

# The Shotcrete Troll

by Knut F. Garshol



The shotcrete troll, a popular feature of the family amusement park Hunderfossen, just North of Lillehammer, Norway, is 11 meters (36 ft) tall, weighs approximately 70 tons, and has been sitting there for 15 years.

Mr. Ivo Caprino was the artist behind the idea and the sculpturing of the troll. He also produced the head of the troll, which is made of fiberglass and polyester.

Its body was prepared as a light wood frame, which was covered by a reinforced plastic sheet fixed to the wooden frame by staples. On top of this, three layers of hot-dip galvanized chicken mesh were installed. Staples were shot into the wooden frame to tie down and tighten the layers of mesh.

A pre-bagged steel fiber-reinforced mortar with micro silica, enlarged end steel fibers, and sand - up to a maximum of 4 mm ( $5/32$  in) particle size - was used. The mortar also contained a water-reducing admixture and typically produced compressive strength above 50 MPa (7250 psi). The concrete was mixed with water, pumped by a mono-pump (screw-pump) and applied by a hand-operated nozzle. Mr. Caprino was in the basket most of the time to instruct the nozzleman on how to

spray the folds in the clothing and other details of the troll. The general thickness of the shotcrete shell was 50 mm (2 in.) with local artistic details added to that.

The troll's jacket was covered by a spray-on green pigmented special mortar as a final finish. The last stage of construction was the head which was placed by a mobile crane. The fit of the head to the body was perfect, based on a pre-made three-dimensional mapping of the troll's shoulder area. ■■■

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