

## **BEGIN - ARAMID REINFORCEMENT FOR HMA & WMA**

### **General**

The Contractor shall furnish all materials, equipment, labour, and incidentals for mixing aramid reinforcement into project HMA/WMA per this special provision. Aramid reinforcement shall conform to ASTM D8395-23, Standard Specification for Aramid Fibers for Asphalt Mixes.

The Contractor shall develop and submit for Owners review a mixing plan to use equipment capable of continuously feeding of the aramid product in a stream-like manner into the HMA/WMA at the specified dosage rate for the aramid reinforcement. The mixing process must ensure that no balls of reinforcing aramid are observed. Aramid reinforcement cannot be introduced into the asphalt mix drum in pre-packaged containers. Manual or automated dosing systems are acceptable.

Aramid reinforcement shall be metered by either a manual or automated metering system developed by the manufacturer so that the aramid is continuously fed in a constant stream-like manner based on the speed of operation of the asphalt plant. Aramid shall be mixed with the heated aggregates before injection of the liquid asphalt during the asphalt mixing process. Individual unit packages shall not be an acceptable method of feeding the aramid reinforcement into the asphalt plant.

A certified QA/QC mixing technician shall perform continuous stream like feeding of the treated aramid into the asphalt during plant mixing operations for all the Aramid Reinforced HMA/WMA quantities required for the project. Daily fibre mixing logs and a final project certification report from the manufacturer of the aramid reinforcement must be submitted to the owner upon project completion.

The aramid material and treatment properties must comply with Table 1 and Table 2 of ASTM D8395-23. Aramid reinforcement shall be dosed at 65g/t of aramid, using 38mm long fibres only.

### **Submittals**

Provide the following from the product supplier at least two weeks prior to asphalt production.

1. Identify the mixing plant and type (Batch or Continuous Drum).
2. Material data sheet for the treated aramid fibre describing aramid fibre and treatment properties, including the type, weight, and flash point of treatment material.
3. A certified QA/QC mixing plan including procedures for continuously feeding the aramid fibre into the asphalt. The fibre supplier must approve the QA/QC mixing plan and provide certification of the QA/QC mixing technician at the asphalt mixing plant who is responsible for continuous feeding of the fibre into the HMA or WMA. The continuous feeding can be accomplished by using either manual or machine operated equipment for the entire fibre mixing process.

### **Job Mix Formula**

When treated aramid fibre is required as a mixture ingredient in a volumetric asphalt mix design, modification to the job mix formula is not required. A note shall be made on the JMF specifying dosage and length of aramid reinforcement.

## **Storage Requirements**

Store treated aramid product in a dry environment. Do not allow any contact with moisture.

## **Asphalt Mix Production**

Introduce aramid reinforcement as follows:

1. Batch Plant - Aramid product must be added to aggregate in the weigh hopper or pugmill and metered separately from aggregates, binder, and other additives. Control the aramid product metering system with a proportioning device to meet the dosing requirements.
2. Drum Mixing Plant - Aramid product must be added at the RAP collar or to the RAP belt in a continuous manner to uniformly disperse with the aggregate and metered separately from aggregates, binder, and other additives. Control the aramid product metering system with a proportioning device to meet the dosing requirements.

A visual inspection shall be performed during the mixing process to verify uniform distribution of aramid fibre. Dry mix time for the aggregate and aramid fibres shall be adjusted to allow for sufficient melting and mixing of the fibre treatment material.

When WMA is used, a feeder system will be required for both Drum and Batch plants to ensure correct distribution and coating of the aramid fibres. It will be necessary to mix the aramid fibre with the aggregate longer to allow thorough distribution of aramid fibres at the end of the mixing process and to promote asphalt coating of individual strands of aramid fibre.

## **Quality Control**

Metering equipment must be calibrated prior to initial use, recalibrated after any malfunction, and recalibrated monthly.

Plant personnel operating metering equipment must be trained and certified by the supplier.

The aramid supplier's representative must be on site during the first day of production mixing. This requirement can be waived if fibre supplier and HMA producer can supply evidence of supplier's brand of fibre product being successfully produced by the HMA producer. The fibre supplier's representative may be on site for additional days as requested by the Engineer.

At the start of any fibre mixing, visually observe the reinforced asphalt mixture at the plant and in first three trucks at the point of discharge and prior to delivery to the job site. Observation must include using a shovel or other tool to inspect the mixture by allowing it to slightly cool and fall from the shovel or tool's edge. Further inspection can be performed by allowing the loose mixture to cool and pulling apart to inspect for strands of aramid. Adjust mixing time and temperature if needed to ensure aramid fibre distribution.

If recorded aramid fibre dosage data results indicate a deviation of more than 10 percent below the authorized JMF aramid fibre dosage or metering device malfunctions:

1. Stop production
2. Take corrective action
3. Demonstrate compliance with the approved JMF dosage before resuming production and placement.

**Aramid Reinforced HMA/WMA Placement**

All construction, mixture and density requirements of the asphalt as detailed in the Standard Specifications shall apply.

**Pre-Approved Products**

Product: ACE XP Polymer Fiber™  
Manufacturer: Surface Tech  
Contact: Alex Snell  
(403) 651-4808

**Acceptance**

Acceptance of the reinforced HMA/WMA will include the following factors:

1. The owner/specifier shall receive from the contractor a Certification Report from the fibre manufacturer which certifies that the metering and continuous feeding was performed per the Dosage rate and all other requirements of this specification by a certified technician, and that visual inspection was performed during the mixing process to certify that no clumping of aramid fibre or treatment product occurred.
2. All other construction, mixture and density requirements of the asphalt as detailed in the Standard Specifications shall apply.

**Basis of Payment**

Each tonne of Aramid Reinforced HMA/WMA placed according to this specification will be measured and paid for at the contract unit bid price per tonne and shall include full compensation for furnishing all material labour, tools, equipment, QA/QC mixing and reporting, and incidentals for doing all the work involved in metering and feeding the treated aramid, and placement and compaction of the Aramid Reinforced HMA/WMA.

**Pay Item**

Aramid Reinforced HMA or WMA \_\_\_\_\_ TONNES \_\_\_\_\_ \$/TONNE