



Warning 2018/001

Warning against the use of loop bar details in flange-hung double-tee precast concrete floor units that do not comply with NZS 3101

The Chief Executive of the Ministry of Business, Innovation and Employment (MBIE) is warning that the use of loop bar details in flange-hung double-tee precast concrete floor units that do not comply with NZS 3101 is likely to fail to comply with clause B1 Structure of the New Zealand Building Code.

This warning comes into force on 3 April 2018 and will remain in place until amended or revoked by MBIE.

Reasons for the warning:

MBIE considers that the loop bar detail that does not comply with NZS 3101 (as it has typically been designed and used in buildings to date), is unlikely to provide sufficiently robust/resilient earthquake performance to comply with the New Zealand Building Code clause B1 Structure. Additional tests are needed to account for earthquake effects and allow for variability in material properties, construction details and tolerances (as required by Appendix B of AS/NZS 1170.0).

Structural engineers and designers have been aware of the shortcomings of loop bar details for several years. In 2008 SESOC cautioned the structural engineering community against the use of loop bar details as they are commonly designed. Subsequently, the use of loop bar details has decreased, but has not stopped.

MBIE considers a warning to be the most appropriate regulatory measure to prevent the use of non-compliant loop bar details.

Implementation of warning:

This warning is issued under section 26 of the Building Act 2004 using the procedures in section 29(5)(d) of the Building Act.

Under section 19(2) of the Building Act a building consent authority or regional authority must have regard to any relevant warning in considering whether something complies with the Building Code.

What the warning covers:

The warning applies to building consent applications that include loop bar details in flange-hung double-tee precast concrete floor units, for any length or width of floor span.

Exclusions:

The warning does not apply to any variation of loop bar details that comply with NZS 3101. Loop bar details that comply with NZS 3101 are expected to meet the performance requirements of New Zealand Building Code clause B1 Structure.

Definitions:

Loop bar detail means a particular reinforcing detail used to provide gravity support for flange-hung double-tee precast concrete flooring units in a building. The detail comprises one or more reinforcing bars which extend from the rib of the precast unit and rise up over the edge of the support into the flange of the unit where they are looped around a transverse (perpendicular to the span) reinforcing bar and extend horizontally back through the flange of the precast unit.

Double-tee precast concrete floor unit means a precast, reinforced concrete floor unit made with two ribs that are parallel to the span.

Flange means the thin section of a double-tee precast concrete floor unit, projecting from, and spanning between, the ribs of the unit.

Flange-hung describes the situation where gravity support for a suspended floor unit is provided by projecting portions of the flange of the floor unit (nibs) that rest on a supporting ledge.

Floor unit means a discrete element that forms part of the floor diaphragm in a building.

AS/NZS 1170.0 means the Australian/New Zealand Structural Design Actions Standard – Part 0: General principles (AS/NZS 1170.0:2002 Incorporating Amendment No. 1, 2, 3, 4 and 5).

NZS 3101 means the New Zealand Concrete Structures Standard (NZS 3101. 1:2006, Incorporating Amendment No. 1, 2 and 3).

Rib means the long, horizontal, structural support section of a double-tee precast concrete floor unit, which is parallel to the span of the unit and deeper than the flange of the unit.

SESOC means the Structural Engineering Society of New Zealand.

Span means the distance between two support elements.

Contact MBIE:

If you are unsure whether the work you are intending to carry out is covered by the warning, or have any questions, please contact MBIE:

Freephone: 0800 24 22 43 (between 8.30am to 5pm Monday to Friday)

Email: info@building.govt.nz

Visit MBIE's Building Performance website www.building.govt.nz.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 3 April 2018.



General Manager
Building System Performance
Ministry of Business, Innovation and Employment

Appendix 1 (Informative)

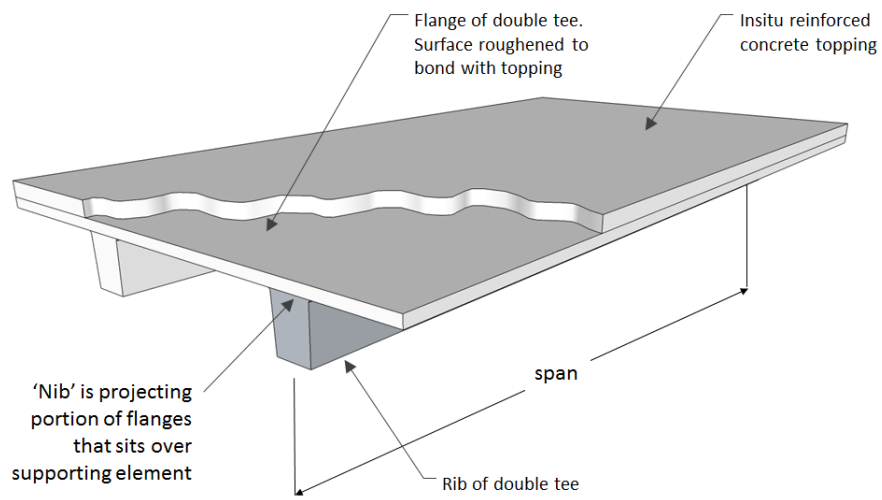


Figure 1 Illustration of a double-tee precast concrete floor unit