



## Fire formal interpretations

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FI-122

NZS 4541:2013 Automatic fire sprinkler systems Clauses 403.12 and 403.13 Seismic Resistance of Pipework

### Question:

Clause 403.12.1 allows seismic design of sprinkler pipework by either:

(a) Seismic analysis under earthquake loadings in accordance with NZS 1170.5 (parts category P4); or

(b) A support system complying with the requirements of 403.12.1 to 403.13.4, including sprinkler pipework to:

- remain functional under the seismic loads specified in NZS 1170.5
- be designed to resist ... seismic acceleration of 1.0g...

### QUESTION

Is it the intention of the standard to allow repeated forces due to seismic acceleration of 1.0g acting on the mass of the pipework in any direction in addition to the gravity force if NZS1170.5 (parts category 4) would require higher design acceleration?

### Interpretation issued by the Fixed fire protection group:

NZS 4541 does not consider repeated forces nor does NZS 1170.5. Notwithstanding the question about “repeated forces” the following is the SNZ interpretation.

A review of the previous editions of the Standard indicate that an error was made in the 2007 edition of the Standard, which was not noted during the preparation of the 2013 edition. The clause should read:

### 403.12.1

The sprinkler system pipework shall be braced to resist seismic loads appropriate to the site and importance level (IL) of the building by either:

(a) A complete piping support system based on a seismic analysis such that the pipework system performance shall be at least equal to that of the building structure under the earthquake loadings of NZS 1170.5 (parts category P4); or

(b) A piping support system which shall comply with the requirements of 403.12.2 to 403.13.5 inclusive.

This correction allows the use of a design acceleration of 1g, or that as specified by NZS1170.5.

### It is noted that

- 1) The note to clause 403.12.2 is misleading. The loads required by NZS1170.5 may be greater than 1g.
- 2) The Building Consent Documentation and/or Project Specification for a building may require higher design accelerations than 1g. In this case, use of a design acceleration of 1g will not meet the requirements of the Building Consent.
- 3) That this clause is expected to be reviewed during the next revision of NZS4541. This may result in the 1g design option being removed.