

Zeitschrift: Swiss express : the Swiss Railways Society journal
Herausgeber: Swiss Railways Society
Band: 2 (1988-1990)
Heft: 7

Artikel: The B.L.S. double track programme : update
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DOI: <https://doi.org/10.5169/seals-855312>

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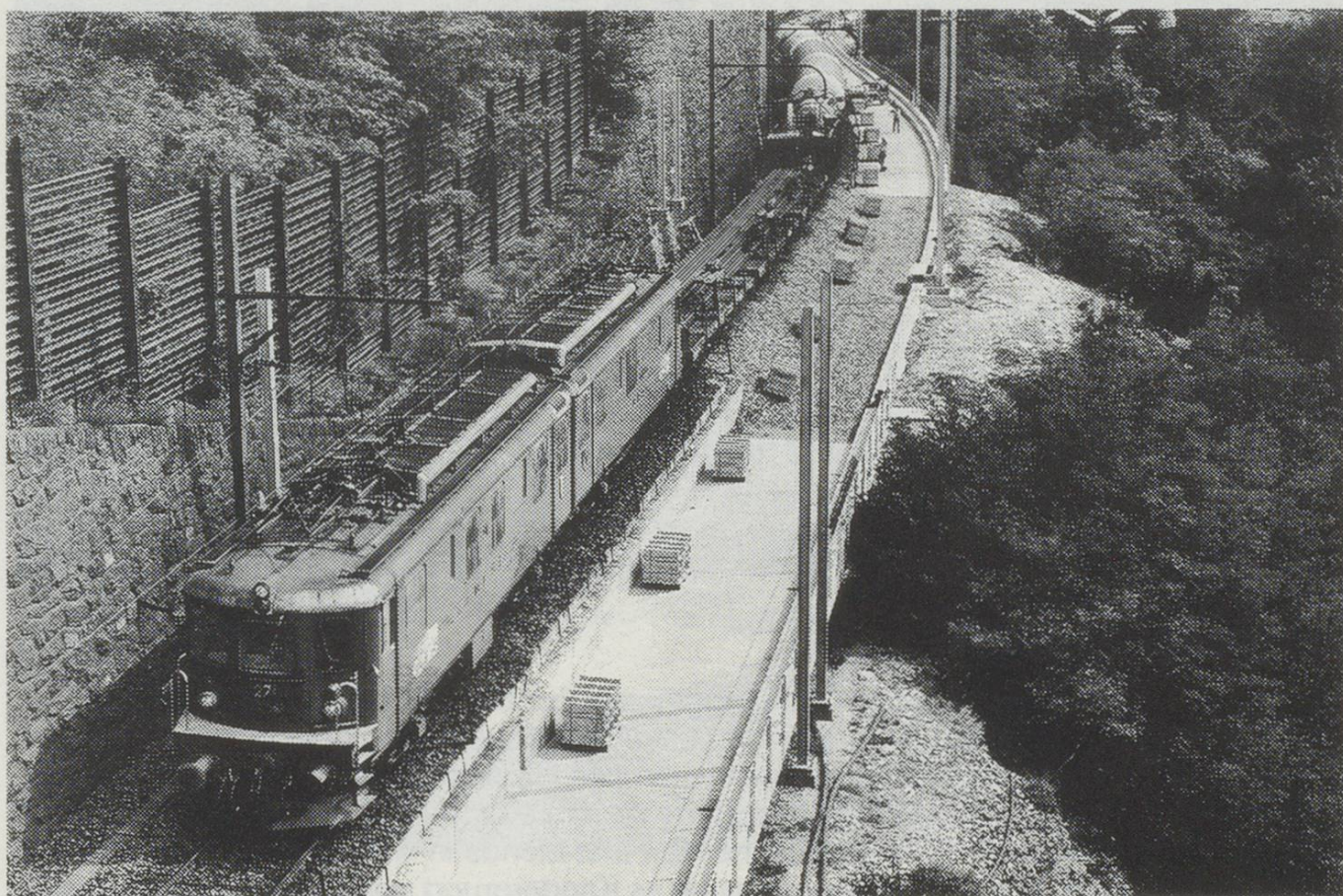
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THE B.L.S. DOUBLE TRACK PROGRAMME. UPDATE.

By The Editor.

The B.L.S. started in 1976, to rebuild the line from Spiez to Brig which for reasons of cost had originally been built as mostly single track. The construction of the second track commenced in 1977, funded by the BLS itself until the federal grant was credited nearly one year later. When the work is completed in 1990 the annual freight capacity of the line will have been lifted from 4.5 million tonnes to approximately 12 million tonnes. The plan to convert the 37 kms of the Thun to Brig mainline was simple in its concept but complex in its implementation. The line passes through 34 tunnels - aggregate length 27 kms - and over 25 large bridges or viaducts, all the time at an average incline of approximately 2.2%. Whereas all the tunnels, except the Hondrich, were originally designed - but only partly drilled out - for double track working, whereas the bridges, except the Bietschtal, were not.

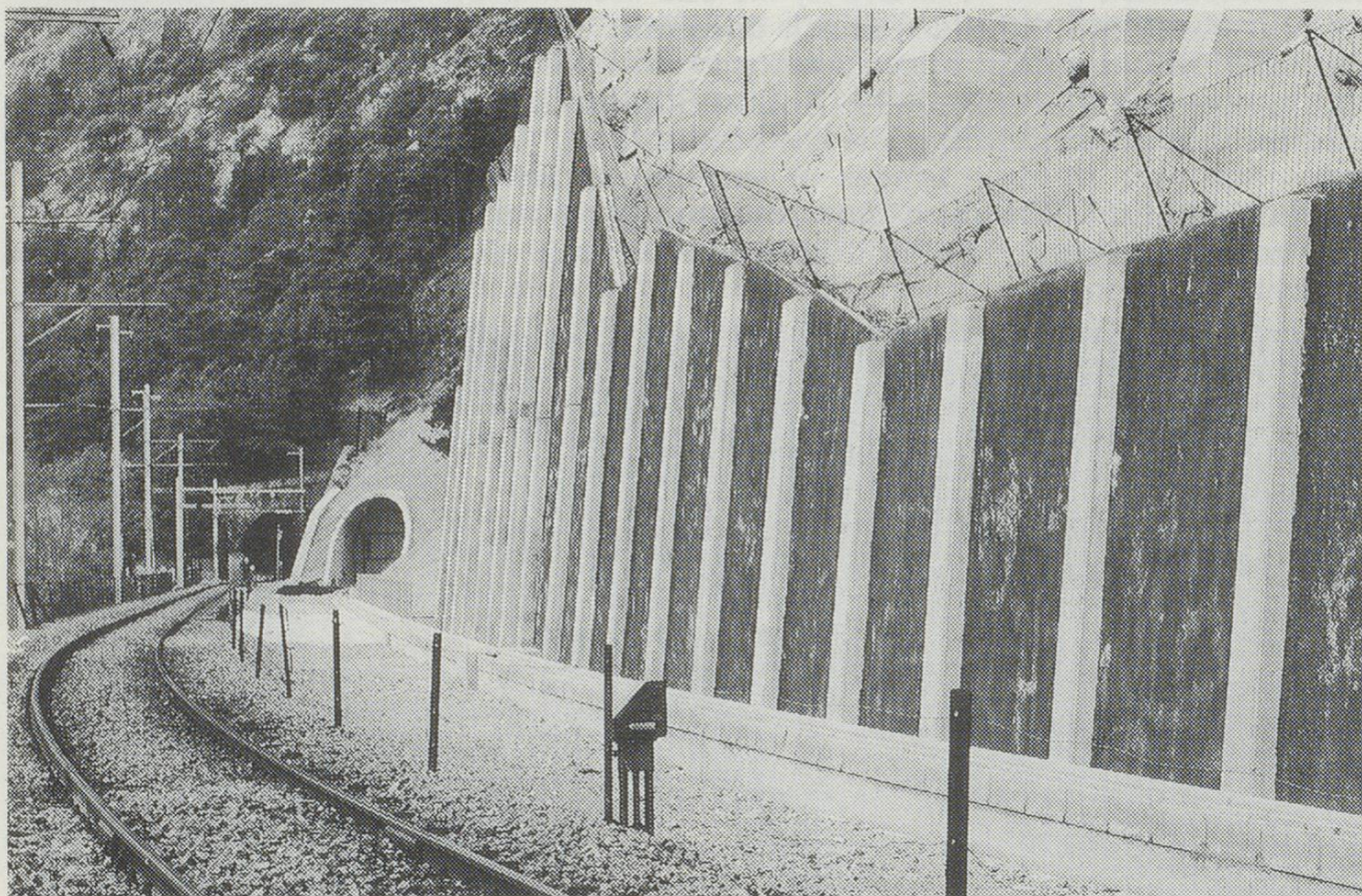


Ae8/8 No. 271 near Baltschiedertal.

Photo. Courtesy of B.L.S.

The geology of the northern sector is mostly chalk or tertiary formations which presented few problems, but the southern ramp is built on a precipitate strata of mostly crystalline rock which presented many problems concerning stability. A total of 32 tunnels had to be re-profiled to UIC - B standards, and two extra tunnels, one at Hondrich near Spiez and the other at Mittelgraben near Goppenstein had to be built. All of this work is taking place with the minimum of delay to the 110 trains that daily pass through the Lötschberg.

Starting from the northern approaches, the first obstacle was the 1.7 km single bore tunnel at Hondrich, just to the south of Spiez station. A second bore was started at both ends of the tunnel route. The southern approach through unconsolidated rock was drilled as a twin track tunnel, until the solid rock of the northern side of the massif was met, and from that point, about 1200 metres from the northern portal, the tunnel becomes two single track bores in length. This part of the project was completed in June 1987, which along with the associated track realignments provide a smoother path for the traffic.



Entrance to the new Mittalgraben II tunnel.

Photo. Courtesy of B.L.S.

The station area at Frutigen was lengthened on the southern side, completed in September 1982, to cater for the stabling of trains that have to await being called forward by the Italian customs. Just south of the station lies the famous 269 metre long Kander viaduct which could not be widened due to the structure of the surrounding ground, so a separate viaduct was built 15 metres to the east that blends in with the present structure. The new viaduct and the extra trackwork as far as Kandergrund was completed for service in December 1981, providing double track all the way to Blausee Mitholz station.

After Blausee station at kilometre mark 22.5 the second track is supported on reinforced concrete platforms built on the valley side of the existing track, which have been designed to blend in with the environment. The Felsenburg, Fürten and the 1.6km Spiral tunnels which were only partly bored, had to be drilled out to take the second track, and when the concrete supports at Felsenburg were fitted with the extra track in 1988 the section was opened for traffic. This section links up with the line to Kandersteg which was fitted with double track and opened in October 1984. From the station of Kandersteg to the south side of Goppenstein station, the main Lötschberg tunnel section, the route was originally built with twin track throughout. From Goppenstein the track descends to Brig which is 25 kms further and 572 metres lower down the mountain.

The avalanche protection shelters were extended, but the largest project in this section is the construction of the new 3.2km single track Mittalgraben tunnel due to be completed and ready for normal traffic by early 1990.



Re4/4 No.180 passing the new section near Hohtenn.

Photo: Courtesy of B.L.S.

The section of route from Hohtenn to Ausserberg is the longest to be converted and the most complex, for in this area are eight tunnels measuring a total of 3 kms, the Luogelkin viaduct and the steel Bietschtalbrücke. The tunnel work was fairly straight forward as they were drilled out to take the extra track, capable of taking the new Rolling road trains. The Luogelkin viaduct turned out to be a lucky stroke for the engineers, as the masonry bridge was constructed on foundations built on solid Malm rock, this allowed the building of the concrete pillars for the second track to be placed alongside the original structure. When this work was finished the whole of the new area was encased in natural stone facing. When the Bietschtalbrücke was built the centre span was constructed to

accommodate two tracks, but due to shortage of money the approach spans were built for single track only. The new programme called for the building of the reinforced concrete approaches and the laying of the steel connecting bridges and platform above the centre section for the tracks. This task and the tunnel work was completed and the tracks were placed into service on the 19th September 1986, just six years after the building began.

From Ausserberg to Lalden the work involved the widening of the 792 metre long Eggerberg tunnel and the reconstruction of the 100 metre long Baltschieder viaduct. The viaduct has had two piers built on the valley side of the original bridge, and onto this has been constructed the reinforced concrete beams for the second track. The whole of the centre section has been reinforced and faced with natural stone. This section is due to be opened for traffic from the latter part of 1989.

For the final part of the route from Lalden to Brig, the track had to built onto concrete platforms built into the rock face which in itself was not too difficult. The problem was how to get the materials to and from the various sites without disrupting the flow of traffic on the railway. The answer was for the sites to be connected to the valley below by cable ropeways which carried up concrete for the platforms and took away the spoils from the tunnels and the levelling of the area for the new track. To carry the main line across the Rhône river a second steel girder bridge was constructed alongside the original. This section was completed by 22 May 1981.

Apart from all the work mentioned above there was the task of modernising the overhead catenary which has been done in the sections opened for traffic and, will be done in the sections remaining to be completed. The power for the locomotives will be provided by a new 132kV line being laid between Kandersteg and Gampel-Steg, but this is running behind schedule because of protests from the local populace about the proposed route through the Gemmi pass. A special tunnel to accommodate the high power cable may have to be drilled. The new SBB 20 mVA substation at Gampel will provide the traction power for the southern ramp. The whole of the signal system has been modernised, and the signal boxes of Frutigen and Goppenstein have been replaced with a Domino 67 signal system built by Integra Signum. This will allow the remote control of the entire line from three signal centres located at Spiez, Kandersteg and Goppenstein, and with the new block system and several new crossover points installed, will permit train running in either direction on any of the tracks between Frutigen and Brig.

B.L.S. Mainline. Thun to Brig.

Section.	Length. km	Radius. metres Minimum.	Incline % Maximum.	Speed. km/h Maximum.
Thun - Frutigen	24	360	1.5	90-100
Frutigen - Kandersteg	18	300	2.7	80
Kandersteg - Goppenstein	17	1060	0.7	125
Goppenstein - Hohtenn	5	290	2.7	80
Hohtenn - Brig	20	280	2.4	80

Source, BLS "Ausbau auf Doppelspur" 1988 and 1989. My thanks to Walter Kleine and Peter Senn of the B.L.S. for their inestimable help in producing this item.

Front Cover. Luzern Station & new Signal Tower. Photo: Courtesy of Integra Signum.
