

Supporting guidelines and principles for rope work and gear placement.

S.I.R.E.N.S

All belays or anchor systems need to meet certain criteria and over the years many acronyms have been used to help people remember the things to consider. I've developed my own version that I think is more logical. It starts with **Solid** as this is the first thing in my opinion that you should be looking for as everything else hinges on solid placements and anchors. If your belay doesn't meet the following criteria then **SIRENS** should be going off in your head!

Solid. The tree AND the ground it's in must be solid. The flake must be firmly attached. The boulder must not move or be on a bed of gravel. The nut or cam placement must be good as should the rock it's in. Look wider than your normal 2ft range of vision. Test natural anchors well but progressively so that you don't risk pulling the block/flake/tree off and down onto anyone below. Feel as well as look for movement/vibration. Listen to the rock. When you tap it with a karabiner there should be a high 'ting', a low or hollow sound is an indicator of potentially poor rock. Is the tree alive? Is the tree in a granite area (shallow roots) or limestone (usually deeper/more secure roots)? Without solid anchors everything else that follows is pointless!!

Inline. Are the chosen anchors suitable for the anticipated direction of load? Where appropriate are the **Anchor-Belay-Climber** all in line? In the case of abseils and bottom ropes are the **Anchor-Climber-Direction of travel** all in line?

Redundant. If one of the anchors were to fail would it lead to catastrophic failure of the whole anchor/system. Here's a tip the answer should always be **NO!**

Equalised. Is the load being shared as equally as possible between all the anchors? The angle between the 'legs' should be no more than 90 degrees and ideally less than 60 degrees.

No shock load potential. In the event of one of the anchors failing would it result in the load dropping suddenly onto the remaining pieces and therefore be likely to cause them to fail also?

Swift. At the end of the list but can you achieve all of the above without taking an age to do so. It's not about rushing but about having well practiced systems. Slow is smooth, smooth is fast....

Hierarchy of Anchors

1-5 gear scoring

I'm going to detail one way of assessing or scoring your gear placements to help you develop an eye for a good placement. I'm going to score potential placements from 0-5 with 0 being psychological where you know it's more than likely going to fall out and is barely holding the karabiner that's clipped to it. At the other end of the scale is 5 the strongest most solid multidirectional anchor you could ever of dreamed of. When building a belay aim for a minimum of two pieces/anchors and all pieces should score 3 and above. This scoring system is not meant to be an exact science merely a starting point from which you can begin to build your own opinion on what's good and what's not as your experience grows.

0. Psychological placements- poor rock or poor placement- will not hold a fall! Be aware that any piece or natural feature can easily score a big fat 0 if it's badly placed, unstable or in bad rock.

1. Micro nuts and cams- thin natural features. Ok for runners but if using for a belay because there is absolutely nothing else then lots need to be used and brought together using load sharing and redundancy principles.

2. Small cams, small natural features. Small nuts good in one direction Good for runners but again if they're the only thing available for a belay then place more of them and link together to create a strong anchor.

3. Medium Pieces good in one direction (where that direction is the anticipated direction of loading or fall)- minimum for 1 part of a two piece belay. Small pieces good in more than one direction.

4. Large pieces good in one direction (where that direction is the anticipated direction of loading or fall) - medium natural features. Medium pieces good in more than one direction.

5. Large pieces good in more than one direction- large natural features

Improving the score

Often it's possible to improve a low scoring piece by the following means;

- Weighting slings on spikes and flakes with spare gear to prevent it lifting off.
- Placing a nut in the crack behind the flake but above the sling to prevent it lifting off (clip the nut into the sling just so it doesn't get lost).
- Putting nuts in opposition to create a multidirectional piece or at least a piece that will stay put.
- Bringing 2,3 or more pieces together with a sling or the rope to form one good anchor.
- Tapping a nut further into place with a nut key (be mindful of potential rock damage and use only in desperate times).
- Make sure that the 1st piece will resist an upward pull to minimise the risk of un-zipping. Un zipping is where pieces are subjected to an upward/outward pull from the ground. This can be because the belayer is too far back or off to the side of the line of the route. Sometime this is unavoidable as the ground at the bottom of the route dictates where you can belay from but often it's because belayers stand too far back. A cam makes a good 1st piece.

This system presumes that each nut, sling or cam placed is done so correctly....

A piece that can take a load or stay put when force is applied to it in more than one direction (including the ultimate direction of peak loading) will score higher than a piece that's good for just one direction. Rope drag, a wandering line, the climbers clumsy foot or the unpredictable nature of falling can all place unexpected directions of force onto a piece.

What about the in situ pieces like threads, pegs and bolts?

It's a lot easier to assess the condition and suitability of a natural feature or piece of protection that you've placed yourself. When it comes to in situ threads if you've replaced the sling or cord and the rocks good then it could score highly- if it's a small thread using a bleached sling of indeterminable age then it might not be much better than a 1 or 2. When clipping a peg it's very hard to impossible to determine how far in its gone- did it get sawn off before placement? How old is it? How corroded is the section you can't see? A friend of mine was seconding a route, and as he unclipped an extender from a peg the eye came off and rattled down the spine of the krab. Some pegs are bomber and in the Avon gorge there's a like for like policy regarding fixed gear with the proviso that if you can get natural pro in once the old peg is out then leave it out. This means most poor pegs have been removed and any pegs found *should* be trustworthy....?

It's a similar story with bolts as their quality and reliability can vary massively. From aged 8mm bolts that only go an inch into the rock to recently glued in staples and well placed 10mm expansion bolts it can be a bit of a lottery to the uninitiated. A good bolt could score highly but the wrong direction of load on a poor one could be a ticking time bomb. Recent guidebooks and the internet are good places to find out about the age and type of bolt at a particular venue. Do some research too into what a good, and more importantly, a bad bolt look like!

If you're reading this and thinking 'well- I've taken massive lobs onto small cams and they've been bomber and so they should score higher!' Then this guide isn't for you as you've probably the experience to judge each piece on its own merits. If you've very little experience of placing gear and making those judgements then hopefully this will give you something to start working with and whilst it's not meant to be definitive it's a damn sight better than haphazardly putting in pieces and assuming they'll hold...