STAIR CLIMBING ELEMENTS

One of the dynamic and exciting activities found at many fun climb centers is the Stair Climbing Element (SCE). The primary attributes of SCEs are:

- Participants ascend separate pillars of increasing height.
- Pillars are usually arranged in a circular pattern with an auto belay installed above and in the center of the pillar arrangement.
- Participants are encouraged to complete the ascent of the pillars hands-free.

Participants ascend these elements until they complete the climb, fall, or descend early by will. In all cases they safely descend via the autobelay.

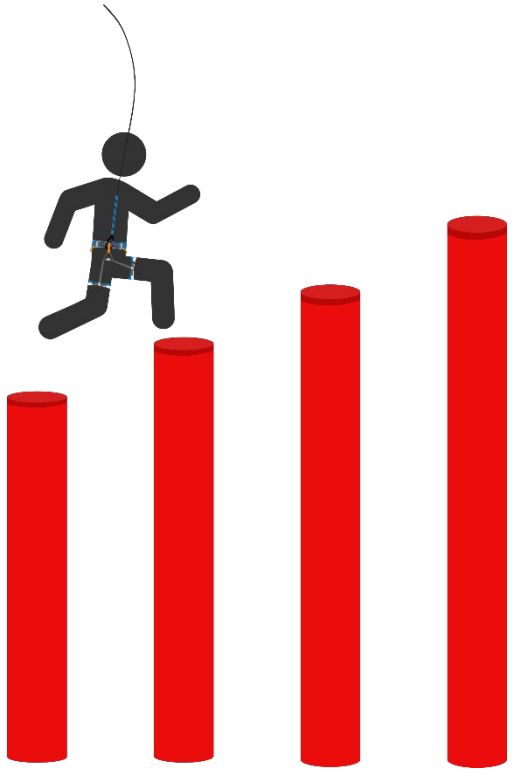

Figure 1: Example Illustration of a Stair Climbing Element

SCEs share many inherent hazards common to all climbing elements, and like all climbing elements the safe use of SCEs requires a properly instructed participant and a diligent operator. However, there are two potential hazards inherent to the design of SCEs:

1. Participants may grasp the webbing and pull down on it looking for extra support while climbing. This can lead to slack in the webbing between the participant and the auto belay. If the webbing is not allowed to retract before the participant descends, the participant may swing into objects or experience a ground fall that could result in equipment damage, serious injury, or death.

2. The circular nature of many SCEs increases the risk of twisting the webbing. Twisted webbing can impair the auto belay's retraction speed and in severe cases, the auto belay's ability to retract. Impaired retraction can lead to slack in the webbing that, if not noticed and corrected, could result in a ground fall and serious injury, or death.

Users of TRUBLUE Auto Belays should never climb or descend with excessive slack in the webbing. Operators are required to:

- Have a rescue plan for all climbing elements that have a TRUBLUE auto belay.
- Follow operational guidelines set by the manufacturer of the stair climbing element
- Implement a risk reduction strategy
- Train, orient, and monitor participants to ensure correct usage of the element and its auto belay.

POTENTIAL RISK REDUCTION METHODS

Although each facility is different and individual SCE elements can differ in design and specific use, TruBlue Technologies has created a list of general methods and steps that could help to minimize risk with SCEs, which are described below. TruBlue Technologies strongly encourages each facility to conduct an individualized risk analysis with their specific features and equipment.

ADD STAFF SUPERVISION AT THE ELEMENT

A staff member monitoring this element can reinforce proper use, warn against pulling on the webbing while ascending, and intervene when necessary.

Pros	Cons
• Supervision may mitigate participant risk. • Supervisor will be able to observe and intervene if participant pulls out slack manually while ascending.	• Possible increase in cost of operation.

USE AN ALARM SYSTEM

Some alarm systems – such as the TRU-ALERT Height Alarm – alert participants and staff of excessive slack in the webbing

Pros	Cons
• An alarm system can indicate when slack is present in the system and allow participants to correct the issue • An alarm system can indicate to participants and staff when a climbing element is being used without proper connection to the auto belay	• Possible increase in cost of operation.

USE A DORSAL CLIP-IN POINT

Many full body harnesses come with a dorsal connection point.

Pros	Cons
• May keep the webbing out of reach for the participant thus reducing their ability to introduce webbing slack.	• A dorsal connection requires staff to connect participants. • A soft landing after descending can be more difficult for the participant to judge.

ADD A SUPPORT FEATURE

Add separate support features, such as hanging ropes. **Always consult with the element manufacturer before modifying it.**

Pros	Cons
• A separate support feature may help participants maintain their balance without using the auto belay webbing.	• Participants may still grab auto belay webbing. • Depending on the design, a support feature may rub on and thus increase wear of the auto belay webbing. • Depending on the design, there may be potential for entanglement between the participant or webbing and the feature

ADD PADDING AROUND THE HAND GRIP

Install a padded tube, preferably with a large outside diameter, around the hand grip. The padding must be loose enough to accommodate daily webbing inspection. The tube must not inhibit any swivel capabilities of the connector/webbing. It must be attached in a manner that allows the participant to clearly check whether the connector is properly attached to their harness.

Pros	Cons
• Discourages participants from pulling on the webbing for support. • Low cost	• May be difficult to mount in a manner that doesn't interrupt webbing inspections, swivel functionality, and connector checks.

CONCLUSION

It is the responsibility of stair climbing element manufacturers and operators to devise and implement an overall risk reduction strategy to address excessively slacked descents. Various risk reduction strategies should include participant orientation, and may include increased staff supervision, alarm systems, other support pieces, and using a dorsal connection. Always consult your manufacturer before implementing any operational changes or modifications to the element. None of these methods alone will fully mitigate risk, but a combination of tactics should be considered to support an overall strategy.