

Republic of the Philippines DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS OFFICE OF THE SECRETARY Bonifacio Drive, Port Area Manila



APR 3 0 2025



SUBJECT: DPWH Standard Specification for ITEM 310 (19) - Bituminous Concrete Surface Course with Polyethylene Terephthalate (PET) Plastic Bottle Wastes, Hot-Laid

In line with the continuing efforts to support sustainable engineering and upgrade construction technology and thru adoption of successful research studies, this Department has approved the use of Polyethylene Terephthalate (PET) Plastic Bottle Wastes as additive/modifier in hot mix asphalt, subject to the specifications hereto attached.

The Standard Specification shall form part of the DPWH Standard Specifications for Highways, Bridges and Airports, Volume II and is now included in the Project and Contract Management Application (PCMA).

This Order shall take effect immediately.

MANUEL Department of Public Works and Highways М. Secretary N5U02144

Encl.: DPWH Standard Specification for Item 310 (19) – Bituminous Concrete Surface Course with Polyethylene Terephthalate (PET) Plastic Bottle Wastes, Hot-Laid

14.1 JDV/AGC

DPWH Standard Specification for ITEM 310 (19) – Bituminous Concrete Surface Course with Polyethylene Terephthalate (PET) Plastic Bottle Wastes, Hot-Laid

Item 310 (19).1 Description

This Item shall consist of Bituminous Concrete Surface Course with Polyethylene Terephthalate (PET) plastic waste, constructed on a prepared base or surface course, in accordance with this Specification and in conformity with the lines, grades and typical cross-sections shown on the Plans.

310 (19).2 Material Requirements

310 (19).2.1 Composition and Quality of Bituminous Mixture (Job Mix Formula)

The bituminous mixture shall be composed of bituminous material, aggregates, mineral filler, hydrated lime, and PET plastic bottle waste. It shall conform to the requirements of Item 307, Bituminous Plant-Mix Surface Course – General and Table 310 (19).1.

Table 310 (19).1 Marshall Mix Design for Surface Course		
Property	Requirement (Heavy Traffic)	
Binder Content, %		
By wt. of mix ^a	4.95 – 5.75	
Marshall Stability, N, Min.	8,006	
Air Voids, %	3 – 5	
Flow, 0.25 mm	8-14	
Voids in Mineral Aggregates (VMA), %, Min	13	
Voids Filled with Asphalt (VFA), %	65 –75	

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a - exact percentage shall be fixed by the Engineer in accordance with job-mix formula and other quality Note control requirements

The PET plastic bottle waste content shall be 15% by weight of bitumen.

310 (19).2.2 Bituminous Material

It shall be asphalt cement with penetration grade 60/70 and shall conform to the requirements of Item 702, Bituminous Materials.

310 (19).2.3 Aggregates

It shall be crushed/manufactured aggregates using the design aggregate gradation based on Grading D of Item 703, Aggregates.

310 (19).2.4 Mineral Filler

It shall conform to the requirements of Item 703A, Mineral Filler.

310 (19).2.5 Hydrated Lime

It shall conform to the applicable requirements of Item 701, Hydrated Lime.

310 (19).2.6 Polyethylene Terephthalate (PET) Polymer

It shall consist of clean, dry, durable, lightweight, and naturally transparent plastic waste shredded into less than or equal to 2.36 mm.

310 (19).3 Construction Requirements

The construction of Hot Mix Asphalt (HMA) with PET plastic bottle waste shall be in accordance with the applicable requirements of Item 307, Bituminous Plant-Mix Surface Course – General, except for the addition of shredded plastic bottles which will be subjected to Table 310 (19).2.

Parameter	Requirement	
Compacted Pavement Density, %	97 (-2%)	
Index of Retained Strength, %	70	
Mixing Temperature, °C	150 - 165	
Laying Temperature, °C	120 - 160	
Compaction Temperature, °C	120 - 150	
No. of Blows	75	

Table 310 (19).2 Specification Parameters

310 (19).4 Method of Measurement

Bituminous Concrete Surface Course with PET plastic bottle waste shall be measured in square meters (m²). The quantity to be paid for under this Item shall be the number of square meters of the mixture placed and compacted in the accepted based on the thickness and density of the cores taken in accordance with the acceptance, sampling and testing of Item 307, Bituminous Plant-Mix Surface Course – General.

310 (19).5 Basis of Payment

The accepted quantities, measured as prescribed in Section 310 (19).4, Method of Measurement shall be paid for at the Contract Unit Price for Bituminous Concrete Surface Course with Polyethylene Terephthalate (PET) plastic bottle wastes, 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 shall be made under:

Pay Item Number	Description	Unit of Measurement
310 (19)	Bituminous Concrete Surface Course with Polyethylene Terephthalate (PET) Plastic Bottle Waste	Square Meter