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ASPHALT CONFERENCE & EXPO
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The asphalt contractor

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PAVING AMERICA

Special Series: Recycling, RAP get their due

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Patching the pothole problems

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Fabric, from page 26

fabric meets spec. Each manufacturer may use different diameter cardboard cores from 3 inches (75 mm) to 6 inches (150 mm) to roll the fabric on. Equipment cones should be checked to make sure that the diameter of the core will fit on the cones of the contractors equipment. Not all cones fit all cores and second core thickness is important. Some manufacturers have learned to use thicker cores — 0.75 to 1 inch (19 to 25 mm) — to insure core strength so that the core will not break during installation. Thin drainage fabric cores are not suitable for equipment installation. This can cause the roll to sag in the middle during installation causing wrinkles. The thin core may break causing a possible accident if it jumps of the machine. It also causes a possible injury as the workers must pull the fabric up to remove the roll from the oil that is already down.

The simplest way to fix core problems should they occur is to obtain an aluminum or steel pipe slightly smaller than the diameter of the fabric core and about a foot (0.3 meter) shorter than the fabric width to allow the cones to grab the core without hitting the pipe. This will reinforce the core from breaking and sagging. Having more than one pipe will speed installation, preload the rolls so the new roll can be loaded and the tractor on it's way while the other pipe is retrieved. If one end of the pipe is cut and welded into a point the pipe can more easily be pushed through a roll that the core is already broken on.

Fabric is rolled onto the core by the manufacturer two ways, with the heat bonded side up or down. Hand placement fabric and machine placement fabric need to be exact opposites. When placing fabric by hand it is important to order the fabric to unroll with the heat bonded side up. Otherwise, the laborers will have to hold the fabric up off the ground and walk backwards when unrolling the fabric. When ordering fabric for equipment installation it should be rolled onto the core in reverse direction. When the fabric is placed on the equipment it should come off the back of the roll, providing for more stretch while placing the heat bonded side up. If the fabric comes off the front of the roll, less tension is derived and more wrinkles are likely. Wrinkles and overlaps in the fabric can cause cracks in the new overlay if not properly handled during the construction process. Wrinkles twice the thickness of the fabric should be slit and laid flat. Excess fabric more than 2 inches (50 mm) should be trimmed off. Overlaps and slit wrinkles should be shingled in the direction of the paving. If shingled in the wrong direction the paver is likely to lift or tear the fabric during construction.

The overlapped wrinkles and all overlaps in the fabric should have an additional tack coat applied and be sufficient enough to saturate the two layers of fabric and make a bond. If this is not done a slip plane will exist at each overlapped joint, resulting in a crack and potential stripping of the asphalt from the fabric. Overlaps should be no more than 6 inches (150 mm) on longitudinal joints, and one foot at transverse joints.

After wrinkles are cut, all overlapped wrinkles and all overlaps in the fabric should have an additional tack coat applied.

When paving on one pass while installing another care must be taken to leave 6 inches (150 mm) of fabric unpaved to overlap on. Nailing down fabric with case hardened nails and surveying shiners to hold fabric in place is not recommended. This is an old practice that has been found to cause damage later on if recycling is planned at any time.

Installing fabric around curves without excessive wrinkles is the most difficult task. With the proper procedures it can be accomplished with ease. Never attempt to roll the fabric around the curve by hand because it will wrinkle too much. The wrinkles may be so excessive that it will be almost impossible to cut them all without damaging the fabric. Cutting small pie-shaped fabric sections placed by hand around the curve enables you to match the fabric to the curve with a number of overlaps.

Driving the fabric around the curve with machinery is possible if the machinery is the type that includes patented features for stretching and tensioning the fabric. Some minor wrinkles may occur. Mechanical placement around a curve using a small tractor mounted unit involves hopping around the curve. If the equipment has patented tensioning cones tighten the inside cone and loosen the outside cone which places more stretch across the fabric allowing the outside to sweep more. Do not attempt to drive around the curve, instead drive straight passes and then make one big, quick adjustment with the tractor, almost like hopping. This will place one or two large wrinkles in the fabric at each adjustment. Continue this all the way around the curve. After slitting the wrinkles the effect will be similar to pie shape placement.

Units on larger horsepower tractors and behind oil trucks can install around curves almost wrinkle free. The faster the fabric turns and is tensioned the smoother the installation with these units. Two problems exist when using fabrics other than needle-punched heat bonded. The first is if a dual sided heat bonded fabric is very thin and is used the oil may excessively bleed through. The second is when a needle punched non-heat bonded fabric is used and delamanating and fuzzing may occur. Both fabrics require the same installation requirements.

Types of oils and construction

Both hot asphalt cements and emulsions have been used with success. Prior to starting the job the distributor truck should be checked for proper spread rate. Clogged valves, sometimes a common occurrence, must be cleared, otherwise the oil streaks and the fabric is fully saturated or bonded.

To save on clean up of the monuments a piece of fabric can be cut and placed on the monument prior to spraying the oil. The fabric will absorb most of the oil, reducing cleanup time and saving on labor.

Rapid set emulsions work well in the membrane system, but the emulsion must break completely prior to the fabric being placed in the emulsion and this slows the overlay and installation process. Run off problems have occurred when applying emulsions on sloped and crowned roadways, making the application rate difficult to control. Under no circumstances can fabric be placed in the emulsion until all water has evaporated. In one report, steam from water was shown to create bubbles in the overlay. Moisture can cause stripping problems after a short period of time.

Since a 4 ounce (113 gram) fabric absorbs 0.20 gallons /square yard (0.76 liters/meter squared) as a residual, cutback emulsion must be spread at a thicker rate. The residual after it has broken must be sufficient to saturate the fabric so the old and new asphalt can make a bond. It was suggested in one report that petroleum-based solvent cutbacks should never be used as tack or to secure overlaps. They are damaging to most synthetic fabrics.

The thickness of the asphalt must not be less than 1.5 inches (38 mm) if installed under ideal climactic conditions — 70°F (21°C) or above. For temperatures between 50 and 70°F (10 and 21°C) overlay thickness should not be less than 2 inches (50 mm). Overlays should not be attempted with temperatures less than 50°F (10°C). The heat from the overlay draws the tack coat up through the fabric making a bond. If sufficient residual heat is not present to continue the drawing of the tack up through the fabric then the bonding process is disrupted. This results in slippage, stripping and eventual overlay failure. Rolling the asphalt immediately after placement helps to concentrate the heat and supply pressure to start the process of the oil moving up into and through the fabric.

Caltrans found polypropylene fabric to be recyclable during experimental milling research and cohesion values for both the hot and cold recycle briquettes with fabric exceeded the cohesion values of the control mixes. The fabric seemed to provide some tensile reinforcement to the asphalt mix. The surface abrasion test results showed a significant improvement in the hot recycle briquettes and no detriment in the cold recycle briquettes. Polyester manufactures have run tests showing that their product is also recyclable.

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