

Mecklenburg County Council

COPE & Climbing

Releasable Rappel with Belay SOP

Overview

The purpose of this document is to set a standard means for rigging and facilitating a releasable rappel with a top rope belay or fireman's (bottom) belay at any MCC camp or climbing/rappelling activity. By use of a standard releasable rappel all instructors will be trained in the same method(s) and therefore be able to release the rappel in case of an emergency incident.

The releasable rappel shown here uses a Munter-Mule-Overhand (MMO) configuration and a single static rope. A 2nd rope is used for the top rope belay. This should be the default setup for both towers at Belk and MSR as well as all natural rock climbing and rappelling events. If using a bottom belay, then clearly the top rope will not be used however the releasable rappel should be rigged the same way as described in this document.

Equipment

The following lists the equipment needed to rig the tethers and rappel as detailed below in this document.

- Belk Scout Camp
 - 2 x Lobster claws including auto locking carabiners for personal attachment
 - 1 Rope Tether – R
 - 1 Rope Tether – T
 - 3 steel screw gate locking carabiners
 - 1 Petzl Rescucender on a sewn sling with dedicated carabiners
 - 2 captive eye tri-action locking carabiner
 - 2 rescue 8 (steel preferred)
 - 1 aluminum rappelling 8
 - 3 screw gate locking aluminum carabiner
 - 1 static rope; minimum 30m (for rappel)
 - 1 static or dynamic rope; 50ft (for top rope belay)
 - 1 loop of accessory cord for use as a friction/prusik hitch (if using a bottom belay)
 - 2-3 pairs of rappel gloves (youth & adult)
 - Rescue bag
- MSR
 - 2 x Lobster claws including auto locking carabiners for personal attachment
 - 1 Rope Tether – R
 - 1 Rope Tether – T

- 3 steel screw gate locking carabiners
- 2 locking aluminum carabiners
- 1 Petzl Rescucender on a sewn sling with dedicated carabiners
- 2 captive eye tri-action locking carabiner
- 2 rescue 8 (belay friction device)
- 1 static rope; minimum 30m (for rappel)
- 1 static or dynamic rope; 50ft (for top rope belay)
- 1 loop of accessory cord for use as a friction/prusik hitch (if using a bottom belay)
- 2 pairs of rappel gloves
- Rescue bag

Tower Cables

At both of our camp towers we use overhead steel cables for all safety tethers and rappel rigging. Always make sure that you only use steel carabiners to clip to the steel cables.

On the rappel cable at both towers are a series of clamps above the rappel position. These clamps should be used to separate the various rappel rigging elements. This helps to ensure that the rigging stays neat and orderly and does not get tangle up when loads are applied. Please note the positioning of the rigging gear and carabiners as detailed below.

Safety Tethers

The first items to be rigged must be the safety tethers at the top of the tower. Safety first. Rig the tethers to keep the instructor(s) safe while completing the rest of the rigging for the top rope belay and the releasable rappel.

At the MSR tower the instructor tether must be rigged and the instructor clipped in before any wooden gate is unlocked and opened.

Instructor Tether

At the towers the lead instructor must be on lobster claws. The lobster claws should be attached to the middle of the cable with the gates on the double carabiners opposite and opposed to each other.



Participant Tethers

Next set up the participant tethers. Note that a second instructor can also be on one of these tethers or an additional set of lobster claws. For the participant tethers we use pre-tied rope tethers including a steel dual action carabiner on one end and an aluminum carabiner on the other end. A steel carabiner must be used to attach the top of the tether to the tower cable. A triple action locking carabiner should be used to clip in the participant. (The scouts are less likely to “play” with the triple action carabiner and open it without the instructor noticing.) Do not untie the rope tethers.

At Belk the primary participant tether is marked with an R and a number to uniquely identify the tether. This tether is short enough to prevent a fall off the platform. This tether is for the participant that is about to rappel. For the south rappel (the main rappel at Belk) it should be clipped to the left of the spacing clamps on the life safety line. On the north rappel (the side facing the flag pole) the primary rappel tether should be clipped to the triangle formed by the life safety line above the ladder on the side of the north rappel.

The secondary participant tether is marked with a T and a number to uniquely identify the tether. It is long enough to allow a participant or observer some limited movement around the inside of the railings at the top of the tower. It can be set up either along the cable above the ladder or inside one of the cable triangles to the left of the tower ladder.

When the rappel participant climbs up the ladder he/she should be attached to the secondary tether. This is also a useful “on deck” position for the next rappeller in line. He/she can watch the rappel process and become comfortable with the top of the tower. When the participant is ready to move to the primary rappel position tether, the participant should be attached to the primary tether before being taken off the secondary tether. The tethers are long enough to meet in the middle to allow for this transfer.



On deck participant tether shown on the cable to the left of the ladder at the Belk tower.



Primary participant tether for the south rappel at the Belk tower.



Primary participant tether for the north rappel at the Belk tower.

When not in use the tether can be left hanging. Never clip the participant end of the tether to a staple on the pole. The staples are NOT life safety rated and a tether must never be clipped to a staple. It is also recommended that a tether not be clipped to the overhead cable. If an aluminum carabiner is on one end of the tether the instructor might inadvertently leave this clipped to the steel cable and attach the participant to the steel carabiner.



Instructor tethers for rappel at the Belk tower.

At MSR the primary participant tether should be attached to the cable to the left of the rappel station gate – the left of the top of the stairs leading to the rappel platform. The participant should not come through the rope “gate” at the top of the stairs until ready to begin the rappel process. The “on deck” position is the top of the stairs behind the rope gate. Note that in the equipment list above and the picture below the participant is on a lobster claw tether (without the Zorber) instead of a rope tether. This is fine as long as the lobster claws are not needed for the High COPE course.



The rappel platform at MSR showing the participant tether on the left at the top of the stairs.

Top Rope Belay

To rig the top rope belay you should use one of the ropes designated for this purpose. A tri-action captive eye carabiner should be tied into both ends of the belay line using a figure 8 on a bite. The top rope belay will be set up using a Munter hitch on a steel carabiner hanging on the cable. This steel carabiner should be positioned in between the right most set of separating clamps on the cable.



Captive eye carabiner tied with a figure 8 on a bite and properly backed up.

The Munter hitch allows instructors of varying heights and belay styles to hold the brake strand comfortably. Some instructors stand while others kneel to facilitate the rappel for shorter scouts such as Webelos. The brake strand of the Munter hitch can be held at any height and still provide plenty of braking strength for any size rappeller.

While one end of the belay rope will remain at the rappel platform, the other end will need to be gently lowered toward the ground. DO NOT throw the other end of the belay rope over the tower. It has a carabiner attached and this could damage the carabiner or cause a personal injury below.

The Petzl Rescucender should be attached to the brake side of the belay rope. This is the end that is currently down the tower. Ensure that the Rescucender is oriented properly. There is an Up arrow on the device. This arrow should point up toward the life safety cable. When in use the screw gate carabiner will be attached to the instructor's belay loop. When not in use the screw gate carabiner can be attached to the captive eye carabiner on the top rope belay.

When not in operation one end of the belay rope with the captive eye carabiner should be raised to the platform and left in place for the next participant. It is often convenient to leave the rescue 8 and rappel gloves clipped to the captive eye carabiner.



Yellow belay rope tied with a figure 8 on a bite through a tri-act captive eye carabiner and tied to the overhead steel carabiner with a Munter hitch.

Note the rescue 8, carabiner and rappel gloves for the participant are already in place.

The Rescucender is attached to the rope for the next rappel (on the brake side of the belay rope) and is clipped to the captive eye carabiner waiting for the facilitating instructor.

Releasable Rappel

Begin by finding the middle of the static rope. Note that the rope must be able to reach the bottom of the tower or pitch with several feet to spare (typically 6'-10') when doubled over. This is necessary in case a jam occurs near the top of the rappel and the participant must be lowered nearly the entire length of the tower or pitch. There also must be a few extra feet for tying the knots in the line(s). For example, if the pitch is 35' then you need a rope 80' or more.

Tie the midpoint of the rappel rope to a steel carabiner clipped to the overhead cable. The steel carabiner with the Munter should be attached to the cable between the left most pair of clamps. An autolocking carabiner is ideal for this application as once the Munter is tied, there should never be a reason to open this carabiner until the end of the day/event.



The carabiner is gate side in, facing the instructor standing inside the tower. Although a locking carabiner, it is in the “screw down” orientation. This is to make it easier to open and load the rope and thus tie the Munter hitch.

The rappel rope has been tied to the steel carabiner using a Munter hitch. The load side, the rappel line going down the tower, is tied on the spine of the carabiner (left in this picture). The right side, gate side, is the release line.

As you tie the MMO (Munter-Mule-Overhand) you only manipulate the release line. The rappel line hangs inert through all steps of tying this releasable rappel.

Using the release side of the rope, tie the Mule knot, keeping it snug against the Munter hitch.



The bite of rope coming sideways out of the Mule knot should be quite long. Much longer than you think when you first tie the knot. The bite should be about 2 feet long.



Using this long bite of rope, tie the overhand knot around both the hanging rappel line and the release line, capturing both. The over hand should be tight up to the Mule knot. You want to remove as much slack as you can. If there is slack in the system, it can work through, causing issues with the Munter and Mule knots. This makes it VERY difficult to release the rappel under load.

There should be about 12-18 inches of bite left hanging straight down after securing the overhand knot. If the bite of rope is sticking off to the side and not straight down, then you have likely tied to half-hitch and not an overhand knot.



Bring the bite of rope up to the left and clip it into a steel carabiner hanging on the cable to the left of the clamps. Note that there should be ample slack in the bite of rope when clipped such that it will not become trapped or loaded to such a degree that it is impossible to open the carabiner and remove the bite of rope when the system is under body weight load. A screw gate carabiner is ideal in this application since anyone, even wearing gloves, should be able to operate and open a screw gate carabiner. If using a screw gate carabiner be sure to screw down. It is easiest if the gate is facing in toward the tower as shown in the picture below.



If tying in a natural rock setting where there is no cable available overhead, then clip the bite of rope to both of the rappel and release lines or back to the anchor's masterpoint. Either a steel or aluminum carabiner can be used but it should still be a locking carabiner.

At the end of each end of the rappel rope, the rappel line and the release line, tie a stopper knot about 12 inches from the end of the line. This prevents the participant from rappelling off the end of the rope – the most common cause of fatal rappelling incidents.



The rappel line should be gathered up and thrown over the side of the tower. The release line should be neatly hand coiled using a small butterfly coil and placed off to the side on the tower platform where it will not get in the way or become a tripping hazard.



At Belk on the south face rappel route (the standard rappel face) the release line can be placed behind the railing at the base of the pole the participant uses to climb onto the rappel platform.



On the north face rappel route (facing the American Flag) the coil of the release line should be placed inside the cable triangle on the left as you face the American flag. Any extra rope can be clipped into the steel carabiner outside the left most clamp.



Releasable rappel on the north face of the Belk tower with the releasable line coiled and placed over the cable triangle.



Complete rigging at Belk on the north face rappel route.

At MSR the release line for the rappel can be hand flaked and placed over the cable triangle.



The participant tether for the MSR rappel hangs from the cable to the left of the rappel, allowing the participant to be clipped in behind the rope gate and then transition into position at the rappel station.

Gloves for the participants can be placed on the main platform where the instructor can reach through the railings to pick them up. This is better than having gloves on the rappel platform where they can become a tripping hazard or inadvertently kicked over the edge of the tower. At MSR we often keep the gloves in the gear bucket on the platform of the tower to the right of the top of the stairs.

Rigging without a Top Rope Belay

When rigging the releasable rappel without an independent top rope belay (a bottom or fireman's belay will be used), it is necessary to set up a back up hitch on the release line of the rappel rope. A short loop of accessory cord must be used to tie a friction hitch to the release line below the MMO. A three wrap prusik hitch is the preferred friction hitch used in this application. The standing loop of the prusik hitch cord should then be clipped to the same carabiner securing the bite of rope to the overhead cable. If available, a rescucender can be used in lieu of the friction hitch.



Facilitating a Rappel

There are many styles and techniques to facilitate a rappel at one of our towers or at a natural rock site. However, there are certain steps that must always be followed. These are detailed below.

- Instructor Safety & CHECK
- Rappeller Safety
- Rappeller Orientation – right or left handed
- Rappel Belay - From the Top
- Clip in to Rappel
- Gloves and Hands – Your Other Right
- Assume the Position
- On Belay
- Rappelling
- Off Belay

Instructor Safety & CHECK

When the instructor first ascends to the rappel platform at either tower or approaches the ledge for a natural rock site rappel he should immediately clip in to the appropriate tether. He should then perform a CHECK of the rigging before any participant is allowed onto the rappel platform or near the rock ledge.

As part of the rigging CHECK, reposition the Rescucender on the belay end of the top rope belay line. This is the end of the rope that is trailing down the tower. Note that it is not necessary to unclip the Rescucender from the instructor's harness belay loop.

Participant Safety

As each participant ascends the platform or nears the rock ledge he/she should immediately be clipped in to a tether. There should be no untethered participants on the top of the platform at either tower. This is especially true at MSR with the open gates. At Belk there is an "on deck" tether for a 2nd participant to watch the rappel. At MSR the on deck participant can stand at the top of the stairs, behind the rope gate, and watch the rappel.

At Belk have the participant climb over the railing using the staples in the corner pole. The participant may hold on to anything over their head to help them climb over. Often it is necessary for the instructor to help guide the participant over the railing keeping an eye out for the tether so that it does not become tangled in the participant's legs, the staples or the wooden railing. Have the participant lower themselves gently to the wooden step and finally onto the rappel platform. Once on the platform the participant should face the railing, looking inside the tower. Often it is a good idea to have the participant hold on to the railing with both hands. They may do this anyway!

At MSR simply have the participant turn and face the stairs with their back to the rappel opening but not yet standing on the edge pad.

Rappeller Orientation

Ask the participant if they are left or right handed. At Belk if the participant is right handed you will need to pass the rappel line over his head to his right side and have him leave the rope between his arms.

Rappel Belay – From the Top

Next clip the participant to the top rope belay. Given the horizontal loop on the participant harnesses (Misty Mountain Challenge harnesses) the top rope belay's captive eye carabiner should be clipped on the guide hand side of the participant. If the participant is right handed, clip the captive eye carabiner on the left side of the loop. It should remain the left most carabiner on the loop for the remainder of the rappel. The captive eye carabiner should be clipped up from the bottom so that the gate is facing toward the participant.

Clip in to Rappel

Now thread the rappel rope through the rescue 8. Orient the rescue 8 and attached carabiner so that the carabiner is in a screw up position with the gate toward the participant. Make sure that the rappel line is coming out of the rescue 8 on the brake hand side of the participant. If the participant is right handed, then the brake line should be on the right side and the guide line is on the left. The rescue 8 should be clipped to the harness loop on the same side as the brake hand. If the participant is right

handed the rescue 8 should be clipped to the right of the harness loop, the tower tether is still clipped in the middle and the top rope belay's captive eye carabiner is clipped to the left side of the loop. After you clip the rescue 8 to the participant's harness loop make sure to flip the carabiner around so that the gate is now in a screw down orientation. Be sure to screw down and lock this carabiner.

Pull any slack out of the rappel line. Not only does BSA prohibit slack line rappelling but it will make for an easier beginning to the rappel for the participant to feel the tension on the rappel line. To pull out the slack, pull up on the brake line while also pulling up on the rescue 8.

Gloves and Hands – Your Other Right

Have the participant put on his gloves and explain the brake hand versus the guide hand. Have the participant hold the rappel rope with both hands. The brake hand should be on the hip or slightly behind the back. The brake hand should not ride up the rope and be against the rappel device. The guide hand should be above the rappel device. Strong, fist like grips should be maintained by both hands.

Assume the Position

The participant next places his feet in the correct positions for the rappel. His body should be centered over the rappel line if possible, his feet should be shoulder width apart and the heels of his feet should be off the edge of the platform. The participant should have all of his weight on the balls of his feet. He must straighten his legs and stand up big and tall.

On Belay

Once the participant is comfortable in this position the tower tether may be removed. As the instructor, your brake hand MUST be on the brake line of the top rope belay above the Rescucender before you remove the tower tether. Once this tether is removed from the participant your brake hand MUST NOT leave the brake line of the top rope belay. When the tether has been removed allow it to hang freely. You may very well need it for this same participant if he does not make it over the edge. The tether needs to be free and within easy reach. Do not have another participant or instructor clip in to this tether until the first rappel participant is safely on the ground and you are ready to reset.

Rappelling

The participant needs to keep his legs straight and his feet on the edge of the platform. Instruct him to lean back, butt first like he is going to sit down. Have him focus on the rescue 8 and the rope as it slides through the 8. As he leans backward you may need to begin to let slack through the belay line. Once his legs are parallel with the rappel platform he can begin to step down, first to the board just on his heels, then to the horizontal green pole and finally to the wall of the tower. Make sure that his legs are parallel with each of these before he steps down. If he steps too soon he will likely slip and “fall” into the rappel platform thus bruising his arms or legs. Some participants will even let go of the rope to stop themselves from hitting the platform. It is VERY IMPORTANT that you keep your hands on the top rope belay and are very attentive to this portion of the rappel. Once the participant has lowered himself to the tower wall the danger is significantly reduced. If he now slips the worst that can happen is that he will bang a knee on the tower.

Note that at MSR the tower wall extends straight down. There is no need for the awkward stepping down process as at Belk. Instruct the participant to lower until his legs are parallel with the platform (perpendicular to the wall) then he may begin his rappel.

As the participant rappels down the tower, you must mind the Rescucender. This is easily done by keeping your brake hand above the device. If you let go of the brake line or do not keep your brake hand low enough, the Rescucender will engage and lock on the brake strand of the top rope belay line. To release the Rescucender, pull down on the device as you push up on the black lever arm of the device. This must be done while continuing to maintain a grip on the brake strand. With practice this is easily accomplished.

Watch the participant all the way down the wall. Sometimes they freeze, panic or encounter other difficulties. You must watch the entire process until the participant is safely on the ground.

Off Belay

At both camps it is easiest if another instructor or trained staff is available to unclip the participant. Have this staff member connect the rescue 8 and the gloves to the top rope belay captive eye carabiner. When the next rappeller descends the bottom of the belay line will rise up the tower bringing the previous set of gear with it. There is no need to haul the belay line up the tower in order to reset. Be aware though that you may need to guide the belay rope off to the side and away from the rappeller with your foot so that the line and the hardware do not become tangled with the rappeller.

At this point it is best to reposition the Rescucender. Open the Rescucender using the two tabs on either side of the device to remove it from the rope and reposition the Rescucender to the belay end of the top rope belay line. This is the end of the rope that is trailing down the tower. Note that it is not necessary to unclip the Rescucender from the instructor's harness belay loop.

Fireman's or Bottom Belay

BSA requires that all rappellers be on a belay. However, both top rope and bottom belays are allowed. In a bottom belay the participant is only clipped into the rappel device and rappel line. The top rope belay as discussed throughout this document is not used. If the tower has been rigged that way just leave the top rope belay off to the side unused.

There are a few important notes in facilitating a rappel with a bottom belay. The rappeller must still be clipped in to the rappel rope with the rappel device on the brake hand side of the harness loop. Before the tower tether is removed the bottom belay must be in place. You or the rappeller must confirm this with the ground using the appropriate rappel commands "On Belay" followed by "Belay On." DO NOT remove the tower tether until the bottom belay has been confirmed. Once the tower tether is removed, the rappeller must call "Rappelling" and wait for the ground belay team to reply "Rappel On" before beginning his rappel.

As the instructor on the top of the tower, even though you have no direct role in this style of rappel belay once the rappeller has started his decent, you should still watch the entire rappel. You have a perspective that the ground belay team may not be able to see due to angles, sun angle, etc. You may need to alert them to a problem in time for them to arrest the fall of the rappeller.

With the bottom belay you will need the next rappeller to carry up the rappel device, carabiner and gloves or you will need another method to retrieve them (such as a haul line). You may want to have several rappel devices and carabiners available to keep the process going if you have a large number of participants and do not want to wait for the device to be returned to the top of the tower.

Note that although the BSA *Guide to Safe Scouting* does not prohibit Webelos from rappelling with a bottom belay it is not recommended. In fact, even with Boy Scouts, Venture Scouts and adults a top rope belay is always the preferred method of facilitating a rappel unless the instructor knows the experience level of the scouts. In all cases a 2nd trained instructor should be present at the bottom to supervise the bottom belay.

Releasing the Rappel

In the case of a rappelling incident such as the rappel device becoming jammed (i.e. with gloves, clothing, hair, etc.) it may become necessary to release the rappel line and lower the participant to the ground using the top rope belay.

The first step in this process is to lock off the Rescucender. Push the device up the brake strand of the belay rope to engage the camming arm. The Rescucender should not reach the Munter hitch on the life safety cable. If the Rescucender does reach the Munter hitch, the Rescucender could be defeated and it will not grab and hold the belay rope.



Pull up about two to three feet of rope on the brake strand of the belay rope below the Rescucender (note that this is the end of the rope not attached to the rappeler). Tie an over hand on a bite knot in

the brake strand. This knot should be about 2 feet below the Rescucender device. This is called a catastrophe knot and is the backup to the Rescucender. This knot will not pass through the device were the device to disengage and release the brake strand of the belay rope.



The Rescucender device is locked off and the catastrophe knot is tied. Note that the catastrophe knot is close to the device for clarity in the picture. It should be tied lower on the brake strand of the belay rope.

Once the catastrophe knot has been tied, the instructor may go hands free to release the rappel line. After the rappel line has been untied and the tension on the rappel rope has been released, the instructor should return his/her attention to the belay rope. (Note that is not necessary to hold the rappel line. In this two-rope rigging the life safety line is the belay rope, not the rappel rope. The rappel rope can slide through the Munter hitch unimpeded. If a second instructor is available at the top of the tower, he/she can hold the brake side of the rappel line for added security but this is not required.) Untie the catastrophe knot on the belay rope. Once the catastrophe knot has been untied, the instructor must keep at least one hand on the belay rope. The Rescucender can be released by pulling the device down (hold the gold portion of the device) while pushing up on the black camming arm. To lower the rappeler using the belay rope, mind the Rescucender with one hand while the belay rope slides through the brake hand. Ensure that the rappeler is safely on the ground before letting go of the Rescucender and brake strand.

Releasing a Rappel Without an Independent Belay Line

Occasionally the rappel is rigged without an independent belay line but instead a bottom belay or fireman's belay is used (i.e. during a climbing merit badge class or at a natural rock site). When releasing

a rappel rigged in this manner, it is required that a friction hitch or device be in place on the release side of the rappel rope (the brake strand) to back up the instructor's brake hand. (Refer to the section above on rigging the releasable rappel without a top rope belay.) When untying the rappel rigging, the friction hitch or device is clipped to the instructor's harness. This should be done as soon as the release is started.



As the rappel rigging is then released, the slack in the release side (the brake strand) must be passed through the prusik hitch. When the rappel rigging has been completely released, there should be no slack between the Munter hitch and the friction hitch.



The instructor must always maintain control of the brake strand when releasing the rappel (brake hand on the brake strand). The friction hitch is there as a backup, not the primary for maintaining control of the brake strand.

While the friction hitch is present as a failsafe backup when releasing the rappel, the preferred method is to have another person hold the backside of the release line (the brake strand). This person could be another instructor, an observer or the next person waiting to rappel. In essence, this person is the backup belayer for the instructor facilitating the release of the rappel.

In addition to the backup belay at the top of the tower, it is necessary for the instructor to communicate with the bottom belayer. The bottom belayer must still maintain tension on the bottom of the rappel rope during the release of the system and the lowering of the rappeller. This is necessary in case the jam or obstruction on the rappel rope & device should come free or work loose. The bottom belayer would be required to apply tension on the rappel rope to prevent the rappeller from sliding down the rope if they no longer had their brake hand on the rappel rope.

Securing the Rappel System

Following a release of the rappel system, the rappel system including the rope must be secured. This is best done by resetting the system, i.e. hauling the rope back up and tying off the releasable rappel knot. If the system is not reset, then the system must be broken down (derigged) in such a manner that no one can rappel on the system.