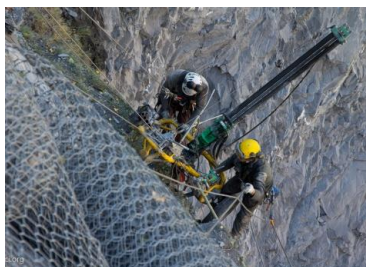




CHAMBON ROAD: 5 KM ROAD CONSTRUCTION AFTER TUNNEL COLLAPSING

Hydrokarst
GROUPE



" Chambon's road construction was a huge challenge ; we had to face an emergency situation within a very short timeframe specifically for such a important project. Hydrokarst managed this complex work in compliance with high safety standards. "

■■■ DESCRIPTION

In April 2015, a massive landslide occurred on the right bank of the Chambon Lake (France). This event caused the closure of a tunnel and led to the brutal interruption in traffic between the cities of Grenoble and Briançon and isolation of local populations. The rehabilitation of the collapsed tunnel being deemed unfeasible in reasonable delays, local authorities opted for the construction of a new road on the left bank of the lake. HYDROKARST was in charge of conducting works and leading all partners, in an extremely short schedule.

■■■ KEY MILESTONES

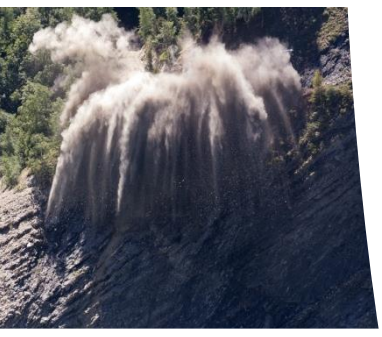
April 10th, 2015 : Closure of the tunnel after first apparition of arch movement

April 20th, 2015 : First remedial work on tunnel arch

June 23rd, 2015 : Interruption of work due to geological hazard movement

July 29th, 2015 : Beginning of work for the construction of 5km road on the left bank

End of October 2015 : Official opening of the new road



■■■ SCOPE OF WORK

1 - PRELIMINARY STUDIES

Site survey, geological studies, design

2 - SITE SECURING

Preliminary securing of the cliffs located above future road: hand scaling, blasting of smaller rocks, installation of rock fall devices (barriers and nets) by rope access technicians, to enable technicians to work safely during next phases of project

3 - BLASTING

Vertical access blasting to enable access into unreachable zones and blasting of a major rock buttress inclined at a 60-degree angle

4 - STABILIZATION WORKS

Slope stabilization, enlargement of narrower portions of the road with ACROSOLS® structures, retaining walls, self-drilling anchor bolts, shotcrete, construction of embankment, installation of gabions and snow barriers, grouting and injection...

5 - PUBLIC WORKS

Earthworks, bridge construction, connection of the new road onto existing ones, asphalt layer, commissioning of the road



■■■ MAIN QUANTITIES

Number of blasts.....	200 units
Total volume of rock blasting.....	14 600 m3
Rockfall barriers 1000 kJ and 2000 kJ.....	750 lm
High resistance wire mesh TUTOR®.....	10 000 m2
Wire mesh	14 000 m2
Rock bolting.....	4 000 lm
Shotcrete.....	400 m2
ACROSOLS® system.....	150 lm
Snow barriers.....	15 lm
Gabions	660 m3