

TO	Inland Rail, Programme Engineering Manager
FROM	Enterprise Services, General Manager Technical Standards
DATE	24 March 2016
SUBJECT	Track and Civil Code of Practice – Section 10 Flooding – Technical Note ETD-10-02
Amendment	Editorial change to clause numbering

References

Track and Civil Code of Practice Section 10 Flooding
 RTS 3433 Track Drainage – Design and Construction
 AS 7637:2014, Hydrology and Hydraulics (Excluding Appendix E)
 AS 7638:2013 – Railway Earthworks
 AS 7636:2013 – Railway Structures

Issue

Section 10 of the Track and Civil Code of Practice Rev 2.2 dated 08 Nov 11 does not directly state the design flood event, and does not state the location on the track structure where the water level should reach for the design flood event. The Standard does not currently consider what level of operational loads should be combined with flooding loads on the formation. There is also no differentiation in the Standard for new design compared to the upgrade of an existing track structure.

Status and applicability of this Technical Note

This Technical Note has the status of an ARTC Standard and shall remain in force until such time as the Track and Civil Code of Practice Section 10 Flooding is updated to incorporate the Technical Note contents. It is ARTC's intention to incorporate AS 7637:2014 into the Track and Civil Code of Practice in the future. This Technical Note is only applicable to Melbourne to Brisbane Inland Rail (MBIR) design for greenfield and brownfield sites.

Inserted paragraphs into Track and Civil Code of Practice Section 10 Flooding

10.1.3 Design Flood Event

The flood immunity is described in this document as Annual Exceedance Probability (AEP). 1% AEP is taken to be equivalent to a 1:100 year Average Recurrence Interval (ARI).

The flood immunity and serviceability limit state AEP shall be 1% at the shoulder corner of the formation capping. For railway structures the design shall be in accordance with AS 7636.

Avoid locating key infrastructure in areas prone to flooding or where this is not practical design to providing a flood immunity greater than 1% AEP. Examples of key infrastructure include:

- a. Turnouts including the points operation;
- b. Signals and signalling equipment; and
- c. Storage and holding roads.

Any deviation from 1% AEP design requirements at greenfield sites in this technical note shall only be by the Engineering Waiver Approval process per EGP-02-01.

Flood risk assessment shall be in accordance with AS7637.

10.1.4 Load Combinations for design of railway formation for Greenfield Sites

Under the action of the design flood event, the formation shall be designed for forces exerted by hydrostatic pressure on one or both sides of the formation, in combination with coexisting rail traffic loads, when they produce more adverse effects. The effects of any draw forces exerted by flood receding waters and loss of any formation materials due to scouring shall be taken into consideration.

10.1.5 General Formation Drainage Design for Greenfield Sites

The design standard for formation drainage at greenfield sites shall be in accordance with AS 7637 and AS7638. Designers are required to use geotechnical engineering methods appropriate to the problem at hand, together with appropriate characteristic values and factors, when deriving economical and safe solutions. It is further required that designers apply engineering judgment to the application of sound rational design methods outlined in texts, technical literature and other design codes to supplement the design requirements contained herein. Calculation techniques shown in guideline RTS 3433 are considered reasonable.

10.1.6 Design Requirements at Brownfield Sites

The following requirements shall be complied with for brownfield sites:

- a. All brownfield sites not meeting 1% AEP shall be identified and recorded as special locations;
- b. Each site should be considered for improvement. Site specific improvement actions can include floodplain levees, changes to cross-formation drainage volumes or changes to formation height, or a combination of these actions;
- c. The recorded information shall include AEP for each special location; and
- d. The records shall be included in the handover to the maintenance organisation.

10.1.7 Transition from Brownfield Site to Greenfield Site

Where formation height varies due to the design water datum at the interface of brownfield and greenfield sites the transitioning gradient shall not exceed 1 in 100. Other requirements are to be as per the Track and Civil Code of Practice.

Deleted or Altered Paragraphs

Nil.

Effectivity

This Technical Note shall apply to all prior and forthcoming Melbourne to Brisbane Inland Rail greenfield and brownfield earthworks and track designs undertaken at any date until such time as the Track and Civil Code of Practice Section 10 Flooding is updated and this Technical Note is withdrawn.

Updates to this Technical Note

This Technical Note may be replaced by an updated version if so determined by the undersigned from time to time.



Phillip Campbell OAM
General Manager Technical Standards