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 Moving goods and people
- 3.14.1 Using Australian materials in construction
- 8.10.5 Advancing knowledge in science and technology

HERITAGE COUNCIL OF WESTERN AUSTRALIA THEME(S)

- 112 Technology and technological change
- 203 Road transport
- 304 Timber industry
- 404 Community services & utilities

11.1 AESTHETIC VALUE*

Clackline Bridge has aesthetic value as a substantial timber bridge spanning Clackline Brook and the railway formation and is valued by members of the local community. (Criterion 1.1)

Clackline Bridge is of creative design being constructed to conform with the existing topography with a horizontal curve of constant four hundred metre radius and a vertical slope with a difference in level from end to end of six metres. (Criterion 1.2)

11.2 HISTORIC VALUE

Clackline Bridge was constructed in 1935 to provide a safer roadway for the greatly increasing motor vehicle traffic on the Great Eastern Highway, which is the major road route between Perth and the Eastern States. (Criterion 2.1)

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

For consistency, all references to garden and landscape types and styles are taken from Ramsay, J. *Parks, Gardens and Special Trees: A Classification and Assessment Method for the Register of the National Estate,* Australian Government Publishing Service, Canberra, 1991, with additional reference to Richards, O. *Theoretical Framework for Designed Landscapes in WA*, unpublished report, 1997.

Clackline Bridge was built by day labour under the State and Commonwealth governments' unemployment relief programmes that operated during the Great Depression. (Criterion 2.1)

Clackline Bridge delineates the original route of the Eastern Railway line to Northam, which was opened in 1886 and closed in 1981, and over which the bridge was constructed. (Criteria 2.1 & 2.2)

Clackline Bridge was built in 1935 as a result of efforts by the Northam Member of Parliament A.R.G. Hawke MLA, later Premier of Western Australia. (Criterion 2.3)

Clackline Bridge is a surviving example of the timber bridges constructed by the Main Roads Department during the time of E.W. Godfrey, the first of the Department's bridge engineers. (Criterion 2.3)

The design of *Clackline Bridge* to achieve a curved and sloping roadway was an innovative and technical achievement. (Criterion 2.4)

Clackline Bridge demonstrates the continued use of timber in bridge building in Western Australia, where its cost was relatively low and its qualities well understood. (Criterion 2.4)

11.3 SCIENTIFIC VALUE

Refurbishment of *Clackline Bridge* decking and structure, including concrete overlay, demonstrates innovative maintenance of timber bridges developed by the Main Roads Department. (Criterion 3.3)

Clackline Bridge was constructed in less than 12 months, which was a considerable achievement of the management and workforce for such a complex structure. (Criterion 3.3)

11.4 SOCIAL VALUE

Clackline Bridge is highly valued by the community for its associations with road and rail transport and for the aesthetic and technical aspects of its design, demonstrated by its inclusion in the Northam Municipal Inventory and agitation for its retention. (Criterion 4.1)

Clackline Bridge contributes to a sense of place for the local and wider community, being a significant element in transport through the district since 1935. (Criterion 4.2)

12. DEGREE OF SIGNIFICANCE

12.1 RARITY

Clackline Bridge is rare due to the innovative design and construction techniques to achieve a curved and sloping bridge 126.35 metres in length conforming to the topography of the location. (Criterion 5.1)

Clackline Bridge is an example of a functional design rarely practised. (Criterion 5.2)

12.2 REPRESENTATIVENESS

Clackline Bridge is representative of a design innovation to take into account two existing railway lines and the route of a highway in a difficult landscape. (Criterion 6.1)

The bridge demonstrates the techniques of bridge maintenance that were developed by the Main Roads Department from the 1970s. (Criterion 6.1)

12.3 CONDITION

Clackline Bridge remains an operational bridge on a major highway. It is essentially a timber structure requiring continuing maintenance of key structural elements to achieve an ongoing operational structure.

12.4 INTEGRITY

Clackline Bridge is of high integrity and although since widened following construction in 1935, and a concrete deck installed over the timber decking, the integrity of the original bridge is still maintained.

12.5 AUTHENTICITY

The bridge is of high authenticity and continues to demonstrate the technology of constructing a curved and sloping road bridge.

13. SUPPORTING EVIDENCE

The documentation for this place is based on the heritage assessment completed by Irene Sauman, Historian, Gena Binet and Alan Kelsall of Kelsall Binet Architects and Jim Paton, Structural Engineer in October 2006, with amendments and/or additions by HCWA staff and the Register Committee.

13.1 DOCUMENTARY EVIDENCE

Clackline Bridge is a curved timber road bridge with a one in twenty gradient constructed in 1935 on the Great Eastern Highway, immediately east of the village of Clackline. The structure is 126.35 metres in length and 8.8 metres wide and was built over the Eastern Railway line and the Clackline Brook gully, replacing two rail/road crossings and a small bedlog bridge.

The village of Clackline developed as a stopping place on the Eastern Railway line between Spencer's Brook and Northam, following the opening of that section of line on 13 October 1886. Clackline was also the junction of the Newcastle (Toodyay) Road and the Perth-Kalgoorlie road, and the point where both road and rail traversed the Clackline Gully. The construction and maintenance of roads was a matter for local Road Boards, with the financial assistance of the Government through the Public Works Department, but this meant that major highways that passed through a number of Road Board districts did not get the same attention in all areas. Following World War One, privately owned motor vehicles became more common and tourist traffic increased.

In 1926, the Main Roads Department (MRD) was formed and given overall responsibility for public roads and bridges in the State. The highways were the first focus for the new Department. Engineer for Roads and Bridges, A. Fotheringham, reporting on the 13.5 mile length of road between Wooroloo and Clackline, stated that: 'the road, excepting a few isolated portions a few chains

each in extent only, is simply a bush track widened out from time to time by the traffic'.[1]

Within the Clackline townsite the road took the most direct route, which was through the railway reserve, where it crossed the line twice and traversed the Clackline Brook gully. It was recognised that this section of road in particular had to be improved with a bridge, but funds were limited and the whole of the required work could not be undertaken. In 1926, £8,000 was spent on the Wooroloo-Clackline section under the Commonwealth's Recondition Main Road Grant. At Clackline, the highway was rerouted via Lockyer road, requiring resumption of several town lots, and the road surface was greatly improved, but the work created a twisting section of roadway and left the two rail/road crossings, with a small bedlog bridge over the Clackline Brook in between.[2]

> Both these crossings are awkwardly and dangerously situated in regard to road traffic, owing to limited visibility. The situation is complicated by the broken nature of the country and the proximity of Clackline Gully, a large quick-flowing stream crossing the road under a primitive and inadequate culvert between the two railway crossings, and thence flowing under the railway bridge on the Branch Line.[3]

The Northam Road Board wrote to the MRD in August 1926:

> [W]e desire to draw your attention to the present unfinished condition of this section, and the difficulties users of this highway experience. We are therefore anxious that the reconditioning of the whole section Wooroloo to Northam should appear on your first Year's programme. The heavy and daily increasing traffic on this road is not only confined to the Northam District and Wheat Belt, but also includes the Eastern Goldfields, the Murchison, and Wongan Hills Traffic, to and from the City. A considerable portion of last year's wool clip from the localities mentioned, per Motor Lorry were taken direct to the Wool Sheds at Fremantle over this road, and we anticipate a considerable increase in this class of traffic early next month when shearing commences.[4]

In late 1929, the Northam Roads Board and the MRD were still discussing responsibility for payment for the resumption of the two Clackline town lots and no further funds had been made available for improvements to the road.[5] During the Depression years of the early 1930s, the Commonwealth and State governments provided relief work for unemployed men, which included water supply, drainage and road works.[6] In November 1933, the MRD was investigating the possibility of completing the planned improvements at Clackline. In early March 1934, floodwaters swept down the Clackline Brook gully, cutting the highway and disrupting both rail and road traffic, making provision of a new bridge more urgent. In mid-March 1934, A.R.G. Hawke MLA for the Northam district, wrote to E.W. Tindale, Commissioner for Main Roads, urging that the work be put in motion, not least because the programme of relief employment

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1 Main Roads Department Western Australia (MRD) file, Midland Junction-Merredin Road No. 1001, Greenmount and Northam Road Board Districts, Wooroloo-Clackline Section, SROWA, WAS 635 CONS 1140, Item 1926/0630.

2 MRD File, Item 1926/0630, op cit.

3 Notes provided for the opening of Clackline Bridge in August 1935, MRD File, 680/35, Clackline Bridge and approaches, Great Eastern Hwy.

4 Correspondence 12 August 1926, MRD File, Item 1926/0630 op cit.

5 Correspondence 18 November 1929, MRD File, Midland Junction-Merredin Road No. 1001, Northam Roads Board district, SROWA, WAS 635, CONS 1140 Item 0963/1928.

6 Leigh Edmonds, *The Vital Link: A History of Main Roads Western Australia 1925-1996*, UWA Press, Nedlands, 1996, p. 27.

works at Northam was nearing completion and new projects were required for the winter months.[7]

In August 1934, Ernest Godfrey, first bridge engineer for Main Roads, completed his report for what was being called the Clackline Deviation, involving a single bridge spanning both the railway line and the Clackline Brook. Godfrey was responsible for the introduction of concrete and steel bridges instead of the usual timber, which had been the standard bridge material in WA for the previous hundred years.[8] For *Clackline Bridge*, however, he recommended standard construction in timber with sill piers, and steel construction over the 45-foot railway span 'similar to that adopted on the Garrett Street Bridge over the Swan River'.[9] It was also recommended that a 3 ft 6 inch wide footway should be added as the road bridge without footway would not reduce the risk to foot traffic, including for the number of school children who crossed the railway line each day to get to and from school. The work for the road and bridge was estimated at £8,500 with an extra £700 for the footway.[10]

The route proposed for the new line of the road and *Clackline Bridge* was considered by the Railways Department to be too close to the Toodyay rail line, which ran beside the highway at this point, so the centre line had to be moved 10 feet. This gave the curves a slightly greater radius and brought the road closer to the Clackline School and school residence, resulting in 'the destruction of some well developed pine trees inside the old boundary fence of the school playground'.[11]

Construction of *Clackline Bridge* was undertaken by Mains Road Departmental day labour under the unemployment relief works programme. *Clackline Bridge* had 18 spans covering a distance of 414 feet 7 inches (126.35 metres) and a width of 18 feet (13.8 metres) between the curbs. It featured both a curve and a slope, being built on a 1300-foot (400 metre) radius at a skew of 37 degrees to the Brook, with a rising grade of 1 in 20. The gradient created a need for special detailing of the corbels and staggered fixing of the half caps, while the curve meant longitudinal bracing was required between piers 14, 15 and 16. The internal piers were concrete masonry on rock, with 18-inch (457mm) diameter timber sills. The abutments were concrete masonry with timber bearers. Timbers used in the construction comprised piles and stringers in wandoo, half caps in jarrah, and decking in karri with, possibly, powellised karri on the 46-foot steel span over the railway line.[12]

The work involved co-operation on several matters between the West Australian Government Railways (WAGR) and the MRD. Some railway land was acquired for *Clackline Bridge*, and erection of the five steel girders for the railway span was

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7 Correspondence 13 March 1934, MRD File, 680/35, Midland Junction-Merredin Road, Clackline Deviation.

8 Leigh Edmonds, op cit, p. 27; OH 2599/46, John Gilbert Marsh, Engineer at Main Roads Department, interviewed by Leigh Edmonds, 1994.

9 Engineer's Report, 20 August 1934, MRD File, 680/35, op cit.

10 Engineer's Report, 20 August 1934, op cit; Correspondence 5 June 1998 from Bridge Structure Engineer, Lloyd Margetts, MRD File, 711-0608, Clackline Bridge.

11 Engineer's Report, 20 August 1934, op cit; *West Australian Government Gazette,* 17 December 1937, p. 2136.

12 MRD Plan 1592, 1935; Fact Sheet - Clackline Bridge (no. 608), MRD File, 711-0608, Clackline Bridge. 'Powellising' or 'powellizing' is a wood preservation treatment.

undertaken by the MRD under the supervision of Mr Bromilow, WAGR's Northam District Engineer, with the aid of a five-ton crane provided by WAGR.[13]

In July 1935, *Clackline Bridge* was approaching completion and Northam MLA A.R.G. Hawke, suggested to the Minister for Works that there should be an official opening, stating that:

> As this bridge from the point of view of safety of the travelling public is one of the most important ever built in the State, I suggest there should be an official opening... The local people agitated for years in favour of a bridge being built. Naturally they are very pleased to see the bridge being built. They would certainly appreciate an official opening.[14]

The opening took place on 30 August 1935. Those present included the Acting Minister for Works, H. Millington; Commissioner of Main Roads, E. Tindale; Secretary for Main Roads, H. Glendinning; Inspecting Engineer, J.W. Young; A.R.G. Hawke; Chairman of Northam Roads Board, E.A. Letch; Mayor of Northam, O. Northey; and, various Northam councillors and Road Board members. Mr Millington declared the bridge open and he and Mr Hawke rode on the front bumper of Mr Millington's car as it was driven slowly over the bridge. A small boy joined the ceremony by hitching a ride on the petrol tank. After proposing a vote of thanks to the Minister, Mr Hawke said that two things had influenced the agitation for the new bridge: public safety and the provision of employment. After the ceremony, the Northam Roads Board hosted a lunch at Northam for the official party.[15]

Over time, as traffic and speeds on the highway increased and trucks became larger and heavier, the narrowness of the bridge and the radius of the curve became an increasing safety hazard. In 1959-60, *Clackline Bridge* was widened and strengthened. It had been suggested that the footway be added to the road width but the widening was done on the inside of the structure with an addition of ten feet, making the bridge 28-feet (8.8 metres) in width and leaving the footway on the outside curve. The approaches to the bridge were also widened over a length of 500 feet on the west side and 200 feet on the east side, and the span over the railway line was strengthened.[16]

New concrete buttressed piers were erected on each side of the railway span and the steel crossbeams between pairs of girders were cut to allow insertion of new girders, which were 50 feet long and weighed 3 to 4 ton each. Six of the eight new girders were from stock salvaged from the old Perth Causeway navigation spans. To ensure the work did not disrupt rail traffic, a suspended working platform on specially strengthened wires was used, which could be hauled up quickly as required to clear passing trains. The cost of the work was estimated to be £20,000.[17] Gilbert Marsh, the MRD's second bridge engineer, designed the widening of Clackline Bridge.[18]

In the 1970s, there were several traffic accidents on *Clackline Bridge* attributed to the narrowness of the roadway and the small radius curve. Also reported was the roughness of the road surface between the 1959-60 widened section and the

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13 Correspondence 7 July 1935, MRD File, Item 1926/0630 op cit.

14 Correspondence 13 July 1935.

15 *The West Australian*, 31 May 1935.

16 MRD File, 680/35, op cit; MRD Plan 1592, Bridge widening, 1959; Main Roads Department, *Annual Report*, 1960, pp. 36-37.

17 MRD File, 680/35, op cit; Main Roads Department, *Annual Report*, 1960, pp. 36-37.

18 Correspondence 5 June 1998, Bridge Structure Engineer, Lloyd Margetts, MRD File, 711-0608, op cit

1935 original section. In 1978, a reinforced concrete overlay was installed on the deck, at a cost of £70,000, with major work commencing on 25 September 1978, after the provision of detours and a temporary railway crossing.[19] In 1981, the narrow-gauge Perth-Northam railway line through Clackline ceased and the track was removed. In 1987, a new 40mm-thick bituminous concrete surface was laid because the single coat surface laid in 1978 was breaking in places.[20]

At least two fatal accidents and a number of other major incidents involving prime movers occurred on the bridge in the 1980s, and there were several other accidents involving cars. Clackline residents complained of living with the screaming brakes of cars and the hiss of airbrakes every night as vehicles tried to negotiate the bridge. There was also the stress of attending accidents when the vehicles didn't make it.[21] The bridge required repairs after each accident, which generally involved guardrails and handrails or repairs to the bridge entry sections.[22] In the 1989 accident involving a prime mover, the footway was damaged over the eastern six spans, and as it was considered substandard (too narrow) and the railway crossings no longer existed, the footway was removed in favour of a footpath below the bridge.[23]

Eventual replacement of *Clackline Bridge* seemed inevitable to local residents and both the MRD and the Shire of Northam received letters supporting its retention. In 1988, the Shire of Northam wrote to the MRD requesting that *Clackline Bridge* be recorded as a structure worthy of preservation and to ensure it is not dismantled or destroyed in the event of future road realignment.[24]

In December 1993, a bushfire destroyed the unused railway bridge and damaged *Clackline Bridge* because of the heavy undergrowth that had been allowed to accumulate beneath it. Steel props were installed to add support to the damaged structure. Reports in the later 1990s noted that internal expansion joints had failed allowing water ingress, and there were split bedlogs and other deteriorated timbers, but the structure was still considered to be in fair condition. In 1995 the substructure was strengthened, principally by the replacement of connecting bolts.[25]

Clackline Bridge was entered on the Northam Municipal Heritage Inventory in 1998, with a recommended management category C, to conserve if possible. The place was entered in the survey of Large Timber Structures in 1998, with a heritage ranking of 4, which is described as 'current structure and features significant'.[26]

The MRD and the Department of Transport and Regional Services were planning for a highway deviation to bypass *Clackline Bridge*, but in the meantime,

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19 MRD File, Item 51-608-14, Bridge no 608, Clackline bridge, day labour construction; MRD Plan 7830-302-1, concrete overlay details, 1978.

20 MRD File, 711-608, op cit.

21 MRD File, Damage to Clackline Bridge, SROWA, WAS 2361 Cons 6051, Item 61-608-17; MRD File, 711-608, op cit, local resident Sue Bore, Lockyer Rd in a telephone call to the Premier during his Howard Sattler radio segment.

22 MRD File, Damage to Clackline Bridge, Item 61-608-17, op cit.

23 The footway was reported to have been removed by 23 August 1990, MRD File, 711-608, op cit.

24 MRD File, 711-608, op cit.

25 MRD File, 711-608, op cit, correspondence, photographs of 1994 and 1997 inspections; MRD Plan 9530-1158, Substructure repair detail, 1995.

26 O'Brien Planning Consultants, *Town and Shire of Northam Municipal Heritage Inventory*, 1998, place S07; *Large timber structures in Western Australia*, Institution of Engineers, WA Division, Perth, 1998, Vol. 1, entry 1017.

maintenance was ongoing. In 1998, a 3.4 metre wide concrete approach slab was installed adjacent to the abutment at the Perth end and in 2001 repairs to the concrete deck at pier 13 were carried out.[27] An amount of eight million dollars was allocated for the Clackline deviation in 2005-06 under the Commonwealth Government's Auslink Program. The proposed new road route will bypass the Clackline village to the north, largely making use of the former Toodyay railway route before rejoining the current line of the highway east of Clackline. A three barrel reinforced concrete box culvert drainage structure (3 off / 2.4m wide by 2.4m high) will be constructed at the waterway crossing of Clackline Brook on the new bypass route and a separate pedestrian underpass structure will be constructed opposite the Clackline General Store for the continuation of existing Farming Heritage Trail.[28]

In 2006 *Clackline Bridge* continues to be used for the Great Eastern Highway traffic and maintained by Main Roads Western Australia. When the Clackline Bypass project is constructed (due in 2007), *Clackline Bridge* will form part of the local road network in the future (attached is the proposed layout plan).

13.2 PHYSICAL EVIDENCE

Clackline Bridge is a timber bridge with concrete abutments, constructed in 1935 and located on the 76.93km mark on Great Eastern Highway within the Shire of Northam and bridging over Clackline Brook and the rail formation of the former Great Eastern railway.

Clackline Bridge is an elevated structure constructed in a general north-easterly direction from Perth towards Northam with the elevated section at the Perth end where it crosses over the Clackline Brook gully, which is the main topographical feature. The double rail tracks of the Eastern Railway (Perth-Northam) and the single track Toodyay branch line have been removed and only the railway formation and a single pier section of the timber railway bridge over Clackline Brook remain. The school buildings on Crown Reserve 2792 have also been removed. A stone memorial commemorating an anniversary of British settlement of Western Australia, erected by the students, remains on the school site.

The design of *Clackline Bridge* was governed by the topography of the location and the route of the railway tracks existing at the time of construction with the Great Eastern Railway (Perth-Northam) passing under the bridge at the western end.

Clackline Bridge is 126.35 metres in length consisting of 18 spans constructed on a 1 in 20 slope and a horizontal radius curve of 1,300 feet. The piers are numbered, with pier 1 at the Northam end and pier 18 at the Perth end. The horizontal curve was required to conform with the realignment of Great Eastern Highway and to a lesser extent with the alignment of the Toodyay branch line. The Perth-Northam line passing under *Clackline Bridge* between piers 16 and 17 determined the level of the bridge at the Perth end. The spans are of varying length due to the requirement to bridge over the Railway line track at a skewed angle. A 7.6 metre span leads out from the abutment at the Perth end followed by a 14 metre span between piers 16 and 17 with steel beams supporting the road deck over the Railway line. This is followed by a 4.8 metre span between piers 15 and 16 followed by two 5.2 metre spans and 13 spans of 6 metres.

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27 MRD Plans 9830-0609-2, approach slab details, 1998 & 0130-0710-1, Pier no.

28 *Clackline Bypass: project overview*, Creative Express, Canningvale, 2005.

Clackline Bridge has been altered a number of times and it is possible to discern the various changes which have been carried out. The original bridge was 5.5 metres in width with a 3.5 foot (1.07m) wide footway. The original piers remain, mainly consisting of four rounded braced wandoo piles supported from horizontal 450mm timber sills, adzed to 400mm, fixed to concrete footings. The plans show that the footings extend approximately 1,500mm in depth below ground level bearing on foundation rock.[29]

With the exception of the span over the former Perth-Northam Railway the original bridge spans consist of seven 400mm minimum diameter rounded timber wandoo stringers bearing on jarrah corbels supported on 660mm by 150mm jarrah half caps. The 14 metre span over the railway is supported on the four original 610mm x 190mm 41 kilogram steel beams. Piers 14, 15, 16, 17 and the concrete abutments are built parallel to the former Perth-Northam Railway line and hence are not at right angles to the bridge but at an angle of approximately 40 degrees.

The bridge has been widened by three metres on the western side with the installation of three additional stringers and the extension of the concrete footings and sills supporting two additional piles at each pier. At the same time, the span over the Perth-Northam Railway has been strengthened with the addition of eight steel beams and the existing girders have been strengthened by welding steel plates to the top and bottom flanges. The approaches to the bridge have been widened over a length of approximately 150 metres on the west side and 60 metres on the east side.

The timber decking has been replaced with a reinforced concrete overlay that shows evidence of repair at various times, particularly in the vicinity of pier 13. Some of the original substructure connecting bolts have been replaced and a 3.4 metre wide concrete approach slab has been installed adjacent to the abutment at the Perth end. The footway has been removed.

Clackline Bridge is an operational bridge in a well-maintained condition.

13.3 COMPARATIVE INFORMATION

There are 154 road bridges identified on the HCWA database. Of these, 64 are of timber construction. There are 15 bridges entered on the State Register, of which one is of stone and timber (c.1860), seven of these are of steel, concrete and brick (1904-59), and five are of timber construction comprising *Jalbarragup Bridge* (ruin, 1900), *Guildford Road Bridge* (1936-37), *Fremantle Traffic Bridge* (1938-39) and one former railway bridge, the *Asquith Bridge* (1949-52).[30]

A recently registered bridge is the Lower Kalgan River Bridge built in 1958, which also has a steel navigation span and at 170.2 metres is the third longest road bridge in the State (Garratt Road Bridge, 237.89 metres and *Fremantle Traffic Bridge,* 205.49 metres are longer) and is the longest outside the metropolitan area. *Clackline Bridge* is 126.35 metres in length.

In the 1930s, five timber bridges were built in the metropolitan area over rivers, including: the upstream Garratt Road Bridge (1934-35); Guildford Road Bridge and *Fremantle Traffic Bridge* over the Swan River, all of which have steel navigation spans; the bridge over the Helena River at Great Eastern Highway (1934-35); and, the *Canning Bridge* over the Canning River at Canning Highway

29 MRD Plan 1592, 1935, drawing 3, sheet 2.

30 HCWA database and assessment documentation.

(1937-38).[31] The steel span in *Clackline Bridge* was built for the passage of rail traffic, rather than river traffic, but the concept and construction are similar.

The *Asquith Bridge* on Long Gully Road over the Murray River is a 28 span curved timber bridge, with a length of 127.96 metres, which is roughly 1.61 metres longer than *Clackline Bridge*, but is only 2.79 metres wide. It was built as a railway bridge in 1949-52, used as a road bridge between 1960 and 1990, and is now part of the Bibbulmun Track and used only by hikers.[32]

All the existing major timber road bridges have had work done, including replacement of timber decking with concrete, and all are well maintained, but there is a general decline in the number of timber road bridges in use in Western Australia because sourcing new timber for maintenance or re-building is difficult.

Clackline Bridge is the only known bridge in the State that crossed both a railway and a waterway, and although marginally shorter than the Asquith railway bridge it is three times the width and built with a gradient. No other bridge with similar characteristics has been identified in the State.

13.4 KEY REFERENCES

Main Road Department Plans, Clackline Bridge, Books 1 & 2, held by Main Roads WA.

Main Roads Department correspondence files for Clackline Bridge held by Main Roads WA and State Records Office, as referenced.

13.5 FURTHER RESEARCH

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31 Main Roads Department Annual Report, 1935, Appendix III; Annual Report, 1936, Appendix XIII, p.12; Edmonds, Leigh, op. cit., p. 90.

32 Correspondence 5 June 1998, Bridge Structure Engineer, Lloyd Margetts, op cit; HCWA assessment documentation.