

Hawaiian Connections



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Superpave is Here!!!

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In 1987, Congress established the five year, 150 million dollar Strategic Highway Research Program (SHRP) to improve the performance and durability of US roadways. 50 million dollars of SHRP research funds were dedicated to asphalt research. SUPERPAVE (SUPERior PERforming Asphalt PAVEMENTS) is the end product of the SHRP Asphalt Research Program.



ABOVE: FRESHLY LAID SUPERPAVE WITHSTANDS TRUCK CROSSING

The Superpave system incorporates performance-based asphalt binder specifications, mixture design, and analysis to optimize resistance to rutting, low temperature cracking, and fatigue cracking of asphalt concrete pavements.

The system was developed and calibrated for a wide range of traffic and environmental conditions. The key elements of Superpave are Performance Graded (PG) asphalt binders and volumetric mix designs using the Superpave Gyratory Compactor (SGC).

The use of Superpave is increasing nationwide – almost every state in the US is making some commitment to implement part or all of Superpave technology. In 1997, Hawaii DOT selected the Moanalua Freeway Ramps in the Vicinity of Ala Kapuna to Ala Napunani for its Superpave pilot project. The project included the paving of two inbound ramps, one outbound ramp, and a frontage road with 2 ½ inches of Superpave mix.

The Materials Testing Laboratory prepared and evaluated numerous trial blends. Using criteria based on one million 18 kip Equivalent Single Axle Loads (ESAL), a ¾-inch (19mm) Nominal Maximum Size design aggregate structure and PG 70-16 binder were selected for the project. With Superpave, the typical Performance Graded binder designation is PG N-M, where N is the average 7-day maximum pavement design temperature and M is the minimum pavement design temperature. For the pilot

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SUPERPAVE, *Cont'd from page 1*

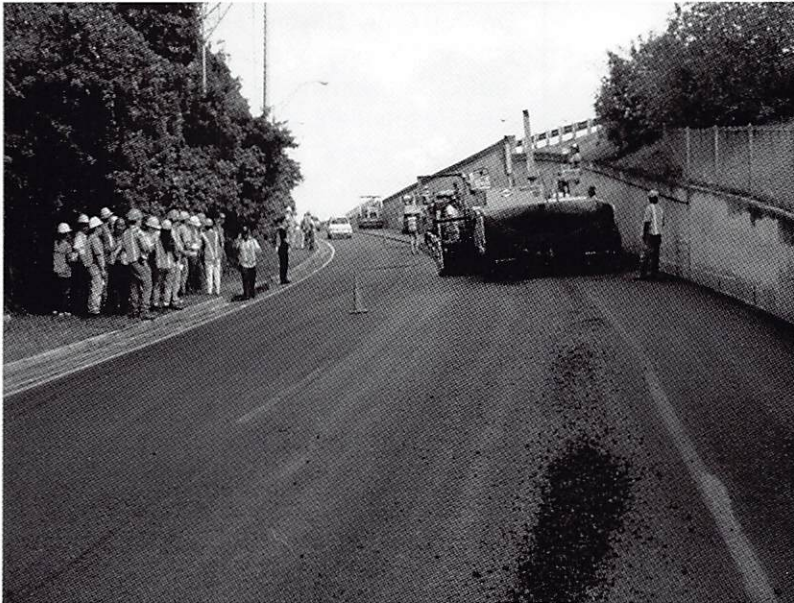
project, the PG 70-16 asphalt binder that was specified had to meet physical property requirements when tested at high temperature grade 70°C and low temperature grade -16°C.

The project was awarded to Grace Pacific Corporation in 1998. The contract unit price of the Superpave mix was \$56.45 per ton. The contractor was allowed to develop the mix design using the State's Superpave Gyratory Compactor. The optimum asphalt content for the mix was established at 4.5 percent by weight of total mix.

Approximately 3,950 tons of Superpave mix were placed in April 1999. Initially, a test strip was constructed to verify that mixture volumetrics were satisfactory and to evaluate placement and compaction techniques. During the paving of the test strip, the contractor determined the proper compaction temperature, rolling patterns and compaction effort required to meet specification density requirements. Inspections conducted by the District's construction staff did not reveal any extraordinary problems in handling, placing and compacting of the mix.

While compacting the Superpave mix, the contractor did not encounter the "tender zone" (temperature range between 200°F - 240°F where the mix does not compact well) that affected many of the mainland states. Even at higher temperatures, the Superpave mix was extremely stable and did not shove or rut when the roadway was opened early to traffic.

The objectives of the pilot project included gaining experience with the use of PG binders, designing a Superpave mix with local materials, producing the mix, and constructing the pavement. Through the cooperative efforts of all involved, these objectives were achieved. As part of an ongoing research project associated with the construction of this pilot project, the Materials Testing Laboratory will continue to monitor and document the pavement performance. Due to the initial success of the pilot project, plans are already underway to include Superpave in future projects.



ABOVE: HAWAII ASPHALT PAVING INDUSTRY (HAPI) MEMBERS ON FIELD TRIP TO VIEW DEMO SUPERPAVE PROJECT.

RELATED INFO....

■ Asphalt Pavements account for more than 90 percent of all paved highways in the United States, and annual expenditures for asphalt pavements top \$10 billion.

■ The Superpave system primarily addresses two pavement distresses: permanent deformation, which results from inadequate shear strength in the asphalt mix; and low temperature cracking, which is generated when an asphalt pavement shrinks and the tensile stress exceeds the tensile strength.

SOURCE:

ce.ecn.purdue.edu/~spave/superp.htm