097.13 DPWH
05-31-2016

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

31 MAY 2016

DEPARTMENT ORDER) **SUBJECT : DPWH Standard Specification on Item 1015A – Asphalt Roofing Shingles**
)
No. 108)
Series of 2016 05.31.16)

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 asphalt shingles appropriate for roofing, the attached **DPWH Standard Specification on Item 1015A – Asphalt Roofing Shingles** 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.

ROGELIO L. SINGSON
Secretary

Department of Public Works and Highways
Office of the Secretary
WIN6U01296

5.5.2 FET/JFS

DPWH Standard Specification on
Item 1015A - Asphalt Roof Shingles

1015A.1. Description

This Item shall consist of furnishing all labor, tools, equipment and asphalt roof shingles required to complete the roofing as shown on the Plans and in accordance with this Specification.

1015A.2. Material Requirements

1015A.2.1. Asphalt Roof Shingles

Organic-based asphalt shingles are manufactured with a base (also termed mat or substrate) made of various cellulose fibers such as recycled waste paper and wood fibers. This organic base is then saturated with a specially formulated asphalt coating and surfaced with weather-resistant mineral granules. It shall show no unsaturated spots at any point upon cutting 50-mm wide strips at random across the entire shingle and splitting them open to their full length.

The weather side shall be uniform in finish and texture, but may be embossed to simulate a grainy texture. The mineral granules shall be uniformly distributed in a smooth layer over the entire surface and shall be firmly embedded in the asphalt coating. The mineral granules shall not have ruptured the felt fibers as a result of embedment or embossing.

The reverse side coating and the material applied to prevent the shingles from sticking together shall be uniform over the entire surface.

The finished shingles shall be free of visible defects such as holes, ragged or untrue edges, breaks, cracks, tears, protuberances, and indentations.

1015A.2.1.1. Physical Requirements

During handling and application, the shingles shall not crack at ambient temperatures above 10°C (50°F) nor be so sticky at temperatures below 60°C (140°F) as to cause tearing or other material damage upon being unpacked.

The shingles shall conform to the physical requirements prescribed in Table 1015A.1.

Table 1015A.1 Physical Requirements of Asphalt Shingles

Behavior on heating:	
Loss of volatile matter, %	1.5 Max
Sliding of granular surfacing, mm	1.6 Max
Wind Resistance	Pass
Fire Resistance	Class C
Weight of displaced granules,g	1.0 Max

1015A.2.1.2. Sampling and Test Methods

Sample the material and determine the properties prescribed in ASTM D 255 (Standard Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules) in accordance with ASTM D 228 (Standard Test Methods for Asphalt Roll Roofing, Cap Sheets, and Shingles) and determine conformance to the requirements of Table 1015A.1 in accordance with the following test methods:

1. Weight Loss and Behavior on Heating—ASTM D 228.
2. Wind Resistance — ASTM D 3161 (Standard Test Method for Wind Resistance of Asphalt Shingles (Fan-Induced Method)).
3. Fire Test Classification— ASTM E 108, Class A (Standard Test Methods for Fire Tests of Roof Coverings)
4. Weight of Displaced Granules— ASTM D 4977 (Standard Test Method for Granule Adhesion to Mineral Surfaced Roofing by Abrasion).

1015A.2.1.3. Inspection

Inspection of the material shall be agreed upon between the Engineer and the Contractor as part of the contract.

1015A.2.1.4. Rejection and Resubmittal

Failure to conform to the requirements prescribed in this specification shall constitute grounds for rejection. In case of rejection, the supplier/contractor may request for re-inspection of the rejected materials and resubmits the lot after removal of those packages not conforming to the requirements, as approved by the Engineer.

1015A.2.1.5. Packaging and Marking

Asphalt shingles shall be plainly marked with the following information:

a) Name and brand of producer or supplier
b) The area of roof surface covered
c) Style, type, and color of product
d) Directions for application shall be included in at least every square or every third package of shingles.

1015A.2.1.6. Storage

Asphalt roof shingles shall be kept unexposed to bad weather and placed on a raised platform of more than 1.2 m high prior to cutting or bending.

1015A.2.2. Ventilation

All roof structures must be provided with ventilation to prevent entrapment of moisture-laden air beneath the deck. Minimum requirements are unobstructed vent areas of 1/300 of the

total insulated ceiling area for conventional roofs, some jurisdictions as well as low slope 2 /12 to 4/ 12 or cathedral ceilings require 1/150. Vent holes shall be distributed according to the following conditions: 55% as the base of the roof (soffits) for air inflow and 45% at the ridge for air outflow.

1015A.2.3. Sheathing

It shall be in accordance with the requirements of Item 1015 - Clay Roof Tile, Section 1015.2.2 – Sheathing.

1015A.2.4. Batten

Battens shall be installed in straight lines, leveled, squared and firm and spaced to fit shingles and accessories as indicated on the Plans. A layer of underlayment (one layer Type 15 or Type 30 felt complying with ASTM D 226-Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing, ASTM D 4869-Standard Specification for Asphalt-Organic Felt Shingle Underlayment Used in Roofing or ASTM D 6757-Standard Specification for Underlayment Felt Containing Inorganic Fibers Used in Steep-Slope Roofing) shall be used before applying the shingle panels. Top chord or jack rafter shall have at least a minimum roof pitch of 18 degrees.

1015A.2.5. Underlayment

The underlayment shall be installed over entire deck surface, with the length perpendicular to the eave. Nail sufficiently to hold the underlayment in place until the shingles, are applied. Install shingles as soon as possible after installation of the underlayment. If underlayment is used to waterproof over a long period of time, it shall be visually inspected to ensure it is not wet, wrinkled or otherwise damaged. Damaged items shall be discarded and replaced by a new approved underlayment.

1015A.2.6. Fasteners

Fasteners to be used are preferably galvanized roofing nails with a minimum 12-gauge shank and head diameter of at least 10 mm. Both nails and staples should be long enough to penetrate the roof sheathing by 19 mm or penetrate 6 mm through the sheathing if it is less than 19 mm thick. Fasteners should be driven straight and flush with the shingle surface. Over-driven nails or staples can cut into the shingle or crack it in cold weather.

1015A.2.7. Asphalt Cement

Asphalt plastic cement which conforms to ASTM D 4586 (Standard Specification for Asphalt Roof Cement, Asbestos Free) Type I shall be used to ensure compatibility. Cement must be applied only with a comb or notched trowel in a thin (less than 2 mm thick) even coating. Overuse of cement can damage the shingles.

1015A.2.8. Drip and Rake Edge

Metal drip edge of either galvanized steel or copper sheet shall be applied to eaves and rake edges. Fasten metal at eaves directly to the wood deck and rake over the underlayment, using nails spaced at 20 cm to 25 cm.

1015A.3. Construction Requirements

Prior to starting any work, the Contractor shall secure approved roof framing Plan and determine/evaluate actual size condition. In case modification is necessary, the Contractor shall submit shop drawings to the Engineer for approval.

1015A.3.1. Preparatory Work

The deck shall be prepared with eaves protection, underlayment, drip edges and flashings as recommended. Shingling works shall proceed after unsatisfactory conditions were corrected according to the manufacturer's specifications and when existing and forecast weather conditions will permit the work to be completed without interruption. All building surfaces and materials shall be protected against damage.

1015A.3.2. Valleys

Valleys shall be set in place before wood battens are installed by applying roll roofing materials then add metal flashing down the middle of the valley, securing it only to the exterior edges, and add cement.

Mark dual chalk lines, starting from the ridge with an initial spacing of 150 mm, and extend them outward from each other with increased spacing of 4 mm for every foot the lines extend. Next lay the shingles along the chalk lines. The shingles should not be laid any closer than 150 mm to the lines.

1015A.3.3. Hips and Ridges

Shingle panels used for hips and ridges protection shall be cut from strip shingles with a dimension of 310 mm by 300 mm. These shingles shall be bent lengthwise down the center with equal exposure on each side of hip or ridge. Lapped shingle panels shall be provided with not more than 125 mm exposure from butt, and nail in unexposed area 130 mm from the butt and 25 mm vertically from the edge.

1015A.3.4. Installation

Installation shall be in accordance with the lines and grades shown in the Plans or as established by the Engineer.

Immediately after job completion, roof membrane, flashing surfaces, gutters and downspouts shall be cleaned of debris.

1015A.4. Method of Measurement

This Item shall be measured by actual roof area laid with asphalt roof shingles and accessories in square meters or part thereof, for work completed and accepted to the satisfaction of the Engineer.

1015A.5. Basis of Payment

The accepted work quantified and provided in the Bill of Quantities shall be paid for at the contract unit price which constitutes full compensation for furnishing all materials, labor, tools, equipment and other incidentals necessary to complete this Item.

Payment shall be made under:

Pay Item No.	Description	Unit of Measurement
1015A	Asphalt Roof Shingles	Square Meter