

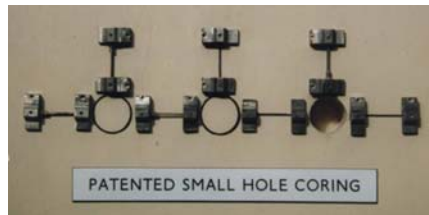


Patented Small Hole Coring



Photo above – Measurements are taken on vibrating wire strain gauges at each increment of core drilling.

Photo below – Typical hole/ gauge array for stress measurement on beam element.



- **Technique is useful for areas of congested reinforcement where standard 78mm coring test cannot be used**
- **Widely used for precast pre-tensioned beams where tendons are closed spaced**

STRAINSTALL are well known for their techniques for measuring in situ stress in prestressed concrete structures. For many years they have provided a valuable service to bridge engineers wanting confirmation of the stress regime within their structures. They are now pleased to announce the award of a patent for their latest technique.

Stresses and stress directions within a structure are found by measuring surface strain changes resulting from the incremental removal of concrete. With the standard method a 78mm diameter core is removed within a radial array of 50mm long vibrating wire strain gauges. Because of the size of the core and the strain gauges, this method can only be used where there is adequate clear space between reinforcement and pre-stressing tendons, ideally a minimum of 150mm square close to the surface.

Strainstall have been awarded the patent for their newly developed technique which can be used where tendon or reinforcement spacing is as low as 50mm. The stress state can now be found using an array of smaller core holes instead of one large hole.

Typically, 36mm diameter core holes are used in a layout chosen to suit the particular structure. 50mm strain gauges are fixed in a special array around and between the cores.

The method has proven extremely useful and successful in the field for certain concrete structures, particularly prestressed beams, where the tendon spacing has prevented use of the standard test. It provides the bridge engineer with a cost effective, accurate and reliable means for measuring the stresses within concrete structures that were previously impossible to test.

A recent project using the small hole coring method was completed with Weeks Group and Bullen and Partners, on behalf of London Borough of Bromley. Chislehurst Road Bridge is a segmental post-tensioned bridge comprising 'T' beam components, spanning a four track railway line. The bridge had been assessed and found to be adequate, however a special inspection had identified grouting deficiencies and tendon corrosion within some beams.

Straininstall completed a programme of small hole coring tests to the soffits of six beam elements, at positions between the post-tensioning tendons (*see photographs*). The tests confirmed that a reasonable level of longitudinal compressive stress was present, providing confidence in the assessment results.

This patented technique is added to the already extensive list of methods that Straininstall offer for determination of in situ stresses. The procedures all provide information that assists with structural assessments and in many cases help to avoid the need for imposing weight restrictions or costly strengthening schemes.

Straininstall's team of experienced engineers operate from offices in Cowes, Bath and Aberdeen (UK) and Tønsberg (Norway). For further information, please contact:

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