

4 September 2023

## Industry Notice

### **Amendment to Design Criteria for Bridges and Other Structures (February 2021) and Volume 3: Structural Drafting Standards (November 2015)**

The purpose of this notice is to provide an interim update to the **Design Criteria for Bridges and Other Structures (February 2021), Volume 3: Structural Drafting Standards (November 2015) for deck unit bridge bearing details and Technical Specification MRTS74 (July 2018) Supply and erection of prestressed concrete.**

In recent projects, feedback has been received regarding the gap between the top of the headstock and the soffit of the deck units/wing planks. This includes:

- 1.0 Minimum bearing thickness is not specified in TMR technical documents to achieve the required clear gap between the top of headstock and soffit of deck unit.
- 2.0 Tolerances could be specified in TMR Specification MRTS74 to aid in bearing recess construction.
- 3.0 There is a risk of not achieving a minimum clearance (15 mm) between the top of the headstock and soffit of the deck unit due to construction tolerances.
- 4.0 Not possible to clean the excess epoxy around the bearing after deck unit placement.
- 5.0 Difficulties inspecting the bearings at subsequent bridge inspections.

To achieve an acceptable outcome some bridges under construction have required concrete remedial works to bearing recess construction and in some isolated cases jacking of bridge decks to make corrections to the bearing recess depths.

#### **Current TMR requirements:**

Current criteria pertaining to bearing installation are published in the following TMR Technical documents. Please note that these are currently being reviewed by TMR.

- 1.0 **Design Criteria for Bridges and Other Structures (2021) Clause 4.7.5 (ii)** – Elastomeric bearings shall be placed in a 10 mm deep recess. The recess shall be initially constructed to a greater depth and then filled with epoxy mortar to achieve a 10 mm deep recess for the bearings.
- 2.0 **Structures Drafting Manual Chapter 13 (2013), Clause 13.3-** The Gap between top of the headstock and deck unit soffit shall be limited to 15 mm. Therefore, the bearing thickness to be limited to 25 mm. This is to make sure M30 Class 8.8 hold down bolts are structurally

adequate at fixed joints.

- 3.0 **Technical Specification MRTS74 (July 2018), Clause 7.3.3** - The deck units shall be lowered into position and supported on temporary packers maintaining a minimum epoxy paste thickness of 1 mm on top of the bearings. Also, the maximum clearance because of unit hogs and any grades / vertical curves shall not exceed 15 mm. (While not explicitly stated, this “maximum clearance” is between top of bearing and soffit of deck unit).

**New interim TMR requirements:**

In response to the feedback provided, the following interim criteria are to replace the existing criteria specified in the above mentioned TMR published technical documents. These criteria are effective the date of this letter up until subsequent versions of the Design Criteria for Bridges and Other Structures (2021) (DCBoS 2021), Structures Drafting Manual Chapter 13 (2013) and relevant MRTSs are revised and become effective.

These requirements shall be applicable on design projects commencing after the date of this letter. Application of these requirements, to design projects in progress is at the sole discretion of the *authorised person/position outlined in the project contract*.

The requirements are;

- 1.0 As per DCBoS 2021 Clause 4.7.5 (ii), elastomeric bearings for deck units shall be placed in a 10 mm deep recess. The construction requirements as per the below, will be included in an updated version or MRTS62.

*The recesses may be initially constructed to a greater depth and then filled with cementitious grout or mortar to achieve a finished recess depth of 10mm. The initial constructed recess depth shall be such that the minimum thickness of the cementitious mortar or grout as recommended by the manufacturer that can be placed to achieve the final recess depth. Initial recess depth shall not be deeper than 15 mm. The base of the recess as cast may require roughening or texturing to achieve a satisfactory bond with the cementitious grout or mortar used to fill the recess.*

- 2.0 The base of the finished bearing recess shall match the longitudinal and transverse fall of the headstock.
- 3.0 Finished recess shall be constructed to a tolerance of **+0/-3 mm** on all sides of the recess where a positive tolerance indicates a deeper recess. Recess depth shall be a **HOLD POINT** for inspection by the project Administrator prior to placing the bearings in the recess.
- 4.0 A minimum gap of 15 mm (*To be specified on the project drawings*) between top of the headstock and deck unit soffit shall be achieved. The RPEQ bridge designer shall ensure that this minimum gap can be achieved at completion of construction of the bridge under all permanent dead loads including superimposed dead loads.
- 5.0 The bridge designer will need to calculate a minimum gap between the top of the headstock and the soffit of the deck unit. That is applicable at the completion of landing the deck unit that corresponds to a final minimum gap of 15mm at the completion of

construction of the bridge including superimposed dead loads.

- 6.0 In accordance with MRTS74 (July 2018), minimum thickness of the epoxy paste on top of the bearing shall be 1 mm and the maximum thickness of epoxy at any point shall be 15mm.
- 7.0 The Bridge designer shall determine a suitable bearing thickness to achieve a required minimum gap of 15mm at the completion of bridge construction under all dead loads including superimposed dead loads as per item (v) above.
- 8.0 In relation to Clause 7.3.3 of MRTS74 (July 2018), and **Structures Drafting Manual Chapter 13 (2013), Clause 13.3**, the "maximum clearance of 15 mm" between the soffit of the deck units and the top of the headstock after placement of the deck unit will be removed and the bridge designer shall check the hold down bolt adequacy as per the design, specified bearing thickness, and required minimum gap between top of headstock and soffit of deck unit and for a probable maximum gap due to construction tolerances and bridge geometry.
- 9.0 20 mm to 25 mm thick bearing pads or strip bearings shall not be permitted for use together with 10mm deep recesses in headstocks.
- 10.0 Minimum hold down bolt size shall be M30 class 8.8. The RPEQ designer shall ensure whether this standard bolt size is adequate for the bridge articulation. If M30 hold down bolts are not adequate a larger diameter bolt and associated details or other alternative details may be required.
- 11.0 Above interim criteria from 1.0 to 10.0 is also applicable to bridge decks constructed with winged planks.
- 12.0 The RPEQ designer shall determine the required bearing functionality in accordance with the proposed bridge articulation. The structure inspection/maintenance and requirement of bearing replacement shall dictate the bearing functionality assumed in the bridge design.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'Evan Lo', with a horizontal line extending to the right and two dots at the end.

**Evan Lo**

Acting Director (Structures Design, Review and Standards)