

CSA Standard Update

CSA-Z271:20 - New Field Test Requirements for Suspended Access Equipment (Anchors)

Prepared by: Pro-Bel Marketing Department

As of June 2020, the publication date of the CSA Z271:20 – Design of Suspended Access Equipment now requires on-site post-installation load testing of anchors and other permanently installed suspended access equipment. This affects projects where the Building Permit application was awarded after May 31, 2020 (June 2020 publication date).

NEW

Published CSA Z271:20 “Design of Suspended Access Equipment” (Dated: June 2020)

AFFECTS

Building Permit applications submitted after May 31, 2020 (June 2020 publication date)

ON-SITE LOAD TESTING

now required to be performed on “anchors” following installation and before use.

ENGINEER OF RECORD

for the project to provide a letter confirming structure has been designed and constructed, to take the applied test loads (prior to testing).

PREVIOUSLY

Only equipment installed with adhesive bolts required load testing.

EXEMPTIONS

On-site load testing of Equipment Tie-Ins (Stabilization buttons) and Horizontal Lifelines (cable, end connections etc..) and Line-Redirectors are exempt.

1. Why is on-site load testing now required?

The primary purpose of onsite load testing is to verify the structural attachment of the equipment following the permanent installation. The following section 11.3.3 from the CSA Z271:20 “Design of suspended access equipment” states this requirement:

11.3.3 Anchors

New or altered anchors, shall be inspected and tested on site after installation by an engineer or the engineer’s delegate prior to first use to verify compliance with the design drawings and with this Standard, including the capability to resist a test loading of 11 kN without permanent deformation of any component when subjected to test loading in the direction(s) that generate the most critical effect on the anchorage system with respect to stability and strength. Each post-installed bolt that is new or altered and is part of an anchor installation shall be inspected and tested to verify strength equal to at least 50% of the factored load for the application. The proof test load shall not exceed the less of:

- a) 50% of the characteristic bond or concrete strength; or
- b) 80% of the yield strength of the bolt material.

The test shall be carried out per ASTM E3121/3121M.

Note: *the proof test load values should be specified on the engineering drawing.*

The next excerpt is from the CSA Z271 published in 2010. The 2020 version (above) CSA has specifically included the words “on site after installation” prior to this shop test reports and calculations were provided; except for adhesive equipment which has always been load tested onsite following the installation.

11.3.3 Anchorage connectors

New or altered anchorage connectors shall be inspected and tested by an engineer or the engineer’s delegate prior to first use to verify compliance with the design drawings and with this Standard, including the capability to resist a test loading of 11.1 kN without permanent deformation of any component when subjected to test loading in the direction(s) that generate the most critical effect on the anchorage system with respect to stability and strength. In addition, each post-installed bolt that is new or altered and is part of an anchorage connector installation shall be inspected and tested to verify strength equal to at least 75% of the design load for the application.

2. What is deemed an “Anchor” or “Anchorage”?

Section 11.3.3. of the standard uses the term “anchors and anchorages.” This was developed as a general and all encompassing term. For clarification, let’s review applicable defined terms from CSA-Z271:20 – they are as follows:

Connection point — the element on an anchorage connector to which a fall protection, descent control, positioning, rescue, or suspended component/tie-back line system is attached.

Anchorage connector — see **Anchor**.

Anchor — a component or system of components that secures a fall protection, descent control, positioning, rescue, or suspended component/tie-back line system to an anchorage.

Anchorage — a structure that resists the forces applied by a fall protection, descent control, positioning, rescue, or suspended component/tie-back line system.

Note: *A beam and a roof slab are examples of anchorages.*

Therefore, the terms “connection point” or “anchor” can mean *any* equipment used to secure the *attachment, suspension, or tie-back* of workers safety or suspension lines back to the anchorage (aka. building structure).

Additionally, it should be noted that Davit Arm Assemblies and Davit Bases are covered in section 9.13 refer specifically refer back to to section 11.3 for inspection and testing. Please see the following applicable excerpt from the standard:

9.13.5

Davit testing shall include the following requirements:

- a) Each installed and fully assembled davit, davit socket, and base shall be inspected and tested in accordance with Clause [11.3](#) prior to the initial commissioning of the equipment for use.
- b) The critical welds shall be inspected by non-destructive techniques (NDT) in accordance with CSA Z91, Clause 6.5.6.3.2.
- c) Each davit shall be proof load tested to twice its rated capacity $\pm 5\%$ in the factory prior to commissioning.

3. What equipment requires on-site load testing and inspection?




The following are the general Pro-Bel equipment categories that under section 11.3.3 of CSA Z271:20 require post-installation, on-site load testing and inspection.

		
<p>Safety & Tie-Back Anchors</p>	<p>Davit Bases</p>	<p>Rigging Sleeves</p>
		
<p>Monorail</p>	<p>Soffit Anchors</p>	<p>Adhesive (Post-Installed Bolts)</p>
		
<p>*Davit Arm Assemblies</p>	<p>*Outrigger Beams</p>	<p>*Roof Car / BMU (Building Maintenance Unit)</p>

**Note: shop tested before shipping to site and does not require additional on-site load testing.*

4. Is there equipment that is considered exempt from on-site load testing?

There are some items that are considered to be exempt from on-site, post-intallation load testing. They are as follows:

	<p>Equipment Tie-Ins (aka. Stabilization Buttons)</p>
	<p>Line Redirectors and expansion inserts</p>
	<p>Horizontal Lifeline Components (Cable, Shock Absorber, and End Connections)</p>

Equipment Tie-Ins (aka. Stabilization Buttons)

Stabilization buttons are defined as “Equipment Tie-in’s” in CSA Z271:20. The section 9.5.1.3 intermittent engagement do not refer to inspection, load testing or refer back to requirements of 11.3 for inspection and testing as the standard does for Davits and therefore do not require on-site load testing. For your reference, the following are experts from the standard.

9.5.1.3 Intermittent engagement

The building or structure shall be provided with intermittent stabilization by means of equipment tie-in devices located not more than

- a) 15 m apart in the vertical direction where roof-launched platforms will be used as the primary means of access; and
- b) 5.0 m apart in the vertical direction where ground-launched platforms will be used as the primary means of access.

Note: *Intermittent engagement systems are typically designed to be used during descent of a roof-rigged platform; however, it is not the intent of this Clause to prevent the operation of temporary platforms without the use of intermittent engagement during rigging and de-rigging.*

Line Redirectors and expansion inserts

Line redirectors are newly engineered devices that, as the name suggests, *re-direct the lines* over a non-structural parapet or railing. They currently are not covered by this standard. However, this transportable equipment, is not a means of suspension or used to *secure* the vertical lifeline or suspension line to the anchor or structure (anchorage). Please note: general shop test reports for this device are available upon request.

Horizontal Lifeline (HLL) Components: Cable, Shock Absorber, and End Connections

The design requirements for HLL's are do not refer back to section 11.3.3 of CSA Z271:20 for testing and inspection. Furthermore, this standard refers to compliance with CSA Z29.13 or Z259.16 which do not require on-site load testing. Below are the relevant sections from Z271:20 to support the above.

Important note: *HLL's end and intermediate anchors can be used for tie-back or suspension and therefore require on-site load testing where applicable.*

5.5.5.8 Horizontal lifeline fall-arrest on a building or structure

A horizontal lifeline fall-arrest system that is anchored to a building or structure shall comply with Clause [9.4.8](#).

9.4.8 Flexible horizontal lifeline

A flexible horizontal lifeline may be provided as an anchor for fall protection or tie-back(s). The line shall

- a) be designed by an engineer;
- b) be marked for such use in accordance with Clause [10.2.7](#);
- c) comply with CSA Z259.13 or Z259.16;
- d) comply with Clauses [9.4.3](#) to [9.4.7](#) and [9.4.10](#) if it is an anchorage for one or more tie-backs; and
- e) not be used as a primary means of suspension.

Thank you for your time and consideration. Moving forward, we will be including pricing for on-site load testing services in our proposals.

For further discussion, questions or concerns please contact us.