

Rock-Lifting Experiment on the Trail in Baxter State Park

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The Baxter State Park and Maine Appalachian Trail Club Trail crews have been engaged in a major reconstruction of the A.T. (known as the Hunt Trail in the park) on Katahdin during the past four seasons.

This project involved placing hundreds of rock steps in order to repair erosion damage near popular Katahdin Falls. The crews used a 400-foot cable system to lift rocks 100 vertical feet from a nearby "quarry." Many of the rocks are glacially rounded boulders that were buried in the ground. Moving this type of rock can involve extensive digging, in order to slide lifting slings under them.

During the last work session, the Hunt Trail crews discovered an easier way. The experiment involved placing an expansion bolt into a rock, so that a winch cable could be attached to the rock without the use of slings. A commercially available rock anchor was adapted for this purpose. Holes were drilled using a Cobra gas-powered drill. The holes were placed in locations on the rock that would be concealed after they were placed in the Trail.

During the project, the following process was developed:

1. First, a hole was drilled to accept the expansion bolt. In this case, a 1 7/8-inch diameter hole, eight inches deep, was needed. The drilling took about five minutes.
2. Next, the bolt assembly was placed in the hole and expanded in place, leaving clearance for the bottom of the center rod. The expansion bolt was then rotated with a steel pipe in order to fit it tightly in the hole.
3. Next, rigging was attached to the eye of the bolt, and the rock was lifted from the ground.
4. Upon delivery, the bolt was loosened with a pipe, and the rod was removed. The remaining parts were fished out of the hole with a piece of wire.

During the experiment, more than 30 rocks, some weighing close to 1,000 pounds, were lifted without serious problems. Workers should be alert to the potential of rocks breaking loose, however, and should not place anyone at risk of being hit.

Expansion bolts rely on threaded rods and nuts to hold the assembly together. Parts with worn or damaged threads should not be used.

Figure 1



Expansion bolt next to hole

Figure 2



Expansion bolt placed in hole & tightened

Figure 3



Snatch block attached to eye and ready for lift

Figure 4



Rock lifted and headed for the Trail