



02 MAR 2017

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

097.13 DPWH
03.07.17

DEPARTMENT ORDER)

No. **29**)

Series of 2017)

SUBJECT: Specification on The Use of Advera in Warm Mix Asphalt (WMA) in Bituminous Concrete (Hot Laid) and Gap Graded Hot Mix Asphalt (Stone Mastic Asphalt) Surface Courses

In line with the continuing efforts to upgrade the construction technology thru adoption of successful research studies, this Department has approved the Specification on The Use of **Advera in Warm Mix Asphalt (WMA)** in Bituminous Concrete (Hot-Laid) and Gap Graded Hot Mix Asphalt (Stone Mastic Asphalt) Surface Courses, subject to the specifications hereto attached. A Certificate of Conditional Approval had been issued by this Department allowing the use of **Advera in WMA** in DPWH road projects from **February 27, 2017** until **February 26, 2022**.

This order takes effect immediately.

RAUL C. ASIS

Undersecretary for Technical Services
Officer-in-Charge

Department of Public Works and Highways
Office of the Secretary



WIN7U01441

14.1.2 FET/RPF

**SPECIFICATION ON THE USE OF ADVERA IN WARM MIX ASPHALT (WMA) IN
BITUMINOUS CONCRETE (HOT-LAID) AND GAP GRADED HOT MIX ASPHALT
(STONE MASTIC ASPHALT) SURFACE COURSES**

1.0 Description

This Specification shall consist of constructing a Bituminous Concrete (Item 310) and/or Gap Graded Hot Mix Asphalt (Item 734) Surface Courses composed of aggregates, mineral filler and bituminous material and the addition of Advera in Warm Mix Asphalt (WMA) mixed in a central plant, constructed and laid warm on the prepared base in accordance with this Specification and in conformity with the lines, grades, thickness and typical cross-section shown on the Plans.

Advera is a powder-form mineral containing 18-20% moisture used in the manufacture of WMA. WMA that is produced is 20°C to 30°C lower than the equivalent Hot Mix Asphalt (HMA).

2.0 Material Requirements

2.1 Composition and Quality of Bituminous Mixture (Job-Mix Formula)

Same as Subsection 307.2.1 – Composition and Quality of Bituminous Mixture (Job-Mix Formula), for Item 310 and Subsection 734.2.1 - Composition and Quality of Stone Mastic Asphalt Mixture for SMA, except with the addition of Advera in WMA. The mixing temperature shall be made 20°C to 30°C lower than the mixing temperature of conventional asphalt. The Job-Mix Formula for Item 310 – Grading "D" and Item 734 – Grading "B" shall be added with 0.25% (2.5 kgs/tonne) Advera in WMA.

2.2 Warm Mix Asphalt

Advera is an inorganic chemical, in powder form, containing 18% – 25% moisture that is chemically and structurally bound.

Advera shall be stored under cover away from precipitation. Its shelf life is indefinite as long as it is stored properly.

Typical addition rate shall be 0.20% – 0.25% on the weight of the asphalt mix. The criteria for adjusting rate shall be as follows:

- a) Hot Mix Compaction Aid – When utilized as HMA with WMA technology, the dosage rate of Advera in WMA shall be 0.10% to 0.20% on the asphalt
- b) If the asphalt content is above 7%, dosage of Advera in WMA shall be increased to 0.30% of the asphalt mix.

2.3 Bituminous Material

It shall be Penetration Grade Asphalt Cement and shall conform to the requirements of Item 702, Bituminous Materials. The grade of the bituminous material shall be specified in the Plans.

2.4 Aggregates

Aggregates shall conform to the requirements of Item 307, Bituminous Plant Mix Surface Course-General and Item 310 and Subsection 734.2.4 - Fine Aggregates for Item 734, SMA.

2.5 Stabilizing Additives

Cellulose fibers, either pure or bitumen coated if to be used as additives to SMA, shall conform to the specifications of Subsection - 734.2.5 Stabilizing Additives of Item 734, SMA.

2.6 Mineral Filler

It shall conform to the requirements of Item 307, Bituminous Plant Mix Surface Course-General.

2.7 Hydrated Lime

It shall conform to the requirements of Item 307, Bituminous Plant-Mix Surface Course-General.

2.8 Proportioning of Mixtures

It shall conform to the requirements of Subsection 307.2.6 - Proportioning of Mixture for Item 310 and Subsection 734.2.7 - Proportioning of Mixture for Item 734, SMA

3.0 Construction Requirements

The construction requirements shall be in accordance whenever applicable, with Item 307.3 - Construction Requirements.

3.1 Operations

- a) Plant Equipment shall be thoroughly heated up prior to the manufacture of WMA. This includes drum, slate conveyors and silos. Once the equipment is heated to HMA temperatures, it shall be brought down slowly to warm mix asphalt target.
- b) Test density in the field shall be correlated with laboratory cores.
- c) Bag house shall be checked to make sure temperatures remain above dew point.
- d) Material shall be sampled from truck for all testing requirements.
- e) Silo Storage – As with any mix, the storage time in a silo shall be minimized.

4.0 Method of Measurement

The area to be paid for under this item shall be the number of square meters (m²) of asphalt pavement placed, compacted and accepted based on the thickness and density of

the cores taken in accordance with Subsection 307.3.10 - Acceptance, Sampling and Testing.

5.0 Basis of Payment

The accepted quantity, measured as prescribed in Section 4.0 – Method of Measurements, shall be paid for at the contract unit price for Bituminous Concrete and/or Gap Graded Hot Mix Asphalt Surface Courses with Advera, which price and payment shall be full compensation for furnishing all materials, handling, mixing, hauling, placing, rolling, compacting, labor, equipment, tools and incidentals necessary to complete this Specification.

Payment shall be made under:

Pay Item Number	Description	Unit of Measurement
	Bituminous Concrete Surface Course, Hot-Laid with Advera	Square Meter
	Stone Mastic Asphalt (SMA) with Advera	Square Meter

14.1.2 FET/JFS

- References:
1. FINAL REPORT – Pilot Road Research Project on the Use of "Warm Mix Asphalt (WMA) –Advera"
 2. DPWH Standard Specifications for Highways, Bridges and Airports Volume II, 2012 Edition
 - a. Item 307 - Bituminous Plant-Mix Surface Course – General
 - b. Item 310 - Bituminous Concrete Surface Course, Hot-Laid
 - c. Item 734 – Stone Mastic Asphalt (SMA)



Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
CENTRAL OFFICE
Manila

Certificate of Conditional Approval

Product Accreditation

This is to certify that

ADVERA

Supplied by:

CCT Chemicals, Inc.

*Unit 302, Alabang Business Tower Building, 1216 Acacia Avenue
Madrigal Business Park, Alabang, Muntinlupa City*

is duly accredited for use in DPWH projects as an additive to Hot Mix Asphalt (HMA) and Stone Mastic Asphalt (SMA) in order to produce Warm Mix Asphalt (WMA) subject to its specifications (hereto attached) pursuant to the provisions of DPWH Department Order No. 189, Series of 2002.

This accreditation shall remain in force until expiry date printed below, subject to its compliance with the requirements of the aforementioned Department Order.

Conditional Approval Number	:	0024
Date Issued	:	March 02, 2017
Expiry Date	:	March 01, 2022


RAUL C. ASIS

Undersecretary for Technical Services
Officer-In-Charge