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REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS  
OFFICE OF THE SECRETARY  
MANILA

DEPARTMENT ORDER )

NO. **03** )  
Series of 2018 )

SUBJECT: Amendments to DPWH Standard  
Specification for Item 1014 -  
Prepainted Metal Sheets

It has been the thrust of the Department to provide effective standard specifications in the implementation of various infrastructure projects. In view of the need to set an upgraded standard specification for ceiling, roofing and other ancillary systems, the attached amendment to **DPWH Standard Specification for Prepainted Metal Sheets, Item 1014** is hereby prescribed, for the guidance and compliance of all concerned.

This specification shall form part of the revised 1995 edition of the DPWH Standard Specifications for Public Work Structures (Buildings, Ports and Harbors, Flood Control and Drainage Structure and Water Supply Systems), Volume III, 1995 Edition.

This Order shall take effect immediately.

**MARK A. VILLAR**  
Secretary

Department of Public Works and Highways  
Office of the Secretary



WIN8U01563

14.1.2 FET/RGT

**DPWH Standard Specification for  
ITEM 1014 – PREPAINTED METAL SHEETS**

**1014.1 Description**

This item shall consist of furnishing all prepainted metal sheet materials, tools and equipment, plant including labor required in undertaking the proper installation complete as shown on the Plans and in accordance with this Specification.

**1014.2 Material Requirements**

All prepainted metal sheet and roofing accessories shall be oven baked painted true to profiles indicated on the Plans as per approval of the Engineer.

**1014.2.1 Prepainted Roofing Sheets**

Prepainted 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 67:2014 Hot-dip Metallic-Coated Steel Sheets for Roofing - Specification*. Profile section in identifying the architectural moulded rib to be used is as follows: Regular corrugated, Quad-rib, Tri-wave, Rib-wide, Twin-rib, and others. Desired color shall be subject to the approval of the Architect/Engineer.

Gutters, Valleys, Flashings Hip and Ridge roll shall be fabricated from gauge 24 (0.600 mm thick) cold-rolled plain galvanized iron sheets specially tempered steel. Profile section shall be as indicated on the Plans. Fastening hardware shall be of galvanized iron straps, rivets or J-bolts. G.I. straps are of 0.500 mm thick x 16 mm wide x 267 mm long (gauge 26 x 5/8" x 10-1/2") and standard rivets.

Base metal thickness shall correspond to the following gauge designation available locally as follows:

1.	<u>Base Metal Thickness</u>	<u>Designated Gauge</u>
	0.400 mm thick	Gauge 28
	0.500 mm thick	Gauge 26
	0.600 mm thick	Gauge 24
	0.800 mm thick	Gauge 22
2.	<u>Protective coatings</u>	<u>Thickness</u>
	1. Zinc ( <i>minimum</i> )	14 microns (100 gm/m <sup>2</sup> )
	2. Paint coatings	
	Top coat	15.20 microns
	Bottom coat	6.8 microns
3.	<u>Base Metal Thickness</u>	<u>Overall thickness with protective coats</u>
	0.400 mm	0.427-451 mm
	0.500 mm	0.532-551 mm
	0.600 mm	0.638-651 mm

4. Length of roofing sheets – available in cut to length long span length up to 18.29 meters
5. Special length and thickness are available by arrangements.

### **1014.3 Construction Requirements**

Before any installation work is commenced, the top face of the purlins should be checked for proper alignment. Correct the alignment as necessary in order to have the top faces of the purlins on an even plane.

#### **1014.3.1 Processing of Prepainted Metal Sheets**

Fabricated metal sheets is cleaned and pretreated in preparation for painting. Surface contaminants are removed using a suitable alkaline cleaner. The sheet is then pretreated with a chromate pretreatment. The pretreatment is a uniform, continuous deposit applied in a manner to provide excellent paint adhesion and corrosion resistance. A minimum of two coats of paint are applied to both the face side and back side of the sheet. A corrosion inhibitive primer and a top coat shall be used on the sheet. The primer is a uniform continuous film, compatible with the subsequently applied top coat. It is applied to each surface at a thickness specified by the paint manufacturer with a minimum of 0.2 mm thick. Top coat thickness varies depending on paint type and end use. The face side top coat has excellent long-term outdoor weathering characteristics.

#### **1014.3.2 Handling/Lifting/Positioning of Sheets**

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.

#### **1014.3.3 Installation Procedure**

The laying of the roofing panels should begin on the end of the building away from the prevailing wind so that the side-lap seams face away from the prevailing wind-driven rain thus providing additional security against water penetration. Start roofing installation by placing the first sheet in position with the downturned edge in line with other building elements and fastened to supports as recommended. Fasteners should have corrosion resistance at least equivalent to the expected life of the base material. 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 and/or (Adopt installation procedure provided in the instruction manual for each type of Architectural molded rib profile section). Prepainted metal sheet should not come in direct contact with wet concrete. Concrete's high alkalinity attacks the aluminum, causing the coating to peel. It shall also not be placed in contact with copper, lead, or the water run-off. Electrochemical reaction between these elements and the aluminum-zinc alloy coating will lead to premature corrosion of the coating. For walling applications follow the procedure for roofing and allow a minimum end lap of 100 mm for vertical walling. For panel lapping, requirements depend on the product installation guide of

a specific type of prepainted metal sheet as per approval of the Engineer. Provide sealant, butyl tape or caulking along the lap edge to prevent any leaking. Specifications of the sealant and butyl tape shall be as per manufacturer's recommendation per Engineers approval.

#### **1014.3.4 Gutters, Valleys, Flashing ridge and Hip rolls**

Gutters, valleys, flashing ridge and hip rolls shall be fastened where indicated on the Plans by self-tapping screws or galvanized iron straps and rivets. Always begin flashing installation from bottom and work up, so that flashings are lapped on top of the lower flashings. This will prevent moisture from leaking under the flashings and into the structure.

#### **1014.3.5 End Laps**

In case handling or transport consideration requires to use two (2) or more end tapped sheets to provide full length coverage for the roof run, install each line of sheets from bottom to top or from eave line to apex of roof framing. Provide 150 mm minimum end lap.

#### **1014.3.6 Anchorage/Fastening**

Prepainted steel roofing sheets shall be fastened to the wood purlins with standard length G.I. straps, rivets or J-bolts. For steel frame up to 4.5 mm thick use self-drilling screw No. 12 by 35 mm long hexagonal head with neoprene washer. For steel support up to 5 mm thick or more use thread cutting screw No. 12 by 40 mm long hexagonal head with neoprene washer. Side lap fastener use self-drilling screw No. 10 by 16 mm long hexagonal head with neoprene washer. Valley fastener use self-drilling wood screw No. 12 by 25 mm long hexagonal head with neoprene washer. Valleys fastened to steel supports use self-drilling screws hexagonal head with neoprene washer. Drill size is 5 mm diameter.

#### **1014.3.7 Cutting of Sheets**

In cutting prepainted steel roofing sheets and accessories, place the exposed color side down. Cutting shall be carried out on the ground and not over the top of other painted roofing product. Power cutting or drilling to be done or carried out on prepainted products already installed or laid in position, the area around holes or cuts shall be masked to shield the paint from hot fillings.

#### **1014.3.8 Storage and Protection**

Prepainted steel roofing, walling products and accessories should be delivered to the jobsite in strapped bundles. Sheets and/or bundles shall be neatly stacked in the ground dry and if left in the open it shall be protected by covering the stack materials with loose tarpauline. Bundles should be stored above ground at a slight angle, to prevent water or condensation build up between adjacent sheets. Removing installation debris and metal fines due to drilling and cutting from the sheet surface and avoiding exposure of insulation to the weather shall be practice at all times.

**1014.4 Method of Measurement**

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

**1014.5 Basis of Payment**

The area of prepainted steel roofing and/or walling in square meters as provided in Section 1014.4 shall be paid for at the unit bid or contract unit price which payment shall constitute full compensation including labor, materials, tools and incidents necessary to complete this Item.

Payment shall be made under:

<b>Pay Item No.</b>	<b>Description</b>	<b>Unit of Measurement</b>
1014 (1) a1	Prepainted metal sheets below 0.427 mm (Corrugated, Short span)	Square Meter
1014 (1) a2	Prepainted metal sheets below 0.427 mm (Rib type, Short span)	Square Meter
1014 (1) b1	Prepainted metal sheets above 0.427 mm (Corrugated, Long span)	Square Meter
1014 (1) b2	Prepainted metal sheets above 0.427 mm (Rib type, Long span)	Square Meter

**References:**

- 1) Philippine National Standard (PNS) 67:2014 – Hot-dip Metallic-Coated Steel Sheets for Roofing-Specification
- 2) Bethlehem Data Sheet "Prepainted Galvalume Sheet"
- 3) Fabral - Standard Details for Metal Roofing and Siding
- 4) Prepainted Galvalume Steel Fact Sheet
- 5) Majestic Steel USA