

CHIEF BRIDGE ENGINEER CIRCULAR

CBE 00/05

COMPACTION OF CONCRETE IN SOLID AND NON-CIRCULAR BRIDGE COLUMNS

No. Sketches Following	0	No. Appendix Sheets Following	0
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Background

It has been increasingly noticed that the provision of lateral ties in solid and non-circular columns to satisfy the requirements of the Australian Bridge Design Code in regard to the full lateral restraint of longitudinal reinforcement (ie Clause 5.10.7.3) has caused problems for access in columns for workmen. Access in the column during concrete placing is required in order that the concrete can be adequately vibrated.

Inadequate compaction of the concrete in columns has caused durability problems and in some cases has lead to the column being demolished and replaced.

It is noted that where the column design axial force is less than half the column ultimate axial strength under eccentric loading (reduced by the strength reduction factor) the Code allows the requirements for full lateral restraint to be relaxed.

Occupational health and safety factors are now relevant design matters and require the provision of an adequate space inside the reinforcing cage for a worker to vibrate the concrete.

For lifts of not more than 3.6 metres, this can be achieved by providing vibrator access of not less than 200 mm diameter at frequent intervals. For lifts exceeding 3.6 metres, access for the worker to safely enter the reinforcing cage must be provided. The access must allow for the emergency retrieval of the worker in case of accident. The minimum access gap for a worker is 750 mm diameter.

Jump form and slip form construction may be used in very high columns, to overcome these difficulties. Such construction methods may require special detailing of the column, and specialist advice may be required.

Action

The designer shall ensure that the arrangement of lateral ties in solid and non-circular columns allows adequate access inside columns for workers to vibrate the column concrete, or shall detail the column with appropriate lift heights to avoid the need for such access.

Where very high columns are proposed, the designer shall ensure that an appropriate construction method is detailed on the drawings.



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Date 11/5/00

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