HERITAGE COUNCIL OF WESTERN AUSTRALIA

REGISTER OF HERITAGE PLACES - ASSESSMENT DOCUMENTATION

11. ASSESSMENT OF CULTURAL HERITAGE SIGNIFICANCE

The criteria adopted by the Heritage Council in November 1996 have been used to determine the cultural heritage significance of the place.

PRINCIPAL AUSTRALIAN HISTORIC THEME(S)

- 3.8.5 Moving people and goods on land
- 3.8.6 Building and maintaining railways
- 5.1.2 Coping with dangerous jobs and workplaces

HERITAGE COUNCIL OF WESTERN AUSTRALIA THEME(S)

- 202 Rail and light rail transport
- 209 Technology and technological change

11. 1 AESTHETIC VALUE*

The two stone portals of the Swan View Tunnel blend well in their environment, while the dark cavern created by the vault, lends an aura of mystery for travellers using the heritage trail. (Criterion 1.2)

Sections of *Eastern Railway Deviation* have magnificent views across the Jane Brook valley, particularly along the section of the embankment just before the Swan View Tunnel, and also the section of the trail between the trestle bridge and Bridge 3, which passes Hovea falls. (Criterion 1.3)

11. 2. HISTORIC VALUE

The construction of railways in Western Australia opened up large areas for settlement that previously were uninhabitable due to their isolation and the difficulties settlers encountered either obtaining supplies or getting their produce to markets. The construction of *Eastern Railway Deviation* gave rise to a number of settlements in the previously unknown area of the Jane Brook Valley and permitted industries to become established in the hills district. (Criterion 2.1)

Eastern Railway Deviation passed through the Jane Brook valley and settlers soon became aware of the picturesque qualities of the area and picnicking parties visited the area. This led to the establishment of Western Australia's first national park, originally known as Greenmount National Park, and later renamed John Forrest National Park in 1901. (Criterion 2.2)

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* For consistency, all references to architectural style are taken from Apperly, Richard; Irving, Robert and Reynolds, Peter *A Pictorial Guide to Identifying Australian Architecture: Styles and Terms from 1788 to the Present* , Angus & Robertson, North Ryde, 1989.

The extension of the rail link to other country areas such as Beverley and Albany, together with the eastern link to Kalgoorlie in 1896, saw *Eastern Railway Deviation* become part of the major east - west rail link in Western Australia. (Criterion 2.2)

Eastern Railway Deviation was a successful endeavour to turn Western Australia's floundering railway system into an ongoing, viable economic prospect. (Criterion 2.2)

Eastern Railway Deviation was constructed under the guidance of C.Y. O'Connor, in his role as Commissioner for Western Australian Railways. C.Y. O'Connor became Western Australia's Engineer-in-Chief in 1891, and is best known for his crucial role in the construction of Fremantle Harbour and the Goldfield's water supply pipeline. (Criterion 2.3)

Eastern Railway Deviation is associated with John Forrest, Premier of Western Australia, as it was through his interest that a reserve was set aside for recreational purposes, in the area through which *Eastern Railway Deviation* passed, which ultimately became the state's first national park. (Criterion 2.3)

The construction of *Eastern Railway Deviation* was a major engineering project which saw vast amounts of rubble moved to construct embankments, together with intensive blasting and digging which created the first rail tunnel for Western Australia. All of this was achieved by using only picks and shovels, dynamite and horsepower. (Criterion 2.4)

11. 3. SCIENTIFIC VALUE

Six wooden trestle bridges were initially constructed along *Eastern Railway Deviation*. Only one of these bridges now survives, due to its 'entombment' in layers of dirt. The resulting embankment not only has the potential to reveal information about timber trestles bridges of the late nineteenth century, but also has the capacity to reveal working practises and material culture dating to the first quarter of the twentieth century. (Criterion 3.2)

Swan View Tunnel is important as a significant engineering achievement that was the only rail tunnel constructed in Western Australia. The precision with which both ends met during construction serves to illustrate the technical precision of both the surveyors and engineers of the day who laboured under extreme difficulties. (Criterion 3.3)

11. 4. SOCIAL VALUE

Eastern Railway Deviation is highly valued by the local and wider community as a walking, cycling and bridle trail. The trail is intensively used for recreational purposes and provides important historical reminders of an era when the hills community was linked to Midland by rail. (Criterion 4.1)

Eastern Railway Deviation contributes to the community's sense of place as it assists in defining and linking the settlements which were established along the railway route. The nuclei of these small settlements exist today, forming separate entities within the Shire of Mundaring. (Criterion 4.2)

12. DEGREE OF SIGNIFICANCE

12. 1. RARITY

The Swan View tunnel is the only railway tunnel constructed in Western Australian. It is unique in Western Australia, the sections of underground

railway in Perth and Subiaco and on the Joondalup line having been created by a cut and fill technique rather than tunnelling. (Criterion 5.1)

12. 2 REPRESENTATIVENESS

The three steel bridges remaining on *Eastern Railway Deviation* are representative examples of the type of steel bridge constructed by the Western Australian Government Railway department during the 1920s. (Criterion 6.2)

12. 3 CONDITION

The Swan View Tunnel does not appear to have any structural problems, and apart from the water which collects at the western end of the tunnel it is in good condition.

The four railway bridges differ one to the other. The current condition of the timber trestle bridge (Deep Creek Bridge) is not known as the structure in entirely encased in dirt. However, it is likely that the timber supports are in various stages of decay. Its condition is probably poor.

The dirt covering the timber deck of the Jane Brook Bridge, and the concrete abutments are in good condition. The steel girders and plates, while showing signs of corrosion, do appear to be in any imminent danger of collapse as yet. Overall, Jane Brook Bridge is in good condition.

Bridges 3 and 4 are very similar. The northern span of Bridge 3 has been abandoned and is currently deteriorating with vegetation growing up around the track. The track is in poor condition. The southern span is still maintained and is in good condition. New timbers to the decking suggest that this span undergoes regular maintenance. The concrete embankment and concrete piers are in good condition, although several of the concrete caps are missing or damaged.

At Bridge 4, the northern span has been maintained and is in good condition, while the southern span has been left to deteriorate. This span has lost a large section of timber decking, exposing the steel framework. The span is in poor condition. The concrete embankments are in good condition although several of the concrete caps are missing or damaged.

12. 4 INTEGRITY

Although the various elements that comprise *Eastern Railway Deviation* are no longer used for rail transport, their current use as a walking trail has not compromised the original intent of either the tunnel or the bridges. However, as the tunnel and the bridges are no longer used for rail traffic their integrity is moderate.

12. 5 AUTHENTICITY

The tunnel has under-gone very little change since its first construction. Apart from changes to the manner in which excess water is drained from the two portals and the removal of the track and rail bed, the tunnel has retained a high level of authenticity.

The wooden trestle bridge was completely filled in and, if exposed through archaeological investigations, its level of authenticity could be ascertained.

The three steel bridges were built during the 1920s and the steel girders and plating appears to be original. It is not known how often the timber decking has been renewed. The bridges have a high degree of authenticity.

The track has been lifted along the length of *Eastern Railway Deviation.* Is some places a few timber sleepers remain and metal spikes can often be found along the track.

13. SUPPORTING EVIDENCE

The documentary and physical evidence has been compiled by Fiona Bush.

13. 1 DOCUMENTARY EVIDENCE

Eastern Railway Deviation which comprises the Swan View tunnel, a masonry and brick lined structure, three steel railway bridges, and one wooden trestle bridge enclosed in a dirt embankment with a culvert, was constructed by the Government of Western Australia between 1894 and 1896.

In 1881, the first stage of what became known as the Eastern Railway was completed by the state government of Western Australia. The line ran between Fremantle and Guildford. Shortly after the opening of this section, loan funds were approved by the Legislative Assembly for the construction of Stage 2, which extended the line to Childow's Well (Childlow).[1] Initial surveys around Greenmount Hill indicated that the gradients would be rather steep and some of the curves were less than ideal. None-the-less, tenders were called and the contract was let to J.W. Wright in December 1881.[2] Work was completed in 1884.[3] Stage 3, which stretched from Chidlow's Well to York was constructed by Edward Keane and completed in 1885.[4] The extension of the rail network to Albany in 1889 linked the Eastern Railway to the great Southern district creating extra load on the route.[5]

C.Y. O'Connor was appointed the Western Australian Government's Engineer-in-Chief in May 1891.[6] At the time of his appointment, Western Australia had only just been granted responsible government, under the leadership of John Forrest.[7] Gold was also a comparative new discovery in the state, providing the government coffers with much needed revenue which was required to boost the railway system which was running at a loss. O'Connor's predecessor, J. Arthur Wright, had written a report in August 1885 on the Eastern Railway, commenting that for a small additional outlay on carrying out trial surveys to choose the most effective route and greater expenditure on earthworks, the government could have reduced working expenses on the line. This problem would only increase as the line became the principle rail route into the state. O'Connor could only concur with Wright's assessment of the problem, and he set about trying to make Western Australia's rail system profitable.[8]

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1 Le Page, J.S. H., *Building a State: the story of the public works department of Western Australia 1829 - 1985*, Water Authority of Western Australia, Leederville, 1986, p. 132.

2 Le Page, p. 149.

3 Elliot, I., *Mundaring: A history of the Shire*, Shire of Mundaring, Mundaring, 1983, p. 42.

4 Le Page, p. 149.

5 Le Page, p. 150.

6 Le Page, p. 179.

7 Le Page, p. 174.

8 Le Page, p. 214.

As Wright had noted, the expeditious manner in which Stage 2 of the Eastern Railway had been surveyed, gave the section which wound its way through the Darling Range some rather unfavourable curves and steep grades. As traffic on the route became increasingly heavier these defects began to take their toll. One section in particular, between Midland and Lion Mill (Mount Helena), was of great concern. Problems were generally encountered on the down-ward trip, in particular at a point near Boya which had a steep 1 in 38 gradient coupled with a sharp curve. This section of the track became known to railway employees as 'Cape Horn'.[9]

O'Connor was keen to solve this particular problem and in October 1891, John Muir, a railway engineer seconded from Victoria, was appointed to find a more favourable route over Greenmount Hill.[10] Muir surveyed three routes to the north of the existing line: through the Swan River valley, the Helena valley and the Deep and Mahogany Creeks valley. Muir recommended the Mahogany Creek route as the most cost efficient route. He estimated construction costs at £86,000.[11] Funding was approved and tenders called in October 1893. The South Australian firm of Smeaton and Hedges were successful with a tender of £47,608.[12] This quote was for the construction of a tunnel, earth works, ditches, cuttings, embankments, protective facings to embankments, six bridges and culverts; the overall cost was reduced because the government supplied the rails.[13]

The contract also stipulated that excavation work was to be carried out 24 hours a day except on Sundays. The total length of the contract was 12 miles, 60 chains. The gradient was to be 1 in 50 with the minimum radius of curves to be 12 chains. The route followed the contours of Blackboy Hill, the Darling Range and the Jane Brook (or Mahogany Creek as it was mistakenly called), in a series of curves. Unfortunately this route also featured a granite ridge which acted as a natural barrier. O'Connor's solution to this problem was to construct a tunnel 1,089 feet long through the ridge.[14] All of the work was carried out using picks and shovels with the accumulated spoil carted away by horses.[15]

Difficulties in the construction of the route were soon encountered. A report on the progress of the works was presented to Parliament during 1895. It noted:

> …works are exceptionally heavy for this Colony, and comprise a succession of deep cuttings, mostly through rock (hard diorite), and of high banks across gullies and ravines. Not far from the centre of the length is a tunnel 16.5 chains long, which has been pierced through the solid rock (chiefly granite); the approach cuttings to this are of considerable magnitude. The heading was broken through on 18 April, and the lines and levels from the two ends were found to come in exactly. Owing to the somewhat treacherous nature of the rock formations, as experienced in the cuttings and in the tunnel itself, it has been decided to give effect to the

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9 Le Page, p. 214.

10 Le Page, p. 215.

11 Le Page, p. 216. It should be noted that Muir erred in his naming of the creek as his route actually followed the valley of the Jane Brook. However, once the mistake had been made the route became known as the Mahogany Creek deviation.

12 Watson, Lindsay, *The Railway History of Midland Junction. Commemorating the centenary of Midland Junction 1895 - 1995.* L. & S. Drafting, Shire of Swan and Western Australian Light Railway Preservation Association Inc., Swan View, 1995, p. 122.

13 Contract for Specifications for Mahogany Creek Deviation. State Records Office, Acc No. 2620/2, AN No. 260 Item 33.

14 Watson, p. 122.

15 Evidence of these tools can be seen in a photographic copy held by the Mundaring Mundaring & Hills Historical Society.

> provision made against such possibility in the specification, and line the tunnel throughout. The side walls are being built of masonry, and the arches will be turned in brick. This tunnel is the only one, so far, on the railways of the Colony.[16]

In the same report, the bridges were described:

> ..... the largest is that over the stream at 28 miles 49 chains, consisting of 25 spans of 15ft., and one span of 40ft. The abutments and piers of one bridge are of masonry, and of the others of driven piles, or trestles on concrete foundations. The superstructures are jarrah, except the lower cords of the 40ft. span, which are karri.[17]

Excavation work on the tunnel proceeded from both ends and they met perfectly on 18 April 1895. The line was completed by 22 February 1896 and trains commenced immediate operation. The route was officially opened on 1 July 1896.[18] O'Connor had estimated that the improvements to the line would save the government approximately £19,000 per annum. This was assuming that traffic on the route would increase by twenty-five percent. Returns in the years to follow were to vindicate the expense of the deviation.[19]

The completion of the line led to the opening up of land along the Jane Brook valley to settlement and industries such as quarrying, timber and orchards were soon established in the area and small settlements sprang up along the route, linking them to Midland and Perth. Industries made full use of the nearby rail transport to get their goods to Perth.[20] Additionally, the picturesque qualities of the Jane Brook valley soon came to be appreciated and in 1898 a reserve was set aside for public use. Through the efforts of John Forrest, the area became Western Australia's first National park in 190l. A stopping point for picnickers was initially provided at Hovea until a station was installed further to the west in 1936. This station was provided specifically to cater to day-trippers.[21]

Shortly after the route was opened to traffic, it became evident that the tunnel was not particularly well ventilated and noxious fumes from the locomotives could be dangerous to the operators. Rail traffic on the line had increased shortly after the route was opened, when the line was extended to Coolgardie in 1896.[22] The line was extended still further to Kalgoorlie by the end of 1896 and began to carry the increased traffic loads that the gold fever brought.[23]

In December 1903, driver John Ross fainted and fell off the train while it was heading east. The fireman, C. Marsden didn't notice that the driver was missing until he had reached the other side of the tunnel. Fortunately, the driver had remained unharmed after his fall from the train.[24] Nearly a year later, the *Swan Express* reported that the tunnel was still causing trouble and

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16 Public Works Department, Statement of works carried out during the year ending 30 June 1895. Votes & Proceedings, 1895, No. 20

17 Public Works Department, Statement of works carried out during the year ending 30 June 1895. Votes & Proceedings, 1895, No. 20

18 WAGR Annual Report. 1896.

19 Le Page, 217.

20 Elliot, I., pp. 246 - 7, 255 - 6.

21 John Forrest Heritage Trail Pamphlet, Commonwealth Bicentennial Project, 1988, pp.2, 5, & 10.

22 Le Page, p. 224

23 Le Page, p. 225.

24 *Swan Express*, 23 December 1903, p.2f.

cynically noted that probably nothing would be done until someone died.[25] However, nothing further was done (and no one died) and the tunnel soon gained a poor reputation with drivers and firemen. One writer described the tunnel as being 'secreted up in the Darling Ranges, like a death trap, is [sic] the engine-men's Black Hole'.[26] Drivers or firemen were frequently overcome by the noxious fumes and heat. Experiments to reduce these effects were tried by the Railways Department: wet sponges, wet hessian bags and even an air tube extending into the cabin from the front of the engine. The men would often lie on the floor of their cab with a hessian bag placed over their heads.[27] Finally in 1914, after a serious accident occurred in the tunnel, a deputation of engine drivers and firemen approached the commissioner for railways, Mr. J. T. Short. Mr Short was sympathetic, and 'promised to ameliorate the conditions until such times as an open cut or deviation' could be constructed to deal with the problem.[28] To help alleviate the problem, a 'banker' engine was attached to the rear of the train to assist with the push through the tunnel. [29]

During the 1920s, the single line was duplicated between Northam and Bellevue to cope with the extensive traffic that used the route.[30] Due to age and the increase in the size of locomotives, the wooden bridges had become somewhat unstable and in 1928, three of the bridges which passed through the John Forrest National Park (known at this time as Greenmount National Park), were replaced with riveted steel girder structures. They were manufactured at the Midland Junction Workshops. The fourth bridge (Deep Creek Bridge which at 125. 76 metres was actually the longest on the line), was completely filled with dirt and concrete culverts placed underneath. The timber supports were left in situ.[31]

In November 1942, the worst fears of the men who travelled through the tunnel were realised. Two locomotives were pulling a train through the tunnel when the driver and fireman in both locomotives were overcome by the heat and fumes. Conditions on the track led the train to stall and it rapidly began its descent back down the hill towards Swan View, where the alert stationmaster routed the train onto a spur line. The driver in the second locomotive, Tom Beer, was killed and debris from the wrecked train was spread across both tracks, blocking traffic on the line.[32]

A government enquiry into the incident found that the unconscious driver's blood was saturated with carbon monoxide. Exhaustive tests followed using different types of coal, locomotives, assessing wind direction and letters were sent to other states with similar tunnels, to determine how they coped with the problem. It was readily acknowledged that the tunnel required ventilation but how this was to be effectively achieved during war-time conditions became the main stumbling block.[33] A suitable route for a deviation was located to the north of the tunnel in April 1943. The committee who had convened to find a solution to the tunnel problem, recommended

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25 *Swan Express*, 22 October 1904, p.3d.

26 *Swan Express*, 22 October 1909, p.4a.

27 *Swan Express*, 22 October 1909, p.4a.

28 *Swan Express*, 14 January 1914, p.4.

29 Elliot, I., *Mundaring: A history of the Shire*, Shire of Mundaring, Mundaring, 1983, p.228.

30 Watson, p. 124.

31 Elliot, p.235; John Forrest Heritage Trail Pamphlet, Commonwealth Bicentennial Project, 1988, pp. 4 & 8; Watson, p. 124.

32 Watson, pp. 129 - 130.

33 'Working of the Swan Tunnel', State Records Office, Acc. No. 3273, AN 260/CME/2, Item 2159.

the immediate construction of the deviation once World War II had ended. The cost of constructing the deviation was estimated at £130,000. Tenders were called for the construction of the deviation in May 1944 and the new deviation was opened for traffic in November 1945.[34] 'Down' trains continued to use the tunnel while 'up' trains used the new deviation.

In February 1956, the tunnel was closed temporarily to permit an up-grade to the rails and to carry out various other repairs. The restrictive profile of the tunnel meant that all rolling stock had to be designed with the tunnel's parameters in mind, so the opportunity was taken to lower the floor by a foot. Other work included the replacement of blocked drainage pipes and worn out timber sleepers. New concrete slabs, fitted on special metal base plates incorporating rubber pads which would help reduce noise and vibration, were placed on the tunnel floor.[35]

During the 1950s, bus travel between Midland and the various settlements in the 'hills' gradually became more popular and rail patronage began to decline. By 1952, the Mundaring Weir branch had closed and in 1958, the original Eastern Railway route between Midland and Mundaring closed.[36]

In 1961, the Western Australian Government signed the Railway Standardisation Agreement with the Federal Government. This agreement provided for a standard gauge link between Kwinana, Fremantle and Kalgoorlie which connected to the Commonwealth east - west rail link. Work on the new link commenced in November 1962. The new route followed the Avon Valley, one of the routes (Swan Valley) initially suggested by John Muir in 1891.[37] The route was opened to traffic on 15 February 1966.[38] The opening of this new route led to the closure of the Mahogany Creek Deviation.[39]

In 1978, the Public Works Department decided that the tunnel could serve as a baseline facility for calibrating survey instruments. The ends of the tunnel were bricked in and metal doors fitted, to assist in providing a stable environment. The track was lifted and seven concrete pillars were placed in a line down the centre of the tunnel.[40]

Along the remainder of the route, the rails were lifted and the line was abandoned. In 1988, the route was revitalised when it became part of the Heritage Trails Network established by the Western Australian Heritage Committee as part of a Commonwealth Bicentennial Project.[41] The tunnel was re-opened and the bricked up portals and concrete survey pillars removed. Today, the former Mahogany Creek Deviation forms part of the John Forrest Heritage Trail. The trail is used by walkers, cyclists and horse-riders on a regular basis.

The settlements which sprang up along the line continue today as separate entities within the Shire of Mundaring. The unusual nature of this pattern of settlement led to the establishment of a special clause within the Shire's Town

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34 'Working of the Swan Tunnel'; Watson p. 130.

35 Watson, p. 130.

36 Elliot, p. 51.

37 Watson, p. 87.

38 Watson, p.130.

39 Watson, p. 130.

40 National Trust Assessment.

41 O'Brien, A.V., Heritage Trails in Western Australia, The Western Australian Heritage Trails Network, undated, p.2.

Planning Scheme No. 3 which recognised that rural buffer zones should be kept between the settlements to maintain the individual character of each settlement.[42]

13. 2 PHYSICAL EVIDENCE

Eastern Railway Deviation which comprises the Swan View Tunnel, a masonry and brick lined structure, three steel railway bridges, and one embankment with a culvert which contains the remains of one of the original wooden bridges, was constructed by the government of Western Australia between 1894 and 1896.

The line ascends gently to the east through hilly countryside featuring natural bushland, steep ravines and waterfalls. The tunnel is situated at the end of a long cutting, approximately 1 km from the reconstructed Swan View platform. Eastward from the tunnel, the first railway bridge (Jane Brook Bridge), is situated across the Jane Brook near the point where Glen Brook enters Jane Brook in one of the main picnic areas in John Forrest National Park. It lies approximately 100 metres to the north of the Ranger's Office in John Forrest National Park. The second bridge (Deep Creek Bridge), lies slightly to the north of where Mahogany Creek joins Jane Brook and lies approximately 500 metres east of the Jane Brook Bridge. The third bridge lies approximately 400 metres to the east of Deep Creek Bridge, while the fourth bridge lies approximately 200 metres beyond the third bridge. All of the bridges span the Jane Brook.

The Swan View Tunnel has been cut through granite and lies at the eastern end of a cutting which displays evidence of dynamite blasting. The tunnel rises gently to the east. The bed of the former railway line is composed of clay and loose pea gravel with scatterings of blue metal, evidence of its former use as a railway line. Both the western and eastern portals are constructed from ashlar stones (granite), with dressed margins, laid randomly. The rectangular, dressed stones above the keystones of both portals bear the date '1895'. A low, capped parapet rises above the archway and hides a concrete dome in the western portal which appears to seal the front portion of the tunnel's vault before it disappears into the granite hillside. This area obviously collected water as a broken terracotta drainage pipe is located on the southern side of the portal, just below the line of this wall. Below this pipe (approximately 4.5 metres above ground level), is a heavily corroded metal downpipe. The lower section of this pipe is enclosed in randomly laid, rough dressed stone. The two pipes no longer connect and staining to the stonework indicates that water runs freely down the southern section of this face. Water then collects at the base of the tunnel on the southern side. (The site was visited in January and this area was extremely wet). It is not clear where the exit point of the down pipe was originally located.

A similar arrangement can be found on the southern side of the eastern portal, although in this case the top of the downpipe is located just beneath the pipe in the wall. This pipe is no longer used as a more recent galvanised iron pipe has been inserted in the exit pipe and extended south onto the top of the cutting. A raised stone wall, heavily sealed with cement, has been built up above the line of the cutting to contain any water that collects here. Staining to the side of the cutting indicates that water does leak out of this

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42 Shire of Mundaring, Town Planning Scheme No. 3 District Zoning Plan Gazetted 18 March 1994

collection point. No water has collected at the base of the tunnel at this end, although this end is higher then the western end.

In the interior, the lower sections of the tunnel are lined with roughly dressed, randomly laid stone which extends to a height of 1.7 metres. Above the stonework the tunnel is lined with bricks laid in stretcher bond. The bricks meet at a point in the centre forming an arched, rather than a curved vault. The floor of the tunnel consists of a thick layer of blue metal. Drainage pipes run down the length of the tunnel on the southern side. These pipes do not appear to be connected to any sump or exit point.

Shallow recesses have been built into both sides of the tunnel at approximately 21 metre intervals. These recesses alternate from side to side and are 1.8 metres wide, 2.15 metres high and .75 metres deep. The third recess from the western end (68.2 metres from the western end), has been fitted with a metal cupboard. This cupboard is currently empty.

The tunnel appears to be in good condition and no evidence of any extensive cracking could be seen. The ceiling is covered in a heavy layer of soot. Drainage in the tunnel could be improved, particularly at the southern end where water collects. A small amount of graffiti appears on the southern wall at the western end.

The first bridge east of the tunnel is the Jane Brook Bridge. The bridge consists of a pair of riveted, steel plate girder spans with timber decking. The decking is supported with steel cross-bracing. The edges of the Jane Brook are contained behind concrete abutments which extend for some distance on either side of the bridges. The spans are supported on two pairs of concrete pylons. The timber sleepers (decking) are covered with dirt (clay mixed with pea-gravel). The bridges are approximately 2.5 metres wide and 50 metres long. Capped concrete piers are located on either side of the bridges at both ends. An oval disk has been welded onto the southern side of the southern span and bears the letters: W.A.G.R. across the top, in the centre are some illegible letters, beneath which is 1928. Below the date: Midland Junction.

The deck of both spans is in good/fair condition. The steel structural components shows evidence of some corrosion which is to be expected when maintenance slips. This section of the bridge is in fair/good condition.

The wooden trestle bridge, known as Deep Creek Bridge, is entirely contained within a dirt embankment. Where the 'bridge' crosses Jane Brook, three concrete culverts have been constructed across the creek bed. No evidence of the timber structure can be seen. The concrete culvert is in good condition.

The trail between Deep Creek Bridge and Bridge 3 passes close to the Hovea Falls, which features a huge expanse of granite through which the creek flows in winter. Bridge 3 is the same construction as the Jane Brook Bridge: a pair of steel plate riveted spans, with timber decking and steel crossing bracing beneath the deck. The edge of the creek has been contained behind a concrete embankment. Concrete piers, topped with concrete caps, are located on either side of the spans and at both ends. The northern span is in a dilapidated state and does not appear to have been maintained. There are several gaps in the dirt covering, leaving the timber sleepers clearly defined. Melaleuca trees growing in the creek bed have grown up around the northern span. The southern span appears to have been recently re-furbished as it has fairly new timber bearers and decking. The decorative caps to the concrete piers have suffered badly, with only three of the eight caps remaining insitu. Only one of these caps is totally intact. The deck of the

southern span is in good condition. The steel structural components of both spans displays evidence of corrosion and they are in fair / good condition.

The third steel bridge (Bridge 4), is similar to Bridge 3, although here it is the southern span which has been left to deteriorate. The timber decking has completely disappeared along the western half of this span, leaving the steel components exposed. Vegetation partially blocks the eastern approach of this span. This span is in poor condition. The deck of the northern span has not been covered with dirt and lies exposed. The decking is in fair / good condition. The steel structural components of both spans shows evidence of corrosion and they are in fair / good condition.

The concrete embankment walls of all three bridges are in good condition, although the caps have suffered some damage.

13. 3 COMPARATIVE INFORMATION

Swan View tunnel is the earliest rail tunnel constructed in Western Australia. The Western Australia Government Railways Department replaced a number of their wooden trestle bridges during the 1920s and 1930s with steel bridges. Several of these steel bridges remain, although the lines have been abandoned. For example the steel bridge on the Northampton-Ajana line across the Chapman River and on the Geraldton-Mullewa line across the Greenough River.[43] Although abandoned the bridges do not appear to be rare.

13. 4 KEY REFERENCES

No key references.

13. 5 FURTHER RESEARCH

The original plans for the railway bridges were not bound with the rest of the cross-sections and plans for the deviation. To date, only photographic evidence of the original wooden trestle bridges has been sighted. In the event that archaeological investigations take place on the remains of the Deep Creek trestle bridge these plans could be useful.

43 Information obtained from files held by Mundaring & Hills Historical Society.