



EFFECT OF SUBGRADE STRENGTH ON BASE THICKNESS

In concrete pavement design we calculate the equivalent strength of 1 m thickness of the subgrade under the subbase. This result is called **Equivalent Subgrade** strength and is worked out on the basis of a Japan Road Association formula. For example, if we have a subgrade of CBR 2% and place on it 300 CBR 15% material as the SMZ, then

$$\text{CBR}_{\text{Eqv}} = [0.3 \sqrt[3]{15} + 0.7 \sqrt[3]{3}]^3 = 5.4\%$$

If we had a subgrade of CBR 80% and the same SMZ then the Equivalent subgrade strength would be CBR 80%

In all rigid pavement designs the subbase is not a structural layer, but it is there to distribute the loads as well as resist erosion, provide uniform support, reduce deflection at joints and assist in the control of shrinkage and swelling of high volume change subgrade soils. In NSW we use 150 LMC as the min and max. The effect of this is included in the design and it is called the **Effective Subgrade** strength. This can now be read off the following a graph from the Austroads Pavement Design Guide. You will note that for our designs the maximum Effective Strength of CBR 75% applies for all subgrades having an Equivalent Strength of CBR 5% and greater.

What this means that there is no difference in the base thickness whether it sits on CBR 5% or CBR 80% material.

