

Method Statement In-situ CBR Test

The CBR test is fully described in BS1377: Part 9: 1990: Soils for civil engineering purposes. It is used in the field as an arbitrary strength test to stress soils and replicate wheel loads and is often used to determine the thickness of materials needed for a proposed road construction.

The test requires the use of a 4WD vehicle, equipped with special jacking points, as the reaction load to provide the force for a plunger of standard area to penetrate the soil, measured through a CBR press.

The measured pressure is then divided by the pressure required to achieve an equal penetration on a standard crushed rock material. The harder the surface, the higher the CBR value.

The test is carried out on soils with a maximum particle size of 20m, normally carried out at surface level or at depths of between 500-1000mm in 20-30m intervals along the proposed construction centreline.

A minimum of three tests are usually carried out at each location; typically, a value of 2% equates to clay, while some sands may have a CBR value of 10%. High quality sub-base will have a value of between 80-100% (maximum).

All crews are trained and experienced in the use of the equipment and have obtained an appropriate CSCS card.

Exploratory locations will be set out with reference to utility information and drawings/plans, access and egress routes, as well as other hazards such as obstacles, soft, uneven or sloping ground etc. A CAT/Genny scan will be undertaken if there is any danger from buried services.

The test area should be levelled, and the vehicle backed up carefully to a point over the test area, (using a banksman at all times), then jacked up, secured, and connected via the tow hitch to the load measuring equipment, to provide the force to the plunger and CBR Press.

If the test is carried out in a shallow pit, the operative will ensure that the pit sides are checked for stability prior to any man-entry, regardless of depth. If there is any doubt, then the pit sides must be battered or a new location chosen.

On completion of the test, the equipment and vehicle will be removed, excavated areas backfilled if required, and the site left tidy.

Risk Scoring and Assessment

Health, Safety and Environmental Risk is measured using a 5 x 5 matrix to obtain a result that, after control measures have been applied is scored as: Low (Proceed with care), Medium (If no alternative, proceed with care), High (Do not proceed, seek alternative).

		Severity					
		1	2	3	4	5	
		No Injury or Impact	Minor Injury or Impact	Reportable Injury or Impact	Serious Injury or Impact	Fatality, Disability or Major Impact	
Likelihood	Unlikely or Rare	1	1 LOW	2 LOW	3 LOW	4 LOW	5 LOW
	Remote possibility	2	2 LOW	4 LOW	6 LOW	8 MED	10 MED
	Possibly occur	3	3 LOW	6 LOW	9 MED	12 MED	15 MED
	Probably occur	4	4 LOW	8 LOW	12 MED	16 HIGH	20 HIGH
	Certain to occur	5	5 LOW	10 MED	15 HIGH	20 HIGH	25 HIGH

Hazard/Risk	Type	Affected	Control Measures	Score	Residual Risk
Operating equipment	H&S	Oprs	Trained and competent operators only.	2 x 3	Low
Excavating equipment (if used)			Only by trained and competent operators. Operatives to keep clear of swing of bucket & in sight of driver at all times	2 x 3	Low
Entry to test area			Never enter unless confirmed as safe, monitor stability at all times.	2 x 2	Low
Traffic (if on Highway)	H&S	Oprs	Apply NSRWA traffic management measures	2 x 4	Med
Entrapment - damage to hands and fingers	H&S	Oprs	Keep hands/ fingers clear of all moving parts. Movable guard.	2 x 3	Low
Lifting and Handling injuries	H&S	Oprs	Adopt good lifting and manual handling practices. Jack up vehicle using specialised jacks only when locked into jacking points.	2 x 3	Low