

# Mecklenburg County Council

## COPE & Climbing

### Releasable Rappel with Belay SOP

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#### 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 rescue 8 and a single static rope. A 2<sup>nd</sup> rescue 8 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
  - 2 x 15' webbing
  - 5 steel screw gate locking carabiners
  - 2 tri-action locking aluminum carabiners
  - 1 Petzl Rescucender on a sewn sling with dedicated carabiners
  - 2 captive eye tri-action locking carabiner
  - 4 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)
  - 2-3 pairs of rappel gloves (youth & adult)
  - Rescue bag
- MSR
  - 2 x Lobster claws including auto locking carabiners for personal attachment
  - 2 x 12' webbing
  - 5 steel screw gate locking carabiners
  - 4 locking aluminum carabiners
  - 1 Petzl Rescucender on a sewn sling with dedicated carabiners

- 2 captive eye tri-action locking carabiner
- 4 rescue 8 (belay friction device)
- 1 static rope; minimum 30m (for rappel)
- 1 static or dynamic rope; 50ft (for top rope 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 tangled 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 a 15' length of tubular webbing tied in a loop with a water knot appropriately backed up. A steel carabiner must be used to attach the top of the tether to the tower cable, typically a steel screw gate oval carabiner. Clip the webbing into the steel carabiner on the cable sliding the webbing so that the water knot is near, but not against, the steel carabiner. Clip an aluminum locking carabiner to the other end of the webbing and tie an overhand knot near the aluminum carabiner leaving as small a loop as possible. Whenever possible a tri-action locking carabiner should be used to clip in the participant. (The scouts are less likely to "play" with the tri-action carabiner and open it without the instructor noticing.)

At Belk the primary participant tether (the participant that is about to rappel) should be clipped inside the triangle of the cable used for the rappel rigging. This holds the tether so that it does not slide down the cable and interfere with the rappel rigging.

The secondary participant tether 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. If the webbing used for the tethers is 15' and the tethers are attached to the cable inside the two triangles, then the two tethers should meet in the middle to allow for this transfer.



Primary participant tether for rappel at the Belk



Extra participant tether shown on the cable at the

tower.

top of the ladder 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 and participant 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 webbing 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 and the rappel line in orange.

## Top Rope Belay

To rig the top rope belay you must use one of the dedicated 50ft lengths of dynamic rope. A tri-action captive eye carabiner should be tied into both ends of the belay line using a figure 8 on a bite with appropriate backup. We use a steel rescue 8 as the belay device for the top rope belay. Once the rope has been tied, pass a bite of rope through the steel rescue 8 and clip the rescue 8 into a steel carabiner. 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 rescue 8 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 rescue 8 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 bottom of the rescue 8 attached to the life safety cable.

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 fed through the rescue 8 belay device.

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 top rescue 8 belay device 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.

Make a bite of rope at the midpoint and place it through the rescue 8 and over the top of the 8. Once this is done you can hang the 8 on the tower cable using a steel carabiner to make it easier to tie the rest of the rig. The rescue 8 should be attached to the cable between the left most pair of clamps.



Notice the relative positions of each rigging element on the separating cable clamps.



The rappel rope has been fed through the rescue 8 at the rope midpoint and the steel carabiner has been screwed closed.

Determine which end of the rope will be the rappel line and which will be the release line. At Belk it is easiest if the rappel line is the right line. The steps and pictures demonstrate this right line approach. However, you can rig the rappel either from the left or the right, it does not make a difference to the rappel application. Throughout this process you only manipulate the release line. The rappel line hangs inert through all steps of tying this releasable rappel.

Bring the release line under the rappel line between the rappel line and the rescue 8 then over the right hand ear of the rescue 8.



Wrap the release line around the front side of the rescue 8 from right to left over the left ear of the 8.



Bring the release line over the left hand ear of the rescue 8, behind the 8 and under the rappel line – between the rappel line and the rescue 8.





Wrap the release line over the right hand ear of the rescue 8 then across the front of the rescue 8 again from right to left.



Bring the release line over the left hand ear of the rescue 8 behind the rescue 8. Now grab a large bite of the release line and bring it through the rescue 8. Be sure to grab a LARGE bite of rope. More is better.



You are now going to tie an overhand knot using the bite of rope around both the release line and the rappel line. Pass the bite around both lines a full time and tie off the overhand knot from the top to the bottom in much the same manner as we tie the stopper knot on our climbing lines.



Now be sure to dress the knot and cinch up the overhand knot as close to the rescue 8 as you can. You want to remove as much slack as you can. If there is slack in the system it can work through and allow a bite of the release line to fall off an ear of the rescue 8. This makes it VERY difficult to release the rappel under load.

The bite of rope hanging to the side of the rescue 8 now needs to be secured using a locking carabiner. If rigging the rappel on a tower at Belk or MSR use a steel carabiner to clip the bite of rope to the cable overhead. In this case you want some slack in the bite to make it easier to remove from the carabiner. If the bite is taught now, then under load it will be almost impossible to slip over the carabiner when under load. The steel carabiner must be clipped to the cable outside of the left most clamp. 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 pictures 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.

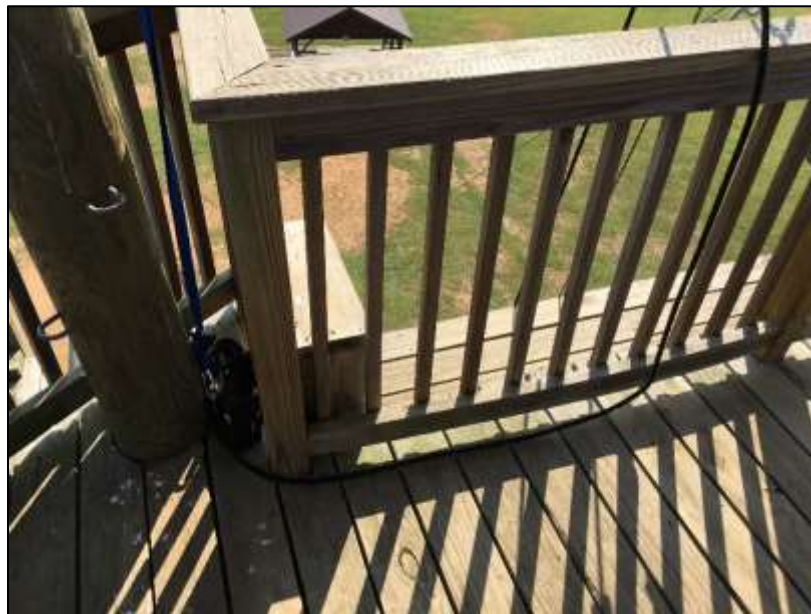
At the end of each end of the rappel rope, the rappel line and the release line, tie a stopper knot about 12 inches from the end of the line. This prevents the participant from rappelling off the end of the rope – the most common cause of fatal rappelling incidents.



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 placed over the railing on a small wooden ledge. You cannot see the rope on the ledge in the picture below however you can see the orange release line passing over the wooden railing to the left.



Complete rappel rigging at MSR including all tethers. Note the participant tether is just on the left leaning against the railing.

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.

## 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 2<sup>nd</sup> 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 2<sup>nd</sup> 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 rescue 8 belay device on the life safety cable. If the Rescucender does reach the rescue 8, 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 rescue 8 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

Often a rappel is rigged without an independent belay line such as at a natural rock site. When releasing a rappel rigged in this manner, it is required that a progress capture friction hitch or device be in place on the brake strand to back up the instructor's brake hand. This friction hitch or device is most often attached to the instructor's harness. The instructor must always maintain control of the brake strand when releasing the rappel.

## 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.