



Purpose

1. To notify inspectors that nuclear gauge density testing of HMA will no longer be performed using direct transmission.
2. To provide guidance to designers on when to include the new bid items “HMA Core – Roadway” and “HMA Core – Bridge Deck”, and guidance to Construction Project Engineers in providing input to that decision.
3. To provide guidance to Construction Project Engineers when there is no bid item for “HMA Core – Roadway” or “HMA Core – Bridge Deck”.

1. For new contracts, nuclear gauge density testing of HMA will no longer allow direct transmission, but will allow backscatter as an alternative

The January 3, 2017 amendments to the Standard Specifications make a subtle but noteworthy change in how we will be using nuclear density gauges for HMA compaction testing. For contracts advertised January 3, 2017 or later, the direct transmission mode will no longer be an acceptable method of testing HMA compaction, but backscatter mode will be acceptable. The thin layer mode was and continues to be acceptable.

The test procedure cited in the January 3, 2017 Amendment to the Standard Specification is WSDOT FOP for AASHTO T355¹. The test procedure says that HMA compaction testing shall be done in the “backscatter or thin layer” mode². Thin layer mode is still the method of preference for compaction testing HMA, but backscatter mode will be acceptable for gauges that do not have thin layer capability.

The reason for this change is to bring our agency more in line with how other states test for density of HMA. Additionally, Troxler Electronics (manufacturer of the gauges we use) states that backscatter or thin layer readings provide accurate measurement of HMA density. This change also has the benefit of being easier and safer for our staff to conduct density testing of HMA because it eliminates the need for driving holes in our new pavements with a sledge hammer.

What about HMA nuclear gauge compaction testing on contracts advertised before January 3, 2017?

Contracts advertised before January 3, 2017 require nuclear gauge density testing of HMA to follow FOP for WAQTC TM8, which requires the direct transmission or thin layer mode, but does not allow backscatter mode. For those contracts it will be acceptable to continue to use direct transmission (or thin layer mode) for density testing HMA as the contract provides. As an alternative, and only if mutually agreeable to the contractor, a no-cost change order may be executed to replace FOP for

¹ See Section 5-04.3(10)C2 Table 16, and 5-04.3(10)C3.

² WSDOT FOP for AASHTO T355 was updated January 5, 2017 to include use of the thin layer mode.

WAQTC TM8 with WSDOT FOP for AASHTO T355 when using the nuclear gauge for density testing of HMA - this would allow backscatter (and thin layer) mode.

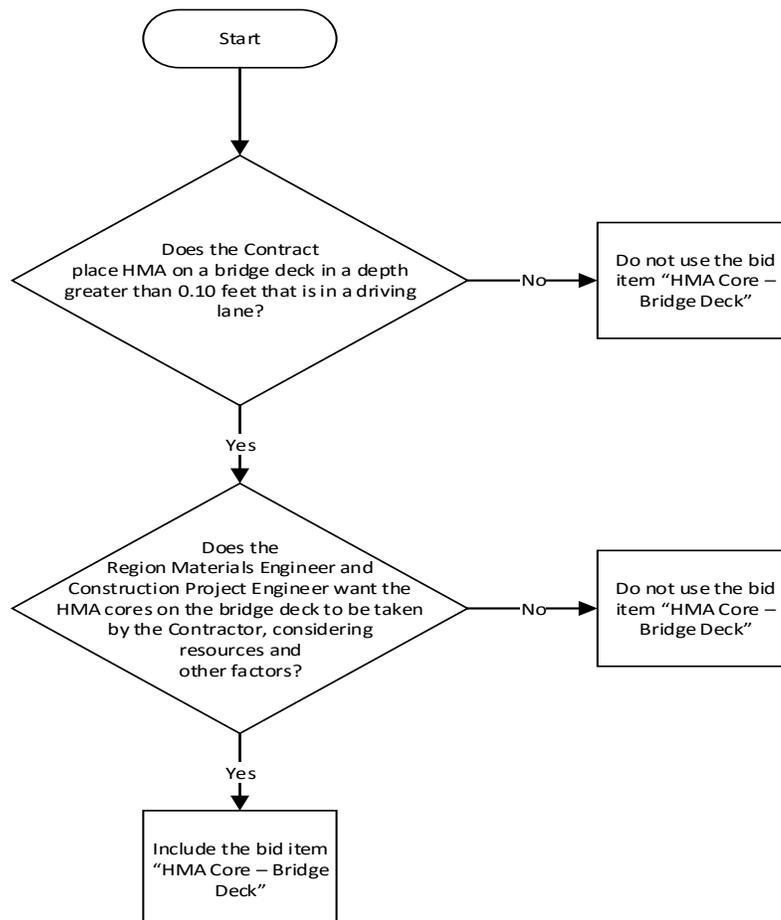
Does This Affect Nuclear Gauge Compaction Testing of Materials Other Than HMA?

This change only affects HMA compaction testing. The use of direct transmission for compaction testing is still appropriate when WSDOT FOP for AASHTO T 310 and WSDOT SOP 615 is the required procedure, such as for soils, crushed surfacing, ballast, etc.

2. Use of new bid items “HMA Core – Roadway” and “HMA Core – Bridge Deck”

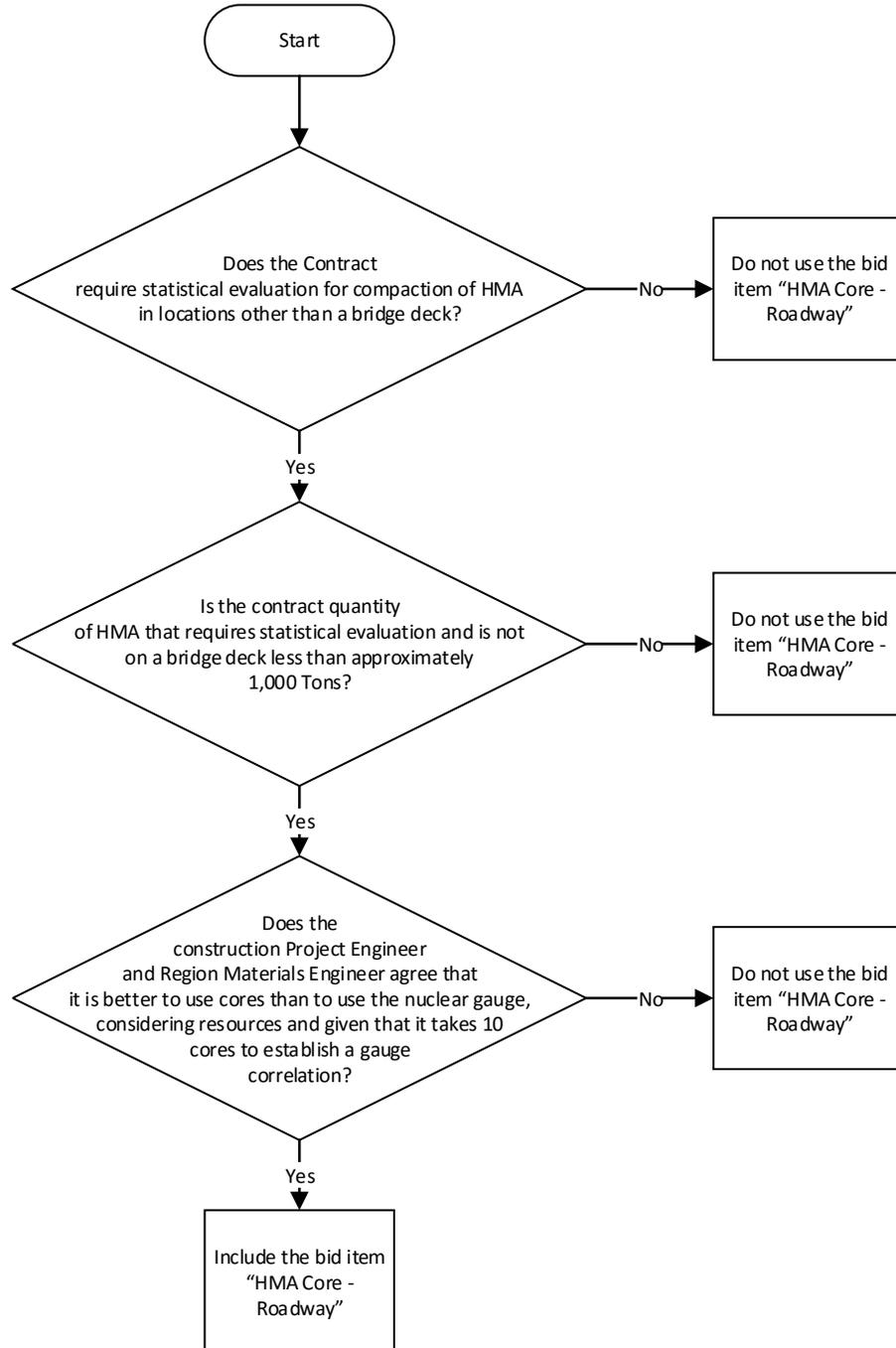
The January 3, 2017 Amendments to the Standard Specs eliminates the bid item “Roadway Core”, and replaces it with “HMA Core – Roadway” and/or “HMA Core – Bridge Deck”. This change is a result of the recent increased emphasis on HMA compaction on bridges³. When putting together the list of bid items during PS&E development, the decision to use these bid items (or not) should be based on two things: the nature of the project and availability of resources. Use the following flow charts.

Regarding the Bid Item “HMA Core – Bridge Deck”



³ See Construction Bulletin 2016-05 “HMA Paving on Bridge Decks: HMA Compaction”.

Regarding the Bid Item "HMA Core – Roadway"



3. When There is No Bid Item for Cores: To Core or Not to Core, That Is NOT the Question

Cores are required on every HMA paving contract that requires any amount of HMA to be accepted by statistical evaluation, so the question is: what will the cores be used for – density determination or gauge correlation? The Construction Project Engineer must provide guidance to the inspectors and testers for a contract that has no bid items for cores.

If the project places HMA on a bridge deck that is in a driving lane and thicker than 0.10 feet compacted depth, cores are required by the Standard Specifications to be the basis for evaluating compaction of that HMA. If there is no bid item "Roadway Core – Bridge Deck", the Standard Specifications require that WSDOT will take the cores and run the core density tests.

If the project places HMA in locations other than on a bridge deck, and that HMA is in a driving lane and thicker than 0.10 feet compacted depth, the Standard Specifications indicate that WSDOT decides whether to determine HMA compaction by cores or the nuclear gauge. In determining which, be guided by this question – which requires fewer cores? Remember, in order to determine HMA density with the nuclear gauge, 10 cores are required to establish a gauge correlation factor. Therefore, a project with 1000 tons of HMA is the tipping point; it would require 10 cores if cores were the basis for testing density, or 10 cores plus ten nuclear gauge tests if the nuclear gauge were the basis for determining density. Do not use cores as the basis for density testing if more than 10 cores would be required.

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