

**Specification**  
**NSSP BITU0029 WMA**  
Email: 09/17/2021 and  
Teams Meeting: 10/26/2021

**ORBA Comment**

Following our **HMA - TWG** meeting on September 14<sup>th</sup>, concerns were raised on the latest revisions to **NSSP BITU0029** about **focus on the green aspects of using Warm Mix**. In regards to the provisions for operational constraints, and production temperatures,

- the initial cold weather qualifications, which recognized the challenge of producing at certain environmental conditions have been removed, and this could impact production quality in the colder seasons.

**MTO Comment**

- OPSS 313 April 2021 in 313.7.7.1 Operational Constraints refers only to placement and compaction of HMA and WMA when ambient air temperature is at least 2°C for binder courses and at least 7°C for surface courses. All content of this clause still applies for the new WMA specification.

NSSP BITU0029 – Aug 2021 version, did not remove any content, more so it stated:

Clause 313.07.07.01 of OPSS 313 **is amended by the addition of the following:**

The maximum allowable production temperature at the asphalt plant for WMA shall be:

- a) 135 °C, or
- b) At least 20 °C below the production temperature of the control HMA with identical mix design parameters to WMA and not exceeding 150 °C.

In the event neither condition a) nor b) above are met, the mix shall not be allowed to be placed in the Work.

Depending on the technology used, the WMA can be produced at temperatures 20°C-50°C lower than the HMA, at 115 °C-150 °C. WMA can be produced in a wide range of environmental conditions, including cooler weather.

Based on further discussion with ORBA/OAPC, the following clause was removed in the Nov 2021 version:

“In the event neither condition a) nor b) above are met, the mix shall not be allowed to be placed in the Work.”

Instead, new wording was added in the Nov 2021 version:

- c) During daily start-up, temporary increases of up to 15°C above the maximum allowable production temperatures stated in a) and b) are allowed for a maximum period of 1 hour.

With the exception of the daily start-up, (when the maximum allowable temperatures may be exceeded for the first hour), any subsequent production at HMA mixing temperatures that exceed the limits in the specification (where the WMA additives or technologies are used to help placement or as compaction aids) is considered non-conforming.

**At HMA temperatures, the greenhouse gas (GHG) emissions are not reduced, and one of the WMA’s most important environmental benefit is lost.**

Therefore, the WMA produced beyond the allowed temperature range is considered non-conforming. However, it is accepted into the work subject to a payment adjustment:

WMA Payment Adjustment = -3% x price x quantity of non-conforming WMA

price= the Contract price of the WMA tender item  
quantity of non-conforming WMA = quantity of (t or m<sup>2</sup>) of non-conforming WMA

- The focus on production temperatures has a potential of removing all the benefits warm mix can have.
- **Generally, we feel that, the revised focus is now too much on the administration of the NSSP, rather than on the technical issues that can improve pavement quality. Hence, we foresee problems leading to potential non-conformances.** If Ministry is to hold-on to the revised provisions spelt in **313.07.07.01**, then the least we'd like to see is **an exemption for contractors from all moisture related deficiencies.**

As a reminder, we draw Ministry's attention to **NCHRP 20-44 (see attached)**, which summarizes challenges of other jurisdiction with warm mix implementation, with prescriptive recommendations not to place restrictions on production temperatures, if success is desired.

- Trusting Ministry will give necessary considerations, and provide clarity as to the goals of re-introducing warm mix – **for performance or an environmental focus?**

- Restriction on production temperatures are **essential in achieving two important of the WMA environmental and cost benefits:** reduced greenhouse gas (GHG) emissions during production of WMA at a lower temperatures and lower fuel combustion requirement.

- Contractors can adjust the production temperature within the allowable range (up to 150°C) to ensure that there are not moisture related deficiencies. Ministry is not aware of moisture related deficiencies in WMA contracts paved since 2008. In fact, our data shows that WMA has been generally performing equivalently or better than HMA.

- The Mistry's focus is on both environmental and performance. The GHG reduction associated with WMA will help MTO in achieving improved environmental sustainability.

NCRP 20-44 confirms that WMA can be produced at temperatures lower than 150°C, consistent with the NSSP, while achieving all the WMA benefits:

- Reduced greenhouse gas (GHG) emissions during asphalt production
- Potential cost savings due to lower fuel usage
- Improved compaction and better joint construction for longer life
- Less potential for cracking due to less asphalt aging

- Improved on-site worker safety due to lower mix temperatures, fewer respirable fumes and lower exposures
- Potential to extend the paving season into cooler weather
- Facilitates longer haul distances from the asphalt plant

This NSSP accelerates the widespread implementation of WMA.

If plant temperature restrictions will be removed, all GHG benefits may be lost. The performance and environmental benefits are linked together.

In the future the temperature limits maybe revisited based on the data collected.

**Specification**  
**NSSP BITU0029 WMA**  
Email 09/24/2021

**ORBA Comment**

Following-up on our previous concerns pertaining to the mixing temperature restrictions included in NSSP BITU0029.

There is concern regarding rigidly controlling the mixing temperature at the plant for 100% of the mix produced without risk of impact to quality. Also there is a concern that regardless of efforts to control temperature at the plant, there is a very high probability of good mix being rejected. If temperature control is desired, it should be at placement. The concerns and major points are noted below:

1. The temperature of the plant needs to be set such that heat loss during transport is accounted for and the mix arrives at the paver at a temperature that allows sufficient time for compaction after placement. The temperature adjustment needed will vary with the environmental conditions being experienced at the time. The desired plant temperatures reduction will be achieved under these circumstances, with the amount of reduction proportional to the reduced placement temperature.
2. During daily plant startup, the first few loads of mix will be at high risk of not meeting the plant temperature requirements until the plant temperature stabilizes. There is also a risk that the temperature of the last few loads of mix produced for the day could also be at risk. This could particularly impact production in Northern Regions. We also understand that, in the USA, typical practice is to start production at a semi hot temperature until the plant is warmed up. When the mix is found to be in control the temperature is brought down to the

**MTO Comment**

1. WMA can be produced to up to 150°C and placement temperature of WMA is significantly lower from HMA, therefore the WMA production temperature can be reduced proportionally.
2. As per previous point, WMA can be produced to up to 150°C which allows sufficient range to operate, especially considering that WMA can be produced at much lower temperatures.

<p>target placement temperature. Therefore, extreme scepticism have been expressed about the ability to produce 100% of the mix made in a days paving at the reduced mixing temperature without some mix not meeting requirements.</p> <p>We understand the motivation behind trying to control the plant temperature for all production to a maximum limit. However, from a practical and quality point of view its highly likely there will be mix found out of specification and negative impacts to quality can be expected under some weather conditions.</p> <p>Trusting these additional perspectives aids Ministry's understanding of Industry's concerns, as we anticipate feedback, thanks.</p>	
<ul style="list-style-type: none"><li>• I was wondering if the Ministry has some kind of special requirements on bulk transport trucks for asphalt warm mix (cargo bed -squared/rounded, hermetic, protective cover, heating system)?</li><li>• I understand that some jurisdictions have a kind of framework contracts about assignment of responsibility for bulk transport, involving a 50/50 split between contractor trucks and local broker trucks. Is there something like that in Ministry's contracts?</li></ul>	<ul style="list-style-type: none"><li>• The WMA spec did not introduce anything different from the HMA spec in the transport aspect. This is the contractor's responsibility.</li><li>• It is the contractor's responsibility to oversee the actions and quality of service provided by the sub-contractor employed. MTO does not have contractual relationships with the sub-contractors.</li></ul>