

Concrete Stress Measurement by Slotting



Strainstall



Slot cut between parallel plates

Work completed in 1997 for Mott MacDonald and Surrey CC through contract with Raynesway Construction

Special jack inserted and pressurised, straingauges monitored



Gatwick Link Underbridge carries the link between Gatwick Airport and the M23 motorway across the A23 dual carriageway. It is a highly skewed concrete slab structure with a line of twelve columns in the central reservation.

Mott MacDonald and SCC were carrying out assessments of the bridge. Due to the high degree of skew, the original construction involved jacking the bearings to induce different loads at the outer two columns, to overcome deck corner uplift problems. The assessment teams wished to confirm whether the columns were still subjected to different axial loads.

STRAINSTALL were appointed to determine the axial loads in eight of the columns using the pressure compensation jacking technique that was developed in conjunction with TRL.

The method involves the cutting of a slot to a certain depth between two parallel plates, which have strain gauges fitted to their ends (see photos). The saw is removed and a segment shaped jack inserted and incrementally pressurised. The relationship between jacking pressure and strain change gives a direct measurement of the dead load stress.

The slot is enlarged to a further depth increment in order that surface effects can be identified in the results. For Gatwick Link Underbridge, slotting tests were carried out on opposite sides of the columns in order to identify any bending components.

The testing was completed over eight nights and provided the Client with full information about the axial dead loading within the columns.

Strainstall's team of experienced engineers operate from offices in Cowes, Bath and Aberdeen (UK) and Tønsberg (Norway).

- Technique is virtually a direct measurement of uniaxial in-situ stress
- Method can be used in areas of low tension and compression

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