

Guidance for the Design of Road Pavement Foundations

Design Phase

For the design of the road pavement foundation, the Designer should refer to CD225 (Design for New Pavement Foundations, Rev 0, Design Manual for Roads and Bridges, March 2020), or the latest revision thereof, and the latest revision of West Sussex County Council Standard Detail S278/38/21.

A geotechnical investigation must be undertaken along the line of the proposed roads in order to establish the Design California Bearing Ratio (CBR) and frost susceptibility of each subgrade type present along the road corridor. The sampling/testing should be undertaken at frequencies to suit the anticipated ground and site conditions but the spacing should not be greater than 30m to 50m, staggered across the width of the highway corridor. On small sites, a minimum of three samples/tests is required.

The ground investigation report, including exploratory hole logs, in-situ and laboratory test results, together with the interpretation of the data used to establish the Design CBR value, must be submitted to West Sussex County Council for review and approval.

The Design CBR value should be established in general accordance with the guidance given in CD225 (Design Manual for Roads and Bridges, March 2020), and TRRL LR1132 (The Structural Design of Bituminous Roads – Powell, Potter, Mayhew, and Nunn, 1984) using either of the following methods, depending on the site conditions, ground and groundwater conditions, proposed drainage measures, and the time of year of construction, etc.

- Laboratory CBR testing in accordance with BS1377: Part 4: 1990. In line with CD225 the tests should be carried out over a range of conditions to reproduce, as far as possible, the conditions of moisture content and density which are likely to be experienced during construction and in the completed pavement. If applicable, soaked CBR tests may need to be undertaken.
- The Suction Index Method, as referred to in TRRL LR1132.

It should be noted that in-situ CBR readings can vary significantly depending on a number of factors, including the moisture content of the soil and this can in turn vary depending on the weather conditions leading up to and during testing. For these reasons it is deemed that the results of in-situ CBR testing represent the CBR value only on the day of the test and are not considered as being equivalent to the Design CBR value. The thickness of capping must be based on the agreed Design CBR value alone.

All materials used within 450mm of finished surface level shall be non-frost susceptible as defined in Clause 602.19 of the Manual of Contract Documents for Highway Works (MCHW) Volume 1 Specification for Highway Works (SHW), Series 600 Earthworks, February 2016, (or latest revisions thereof).

Any earthworks shall be undertaken in general accordance with the guidance in the Manual of Contract Documents for Highway Works (MCHW) Volume 1 Specification for Highway Works (SHW), Series 600 Earthworks, February 2016, (or latest revisions thereof).

Construction Phase

During construction the Developer must demonstrate that the CBR value of the subgrade is equal to or greater than the Design CBR value. It should be noted that the construction thickness may need to be increased if in-situ CBR values at the time of construction are less than the Design CBR value. However, a reduction in the construction thickness will not be considered if the in-situ CBR values at the time of construction are greater than the Design CBR value.

In-situ CBR testing shall be carried out at not greater than 30m centres, staggered across the width of the road corridor. Acceptable in-situ CBR test methods include TRL Dynamic Cone Penetrometer testing, California Bearing Ratio (BS1377, Part 9), or alternatively the CBR value may be derived from Plate Bearing Test data.