Introduction

This factsheet provides technical support to those who wish to build temporary or permanent climbing structures from scaffolding. If other forms of permanent structure are contemplated attention is drawn to the British Mountaineering Council’s Climbing Wall Manual (ISBN 0903908123).

General

It is recommended that if at all possible, a wall should be secured to an immovable object such as a building, subject to its design, and braced.

Freestanding towers pose the greatest potential risk from overturning. The risk is heightened in two respects when used as a wall: Sheeted towers greatly increase the resistance to wind by acting as a sail, and climbing walls are specifically built to have weights on the outside of the scaffolding causing an unnatural stress to the tower.

Aluminium alloy towers are very light and are not capable of taking the loadings that are put upon it from either abseiling or climbing.

System Scaffolds

System scaffolds although easier to construct are far less stable than conventional steel tubes and fittings due to the size of the components (three metres max size). If this is your only source of scaffold materials you should ensure that all joints (where the uprights are fixed together) are spliced with load bearing fittings.

Design

Attached to this factsheet is a design for abseiling/climbing walls constructed from scaffolding BS1139 tubes and fittings and BS2482 scaffold boards. They show all the points mentioned in respect of access, tie points and access to platform levels.

Height

The height of a structure will depend on the area and type of activity that is to be undertaken. A recommendation is an area of 3.90m x 3.90m, giving a good base dimension and sufficient room to undertake four climbs or drops (i.e. two abseils and two climbs) and a reasonable holding area on top for people waiting to take part. With a base dimension of 3.90m x 3.90m you can easily construct a platform level of six metres (see drawings attached).

Access

Access to a working platform should be by conventional ladder outside the framework of the tower, with a safety line from the ground to the holding area at platform level. If possible two ladders should be fixed, one either side of the tower, to allow easy access to the platform level. Caving ladders are not suitable due to the training required to use them properly, the extra safety ropes needed and the problems of evacuating anyone who does not wish to abseil off the top.

Belay and Abseil Ropes

Every effort should be made to ensure that a failure of the attachment points does not affect the structural integrity of the tower. Three fixing points should be provided:
1 Abseil ropes
2 Safety belay ropes
3 Personal safety point

All three points should be fixed to meet their own requirements and with load bearing scaffold couplers. The safety and active ropes should be attached to separate anchorage points to minimize the dangers involved.

General

Whether a tower is fastened to a building or is freestanding, a series of checks should be done to ensure the safety of the tower. On erection, the tower must be vertical and preferable built on level ground. If the tower is being secured to a building, ensure that the structure will be able to take the stresses and strains to which the building will be subjected.

The platform at the top of the scaffolding should be close boarded and fitted with a double guardrail at 0.500m and 1.0m running continuously around all those sides of the tower (normally two), which are not actually used for climbing or abseiling. Toe boards (about. 150mm high) should be fixed similarly on all sides of the tower, except those actually used for climbing or abseiling, to ensure that equipment is not knocked off the top of the tower.

An area around the bottom of the tower should be roped off so that only those who are on the tower, those supervising and those bottom roping, are inside the control area. Those waiting or spectating should be kept at a safe distance back from the tower. The numbers on the tower should be strictly controlled. A maximum of 3 ‘per active rope is recommended.

The erection of a tower should be by a person holding a competency certificate in scaffolding of the Construction Industry Training Board. If a tower is going to be permanent then a qualified scaffold engineer should assist with the design, as well as climbing/abseil instructor who will know what they require in respect of tying off points etc. Full and exhaustive checks on equipment, ties and foundations should be undertaken to ensure that the location is suitable.

Side Walls

The actual abseil/climbing wall can be fixed in several ways. Possibly the easiest is to fix scaffold boards horizontally, then attach scaffold boards or 2.4m sheets of plywood to these, giving a smooth face for abseiling on. At the top or platform level the vertical boards may be up to 100mm from the platform deck. This should be covered with a small piece of timber from the vertical boarding to the platform, ensuring there is no gap for a foot to slip down.

Safety Checks

Whatever the style of the tower, each tower should be regularly and rigorously checked to ensure its safety. The tower should be checked every session to assess wear and tear and checks should be especially thorough following adverse weather conditions such as high wind or heavy rain.

The following is a suggested list of checks, although these are not exhaustive due to the variety of climbing towers available:

1 Are the foundations secure?
2 Are all outriggers in position and secure?
3 Are all the diagonals in place and secure?
4 Are all ties, guy ropes and anchorage tight, secure and well maintained?
5 Are all ladders and boards secure and showing no signs of excessive wear?
6 Are all hand holds and toe holds secure?
7 Are the platform and tie up points safe and secure?

Upon discovery of cracked, heavily corroded or damaged hand holds, abseil boards or scaffold boards, activities on the tower should be suspended until the equipment is either made safe or replaced.

Although we have very few reports of accidents occurring on or with scaffolding climbing towers, it
is as well that a cautious approach is adopted. If you feel worried or concerned about erecting and operating a climbing wall, talk to local climbers and other experts in the field who will often be willing to offer assistance.

**Design For A Scaffold Climbing / Abseiling Tower:**

**Elevation A - A**
Plan At Deck Level

Plan At Top Lift

INSTRUCTOR’S TIE POINT

ABSEIL POINTS

BELAY POINTS

Face brace

Plan brace

WB II
ALL LOADING AREAS TO BE FULLY HANDRAILED WITH AUTO SHUT GATES BOTH IN AND OUT

Access ladder with safety line from ground to holding area

Face brace lines Pattern as elevation “A” except last post of top brace

Transoms in pairs

Beards

Punchions

Ladder beams

Spurs