


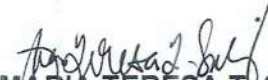
ESTABLISHMENT OF RAINWATER HARVESTER

TECHNICAL SPECIFICATIONS


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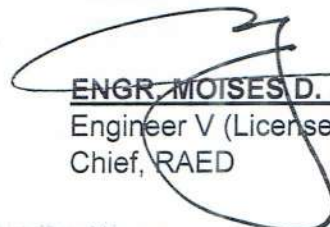
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GENERAL CONDITIONS and SCOPE OF WORKS

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 location as per plans and specifications.

All work to be done shall be of 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.

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.

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

B.5 PROJECT SIGNBOARD & COA BILLBOARD

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

B.7(2). OCCUPATIONAL SAFETY AND HEALTH

(Refer to DPWH DO No. 56, Series of 2005)

Section 6 (Personal Protective Equipment) of D. O. No. 13 guidelines states that "every employer shall, at his own expense, furnish his workers with protective equipment for eyes, face, hands and feet, lifeline, safety belt/harness, protective shields and barriers whenever necessary by reason of the hazardous work process or environment, chemical or radiological or other mechanical irritants of hazards capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical agent".

All Personal Protective Equipment and Devices shall be in accordance with the requirement of the

Occupational Safety and Health Standards (OSHS) and should pass the test conducted and/or standards set by the Occupational Safety and Health Center (OSHC). For General Construction Work the required Basic PPEs for all workers should be Safety Helmet, Safety Gloves and Safety Shoes. Specialty PPEs shall be provided to workers in addition to or in lieu of the corresponding basic PPE as the work or activity requires.

Overall supervision, control and monitoring of the implementation of the Construction Safety and Health Program for projects undertaken by administration/contracts shall be under the Bureau of Construction.

803 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 filling 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

Generally, 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 of 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.

804 Structural Backfill and Embankment

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.

Insuitable Material – Material other than suitable materials such as:

Materials contain detrimental quantities of organic materials, such as grass, roots and sewage.

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/m³ 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 800, Clearing and Grubbing.

Embankments and backfills shall contain no muck, peat, sod, roots or other deleterious matters. 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 ensure uniform density. Water should be added or removed, if necessary, to obtain the required density. Removal of water shall be accomplished through aeration by plowing, blading,

doing, 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 filling 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 compact trials in 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 filling material to be used in the works shall be completed before work with the corresponding materials will be allowed to commence.

804. STRUCTURAL BACKFILL

(Refer to Item 104, Part C of Volume II (Blue Book))

ITEM 104 – EMBANKMENT

Description

This Item shall consist of the construction of an embankment in accordance with this Specification and in conformity with the lines, grades, and dimensions shown on the Plans or established by the Engineer.

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.

Construction Requirements

General

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

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.

Compaction

Throughout the periods when compaction of earthwork is in progress, the Contractor shall adhere to the compaction procedures found from compaction trials for each type of material being compacted, each type of compaction equipment employed, and each degree of compaction specified.

Earth

The Contractor shall compact the material placed in all embankment layers and the material scarified to the designated depth below subgrade in cut sections, until a uniform density of not less than 95 mass percent of the maximum dry density determined by AASHTO T 99 Method C, is attained, at a moisture content determined by Engineer to be suitable for such density. Acceptance of compaction may be based on adherence to an approved roller pattern developed as set forth in Item 106, Compaction Equipment and Density Control Strips.

Method of Measurement

The quantity of embankment to be paid for shall be the volume of material compacted in place, accepted by the Engineer and formed with material obtained from any source.

Material from excavation per Item 102 which is used in embankment and accepted by the Engineer will be paid under Embankment and such payment will be deemed to include the cost of excavating, hauling, stockpiling and all other costs incidental to the work.

Material for Selected Borrow topping will be measured and paid for under the same conditions specified in the preceding paragraph.

Basis of Payment

The accepted quantities, measured as prescribed in Section 104.4, 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
804 (1)	Structural backfill	Cubic Meter

1101 LEVELLING COURSE

(Refer to ITEM 200, Part C, Volume II (Blue Book))

Aggregate Subbase Course 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.

Material Requirements

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

The subbase material shall conform to Table 200 1, Grading Requirements

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
0.075	No. 200	0 - 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 limit 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.

Construction Requirements

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. Placing shall be from vehicles especially equipped to distribute the material in a continuous uniform layer or window. 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.

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.

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

Immediately following final spreading and smoothening, each layer shall be compacted to 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 the 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.

1047. STRUCTURAL STEEL WORKS

(Refer to Item 403, Part F of Volume II (Blue Book))

Description

This work shall consist of steel structures for beams, columns and roof framing, 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, and welding of structural metals called for in the Special Provision or shown on the Plans. Structural metals will include structural steel and welding, this work will also include any incidental metal construction not otherwise provided for, all in accordance with these Specifications, Plans, and Special Provisions.

MATERIAL REQUIREMENTS

Angle Bar – 50x50x5mm
Welding rod

CONSTRUCTION REQUIREMENTS

STOCK MATERIAL CONTROL

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

FABRICATION

These Specifications apply to welded construction.

Workmanship and finishing 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 the ground upon platforms, skids or other supports. It shall be kept free from dirt, grease, or other foreign matters, and shall be protected as far as practicable from corrosion.

Preparation of material shall be in accordance with AWS (American Welding Society) D 1.1, paragraph 3.2 as modified by AASHTO Standard Specification for Welding of Structural Steel Highway Bridges.

FINISHING AND SHAPING

Finished members shall be true to line and free from twists, bends, and open joints.

Fabrication of Members

Unless otherwise shown on the Plans, fabricated members shall be true to line and free from twists, bends, and open joints.

WELDING

Welding shall be done in accordance with the best modern practice and the applicable requirements at AWS D1.1 except as modified by AASHTO "Standard Specifications for Welding of Structural Steel Highway Bridges".

ASSEMBLING STEEL

The parts shall be accurately assembled as shown on the working drawings and any match marks 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.

METHOD OF MEASUREMENT

Unit Basis

The quantity of structural steel to be paid for shall be the number of linear meters complete in place and accepted. For measurement for payment components fabricated from metals listed in (1) below, such as welds metal, will be considered as structural steel.

Furnished, Fabricated and Erected

The quantity, determined as provided above, shall be paid for at the contract unit price per kilogram for "Structural Steel, furnished, fabricated and erected", which price and payment shall constitute full compensation for furnishing, fabricating, delivering, erecting ready for use, and painting all steel and other metal including all labor, equipment, tools and incidentals necessary to complete the work, except as provided in Subsections, 403.5.2

Payment will be made under:

Pay Item Number	Description	Unit of Measurement
1047	Structural Steel Works	Kg

902(1)A. REINFORCING STEEL BAR

It shall conform to the requirements of ASTM standard specifications for Billet Steel Bars for concrete reinforcement (a15-625) and to specification for requirements for deformed steel.

1. Unless otherwise noted in plans, the yield strength of reinforcing bars shall be:

A. Footings, footing beams and girders----- $f_y=275\text{MPa}$ (40,000 psi)

B. Columns and shear walls----- $f_y=275\text{MPa}$ (40,000 psi)

C. Beams and girder----- $f_y=275\text{MPa}$ (40,000 psi)

D. Non-load bearing wall partitions, bedded slabs, floor & roof slabs, Parapets ----- $f_y=230\text{MPa}$ (33400 psi)

2. All reinforcing bars size 10mm or larger shall be deformed in accordance with the astm a-706
Bars smaller than 10mm may be plain.

3. Splices shall be securely wired together & shall lap or extend in accordance w/ table b
(table of lap splice & anchorage length) unless otherwise shown on drawings, splices shall be
Staggered whenever possible

All dowels for anchorage of vertical and horizontal reinforcements for CHB walls and anchor bolts including structural frames, drains and all other materials in contact with concrete construction shall practically be placed in position when concrete is placed. Refer to drawing for Reinforcing Bars

C. PROPORTIONING AND MIXING:

Proportions of all materials entering into the concrete shall be as follows:

	Cement	Sand	Gravel
Class A 3000 psi	1	2	4
Class B	1	2 ^{1/2}	5
Class C	1	3	6

MIXING - concrete shall be machine mixed. Mixing shall begin within 30 minutes after cement has been added to the aggregates. Manual mixing is allowed in the absence of concrete mixer.

D. CURING

Class of Concrete-concrete shall have a 28-day strength of 3,000 psi, for all concrete work unless otherwise indicated in the plans. All concrete shall be moist cured through an approved method for a period of not less than 7 days or at least 3 days in case of high early- strength concrete, shall be protected from injuries and shall not be allowed to dry out for a period of 28 days. Curing starts as soon as the concrete has attained initial settings of sixty (60) min. The surface of the concrete shall be kept continuously wet by covering hurlap Plastic or other approved materials thoroughly saturated with water.

414. FORMWORKS

Forms shall be used wherever necessary to confine the concrete and shape it to the required lines, or to ensure the concrete contamination with materials caving with adjacent, excavated surfaces. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete and shall be

maintained rigidly in the correct position. Forms shall be sufficiently tight to prevent loss of mortar from the concrete. Forms for exposed surfaces against which backfill is not placed shall be lined with a form grade plywood. Provide all scaffolding required for masonry work, including cleaning down on completion, remove. Cleaning and Oiling of forms must be performed. Before placing the concrete, the contact surfaces of the forms shall be cleansed of encrustations of mortar, the grout or other foreign material, and shall be coated with a commercial form oil that will effectively prevent sticking and will not stain the concrete surfaces.

Forms should be removed in a manner which will prevent damage to the concrete. Forms shall not be removed without approval. Any repairs of surface imperfections shall be performed at once and airing shall be started as soon as the surface is sufficiently hard to permit it without further damage.

900(1) – REINFORCE CONCRETE (CLASS A)

Description

This Item shall consist of furnishing, placing, and finishing concrete in buildings and related structures in accordance with this specification and conforming to the lines, grades, and dimensions shown on the plans.

Materials Requirements

Portland Cement

This shall conform to the requirement of ITEM 700, Volume II (Blue Book), and Hydraulic cement.

Concrete Aggregates

Concrete aggregate shall conform to the requirements of subsection 311.2.2 and 311.2.3 under Item 311 of Volume II, (Blue Book)

Water

Water used in mixing concrete shall conform to the requirement of subsection 311.2.4 under Item 311, Part E, of Volume II, (Blue Book).

Metal Reinforcement

Refer to Item No. 1046 of this Specification

Storage of Materials

(Refer to Item 311.2.10)

Concrete Quality

Class A concrete mix shall be used in all structural members, and it shall be a mixture of part 1 cement, 2 parts fine aggregate, and parts coarse aggregate by volume, plus enough water to make the mixture into a pliable paste.

Sampling and Testing of Structural Concrete

As work progresses, at least one (1) set of a sample consisting of three (3) concrete cylinder test specimens, 150 x 300 mm shall be taken from each class of concrete placed each day, and each set to represent not more than 75 cu m of concrete.

Consistency

Concrete should be mixed thoroughly such that there is uniform distribution among the cement and aggregates

Mixing and Delivery

Mixing and delivery shall conform to the requirements of Item 405, Structural Concrete.

Concrete Surface Finishing: General

This shall be in accordance with Item 407, Concrete Structures.

Curing Concrete (See subsection 407)

Method of Measurement

The quantity of concrete to be paid shall be the quantity shown in the Bid Schedule, unless changes in design are made in which case the quantity shown in the Bid Schedule will be adjusted by the amount of the change for the purpose of payment

Basis of Payment

The accepted quantities of structural concrete completed in place will be paid for at the contract unit price for cubic meter as indicated on the Bid Schedule.

Pay Item and	Description	Unit of measurement
900(1)	Structural Concrete	Cubic Meter

Such prices and payment shall be full compensation for furnishing all materials, including metal, and rock backing; for all form and false work; for mixing, placing, furnishing, and curing the concrete; and for all labor, materials, equipment, tools and incidentals necessary to complete the item, except that reinforcing steel shall be paid for at the contract unit price per kilogram

1602 INSTALLATION OF WATER TANK, PIPES, VALVES, FITTINGS AND OTHER ACCESSORIES

Description

This item shall consist of the installation of valves and water tank in accordance with the plans/drawings or as directed by the Engineer.

Material Requirement

All materials shall conform to AWWA and ISO specification for valve installation. Valves used are the following: 50mm diameter PVC Ball Valve with female threaded to be attached to the distribution pipe; and Storage Tank shall be a 1500 liters Dark Color Vertical Polyethylene Tank, as shown on the plans. It must be brand new.

Construction Requirements

Valves shall be installed as specified herein and as shown on the drawings. All valves shall be new and of current manufacture.

Method of Measurement

The work to be paid item shall be the installation and the number of lot/units installed.

Basis of Payment

Pay Item Number	Description	Unit of Measurement
1602	Installation Of Water Tank, Pipes, Valves, Fittings and Other Accessories	lot

1032 (1)C PAINTING WORKS (METAL PAINTING)

This Item shall consist of furnishing all paint materials, labor, tools, and equipment in undertaking the proper application of paint, and related works indicated on the Plans and in accordance with this Specification.

Material Requirements

Paint Materials

All types of paint material, varnish, and other related products shall be subject to random test as to material composition by the Bureau of Research and Standard, DPWH or the National Institute of Science and Technology. (Use the following approved and tested brand name: Boysen, Davies, Dutch Boy, Fuller O Brien, or any approved equal).

1032.3 Construction Requirements

The Contractor prior to commencement of the painting, varnishing, and related work shall examine the surfaces to be applied in order not to jeopardize the quality and appearances of the painting varnishing and related works.

Surface Preparation

All surfaces shall be in proper condition to receive the finish. Metal shall be clean, dry, and free from mill scale and rust. Remove all grease and oil from surfaces. Wash unprimed galvanized metal with etching solution and allow it to dry.

Application

Paints when applied by brush shall become non-fluid, thick enough to lay down as adequate film of wet paint. Brush marks shall flow out after application of paint. Paints made for application by roller must be like brushing paint. It must be nonstick when it is thinned to spray viscosity so that it will break up easily into droplets. Paint is atomized by high pressure pumping rather than broken up by the large volume of air mixed with it. These procedures change the required properties of the paint.

Mixing and Thinning

At the time of application paint shall show no sign of deterioration. Paint shall be thoroughly stirred, strained and kept at a uniform consistency during application. Paints of different manufacturers shall not be mixed. When thinning is necessary, this may be done immediately prior to application in accordance with the manufacturer's directions, but not more than 1 pint of suitable thinner per gallon of the paint.

Storage

All material to be used under this Item shall be stored in a single place to be designated by the Engineer and such a place shall be kept neat and clean at all times. Necessary precautions to avoid fire must be observed by removing oily rags, waste, etc. at the end of daily work.

Cleaning

Upon completion of the work, all staging, scaffolding and paint containers shall be removed. Paint drips, oil, or stains on adjacent surfaces shall be removed and the entire job left clean and acceptable to the Engineer.

Workmanship in General

All paints shall be evenly applied. Coats shall be of proper consistency and well brushed out to show a minimum of brush marks.

All coats shall be thoroughly dry before the succeeding coat is applied.

Where surfaces are not fully covered or cannot be satisfactorily finished in the number of coats specified such preparatory coats and subsequent coats as may be required shall be applied to attain the desired evenness of surface without extra cost to the owner.

Where the surface is not in proper condition to receive the coat, the Engineer shall be notified immediately. Work on the questioned portion(s) shall not start until clearance be proceeded is ordered by the Engineer.

Hardware, lighting fixture and other similar items shall be removed or protected during the painting varnishing and related work operations and re-installed after completion of the work.

Method of Measurement

The areas of concrete, wood and metal surfaces applied with paint and other related coating materials shall be measured in square meters as desired and accepted to the satisfaction of the Engineer.

Basis of Payment

The accepted work shall be paid at the unit bid price, which price and payment constitute full compensation for furnishing all materials, labor, equipment, tools and other incidental necessary to complete this Item.

Payment will be made under:

Pay Item Number	Description	Unit of measure
1032 (1)c	Painting works (Metal Paintings)	Square meter

References:

- 1) DPWH – Standard Specifications for Public Works Structures Volume III (Buildings, Ports and Harbors, Flood Control and Drainage Structures and Water Supply Systems)
- 2) DPWH – Standard Specifications for Public Works and Highways Volume II (Highways, Bridges and Airport