

Fact Sheet

USING WASTE TIRES IN PAVEMENTS: TESTS IN MAINE

PROBLEM

The addition of insulation to roadbeds during construction would reduce freezing and subsequent loss of strength upon thawing of frost-susceptible subgrade soils beneath unpaved roads. Insulation is seldom used, however, because of the high cost of polystyrene boards. Scrap tire chips are an alternative to the insulating boards. Tire chips are durable, free draining, and have a high insulating value. Furthermore, tire chips are available at a reasonable price in many parts of the United States, and their use in road construction would help to dispose of many waste tires. Researchers from the Cold Regions Research and Engineering Laboratory (CRREL) and the University of Maine at Orono are monitoring the performance of tire chip test sections constructed in Richmond, Maine, during August 1992. The objectives are to monitor:

- the thermal performance of the rubber layers by installing and monitoring temperature and resistivity sensors;
- the load-bearing capacity by conducting surface deflection tests year-round; and
- other factors, e.g., frost heave, weather data, groundwater changes, and traffic count.

TESTING

The 20- by 750-foot project road consists of five sections with different thicknesses of tire chips and overlying soil cover. One test section has a geotextile enclosing the tire chip layer. The thickness of the tire chip layer ranges from 6 to 12 inches and the granular soil cover ranges from 12 to 24 inches. The control section has no tire chips.

BENEFITS

This method has potential to be developed into a cost-effective technique to improve the trafficability of gravel-surfaced roads in cold climates during the spring thaw, and to productively use some of the more than 2 billion waste tires piled up around the United States. Tire chips can be hauled, placed, and compacted with conventional construction equipment.

RESULTS

Performance of the tire chip test sections during the past three years has been excellent. The tire chip layer has been shown to reduce the depth of frost penetration. (A minimum of 21 inches' difference in frost penetration has been made by using tire chips.) More than 20,000 scrap tires were used in the test road. Approximately 1.2 million scrap tires are generated in the State of Maine each year; just six miles of this type of road construction each year would use every one of these scrap tires.

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