[Description of the hazards for visitors, climbers and the houses at the Helleren area in Jøssingfjord]

[27.05.2013]
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24. May 2013

1. INTRODUCTION

This report aims to describe the potential risk and hazards for the visitors of the Helleren area in Jøssingfjord. The overhanging slope that exists over the two houses at Helleren area could be characterized as a “geo-monument”, as it is a landscape of great natural beauty. Every year two kind of activities are taking place:

1) Visitors, who want to spent some time at the area, by visiting the two houses and by observing the overhanging slope.

2) Climbers, who are coming every year during the spring/summer period. This overhanging is a great challenge for them and is quite popular along the community of climbers.

2. GEOLOGICAL SETTING.

This overhanging lithologically is characterized as anorthosite, and is actually the hanging wall of a thrust fault zone. The core of the fault zone is shown in figure three. This zone is quite thick (0,5 meters or more at some places), which is a strong indication of great tectonic event that took place in the geological past. The practical meaning, is that the rock has poorer geotechnical characteristics, and is more susceptible to the forces of erosion and weathering. Actually the overhanging formation is a result of the erosion from the wind and the water.

3. GEOTECHNICAL SETTING.

The disintegrated rock along the hanging wall is susceptible to rock falls. As it can be seen in figures 1, 2 and 3, there are many parts of the wall, where short or longer fractures, are defining rock blocks that are susceptible to rock falls especially during the thawing periods. The periodical freezing-thawing circles are disintegrated the rock even more, and rock falls could happened at any time without warning. The surrounding area is full of rock blocks that fall in the past. What happened in the past, it will happen in the future, as the geotechnical setting is still the same. The time that a rock fall will happen is impossible to predict, but the most likely period is the spring period.

4. HAZARDS DESCRIPTION.

The potential hazards are obvious, as a rock piece of some centimeters could be fatal for a visitor or a climber. Especially for the climbers the hazard is even higher as the routes they are following are passing from areas of the hanging wall which are susceptible to rock falls. Additionally as they are placing rock bolts in the fractures, a rock bolt could induce a rock fall, by opening even further one of the fractures that defines the rock blocks.

In addition the houses which are the “core” of this sightseeing are quite vulnerable to rock falls as wall. As it can be seen in photo 3 there rock blocks that could potentially harm parts of the houses. These infrastructures are in constant danger, even if people are not visiting that place all the periods of the year.

It is recommended that the climbing activities should stop as soon as possible. The hanging wall should be cleaned by specialized climbers that will remove the loose rocks on the steep rock slope.

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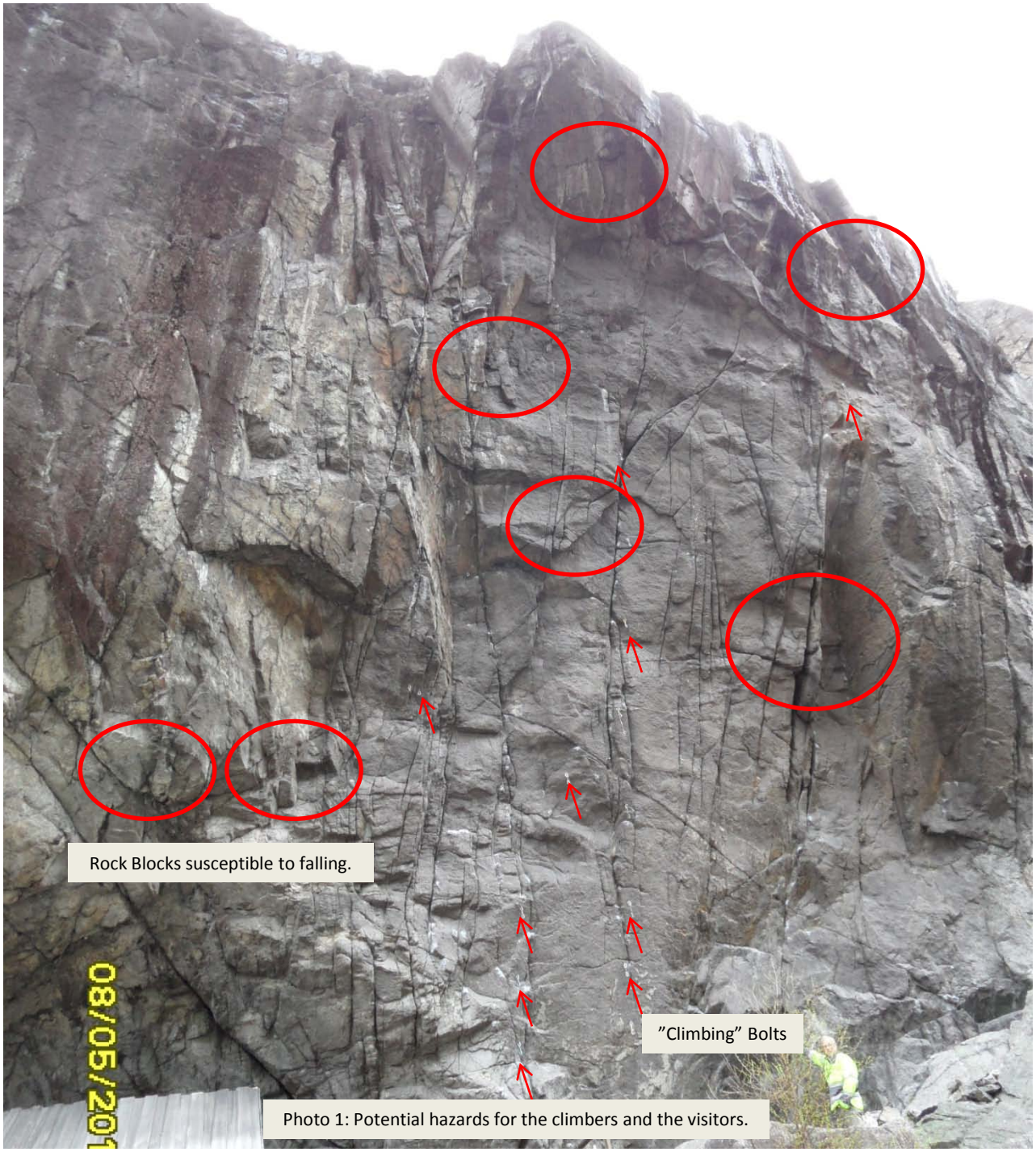

Photo 1: Potential hazards for the climbers and the visitors.

Photo 2: Potential hazards for the climbers and the visitors.

Photo 3: Potential hazards for the climbers visitors and the houses. Possible rockfalls from the crest of the slope.