractions thereof acceptably cleared and grubbed within the limits indicated on the Plans or as may be adjusted in field staking by the Engineer. Areas not within the clearing and grubbing limits shown on the Plans or not staked for clearing and grubbing will not be measured for payment.

**Lump-Sum Basis.** When the Bill of Quantities contains a Clearing and Grubbing lump-sum item, no measurement of area will be made for such item.

**Individual Unit Basis (Selective Clearing).** The diameter of trees will be measured at a height of 1.4 m (54 inches) above the ground. Trees less than 150 mm (6 inches) in diameter will not be measured for payment.

When Bill of Quantities indicates measurement of trees by individual unit basis, the units will be designated and measured in accordance with the following schedule of sizes:

Diameter at height of 1.4 m	Pay Item Designation
Over 150 mm to 900 mm	Small
Over 900 mm	Large

## Basis of Payment

The accepted quantities, measured as prescribed in Section 100.3, shall be paid for at the Contract unit price for each of the Pay Items listed below that is included in the Bill of Quantities, which price and payment shall be full compensation for furnishing all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
800 (1)	Clearing and Grubbing	Hectare
800 (2)	Clearing and Grubbing	Lump Sum
800 (3)	Individual Removal of Trees, Small	Each
800(4)	Individual removal of Trees, Large	Each

## III. EARTHWORKS

### STRUCTURE EXCAVATION- ITEM 803 (Refer to Item 103, Part C of Volume II (Blue Book))

#### ITEM 803a STRUCTURE EXCAVATION

##### Description

This Item shall consist of the necessary excavation for foundation, wall footing, and other structures not otherwise provided for in the Specifications. 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.

It shall also include the furnishing and placing of approved foundation fill material to replace unsuitable material encountered below the foundation elevation of structures.

No allowance will be made for classification of different types of material encountered.

##### Construction Requirements

###### Clearing and Grubbing

Prior to starting excavation operations in any area, all necessary clearing and grubbing in that area shall have been performed in accordance with Item 100, Clearing and Grubbing.

###### Excavation

General, all structures. The Contractor shall notify the Engineer sufficiently in advance of the beginning of any excavation so that cross-sectional elevations and measurements may be taken on the undisturbed ground. The natural ground adjacent to the structure shall not be disturbed without permission of the Engineer.

Trenches or foundation pits for structures or structure footings shall be excavated to the lines and grades or elevations shown on the Plans or as staked by the Engineer. They shall be of sufficient size to permit the placing of structures or structure footings of the full width and length shown. The elevations of the bottoms of footings, as shown on the Plans, shall be considered as approximate only and the Engineer may order, in writing, such changes in dimensions or elevations of footings as may be deemed necessary, to secure a satisfactory foundation.

Boulders, logs, and other objectionable materials encountered in excavation shall be removed.

After each excavation is completed, the Contractor shall notify the Engineer to that effect and no footing, bedding material shall be placed until the Engineer has approved the depth of excavation and the character of the foundation material.

Structures other than pipe culverts. All rock or other hard foundation materials shall be cleaned all loose materials, and cut to a firm surface, either level, stepped, or serrated as directed by the Engineer. All seams or crevices shall be cleaned and grouted. All loose and disintegrated rocks and thin strata shall be removed.

When the footing is to rest on material other than rock, excavation to final grade shall not be made until just before the footing is to be placed. When the foundation material is soft or mucky or otherwise unsuitable, as determined by the Engineer, the Contractor shall remove the unsuitable material and backfill with approved granular material. This foundation fill shall be placed and compacted in 150 mm (6 inches) layers up to the foundation elevation.

### **Utilization of Excavated Materials**

All excavated materials, so far as suitable, shall be utilized as backfill or embankment. The surplus materials shall be disposed off in such 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.

### **803.2.3 Backfill and Embankment for Structures**

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 (6 inches) 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.

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 concrete walls or rigid frame structures until the top slab is placed and cured.

All embankments adjacent to structures shall be constructed in horizontal layers and compacted as prescribed in Subsection 104.3.3 except that mechanical tampers may be used for the required compaction. Special care shall be taken to prevent any wedging action against the structure and slopes bounding or within the areas to be filled shall be benched or serrated to prevent wedge action.

### **803.3.5 Basis of Payment**

The accepted quantities, measured as prescribed in Section 103.3, shall be paid for at the contract unit price for each of the particular pay items listed below that is included in the Bill of Quantities. The payment shall constitute full compensation for the removal and disposal of excavated materials including all labor, equipment, tools and incidentals necessary to complete the work prescribed in this Item, except as follows:

Any excavation for footings ordered at a depth more than 1.5 m below the lowest elevation shown on the original Contract Plans will be paid for as provided in Part K, Measurement and Payment, unless a pay item for excavation ordered below Plan elevation appears in the Bill of Quantities.

Concrete will be measured and paid for as provided under Item 405, Structural Concrete.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
803 (1)	Structure Excavation	Cubic Meter
803 (3)	Foundation Fill	Cubic Meter
803 (4)	Excavation ordered below Plan elevation excavation	Cubic Meter

#### **STRUCTURAL BACKFILL AND EMBANKMENT- ITEM 804**

##### **Material Requirements**

Embankments shall be constructed of suitable materials, in consonance with the following definitions:

**Suitable Material** – Material which is acceptable in accordance with the Contract and which can be compacted in the manner specified in this Item. It can be common material or rock.

**Selected Borrow, for topping** – soil of such gradation that all particles will pass a sieve with 75 mm (3 inches) square openings and not more than 15 mass percent will pass the 0.075 mm (No. 200) sieve, as determined by AASHTO T 11. The material shall have a plasticity index of not more than 6 as determined by ASSHTO T 90 and a liquid limit of not more than 30 as determined by AASHTO T 89.

**Unsuitable Material** – Material other than suitable materials such as:

Materials containing detrimental quantities of organic materials, such as grass, roots and sewerage.

Organic soils such as peat and muck.

Soils with liquid limit exceeding 80 and/or plasticity index exceeding 55.

Soils with a natural water content exceeding 100%.

Soils with very low natural density, 800 kg/m<sup>3</sup> or lower.

Soils that cannot be properly compacted as determined by the Engineer.

##### **Construction Requirements**

###### **General**

Prior to construction of embankment, all necessary clearing and grubbing in that area shall have been performed in conformity with Item 100, Clearing and Grubbing.

Embankments and backfills shall contain no muck, peat, sod, roots or other deleterious matter. Rocks, broken concrete or other solid, bulky materials shall not be placed in embankment areas where piling is to be placed or driven.

Where shown on the Plans or directed by the Engineer, the surface of the existing ground shall be compacted to a depth of 150 mm (6 inches) and to the specified requirements of this Item.

Where provided on the Plans and Bill of Quantities the top portions of the roadbed in both cuts and embankments, as indicated, shall consist of selected borrow for topping from excavations.

## Methods of Construction

Where there is evidence of discrepancies on the actual elevations and that shown on the Plans, a preconstruction survey referred to the datum plane used in the approved Plan shall be undertaken by the Contractor under the control of the Engineer to serve as basis for the computation of the actual volume of the embankment materials.

Effective spreading equipment shall be used on each lift to obtain uniform thickness as determined in the trial section prior to compaction. As the compaction of each layer progresses, continuous leveling and manipulating will be required to assure uniform density. Water shall be added or removed, if necessary, in order to obtain the required density. Removal of water shall be accomplished through aeration by plowing, blading, discing, or other methods satisfactory to the Engineer.

When excavated material contains more than 25 mass percent of rock larger than 150 mm in greatest diameter and cannot be placed in layers of the thickness prescribed without crushing, pulverizing or further breaking down the pieces resulting from excavation methods, such materials may be placed on the embankment in layers not exceeding in thickness the approximate average size of the larger rocks, but not greater than 600 mm (24 inches).

Even though the thickness of layers is limited as provided above, the placing of individual rocks and boulders greater than 600 mm in diameter will be permitted provided that when placed, they do not exceed 1200 mm (48 inches) in height and provided they are carefully distributed, with the interstices filled with finer material to form a dense and compact mass.

Each layer shall be leveled and smoothed with suitable leveling equipment and by distribution of spalls and finer fragments of earth. Lifts of material containing more than 25 mass percent of rock larger than 150 mm in greatest dimensions shall not be constructed above an elevation 300 mm (12 inches) below the finished subgrade. The balance of the embankment shall be composed of suitable material smoothed and placed in layers not exceeding 200 mm (8 inches) in loose thickness and compacted as specified for embankments.

Dumping and rolling areas shall be kept separate, and no lift shall be covered by another until compaction complies with the requirements of Subsection 104.3.3.

Hauling and leveling equipment shall be so routed and distributed over each layer of the fill in such a manner as to make use of compaction effort afforded thereby and to minimize rutting and uneven compaction.

## Compaction

### Compaction Trials

Before commencing the formation of embankments, the Contractor shall submit in writing to the Engineer for approval his proposals for the compaction of each type of fill material to be used in the works. The proposals shall include the relationship between the types of compaction equipment, and the number of passes required and the method of adjusting moisture content. The Contractor shall carry out full scale compaction trials on areas not less than 10 m wide and 50 m long as required by the Engineer and using his proposed procedures or such amendments thereto as may be found necessary to satisfy the Engineer that all the specified requirements regarding compaction can be consistently achieved. Compaction trials with the main types of fill material to be used in the works shall be completed before work with the corresponding materials will be allowed to commence.

#### IV. PLAIN AND REINFORCED CONCRETE WORKS

##### ITEM 900 STRUCTURAL CONCRETE

##### 900.1 Description

##### 900.1 Classes and Uses of Concrete

Five classes of concrete are provided for in this Item, namely: A, B, C, P and Seal. Each class shall be used in that part of the structure as called for on the Plans.

The classes of concrete will generally be used as follows:

Class A – All superstructures and heavily reinforced substructures. The important parts of the structure included are slabs, beams, girders, columns, arch ribs, box culverts, reinforced abutments, retaining walls, and reinforced footings.

Class B – Footings, pedestals, massive pier shafts, pipe bedding, and gravity walls, unreinforced or with only a small amount of reinforcement.

Class C – Thin reinforced sections, railings, precast R.C. piles and cribbing and for filler in steel grid floors.

Class P – Pre-stressed concrete structures and members. Seal

– Concrete deposited in water.

##### 900.1. Material Requirements

##### 900.1.1 Portland Cement

It shall conform to all the requirements of ITEM 700.

##### 900.1.2 Fine Aggregate

It shall conform to all the requirements of Subsection 311.2.2.

##### 900.1.3 Coarse Aggregate

It shall conform all the requirements of Subsection 311.2.3 except that gradation shall conform to Table 405.1.

Table 405.1 – Grading Requirements for Coarse Aggregate

Sieve Designation		Mass Percent Passing				
Standard Mm	Alternate US Standard	Class A	Class B	Class C	Class P	Class Seal
63	2-1/2"		100			
50	2"	100	95 – 100			
37.5	1-1/2"	95 – 100	-			100
25	1"	-	35 – 70		100	95 – 100
19.0	3/4"	35 – 70	-	100	95 – 100	-
12.5	1/2"	-	10 – 30	90 – 100	-	25 – 60
9.5	3/8"	10 – 30	-	40 – 70	20 – 55	-
4.75	No.4	0 – 5	0 – 5	0 – 15*	0 – 10*	0 – 10*

\* The measured cement content shall be within plus (+) or minus (-) 2 mass percent of the design cement content.

##### 900.1.4 Water

It shall conform to the requirements of Subsection 311.2.4

#### **900.1.5 Reinforcing Steel**

It shall conform to the requirements of Item 710, Reinforcing Steel and Wire Rope.

#### **900.1.6 Admixtures**

Admixtures shall conform to the requirements of Subsection 311.2.7

#### **900.1.6 Curing Materials**

Curing materials shall conform to the requirements of Subsection 311.2.8.

#### **900.1.7 Expansion Joint Materials**

Expansion joint materials shall be:

1. Preformed Sponge Rubber and Cork, conforming to AASHTO M 153.
2. Hot-Poured Elastic Type, conforming to AASHTO M173.
3. Preformed Fillers, conforming to AASHTO M213.

#### **900..2.11 Storage of Cement and Aggregates**

Storage of cement and aggregates shall conform to all the requirements of Subsection 311.2.10.

#### **900.2.12 Sampling and Testing of Structural Concrete**

As work progresses, at least one (1) sample consisting of three (3) concrete cylinder test specimens, 150 x 300mm (6 x 12 inches), shall be taken from each seventy five (75) cubic meters of each class of concrete or fraction thereof placed each day.

Compliance with the requirements of this Section shall be determined in accordance with the following standard methods of AASHTO:

Sampling of fresh concrete	T141
Weight per cubic meter and air content (gravimetric) of concrete	T121
Sieve Analysis of fine and coarse aggregates	T127
Slump of Portland Cement Concrete	T119
Specific Gravity and Absorption of fine aggregates	T84

Tests for strength shall be made in accordance with the following:

Making and curing of concrete compressive and flexural strength tests of specimen in the field	T23
Compressive Strength of Molded Concrete Cylinders	T2

## V. MASONRY WORKS

### MASONRY WORKS (W/ SMOOTH PLASTERED FINISH)

#### ITEM 1027 MASONRY UNITS

##### 1046.2 Concrete Masonry Blocks

All materials shall be so delivered, stored and handled as to prevent the inclusion of foreign materials and the damage of the materials by water or breakage. Concrete masonry blocks may be rectangular or segmented and, when specified, shall have ends shaped to provide interlock at vertical joints.

Dimensions and tolerances shall be as individually specified on the Plans.

#### ITEM 1027 CEMENT PLASTER FINISH

##### 1027.1 Description

This Item shall consist of furnishing all cement plaster materials, labor, tools and equipment required in undertaking cement plaster finish as shown on the Plans and in accordance with this Specification.

##### 1027.2 Material Requirements

Manufactured materials shall be delivered in the manufacturer's original unbroken packages or containers which are labeled plainly with the manufacturer's name and trademark.

##### 1027.2.1 Cement

Portland cement shall conform to the requirements as defined in Item 700, Hydraulic Cement.

##### 1027.2.3 Fine Aggregates

Fine aggregates shall be clean, washed sharp river sand and free from dirt, clay, organic matter or other deleterious substances. Sand derived from crushed gravel or stone may be used with the Engineer's approval but in no case shall such sand be derived from stone unsuitable for use as coarse aggregates.

##### 1027.3 Construction Requirements

##### 1027.3.1 Mixture

Mortar mixture for brown coat shall be freshly prepared and uniformly mixed in the proportion by volume of one part Portland Cement, three (3) parts sand and one fourth (1/4) part hydrated lime.

Finish coat shall be pure Portland Cement properly graded conforming to the requirements of Item 700, Hydraulic Cement and mixed with water to approved consistency and plasticity.

##### 1027.3.2 Surface Preparation

After removals of formworks reinforce concrete surfaces shall be roughened to improve adhesion of cement plaster.

Surfaces to receive cement plaster shall be cleaned of all projections, dust, loose particles, grease and bond breakers. Before any application of brown coat is commenced all surfaces that are to be plastered shall be wetted thoroughly with clean water to produce a uniformly moist condition.

All wall to floor connections in Processing Area shall have a cove with 75mm min. radius. This portion shall be included in Polyurethane Painting Application.

### 1027.3.3 Application

Brown coat mortar mix shall be applied with sufficient pressure starting from the lower portion of the surface to fill the grooved and to prevent air pockets in the reinforced concrete/masonry work and avoid mortar mix drooping. The brown coat shall be lightly broomed/ or scratch before surface had properly set and allowed to cure.

Finish coat shall not be applied until after the brown coat has seasoned for seven days and corrective measures had been done by the Contractor on surfaces that are defective. Just before the application of the finish coat, the brown coat surface shall be evenly moistened with potable water. Finish coat shall be floated first to a true and even surface, then troweled in a manner that will force the mixture to penetrate into the brown coat. Surfaces applied with finish coat shall then be smooth with paper in a circular motion to remove trowel marks, checks and blemishes. All cement plaster finish shall be 10 mm thick minimum on vertical concrete and/or masonry walls.

### 1027.3.4 Workmanship

Cement plaster finish shall be true to details and plumbed. Finish surface shall have no visible junction marks where one (1) Day's work adjoins the other. Where directed by the Engineer or as shown on the Plans vertical and horizontal groove joints shall be 25 mm wide and 10 mm deep.

### 1027.4 Method of Measurement

All cement plaster finish shall be measured in square meters or part thereof for work actually completed in the building.

### 1027.5 Basis of Payment

The work quantified and determined as provided in the Bill of Quantities shall be paid for at the Contract Unit Price which price constitutes full compensation including labor, materials, tools and equipment and incidentals necessary to complete this Item.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
1027 (a)	Cement plaster finish	m <sup>2</sup>

## VI. FABRICATED MATERIALS

### ITEM 1010 DOORS

- (H2.10m X W1.2m) Wooden Double Swing Door w/ Jamb and Complete Accessories- 1 Set
- (H2.10m X W0.7m )uPVC Door Plain w/ Jamb and Complete Accessories: 2 Sets
- (H2.10m X W1.4m )10mm Thk. Glass Double Swing Door w/ Aluminum framing and Complete Accessories: 2 Sets
- (H2.10m X W0.75m )Wooden Door w/ Jamb and Complete Accessories: 4 Sets
- (H2.10mXW0.9m )Wooden Door w/ Jamb and Complete Accessories: 9 sets
- (H2.10MXW0.9M) Aluminum Panel Door with complete accessories: 1 set

## ITEM 1008(1) WINDOWS

- (H2.10m X W1.65m )8mm Thk. Clear Glass Awning Window w/ Aluminum framing and Complete Accessories: 4 Sets
- (H0.3mXW0.5m )8mm Thk. Clear Glass Awning Window w/ Aluminum framing and Complete Accessories: 2 Sets
- (H1.3mXW2.58m )8mm Thk. Clear Glass Fixed Window w/ Aluminum framing and Complete Accessories: 3 Sets
- (H1.3mXW2.58m )6mm Thk. Clear Glass Awning Window w/ Aluminum framing and Complete Accessories: 2 Sets
- (H1.3mXW1.74m )8mm Thk. Clear Glass Sliding Window w/ Aluminum framing and Complete Accessories: 5 Sets

### INSTALLATION

Frames shall be installed plumb, level, rigid and in true alignment as per the requirements. All frames shall be fastened to the adjacent structure so as to retain their position and stability. Where grouting is required in masonry installations, frames shall be braced or fastened in such a way that will prevent the pressure of the grout from deforming the frame members. Grout shall be mixed to provide a 4" (102mm) maximum slump consistency and hand troweled into place. Grout mixed to a thinner, "pumpable" consistency shall not be used. Excess water from thin consistency grout will cause premature rusting of steel frames and probable Deformation or discoloration of certain wall constructions. Standard mortar protection in frames is not intended for thin consistency grout or drywall compound. Doors shall be installed and fastened to maintain alignment with frames to achieve Maximum operational effectiveness and appearance. Doors shall be adjusted to maintain perimeter clearances as specified in the drawings. Shimming shall be performed by the installer as needed to assure the proper clearances are achieved.

### CONFORMITY

The doors/windows/ventilators selected in the sample shall be inspected for dimensions, tolerances, materials, fabrication, positioning of holes, fixing screws and lugs, finishing and glazing. Any door/window, ventilator not satisfying any or more of the requirements inspected by the Engineer shall be classified as defective thus leading to subsequent rejection. The lot having satisfied the above requirements than shall be inspected for requirements of welded joints.

All panel doors shall be made of hard wood, door jambs / frames shall be of kiln dried/treated wood, all flush type doors shall be made of marine plywood and all other doors specified in the plan must be manufactured in accordance to its sizes and by a manufacturer of good quality.

Doors shall be extended through the full width of sills with ten on and mortised joints glued well and planed. It shall hang straight and true to plump.

Windows shall be of size and type indicated in the schedule and as specified therein.

Glass door and glass windows shall conform to plans and specifications.

### Method of Measurement

Doors and windows, fully equipped with fixing accessories and locking devices shall be measured in square meters based on actual in place installed as shown on the Plans accepted to the satisfaction of the Engineer.

## VII. PAINTING WORKS

### ITEM 1032(1) a Painting(Concrete structures including Polyurethane floor finish)

#### Materials:

- **Elastomeric Latex Semi-Gloss Paint (2 coats)Thinner**
- **Concrete Primer**
- **Roller, Brush, Roller Pan, Masking Tape, Sanding Paper, and Other Painting Accessories**
- **Polyurethane with hardener**
- **Reducer**

### ITEM 1032(1) b Paintings(Steel)

#### Materials:

- **Red Oxide Primer (Two Coats)**
- **Thinner**
- **Paint Brush**

This section of the specification covers the complete painting and finishing of the wood surface, the painting of plasters, concrete, unfinished metal, Woods and other surfaces through the interior and exterior of the building.

- 1.0 The work covered by this section of the specification consist in the proper preparation of surfaces, the furnishing of labor, materials, tools, appliances, scaffoldings and other necessary equipment and in the performing of all operations in connection with painting, varnishing, complete in accordance with color schemes and as specified therein. (color shall be approved by the supervision engineer otherwise specified.)
- 2.0 All paint materials shall met the requirements of the specifications by the standardization committee on supplies and shall be delivered on the job in the original containing, with labels intact and seal unbroken.
- 3.0 Tinting colors for all paints shall be colors in oil, ground and pure in linseed oil, and for the highest grade obtainable.
- 4.0 Color pigments shall be used to produce the exact shades paint, which shall conform to the approved color scheme of the building.
- 5.0 Except as otherwise noted, color of the priming coat shall be lighter than the body coat and color of the body lighter than the finished coat. The first coat shall be white.
- 6.0 Wood surfaces shall be thoroughly cleaned, smoothly had pressed and well sandpaper before any paint or oil finished is applied.
- 7.0 Steel surfaces shall be thoroughly cleaned, application of rust converter if necessary, shall be done before application of epoxy primer.
- 8.0 Before applying paint to concrete cement plaster or other cement finishes, etc., this surface must be allowed to dry thoroughly. Application of paint shall be of 3 coats.
- 9.0 Use quality paints for all surfaces to be painted.

## VIII. ROOF AND ROOF FRAMING WORKS

### ITEM 1003(1)a1 CEILING WORKS

#### Materials:

- **Fiber Cement Board, 3.5mm**
- **Double Furring, ¾" x 2" Ga.26**
- **Tension Rod, 8mm**
- **Wall Angle, 25mm x 25mm x 0.50 x 2500mm**
- **Accessories:**
  - **W-clip, Concrete Nails, Blind Rivets, Screws, and other Ceiling Accessories**

Framing shall be select grade, free from defects and where exposed in finished work, shall be selected for color and grain.

Joints of framing shall be tenoned, mortised or doweled where suitable, closely fitted and secured with water resistant resins glue. Exterior joints shall be mitered and interior angles coped.

Panels shall be fitted allow for contraction or expansion and insure that the panels remain in place without warping, splitting and opening of joints.

Fabricated steelworks and woodworks shall be done preferably at the shop. It shall be done true to details and profiles indicated on the Plans. Where set against concrete or masonry, woodwork shall be installed when curing is completed.

Exposed surfaces shall be free from disfiguring defects such as raised grains, stains, uneven planing, sanding, tool marks and scratches. Exposed surfaces shall be machine or hand sanded to an even smooth surface, ready for finish.

### ITEM 1047 STRUCTURAL STEEL (Steel Trusses/Roof framing Works and Hand Rails)

#### Materials:

- **Top Chord and Bottom Chord: 50mmx50mmx4.7mm**
- **Web Member: 38mmx38mmx4.7mm**
- **Purlins: 50mmx100mmx1.5mm**
- **Sagrod: 12mm dia. Plain Bar w/ standard nuts & washers @ both ends**
- **Cross Bracing: 10mmØ Plain Bar**
- **Support: Gusset Plate, 10mm thk. and 10mm thSteel Base Plate, 10mm thk.**
- **Use 50mm Stainless Steel Pipe for Hand rails of stairs and ramp.**

1.0 All materials and accessories shall be free from rust or any other form of corrosion.

2.0 Steel trusses shall be done in accordance with the plans and drawings, all plates, angle bars and C-Channel and other roof framing materials shall be pre-painted to installation and re-painted on welded joints.

3.0 Roofing materials shall be multi-tile pre-painted long span or its equivalent with similar design and quality sheets should be kept dry when stacked, store clear of the ground and under cover should sheets become wet, they must be dried and fillet stacked to allow air circulation. Storage should be kept to a minimum; all sheets shall be installed in accordance to the manufacturer's specification and by persons specializing on the same.

## 1047(1) b). ROOF CLADDING AND BENDED ACCESSORIES

Materials:

- Roofing: Long Span Rib Type Pre-Painted Roofing, 0.551mm thk.
- Fascia: Fascia Board, 2.4mx0.3m
- Bended Accessories:
  - Ridge Roll: Pre-painted G.I., 2.4mx0.4mm
  - Gutter: Pre-painted, G.I., 2.4mx0.3mx0.4mm
- Accessories: Staples, Texcrews, Gutter Strap, and other Fastener
- Provide Roof Sealant /High Quality Water Proofing

This item shall consist of furnishing all plant, equipment, tools, materials and labor required to perform and complete the high rib metal roofing, together with related accessories such as end wall flashing, parapet wall capping, rivets, soldering and downspout when called for on the Plans all in conformity with this Specifications.

## MATERIAL REQUIREMENTS

### RIB GALVANIZED IRON

Rib galvanized iron (G.I.) sheets, including plain G.I. sheets for roofing accessories, shall be cold – rolled meeting ASTM153 and with spelter coating of zinc not less than 0.381kg/m<sup>2</sup>.

Unless otherwise specified or shown on Plans, roofing sheets shall be 0.40 mm thick provided in long span sizes to minimize end lapping.

Sheets shall weigh not less than 4.14kg. /m<sup>2</sup> and shall be marked or stamped showing the thickness, size, amount of zinc coating, brand and name of manufacturer.

Test specimens shall stand being bent through 180 degrees flat on itself without fracture of the base metal and without flaking of the zinc coatings.

## ROOFING ACCESSORIES

### Strap Fasteners

Strap fasteners shall be 0.50mm thick by 2.5cm. wide and sufficiently long to bend up to the opposite face of the purlins with corners chipped off at the riveting ends.

### Rivets and washers

- 1.0 Rivets and washers shall be galvanized mild iron and shall not be less than 5mm diameter and 10mm length.
- 2.0 Washers shall not be less than 1.5mm thick and 20mm in outside diameter and shall provide snug fit to the rivet.

### Soldering Lead

Soldering lead shall have a composition of 50 % lead, conforming to ASTM B-32. Rivets and burrs for lap joints of gutters, downspouts and flashings shall be copper or aluminium not less than No. 8 or 3.175 diameter.

### Fabricated Metal Roof Accessories

- 1.0 End wall, parapet wall capping, and downspouts, whenever required, shall be pre-fabricated and shall be of 0.5mm thick or as specified on the plan.
- 2.0 Downspouts shall be 0.60 mm thick unless otherwise specified on Plans. Wire basket strainers shall be gauge 14, galvanized, aluminum or stainless steel.
- 3.0 Roof ventilators, whenever required, shall be fabricated from gauge 26, 0.50mm thick plain G.I. sheets and constructed to the dimensions otherwise specified..
- 4.0 Bending of plain G.I. sheets for various accessories shall be done by machine press. Hand bending shall not be permitted.

### Preparatory Work

- 1.0 Preparatory to the installation of the high rib G.I. roofing, purlins should have been placed and spaced properly to fit the length of roofing sheets to be installed.
- 2.0 The centre line of the purlins at end laps shall be 15 cm. from the bottom line of end laps and intermediated purlins are placed equidistant with each other.
- 3.0 Ascertain that the top of the purlins should be at the same plane.

### Installation of Rib G.I. Sheet

- 1.0 Provide an end lap of 25cm. minimum length. Each sheet shall be fastened temporarily by 1.83mm diameter by 2.5 cm. long galvanized flat-head nails at valleys of corrugations covered by side or end laps.
- 2.0 Succeeding upper rows of High Rib G.I. sheets shall be installed in the same manner until the entire roof area is covered.
- 3.0 End wall flashings and parapet wall capping when required, shall be installed after fastening the roofing sheets with heavy duty sealant, rivets or with G.I. roofing nails and washers
- 4.0 Rivets shall be provided with a galvanized mild iron washer below and one lead and one galvanized washer above the sheet.
- 5.0 Rivets shall be sufficiently long to permit forming a hemispherical head. Riveting shall be done such that the lead washer shall be compressed to provide a water tight fit around the rivet.

### Installation of Roofing Accessories

- 900.2 End wall flashing and parapet wall capping shall lap at least 25 cm and fastened tightly with rivets and any fasteners with heavy duty sealant to avoid water leakage.

### **PRE-PAINTED METAL SHEET**

This item consists of furnishing all pre-painted metal sheet materials, tools and equipment, plant including labor required in undertaking the proper installation complete as shown on the Plans and in accordance with these Specifications.

## MATERIAL REQUIREMENTS

All pre-painted metal sheet and roofing accessories shall be oven – baked painted true to profiles indicated on the Plans. Pre – painted roofing sheets shall be fabricated from cold rolled galvanized iron sheets specially tempered from cold rolled galvanized iron sheets specially tempered steel for extra strength and durability. It shall conform to the material requirements defined in PNS 67: 1985.

Profile sections in identifying the architectural moulded rib to be used are: Regular corrugated, Quad – rib, Tri-wave, Rig-wave, Twin rib, etc. Forest green color shall be adopted if not available color of roofing is subject to the approval of the Architect.

- 1.0 End wall flashing and parapet wall capping shall be fabricated from gauge 24 (.6mm) thick cold rolled plain galvanized iron sheets specially tempered steel. Profile section shall be as indicated on the Plans.
- 2.0 Fastening hardware shall be of galvanized iron, rivets. G.I. straps are of .50mm thick x 16mm gauge 26 and standard G.I. rivets
- 3.0 Base metal thickness shall correspond to the following gauge designation available locally as follows:

## SPECIFICATIONS AND CONTRACT

Base Metal Thickness	Designated Gauge
0.40mm thick	Gauge 28
0.50mm thick	Gauge 26
0.60mm thick	Gauge 24
0.80mm thick	Gauge 22

Length of roof sheets available in cut from 5 feet to 12') long. Long span length up to 18 meters. Special length by arrangements.

## CONSTRUCTION REQUIREMENTS

- 1.0 Before any installations begin, the Contractor shall ascertain that the top faces of the purlins are in proper alignment.
- 2.0 Correct the alignment as necessary in order to have the top faces of the purlins on an even plane.
- 3.0 Sheets shall be handled carefully to prevent damage to the paint coating. Lift all sheets or sheet packs on to the roof frame with the overlapping down-turned edge facing towards the side of the roof where installation will commence, otherwise the sheets will have to be turned end to end during installation.
- 4.0 Start roofing installation by placing the first sheet in position with the down turned edge in line with other building elements and fastened to supports as recommended.
- 5.0 Place the down-turned edge of the next sheet over the edge of the first sheet, to provide side lap and hold the side lap firmly in place. Continue the same procedure for the subsequent sheets until the whole roofing area is covered and or adopt installation procedure provided in the instruction manual for each type of molded rib profile.
- 6.0 End lap. In case handling or transport consideration requires to use two or more end lapped sheets to provide full length coverage for the roof run, install each line of sheets from bottom to top or from eave line to apex of roof framing. Provide 15 cm. minimum end lap
- 7.0 Anchorage. Pre- painted steel roofing sheets shall be fastened to the wood purlins with standard length G.I. straps and rivets.

- 8.0 For steel Frame up to 4.5 mm thick, use self-drilling screw No.12 by 3.5 cm. long hexagonal head with neoprene washer.
- 9.0 For steel support up to 5mm thick or more, use threaded cutting screw No.12 by 4.0 cm. long hexagonal head with neoprene washer.
- 10.0 For side lap fastener use self-drilling screw No. 10 by 1.6 cm. long hexagonal head with neoprene washer.
- 11.0 In cutting pre-painted steel sheets to place the exposed color side down, cutting shall be carried out on the ground and not over the top of other painted roofing product.
- 12.0 Power cutting or drilling to be done or carried out on pre-painted products already installed or laid in position, the area around holes or cuts shall be masked to shield the paint from hot filings.
- 13.0 Storage and Protection. Pre-painted steel roofing, walling products and accessories should be delivered to the job site in strapped bundles.
- 14.0 Sheets and or bundles shall be neatly stacked in the ground and if left in the open it shall be protected by covering the stack materials with loose tarpaulin.

## IX. ELECTRICAL WORKS

The work to be undertaken here under includes the furnishing of all labor, materials, equipment, tools and supervision to the project and to be completed the good working condition of the electrical system for the proposed building.

All works here under shall comply with the requirement of the latest edition of the National Electrical Code of the Philippines and the Rules and Regulations of the local Electric company.

The contractor shall conduct **megger testing** after the completion of electrical fixing and installation.

### MATERIALS and WORKMANSHIP

All materials shall be unused brand new and shall conform with the standard of the underwriter laboratories in every case where such a standard has been established for the particular type of materials to be installed.

### SERVICE ENTRANCE

Service entrance shall be 220-250 volts, single phase, 2 wires, 60 cycles as indicated in the plan. The service entrance installation shall be part of the electrical works as indicated therein. The service entrance conduit and accessories shall be installed in the nearest power source up to service entrance cap and the work shall be done in accordance with the latest specification required by Electric Company

### . DISTRIBUTION SYSTEM

The distribution system shall be 2 wire, 220 volts.

### WIRING METHOD

All wiring shall be installed in standard polyvinyl conduit of the Philippines manufacture or equal and shall conform to the underwriter's standards in code.

Conduit shall not be less than 1.5cm nominal diameter and where so indicated, sizes on the plans are minimum two or more ducts shall be installed in lieu of the larger size.

All wire shall be copper under no circumstance will aluminum or other metallic conductors be permitted helps. All materials to be used shall be new and approved by the underwriter's laboratories.

All joints in junction boxes, those for feeders and service wire shall be joint by 3m scotch lock. Provide proper sizes and installed according to the manufacturer's specification for service and feeder conductors, tape shall be made with heavy duty all brass or copper solder less connectors.

## OUTLET and SWITCH BOXES

All boxes shall be hard plastic, approved product of reputable manufacturer.

. All ceiling and wall bracket outlet boxes shall be of deep rectangular flush type gang boxes or section switch boxes shall be installed where required.

All boxes, including junction and pull boxes shall be sufficient size to provide free space for all conductors enclosed in the box in addition to the fittings. Such as witch mechanism, receptacles, fixtures slabs, that may contain in the box.

## OUTLET and SWITCH BOXES

7.1 Suitable single pole and three-way switches of the flush tumbler type with an appropriate white plastic or aluminum cover plate shall be provided where indicated on the plans.

7.2 All convenience outlet receptacles shall be flushed or wall mounted type of various kinds as indicated in the drawings with suitable cover plates.

7.3 Switches and receptacles are indicated in the drawings as close as possible to the desired points, however actual constructions condition may require the change of location and in such cases the attention of the engineer shall be called for the final location. The engineer may direct minor changes in the location of the switches and receptacles depending solely on his engineering judgment.

7.4 Unless otherwise directed by the engineer, outlet shall be mounted at the following heights above the floor or steps.

7.4.1. Wall switches                      1.50m.

7.4.2. Wall brackets                      2.00m.

7.4.3. Convenience outlet              0.30m.

7.5 Use flush type switches

7.5.5 ACU Outlet                          2.0m

## PANELBOARD

Wall mounted gauge no.16 steel sheet, baked enamel finish (color gray), enclosure with grounding terminal bus with lugs.

## CIRCUIT BREAKER

Main: 3-Pole, 240V, Bolt-on Industrial type MCCB

Branch circuit: 2-Pole, 240V, Bolt-on type CB

Individual CB: indoor-NEMA 1 enclosure

Outdoor- NEMA 3R enclosure Minimum

Interrupting capacities: 10kaic

Only one single brand shall be used on the entire project requirements

## WIRES AND CABLES

THHN/THWN copper wire stranded 600 volts insulation pressure, minimum size of wire for lighting and power system shall be 3.5 sq. mm (AWG no.12 stranded) and must be color coded.

Line 1 - Red

Line 2 – Yellow

Line 3 - Blue

Ground - Green

## ELECTRICAL LIGHTING FIXTURES

11.1 Tube light LED tube lamp, with recessed type luminaire mirrored reflector and louver. Aluminum heat sink, No UV and RF interference, patented heat sink with or without optical diffuser, longer life than incandescent and fluorescents. No mercury, no ballast required, wide voltage input range and constant current design, solid state, high shock and vibration resistant, mercury free, 60%-plus savings in energy consumption, quiet, no noise, no flickering.

Products brand are compliance in accordance with CE, UL and FCC testing standards.

11.2 Pin light LED lamp with diamond design reflector white ceiling rim recessed mounted or round LED panel light white 6-24w power variant, shall be low maintenance, rust proof, highly efficient, longer life span, environmentally friendly, less power consumption.

11.3 Use approved quality brand for the entire led lights and slim tube led type or other equivalent brand approved by Electrical Engineer.

11.4 Comply with the latest applicable provision and latest recommendation of the following: Philippine Electrical Code (PEC) Illuminating Engineering Society (IES) National Electrical Manufacturers Association (NEMA)

11.6 Use circuit breaker in a good quality.

## X. PLUMBING WORKS

All works, comply with the requirement and provision of the National Plumbing Code of the Philippines.

All fixtures shall be separately trapped. The traps shall be placed as near as possible to the fixtures.

No fixtures shall be double trapped.

Horizontal waste lines shall be secured by hook to the building frames or embedded in concrete whenever necessary.

Horizontal waste line receiving the discharge from two or more fixtures shall be provided with vents connected to the station at least 1.20m from floor level.

Connection of the water closet shall be made to soil pipe by means of charges and asbestos packing without the use of water, cement.

Waste pipe potable water line pipes shall be extended to all the fixtures outlets and equipment from the gate valve near the riser.

Provide and installed complete floor drain shown on plan, stainless, brass or nickel plated 4"x4" with waste line, P-trap and vents.

All pipes, fitting traps, fixture, appurtenances and devices of plumbing and drainage system shall be inspected and approved by the engineer to ensure compliance with all requirements of all codes and regulation referred in these specifications.

Use PPR Type 3 pipes for all cold-water lines.

Use any commercial brand sanitary pipes, fittings, accessories, materials and all works obviously necessary for the proper functioning of all specification or indicated in the drawing are included in this works.

All Toilets shall have its own VTR.

Use 60x60cm non-skid tile (granite like) for bathroom flooring, 60x60cm porcelain tile in display and office area and 40x40 cm glazed wall tiles and partitions in comfort rooms Other tile sizes shall be referred as per specifications or approved by the project engineer.

Wall to be finished with glazed tiles or elsewhere indicated as such in the drawings, shall be chipped off, cleaned thoroughly with wire brush, washed with clean water and painted up solid with 1:2 cement mortar before applying wainscoting.

The tiles and accessories shall be free from imperfection that affects their quality, appearance and strength. The tile should be thoroughly soaked in water before installation. All tiles for wainscoting shall be set to correct grades and level true to lines, lay even and shall be set truly vertical in accordance with the details shown on the drawing the tiles shall be firmly laid on 1:2 cement pastes.

Glazed tiles shall be cushion-edge locally manufactured of the sized or type and pattern shown on drawing and/or specified above. Use synthetic granite and non-skid and glazed tile. 16. Use quality type for toilet fixtures as approved by end user.

All tile color schemes and designs shall be approved by the designer.

## **XI. SEPTIC TANK**

Dimension of septic vault ---L2.50m x W1.0m

Depth -----1.50m

Materials: 100mm CHB

10mm dia. Deformed bar

All Pvc pipes to be used shall be of series 1000.

The interior wall shall be smooth finish with water proofing.

If not specified on the plans Flooring shall be constructed with 1.5% slope.

All works to be done shall be supervised by the master plumber. Piping and other fixtures shall be done in accordance with the National plumbing Code of the Philippines.

## **XI. CARPENTRY WORKS**

### **ITEM 1035- Non-Structural metal framing**

Drywall framing shall be used to construct interior walls that do not need to support any load from above and will not have to withstand any wind forces. Drywall studs need not to support any load from above and will not have to withstand any wind forces. Drywall studs shall be used for non-load bearing partition walls and ceilings. Knockouts (pre-punched holes) shall be conveniently placed in the studs to facilitate the installation of electrical wiring, plumbing and bridging.

Studs shall be connected to the floor and ceiling track (runner) with pan head screws, spaced at either 30.48 cm, 40.64 cm or 60.96 cm on center-spacing based on wall height. Wallboard or other sheathing shall be then attached with Type "5" (fine-tread) drywall screws.

Metal studs shall be straight, light, non-combustible and not susceptible to termite damage. Matching track is available for each stud size with 3.18 cm, 5.08 cm and 7.62 cm leg heights.

**Power- Actuated Fasteners-Screws** and power actuated fasteners shall be used to connect framing components and fasten other materials to the framing.

**Self-drilling Screws**-are externally threaded fasteners with the ability to drill their own hole and form or 'tap' their own internal threads without deforming their own thread and without breaking during assembly. These screws are used with 33 mil (20 gage) steel or thicker.

#### Installation of Steel Framing

1. Cut studs and track to required lengths as you install using aviator snips or circular saw with abrasive, metal cutting blade.
2. Attach ceiling track. Use drywall screws to attach to joists. For parallel joists, bridge two joists with track spaced 61 cm o.c. or less and install ceiling runner across bridges
3. Plumb to position floor runner directly below ceiling track.
4. Attach floor track. Use power-actuated fasteners for concrete floors. Use drywall screws for wood sub-floor. Same fastener spacing as ceiling track. Then mark stud locations 40.64 cm o.c. top and bottom starting from the same end.
5. Insert stud at a slight angle into tracks - then twist into place. Be sure all studs are pointed the same way for easier drywall attachment and punch-outs are oriented the same way for easy plumbing or electrical installation.
6. Screw-attach stud to ceiling track and floor track with 1.11 cm pan or wafer-head screws. Hold stud flange to the runner for easier screw attachment.
7. For door and window openings, cut the track 10.16 cm longer than the opening. Notch legs and bend web 90° to attach to jamb stud.
8. Attach C-runner bracing across studs to support cabinet attachment. C-runner must be notched to fit between studs.
9. Insert grommets or pieces of pipe insulation into pre-punched holes whenever you pass through wiring or plumbing.
10. Screw-attach drywall to framing using drywall screws. Board should be attached to the open end of the studs first.
11. Install corner beads and trim with screws or staples.
12. Tape and finish with joint compound.

#### Additional Instructions

Door frames shall be attached directly to steel framing, but installers prefer wood 5.08 cm x 10.16 cm framing around the rough opening. If this option is chosen, frame rough opening 7.62 cm wider to allow for wood studs.

#### Basis of Payment

The accepted quantities, measured as prescribed in Section 1035.4 shall be paid for at the contract unit price for Furring Channel, which price and payment shall be full compensation for furnishing and placing all materials and for all labor, equipment, tools and incidentals necessary to complete this item. Unit of measurement-Per Linear Meter.

#### **ITEM 1003(2)a1 –Carpentry and Joinery Works**

##### Drywall Partition

1. Layout the floor tracks and ceiling tracks, Secure this using suitable anchoring method.
2. Install the metal studs to the tracks spacing from 0.40 meter up to 0.60 meter, use blind rivets or screws. No horizontal bracing needed if the studs are spaced 0.40 m and the height does not exceed 3.00 meters. Thus, making the installation economical and durable.
3. Install the Gypsum board or fiber cement board using drywall screw.

## **ADDITIONAL WORKS**

In case of additional works not shown in the plans and not specified herein, the Contractor shall be paid an additional amount corresponding to the work added.

Demolitions and works due to Contractor's fault shall be done by the Contractor without extra compensation to the Owner.

Any changes or revisions on the plans shall be approved by the designer.