

G11.6-1 Anchors

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Section 11.6 of the *OHS Regulation* states:

- 11.6 (1) In a temporary fall restraint system, an anchor for a personal fall protection system must have an ultimate load capacity in any direction in which a load may be applied of at least
- (a) 3.5 kN (800 lbs), or
 - (b) four times the weight of the worker to be connected to the system.
- (2) Each personal fall protection system that is connected to an anchor must be secured to an independent point of anchorage.
- (3) In a temporary fall arrest system, an anchor for a personal fall protection system must have an ultimate load capacity in any direction required to resist a fall of at least
- (a) 22 kN (5 000 lbs), or
 - (b) two times the maximum arrest force.
- (4) A permanent anchor for a personal fall protection system must have an ultimate load capacity in any direction required to resist a fall of at least 22 kN (5 000 lbs).

This guideline provides additional information for selecting anchors that are acceptable under section 11.6.

Anchors

The *OHS Regulation* defines an anchor as "a secure point of attachment for a lifeline or lanyard". Types of anchors under this definition include:

1. a device that has been purposefully manufactured and installed as an anchor to support a personal fall protection system; and
2. substantial structure, such as a beam, column or similar substantial portion of the structure, selected as a point of anchorage where no dedicated anchor device is available. These *points of anchorage* generally require some supplemental rigging, such as a sling, to allow the anchorage connector of a personal fall protection system to connect to the anchorage.

Natural anchors, such as large well-rooted trees or rock outcroppings can be acceptable points of anchorage as well if deemed by a qualified person to be able to withstand the forces that may be imposed by the fall protection system.

The actual strength of an anchor is dependent on:

- The design of the anchor
- The orientation of the anchor relative to the direction of loading
- The condition of the anchor
- The connection of the anchor to the supporting structure
- The adequacy of the structure to resist the imposed loading

Anchors in a temporary fall arrest system

If an employer proposes to use an anchor for a personal fall protection system in a temporary fall arrest system with an ultimate load capacity of less than 22 kN (5,000 pounds), the employer will need to be able to demonstrate that the anchor has an ultimate load capacity of two times the maximum arrest force (MAF) at the particular location. In some cases, and especially on complex fall protection systems, a professional engineer will design the system and calculate the expected MAF. The Board considers the upper limit of acceptable MAF to be 8kN (1800 lbs).

By using other methods to reduce the arrest forces in conjunction with the anchor, the employer may not need to obtain engineering advice. At work locations where that expertise is not readily available, the employer may choose to use a manufactured product that indicates on the label and within the product instructions what the MAF will be in the circumstances in which it is used. Shock absorbers are an effective way to reduce and control the MAF that can occur in the event of a fall. In the absence of advice from a professional engineer, a shock absorber should be included in a fall arrest system when connecting to an anchor that has a load capacity of less than 22 kN but is designed to resist two times the maximum arrest force.

Standard *CAN/CSA-Z259.11-M92, Shock Absorbers for Personal Fall Arrest Systems*, requires that that a shock absorber must limit the maximum arrest force to 4.0 kN (900 pounds) when at room temperature and dry.

As the calculation of the MAF in any situation can be complex and dependent to some degree on the particular circumstances of the place where the equipment is used, simply using such a product may not suffice. A person selecting an energy absorber is to consider his or her weight, atmospheric conditions, and fall distance in order to make the correct choice. Additional detail is available in the new *CSA Standard Z259.16-04 Design of Active Fall-protection Systems*.

A temporary anchor should be removed upon completion of the work for which it was intended.