



Construction & Materials Tips

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Hot Mix Certification Center

Changes are underway at the Hot Mix Asphalt Center, which is managed by the Texas Hot Mix Asphalt Pavement Association. The Center is responsible for training and certification of all hot mix technicians who work under TxDOT's QCQA specifications. Two major changes are:

- Last December the Center began teaching a 4-day Superpave course, with over 20 hours of hands-on training in the laboratory. The primary instructor is Maghsoud Tahmoressi. Currently, some of TxDOT's new hot mix specifications, such as the Stone Filled Hot Mix and QCQA Superpave specifications, require that the technician performing the mix design has a Level II certification and has attended an approved Superpave training course. The new 4-day Superpave course was established to meet this requirement. However, any formally established Superpave training course offered through organizations such as the National Asphalt Pavement Association, the Asphalt Institute, or any of the regional Superpave Centers meets this requirement.
- The Level 1B certification course has undergone a major revision. Pending formal approval by the Center's steering committee, the new Level 1B course is scheduled to replace the existing course in the next few months. In addition, this course will be taught in a different TxDOT district at least once a month, beginning in August of 2001. This will still be a certification course requiring a written test upon completion. However, the course will focus on comprehensive training on loading and unloading trucks, transporting mix, surface preparation, placing the mix, compacting the mix, preventing segregation, achieving adequate joint density, improving smoothness, etc. The course will run about three days and cost around \$500. Anyone who has recently received a Level 1B certification may want to attend this new course. It is an excellent overall course for anyone involved with hot mix.

The Hot Mix Asphalt Center will be sending out schedules soon. For content or scheduling information about this, or any other course, contact Karen Pagitt at 512.339-9449 or by email at kpagitt@txhotmix.org, or Dale A. Rand at 512.232-1903, or by email at drand@dot.state.tx.us.

Curing Mats for Concrete Structures

Curing is defined as maintaining a satisfactory moisture content and temperature in concrete during its early stages to develop desired properties. These properties include strength and permeability, plus resistance to scaling, abrasion, sulfate attack, carbonation, and alkali-aggregate reactions (ASR). The Standard Practice for Curing Concrete (ACI 308) lists several methods by which adequate curing can be achieved: Water curing through ponding or immersion; fog-spraying or sprinkling; burlap, cotton mats or rugs; earth curing; wet sand and sawdust; and straw or hay. ACI 308 also lists several non-water curing methods such as application of plastic film, reinforced paper, and liquid membrane-forming compounds.

(Continued on Page 2)

(Continued from Page 1)

TxDOT specifications for water curing allows the use of wet cotton mats, ponding or spraying. If the air temperature is expected to be below 40° F, polyethylene sheeting (in conjunction with other insulated mats), burlap-polyethylene blankets, laminated mats, or insulated curing mats are required, as well. These products should not be used in warm weather as they can artificially raise the concrete temperature and cause damage to the concrete. Black plastic should not be used to replace clear or opaque white polyethylene sheeting if the air temperature during the curing period will exceed 60° F.

The use of synthetic fiber blankets is not allowed in the specs because they have not proven to be able to maintain the required moisture level at the concrete surface. Synthetic blankets require additional wetting that is often neglected by contractors. If the surface of the concrete is allowed to dry, later addition of water has much less effect than if the water-curing process was not interrupted.

The type of curing materials used on your projects is critical to the proper performance of the final product. For further information, call Brian Merrill (BRG) at 512.416-2232.

Source Control - The Key to Ensuring Recycling Benefits

Many TxDOT special provisions and specifications allow the use of nonhazardous recyclable materials (NRMs) as substitutes for conventional materials. NRMs include municipal and industrial nonhazardous wastes and by-product materials. The majority of NRMs we use are physically similar to the natural aggregates they replace, and include materials such as foundry sand, slag, refractory materials, spent sand blast grit, contaminated soil, spent catalysts, etc. While many benefits are achievable with proper recycling, there are cautions. Many waste materials may contain chemical contaminants that could negatively affect human health or the environment. In addition, extraneous chemicals or properties of a NRM might compromise the durability or strength of our structures.

The FHWA states in their *User Guidelines for Waste and By-Product Materials in Pavement Construction* that “any proposal to incorporate a nonconventional material, and particularly a waste or by-product material, into a pavement structure requires, in addition to an engineering evaluation, an evaluation of environmental, occupational safety and health, recyclability, economic and implementability issues.” As the end user, TxDOT can be held legally responsible, by federal and state law, for adverse effects on the environment or human health caused by the recycled product.

To ensure that only environmentally acceptable and occupationally safe materials are considered, TxDOT developed Departmental Material Specification (DMS) 11000, *Guidelines for Evaluating and Using Nonhazardous Recyclable Materials (NRMs) in TxDOT Projects*. DMS-11000 is found in TxDOT's Materials and Tests Manual (<http://manuals.dot.state.tx.us>) under "Material Specifications" - "Materials Guidelines." DMS-11000 outlines the environmental review necessary when considering NRMs for use in transportation projects. These environmental requirements are in addition to the standard engineering and material specifications that cover materials proposed for TxDOT use. When a contractor proposes an NRM for use in a TxDOT project, documentation that is certified, signed, and sealed by a professional engineer stating that the NRM was evaluated in accordance with DMS-11000 and that the NRM does not present an increased risk to human health or the environment compared to material it replaces, must be submitted. District personnel responsible for material approval should always be aware that some materials proposed for use may contain multiple NRMs that have been blended into the final product. Each NRM used must have its own certification. Although the contractor should notify TxDOT when an NRM is proposed, good material source control is the key to identifying NRMs.

For more information, call David L. Boswell, P.E., Environmental Affairs Division at 512.416-3007, or GroupWise dboswel@dot.state.tx.us.
