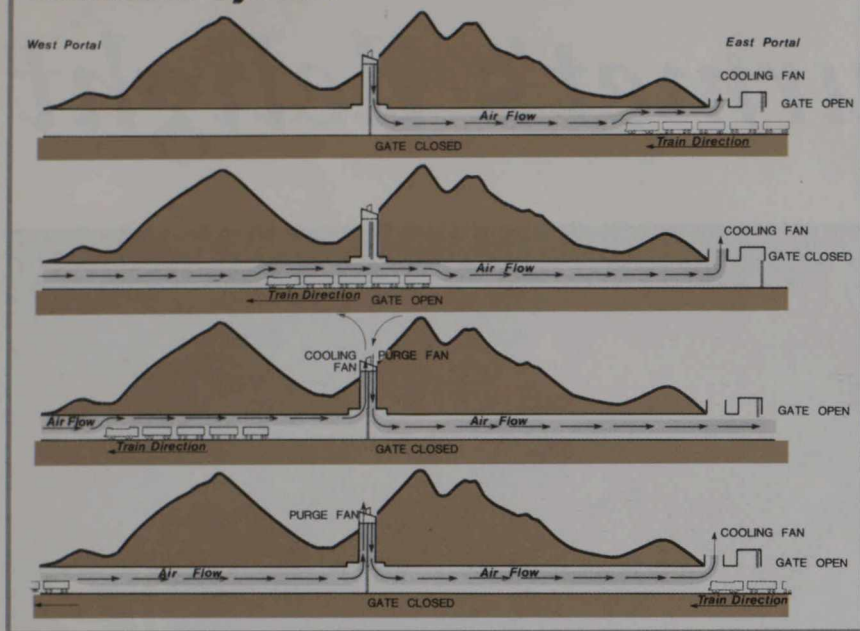


## Rogers Pass Ventilation System



ABOVE RIGHT:

At the western end of the project, a train bound for Vancouver emerges from Mount Macdonald Tunnel, while an empty eastbound grain train heads back for another load. The new line allows CP Rail to increase its westbound capacity by 60%.

After 4 1/2 years construction, the Rogers Pass Project was completed on time and under budget.



ABOVE:  
Test train passing over Stoney Creek Bridge, the longest on the project and the only one visible from the Trans-Canada Highway. Special care was taken to ensure that it blended in with the surrounding terrain.

RIGHT:  
Preliminary work began in 1983 on the west portal. Here the tunnel passes under the Trans-Canada Highway and into Mount Cheops. Special care was required as the first 274 meters were through loose glacial-till material.

summit of Rogers pass by some 550 feet. But there still remained the tough climb along Beaver River Valley to the tunnel, which required westbound trains to climb 900 feet in eight miles – a steep gradient in freight-train terms.

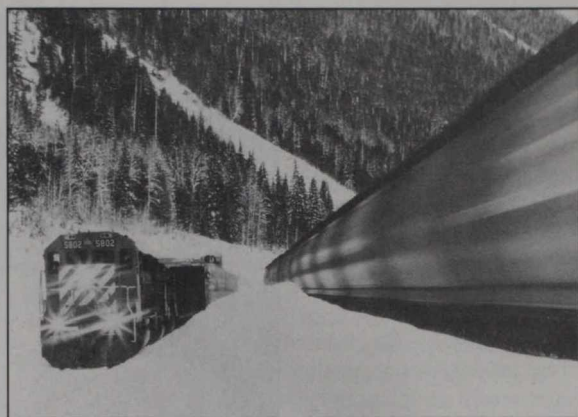
To construct a new route with a more gradual gradient, CP Rail knew it would have to find a way under the mountains rather than through them.

### Environmental regulations

The route it chose involved the construction of two tunnels. The shorter one under Mount Shaughnessy, is just over 1.1 miles in length; the other, under Mount Macdonald and Mount Cheops, is 9.1 miles in length, making it one of the longest tunnels in the world.

Although construction of the tunnels was far from easy – the Mount Macdonald Tunnel, for example, required construction of a unique ventilation system that is built around a 1150-foot vertical shaft rising from the tunnel floor to the surface – in many ways, it was easier than the construction of the surface route which leads to the tunnels.

That surface route begins on the floor of the Beaver River Valley and climbs the mountain slopes below the old railway line before entering



the east portal of the shorter, Mount Shaughnessy Tunnel. It then continues for less than one mile from the west portal of the tunnel, before entering the longer, Mount Macdonald Tunnel.

The challenge for the railway's engineers was that environmental regulations restricted the railway's right-of-way to a width of just 98 feet on a 40-degree slope that had to be stabilised to ensure the integrity of the existing line above.

In addition, the surface crosses many mountain streams, which required the construction of five major bridges, three concrete box culverts and several different types of retaining walls. It also required construction of a 4000-foot-long viaduct supported by 44 concrete piers – all of different heights.

In spite of the problems, the project was completed – nearly five years after construction began – exactly on time, ready for its official inauguration on May 4 of last year. It was also completed well below budget. Originally expected to cost some £325 million, it in fact was completed for £270 million – more than £50 million below budget.

What's more, the project has been praised by environmentalists and national park administrators as a model of how to get things right.

