



AAC Publications

Rappel Anchor Failure

Minnesota, Taylors Falls

On March 25, Climber 1 (31) and Climber 2 (23) were involved in a rock climbing accident at Interstate State Park in Taylors Falls, Minnesota. The accident occurred while rappelling, with both falling from near the top of the cliff. Climber 2 was killed in the accident, and Climber 1 was seriously injured.

Climber 1 had over a decade of climbing experience, including trad, sport, and alpine climbing, from Minnesota to Alaska. He had worked as an outdoor trip leader for the University of Minnesota, graduating with a degree in recreation administration and a minor in outdoor recreation and education.

Climber 2 had climbed indoors extensively, with some experience bouldering and sport climbing outdoors. He had been planning a road trip for the upcoming climbing season with his girlfriend. According to Climber 1, Climber 2 wanted to expand his skills in preparation for that trip. March 25 was intended to be the first in a series of mentoring outings.

On the way to the crag, the pair discussed goals for the day. Climber 2 wanted to focus on anchors and get introduced to trad gear. Upon arrival, the team spent 30 minutes discussing types of protection (nuts, hexes, and cams), along with the SERENE acronym for anchor building. They then walked to an adjacent crag and further discussed anchors at the base. After about an hour, they walked to the top of the cliff and built an anchor together to top-rope a popular route called The Bulge.

After lunch, they agreed on mini-pitching (breaking a single established rope length into two short pitches) an easy route and then finish the day by building an anchor and rappelling. They chose the nearby Sonny and Juanita (5.5, trad). The route is about 45 feet tall, with a large ledge 35 feet up.

Climber 1 had climbed Sonny and Juanita many times and led two short pitches to the top without incident. There, he built an anchor comprised of three small cams placed in a vertical crack at the back of a ledge. He tied all the pieces together with a cordelette and tied in direct. He then belayed Climber 2 to the top, where the latter tied in directly to the anchor and the pair set up the rappel. Climber 2 had limited rappel experience and wanted to gain more.

After safety checks, Climber 2 unclipped from the anchor and rappelled over the lip. Still connected to the anchor, Climber 1 leaned over the edge to watch his partner rappel. When Climber 2 was 10 feet below the lip, Climber 1 heard a loud cracking noise. He turned his head quickly enough to see the anchor gear snapping out of the crack. He was then pulled off of the ledge by his falling partner's weight.

He recalls, "I vaguely remember hitting the large ledge ten feet beneath me with the left side of my body before falling the rest of the way to the ground. I was knocked unconscious by the impact, landing just a few feet from where I tied in to do my very first climb nearly ten years before."

Many bystanders in this popular area responded, as Climber 1 fell in and out of consciousness. An

ambulance arrived and he was driven to the hospital and then flown to a regional medical center. X-rays and CT scans revealed no major broken bones or internal injuries. He suffered two sprained ankles, a broken left foot, a severely dislocated left ring finger, abrasions, and a concussion. Climber 2 unfortunately died from the injuries suffered in the fall.

ANALYSIS

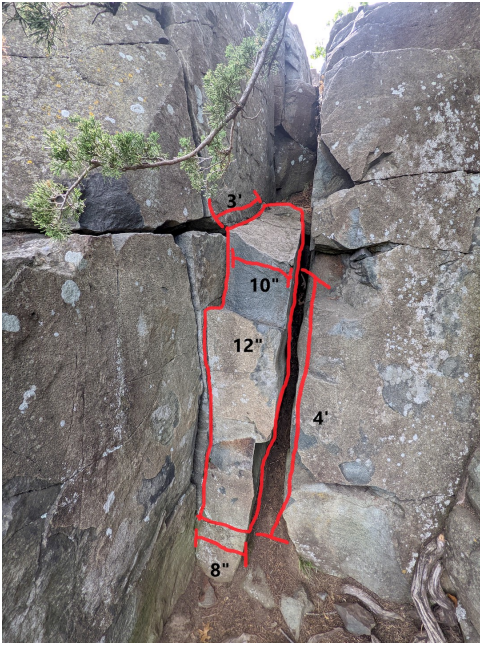
The rappel anchor was built with three cams in a single crack in the blocky basalt atop the cliff. The combined weight of Climber 2 rappelling and Climber 1 leaning off his tether to look over the edge was apparently enough to lever open the crack and cause the cams to fail.

Climber 1 recalled, "I have built over 1,000 anchors in rock, ice, and snow in my climbing career. I have never had a piece of protection, let alone a whole anchor, fail. I do remember testing the rock and it not moving, but regardless of how well I tested it, there was simply no reason to build the anchor in a single crack. There were other rock features in the area I could have used, along with at least one significant tree I could have included in the anchor."

He concluded, "Building an anchor with three pieces of protection does not necessarily mean that anchor is redundant. A redundant anchor should also use redundant features. This ensures that if one of the rock features fails, the other pieces remain intact."

Using multiple features to build an anchor is particularly important in an area like Taylors Falls, which is susceptible to severe freeze/thaw cycles and is known to have fractured rock. The top of the cliff is composed of exposed and often shattered basalt. Small rocks are routinely released from the cliff tops and faces, and at times entire rock formations have failed. (Sources: Climber 1 and the Editors.)

Images



This pillar is a solid block about five feet high and a foot wide. It's estimated to weigh at least a ton. Climber 1: "The block appears to extend into the ground both at the bottom and back. In reality, it is completely separated and can be moved back and forth over an inch with only moderate effort."



The failed cam placements in the rappel anchor are marked. Although it appears to be comprised of stacked blocks, the pillar is one solid block. However, the entire pillar moved under load.

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