



Figure 3.3 Example Pavement Temperature Variations

►► Binder Grade Selection Based on Pavement Temperatures

To achieve a reliability of at least 50 percent and provide for an average maximum pavement temperature of at least 52°C, the standard high temperature grade, PG 52, happens to match the design temperature, 52°C. Using the same reasoning, the standard low temperature grade is a PG -16 to attain 50 percent reliability, which again happens to match the design temperature, -16°C. As shown in Figure 3.4, to obtain at least 98 percent reliability, it is necessary to select a standard high temperature grade of PG 58 to protect above 56°C and a standard low temperature grade of PG -28 to protect below -23°C. In both the high and low temperature cases of the PG 58-28 binder grade, the actual reliability exceeds 99 percent because of the “rounding up” caused by the six degree difference between standard grades.

This “rounding up” introduces conservatism into the binder selection process. Another source of conservatism occurs when considering the actual asphalt binder physical properties. The specific binder may possess the actual properties of a PG 60-24, but it will nevertheless be classified to a standard grade of PG 58-22. The net result is that a significant factor of safety is included in the binder selection scheme. For example, it is possible that the PG 52-16 binder, selected previously for a minimum of 50 percent reliability for Cleveland, may actually have been graded as a PG 56-20, had such a grade existed. Users of the PG grading system for binder selection should recognize that considerable safeguards are already included in the process. Because of these