ports, CP Rail needed a new route – one that would reduce the westbound grade that trains had to climb. The railway calculated that if it cut the grade to a maximum of one per cent from the 2.2 percent that then prevailed, it could move 24 trains west through the pass every day, instead of 15. That would give it a capacity boost of about 60 percent.

The reduction in grade was somewhat easier to plan than it was to execute. It would involve 1000 people working for 4 1/2 years, building 21 miles of new track at an average cost of some £13 million per mile (making it the most expensive section of railway track in the world). It would also involve construction of two tunnels – one of which would be the longest in the Western Hemisphere (at least until the Channel Tunnel is completed).

Furthermore, the whole project had to be constructed in some of the wildest mountains in North America and largely within one of the continent's most environmentally sensitive areas – Glacier National Park.

More than 400 inches of snow.

Rogers Pass, discovered by Major Albert Bowman Rogers in 1881, is a narrow heavily forested gash in the Selkirk Mountains. Each year, it averages more than 400 inches of snow, with the result that avalanches are frequent.

Parks Canada and the Canadian Armed Forces work together to trigger avalanches using artillery fire in what is part of one of the most extensive avalanche-control programmes in the world.

In 1916, CP Rail opened the five-mile-long Connaught Tunnel, which avoided the worst avalanche paths and which reduced the rail

Safeguards to protect environment

Only a few months into its first growing season, the success of the Rogers Pass revegetation and seeding programme is apparent. Here the seeding on either side of the nearly mile-long viaduct has taken root and is growing vigorously. Parks Canada has determined that CP Rail's environmental reclamation programme is the standard by which all future national parks projects will be judged.

Although the Rogers Pass project used advanced engineering techniques, it also developed into something of a showcase for environmental responsibility.

Long before the first spade of earth was moved, CP Rail drew up environmental plans in conjunction with Parks Canada and with the superintendent and staff at Glacier National Park. During hearings held in 1982 and 1983, it tabled its plans and made formal management arrangements with Environment Canada and Parks Canada to minimise the environmental impact of the project. A committee with government environmental representatives was set up, and an environmental co-ordinator was appointed to oversee all construction activity.

Pre-project planning was exhaustive. In addition to conducting in-depth analysis of vegetation, fish and wildlife, environmental specialists examined a wide range of other potential problems.

These included such things as the effect of construction-related erosion; concerns over how grazing animals such as moose and deer might be attracted to revegetation areas near the railway's right-of-way; the impact of bridge construction on streams and rivers; assessment of air emissions from the tunnel ventilation shaft; treatment of waste water; and visual and noise impact assessments.

During construction, the project was carefully monitored to ensure that CP Rail employees adhered to the stringent environmental guidelines. All workers on the project were given a Parks Canada course on the local environment and wildlife.

A programme of regular testing was carried out during the construction period to protect streams and rivers from construction-related debris and spills. There was continuous treatment of waste water from the construction camps and of tunnel water to remove blasting residues such as ammonia.

A massive revegetation programme means that one million trees and shrubs have now been planted, including alder, cottonwood, red-osier dogwood, thimbleberry, willow, juniper, elderberry, paper birch, douglas fir, lodgepole pine, western red cedar, subalpine fir, spruce and western hemlock.

Revegetation and reforestation were conducted in step with construction, and only species authorised by Parks Canada were used. Although the project has been completed, environmental monitoring will continue for several years to come.