

AON SPRINKLER CERTIFICATION

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Aon Sprinkler Certification Technical Note		
Note Number: TN-14-14	Issue: One	Date: 27 June 2014
Subject	Sprinkler Systems and NZS4219	
Notice: Aon Sprinkler Certification Technical Notes provide guidance notes which may be used in certification of sprinkler installations by Aon New Zealand. If sprinkler installations are being certified by any other Sprinkler System Certifier, these Technical Notes may not apply.		

Following a review of the Christchurch and Wellington earthquakes, there is increasing emphasis on non-fire related trades to design and install their services and equipment to resist seismic events.



As a result of this, there is an emphasis with other services complying with NZS4219:2009. We are receiving reports that on some projects, that assurance that sprinkler pipe work complies with NZS4219 is being sought.

NZS4219 specifically excludes sprinkler system pipework from its scope. This was as a result of the committee preparing that document reviewing NZS4541 and effectively endorsing that the provisions for seismic design of pipe work within that document is correct. Never-the-less, there are some provisions of NZS4219 that those installing sprinkler systems should be aware of. Compliance with these provisions would be sound practice.

1. Post-Installed Fixings into Concrete or Masonry

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NZS4219 requires that “post-installed and proprietary anchors” used in concrete masonry complies with the seismic qualification test stipulated in ACI355.2¹ Give that this is an American Standard, compliance is difficult to achieve with metric fasteners. The European Standard ETAG001² provides the same testing regime for metric fasteners.

It would be Aon’s best advice that any post-installed fasteners used in the support or bracing of sprinkler systems complies with these requirements. Information on suitable fasteners can be sourced from the following:

- Hilti engineering for earthquake applications
- Powers Seismic Approved Fixings
- Ramset Engineering Bulletin EB04013 dated 25 November 2013

Note that NZS34219 also describes the requirements for other fixings, including those cast into concrete, wood and coach screws and steel bolts.

NZS4541 has limited guidance for the selection of fasteners into concrete:

- 403.13.2.14 – explosive fasteners shall only be used if listed. At the date of publication of this Note, no such fasteners are listed.
- 403.13.2.17 – expansion fasteners secured by driving the fastener against a wedge at the bottom of a hole shall not be used.
 - One such example previously used in NZ was Ramset’s DynaSet Drop-in Anchor.
- Fasteners into materials that fail in a brittle like manner (such as timber or concrete) require a safety factor of 2.

2. Other Equipment

NZS4541 does not provide detailed requirements for the seismic restraint for sprinkler system components such as pumps, tanks, controllers and the like.

In such cases, the requirements of NZS4219 are required to be met, as is appropriate. Strictly speaking, if Aon’s advice for pipe work supports to comply with ACI355.2 is ignored, it cannot be ignored for components such as this.

¹ ACI 355.2/355.2R-01 *Evaluating the performance of post-installed mechanical anchors in concrete and masonry*

² European Technical Approval Guideline ETAG 001 Metal Anchors for Use in Concrete Annex E: Assessment of Metal Anchors under Seismic Action

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3. Clearances

NZS4541 provides limited advice for clearance between sprinkler components and other services. Attention is drawn to NZS4219 Table 15, which requires that “unless otherwise specified” that clearance be provided between various components (services.)

Condition being considered	Minimum clearance (mm)	
	Horizontal	Vertical
Unrestrained component to unrestrained component	250	50
Unrestrained component to restrained component	150	50
Restrained component to restrained component	50	50
Penetration through structure (such as walls and floor)	50	50

NOTE- Ceiling hangars and braces are considered to be restrained components for the purposes of this table

Sprinkler contractors can expect greater scrutiny in ensuring that separation distances are provided between their pipe work and other trades.

4. Attachments to Other Services

Given the scrutiny being placed on other services, sprinkler contractors can expect greater scrutiny if they expect to fix to other trades – examples include bracing drops to ceiling grids, and supporting sprinkler pipe work under ducts. Issues such as these are probably the responsibility of the main contractor, and probably resolvable if dealt with early in the construction contract.

Contractors are reminded that NZS4541:2013 clause 403.9.2 requires that if sprinkler pipe is support from other services that the supports need to be engineered to comply with NZS1170.5.

Technical Services Manager



Technical Services Manager