

Future secured – the mountain railway from Rheineck to Walzenhausen

By Bernhard Studer (all photos unless stated otherwise)

The 1.9 km long rack railway, connecting 405 metre high Rheineck in the canton of St.Gallen with 672 metre high Walzenhausen in the canton of Appenzell Auser rhoden, is to be upgraded. The current railway, which went into operation in 1958, will only run until 2025. In 2027, the railway will be reopened – as a fully automated railway system the likes of which the world has never seen before.

IN THE NORTH-EAST OF Switzerland, close to the borders with Germany and Austria, lies the holiday resort of Walzenhausen. The magnificently situated village is often called the balcony of eastern Switzerland because of its location. There are unique views of the green, pre-Alpine hilly landscape of the Appenzeller Vorderland and down into the Rhein Valley and Lake Constance.

The first railway to Walzenhausen

As early as the first half of the 19th century, Walzenhausen, like the neighbouring village of Heiden, developed into a spa and holiday resort for wealthy guests. In 1871, a stagecoach connection was opened between the small town of Rheineck in the Rhein Valley and Walzenhausen. When a cogwheel railway from Rorschach to Heiden was opened in autumn 1875, Walzenhausen recognised the need to build an efficient railway connection as well.

But it was not until two decades later, on 27 June 1896, that a 1218 m long funicular railway with water counterweight was opened as the first railway connection between Rheineck and Walzenhausen. The bottom station was in Ruderbach, just under 700 m from the existing Rheineck railway station. From Ruderbach the railway ran in a straight line and with a maximum gradient of 253‰ (1 in 3.95) up to Walzenhausen, overcoming a height difference of 269 m. The track gauge was 1200 mm. For braking purposes a rack (Riggenbach rack system) was installed between the tracks and the railcars were equipped with a braking cog-system.

In 1909, the 'Rheineck connecting railway', a standard-gauge tram with a length of only 670 m, was opened between Rheineck railway station and the valley station of the cable car. Guests could now travel comfortably, without a walk from Rheineck station to Ruderbach, directly to Walzenhausen. The tramway was electrified and had one three-phase and one petrol railcar.



On 29 June 1986 SBB's Re 4/4 10027 arrives in Rheineck in front of a regional train from Rorschach to Buchs SG. The Rh-W railcar and a Postbus are waiting for connecting passengers.



Seen at Rheineck on 14 May 1977, and without paint, the Rh-W railcar waits for passengers. A railway that owns only one vehicle must also know how to maintain the railcar and also continue the service. A new coat of paint was applied shortly after.

The Rheineck–Walzenhausen mountain railway from 1958

Over the years, this operation became tedious and the increasing age of the infrastructure and rolling stock required a rethink. In the mid-1950s, it was decided to completely renew the railway. The 1200 mm gauge was retained on the mountain line, and the tramway was re-gauged to this gauge. Today's combined adhesion (709 m) and rack (1255 m) railway was created as a direct, transfer-free connection between the Rheineck SBB station and Walzenhausen. Only one BDeh 1/2 railcar was obtained, with a maximum capacity of 60 passengers.

During the renovation of Rheineck station in 1999, the line was extended by a few meters in front of the platform roof. A 400-metre stretch between the road bridge to Gaissau and the train station was also slightly realigned as the SBB had reduced its tracks to just the two main tracks and the space previously used by the former SBB track 1 was now available for the Rh-W.

From November 2013 to May 2014 the railcar was upgraded – the car body was renewed, the cogwheel brake system was adapted to the current regulations and the interior of the car was refreshed (the railcar still had the 1957 wooden bench seating). In addition, the railcar was given a new coat of paint.

The upgrade of the railcar providing at least another 20 years of service. Cost of the upgrade was approximately CHF 900,000. The upgraded vehicle was officially inaugurated on 8 May 2014, with scheduled operations resuming on 20 May 2014.

From October 2015 to March 2016, the station building in Walzenhausen was renovated. The entrance was relocated, designed with glass walls and is now on the south side of the building so that the train can be seen from the village. A shop for everyday products with a bistro, ticket office and post office moved into the building, as before there

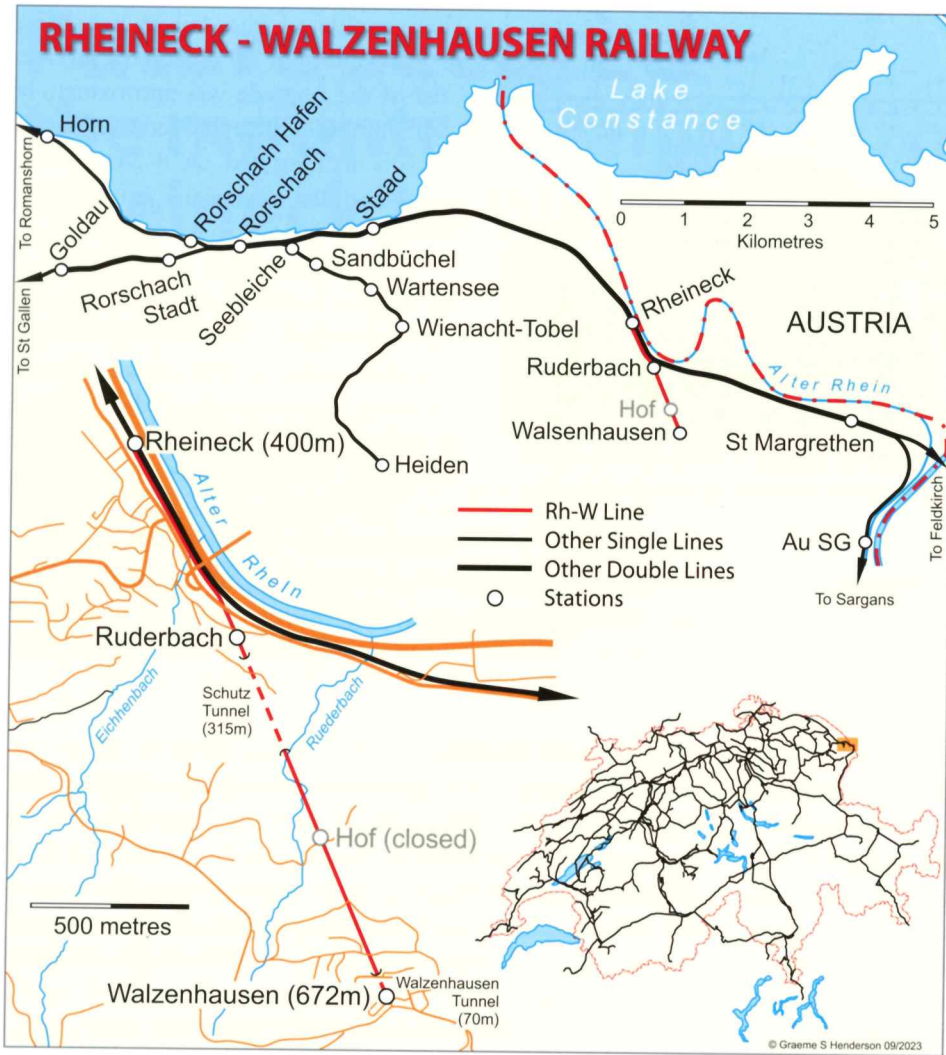
is also a hairdressing salon in the station. Solar cells were also installed on the roof. From mid-October to the end of December 2015, buses replaced the railcar while the building was upgraded.

The line in detail

The Rh-W starts at a siding in front of the Rheineck SBB railway station and, after 643 meters of adhesion track and crossing the road from Rheineck to St. Margrethen, reaches the start of the rack at Ruderbach (stop on request) the valley station of the former funicular. Immediately afterwards, the line runs through the 315 metre long Schutz tunnel. This is followed by three bridges of 50 m, 25 m and 75 m length, where the Ruederbach in the Hexenkirchlitobel is bridged. The bridges were initially unballasted steel girders. When the route was converted into a rack railway in 1958, these were replaced by prestressed concrete bridges. The Ruederbach bridges belong to the initial phase of prestressed concrete construction in Switzerland. This is followed by now closed Hof station (also stop on request), before another 70-metre-long tunnel under the Kurhaus in Walzenhausen. In the Walzenhausen tunnel, the maximum incline of 253 ‰ is reached. This is one of the steepest sections of a vertical cog railway in Switzerland.



At the Ruderbach stop, passengers had to change from the funicular to the tram until 1958. In 1958 a small depot and workshop for the railcar was built here. In the background you can see the only set of points on the railway, which connects the depot with the main line. Immediately after the switch, the rack begins. The railcar is commencing the climb on 31 August 1985.



Operation

The journey time is six minutes uphill and nine minutes downhill as per the timetable, but this varies slightly depending on the number of stops. The stops at the former Ruderbach valley station and Hof station (are on request for groups).

To date there is only one railcar, the BDeh 1/2, built in 1958 by SLM, FFA and BBC, which has been overhauled or maintained on various occasions in the RhB workshop in Landquart. On weekdays, 25 pairs of trains run from Monday to Friday, with 23 on the weekends. Overnight the railcar is stabled at the top station with the first service departing at 05:45 and then at XX:13 and XX:45 through the day to 19:13. The first service up the hill departs Rheineck at 06:05 and then every 30 minutes with the last departing at 19:35. In Rheineck, these connect with trains on St.Gallen to Chur services. After the last service mini buses are used that connect Rheineck, Walzenhausen and Heiden (at the top of the Rorschach-Heiden rack line).

In 1896, the first full year, 46,606 people used the service. The highest



Seen climbing the grade on 15 June 2023 the Bodensee/Lake Constance as well as to the church of Gaissau (in the foreground) can be seen from the train.

patronage was in 1963 with 205,083 passengers and in 1995 it was 104,053. In the anniversary year 1996, 17,430 trains covered a distance of 32,445 kilometres and carried 109,326 passengers.

The future

This railcar has now been in reliable service since 1 December 1958. In today's somewhat old-fashioned-looking vehicle, every journey is a likeable experience: when the vehicle is moving, it rumbles, the passenger is shaken a little and you feel the ride. But the railcar is nearing the end of its service life. The Appenzeller Bahnen, which has been operating the previously independent Rh-W since 2006, is determined to keep the small railway to Walzenhausen running and has been looking for a solution for several years.

They were therefore not very pleased when, at the beginning of 2019, the federal office for traffic was demanding in-depth study of alternatives – for example, a switch to bus operation – for the line to Walzenhausen. Two other rack railways in the region: the Rorschach to Heiden and Altstätten via Stoss to Gais lines were also being studied. The cost recovery ratio

of each of these three railways is very low, passenger numbers were declining, and the expected cost of renewal was too high.

The local population was outraged and formed a strong opposition, assisted by the local politicians who also clearly supported the railways. The mindset of the area was that economic efficiency should not be the deciding factor. Apart from a few exceptions, the rule in Switzerland is that secondary lines are operated even if they do not make a profit.

The federal office for traffic has in fact spoken out in favour of the continued existence of both the rack railway to Walzenhausen and the one to Heiden. The future of these two railways is thus secured, even though they will not be profitable. The long-term fate of the line from Altstätten to Gais is still undecided. But we can assume that it will operate for the next few years.

Automatic Train Operation – the third railway to Walzenhausen

The railway to Walzenhausen is to be converted into an automated train system. This will give Appenzeller Bahnen the opportunity to develop and implement an innovative



On 4 November 2022, the railcar crosses the bridge over the Hexenkirchlitobel.



Between Rheineck and Walzenhausen the maximum gradient is 253‰ (1 in 3.95). In Switzerland, there is only one rack railway that is even steeper, the Pilatus Railway, equipped with the unique Locher rack system, with a maximum of 480‰ (1 in 2.08). The railcar is descending to Rheineck on 15 June 2023.

solution. The future railway between Rheineck and Walzenhausen will be fully automated and driverless. This

will enable savings in operations, while at the same time operating hours are to be extended.



On 15 June 2023, with the Schutz tunnel in the distance the railcar is about to pass under the overbridge shortly before the Walzenhausen tunnel to the terminus. Between Ruderbach and Walzenhausen the track is a continuous straight. In the upper section of the line, modern von Roll racks have been installed. Today, Riggenbach racks are only in the lowest section.

The planning work is currently underway. The existing railway is scheduled to run until 2025. The new railway is to be built in 2026, and its commissioning is already planned for 2027.

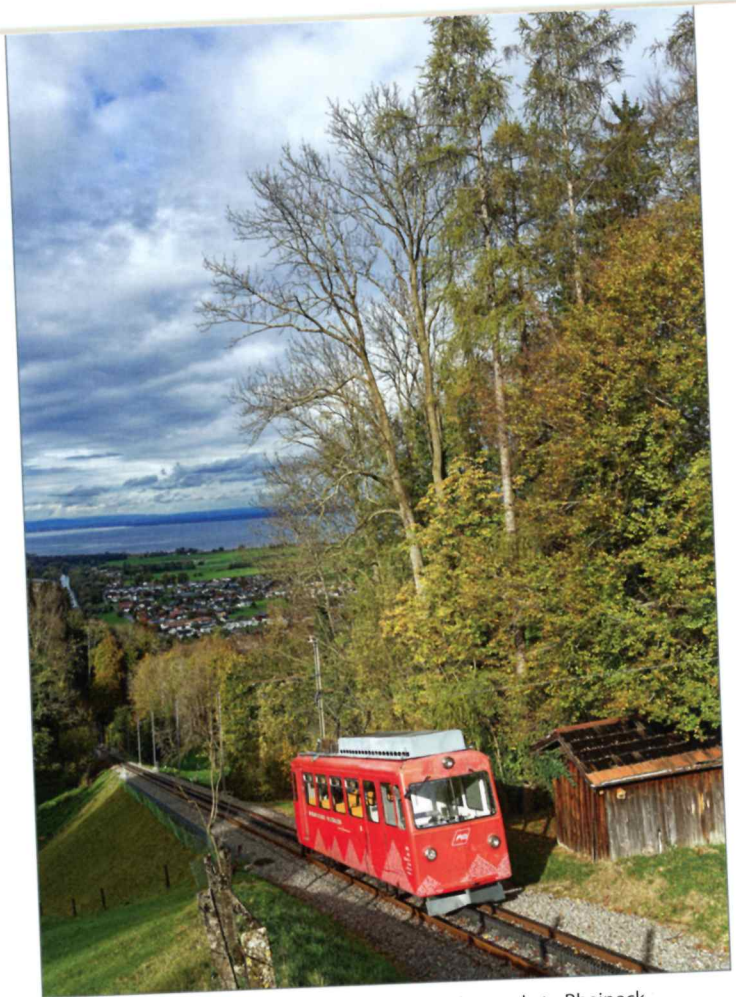
The existing line layout will be retained, as will the combined adhesion and cogwheel operation on 1200 mm gauge and the power system (600 VDC). The two tunnels and the three bridges will be upgraded, new safety equipment will be installed in the stations (Rheineck, Ruderbach and Walzenhausen), and at the level crossings on the line, and fences will be erected along the line.

The new railway will also have only one railcar. Stadler will supply the new vehicle, as well as the CBTC solution (CBTC = Communications-based Train Control), required for automated operation.

The new railway to Walzenhausen will be the world's first fully automated overland combined adhesion and rack railway. In total – for the changes to the track, the new vehicle and for the new technology – costs of CHF 25 million are expected.




On 25 April 1998 the railcar is near the top of the climb. This picture gives an impression of the magnificent view that can be enjoyed from Walzenhausen. The wide ribbon of motorway is clearly visible at the bottom of the valley. To the right of it flows the Alter Rhein, which here forms the border between Switzerland and Austria. On the right is the Vorarlberg village of Gaissau, on the left part is Rheineck. Rheineck railway station and thus the starting station of the Rh-W can be seen. Bodensee/Lake Constance spreads out in the background.



On 4 November 2022 the railcar is descending the grade to Rheineck.

Tourism

The Rh-W is an integral part of the adventure tour Rorschach–Heiden AR–Walzenhausen–Rheineck–Rorschach. This includes a trip with two mountain railways (Rorschach–Heiden-Bergbahn being the other line) and a boat on Lake Constance (Rheineck SG–Rorschach). There are two alternatives for the Heiden–Walzenhausen route: either by Postbus, or on foot along the approximately eight-kilometre long Witzweg

walking trail. The tour can also be completed in the opposite direction. 

The abbreviation for the Rheineck–Walzenhausen Railway was originally written Rh-W but the official abbreviation is RhW. Both spellings are used interchangeably. For the purposes of consistency we have used Rh-W.

