

Wasatch Mountain Club
Climbing Skills
Index, Assessment &
Instructor's Guide

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Introduction

Rock climbing is potentially dangerous and fun. To minimize the danger, and maximize the fun, teams need to have a minimum toolbox of skills when venturing outdoors for rock climbing. Regardless of the expected outing, outdoor climbing can quickly evolve due to weather, injury, etc. This minimum toolbox is meant to be a safeguard to get the entire team home safe in event of adverse conditions, and to handle other less serious issues to keep the fun high. Leaving gear on a sandbagged route is no fun, but coming home with all your gear (because of the toolbox) makes a great story around the fire.

What is the Climbing Skills Index?

Many of the skills in the toolbox take time to achieve, and many build on other skills. The WMC Climbing Skill Index is a structured list of skills for the outdoor climbing toolbox. The structure helps climbers efficiently learn their skills and prevent critical holes in knowledge.

As some skills build on others, the index is broken into levels. The idea is that level 1 skills are the first skills to learn, level 2 has skills that build on level 1 and are used for level 3, etc. The index is broken into 6 levels; going from level 1 to 6 will take multiple years of outdoor climbing, and the structure helps keep climbers efficiently progressing.

The levels of the index are based on a progression of skills, rather than particular scenarios for outdoor climbing. This is because any assumed scenario can quickly transform into something very different due to weather, injury, daylight, etc. It is felt that trying to label levels with common scenarios ("Sport Leading", "Multi-pitch Trad Climbing") could lead to a false sense of security.

Many of these skills transfer to other sports with ropes. Mountaineering, ice

climbing, and canyoneering all benefit from parts of this toolbox, with additions specific to those sports. We could equally build an index around one of those sports and then expand to rock climbing, but we have chosen to start with free rock climbing.

Also note that climbers do not need to learn these skills in this order. The presented order is meant to be an efficient line of progress with later skills building on earlier ones. However, due to a climber's preference or history, they may have later skills before earlier ones; mountaineers may learn the butterfly knot very early on, well before they lead rock pitches. This is fine, and such a climber should get their assessments in whatever skills they have, when they have them. Instructors and assessors should happily sign off on correctly demonstrated skills, regardless of skill or climber "level."

Are CSI Skills the "Best" Skills?

While the CSI provides a map of a minimal comprehensive toolbox, it does not include all the climbing skills of value.

The CSI does not provide the best skills for all scenarios. The objectively *best* skill for a particular task depends on the actual conditions encountered when the skill is needed. What is presented in the CSI is a toolbox with sufficient breadth and depth to allow handling a wide, possibly complete, range of scenarios encountered when climbing outdoors.

The skills of the CSI are not the only skills a climber should know; add to the CSI as desired!

The skills of the CSI are not the only skills allowed on WMC outings; use any safe skill you know to get the job done!

Climbers who reach CSI level 6 are encouraged to continue expanding their toolboxes, and adding more skills and knowledge. Reaching CSI Level 6 is not the end of education or learning - it is the start of learning on your own & teaching the rest of us!

Some Comments on Training

Training to a particular CSI level is not required, and may be too disjointed for easy learning. Many of these skills can be learned individually, or as part of a scenario-

based approach. For example, many of the skills listed in CSI Level 2 apply to cleaning an anchor, and are likely best learned as part of a workshop on cleaning anchors and rappelling down. Similarly, climbers learning self-rescue strategies will likely check off skills from CSI Levels 3-6 in one set of workshops.

When sufficient desire exists, the club should offer training in any of these skills to help climbers progress from CSI Level 1 to 6. The goal is to get every WMC member who wishes up to level 6, so we can all have fun climbing outdoors in the mountains. So, in addition to the more scenario-based training that has been done in the past, the club could (and probably should) offer some training workshops focused around CSI levels, and maybe around just a couple skills people are lacking/interested in. A short workshop for just a couple skills could be done as part of a climbing outing, or just before an ordinary climbing event.

Check the New Before You Remove the Old

Something to emphasize when climbing:

- **Check the new system before you remove the current system.**

This applies from leaving the ground until returning to the ground. When climbers leave the ground, they check the new system (harness, belay setup, and rope) before removing the current system (standing on flat ground). When getting on rappel, check the rappel system before removing the tethers keeping the climber to the anchor. This continues throughout climbing - checking for a belay before removing the current anchor to climb the next pitch, connecting to an anchor before coming off belay, etc. All trainers should continue to emphasize the need to check the new system before removing the current system, as this is a principle that runs through nearly every skill listed here. Certainly the principle runs through all the scenarios for building anchors, placing protection, cleaning anchors, rappelling off anchors, and all the other parts of climbing and mountaineering.

What are Climbing Skills Assessments?

Climbing Skill Assessments are personal, voluntary assessments of skills in the Climbing Skill Index. When a climber passes a skill assessment in the CSI, the assessor signs the climber's Log Book to permanently record the accomplishment.

Purpose

The purpose of a Climbing Skill Assessment (CSA) is to identify if a member can demonstrate a skill identified in the CSI. The CSA Test Script is the primary tool used to conduct an assessment.

For each skill being assessed, the result will be a pass or did not pass. A member may be assessed any number of times to pass a skill, but should expect only one try per session, to keep the total assessment time manageable in a session.

Scope

A CSA is a voluntary, free service that is limited to WMC members. Members who wished to be assessed should get a log book from the WMC before their first assessment.

Assessments are not training, nor a list of "suggested", "superior", or "best" skills. The best (or better) skill to use in any particular scenario is dependent on many variables. The CSI, CSA test script, instructor's guide, and assessment events are not designed to address those variables or that decision-making process. Training on that decision-making process will be left to a qualified instructor in a training environment.

Are CSAs Required?

No. No WMC member is required to take an assessment. Any member may choose to take an assessment, whenever they are offered, for any skill in the CSI. Any skill may be assessed at any time and in any order. No specific WMC training is required before the assessment.

WMC members are encouraged to take assessments as they feel they can pass the skills. A climber may be assessed on one or more skills at a time, in any mix of levels. Climbers are encouraged to get assessed on all the skills they know first, and then add new skills at whatever levels as they wish.

Displaying Your Assessed Level

If a climber so chooses, they may display their assessed level with stickers on their helmet. When a climber completes assessment in all skills listed for a particular level,

they are eligible to receive a sticker for that level. The stickers are offered at cost (or below), and are voluntary.

Once a WMC member receives a sticker, they may display the sticker on their helmet. This is an indication to other climbers that they have a certain base set of skills (plus anything not in the CSI). It is most helpful if those assessed at the higher levels (CSI Level 4+) display their level, as less-skilled climbers can then ask for help when they want it.

A member's log book is also a way of showing your assessed skills. A member may, at their discretion, show their log book to other climbers to show they know certain skills. Please don't lose your log book, as there are no backup copies.

A member may keep all their assessments and levels private, if they so choose. There is no requirement to be assessed, or to display the results of those assessments.

Definitions

This document has some specific acronyms and terms that are defined here. Note that some of these definitions are just for this document, and do not represent the general use or common definition.

Climbing Skill Index (CSI)

An ordered list of essential climbing skills. This list does not include all climbing skills, and does not represent the best skills for all situations. The skills across the entire index form a minimal, comprehensive toolbox for a climber to safely lead an outdoor climb of a group.

Climbing Skill Assessment (CSA)

An assessment of personal climbing skills, but only of skills in the CSI. Other skills in climbing or other fields are excluded.

CSA Administrator

A person qualified to administer a CSA and sign off for the skill in a CSA Log Book.

CSA Script

The primary tool used by a CSA Administrator to determine if a member has a CSI skill. The CSA Script specifies the test criteria for each CSI skill.

CSA Log Book

A book given to a WMC member who volunteers to participate in the CSA program. This book contains a short form of the CSI, with spaces for CSA Administrators to sign off that the skill has been demonstrated. This book forms a personal permanent record of demonstrated skills in the CSI.

Full-Body Harness

Any combination of leg loops, waist belt, and chest harness elements connected such that it pulls all three of these elements toward the sternum when weighted. Single-piece full-body harnesses also exist with minimal waist connections; tie in points are still at the sternum.

Sit Harness

A combination of waist belt and leg loops, with leg loops connected to the waist belt by a full strength connection.

Belay/Rappel Device (BRD)

Any device that allows controlling the rope speed for belay and rappel. For the assessments in this document, almost all skills require a 2-slot device capable of holding and controlling 2 ropes simultaneously. This excludes the use of single-rope devices, such as a Petzl Grigri.

Updates & Contributions

This document is typeset by LaTeX 2_ε, from a source file currently maintained by Paul Gettings and Tony Calderone. Tony provided the list of skills and broke them into levels. Paul converted to a LaTeX file, and added some of the additional notes.

Anyone may contribute to the guide, particularly for additional skills and notes. Send your changes to the maintainers or the WMC Climbing Director(s).

The date on the title page is the date of typesetting, and should be date of the most recent revision.

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7 Additonal Skills

Climbing Skills Assessment Script

- 1 CSI Level 1 ☐
- 1.1 Identify climbing harness parts ☐
 - 1.1.1 Waist Belt ☐
 - 1.1.2 Leg Loop ☐
 - 1.1.3 Front Leg Loop Riser ☐
 - 1.1.4 Rear Leg Loop Riser ☐
 - 1.1.5 Belay Loop (if present) ☐
- 1.2 Select a climbing harness; who needs a full-body harness? ☐
 - 1.2.1 Anyone under 16 years old ☐
 - 1.2.2 Anyone who is pregnant ☐
 - 1.2.3 Anyone with a waist bigger than their hips ☐
- 1.3 Fit a climbing harness ☐
 - 1.3.1 Waist belt must not be able to pull over the iliac crest ☐
 - 1.3.2 All buckles must be secured in accordance with manufacturer's instructions ☐
 - 1.3.3 Leg loops must fit tight enough to prevent pinching ☐
 - 1.3.4 Front leg loop risers must be long enough to not deflect the waist belt ☐
 - 1.3.5 Front leg loop risers must be short enough to prevent waist belt from reaching rib cage ☐
 - 1.3.6 Rear leg loop risers must be tight enough to prevent leg loops from reaching the knee ☐
 - 1.3.7 The waist belt, leg loops, risers, and belay loop must not be twisted more than 90 degrees ☐
- 1.4 Tie into a climbing harness (rewoven figure 8) ☐

- 1.4.1 Figure 8 knot is backed up with an overhand knot with 1"-4" of tail beyond overhand knot ☐
- 1.4.2 Strands must not be twisted ☐
- 1.4.3 Rope must be threaded in accordance with manufacturers instructions ☐
- 1.5 Conduct a pre-climb safety check ☐
 - 1.5.1 Team must consist of 2 climbers ☐
 - 1.5.2 Belayer must use 1 rope and 1 BRD on their harness ☐
 - 1.5.3 Both harnesses must be selected in accordance with §1.2 ☐
 - 1.5.4 Both harnesses must be fit in accordance with §1.3 ☐
 - 1.5.5 Both people must be tied to the rope in accordance with §1.4 . . ☐
 - 1.5.6 Belay carabiner must be locked in the fully closed position . . ☐
 - 1.5.7 Rope must be properly threaded through the belay device . . ☐
 - 1.5.8 Both people must have a common understanding of the descent plan ☐
- 1.6 Belay a top-rope climber ☐
 - 1.6.1 Belayer must use 1 rope and 1 BRD on their harness ☐
 - 1.6.2 Belayer must maintain a secure position that enables them to maintain control of the rope when violently pulled. This may require anchoring themselves to the Earth ☐
 - 1.6.3 Belayer must maintain at least their thumb and forefinger in a closed loop around the brake strand, from as soon as the climber says *On Belay*, until the climber says *Off Belay* ☐
 - 1.6.4 Belayer must not allow the climber to hit the ground ☐
- 1.7 Belay a lead climber ☐
 - 1.7.1 Belayer must use 1 rope and 1 BRD on their harness ☐
 - 1.7.2 Belayer must maintain a secure position that enables them to maintain control of the rope when violently pulled. This may require anchoring themselves to the Earth ☐
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 - 1.7.4 Belayer must consistently allow the climber to advance ☐

- 1.7.5 Belayer must not allow more rope out of the belay than what allows the climber to advance ☐
- 1.8 Respond to commands ☐
 - 1.8.1 When climber says *On Belay*, the belayer immediately employs a method to control the rope speed. Immediately after doing so, the belayer responds with *Belay On* ☐
 - 1.8.2 When climber says *Climbing*, the belayer immediately ensures the entire length of rope will move smoothly and consistently through the belay. Immediately after doing so, they respond with *Climb On* ☐
 - 1.8.3 When the climber says *Slack*, the belayer immediately feeds rope out of the belay ☐
 - 1.8.4 When the climber says *Lower*, the belayer lowers the climber to the ground or until the climber says to stop (*That's Me*) . . ☐
 - 1.8.5 When the climber says *That's Me*, the belayer immediately stops moving the rope. ☐
 - 1.8.6 When the climber says *Up Rope*, the belayer immediately pulls rope into the belay ☐
 - 1.8.7 If the climber says *Tension*, the belayer immediately takes as much rope as possible into the belay ☐
 - 1.8.8 When the climber says *Off Belay*, the belayer immediately ensures the rope will move without control. Immediately after doing so, the belayer responds with *Belay Off* ☐
- 1.9 Safely lower a climber 50' (16 m) through a top anchor ☐
 - 1.9.1 Belayer must use 1 rope and 1 BRD on their harness ☐
 - 1.9.2 Belayer appropriately changes speed relative to terrain ☐
 - 1.9.3 Belayer appropriately changes speed relative to the climber lowering ☐
- 1.10 Demonstrate respect for other climbers at the crag ☐
 - 1.10.1 Gear is kept in or under pack while climbing ☐
 - 1.10.2 Gear is kept out of staging areas when climbing multi-pitch routes ☐
 - 1.10.3 Talking is minimal and quiet when others are leading nearby . ☐

2 CSI Level 2

- 2.1 Build a 2-bolt belay anchor ☐
- 2.1.1 S - Strong ☐
- 2.1.2 T - Timely ☐
- 2.1.3 E - Equalized ☐
- 2.1.4 A - Angle ☐
- 2.1.5 ME - Minimal Extension ☐
- 2.1.6 R - Redundant ☐
- 2.1.7 S - Simple ☐
- 2.2 Build and rappel from carabiner block ☐
- 2.2.1 Carabiner Block must consist of a clove hitch and a locking carabiner ☐
- 2.2.2 A locking carabiner joins a clove hitch on the pull strand to the rappel strand ☐
- 2.2.3 Rappel on one strand. Retrieve with other strand ☐
- 2.3 Join ropes with 2 Double Fisherman's Bends ☐
- 2.3.1 Two Double Fishermen's Bends must be tied and interlaced correctly ☐
- 2.3.2 Rope strands must not be twisted ☐
- 2.4 Clean a 2-bolt anchor & rappel ☐
- 2.4.1 Climber remains secured to protection from arrival at anchor until on rappel ☐
- 2.4.2 Equipment is removed from a 2-bolt anchor with chain hardware ☐
- 2.4.3 Rope is properly threaded through two chains ☐
- 2.4.4 Chains must not be twisted ☐
- 2.4.5 Rappel with a BRD using 2 rope strands ☐
- 2.4.6 Foot position is appropriately wide while descending ☐
- 2.4.7 Speed is safe while descending ☐
- 2.4.8 Body angle prevents foot slippage while descending ☐
- 2.4.9 Obstacles are passed without slipping or injury while descending ☐
- 2.4.10 Locking friction hitch is correctly used to back up rappel . . . ☐
- 2.5 Understand single, half, twin & static ropes ☐
- 2.5.1 Legitimate uses must be accurately explained ☐
- 2.5.2 Elongation differences must be accurately explained ☐
- 2.6 Join webbing with a Ring Bend ☐

2.6.1	Ring Bend must be tied correctly	☐
2.6.2	Ring Bend must be well-dressed	☐
2.7	Explain leading and top-roping	☐
2.7.1	Differences in risk must be accurately explained	☐
2.7.2	Differences in the effect on the belayer and anchors must be accurately explained	☐
2.8	Identify geological features	☐
2.8.1	Scree	☐
2.8.2	Talus	☐
2.8.3	Intrusion	☐
2.8.4	Buttress	☐
2.8.5	Crack	☐
2.8.6	Seam	☐
2.8.7	Arete	☐
2.8.8	Dihedral	☐
2.8.9	Ledge	☐
2.8.10	Roof	☐
2.8.11	Chimney	☐
2.8.12	Summit	☐
2.8.13	Ridge	☐
2.8.14	Spur	☐
2.8.15	Draw	☐
2.8.16	Couloir	☐
3	CSI Level 3	☐
3.1	Identify 3 bolt types typically used in fixed protection	☐
3.1.1	Compression bolts	☐
3.1.2	Expansion bolts	☐
3.1.3	Glue-in bolts	☐
3.2	Lead 80' (25 m) of 5th class with bolts	☐
3.2.1	Rope must be properly clipped into carabiners	☐
3.2.2	Runners must prevent rope drag	☐
3.2.3	Protection must prevent team injury	☐
3.3	Join 2 ropes with Flemish Bend	☐

- 3.3.1 Must be tied correctly ☐
- 3.3.2 Strands must not be twisted ☐
- 3.4 Belay & lower a climber with a Munter Hitch ☐
 - 3.4.1 Munter hitch must be attached directly to anchor ☐
 - 3.4.2 Lowering speed must be appropriate to the terrain ☐
 - 3.4.3 Speed must be appropriate to the skill of the person being lowered ☐
- 3.5 Tie a Prussik Hitch ☐
 - 3.5.1 Tied correctly in under 20 seconds ☐
 - 3.5.2 Hang from Prussik Hitch ☐
- 3.6 Understand climbing shoe features ☐
 - 3.6.1 Must explain how camber, midsole & toe profile affect performance ☐
 - 3.6.2 Must explain differences in fit and stiffness ☐
 - 3.6.3 Must explain differences in capabilities on various terrain . . . ☐
- 3.7 Coil 200' (60 m) of rope ☐
 - 3.7.1 Coils must be less than 6 feet long ☐
 - 3.7.2 Coil must be secure enough to be thrown without falling apart ☐
 - 3.7.3 Coil must be easily carried on back or backpack ☐
 - 3.7.4 Coil pays out easily when unsecured and thrown ☐
- 3.8 Identify standard climbing topo sketch symbols ☐
 - 3.8.1 Arete ☐
 - 3.8.2 Dihedral ☐
 - 3.8.3 Ledge ☐
 - 3.8.4 Roof ☐
 - 3.8.5 Chimney ☐
- 3.9 Give a Safety Briefing ☐
 - 3.9.1 Address equipment requirements for 3rd class terrain on the approach if applicable ☐
 - 3.9.2 Address equipment requirements for 4th class terrain on the approach if applicable ☐
 - 3.9.3 Address equipment requirements for 5th class terrain ☐
 - 3.9.4 Address equipment to mitigate injury from possible rockfall on the approach if applicable ☐

- 3.9.5 Address respectful behavior toward other climbers that may be encountered ☐
- 4 CSI Level 4** ☐
 - 4.1 Build belay anchor without fixed protection ☐
 - 4.2 Lead 80' (25 m) of 5th class without fixed protection ☐
 - 4.2.1 Rope must be properly clipped into carabiners ☐
 - 4.2.2 Runners must prevent rope drag ☐
 - 4.2.3 Protection must prevents team injury ☐
 - 4.3 Explain "pitching" belays ☐
 - 4.3.1 Member explains switching roles between climbing and belaying ☐
 - 4.4 Tie a bowline around your waist ☐
 - 4.4.1 Strands are well-dressed ☐
 - 4.5 Escape the belay ☐
 - 4.5.1 Belay must be loaded ☐
 - 4.5.2 Belay must begin on harness ☐
 - 4.5.3 Member must maintain control of the load ☐
 - 4.6 Rappel without a harness ☐
 - 4.6.1 Any safe, recognized, legitimate method may be employed . . ☐
 - 4.7 Identify pitons ☐
 - 4.7.1 Point to each item and ask, "What is this?" ☐
 - Blade Piton ☐
 - Angle Piton ☐
 - 4.8 Identify & understand runner materials ☐
 - 4.8.1 Ask member to explain the difference between these two runners ☐
 - Member identifies nylon runner ☐
 - Member identifies Dyneema or Spectra runner ☐
 - Member demonstrates they know nylon has greater elongation
and water absorption ☐
 - 4.9 Identify features on a USGS topo ☐
 - 4.9.1 Summit ☐
 - 4.9.2 Ridge ☐
 - 4.9.3 Spur ☐
 - 4.9.4 Draw ☐

- 5 CSI Level 5** ☐
- 5.1 Lead a 400' (122 m) route without fixed protection ☐
 - 5.1.1 Route must be at least 400' (122 m) long ☐
 - 5.1.2 Route may not have fixed protection ☐
 - 5.1.3 Protection must prevent team injury ☐
 - 5.1.4 Direct aid may not be used ☐
 - 5.2 Climb with direct aid ☐
 - 5.2.1 Direct aid section must be at least 25' (8 m) long ☐
 - 5.2.2 Aid must be employed on lead ☐
 - 5.2.3 Protection must prevent team injury ☐
 - 5.3 Tie a Munter Mule knot ☐
 - 5.3.1 Properly tie within 20 seconds ☐
 - 5.4 Tie a Butterfly knot ☐
 - 5.4.1 Properly tie within 20 seconds ☐
 - 5.5 Belay with two twin or double ropes ☐
 - 5.5.1 Belay must be done from above climber ☐
 - 5.5.2 Belayer must keep ropes separately stacked for the entire rope length ☐
 - 5.6 Haul a bag with a Z-pulley ☐
 - 5.6.1 Use 1 rope, 1 auto-blocking BRD, 1 prussik, & 3 carabiners ☐
 - 5.6.2 Bag must weigh at least 50 pounds ☐
 - 5.7 Tandem rappel ☐
 - 5.7.1 A second person must be directly attached to member ☐
 - 5.8 Install & remove pitons ☐
 - 5.8.1 Install angle piton ☐
 - 5.8.2 Install blade piton ☐
 - 5.8.3 Remove angle piton ☐
 - 5.8.4 Remove blade piton ☐
 - 5.9 Demonstrate community awareness by identifying 5 climbers' accomplishments. ☐
- 6 CSI Level 6** ☐
- 6.1 Climb a fixed rope with friction hitches ☐
 - 6.1.1 Must climb 50 feet ☐

- 6.2 Tie into the middle of a rope with a bowline on a bight ☐
 - 6.2.1 Must be properly dressed ☐
- 6.3 Tie a Munter Hitch with one hand ☐
 - 6.3.1 Must tie in less than 20 seconds ☐
- 6.4 Short-Pitch belay on 4th Class terrain ☐
 - 6.4.1 Employ body belay ☐
- 6.5 Short-Rope belay on 4th Class terrain ☐
 - 6.5.1 Employ carry coils techniques ☐
- 6.6 Belay 2 followers simultaneously on 5th class terrain ☐
 - 6.6.1 Belayer must use autoblocking BRD ☐
 - 6.6.2 Belay must be done from above climber ☐
 - 6.6.3 Belayer must keep ropes separately stacked for the entire rope length ☐
- 6.7 Install a bolt with a power drill ☐
 - 6.7.1 Bolt must be installed correctly ☐
- 6.8 Install bolt with a hand drill ☐
 - 6.8.1 Bolt must be installed correctly ☐
- 6.9 Sketch a climbing topo ☐
 - 6.9.1 Must use standard symbols ☐
- 6.10 Belay & lower a climber with a body belay ☐
 - 6.10.1 Belayer may not use a friction device ☐
 - 6.10.2 Belayer may use a climbing harness ☐
 - 6.10.3 Belayer may use 1 carabiner ☐
- 6.11 Demonstrate community awareness through identifying 5 local route developers by name ☐

7 Additonal Skills☐

CSI Level 1

1.1 Identify climbing harness parts

For each part, ask the participant to name the part-

1.1.1 Waist Belt

This is the belt around the waist, normally with a buckle to be doubled-back. Many current harness manufacturers use "speed" buckles that stay doubled back, and are not fully unthreaded to remove the harness. Others, particularly for mountaineering harnesses, have speed buckles that are easy to thread and unthread. This allows putting on a harness without stepping through any loops; useful when wearing crampons or skis. The waist belt also has one of the hard points for tying in ropes and slings.

1.1.2 Leg Loop

The leg loops go around each leg, are connected together with a strength member, and provide half the redundancy of a sit harness. Leg loops are also what allow hanging in a sit harness for hours without losing feeling the legs or suffocating. The center of the front of the leg loop connector is normally the lower hard point of a typical sit harness.

1.1.3 Front Leg Loop Riser

This is also better called a bridge between the leg loops. Has a hardpoint.

1.1.4 Rear Leg Loop Riser

These keep the leg loops from falling down to the knees, which causes the harness to fold the climber in half when they sit down. Are often elastic, and droppable for going to the bathroom without taking off the harness.

1.1.5 Belay Loop (if present)

Most modern harnesses have a strong belay loop connecting the leg and waist hard points. Some mountaineering or ultralight harnesses drop the belay loop for weight savings.

1.2 Select a climbing harness; who needs a full-body harness?

Ask the participant who needs to use a full-body harness.

1.2.1 Anyone under 16 years old

The soft bones and lack of hips on young climbers means they should use a full-body harness setup.

1.2.2 Anyone who is pregnant

A full-body harness allows tying in above the waist, preventing pressure on the abdomen.

1.2.3 Anyone with a waist bigger than their hips

Anyone where the harness waist belt can't be collapsed to prevent dropping over the hips needs a full-body harness to prevent catastrophe if they invert.

1.3 Fit a climbing harness

1.3.1 Waist belt must not be able to pull over the iliac crest

This is important. A climber can be inverted in a fall, and if the waist belt can slide over the hips, the climber will fall out of the harness!

1.3.2 All buckles must be secured in accordance with manufacturer's instructions

This normally means doubles back, but could also be speed buckles or some other setup depending on the manufacturer.

1.3.3 Leg loops must fit tight enough to prevent pinching

Very loose leg loops can ride up in a fall or weighting the rope, and pinch in the groin. Very uncomfortable.

1.3.4 Front leg loop risers must be long enough to not deflect the waist belt

The waist belt needs to be straight, not pulled down at the front.

1.3.5 Front leg loop risers must be short enough to prevent waist belt from reaching rib cage

If the waist belt can rise to the rib cage, the belt will inhibit breathing.

1.3.6 Rear leg loop risers must be tight enough to prevent leg loops from reaching the knee

If the leg loops drop to the knees, sitting in the harness will try to fold the climber in half, and impede breathing.

1.3.7 The waist belt, leg loops, risers, and belay loop must not be twisted more than 90 degrees

Twisted loops will be uncomfortable, put extra stress on components, and will affect belay performance.

1.4 Tie into a climbing harness (rewoven figure 8)

1.4.1 Figure 8 knot is backed up with an overhand knot with 1"-4" of tail beyond overhand knot

The figure 8 is used instead of other knots because of the ease of inspection. It is also very strong, and easy to tie around/through the hard points of a harness.

1.4.2 Strands must not be twisted

All strands should be parallel on both sides of the knot. 5 pairs from the harness to the free ends.

1.4.3 Rope must be threaded in accordance with manufacturers instructions

Check the harness to see where the rope needs to be run. Most harnesses have the rope run through 2 hard points (leg loop bridge, waist belt front).

1.5 Conduct a pre-climb safety check

1.5.1 Team must consist of 2 climbers

We are starting here with just a 2-climber team. Additional climbers can be incorporated once using 2 ropes or other uncommon setups. In any case, all team members should inspect themselves and all other team members.

1.5.2 Belayer must use 1 rope and 1 BRD on their harness

This assessment is for a 2-person team with a single rope. The BRD must be on the belayer's harness.

1.5.3 Both harnesses must be selected in accordance with §1.2

Both climbers must have appropriate harnesses.

1.5.4 Both harnesses must be fit in accordance with §1.3

The fit of the harnesses on both climbers must be good, and both team members check all harnesses.

1.5.5 Both people must be tied to the rope in accordance with §1.4

There is never a penalty for tying into both ends of the rope. There are cases where not being tied in can result in dangerous scenarios. Thus, we should encourage always tying into both ends.

1.5.6 Belay carabiner must be locked in the fully closed position

Closed locking carabiner must be locked closed. However the carabiner locks, check that it is locked in the safety check.

1.5.7 Rope must be properly threaded through the belay device

Whatever on the belay device, it must be rigged correctly.

1.5.8 Both people must have a common understanding of the descent plan

Before anyone leaves the ground, or belay station, the entire team needs to know what the plan is once the climber reaches the next anchor. This could be lowering, continuing, cleaning, etc.

1.6 Belay a top-roped climber

This skill is the general top-rope belay of a follower with a device on the belayer's harness. The typical gym skill, although we are requiring 2-slot devices for other reasons.

1.6.1 Belayer must use 1 rope and 1 BRD on their harness

Single rope only for this skill. Double rope setups are covered later.

1.6.2 Belayer must maintain a secure position that enables them to maintain control of the rope when violently pulled. This may require anchoring themselves to the Earth

Depending on the weight of climber vs. belayer, anchors may be required. Do not depend on an Ohm device or similar. We are looking for the belayer to be close to the wall, on good footing, with easy control of the rope under violent falls.

1.6.3 Belayer must maintain at least their thumb and forefinger in a closed loop around the brake strand, from as soon as the climber says *On Belay*, until the climber says *Off Belay*

This is essentially not letting go of the brake strand. The ring with thumb and forefinger is the minimum; other fingers may be added. With a ring around the brake

strand, the belayer cannot drop or lose the rope while belaying. Do not let go of the brake until the belay is released.

1.6.4 Belayer must not allow the climber to hit the ground

No dropping climbers. Ever.

1.7 Belay a lead climber

1.7.1 Belayer must use 1 rope and 1 BRD on their harness

Similar to top-rope belay, the skill here is with a single rope and device on the harness.

1.7.2 Belayer must maintain a secure position that enables them to maintain control of the rope when violently pulled. This may require anchoring themselves to the Earth

Same as top-rope belay, but more so. Lead falls generate much larger forces, and thus the belayer is at greater risk of flying to the first protection. Ground anchors are a good idea when the leader outweighs the belayer.

1.7.3 Belayer must maintain at least their thumb and forefinger in a closed loop around the brake strand, from as soon as the climber says *On Belay*, until the climber says *Off Belay*

Same as the top-rope belay. Do not let go of the brake strand until the belay is released.

1.7.4 Belayer must consistently allow the climber to advance

Unlike the top-rope belay, the lead belay must take care to have enough slack the climber can advance, but not so much that the leader falls too far.

1.7.5 Belayer must not allow more rope out of the belay than what allows the climber to advance

Too much slack is very dangerous, as a lead fall could become long enough for the climber to hit rocks or ground.

1.8 Respond to commands

This is checking on a minimal set of commands; more commands are typically in use, and currently collected in a separate document.

1.8.1 When climber says *On Belay*, the belayer immediately employs a method to control the rope speed. Immediately after doing so, the belayer responds with *Belay On*

Do not respond until the rope is controlled. The now-belayed climber may immediately trust their life to the belay when they hear *Belay On*.

1.8.2 When climber says *Climbing*, the belayer immediately ensures the entire length of rope will move smoothly and consistently through the belay. Immediately after doing so, they respond with *Climb On*

1.8.3 When the climber says *Slack*, the belayer immediately feeds rope out of the belay

This is the basic command for getting more rope out of the belay. The belayer should give an arm-pull of slack as quickly as possible. The belayer then goes back to locking off the belay in case of a fall. If the climber needs more slack, they repeat the command. This command should not be used to indicate lowering down a pitch, as there is no way for the belayer to know what sort of slack the climber is requesting. To lower down the pitch, use *Lower*.

1.8.4 When the climber says *Lower*, the belayer lowers the climber to the ground or until the climber says to stop (*That's Me*)

This is different from *Slack* in that the belayer is being asked to slowly lower the climber, not give an armful of slack as fast as possible. The lowering will continue until the climber requests a stop with *That's Me* or until the climber is on the ground.

1.8.5 When the climber says *That's Me*, the belayer immediately stops moving the rope.

That's me is the general stop command for any rope motion. We have discovered that "Stop" does not carry well in the mountains. The "a" and "eee" sounds carry better. This command also comes from multi-pitch routes, where the climber at the next belay is pulling up all the extra rope; when there is no more rope, the bottom climber is telling the top climber they are trying to pull them up the wall ("stop pulling, that tension is me!").

1.8.6 When the climber says *Up Rope*, the belayer immediately pulls rope into the belay

This differs from *Tension* in that *Up Rope* instructs the belayer to remove some slack, but not try to hold the climber at their current location. As soon as the rope comes tight, the belayer stops taking in rope.

1.8.7 If the climber says *Tension*, the belayer immediately takes as much rope as possible into the belay

Tension differs from *Up Rope* in that the belayer is trying to get ALL the slack removed, and start removing the stretch.

1.8.8 When the climber says *Off Belay*, the belayer immediately ensures the rope will move without control. Immediately after doing so, the belayer responds with *Belay Off*

The belayer should not respond with *Belay Off* until the rope is uncontrolled. As soon as the belayer responds, the climber may start pulling the rope as fast as desired; this makes it hard to release a belay device. If the belayer needs the climber to stop pulling rope, say *That's Me*.

1.9 Safely lower a climber 50' (16 m) through a top anchor

This is checking on the typical top-rope lower of the climber back to the ground from the top anchor.

1.9.1 Belayer must use 1 rope and 1 BRD on their harness

This is an outgrowth of the top-rope belay.

1.9.2 Belayer appropriately changes speed relative to terrain

The belayer controls the lowering speed so that the climber does not fall or drop badly at roofs. The belayer will stop feeding rope if the climber unweights on a ledge until the climber reweights at the edge of the ledge.

1.9.3 Belayer appropriately changes speed relative to the climber lowering

Do not lower so fast the climbers can't keep up. The climber needs to be comfortable and walking down the wall at their pace.

1.10 Demonstrate respect for other climbers at the crag

This "skill" is about keeping the climbing areas neat and tidy, preventing silly falls from tripping on gear, and not being annoying to others out in the mountains.

1.10.1 Gear is kept in or under pack while climbing

Don't leave gear spread all over the staging area or base of the crag. Keep gear corralled into or under your pack and away from the base of the climbs.

1.10.2 Gear is kept out of staging areas when climbing multi-pitch routes

When leaving for a multipitch route, make sure all the team's gear remaining on the ground is out of the way of anyone else coming to climb the crag. Collect gear to keep it from blowing around in the wind.

1.10.3 Talking is minimal and quiet when others are leading nearby

Leaders need to talk to their belayers; do not make it hard for a belayer to hear their climber.

CSI Level 2

2.1 Build a 2-bolt belay anchor

From Earth to power point, the system must be: **S T E A M E R S**

2.1.1 S - Strong

The rock, protection, and other anchor components must individually be strong. A strong anchor cannot be built from terrible components.

2.1.2 T - Timely

Assembling the anchor system should be efficient and quick. Speed is less important than correctness, but excessive slowness increases exposure to objective hazard.

2.1.3 E - Equalized

The load should be spread equally among all the protection in the anchor. The load should be equalized in all reasonable directions of pull in use. This includes the following climber and the leader for the next pitch.

2.1.4 A - Angle

The angle between any 2 legs of the equalized anchor system must be less than 90 degrees, and should have a goal of less than 45 degrees. Minimizing the angle, given

terrain and angle, is an important requirement. Angles between legs should not exceed 90 degrees; each (equalized) piece will take more than the full load at the power point!

2.1.5 ME - Minimal Extension

Minimize extension while maintaining equalization. Excessive extension leads to shock loads on protection, which leads to cascade failure of the entire anchor system. Since no extension removes equalization, some extension and equalization is better.

2.1.6 R - Redundant

No single point of failure between the Earth and the power point. Multiple independent strands at the power point. Any single failure will not cause a failure of the entire anchor system.

2.1.7 S - Simple

The simplest anchor system that meets all the other requirements is preferred over more complex options. Simple is easy to inspect. Simple is fast to assemble. Simple takes less gear.

Examples

Note that some currently popular anchor options do not meet these requirements. Others do. Some examples-

- Cordelette with static BFK for power point - does not equalize; your attempt at equalization when tying the knot is wrong. No extension, but all the load will be on a single piece at a time.
- Sliding X - with one sling, fails redundancy. With 2 slings, fails minimal extension leading to large shock loads.
- Sliding X with limiting knots - meets all requirements. Limiting knots minimize extension and make each leg independent.

- Quad anchor - meets all requirements. Doubled sling with limiting knots, clip at least 2, no more than 3 in the power point.
- Cordelette used as an "equatelette" - meets all requirements, but can be excessively long at a bolted belay station.
- Girth Hitch Master Point - fails redundancy, equalization. Think about the sling failing in the top of the knot.
- Sling with static BFK for power point - does not equalize.

2.2 Build and rappel from carabiner block

This technique is applicable to both the cases where 2 ropes are being joined, and one is too small for a rappel (e.g. 9.5 mm rap line, 5 mm pull cord); and the case where a single rope is rigged through the anchor, but the climber does not have a 2-strand rappel device. This is common for someone rappelling off a pitch with a grigri or equivalent.

2.2.1 Carabiner Block must consist of a clove hitch and a locking carabiner

The clove hitch locks the rope to the carabiner, and the carabiner is on the far side of the anchor from the rappel line. This way, pulling on the rappel line brings the carabiner against the anchor, which stops it. The clove hitch is preferred in this application. Tying a bight leads to the carabiner flopping about, increasing the chance of the entire rope getting stuck on the pull.

2.2.2 A locking carabiner joins a clove hitch on the pull strand to the rappel strand

By clipping the carabiner around the rappel line, the top of the setup is a closed loop. This prevents the uncommon, but serious, case where unweighting or shifting of the carabiner while on rappel can allow the carabiner to slip through a large anchor ring. This has happened.

2.2.3 Rappel on one strand. Retrieve with other strand

Obviously, the climber needs to rappel on the strand that is locked by the carabiner block, and pull the other strand. Ideally, the climber should track which strand to rappel and pull from the start, with no false starts or wrong choices. It is up to the assessor how many wrong choices lead to not passing the skill.

2.3 Join ropes with 2 Double Fisherman's Bends

This is the preferred knot for joining ropes when any doubt in another method might be present. The double fisherman's will work with wildly different diameters and materials. It does not depend on friction, and will not untie when rolled across the rock. For this reason, we start everyone with the double fisherman's. Also, this knot on one line is perfect as the stopper knot for rappelling.

2.3.1 Two Double Fishermen's Bends must be tied and interlaced correctly

When tightened, the knots should be straight, with a minimum of 2 wraps on each side. All strands should be next to each other, with no gaps.

2.3.2 Rope strands must not be twisted

2.4 Clean a 2-bolt anchor & rappel

The WMC preference is to sling out the rappel device, to allow the backup to be attached to the belay loop on the harness. Slings out the rappel will also help prevent climbers from inverting on rappel, even with a pack. When slinging out the rappel, the device must still be reachable while descending.

2.4.1 Climber remains secured to protection from arrival at anchor until on rappel

From when the climber reaches the anchor, they must remain secured to the fixed protection at all times with at least one locking carabiner on a tether or sling, and

preferably 2 separate connections. Once the climber has tested the rappel system, they may remove the connections from themselves to the fixed protection.

2.4.2 Equipment is removed from a 2-bolt anchor with chain hardware

Nothing should be left except the fixed protection.

2.4.3 Rope is properly threaded through two chains

The rope should go through the bottom of the chains, without knots or twists. The rope must not be over too thin an edge.

2.4.4 Chains must not be twisted

Twisted chains will trap a rope when trying to pull the rope down.

2.4.5 Rappel with a BRD using 2 rope strands

Both strands in the device, and control both strands so they do not slide through the fixed protection.

2.4.6 Foot position is appropriately wide while descending

No falling sideways.

2.4.7 Speed is safe while descending

No dropping onto the ground.

2.4.8 Body angle prevents foot slippage while descending

The climber must keep their feet high enough for secure foot placements. Slipping can lead to loss of control.

2.4.9 Obstacles are passed without slipping or injury while descending

No hitting the face on the roof.

2.4.10 Locking friction hitch is correctly used to back up rappel

Either a VT Prussik above the rappel system, or autoblock below the rappel device may be used. Suitable material for a friction hitch must be used. The backup must be connected with a locking carabiner.

2.5 Understand single, half, twin & static ropes

2.5.1 Legitimate uses must be accurately explained

2.5.2 Elongation differences must be accurately explained

2.6 Join webbing with a Ring Bend

This can be done with 2 different pieces of webbing, or one long piece being tied into a loop.

2.6.1 Ring Bend must be tied correctly

Each end of the webbing goes into the knot from each side. This is not an overhand on a bight, but a rewoven overhand with tails on each side.

2.6.2 Ring Bend must be well-dressed

No twists or gaps in the knot. Tails are at least 2 inches long on each side. Knot should be set with body weight or more.

2.7 Explain leading and top-roping

2.7.1 Differences in risk must be accurately explained

2.7.2 Differences in the effect on the belayer and anchors must be accurately explained

We are looking for recognition of the dangers to the belayer and anchor from lead falls, and how the belayer must mitigate those risks each pitch.

2.8 Identify geological features

Photos may be used.

2.8.1 Scree

Small loose rocks, less than double-fist size.

2.8.2 Talus

Larger loose rocks, at least double-fist size.

2.8.3 Intrusion

Geologic definition - foreign rock injected into an existing rock formation.

2.8.4 Buttress

Large independent rock formation; bounded by terrain features.

2.8.5 Crack

Open fracture in the rock face. Large enough for stuff to be inserted into, but smaller than a chimney that admits the entire body.

2.8.6 Seam

Closed fracture. May be only a corner, or undercut with no space for protection.

2.8.7 Arete

Outside corner on a buttress.

2.8.8 Dihedral

Inside corner on a buttress.

2.8.9 Ledge

Horizontal shelf with space on top of the shelf.

2.8.10 Roof

Horizontal shelf with an undercut; may be bottom of a ledge.

2.8.11 Chimney

Crack wide enough to admit the entire body for climbing.

2.8.12 Summit

Top of a formation that is more equal in width and length.

2.8.13 Ridge

Elongated top of a formation.

2.8.14 Spur

A ridge that has one end on a larger formation/mountain, and the other end in space.

2.8.15 Draw

A valley on the side of a mountain.

2.8.16 Couloir

A draw that terminates in a headwall.

CSI Level 3

3.1 Identify 3 bolt types typically used in fixed protection

The goal here is to recognize what sort of fixed protection is being encountered on unfamiliar routes. Thus, the details given here are about recognizing bolts once installed, not on the shelf.

3.1.1 Compression bolts

Button heads. No method of using a wrench; they are not tightened after installation.

3.1.2 Expansion bolts

Studs with nuts or hex heads for tightening with a wrench after being driven into the hole.

3.1.3 Glue-in bolts

Visible glue or a wire bent into a P-shape with 2 ends going into the hole are the most common indications of a glue in. Generally don't have separate hangers.

3.2 Lead 80' (25 m) of 5th class with bolts

This is essentially sport leading. The fixed protection is expected to be bolts to a 2-bolt belay station. Any kind of draws can be used, and the lead should include building a top-rope anchor at the end. The 80' should be in one pitch. Anchor should meet the requirements in §2.1.

3.2.1 Rope must be properly clipped into carabiners

No back clipping. No Z clipping. Spine to the line.

3.2.2 Runners must prevent rope drag

Quickdraws may be used, but alpine draws should be used where needed to prevent rope drag. Choosing a route with some wandering is preferable for the assessment of this skill.

3.2.3 Protection must prevent team injury

No skipped bolts, and choose a route for the assessment that is not dangerously run out.

3.3 Join 2 ropes with Flemish Bend

This is a rewoven Figure-8 with 2 different ropes. Rope diameters should be within 1 mm of each other for a good hold in the knot. Ropes enter from opposite sides. You may add an overhand to the free tails as backups.

3.3.1 Must be tied correctly

All strands are flat, parallel, with no gaps. Tails are at least 6 inches before backup knots.

3.3.2 Strands must not be twisted

3.4 Belay & lower a climber with a Munter Hitch

This must be from the top of a pitch, with the Munter carabiner directly attached to the power point of a belay anchor. The point is to use a Munter on a locking carabiner to replace the belay device normally used, AND to show that the climber knows how to belay from the top directly off the anchor with a single rope.

Choosing an HMS carabiner is a good idea.

3.4.1 Munter hitch must be attached directly to anchor

The Munter hitch carabiner must be in the power point or shelf, so it is clipped to all components of a STEAMERS anchor in compliance with §2.1. The carabiner should be a locking HMS style, and must be locked while belaying and lowering.

3.4.2 Lowering speed must be appropriate to the terrain

The belayer should keep up with the climber during ascent, and control the speed when lowering.

3.4.3 Speed must be appropriate to the skill of the person being lowered

The lowering must not be faster than the climber's comfort level.

3.5 Tie a Prussik Hitch

Start with a fixed, tight rope for the Prussik. Any suitable material can be used for the Prussik - accessory cord, rope, or other rated material (e.g. Hollowblock or VT Prussik). Do not use HMW PE for friction hitches. Both hands may be used. When the climber hangs on the Prussik, it must not move.

3.5.1 Tied correctly in under 20 seconds

The knot must start at the outside, with wraps moving to the center. The wraps are next to each other, without crossing. The spine cord is tight to the hitch. Any sewn section in the sling is out where the carabiner clips, but does not prevent the loop from being straight.

3.5.2 Hang from Prussik Hitch

When the climber hangs from the Prussik, it must not move on the rope.

3.6 Understand climbing shoe features

We are looking for differences in edging, crack climbing, friction climbing, and comfort.

3.6.1 Must explain how camber, midsole & toe profile affect performance

Edging vs friction climbing, crack vs face, etc.

3.6.2 Must explain differences in fit and stiffness

For example, slippers vs. trad shoes.

3.6.3 Must explain differences in capabilities on various terrain

This is particularly relevant for friction and crack climbs.

3.7 Coil 200' (60 m) of rope

As a general note, wrapping around an arm is an instant fail here. We are looking for a butterfly coil of some sort, so it can be collected into a backpack, or tied off to attach

to a pack, and will drop nicely when thrown into space off a cliff. Mountaineer's coils are not appropriate here, as they will not fall nicely when thrown.

3.7.1 Coils must be less than 6 feet long

Coils longer than this will be too long for a pack or use as a backpack.

3.7.2 Coil must be secure enough to be thrown without falling apart

When secured, the coil should stay together until released.

3.7.3 Coil must be easily carried on back or backpack

This could be 2 different styles of coiling - one that whips the tails around the center of the coils for laying over the top of a pack, and one that wraps the coils in half to be a backpack itself. The tails must be long enough to allow wrapping around the coils and waist to tie the rope to the climber. Use a square knot in the tails to secure the rope to the climber.

3.7.4 Coil pays out easily when unsecured and thrown

This is where we effectively require butterfly coils. Other coiling methods do not fall cleanly when thrown off a cliff.

3.8 Identify standard climbing topo sketch symbols

3.8.1 Arete

See label ??? in figure ????.

3.8.2 Dihedral

See label ??? in figure ????.

3.8.3 Ledge

See label ??? in figure ????

3.8.4 Roof

See label ??? in figure ????

3.8.5 Chimney

See label ??? in figure ????

3.9 Give a Safety Briefing

This is going through the briefing document for a climbing activity. Include the sections on approach difficulty and dangers if applicable.

3.9.1 Address equipment requirements for 3rd class terrain on the approach if applicable

This is for when the approach will require light scrambling, with little exposure.

3.9.2 Address equipment requirements for 4th class terrain on the approach if applicable

This is when the approach will have exposed and significant scrambling.

3.9.3 Address equipment requirements for 5th class terrain

Some climbs have a short 5th-class section to reach the base of the climb. If this is the case, bring up the sections of the safety brief that apply.

3.9.4 Address equipment to mitigate injury from possible rockfall on the approach if applicable

This means helmets, of course.

3.9.5 Address respectful behavior toward other climbers that may be encountered

Gentle reminders to not scatter gear across the base of the crag.

CSI Level 4

4.1 Build belay anchor without fixed protection

From Earth to power point, system must follow **S T E A M E R S**. See §2.1 for discussion of acronym and terms. This is like §2.1, but with traditional (temporary) protection. This will generally mean a 3-piece equalized anchor instead of the 2-bolt station in §2.1. The same acronym and requirements apply, but now there is a lot more to the strength of placements, and equalization becomes even more important. Equalettees are an excellent option here, but by no means the only good (much less acceptable) option.

4.2 Lead 80' (25 m) of 5th class without fixed protection

This should be a single pitch of trad climbing, and not direct aid. The climber must place the protection and build an anchor without using any fixed protection. Obviously, they can use a fixed rappel station to get off the climb when done.

4.2.1 Rope must be properly clipped into carabiners

This means no Z clipping, no back clipping, and using the correct end of quick draws or slings. See §4.2.3 for more instructions on the placements.

4.2.2 Runners must prevent rope drag

Use of any sort of draw or runner is permitted, so long as they will hold a lead fall. However, the leader needs to choose slings that will prevent rope drag on the pitch. They must also keep the sling choice in mind for §4.2.3, below.

4.2.3 Protection must prevents team injury

Protection must be placed that will hold a lead fall at any point, with minimal chance for injury of the leader. The slings should not extend the fall to where the leader might get hurt by hitting a wall feature or the ground. The placed protection must be sufficiently strong to hold a lead fall, and sufficiently close together to prevent the leader from hitting anything when falling. The protection must also prevent a follower from taking an excessive fall or swing that could lead to injury.

4.3 Explain "pitching" belays

We are looking to make sure the climber understands what happens on a multi-pitch climb, including the transitions.

4.3.1 Member explains switching roles between climbing and belaying

The training and assessment should include when and how to clean the anchor, the required communication between climbers, and how to swap leads or not.

4.4 Tie a bowline around your waist

This is in a single line, and included because of rescue scenarios where someone without a harness is on high-angle terrain. Both hands may be used.

4.4.1 Strands are well-dressed

The tail should emerge from the middle of the knot, and should be at least 6 inches when tightened. No gaps in the knot; the knot should be fully set.

4.5 Escape the belay

This will require an anchor for the load, and any number of techniques to transfer the load to an anchor and then get out of the belay. When completed, the load should be tied off to the anchor with a releasable system, with a static backup to the anchor.

4.5.1 Belay must be loaded

Start with at least 50 lbs, and preferably 200 lbs on the belay line. Do not put a climber at risk of serious harm during the assessment.

4.5.2 Belay must begin on harness

The belay must be in a BRD, and on the harness. Then end with the belayer completely out of the system, as is the BRD.

4.5.3 Member must maintain control of the load

It is an automatic fail to drop the load (climber) at any point. Escaping can be done without unweighting and without dropping the load, so that is the standard.

4.6 Rappel without a harness

4.6.1 Any safe, recognized, legitimate method may be employed

Examples include the Dulfersitz, the South African Style (????).

4.7 Identify pitons

The goal here is for climbers to be able to identify pitons in the field. This is mostly for inspecting protection on routes and at anchors.

4.7.1 Point to each item and ask, "What is this?"

Blade Piton

These are both thin and thick (knifeblade vs. Lost Arrow). Also note these may include both steel and iron. Steel pitons are reusable. Iron pitons are not - place once and leave until they rust into nothing.

Angle Piton

These are larger, and more often reusable steel. They are often left as alpine anchors in larger cracks.

4.8 Identify & understand runner materials

HMW PE goes by a number of trade names: Spectra, Dyneema, etc. All are variations of an Ultra-High Molecular Weight Poly-Ethylene; very strong, slick, and low melting point. For the last 2 reasons, PE is a bad choice for friction hitches. It is also very difficult to tie into a loop that will hold; HMW PE slings are bar-tacked to make a loop. PE has almost no stretch, which makes it dangerous to fall on. Nylon stretches some, making it safer for a tether that might take a fall. Nylon has a much higher melting point and is much less slick, so it is suitable for friction hitches and tied webbing loops. Nylon absorbs water, and weakens when wet.

4.8.1 Ask member to explain the difference between these two runners

Member identifies nylon runner

This should be a sewn runner, of any common length. Choose a 3/4" runner, if possible instead of a 1" runner.

Member identifies Dyneema or Spectra runner

This should be a sewn runner, of any common length. Preferably, choose larger HMW PE widths to better match the nylon sling.

Member demonstrates they know nylon has greater elongation and water absorption

PE does not absorb water. Nylon does. PE does not stretch (VERY high peak force in a fall). Nylon stretches a few percent (much lower peak force in a fall).

4.9 Identify features on a USGS topo

Any map with the features will work, but depending on the difficulty desired, a local map could be used instead of a random map from somewhere in the world.

4.9.1 Summit

Closed contour loops at a high point.

4.9.2 Ridge

Long, parallel contour lines in a high region.

4.9.3 Spur

Long contour lines closed on one end.

4.9.4 Draw

Notch in the contour lines.

CSI Level 5

5.1 Lead a 400' (122 m) route without fixed protection

This should be a set of trad pitches. No bolts (even for anchors) or direct aid. No injuries. The climber may swap leads, but the pitches following do not count towards the 400' (130 m). Leads meet the criteria for §4.2; no credit for soloing.

5.1.1 Route must be at least 400' (122 m) long

The route can be longer, and the climber can swap leads. This could require an 800' route of 5th class terrain.

5.1.2 Route may not have fixed protection

The ascent route must not have fixed protection. The descent may use fixed protection.

5.1.3 Protection must prevent team injury

See §4.2 for details of this requirement.

5.1.4 Direct aid may not be used

Free climbing, with a rope and protection, only. Direct aid is covered in another entry.

5.2 Climb with direct aid

This is a requirement for some experience in direct aid. The climber should use full aid gear, including ladders and daisy chains. The climber may use fixed anchors to retreat after the lead.

5.2.1 Direct aid section must be at least 25' (8 m) long

Less than this length is too short for good experience.

5.2.2 Aid must be employed on lead

Following aid is just juggling a line, so the climb needs to be on lead.

5.2.3 Protection must prevent team injury

Protection must hold for the aid climbing, and protect the follower.

5.3 Tie a Munter Mule knot

Using a rope or sling, tie a Munter Mule around a carabiner. Fix the other end of the sling first. Munter Mule must not slip when loaded.

5.3.1 Properly tie within 20 seconds

The Munter hitch should be easily visible on the carabiner. Above that, at the Munter hitch, should be the slip knot (Mule). Above the Mule should be an overhand to lock the Mule. All should be directly on top of each other; no slack to creep.

5.4 Tie a Butterfly knot

Use a rope, and tie in the middle. Knot must be nicely dressed when completed for inspection. Loop must be at least big enough for a carabiner to clip.

5.4.1 Properly tie within 20 seconds

The loop is large enough for a carabiner to clip, and the wraps on the sides are symmetric.

5.5 Belay with two twin or double ropes

Using a belay device on your harness, belay a climber through a top anchor using twin or half ropes. The belay must be controlled at all times. Clearly, a device for two ropes must be used.

5.5.1 Belay must be done from above climber

The anchor point must be above the climber; this is to be a top-rope belay.

5.5.2 Belayer must keep ropes separately stacked for the entire rope length

This is to keep the ropes clear for feeding back out.

5.6 Haul a bag with a Z-pulley

We are looking to make sure the climber knows how to build a simple Z pulley with the rope, a Prussik, carabiners, and a progress capture setup. If using an auto-blocking belay device, the belay device is the progress capture setup. It is a fail to just haul the bag up by raw arm strength.

5.6.1 Use 1 rope, 1 auto-blocking BRD, 1 prussik, & 3 carabiners

Progress capture should be using an auto-blocking belay device. The prussik and carabiners form the rest of the Z-pulley rigging. Use the rope instead of a sling, since the rope is loose.

5.6.2 Bag must weigh at least 50 pounds

Bag should be free-hanging, so it is not snagged on the rock when hauling it up.

5.7 Tandem rappel

The goal here is for a tandem rappel; two people on one rappel system. The preferred setup is to sling out the rappel device from the controlling climber, and attach the second climber to the slung-out device. Additional backup connections are made from the second climber to the controlling climber, in case the rappel sling fails. The second climber should be below the controlling climber, but close enough that the controlling climber can help the second climber around obstacles. A rappel backup is mandatory. This skill is for getting a climber down who, for whatever reason, cannot rappel themselves.

5.7.1 A second person must be directly attached to member

There must be more than one connection between the climbers. No single points of failure except the rappel device, locking carabiner, and rope.

5.8 Install & remove pitons

This can be done anywhere a suitable crack is available; it probably should **not** be on a climbing route. Removal must be done with a hammer and funkness device, not by destroying the rock. Use steel pitons, not iron.

5.8.1 Install angle piton

5.8.2 Install blade piton

5.8.3 Remove angle piton

5.8.4 Remove blade piton

5.9 Demonstrate community awareness by identifying 5 climbers' accomplishments.

There is no real wrong answer here. We are looking for the climber to find out about some local or national climbers, and what they have done of note. Note that there is no requirement for what the climbing accomplishments are, or how famous the climber's need to be.

CSI Level 6

6.1 Climb a fixed rope with friction hitches

Any friction hitches may be used, so long they can lock onto the rope to hold the climber when weighted. The rope must be climbed with the friction hitches, not the rock with hitches to capture progress. The rope does not have to be free-hanging, but a free-hanging rope is ideal for this skill.

6.1.1 Must climb 50 feet

At least 50 feet (15 m) of rope must be ascended by friction hitches. Any method to descend is allowed.

6.2 Tie into the middle of a rope with a bowline on a bight

This is for tying into the middle of a climbing rope for lead climbing.

6.2.1 Must be properly dressed

Knot must have free end of the bight come through the center of the knot. All strands must be parallel, with no gaps in the knot. The free end of the bight must be clipped to the belay loop with a locking carabiner.

6.3 Tie a Munter Hitch with one hand

Use a rope and a carabiner attached to the wall. For extra points, also tie a clove hitch with one hand.

6.3.1 Must tie in less than 20 seconds

When completed, must be a clean Munter hitch.

6.4 Short-Pitch belay on 4th Class terrain

This is a set of techniques for helping people and climbers through a short exposed or tough section on otherwise easy terrain. The leader uses a hip belay (or equivalent) with a minimal, perhaps terrain, anchor. The pitch will be 10-30 feet (3-10 m) maximum length.

6.4.1 Employ body belay

Use a hip belay, with carabiner lock if desired. The emphasis is on speed, not strength.

6.5 Short-Rope belay on 4th Class terrain

This is a set of techniques for moving on 4th class terrain with some protection for the follower in case of losing their balance.

6.5.1 Employ carry coils techniques

The leader carries coils to keep the rope short, and allow them to pull a falling follower back into balance.

6.6 Belay 2 followers simultaneously on 5th class terrain

6.6.1 Belayer must use autoblocking BRD

The belay device used must automatically lock if a follower falls. Each rope can be a single rope, twin rope, or double rope.

6.6.2 Belay must be done from above climber

The belay should be done directly off the anchor.

6.6.3 Belayer must keep ropes separately stacked for the entire rope length

The climb should be at least 80 feet (25 m) long.

6.7 Install a bolt with a power drill

This does not need to be on a route. Either on a route being developed, with permission, or in a boulder in a yard. The skills are about how bolts work in the real world, and what it takes to place a bolt in a cliff.

6.7.1 Bolt must be installed correctly

If installing an expansion bolt, the hanger should be tight and the nut/head tight to the rock. Glue-in bolts should have the correct glue installed in the correct conditions. Compression bolts are not allowed for this skill.

6.8 Install bolt with a hand drill

This does not need to be on a route. Either on a route being developed, with permission, or in a boulder in a yard. The skills are about how bolts work in the real world, and what it takes to place a bolt in a cliff. Hand drilling is something everyone

should do once to see how slow it is. This skill can also be a last resort for escaping keeper potholes.

6.8.1 Bolt must be installed correctly

If installing an expansion bolt, the hanger should be tight and the nut/head tight to the rock. Glue-in bolts should have the correct glue installed in the correct conditions. Compression bolts are not allowed for this skill.

6.9 Sketch a climbing topo

This should be a route with which the climber is familiar. This is not for a new route, or one in development. More than one attempt may be made, if time allows.

6.9.1 Must use standard symbols

The topo should also be roughly to scale.

6.10 Belay & lower a climber with a body belay

This is most likely a hip belay with a carabiner to control the incoming rope so the belay cannot unravel. The climber should not be dropped, and the lowering must be in accordance with §1.9.

6.10.1 Belayer may not use a friction device

This is about belaying and lowering WITHOUT a device.

6.10.2 Belayer may use a climbing harness

The belayer should use a harness so they can use the carabiner to keep the belayed strand controlled at the front of the harness.

6.10.3 Belayer may use 1 carabiner

This should be encouraged. Use a carabiner to clip the belayed strand to the belay loop. This keeps the belay from unraveling.

6.11 Demonstrate community awareness through identifying 5 local route developers by name

There is no real wrong answer here. The member needs to look up routes to find the names of 5 different route developers. They do not need to be famous.

Additional Skills, not in the Index

This chapter is for additional skills worth teaching, and notes on how to teach them. They are not part of the index or assessment, but of value to a climber's toolbox.

Feel free to submit ideas for new content to the document authors, WMC climbing director(s), or anyone who can get the suggestion to one of those people.

Additional Knots & Hitches

Friction Hitches

- Kleimheist
- Bachmann
- Autoblock

Knots

- Dog-Eared 8
- Slip Knot
- ????

Additional Hauling Skills

5-to-1 & 10-to-1 Z Pulley Setups

Notes about high advantage setups. Multiple equalized anchors. Forces approaching breaking strength of carabiners, ropes, etc.

Additional Rappel Skills

Rescue Spider

I'd really love to have a description and diagrams for this; seems to be hard to find. Will have to bug Mark about it.