

BRIDGE POLICY CIRCULAR

BPC 2003/07

SUBJECT: BRIDGE MAINTENANCE PILING WORKS

No. Drawings Following	0	No. Appendix Sheets Following	0
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Background

It is a common bridge maintenance activity, particularly on timber bridges, to replace piles or strengthen the substructure using piles replicating the original pile details.

Traditionally, such bridge maintenance piling works have often had little design control, even if the new piles resulted in significant design modifications to the piers and abutments. Geotechnical investigations have rarely been carried out. Pile driving criteria have rarely been provided, other than to match the existing contract levels (e.g. as marked on the existing piles).

Furthermore, new timber piles have been driven in close proximity or even in contact with the existing piles. Because driven timber piles are displacement piles, damage and other problems can result from interference of the new with the old piles. Loss of capacity may also occur due to pile group effects (depending on spacing). The new piles need to be driven clear of the old piles, including the buried stubs of old piles.

Current Position

A standard RTA policy is required for bridge maintenance piling works, consistent with the Australian Bridge Design Code (ABDC), also known as '92 AUSTROADS Bridge Design Code (amended 1996), and AS 2159 *Piling – Design and Installation*.

Limits need to be placed on pile spacing, to minimise both the risks associated with driving piles in close proximity and with group effects on load capacity. These limits should be consistent with ABDC and AS 2159 requirements for displacement piles.

Significant structural modifications to bridges need to be supported by certified structural designs, including geotechnical investigations as appropriate. These should be fully documented by registered design sketches and works as executed drawings, with these records kept permanently.

Action Required

The following policy is to be adopted:

1. All bridge maintenance piling works and all significant structural modifications to bridges must be in accordance with a structural design, or instructions, certified by a structural engineer experienced in bridge design.

2. Piles must be designed and installed in accordance with ABDC and AS 2159 and the relevant RTA specifications, except that for old bridges comprising timber or wrought iron construction, the design braking load must be 20% of the value shown in Fig. 2.5.2 of ABDC. Load distribution into the abutments must be considered in the design. However, where an old timber or wrought iron bridge is to be widened to a deck width exceeding 7.0 m, the advice of the Manager, Bridge Technology must be sought as to the appropriate design braking load to be adopted.
3. Designs and instructions must state the pile driving criteria in accordance with CBE Circulars 95/3 and 96/4 (e.g. contract levels, driving energy, set), must be supported by a geotechnical investigation where appropriate, and must be documented with accurate sketches certified by the designer.
4. Works as executed (WAE) drawings must be produced by the organisation performing the works and delivered to the Regional Bridge Maintenance Planner on completion of the works.
5. Permanent records must be kept of all such sketches and WAE drawings, including microfilms, bridge files and Bridge Information System (BIS) data. All design drawings, sketches and WAE drawings must be of an appropriate standard in accordance with the RTA Structural Drafting Manual.
6. For all displacement piles (e.g. timber piles), minimum spacing limits consistent with ABDC Section 3.7.3.7 (*Commentary*) must be adopted – viz pile spacing (centre to centre) must be at least 2.5 times the pile diameter. This may be reduced to 2.0 times the pile diameter for piles driven between the piles of an existing trestle pier.
7. For new piles in the vicinity of an existing trestle pier, the presence of old pile stubs below ground must be checked carefully prior to commencing the piling works.
8. Timber piles must be supplied in accordance with RTA 2380. Other pile types must comply with relevant RTA bridge construction specifications.


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Date 09/12/03

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