

097.13 DPWH
06.09.2017



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

08 JUN 2017

DEPARTMENT ORDER) SUBJECT : DPWH Standard Specification on
77) Item 1045 - Aluminum Panel
No. _____)
Series of 2017 *06.09.17*)

In line with the mandate of the Department in providing effective standard specifications in the implementation of various infrastructure projects and in view of the need of setting a standard specification for aluminum panels, the attached **DPWH Standard Specification on Item 1045 - Aluminum Panel** is hereby prescribed, for the guidance and compliance of all concerned.

This specification shall form part of the on-going revision of the DPWH Standard Specifications for Public Works 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



WIN7U01483

14.1.2 FET/RGT

**DPWH Standard Specification on
Item 1045 - Aluminum Panel**

1045.1 Description

This Item covers the use of aluminum panel as perforated ceiling panel and shall consist of furnishing and installing materials, tools, labor and equipment necessary for aesthetic purposes as indicated on the Plans and in accordance with this Specifications.

1045.2 Material Requirements

1045.2.1 Aluminum

The aluminum shall be high strength, heat-treatable alloy which provides good formability and weldability and good corrosion resistance. It shall be suitable for a wide variety of architectural applications and of commercial quality unless specified in the Plans. It shall conform to the applicable requirements of ASTM B 209M, Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.

1045.2.2 Thickness

Thinner material perforate easier and faster. Table 1045.2.2 shall be used as reference in determining thickness of panel. It shall have a gauge thickness tolerance of ± 0.2 mm.

1045.2.2 Thickness Gauge

Gauge	Thickness (mm)	Gauge	Thickness (mm)
2	6.544	18	1.024
3	5.827	19	0.912
4	5.189	20	0.812
5	4.621	21	0.723
6	4.115	22	0.644
7	3.665	23	0.573
8	3.264	24	0.511
9	2.906	25	0.455
10	2.588	26	0.405
11	2.305	27	0.361
12	2.053	28	0.321
13	1.828	29	0.286
14	1.628	30	0.255
15	1.450	31	0.227
16	1.291	32	0.202
17	1.150		

From B&S Gauge Table

1045.2.3 Panel Shape and Size

Panel shape and sizes shall be as indicated in the Plans or as approved by the Engineer. Aluminum panels shall be equipped with perimeter welded metal frames, return edges,

borders, mounting holes, attachment brackets, and clips. It shall be dimensioned as indicated on the Plans and as approved by the Engineer with a width and length tolerances of ± 2.0 mm and ± 4.0 mm respectively.

1045.2.4 Perforations

1045.2.4.1 Shape and Size

The shape of perforations shall be as indicated on the Plans using the following standard shapes:

1. Round perforations shall be spaced in centers in straight line or in 60 degrees staggered pattern provided with the percent of open area and hole size as specified on the Plans.
2. Square perforations shall be placed in straight line or in staggered pattern provided with the percent of open area.
3. Slotted perforations shall have round or square ends in straight line, end staggered or side staggered pattern with side bar and wide end bar provided with the percent of open area.

In any cases that a custom shape perforations is needed for functional requirement, spacing and size of perforation shall be provided.

The hole diameter should not be less than the thickness of the aluminum panel.

1045.2.4.2 Pattern

Staggered pattern perforations shall have an unfinished end pattern that appears incomplete at both ends of the sheet.

For staggered perforations, both Round and Square, the pattern stagger shall be in the short dimension of the sheet. Holes in a straight row pattern shall be parallel to long dimension of sheet.

Slotted Perforation – Slots shall be identified if to be furnished parallel with either the length or width of the sheet.

1045.2.5 Margin

The "margin" on a perforated sheet or plate refers to the distance from the edge of the sheet to the first perforation along the same dimension. "No margin" refers to the last row or set of perforations extending off the sheet or plate.

The long side of a sheet shall be supplied with minimum margins. The short side of a sheet will have either minimum margins or no margins.

1045.3 Construction Requirements

1045.3.1 Installation

Install in accordance with manufacturer's installation instructions and approved shop drawings.

1. Before installing a perforated ceiling, the room/site conditions should be assessed. The area should be weather tight (windows and doors in place) and have a stable, dry environment. The ceiling panels should only be installed after the wet trades, such as plaster and screed-work have been completed and the environment is dry and stable.
2. Check soffit and fix perimeter option at specified height.
3. Select correct top fixings for substrate.
4. Level and fix perimeter trims.
5. Install top fixings for hanger.
6. Ensure U-profiles are installed parallel, level and with the slots aligned. Do not exceed the recommended installation centres for U-profiles. Joints must be staggered.
7. Level and fix wall anchors.
8. Install brackets and secondary clip-in profiles to U-profiles
9. Install the ceiling panels.
10. Cut perimeter panels to the required size with electric shears.
11. Install other components in the ceiling plane.
12. Touch up damaged finish with paint supplied by the Manufacturer and matching original coating

1045.3.2 Finishing

Perforated panels shall be coated with the following:

1. Polyester powder coating
Electrostatically applied colored polyester powder coating heat cured to chemically bond finish to metal substrate.
2. Polyurethane coating
Thermoset enamel with 1.0 mil dry film thickness.

In addition to polyester powder and thermoset polyurethane color coatings, the anodized and Mill finishes are applicable to aluminum as approved by the Engineer.

Color shall be as indicated on the Plans or as approved by the Engineer.

1045.3.3 Inspection

When items not meeting specification requirements are discovered, their existence shall be called to the attention of the manufacturer prior to installation. Possible use of such items may be adjudicated among the responsible parties involved, based on the nature of the deficiency and the effect on the performance of the ceiling.

When rejection occurs, the manufacturer shall have the right to examine the rejected material. After removal of the portion not conforming to the specification, resubmission of the lot shall be permitted.

The inspection of specific ceiling areas for acceptability shall be made with lighting conditions corresponding to that of final building occupancy. If temporary lighting must be used, care shall be taken to position lights such that temporary conditions will approximate the final lighting condition.

1045.4. Method of Measurement

The area to be paid for shall be the number of square meter of the ceiling to be covered with aluminum panel, placed and accepted as the completed work, measured from edge to edge.

1045.5. Basis of Payment

The quantity determined in subsection 1045.4 shall be paid for at the Contract Unit Price which price constitute full compensation including labor, materials, tools and equipment and incidentals necessary to complete this Item.

Payment will be paid under:

Pay Item No.	Description	Unit of Measurement
1045 (1)	Perforated Ceiling Panel	Square Meter

acg

References:

1. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
2. Ametco Manufacturing Corporation, Perforated Steel, Stainless Steel, Aluminum and Plastic.
3. Designers, Specifiers and Buyers Handbook for Perforated Metals, Industrial Perforators Association publication.
4. Technical Specification of Aludecor Aluminum Composite Panels
5. Armstrong Metal Ceilings
6. <http://www.vivalda.co.uk/products/decorative-cladding/aluminium-composite-panel/>
7. <http://www.metalsdepot.com/products/alum2.phtml?page=Perforated%20Aluminum%20Sheet>
8. <https://www.ametco.com/pdfs/400557ametcoperfproducts.pdf>
9. <http://www.hendrickmfg.com/tech-info>
10. <https://www.unc.edu/~rowlett/units/scales/sheetmetal.html>
11. <http://www.engineershandbook.com/Tables/gauge2.htm>
12. <https://www.sapagroup.com/en-US/profiles/6061-t6-aluminum-properties/>
13. www.esabna.com/us/en/education/blog/understanding-the-aluminum-alloy-designation-system.cfm