Corporate Circular

*CC*: BTD2008/02

# BRIDGE TECHNICAL DIRECTION BTD2008/02

## *ACCESS FOR INSPECTION, MONITORING AND REPAIR OR REPLACEMENT OF BRIDGE COMPONENTS*

### Background

Recent bridge maintenance works have highlighted deficiencies in previous designs relating to the provision of adequate access for inspection, monitoring and repair or replacement of bridge components, in particular bearings.

The current OH&S regulatory and legal liability environments have made such works more demanding and costly than in prior years, resulting in some instances very expensive preparatory works to provide safe access prior to replacing such bridge components.

Clause 15 of AS 5100.1 makes provision of access for inspection and maintenance mandatory.

### Information

Underbridge inspection units can be assumed, depending on bridge configuration and ground/water levels, to provide safe access for inspection and monitoring, but not for repair or replacement of bridge components.

### Bridge Technical Direction

Where access from the ground is not possible without construction of scaffolding, platforms and the like, to facilitate future inspection, monitoring and repair or replacement of bridge components, bridge designs shall make provision for safe access to each separate bridge component without the need to disrupt or stop traffic travelling in the marked traffic lanes of the carriageway of the bridge or under the bridge.

Provisions for access may be permanent, non-permanent or a combination of the two.

Permanent access shall be required to the underside of modular expansion joints or joints that require access from below for removal or replacement e.g. proprietary finger plate type joints. Such access will typically be required at abutments and at the expansion joints, except under cantilevered deck slabs where provisions for attachment of scaffolding shall be provided.

Permanent safe access to spill-through abutments shall include the provision of steps on the embankment at the front face of the abutment, unless alternative safe means of access are provided. A level berm at least 750 mm wide shall be provided at the front face of the abutment. No berms need be provided at abutments of bridges with elastomeric strip or unreinforced pad bearings that support prestressed concrete plank superstructures as these bearings have an expected life in excess of 100 years.


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Where permanent access is not provided, provisions shall be made to provide non-permanent access to all bridge components, except elastomeric strip and unreinforced pad bearings. Such non-permanent access shall be of width of at least 750 mm, railing height of at least 1200 mm and capacity to support 5 kPa live load, unless otherwise approved by the Principal Bridge Engineer.

A combination of permanent and non-permanent access will typically be applicable for access to bearings. Non-permanent access may comprise temporary scaffolding to provide access to the tops of piers. Permanent access may comprise the design of the substructure and superstructure members and elements to accommodate access additional to the temporary works. The minimum area of openings in diaphragms of box girder bridges provided for permanent access for inspection must be 442,000 $mm^2$ with the minimum horizontal dimension not less than 500 mm and minimum vertical dimension not less than 750 mm.

The detailed design must include drawings of all components of permanent accesses and all provisions for attachment of non-permanent accesses, such as embedded ferrules, voids for stressbars for attachment of scaffolding, for safety anchorages for harnesses at tops of piers, etc. The detailed design must consider all requirements for access for maintenance works, including provision of lighting, power, ventilation, permanent lugs above access holes in box girder bridges to facilitate movement of materials, and for work in confined spaces, etc.

The detailed design of provisions for non-permanent access is not required, but the design drawings must include the concept for the non-permanent access.

The proposed provisions for permanent and non-permanent access must be included in the bridge proposal sketches and RTA Form 62.

Designers are advised that some of the measures to improve maintenance access also provide easier access to non-authorised persons. This may require compromises and trade offs in the design, e.g. whilst it may be desirable for maintenance purposes to locate access holes in box girder bridges in the most accessible locations close to the ground, other locations may be preferable for increased bridge security; maintenance crew may use hydraulic platforms or hoists to gain access. Such accesses must be heavy duty and vandal proof, i.e. locks in access covers must be secure against bolt cutters.

All steel components that cannot be regularly inspected because of lack of access, such as attachments for pile cap skirts and fascia panels, dowels, and the like shall be of stainless steel. The stainless steel type and grade shall be appropriate for the governing exposure.

**Effective date:** 18/02/2008

**Approved:** Wije Ariyaratne
Principal Bridge Engineer

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