



Republic of the Philippines  
DEPARTMENT OF AGRICULTURE WESTERN VISAYAS  
Hamungaya, Brgy. Buntata, Jaro, Iloilo City  
westernvisayas@mail.da.gov.ph | (033) 836-4221

**ESTABLISHMENT OF ANIMAL HOUSING  
FACILITY FOR POULTRY PRODUCTION  
(INCLUDING PERIMETER & DIVISIONAL FENCES)**  
(DA – HALAL F.Y. 2025)

DA NOROS Sitio Bingig, Brgy. 3, Himamaylan City, Negros Occidental

**TECHNICAL SPECIFICATIONS**

Prepared by:

  
**GLADYL MAE T. AQUIDADO, CE**  
RAED Technical Staff  
(License No. 0205425)

Reviewed by:

  
**YVONNE GRACE H. SUR, ABE**  
Engineer III (License No. 0005970)  
Head, EPDSS

Submitted by:

  
**MOISES D. MANAYAY, ABE**  
Engineer V (License No. 0006077)  
Division Chief, RAED

Recommending Approval:

  
**MARIA TERESA T. SOLIS**  
OIC - RTD for Operations

Approved by:

  
**DENNIS R. ARPILA**  
Regional Executive Director

## PROJECT MARKER SIGNBOARD AND COA BILLBOARD

The project signboard design layout and dimension shall be on standard billboard measuring 1200mm x 2400mm (4ft x 8ft) using 12mm (1/2 inch) thick marine plywood or tarpaulin posted on 5mm (3/6 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 12mm (1/2 inch) marine plywood and framed with 2" x 2" x 8' good lumber support. Resolution used shall be 70 dpi with Helvetica font name and black color as font design.

## SPL2

## MOBILIZATION AND DEMOBILIZATION

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

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. The time of demobilization shall also include clean-up of the site after completion of the Contract Works.

## 803

## STRUCTURE EXCAVATION

### 103.1 Description

This item shall consist of the necessary excavation for foundation of bridges, culverts, underdrains, and other structures (wall footings, column footings and pedestal) 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. It shall also include the furnishing and placing of approved foundation fill material to replace unsuitable material encountered below the foundation elevation of structures.

### 103.2 Construction Requirement

#### 103.2.1 Excavation

(1) 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.

(2) 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.

#### 103.2.2 Utilization of Excavated Materials

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

### 103.2.3 Backfill and Embankment for Structures Other Than Pipe Culverts

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.

### 103.3 Method of Measurement

#### 103.3.1 Structure Excavation

The volume of excavation to be paid for will be the number of cubic meters measured in original position of material acceptably excavated in conformity with the Plans or as directed by the Engineer but in no case, except as noted, will any of the following volumes be included in the measurement for payment:

- (1) The volume of any excavation performed prior to the taking of elevations and measurements of the undisturbed ground.
- (2) The volume of excavation for footings ordered at a depth more than 1.5 m (60 inches) below the lowest elevation for such footings shown on the original Contract Plans, unless the Bill of Quantities contains a pay item for excavation ordered below the elevations shown on the Plans for individual footings.

### 103.4 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.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
803	Structure Excavation	Cubic Meters

1707

## LEVELING COURSE

### 200.1 Description

This item shall consist of furnishing, placing, and compacting an aggregate subbase course on a prepared subgrade in accordance with this Specification and the lines, grades and cross-sections shown on the Plans, or as directed by the Engineer.

### 200.2 Material Requirements

Aggregate for subbase shall consist of hard, durable particles or fragments of crushed or natural gravel and filler of natural or crushed sand. The composite material shall be free from vegetable matter and lumps or balls of clay, and shall be of such nature that it can be compacted readily to form a firm, stable subbase.

The subbase material shall conform to Table 200.1, Grading Requirements.

Table 200.1 – Grading Requirements

Sieve Designation		Mass Percent Passing
Standard, mm	Alternate US Standard	

50	2"	100
25	1"	55 - 85
9.5	3/8"	40 - 75
0.75	No. 200	1 - 12

The fraction passing the 0.075 mm (No. 200) sieve shall not be greater than 0.66 (two thirds) of the fractions passing the 0.425 mm (No. 40) sieve.

The fraction passing the 0.425 mm (No. 40) sieve shall have a liquid not greater than 35 and plasticity index not greater than 12 as determined by AASHTO T 89 and T 90, respectively.

The coarse portion, retained on a 2.00 mm (No. 10) sieve, shall have a mass percent of wear not exceeding 50 by the Los Angeles Abrasion Tests as determined by AASHTO T 96.

The material shall have a soaked CBR value of not less than 25% as determined by AASHTO T 193.

The CBR value shall be obtained at the maximum dry density and determined by AASHTO T 180, Method D.

### **200.3 Construction Requirements**

#### **200.3.1 Preparation of Existing Surface**

The existing surface shall be graded and finished as provided under Item 105, Subgrade Preparation, before placing the subbase material.

#### **200.3.2 Placing**

The aggregate subbase material shall be placed at a uniform mixture on a prepared subgrade in a quantity which will provide the required compacted thickness. When more than one layer is required, each layer shall be shaped and compacted before the succeeding layer is placed.

The placing of material shall begin at the point designated by the Engineer. The layer or window shall be of such size that when spread and compacted the finished layer be in reasonably close conformity to the nominal thickness shown on the Plans.

#### **200.3.3 Spreading and Compacting**

When uniformly mixed, the mixture shall be spread to the plan thickness, for compaction.

Where the required thickness is 150 mm or less, the material may be spread and compacted in one layer. All subsequent layers shall be spread and compacted in a similar manner.

The moisture content of subbase material shall, if necessary, be adjusted prior to compaction by watering, as required in order to obtain the required compaction.

Immediately following final spreading and smoothing, each layer shall be compacted to the full width by means of approved compaction equipment. Any irregularities or depressions that develop shall be corrected by loosening the material at these places and adding or removing material until surface is smooth and uniform.

If the layer of subbase material, or part thereof, does not conform to the required finish, the Contractor shall, at his own expense, make the necessary corrections.

Compaction of each layer shall continue until a field density of at least 100% of the maximum dry density determined in accordance with AASHTO T 180, Method D has been achieved. In-place density determination shall be made in accordance with AASHTO T 191.

### **200.4 Methods of Measurements**

Aggregate Subbase Course will be measured by the cubic meter (m<sup>3</sup>). The quantity to be paid for shall be the design volume compacted in-place as shown on the Plans, and accepted in the completed course. No allowance will be given for materials placed outside the design limits shown on the cross-section.

### **200.5 Basis of Payments**

The accepted quantities, measured as prescribed in Section 200.4, shall be paid for at the contract unit price for Aggregate Subbase Course which price and payment shall be full compensation for furnishings and placing all materials, including 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
1707	Aggregate Subbase Course	Cubic Meters

## Sub Item 105 – SUBGRADE PREPARATION

### 105.1 Subgrade in Common Excavation

Unless otherwise specified, all materials below subgrade level in earth cuts to depth 150 mm or other depth shown on the Plans or as directed by the Engineer shall be excavated. The material, if suitable, shall be set aside for future use or, if unsuitable, shall be disposed off in accordance with the requirements of Subsection 102.2.9.

404

## REINFORCING STEEL BAR

### 404.1 Description

This item shall consist of furnishing, bending, fabricating and placing of steel reinforcement of the type, size, shape and grade required in accordance with this Specification and in conformity with the requirements shown on the Plans or as directed by the Engineer.

### 404.2 Material Requirements

Reinforcing steel shall meet the requirements of item 710, Reinforcing Steel and Wire Rope. Reinforcing steel bars shall be standard commercial, deformed steel such as steel or other locally available equivalent. Steel bars shall be free from rust and dust. Scale and splices in bars shall be made at the critical points of maximum stress.

### 404.3 Construction Requirements

#### 404.3.1 Order List

Before materials are ordered, all order list and bending diagrams shall be furnished by the Contractor for approval of the Engineer. The approval of order list and bending diagrams by the Engineer shall in no way relieve the Contractor of responsibility for the correctness of such lists and diagrams. Any expense incident to the revisions of materials furnished in accordance with such lists and diagrams to make them comply with the Plans shall be borne by the Contractor.

### 404.4 Protection of Material

Steel reinforcement shall be stored above the surface of the ground upon platforms, skids or other supports and shall be protected as far as practicable from mechanical injury and surface deterioration caused by exposure to conditions producing rust. When placed in the works, reinforcement shall be free from dirt, detrimental rust, loose scale, paint grease, oil, or other foreign materials.

Reinforcement shall be free from injurious defects such as cracks and laminations. Rust, surface seams, surface irregularities or mill scale will not be cause for rejection, provided the minimum dimensions, cross sectional area and tensile properties of a hand wire brushed specimen meets the physical requirements for the size and grade of steel specified.

#### 404.4.1 Bending

All reinforcing bars requiring bending shall be cold-bent to the shapes shown on the Plans or required by the Engineer. Bars shall be bent around a circular pin having the following diameters (D) in relation to the diameter of the bar (d):

Nominal diameter, d, mm	Pin diameter (D)
10 to 20	6d

Bends and hooks in stirrups or ties may be bent to the diameter of the principal bar enclosed therein.

#### 404.4.2 Placing and Fastening

All steel reinforcement shall be accurately placed on the position shown on the Plans or required by the Engineer and firmly held there during the placing and setting of the concrete. Bars shall be tied a

all intersections except where spacing is less than 300 mm in each direction, in which case, alternate intersections shall be tied. Ties shall be fastened on the inside.

Distance from the forms shall be maintained by means of stays, blocks, ties, hangers, or other approved supports, so that it does not vary from the position indicated on the Plans by more than 6 mm. blocks for holding reinforcement from contact with the forms shall be precast mortar blocks of approved shapes and dimensions. Layers of bars shall be separated by precast mortar blocks or by other equally suitable devices. The use of pebbles, pieces of broken stone or brick, metal pipe and wooden blocks shall not be permitted. Unless otherwise shown on the Plans or required by the Engineer, the minimum distance between bars shall be 40 mm. reinforcement in any member shall be placed and then inspected and approved by the Engineer before the placing of concrete begins. Concrete placed in violation of this provision may be rejected and removal may be required. If fabric reinforcement is shipped in rolls, it shall be straightened before being placed. Bundled bars shall be tied together at not more than 1.8 m intervals.

#### 404.4.3 Splicing

All reinforcement shall be furnished in the full lengths indicated on the Plans. Splicing of bars, except where shown on the Plans, will not be permitted without the written approval of the Engineer. Splices shall be staggered as far as possible and with a minimum separation of not less than 40 bar diameters. Not more than one-third of the bars may be spliced in the same cross-section, except where shown on the Plans.

Unless otherwise shown on the Plans, bars shall be lapped a minimum distance of:

Splice Type	Grade 40 min. lap	Grade 60 min. lap	But not less than
Tension	24 bar dia	36 bar dia	300 mm
Compression	20 bar dia	24 bar dia	300 mm

In lapped splices, the bars shall be placed on contact and wired together. Lapped splices will not be permitted at locations where the concrete section is insufficient to provide minimum clear distance of one and one-third the maximum size of coarse aggregate between the splice and the nearest adjacent bar. Welding of reinforcing steel shall be done only if detailed on the Plans or if authorized by the Engineer in writing. Spiral reinforcement shall be spliced by lapping at least one and a half turns or by butt welding unless otherwise shown on the Plans.

#### 404.4.4 Lapping of Bar Mat

Sheets of mesh or bar mat reinforcement shall overlap each sufficiently to maintain a uniform strength and shall be securely fastened at the ends and edges. The overlap shall not be less than one mesh width.

#### 405.5 Method of Measurements

The quantity of reinforcing steel to be paid for will be the final quantity placed and accepted in the completed structure. No allowance will be made for tie-wires, separators, wire chairs and other material used in fastening the reinforcing steel in place. If bars are substituted upon the Contractor's request and approved by the Engineer and as a result thereof more steel is used than specified, only the mass specified shall be measured for payment.

No measurement or payment will be made for splices added by the Contractor unless directed or approved by the Engineer.

When there is no item for reinforcing steel in the Bill of Quantities, cost will be considered as incidental to the other item in the Bill of Quantities.

#### 404.6 Basis of Payment

The accepted quantity, measured as prescribed in Section 404.4, shall be paid for at the contract unit price for Reinforcing Steel which price and payment shall be full compensation for furnishing and placing all materials, including 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
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## 414

## FORMWORKS

**414.1 Description**

This item shall consist of designing, constructing and removing forms to temporarily support concrete girders and other structural elements until the structure is completed to the point it can support itself.

**414.2 Material Requirements****414.2.1 Formwork**

The materials used for smooth form finish shall be plywood, lumber or other acceptable materials capable of producing the desired finish for form-facing materials. Form-facing materials with raised grain, torn surfaces, worn edges, patched, dents, or other defect that will impair the texture of concrete surfaces shall not be permitted. No form-facing material shall be specified for rough form finish.

**414.2.1.1 Formworks Accessories**

Formwork accessories that are partially or wholly embedded in concrete, including ties and hangers shall be commercially manufactured. The use of non-fabricated wire form ties shall not be permitted. Where indicated in the Contract, use form ties with integral water barrier plates in walls.

**414.3 Construction Requirements****414.3.1 Forms**

The forms construction shall be in accordance whenever applicable, with Item 407 Concrete Structure subsection 407.1.13 Formwork Construction.

Form panels to be used shall be in good condition free of defects on exposed surfaces. If form panel material other than plywood is used, it shall have flexural strength, modulus of elasticity and other physical properties equal to or greater than the physical properties for the type of plywood specified. Furnish and place form panels properties for exposed surfaces in uniform widths of not less than 1 meter and in uniform lengths of not less than 2 meters except where the width of the member formed is less than 1 meter.

Arrange panels in symmetrical patterns conforming to the general lines of the structure. Place panels for vertical surfaces with the long dimension horizontal and with horizontal joints level and continuous. For walls with slopping footings which do not abut other walls, panels may be placed with the long dimensions parallel to the footing.

Use form ties and anchors that can be removed without damaging the concrete surface. Construct metal ties or anchorages within the forms to permit their removal to a depth of at least 25 millimeters from the face without damage to the concrete. Fill cavities with cement mortar and finish to a sound, smooth, uniform colored surface.

**414.3.2 Removal of Forms**

The removal of forms and falseworks shall be in accordance whenever applicable with Item 407 Concrete Structure subsection 407.3.14 Removal of Forms.

**414.4 Method of Requirements**

When the Contract stipulates that payment will be made for forms on square meter basis, the pay item will include all materials and accessories needed in the work.

Whenever the Bill of Quantities does not contain an item for form, the work will not be paid directly but will be considered as a subsidiary obligation of the contractor under other Contract items.

**414.5 Basis of Payments**

The accepted quantities measured as prescribed in subsection 414.4, shall be paid for at the Contract square meter price for Forms which price and payment shall be full compensation for designing, constructing and removing forms, all materials and accessories needed and for furnishing all labor equipment tools and incidentals necessary to complete the item.

Payment shall be made under:

Pay Item Number	Description	Unit of Measurement
414	Formworks	Square Meter

405

## STRUCTURAL CONCRETE

### 405.1 Description

#### 405.1.1 Scope

This item shall consist of furnishing, bending, placing and finishing concrete in all structures except pavements in accordance with this Specification and conforming to the lines, grades, and dimensions shown on the Plans. Concrete shall consist of a mixture of Portland Cement, fine aggregate, coarse aggregate, admixture when specified, and water mixed in the proportions specified or approved by the Engineer.

#### 405.1.2 Classes and Uses of Concrete

Class A of concrete mixture will be used in the construction.

The classes of concrete will generally be used as follows:

Class A – mixture to be used footings and pedestal.

### 405.2 Material Requirements

#### 405.2.1 Portland Cement

It shall conform to all the requirements of Subsection 311.2.1.

#### 405.2.2 Fine Aggregate

It shall conform to all the requirements of Subsection 311.2.2.

#### 405.2.3 Coarse Aggregate

It shall conform to 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	
		Class A	Class B
Standard Mm	Alternate US Standard		
63	2 – 1/2"		100
50	2"	100	95 – 100
37.5	1 – 1/2"	95 – 100	-
25	1"	-	35 – 70
19.0	3/4"	35 – 70	-
12.5	1/2"	-	10 – 30
9.5	3/8"	10 – 30	-
4.75	No. 4	0 – 5	0 – 5

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

#### 405.2.4 Water

It shall conform to the requirements of Subsection 311.2.4

#### 405.2.5 Reinforcing Steel

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

#### 405.2.6 Admixtures

Admixtures shall conform to the requirements of Subsections 311.2.7

#### 405.2.7 Curing Materials

Curing materials shall conform to the requirements of Subsection 341.2.8.

#### 405.3 Sampling and Testing of Structural Concrete

As work progresses, at least one (1) sample consisting of three (3) concrete cylinder test specimens, 150 x 300 mm (6x 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	T 141
Weight per cubic meter and air content (gravimetric) of concrete	T 121
Sieve analysis of fine and coarse aggregates	T 27
Slump of Portland Cement Concrete	T 119
Specific gravity and absorption of fine aggregate	T 84
Tests for strength shall be made in accordance with the following:	
Making and curing concrete compressive and flexural tests specimens in the fields	T 23
Compressive strength of molded concrete Cylinders	T 22

#### 405.4 Production Requirements

##### 405.4.1 Proportioning and Strength of Structural Concrete

The concrete materials shall be proportioned in accordance with the requirements for each class of concrete as specified in Table 405.2, using the absolute volume method as outlined in the American Concrete Institute (ACI) Standard 211.1, "Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete". Other methods of proportioning may be employed in the mix design with prior approval of the Engineer. The mix shall either be 213 designed or approved by the Engineer. A change in the source of materials during the progress of work may necessitate a new mix design.

The strength requirements for each class of concrete shall be as specified in Table 405.2.

Table 405.2 - Composition and Strength of Concrete for Use in Structures

Class of Concrete	Minimum Cement Content Per m <sup>3</sup> kg (bag <sup>**</sup> )	Maximum Water/Cement Ratio kg/kg	Consistency Range in Slump mm (inch)	Designated Size of Aggregate Square Opening Std. mm	Minimum Compressive Strength of 150x300mm Concrete Cylinder Specimen at 28 days, MN/m <sup>2</sup> (psi)
A	360	0.53	50 - 100	37.5 - 4.75	20.7
	(9 bags)		(2 - 4)	(1½" - No. 4)	(3000)
B	320	0.58	50 - 100	50 - 4.75	16.5
	(8 bags)		(2 - 4)	(2" - No. 4)	(2400)

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

\*\*Based on 40 kg/bag

##### 405.4.2 Consistency

Concrete shall have a consistency such that it will be workable in the required position. It shall be of such a consistency that it will flow around reinforcing steel but individual particles of the coarse aggregate when isolated shall show a coating of mortar containing its proportionate amount of sand. The consistency of concrete shall be gauged by the ability of the equipment to properly place it and not by the difficulty in mixing and transporting. The quantity of mixing water shall be determined by the Engineer and shall not be varied without his consent. Concrete as dry as it is practical to place with the equipment specified shall be used.

#### **405.4.3 Mixing and Delivery**

Concrete mixers may be of the revolving drum or the revolving blade type and the mixing drum or blades shall be operated uniformly at the mixing speed recommended by the manufacturer. The pick-up and throw-over blades of mixers shall be restored or replaced when any part or section is worn 20 mm or more below the original height of the manufacturer's design. Mixers and agitators which have an accumulation of hard concrete or mortar shall not be used.

When bulk cement is used and volume of the batch is 0.5 m<sup>3</sup> or more, the scale and weigh hopper for Portland Cement shall be separate and distinct from the aggregate hopper or hoppers. The discharge mechanism of the bulk cement weigh hopper shall be interlocked against opening before the full amount of cement is in the hopper. The discharging mechanism shall also be interlocked against opening when the amount of cement in the hopper is underweight by more than one (1) mass percent or overweight by more than 3 mass percent of the amount specified. When the aggregate contains more water than the quantity necessary to produce a saturated surface dry condition, representative samples shall be taken and the moisture content determined for each kind of aggregate.

The batch shall be so charged into the mixer that some water will enter in advance of cement and aggregate. All water shall be in the drum by the end of the first quarter of the specified mixing time.

Cement shall be batched and charged into the mixer so that it will not result in loss of cement due to the effect of wind, or in accumulation of cement on surface of conveyors or hoppers, or in other conditions which reduce or vary the required quantity of cement in the concrete mixture.

The entire content of a batch mixer shall be removed from the drum before materials for a succeeding batch are placed therein. The materials composing a batch except water shall be deposited simultaneously into the mixer.

All concrete shall be mixed for a period of not less than 1 - ½ minutes after all materials, including water, are in the mixer. During the period of mixing, the mixer shall operate at the speed for which it has been designated.

Mixers shall be operated with an automatic timing device that can be locked by the Engineer. The time device and discharge mechanics shall be so interlocked that during normal operation no part of the batch will be charged until the specified mixing time has elapsed.

The first batch of concrete materials placed in the mixer shall contain a sufficient excess of cement, sand, and water to coat inside of the drum without reducing the required mortar content of the mix. When mixing is to cease for a period of one hour or more, the mixer shall be thoroughly cleaned.

#### **405.5 Methods of Measurement**

The quantity of structural concrete to be paid for will be the final quantity placed and accepted in the completed structure. No deduction will be made for the volume occupied by pipe less than 100 mm (4 inches) in diameter or by reinforcing steel, anchors, conduits, weep holes or expansion joint materials.

#### **405.6 Basis of Payment**

The accepted quantities, measured as prescribed in Section 405.5, shall be paid for at the contract unit price for each of the Pay Item listed below that is included in the Bill of Quantities.

Payment shall constitute full compensation for furnishing, placing and finishing concrete including all labor, equipment, tools and incidentals necessary to complete the work prescribed in the item.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
405	Structural Concrete	Cubic Meter

## **SUBTOPIC REFERENCES FOR ITEM 405**

### **311 – PORTLAND CEMENT CONCRETE PAVEMENT**

#### **311.1 Description**

This Item shall consist of pavement of Portland Cement Concrete, with or without reinforcement, constructed on the prepared base in accordance with this Specification and in conformity with lines, grades, thickness, and typical cross-section shown on the Plans.

#### **311.2 Material Requirements**

##### **Portland Cement**

It shall conform to the applicable requirements of Item 700, Hydraulic Cement. Only Type I Portland Cement shall be used unless otherwise provided for in the Special Provisions. Different brands or the same brands from different mills shall not be mixed nor shall they be used alternately unless the mix is approved by the Engineer.

Cement which for any reason, has become partially set or which contains lumps of caked cement will be rejected.

Cement salvaged from discarded or used bags shall not be used.

Samples of Cement shall be obtained in accordance with AASHTO T 127.

##### **311.2.2 FINE AGGREGATE**

It shall consist of natural sand, stone screening or other inert materials with similar characteristics, or combinations thereof, having hard, strong and durable particles. Fine aggregate from different sources of supply shall not be mixed or stored in the same pile nor used alternately in the same class of concrete without the approval of the Engineer.

It shall not contain more than three (3) mass percent of material passing the 0.075 mm (No. 200 sieve) by washing nor more than one (1) mass percent each of clay lumps or shale. The use of beach sand will not be allowed without the approval of the Engineer.

The fine aggregate shall be free from injurious amounts of organic impurities.

##### **311.2.3 COARSE AGGREGATE**

It shall consist of crushed stone, gravel, blast furnace slag, or other approved inert materials of similar characteristics, or combinations thereof, having hard, strong, durable pieces and free from any adherent coatings.

It shall not contain more than one (1) mass percent of material passing the 0.075 mm (No. 200) sieve, not more than 0.25 mass percent of clay lumps, nor more than 3.5 mass percent of soft fragments.

### **700 – HYDRAULIC CEMENT**

#### **700.1 Portland Cement**

Cement shall conform to the requirements of the following cited Specification for the type specified or permitted.

##### **Type Specifications**

Portland Cement AASHTO M 85 (ASTM C 150)

When Types IV and V (AASHTO M 85), P and PA (AASHTO M 150) cements are used, proper recognition shall be given to the effects of slower strength gain on concrete proportioning and

construction practices. Types S and SA cements will be permitted only when blended with Portland Cement in proportions approved by the Engineer.

Unless otherwise permitted by the Engineer, the product of only one mill of any one brand and type of Portland Cement shall be used on the project.

The Contractor shall provide suitable means of storing and protecting the cement against dampness. Cement which, for any reason, has become partially set or which lumps of caked cement will be rejected. Cement salvaged from discarded or used bags shall not be used.

## 1601

### STRUCTURAL BACKFILL

#### 1601.1 Description

This item shall consist of all operations required to replace excavated and unsuitable materials to fill up to grade in accordance with the approved Plans and Specifications.

#### 1601.2 Material Requirements

The selected materials shall be free from grass, roots, brush, or other vegetation, or rocks having maximum dimension larger than 150 mm.

#### 1601.3 Construction Requirements

Backfill materials shall be laid in horizontal layers, not more than 200 mm in thickness and compacted to 100 percent of maximum density and to be carried to the level of the surrounding ground or to the lines and grades as shown on the drawings.

#### 1601.4 Methods of Measurements

The quantity of backfill and fill materials to be paid for under this item shall be the volume which were actually placed and accepted and computed by the average end-area multiplied by total length.

#### 1601.5 Basis of Payment

The accepted quantities, measured as prescribed in Section 1601.4, 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. The payment shall continue full compensation for placing and compacting all materials including 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
1601	Structural Backfill	Cubic Meter

## 1046

### MASONRY WORKS

#### 1046.1 Description

This item shall consist of furnishing of all necessary materials, tools equipment and labor necessary to complete the execution of the masonry works using Concrete Hollow Blocks and Louver Blocks as shown on Plans and herein specified.

#### 1046.2 Material Requirements

##### 1046.2.1 Hydraulic Cement

Hydraulic Cement shall conform to the applicable requirements of Item 700, Hydraulic Cement.

##### 1046.2.2 Aggregates

Aggregates shall conform to the applicable requirements of Item 405, Structural Concrete.

#### **1046.2.3 Water**

Water shall conform to the applicable requirements of Item 714, Water.

#### **1046.2.4 Reinforcing Steel**

Reinforcing steel shall conform to the applicable requirements of Item 404 Reinforcing Steel.

#### **1046.2.5 Mortar**

Mortar shall consist of sand, cement and water conforming to the requirements of Item 405, Structural Concrete, mixture must be class A. Mixture must have sufficient water to obtain the required consistency.

#### **1046.2.6 Concrete Hollow Blocks**

Load bearing concrete hollow blocks shall conform to the physical requirements as prescribed on the ASTM C 90, Standard Specification for Load-bearing Concrete Masonry Unit.

### **1046.3 Construction Requirements**

#### **1046.3.1 Mixing**

Concrete shall be mixed well using the proportion specified by the Engineer. Hand mixing shall be done, using shovels, on a level concrete slab or steel plate. Mix aggregate and cement until the color is uniform. Spread the mixture out, sprinkle water over the surface and mix. Continue with this process until the right amount of water has been mixed in. Mixture shall be free from impurities such as dirt and grass.

#### **1046.3.2 Installation**

All masonry shall be laid true to line, level and neat in accordance with the Plans. Units shall be cut accurately to fit all openings and all holes shall be neatly patched. Masonry unit shall be sound, dry, clean and free from cracks when placed in the structure. Where masonry units cutting is necessary, all cuts shall be neat and true to line.

Units shall be placed while the mortar is soft and plastic. Any unit disturbed to the extent that the initial bond is broken after initial positioning shall be removed and re-laid in fresh mortar.

Mortar should not be spread too far ahead of units, as it will stiffen and lose plasticity, especially in hot weather. Mortar that has stiffened should not be used. ASTM C 270 requires that mortar to be used within 2½ hours of initial mixing.

#### **1046.3.3 Reinforcing for Concrete Hollow Blocks**

Reinforcement shall be done in accordance with the structural plans as to size, spacing and other requirements of Item 404, Reinforcing Steel.

#### **1046.3.4 Finish and Appearance**

All units shall be sound and free from cracks or other defects that interfere with the proper placement of the unit or significantly impair the strength or permanence of the construction.

Where units are to be used in exposed wall construction, the face or faces that are to be exposed shall not show chips or cracks, not otherwise permitted, other imperfections when viewed from a distance of not less than 6.1 m under diffused lighting.

#### **1046.3.4 Storage and Handling of Masonry Works**

The blocks shall be stored in such a way as to avoid contact with moisture at site. They shall be stock-piled on planks or other supports free from contact with ground and covered to protect against wetting. The block shall be handled with care and damaged units shall be rejected.

### **1046.4 Method of Measurement**

The work to be paid for under this Item shall be the number of square meters of masonry units that are satisfactory accepted and completed.

#### 1046.5 Basis of Payment

The accepted quantity, measured as prescribed in Section 1046.4, Methods of Measurement, shall be paid for at the contract unit price for masonry works which price and payment shall include the cost of furnishing all labor, materials and equipment necessary to complete the work.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
1046	Masonry Works	Square Meter

### 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. Thickness of plaster is 16 mm.

##### 1027.2 Material Requirements

###### 1027.2.1 Cement

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

###### 1027.2.2 Fine Aggregates

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

##### 1027.3 Construction Requirements

###### 1027.3.1 Mixture

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

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.

###### 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 grooves and to prevent air pockets in the reinforced concrete/masonry work and avoid mortar mix dropping. 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 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, 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.

##### 1027.4 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	Cement Plaster Finish	Square Meter

### 403

#### METAL STRUCTURES

(Beams, Doors, Posts and Walls; Trusses, Purlins, Sag Rods, Cross Bracing with Turnbuckle and Other Accessories)

##### 403(2)a1.1 Description

This work shall consist of steel structures and the steel structure portions of composite structures, constructed in reasonably close conformity with the lines, grades and dimensions shown on the Plans or established by the Engineer.

The work will include the furnishing, fabricating, hauling erecting, welding, and painting of structural metals called for in the Special provision or shown on the Plans. Structural metals will include structural steel, rivet, welding, special and alloy steel, steel forgings and castings and iron castings. This work will also include any incidental metal construction not otherwise provided for, all in accordance with these Specifications, Plans and Special Provisions.

##### 403(2)a1.2 Metal Requirements

Metal shall meet the requirements of Item 712, Structural Metal; Item 409, Welded Structural Steel, and Item 709, Paints. All materials shall be brand new and free from fractures/defects.

##### (1) Doors, Walls, Posts, Beams and Other Accessories

###### a. Doors

Doors for poultry shall conform to the applicable requirements of Item 1006, Steel Doors and Frames.

###### b. Walls

Outer walls above the concrete hollow blocks up to the bottom frame of roof beams shall be made of 50MMx50MMx4.5MM thick steel matting. Wall frame shall be made of 40MMx40MMx4MM thick angle bar and placed as shown on the Plans.

###### c. Posts

Posts shall be made of 101.6MM (4 inches) Schedule 40 Galvanized Iron Pipe, embedded into the pedestal as shown on the Plans.

###### d. Roof Beams

Top and bottom chord of the beams shall be made of 50MMx50MMx5MM thick angle bar. For the web member it shall be made of 40MMx40MMx4MM thick angle bar, all in accordance with the Plans and Specification or as ordered by the Engineer.

##### (2) Trusses, Purlins, Sag rods, Cross Bracing and Other Accessories

###### a. Trusses

The top chord, bottom chord and king post shall be made of 50MMx100MMx5MM thick Tubular bar. For web members it shall be made of 50MMx75MMx1.5MM thick Tubular Bar, all in accordance with the Plans and Specification or as ordered by the Engineer.

###### b. Purlins

Shall be made of 50MMx75MMx1.2MM C-channels all in accordance with the plans and specifications or as ordered by the Engineer.

c. Other Support:

10mm diameter shall be used for sag rods welded to c-purlins and cross bracing with turn buckle, all in accordance to the plans and specifications or as ordered by the site Engineer.

(3) Painting

All exposed steel materials must be painted with epoxy primer.

**403(2)a1.3 Construction Requirements**

**403(2)a1.3.1 Fabrication**

These Specifications apply to riveted, bolted and welded construction.

Workmanship and finish shall be in accordance with the best general practice. Portions of the work exposed to view shall be finished neatly.

Structural material, either plain or fabricated, shall be stored above ground upon platforms, skids or other supports. It shall be kept free from dirt, grease, or other foreign matter, and shall be protected as far as practicable from corrosion.

**403(2)a1.3.2 Bolted Connection, Unfurnished, Turned and Ribbed Bolts**

(1) General

Bolts under this Subsection shall conform to "Specifications for Carbon Steel Externally and Internally Threaded Standard Fasteners", ASTM A 307. Specification for high strength bolts is covered Subsection 403.3.10. bolts shall be unfinished, turned or an approved form of ribbed bolts with hexagonal nuts and heads except those ribbed bolts shall have button heads. Bolted connections shall be used only as indicated by the plans or Special Provisions. Bolts not tightened to the roof loads shall have single self-locking nuts or double nuts. Bevel washers shall be used where bearing faces have a slope or more than 1:20 with the respect to a plane normal to the bolt axis. Bolts shall be of such length that will extend entirely through their nuts but not more than 6.3MM beyond them. Bolts shall be driven accurately into the holes without damage to the threads. A snap shall be used to prevent damage to the heads. The heads and nuts shall be drawn tight against the work with the full effort of a man using a suitable wrench, not less than 381MM long for bolts of nominal diameter 19MM and over. Heads of bolts shall be tapped with a hammer while the nuts are being tightened.

(2) Unfinished Bolts

Unfinished bolts shall be furnished unless other types are specified. The number of bolts furnished shall be 5% more than the actual number shown on the Plans for each size and length.

(3) Turned Bolts

The surface of the body of turned bolts shall meet the ANSI roughness rating value of 125. Heads and nuts shall be hexagonal with standard dimensions for bolts of the nominal size or the next larger nominal size. Diameter of threads shall be equal to the body of the bolt or the nominal diameter of the bolt specified. Holes for turned bolts shall be carefully reamed with bolts furnished to provide for a light driving fit. Threads shall be entirely outside of the holes. A washer shall be provided under the nut.

(4) Ribbed Bolts

The body of ribbed shall be of an approved form with continuous longitudinal ribs. The diameter of the body measured on a circle through the points of the ribs shall be 1.98MM greater than the nominal diameter specified for the bolts.

Ribbed bolts shall be furnished with round heads conforming to ANSI B 18.5 unless otherwise specified. Nuts shall be hexagonal, either recessed or with a washer of suitable thickness. Ribbed bolts shall make a driving fit with the holes. The hardness of the ribs shall be such that the ribs do not mash down enough to permit the bolts to turn in the holes during tightening. If for any reason the bolts twists before drawing tight, the holes shall be carefully reamed and an oversized bolt used as a replacement. The Contractor shall provide and supply himself with oversized bolts and nuts for these replacements in an amount not less than ten percent (10%) of the number of ribbed bolts specified.

#### **403(2)a1.3.3 Welding**

Shall conform to the applicable requirements of Item 409, Welded Structural Steel.

#### **403(2)a1.3.4 Erection**

The Contractor shall provide the falsework and all tools, machinery and appliances, necessary for the expeditious handling of the work and shall erect the metal work, remove the temporary construction, and do all work necessary to complete the structure as required by the Contractor and in accordance with the Plans and Specifications.

#### **403(2)a1.3.5 Handling and Storing Materials**

Materials to be stored shall be placed on skids above the ground. It shall be kept clean and properly drained. Girder and beams shall be placed upright and stored. Long members, such as columns and chords, shall be supported on skids placed near enough together to prevent injury from deflections. If the Contractor is for erection only, the Contractor shall check the material turned over to him against the shipping lists and report promptly in writing any storage or damage discovered. He shall be responsible for the loss of any material while in his care, or for any damage caused to it after being received by him.

#### **403(2)a1.3.6 Falsework**

The falsework shall be properly designed and substantially constructed and maintained for the loads which will come upon it.

#### **403(2)a1.3.7 Method and Equipment**

Before starting the work of erection, the Contractor shall inform the Engineer fully as to the method of erection he proposed to follow, and the amount and character of equipment he proposes to use, which shall be subject to the approval of the Engineer. The approval of the Engineer shall not be considered as relieving the Contractor of the responsibility for the safety of his method or equipment or from carrying out the work in full accordance with the Plans and Specifications. No work shall be done until such approval by the Engineer has been obtained.

#### **403(2)a1.3.8 Assembling Steel**

The parts shall be accurately assembled as shown on the working drawings and any matchmarks shall be followed. The material shall be carefully handled so that no parts will be bent, broken or otherwise damaged. Hammering which will injure or distort the members shall not be done. Bearing surfaces and surfaces to be in permanent contact shall be cleaned before the members are assembled.

#### **403(2)a1.3.9 Painting**

All surfaces of new structural steel shall be cleaned before applying Epoxy Primer.

#### **403(2)a1.4 Basis of Payment**

##### **403(2)a1.4.1 Structural Steel**

Lump Sum/lot/square meters

When the Bill of Quantities calls for lump sum/lot/square meters price for "Structural Steel, furnished, fabricated and erected", the Item will be paid for at the contract lump sum price and payment shall be full compensation for furnishing, fabricating and erecting material and for all work herein before prescribed in connection therewith, including all labor, equipment, tools and incidentals necessary to complete the work.

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
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403(2)a1	Conduits, Boxes, and Fittings (Conduit Works / Conduit Rough-in)	kg
403	Trusses, Purlins, Sag Rods, Cross Bracing with Turnbuckle and Other Accessories	kg

### SPL3

#### RANGING NET & ACCESSORIES

This work shall consist of ranging net and the steel structure portions of composite structures, constructed in reasonably close conformity with the lines, grades and dimensions on the Plans or established by the Engineer.

The work will include welding and painting of structural metals called for in the Special Provision or shown on the Plans. This work will include any incidental metal construction not otherwise provided for, all in accordance with these Specifications, Plans, and Special Provisions.

Posts shall be made of 2" GI Pipe Schedule 40. Support frame shall be made up of 8mm RSB as shown on the Plans. Fence shall be covered with Polynet/Chicken Net/Poultry Net (1.80Mx25Mx25MM Aperture).

### 1100, 1101, & 1102

#### ELECTRICAL WORKS

##### 1100.1 Description

This Item shall consist of the furnishing and installation of the complete conduit work consisting of electrical conduits; conduit boxes such as junction boxes, pull boxes, utility boxes, octagonal and square boxes; conduit fittings such as couplings, locknuts and bushings and other electrical materials needed to complete the conduit roughing-in work of this project.

##### 1100.2 Material Requirements

All materials shall be brand new and shall be of the approved type meeting all the requirements of the Philippine Electrical Code and bearing the Philippine Standard Agency (PSA) mark.

##### 1100.3 Construction Requirements

All works throughout shall be executed in the best practice in a workmanlike manner by qualified and experienced electricians under the immediate supervision of a duly licensed Electrical Engineer.

##### Conduits

Conduits should be cut square with a hacksaw and reamed. Bends shall be made with the required radius. In making bends only conduit bending apparatus will be used. The use of a pipe tee or vise for bending conduits shall not be permitted. Conduits which have been crushed, deformed or flattened shall not be installed. No running thread shall be allowed. Conduit runs crossing construction joints of the building shall be provided with standard expansion fittings of the approved type.

No conduits shall be used in any system smaller than 12 mm diameter electric trade size nor shall have more than four (4) 90-degree bends in anyone run and where necessary, pull boxes shall be provided.

All ends of conduits which are left empty in cabinets and conduit boxes shall be plugged with lead or approved pipe caps so as to prevent the entrance of white ants and dirt within the conduit system. Pull wires shall be inserted in the empty ducts before they are closed with lead or pipe caps and shall be left therein for future use.

On exposed work, all pipes and outlet boxes shall be secured by means of galvanized metal clamps which shall be held in place by means of machine screws. When running over concrete surfaces, the screws shall be held in place by means of expansion sleeves for big pipes and rolled lead sheet for small pipes.

All pipes shall be run at right angles to and parallel with the surrounding walls. No diagonal run shall be allowed and all bends and offsets shall be avoided as much as possible. Conduits shall be supported at 1,500 mm intervals maximum.

#### **Conduit Boxes & Fittings**

Provide conduit boxes for pulling and splicing wires and outlet boxes for installation of wiring devices.

As a rule, provide junction boxes or pull boxes in all runs greater than 30 meters in length, for horizontal runs. For other lengths, provide boxes as required for splices or pulling. Pull boxes shall be installed in inconspicuous but accessible locations.

Support boxes independently of conduits entering by means of bolts, rod hangers or other suitable means.

Conduit boxes shall be installed plumb and securely fastened. They shall be set flush with the surface of the structure in which they are installed where conduits are run concealed.

All convenience and wall switch outlet boxes for concealed conduit work shall be deep, rectangular flush type boxes. Four-inch octagonal flush type boxes shall be used for all ceiling light outlets and shall be of the deep type where three or more conduits connect to a single box.

Floor mounted outlet boxes required shall be waterproof type with flush brass floor plate and brass bell nozzle.

All boxes shall be painted with antirust red lead paint after installation. All conduits shall be fitted with approved standard galvanized bushing and locknuts where they enter cabinets and conduit boxes.

Junction and pull boxes of code gauge steel shall be provided as indicated or as required to facilitate the pulling of wires and cables.

#### **1100.4 Method of Measurement**

The work under this Item shall be measured either by lengths, pieces, pairs, lot and set actually placed and installed as shown on the approved Plans.

#### **1100.5 Basis of Payment**

All works performed and measured and as provided for in the Bill of Quantities shall be paid for at the Unit Bid or Contract Unit Price which payment shall constitute full compensation including labor, materials, tools and incidentals necessary to complete this Item.

Payment shall be made under:

Pay Item Number	Description	Unit of Measurement
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1100	Conduits, Boxes, and Fittings (Conduit Works / Conduit Rough-In)	lot
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## **ITEM 1101 - WIRES AND WIRING DEVICES**

### **1101.1 Description**

This item shall consist of the furnishing and installation of all wires and wiring devices consisting of electric wires and cables, wall switches, convenience receptacles, heavy duty receptacles and other devices shown on the approved Plans but not mentioned in these specifications.

### **1101.2 Material Requirements**

Wires and cables shall be of the approved type meeting all the requirements of the Philippine Electrical Code and bearing the PSA mark. Unless specified or indicated otherwise, all power and lighting conductors shall be insulated for 600 volts.

All wires shall be copper, soft drawn and annealed, smooth and of cylindrical form and shall be centrally located inside the insulation.

All wiring devices shall be standard products of reputable electrical manufacturers. Wall switches shall be rated at least 1 OA, 250 volts and shall be spring operated, flush, tumbler type. Duplex convenience receptacles shall be rated at least 15A, 250 volts, flush, parallel slots.

Single heavy-duty receptacles shall be rated at least 20A, 250 volts, 3wire, flush, polarized type.

### **1101.3 Construction Requirements**

Conductors or wires shall not be drawn in conduits until after the cement plaster is dry and the conduits are thoroughly cleaned and free from dirt and moisture. In drawing wires into conduits, sufficient slack shall be allowed to permit easy connections for fixtures, switches, receptacles and other wiring devices without the use of additional splices.

All conductors of convenience outlets and lighting branch circuit home runs shall be wired with a minimum of 3.5 mm in size. Circuit home runs to panel boards shall not be smaller than 3.5 mm but all home runs to panel board more than 30 meters shall not be smaller than 5.5 mm. No conductor shall be less than 2 mm in size.

All wires of 14mm and larger in size shall be connected to panels and apparatus by means of approved type lugs or connectors of the solder less type, sufficiently large enough to enclose all strands of the conductors and securely fastened. They shall not loosen under vibration or normal strain.

All joints, taps and splices on wires larger than 14 mm shall be made of suitable solder less connectors of the approved type and size. They shall be taped with rubber and PVC tapes providing insulation not less than that of the conductors.

No splices or joints shall be permitted in either feeder or branch conductors except within outlet boxes or accessible junction boxes or pull boxes. All joints in branch circuit wiring shall be made mechanically and electrically secured by approved splicing devices and taped with rubber and PVC tapes in a manner which will make their insulation as that of the conductor.

All wall switches and receptacles shall be fitted with standard Bakelite face plate covers. Device plates for flush mounting shall be installed with all four edges in continuous contact with finished wall surfaces without the use of coiled wire or similar devices. Plaster fillings will not be permitted. Plates installed in wet locations shall be gasketed.

When more than one switch or device is indicated in a single location, gang plate shall be used.

#### **1101.4 Method of Measurement**

The work under this item shall be measured either by meters, rolls, pieces, and set, actually placed and installed as shown on the Plans.

#### **1101.5 Basis of Payment**

All work performed and measured and as provided for in this Bid of Quantities shall be paid for at the Unit Bid or Contract Unit Price which payment shall constitute full compensation including labor, materials, tools and incidentals necessary to complete this item.

Payment shall be made under:

Pay Item Number	Description	Unit of Measurement
1101	Wires and Wiring Devices	lot

#### **1103(1)-LIGHTING FIXTURES**

##### **SCOPE**

This item shall consist of the furnishing and installation of the lightings and electrical fixtures at the location shown on the approved Plans complete with transformer, circuit breakers, cabinets and all accessories, completely wired and ready for service.

##### **MATERIAL REQUIREMENTS**

All materials shall be brand new and shall be of the approved type. It shall conform to the requirements of the Philippine Electrical Code and shall bear the Philippine Standard Agency (PSA) mark.

- Interior -12- 20W RECESSED LED DOWN LIGHT
- Exterior -8-12W SQUARE RECESSED LED DOWN LIGHT

See drawings and schedules for size, details, material use and location of required work or verify with the Project Engineer.

##### **METHOD OF MEASUREMENT**

The work under this item shall be measured either by set and pieces actually placed and installed as shown on the approved Plans.

##### **BASIS OF PAYMENT**

All works performed and measured and as provided for in the Bill of Quantities shall be paid for at the Unit Bid or Contract Unit Price which payment shall constitute full compensation including labor, materials, tools and incidentals necessary to complete this item.

Pay Item Number	Description	Unit of Measurement
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1101	Wires and Wiring Devices	lot
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### **1103(1)- LIGHTING FIXTURES**

#### **SCOPE**

This Item shall consist of the furnishing and installation of the lightings and electrical fixtures at the location shown on the approved Plans complete with transformer, circuit breakers, cabinets and all accessories, completely wired and ready for service.

#### **MATERIAL REQUIREMENTS**

All materials shall be brand new and shall be of the approved type. It shall conform to the requirements of the Philippine Electrical Code and shall bear the Philippine Standard Agency (PSA) mark.

- Interior -12- 20W RECESSED LED DOWN LIGHT
- Exterior -8-12W SQUARE RECESSED LED DOWN LIGHT

See drawings and schedules for size, details, material use and location of required work or verify with the Project Engineer.

#### **METHOD OF MEASUREMENT**

The work under this Item shall be measured either by set and pieces actually placed and installed as shown on the approved Plans.

#### **BASIS OF PAYMENT**

All works performed and measured and as provided for in the Bill of Quantities shall be paid for at the Unit Bid or Contract Unit Price which payment shall constitute full compensation including labor, materials, tools and incidentals necessary to complete this Item.

### **1014**

### **PREPAINTED METAL SHEETS AND OTHER BENDED ACCESSORIES**

#### **1014.1 SCOPE**

The work under this Item shall consist of furnishing all required materials, fabricated steel work, tools, equipment and labor and performing all operations necessary for the satisfactory completion of all under this item of works in strict accord with applicable drawings, details and these Specifications.

#### **1014.2 MATERIALS AND METHODS OF CONSTRUCTION**

Pre-Painted HI-Rib Roofing 0.5mm thickness (Green Color)

Pre-painted roofing sheets shall be fabricated 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 section in identifying the architectural molded rib to be used are as follows: Regular corrugated, Quad-rib, Tri-wave, Rib-wide, twin-rib, etc. Desired color shall be subject to the approval of the DA-WV Project Engineer.

Fastening hardware shall be of two- and one-half inch (2 1/2") Tex screw and standard aluminum blind rivets.

Before any installation work is commenced, the Contractor shall ascertain that the faces of the purlins are in proper alignment. Correct the alignment as necessary in order to have the top faces of the purlins on an even plane.

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 sheets will have to be turned end-to-end during installation.

Start roofing installation by placing the first sheet in position with the downturned edge line with other building elements and fastened to supports as recommended. Place the downturned 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 subsequent sheets until the whole roofing area is covered.

In cutting pre-painted steel roofing sheets, the exposed color must be turned upside down. Cutting shall be carried out on the ground and not over the top of other painted roof product. 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 fillings.

#### 1014.3 METHODS OF MEASUREMENT

The work done under this item shall be measured by actual area covered or installed with pre-painted steel roofing and/or walling in square meters and accepted to the satisfaction of the Project Engineer.

#### 1014.4 BASIS OF PAYMENT

The accepted quantity, measured as prescribed in method of measurement shall be paid for the contractor unit price, which price and payment shall include the cost of furnishing all labor, materials and equipment necessary to complete the work. The unit bid or contract unit price which payment shall constitute full compensation including labor, materials, tools and incidentals necessary to complete this item.

Pay Item Number	Description	Unit of Measurement
1014	Pre-painted Metal Roofing Sheets and Other Bended Accessories	Sq.m