TEN MILE CREEK CONCRETE CULVERT

Location

BELSAR ROAD BARONGAROOK, COLAC OTWAY SHIRE

Municipality

COLAC OTWAY SHIRE

Level of significance

Heritage Inventory Site

Heritage Inventory (HI) Number

H7621-0027

Heritage Listing

Victorian Heritage Inventory

Interpretation of Site	Site is part of the former Colac-Beech Forest-Crowes railway line. Closure of the line during the 1960s lead to the abandonment of the line and the removal of the railway and associated infrastructure. The concrete culvert is an example of the difficult feats of engineering that were required for the construction of the Colac-Beech Forest- Crowes railway line.
Archaeological Significance	Low potential to contain archaeological deposits. Constructed in association with the railway and the formation, the area around the culvert may contain archaeological deposits . The culvert is the only concrete culvert found along the length of the Colac-Beech Forest-Crowes formation.
Hermes Number	194684
Property Number	

History

Place History

Promoting settlement in the Otway Ranges

A series of land acts were passed in the 1860s in an attempt to create small farm holdings, whilst at the same time recognising the pioneering effons of the squatters.Under the first land act, the 1860 Land Sales Act, three million acres were surveyed into allotments of between 80 to 640 acres. No person could select more than 640 acres annually, and the land had to be paid for outright, or half paid and halfleased. Subsequenrly more land was made available for selection under the Land Act (1862) and the 1865 Amendment Act. Then in 1869, most land - including unsurveyed land - became available for selection under the Land Act. (Sheehan, 2003: 19)

The Otway Ranges, in south west Victoria, were first opened to agricultural selection in 1884, under the *LalldAct* 1884, when allotments were selected from pre survey maps prepared by the Lands Department (Minchinton 2011:2). Within ten years more than 200 allotments had been taken up (Houghton 2005:1). Yet it wasn't until the arrival of the railway, during the 1870s, that Victoria's isolated south western tegion was considered penetrable. Until this time, the Otway Ranges were virtually impassable and as such, wete oflitrle economic value. The introduction of the railway provided the first all weathet, fast and reliable transport service into the area, which as Houghton noted was 'characterised by dense timber and high rainfall' (Houghton 2003:5).

Narrow gauge railways

The role of the Colonial government in surveying the area in 1884 and 1889 was instrumental in the change from the design of a broad gauge to a narrow gauge railway, with the resulting decrease in cost. Although initially against the policy of the Victorian Railways, narrow gauge railways were eventually tecommended for sparsely serried districts including Beech Forest (1902), Gembrook (1900) and Whitfield (1899) and Walhalla (1910), were eventually built as narrow gauge lines. The fourth line, initially recommended as narrow gauge was built as a broad gauge line at Warburton. The Beech Forest line, is therefore not the earliest nor the latest, but constructed at the peak of construction in the sparsely setrled areas. During the 1890s pressure rose ro find the means to construct cheap railways to the underdeveloped parts of Victoria, as the government realised that the cost of providing communicatio.ns to the ourlying communities by means of railways was excessive for the small populations served. **In** 1894 the Parliamentary Standing Commirtee on Railways considered the use of narrow gauge railways. The idea was opposed by the Victorian Railways (VR) in that it would introduce a non-srandard operating regime, which would without doubt incur extra costs, especially when stock had to be transferred between the two gauges.

In 1895 the Committee recommended that narrow gauge lines be only introduced in sparsely setrled areas. The first of the four narrow gauge lines, between Wangaratta and Whitfield opened in March 1899. It was followed by the Upper Ferntree Gully to Gembrook line in December 1900, the Colac to Beech Forest line in March 1902 and the Moe to Walhalla in May 1910. The Colac to Beech Forest line was extended to Crowes in June 1911 (see Houghton 2003:6 and Thompson 2004:2). An initial broad gauge line from Colac to the top of the Otway Ridge had been constructed in 1884 but it was abandoned due to the high COSt in laying the broad gauge, especially in such difficult terrain. The construction of the narrow gauge railway was delayed until 1900 when the initial section between Colac to Beech HV Report #4201 Context Site Number 007, Concrete culvert, part of former Colac-Beech Forest-Crowes railway line. Forest was developed. It was completed by March 1902, by which time some 44.7km ofline had been laid. The line was extended to Crowes, some 22.5km west of Beech Forest from 1909-1911. Not only did the narrow gauge railways open up of these isolated communities, they too provided a vital service for pioneer setders, allowing food produce and people to cravel into and out of the region. The Colac Beech Forest-Crowes railway was an immediate success providing access to the forests. With this, timber could be harvested and sent out as 'palings, mining props and laths, charcoal, sleepers, posts, piles, barrel staves, furniture and carriage timbers and sawn timber for building purposes' (Houghton 2012:21). Yet despite the use of these lines and the communities they served, the narrow gauge lines generally suffered heavy financial losses dlroughout their lifetimes and were closed as soon as conveniently I'0ssible (see Anchen 2012:3).

Linking the Otway's by rail

The topography of the Otway's required the design of the railway formation to be a complex affuir, with a climb of over 400m, traversing east-west flowing creeks on a north- south aspect and several drops into valleys. Designing the engineering solutions was challenging, with th guiding principle of minimizing earthworks in order to save cost. Wherever possible the route was lid over natural surface with a low earthern mound and an occasional slight cut into the high side. This is typical of the section from Colac to Elliminyt. **Other sections required the construction of low elnbankrnents to maintain an even** bed in undulating terrain or to gain elevation to a hilltop or Sput. Steep sided narrow box cuttings are characteristic of the sections from near Elliminyt to Barongarook, Birnam to Gellibrand and southwards from Gellibrand for several **kilometres.** The steeper terrain posed further engineering problems where the embankments and cutrings were higher and there is the use of 'borrow pits' and culverts. The cutrings and embankments were formed with curves, following the outward face of the slope. Cutrings and embankments were generally of a short lengrh apart from at the head of the Ten Mile where the long cuttings stand out. The design of the formation was adapted along its lengrh to suit the nature of the terrain through the height, slope, batter and location of the cuttings and embankments, enabling the line to pass through the challenging countty.

The formation was used as an important transport corridor for the people and industries of the West Otway Ranges at a time when road transport was primitive. The railway served the area economically for sixty years, carrying freight in and out, parricularlyas outwards loading of bulk commodities that provided the bulk of the revenue derived from the line. The function of the railway was also to act as a transport conduit for the wider region with railheads connecting with road transport to the coast on the orher side of the Otway Ranges.

Construction took place in two periods of activity with the initial 48 kilometres from Colac to Beech Forest between 1900 and 1902, followed by a further 22.5 kilometres to Crowes between 1909-1911. The railway was an immediate stimulus to the development of the region through providing fast, convenient and all weather access to the region. Fifteen bridges were constructed along the entire length of the Colac-Beech Forest-Ctowes line. Houghton notes that earth filled embankments were preferred on economic and maintenance grounds, with timber bridges being only used in wet areas and over the more 'substantial watercourses and very steep gullies' (Houghton 2012: 14).

The bridges were built to a standard VR narrow gauge design arid were constructed from Northern Victorian and Gippsland timber. Although originally built from local timber, this was eventually found ro be too soft and other timber was employed. The use of timber bridges was confined to the wettest areas, the steepest gullies and more subsrantial watercourses where earth fill was a liability. Bridges were constructed of timber from northern Victoria, the local hardwood proving to be too soft in comparison. Bridges were built to a standard Victorian Railways design for narrow gauge lines.

The line has, throughout its life had numerous changes brought about through

floods, bushfires, washaways and earth-slips. Natural disasters have taken their toll on the infrastructure. Cuttings and embankments have had to be cut back or modified in response to damage, and buildings, stations and sidings needed consrant maintenance and some replacement. Generally the modifications were carried out with similar materials and methods to the original construction.

Building the formation

The Colac-Beech Forest-Crowes railway was a narrow gauge mountain railway that was designed to secure communication between the broad gauge rail network at Colac and Beech Forest, and was specifically designed for rugged terrain. The earthworks, consisting of cuttings and embankments were designed to create an evenly graded bed that allowed for a gentle progression up and down the steep terrain through which it travelled.

Houghton notes that the Colac-Beech Forest-Crowes line was 'not a simple liner one on a constant rising grade because the intervening topography has several eastwest flowing watercourses whose valleys had to be negotiated on a north-south axis. This entailed a climb from Colac to the divide between Barongarook Creek and Boundaty Creek before dropping into the Boundary Creek valley, then another climb into the Ten Mile Creek valley and a drop into the Loves Creek valley and subsequent continuation to the floor of the Gellibrand River valley at 75 metres above sea level. From Gellibrand the climb to Beech Forest entailed a vettical rise of 457 metres over 19km along the face of a long rising spur to the main Otway Ridge' (Houghton 2005:10).

The variety of topography meant that the railway engineers constructed the rail route with the minimum amount of earthworks and where possible the route was laid onto the natural surface, with sleepers resting on sand/gravel/cinder ballast at 150mm deep.

Low embankments were built to maintain an even track bed in undulating terrain ,or to gain elevation, where as more extensive earthworks were created in the 'true mountain sections of the route such as the head of the Ten Mile Creek to Birnam section' (Houghton 2005:12). Larger embankments had concrete culverrs under them, which allowed water flow.

Extreme engineering feats were underraken at rhe mountain sections of the rail line, where roadbeds were built on the 'extremity of rhe outer edge of the facing slope to

minimise deep earthworks' (Houghton 2005: 12). This meant rhat the line had many tight curves, following the contours of the natural environment. Over the length of the line, cuttings and embankments were generally short, with the cutting walls having a sloping batter. Vertical batters were uncommon, as they were prone to slippage.

Standard VR wooden portable or standard corrugated iron passenger shelters were located along tI,e length of the Colac-Beech Forest-Crowes line. The installation of these differed to those of the broad gauge, in that they were placed on the surface, without raised platforms. Houghton notes that goods sheds were 'more solidly builr on site and there were platform types of timber or corrugated iron' (see Houghton 2005:13 and Houghton 2012:15).

Operating a train service

Other infrastructure included ramped platforms for the moving of farm machinery (at Weeaproinah and Wyelangta) and cranes for the timber trade (these were rare but were provided at Beech Forest and Wyelangta).

Stations were built without raised platforms and were of a standard Victorian Railways portable type. Smaller stations were simply corrugated iron shelter sheds and staff housing was provided also to standard design at Barongarook, Banool, Wimba, Weeaproinah, Lavers Hill, Wyelangta. Gellibrand" Crowes and Beech Forest.

The servicing of the locomotives and the line meant that fixtures and other infrastructure were developed long its length, these included water poinrs, coal storage, signals, distance markers, stopping places and a telephone line. Water points were located at Barongarook, Gellibrand, Wimba, Dinmonr, Beech Forest, Kincaid and Crowes. and these comprised weirs or pumps. concrete reservoirs, piping and elevated banks. Further infrastructure included loco sheds, located at Beech Forest and a coal stotage, located at Beech Forest (see Houghton 2005: 13 and Houghton 2012:25).

The service needs of the locomotives required substantial fixtures including water points at Barongarook. Gellibrand, Wimba, Dinmont, Beech Forest, Kincaid, and Crowes. Watering points required the weirs or pumps, reservoirs, piping and elevated tanks. Much of this infrastructure is no longer evident. Concrete posts provided distance markers and communication via telephone along the fulllengrh

of the line. A coal stage was provided at Beech Forest.

Mile posts, or distance markers, were placed along the entire length of the railway.

These were constructed from concrete and painted whire wirh black numbering. A

relephone line travelled the length of the line, so that there was communication

from the Colac Station Master's office all the way to Crowes. The line was carried

on wooden or iron poles and was set to the side of the track. Stopping places were

only marked by name boards and have no obvious remains.