

Code of Practice Bridge joints

1. Scope

BTN004 Bridge joints states VicRoads' requirements for the design of bridge joints.

Bridge Technical Notes are a Code of Practice. Compliance with Bridge Technical Notes is mandatory.

BTN004 is to be read in conjunction with:

- Standard Specification 660

Other than as stated in this document and relevant VicRoads standard specifications, the provisions of AS5100:2017 shall apply. Where this document differs from AS5100:2017, its requirements override those of AS5100:2017.

2. General

Preference shall be given to the use of the integral or semi-integral bridge form i.e. bridges that do not incorporate a deck joint. In the event, that deck joints are provided, these shall be specified on the drawings.

If an alternative deck joint is proposed, full design details for the proposed alternative shall be submitted to the Superintendent for approval.

3. Design Requirements

3.1. General

Deck joints and anchorages shall be designed in accordance with the requirements of AS5100 and, in particular, AS5100.4 C19 to accommodate the movements specified in AS5100.4 C19.3.4.

Deck movement capacity and the installation gap at 20°C shall be stated on the drawings.

3.2. Gap width

The definition of open gap and requirements for gap widths are specified in AS5100.4 C19.3.5.

3.3. Cover plates

If an expansion joint is located on a pedestrian or shared-user path, a proprietary cover plate shall be provided regardless of

gap width. The cover plate shall be manufactured by the joint supplier.

3.4. Anchorage of deck joints

Anchorages for deck joints shall be designed in accordance with AS5100.4.

The use of retro-fitted bonded or mechanical anchors to hold-down deck joints is not permitted.

3.5. Reinforcement at deck joints

A minimum of 3no 16mm diameter transverse reinforcing bars shall be provided on each side of the joint as shown in Figure 1.

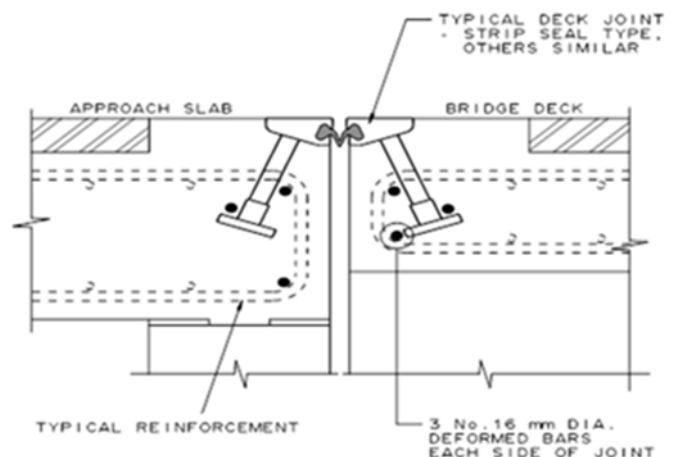


Figure 1: Typical deck joint showing minimum transverse reinforcement.

The use of retro-fitted bonded or mechanical anchors to hold-down deck joints is not permitted.

3.6. Drainage

A drainage system with suitable connections compliant with AS5100.4 C19.5 must be provided. The drainage system must:

- channel water away from the substructure
- incorporate provisions for inspection and maintenance.

3.7. Installation

Deck joints shall be installed in accordance with Standard Section 660 and follow the bridge deck geometry including the profile of kerbs and parapets if these are present.

3.8. Skew joints at parapets

Movement joints between the substructure and superstructure in a skewed bridge, together with the associated deck joint, may be aligned at 90° to the edge of the bridge where they intersect parapets.

3.9. Skid resistance on metal surfaces

Metal surfaces wider than 200mm shall be textured. Subject to the material properties of the metal surface, the texture shall be provided by either:

- 3mm high x 6mm wide welds, or
- 3mm deep x 6mm wide grooves

Grooves or welds shall be uniformly straight and in a 100 mm x 100 mm regular criss-cross pattern.

Joints located in turning lanes or on curved alignments must incorporate a suitable anti-skid surface treatment.

3.10. Longitudinal expansion joints

The structural effect of the widening on existing beams shall be evaluated.

Longitudinal movement joints are not permitted unless the addition of the widening components will result in undesirable effects on the adjacent existing bridge beams.

Proposals for use of longitudinal joints shall be submitted to the Superintendent for approval.

3.11. Fatigue Design

Expansion joints shall meet the fatigue requirements of AS5100.4 Clause 19.3.3.

4. Joint Systems

4.1. Compression seal joints

Compression seal joints are not permitted for use in joints with skew > 20°.

If the traffic volume is less than 150 vehicles per day, the vertical faces of the joint may be formed by casting or saw-cutting the concrete. For heavier traffic volumes, steel angles shall be used. The seal is to be set 5mm below the deck level to prevent damage by traffic.

The compression seal must be continuous for the full length of the deck joint.

4.2. Strip seal joints

Reinforcement shall be provided at strip seal joints in accordance with the detail shown in Figure 1.

4.3. Finger plate joints

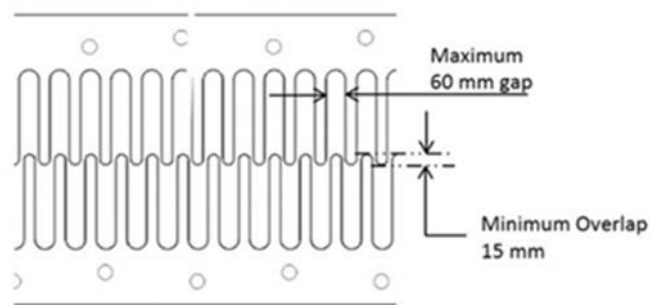


Figure 2: Illustration of finger plate joint

4.4. Saw-tooth joints

If bicycle access is allowed, the gap-width in any direction between adjacent fingers must not exceed 60mm. The minimum overlap between opposing sided fingers shall be 25 mm. Refer to Figure 3.

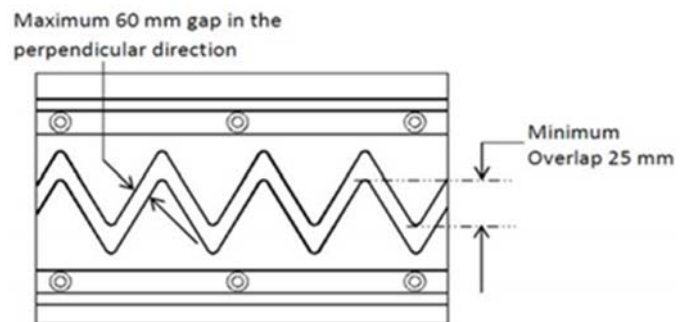


Figure 3: Illustration of saw tooth joint

4.5. Sliding plate joints

The use of sliding plate joints is not permitted on roads.

4.6. Flexible plug joints

The use of asphaltic plug joints is not permitted.

4.7. Modular Joints

Modular deck joints shall only be used if finger joints or saw-tooth joints cannot accommodate bridge movements.

If it is practicable, access for maintenance of modular joints shall be provided from below deck level.

Full design information shall be provided to the Asset Owner in order to allow fabrication of replacement components.

4.8. Poured sealant joints

This type of joint comprises a poured sealant together with a compatible nosing (header) material from the same supplier.

Poured sealant joints are suitable for use as a maintenance replacement during rehabilitation of existing bridge joints in bridges which have a maximum movement range of $\pm 20\text{mm}$ and subject to the maximum strain limit specified in AS5100.4 Clause 19.7.2.

The designer shall take into consideration the design life of this type of joint when making a selection i.e. with the aim to minimise future maintenance interventions.

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Bridge Technical Notes are subject to periodic review and may be superseded.