

CONSTRUCTION AND MATERIALS TIPS

Prepared by the Construction Division

Asphalt-Rubber Pavements

TxDOT is using shredded tires in paving operations. The crumb rubber (CRM) generated from discarded, shredded tires reacts with the heat from the asphalt and dissolves partially or totally into the binder. Advantages can include increased resistance to reflective cracking and oxidation. The Odessa District is experiencing good success with asphalt-rubber hot mix overlay and plant mix seal. The asphalt-rubber provides a thicker asphalt film without the drain-down problems that have been experienced with plant mix seal in the past. Hot rubber seal coats are in use as well. Past CRM hot mix jobs have generally used CMHB or gap-graded mix designs, and have typically cost significantly more than conventional mix. New CRM projects are scheduled for Odessa and Abilene.

Recently the Texas Transportation Institute completed a test section using a Type D hot mix with an asphalt-rubber binder blended using a new "high-curing" process. This creates a binder similar in nature to an AC 15-5TR. The binder is very smooth, without visible particles of rubber, and is stable. Sections were constructed using Type D hot mix with straight AC-20, AC-20 containing 10% of the tire rubber, and AC-20 with 15% tire rubber. No changes were made in the mix design or asphalt content. During construction, no significant adjustments were made for the different materials. Workers on the job, including roller operators, said they could not tell much difference between the mixes. So far the mixes are all performing well. Researchers plan a second section and should be able to provide a binder spec for controlling the blending and curing process. (Gerald Peterson, CST/M, 512-232-1939)

Sawing Concrete Pavement

The department continues to have uncontrolled full-depth cracking in new concrete pavements that require saw joints. This applies to both longitudinal and transverse cracks. These uncontrolled cracks greatly decrease pavement life and are usually the result of not sawing soon enough, deep enough or both. A properly sawed joint produces a weak plane that generates a full-depth crack at the desired location.

Joints must be sawed as soon as this can be done without major spalling of the saw cut. Contractors must have sufficient saws and crew available to accomplish this. A backup saw is needed and required by the specs. The sawing sequence should follow the sequence of concrete placement. The minimum depth of the saw cut is one-third of the pavement thickness (T/3), but may be one-fourth of the slab thickness (T/4) when crushed limestone is the coarse aggregate. Widening joints for the sealant reservoir is not time sensitive and can be done at a later time. (James Kosel, CST/C, 512-416-2469)

New Ride Specification

A new ride quality specification has been approved for statewide use. The new specification (Items 5591 English, 5310 Metric) replaces the current specifications. Significant changes include:

New Ride Specification (continued)

- ❖ The profilograph may be used to adjust pay based on smoothness if the overlay depth is at least 1.5 inches, even if no milling, level-up or other grade restoration has been performed. For overlays from 1.5 up to 2.5 inches, if the district elects to use the profilograph *and no grade restoration procedures are planned*, TxDOT must obtain the surface profile of the roadway using department high-speed profilers located in the districts. The District Pavement Engineer will coordinate. This profile must be made available to contractors prior to letting. Sections with IRI values of 95.0 inches per mile will be subject to pay adjustments. If requested by the contractor in writing prior to paving, sections of more than 95.0 will be excluded from pay adjustments.
- ❖ The 0.2 inch blanking band has been eliminated. This blanking band was found to filter out some of the roughness caused by laydown operations. The allowable roughness value (PI) has been increased in the new spec, but it is expected that the new spec will make it more difficult to obtain a bonus. Use of the “zero” blanking band will give us data that will allow future use of laser profiling at roadway speeds and eliminate the use of the profilograph.
- ❖ The Engineer has the option to penalize the contractor \$250 for bumps instead of requiring correction. This was done at the request of districts who are not satisfied with the smoothness of corrected areas. Requiring the contractor to correct the bump is probably a more costly “penalty”.

These and other requirements are discussed more fully in the memorandum from the Design Division to the District Engineers dated April 29, 1999. (Mike Koen, CST/C, 512-416-2468)

Sign Warranty

In general, TxDOT signs perform well over their design lives. Field performance requirements and a warranty are included in materials specification DMS-8300. Following are the key points:

Documentation: Each sign must have a sticker indicating the manufacturer of the sheeting, date the sign was made, and date of installation. It is essential that this information be coded in case of a sign failure.

Field Performance Requirements: The signs shall perform satisfactorily for : Engineering Grade: 3 years, Super Engineer Grade or High Intensity: 7 years plus an additional three years with obligation for sheeting replacement only). The sheeting shall be considered unsatisfactory if it has deteriorated, due to natural causes, to the extent that the sign is ineffective for the intended purpose when viewed from a moving vehicle under normal day and night driving conditions or shows any of the following defects:

- ❖ Cracks seen with unaided eye at a distance of 50 feet or greater from the sign;
- ❖ Peeling in excess of 1/4 inch;
- ❖ Shrinkage in excess of 1/8 inch total per 48 inches of sheeting width;
- ❖ Excessive fading or loss of color;
- ❖ Loss of reflectivity in excess of 40 percent of the minimum values specified.

Warranty: Signs failing to meet field performance requirements must be replaced by the manufacturer .

Please call with any questions regarding sign performance. We have portable reflectivity and color instruments to take readings in the field if necessary. (John Bassett, CST, 512-465-7922)