Shire of Narrogin

Love the life

BRIDGES ASSET MANAGEMENT PLAN

2020-2030

Contents

Acknowledgments:

The author would like to thank and acknowledge the input and supply of information from:

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Preamble

Shire of Narrogin Bridges Asset Management Plan 2020-2030

The Shire of Narrogin has a network of seven (7) bridges on road reserves to assist in promoting connectivity across the Shire for heavy vehicles, vehicles, cyclists and pedestrians. Like other infrastructure asset classes, for which the Shire has responsibility, it is critical that these assets are managed appropriately and responsibly. This asset management plan is intended to assist the Shire as it works towards more sustainable provision and management of its assets.

The seven (7) bridges include:

- Whinbin Rock Road (3125) over Arthur River;
- Tarwonga Road Bridge (South) (4551) over Wangelling Gully;
- Tarwonga Road Bridge (North) (3122) over Torbling Brook;
- Manaring Road Bridge (3128A) over Williams River;
- Havelock Street Bridge (3142) within the Narrogin Townsite;
- Pedestrian Railway Bridge (9250) connecting the Eastern side of Town with the Railway Station and CBD, over Pioneer Drive; and
- Pedestrian Doney Street Bridge (4629) allowing access from Doney Street through Gnarojin Park to Pioneer Drive, over Narrogin Brook.

Introduction

- This Plan forms part of a suite of asset management plans (10 Year Road, Footpath and Plant Replacement etc.) that identify the requirements of the life cycle of an asset and form a guide for long term financial planning to preserve these assets in an acceptable condition for use.
- It has been developed to provide a strategic and practical framework for the management, protection and care of the Shire's bridges.
- A list of the Shire's bridge structures considered in this Plan is provided, demonstrating the recommended amounts of funding annually to preserve the asset.
- A number of bridge structures within the Shire are the responsibility of other authorities, and therefore not included in this Plan. Examples include bridges on Main Roads WA (MRWA) arterial roads, railway bridges and culverts under railway lines.
- Minor bridge structures on parks and reserves are excluded from this plan and will be considered in the costings of the Parks and Gardens Asset Management Plan soon to be drafted.
- Development and adoption of this Plan meets a number of Council objectives as well as the requirements of State and Federal Governments to allow the Shire to be eligible for grant funding when demonstrating a maintenance schedule over a ten year period.

- Implementation of this Plan is in line with the Shire's Strategic Community Plan 2017-2027:
    - 1.3 An effective well maintained transport network.
    - 1.3.1 Maintain and improve road network in line with resource capacity.
    - 3.4 A well maintained built environment.
    - 3.4.1 Improve and maintain built environment.

Asset Knowledge

- The Shire is responsible for the management of seven (7) separate bridge structures on Shire road reserves worth approximately $1,911,721 (current replacement cost February 2020) (valuation by Griffin Valuations 2019).
- In 2019/20, the Shire budgeted $58,652 on bridge maintenance. This equates to an average of $8,323.14 per structure. In the same year, $31,040 was spent on renewal. It is envisaged with this Bridge Asset Management Plan, that between the years 2020 and 2030, the Shire's average spend to maintain its bridge assets will be $40,782.00.
- Data regarding the Shire's bridge structures is stored within the W Drive.
- Annual formal inspections of all Shire managed bridges are carried out and formally recorded by trained personnel. All identified works and scheduled maintenance i.e. visual check, tightening of nuts and bolts, cleaning of scuppers, pruning of vegetation and the renewal of signage and barriers are undertaken by the Shire's works crew or suitably qualified contractors.
- Five (5) yearly preventative maintenance is carried out by an experienced contractor, due to these works being more specialised and requiring specific tools. These tasks include fungal treatment, termite inspections and treatment, bolt shimming, pile repairs, corbel repairs, pile banding and jacking.
- L2 inspections are formal inspections conducted by Main Roads WA engineers every five years for timber bridges and 7 years for steel bridges and are provided to the Shire for action or budgeting purposes.
- This Ten Year Program, has been developed to recognise the use and requirements of each structure and is expected to be used in future years to facilitate prioritisation of the Shire's renewal, upgrade, inspection and maintenance programs.

Current Asset Performance

- Over the past four (4) years, a condition audit (Level 2 Inspection) has been undertaken in accordance with the requirements described in the Main Roads WA Road Structures Inspection Manual on six (6) of the Shire's Bridges. The one remaining bridge being the Doney Street pedestrian bridge has not had an L2 inspections conducted on it since 2003, at which time it had major refurbishment and became non trafficable. It is worth mentioning that refurbishment works are scheduled to be conducted on the Railway pedestrian bridge in the 2019/20 financial year.
- Both bridges on Tarwonga Road and the Manaring Road Bridge were considered to be in good condition.
- Whinbin Rock Road Bridge was found to be in a fair condition.

- Havelock Street Bridge had no conditioning data recorded.
- In addition to the Level 2 Inspection, the Shire inspects all bridges on a 12 monthly cycle in accordance with MRWA recommendations and guidelines – L1 inspections. This annual inspection routine, demonstrates that the Shire has a formal maintenance program in place which in turn, allows the Shire to be eligible for MRWA grant funding for bridge preservation.
- A review of maintenance history, since 2016, suggests that less than 20 issues per bridge are identified each year. The majority of issues are identified by annual and L2 inspections. Often, the items identified result in no action because the defect does not meet documented intervention levels or the defect reported is a known issue that is already being addressed by staff. Any items identified for action are scheduled for repair unless urgent, whereby immediate action is taken for the safety of the bridge users.
- The performance of the Shire's reactive bridge maintenance has been to a good standard however reactive maintenance required is minimal due to the Shire's annual L1 inspection routine and MRWA L2 bi-annual inspection routine.

Understanding Community Expectations & Demand

- The Shire's bridge assets have been constructed to support the Shire's road and path network, whilst ensuring stormwater runoff is not obstructed. Community expectations and demand for bridges therefore arise from demand for improvements in water management or the connectivity of the Shire's roads and/or pathways.
- Stakeholders include: local residents and businesses, farmers, transport industry, people passing through the Shire, the Shire's Insurers and other authorities including neighbouring Shire's, MRWA, Western Power, Water Corporation and other utilities.
- The Shire currently investigates community expectations and demand in a number of ways:
    - Informal interactions between Shire officers and the community as part of normal daily activities.
    - Review of community requests.
    - Community consultation undertaken during the development of strategic documents.
    - Road traffic counters to inform on usage volume and type.
- It is recognised that further strategic service planning work is required to better understand current and future community needs.
- Recommended improvement actions:
    - Consider demand forecasting and levels of service in all future Transport and Traffic and Integrated Water Management service planning work, eg the Secondary Freight Route initiative.

Asset Lifecycle Management

- A coordinated approach to the management of all phases of the service and asset lifecycles is considered necessary to sustainably meet community needs and preserve the asset for its intended purpose.
- Transport services and general traffic make use of the Shire's bridges.
- These services were established long ago and will continue into the foreseeable future to service the Town and Region.
- This Plan focuses on analysing the Shire's approach to asset lifecycle management and the required funding to do so to preserve the asset for its intended use.
- The Plan also demonstrates:
    - Maintenance and renewal cost estimates into designs to enable improved estimation of lifecycle costs associated with new works.
    - The use of routine inspection strategies by trained and qualified inspectors to identify the assets maintenance and renewal requirements and allow for costing for the management of the assets life cycle.

Financial Sustainability

- Financial sustainability requires a balance between the delivery of new assets and the maintenance, renewal or disposal of existing assets.
- Funding allocations at each stage of the asset lifecycle impact the standard to which the assets perform.
- Funding will also be dependent on the Shire's annual budget process. Bridges form an important part of a rural community for connectivity and it is recommended that funding the preservation of these assets is given high priority by Council.
- This plan will be factored into the Shire's Long Term Financial Plan (LTFP) which identifies the Shires long term financial strategy to maintain the organisations assets in a sustainable financial manner.

Grant Funding

Following a load assessment analysis carried out by MRWA during a L2 inspection, bridge structures that are deficient will require Emergency Repairs to restore the load carrying capacity of the bridge and/or a load posting.

Given the significance of the structure on the road network a Local Government may consider it appropriate to adopt the load limit for the bridge. If this option is preferred, Main Roads will arrange for the installation of the load limit signage. If a load limit is not acceptable then Emergency Repairs are required and these works will need to be funded by the Local Government. If the Local Government can demonstrate that they have an ongoing programme of Preventative Maintenance for their bridge structures then the Local Government is eligible for a funding contribution of 2/3 Main Roads and 1/3 Local Government, subject to a number of conditions.

Preventative Maintenance is the responsibility of the Local Governments to fund and undertake. The WA Local Government Grants Commission (WALGGC) provides a contribution towards these activities. This money is included in the Local Government's Road Preservation Grant. The funds are calculated on bridge deck area and $\$m^2$ rate depending on the type of structure.

The Commonwealth provides Financial Assistance Grant funding (FAGS) to the WALGGC in the form of Untied Funds for Local Roads. Of these funds (excluding Roads to Recovery funding), 7% is set aside for Special Projects and two thirds of the 7% is provided for Specific Works on Local Government bridges and one third for Remote Aboriginal Access Roads. The State provides a one third matching contribution from the Agreement for every two thirds provided by the Commonwealth.

In special circumstances funds are also provided for bridgeworks that are either totally funded through MRWA Programs or contributions arranged with Local Government.

MRWA's contribution for bridgeworks funded from the WALGGC is limited to a maximum of one third of the estimated total cost of the work and is only available after the Local Government's two third share is expended.

WALGGC prompts all Local Governments to submit project applications on an annual basis. Funds are allocated by the WALGGC based on recommendations provided by the Bridge Committee. The Bridge Committee comprises representatives from Main Roads WA, WALGGC and WALGA. The Committee receives recommendations from Main Roads WA on the priorities of projects under consideration. Delivery of projects is generally managed by Main Roads WA but Local Governments have the option to manage the projects themselves.

Special Project funds are only allocated for Specific Works on bridges which are defined as planned proactive work items normally scheduled at least two years in advance to maintain the integrity of bridge structural components. Funds may also be allocated for bridge reconstruction where the existing bridge has reached the end of its economic life. Funding only covers like for like replacement costs. The Special Project funds do not cover routine or preventative maintenance or new bridge construction where there is no existing bridge.

In order to be eligible for Special Project funds a Local Government must be able to show that annual visual inspections have been performed in accordance with the Level 1 Bridge Inspection Framework and also that adequate routine and preventative maintenance have been undertaken to prevent undue deterioration.

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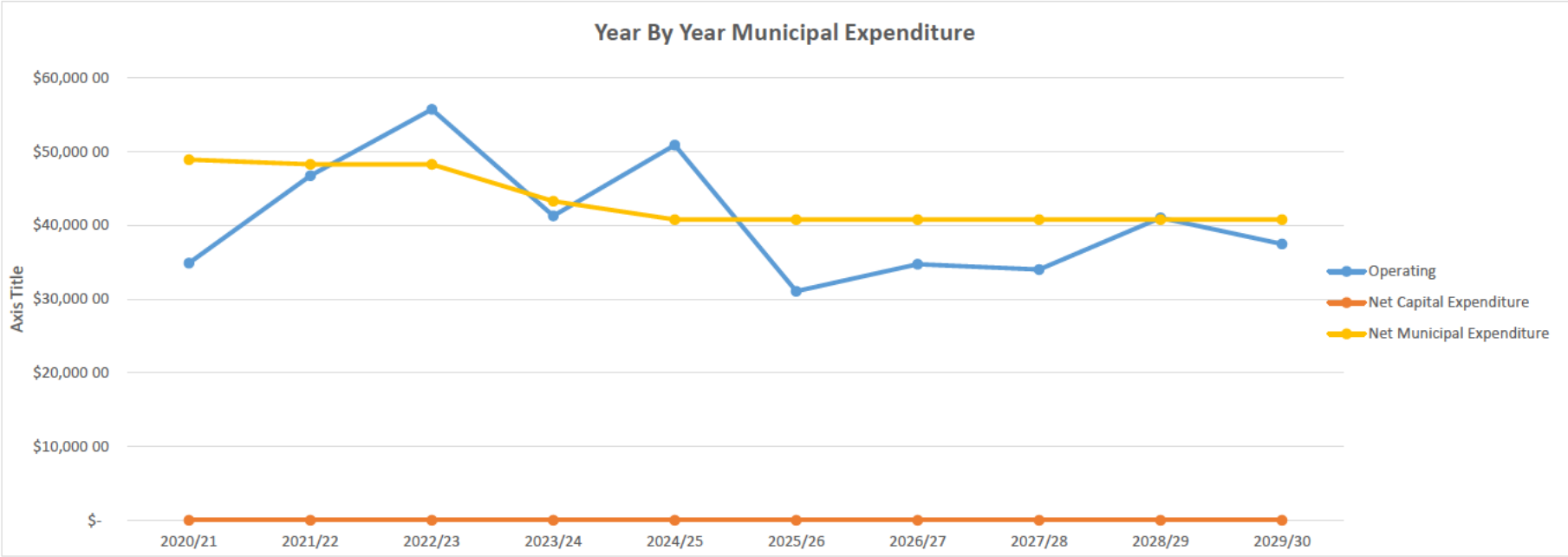
Bridge Asset Management Plan Financial Summaries

Municipal Expenditure	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	Average
Operating	$ 34,883.00	$ 46,733.00	$ 55,733.00	$ 41,293.00	$ 50,904.00	$ 31,064.00	$ 34,714.00	$ 34,014.00	$ 41,014.00	$ 37,474.00	$ 40,782.60
Net Capital Expenditure	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Transfer to / (From) Bridge Reserve	$ 14,035.00	$ 1,549.00	$ (7,451.00)	$ 1,989.00	$ (10,122.00)	$ 9,718.00	$ 6,068.00	$ 6,768.00	$ (232.00)	$ 3,308.00	
Net Municipal Expenditure	$ 48,918.00	$ 48,282.00	$ 48,282.00	$ 43,282.00	$ 40,782.00	$ 40,782.00	$ 40,782.00	$ 40,782.00	$ 40,782.00	$ 40,782.00	$ 43,345.60
Reserve Fund Balance	$ 14,035.00	$ 15,584.00	$ 8,133.00	$ 10,122.00	$ -	$ 9,718.00	$ 15,786.00	$ 22,554.00	$ 22,322.00	$ 25,630.00	



2020/2021

OPERATING EXPENDITURE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Labour	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	**$1,400.00**
Labour Overhead	$240.00	$240.00	$240.00	$240.00	$240.00	$240.00	$240.00	**$1,680.00**
Plant Cost	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	**$1,750.00**
Materials (Specific Repairs)	$700.00	$700.00	$700.00	$700.00	$700.00	$700.00	$700.00	**$4,900.00**
Contractors (5 Year Preventative Mtc)			$8,150.00					**$8,150.00**
Contractors (Termites)	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	**$14,000.00**
Insurance	$429.00	$429.00	$429.00	$429.00	$429.00	$429.00	$429.00	**$3,003.00**

Total Operating Expenditure **$34,883.00**

CAPITAL EXPENDITURE/REVENUE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Expenditure	0	0	0	0	0	0	0	**0**
Revenue	0	0	0	0	0	0	0	**0**

Total Capital Expenditure **0**

Transfer to / from Bridge Reserve **$14,035.00**

Total Cost To Muni 2020/21 **$48,918.00**

2021/22

OPERATING EXPENDITURE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Labour	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	**$1,400.00**
Labour Overhead	$240.00	$240.00	$240.00	$240.00	$240.00	$240.00	$240.00	**$1,680.00**
Plant Cost	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	**$1,750.00**
Materials (Specific Repairs)	$700.00	$700.00	$700.00	$700.00	$700.00	$700.00	$700.00	**$4,900.00**
Contractors (5 Year Preventative Mtc)				$9,000.00		$11,000.00		**$20,000.00**
Contractors (Termites)	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	**$14,000.00**
Insurance	$429.00	$429.00	$429.00	$429.00	$429.00	$429.00	$429.00	**$3,003.00**

Total Operating Expenditure **$46,733.00**

CAPITAL EXPENDITURE/REVENUE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Expenditure	$15,001.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	**$15,001.00**
Revenue	-$15,001.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	**-$15,001.00**

Total Capital Expenditure **0**

Transfer to / from Bridge Reserve **$1,549.00**

Total Cost To Muni 2021/22 **$48,282.00**

2022/23

OPERATING EXPENDITURE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Labour	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	**$1,400.00**
Labour Overhead	$240.00	$240.00	$240.00	$240.00	$240.00	$240.00	$240.00	**$1,680.00**
Plant Cost	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	**$1,750.00**
Materials (Specific Repairs)	$700.00	$700.00	$700.00	$700.00	$700.00	$700.00	$700.00	**$4,900.00**
Contractors (5 Year Preventative Mtc)					$11,000.00		$18,000.00	**$29,000.00**
Contractors (Termites)	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	**$14,000.00**
Insurance	$429.00	$429.00	$429.00	$429.00	$429.00	$429.00	$429.00	**$3,003.00**

Total Operating Expenditure **$55,733.00**

CAPITAL EXPENDITURE/REVENUE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Expenditure	0	0	0	0	0	0	0	**0**
Revenue	0	0	0	0	0	0	0	**0**

Total Capital Expenditure **0**

Transfer to / from Bridge Reserve **-$7,451.00**

Total Cost To Muni 2022/23 **$48,282.00**

2023/24

OPERATING EXPENDITURE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Labour	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	**$1,400.00**
Labour Overhead	$240.00	$240.00	$240.00	$240.00	$240.00	$240.00	$240.00	**$1,680.00**
Plant Cost	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	**$1,750.00**
Materials (Specific Repairs)	$700.00	$700.00	$700.00	$700.00	$700.00	$700.00	$700.00	**$4,900.00**
Contractors (5 Year Preventative Mtc)	$14,560.00							**$14,560.00**
Contractors (Termites)	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	**$14,000.00**
Insurance	$429.00	$429.00	$429.00	$429.00	$429.00	$429.00	$429.00	**$3,003.00**

Total Operating Expenditure **$41,293.00**

CAPITAL EXPENDITURE/REVENUE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Expenditure	$0.00	$0.00	$0.00	$270,000.00	$0.00	$0.00	$0.00	**$270,000.00**
Revenue	$0.00	$0.00	$0.00	-$270,000.00	$0.00	$0.00	$0.00	**-$270,000.00**

Manaring Road Bridge 3128A Converted To Culvert

Total Capital Expenditure **0**

Transfer to / from Bridge Reserve **$1,989.00**

Total Cost To Muni 2023/24 **$43,282.00**

2024/25

OPERATING EXPENDITURE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Labour	$200.00	$200.00	$200.00		$200.00	$200.00	$200.00	**$1,200.00**
Labour Overhead	$240.00	$240.00	$240.00		$240.00	$240.00	$240.00	**$1,440.00**
Plant Cost	$250.00	$250.00	$250.00		$250.00	$250.00	$250.00	**$1,500.00**
Materials (Specific Repairs)	$700.00	$700.00	$700.00		$700.00	$700.00	$700.00	**$4,200.00**
Contractors (5 Year Preventative Mtc)		$27,990.00						**$27,990.00**
Contractors (Termites)	$2,000.00	$2,000.00	$2,000.00		$2,000.00	$2,000.00	$2,000.00	**$12,000.00**
Insurance	$429.00	$429.00	$429.00		$429.00	$429.00	$429.00	**$2,574.00**

Total Operating Expenditure **$50,904.00**

CAPITAL EXPENDITURE/REVENUE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Expenditure	0	0	0	0	0	0	0	**0**
Revenue	0	0	0	0	0	0	0	**0**

Total Capital Expenditure **0**

Transfer to / from Bridge Reserve **-$10,122.00**

Total Cost To Muni 2024/25 **$40,782.00**

2025/26

OPERATING EXPENDITURE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Labour	$200.00	$200.00	$200.00		$200.00	$200.00	$200.00	**$1,200.00**
Labour Overhead	$240.00	$240.00	$240.00		$240.00	$240.00	$240.00	**$1,440.00**
Plant Cost	$250.00	$250.00	$250.00		$250.00	$250.00	$250.00	**$1,500.00**
Materials (Specific Repairs)	$700.00	$700.00	$700.00		$700.00	$700.00	$700.00	**$4,200.00**
Contractors (5 Year Preventative Mtc)			$8,150.00					**$8,150.00**
Contractors (Termites)	$2,000.00	$2,000.00	$2,000.00		$2,000.00	$2,000.00	$2,000.00	**$12,000.00**
Insurance	$429.00	$429.00	$429.00		$429.00	$429.00	$429.00	**$2,574.00**

Total Operating Expenditure **$31,064.00**

CAPITAL EXPENDITURE/REVENUE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Expenditure	0	0	0	0	0	0	0	**0**
Revenue	0	0	0	0	0	0	0	**0**

Total Capital Expenditure **0**

Transfer to / from Bridge Reserve **$9,718.00**

Total Cost To Muni 2025/26 **$40,782.00**

2026/27

OPERATING EXPENDITURE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Labour	$200.00	$200.00	$200.00		$200.00	$200.00	$200.00	**$1,200.00**
Labour Overhead	$240.00	$240.00	$240.00		$240.00	$240.00	$240.00	**$1,440.00**
Plant Cost	$250.00	$250.00	$250.00		$250.00	$250.00	$250.00	**$1,500.00**
Materials (Specific Repairs)	$700.00	$700.00	$700.00		$700.00	$700.00	$700.00	**$4,200.00**
Contractors (5 Year Preventative Mtc)						$11,800.00		**$11,800.00**
Contractors (Termites)	$2,000.00	$2,000.00	$2,000.00		$2,000.00	$2,000.00	$2,000.00	**$12,000.00**
Insurance	$429.00	$429.00	$429.00		$429.00	$429.00	$429.00	**$2,574.00**

Total Operating Expenditure **$34,714.00**

CAPITAL EXPENDITURE/REVENUE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Expenditure	0	0	0	0	0	0	0	**0**
Revenue	0	0	0	0	0	0	0	**0**

Total Capital Expenditure **0**

Transfer to / from Bridge Reserve **$6,068.00**

Total Cost To Muni 2026/27 **$40,782.00**

2027/28

OPERATING EXPENDITURE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Labour	$200.00	$200.00	$200.00		$200.00	$200.00	$200.00	**$1,200.00**
Labour Overhead	$240.00	$240.00	$240.00		$240.00	$240.00	$240.00	**$1,440.00**
Plant Cost	$250.00	$250.00	$250.00		$250.00	$250.00	$250.00	**$1,500.00**
Materials (Specific Repairs)	$700.00	$700.00	$700.00		$700.00	$700.00	$700.00	**$4,200.00**
Contractors (5 Year Preventative Mtc)					$11,100.00			**$11,100.00**
Contractors (Termites)	$2,000.00	$2,000.00	$2,000.00		$2,000.00	$2,000.00	$2,000.00	**$12,000.00**
Insurance	$429.00	$429.00	$429.00		$429.00	$429.00	$429.00	**$2,574.00**

Total Operating Expenditure **$34,014.00**

CAPITAL EXPENDITURE/REVENUE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Expenditure	0	0	0	0	0	0	0	**0**
Revenue	0	0	0	0	0	0	0	**0**

Total Capital Expenditure **0**

Transfer to / from Bridge Reserve **$6,768.00**

Total Cost To Muni 2027/28 **$40,782.00**

2028/29

OPERATING EXPENDITURE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Labour	$200.00	$200.00	$200.00		$200.00	$200.00	$200.00	**$1,200.00**
Labour Overhead	$240.00	$240.00	$240.00		$240.00	$240.00	$240.00	**$1,440.00**
Plant Cost	$250.00	$250.00	$250.00		$250.00	$250.00	$250.00	**$1,500.00**
Materials (Specific Repairs)	$700.00	$700.00	$700.00		$700.00	$700.00	$700.00	**$4,200.00**
Contractors (5 Year Preventative Mtc)							$18,100.00	**$18,100.00**
Contractors (Termites)	$2,000.00	$2,000.00	$2,000.00		$2,000.00	$2,000.00	$2,000.00	**$12,000.00**
Insurance	$429.00	$429.00	$429.00		$429.00	$429.00	$429.00	**$2,574.00**

Total Operating Expenditure **$41,014.00**

CAPITAL EXPENDITURE/REVENUE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Expenditure	0	0	0	0	0	0	0	**0**
Revenue	0	0	0	0	0	0	0	**0**

Total Capital Expenditure **0**

Transfer to / from Bridge Reserve **-$232.00**

Total Cost To Muni 2028/29 **$40,782.00**

2029/30

OPERATING EXPENDITURE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Labour	$200.00	$200.00	$200.00		$200.00	$200.00	$200.00	**$1,200.00**
Labour Overhead	$240.00	$240.00	$240.00		$240.00	$240.00	$240.00	**$1,440.00**
Plant Cost	$250.00	$250.00	$250.00		$250.00	$250.00	$250.00	**$1,500.00**
Materials (Specific Repairs)	$700.00	$700.00	$700.00		$700.00	$700.00	$700.00	**$4,200.00**
Contractors (5 Year Preventative Mtc)	$14,560.00							**$14,560.00**
Contractors (Termites)	$2,000.00	$2,000.00	$2,000.00		$2,000.00	$2,000.00	$2,000.00	**$12,000.00**
Insurance	$429.00	$429.00	$429.00		$429.00	$429.00	$429.00	**$2,574.00**

Total Operating Expenditure **$37,474.00**

CAPITAL EXPENDITURE/REVENUE

TYPE	Whinbin Rock Rd 3125	Tarwonga Rd 4551	Tarwonga Rd 3122	Manaring Rd 3128A	Havelock St 3142	Doney st Footbridge 4629	Main Footbridge 9250	Total
Expenditure	0	0	0	0	0	0	0	**0**
Revenue	0	0	0	0	0	0	0	**0**

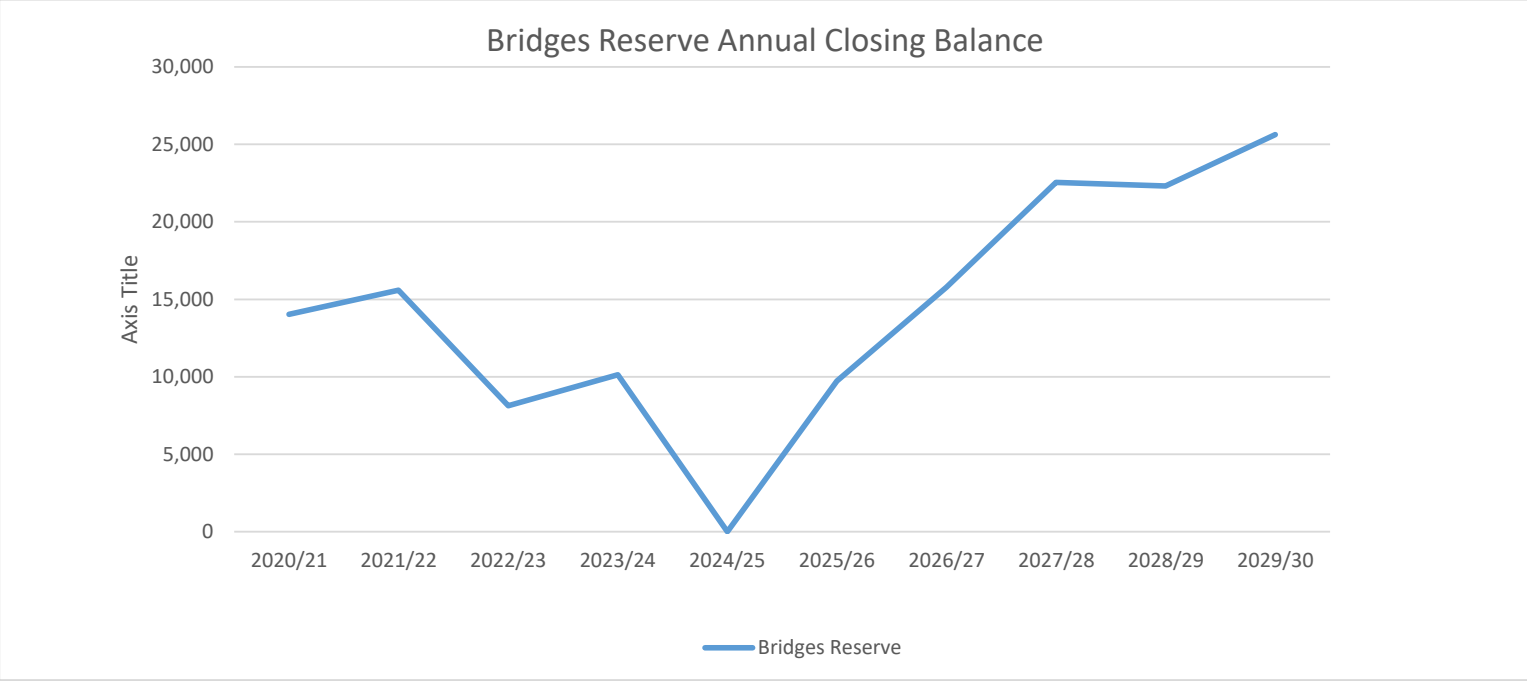
Total Capital Expenditure **0**

Transfer to / from Bridge Reserve **$3,308.00**

Total Cost To Muni 2029/30 **$40,782.00**

Bridges Reserve

	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Opening Balance	0	14,035	15,584	8,133	10,122	0	9,718	15,786	22,554	22,322
Operating	(34,883)	(46,733)	(55,733)	(41,293)	(50,904)	(31,064)	(34,714)	(34,014)	(41,014)	(37,474)
Net Capital Expenditure	0	0	0	0	0	0	0	0	0	0
Transfer to / (From) Bridge Reserve	48,918	48,282	48,282	43,282	40,782	40,782	40,782	40,782	40,782	40,782
Closing Balance	14,035	15,584	8,133	10,122	0	9,718	15,786	22,554	22,322	25,630



Main Roads WA Report:
LGA Roles and Responsibilities 2020

by Anthony Humphreys

Bridge Roles and Responsibilities:

Bridge Owners

- Local Government Authority:
  - Bridge on the local road network.
- Main Roads:
  - Typically bridges on Highways and main roads.
  - With the exception of a few:
    - Significant bridges on local roads and
    - Bridges over rail lines on local roads.
- Department of Parks and Wildlife (formally Department of Environment and Conservation):
  - Typically on forestry and logging roads.
- Private:
  - Bridge on private land, records kept for future enquires over ownership.
- Water Corporation:
  - Bridges on local roads over drainage channels.
- Harvey Water:
  - Bridges on local roads over irrigation channels (applicable in the South West Region)
- Public Transport Authority:
  - Railway bridges over a road.

Detail and Annual Visual Inspections

Level 2 or Detail inspections are undertaken by Main Roads to determine the load carrying capacity of bridges that can be accessed by the General Public. The frequencies of these inspections are every 5 years for Timber bridges and 7 years for Steel or Concrete bridges. From this report the following is determined:

- Load capacity of the structure
- Preventative Maintenance activities required to preserve bridge.
- Specific Work activities to maintain the load carrying capacity of the structure.

A copy of this report is issued to the Local Government.

Main Roads recommends that Local Government undertake Level 1 or Annual Visual Inspections of their bridges to identify any problems that may occur in between the detailed inspection cycle and their responsibility under nonfeasance. If the Local Government has any concerns over any issues please contact me and I will inspect and or arrange a future detailed inspection. For details on how to undertake inspections and associated forms refer to the “Useful Information” section.

Emergency Repairs and Load Posting

Following the load assessment analysis, structures that are deficient will require Emergency Repairs to restore the load carrying capacity of the bridge and/or a load posting.

Given the significance of the structure on the road network a Local Government may consider it appropriate to adopt the load limit for the bridge. If this option is preferred, Main Roads will arrange for the installation of the load limit signage.

If a load limit is not acceptable then Emergency Repairs are required and these works will need to be funded by the Local Government. If the Local Government can demonstrate that they have an ongoing programme of Preventative Maintenance for their structures then the Local Government is eligible for a funding contribution of 2/3 Main Roads and 1/3 Local Government, subject to a number of conditions, see page 22 of the link below:

https://www.mainroads.wa.gov.au/Documents/State Road Funds to Local Government Procedures.RCN-D13^23169676.PDF

1. The Local Government will provide Main Roads with evidence that it has undertaken preventative maintenance on the **affected** bridge.
2. Main Roads and the Local Government are to agree on the scope of works required.
3. The Local Government will provide Main Roads with an agreed cost estimate for undertaking the repairs.
4. Main Roads will authorise the repair work prior to commencement
5. The Local Government will complete the repairs and invoice Main Roads for the 2/3 of the agreed estimated cost.
6. Main Roads will confirm that the standard of repair work is acceptable prior to arranging payment from the Emergency Bridge Fund.

Preventative Maintenance

Preventative Maintenance is the responsibility of the Local Governments to fund and undertake.

The WA Local Government Grants Commission (WALGGC) provides a contribution towards these activities (refer attached policy). This money is included in the Local Government's Road Preservation Grant. The funds are calculated on bridge deck area and $m2 rate depending on type of structure.

Preventative maintenance includes the following activities:

- Routine Maintenance:
  - Activities required to preserve the structure.
  - The frequency of this type of maintenance is typically annual and includes:
    - cleaning of scuppers, drainage, expansion joints
    - vegetation and debris clearing
    - termite inspection and treatment
    - guardrail maintenance
    - signage etc.
- Periodic Maintenance
  - Rate $100/m^2
  - Activities required to preserve the structure.
  - The frequency of this type of maintenance is 5 yearly and includes:
    - fungicide treatment to stingers, piles, sill beams etc
    - timber end grain sealing
    - fastener maintenance
- Specific Works - minor
  - Activities required to preserve the structure.
  - Rate $3000 to $5000 per bridge
  - The frequency of this type of maintenance is undertaken as required and includes:
    - repair splits in piles and stringers including bolting and banding
    - abutment sheeting repairs
    - shimming and packing of stringers and halfcaps etc

For details of the "Timber Bridge Preventative Maintenance Standards" refer to the "Useful Information" section.

Note: Plastic Plug Colours

Colour	Grey	Red	Blue	Yellow	Green	White	Pink
Year		2015	2016	2017	2018	2019	2020
	2021	2022	2023	2024	2025	2026	2027
	2028	2029	2030	2031	2032	2033	2034

A key reason for implementation of this system was for the safety of bridge inspectors – hot liquids on skin don't mix.
Another benefit is it easy to see when the bridge was last treated.

Costs for LGA's to consider when developing their 5 year Preventative Maintenance schedule, detail break down:

	Rate per m2 deck area	Annualised rate per m2 deck area
Routine Maintenance, undertaken annually	$5 in rural areas $15 urban areas	$5 in rural areas $15 urban areas
Routine Maintenance - termite treatment (timber) undertaken every two years	$12	$6
Periodic Maintenance, undertaken on a 5 year cycle (timber)	$130	$26
Minor Specific Repairs, undertaken with Periodic Maintenance	$25	$5
Periodic Maintenance, undertaken on a 5 year cycle (concrete) There is not Periodic Maintenance that is done on a cyclic basis for concrete bridges, the works are more Routine Maintenance and Minor Specific Repairs.	~~$10~~	~~$2~~
Reconstruction, bridge replacement	$6000 to $10,000 $14,000 further from Perth 7hrs+	N/A
Concrete Overlays	$2500-simple overlays $3500 substantial substructure repairs as well.	N/A

Insurance

Insurance is prudent.

Specific Works

Specific Works are repairs to maintain the carrying capacity of the structure and are either complex and/or expensive. These are typically once-off repairs.

Specific Works activities can be funded and undertake by the Local Government. However, if the Local Government is prepared to wait for Main Roads to arrange funding, projects can be funded:

1. On an as-needs basis – higher priority projects gets funding first.
2. If the Local Government can demonstrate that Preventative Maintenance is being undertaken on its bridges. (a condition for WALGGC funding)

Funding Sources for Specific Works are:

- Bridge Maintenance Programme (Special Projects):
  - The funding split is 1/3 Main Roads and 2/3 Grants Commission.
  - Refer attached policy.
    - Grants Commission funding is typically like for like, so if a structure is to be widened then the Local Government will need to find additional funds to widen the structure prior to the works proceeding.
- Local Government funds
- Regional Road Group
- Roads to Recovery
- Black Spot.

Issues for Consideration

- Preventative Maintenance – 5 year plan.
- Timing of works on your road network – tie in with bridge works.
- Bridges with 1 to 3 spans - look to replace with culvert or concrete overlay – check for value for money; undertake waterways assessments to determine suitability of a culvert replacement
- Bridges with a headroom of less than 1.20m – look at replacing with a culvert.. These bridges are causing an Occupational Health and Safety Issue with the Bridge Inspectors and Bridge Contractors.
- Bridges of 8+ spans - look to preserve and maintain, as the cost of replacement is very high.

Useful information:

The Main Roads website contains a number of useful documents:

Web Site: www.mainroads.wa.gov.au
→Building Roads
→Standards & Technical
→Structures Engineering
→Asset Management

- Structures Location Map Books
- Structure Definitions
- Inventory Forms
- Inspection Guidelines
  - Level 1 Bridge & Culvert Inspection – documents and forms.
  - Level 2 Culvert Inspection – document and from
- Asset Management Plan
- Attachment of Services to Existing Structures
- Miscellaneous Asset Management Documents
  - Termite Inspection Plate (see attached)
  - Periodic Maintenance Plate (see attached)
  - Bridge Number Tag (see attached)
  - Vegetation Clearance Envelope (see attached)
  - Timber Bridge Preventative Maintenance Standards

→Main Roads Drawings
→Standard Contact Drawings

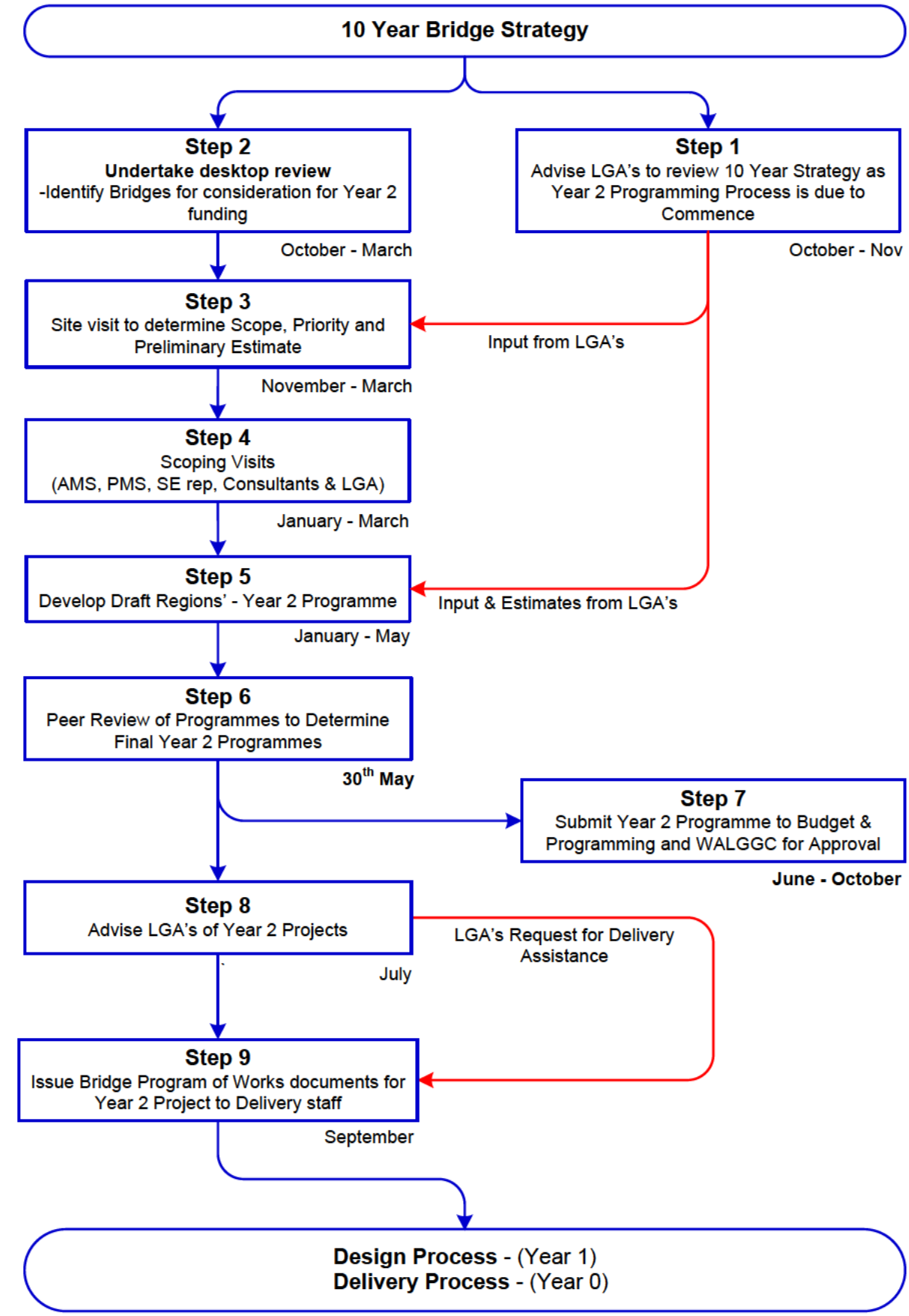
- Culverts – Box
- Culverts – Pipe
- Guardrail

Contact Details

Anthony Humphreys
Asset Manager Structures

Ph: 9892 0534
Mobile: 0408955908
Email: anthony.humphreys@mainroads.wa.gov.au

Bridge Programming Process (LGA)



WA Local Government Grants Commission

POLICY FOR ALLOCATION OF SPECIAL PROJECT FUNDS FOR BRIDGES

Under the current principles, 93% of the Federal road funds are allocated to local governments in accordance with road asset preservation needs. The remaining 7% is allocated as Special Projects, two thirds for bridges and one third for roads serving remote Indigenous communities.

The cost of preventive maintenance and annual routine maintenance of bridges is taken into account in calculating road asset preservation needs. The current rates are $24.60 per square metre for timber bridges and $12.30 per square metre for steel and concrete bridges. The cost of specific maintenance, refurbishment and replacement of bridges is not taken into account because funds are specifically provided for these works through the Special Project funds.

The Commission's policy for allocating the Special Project funds for bridges recognises that there are a large number of Local Government bridges in poor condition, and that the preservation of these bridges must be given priority in allocating the Special Project funds.

The Commission's policy on Special Project funds for bridges restricts funding to only preservation type projects, recognising that some of these projects may involve some upgrading, and preservation includes replacement when the existing bridge has reached the end of its economic life.

Bridges must meet the following definition to be eligible for Special Projects funds:

A bridge is defined as:

> *A structure with a clear opening in any span of greater than 3 metres measured between the faces of piers and or abutments*.
>
> *A structure with a clear span of less than 3 metres where the deck is supported on timber stringers. This provision is in recognition of the higher maintenance costs and management requirements of timber structures.*

A footpath attached to a road bridge or a footbridge over a road is eligible for Special Project funds. A free-standing footbridge over a river is not eligible.

The Commission will not allocate funds for the construction of a new bridge where there is no existing bridge, or where an existing bridge has not reached the end of its economic life.

The Commission considers recommendations of the Bridge Committee in allocating the Special Project funds. The Committee is made up of representatives of Main Roads WA, the Western Australian Local Government Association and the WA Local Government Grants Commission.

The Bridge Committee makes its recommendations after considering technical advice and priority ratings from Main Roads WA. These ratings take into account bridge condition data and issues such as safety considerations which are identified through liaison with local governments.

The Bridge Committee will not support grants for the repair or replacement of a bridge if the bridge has not been given the degree of routine and preventive maintenance necessary to prevent undue deterioration. For timber bridges, owners are referred to the Main Roads WA document "Timber Bridge Maintenance and Refurbishment – Preventive Maintenance Standards".

Commission Policy

That Special Project funds be allocated to only preservation type projects. These include:

1. ***Specific maintenance and refurbishment aimed at preserving the bridge.***

2. ***Replacement of an existing bridge where it has reached the end of its economic life.***

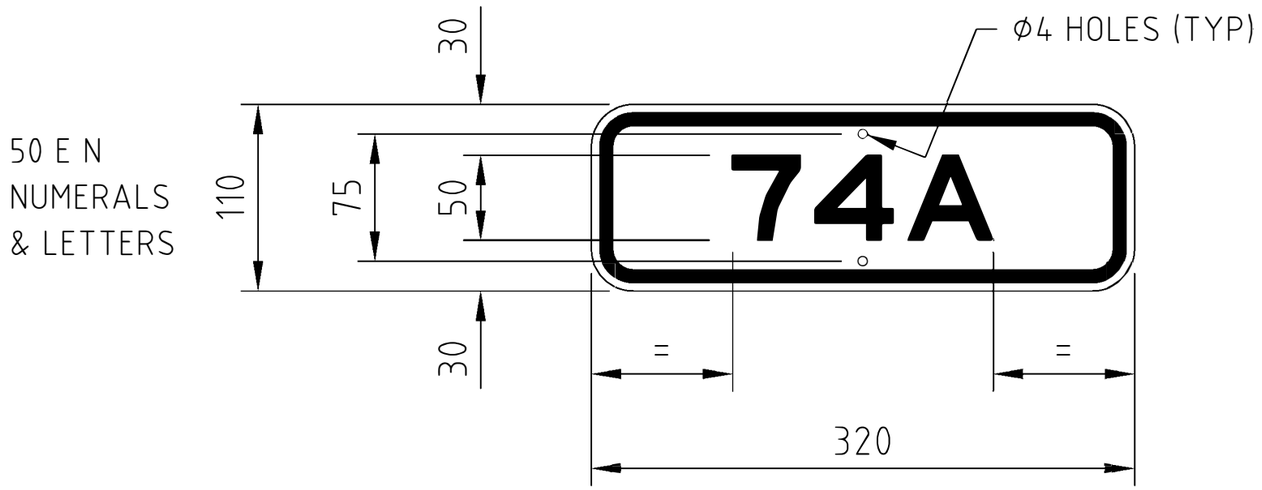
   - ***Where a bridge is replaced with a new bridge, the new structure must be of a similar geometric standard to the existing bridge; e.g. a single lane bridge is replaced with a single lane bridge. Replacement may include minor upgrading and widening [up to one metre] to meet current design and safety standards.***

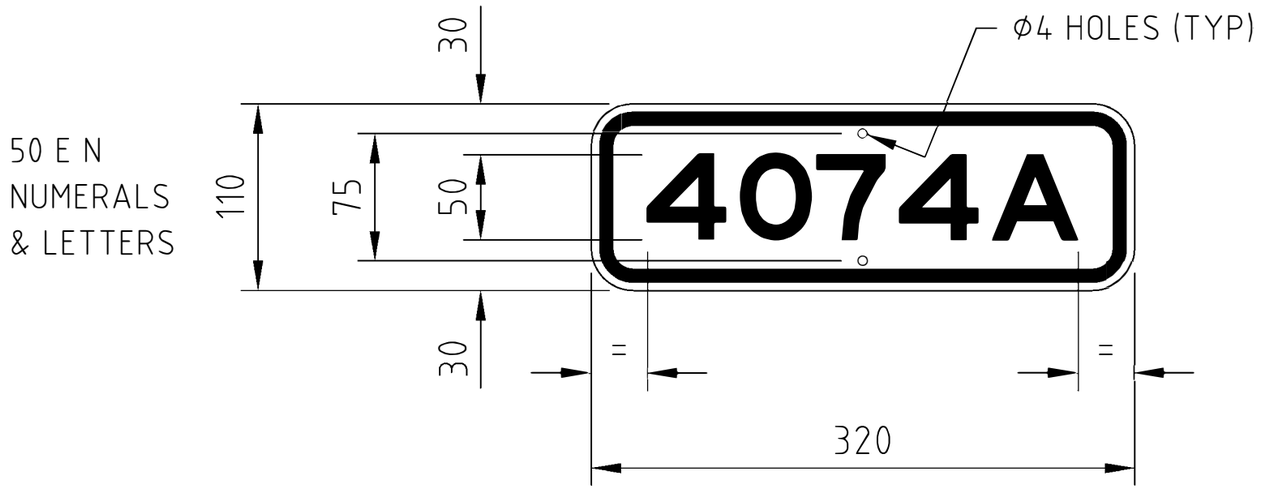
   - ***Where widening greater than one metre is required to meet current design standards or to satisfy local government policies, the additional cost of the widening will be met by the local government.***

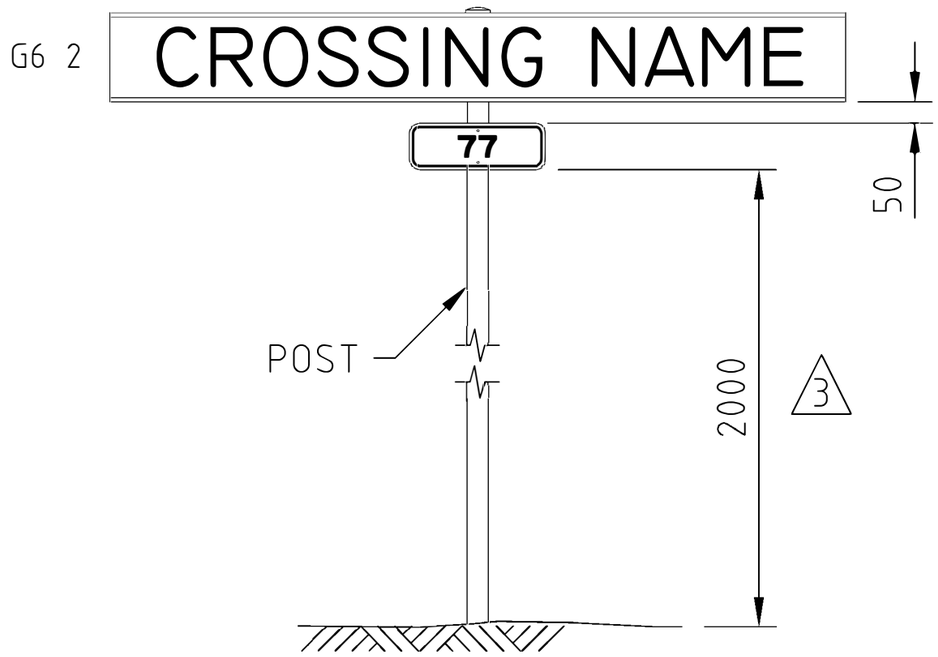
   - ***A bridge that has reached the end of its economic life may be replaced with a culvert or a floodway where engineering investigations show that this is the best solution.***

3. ***In special circumstances, and where the existing bridge has not reached the end of its economic life, the Commission may agree to the Special Project funds allocated for the preservation of the existing bridge being put towards the construction of a new bridge of a higher standard than the existing structure. This provision would apply where a local government is able to access the additional funds needed for the new bridge from other sources.***

3 August 2015
\clives\bridges\policy\policy amended 2015.docx







BRIDGE NUMBER TAG ARRANGEMENT

(TO BE PLACED AT BOTH BRIDGE ABUTMENTS)

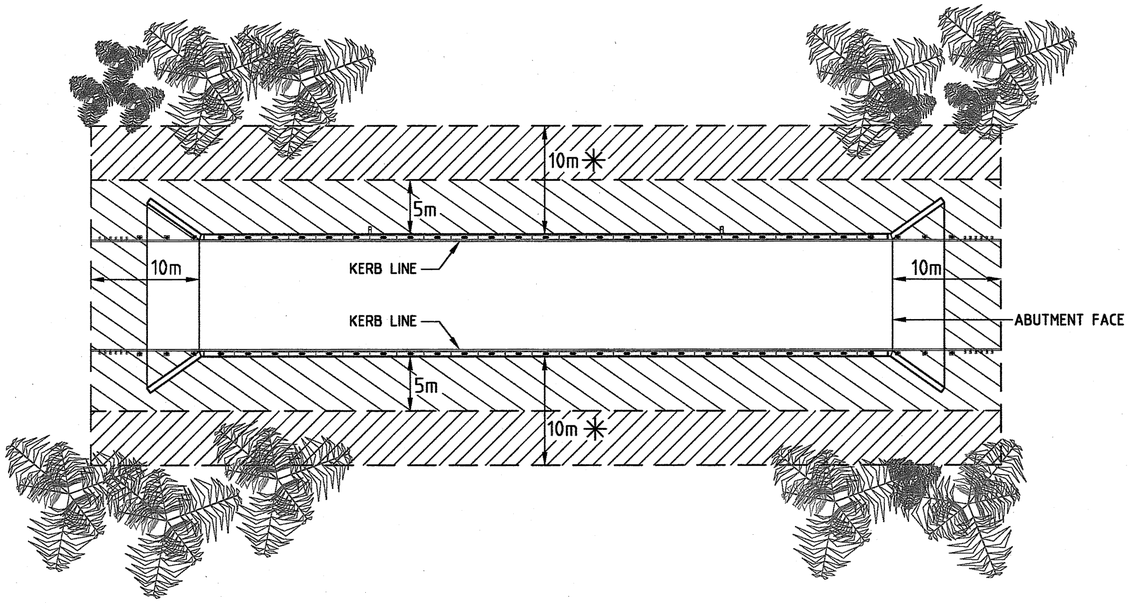
NOTES:

1. SIGN DIMENSIONS (IN mm) :
   SIZE 320 x 110 CORNER RADIUS 25 BORDER 8 + 5
   SIGN PANEL AREA = 0.03466 m
2. COLOURS : BLACK LEGEND ON WHITE RETROREFLECTIVE BACKGROUND
3. RETROREFLECTIVE CLASS OF MATERIAL : CLASS 1
4. GRAFFITI PROTECTION: NOT REQUIRED
5. ALL SIGN MATERIALS AND MANUFACTURE TO BE IN ACCORDANCE WITH MAIN ROADS SPECIFICATION 601.
6. SIGN HOLES : DRILL Ø4 HOLES TOP & BOTTOM CENTRALLY ON PANEL
7. THERE ARE TO BE NO ZERO's (0) BEFORE BRIDGE NUMBER.

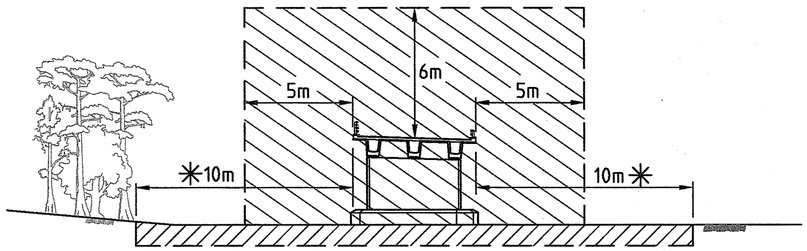
3	12/12/12	ADDED BRIDGE TAG HEIGHT DIMENSION.	T.S.
2	29/10/12	CHANGED RETROREFLECTIVE CLASS TO 1 & ADDED CROSSING NAME SIGN TYPE.	T.S.
1	24/4/12	ADDED HOLE DIMENSION.	T.S.

MRWA - STRUCTURES ENGINEERING

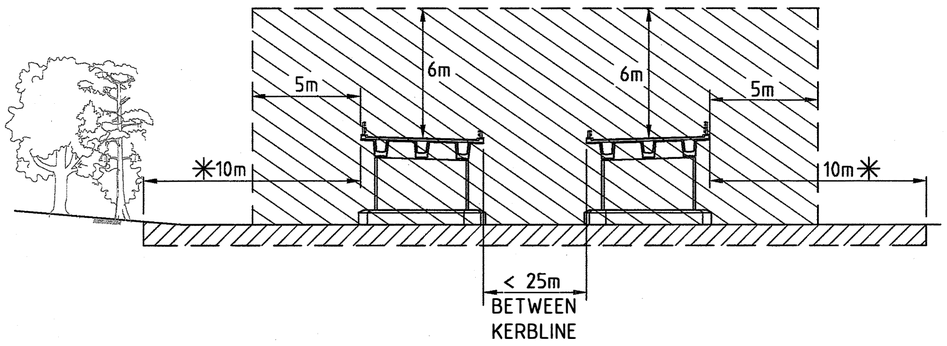
BRIDGE NUMBER	DRAWING NUMBER	AMEND.
-	1230-0487-3	



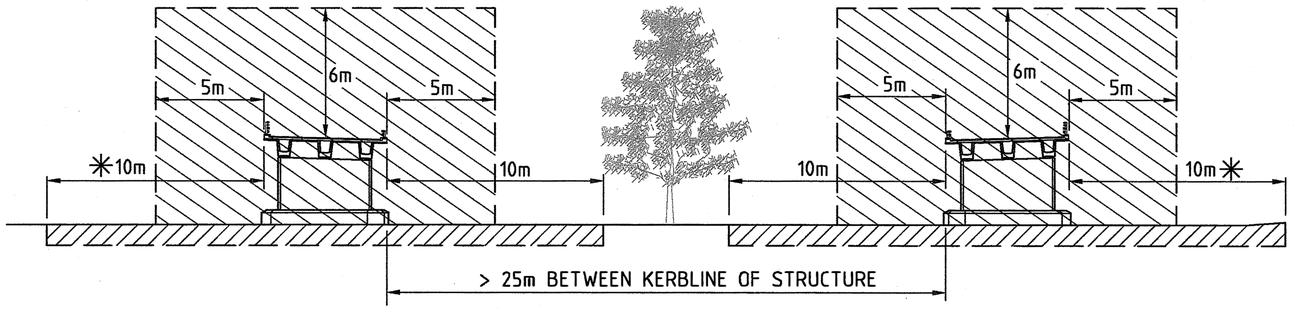
GENERAL PLAN VIEW FOR CLEARING AROUND STRUCTURES



ELEVATION - SINGLE STRUCTURE



ELEVATION - DUAL STRUCTURE



ELEVATION - SPLIT STRUCTURE

LEGEND:

NO TRUNKS > ϕ100mm. MAXIMUM INTERVENTION LEVEL IS 300mm ⚠1

NO OVERHANGING BRANCHES FOR 6m ABOVE DECK SURFACE

NOTE:
✳ WHERE THERE IS LESS THAN 10m TO ROAD RESERVE BOUNDARY, CLEARING SHALL BE TO BOUNDARY ONLY

THIS DRAWING IS AN AMENDMENT OF THE APPROVED DRAWING. G.P. Fitzgerald

No.	DATE	DESCRIPTION	AUTHORISED
⚠1	02/05/13	AMENDED MAXIMUM INTERVENTION LEVEL FROM 100mm TO 300mm.	E.R.Smith 02-05-2013

Shire of Narrogin **AMENDMENTS**

MICROFILM DATE

SCALE A2

PLANNING AND TECHNICAL SERVICES DIRECTORATE
STRUCTURES ENGINEERING
Don Aitken Centre
Waterloo Crescent, East Perth WA 6004
Telephone (08) 9323 4111 Fax (08) 9323 4136

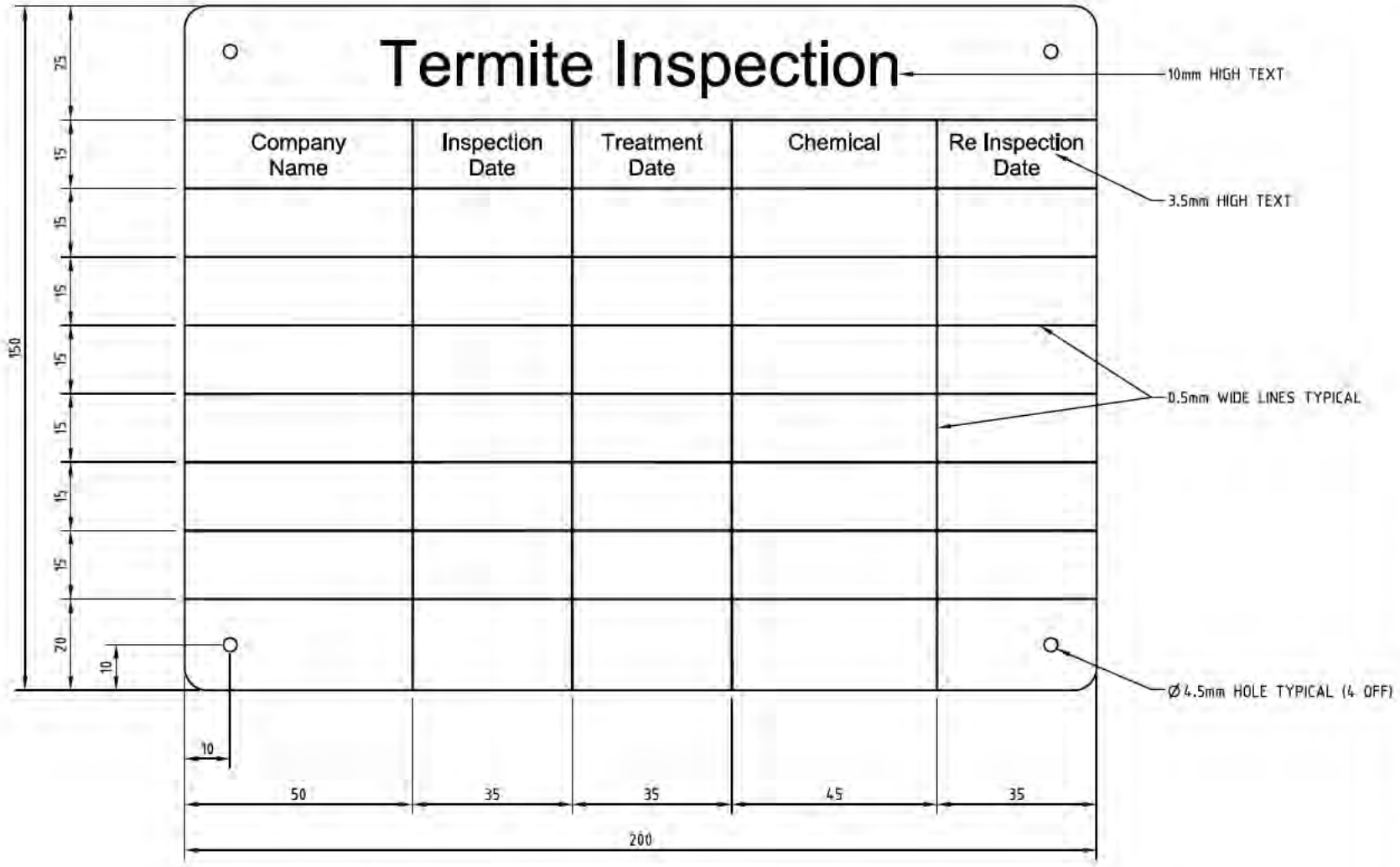
APPROVED

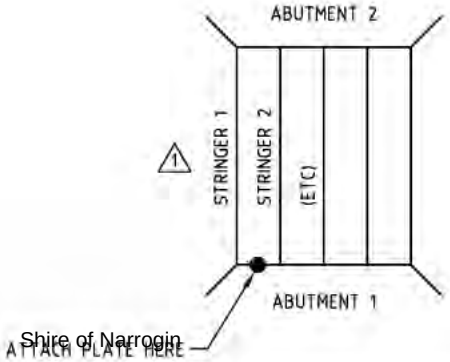
DESIGNED		
VERIFIED	DAVID WILSON	18/6/12
DRAWN	M. GUEVARRA	JUNE 2012
CHECKED	W.GILES	
DATUM		
FILE No.		

VEGETATION CLEARANCE ENVELOPES FOR BRIDGES

Government of Western Australia
mainroads WESTERN AUSTRALIA

DRAWING NUMBER 1230-1666-1 AMEND.





NOTES :

1. DIMENSIONS SIZE 200 x 150 CORNER RADIUS 5
   SIGN PANEL AREA = 0.03 SQ.M
2. MATERIALS : 1.6mm ALUMINIUM SHEET ALLOY 5251 TEMPER H38 -- MEASUREMENTS IN mm
3. COLOURS : TEXT & LINES ARE TO BE BLACK.
4. ANTI-GRAFFITI COATING : NO
5. WHERE POSSIBLE, ATTACH PLATE TO ABUTMENT 1 HALFCAP BETWEEN STRINGERS 1 AND 2 AS PER DIAGRAM LEFT

THIS DRAWING IS AN AMENDMENT OF THE APPROVED DRAWING _____

AMENDMENTS

No.	DATE	DESCRIPTION	APPROVED
1.	26.06.06	NOTE 5 AND DIAGRAM ADDED	

SCALE (FOR A3 ORIGINAL ONLY) 1:1

ORIGINAL DRAWING SIZE A3

STIFFENER & POST DESIGN CRITERIA

REGION	CATEGORY

Western Australia

SOUTH WEST REGION
ROBERTSON DRIVE
BUNBURY 6230

		DATE
DES/DRN	A. HUMPHREYS	04/11/04
EXAMINED		
VERIFIED		
APPROVED	PETER NEWHOUSE	20/06/06

TERMITE INSPECTION PLATE

LOCAL AUTHORITY ( )

DRAWING TYPE 6025

DRAWING NUMBER

0402-2153-1

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Main Roads WA Report: Development of a Network Level Bridge Criticality and Risk Assessment Model

by Neil Telfer

Development of a Network Level Bridge Criticality and Risk Assessment Model

Neil Telfer, July 2018

1. Background

Main Roads are developing an Asset Management System (AMS) aligned with the ISO55000 Series of standards. As part of the system development Main Roads have produced an Asset Management Policy (D17#1030856) with the following principles included;

- Apply a risk-based whole of lifecycle approach in the acquisition, operation, maintenance and disposal of our assets.
- Prioritise our investments based on appropriate consideration of customer outcomes, cost and risk.

To assist in delivering on these principles, a Network Level Criticality and Risk Assessment for Bridges is required.

2. Scope

2.1. Stage 1

A Network Level Criticality and Risk Assessment for Bridges should be a 'low definition' assessment based on explicit Bridge Data held in corporate asset data systems and is Stage 1 in progressing on to developing further Multi Criteria Assessment for the prioritisation of Maintenance and Capital projects.

2.2. Stakeholder Review

Review feedback and acceptance of the Criticality and Risk model by the Regional Stakeholders.

2.3. Stage 2

Stage 2 will use Criticality and Risk Assessment ratings from Stage 1 with additional criteria used in existing manual MS Excel based MCA tools as per the Bridge Management Manual, to produce automated prioritisation for Maintenance and Capital (renewal and improvement) Programs.

2.4. Stakeholder Review

Review feedback and acceptance of the Maintenance and Capital MCA model by the Regional Stakeholders.

2.5. Interim Implementation

The scope of Stage 1 and Stage 2 is therefore to identify existing explicit data sources from corporate data systems that can be used to perform a 'low definition' Risk Assessment that broadly conforms to Main Roads (and Transport Portfolio) Risk Management Process.

The scope includes the production of a 'proof of concept' data model constructed using Microsoft Power BI. Power BI reports are used to display the Criticality and Risk Assessment criteria ratings/scores. The Power BI Dashboard shall be connected to the BMS SQL Server and run on a scheduled refresh.

2.6. Final Implementation

On approval of the concept, the assessment will be embedded into the Bridge Management System (BMS) where the full Risk Management process will be made available for Asset

Managers to transparently apply and record risk treatment and mitigation measures in accordance with the risk treatment hierarchy and Main Roads Risk Management Process. This will allow transparent reporting and communication of the management of bridge risks at a local regional and state level.

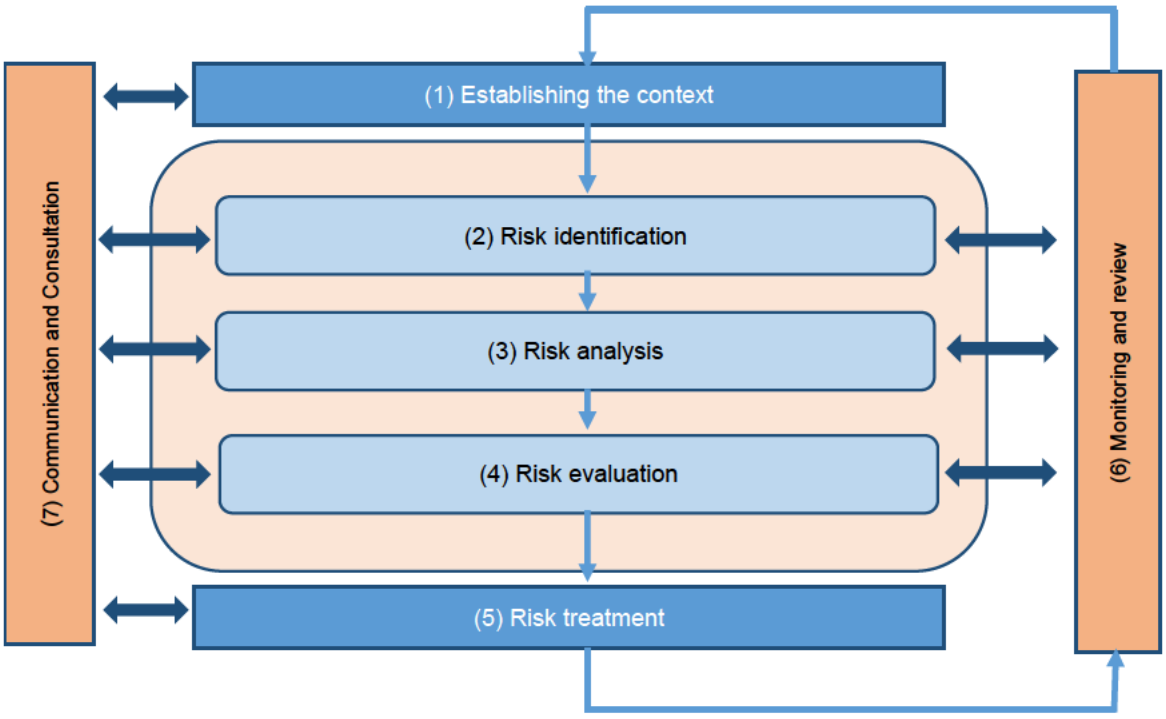
The final implementation is identified and funding is available in the Bridge Management System Business Case Phase 2 Development Business case at D17#462340.

3. Purpose

A 'low definition' assessment is one that uses broadly available explicit data on network demand and bridge configuration, performance and condition. A risk assessment framework can be developed using accepted bridge inspection, condition and performance data as an evaluation of likelihood of risk and using network demand and use as a measure of the consequence of any bridge related hazard occurring. The 'low definition' risk assessment should identify the 'critical bridges' on Main Roads network for further 'higher definition' risk assessment and management. The 'low definition' risk assessment is intended to focus attention and effort rather than be a comprehensive Risk Assessment.

'Explicit Data' refers to Main Roads corporate data with processes used in the control of that data are often subject to management and audit under our Integrated Management System (IMS) making it reliable and well managed. Main Roads has a wealth of Asset inventory, condition, demand and performance data most of which is held in IRIS. Further corporate data is held in Systems such as Oracle Finance, BEARS, and Bridge Management System (BMS) etc. Using 'explicit data' removes the subjective nature of risk assessment, improves repeatability and allows the Network Level Risk Assessment for Bridges to be systemised and embedded into the corporate BMS. Flow on tools such as Risk Management Measures and Multi Criteria Analysis (MCA) can be developed to assist in prioritisation for Route Planning and Investment Planning.

Main Roads and the WA Transport Portfolio base their Rosk Assessment Processes on ISO31000. The Risk Process is shown below.



4. Context of Bridge Criticality

Bridge Criticality is a measure of how important the bridge is in maintaining a high performing road network. Closures or restrictions to these bridges would have considerable ***Consequence*** on the performance of the Network.

5. Context of Bridge Related Risks

For a Network Level Risk Assessment for Bridges it is important to set the context for the Risk Assessment. The context for this low definition assessment is;

"The potential for Bridge related issues to effect Main Roads ability to provide a safe, reliable and sustainable road based transport system."

Under this context the criteria identified for risk assessment are those which may impact upon;

- Safety:
    - Age
    - Bridge Type
    - Inspection status
    - Condition
    - Barrier containment
- Reliability:
    - Level of service
        - strength,
        - width,
    - Currency of Load Rating
    - ~~Vertical Clearance~~
- Sustainability:
    - Planned Past and Future Maintenance
    - Asset Consumption Ratio

Under this context, it is important to understand that a bridge with a resulting Network Level High Risk rating does not mean the bridge is at risk of failure or collapse. Rather that the bridge is a Critical Asset to the delivery of Main Roads services and warrants a high standard of management due to its potential (risk) to adversely affect service delivery and customer satisfaction.

6. Measures of Bridge Criticality (consequence) to Network Operation

6.1. Commonwealth Class

Main Roads has varying responsibility for management of all bridges including on Local Authority Roads and bridges belonging to other Government Departments and Government Trading Enterprises (GTE), such as DBCA and Water Corporation.

6.1 Commonwealth Class	Commonwealth Class Score
National Highway	5
State Road	4
Local Road	3

6.2. Functional Class

The consequence to service delivery of any bridge risk materialising is broadly related to the number of customers who could be affected. While vehicle count data is not available for each and every bridge on the network, the functional class is dependent on the volume and type of traffic using the bridge. The functional class of the road being carried and, if applicable, the road being crossed are important for the bridge risk assessment.

The Functional Class of the road being supported is available in IRIS and BMS.

6.2 Functional Class	Functional Class Score
1 Inter Capital City Highway	5
2 Rural Highway	4
3 Main Road	3
4 Rural Local Road	2
5 Rural Special Purpose Road	1
6 Urban Highway	5
7 Significant Urban Local Road	4
8 Urban Local Road	3
9 Urban Special Purpose Road	1

6.3. Link Subcategory

As with Functional Class above, the Link Subcategory of the road being carried and any road being crossed is important for the risk assessment.

The Link Subcategory of the road being supported is available in IRIS.

6.3 Link Subcategory	Link Subcategory Score
MI	5
MFF	5
AW+	4
AW	4
BW+	3
BW	3
CW	2
DW	1

6.4. Crossing Type

The type of obstacle crossed is relevant to the possible consequences of a lack of containment or structural failure in terms of number of people affected. A structural failure, bridge strike or barrier penetration affecting train or road travel below a bridge would carry a higher consequence than an incident over water or a dry river bed when considering the risk context of network operation and service delivery across the transport portfolio. The risk to road and rail user safety would be greater due to vehicle penetration of a barrier over road/rail or structural failure than over water or a dry river bed as the latter would most likely involve fewer vehicles.

The Crossing Type is captured in the IRIS Bridge Inventory and in BMS.

6.4 Crossing Type	Crossing Type Score
Over Road and Rail	5
Over Rail	5
Over Road and Water	4
Over Road	4
Over Water	3
Under Road	3
Ramp	3
Pedestrian Underpass	2
Stock Underpass	1
(blank)	1

6.5. Primary Function

The primary function data set for a bridge is the purpose of the structure. Structures carrying a road over other roads, rail or water are more critical in terms of maintaining reliable transport that pedestrian bridges or stock underpasses etc.

6.5 Primary Function	Primary Function Score
Road and Rail Bridge	5
Road Tunnel	5
Road Bridge	4
Rail Bridge	4
Rail Tunnel	4
Over Road	3
Pedestrian Bridge	2
(blank)	1

6.6. Deck Area

Bridge Deck Area can be an indication of the consequence of any bridge related risk occurring as it is generally accepted that the larger a structure, the more complex and time consuming any intervention to reinstate service would be.

The Deck Area is captured in the IRIS Bridge Inventory and in BMS.

6.6 Deck Area	Deck Area Score
>2000m^2	5
1000m^2 to 2000m^2	4
500m^2 to 1000m^2	3
200m^2 to 500m^2	2
<200m^2	1
	1

6.7. Current Replacement Cost

The Current Replacement Cost (CRC) is the cost to replace a damaged or destroyed asset. While the context of the Criticality Assessment is impact on network service delivery, the replacement cost of an asset is useful explicit data relating to financial consequence. As with bridge size, the replacement cost could also be an indicator of the financial cost of repair or rehabilitation and the duration it is out of service after a bridge risk has occurred.

Subsequent 'higher definition' risk assessment or MCA can refine the financial consequence through calculation of Road User Cost (RUC) or Net Present Value (NPV) assessment of investment options.

The CRC is maintained in the Oracle Asset Register which is managed to AASB requirements.

6.7 Current Replacement Cost	Current Replacement Cost Score
Current Replacement Cost >$10M	5
Current Replacement Cost $5M to $10M	4
Current Replacement Cost $1M to $5M	3
Current Replacement Cost $500,000 to $1M	2
Current Replacement Cost < $0.5M	1

7. Measures of Bridge Characteristics Indicating Likelihood of Risk to Network Operation

The following criteria contribute the 'likelihood' of bridge configuration or condition to the risk assessment process.

7.1. Age

The likelihood of an issue occurring with a bridge can be linked to age due to deterioration over time and the potential for design standards to be superseded.

Main Roads maintains good bridge age data within IRIS and BMS.

7.1 Age	Age Score
Over 80 Years Old	5
60-80 Years Old	4
40 to 60 Years old	3
10 to 40 Years Old	2
Less than 10 Years Old	1
Not Known	3

7.2. Bridge Type

The Bridge Type can be used as a measure of criticality when the rate of deterioration, design approach, durability and robustness of the structure are considered.

7.2 Bridge Type	Bridge Type Score
Timber	5
Timber Hybrid	5
Steel/Concrete Composite	4
Steel	4
Prestressed Concrete	4
Reinforced Concrete	3
Tunnel	3
Sign Gantry	2
Culvert	1

7.3. Inspection Status

Bridge inspection is a risk management measure used to ensure that bridge condition is in line with design durability standards and is on track to realise its expected useful life. Bridges that have not, or cannot be inspected in line with Main Roads scheduled inspection regime may present an increased likelihood of an (unknown) issue affecting network performance.

Main Roads records inspection cycles within IRIS. A BMS Inspection Planning and Management module is also under development.

7.3 Inspection Status	Inspection Status Score
Structure never Inspected	5
Full Detailed Inspection >24mths overdue	4
Full Detailed Inspection 12-24mths overdue	3
Full Detailed Inspection 0-12mths overdue	2
Full Detailed Inspection Current (All Elements)	1

7.4. Condition

Bridges in poor condition would generally be expected to present a greater likelihood of having an issue that would affect network performance.

Main Roads also records Condition State (CS) information for bridges at individual component level. This is available for most components of timber bridges and all components of non-timber bridges.

Where the CS of a bridge component is poor a Work Item (WI) is assigned during the inspection process. WI's are created as part of the inspection process to alert Asset Managers to work that may be required. WI's are given a priority rating and Asset Managers can review these WI and elect to down grade priority, delete the Work Item or escalate the Work Item to a Work Stage and include in a planned maintenance or capital project in the Program Management module of BMS.

The condition criteria considers the severity of the defect and the importance of the component group to structural stability. The scores are based on a matrix of CS and Component Group.

7.4 Condition	Any Component in Condition State			
Component Group	CS4	CS3	CS2	CS1
CG1	5	5	3	1
CG2	4	3	2	1
CG3	3	2	1	1
Bridge/Other	2	1	1	1

Asset Managers are encouraged to practice good housekeeping with regard to WI's in BMS to ensure the Risk Assessment is accurate.

7.5. Containment

Bridge Barriers provide containment of errant vehicles both on the approaches to the bridge and while on the bridge itself. Main Roads bridge inventory captures the barrier types on approaches and on the bridge, it also collects the length of barrier off the bridge. **Refer Section 17 of SE Design Manual**

7.5 Barrier Containment	BC Score
None	5
W Beam	4
Thriebeam	3
RHS Rails	2
Tric-Bloc Concrete Barrier	1
Other Concrete Profiles	1
Reinforced Concrete Barrier (Type F)	1
Constant Slope Concrete Barrier	1
(blank)	4

7.6. Strength and Load Management

Main Roads maintains Investigatory Criteria (IC) and Key Performance Measures on Bridge Strength using the Actual and Required Rating Indexes (ARI/RRI). Data on Load Posting and Propping of understrength bridges is also available. These are held in IRIS and BMS.

7.6 Strength and Load Management	Score
Load Posted	5
Propped	5
Fails Strength IC – ARI<RRI	5
Pass Strength IC – ARI=>RRI	1

7.7. Load Rating Status

Bridges are Load Rated to assess their capability to carry heavy or permit loads on an as needs basis. Older load ratings can be performed to older codes or older vehicle configurations. The older the load rating the more likely codes or usage requirements have been superseded and should be revisited.

7.7 Load Rating Status	Score
Structure never Load Rated	5
Load Rating >120 mths old	4
Load Rating 60 to 120 mths old	3
Load Rating 24 to 60 mths old	2
Load Rating <24 mths old	1
Not Known	4

7.8. Width

Main Roads maintains Investigatory Criteria (IC) and Key Performance Measures on Bridge width. This is held in IRIS.

7.5 Bridge Width	Score
Fails Width IC	5
Bridge Width between kerbs <5.0m	4
Meets Width IC	1

7.9. Vertical Clearance

Clearance is Maximum and Minimum Headroom are collected as part of the as constructed and bridge inspection processes.

Where bridges have reduced or close clearances over road, HVS maintains a list of bridges which have limiting clearance for selected routes based on specific headroom over lanes. This data is held at;
https://www.mainroads.wa.gov.au/Documents/Bridge%20Heights%20For%20MRWA%20Website%20-%20CURRENT%20-%20July%202018.RCN-D18%5E23581592.PDF

Headroom clearances for bridges over roads relates the likelihood of bridge strikes by vehicles and the restriction to reliable and unimpeded movement of vehicles.

7.9 Vertical Clearance	5.7 Vertical Clearance Score
Low Height managed by HVS	5
No Clearance Issues	1

****NOTE: Vertical Clearance is currently excluded from the Model.****

7.10. Sustainability of Investment

Sustainability of investment is also included here as it is intended that the results of the financial risk assessment will flow on to and guide whether recurrent or capital investment MCA Tools should be used. This measure takes the ratio of Planned Maintenance and Net Book Value to test the logic of expending a large amount of money maintaining a low value asset.

7.10 Sustainability of Investment	Sustainability Score
Planned maintenance >100% of Net Book Value	5
Planned maintenance 75-100% of Net Book Value	4
Planned maintenance 50-75% of Net Book Value	3
Planned maintenance <50% of Net Book Value	2
No Planned maintenance	1

7.10.1. Planned Maintenance – Past and Future

The BMS records all planned past maintenance for each bridge since the BMS inception, up to and occasional greater than 5 years ago. BMS also captured future maintenance over a 10 Year Plan. Past and future expenditure provides an indication of the likelihood of growing unsustainable maintenance expenditure.

7.10.2. Net Book Value

Net Book Value can be sourced from the Oracle Asset Register which is managed and audited against Australian Accounting Standards Board (AASB) requirements. The Net Book Value for each bridge is an indicator of the likelihood of an investment of recurrent expenditure achieving sustained economic benefit.

7.11. Asset Consumption Ratio

The Asset Consumption Ratio (ACR) is the Net Book Value divided by the Current Replacement Cost of the asset. A low ACR indicates that the asset is coming close to being fully consumed financially and has low remaining value and theoretically, low remaining life.

7.11 Asset Consumption Ratio	Asset Consumption Ratio Score
Asset Consumption Ratio <0.2	5
Asset Consumption Ratio 0.2 to 0.4	4
Asset Consumption Ratio 0.4 to 0.6	3
Asset Consumption Ratio 0.6 to 0.8	2
Asset Consumption Ratio 0.8 to 1	1
No Constructed Date	3

7.12. Deferred Maintenance

Consistent deferral of Maintenance can result in a greater likelihood of defects becoming more serious with an increase in condition state and escalating cost. The longer maintenance has been deferred the greater the likelihood of a risk eventuating.

7.12 Deferred Needs	7.12 Deferred Needs	Deferred Needs Score
Deferred	Previously identified Needs have been deferred	5
Not Deferred	Identified Needs have not been deferred	4

7.13. Work Item Density

The number of Specific Work Items and their location on the structure, expressed in terms of their Component Group, shows the quantum of maintenance work is necessary on the structure. Along with 7.4 Condition, this is an indicator of how likely the bridge requires maintenance.

7.13 Work Item Density	Number of Specific Work Items				
Component Group	>10	5-10	3-5	<3	0
CG1	5	4	3	2	1
CG2	4	3	2	2	1
CG3	3	2	2	1	1
Bridge/Other	2	1	1	1	1

7.14. Potential Future Measures of Criticality and Risk

The measures below could potentially be added to the model in the future.

7.14.1. Key Freight Routes

The movement of Freight by Road is an important service delivery for Main Roads. A consequence criteria for Key Freight Routes is included in the low definition binary (yes/no) criteria for risk scoring.

7.14.2. Vertical Clearance over Rail

The Public Transport Authority (PTA) publishes clearance envelops for structures over rail. The headroom measurement captured in IRIS can be used to assess the risk related to close clearances over rail. As the height of rail vehicles is easier to manage than the height of road vehicles, the risk scores will be lower than that for clearances over road.

7.14.3. Low Headroom for Inspection Safety

Minimum headroom when 1.2m or less can relate the likelihood of incomplete bridge inspections due to health and safety issues of performing inspections. Currently a risk based process for identifying bridges that are too low to inspect is being developed, this will allow the majority of bridges with minimum headroom of 1.2m or less to be inspected as required. The scoring of this risk will therefore be less onerous than other criteria but will be included in assessing risk.

7.14.4. Horizontal Clearance

At present data on horizontal clearances for assessing the risk of bridge supports within clear zones, or weak bridge supports susceptible to failure on being struck resulting in bridge collapse is not available. Risk to network service for horizontal clearances is therefore not included in the assessment until explicit bridge inventory data is available.

7.14.5. Planned Capital Works

The BMS records planned capital works over a 10 Year Plan. Where a bridge has a low Net Book Value and No future Capital Works are planned there is a risk to diminishing capital value of structures and therefore the Agencies Asset Valuation. There is also a risk of building future financial shock from an accumulating backlog of bridge renewals.

7.14.6. Barrier End Treatment and Length off Bridge.

The length of barrier and barrier end treatment type is captured in IRIS and refreshed using As constructed drawings and during Level 2 bridge inspections. The length of barrier and end treatment types are important in providing both safe, crashworthy end terminals and run-off containment for the hazard being crossed.

7.14.7. Fire Risk

Fire risk assessment is currently under development and will be linked to the Office of Bushfire Risk Management (OBRM) Bushfire Risk Management System (BRiMS). At present Main Roads does not keep asset data on bushfire risk for bridges so an additional bridge inventory field will need to be included in IRIS for fire risk once the process of evaluating the risk using BRiMS is completed.

8. Criticality Scoring

The calculation of the final Criticality Score is by simple averaging as shown for a variety of scores against each criteria in the table below and provides a Criticality Score between 1 and 5.

Network			Bridge			Finance	
6.1 Commonwealth Class	6.2 Functional Class	6.3 Link Subcategory	6.4 Crossing Type	6.5 Primary Function	6.6 Deck Area	6.7 Current Replacement Cost	Bridge Criticality (Ave.)
3	1	1	1	1	1	1	1.29
3	1	1	1	1	1	5	1.86
3	1	1	5	5	5	5	3.57
5	5	5	5	5	5	5	5.00
3	1	1	5	5	5	1	3.00
5	5	5	1	1	1	1	2.71
5	5	5	5	5	5	1	4.43
4	4	5	1	1	3	5	3.29
4	4	5	1	1	1	5	3.00
4	4	5	1	2	2	5	3.29

9. Risk Ratings

Risk Ratings are derived from the Risk Likelihood Score multiplied by the Criticality Score (Consequence)

Safety						
7.1 Age	x	Bridge Criticality Score	=	X /25		
7.2 Bridge Type	x	Bridge Criticality Score	=	X /25		
7.3 Inspection Status	x	Bridge Criticality Score	=	X /25		
7.4 Condition		Bridge Criticality Score	=	X /25		
7.5 Barrier Containment	x	Bridge Criticality Score	=	X /25		
				AVE	=	XX/25 Safety Risk Score

Reliability						
7.6 Strength and Load Management	x	Bridge Criticality Score	=	X /25		
7.7 Load Rating Status	x	Bridge Criticality Score	=	X /25		
7.8 Width	x	Bridge Criticality Score	=	X /25		
7.9 Vertical Clearance	x	Bridge Criticality Score	=	X /25		
				MAX	=	XX/25 Reliability Risk Score

Sustainability						
7.10 Planned Maintenance (Past and Future)	x	Bridge Criticality Score	=	X /25		
7.11 Asset Consumption Ratio	x	Bridge Criticality Score	=	X /25		
				MAX	=	XX/25 Sustainability Risk Score

		Safety Risk Score
		Reliability Risk Score
		Sustainability Risk Score
Total Risk Score = MAX(Safety,Reliability,Sustainability)		

10. Capital Investment Multi Criteria Analysis (Capital MCA)

The Capital Investment MCA uses the following Risk Scores to determine a Priority Score and Risk Rating for bridges and indicates where LoS or Investigatory Criteria (IC) are not met.

Deterioration										
	7.1 Age	x	Bridge Criticality Score	=	X	/25				
	7.4 Condition	x	Bridge Criticality Score	=	X	/25				
	7.13 Work Item Density	x	Bridge Criticality Score	=	X	/25				
					AVE	**/3**	**=**	**XX**	**Deterioration MCA Score**	
Level of Service (LoS)										
	7.6 Strength and Load Management	x	Bridge Criticality Score	=	X	/25				
	7.8 Bridge Width	x	Bridge Criticality Score	=	X	/25				
					MAX		**=**	**XX/25**	**LoS MCA Score**	
Cost (Sustainability of Investment)										
	7.10 Sustainability of Investment	x	Bridge Criticality Score	=	X	/25				
	7.11 Asset Consumption Ratio	x	Bridge Criticality Score	=	X	/25				
					AVE		**=**	**XX/25**	**Cost MCA Score**	
									Deterioration MCA Score	
									LoS MCA Score	
									Cost MCA Score	
					Capital MCA Score = MAX(Deterioration,LoS,Cost)					

11. Maintenance Investment Multi Criteria Analysis (Maintenance MCA)

Maintenance MCA										
	7.4 Condition	x	Bridge Criticality Score	=	X	/25				
	7.12 Deferred Maintenance	x	Bridge Criticality Score	=	X	/25				
	7.13 Work Item Density	x	Bridge Criticality Score	=	X	/25				
					AVE		**=**	**XX/25**	**Maintenance MCA Score**	

12. Bridge Inspection Prioritisation Multi Criteria Analysis (Inspection MCA)

The Bridge Inspection MCA determines a Risk Rating for all bridges.

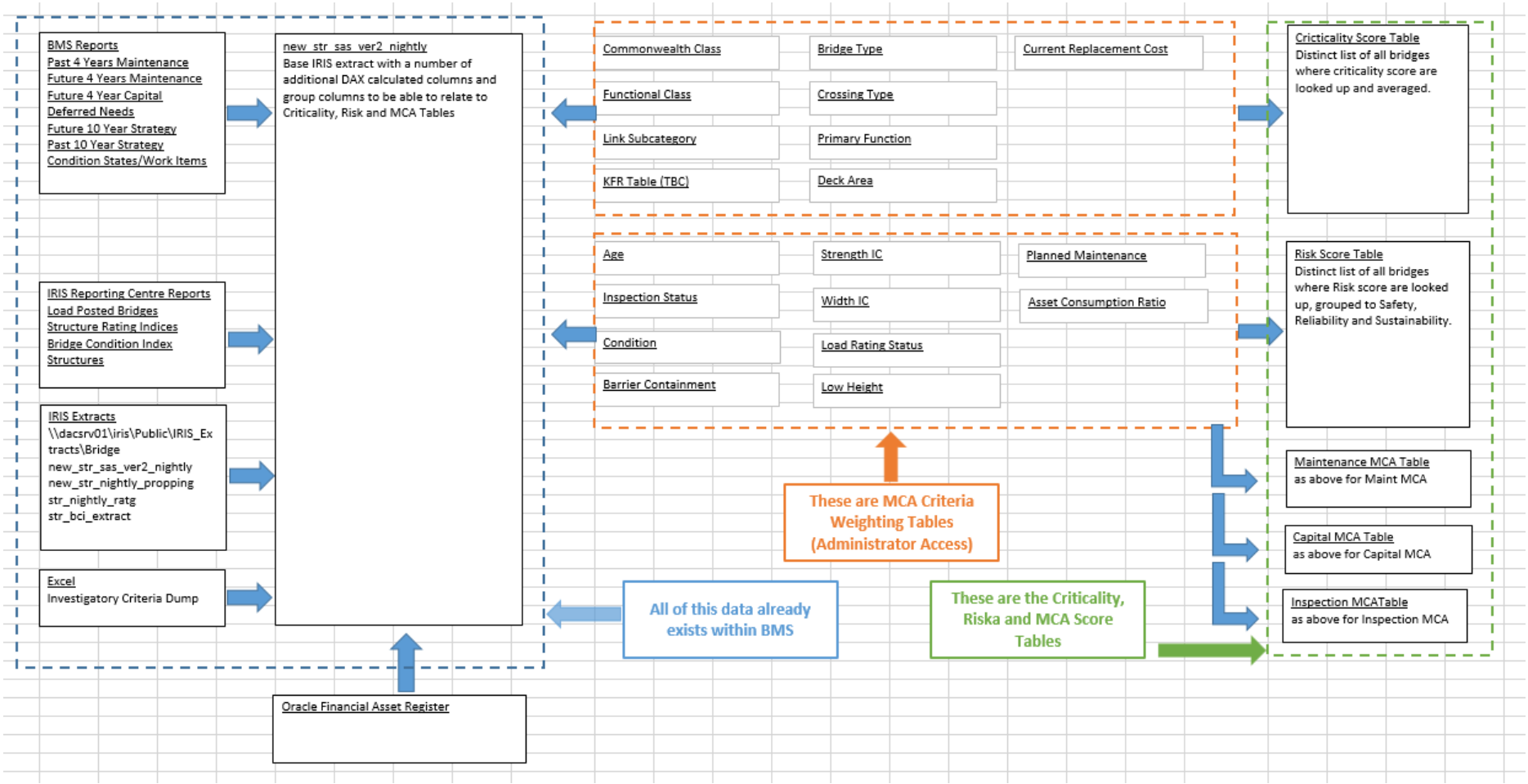
Bridge Inspection Backlog MCA										
	7.1 Age	x	Bridge Criticality Score	=	X /25					
	7.3 Inspection Status	x	Bridge Criticality Score	=	X /25					
	7.4 Condition	x	Bridge Criticality Score	=	X /25					
	7.13 Work Item Density	x	Bridge Criticality Score	=	X /25					
	7.6 Strength and Load Management	x	Bridge Criticality Score	=	X /25					
						=	**MAX**	**Inspection Backlog Risk Score**		

13. Bridge Improvement MCA

The Bridge Improvement MCA determines a risk rating based on whether the bridge meets Level of Service criteria and is relatively new and in good condition.

Level of Service (LoS)											
	7.6 Strength and Load Management	=	X /5								
	7.8 Bridge Width	=	X /5								
			MAX		**=**	**XX/25 LoS MCA Score**					
Deterioration											
	7.1 Age	=	X /5								
	7.4 Condition	=	X /5								
	7.13 Work Item Density	=	X /5								
			AVE		**=**	**XX Deterioration MCA Score**					
				Improvement MCA Score = (MAX LoS / AVE Deterioration) * Bridge Criticality Score							

14. Power BI Model Diagram



15. Regional Review of Risk Assessment Process

A process is required that allows the Regional Asset Manager Structures (AMS) to apply in depth regional knowledge and of the network and bridge Levels of Service (LoS).

This is an essential part of the process as the ‘low definition’ explicit data based process can only derive Risk Ratings from corporately supported data. A Regional Review process allows the knowledge and capability of experienced staff to improve the system generated Risk Assessment.

It is also important to include a review facility to ensure that the Regional AMS revised risk ratings are reasonable and based on sound justification. A central review of revised risk ratings is required by the Structures Asset Strategy Manager (SASM) in Network Management Branch.

Further, the Regional AMS are best placed to identify the appropriate risk treatment measures for identified risks using the hierarchy of control measures. Once risk ratings are reviewed and agreed, mitigation measures are applied and the Residual Risk calculated and agreed.

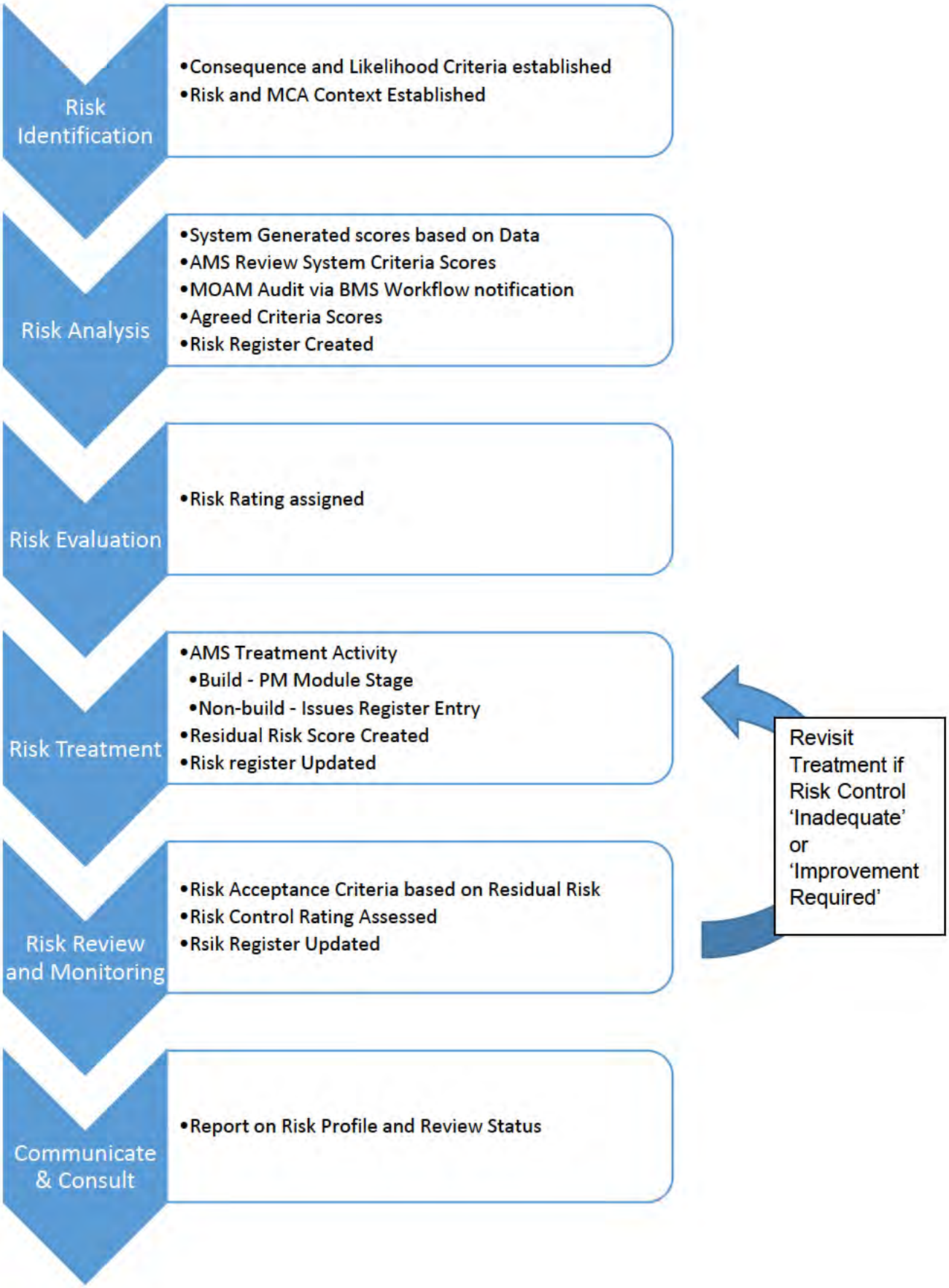
16. Risk Treatment, Residual Risk Evaluation and Risk Communication.

It is then essential that the actions to mitigate risk be they a build or non-build solution, are communicated, reviewed and endorsed at the appropriate level within the Agency.

Build solutions for risk mitigation result in the generation of Maintenance, Improvement and Renewal and Refurbishment Programs. These are collated in Network Management Branch and in liaison with Budget and Programming and Investment Planning, programs are submitted through AMSC, IPSC and MRIC.

Non-build solutions such as load posting, warning signage, temporary propping, bridge monitoring etc. are lower in the risk control hierarchy and require communication and regular review of effectiveness. Where these measures are in place and the Residual risk is still High or Very High, these will be reviewed and the AMSC will receive regular updates with the highest Residual Risk bridges being reported on to CorpEx.

The Flow chart below shows the process and activities associated with Regional Review and Risk Communication.


Risk Identification
•Consequence and Likelihood Criteria established
•Risk and MCA Context Established
Risk Analysis
•System Generated scores based on Data
•AMS Review System Criteria Scores
•MOAM Audit via BMS Workflow notification
•Agreed Criteria Scores
•Risk Register Created
Risk Evaluation
•Risk Rating assigned
Risk Treatment
•AMS Treatment Activity
•Build - PM Module Stage
•Non-build - Issues Register Entry
•Residual Risk Score Created
•Risk register Updated
Risk Review and Monitoring
•Risk Acceptance Criteria based on Residual Risk
•Risk Control Rating Assessed
•Rsik Register Updated
Communicate & Consult
•Report on Risk Profile and Review Status
Revisit Treatment if Risk Control 'Inadequate' or 'Improvement Required'

<table>
<tr><th>Step</th><th>(1) Establish the Context</th><th>BMS Structures Criticality, Risk and Prioritisation Process</th></tr>
<tr><td>Overview</td><td>This step is the planning phase of the risk assessment. The ‘Relevant Officer’ should ensure the subject of the risk assessment is defined and placed into context and the format of the risk assessment and level of effort should be defined.</td><td>The context of the Risk Assessment is the identification and prioritization of bridge asset management activities during the operational phase. This includes prioritization of maintenance, improvement, renewal and refurbishment and planning of delivery of bridge inspection backlog.</td></tr>
<tr><td>Expected Outcome</td><td>The objectives, scope and parameters of the risk assessment are documented.</td><td>Identify Critical Assets (Highest Consequence to network operations)
Identify Bridge Risk against key categories;
Safety
Reliability
Sustainability
Use selected risk scores and ratings to prioritise and plan;
Bridge Maintenance works
Bridge Capital works
Bridge Inspections</td></tr>
<tr><td>Procedure</td><td>There are different ways in which the risk assessment can be carried out – workshops, team meetings, interviews, surveys or a desktop exercise. Consider which one of these options would be most appropriate in the circumstances to adopt.
Identify the participants for the risk assessment. Ideally the participants in the risk assessment have competencies that will allow for effective risk identification and assessment.
Define objectives of the risk assessment – purpose and use of the results.
Define the focus of the risk assessment – This step seeks to answer the question – what are we assessing the risks of – an initiative, a process, a contract, a supplier etc.
Determine the resources required to perform the risk assessment - people, time and information.
Identify any internal relationships and their impact on the risk assessment – is the subject of this risk assessment related to another project, product, strategy or initiative at main Roads. If so, what is the impact of it on the risk assessment?
It is important to understand the organisation and the external environment and determine their impact on the risk assessment. The table below outlines some of the internal and external factors to consider.
<table>
<tr><td rowspan="4">External factors</td><td>Business, social, regulatory, cultural, competitive, financial and political environments</td></tr>
<tr><td>The Organisation’s strengths, weaknesses, opportunities and threats</td></tr>
<tr><td>External stakeholders and their perceptions</td></tr>
<tr><td>Key business drivers</td></tr>
<tr><td rowspan="5">Internal factors</td><td>The culture</td></tr>
<tr><td>Internal stakeholders</td></tr>
<tr><td>Organisational structure</td></tr>
<tr><td>Capabilities in terms of resources</td></tr>
<tr><td>Goals, objectives and strategies to achieve them</td></tr>
</table>
Document the process to the extent required.</td><td>Initial risk assessment to be carried out on Asset data held in corporate systems
Key stakeholders engaged in the Bridge risk assessment process are;
Structures Engineering
Budget and Programming/Investment Planning
Regional Asset Managers
Route Planning Team
Crisis and Emergency Management
DFES Emergency Management
Road Network Definition
Legal Services
Results are used to prioritise asset management activities for bridges by regional Asset Manager Structures and to communicate forward program requirements to Budget & Programming and Investment Planning
We are assessing the risk of bridge deterioration and LoS gaps on the safe, reliable and sustainable operation of our network
Main resources are;
Asset Management System Analyst, NMB
Regional AMS
BMS Development Project Manager
Related to development of the Asset Management System and AM Policy which requires a Risk based approach to management of assets.
As per table opposite
This document demonstrates alignment with the risk process.</td></tr>
<tr><td colspan="2">TIP:
Following the guidance in this document will assist you in facilitating a risk assessment or a risk workshop. Alternatively, the CUA for Financial services provides risk services including risk workshop facilitation.
Use this step to set the context and scene for the risk assessment.</td><td></td></tr>
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</table>

Step	(2) Risk Identification	BMS Structures Criticality, Risk and Prioritisation Process
Overview	Risk identification involves describing the source and causes of a risk. Risk may originate from all areas of the business e.g. business units, projects, sites, support services and corporate. During this step, all risks that may impact on the achievement of the objectives should be identified. Identified risks should be: • Relevant to the subject matter; • Appropriate, given the context; and • Useful for decision-making purposes. For example: the risk of a natural disaster may be possible, but not relevant, appropriate or useful when assessing the risk of introducing a new product.	Risk Source is the ownership and responsibility for safe, reliable and sustainable asset management of bridge structures to facilitate road based transport systems. Factors affecting Bridge Risk (Consequence and Likelihood) are Identified and detailed in D18#932044. A sample are listed below; • Bridge Age • Bridge Condition • Bridge Value • History of expenditure • Strength • Width
Expected Outcome	1. Documentation of risks. 2. Progress towards completion of a Risk Register – see Appendix 2 for a template.	1. D18#932044 – Development of a Network Level Bridge Criticality and Risk Assessment Framework 2. Criticality (Consequence) Criteria 3. Risk Likelihood Criteria 4. Proof of concept Risk Register set up in Power BI - https://app.powerbi.com/groups/me/dashboards/27a815e1-27f5-415b-b686-88469159f3e4 5. Final Bridge Risk Register will be Managed and Stored within the corporate Bridge Management System (BMS)
Procedure	1. Identify the objectives of the project, initiative, process (subject of the risk assessment). There are different ways of identifying the risks – judgements based on experience and records, checklists, flow charts, brainstorming, scenario analysis, system analysis and so on. 2. Consider holistically what events may impact on the ability to achieve these objectives. Consider the events across a range of categories including: - Customer and Market - Finance and Procurement - Fraud and Corruption - Innovation, Quality and Improvement - People - Reputation - Safety - Success and Sustainability - Strategy and Planning - Service Delivery - Environmental 3. Review the key risk areas to determine potential sources of risk, relevant to the objectives. 4. Document the outcomes in the Risk Register.	1. The objective is to apply the principles of risk management to identify and prioritise bridge asset management activities. System and Data analysis is used to undertake initial risk analysis with risk evaluation carried out by regional AMS who have more detailed understanding of the network and bridge needs than can be captured in bridge data systems. 2. The following categories are considered based on the data available from asset management systems; - Customer and Market - Finance (Asset Valuation Register) - Reputation - Safety - Success and Sustainability - Strategy and Planning 3. As per D18#932044 4. As above
TIP: 1. **A risk can be a positive or negative impact on the objective - consider holistically positive or negative events that can influence the objectives.** 2. **Where possible conduct some preliminary research on the potential risks. This will help better inform the** 3. **Consult relevant stakeholders to gain a better understanding and perspective on potential risks**		
Step	**(3) Risk Analysis**	**BMS Structures Criticality, Risk and Prioritisation Process**
Overview	Risk analysis involves determining the causes, consequences, likelihood and impact of each identified risk. This allows each risk to be allocated a risk rating, which influences treatment planning decisions. The results of the risk analysis inform resource allocation so that risks of the highest potential impact are prioritised.	As per D18#932044 scores of 1 to 5 are allocated to the risk consequence and likelihood criteria. The bridge data records in IRIS, BMS and the Asset Valuation register are used to determine the initial risk score. The results of the analysis ensure that the Regional AMS are Evaluating the highest priority bridge risks and planning accordingly. The Transport portfolio Risk Reference table is replicated in the BMS so that scores and ratings are allocated to Portfolio requirements. The Risk Reference Table can be amended by the BMS Administrator in response to any changes in the matrix and risk appetite.

	It is essential that the Transport Portfolio Risk Reference table is provided in Appendix 1 are used to determine the risk ratings.	
Expected outcome	1. Risk rating allocated for each risk. 2. Further completion of the Risk Register.	1. Proof of concept Risk Register set up in Power BI - https://app.powerbi.com/groups/me/dashboards/27a815e1-27f5-415b-b686-88469159f3e4
Procedure	1. Identify possible causes of the risk. Also consider the underlying factors that impact the risk and likely treatment options. 2. Identify the possible consequence of the risk. 3. Identify existing controls including processes, devices or practices that act to minimise or enhance the risks. 4. Determine the potential consequences of the risk occurring. 5. Determine the likelihood of the risk occurring. 6. Combine the impact and likelihood ratings to establish the overall risk rating. 7. You have the option of applying a Residual Risk Rating or an Inherent Risk Rating. 8. Document the results in the Risk Register.	1. As per D18#932044 2. " " " 3. " " " 4. " " " 5. " " " 6. " " " 7. Residual Risk ratings are not calculated at this step 8. As per Power BI PoC dashboard
TIP: **1. Often this step is completed in conjunction with Step 2 – Risk Identification.**		
Step	**(4) Risk Evaluation**	**BMS Structures Criticality, Risk and Prioritisation Process**
Overview	The purpose of risk evaluation is to assist in making decisions, based on the outcomes of the risk analysis, about which risks need treatment and to inform prioritisation decisions regarding the implementation of treatment plans.	Initial risk analysis and evaluation is performed by the data model as described in D18#932044. During the risk evaluation phase the Regional Asset Manager refines the risk evaluation and records justification in the corporate Records Manager system for any changes to the initial risk evaluation. The regional AMS can accept the 'System Risk Evaluation' or modify based on demonstrated regional information aligned to the defined likelihood and consequence criteria.
Expected Outcome	1. Plot levels of risk on the risks matrix and determine risks that need treatment and priority regarding implementation of treatment. 2. Further completion of the relevant Risk Register	1. The risk evaluation process progresses from Initial data based evaluation, to refined Regional AMS Evaluation, Central review and approval of AMS evaluation to Agreed Risk Evaluation. 2. The progression is captured and recorded within the BMS to form an audit trail of the risk process to this point.
Procedure	1. Plot the identified risks on the heat map in the Risk Register to determine its level of priority (very high, high, moderate or low). 2. Determine which risks can be satisfactorily managed through existing controls or processes and where additional treatment or improvements to existing controls will be required to be made to manage the risk exposure.	1. Risk Scores are used to determine the risk ratings as per Portfolio Risk reference tables. 2. AMS will consider existing controls or any acceptable reductions in asset Level of Service in performing his evaluation of Risks through modification of consequence and likelihood scores.
TIP: **1. Plotting the risks on the heat map provides a good pictorial representation of the risks.** **2. Plotting the risks in this manner assists in effective decision making.**		**1. All bridge assets are presented in a table sorted by risk score so that risk profile can be considered and treatment activities (build and non-build) can be**
Step	**(5) Risk Treatment**	**BMS Structures Criticality, Risk and Prioritisation Process**
Overview	Risk treatment involves selecting one or more options to manage the risk. The optimal treatment is not necessarily the one that reduces the risk to its lowest possible level, but the one which allows Main Roads to achieve its objectives, whilst remaining within the agreed risk appetite/parameters.	In selecting risk treatment for bridge assets, treatments/controls using ALARP principles can be selected from; • Existing, non-build' AM procedures such as propping, load posting monitoring etc. These will be monitored through the existing BMS issues register. • Build options such as maintenance, strengthening, widening renewal and associate project development activities such as environmental and AH approvals, scoping and design. These treatments will be captured in the BMS program Management Module and risk monitoring based on the treatments progressing from 'planned' to 'programmed' (funded) and delivered. These are generally eliminate options from the treatment

		hierarchy. The PM module will also capture some non-build treatments such as inspections and load ratings.
Expected Outcome	1. Primary treatment options are identified and documented. 2. Update the Risk Register.	1. Treatment options will be linked to PM module options and stages or Issues Register with associated justification documentation. 2. The BMS Risk register will be updated with Residual Risk Scores added to demonstrate risks are being planned for and managed. Effectiveness of treatments reviewed bi-annually.
Procedure	1. Determine if the identified risk is to be avoided, accepted, transferred or mitigated. Refer to Appendix 1 for the Risk Acceptance Criteria and guidance. 2. The Risk Treatment Options are listed in Appendix 3. . 3. A risk treatment plan must be created for risks that are rated as High or Very High - what is the proposed actions, who is the accountable person and timelines. 4. The risk treatment plan can be a business plan action or a project plan action. 5. If there are existing business/project actions that mitigate the identified risks, note them in the Risk Register. 6. Monitor and review the effectiveness of the treatment plan on a regular basis and document the review.	1. Assessment made by AMS based on ALARP principles and Risk Acceptance Criteria 2. Treatment options are broadly categorized into build and non-build options. Build options are defined by Bridgeworks Work Items 3. The BMS Risk Register forms the Risk Treatment Plan with accountabilities established and communicated based on the Risk Acceptance Criteria. 4. The BMS PM Module and Issues Register for the treatment plans and are linked to Investment Planning through the AMSC and MRIC committees. 5. Existing business processes for asset management will be taken into consideration in the risk evaluation and risk treatment phases with justification documentation link for transparency and auditability. 6. Monitoring and Review as per Step 6 below based on a reporting tool in BMS.
TIP: **1. If there is an existing business or project actions that will treat the identified risk/s, there is no need to develop a discrete treatment action plan. It is essential that the existing business or project action is properly referenced in the Risk Register and monitored and reviewed on a regular basis.**		**1. Links to Asset Management Program (BMS PM Module) and BMS Issues Register capture treatment plans.**
Step	**(6) Monitoring, Reporting and Reviewing**	**BMS Structures Criticality, Risk and Prioritisation Process**
Overview	Ongoing monitoring, reporting and reviewing is an integral part of risk management.	
Expected Outcome	Develop governance system around monitoring, reporting and reviewing risks, controls and treatment plans.	1. Governance system as per risk acceptance criteria and review frequency twice per year or as required. 2. Assessment of Risk Treatments/Controls and review of risk as necessary. 3. Risk Acceptance as per Portfolio Risk Tables. 4. Review triggers; System Data Change, LoS Change, Demand/Use change.
Notes	Risks, controls and the effectiveness of treatment measures need to be monitored, reviewed and reported on to ensure changing circumstances do not alter risk treatment priorities. Where possible consider embed the monitoring, reporting, reviewing requirements in existing processes. <u>Review and Monitor</u> Ensure there is regular reviewing and monitoring of the identified risks, controls and treatment plans. When reviewed, document the review and note if any changes were made. It is recommended that a review be conducted at least twice a year or more depending on the risk profile. <u>Report</u> Clear risk reporting and escalation guidelines are an important component to ensure that management have proper oversight over business activities. Ensure the identified risks are reported in a timely manner to senior managers and the Corporate Executive. Where possible, provide a report on the aggregated risk data. <u>Escalate</u>	BMS Risk Monitoring and Review screen and input table set up for AMS to update bi-annually to coincide with programming cycle. Review and Monitoring carried out through dedicated page/table in BMS. Review and Monitoring also to include any Risk Process improvements via SAMF to NM Branch BMS Project Sponsor/ SE Branch BMS Project Manager. Reporting and Communication at regional level by printed report from BMS to Network Manager and Regional Manager on frequency decided by Regional reporting requirements. Escalation of Issues through Network Asset Management monthly conferences, Regional Manager Conferences, AMSC, MRIC.

	If an Issue occurs, the Risk Register will need to be reviewed and appropriately updated. The flow chart below outlines the process to follow in such instances.	
Step	**(7) Communication and Consultation**	**BMS Structures Criticality, Risk and Prioritisation Process**
Overview	Communication and consultation with relevant stakeholders at every process step is essential. It assists in ensuring that those accountable for implementing risk management process and stakeholders understand the basis on which decisions are made and the reasons why particular actions are required. It also provides the opportunity for stakeholders to share their ideas and assist in making effective decisions.	
Expected Outcome	1. Ongoing communication and consultation with the relevant internal and external stakeholders throughout the process.	1. Communication and consultation locally in region by AMS. 2. Centralised reporting by NM Branch through AMSC, MRIC, Treasury and CorpEx using Power BI Dashboard for statewide risk management for Bridges.
Notes	Relevant people from each Branch or Directorate should be identified, consulted and where appropriate and involved in the risk process. Most people have different perceptions of risk based on their experiences, values, and assumptions. Where possible, a consultative approach should be used in the risk assessment process. Utilising those with different areas of expertise provides greater assurance that all relevant risks have been identified and will lead to greater commitment in implementing risk treatment action plans.	

Main Roads WA Bridge Criticality and Risk Assessment

Structure No.	Structure Type Code	BMA	Owner	LGA	Road Name	Road No.	Crossing Name	SLK	Critical	Current Bridge Criticality Score	Current Combined Risk Rating	Residual Combined Risk Rating	BAMP Complete	No Deferred Maintenance	Level 2 Inspection not Overdue
3125	TMBR	Wheatbelt	Local Authority	Narrogin	Whimbin Rock Rd	4180205	Arthur River	6.10	No	2.50	High	High	No	Yes	Yes
4551	TMBR	Wheatbelt	Local Authority	Narrogin	Tarwonga Rd	4180204	Wangelling Gully	22.78	No	2.67	Medium	Medium	No	Yes	Yes
3122	TMBR	Wheatbelt	Local Authority	Narrogin	Tarwonga Rd	4180204	Torbling Brook	2.82	No	2.50	Medium	Medium	No	Yes	Yes
3128A	TMBR	Wheatbelt	Local Authority	Narrogin	Manaring Rd	4180211	W lliams River	3.58	No	2.50	High	High	No	Yes	Yes
3142	TMBR	Wheatbelt	Local Authority	Narrogin	Havelock St	4180025	Narrogin Brook	0.61	No	2.83	High	Low	No	Yes	Yes
9250	STBR	Wheatbelt	Local Authority	Narrogin	Northam Cranbrook	M031	Northam - Cranbrook Hwy And Rail	167.89	No	3.00	Medium	Medium	No	Yes	Yes

Main Roads WA Bridge Risk Assessment - February 2020

Structure No.	BMA	Road Name	Road No.	SLK	Crossing Name	Road Classification	Owner	Structure Type Code	Safety Risk Score	Reliability Risk Score	Sustainability Risk Score	Combined Risk Score	Capital MCA Risk Score	Maintenance MCA Risk Score	Inspection MCA Risk Score	Improvement MCA Risk Score	Evaluated	Treated / Risk Accepted	Control
3125	Wheatbelt	Whimbin Rock Rd	4180205	6.10	Arthur River	Local Road	Local Authority	TMBR	9.00	12.50	6.25	12 50	12.50	9.17	2.50	3.75	Complete.	Untreated	
4551	Wheatbelt	Tarwonga Rd	4180204	22.78	Wangelling Gully	Local Road	Local Authority	TMBR	8.54	8 01	6.68	8 54	8.90	9.79	2.67	2.67	Complete.	Untreated	
3122	Wheatbelt	Tarwonga Rd	4180204	2.82	Torbling Brook	Local Road	Local Authority	TMBR	8.00	7.50	7.50	8 00	7.50	5.00	2.50	3.22	Complete.	Untreated	
3128A	Wheatbelt	Manaring Rd	4180211	3.58	Wi liams River	Local Road	Local Authority	TMBR	8.50	12.50	3.75	12 50	12.50	8.33	2.50	4.17	Complete.	Untreated	
3142	Wheatbelt	Havelock St	4180025	0.61	Narrogin Brook	Local Road	Local Authority	TMBR	10.75	14.15	8.49	14 15	14.15	5.66	8.49	6.07	Review is completed by AMS and requires SASM input.	Treated/Risk Accepted	Adequate
9250	Wheatbelt	Northam Cranbrook	M031	167.89	Northam - Cranbrook Hwy And Rail	State Road	Local Authority	STBR	8.25	9 00	9.00	9 00	9.00	7.00	9.00	4.50	Complete.	Untreated	

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Bridge 3125
Whinbin Rock Road over
Arthur River
L2 Inspection

File: **04/4053**
To: **Engineer Bridge Loading**
Subject: **Bridge Number: 3125**

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1. Having recently completed an assessment of routine and specific maintenance work required on this bridge, I am of the opinion that the condition of certain structural components has deteriorated to such an extent that the load carrying capacity of the bridge may have been affected.

2. In accordance with the requirements of the procedure for Heavy Loads Assessment, Document number 3912/01-7, this bridge is referred for a detailed structural assessment of the bridge in its present condition.

Mark Billings
Senior Structural Engineer AECOM
18 March 2019
Span 3 Stringer 3

Enquiries: Gavin Johnston on 9323 4431
Our Ref: 04/4053
Your Ref:

mainroads WESTERN AUSTRALIA

ABN: 50 860 676 021

ASSET MANAGER STRUCTURES
WHEATBELT REGION

Structure No.:	3125
Over:	Arthur River
On:	Whimbin Rock Rd (4180205)
SLK:	6.14
LGA:	Shire of Narrogin

1. Please find enclosed a copy of the Detailed Inspection Report for the above Local Authority structure.

2. Attached is a schedule of maintenance items that are required to be undertaken in order to maintain structural integrity and extend the life of the Structure.

3. The maintenance items have been entered into IRIS for programming purposes.

4. Preliminary examination has indicated that the load carrying capacity of this Structure may have been affected by the deterioration of structural components as listed in the attached report. We are in the process of determining its current load capacity and will advise you accordingly when our assessment is completed.

Reviewed By: Mark Billings

Mark Billings
SENIOR STRUCTURAL ENGINEER AECOM
19/3/2019

Issued By:

Gavin Johnston
BRIDGE CONDITION MANAGER
22/3/19

Enc

Don Aitken Centre, Waterloo Crescent, East Perth or PO Box 6202 EAST PERTH Western Australia 6892
Telephone: (08) 9323 4111 Facsimile: (08) 9323 4136 TTY: (08) 9428 2230
Email: dac@mainroads.wa.gov.au Website: www.mainroads.wa.gov.au

WORK ITEMS - TIMBER BRIDGES
BRIDGE No: 3125

ITEM NO	ITEM DESCRIPTION	WORK REQD	PRIORITY CODE	COMMENTS
(A) GENERAL MAINTENANCE				
G005	Bridge Durability Survey (L3)			
G009	Bridge - Load Rating	Y	0	Span 3 Stringer 3, abutment 1 side.
G010	Bridge - Monitor Defect			
(B) PREVENTATIVE MAINTENANCE				
P101	Bridge Seal Timber			
P102	Bridge Maintain Fastener			
P103	Bridge - Fungicide Treatment			
(C) ROUTINE MAINTENANCE				
	Bearing - Maintain			
	Bridge Remove Graffiti			
	Bridge - Repair Scour (Minor)			
	Bridge - Eradicate Termites	Y	1	
	Bridge Clear Debris and Vegetation			
	Deck Joint Maintain			
	Deck Surface Maintain	Y	1	Gap at Approached A1 RHS-req correction
	Drainage - Maintain			
	Expansion Joint - Maintain			
	Fence - Remove			
	Fence - Repair (Control of Access)			
	Guardrail Maintain/Repair			
	Kerb - Repair (Minor) - Non Structural			
	Lighting - Maintain			
	Sign - Maintain	Y	1	Width Marker replace & realign
(D) SPECIFIC MAINTENANCE				
S315	Bridge - Replace Fastener <1.5m			
S350	Bridge Repair Scour (Major)			
S366	Bridge - Access - Improve			
S413	Deck Repair			
S437	Decking - Repair (Timber)			
S449	Drainage - Repair			
S455	Expansion Joint - Repair			
S461	Footpath - Repair			
S501	Abutment - Reconstruct			
S504	Abutment - Repair (Non timber)			
S507	Bedlog - Repair			
S510	Bedlog - Shim			
S522	Corbel Bolt			
S525	Corbel - Repair			
S528	Corbel - Shim	Y	2	Pier 2 corbel 6 A1
S537	Footpath Railing - Repair			
S540	Fullcap - Repair			
S543	Halfcap - Improve Bearing			
S546	Halfcap Pack			
S549	Halfcap - Repair			
S558	Pier - Repair			
S561	Pile - Band			
S564	Pile - Repair	Y	2	Abutment 2 pile 10
S570	Sheeting Repair	Y	2	A1 face, wing caps RHS & LHS. A2 face, wing walls & caps LHS
S582	Waler - Replace			
S607	Bearer - Repair			
S643	Joist Repair			
S655	Stringer - Bolting	Y	2	span 3 Str 7
S661	Stringer - Repair	Y	2	span 3 Str 3
S667	Stringer - Shim	Y	2	Span 2 Str 3 A2, Span 3 Str 1 A2 , Str 6 A2

PRIORITY CODE

0 -Critical Safety Deficiency : EMERGENCY action required (Immediate or within 6 months)
1 - Very High Priority (Within 3 years)
2 - Medium Priority (Within 4 years)
3 Low Priority (Within 5 years-assess again at next Detailed Inspection)

MRWA Ref: 04/4053

DETAILED TIMBER BRIDGE INSPECTION SUMMARY

Bridge No:	**3125**	**Region:**	**WHEATBELT REGION**
River Name:	**Arthur River**	**SLK:**	**6.14**
Road:	**Whimbin Rock Rd**	**Road No:**	**4180205**
LGA:	**Shire of Narrogin**		

1.0 General

Bridge no. 3125 located on Whimbin Rock Rd in the Shire of Narrogin is a three spans bridge crossing the Arthur River. The structure requires maintenance and generally appears to be in fair condition.

2.0 Preventative Maintenance

Preventative maintenance to be undertaken on a 5 year periodic basis.

3.0 Routine Maintenance

Undertake termite inspection and treatment as required in accordance with specification 850.93.09.
Correct road surface on bridge deck and approaches as outlined in report.
Replace signs and lights as outlined in report.

Specific Maintenance

4.0 Substructure

4.1 Undertake pile repairs as outlined in report in accordance with specification 850.31.
(Abutment 2 pile 10)
Undertake timber abutment repairs as outlined in report.
(A1 face, wing caps RHS & LHS. A2 face, wing walls & caps LHS)

4.2 Superstructure

Shim corbels as outlined in report
(Pier 2 corbel 6 A1)
Bolt and or seal stringers as outlined in report in accordance with specification 850.29/850.30
(span 3 Str 7)
Undertake stringer repairs as outlined in report.
(span 3 Str 3)
Shim stringers as outlined in report
(span 2 Str 3 A2, span 3 Str 1 A2 end , Str 6 A2)

5.0 BCI

39.9

6.0 Load Rating

Span 3 stringer 3, abutment 1 side requires load rating.

Mark Billings
Senior Structural Engineer AECOM

March 6 2018
MAIN ROADS Western Australia
2011 T BCM 3125 - Summary(3)

DETAILED VISUAL (LEVEL 2) TIMBER BRIDGE INSPECTION REPORT
BRIDGE CONDITION INDEX (BCI)

mainroads WESTERN AUSTRALIA

Bridge Number 3125

In conjunction with the Detailed Level 2 Bridge Inspection Report (as dated below), a Bridge Condition Index (BCI) has been calculated for this Bridge. The BCI assigns a numerical value to a bridge that is indicative of its condition and provides a relative condition in comparison with other timber bridges (BCI calculation is only applicable for timber bridges). The BCI rating system is a tool to provide a systematic approach for the determination of bridge condition by bridge inspection alone.

The process for determining the BCI is outlined in the Timber Bridge Condition Index User Guide. The BCI is primarily calculated utilising Condition States which are assigned based on the Level 2 Bridge Inspection Report (see attached).

A summary of the condition states and the calculated BCI for this bridge is provided below.

Condition States from Detailed Inspection Report conducted on 17-01-2018

		Condition State - Distribution (%)					
LOCATION	**Weighting**	**CS1**	**CS2**	**CS3**	**CS4**	**Ave AGR**	**BCI**
Condition State Weighting		1	3	9	11		
Stringers	11	58.4	40.0	0.0	1.6	25.5	39.9
Pier Piles	11	57.0	43.0	0.0	0.0		
Abutment Piles	11	60.5	28.3	11.2	0.0		
Halfcaps	11	0.0	100.0	0.0	0.0		
Corbels	6	0.0	100.0	0.0	0.0	20.4	
Timber Decking	6	0.0	90.0	0.0	10.0		
Wing Piles	3	65.0	23.0	12.0	0.0	14.0	
Abutment Sheeting	3	0.0	36.3	60.0	3.7		

Descriptor	BCI Range
Very Good	0 - 19
Good	20 - 39
Fair	40 - 55
Poor	56 - 100
Severe	101 +

BCI Descriptor Range (Refer Table 5.1 Doc No. 6706/02/2232)

Comments:

Prepared by: P Olsen & A Buenaventura

Date: 23/02/2018

TIMBER BRIDGE DETAILED INSPECTION REPORT

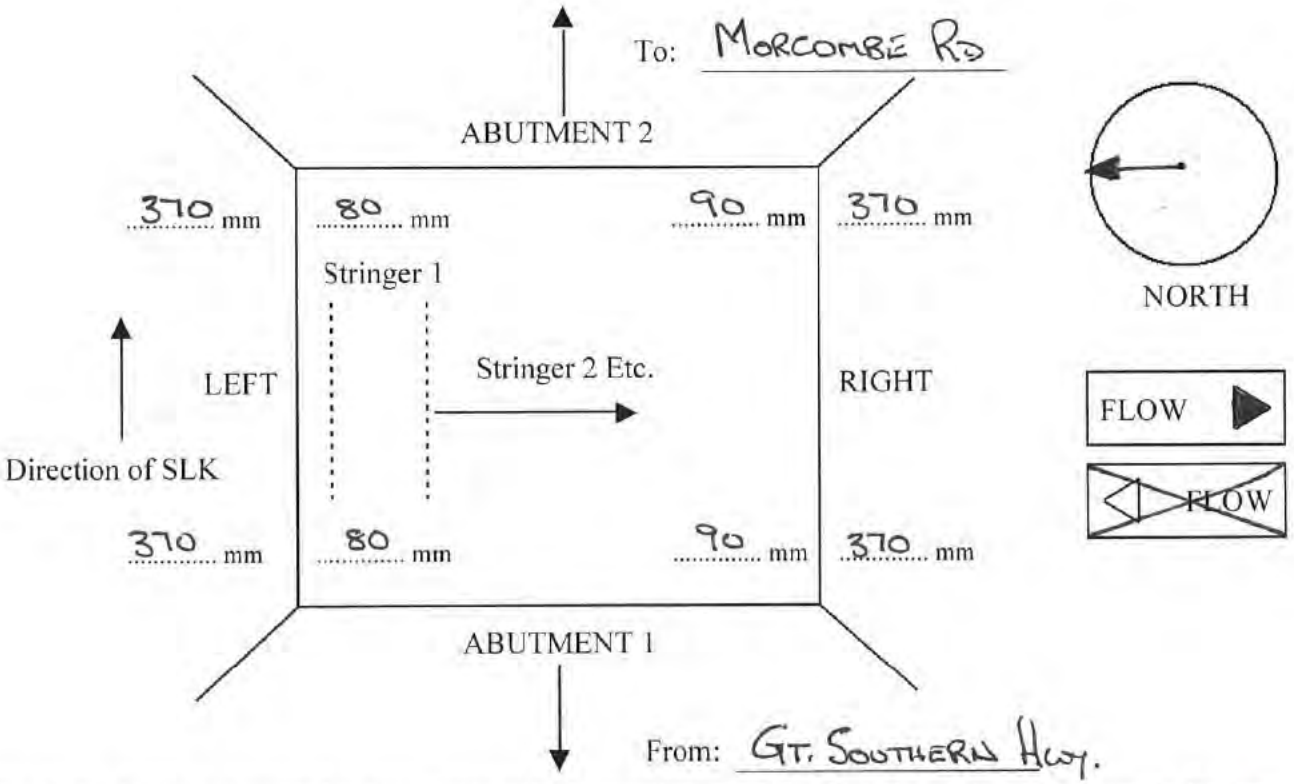
GENERAL INFORMATION - SHEET 1

Bridge No.: 3125

Region:	Wheatbelt	Latitude (S):	-33.08132
		Longitude (E):	117.30610
Road Name:	Whimbin Rock Rd	Road No.:	4180205
Local Government:	Narrogin	Owner:	Local Authority
Crossing Name:	Arthur River	SLK:	6.11
Number of Lanes:	2	Length (m):	18.67
Total Width (m): Inc. Footpath	7.80	Max. Head Room (m): 2.10	Min. Head Room (m): 1.60
No. of Spans:	3	Width between Kerbs (m): 7.20	Concrete Overlay (Y/N): Y (120mm)

Piers are numbered along the bridge in ascending order from ABUTMENT 1 to ABUTMENT 2.
Piles are numbered across the bridge in ascending order from LEFT to RIGHT.
Stringers are numbered across the bridge in ascending order from LEFT to RIGHT.

Inside and outside kerb depths noted in corners of sketch.
Exposed Deck Ends (RCO only): LHS N RHS N



This bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Timber Bridge Detailed Inspection Guidelines.

Inspected by: S. MAULE D. ENKER Checked by: POLSEN A AL KHALAF

Date: 17-1-18 Date: 1-3-18

Drilled by: DAVID ENKER

SITE CONDITIONS
Bridge No: 3125

DRIVE THROUGH	**Visible Line of Sight from Abut. 1:** 1 Km **Visible Line of Sight from Abut. 1:** 1 Km
TRAFFIC CONTROL *(Describe if different to the generic TMP)*	**Abut. 1 end:** N/A **Abut. 2 end:**
PARKING POSITION	**> 3 m** ☒ **Position:** AB 2 L.HS IN PADDOCK **1.2 to 3 m** ☐ **Position:** **0 to 1.2 m** ☐ **Position:**
ACCESS TO ABUTMENTS *(Describe access conditions at each wing)*	**Abutment 1:** LHS: RHS: **Abutment 2:** LHS: RHS: OK FROM PARKING AREA **Vegetation:** LOW GROWTH
ACCESS TO PIERS *(Describe access conditions along each side of the structure)*	**LHS:** AS ABOVE **RHS:** **Vegetation:** OK
POTENTIAL HAZARDS	**Railing/Posts:** **Bolts:** WATER LOW HANGING SCUPPERS **Services:** **Asbestos:** **Other:**
FENCES NONE	**Timber** ☐ **Location:** **Wire/Mesh:** ☐ **Location:** **Electrified:** ☐ **Location:** **Barbed Wire:** ☐ **Location:** **Other (Specify):** ☐ **Location:**
WATER	**Depth (m):** 1.2 m **Flow Rate:** SLOW **Algae:** NO (Access may be restricted by toxic algae) **Tide:** NO **Location:** SPAN 1 TO 3.
POWERLINES	**Side of bridge:** L.H.S **Horizontal distance from edge of deck (m):** 3 m **Estimated vertical height above deck (m):** 5 m

Signature _____ **Date** 17-1-18

GUARDRAIL INFORMATION

Bridge No.: 3125

	Approach 1			On Bridge			Approach 2		
Barrier Type	LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS
None									
RHS Rails No. of Rails (on bridge):									
Thriebeam									
W Beam	X		X	X		X	X		X
Tric-Bloc Concrete Barrier									
Reinforced Concrete Barrier (Type F)									
Constant Slope Concrete Barrier									
Other Concrete Profiles									
Post Type									
None									
Concrete									
Timber									
Steel Type: PFC	X		X	X		X	X		X
Off bridge:									
Number of Posts off Bridge	6		4				4		6
Length of Barrier off Bridge (m)	11.9		8				8		11.9

[Types: C-Section (C), I Section (I), RHS (R), Square Hollow Section SHS (S), Tubular (T), Steel PFC (PFC), Steel Channel (Ch)]

	Approach 1			On Bridge			Approach 2		
Visibility Barrier	LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS
Timber No. of Rails (on bridge):									
Steel Pipe(s) No. of Pipes (on bridge):									
Guide Posts									
Balustrade									
Top Rails									
Steel Pipe									
Steel RHS/Channel									
Steel C Section									
Timber									

	Approach 1			On Bridge			Approach 2		
End Terminals									
Approved End Terminal Types:	LHS	Median	RHS				LHS	Median	RHS
WAMELT									
SKT-350									
ET-2000									
X Tension									
TAU II Crash Cushion									
Other:									
Other End Terminal Types:									
None									
Turn-down									
Bullnose	X		X				X		X
Fishtail									
Other									

Structural problem found? (Y/N) N If yes, comment below.

TIMBER BRIDGE DETAILED INSPECTION REPORT

ROUTINE INFORMATION

Bridge No.: 3125

SCUPPERS LOCATION, TYPE & CONDITION (R208)	None ☐ LHS ☒ RHS ☒	Box ☐ PVC pipe ☒ Hole in deck ☐ Through Deck ☒ Through Kerb ☐
	OK	
FLASHING TYPE & CONDITION (R208)	None ☐ PVC pipe ☒ PGI ☐	
	OK	
BOLT TIGHTENING REQUIRED (P102)	Yes ☐ No ☒	
TERMITES (R204)	Active ☒ Not Active ☐	
	SPAN 3 STR3 TREAT	
PREVENTATIVE FUNGICIDE (P103)	Treated ☒ Not Treated ☐ BLUE PLUGS	
ATTACHED FENCES & OTHER WATERWAY OBSTRUCTIONS (R210)	OK	
ROAD SURFACE & KERBING CONDITION (R207) — ON BRIDGE	Road Surface: R.C.O. ONLY - GOOD	
	Kerbing: CONCRETE - GOOD.	
APPROACHES	Road Surface: BITUMEN SEAL - MINOR DIPS - FAIR	
	GAP AT A1 RHS - REQS CORRECTION	
	Kerbing: SHORT CONCRETE - OK	
VEGETATION (R205)	Requires Clearing : LHS ☐ Abut 1 ☐ RHS ☐ Abut 2 ☐	
	HIGH DRY GRASS	
STREAM BED CONDITION *(General comments and details of location, depth & extent of scour, undermining and silt build up.)* (R203)	OK	

SERVICES *(Type, Size & Location)*	Type	Size (mm)	Location
	NONE		

BRIDGE CONDITION	Priority for Engineering Assessment			
	Low ☐	Medium ☒	High ☐	Urgent ☐

Comments:

TIMBER BRIDGE DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

GENERAL INFORMATION - SHEET 2

Bridge No.: 3125

Bridge Status Built/In Use [X] Not Used [ ]

Date Built 01/06/1966 **Skew (angle)** _____ **Skewed Width (m)** _____

Widening Left Hand side [ ] Width (m) _____ Right Hand side [ ] Width (m) _____
Date _____ Date _____

Surface Type

Unsurfaced	[X]	Bitumen Seal	[ ]	Asphalt	[ ]
Rubberised Seal	[ ]	Tiles	[ ]	Steel Plate	[ ]

Pavement Type

Unpaved	[ ]	Gravel	[ ]	Material Unknown	[X]

Footpath Left	Left Kerb (m) 0.19	Path (m) _____	Right Kerb (m) _____
Footpath Right	Left Kerb (m) _____	Path (m) _____	Right Kerb (m) 0.19
Median	Left Kerb (m) _____	Median (m) _____	Right Kerb (m) _____

Bridge Function 1

Road Bridge	[X]	Rail Bridge	[ ]	Pedestrian Bridge	[ ]

Bridge Function 2

Over Water	[X]	Over Road	[ ]	Over Rail	[ ]
Over Road & Rail	[ ]	Over Road & Water	[ ]	Over Rail & Water	[ ]
Stock Underpass	[ ]	Pedestrian Underpass	[ ]		

SIGNAGE

Load Limits **Abutment 1 End** _____ Tonne **Abutment 2 End** _____ Tonne

Width Markers **Abutment 1** LHS [2] RHS [2] **Abutment 2** LHS [2] RHS [2]

Is position of Width Markers a true indication of the bridge width? (Y/N) [N]

* - REPLACE & REPAINT

Other Signs

No Overtaking or Passing	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
No Overtaking on Bridge	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
One Lane Bridge	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Low Clearance .....m	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Narrow Bridge Sign	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Give Way	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Crossing Sign: _____								
	Abutment 1	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Other _____	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]

Signage Condition Legend *Good* [1] *Fair* [2] *Poor* [3] *None (missing)* [4] *Not Required* [ ]

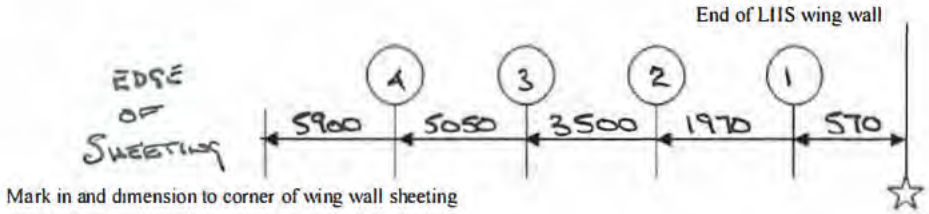
ELEMENT SPACING SHEET 1

Bridge No.: 3125

Abutment 1

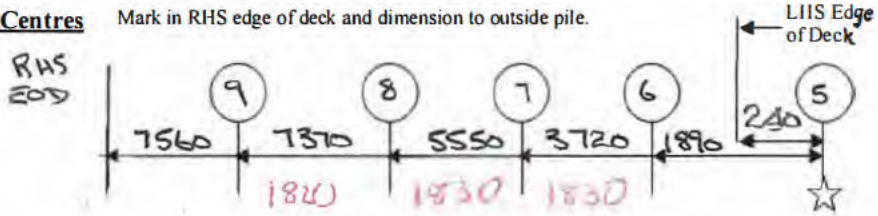
All measurements (cumulative) are taken from the reference point as indicated by the star ☆

LHS Wing Wall Layout

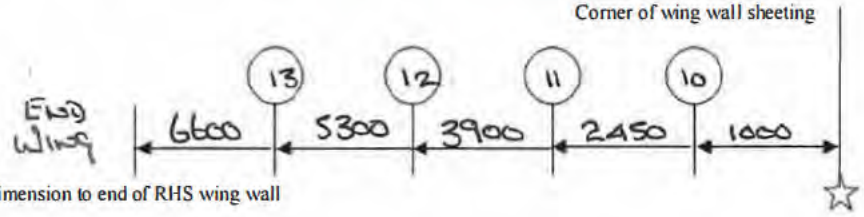


Mark in and dimension to corner of wing wall sheeting

Abutment **Abutment Pile Centres** Mark in RHS edge of deck and dimension to outside pile.



RHS Wing Wall Layout

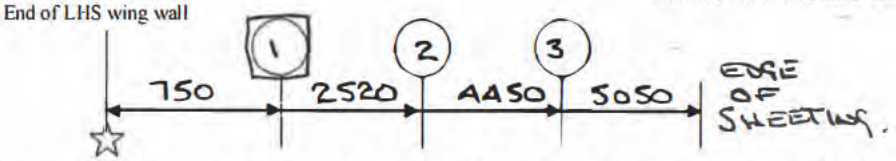


Mark in and dimension to end of RHS wing wall

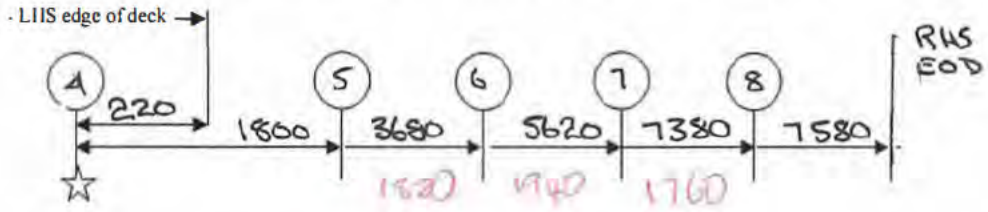
Abutment 2

LHS Wing Wall Layout All measurements (cumulative) are taken from the reference point as indicated by the star ☆

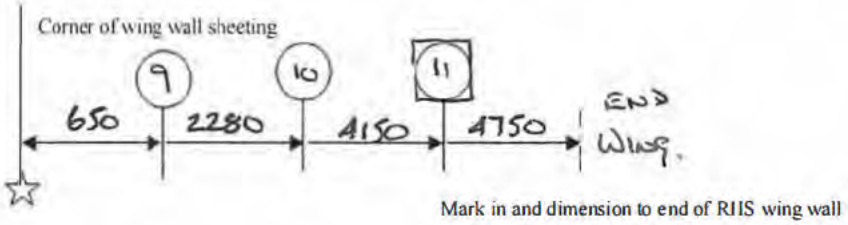
Mark in and dimension to corner of wing wall sheeting



Abutment **Abutment Pile Centres** Mark in RHS edge of deck and dimension to outside pile.



RHS Wing Wall Layout



Mark in and dimension to end of RHS wing wall

ELEMENT SPACING SHEET 2

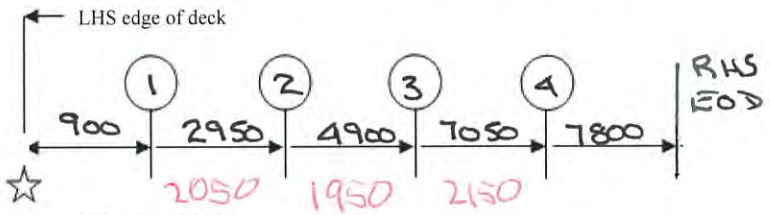
Bridge No.: 3125

All measurements (cumulative) are taken from the reference point as indicated by the star ☆

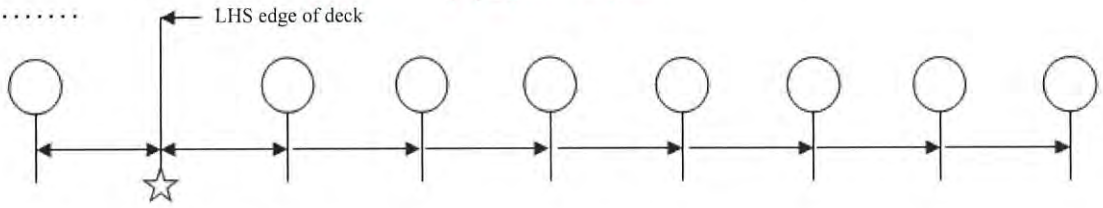
Pier Pile Centres

Mark in RHS edge of deck and dimension last pile to RHS edge of deck.

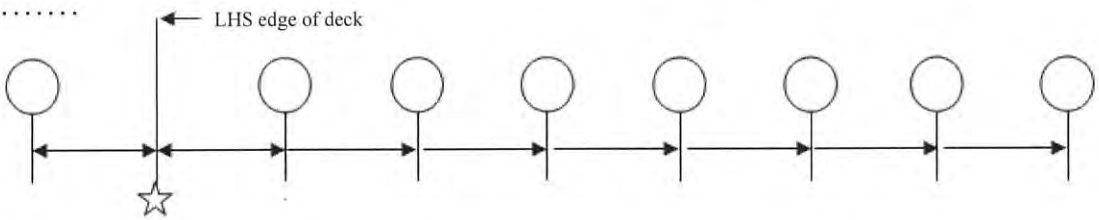
PIER No. 1 TYPICAL



PIER No. . . . . .



PIER No. . . . . .

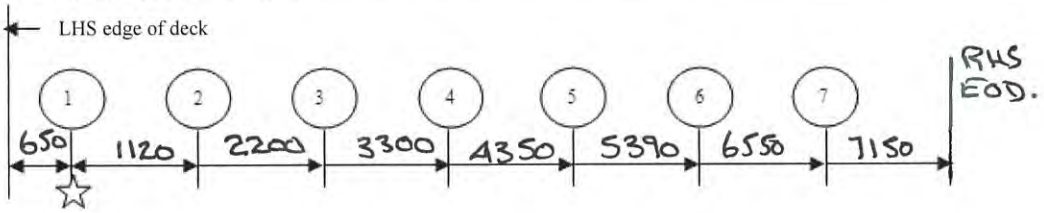


Typical Stringer Spacing

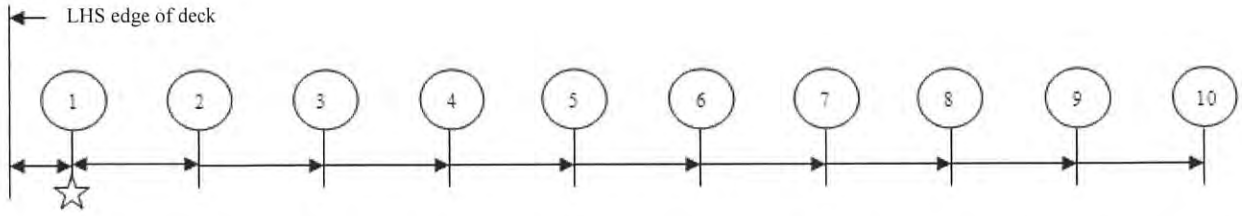
Mark in RHS edge of deck and dimension last stringer to RHS edge of deck.

Note: Stringer spacings must be measured in every span with additional stringers. Use additional sheets as required.

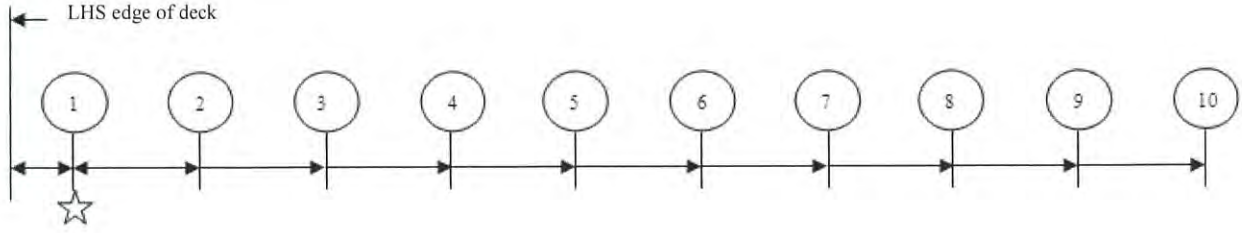
SPAN No. 1 TYPICAL



SPAN No. . . . . .



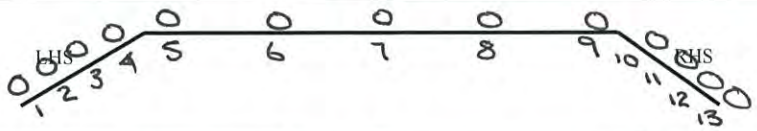
SPAN No. . . . . .



TIMBER BRIDGE
DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

ABUTMENT: 1



Bridge No: 3125

Pile No.	Dia. (mm)	Timber Drilling (mm)			Extent of Rot (m)			Splits		Blaze Markings			Halfcaps Bearing (mm)		Pile Dia. (mm) below H/C (5m+)	Mat. Type	Tied Back	Cond. State
		Solid	Rot	Pipe	Drill Location from top H/C	Above	Below	Location	Requires Band	Marking (ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	A1	A2				
1	330	105	60		0.5			-		-	0.7	-	-	-	-	JAR		2
2	310	100		55	1.0			-		-	1.3	-	-	-	-	JAR		2
3	350	105		70	1.3			-		-	1.8	-	-	-	-	JAR		2
4	360	130	50		1.9			✓		-	2.3	-	-	-	-	JAR		2
5	390	195								-	1.6	-	-	140	-	JAR		2
6	320	160								-	1.7	-	-	150	-	JAR		2
7	350	135		40	1.2			-		-	1.7	-	-	130	-	JAR		2
8	360	180						-		-	1.7	-	-	100	-	JAR		2
9	460	230								-	1.6	-	-	145	-	JAR		2
10	380	190								-	1.8	-	-	-	-	JAR		2
11	430	215						-		-	1.1	-	-	-	-	JAR		2
12	410	SEE	NOTES		0.6	TO TOP	0.6	-		-	0.8	-	-	-	-	JAR		3
13	370	SEE	NOTES		0.4	TO TOP	0.3			-	0.3	-	-	-	-	JAR		2
14																		
15																		

Saturated Piles:

LHS Halfcaps Size V 330 H 150 Length 8630 No. of 1 Gap between H/Caps —

Top of H/Caps to underside of Deck 380 Back of Halfcaps to Sheeting 230 H/Cap Material JAR

RHS Halfcaps Size V H Length No. of Gap between H/Caps

Top of H/Caps to underside of Deck Back of Halfcaps to Sheeting H/Cap Material

Are there more than 2 sets of halfcaps or sill beams (YES/NO) NO (If yes record details on comments sheet)

Comments: FIRST DECKING PLANK A- STR 2 IS IN POOR CONDITION.
ANY RESULTS VASTLY DIFFERING FROM OLD REPORT ARE DOUBLE CHECKED - TLOUT REPORT.

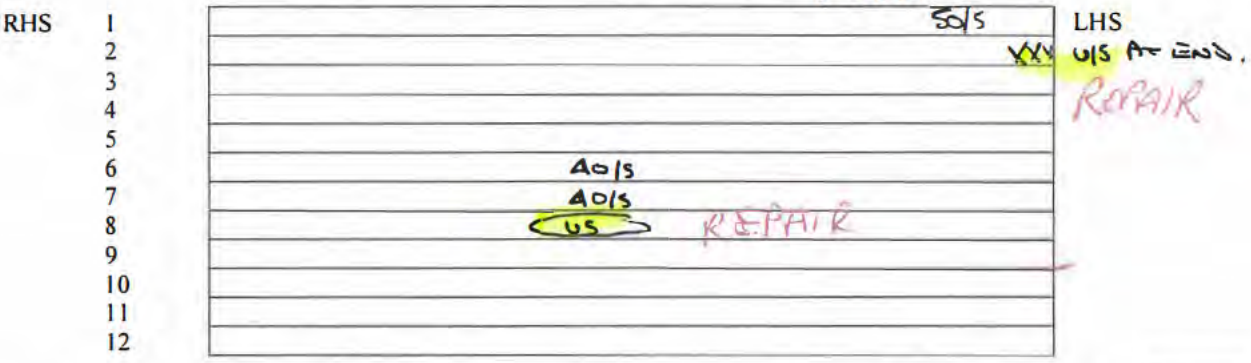
BAND NOT REQ

Pile No. 12 60/s	Pile No. 13 50/s	Pile No. 12 (2013 DIR)	Pile No. 13 (2013 DIR)
R.H.S 120/s L.H.S 120/s	R.H.S 150/s L.H.S 200/s	R.H.S 130/s L.H.S 120/s	R.H.S 180/s L.H.S 200/s
F= 80/s	F= 120/s	F= 130/s	F= 60/s

ABUTMENT 1 and WING WALL SHEETING

Bridge No: 3125

ABUTMENT 1 SHEETING (indicate ground line, piles and failed sheeting) 9 SHTS



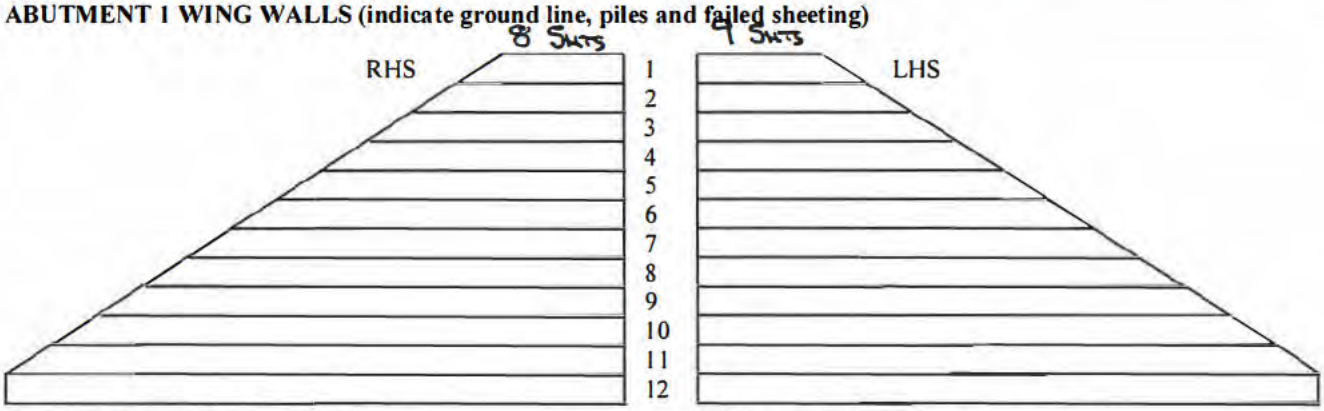
SHEETING - ABUTMENT LHS	TOP 50/S REST SOLID.	Rot from Pile		To Pile	
Centreline	8TH U/S 6&7 40/S REST SOLID	Rot from Pile	6	To Pile	7
RHS	SOLID	Rot from Pile		To Pile	

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 70

	Condition 1	Condition 2	Condition 3	Condition 4
% Condition State		85	10	5

ABUTMENT 1 WING WALLS (indicate ground line, piles and failed sheeting)



WINGCAP / SPIKING RAIL CONDITION

LOWER SECTION U/S REST POOR COND. REQ'S ATTENTION REPAIR

WINGCAP / SPIKING RAIL CONDITION

ALL IN POOR COND. REQ'S ATTENTION REPAIR

SHEETING - WING WALLS LHS	ALL 50 TO 60 SOLID.	Rot from Pile		To Pile	
RHS	ALL 50 TO 60 SOLID.	Rot from Pile		To Pile	

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 70

	Condition 1	Condition 2	Condition 3	Condition 4
% Condition State			100	

TIMBER BRIDGE
DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

PIER No: 1 **Bridge No: 3125**

Pile No.	Circ. (mm)	Dia. (mm)	Timber Drilling (mm)			Extent of Rot (m)			Splits		Blaze Markings			Halfcaps Bearing (mm)		Pile Circ. (mm) below H/C (5m+)	Mat. Type	Cond. State
			Solid	Rot	Pipe	Drill Location from top H/C	Below	Above	Location	Requires Band	Marking (ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	A1	A2			
1	1220	390	195								-	2.8	-	110	140	-	JAR	2
2	1260	400	200						✓		-	2.4	-	85	90	-	JAR	2
3	1160	370	185						-		-	2.3	-	100	130	-	JAR	2
4	1320	420	210						-		-	2.3	-	150	150	-	JAR	2
5																		
6																		
7																		
8																		
9																		
10																		

Total Number of Corbels: 7 Typical Corbel Height (mm): LHS 330 RHS 330

Corbel No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							
Requires Bolting: A1/A2 End	- -	- -	- -	- -	- -	- -	- -	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Condition State: A1/A2 End	2 2	2 2	2 2	2 2	2 2	2 2	2 2	/ /	/ /	/ /	/ /	/ /	/ /	/ /

Ironwork Condition: MEDIUM RUST Tightening Required: No

Walers Size V - x H -

Bracing Size V - x H -

Saturated Piles:

LHS Halfcaps Size V 330 H 170 Length 7380 No. of 2 Gap between H/Caps 150

Top of H/Caps to underside of Deck 700 H/Cap Material JAR

RHS Halfcaps Size V H Length No. of Gap between H/Caps

Top of H/Caps to underside of Deck H/Cap Material

Are there more than 2 sets of halfcaps or sill beams (YES/NO) No (If yes record details on comments sheet)

Comments: PILE 3, AB1 SIDE HAS A H.C. SUPPORT BRACKET, BAND NOT REQ'D

Pile No.:	Pile No.:	Pile No.:	Pile No.:
A2	A2	A2	A2
LHS RHS	LHS RHS	LHS RHS	LHS RHS
A1	A1	A1	A1

TIMBER BRIDGE DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

PIER No: 2 **Bridge No: 3125**

Pile No.	Circ. (mm)	Dia. (mm)	Timber Drilling (mm)			Extent of Rot (m)			Splits		Blaze Markings			Halfcaps Bearing (mm)		Pile Circ. (mm) below H/C (5m+)	Mat. Type	Cond. State
			Solid	Rot	Pipe	Drill Location from top H/C	Below	Above	Location	Requires Band	Marking (ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	A1	A2			
1	1190	380	150	40		1.3			1		-	2.2	-	95	80	-	JAR	2
2	1190	380	190								-	2.0	-	105	110	-	JAR	2
3	1260	400	200								-	2.0	-	110	125	-	JAR	2
4	1350	430	215						1		-	2.1	-	115	120	-	JAR	2
5																		
6																		
7																		
8																		
9																		
10																		

Total Number of Corbels: 7 Typical Corbel Height (mm): LHS 330 RHS 330

Corbel No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							
Requires Bolting: A1/A2 End	- -	- -	- -	- -	- -	- -	- -							
Condition State: A1/A2 End	2 2	2 2	2 2	2 2	2 2	2 2	2 2							

Ironwork Condition: MEDIUM RUST Tightening Required: NO

Walers Size V - x H -

Bracing Size V - x H -

Saturated Piles:

LHS Halfcaps Size V 330 H 170 Length 7470 No. of 2 Gap between H/Caps 140

Top of H/Caps to underside of Deck 700 H/Cap Material JAR

RHS Halfcaps Size V H Length No. of Gap between H/Caps

Top of H/Caps to underside of Deck H/Cap Material

Are there more than 2 sets of halfcaps or sill beams (YES/NO) NO (If yes record details on comments sheet)

Comments: CORBEL 6 A&1 SIDE ROOT PACKING. PACK

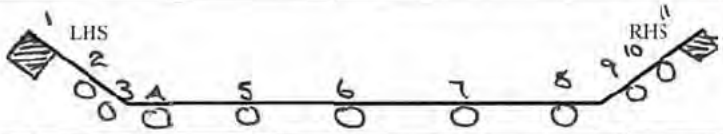
BANDS NOT REQ

Pile No.:	Pile No.:	Pile No.:	Pile No.:
A2	A2	A2	A2
LHS RHS	LHS RHS	LHS RHS	LHS RHS
A1	A1	A1	A1

TIMBER BRIDGE DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

ABUTMENT: 2



Bridge No: 3125

Pile No.	Dia. (mm)	Timber Drilling (mm)			Extent of Rot (m)			Splits		Blaze Markings			Halfcaps Bearing (mm)		Pile Dia. (mm) below H/C (5m+)	Mat. Type	Tied Back	Cond. State
		Solid	Rot	Pipe	Drill Location from top H/C	Above	Below	Location	Requires Band	Marking (Ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	A1	A2				
1	980 1300	CONCRETE			BLOCK					-	0.4	-	-	-	-	CON		1
2	380	SEE	NOTES		0.7	TO TOP	0.3	-		-	1.3	-	-	-	-	JAR		3
3	380	140		50	2.1			-		-	2.1	-	-	-	-	JAR		2
4	410	SEE	NOTES		0.9	TO TOP	0.5	-		-	1.6	-	130	-	-	JAR		3
5 F	380	100		90	1.4					-	1.6	-	95	-	-	JAR		2
6	390	SEE	NOTES		1.4	1.0	0.4			-	1.9	-	145	-	-	JAR		3
7	400	120		80	0.5					-	1.9	-	120	-	-	JAR		2
8	370	145		40	0.5					-	1.8	-	150	-	-	JAR		2
9	360	SEE	NOTES		1.5	TO TOP	0.8			-	2.3	-	-	-	-	JAR		3
10	380	SEE	NOTES		0.8	TO TOP	1.0	-		-	1.4	-	-	-	-	JAR		2
11	700 1000	CONCRETE			BLOCK					-	0.5	-	-	-	-	CON		1
12																		
13																		
14																		
15																		

Saturated Piles: —

LHS Halfcaps Size V 330 170 Length 8650 No. of 1 Gap between H/Caps —

Top of H/Caps to underside of Deck 380 Back of Halfcaps to Sheeting 220 H/Cap Material JAR

RHS Halfcaps Size V II Length — No. of — Gap between H/Caps —

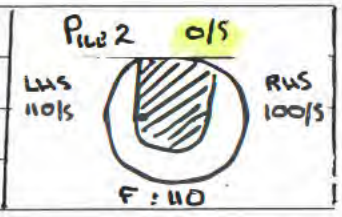
Top of H/Caps to underside of Deck — Back of Halfcaps to Sheeting — H/Cap Material —

Are there more than 2 sets of halfcaps or sill beams (YES/NO) NO (If yes record details on comments sheet)

Comments:

PILE 10 IS POOR AT TOP

SEE AUDIT PHOTO



REPAIR

Pile No. 10 0/S
L.H.S 140/S R.H.S 160/S
F= 120/S

Pile No. 9 0/S
L.H.S 140/S R.H.S 90/S
F=110/S

Pile No. 6 0/S
L.H.S 120/S R.H.S 150/S
F= 80/S

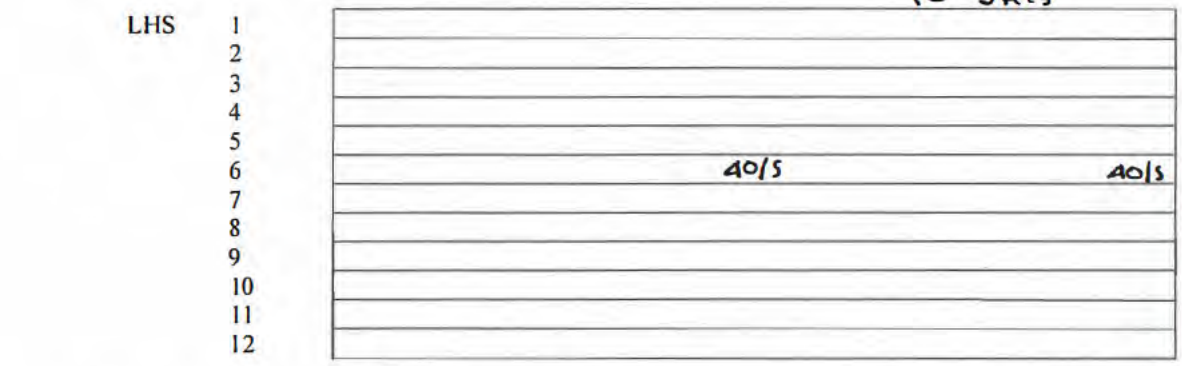
Pile No. 4 60/S
L.H.S 90/S R.H.S 110/S
F= 160/S

ABUTMENT 2 and WING WALL SHEETING

Bridge No: 3125

ABUTMENT 2 SHEETING (indicate ground line, piles and failed sheeting)

10 SHTS



SHEETS 3, 4 & 6 IN POOR CONDITION — RHS SHEET 6 IS U/S BEHIND PILE 7 - SEE AVAIT PHOTO

SHEETING - ABUTMENT LHS	All 50 to 60 Solid	Rot from Pile		To Pile	
Centreline	6th 40/S Rest 60/Solid	Rot from Pile		To Pile	
RHS	6th 40/S Rest 60 Solid	Rot from Pile		To Pile	

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 70

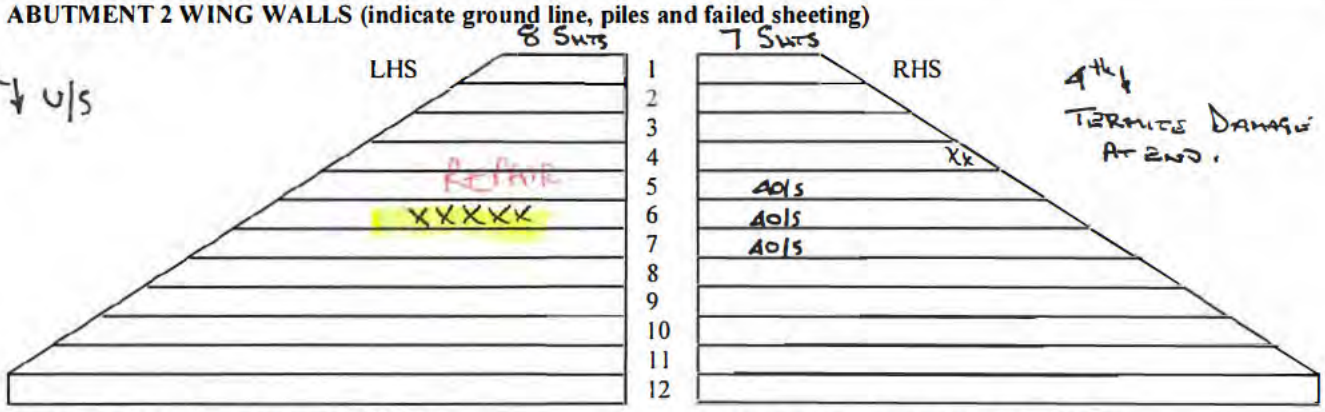
	Condition 1	Condition 2	Condition 3	Condition 4
% Condition State		60	40	

ABUTMENT 2 WING WALLS (indicate ground line, piles and failed sheeting)

6th U/S

8 SHTS

7 SHTS



4th TERMITE DAMAGE AT END.

WINGCAP / SPIKING RAIL CONDITION

U/S Rep's Replacing.
REPAIR

WINGCAP / SPIKING RAIL CONDITION

Badly Weath & Split.

SHEETING - WING WALLS LHS	6th U/S Rest 50 to 60 Solid.	Rot from Pile	2	To Pile	3
RHS	5,6&7th 40/S Rest 50 to 60 Solid.	Rot from Pile		To Pile	

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 70

	Condition 1	Condition 2	Condition 3	Condition 4
% Condition State			90	10

TIMBER BRIDGE
DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

DETAIL SHEET

Span No: 1 **Bridge No:** 3125

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							

Abutment 1 End

H Diameter (mm)		420	490	460	490	520	510	420							
V Measurement (mm)		380	380	380	380	380	380	380							
Drill Vertical	Solid (B)	140	140	100	380	380	380	110							
	Rot		TO												
	Pipe	170	TOP	140				240							
	Rot														
	Solid (T)	70	—	140				30							
Drill Horiz.	Left	200	190					150							
	Right	170	160					150							
Split V	Bolt Rqd	—	—		—	—	—								
Split H	Bolt Rqd														
Propped															
Condition State		2	2	2	1	1	1	2							

Mid Span

H Diameter (mm)		460	530	460	500	540	530	400							
V Measurement (mm)		450	510	410	530	550	530	440							
Drill Vertical	Solid (B)	450	480	410	480	280	480	260							
	Rot														
	Pipe					100		120							
	Rot														
	Solid (T)					100		60							
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd														
Split H	Bolt Rqd														
Propped															
Condition State		1	1	1	1	2	1	2							

NOTE: DRILL IS ONLY 480mm LONG. RESULTS GIVEN TO 480mm ONLY. T/OUT REPORT

Abutment 2 End

H Diameter (mm)		510	600	510	540	550	600	460							
V Measurement (mm)		370	370	370	370	370	370	370							
Drill Vertical	Solid (B)	370	370	370	370	110	370	130							
	Rot														
	Pipe					240		140							
	Rot														
	Solid (T)					20		100							
Drill Horiz.	Left					180									
	Right					190									
Split V	Bolt Rqd	✓	—		—		=								
Split H	Bolt Rqd		—												
Propped															
Condition State		1	1	1	1	2	1	2							

Cond. of Spiking Plank: Not Applicable ✓ Size V — Condition S — R — %

Cond. of Decking (Solid/Rot): S 90 R 10 % Cond. of Deck Ends: S — R — %

Decking Size (mm): V 120 x H 230 Decking Timber Type: JAR

Span Length from Centreline Supports (m): 5.75 Clear Span Length: 4.92 Saturated stringers:

Deck Condition State Percentage:	Condition 1	Condition 2	Condition 3	Condition 4
		90		10

Spiral Grain Stringers:

Comments: BONDECK USED L.HS TO STR 1 & STR 7 TO RHS. T/OUT BRIDGE

STR 3 2 & 6 HAVE S.G. BOLT NOT REQ

OLD TERMITE NEST AT AB FACE, STR 1 TO 3, APPEARS NOT ACTIVE

STR 7, AB 1 RHS DRILLED IN A 30mm CHECKOUT.

TIMBER BRIDGE DETAILED INSPECTION REPORT

DETAIL SHEET

Span No: 2 **Bridge No:** 3125

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							

Abutment 1 End

H Diameter (mm)		540	490	480	560	550	570	500							
V Measurement (mm)		370	370	370	370	370	370	370							
Drill Vertical	Solid (B)	370	370	120	370	100	370	120							
	Rot			60		50									
	Pipe							110							
	Rot														
	Solid (T)			190		220		140							
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd	—	—	—			-	—							
Split H	Bolt Rqd														
Propped															
Condition State		1	1	2	1	2	1	2							

Mid Span

H Diameter (mm)		440	480	460	480	550	520	450							
V Measurement (mm)		450	450	420	570	520	520	500							
Drill Vertical	Solid (B)	230	450	100	480	220	170	480							
	Rot														
	Pipe	70		140		70	140								
	Rot														
	Solid (T)	150		180		190	170								
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd			—											
Split H	Bolt Rqd														
Propped							1								
Condition State		2	1	2	1	2	2	1							

Abutment 2 End

H Diameter (mm)		420	420	440	450	520	480	450							
V Measurement (mm)		370	370	370	370	370	370	370							
Drill Vertical	Solid (B)	180	150	180	370	220	100	140							
	Rot	100													
	Pipe		100	80		50	120	140							
	Rot														
	Solid (T)	90	120	110		100	150	90							
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd			✓	✓	✓	✓	✓							
Split H	Bolt Rqd														
Propped															
Condition State		2	2	2	1	2	2	2							

Cond. of Spiking Plank — Not Applicable ✓ — Size V — — Condition S — R — %

Cond. of Decking (Solid/Rot) — S 90 R 10 % — Cond. of Deck Ends — S — R — %

Decking Size (mm) — V 120 x H 230 — Decking Timber Type JAR

Span Length from Centreline Supports (m) 5.90 — Clear Span Length 4.39 — Saturated stringers: ____

Deck Condition State Percentage: Condition 1 ____ Condition 2 90 Condition 3 ____ Condition 4 10 — Spiral Grain Stringers: ____

Comments: STR 1 HAS SG.

STR 3, AB 2 RIDGE PACKING. PACK

BOLTS NOT REQ

TIMBER BRIDGE DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

DETAIL SHEET

Span No: 3 **Bridge No:** 3125

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							

Abutment 1 End

H Diameter (mm)		400	510	500	470	470	540	460							
V Measurement (mm)		370	370	370	370	370	370	370							
Drill Vertical	Solid (B)	370	370	100	200	370	370	370							
	Rot														
	Pipe			100	60										
	Rot														
	Solid (T)			170	110										
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd	-		-				-							
Split H	Bolt Rqd		-	✓				✓							
Propped				✓											
Condition State		1	1	2	2	1	1	1							

Mid Span

H Diameter (mm)		380	490	500	480	460	580	470							
V Measurement (mm)		460	540	520	500	510	570	510							
Drill Vertical	Solid (B)	480	480	170	480	480	480	480							
	Rot														
	Pipe			120											
	Rot														
	Solid (T)			190											
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd														
Split H	Bolt Rqd							✓							
Propped															
Condition State		1	1	2	1	1	1	1							

Abutment 2 End

H Diameter (mm)		530	590	580	560	600	610	520							
V Measurement (mm)		380	380	380	380	380	380	380							
Drill Vertical	Solid (B)	380	130	0	380	380	380	360							
	Rot														
	Pipe		130	340											
	Rot														
	Solid (T)		120	40											
Drill Horiz.	Left			80											
	Right			80											
Split V	Bolt Rqd	-	-	=	✓	-	-	-							
Split H	Bolt Rqd			-		-									
Propped				✓											
Condition State		1	2	4	1	1	1	1							

Cond. of Spiking Plank — Not Applicable ✓ — Size V — — Condition S — R — %

Cond. of Decking (Solid/Rot) — S 90 R 10 % — Cond. of Deck Ends S — R — %

Decking Size (mm) — V 120 x H 230 — Decking Timber Type JAR

Span Length from Centreline Supports (m) 5.67 — Clear Span Length 4.82 — Saturated stringers:

Deck Condition State Percentage: Condition 1 | Condition 2 90 | Condition 3 | Condition 4 10 — Spiral Grain Stringers:

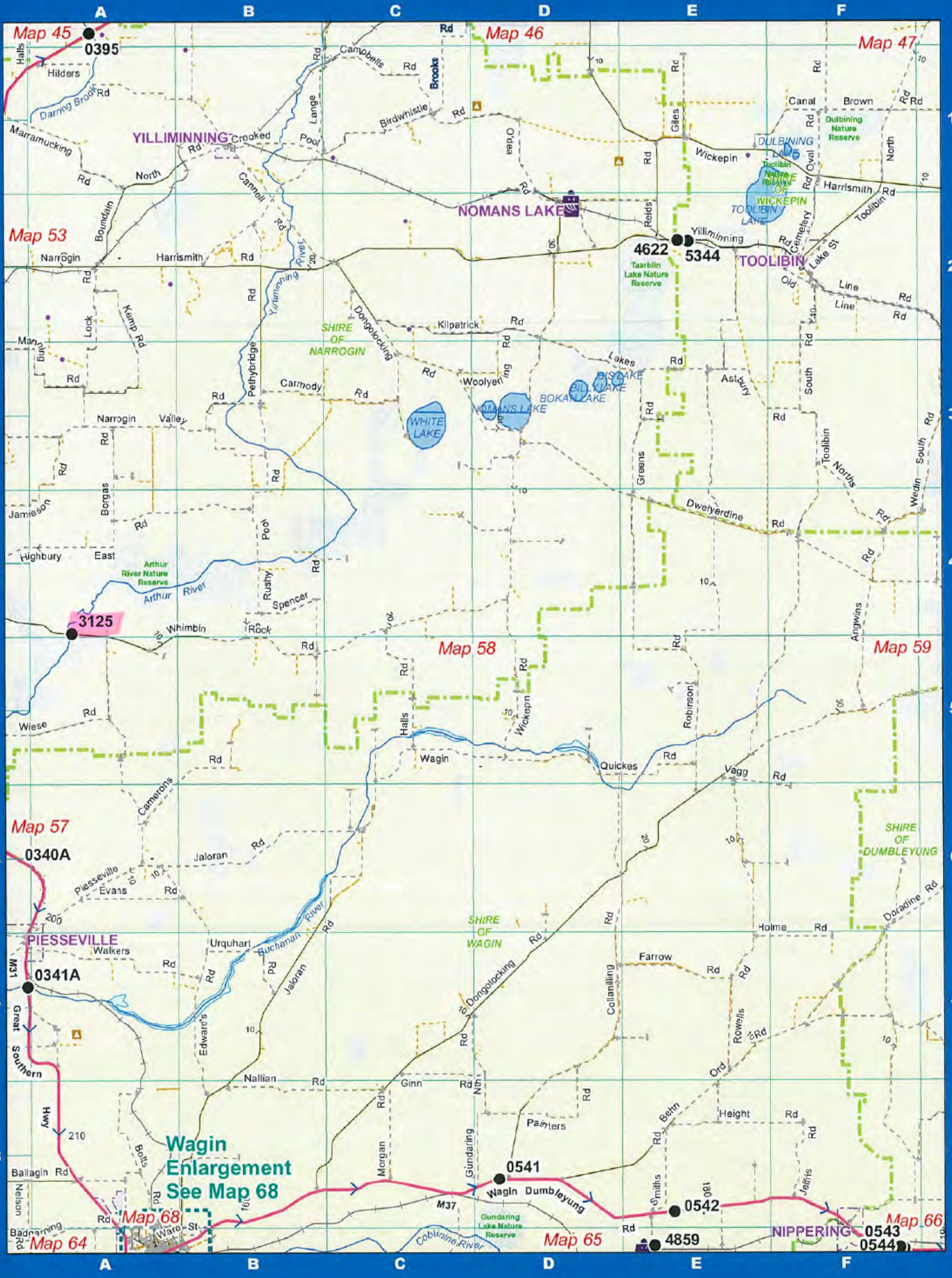
Comments: STR 7 HAS S.G. ACTIVE TERMITES IN STR 3.

STR 1, AB 2 END ROOT PACKING. STR 6, AB 2 ROOT'S PACKING. 3 PACK

STR 3, AB 2 END ROOT'S URGENT ATTENTION - ALREADY PROPPED NEEDS REPAIR BOLT AS INDICATED

STR 5 A1 END HAS 70 PIPE IN 2013 DIR

STR 7 A1 END HAS 90 PIPE IN 2013 DIR


Map 45
0395
Map 46
Map 47
YILLIMINNING
NOMANS LAKE
Map 53
4622
5344
TOOLIBIN
SHIRE OF NARROGIN
WHITE LAKE
BOKAN LAKE
BILLY LAKE
BIS LAKE
SHIRE OF WICKEPIN
Arthur River Nature Reserve
Arthur River
3125
Map 58
Map 59
Map 57
0340A
PIESSEVILLE
0341A
SHIRE OF WAGIN
SHIRE OF DUMBLEYUNG
Buchanan River
Wagin Enlargement See Map 68
Map 68
Map 64
0541
0542
Map 65
4859
NIPPERING
0543
0544
Map 66
Great Southern Hwy
Wagin Dumbleyung Rd
Coblinine River
Gundaring Lake Nature Reserve
Taarblin Lake Nature Reserve
Dulbining Nature Reserve

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Bridge 4551
Tarwonga Road over
Wangelling Gully
L2 Inspection

mainroads
WESTERN AUSTRALIA

ABN: 50 860 676 021

Enquiries: Gavin Johnston on 9323 4431
Our Ref: 04/7524
Your Ref:

ASSET MANAGER STRUCTURES
WHEATBELT REGION

Structure No.:	4551
Over:	Wangelling Gully
On:	Tarwonga Rd (4190004)
SLK:	22.78
LGA:	Shire of Narrogin

1. Please find enclosed a copy of the Detailed Inspection Report for the above Local Authority structure.

2. Attached is a schedule of maintenance items that are required to be undertaken in order to maintain structural integrity and extend the life of the Structure.

3. The maintenance items have been entered into IRIS for programming purposes.

Reviewed by:

Mark Billings
SENIOR STRUCTURAL ENGINEER AECOM

Mark Billings

Issued by:

Gavin Johnston
BRIDGE CONDITION MANAGER

22/2/19

Don Aitken Centre, Waterloo Crescent, East Perth or PO Box 6202 EAST PERTH Western Australia 6892
Telephone: (08) 9323 4111 Facsimile: (08) 9323 4136 TTY: (08) 9428 2230
Email: dac@mainroads.wa.gov.au Website: www.mainroads.wa.gov.au

MRWA Ref: 04/7524

DETAILED TIMBER BRIDGE INSPECTION SUMMARY

Bridge No:	**4551**	**Region:**	**WHEATBELT REGION**
River Name:	**Wangelling Gully**	**SLK:**	**22.78**
Road:	**Tarwonga Rd**	**Road No:**	**4190004**
LGA:	**Shire of Narrogin**		

1.0 General

Bridge no.4551 located on Tarwonga Rd in the Shire of Narrogin is a four span bridge crossing Wangelling Gully. Generally this bridge is in good condition and requires routine and specific maintenance.

2.0 Preventative Maintenance

Preventative maintenance to be undertaken on a 5 year periodic basis. Areas of concern have been identified below,
Carry out fastener maintenance in accordance with specification 850.35.

3.0 Routine Maintenance

Vegetation and Debris clearing shall be undertaken as outlined in report in accordance with specification 850.93.08.
Correct road surface on bridge deck and approaches as outlined in report.
Replace signs and lights as outlined in report.

4.0 Specific Maintenance

4.1 Substructure

Pack halfcaps as outlined in report.
(Pier 3: Pile 1)
Halfcap repair and replacement as outlined in report in accordance with specification 850.32
(Tighten Pier 1 halfcap and repair racking over of halfcap in Pier 1 and 3)
Band and or seal timber pile splits as detailed in the report in accordance with Document No. 6706-02-2226, Preventive Maintenance Standards.
(Abut 1: Piles 4, 5, 10; Pier 1: Piles 2, 4; Pier 2: all piles, 2 bands on Pile 1; Pier 3: Pile 3; Abut 2: Piles 3, 8)
Undertake timber abutment repairs as outlined in report.
(Large gaps and wingcap in poor condition on Abut 1 RHS wingwall/; Wingcaps on Abut 2 require reattachment)
Undertake pile repairs as outlined in report in accordance with specification 850.31.
(Abut 2 Pile 9 leaning forward)

4.2 Superstructure

Bolt and or seal corbels as outlined in report in accordance with specification 850.30 and Document No. 6706-02 2226, Preventive Maintenance Standards.
(Halfmoon washer of Pier 1 Corbel 6 A2 end not making contact)
Shim corbels as outlined in report
(Pier 1: Corbel 3 A1, Corbel 2 A2; Pier 3: Corbel 3 A2)
Shim stringers as outlined in report
(Span 1: Stringer 1 A2, Stringer 6 A2; Span 4: Stringer 7 A1, Stringer 4 A2)

5.0 BCI

25.9

6.0 Load Rating

Not required.

Bruna KN Rocha

Bruna Rocha
Engineer Bridges

March 8 2019

WORK ITEMS - TIMBER BRIDGES
BRIDGE No: 4551

ITEM NO	ITEM DESCRIPTION	WORK REQD	PRIORITY CODE	COMMENTS
(A) GENERAL MAINTENANCE				
G005	Bridge - Durability Survey (L3)			
G009	Bridge - Load Rating			
G010	Bridge - Monitor Defect	Y	1	Abut 2 halfcap split between Pile 7 and 8; Settlement of Pier 1 Pile 2; Sagging of Pier 3 A2 Halfcap
(B) PREVENTATIVE MAINTENANCE				
P101	Bridge - Seal Timber			
P102	Bridge - Maintain Fastener	Y	1	Pier 1
P103	Bridge - Fungicide Treatment			
(C) ROUTINE MAINTENANCE				
	Bearing - Maintain			
	Bridge - Remove Graffiti			
	Bridge - Repair Scour (Minor)	Y	1	Pier 3 Pile 4: bottom of potted pile exposed; Abut 2
	Bridge - Eradicate Termites			
	Bridge - Clear Debris and Vegetation	Y	1	Trees and scrubs around bridge and debris built up on Pier 2 and 3
	Deck Joint - Maintain			
	Deck Surface - Maintain	Y	1	Minor cracking and depression on both abutments and hole at Abut 1 RHS
	Drainage - Maintain			
	Expansion Joint - Maintain			
	Fence - Remove			
	Fence - Repair (Control of Access)			
	Guardrail Maintain/Repair			
	Kerb - Repair (Minor) - Non Structural			
	Lighting - Maintain			
	Sign - Maintain	Y	1	Width markers at Abut 1 RHS and Abut 2 LHS are in poor condition
(D) SPECIFIC MAINTENANCE				
S315	Bridge - Replace Fastener <1.5m			
S350	Bridge - Repair Scour (Major)			
S366	Bridge - Access - Improve			
S413	Deck - Repair			
S437	Decking - Repair (Timber)			
S449	Drainage - Repair			
S455	Expansion Joint - Repair			
S461	Footpath - Repair			
S501	Abutment - Reconstruct			
S504	Abutment - Repair (Non timber)			
S507	Bedlog - Repair			
S510	Bedlog - Shim			
S522	Corbel - Bolt	Y	2	Halfmoon washer of Pier 1 Corbel 6 A2 not making contact
S525	Corbel - Repair			
S528	Corbel - Shim	Y	2	Pier 1: Corbel 3 A1, Corbel 2 A2; Pier 3: Corbel 3 A2
S537	Footpath Railing - Repair			
S540	Fullcap - Repair			
S543	Halfcap - Improve Bearing			
S546	Halfcap - Pack	Y	2	Pier 3: Pile 1
S549	Halfcap - Repair	Y	2	Tightening: Pier 1 / Racking: Pier 1 and 3
S558	Pier - Repair			
S561	Pile - Band	Y	2	Abut 1: Piles 4, 5, 10; Pier 1: Piles 2, 4; Pier 2: all piles, 2 bands on Pile 1; Pier 3: Pile 3; Abut 2: Piles 3, 8
S564	Pile - Repair	Y	3	Abut 2 Pile 9
S570	Sheeting - Repair	Y	2	Large gaps and wingcap in poor condition on Abut 1 RHS wingwall/ Wingcaps on Abut 2 require reattachment
S576	Tie Back - Repair			
S607	Bearer - Repair			
S643	Joist - Repair			
S655	Stringer - Bolting			
S661	Stringer - Repair			
S667	Stringer - Shim	Y	2	Span 1: Stringer 1 A2, Stringer 6 A2; Span 4: Stringer 7 A1, Stringer 4 A2

PRIORITY CODE

0 -Critical Safety Deficiency : EMERGENCY action required (Immediate or within 6 months)
1 - Very High Priority (Within 3 years)
2 - Medium Priority (Within 4 years)
3 - Low Priority (Within 5 years-assess again at next Detailed Inspection)

Bridge Number 4551

In conjunction with the Detailed Level 2 Bridge Inspection Report (as dated below), a Bridge Condition Index (BCI) has been calculated for this Bridge. The BCI assigns a numerical value to a bridge that is indicative of its condition and provides a relative condition in comparison with other timber bridges (BCI calculation is only applicable for timber bridges). The BCI rating system is a tool to provide a systematic approach for the determination of bridge condition by bridge inspection alone.

The process for determining the BCI is outlined in the Timber Bridge Condition Index User Guide. The BCI is primarily calculated utilising Condition States which are assigned based on the Level 2 Bridge Inspection Report (see attached).

A summary of the condition states and the calculated BCI for this bridge is provided below.

Condition States from Detailed Inspection Report conducted on 16-01-2019

		Condition State - Distribution (%)					
LOCATION	Weighting	CS1	CS2	CS3	CS4	Ave AGR	BCI
Condition State Weighting		1	3	9	11		
Stringers	11	89.4	9.4	1.2	0.0	22.5	25.9
Pier Piles	11	50.1	49.9	0.0	0.0		
Abutment Piles	11	55.3	44.7	0.0	0.0		
Halfcaps	11	0.0	100.0	0.0	0.0		
Corbels	6	0.0	100.0	0.0	0.0	15.0	
Timber Decking	6	90.0	0.0	0.0	10.0		
Wing Piles	3	58.0	34.4	7.6	0.0	8.4	
Abutment Sheeting	3	0.0	96.3	0.0	3.8		

Descriptor	BCI Range
Very Good	0 - 19
Good	20 - 39
Fair	40 - 55
Poor	56 - 100
Severe	101 +

BCI Descriptor Range (Refer Table 5.1 Doc No. 6706/02/2232)

Comments:

Prepared by: Bruna Rocha

Date: 24/01/2019

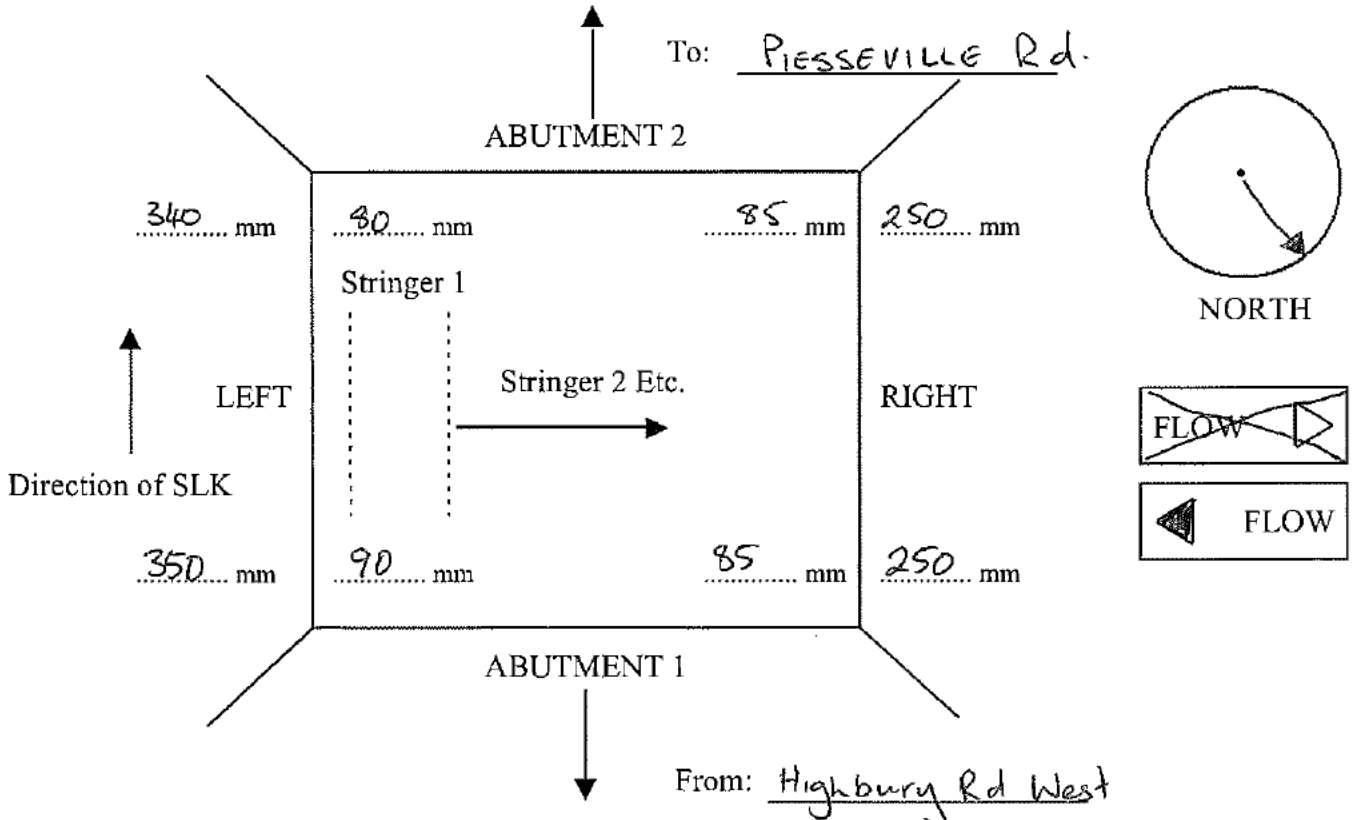
GENERAL INFORMATION - SHEET 1

Bridge No.: 4551

Region:	Wheatbelt	Latitude (S):	-33.14436
		Longitude (E):	117.05573
Road Name:	Tarwonga Rd	Road No.:	4180204
Local Government:	Narrogin	Owner:	Local Authority
Crossing Name:	Wangelling Gully	SLK:	22.78
Number of Lanes:	2	Length (m):	24.6 m
Total Width (m): Inc. Footpath	7.77	Max. Head Room (m): 4.60	Min. Head Room (m): 2.50
No. of Spans:	4	Width between Kerbs (m): 7.17	Concrete Overlay (Y/N): Y (130mm)

Piers are numbered along the bridge in ascending order from ABUTMENT 1 to ABUTMENT 2.
Piles are numbered across the bridge in ascending order from LEFT to RIGHT.
Stringers are numbered across the bridge in ascending order from LEFT to RIGHT.

Inside and outside kerb depths noted in corners of sketch.
Exposed Deck Ends (RCO only): LHS Y RHS Y



This bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Timber Bridge Detailed Inspection Guidelines.

Inspected by: J.P, A.R, L.M, D.N
Date: 15/1/19 - 16
Drilled by: J. Pink, D. North

Checked by: B. Rocha / M. Billings
Date: 6/02/2019

DRIVE THROUGH	**Visible Line of Sight from Abut. 1:** 100m **Visible Line of Sight from Abut. 1:** 100m
TRAFFIC CONTROL *(Describe if different to the generic TMP)*	**Abut. 1 end:** **Abut. 2 end:** } As per T.M.
PARKING POSITION	**> 3 m** ☐ **Position:** **1.2 to 3 m** ☒ **Position:** On bridge behind truck T.M. **0 to 1.2 m** ☐ **Position:**
ACCESS TO ABUTMENTS *(Describe access conditions at each wing)*	**Abutment 1:** LHS: RHS: } Steep banks OK **Abutment 2:** LHS: RHS: } Steep banks OK **Vegetation:** Trees, scrub req clearing
ACCESS TO PIERS *(Describe access conditions along each side of the structure)*	**LHS:** **RHS:** } Piers 2,3 in mud + water **Vegetation:** OK
POTENTIAL HAZARDS	**Railing/Posts:** **Bolts:** **Services:** **Asbestos:** **Other:** Steep banks
FENCES	**Timber** ☐ **Location:** **Wire/Mesh:** ☐ **Location:** **Electrified:** ☐ **Location:** None **Barbed Wire:** ☐ **Location:** **Other (Specify):** ☐ **Location:**
WATER	**Depth (m):** 0.3m **Flow Rate:** Slow **Algae:** Yes (Access may be restricted by toxic algae) **Tide:** **Location:** Pier 2 + 3
POWERLINES	**Side of bridge:** **Horizontal distance from edge of deck (m):** None **Estimated vertical height above deck (m):**

Signature _____ **Date** 16/1/19

GUARDRAIL INFORMATION

Bridge No.: 4551

	Approach 1			On Bridge			Approach 2		
Barrier Type	LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS
None									
RHS Rails No. of Rails (on bridge):									
Thriebeam									
W Beam	X		X	X		X	X		X
Tric-Bloc Concrete Barrier									
Reinforced Concrete Barrier (Type F)									
Constant Slope Concrete Barrier									
Other Concrete Profiles									
Post Type									
None									
Concrete									
Timber									
Steel Type: Parallel Flange Channel (PFC)	X		X	X		X	X		X
[Types: C-Section (C), I Section (I), RHS (R), Square Hollow Section SHS (S), Tubular (T), Steel PFC (PFC), Steel Channel (Ch)]									
Off bridge:									
Number of Posts off Bridge	7		4				4		7
Length of Barrier off Bridge (m)	12.7		6.8				6.8		12.7

	Approach 1			On Bridge			Approach 2		
Visibility Barrier	LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS
Timber No. of Rails (on bridge):									
Steel Pipe(s) No. of Pipes (on bridge):									
Guide Posts									
Balustrade									
Top Rails									
Steel Pipe									
Steel RHS/Channel	X		X	X		X	X		X
Steel C Section									
Timber									

	Approach 1			On Bridge			Approach 2		
End Terminals	LHS	Median	RHS				LHS	Median	RHS
Approved End Terminal Types:									
WAMELT									
SKT-350									
ET-2000									
X Tension									
TAU II Crash Cushion									
Other:									
Other End Terminal Types:									
None									
Turn-down									
Bullnose	X		X				X		X
Fishtail									
Other									
Structural problem found? (Y/N)	N		If yes, comment below.						

ROUTINE INFORMATION

Bridge No.: 4551

SCUPPERS LOCATION, TYPE & CONDITION (R208)	None ☐ LHS ☒ RHS ☒	Box ☐ PVC pipe ☒ Hole in deck ☐ Through Deck ☒ Through Kerb ☐
	Spoon drains A1 + A2 LHS + RHS	
FLASHING TYPE & CONDITION (R208)	None ☐	PVC pipe ☒ PGI ☐
BOLT TIGHTENING REQUIRED (P102)	Yes ☐	No ☒
TERMITES (R204)	Active ☐	Not Active ☒
PREVENTATIVE FUNGICIDE (P103)	Treated ☒	Not Treated ☐
ATTACHED FENCES & OTHER WATERWAY OBSTRUCTIONS (R210)	None	
ROAD SURFACE & KERBING CONDITION (R207) — ON BRIDGE	Road Surface: Concrete, OK	
	Kerbing: Concrete, OK	
APPROACHES	Road Surface: Bitumen seal minor cracking and depressions A1 + A2, Small hole A1 RHS see photo 34	
	Kerbing: Concrete - OK	
VEGETATION (R205)	Requires Clearing: LHS ☒ Abut 1 ☒ RHS ☒ Abut 2 ☒	
	Trees, scrub REMOVE	
STREAM BED CONDITION *(General comments and details of location, depth & extent of scour, undermining and silt build up.)* (R203)	Debris build up pier 2+3 RHS	

SERVICES *(Type, Size & Location)*	Type	Size (mm)	Location
	None		

BRIDGE CONDITION	Priority for Engineering Assessment			
	Low ☒	Medium ☐	High ☐	Urgent ☐

Comments:

GENERAL INFORMATION - SHEET 2

Bridge No.: 4551

Bridge Status Built/In Use [X] Not Used [ ]

Date Built 01/06/1973 **Skew (angle)** _____ **Skewed Width (m)** _____

Widening Left Hand side [X] Width (m) 0.40 Right Hand side [X] Width (m) 0.40
Date _____ Date _____

Surface Type

Unsurfaced	[X]	Bitumen Seal	[ ]	Asphalt	[ ]
Rubberised Seal	[ ]	Tiles	[ ]	Steel Plate	[ ]

Pavement Type

Unpaved	[ ]	Gravel	[ ]	Material Unknown	[X]

Footpath Left	Left Kerb (m) 0.30	Path (m) _____	Right Kerb (m) _____
Footpath Right	Left Kerb (m) _____	Path (m) _____	Right Kerb (m) 0.30
Median	Left Kerb (m) _____	Median (m) _____	Right Kerb (m) _____

Bridge Function 1

Road Bridge	[X]	Rail Bridge	[ ]	Pedestrian Bridge	[ ]

Bridge Function 2

Over Water	[X]	Over Road	[ ]	Over Rail	[ ]
Over Road & Rail	[ ]	Over Road & Water	[ ]	Over Rail & Water	[ ]
Stock Underpass	[ ]	Pedestrian Underpass	[ ]		

SIGNAGE

Load Limits **Abutment 1 End** Tonne **Abutment 2 End** Tonne

Width Markers **Abutment 1** LHS [2] RHS [3] **Abutment 2** LHS [3] RHS [2]

Is position of Width Markers a true indication of the bridge width? (Y/N) [Y]

Other Signs

No Overtaking or Passing	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
No Overtaking on Bridge	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
One Lane Bridge	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Low Clearance .....m	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Narrow Bridge Sign	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Give Way	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]

Crossing Sign: _____

	Abutment 1	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Other _____	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]

Signage Condition Legend *Good* [1] *Fair* [2] *Poor* [3] *None (missing)* [4] *Not Required* [ ]

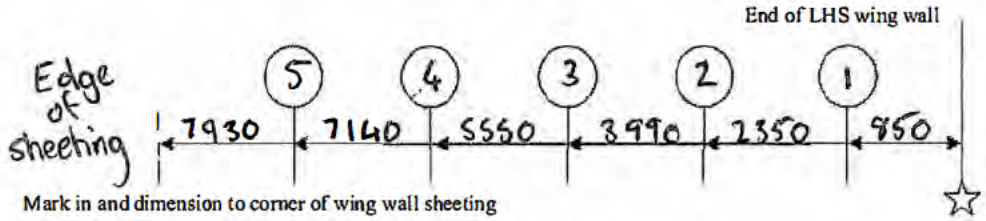
ELEMENT SPACING SHEET 1

Bridge No.: 4551

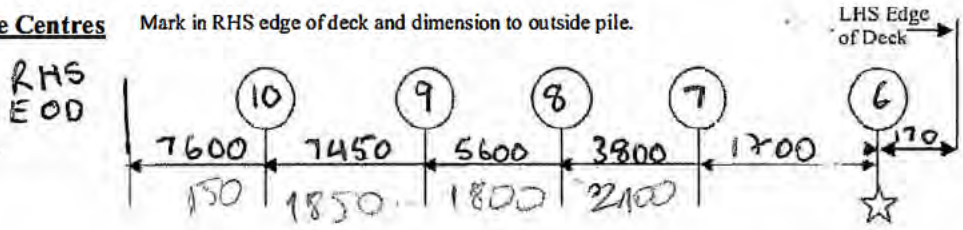
Abutment 1

All measurements (cumulative) are taken from the reference point as indicated by the star ☆

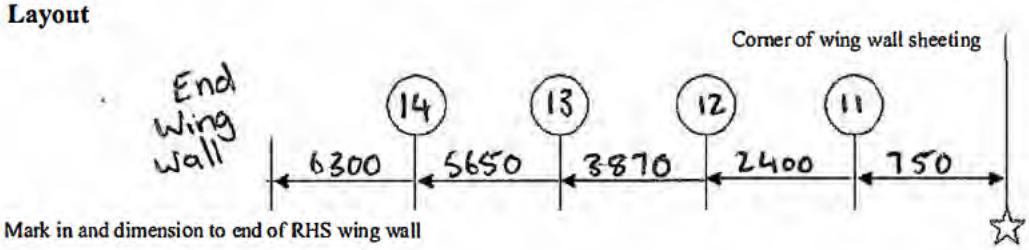
LHS Wing Wall Layout



Abutment **Abutment Pile Centres** Mark in RHS edge of deck and dimension to outside pile.



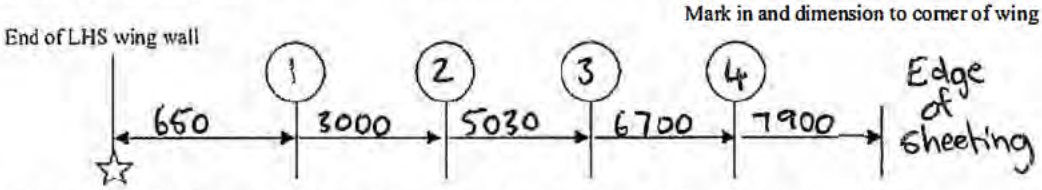
RHS Wing Wall Layout



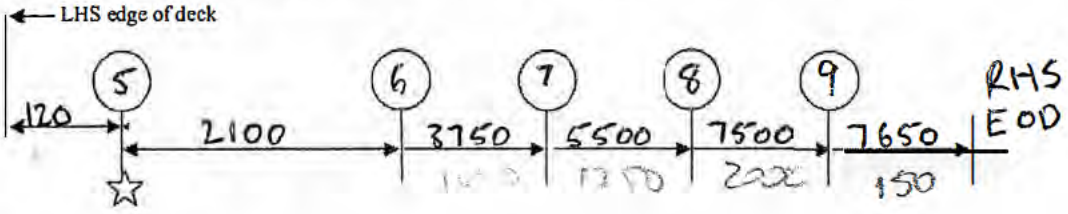
Abutment 2

LHS Wing Wall Layout All measurements (cumulative) are taken from the reference point as indicated by the star ★

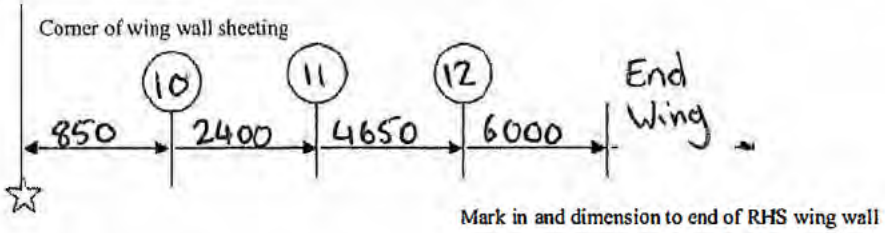
Mark in and dimension to corner of wing wall sheeting



Abutment **Abutment Pile Centres** Mark in RHS edge of deck and dimension to outside pile.



RHS Wing Wall Layout



ELEMENT SPACING SHEET 2

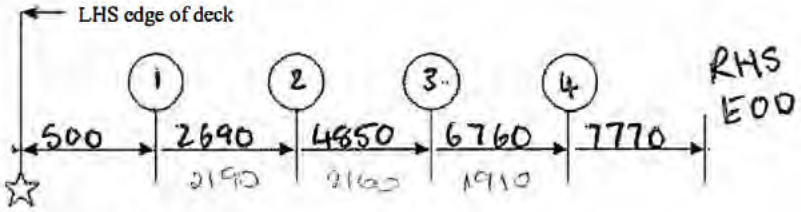
Bridge No.: 4551

All measurements (cumulative) are taken from the reference point as indicated by the star ☆

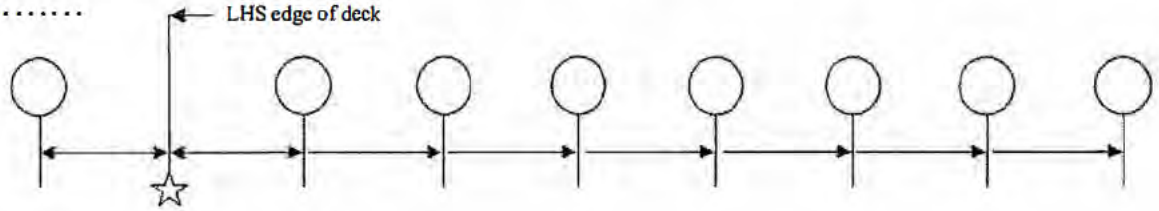
Pier Pile Centres

Mark in RHS edge of deck and dimension last pile to RHS edge of deck.

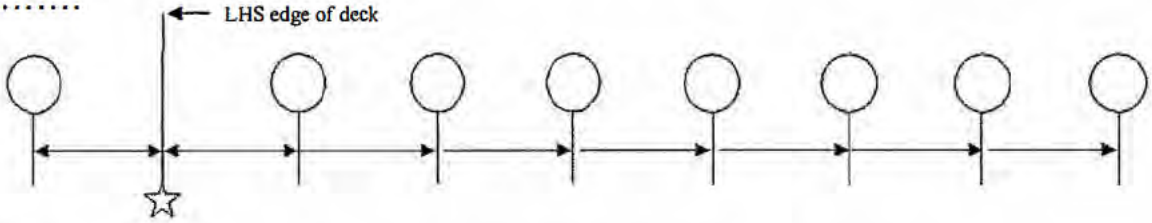
PIER No.....1..... Typical



PIER No.....



PIER No.....

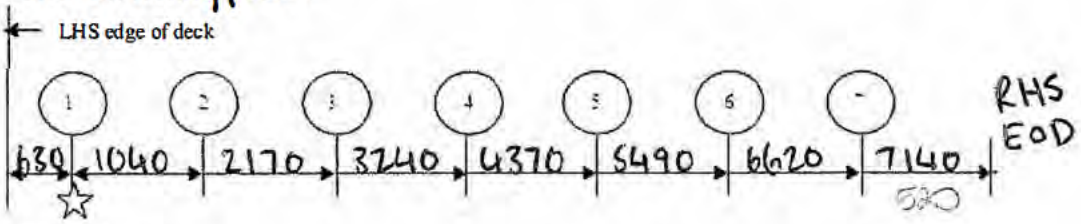


Typical Stringer Spacing

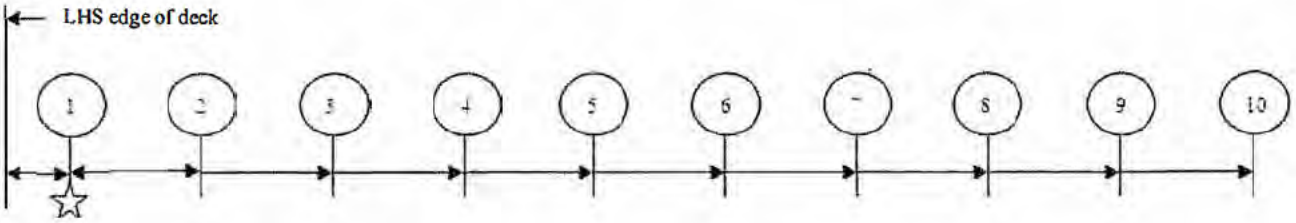
Mark in RHS edge of deck and dimension last stringer to RHS edge of deck.

Note: Stringer spacings must be measured in every span with additional stringers. Use additional sheets as required.

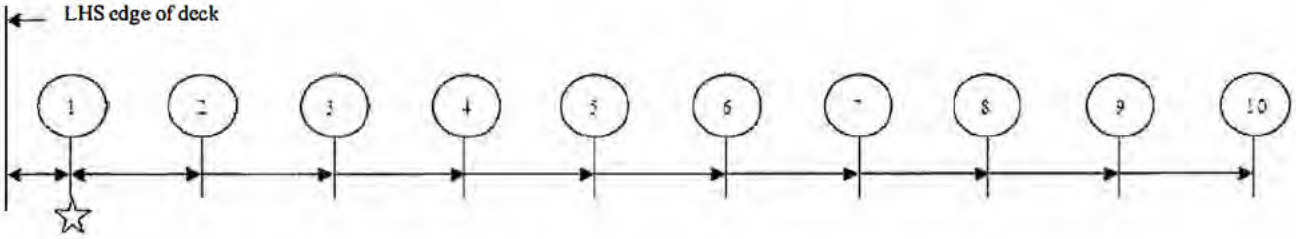
SPAN No. .1.. Typical



SPAN No. .....



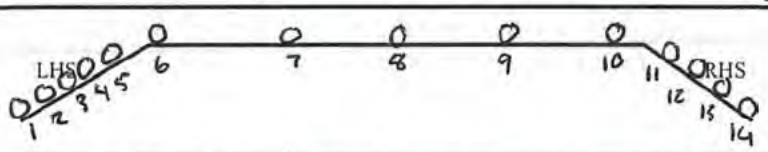
SPAN No. .....



TIMBER BRIDGE DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

ABUTMENT: 1



Bridge No: 4551

Pile No.	Dia. (mm)	Timber Drilling (mm)			Extent of Rot (m)			Splits		Blaze Markings			Halfcaps Bearing (mm)		Pile Dia. (mm) below H/C (5m+)	Mat. Type	Tied Back	Cond. State
		Solid	Rot	Pipe	Drill Location from top H/C	Above	Below	Location	Requires Band	Marking (ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	A1	A2				
1	400	See notes			.4	To Top	.5			-	.2	-	-	-	-	JAR		3
2	400	200						-		-	1.2	-	-	-	-	JAR		2
3	470	235						-		-	2.2	-	-	-	-	JAR		2
4	360	180						-	✓	-	3.0	-	-	-	-	JAR		2
5	380	190						-	✓	-	3.6	-	-	-	-	JAR		2
6	410	205								-	3.1	-	-	120	-	JAR		2
7	360	180						=		-	3.0	-	-	170	-	JAR		2
8	420	210						=		-	3.0	-	-	170	-	JAR		2
9	350	125		50	1.5					-	3.0	-	-	140	-	JAR		2
10	400	200						✓	✓	-	3.1	-	-	130	-	JAR		2
11	390	195								-	3.8	-	-	-	-	JAR		2
12	370	185						-		-	2.6	-	-	-	-	JAR		2
13	400	200								-	1.8	-	-	-	-	JAR		2
14	450	See notes			.3	To Top	.5			-	.3	-	-	-	-	JAR		3
15																		

Fillet

Saturated Piles:

LHS Halfcaps Size V 340 H 170 Length 8500 No. of 1 Gap between H/Caps —

Top of H/Caps to underside of Deck 370 Back of Halfcaps to Sheeting 250 H/Cap Material SAR

RHS Halfcaps Size V H Length No. of Gap between H/Caps

Top of H/Caps to underside of Deck Back of Halfcaps to Sheeting H/Cap Material

Are there more than 2 sets of halfcaps or sill beams (~~YES~~/NO) No (If yes record details on comments sheet)

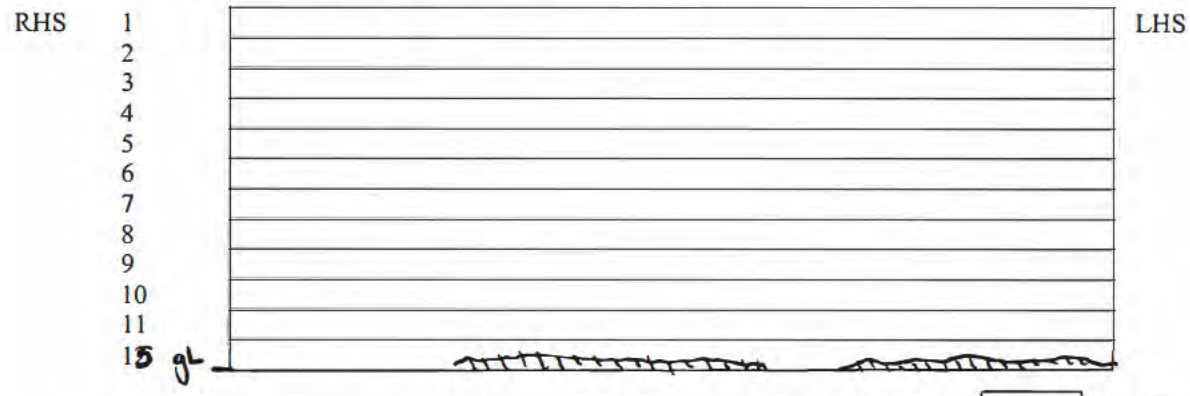
Comments: Pile 5 has termite damage, and sheet 7 LHS W/Wall none found

Pile No. 1	Pile No. 14	Pile No.	Pile No.
R.H.S 100/5 L.H.S 120/5 F= 120/5	R.H.S 160/5 L.H.S 100/5 F= 120/5	R.H.S L.H.S F=	R.H.S L.H.S F=

ABUTMENT 1 and WING WALL SHEETING

Bridge No: 4551

ABUTMENT 1 SHEETING (indicate ground line, piles and failed sheeting)



SHEETING - ABUTMENT LHS: Solid - bottom sheet poor cond
Rot from Pile: To Pile:

Centreline: Solid
Rot from Pile: To Pile:

RHS: Solid
Rot from Pile: To Pile:

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 80

% Condition State	Condition 1	Condition 2	Condition 3	Condition 4
		95		5

ABUTMENT 1 WING WALLS (indicate ground line, piles and failed sheeting)

WINGCAP / SPIKING RAIL CONDITION: Poor condition, splitting

WINGCAP / SPIKING RAIL CONDITION: Minor weathering + splitting

SHEETING - WING WALLS LHS: Solid - Sheet & termite damage
Rot from Pile: To Pile:

RHS: Solid - bottom sheet poor cond
Rot from Pile: To Pile:

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 80

% Condition State	Condition 1	Condition 2	Condition 3	Condition 4
		95		5

TIMBER BRIDGE DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

PIER No: 1 **Bridge No:** 4551

Pile No.	Circ. (mm)	Dia. (mm)	Timber Drilling (mm)			Extent of Rot (m)			Splits		Blaze Markings			Halfcaps Bearing (mm)		Pile Circ. (mm) below H/C (5m+)	Mat. Type	Cond. State
			Solid	Rot	Pipe	Drill Location from top H/C	Below	Above	Location	Requires Band	Marking (ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	A1	A2			
1	1130	360	180								-	3.3	-	100	170	-	JAR	2
2	1260	400	180		20	2.9			✓	✓	-	3.2	-	170	100	-	JAR	2
3	1100	350	175								-	3.0	-	170	170	-	JAR	2
4	1320	420	210						✓	✓	-	2.8	-	140	150	-	JAR	2
5																		
6																		
7																		
8																		
9																		
10																		

Total Number of Corbels: 7 Typical Corbel Height (mm): LHS 320 RHS 320

Corbel No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							
Requires Bolting: A1/A2 End	- -	- -	- -	- -	- -	- -	- -							
Condition State: A1/A2 End	2 2	2 2	2 2	2 2	2 2	2 2	2 2							

Ironwork Condition: Minor Rust Tightening Required: YES

Walers Size V — x H —

Bracing Size V — x H —

Saturated Piles:

LHS Halfcaps Size V 340 H 170 Length 7300 No. of 2 Gap between H/Caps 150

Top of H/Caps to underside of Deck 720 H/Cap Material JAR

RHS Halfcaps Size V H Length No. of Gap between H/Caps

Top of H/Caps to underside of Deck H/Cap Material

Are there more than 2 sets of halfcaps or sill beams (YES/NO) No (If yes record details on comments sheet)

Comments: CORBEL 3 A1 REQ PACKING - SEE PHOTO 13 MONITOR SETTLEMENT OF PILE 2

H/C REQ TIGHTENING. A2 H/C HAS 25mm SAG BETWEEN PILE 1 + 3. (Photo 16) A2 H/C HAS ROLLED OUT FROM PILE, (Photo 17) → REPAIR 35mm GAP BETWEEN PILE + H/C AND 10mm ON BOTTOM OF H/C. Corbel 2 A2 req packing (Ph 18) not required

Pile 2 A1 H/C req packing (Photo 19). Corbel 6 A2 half moon washer not making contact (Photo 20)

Pile No.:	Pile No.:	Pile No.:	Pile No.:
A2	A2	A2	A2
LHS RHS	LHS RHS	LHS RHS	LHS RHS
A1	A1	A1	A1

PIER No: 2 **Bridge No: 4551**

Pile No.	Circ. (mm)	Dia. (mm)	Timber Drilling (mm)			Extent of Rot (m)			Splits		Blaze Markings			Halfcaps Bearing (mm)		Pile Circ. (mm) below H/C (5m+)	Mat. Type	Cond. State
			Solid	Rot	Pipe	Drill Location from top H/C	Below	Above	Location	Requires Band	Marking (ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	A1	A2			
1	1130	360	130		50	2.3			✓	✓	-	4.2	-	140	140	-	JAR	2
2	1225	390	195						✓	✓	-	4.2	-	130	150	-	JAR	2
3	1160	370	185						✓	✓	-	4.2	-	170	100	-	JAR	2
4	1160	370	155		30	2.8			✓	✓	-	4.2	-	120	130	-	JAR	2
5																		
6																		
7																		
8																		
9																		
10																		

Total Number of Corbels: 7 Typical Corbel Height (mm): LHS 320 RHS 320

Corbel No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							
Requires Bolting: A1/A2 End	- -	- -	- -	- -	- -	- -	- -							
Condition State: A1/A2 End	2 2	2 2	2 2	2 2	2 2	2 2	2 2							

Ironwork Condition: Minor Rust Tightening Required: No

Walers Size V — x H —

Bracing Size V — x H —

Saturated Piles:

LHS Halfcaps Size V 340 H 170 Length 7300 No. of 2 Gap between H/Caps 150

Top of H/Caps to underside of Deck 720 H/Cap Material JAR

RHS Halfcaps Size V H Length No. of Gap between H/Caps

Top of H/Caps to underside of Deck H/Cap Material

Are there more than 2 sets of halfcaps or sill beams ~~(YES/NO)~~ No (If yes record details on comments sheet)

Comments: Unable to drill pile 4 at ground level large amount of debris Pier 2 corbel 7 A1 req packing (Photo 25);

Pile No.:	Pile No.:	Pile No.:	Pile No.:
A2	A2	A2	A2
LHS RHS	LHS RHS	LHS RHS	LHS RHS
A1	A1	A1	A1

TIMBER BRIDGE DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

PIER No: 3 **Bridge No:** 4551

Pile No.	Circ. (mm)	Dia. (mm)	Timber Drilling (mm)			Extent of Rot (m)			Splits		Blaze Markings			Halfcaps Bearing (mm)		Pile Circ. (mm) below H/C (5m+)	Mat. Type	Cond. State
			Solid	Rot	Pipe	Drill Location from top H/C	Below	Above	Location	Requires Band	Marking (ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	A1	A2			
1	1130	360	180						=		–	3.2	–	110	150	–	JAR	2
2	1290	410	205								–	3.3	–	100	130	–	JAR	2
3	1290	410	205						✓	✓	–	3.2	–	160	110	–	JAR	2
4	210	UC	Potted			11mm					–	2.9	–	170	170	–	STE	1
5																		
6																		
7																		
8																		
9																		
10																		

Total Number of Corbels: 7 Typical Corbel Height (mm): LHS 320 RHS 320

Corbel No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							
Requires Bolting: A1/A2 End	All bolted													
Condition State: A1/A2 End	2/2	2/2	2/2	2/2	2/2	2/2	2/2							

Ironwork Condition: Minor Rust Tightening Required: No

Walers Size V – x H –

Bracing Size V – x H –

Saturated Piles:

LHS Halfcaps Size V 340 H 170 Length 7300 No. of 2 Gap between H/Caps 150

Top of H/Caps to underside of Deck 720 H/Cap Material SAR

RHS Halfcaps Size V H Length No. of Gap between H/Caps

Top of H/Caps to underside of Deck H/Cap Material

Are there more than 2 sets of halfcaps or sill beams (YES/NO) No (If yes record details on comments sheet)

Comments: Corbel 7 A2 neg packing (photo 30) → small gap - not required

15mm SAG IN A1 H/C BETWEEN PILE 4 + 3.

40mm SAG IN A1 H/C FROM PILE 3 TO R.H.S

REPAIR ↳ BOTH H/C RACKING OVER (audit photo) A2 H/C SAG BETWEEN PILE 1+2 (Ph 28

pile 4 bottom of pot is exposed due to scour see photo 33

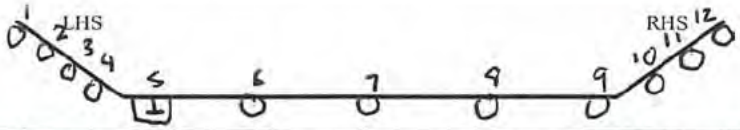
Corbel 3 A2 neg packing (Photo 21) Pier 3 H/C packing neg Pile 1 (Ph 2

Pile No.:	Pile No.:	Pile No.:	Pile No.:
A2	A2	A2	A2
LHS RHS	LHS RHS	LHS RHS	LHS RHS
A1	A1	A1	A1

TIMBER BRIDGE DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

ABUTMENT: 2



Bridge No: 4551

Pile No.	Dia. (mm)	Timber Drilling (mm) Solid	Rot	Pipe	Extent of Rot (m) Drill Location from top H/C	Above	Below	Splits Location	Requires Band	Blaze Markings Marking (Ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	Halfcaps Bearing (mm) A1	A2	Pile Dia. (mm) below H/C (5m+)	Mat. Type	Tied Back	Cond. State
1	400	140		60	.7			✓		-	.3	-	-	-	-	JAR		2
2	350	SEE	NOTES		1.8	TO TOP	5	✓		-	1.6	-	-	-	-	JAR		3
3	350	175						✓	✓	-	2.8	-	-	-	-	JAR		2
4	360	180						—		-	3.1	-	-	-	-	JAR		2
Fillet 5	210	UC	Potted		11mm					-	2.5	-	190	-	-	STE		1
6	400	200						—		-	2.6	-	190	-	-	JAR		2
7	360	180F						✓		-	3.0	-	100	-	-	JAR		2
8	420	210						✓	✓	-	2.8	-	120	-	-	JAR		2
Fillet 9	370	185						—		-	2.7	-	100	-	-	JAR		2
10	360	180								-	2.7	-	-	-	-	JAR		2
Fillet 11	400	SEE	NOTES		1.6	TO TOP	.5	—		-	1.4	-	-	-	-	JAR		3
12	370	SEE	NOTES		.2					-	.2	-	-	-	-	JAR		2
13																		
14																		
15																		

Saturated Piles: —

LHS Halfcaps Size V 340 | 170 Length 6250 No. of 1 Gap between H/Caps —

Top of H/Caps to underside of Deck 370 Back of Halfcaps to Sheeting 290 H/Cap Material SAR

RHS Halfcaps Size V | H Length | No. of | Gap between H/Caps |

Top of H/Caps to underside of Deck | Back of Halfcaps to Sheeting | H/Cap Material |

Are there more than 2 sets of halfcaps or sill beams (~~YES~~/NO) No (If yes record details on comments sheet)

Comments: SCOUR AT ABUT FACE. SEE PHOTO. 8

Halfcap → split between Pile 7 and 8 (Photo 32) → not severe MONITOR

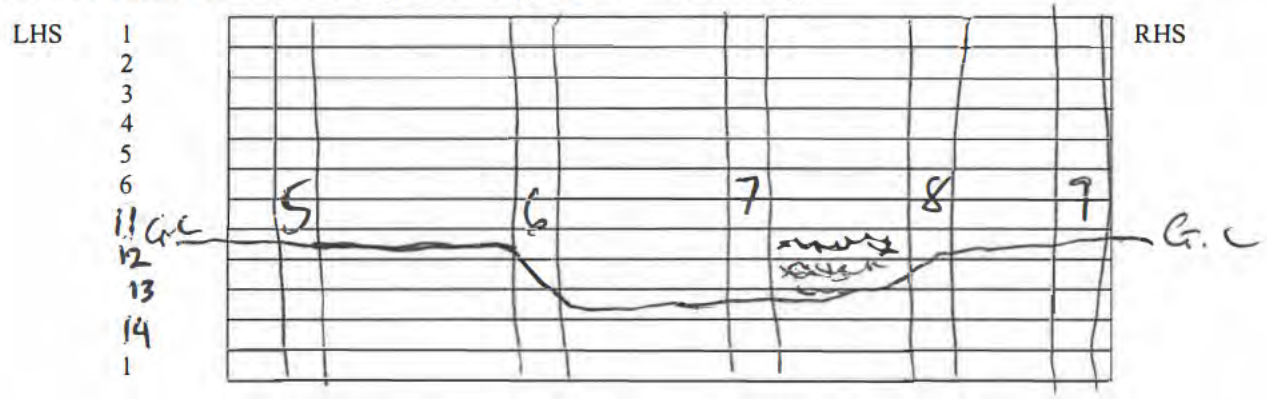
Pile 9: seems to be leaning forward → also creating gap between Pile and H/C. (audit photos) → TIE BACK TO SHEETING

Pile No. 2 o/c	Pile No. 11 o/s	Pile No. 12 o/s	Pile No.
L.H.S 100/s R.H.S 180/s	L.H.S 200/s R.H.S 160/s	L.H.S 150/s R.H.S 150/s	L.H.S R.H.S
F= 110/s	F= 180/s	F= 120/s	F=

ABUTMENT 2 and WING WALL SHEETING

Bridge No: 4551

ABUTMENT 2 SHEETING (indicate ground line, piles and failed sheeting)



SHEETING - ABUTMENT LHS: Solid

Centreline: Solid 11+12 U/S

RHS: Solid

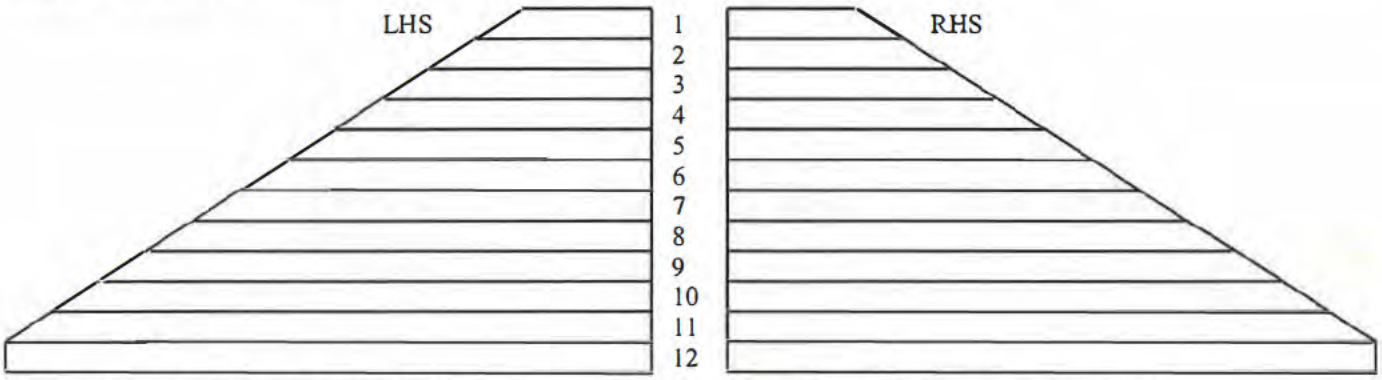
Rot from Pile	7	To Pile	8
Rot from Pile		To Pile	
Rot from Pile		To Pile	

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 80

% Condition State	Condition 1	Condition 2	Condition 3	Condition 4
		95		5

ABUTMENT 2 WING WALLS (indicate ground line, piles and failed sheeting)



WINGCAP / SPIKING RAIL CONDITION

WEATHERED + SPLIT - OK
BOTTOM SECTION HAS COME OFF
REQ RE ATTACHMENT.

WINGCAP / SPIKING RAIL CONDITION

WEATHERED + SPLIT - OK
HAS COME OF - REQ RE ATTACH

SHEETING - WING WALLS LHS: Solid.

RHS: Solid

Rot from Pile		To Pile	
Rot from Pile		To Pile	

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 80

% Condition State	Condition 1	Condition 2	Condition 3	Condition 4
		100		

DETAIL SHEET

Span No: 1 **Bridge No:** 4551

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							

Abutment 1 End

H Diameter (mm)		410	560	530	550	540	400	420							
V Measurement (mm)		370	370	370	370	370	370	370							
Drill Vertical	Solid (B)	130	370	370	370	370	160	370							
	Rot														
	Pipe	80					70								
	Rot														
	Solid (T)	160					140								
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd	–	–	–	✓	–		–							
Split H	Bolt Rqd														
Propped															
Condition State		2	1	1	1	1	2	1							

Mid Span

H Diameter (mm)		420	540	530	460	600	400	460							
V Measurement (mm)		470	480	500	460	500	420	500							
Drill Vertical	Solid (B)	470	480	480	460	480	120	190							
	Rot														
	Pipe						220	90							
	Rot														
	Solid (T)						80	200							
Drill Horiz.	Left						190								
	Right						110								
Split V	Bolt Rqd														
Split H	Bolt Rqd	✓						✓							
Propped															
Condition State		1	1	1	1	1	2	2							

Abutment 2 End

H Diameter (mm)		470	500	550	400	610	390	480							
V Measurement (mm)		400	400	400	400	400	400	400							
Drill Vertical	Solid (B)	400	400	400	400	400	400	400							
	Rot														
	Pipe														
	Rot														
	Solid (T)														
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd	✓		–				–							
Split H	Bolt Rqd							✓							
Propped															
Condition State		1	1	1	1	1	1	1							

Cond. of Spiking Plank Not Applicable ✓ Size V – Condition S – R – %

Cond. of Decking (Solid/Rot) S 90 R 10 % Cond. of Deck Ends S 90 R 10 %

Decking Size (mm) V 127 x H 220 Decking Timber Type JAR

Span Length from Centreline Supports (m) 5.78 Clear Span Length 4.87 Saturated stringers:

Deck Condition State Percentage: Condition 1: 90 Condition 2: Condition 3: Condition 4: 10 Spiral Grain Stringers: 7

Comments: STR 1 REQ PACKING SEE PHOTO - Abut 2 - Photo 15

Stringer 6 Abut 2 requires packing - Photo 14

NO BOLTS REQUIRED

DETAIL SHEET

Span No: 2 **Bridge No: 4551**

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							

Abutment 1 End

H Diameter (mm)			600	500	550	440	550	430	570						
V Measurement (mm)			400	400	400	400	400	400	400						
Drill Vertical	Solid (B)		400	400	400	400	400	400	400						
	Rot														
	Pipe														
	Rot														
	Solid (T)														
Drill Horiz.	Left														
	Right								✓						
Split	V	Bolt Rqd	–		–		–			–	–				
	H	Bolt Rqd													
Propped															
Condition State			1	1	1	1	1	1	1						

Mid Span

H Diameter (mm)			480	550	530	490	500	460	540						
V Measurement (mm)			440	460	480	500	450	450	480						
Drill Vertical	Solid (B)		290	460	290	480	450	450	480						
	Rot		Top												
	Pipe				100										
	Rot														
	Solid (T)		0		90										
Drill Horiz.	Left		180												
	Right		200												
Split	V	Bolt Rqd													
	H	Bolt Rqd	✓												
Propped															
Condition State			3	1	2	1	1	1	1						

Abutment 2 End

H Diameter (mm)			410	600	500	530	460	500	470						
V Measurement (mm)			400	400	400	400	400	400	400						
Drill Vertical	Solid (B)		400	400	400	400	400	400	400						
	Rot														
	Pipe														
	Rot														
	Solid (T)														
Drill Horiz.	Left														
	Right														
Split	V	Bolt Rqd	✓		✓										
	H	Bolt Rqd													
Propped															
Condition State			1	1	1	1	1	1	1						

Cond. of Spiking Plank Not Applicable ✓ Size V – Condition S – R – %

Cond. of Decking (Solid/Rot) S 90 R 10 % Cond. of Deck Ends S 90 R 10 %

Decking Size (mm) V 127 x H 220 Decking Timber Type JAR

Span Length from Centreline Supports (m) 6.13 Clear Span Length 4.70 Saturated stringers: _____

Deck Condition State Percentage: Condition 1: 90 Condition 2: _____ Condition 3: _____ Condition 4: 10 Spiral Grain Stringers: _____

Comments: NO BOLTS REQUIRED

DETAIL SHEET

Span No: 3 **Bridge No: 4551**

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							

Abutment 1 End

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
H Diameter (mm)		460	420	540	430	470	560	480							
V Measurement (mm)		400	400	400	400	400	400	400							
Drill Vertical	Solid (B)	400	400	400	400	400	400	400							
	Rot														
	Pipe														
	Rot														
	Solid (T)														
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd	✓		–		–		–							
Split H	Bolt Rqd						✓								
Propped															
Condition State		1	1	1	1	1	1	1							

Mid Span

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
H Diameter (mm)		470	500	570	420	520	580	520							
V Measurement (mm)		500	400	480	460	510	470	490							
Drill Vertical	Solid (B)	480	400	480	460	480	470	480							
	Rot														
	Pipe														
	Rot														
	Solid (T)														
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd						✓								
Split H	Bolt Rqd														
Propped															
Condition State		1	1	1	1	1	1	1							

Abutment 2 End

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
H Diameter (mm)		540	560	630	470	510	550	560							
V Measurement (mm)		400	400	400	400	400	400	400							
Drill Vertical	Solid (B)	400	400	400	400	400	400	400							
	Rot														
	Pipe														
	Rot														
	Solid (T)														
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd	–	–	–	–	–	–	–							
Split H	Bolt Rqd						–								
Propped															
Condition State		1	1	1	1	1	1	1							

Cond. of Spiking Plank Not Applicable ✓ Size V – Condition S – R – %

Cond. of Decking (Solid/Rot) S 90 R 10 % Cond. of Deck Ends S 90 R 10 %

Decking Size (mm) V 127 x H 220 Decking Timber Type JAR

Span Length from Centreline Supports (m) 6.00 Clear Span Length 4.58 Saturated stringers:

Deck Condition State Percentage:	Condition 1	Condition 2	Condition 3	Condition 4
	90			10

Spiral Grain Stringers:

Comments: Stringer 2 Abut 2 req packing (Photo 22) } NOT REQUIRED
Stringer 7 A2 req packing (Photo 26) }
BOLTS NOT REQUIRED

DETAIL SHEET

Span No: 4 **Bridge No:** 4551

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							

Abutment 1 End

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
H Diameter (mm)		550	530	600	450	520	480	560							
V Measurement (mm)		400	400	400	400	400	400	400							
Drill Vertical	Solid (B)	400	400	400	400	400	400	400							
	Rot														
	Pipe														
	Rot														
	Solid (T)														
Drill Horiz.	Left														
	Right														
Split	V Bolt Rqd	–	–			–	✓	–							
	H Bolt Rqd														
Propped															
Condition State		1	1	1	1	1	1	1							

Mid Span

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
H Diameter (mm)		500	480	520	530	530	510	500							
V Measurement (mm)		500	490	510	450	440	530	470							
Drill Vertical	Solid (B)	240	480	480	450	440	480	470							
	Rot														
	Pipe	80													
	Rot														
	Solid (T)	160													
Drill Horiz.	Left														
	Right														
Split	V Bolt Rqd							✓							
	H Bolt Rqd							✓							
Propped															
Condition State		2	1	1	1	1	1	1							

Abutment 2 End

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
H Diameter (mm)		500	460	500	630	510	540	480							
V Measurement (mm)		370	370	370	370	370	370	370							
Drill Vertical	Solid (B)	370	240	370	370	140	370	370							
	Rot														
	Pipe		20			30									
	Rot														
	Solid (T)		110			200									
Drill Horiz.	Left														
	Right														
Split	V Bolt Rqd	–					✓	–							
	H Bolt Rqd						✓								
Propped															
Condition State		1	2	1	1	2	1	1							

Cond. of Spiking Plank — Not Applicable ✓ — Size V – — Condition S – R – %

Cond. of Decking (Solid/Rot) — S 90 R 10 % — Cond. of Deck Ends S 90 R 10 %

Decking Size (mm) — V 127 x H 220 — Decking Timber Type JAR

Span Length from Centreline Supports (m) 5.94 — Clear Span Length 5.07 — Saturated stringers: ____

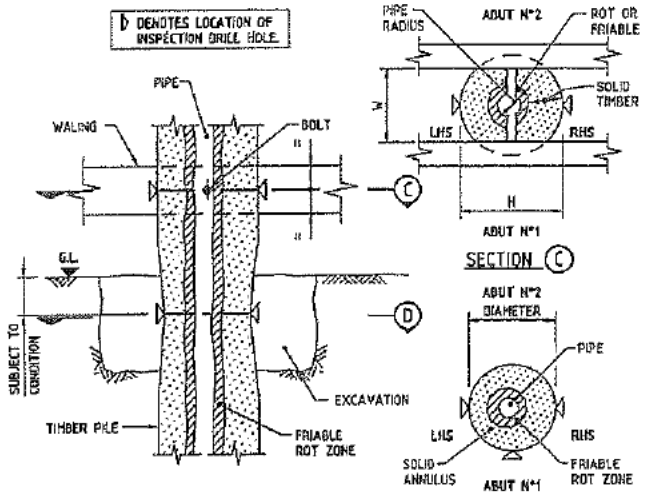
Deck Condition State Percentage: Condition 1: 90 — Condition 2: ____ — Condition 3: ____ — Condition 4: 10 — Spiral Grain Stringers: ____

Comments: TRISHOE PROP UNDER STR 1 AT END. - SEE PHOTO

Stringer 7 About 1 neg packing (Photo 29)

Stringer 4 About 2 neg packing (Photo 31)

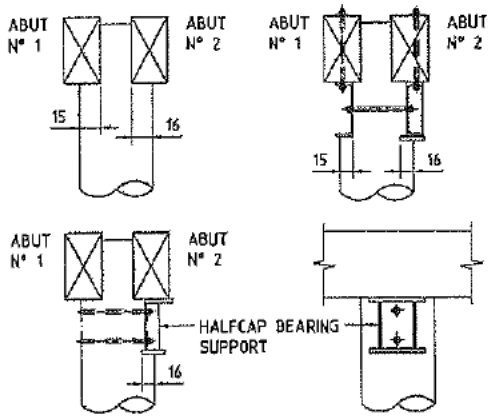
BOLTS NOT REQUIRED



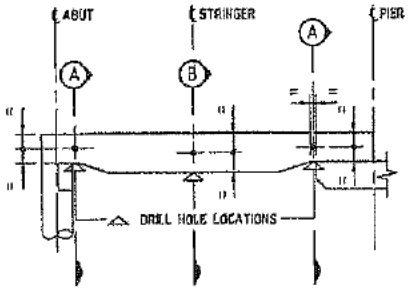
LOCATION OF PILE DRILLINGS

IF FIRST DRILL LOCATION IS ≤ 100 THEN DRILL BOTH ALTERNATE LOCATIONS.

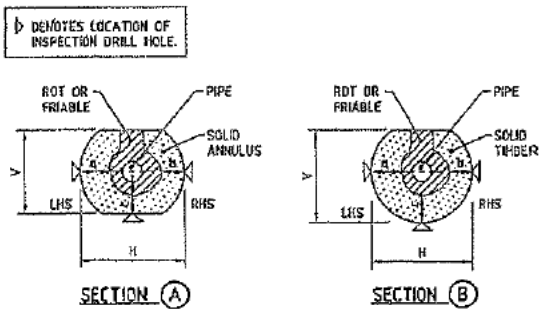
ROUND THE DEMENSIONS ON THE HALFCAP BEARING ON THE PILE AT BOTH ABUTMENT SIDESOF THE PILE. i.e. ABUTMENT N° 1 & ABUTMENT N° 2



HALFCAP SEATING ARRANGEMENTS



LOCATION OF STRINGER DRILLINGS



WHEN 'c' ≤ 100 THEN DRILL 'a' AND 'b'

LEGEND

MATERIAL TYPE
J - JARRAH
W - WANDOO
S - STEEL
U - UNKNOWN TIMBER

SPLITS
✓ TICK ONLY IF REQUIRED

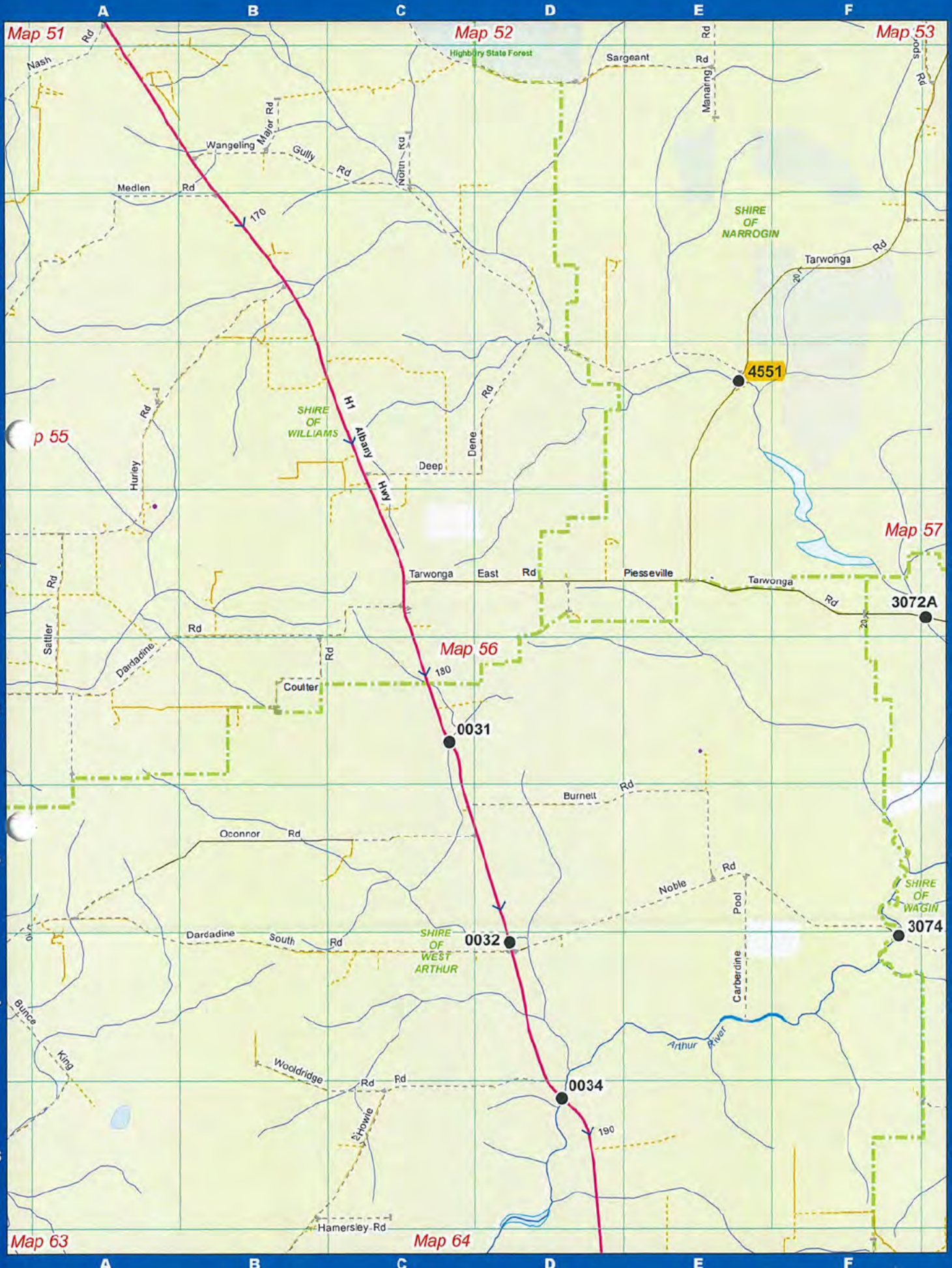
PRIORITY BOLT/BAND (FOR AUDIT PURPOSES ONLY)
U - A.S.A.P.
H - HIGH PRIORITY
M - ROUTINE MAINTENANCE
L - LOW PRIORITY

GENERAL

P	-	PIPE
R	-	ROT
F	-	FRIABLE
S	-	SOLID
N/A	-	NOT APPLICABLE
V	-	VERTICAL
H	-	HORIZONTAL
LHS	-	LEFT HAND SIDE
RHS	-	RIGHT HAND SIDE
Dia	-	PIPE DIAMETER
Circ	-	CIRCUMFERENCE
A1	-	ABUTMENT No. 1
A2	-	ABUTMENT No. 2
Str	-	STRINGER
H/C	-	HALFCAP
H/CAP	-	HALFCAP
Blz	-	BLAZE
℄	-	CENTRE LINE
O/A	-	OVERALL
GL	-	GROUND LEVEL
Ht	-	HEIGHT
Ft	-	FEET
W	-	WIDTH BETWEEN WALING
Cond	-	CONDITION
U/S	-	UNSOUND (STRUCTURALLY)
SG	-	SPIRAL GRAIN

NOTE: All dimensions are of solid timber excluding sap wood and any surface rot on piles and stringers

/SE Documents/Management System Manual/Dwgs/timber_repair.dwg


Map 51
Map 52
Map 53
Map 55
Map 56
Map 57
Map 63
Map 64
Highbury State Forest
Nash Rd
Wangeling
Major Rd
Gully Rd
North Rd
Medlen Rd
170
Sargeant Rd
Manaring Rd
Roads Rd
SHIRE OF NARROGIN
Tarwonga Rd
20
4551
SHIRE OF WILLIAMS
H1
Albany Hwy
Deep
Dene Rd
Hurley Rd
Tarwonga East Rd
Piesseville
Tarwonga Rd
3072A
Sattler Rd
Dardadine Rd
Coulter
180
0031
Burnett Rd
Oconnor Rd
Noble Rd
Pool
SHIRE OF WAGIN
3074
Dardadine South Rd
SHIRE OF WEST ARTHUR
0032
Carberdine
Bunce
King
Arthur River
Wooldridge Rd
Howie Rd
0034
190
Hamersley Rd
A
B
C
D
E
F
1
2
3
4
5
6
7
8

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Bridge 3122
Tarwonga Road over
Torbling Brook
L2 Inspection

mainroads
WESTERN AUSTRALIA

ABN: 50 860 676 021

Enquiries: Gavin Johnston on 9323 4431
Our Ref: 04/4055
Your Ref:

ASSET MANAGER STRUCTURES
WHEATBELT REGION

Structure No.:	3122
Over:	Torbling Brook
On:	Tarwonga Rd (4190004)
SLK:	2.82
LGA:	Shire of Narrogin

1. Please find enclosed a copy of the Detailed Inspection Report for the above Local Authority structure.

2. Attached is a schedule of maintenance items that are required to be undertaken in order to maintain structural integrity and extend the life of the Structure.

3. The maintenance items have been entered into IRIS for programming purposes.

Reviewed By:

Mark Billings
SENIOR STRUCTURAL ENGINEER AECOM
19/3/2019

Issued By:

Gavin Johnston
BRIDGE CONDITION MANAGER
22/3/19

Enc

Don Aitken Centre, Waterloo Crescent, East Perth or PO Box 6202 EAST PERTH Western Australia 6892
Telephone: (08) 9323 4111 Facsimile: (08) 9323 4136 TTY: (08) 9428 2230
Email: dac@mainroads.wa.gov.au Website: www.mainroads.wa.gov.au

WORK ITEMS - TIMBER BRIDGES
BRIDGE No: 3122

ITEM NO	ITEM DESCRIPTION	WORK REQD	PRIORITY CODE	COMMENTS
(A) GENERAL MAINTENANCE				
G005	Bridge Durability Survey (L3)			
G009	Bridge - Load Rating			
G010	Bridge - Monitor Defect			
(B) PREVENTATIVE MAINTENANCE				
P101	Bridge - Seal Timber			
P102	Bridge - Maintain Fastener			
P103	Bridge - Fungicide Treatment			
(C) ROUTINE MAINTENANCE				
	Bearing - Maintain			
	Bridge - Remove Graffiti			
	Bridge - Repair Scour (Minor)			
	Bridge - Eradicate Termites			
	Bridge - Clear Debris and Vegetation			
	Deck Joint - Maintain			
	Deck Surface - Maintain			
	Drainage - Maintain	Y	1	spoon drains a1 & a2 LHS
	Expansion Joint - Maintain			
	Fence - Remove			
	Fence - Repair (Control of Access)			
	Guardrail Maintain/Repair			
	Kerb - Repair (Minor) - Non Structural	Y	1	a2 LHS
	Lighting - Maintain			
	Sign - Maintain			
(D) SPECIFIC MAINTENANCE				
S315	Bridge - Replace Fastener <1.5m			
S350	Bridge - Repair Scour (Major)			
S366	Bridge - Access - Improve			
S413	Deck - Repair			
S437	Decking - Repair (Timber)			
S449	Drainage - Repair			
S455	Expansion Joint - Repair			
S461	Footpath - Repair			
S501	Abutment - Reconstruct			
S504	Abutment - Repair (Non timber)			
S507	Bedlog - Repair			
S573	Sillbeam - Repair	Y	2	Pier 1, knot hole
S522	Corbel - Bolt			
S525	Corbel - Repair			
S528	Corbel - Shim			
S537	Footpath Railing - Repair			
S540	Fullcap - Repair			
S543	Halfcap - Improve Bearing			
S546	Halfcap - Pack			
S549	Halfcap - Repair			
S558	Pier - Repair			
S561	Pile - Band			
S564	Pile - Repair			
S570	Sheeting - Repair			
S582	Waler - Replace			
S607	Bearer - Repair			
S643	Joist - Repair			
S655	Stringer - Bolting			
S661	Stringer - Repair			
S667	Stringer - Shim			

PRIORITY CODE

0 -Critical Safety Deficiency : EMERGENCY action required (Immediate or within 6 months)

1 - Very High Priority (Within 3 years)

2 - Medium Priority (Within 4 years)

3 - Low Priority (Within 5 years-assess again at next Detailed Inspection)

MRWA Ref: 04/4055

DETAILED TIMBER BRIDGE INSPECTION SUMMARY

Bridge No:	**3122**	**Region:**	**WHEATBELT REGION**
River Name:	**Torbling Brook**	**SLK:**	**2.82**
Road:	**Tarwonga Rd**	**Road No:**	**4190004**
LGA:	**Shire of Narrogin**		

1.0 General

Bridge no. 3122 located on Tarwonga Rd in the Shire of Narrogin is a two span bridge crossing Torbling Brook. The structure requires maintenance but generally appears to be in good condition.

2.0 Preventative Maintenance

Preventative maintenance to be undertaken on a 5 year periodic basis.

3.0 Routine Maintenance

Undertake deck drainage maintenance as outlined in report in accordance with specification 850.93.07.
(spoon drains a1 & a2 LHS)
Undertake minor kerb repairs as outlined in report.
(a2 LHS)

4.0 Specific Maintenance

4.1 Substructure

Undertake sillbeam repair as outlined in report. (Pier 1)

4.2 Superstructure

Not required.

5.0 BCI

38.6

6.0 Load Rating

Not required.

Paul Olsen
Engineering Associate Bridges

March 18 2019

Bridge Condition Index (BCI)

Date 21/08/2017

Bridge Number **3122**

LOCATION	Weighting	CS1	CS2	CS3	CS4	ICR	AGR	Ave AGR	BCI
Condition State Weighting		1	3	9	11				
Stringers	11	30.0	58.4	11.6	0.0	3.1	34.1	32.2	38.6
Pier Piles	11	0.0	100.0	0.0	0.0	3.0	33.0		
Abutment Piles	11	0.0	100.0	0.0	0.0	3.0	33.0		
Halfcaps	11	20.0	80.0	0.0	0.0	2.6	28.6		
Corbels	6	0.0	100.0	0.0	0.0	3.0	18.0	20.4	
Timber Decking	6	0.00	90.00	0.00	10.00	3.8	22.8		
Wing Piles	3	0.0	100.0	0.0	0.0	3.0	9.0	6.0	
Abutment Sheeting	3	100.00	0.00	0.00	0.00	1.0	3.0		

Condition States are from a Detailed Inspection Report conducted on 17/08/2017

Table 5.1: BCI Descriptor Range

Descriptor	BCI Range
Very Good	0 - 19
Good	20 – 39
Fair	40 – 55
Poor	56 - 100
Severe	101 +

↑ better ↓ worse

BDO,
Please update in IRIS to indicate BCI values.

CPJ
Bridge Condition Manager
Date: 22/3/19

Calculation of BCI is based on the Timber Bridge Condition Index (BCI) User Guide

Comments:

Structure has concrete abutments and pier

TIMBER BRIDGE DETAILED INSPECTION REPORT

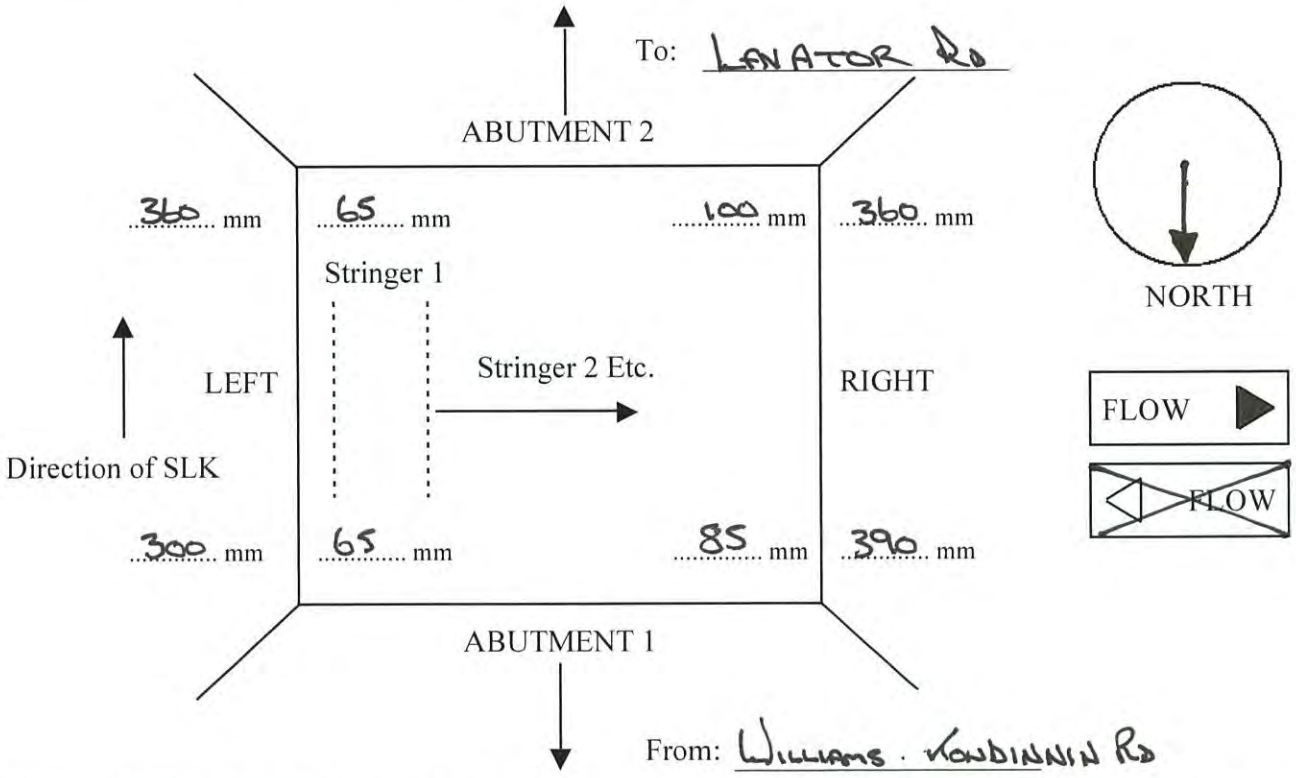
GENERAL INFORMATION - SHEET 1

Bridge No.: 3122

Region:	Wheatbelt	Latitude (S):	-32.98702
		Longitude (E):	117.11055
Road Name:	Tarwonga Rd	Road No.:	4180204
Local Government:	Narrogin	Owner:	Local Authority
Crossing Name:	Torbling Brook	SLK:	2.82
Number of Lanes:	2	Length (m):	10.30
Total Width (m): Inc. Footpath	7.92	Max. Head Room (m): 1.70	Min. Head Room (m): 1.20
No. of Spans:	2	Width between Kerbs (m): 7.38	Concrete Overlay (Y/N): Y (130mm)

Piers are numbered along the bridge in ascending order from ABUTMENT 1 to ABUTMENT 2.
Piles are numbered across the bridge in ascending order from LEFT to RIGHT.
Stringers are numbered across the bridge in ascending order from LEFT to RIGHT.

Inside and outside kerb depths noted in corners of sketch.
Exposed Deck Ends (RCO only): LHS N RHS N



This bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Timber Bridge Detailed Inspection Guidelines.

Inspected by: S. MALLE D. ENKER
Date: 17-8-17
Drilled by: DAVID ENKER

Checked by: POSON J CHAN
Date: 4-10-17

SITE CONDITIONS
Bridge No: 3122

DRIVE THROUGH	**Visible Line of Sight from Abut. 1:** 800 m **Visible Line of Sight from Abut. 1:** 200 m
TRAFFIC CONTROL *(Describe if different to the generic TMP)*	**Abut. 1 end:** Normal **Abut. 2 end:**
PARKING POSITION	**> 3 m** [X] **Position:** ↓ **1.2 to 3 m** [ ] **Position:** AB 2 LHS BEHIND GUARD RAIL **0 to 1.2 m** [ ] **Position:**
ACCESS TO ABUTMENTS *(Describe access conditions at each wing)*	**Abutment 1:** LHS: RHS: OK FROM PARKING AREA **Abutment 2:** LHS: RHS: **Vegetation:**
ACCESS TO PIERS *(Describe access conditions along each side of the structure)*	**LHS:** AS ABOVE **RHS:** **Vegetation:**
POTENTIAL HAZARDS	**Railing/Posts:** WATER **Bolts:** **Services:** **Asbestos:** **Other:**
FENCES NONE	**Timber** [ ] **Location:** **Wire/Mesh:** [ ] **Location:** **Electrified:** [ ] **Location:** **Barbed Wire:** [ ] **Location:** **Other (Specify):** **Location:**
WATER	**Depth (m):** 0.3 **Flow Rate:** SLOW **Algae:** NO (Access may be restricted by toxic algae) **Tide:** NO **Location:** SPAN 1 & 2
POWERLINES NONE	**Side of bridge:** **Horizontal distance from ~~edge of deck~~ (m):** **Estimated vertical height above deck (m):**

Signature _____ **Date** 17-8-17

GUARDRAIL INFORMATION

Bridge No.: 3122

Barrier Type	Approach 1			On Bridge			Approach 2		
	LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS
None									
RHS Rails No. of Rails (on bridge):									
Thriebeam									
W Beam	X		X	X		X	X		X
Trie-Bloc Concrete Barrier									
Reinforced Conerete Barrier (Type F)									
Constant Slope Concrete Barrier									
Other Concrete Profiles									
Post Type									
Steel Type: PFC	X		X	X		X	X		X
None									
Concrete									
Timber									

[Types: C-Section (C), I Section (I), RHS (R), Square Hollow Section SHS (S), Tubular (T), Steel PFC (PFC), Steel Channel (Ch)]

Off bridge:									
Number of Posts off Bridge	7		3				3		6
Length of Barrier off Bridge (m)	13.6		7.4				7.4		13.6

Visibility Barrier	Approach 1			On Bridge			Approach 2		
	LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS
Timber No. of Rails (on bridge):									
Steel Pipe(s) No. of Pipes (on bridge):									
Guide Posts									
Balustrade									
Top Rails									
Steel Pipe									
Steel RHS/Channel									
Steel C Section									
Timber									

End Terminals	Approach 1			On Bridge			Approach 2		
Approved End Terminal Types:	LHS	Median	RHS				LHS	Median	RHS
WAMELT									
SKT-350									
ET-2000									
X Tension									
TAU II Crash Cushion									
Other:									
Other End Terminal Types:									
None									
Turn-down									
Bullnose	X		X				X		X
Fishtail									
Other									

Structural problem found? (Y/N) N If yes, comment below.

ROUTINE INFORMATION

Bridge No.: 3122

SCUPPERS LOCATION, TYPE & CONDITION (R208)	None ☒ LHS ☐ RHS ☐	Box ☐ PVC pipe ☐ Hole in deck ☐	
	NOT REQ'D	Through Deck ☐	Through Kerb ☐
	SPOON DRAINS AT ALL 4 CORNERS - REQ CLEARING CLEAR AL LHS & AI LHS		
FLASHING TYPE & CONDITION (R208)	None ☒	PVC pipe ☐	PGI ☐
BOLT TIGHTENING REQUIRED (P102)	Yes ☐	No ☒	
TERMITES (R204)	Active ☐	Not Active ☒	
	NONE FOUND.		
PREVENTATIVE FUNGICIDE (P103)	Treated ☒	Not Treated ☐	BLUE PLUGS
ATTACHED FENCES & OTHER WATERWAY OBSTRUCTIONS (R210)	FARM FENCES 10m EITHER SIDE OF BRIDGE HAVE DEBRIS BUILD UP - REQ CLEARING		
ROAD SURFACE & KERBING CONDITION (R207) — ON BRIDGE	Road Surface: BITUMEN ON R.C.O. - OK		
	Kerbing: CONCRETE - OK		
APPROACHES	Road Surface: BITUMEN - OK		
	Kerbing: SHORT CONCRETE - MINOR CRACKS, AB2 LHS MISALIGNED REPAIR		
VEGETATION (R205)	Requires Clearing : LHS ☐	Abut 1 ☐	RHS ☐ Abut 2 ☐
	SOME HIGH GRASS & TREE RE-GROWTH		
STREAM BED CONDITION *(General comments and details of location, depth & extent of scour, undermining and silt build up.)* (R203)	OK		

SERVICES *(Type, Size & Location)*	Type	Size (mm)	Location
	NONE		

BRIDGE CONDITION	Priority for Engineering Assessment			
	Low ☒	Medium ☐	High ☐	Urgent ☐

Comments:

GENERAL INFORMATION - SHEET 2

Bridge No.: 3122

Bridge Status Built/In Use [X] Not Used [ ]

Date Built 1/1/1936 **Skew (angle)** _____ **Skewed Width (m)** _____

Widening Left Hand side [X] Width (m) _____ Right Hand side [X] Width (m) _____
Date 12/08/1988 Date 12/08/1988

Surface Type

Unsurfaced	[ ]	Bitumen Seal	[X]	Asphalt	[ ]
Rubberised Seal	[ ]	Tiles	[ ]	Steel Plate	[ ]

Pavement Type

Unpaved	[ ]	Gravel	[ ]	Material Unknown	[ ]

Footpath Left	Left Kerb (m) 0.20	Path (m) _____	Right Kerb (m) _____
Footpath Right	Left Kerb (m) _____	Path (m) _____	Right Kerb (m) 0.20
Median	Left Kerb (m) _____	Median (m) _____	Right Kerb (m) _____

Bridge Function 1

Road Bridge	[X]	Rail Bridge	[ ]	Pedestrian Bridge	[ ]

Bridge Function 2

Over Water	[X]	Over Road	[ ]	Over Rail	[ ]
Over Road & Rail	[ ]	Over Road & Water	[ ]	Over Rail & Water	[ ]
Stock Underpass	[ ]	Pedestrian Underpass	[ ]		

SIGNAGE

Load Limits **Abutment 1 End** _____ Tonne **Abutment 2 End** _____ Tonne

Width Markers **Abutment 1** LHS [2] RHS [2] **Abutment 2** LHS [2] RHS [2]

Is position of Width Markers a true indication of the bridge width? (Y/N) [Y]

Other Signs

No Overtaking or Passing	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
No Overtaking on Bridge	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
One Lane Bridge	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Low Clearance .....m	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Narrow Bridge Sign	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Give Way	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]

Crossing Sign: _____

	Abutment 1	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Other _____	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]

Signage Condition Legend

Good	*1*	*Poor*	*3*	*Not Required*	[ ]
Fair	*2*	*None (missing)*	*4*		

ELEMENT SPACING SHEET 2

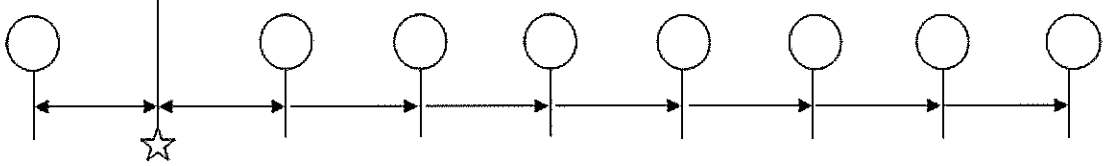
Bridge No.: 3122

All measurements (cumulative) are taken from the reference point as indicated by the star ☆

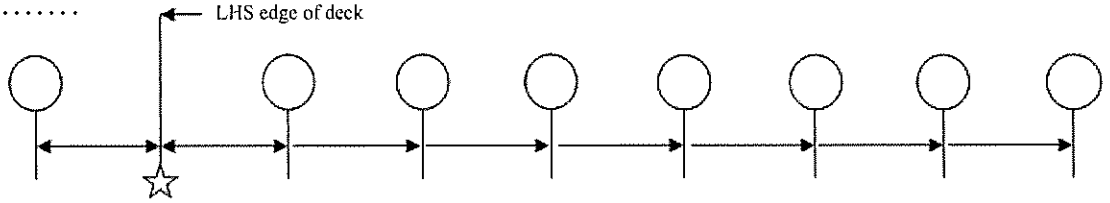
Pier Pile Centres

Mark in RHS edge of deck and dimension last pile to RHS edge of deck.

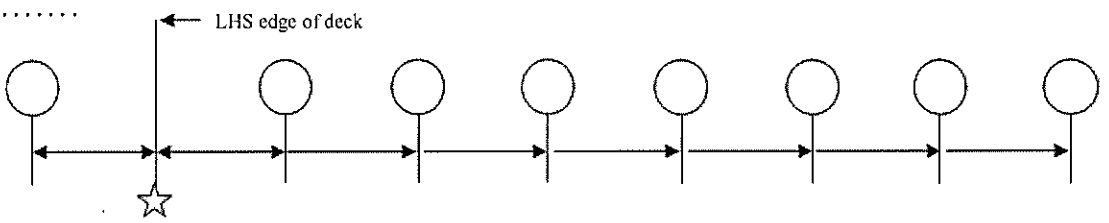
PIER No. . . . . LHS edge of deck



PIER No. . . . . LHS edge of deck



PIER No. . . . . LHS edge of deck



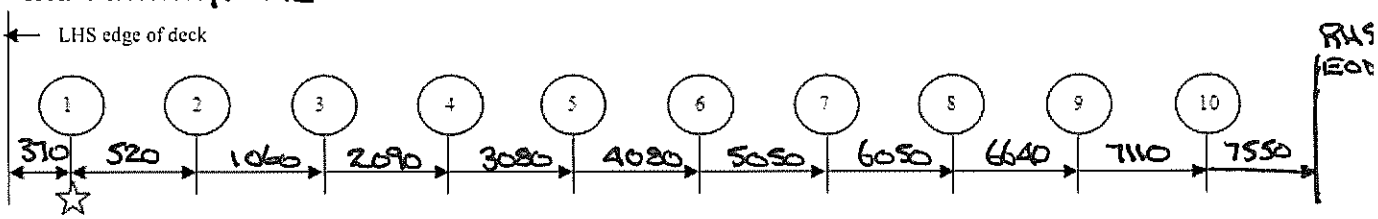
Typical Stringer Spacing

Mark in RHS edge of deck and dimension last stringer to RHS edge of deck.

Note: Stringer spacings must be measured in every span with additional stringers. Use additional sheets as required.

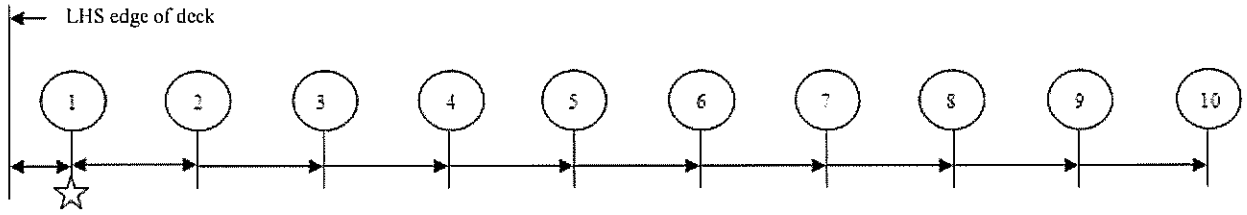
SPAN No. 1 TYPICAL

LHS edge of deck



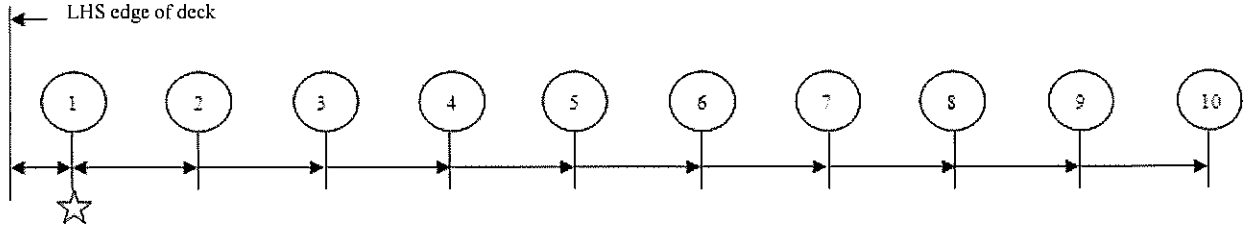
SPAN No. . . . . .

LHS edge of deck



SPAN No. . . . . .

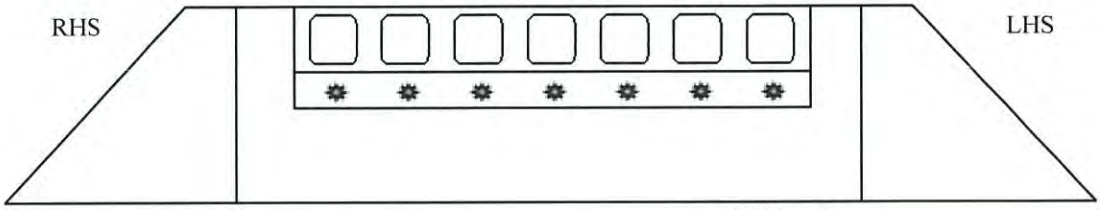
LHS edge of deck



SILL BEAM ABUTMENT 1

Bridge No: 3122

Mark in extent of Abrasion or other Damage



✱ = Drill Location

Sill Beam	Dimens. (mm)	Mat. Type	Drilling (mm)	SILL BEAM CONDITION BELOW STRINGER NUMBER												Condition State
				1	2	3	4	5	6	7	8	9	10	11	12	
1	H 350 V 300	WAN	Solid (Front)	CONCRETE		100	150	210	130	150	170	CONCRETE				1/2
			Rot/ Pipe			90	50	50	80	70	80					
			Solid (Rear)			160	150	90	140	130	100					
2	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													
3	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													
4	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													
5	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													
6	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													

Sheeting: LHS:

CENTRE LINE: PLY BOARD WITH CONC BEHIND.

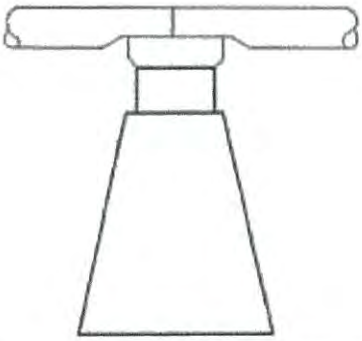
RHS:

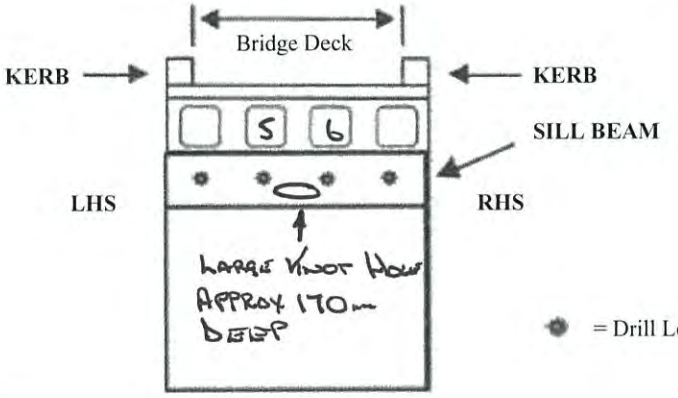
Saturated Sill beams:

Comments: LARGE SPLIT AT R.H. END OF SILL BEAM - MINOR CRACKS IN CONCRETE - OK.
ANY RESULTS VASTLY DIFFERING FROM OLD REPORT ARE DOUBLE CHECKED. TROUT DRILLINGS OK MB.

SILL BEAM PIER

Pier No: 1 **Bridge No:** 3122





Sill Beam	Dimens. (mm)	Mat. Type	Drilling (mm)	SILL BEAM CONDITION BELOW STRINGER NUMBER												Condition State
				1	2	3	4	5	6	7	8	9	10	11	12	
1	H 350	W	Solid (Front)	CONCRETE		110	140	110	120	180	210	CONCRETE				
			Rot/ Pipe			120	80	130	70	70	90					1/2
	300 V		Solid (Rear)			120	130	110	160	100	50					
2	H		Solid (Front)													
			Rot/ Pipe													
	V		Solid (Rear)													
3	H		Solid (Front)													
			Rot/ Pipe													
	V		Solid (Rear)													
4	H		Solid (Front)													
			Rot/ Pipe													
	V		Solid (Rear)													

Total Number of Corbels 10 Typical Corbel Height (mm): LHS 350 RHS 350

Corbel No:	1	2	3	4	5	6	7	8	9	10	11	12
Material Type:	J	J	W	W	W	W	W	W	J	J		
Requires Bolting: A1/A2 End												
Condition State: A1/A2 End	2	2	2	2	2	2	2	2	2	2		

Ironwork Condition: Saturated Sill Beams:

Comments: CORBELS 1, 2, 9 & 10 ARE SQUARE SAWN
SILL BEAM HAS A KNOT HOLE BETWEEN STR 5 & 6 AB 1 SIDE LARGE HOLE
MINOR CRACKS IN CONCRETE A- & = OK
HOLE LOCATION IS BETWEEN CORBELS

CORBEL SHEET

Bridge No.: 3122

This report sheet is only used when a corbel has a visible defect.

CORBEL LOCATION: PIER NO.: 1 CORBEL NO.: 8

Material Type:	WANDOO

Abutment 1 End			
H Diameter (mm)			450
V Measurement (mm)			340
Drill Vertical		Solid (B)	110
		Rot	
		Pipe	160
		Rot	
		Solid (T)	To
Drill Horiz.		Left	130
		Right	150
Vertical Split		Large	
		Minor	
Horiz. Split		Large	
		Minor	
Star Spliting		Large	
		Minor	
RQS Bolting		V.Split	
		H.Split	
Propped			

Abutment 2 End			
H Diameter (mm)			450
V Measurement (mm)			340
Drill Vertical		Solid (B)	110
		Rot	
		Pipe	120
		Rot	
		Solid (T)	110
Drill Horiz.		Left	150
		Right	150
Vertical Split		Large	
		Minor	
Horiz. Split		Large	
		Minor	
Star Spliting		Large	
		Minor	
RQS Bolting		V.Split	
		H.Split	
Propped			

Saturated corbel:

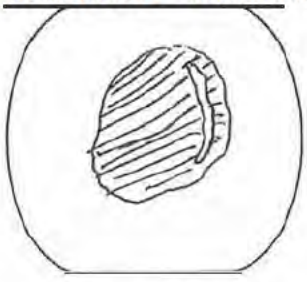
Pipe length from A1 Side 1560

Pipe length from A2 Side 1560

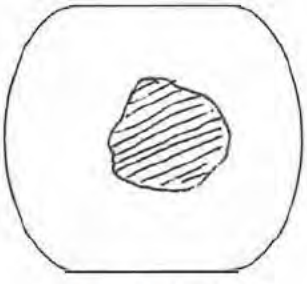
COMMENTS: See Photo's. #12 #13

No Change 17-8-17

DIAGRAM OF CONDITION - Indicate location of bolts



ABUTMENT 1 END
(Refer photos for details)

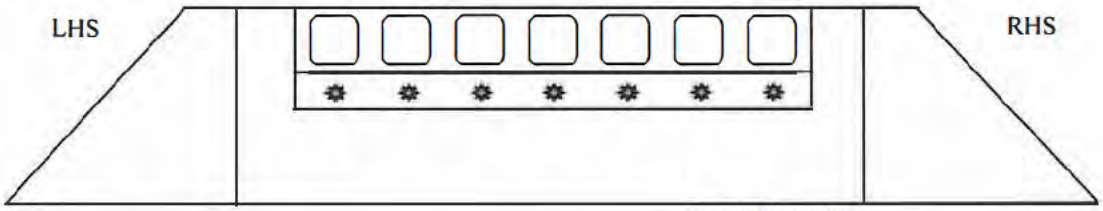


ABUTMENT 2 END
(Refer photos for details)

SILL BEAM ABUTMENT 2

Bridge No: 3122

Mark in extent of Abrasion or other Damage



✸ = Drill Location

Sill Beam	Dimens. (mm)	Mat. Type	Drilling (mm)	SILL BEAM CONDITION BELOW STRINGER NUMBER												Condition State
				1	2	3	4	5	6	7	8	9	10	11	12	
1	H 380 V 300	WAN	Solid (Front)	Concrete		100	140	190	130	70	80	Concrete				1/2
			Rot/ Pipe			180	180	90	140	150	150					
			Solid (Rear)			100	60	100	110	160	150					
2	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													
3	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													
4	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													
5	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													
6	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													

Sheeting: LHS:

CENTRE LINE: Ply Boards with Conc Behind

RHS:

Saturated Sill beams:

Comments:

TIMBER BRIDGE DETAILED INSPECTION REPORT

DETAIL SHEET

Span No: 1 **Bridge No:** 3122

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	WAN	WAN	WAN	WAN	WAN	WAN	JAR	JAR				

Abutment 1 End

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
H Diameter (mm)		350	480	340	470	350	370	410	330	430	410				
V Measurement (mm)		350	350	350	350	350	350	350	350	350	350				
Drill Vertical	Solid (B)	170	350	100	350	110	120	150	180	350	180				
	Rot					TO		TO							
	Pipe	90		200		TOP	60	TOP	120		70				
	Rot														
	Solid (T)	90		50		—	170	—	50		100				
Drill Horiz.	Left			80		160		150							
	Right			90		130		80							
Split V	Bolt Rqd														
Split H	Bolt Rqd														
Propped															
Condition State		2	1	3	1	3	2	3	2	1	2				

Mid Span

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
H Diameter (mm)		360	530	380	390	420	350	430	320	400	420				
V Measurement (mm)		440	500	370	430	410	360	410	440	430	400				
Drill Vertical	Solid (B)	440	480	130	430	410	360	150	150	220	400				
	Rot														
	Pipe			170				240	100	40					
	Rot														
	Solid (T)			70				20	190	170					
Drill Horiz.	Left			90				220							
	Right			100				150							
Split V	Bolt Rqd														
Split H	Bolt Rqd														
Propped															
Condition State		1	1	3	1	1	1	2	2	2	1				

NOTE: DRILL IS ONLY 480mm LONG. RESULTS GIVEN TO 480mm ONLY. TIMBER REPORT

Abutment 2 End

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
H Diameter (mm)		550	580	420	370	470	340	430	340	340	400				
V Measurement (mm)		350	350	350	350	350	350	350	350	350	320				
Drill Vertical	Solid (B)	350	130	100	210	130	180	90	130	100	140				
	Rot														
	Pipe		120	160	50	110	60	230	110	70	90				
	Rot														
	Solid (T)		100	90	90	110	110	30	110	180	90				
Drill Horiz.	Left			110				150							
	Right			110				160							
Split V	Bolt Rqd														
Split H	Bolt Rqd														
Propped															
Condition State		1	2	2	2	2	2	2	2	2	2				

Cond. of Spiking Plank: Not Applicable ✓ Size V — Condition S — R — %

Cond. of Decking (Solid/Rot): S 90 R 10 % Cond. of Deck Ends: S — R — %

Decking Size (mm): V 120 x H 210 Decking Timber Type: JAR

Span Length from Centreline Supports (m): 4.40 Clear Span Length: 3.50 Saturated stringers: ____

Deck Condition State Percentage:	Condition 1	Condition 2	Condition 3	Condition 4
		90		10

Spiral Grain Stringers: ____

Comments: STR 7 IS WANDOO NOT JARRAH

STR 5 MIDSPAN DRILLED 3 TIMES SOLID. STR 1, AB 2 ALSO

STR 1 A2 END HAS 110 ROT IN 2012 DIR ✓ OK MB

STR 5 MID SPAN HAS 100 PIPE IN 2012 DIR ✓ OK MB

DETAIL SHEET

Span No: 2 **Bridge No:** 3122

Abutment 1 End

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	WAN	WAN	WAN	WAN	WAN	WAN	JAR	JAR				
H Diameter (mm)	430	500	360	420	480	410	460	280	530	320				
V Measurement (mm)	350	350	350	350	350	350	350	350	350	350				
Drill Vertical – Solid (B)	350	140	60	140	120	100	100	160	130	350				
Drill Vertical – Rot														
Drill Vertical – Pipe		50	250	130	70	110	110	80	40					
Drill Vertical – Rot														
Drill Vertical – Solid (T)		160	40	80	160	140	140	110	180					
Drill Horiz. – Left			90											
Drill Horiz. – Right			140											
Split – V Bolt Rqd														
Split – H Bolt Rqd														
Propped														
Condition State	1	2	3	2	2	2	2	2	2	1				

Mid Span

H Diameter (mm)	430	490	390	480	400	410	390	300	510	320				
V Measurement (mm)	480	490	420	450	390	420	380	380	460	330				
Drill Vertical – Solid (B)	480	480	140	120	210	420	180	140	280	330				
Drill Vertical – Rot														
Drill Vertical – Pipe			220	250	60		60	200	90					
Drill Vertical – Rot														
Drill Vertical – Solid (T)			60	80	120		140	40	90					
Drill Horiz. – Left			90	190				90						
Drill Horiz. – Right			110	240				80						
Split – V Bolt Rqd														
Split – H Bolt Rqd														
Propped														
Condition State	1	1	2	2	2	1	2	3	2	1				

Abutment 2 End

H Diameter (mm)	410	510	390	520	390	450	390	360	460	420				
V Measurement (mm)	350	350	350	350	350	350	350	350	360	350				
Drill Vertical – Solid (B)	350	130	90	80	120	70	130	50	150	350				
Drill Vertical – Rot														
Drill Vertical – Pipe		130	180	110	60	210	170	240	130					
Drill Vertical – Rot														
Drill Vertical – Solid (T)		90	80	160	170	70	50	60	80					
Drill Horiz. – Left			90	260		140	150	130						
Drill Horiz. – Right			180	120		160	110	70						
Split – V Bolt Rqd														
Split – H Bolt Rqd														
Propped														
Condition State	1	2	2	2	2	2	2	3	2	1				

Cond. of Spiking Plank: Not Applicable ✓ Size V – Condition S – R – %

Cond. of Decking (Solid/Rot): S 90 R 10 % Cond. of Deck Ends: S – R – %

Decking Size (mm): V 120 x H 240 Decking Timber Type: JAR

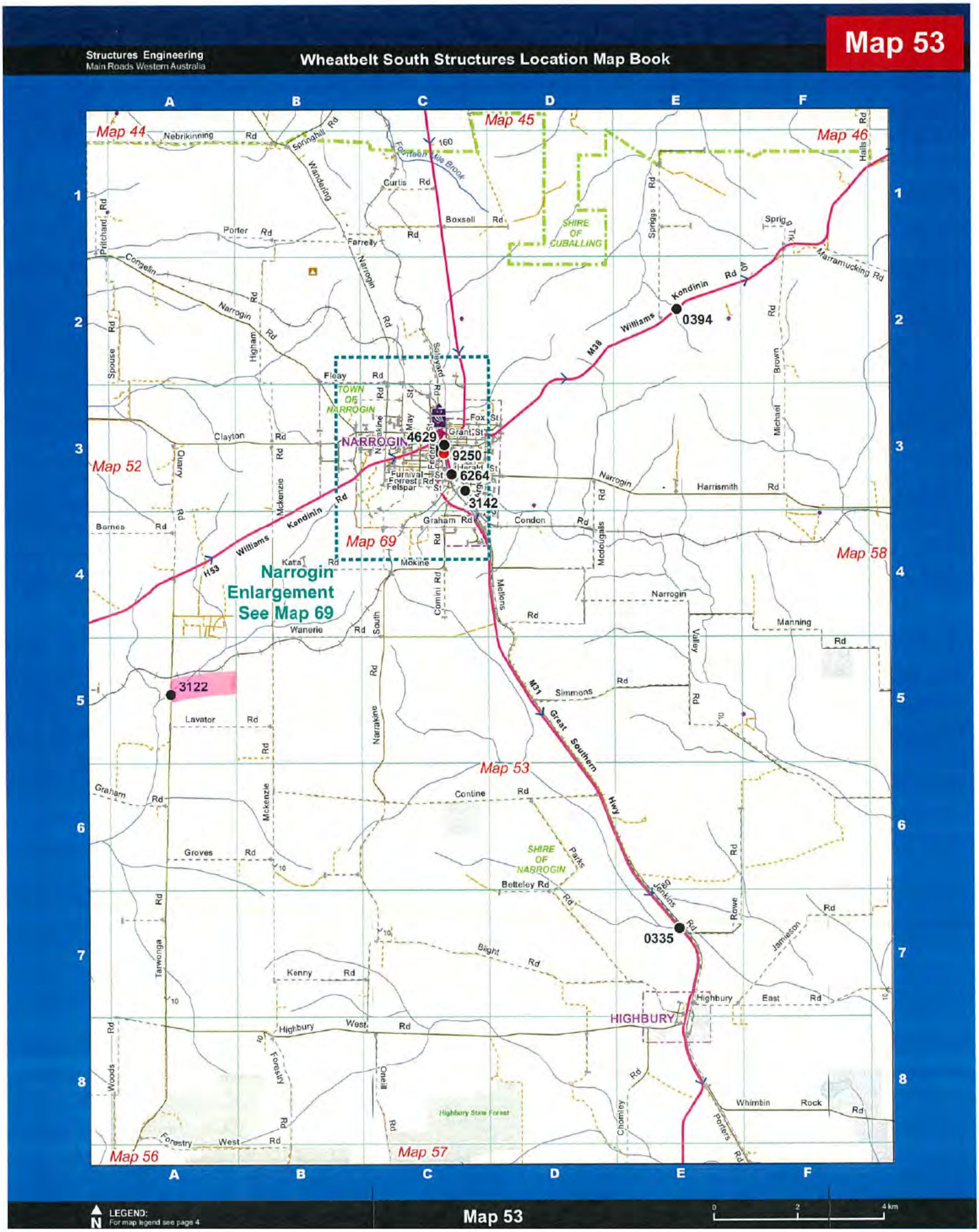
Span Length from Centreline Supports (m): 4.57 Clear Span Length: 3.63 Saturated stringers: _____

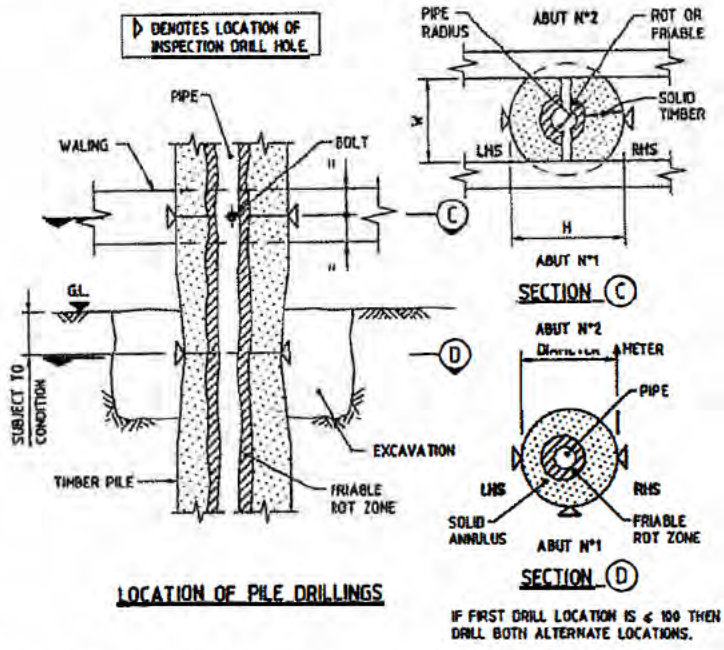
Deck Condition State Percentage:

Condition 1	Condition 2	Condition 3	Condition 4
	90		10

Spiral Grain Stringers: _____

Comments: STR 10 A1 END HAS 100 ROT IN 2012 D/R OK MB.

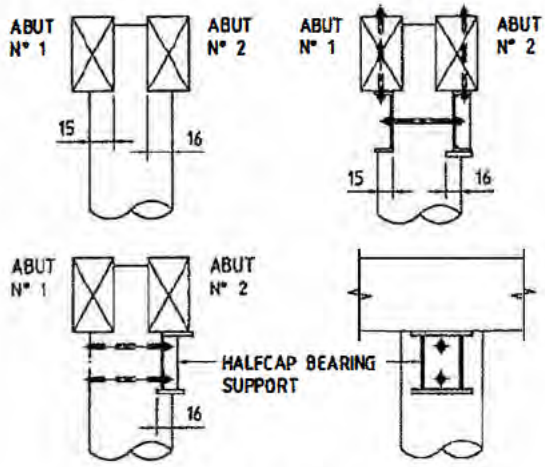

Structures Engineering
Main Roads Western Australia
Wheatbelt South Structures Location Map Book
Map 53
Map 44
Map 45
Map 46
Map 52
Map 58
Map 56
Map 57
Map 69
Narrogin Enlargement See Map 69
TOWN OF NARROGIN
NARROGIN
SHIRE OF CUBALLING
SHIRE OF NARROGIN
HIGHBURY
Highbury State Forest
4629
9250
6264
3142
0394
3122
0335
Williams Kondinin Rd
Great Southern Hwy
Nebrikinning Rd
Springhill Rd
Wandering
Curtis Rd
Boxsell Rd
Porter Rd
Farrelly Rd
Congelin Narrogin Rd
Fleay Rd
Clayton Rd
Quarry Rd
Barnes Rd
Mckenzie Rd
Kata Rd
Wanerie Rd
Lavator Rd
Graham Rd
Groves Rd
Contine Rd
Betteley Rd
Parks Rd
Bight Rd
Kenny Rd
Highbury West Rd
Forestry West Rd
Tarwonga Rd
Woods Rd
Oneill Rd
Chomley Rd
Porters Rd
Whimbin Rock Rd
Highbury East Rd
Jenkins Rd
Jamieson Rd
Rowe Rd
Narrogin Valley Rd
Manning Rd
Simmons Rd
Mellons Rd
Condon Rd
Mcdougalls Rd
Narrogin Harrismith Rd
Michael Rd
Brown Rd
Spriggs Rd
Marramucking Rd
Halls Rd
Narrakine Rd
South Rd
Comini Rd
Mokine
Fox St
Grant St
Furnival St
Forrest Rd
Felspar St
Federal St
May St
Saleyard Rd
LEGEND:
For map legend see page 4
Map 53



LOCATION OF PILE DRILLINGS

IF FIRST DRILL LOCATION IS ≤ 100 THEN DRILL BOTH ALTERNATE LOCATIONS.

ROUND THE DEMENSIONS ON THE HALFCAP BEARING ON THE PILE AT BOTH ABUTMENT SIDESOF THE PILE. i.e. ABUTMENT N° 1 & ABUTMENT N° 2



HALFCAP SEATING ARRANGEMENTS

LEGEND

MATERIAL TYPE

J - JARRAH
W - WANDOO
S - STEEL
U - UNKNOWN TIMBER

SPLITS

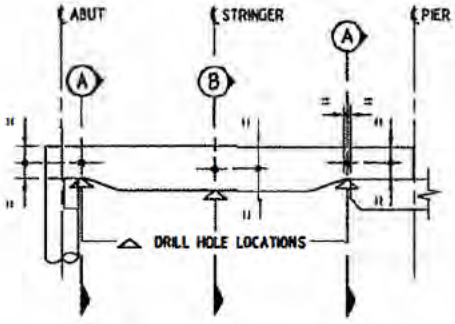
✓ TICK ONLY IF REQUIRED

PRIORITY BOLT/BAND (FOR AUDIT PURPOSES ONLY)

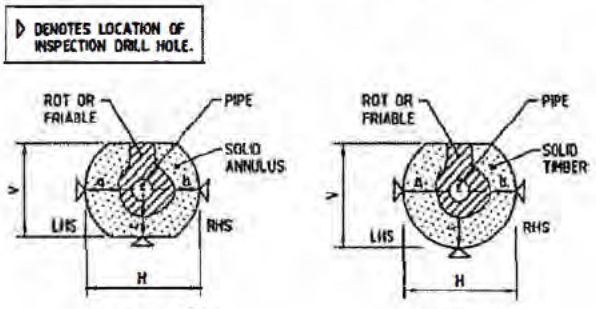
U - A.S.A.P.
H - HIGH PRIORITY
M - ROUTINE MAINTENANCE
L - LOW PRIORITY

GENERAL

P	-	PIPE
R	-	ROT
F	-	FRIABLE
S	-	SOLID
N/A	-	NOT APPLICABLE
V	-	VERTICAL
H	-	HORIZONTAL
LHS	-	LEFT HAND SIDE
RHS	-	RIGHT HAND SIDE
Dia	-	PIPE DIAMETER
Circ	-	CIRCUMFERENCE
A1	-	ABUTMENT No. 1
A2	-	ABUTMENT No. 2
Str	-	STRINGER
H/C	-	HALFCAP
H/CAP	-	HALFCAP
Blz	-	BLAZE
℄	-	CENTRE LINE
O/A	-	OVERALL
GL	-	GROUND LEVEL
Ht	-	HEIGHT
Ft	-	FEET
W	-	WIDTH BETWEEN WALING
Cond	-	CONDITION
U/S	-	UNSOUND (STRUCTURALLY)
SG	-	SPIRAL GRAIN



LOCATION OF STRINGER DRILLINGS



WHEN 'c' ≤ 100 THEN DRILL 'a' AND 'b'

NOTE: All dimensions are of solid timber excluding sap wood and any surface rot on piles and stringers

/SE Documents/Management System Manual/Dwgs/timber_repair.dwg

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Bridge 3128A
Manaring Road over
Williams River
L2 Inspection

File: **04/4051**
To: **Engineer Bridge Loading**
Subject: **Bridge Number: 3128A**

---

1 Having recently completed an assessment of routine and specific maintenance work required on this bridge, I am of the opinion that the condition of certain structural components has deteriorated to such an extent that the load carrying capacity of the bridge may have been affected.

2 In accordance with the requirements of the procedure for Heavy Loads Assessment, Document number 3912/01-7, this bridge is referred for a detailed structural assessment of the bridge in its present condition.

Mark Billings
SENIOR STRUCTURAL ENGINEER AECOM
24 April 2019
Abutment 2 Bearing
Pier 1 Halfcap splice

Enquiries Gavin Johnston on 9323 4431
Our Ref: 04/4051
Your Ref:

ABN: 50 860 676 021

ASSET MANAGER STRUCTURES
WHEATBELT REGION

Structure No.:	3128A
Over:	Williams River
On:	Manaring Rd (4190011)
SLK:	3.58
LGA:	Shire of Narrogin

1. Please find enclosed a copy of the Detailed Inspection Report for the above Local Authority structure.

2. Attached is a schedule of maintenance items that are required to be undertaken in order to maintain structural integrity and extend the life of the Structure.

3. The maintenance items have been entered into IRIS for programming purposes.

4. Preliminary examination has indicated that the load carrying capacity of this Structure may have been affected by the deterioration of structural components as listed in the attached report. We are in the process of determining its current load capacity and will advise you accordingly when our assessment is completed.

Reviewed By: Mark Billings

Mark Billings
SENIOR STRUCTURAL ENGINEER AECOM
27/3/2019

Issued By:

Gavin Johnston
BRIDGE CONDITION MANAGER
24/4/19

Enc

Don Aitken Centre, Waterloo Crescent, East Perth or PO Box 6202 EAST PERTH Western Australia 6892
Telephone: (08) 9323 4111 Facsimile: (08) 9323 4136 TTY: (08) 9428 2230
Email: dac@mainroads.wa.gov.au Website: www.mainroads.wa.gov.au

WORK ITEMS - TIMBER BRIDGES
BRIDGE No: 3128A

ITEM NO	ITEM DESCRIPTION	WORK REQD	PRIORITY CODE	COMMENTS
(A) GENERAL MAINTENANCE				
G005	Bridge - Durability Survey (L3)			
G009	Bridge - Load Rating	y	1	Abutment 2 Pile 2 and bedlog, Pier 1 Halfcap splice cracks.
G010	Bridge - Monitor Defect			
(B) PREVENTATIVE MAINTENANCE				
P101	Bridge - Seal Timber	Y	1	
P102	Bridge - Maintain Fastener			
P103	Bridge - Fungicide Treatment	Y	1	
(C) ROUTINE MAINTENANCE				
	Bearing - Maintain			
	Bridge - Remove Graffiti			
	Bridge - Repair Scour (Minor)			
	Bridge - Eradicate Termites	Y	1	
	Bridge - Clear Debris and Vegetation			
	Deck Joint - Maintain			
	Deck Surface - Maintain	Y	1	clear gravel build up at kerbs
	Drainage - Maintain			
	Expansion Joint - Maintain			
	Fence - Remove	Y	1	span 1 & 2 LHS
	Fence - Repair (Control of Access)			
	Guardrail Maintain/Repair			
	Kerb - Repair (Minor) - Non Structural			
	Lighting - Maintain			
	Sign - Maintain			
(D) SPECIFIC MAINTENANCE				
S315	Bridge - Replace Fastener <1.5m			
S350	Bridge - Repair Scour (Major)			
S366	Bridge - Access - Improve			
S413	Deck - Repair			
S437	Decking - Repair (Timber)			
S449	Drainage - Repair			
S455	Expansion Joint - Repair			
S461	Footpath - Repair			
S501	Abutment - Reconstruct			
S504	Abutment - Repair (Non timber)			
S507	Bedlog - Repair	Y	1	abutment 2 face & LHS wingwall
S510	Bedlog - Shim			
S522	Corbel - Bolt			
S525	Corbel - Repair			
S528	Corbel - Shim			
S537	Footpath Railing - Repair			
S540	Fullcap - Repair			
S543	Halfcap - Improve Bearing			
S546	Halfcap - Pack			
S549	Halfcap - Repair	Y	1	Pier 1 Abutment 2 halfcap splice cracking
S558	Pier - Repair			
S561	Pile - Band			
S564	Pile - Repair			
S570	Sheeting - Repair			
S582	Waler - Replace			
S607	Bearer - Repair			
S643	Joist - Repair			
S655	Stringer - Bolting			
S661	Stringer - Repair			
S667	Stringer - Shim	Y	2	span 1 str 1 a1, strs 1,2 & 6 a2

PRIORITY CODE

0 -Critical Safety Deficiency : EMERGENCY action required (Immediate or within 6 months)
1 - Very High Priority (Within 3 years)
2 - Medium Priority (Within 4 years)
3 - Low Priority (Within 5 years-assess again at next Detailed Inspection)

MRWA Ref: 04/4051

DETAILED TIMBER BRIDGE INSPECTION SUMMARY

Bridge No:	**3128A**	**Region:**	**WHEATBELT REGION**
River Name:	**Williams River**	**SLK:**	**3.58**
Road:	**Manaring Rd**	**Road No:**	**4190011**
LGA:	**Shire of Narrogin**		

1.0 General

Bridge no. 3128A located on Manaring Rd in the Shire of Narrogin is a two span bridge crossing the Williams River. The structure requires maintenance in particular the bedlogs at abutment 2 are in poor condition. The pier 1 a2 halfcap is cracking in the vicinity of the splice but there is no change from the previous DIR.

2.0 Preventative Maintenance

Preventative maintenance to be undertaken on a 5 year periodic basis. Areas of concern have been identified below.
Sealing of timber elements in accordance with Document No. 6706-02-2226, Preventive Maintenance Standards.
Fungicide treatment of all timber elements in accordance with Document No. 6706-02-2226, Preventive Maintenance Standards.

3.0 Routine Maintenance

Undertake termite inspection and treatment as required in accordance with specification 850.93.09.
Remove fences attached to bridge as outlined in report.
Correct road surface on bridge deck and approaches as outlined in report.

4.0 Specific Maintenance

4.1 Substructure

Not required.

4.2 Superstructure

Undertake bedlog repairs as outlined in report.
(abutment 2 face & LHS wingwall)
Shim stringers as outlined in report
(span 1 str 1 a1, strs 1,2 & 6 a2)

5.0 BCI

28.2

6.0 Load Rating

Load rate Abutment 2 Pile 2 for overall stability (in existing condition) and Pier 1 Abutment 2 halfcap splice.

Mark Billings
SENIOR STRUCTURAL ENGINEER AECOM

March 21 2019

Bridge Number 3128A

In conjunction with the Detailed Level 2 Bridge Inspection Report (as dated below), a Bridge Condition Index (BCI) has been calculated for this Bridge. The BCI assigns a numerical value to a bridge that is indicative of its condition and provides a relative condition in comparison with other timber bridges (BCI calculation is only applicable for timber bridges). The BCI rating system is a tool to provide a systematic approach for the determination of bridge condition by bridge inspection alone.

The process for determining the BCI is outlined in the Timber Bridge Condition Index User Guide. The BCI is primarily calculated utilising Condition States which are assigned based on the Level 2 Bridge Inspection Report (see attached).

A summary of the condition states and the calculated BCI for this bridge is provided below.

Condition States from Detailed Inspection Report conducted on 28-07-2018

		Condition State - Distribution (%)					
LOCATION	Weighting	CS1	CS2	CS3	CS4	Ave AGR	BCI
Condition State Weighting		1	3	9	11		
Stringers	11	90.5	9.5	0.0	0.0	21.3	28.2
Pier Piles	11	76.9	23.1	0.0	0.0		
Abutment Piles	11	83.1	15.0	1.9	0.0		
Halfcaps	11	0.0	89.6	10.4	0.0		
Corbels	6	0.0	100.0	0.0	0.0	20.4	
Timber Decking	6	0.0	90.0	0.0	10.0		
Wing Piles	3	82.9	17.1	0.0	0.0	6.5	
Abutment Sheeting	3	0.0	100.0	0.0	0.0		

Descriptor	BCI Range
Very Good	0 - 19
Good	20 - 39
Fair	40 - 55
Poor	56 - 100
Severe	101 +

BCI Descriptor Range (Refer Table 5.1 Doc No. 6706/02/2232)

Comments:

Prepared by: P Olsen

Date: 09/08/2018

GENERAL INFORMATION - SHEET 1

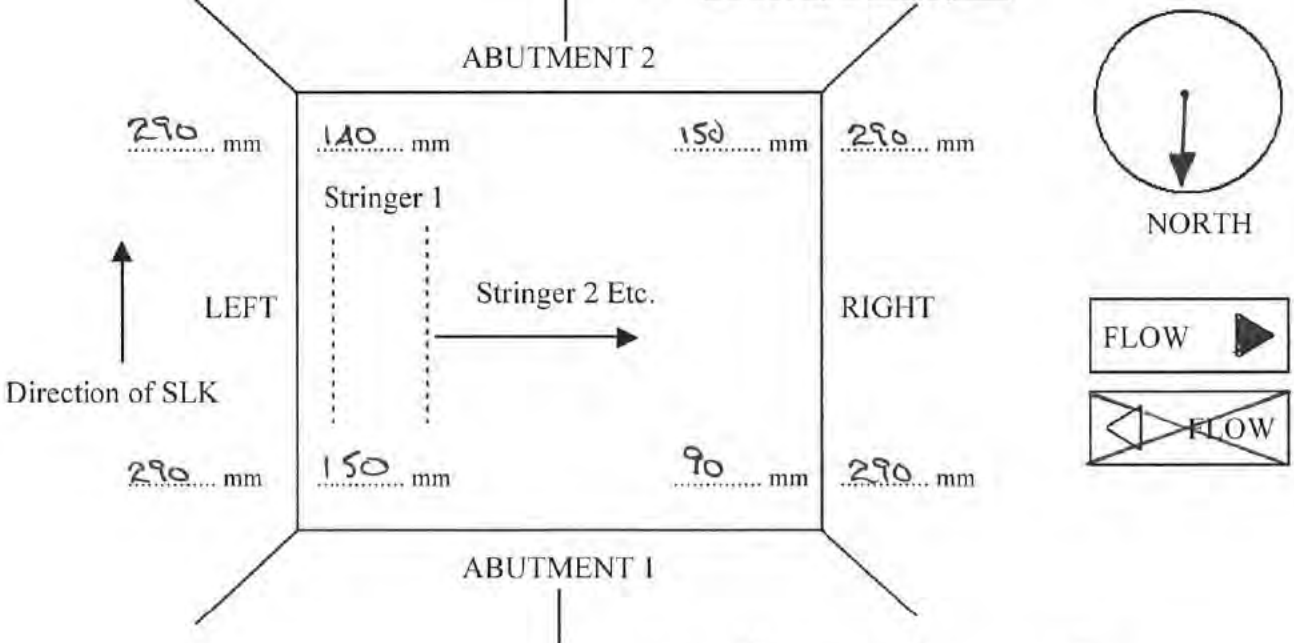
Bridge No.: 3128A

Region:	Wheatbelt	Latitude (S):	-33.01824
		Longitude (E):	117.05446
Road Name:	Manaring Rd	Road No.:	4180211
Local Government:	Narrogin	Owner:	Local Authority
Crossing Name:	Williams River	SLK:	3.58
Number of Lanes:	2	Length (m):	12.60
Total Width (m): Inc Footpath	7.15	Max. Head Room (m): ~~2.50~~ *3.5	Min. Head Room (m): 1.40
No. of Spans:	2	Width between Kerbs (m): 6.85	Concrete Overlay (Y/N): N

Piers are numbered along the bridge in ascending order from ABUTMENT 1 to ABUTMENT 2.
Piles are numbered across the bridge in ascending order from LEFT to RIGHT.
Stringers are numbered across the bridge in ascending order from LEFT to RIGHT.

Inside and outside kerb depths noted in corners of sketch.
Exposed Deck Ends (RCO only): LHS — RHS —

To: GRAHAM RD



From: WILLIAMS - KONDININ RD

This bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Timber Bridge Detailed Inspection Guidelines.

Inspected by:	S MAIE D. ENKEL	Checked by:	P. OLSON D. NGANGA
Date:	17-1-18 26/7/18	Date:	3-10-18
Drilled by:	DAVID ENKEL		

SITE CONDITIONS
Bridge No: 3128A

DRIVE THROUGH	**Visible Line of Sight from Abut. 1:** 100 m **Visible Line of Sight from Abut. 1:** 100 m
TRAFFIC CONTROL *(Describe if different to the generic TMP)*	**Abut. 1 end:** N/A **Abut. 2 end:**
PARKING POSITION	**> 3 m** ☒ **Position:** AB 1 RHS **1.2 to 3 m** ☐ **Position:** **0 to 1.2 m** ☐ **Position:**
ACCESS TO ABUTMENTS *(Describe access conditions at each wing)*	**Abutment 1:** LHS: L.H.S Poor - Farm Fence At Both Wing Walls RHS: **Abutment 2:** RHS Fair - Gravel Banks. LHS: RHS: **Vegetation:** High Grass
ACCESS TO PIERS *(Describe access conditions along each side of the structure)*	**LHS:** As Above **RHS:** **Vegetation:**
POTENTIAL HAZARDS	**Railing/Posts:** Fence on LHS **Bolts:** Gravel Banks **Services:** Water High Grass **Asbestos:** **Other:**
FENCES	**Timber** ☐ **Location:** **Wire/Mesh:** ☒ **Location:** At L.H.S. Wing Walls AB1 & 2 - Remove **Electrified:** ☐ **Location:** **Barbed Wire:** ☐ **Location:** **Other (Specify):** ☐ **Location:**
WATER	**Depth (m):** 1.8m **Flow Rate:** Med **Algae:** No (Access may be restricted by toxic algae) **Tide:** No **Location:** Span 1 & 2
POWERLINES None	**Side of bridge:** **Horizontal distance from edge of deck (m):** **Estimated vertical height above deck (m):**

Signature _____ **Date** 17-1-18

GUARDRAIL INFORMATION

Bridge No.: 3128A

Barrier Type	Approach 1			On Bridge			Approach 2		
	LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS
None									
RHS Rails No. of Rails (on bridge):									
Thriebeam									
W Beam	X		X	X		X	X		X
Tric-Bloc Concrete Barrier									
Reinforced Concrete Barrier (Type F)									
Constant Slope Concrete Barrier									
Other Concrete Profiles									

Post Type									
Steel Type: _____									
None									
Concrete									
Timber	X		X	X		X	X		X

[Types: C-Section (C), I Section (I), RHS (R), Square Hollow Section SHS (S), Tubular (T), Steel PFC (PFC), Steel Channel (Ch)]

Off bridge:

Number of Posts off Bridge	4		2				2		4
Length of Barrier off Bridge (m)	7.8		3.9				3.8		7.55

Visibility Barrier	Approach 1			On Bridge			Approach 2		
	LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS
Timber No. of Rails (on bridge):									
Steel Pipe(s) No. of Pipes (on bridge):									
Guide Posts									
Balustrade									

Top Rails									
Steel Pipe									
Steel RHS/Channel									
Steel C Section									
Timber									

End Terminals	Approach 1			On Bridge			Approach 2		
Approved End Terminal Types:	LHS	Median	RHS				LHS	Median	RHS
WAMELT									
SKT-350									
ET-2000									
X Tension									
TAU II Crash Cushion									
Other:									
Other End Terminal Types:									
None									
Turn-down									
Bullnose	X								X
Fishtail			X				X		
Other									

Structural problem found? (Y/N) N If yes, comment below.

ROUTINE INFORMATION

Bridge No.: 3128A

SCUPPERS LOCATION, TYPE & CONDITION (R208)	None ☐ LHS ☒ RHS ☒	Box ☒ PVC pipe ☐ Hole in deck ☐ Through Deck ☐ Through Kerb ☒
	REQ'S CLEARING - GRAVEL BUILD UP AT ALL KERBS. CLEAR	
FLASHING TYPE & CONDITION (R208)	None ☐	PVC pipe ☐ PGI ☒ OK
BOLT TIGHTENING REQUIRED (P102)	Yes ☐	No ☒
TERMITES (R204)	Active ☒	Not Active ☐ TREAT
	ABUT 2 L.H.S WING BELOW STR. IN BED LOG.	
PREVENTATIVE FUNGICIDE (P103)	Treated ☒	Not Treated ☐ FADED BLUE PLUGS
	END GRAIN ONLY & OUTSIDE STR'S	
ATTACHED FENCES & OTHER WATERWAY OBSTRUCTIONS (R210)	OLD FENCE WIRE ALONG LHS OF BRIDGE & PILE AT PIER DEBRIS BUILD UP - REMOVE.	REMOVE
ROAD SURFACE & KERBING CONDITION (R207) — ON BRIDGE	Road Surface: GRAVEL - OK	
	Kerbing: TIMBER, WEATH & SPLIT - FAIR. SPLIT AL END LHS.	
APPROACHES	Road Surface: GRAVEL - OK	
	Kerbing: NONE	
VEGETATION (R205)	Requires Clearing : LHS ☐ Abut 1 ☐ RHS ☐ Abut 2 ☐ HIGH GRASS	
STREAM BED CONDITION *(General comments and details of location, depth & extent of scour, undermining and silt build up.)* (R203)	POSSIBLE SCOURING THRU SPAN 1,	

SERVICES *(Type, Size & Location)*	Type	Size (mm)	Location
	NONE		

BRIDGE CONDITION	Priority for Engineering Assessment			
	Low ☐	Medium ☒	High ☐	Urgent ☐

Comments: ABUT 2 LHS WING BED LOG U/S

GENERAL INFORMATION - SHEET 2

Bridge No.: 3128A

Bridge Status Built/In Use [X] Not Used [ ]

Date Built 03/05/1979 **Skew (angle)** _____ **Skewed Width (m)** _____

Widening Left Hand side [ ] Width (m) _____ Right Hand side [ ] Width (m) _____
Date _____ Date _____

Surface Type

Unsurfaced	[X]	Bitumen Seal	[ ]	Asphalt	[ ]
Rubberised Seal	[ ]	Tiles	[ ]	Steel Plate	[ ]

Pavement Type

Unpaved	[ ]	Gravel	[X]	Material Unknown	[ ]

Footpath Left	Left Kerb (m) 0.15	Path (m) _____	Right Kerb (m) _____
Footpath Right	Left Kerb (m) _____	Path (m) _____	Right Kerb (m) 0.15
Median	Left Kerb (m) _____	Median (m) _____	Right Kerb (m) _____

Bridge Function 1

Road Bridge	[X]	Rail Bridge	[ ]	Pedestrian Bridge	[ ]

Bridge Function 2

Over Water	[X]	Over Road	[ ]	Over Rail	[ ]
Over Road & Rail	[ ]	Over Road & Water	[ ]	Over Rail & Water	[ ]
Stock Underpass	[ ]	Pedestrian Underpass	[ ]		

SIGNAGE

Load Limits **Abutment 1 End** _____ Tonne **Abutment 2 End** _____ Tonne

Width Markers **Abutment 1** LHS [\] RHS [\] **Abutment 2** LHS [\] RHS [\]

Is position of Width Markers a true indication of the bridge width? (Y/N) [Y]

Other Signs

No Overtaking or Passing	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
No Overtaking on Bridge	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
One Lane Bridge	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Low Clearance .....m	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Narrow Bridge Sign	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Give Way	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]

Crossing Sigu: _____

	Abutment 1	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Other _____	**Abutment 1**	LHS [ ]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]

Signage Condition Legend

Good	[1]	*Poor*	[3]	*Not Required*	[ ]
Fair	[2]	*None (missing)*	[4]		

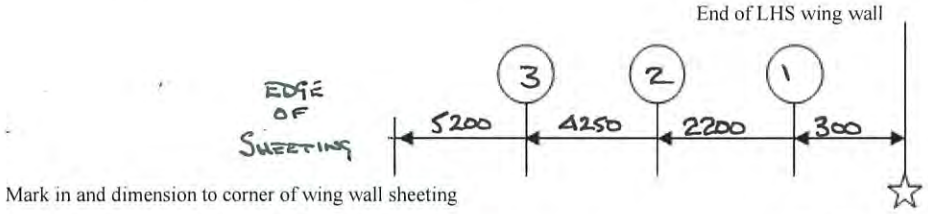
ELEMENT SPACING SHEET 1

Bridge No.: 3128A

Abutment 1

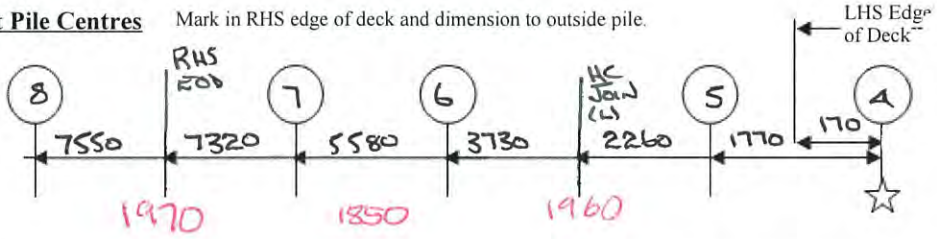
All measurements (cumulative) are taken from the reference point as indicated by the star ☆

LHS Wing Wall Layout

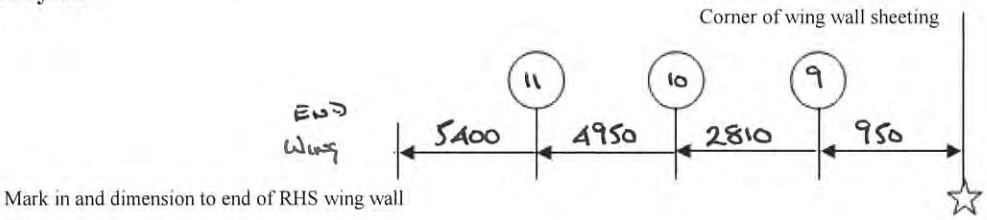


Mark in and dimension to corner of wing wall sheeting

Abutment **Abutment Pile Centres** Mark in RHS edge of deck and dimension to outside pile.



RHS Wing Wall Layout

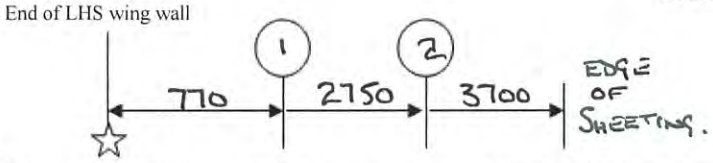


Mark in and dimension to end of RHS wing wall

Abutment 2

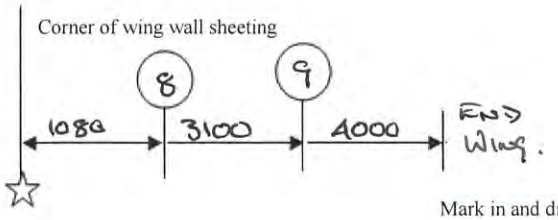
LHS Wing Wall Layout All measurements (cumulative) are taken from the reference point as indicated by the star ☆

Mark in and dimension to corner of wing wall sheeting



Abutment **Abutment Pile Centres** Mark in RHS edge of deck and dimension to outside pile.

RHS Wing Wall Layout



Mark in and dimension to end of RHS wing wall

ELEMENT SPACING SHEET 2

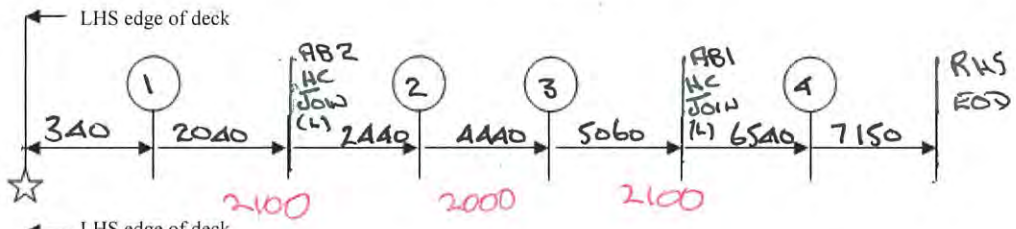
Bridge No.: 3128A

All measurements (cumulative) are taken from the reference point as indicated by the star ☆

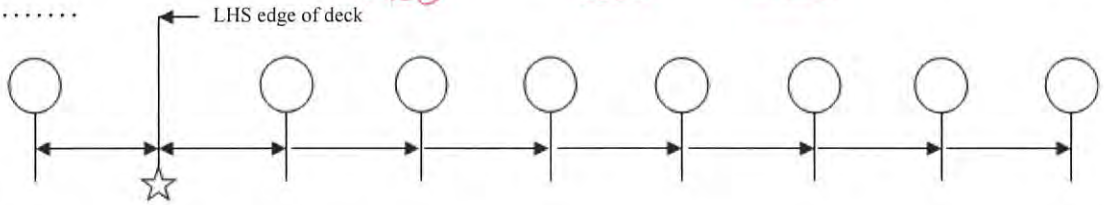
Pier Pile Centres

Mark in RHS edge of deck and dimension last pile to RHS edge of deck.

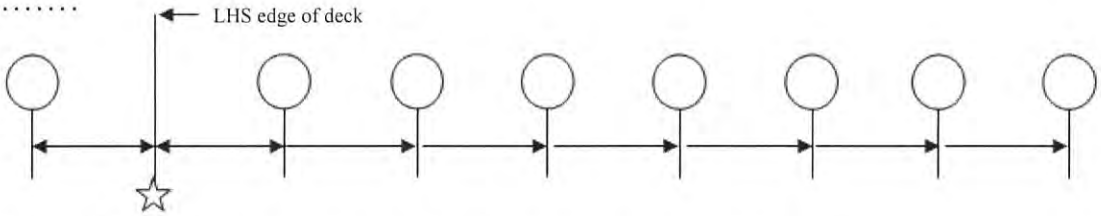
PIER No. 1



PIER No. .....



PIER No. .....

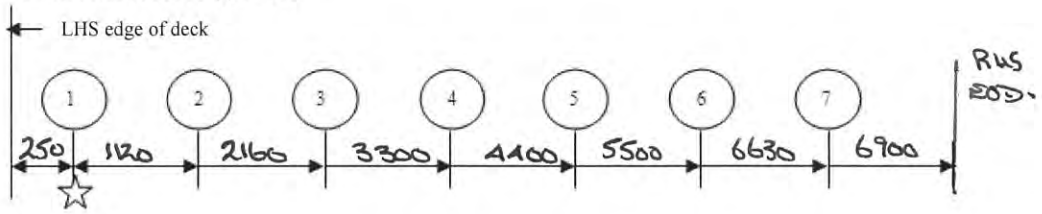


Typical Stringer Spacing

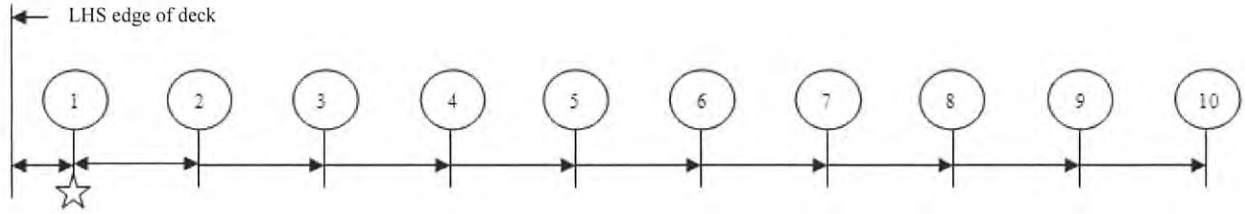
Mark in RHS edge of deck and dimension last stringer to RHS edge of deck.

Note: Stringer spacings must be measured in every span with additional stringers. Use additional sheets as required.

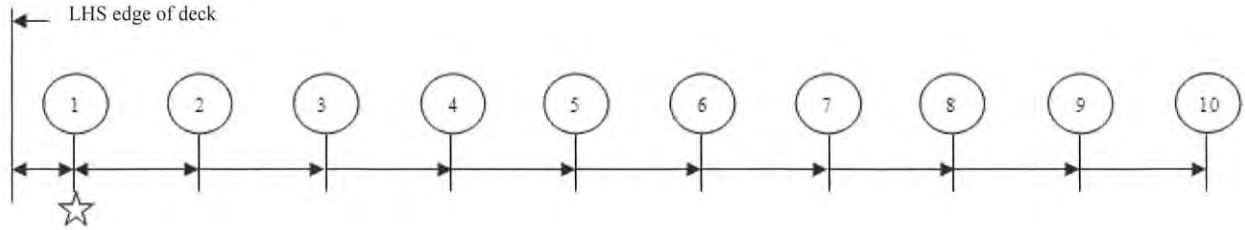
SPAN No. 1 Typical



SPAN No. .....



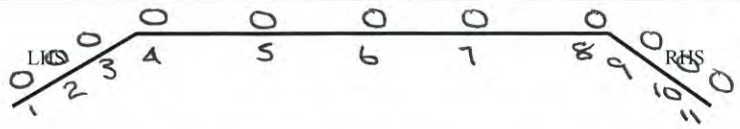
SPAN No. .....



TIMBER BRIDGE DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

ABUTMENT: 1



Bridge No: 3128A

Pile No.	Dia. (mm)	Timber Drilling (mm)			Extent of Rot (m)			Splits		Blaze Markings			Halfcaps Bearing (mm)		Pile Dia. (mm) below H/C (5m+)	Mat. Type	Tied Back	Cond. State
		Solid	Rot	Pipe	Drill Location from top H/C	Above	Below	Location	Requires Band	Marking (ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	A1	A2				
1	400	140		60	0.4					–	0.2	–	–	–	–	JAR		2
2 F	380	150	40		1.2					14	0.6	0.6	–	–	–	JAR		2
3	370	185								12	1.7	0.3	–	–	–	JAR		2
4	380	190								14	0.8	0.6	–	90	–	JAR		2
5 F	410	205								12	1	0.5	–	170	–	JAR		2
6 F	360	180								12	0.8	0.6	–	170	–	JAR		2
7 F	320	160								12	0.7	0.7	–	150	–	JAR		2
8	380	190								11	0.7	0.7	–	55	–	JAR		2
9	390	195								11	1.4	0.6	–	–	–	JAR		2
10	370	105		80	1.1			/		12	0.7	0.5	–	–	–	JAR		2
11	400	170	30		0.2					–	0.5	–	–	–	–	JAR		2
12																		
13																		
14																		
15																		

Saturated Piles: _____

LHS Halfcaps	Size	V 340 / H 170	Length	8160	No. of	1	Gap between H/Caps	—
Top of H/Caps to underside of Deck		380	Back of Halfcaps to Sheeting	350			H/Cap Material	JAR
RHS Halfcaps	Size	V / H	Length		No. of		Gap between H/Caps	
Top of H/Caps to underside of Deck			Back of Halfcaps to Sheeting				H/Cap Material	

Are there more than 2 sets of halfcaps or sill beams (YES/NO) No (If yes record details on comments sheet)

Comments: PILES H & BEARING LOAD RATED AT PREVIOUS INSP. (236% TG4)
BAND NOT REQ
A1 HC SPLICE, NO SIGNS OF DISTRESS

Pile No.	Pile No.	Pile No.	Pile No.
R.H.S L.H.S	R.H.S L.H.S	R.H.S L.H.S	R.H.S L.H.S
F=	F=	F=	F=

ABUTMENT 1 and WING WALL SHEETING

Bridge No: 3128A

ABUTMENT 1 SHEETING (indicate ground line, piles and failed sheeting)

9 Shts

RHS 1 2 3 4 5 6 7 8 9 10 11 12 LHS

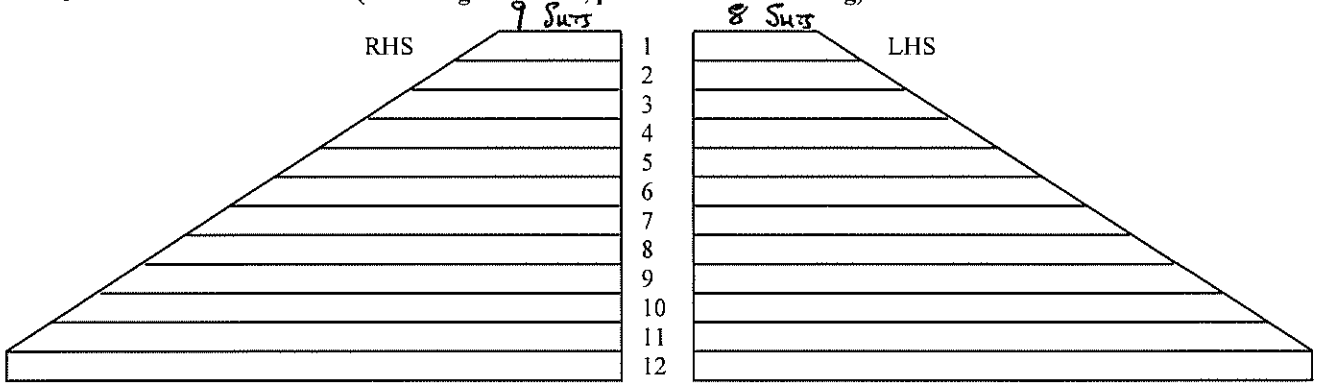
SHEETING - ABUTMENT LHS	Solid	Rot from Pile		To Pile
Centreline	Solid	Rot from Pile		To Pile
RHS	Solid	Rot from Pile		To Pile

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 70

	Condition 1	Condition 2	Condition 3	Condition 4
% Condition State		100		

ABUTMENT 1 WING WALLS (indicate ground line, piles and failed sheeting)



WINGCAP / SPIKING RAIL CONDITION

Minor Weath & Splits - OK

WINGCAP / SPIKING RAIL CONDITION

Minor Weath & Splits - OK

SHEETING - WING WALLS LHS	Solid	Rot from Pile		To Pile
RHS	Solid	Rot from Pile		To Pile

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 70

	Condition 1	Condition 2	Condition 3	Condition 4
% Condition State		100		

PIER No: 1 **Bridge No:** 3128A

Pile No.	Circ. (mm)	Dia. (mm)	Timber Drilling (mm)			Extent of Rot (m)			Splits		Blaze Markings			Halfcaps Bearing (mm)		Pile Circ. (mm) below H/C (5m+)	Mat. Type	Cond. State
			Solid	Rot	Pipe	Drill Location from top H/C	Below	Above	Location	Requires Band	Marking (ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	A1	A2			
1	1180	370	155	30		08					-	0.9	-	110	100	-	JAR	2
2	1240	390	195								-	0.9	-	160	130	-	JAR	2
3	1100	350	175								-	0.9	-	120	120	-	JAR	2
4	1250	400	200								-	0.9	-	140	130	-	JAR	2
5																		
6																		
7																		
8																		
9																		
10																		

Total Number of Corbels: 7 Typical Corbel Height (mm): LHS 340 RHS 340

Corbel No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							
Requires Bolting: A1/A2 End														
Condition State: A1/A2 End	2 2	2 2	2 2	2 2	2 2	2 2	2 2							

Ironwork Condition: MEDIUM RUST Tightening Required: No

Walers Size V - x H -

Bracing Size V - x H -

Saturated Piles:

LHS Halfcaps Size V 330 H 170 Length 7300 No. of 2 Gap between H/Caps 150

Top of H/Caps to underside of Deck 710 H/Cap Material JAR

RHS Halfcaps Size V H Length No. of Gap between H/Caps

Top of H/Caps to underside of Deck H/Cap Material

Are there more than 2 sets of halfcaps or sill beams (YES/NO) NO (If yes record details on comments sheet)

Comments: STUB PILES ARE SEATED ON TIMBER BEDLOG, SEATED ON CONCRETE FOOTING.

AB 2 H.C JOIN HAS SPLITS & MINOR SAG. - NO CHANGE FROM PREVIOUS DIR.

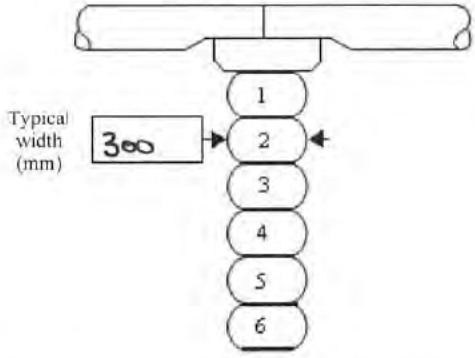
CONCRETE FOOTING HAS MINOR CRACKS BETWEEN PILE 2 & 3.

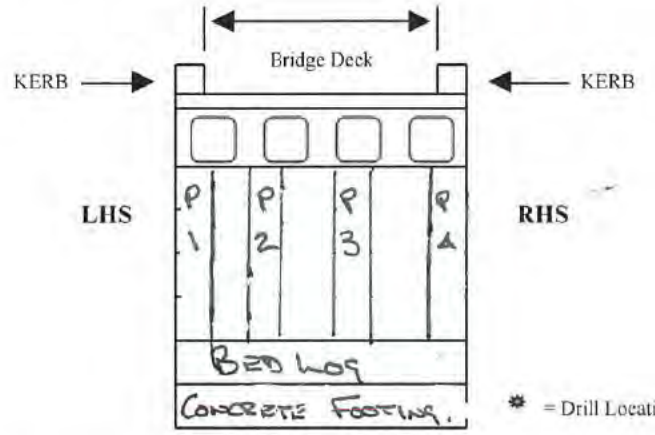
A1 HC SPLICE HAS CRACKING SEE AUDIT PHOTO 1 A1 OK

Pile No.:	Pile No.:	Pile No.:	Pile No.:
A2	A2	A2	A2
LHS RHS	LHS RHS	LHS RHS	LHS RHS
A1	A1	A1	A1

BEDLOG PIERS

Pier No: 1 **Bridge No:** 3128A





Bedlog No	Vert (mm)	Mat Type	Drilling (mm)	BELOW STRINGER NUMBER												Bolt Reqd	Cond State
				1	2	3	4	5	6	7	8	9	10	11	12		
1	300	JAR	Solid (Front)	140	300	300	120										2
			Rot/Pipe	80			120										
			Solid (Rear)	80			60										
2			Solid (Front)														
			Rot/Pipe														
			Solid (Rear)														

Bedlog No	LHS (mm)					CENTRE LINE (mm)				RHS (mm)			
	Face	Solid	Rot	Pipe	Bolt reqd.	Solid	Rot	Pipe	Bolt reqd.	Solid	Rot	Pipe	Bolt reqd.
3	Front												
	Rear												
4	Front												
	Rear												
5	Front												
	Rear												
6	Front												
	Rear												
7	Front												
	Rear												

Total Number of Corbels: 7

Typical Corbel Height (mm): LHS RHS

Corbel No:	1	2	3	4	5	6	7	8	9	10	11	12
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR					
Requires Bolting: A1/A2 End												
Condition State: A1/A2 End												

Ironwork Condition: Saturated bedlogs:

Comments: STUB PILES ARE SEATED ON TIMBER BEDLOG, SEATED ON CONCRETE FOOTING, PILES ARE CHECKED INTO BEDLOG, 300x300 SQUARE

TIMBER BRIDGE
DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

ABUTMENT: 2

Bridge No: 3128A

Pile No.	Dia. (mm)	Timber Drilling (mm)			Extent of Rot (m)			Splits		Blaze Markings			Halfcaps Bearing (mm)		Pile Dia. (mm) below H/C (5m+)	Mat. Type	Tied Back	Cond. State
		Solid	Rot	Pipe	Drill Location from top H/C	Above	Below	Location	Requires Band	Marking (Ft/m)	Height Top H/C to Blaze (m)	Height Blaze to GL (m)	A1	A2				
1	320	SEE NOTES			0.5					-	0.8	-	-	-	-	JAR	✓	2
2	350	SEE NOTES			2.0	0.6	0.2			-	2.2	-	-	-	-	JAR	✓	2
3	290 360	180								-	1.5	-	115	-	-	JAR		2
4	290 330	105	60		1.5					-	1.5	-	120	-	-	JAR		2
5	300 350	125		50	1.3					-	1.5	-	155	-	-	JAR		2
6	300 380	SEE NOTES		200	1.3	0.5	0.2			-	1.5	-	160	-	-	JAR		3
7	280 360	130	50		1.4					-	1.5	-	140	-	-	JAR		2
8	280 360	130	50		2.0					-	2.2	-	-	-	-	JAR	✓	2
9	290 300	SEE NOTES		120	0.7					-	0.9	-	-	-	-	JAR	✓	2
10																		
11																		
12																		
13																		
14																		
15																		

Saturated Piles: _____

LHS Halfcaps Size V 320 | 170 Length 8450 No. of 1 Gap between H/Caps —

Top of H/Caps to underside of Deck 380 Back of Halfcaps to Sheeting 230 H/Cap Material JAR

RHS Halfcaps Size V | H Length | No. of | Gap between H/Caps |

Top of H/Caps to underside of Deck | Back of Halfcaps to Sheeting | H/Cap Material |

Are there more than 2 sets of halfcaps or sill beams (YES/NO) NO (If yes record details on comments sheet)

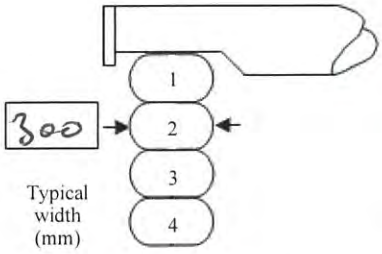
Comments: ALL PILES ARE STUB PILES SEATED ON TIMBER BEDLOG, SEATED ON CONCRETE FOOTING. PILES 3 TO 9 ARE SAWN AT BASE FOR MOUNTING BRACKETS TO BEDLOG. HC SPALLS NO SIGNS OF DISTRESS
PILE 5 HAS MINOR FIRE DAMAGE.
& = REF TO PREVIOUS D.I.R. - BURIED IN LONG GRASS

Pile No. 1 40/S	Pile No. 2 40/S	Pile No. 6 20/S	Pile No. 9 70
L.H.S 160/S R.H.S 100/S	L.H.S 150/S R.H.S 130/S	L.H.S 130/S R.H.S 130/S	L.H.S 100/S R.H.S 170/S
F= 100/S	F= 80/S	F= 80/S	F= 100/S

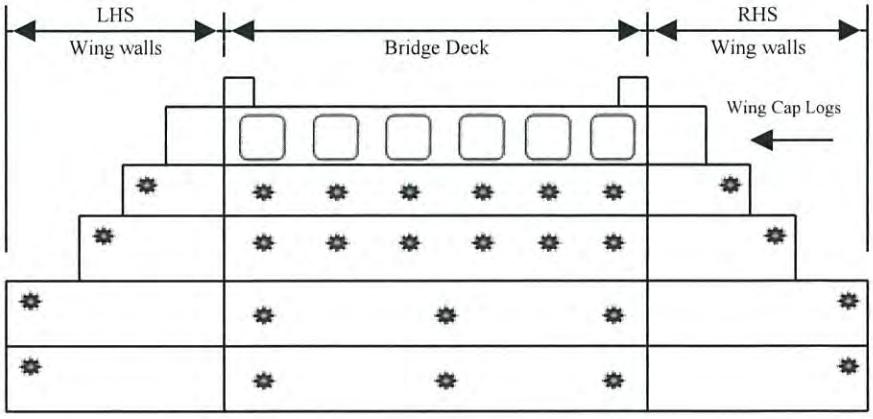
BEDLOG ABUTMENTS

Abutment No. 2

Bridge No: 3128A



View from RHS



= Drill Location

Bedlog	Vert. (mm)	Mat. Type	Drilling (mm)	BELOW PILE NUMBER												Condition State
				1	2	3	4	5	6	7	8	9	10	11	12	
1	300	JAR	Solid (Front)	U/S	U/S	80	120	110	100	100	300	300				2/3/4
			Rot/Pipe			TO BACK	TO BACK	TO BACK	TO BACK	TO BACK						
			Solid (Rear)			–	–	–	–	–						

Bedlog No.	LHS					CENTRE LINE				RHS			
	Face	Solid	Rot	Pipe	Bolt reqd.	Solid	Rot	Pipe	Bolt reqd.	Solid	Rot	Pipe	Bolt reqd.
3	Front												
	Rear												
4	Front												
	Rear												
5	Front												
	Rear												
6	Front												
	Rear												
7	Front												
	Rear												
8	Front												
	Rear												

Bedlog - Wing Walls: LHS: _____ Saturated Bedlogs: _____

RHS: _____

Sheeting: LHS: _____

CENTRE LINE: _____

RHS: _____

Comments: BED LOG FROM L.H.S TO ABUT FACE IS U/S - SEE PHOTOS. ACTIVE TERMITES BELOW PILE 2. REPAIR.

ABUTMENT 2 and WING WALL SHEETING

Bridge No: 3128A

ABUTMENT 2 SHEETING (indicate ground line, piles and failed sheeting) 9 Shts

LHS	1	RHS
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	

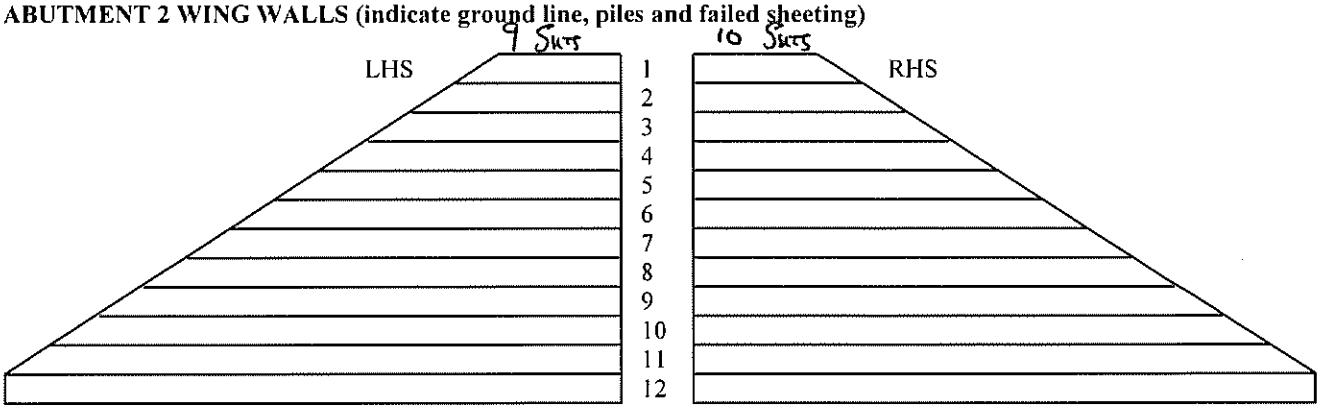
SHEETING - ABUTMENT LHS	Solid	Rot from Pile		To Pile
Centreline	Solid	Rot from Pile		To Pile
RHS	Solid	Rot from Pile		To Pile

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 70

	Condition 1	Condition 2	Condition 3	Condition 4
% Condition State		100		

ABUTMENT 2 WING WALLS (indicate ground line, piles and failed sheeting)



WINGCAP / SPIKING RAIL CONDITION: Minor Weath & Splits - OK

WINGCAP / SPIKING RAIL CONDITION: Minor Weath & Splits - OK

SHEETING - WING WALLS LHS	Solid	Rot from Pile		To Pile
RHS	Solid	Rot from Pile		To Pile

SHEETING Material Type: J

SHEETING Material Size (mm): Vertical 220 Depth 70

	Condition 1	Condition 2	Condition 3	Condition 4
% Condition State		100		

DETAIL SHEET

Span No: 1 **Bridge No:** 3128A

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							

Abutment 1 End

H Diameter (mm)		540	450	660	440	580	460	540							
V Measurement (mm)		380	380	380	380	380	380	380							
Drill Vertical	Solid (B)	380	380	380	380	380	380	380							
	Rot														
	Pipe														
	Rot														
	Solid (T)														
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd		✓	✓											
Split H	Bolt Rqd														
Propped															
Condition State		1	1	1	1	1	1	1							

Mid Span

H Diameter (mm)		480	430	610	450	550	490	460							
V Measurement (mm)		440	450	510	470	450	460	470							
Drill Vertical	Solid (B)	440	450	480	470	450	460	470							
	Rot														
	Pipe														
	Rot														
	Solid (T)														
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd														
Split H	Bolt Rqd														
Propped															
Condition State		1	1	1	1	1	1	1							

NOTE: DRILL IS ONLY 480 mm LONG. RESULTS GIVEN TO 480mm ONLY. TIMBER REPORT

Abutment 2 End

H Diameter (mm)		430	540	530	500	510	550	410							
V Measurement (mm)		380	380	380	380	380	380	380							
Drill Vertical	Solid (B)	380	380	380	380	380	380	120							
	Rot							80							
	Pipe														
	Rot														
	Solid (T)							180							
Drill Horiz.	Left														
	Right														
Split V	Bolt Rqd	✓	✓	✓		✓	✓								
Split H	Bolt Rqd														
Propped															
Condition State		1	1	1	1	1	1	2							

Cond. of Spiking Plank Not Applicable ✓ Size V — Condition S — R — %

Cond. of Decking (Solid/Rot) S 90 R 10 % Cond. of Deck Ends S 90 R 10 %

Decking Size (mm) V 120 x H 220 Decking Timber Type JAR

Span Length from Centreline Supports (m) 5.80 Clear Span Length 5.00 Saturated stringers:

Deck Condition State Percentage:	Condition 1	Condition 2	Condition 3	Condition 4
		90		10

Spiral Grain Stringers: 6

Comments: STR'S 2, 3 HAVE S.G. STR 1 A2 packing + 2+6 PACK

STR 1, AB 1 NEEDS PACKING. PACK

BOLTS NOT REQ

TIMBER BRIDGE DETAILED INSPECTION REPORT

DETAIL SHEET

Span No: 2 **Bridge No: 3128A**

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR	JAR							

Abutment 1 End

H Diameter (mm)		450	570	490	530	480	560	540							
V Measurement (mm)		380	380	380	380	380	380	380							
Drill Vertical	Solid (B)	380	380	380	380	380	380	380							
	Rot														
	Pipe														
	Rot														
	Solid (T)														
Drill Horiz.	Left														
	Right														
Split	V Bolt Rqd		✓				✓	✓							
	H Bolt Rqd														
Propped															
Condition State		1	1	1	1	1	1	1							

Mid Span

H Diameter (mm)		520	430	560	470	510	470	480							
V Measurement (mm)		520	470	500	400	450	560	480							
Drill Vertical	Solid (B)	480	180	480	400	450	480	240							
	Rot							60							
	Pipe		70												
	Rot														
	Solid (T)		220					180							
Drill Horiz.	Left														
	Right														
Split	V Bolt Rqd														
	H Bolt Rqd														
Propped															
Condition State		1	2	1	1	1	1	2							

Abutment 2 End

H Diameter (mm)		560	470	560	450	560	500	450							
V Measurement (mm)		380	380	380	380	380	380	380							
Drill Vertical	Solid (B)	380	380	380	100	380	380	380							
	Rot														
	Pipe				130										
	Rot														
	Solid (T)				150										
Drill Horiz.	Left														
	Right														
Split	V Bolt Rqd	✓	✓	✓		✓		✓							
	H Bolt Rqd														
Propped															
Condition State		1	1	1	2	1	1	1							

Cond. of Spiking Plank Not Applicable ✓ Size V – Condition S – R – %

Cond. of Decking (Solid/Rot) S 90 R 10 % Cond. of Deck Ends S 90 R 10 %

Decking Size (mm) V 120 x H 220 Decking Timber Type JAR

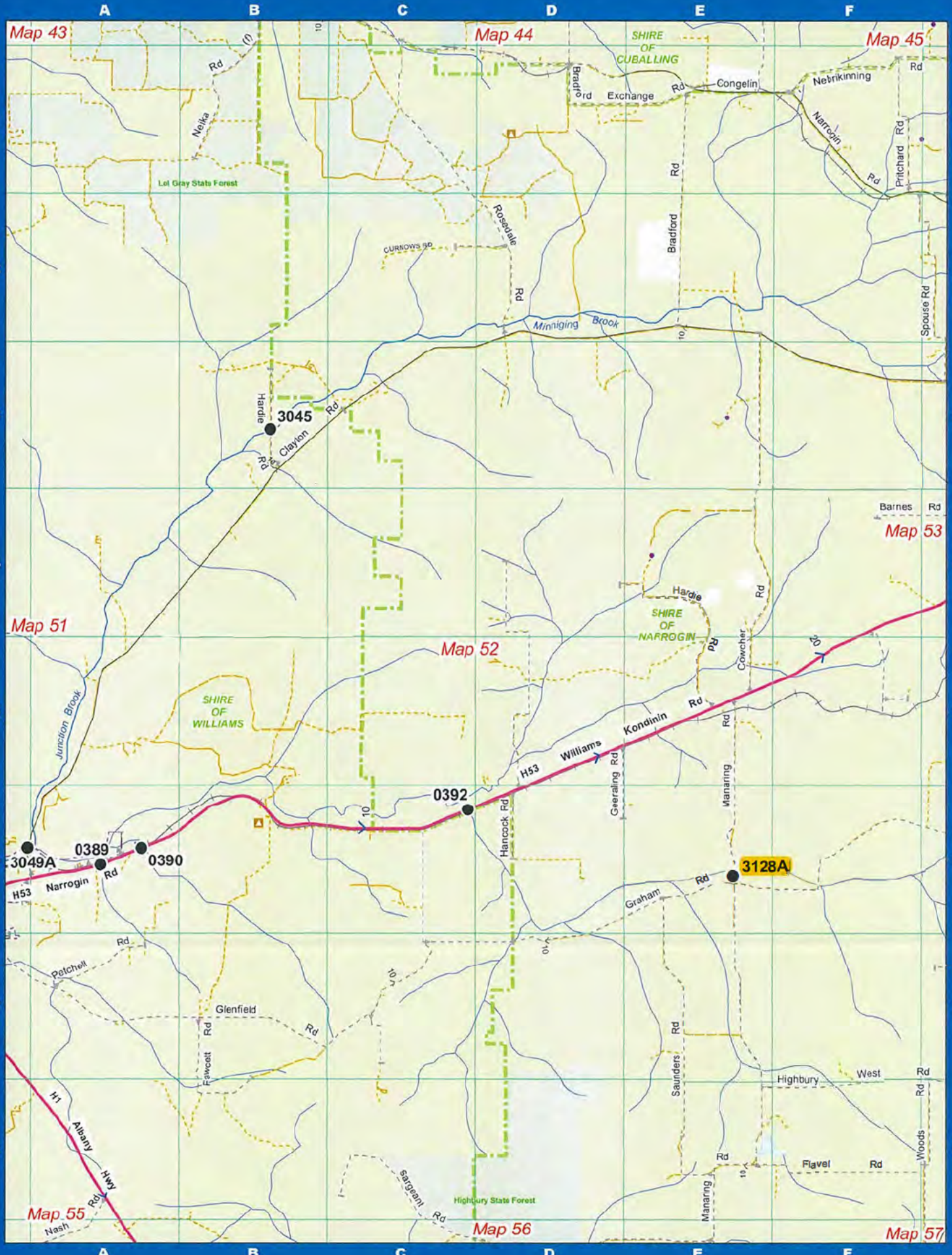
Span Length from Centreline Supports (m) 5.85 Clear Span Length 4.98 Saturated stringers: _____

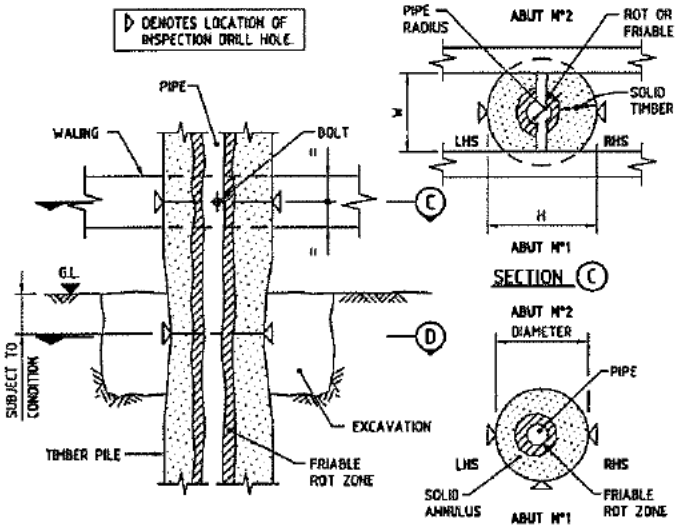
Deck Condition State Percentage:

Condition 1	Condition 2	Condition 3	Condition 4
	90		10

Spiral Grain Stringers: _____

Comments: BOLTS NOT REQ

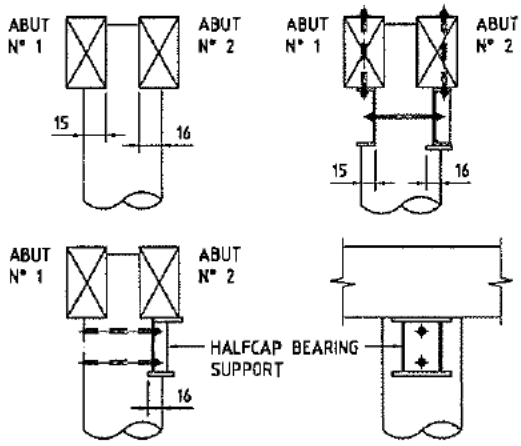

A
B
C
D
E
F
1
2
3
4
5
6
7
8
Map 43
Map 44
Map 45
Map 51
Map 52
Map 53
Map 55
Map 56
Map 57
SHIRE OF CUBALLING
SHIRE OF NARROGIN
SHIRE OF WILLIAMS
Lol Gray State Forest
Highbury State Forest
Bradford Rd
Exchange Rd
Congelin
Nebrikinning Rd
Narrogin Rd
Pritchard Rd
Neika Rd
Rosedale Rd
CURNOWS RD
Bradford Rd
Minniging Brook
Spouse Rd
Hardie Rd
3045
Clayton Rd
Barnes Rd
Hardie Rd
Cowcher Rd
Junction Brook
Kondinin Rd
Williams
H53
Geerating Rd
Hancock Rd
Manaring Rd
0392
3049A
0389
0390
H53 Narrogin Rd
3128A
Graham Rd
Petchell Rd
Glenfield Rd
Fawcett Rd
Saunders Rd
Highbury West Rd
H1 Albany Hwy
Nash Rd
Sargeant Rd
Flavel Rd
Woods Rd
Manaring Rd
LEGEND:
For map legend see page 4
Map 52
0
2
4 km



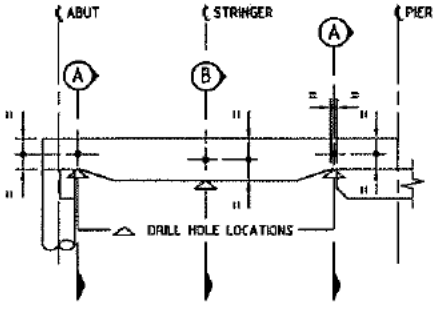
LOCATION OF PILE DRILLINGS

IF FIRST DRILL LOCATION IS ≤ 100 THEN DRILL BOTH ALTERNATE LOCATIONS.

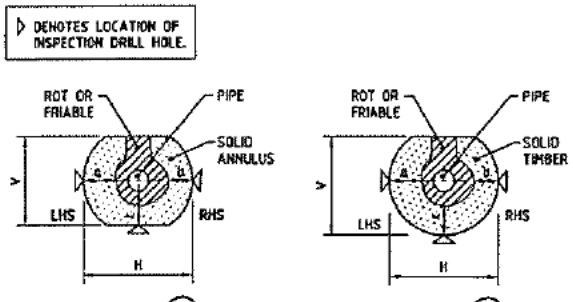
ROUND THE DEMENSIONS ON THE HALFCAP BEARING ON THE PILE AT BDTH ABUTMENT SIDESOF THE PILE. i.e. ABUTMENT N° 1 & ABUTMENT N° 2



HALFCAP SEATING ARRANGEMENTS



LOCATION OF STRINGER DRILLINGS



LEGEND

MATERIAL TYPE

J - JARRAH
W - WANDOO
S - STEEL
U - UNKNOWN TIMBER

SPLITS

✓ TICK ONLY IF REQUIRED

PRIORITY BOLT/BAND (FOR AUDIT PURPOSES ONLY)

U - A.S.A.P.
H - HIGH PRIORITY
M - ROUTINE MAINTENANCE
L - LOW PRIORITY

GENERAL

P	-	PIPE
R	-	ROT
F	-	FRIABLE
S	-	SOLID
N/A	-	NOT APPLICABLE
V	-	VERTICAL
H	-	HORIZONTAL
LHS	-	LEFT HAND SIDE
RHS	-	RIGHT HAND SIDE
Dia	-	PIPE DIAMETER
Circ	-	CIRCUMFERENCE
A1	-	ABUTMENT No. 1
A2	-	ABUTMENT No. 2
Str	-	STRINGER
H/C	-	HALFCAP
H/CAP	-	HALFCAP
Blz	-	BLAZE
℄	-	CENTRE LINE
O/A	-	OVERALL
GL	-	GROUND LEVEL
Ht	-	HEIGHT
Ft	-	FEET
W	-	WIDTH BETWEEN WALING
Cond	-	CONDITION
U/S	-	UNSOUND (STRUCTURALLY)
SG	-	SPIRAL GRAIN

NOTE: All dimensions are of solid timber excluding sap wood and any surface rot on piles and stringers

/SE Documents/Management System Manual/Dwgs/timber_repair.dwg

Bridge 3142
Havelock Street over
Narrogin Brook
L2 Inspection

Enquiries: Gavin Johnston on 9323 4431
Our Ref: 04/4087
Your Ref:

ABN: 50 860 676 021

ASSET MANAGER STRUCTURES
WHEATBELT REGION

Structure No.:	3142
Over:	Narrogin Brook
On:	Havelock St (4180025)
SLK:	0.61
LGA:	Town of Narrogin

1. Please find enclosed a copy of the detailed inspection report for the above Local Authority structure.

2. Attached is a schedule of maintenance items that are required to be undertaken in order to maintain structural integrity and extend the life of the Structure.

3. The maintenance items have been entered into IRIS for programming purposes.

4. This report details all components inspected. Some components have not been inspected due to inaccessibility.

Gavin Johnston
BRIDGE CONDITION MANAGER

Ken Wong (BCM/A)
for G.J.
8/6/15

Enc

Don Aitken Centre, Waterloo Crescent, East Perth or PO Box 6202 EAST PERTH Western Australia 6892
Telephone: (08) 9323 4111 Facsimile: (08) 9323 4136 TTY: (08) 9428 2230
Email: dac@mainroads.wa.gov.au Website: www.mainroads.wa.gov.au

WORK ITEMS - TIMBER BRIDGES
BRIDGE No: 3142

ITEM NO	ITEM DESCRIPTION	WORK REQD	PRIORITY CODE	COMMENTS
(A) GENERAL MAINTENANCE				
G005	Bridge - Durability Survey (L3)			
G009	Bridge - Load Rating			
G010	Bridge - Monitor Defect			
(B) PREVENTATIVE MAINTENANCE				
P101	Bridge - Seal Timber			
P102	Bridge - Maintain Fastener			
P103	Bridge - Fungicide Treatment	Y	1	sillbeams
(C) ROUTINE MAINTENANCE				
R201	Bearing - Maintain			
R202	Bridge - Remove Graffiti			
R203	Bridge - Repair Scour (Minor)			
R204	Bridge - Eradicate Termites			
R205	Bridge - Clear Debris and Vegetation			
R206	Deck Joint - Maintain			
R207	Deck Surface - Maintain			
R208	Drainage - Maintain			
R209	Expansion Joint - Maintain			
R210	Fence - Remove			
R211	Fence - Repair (Control of Access)			
R212	Guardrail Maintain/Repair			
R213	Kerb - Repair (Minor) - Non Structural			
R214	Lighting - Maintain			
R215	Sign - Maintain			
(D) SPECIFIC MAINTENANCE				
S315	Bridge - Replace Fastener <1.5m			
S350	Bridge - Repair Scour (Major)			
S366	Bridge - Access - Improve	Y	2	spans 1 & 2
S413	Deck - Repair			
S449	Drainage - Repair			
S455	Expansion Joint - Repair			
S461	Footpath - Repair			
S473	Kerb - Repair			
S501	Abutment - Reconstruct			
S504	Abutment - Repair (Non timber)			
S507	Bedlog - Repair			
S510	Bedlog - Shim			
S522	Corbel - Bolt			
S525	Corbel - Repair			
S528	Corbel - Shim			
S537	Footpath Railing - Repair			
S540	Fullcap - Repair			
S543	Halfcap - Improve Bearing			
S546	Halfcap - Pack			
S549	Halfcap - Repair			
S558	Pier - Repair			
S561	Pile - Band			
S564	Pile - Repair			
S570	Sheeting - Repair			
S588	Wingwall - Repair			
S607	Bearer - Repair			
S643	Joist - Repair			
S655	Stringer - Bolting			
S661	Stringer - Repair			
S667	Stringer - Shim			

PRIORITY CODE

0 -Critical Safety Deficiency : EMERGENCY action required (Immediate or within 6 months)
1 - Very High Priority (Within 3 years)
2 - Medium Priority (Within 4 years)
3 - Low Priority (Within 5 years-assess again at next Detailed Inspection)

MRWA Ref: ' 04/4087

DETAILED TIMBER BRIDGE INSPECTION SUMMARY

Bridge No:	**3142**	**Region:**	**WHEATBELT REGION**
River Name:	**Narrogin Brook**	**SLK:**	**0.61**
Road:	**Havelock St**	**Road No:**	**4180025**
LGA:	**Town of Narrogin**		

1.0 General

Bridge no. 3142 located on Havelock St in the Shire of Narrogin is a two span bridge crossing Narrogin Brook. The structure requires maintenance in particular the waterway continues silt up and this has resulted in only minimal drilling results being available, excavation is required to improve headroom.

2.0 Preventative Maintenance

Preventative maintenance to be undertaken on a 5 year periodic basis. Areas of concern have been identified below. Fungicide treatment of all timber elements in accordance with Specification 850 is required.

3.0 Routine Maintenance

Not required.

4.0 Specific Maintenance

4.1 Substructure

Undertake works to improve access for elements not inspected.
(span2 1 & 2)

4.2 Superstructure

Not required.

5.0 BCI

Not Available.

6.0 Load Rating

Not required.

Paul Olsen
Engineering Associate

February 10 2015

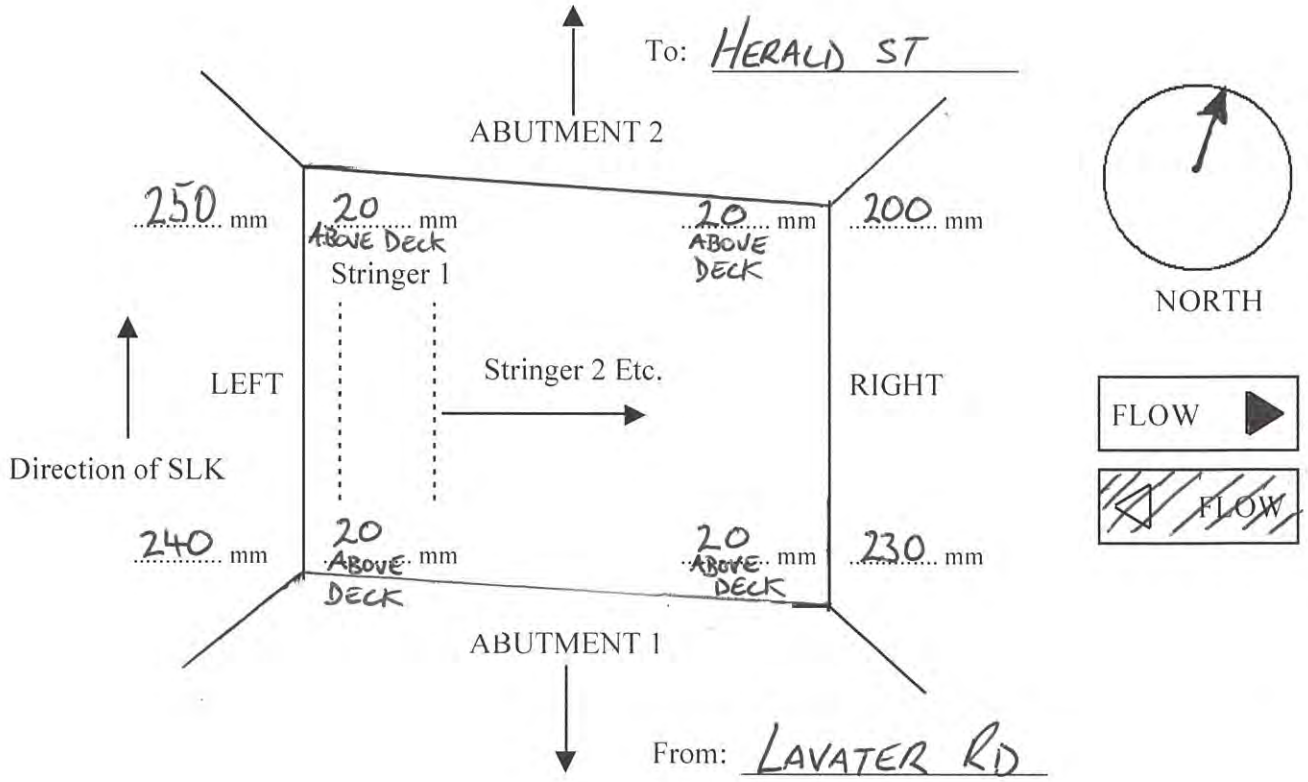
GENERAL INFORMATION - SHEET 1

Bridge No.: 3142

Region:	Wheatbelt	Latitude (S):	-32.943295
		Longitude (E):	117.185440
Road Name:	Havelock St	Road No:	4180025
Local Government:	Narrogin (T)	Owner:	Local Authority
Crossing Name:	Narrogin Brook	SLK:	0.61
Number of Lanes:	2	Length (m):	16.35
Total Width (m): Inc. or Excl. Footpath	6.82	Max. Head Room (m): 1.20	Min. Head Room (m): 0.80
No. of Spans:	2	Width between Kerbs (m): 6.82	Concrete Overlay (Y/✱): Y

Piers are numbered along the bridge in ascending order from ABUTMENT 1 to ABUTMENT 2.
Piles are numbered across the bridge in ascending order from LEFT to RIGHT.
Stringers are numbered across the bridge in ascending order from LEFT to RIGHT.

Inside and outside kerb depths noted in corners of sketch.
Exposed Deck Ends (RCO only): LHS [—] RHS [—]



This Bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Inspection Manual for Western Australian Bridges and Culverts.

Inspected by: S. Maine P. Fish — Checked by: POLSON K McPHIE

Date: 25-11-14 — Date: 4-2-15

SITE CONDITIONS

mainroads WESTERN AUSTRALIA

Structure No.: 3142

DRIVE THROUGH	**Visible Line of Sight from Abut. 1:**	30m	
	Visible Line of Sight from Abut. 2:	200m	
	Traffic Sign Positioning Abut. 1 end:	In the Shoulder	
	Traffic Sign Positioning Abut. 2 end:		
PARKING POSITION (Maximum distance from edge of lane/road to car)	>3 m	[X]	**Position:** AB 2 L.H.S.
	1.2 to 3 m	[ ]	**Position:**
	0 to 1.2 m	[ ]	**Position:**
ACCESS TO ABUTMENTS (Describe access conditions at each wing)	**Abutment 1:** LHS:		Low Head Room.
	RHS:		
	Abutment 2: LHS:		
	RHS:		
	Vegetetion:	Thick Growth on R.H.S. High Grass on L.H.S.	
ACCESS TO PIERS (Describe access conditions along each side of the structure)	**LHS:**		
	RHS:	As Above	
	Vegetation:		
PIER HEADROOM	**Minimum (m):**	1.1m	
	Maximum (m):		
POTENTIAL HAZARDS	**Railing/Posts:**	Low Headroom.	
	Bolts:		
	Services:		
	Other:		
FENCES None	**Timber:**	[ ]	**Location:**
	Wire/Mesh:	[ ]	**Location:**
	Electrified:	[ ]	**Location:**
	Barbed Wire:	[ ]	**Location:**
	Other (Specify):		**Location:**
WATER	**Depth (m):**	0.1m	
	Flow Rate:	Slow	
	Algae: (Access may be restricted by toxic algae)	Nil	
	Tide:	Nil	
	Location:	SPAN 1	
POWERLINES	**Side of bridge:**	L.H.S	
	Horizontal distance from edge of deck (m):	3m	
	Estimated vertical height above deck (m):	5m	

Signature

25-11-14
Date

GUARDRAIL INFORMATION

Bridge No.: 3142

Barrier Type

	Approach 1			On Bridge			Approach 2		
	LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS
None									
RHS Rails No. of Rails (on bridge):									
Thriebeam									
W Beam	X		X	X		X	X		X
Tric-Bloc Concrete Barrier									
Reinforced Concrete Barrier (Type F)									
Constant Slope Concrete Barrier									
Other Concrete Profiles									

Post Type

None									
Concrete									
Timber	X		X	X		X	X		X
Steel Type: _____									

[Types: C Section (C), I Section (I), RHS (R), Square Hollow Section SHS (S), Tubular (T), Steel PFC (PFC), Steel Channel (Ch)]

Off bridge:

Number of Posts off Bridge	2		3				3		2
Length of Barrier off Bridge (m)	4.6		5.2				5.2		4.5

Visibility Barrier

	Approach 1			On Bridge			Approach 2		
	LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS
Timber No. of Rails (on bridge):									
Steel Pipe(s) No. of Pipes (on bridge):									
Guide Posts									
Balustrade									

Top Rails

Steel Pipe									
Steel RHS/Channel									
Steel C Section (C)	X		X	X		X	X		X
Timber									

End Terminals

	Approach 1			On Bridge			Approach 2		
Standard End Terminal Types:	LHS	Median	RHS				LHS	Median	RHS
WAMELT									
SKT-350									
ET-2000									
X-350									
Crash Cushion									
Transitions to another barrier system									
Non Standard End Terminal Types:									
None									
Turn-down									
Bullnose	X								X
Fishtail			X				X		
Other									

Structural problem found? (Y/N) N If yes, comment below.

ROUTINE INFORMATION

Bridge No.: 3142

SCUPPERS LOCATION, TYPE & CONDITION (R619)	None [X] LHS [ ] RHS [ ]	Box [ ] PVC pipe [ ] Hole in deck [ ] Through Deck [ ] Through Kerb [ ]
	Not Reqd	
FLASHING TYPE & CONDITION	None [X] PVC pipe [ ] PGI [ ]	
BOLT TIGHTENING REQUIRED (R654)	Yes [ ] No [X]	
TERMITES (R656)	Active [ ] Not Active [X]	
	None Found.	
PREVENTATIVE FUNGICIDE (R657)	Treated [ ] Not Treated [X]	
	TREAT SILLBEAMS	
ATTACHED FENCES & OTHER WATERWAY OBSTRUCTIONS (R727)	O.K.	
ROAD SURFACE & KERBING CONDITION (R643) — ON BRIDGE	Road Surface: Bitumen on R.C.O. - OK.	
	Kerbing: None	
APPROACHES	Road Surface: Bitumen - Minor Cracks at Abt App. - OK.	
	Kerbing: None	
VEGETATION (R563)	Requires Clearing: LHS [ ] Abut 1 [ ] RHS [ ] Abut 2 [ ]	
	Thick Growth on R.H.S.	
STREAM BED CONDITION *(General comments and details of location, depth & extent of scour, undermining and silt build up.)* (R489)		

SERVICES *(Type, Size & Location)*	Type	Size (mm)	Location
	None		

BRIDGE CONDITION	Priority for Engineering Assessment
	Low [X] Medium [ ] High [ ] Urgent [ ]

Comments:

GENERAL INFORMATION - SHEET 2

Bridge No.: 3142

Bridge Status Built/In Use [X] Not Used [ ]

Date Built 01/09/1935 **Skew (angle)** 29 **Skewed Width (m)** 7800

Widening Left Hand side [–] Width (m) _____ Right Hand side [–] Width (m) _____
Date Date

Surface Type

Unsurfaced	[ ]	Bitumen Seal	[X]	Asphalt	[ ]
Rubberised Seal	[ ]	Tiles	[ ]	Steel Plate	[ ]

Pavement Type

Unpaved	[X]	Gravel	[ ]	Material Unknown	[ ]

Footpath Left	Left Kerb (m) –	Path (m) _____	Right Kerb (m) _____
Footpath Right	Left Kerb (m) –	Path (m) _____	Right Kerb (m) _____
Median	Left Kerb (m) –	Median (m) _____	Right Kerb (m) _____

Horizontal Clearance Left (m) _____ **Horizontal Clearance Right (m)** _____

Bridge Function 1

Road Bridge	[X]	Rail Bridge	[ ]	Pedestrian Bridge	[ ]

Bridge Function 2

Over Water	[X]	Over Road	[ ]	Over Rail	[ ]
Over Road & Rail	[ ]	Over Road & Water	[ ]	Over Rail & Water	[ ]
Stock Underpass	[ ]	Pedestrian Underpass	[ ]		

Concrete Overlay at Kerb Face Permanent Formwork [X] Off Form Edge [ ]

SIGNAGE

Load Limits **Abutment 1 End** 14 Tonne **Abutment 2 End** 14 Tonne

Width Markers **Abutment 1** LHS [1] RHS [1] **Abutment 2** LHS [1] RHS [1]

Is position of Width Markers a true indication of the bridge width? (Y/N) [N]
WITHIN TOLERANCE

Other Signs

No Overtaking or Passing	**Abutment 1**	LHS [–]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
No Overtaking on Bridge	**Abutment 1**	LHS [–]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
One Lane Bridge	**Abutment 1**	LHS [–]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Low Clearance .....m	**Abutment 1**	LHS [–]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Narrow Bridge Sign	**Abutment 1**	LHS [–]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
Give Way	**Abutment 1**	LHS [–]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]

Crossing Sign: _____

Other _____	**Abutment 1**	LHS [–]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]
	Abutment 1	LHS [–]	RHS [ ]	**Abutment 2**	LHS [ ]	RHS [ ]

Signage Condition Legend

Good	[1]	*Poor*	[3]
Fair	[2]	*None (missing)*	[4]

ELEMENT SPACING SHEET 2

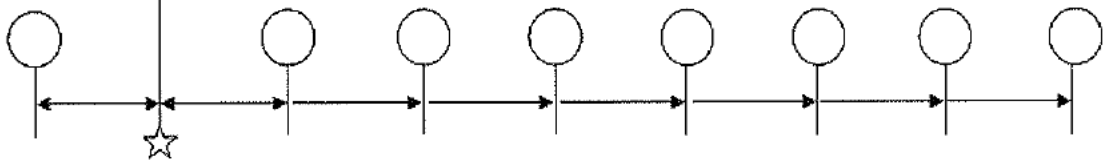
Bridge No.: 3142

All measurements (cumulative) are taken from the reference point as indicated by the star ☆

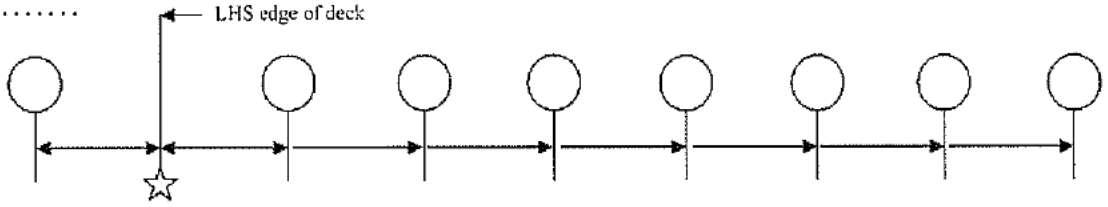
Pier Pile Centres

Mark in RHS edge of deck and dimension last pile to RHS edge of deck.

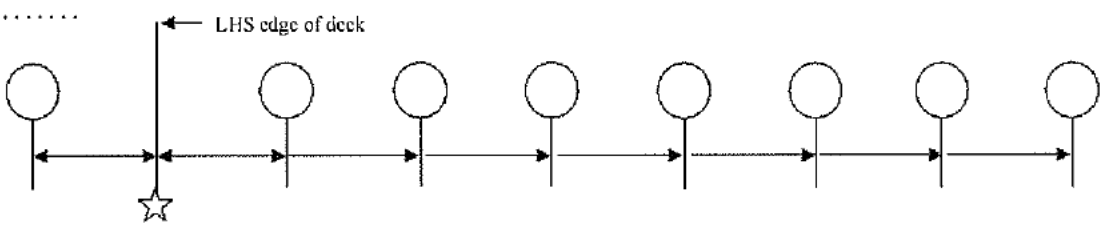
PIER No. ...1.... LHS edge of deck CONCRETE



PIER No. ..... LHS edge of deck



PIER No. ..... LHS edge of deck



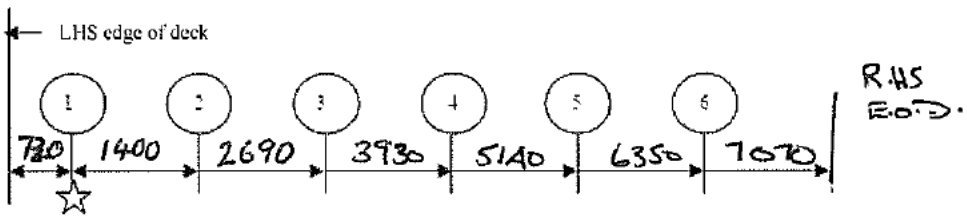
Typical Stringer Spacing

Mark in RHS edge of deck and dimension last stringer to RHS edge of deck.

Note: Stringer spacings must be measured in every span with additional stringers. Use additional sheets as required.

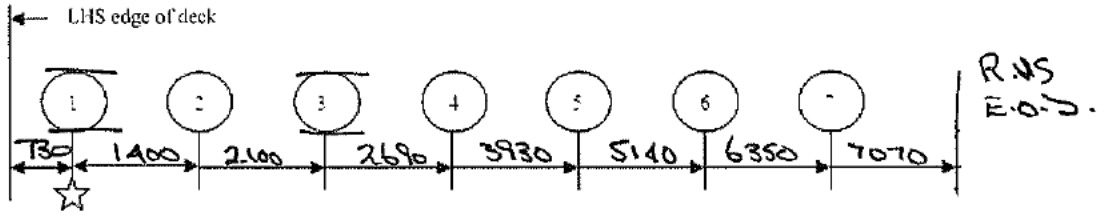
SPAN No. ...1.....

LHS edge of deck



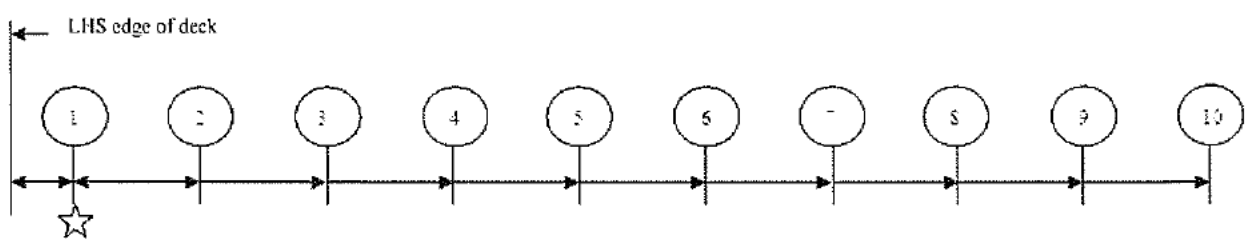
SPAN No. ...2.....

LHS edge of deck



SPAN No. .....

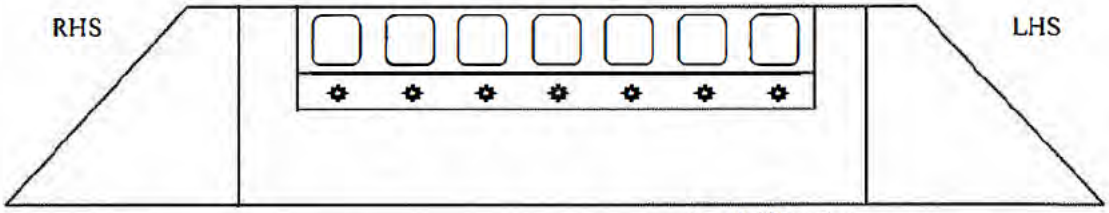
LHS edge of deck



SILL BEAM ABUTMENT 1

Bridge No: 3142

Mark in extent of Abrasion or other Damage



⚙ = Drill Location

Sill Beam	Dimens. (mm)	Mat. Type	Drilling (mm)	SILL BEAM CONDITION BELOW STRINGER NUMBER												Condition State
				1	2	3	4	5	6	7	8	9	10	11	12	
1	H 400 V 290	IAR	Solid (Front)	130	110	100	*	*								2
			Rot/ Pipe	80	160	150										
			Solid (Rear)	190	130	150										
2	H 360 V 280	IAR	Solid (Front)						360							1
			Rot/ Pipe													
			Solid (Rear)													
3	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													
4	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													
5	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													
6	H V		Solid (Front)													
			Rot/ Pipe													
			Solid (Rear)													

Sheeting: LHS: ?

CENTRE LINE: U/S But Has Concrete Behind.

RHS:

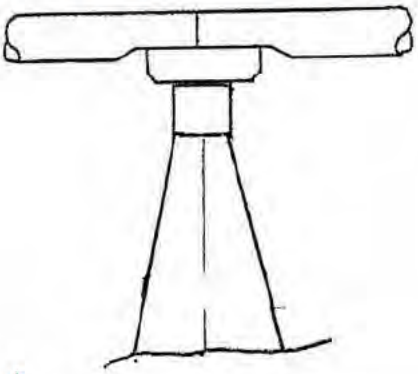
Saturated Sill beams:

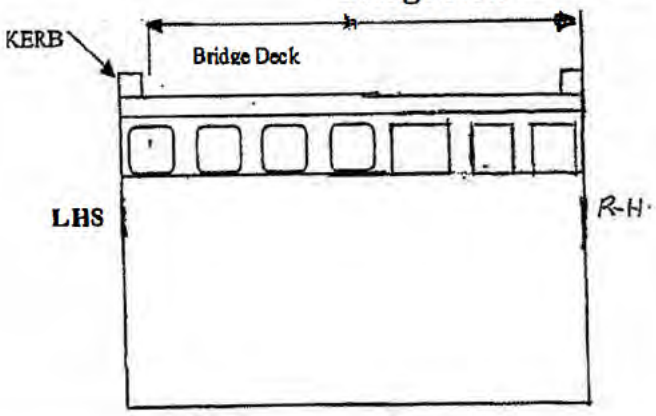
Comments: Stone Pitch & Cement. Minor Crack At L.H. Corner. - OK.

X - Unable To Drill Due To Low Headroom - Typical Throughout Report.

SILL BEAM PIER

Bridge No.: 3142





Pier No. \

Sill Beam	Dimens. (mm)	Mat. Type	Drilling (mm)	SILL BEAM CONDITION BELOW STRINGER NUMBER												Condition State
				1	2	3	4	5	6	7	8	9	10	11	12	
1	H 420	J	Solid (Front)	420	*	*	*	*	*	420						
	V 290		Rot/ Pipe													
			Solid (Rear)													
2	H		Solid (Front)													
	V		Rot/ Pipe													
			Solid (Rear)													
3	H		Solid (Front)													
	V		Rot/ Pipe													
			Solid (Rear)													
4	H		Solid (Front)													
	V		Rot/ Pipe													
			Solid (Rear)													
5	H		Solid (Front)													
	V		Rot/ Pipe													
			Solid (Rear)				/									

Total Number of Corbels: 7

Typical Corbel Height (mm): LHS 290 RHS 290

Corbel No:	1	2	3	4	5	6	7	8	9	10	11	12
Material Type:	J	J	J	J	J	J	J					
Requires Bolting: A1/A2 End		ALL BOLTED.										
Condition State: A1/A2 End												

Ironwork Condition: _____ Saturated bedlogs: _____

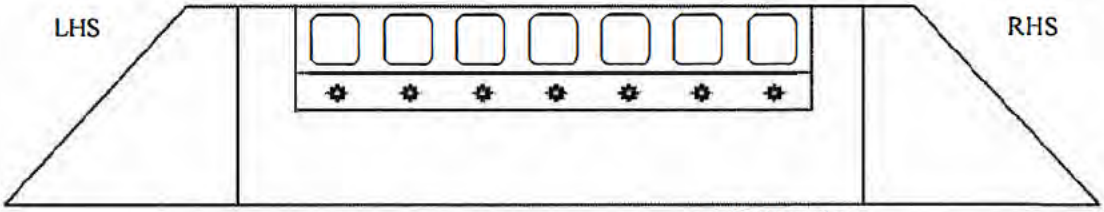
Comments: MINOR CRACKS IN CONCRETE & SOME PITTING PIER. OK

BEDLOG IS IN 3 SECTIONS.

SILL BEAM ABUTMENT 2

Bridge No: 3142

Mark in extent of Abrasion or other Damage



= Drill Location

Sill Beam	Dimens. (mm)	Mat. Type	Drilling (mm)	SILL BEAM CONDITION BELOW STRINGER NUMBER												Condition State
				1	2	3	4	5	6	7	8	9	10	11	12	
1	H	MCO	Solid (Front)	C. ONCRETE												
	V		Rot/ Pipe													
			Solid (Rear)													
2	H		Solid (Front)													
	V		Rot/ Pipe													
			Solid (Rear)													
3	H		Solid (Front)													
	V		Rot/ Pipe													
			Solid (Rear)													
4	H		Solid (Front)													
	V		Rot/ Pipe													
			Solid (Rear)													
5	H		Solid (Front)													
	V		Rot/ Pipe													
			Solid (Rear)													
6	H		Solid (Front)													
	V		Rot/ Pipe													
			Solid (Rear)													

Sheeting: LHS: _____

CENTRE LINE: N/A

RHS: _____

Saturated Sill beams: _____

Comments: MINOR CRACK AT L.H. CORNER OK.

TIMBER BRIDGE DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

DETAIL SHEET

Span No: 1 **Bridge No:** 3142

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	JAR	JAR	JAR	JAR	JAR	JAR								

Abutment 1 End

H Diameter (mm)		410	510	360	520	450	460								
V Measurement (mm)		360	360	360	360	360	360								
Drill Vertical	Solid (B)	110	180	160	*	*	220								
	Rot														
	Pipe	210	110	70			80								
	Rot														
	Solid (T)	30	70	130			60								
Drill Horiz.	Left	180													
	Right	210													
Split V	Bolt Rad						-	-							
Split H	Bolt Rad														
Propped															
Condition State		2	2	2			2								

Mid Span

H Diameter (mm)		440	440	460	430	450	490								
V Measurement (mm)		460	450	390	440	480	480								
Drill Vertical	Solid (B)	460	*	*	*	*	200								
	Rot														
	Pipe						TO								
	Rot						TOP								
	Solid (T)						—								
Drill Horiz.	Left						150								
	Right						100								
Split V	Bolt Rad						-								
Split H	Bolt Rad														
Propped															
Condition State		1					2								

NOTES:
DRILL IS ONLY 480mm LONG.
RESULTS GIVEN TO 480mm ONLY.
TIGHT BEFORE.

Abutment 2 End

H Diameter (mm)		430	410	480	440	600	440								
V Measurement (mm)		360	360	360	360	360	360								
Drill Vertical	Solid (B)	360	*	*	*	*	120								
	Rot														
	Pipe						TO								
	Rot						TOP								
	Solid (T)						—								
Drill Horiz.	Left						100								
	Right						130								
Split V	Bolt Rad	-					-								
Split H	Bolt Rad	-													
Propped															
Condition State		1					3								

Cond. of Spiking Plank Not Applicable ☐ Size V 110 Condition S 90 R 10 %

Cond. of Decking (Solid/Rot) S 80 R 20 % Cond of Deck Ends S — R — %

Decking Size (mm) V 120 x H 225 Decking Timber Type JAR

Span Length from Centreline Supports (m) 7.80 Clear Span Length 6.74 Saturated stringers:

Deck Condition State Percentage:	Condition 1	Condition 2	Condition 3	Condition 4
		80		20

Comments: BOARDWALK USED LHS = STR 2 & STR 5 = RHS.
OLD TERMITE NEST AT ABUTMENT BETWEEN STR 2&3. - NOT ACTIVE

TIMBER BRIDGE DETAILED INSPECTION REPORT

mainroads WESTERN AUSTRALIA

DETAIL SHEET

Span No: 2 **Bridge No:** 3142

Stringer No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Material Type:	STE	JAR	STE	JAR	JAR	JAR	JAR							

Abutment 1 End

H Diameter (mm)		190	390	190	500	400	610	400							
V Measurement (mm)		460	360	450	360	360	360	360							
Drill Vertical	Solid (B)	UB	*	UB	*	*	*	130							
	Rot														
	Pipe							130							
	Rot														
	Solid (T)							100							
Drill Horiz.	Left														
	Right														
Split V	Bolt Rad														
Split H	Bolt Rad														
Propped															
Condition State		1		1				2							

Mid Span

H Diameter (mm)		190	430	190	400	420	440	440							
V Measurement (mm)		460	450	450	450	430	520	500							
Drill Vertical	Solid (B)	UB	*	UB	*	*	*	160							
	Rot														
	Pipe							To							
	Rot							TOP							
	Solid (T)							—							
Drill Horiz.	Left							110							
	Right							170							
Split V	Bolt Rad														
Split H	Bolt Rad														
Propped															
Condition State		1		1				2							

Abutment 2 End

H Diameter (mm)		190	460	190	370	450	470	510							
V Measurement (mm)		460	340	450	310	370	370	370							
Drill Vertical	Solid (B)	UB	*	UB	*	*	*	140							
	Rot														
	Pipe							To							
	Rot							TOP							
	Solid (T)							—							
Drill Horiz.	Left							100							
	Right							210							
Split V	Bolt Rad														
Split H	Bolt Rad														
Propped															
Condition State		1		1				2							

Cond. of Spiking Plank Not Applicable ☐ Size V 120 Condition S 90 R 10 %

Cond. of Decking (Solid/Rot) S 70 R 30 % Cond of Deck Ends S — R — %

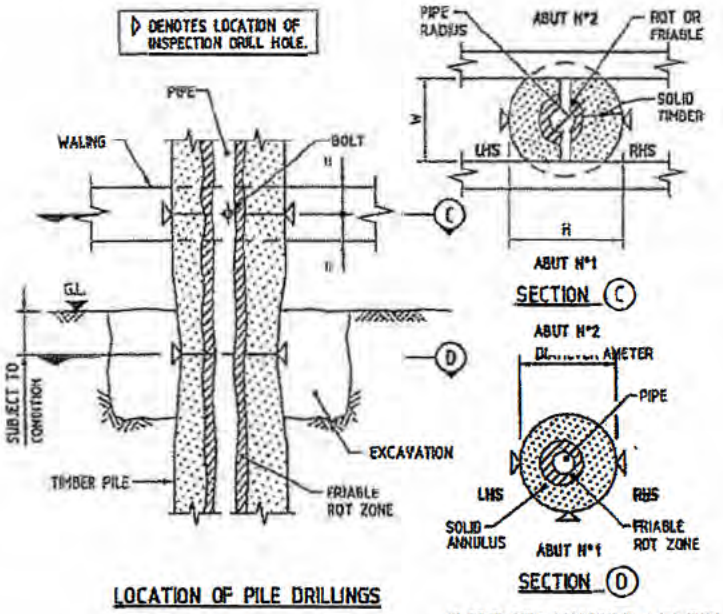
Decking Size (mm) V 120 x H 225 Decking Timber Type JAR

Span Length from Centreline Supports (m) 7.43 Clear Span Length 6.70 Saturated stringers:

Deck Condition State Percentage:	Condition 1	Condition 2	Condition 3	Condition 4
		70		30

Comments: Boxbeck used L.H.S to Str 2 & Str 6 to R.H.S. Boxbeck used L.H.S to R.H.S 2m out From Abut Face.

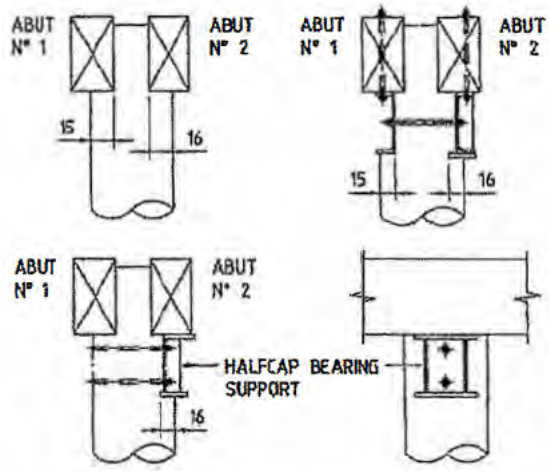

A
B
C
D
E
F
1
2
3
4
5
6
7
8
Fleay Rd
Wandering - Narrogin Rd
Narrakine Rd
Saleyard Rd
Golf Course Pde
Callan Wy
M031 Great Southern Hwy
Quigley St
May St
Myers St
Earl St
Sale St
Bannister St
Fox St
Northwood St
Pioneer Dr
Eaton St
Federal St
Gordon St
Dellar St
White Rd
Clayton Rd
M038 Kipling St
Ensign St
Grant St
Chipper St
Smith St
Jersey St
Lock St
Watt St
NARROGIN
4629
Doney St
Brown St
Hough St
Sylvia Hall Wy
Fortune St
Hansard St
Martin Rd
9250
Park St
Williams Rd
H053
Pioneer Dr
George St
Leroy St
Scaddan St
Falcon St
Hale St
Lukin St
Barron St
Lewis St
Grainger St
Furnival St
Leake St
Forrest Rd
Francis St
6264
Buller St
Felspar St
Pitt St
Argus St
Odgers Rd
Moss Rd
Palmer St
Farrow St
John St
3142
Camm St
H053 Williams Kondinin Rd
Granite Rd
Range Rd
Marsh St
Cullen St
M031 Great Southern Hwy
Macbeath Rd
Gibson St
Havelock St
Booth St
GRAHAM RD
Graham Rd West
Graham Rd
Lydeker Wy
Stewart Rd
Narrogin Valley Rd
Narrakine Rd South
Mokine Rd
Narrogin Enlargement
LEGEND:
For map legend see page 4
Map 69
0
0.4
0.8 km



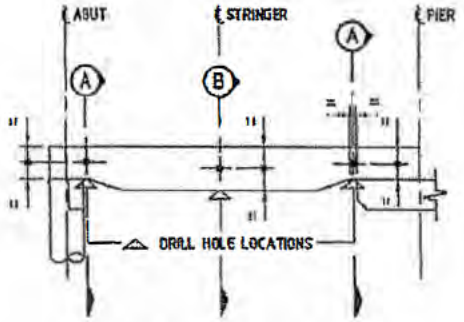
LOCATION OF PILE DRILLINGS

IF FIRST DRILL LOCATION IS ≤ 100 THEN DRILL BOTH ALTERNATE LOCATIONS.

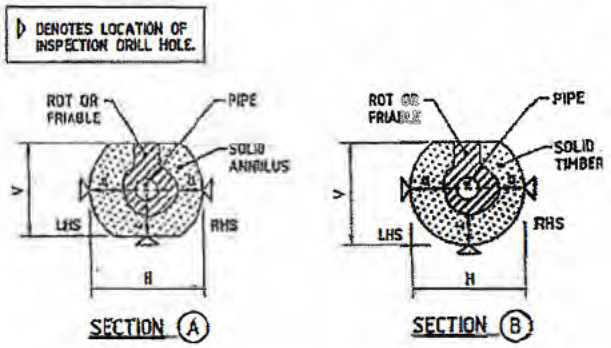
ROUND THE DEMENSIONS ON THE HALFCAP BEARING ON THE PILE AT BOTH ABUTMENT SIDESOF THE PILE. i.e. ABUTMENT N° 1 & ABUTMENT N° 2



HALFCAP SEATING ARRANGEMENTS



LOCATION OF STRINGER DRILLINGS



WHEN 'c' ≤ 100 THEN DRILL 'a' AND 'b'

LEGEND

MATERIAL TYPE

J - JARRAH
W - WANDOO
S - STEEL
U - UNKNOWN TIMBER

SPLITS

✓ TICK ONLY IF REQUIRED

PRIORITY BOLT/BAND (FOR AUDIT PURPOSES ONLY)

U - A.S.A.P.
H - HIGH PRIORITY
M - ROUTINE MAINTENANCE
L - LOW PRIORITY

GENERAL

P	- PIPE
R	- ROT
F	- FRIABLE
S	- SOLID
N/A	- NOT APPLICABLE
V	- VERTICAL
H	- HORIZONTAL
LHS	- LEFT HAND SIDE
RHS	- RIGHT HAND SIDE
Dia	- PIPE DIAMETER
Circ	- CIRCUMFERENCE
A1	- ABUTMENT No. 1
A2	- ABUTMENT No. 2
Str	- STRINGER
H/C	- HALFCAP
H/CAP	- HALFCAP
Blz	- BLAZE
℄	- CENTRE LINE
O/A	- OVERALL
GL	- GROUND LEVEL
Ht	- HEIGHT
Ft	- FEET
W	- WIDTH BETWEEN WALING
Cond	- CONDITION
U/S	- UNSOUND (STRUCTURALLY)
SG	- SPIRAL GRAIN

NOTE: All dimensions are of solid timber excluding sap wood and any surface rot on piles and stringers

/SE Documents/Management System Manual/Dwgs/timber_repair.dwg

PHOTOGRAPHIC RECORD

Bridge No.: 3142

Photo No.	Camera No.	Caption
1		BRIDGE NO
2		O/ALL VIEW FROM AB 1
3		L.H.S VIEW FROM AB 1
4		R.H.S VIEW FROM AB 1
5		LOAD LIMIT SIGN 14 T.
6		AB 1 L.H. WING WALL
7		AB 1 R.H. WING WALL
8		AB 2 L.H. WING WALL
9		AB 2 R.H. WING WALL
10		AB 1 FACE FROM R.H.S.
11		STR LAYOUT W SPAN 1 FROM R.H.S.
12		PIER 1 LAYOUT FROM R.H.S.
13		AB 2 FACE FROM R.H.S.
14		MINOR CRACK AT AB 1 APPROACH L.H.S.
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

Bridge
Pioneer Drive
Pedestrian Bridge
L2 Inspection

mainroads WESTERN AUSTRALIA

Enquiries: Gavin Johnston on 08 9323 4431
Our Ref: 04/8279
Your Ref:

ABN: 50 860 676 021

ASSET MANAGER STRUCTURES
WHEATBELT SOUTH REGION

BRIDGE No.:	9250
OVER:	Northam - Cranbrook Hwy And Rail
AT SLK:	167.89
ON:	Northam Cranbrook
ROAD No.:	M031
LGA:	Narrogin (T)

1. Please find enclosed the detailed inspection report for the above structure.

2. Attached is a schedule of work items that are required to be undertaken in order to maintain structural integrity and extend the life of the structure.

3. The work items have been entered into BMS for programming purposes.

FOR
Gavin Johnston
BRIDGE CONDITION MANAGER
15/10/2013

Enc.

Don Aitken Centre, Waterloo Crescent, East Perth or PO Box 6202 EAST PERTH Western Australia 6892
Telephone: (08) 9323 4111 Facsimile: (08) 9323 4136 TTY: (08) 9428 2230
Email: dac@mainroads.wa.gov.au Website: www.mainroads.wa.gov.au

WORK ITEMS - SUMMARY
CONCRETE & STEEL BRIDGES

BRIDGE No. 9250

(A) GENERAL SUPPORTING ACTIVITIES

BMS Item No.	ITEM DESCRIPTION	WORK REQD	PRIORITY CODE	COMMENTS
G005	Bridge - Durability Survey (L3)			
G009	Bridge - Load Rating			
G010	Bridge - Monitor Defect			

(B) PREVENTATIVE MAINTENANCE

BMS Item No.	ITEM DESCRIPTION	WORK REQD	PRIORITY CODE	COMMENTS
P102	Bridge - Maintain Fastener			

(C) ROUTINE MAINTENANCE

BMS Item No.	ITEM DESCRIPTION	WORK REQD	PRIORITY CODE	COMMENTS
R201	Bearing - Maintain	Y	2	Treat corrosion and replace nut to the bolts along the bearing plates to abutment 2.
R202	Bridge - Remove Graffiti			
R203	Bridge - Repair Scour (Minor)			
R205	Bridge Clear Debris and Vegetation			
R207	Deck Surface - Maintain	Y	1	Repair cracking, rotting and trip hazards to the surfacing. Reapply anti-slip coating.
R208	Drainage - Maintain			
R209	Expansion Joint - Maintain			
R210	Fence - Remove			
R212	Guardrail - Maintain / Repair	Y	1	Pier protection barriers are of inadequate length and require extending
R213	Kerb - Repair (Minor) - Non Structural			
R214	Lighting - Maintain			
R215	Sign - Maintain			

(D) SPECIFIC WORKS

BMS Item No.	ITEM DESCRIPTION	WORK REQD	PRIORITY CODE	COMMENTS
S504	Abutment - Repair (Non-Timber)			
S401	Approach Slab - Install			
S407	Approach Slab - Repair			
S601	Beam - Repair			
S607	Bearer - Repair	Y	1	Repair timber bearers
S619	Bearing - Repair			
S513	Bracing - Replace			
S350	Bridge - Repair Scour (Major)			
S308	Bridge - Widen Embankment			
S324	Bridge - Control Corrosion	Y	2	Treat corrosion to the railings, holding down bolts, columns, bracing, beams, tie-beams and cross-beams.
S516	Capbeam - Repair			
S519	Column - Repair			
S413	Deck - Repair			
S431	Deck Joint - Repair			
S531	Diaphragm - Repair			
S455	Expansion Joint - Repair			
S534	Footing - Repair			
S461	Footpath - Repair			
S537	Footpath Railing - Repair			
S467	Guardrail - Install			
S473	Kerb - Repair			
S555	Mechanically Stabilised Earth Wall - Repair			
S558	Pier - Repair			
S564	Pile - Repair			
S567	Pile Cap - Repair			
S385	Services - Repair			
S479	Slab - Repair			
S585	Wing Wall - Extend			
S588	Wing Wall - Repair			

PRIORITY CODE
1 High Priority
2 - Medium Priority
3 - Low Priority (monitor)

INDICATIVE TIMEFRAME
Within 3 years
Within 4-6 years
Assess again at next Detailed (Level 2) Inspection (7 years for non-timber bridges)

Note: Add additional standard work items to the above lists as required.
Refer to Detailed Visual Bridge Inspection Guidelines for Concrete & Steel Bridges for full listing.

DETAILED CONCRETE AND STEEL BRIDGE INSPECTION SUMMARY

Bridge No.:	9250	**Region:**	Wheatbelt South Region
Crossing Name:	Northam - Cranbrook Hwy And Rail	**SLK:**	167.89
Road:	Northam Cranbrook	**Road No.:**	M031
LGA:	Narrogin (T)		

1.0 GENERAL

This is a steel I-beam structure with timber decking, although the bridge is a mix of both timber and steel elements. In 2000 the footbridge was modified due to construction of the Northam-Cranbrook Highway, date of original construction is unknown. Generally the bridge is considered to be in a reasonable condition.

2.0 SUBSTRUCTURE

2.1 Abutments

Minor surface corrosion is common throughout abutment 1. The bolts to the bearing plates within abutment 2 are also badly corroded.

2.2 Piers

Surface corrosion is common throughout piers 1 and 5 - 9. The holding down bolts to pier 7 are badly corroded and the nuts have sheared off. Shrinkage cracking to the exposed sections of the footings to piers 2 - 4 was also noted.

3.0 SUPERSTRUCTURE

Surface corrosion is common to the beams, tie-beams and bracing of spans 1 and 6 - 9. Within span 7 there are some cross-beams which are also suffering minor surface corrosion. The timber bearers within spans 2 and 5 -7 are also splitting through the centre.

4.0 RECOMMENDATIONS

1. Treat corrosion and replace nut to the bolts along the bearing plates to abutment 2.
2. Repair cracking, rotting and trip hazards to the surfacing. Reapply anti-slip coating.
3. Pier protection barriers are of inadequate length and require extending.
4. Repair timber bearers.
5. Treat corrosion to the railings, holding down bolts, columns, bracing, beams, tie-beams and cross-beams.
6. Change to a hybrid structure.

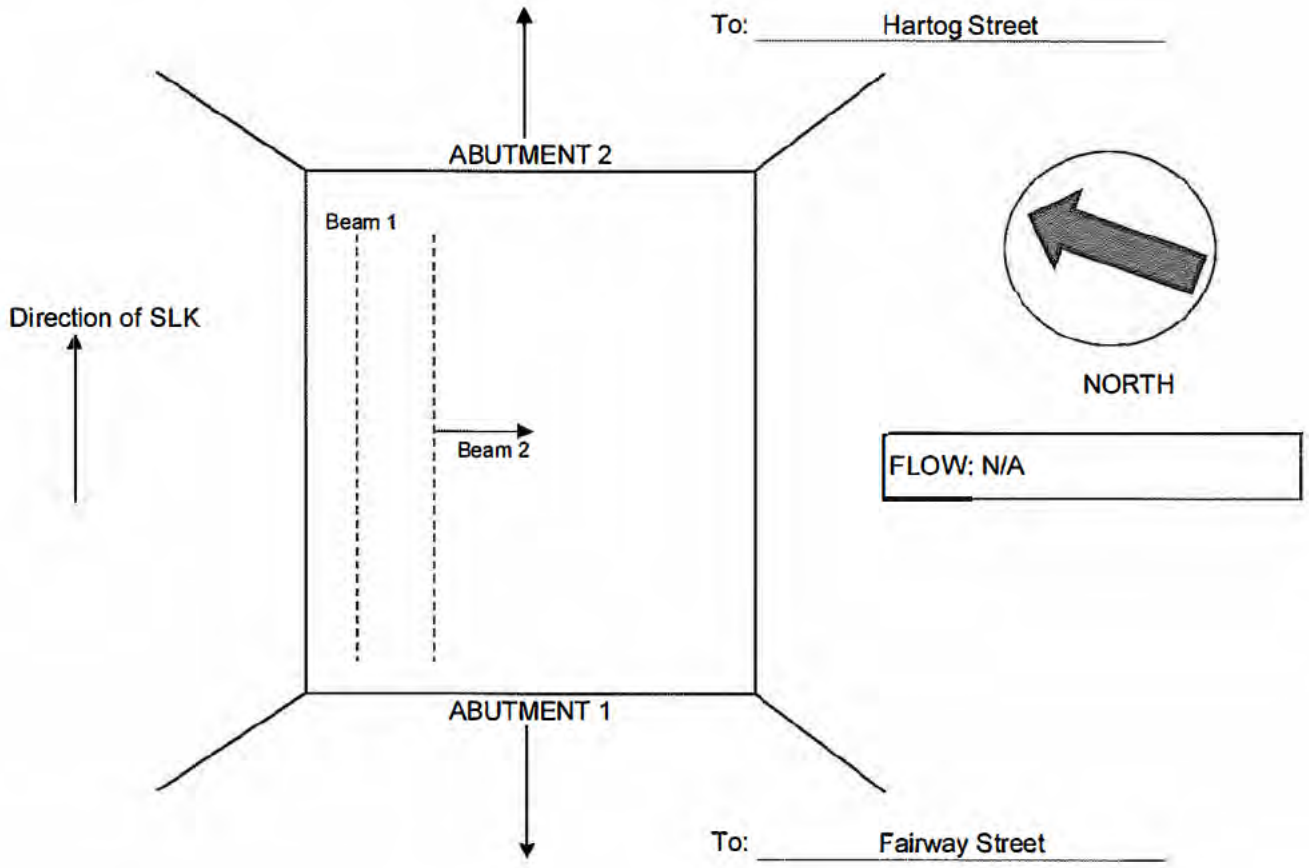
J Hesketh
STRUCTURES INSPECTOR

8th February 2013

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number:	9250			**Date:**	08-February-2013
Structure Type:	Steel		**GPS Location**	**Lat.:**	-32.93528
Superstructure:	I-Beam			**Long.:**	117.18011
Responsibility Area:	Wheatbelt South Region			**Road Number:**	M031
Road Name:	Northam Cranbrook			**Owner:**	Local Authority
Local Govt.:	Narrogin (T)			**SLK:**	167.89
Crossing Name:	Northam - Cranbrook Hwy And Rail			**Skew:**	0 degrees
Total Width (m):	2.12	**Max. H/Room (m):**	6.40	**Min. H/Room (m):**	0.59
No. Spans:	10	**Width Between Kerbs (m):**	2.12	**Length (m):**	85.53

Abutments are numbered in the direction of increasing SLK.
Piers are numbered along the bridge in ascending order from Abutment 1 to Abutment 2.
Piles and Columns are numbered across the bridge in ascending order from left to right when facing the direction of increasing SLK.
Beams are numbered across the bridge in ascending order from left to right when facing the direction of increasing SLK.



Mark in widening and footpath locations.

This bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Bridge Guidelines for Level 2 inspections of concrete and steel bridges.

Inspected by: J Hesketh Checked by: _____

Date: 08-February-2013 Date: _____

Bridge No.: 9250

DRIVE THROUGH	**Visible Line of Sight from Abut. 1:**			>200m
	Visible Line of Sight from Abut. 2:			>200m
TRAFFIC CONTROL (Describe if different to the generic TMP)	**Abut. 1 end:**	1m		
	Abut. 2 end:	1m		
PARKING POSITION	> 3 m	X	**Position:**	Fairway Street
	1.2 to 3 m		**Position:**	
	0 to 1.2 m		**Position:**	
ACCESS TO ABUTMENTS (Describe access conditions at each wing)	**Abutment 1:**			
	LHS:	From Ground level		
	RHS:	From Ground level		
	Abutment 2:			
	LHS:	From Ground level		
	RHS:	From Ground level		
	Vegetation:	Ok		
ACCESS TO PIERS (Describe access conditions along each side of the structure)	**LHS:**	From Ground level		
	RHS:	From Ground level		
	Vegetation:	Ok		
PIER HEADROOM	**Minimum (m):**	0.6		
	Maximum (m):	6.4		
POTENTIAL HAZARDS	**Railing/Posts:**			
	Bolts:			
	Services:	Street lighting		
	Other:			
FENCES	**Timber:**		**Location:**	
	Wire/Mesh:		**Location:**	None
	Electrified:		**Location:**	
	Barbed Wire:		**Location:**	
	Other (Specify):		**Location:**	
WATER	**Depth (m):**	None		
	Flow Rate:			
	Algae:			
	{Access may be restricted by toxic algae}			
	Tide:			
	Location:			
POWERLINES	**Side of bridge:**	None		
	Horizontal distance from edge of deck (m):			
	Estimated vertical height above deck (m):			

J Hesketh
Signature

8th February 2013
Date

Guardrail Information

Bridge No.: 9250

Barrier Type

None
RHS Rails No. of Rails (on bridge): ___
Thrieheam

Tric-Bloc Concrete Barrier
Reinforced Concrete Barrier (Type F)
Constant Slope Concrete Barrier
Other Concrete Profiles

Approach 1			On Bridge			Approach 2		
LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS

Post Type

None
Concrete
Timber
Steel Type: _____
[Types: C Section (C), I Section (I), RHS (R), Square Hollow Section SHS (S), Tubular (T), Steel PFC (PFC), Steel Channel (Ch)]

Off bridge:
Number of Posts off Bridge
Length of Barrier off Bridge (m)

Visibility Barrier

Timber No. of Rails (on bridge):
Steel Pipe(s) No. of Pipes (on bridge):
Guide Posts
Balustrade

Approach 1			On Bridge			Approach 2		
LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS
			X		X	X		X

Top Rails

Steel Pipe
Steel RHS/Channel
Steel C Section (C)
Timber

						X		X

End Terminals

Standard End Terminal Types:
WAMELT
SKT-350
ET-2000
X-350
Crash Cushion
Transitions to another barrier system

Approach 1			On Bridge			Approach 2		
LHS	Median	RHS	LHS	Median	RHS	LHS	Median	RHS

Non Standard End Terminal Types:
None
Turn-down
Bullnose
Fishtail
Other

Structural problem found? (Y/N) N If Yes, comment below.

Bridge Number: 9250 **Group:** BRIDGE **Group Number:** N/A

General Items	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Vegetation	Good condition			N			
Drainage	Good condition			N			
Pier Protection Barrier	The pier protection barriers are in good condition, however they are of inadequate length to effectively protect the pier from impact damage.		28 - 30	Y	R212	Guardrail - Maintain/Repair	1
Scour	None			N			
Signs and Lights	Street lighting along the footbridge			N			
Fences	None			N			
Services on Bridge (types, size, location)	Street lighting along the footbridge			N			

Bridge Number: 9250 **Group:** APPROACH **Group Number:** 2

Component Type	Component Number	Component Material	Modification Status	Unit	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Footpath Railing	LHS	Steel	Existing	Linear m	Minor corrosion is common along the toprail of the railing		42, 45	Y	S324	Bridge - Control Corrosion	2
Footpath Railing	RHS	Steel	Existing	Linear m	Minor corrosion is common along the toprail of the railing		43, 45	Y	S537	Bridge - Control Corrosion	2
Footway	1	Asphalt	Existing	m^2	Cracking to the surfacing and slight trip hazard between the approach and the footbridge		44, 46	Y	R207	Deck Surface - Maintain	1

Bridge Number: 9250 **Group:** DECK **Group Number:** N/A

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Footpath Railing	LHS	Steel	Existing	Linear m						Good condition		2, 48	N			
Footpath Railing	RHS	Steel	Existing	Linear m						Good condition		3, 48,	N			
Footway	1	Jarrah	Existing	m^2						Anti-slip coating has warn away, a couple of the timbers have started rot and potentially act as a trip hazard.		4, 49, 50	Y	R207	Deck Surface - Maintain	1

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** ABUTMENT **Group Number:** 1

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Pile/Column	1-4	Steel	Existing	Linear m		100				Minor corrosion to the columns and the holding down bolts		26	Y	S324	Bridge - Control Corrosion	2
Bracing	1-28	Steel	Existing	Each		100				Minor corrosion to the bracing		25	Y	S324	Bridge - Control Corrosion	2
Footing	1-2	Concrete	Existing	m^2	100				75	Good Condition, however the majority of the footings are buried		25	N			
{Bearing Units shall only be assigned Condition States when structural. In this instance, 'structural' means that the bearing is a rocker, elastomeric or pot bearing. Mortar pad or thin rubber bearings shall be inspected with comments but the Condition State columns shall be greyed out in the inspection report template.}																

Bridge Number: 9250 **Group:** ABUTMENT **Group Number:** 2

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Wing Wall	LHS	Concrete	Existing	m^2	100					Good condition		39	N			
Wing Wall	RHS	Concrete	Existing	m^2	100					Good condition		40	N			
Wall	1	Concrete	Existing	m^2	100					Good condition		5	N			
Bearing Unit	1-2	Rubber	Existing	Each						Bolts to the steel plates are corroded		55	Y	R201	Bearing - Maintain	1
Footing	1	Concrete	Existing	m^2	100					Good condition			N			

{Bearing Units shall only be assigned Condition States when structural. In this instance, 'structural' means that the bearing is a rocker, elastomeric or pot bearing. Mortar pad or thin rubber bearings shall be inspected with comments but the Condition State columns shall be greyed out in the inspection report template.}

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** PIER **Group Number:** 1

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Bracing	1-7	Steel	Existing	Each		100				Minor corrosion common throughout the bracing		21	Y	S324	Bridge - Control Corrosion	2
Column	1-2	Steel	Existing	Linear m		100				Minor corrosion common throughout both columns		21	Y	S324	Bridge - Control Corrosion	2
Footing	1-2	Concrete	Existing	m^2	100				75	Good Condition, however the majority of the footings are buried		21				
{Bearing Units shall only be assigned Condition States when structural. In this instance, 'structural' means that the bearing is a rocker, elastomeric or pot bearing. Mortar pad or thin rubber bearings shall be inspected with comments but the Condition State columns shall be greyed out in the inspection report template.}																

Bridge Number: 9250 **Group:** PIER **Group Number:** 2

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Bracing	1-7	Steel	Existing	Each	100					Good condition		19	N			
Column	1-2	Steel	Existing	Linear m	100					Good condition		19	N			
Footing	1	Concrete	Existing	m^2	100				50	Hairline shrinkage cracking to the exposed concrete. Footing is partially buried		27	N			
Footing	2	Concrete	Existing	m^2					100	Buried			N			
{Bearing Units shall only be assigned Condition States when structural. In this instance, 'structural' means that the bearing is a rocker, elastomeric or pot bearing. Mortar pad or thin rubber bearings shall be inspected with comments but the Condition State columns shall be greyed out in the inspection report template.}																

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** PIER **Group Number:** 3

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Bracing	1-7	Steel	Existing	Each	100					Good condition		17	N			
Column	1-2	Steel	Existing	Linear m	100					Good condition		17	N			
Footing	1	Concrete	Existing	m^2	80	20			50	Shrinkage cracking to the exposed concrete. Footing is partially buried		31	N			
Footing	2	Concrete	Existing	m^2					100	Buried			N			
{Bearing Units shall only be assigned Condition States when structural. In this instance, 'structural' means that the bearing is a rocker, elastomeric or pot bearing. Mortar pad or thin rubber bearings shall be inspected with comments but the Condition State columns shall be greyed out in the inspection report template.}																

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** PIER **Group Number:** 4

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Bracing	1-7	Steel	Existing	Each	100					Good condition		15	N			
Column	1-2	Steel	Existing	Linear m	100					Good condition		15	N			
Footing	1	Concrete	Existing	m^2	80	20			50	Shrinkage cracking to the exposed concrete. Footing is partially buried		35	N			
Footing	2	Concrete	Existing	m^2					100	Buried			N			

{Bearing Units shall only be assigned Condition States when structural. In this instance, 'structural' means that the bearing is a rocker, elastomeric or pot bearing. Mortar pad or thin rubber bearings shall be inspected with comments but the Condition State columns shall be greyed out in the inspection report template.}

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** PIER **Group Number:** 5

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Bracing	1-7	Steel	Existing	Each		100				Minor corrosion common throughout the bracing		53	Y	S324	Bridge - Control Corrosion	2
Column	1-2	Steel	Existing	Linear m		100				Minor corrosion common throughout both columns		53	Y	S324	Bridge - Control Corrosion	2
Footing	1	Concrete	Existing	m^2	100				75	Good Condition, however the majority of the footings are buried		53	N			
{Bearing Units shall only be assigned Condition States when structural. In this instance, 'structural' means that the bearing is a rocker, elastomeric or pot bearing. Mortar pad or thin rubber bearings shall be inspected with comments but the Condition State columns shall be greyed out in the inspection report template.}																

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** PIER **Group Number:** 6

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Bracing	1-7	Steel	Existing	Each		100				Minor corrosion common throughout the bracing		51	Y	S324	Bridge - Control Corrosion	2
Column	1-2	Steel	Existing	Linear m		100				Minor corrosion common throughout both columns		51	Y	S324	Bridge - Control Corrosion	2
Footing	1	Concrete	Existing	m^2	100				75	Good Condition, however the majority of the footings are buried		51	N			
{Bearing Units shall only be assigned Condition States when structural. In this instance, 'structural' means that the bearing is a rocker, elastomeric or pot bearing. Mortar pad or thin rubber bearings shall be inspected with comments but the Condition State columns shall be greyed out in the inspection report template.}																

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** PIER **Group Number:** 7

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Bracing	1-7	Steel	Existing	Each		90		10		Minor corrosion common throughout the bracing. Holding down bolts badly corroding and sheared off.		36	Y	S324	Bridge - Control Corrosion	2
Column	1-2	Steel	Existing	Linear m		100				Minor corrosion common throughout both columns		11	Y	S324	Bridge - Control Corrosion	2
Footing	1	Concrete	Existing	m^2	100				75	Good Condition, however the majority of the footings are buried		11	N			
{Bearing Units shall only be assigned Condition States when structural. In this instance, 'structural' means that the bearing is a rocker, elastomeric or pot bearing. Mortar pad or thin rubber bearings shall be inspected with comments but the Condition State columns shall be greyed out in the inspection report template.}																

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** PIER **Group Number:** 8

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Bracing	1-4	Steel	Existing	Each		100				Minor corrosion common throughout the bracing		9	Y	S324	Bridge - Control Corrosion	2
Column	1-2	Steel	Existing	Linear m		100				Minor corrosion common throughout both columns		9	Y	S324	Bridge - Control Corrosion	2
Footing	1	Concrete	Existing	m^2	100				75	Good Condition, however the majority of the footings are buried		9	N			
{Bearing Units shall only be assigned Condition States when structural. In this instance, 'structural' means that the bearing is a rocker, elastomeric or pot bearing. Mortar pad or thin rubber bearings shall be inspected with comments but the Condition State columns shall be greyed out in the inspection report template.}																

Bridge Number: 9250 **Group:** PIER **Group Number:** 9

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Bracing	1-4	Steel	Existing	Each		100				Minor corrosion common throughout the bracing		7	Y	S324	Bridge - Control Corrosion	2
Column	1-2	Steel	Existing	Linear m		100				Minor corrosion common throughout both columns		7	Y	S324	Bridge - Control Corrosion	2
Footing	1	Concrete	Existing	m^2	100				50	Good Condition, however the majority of the footings are buried		7	N			
{Bearing Units shall only be assigned Condition States when structural. In this instance, 'structural' means that the bearing is a rocker, elastomeric or pot bearing. Mortar pad or thin rubber bearings shall be inspected with comments but the Condition State columns shall be greyed out in the inspection report template.}																

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** SPAN **Group Number:** 1

Span Length (m): _____ (CL to CL) **Span Length (m):** 7.402 (Clear Span)

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Beam	1-2	Steel	Existing	Linear m		100				Minor corrosion common along the beams		22	Y	S324	Bridge - Control Corrosion	2
Bearers	1-2	Jarrah	Existing	Each	100					Good condition		22	N			
Bracing	1-4	Steel	Existing	Each		100				Minor corrosion common along the bracing		22	Y	S324	Bridge - Control Corrosion	2
Tie Beam	1-5	Steel	Existing	Linear m		100				Minor corrosion common along the tie-beams		22	Y	S324	Bridge - Control Corrosion	2
Spiking Beam	1-2	Jarrah	Existing	Each	100					Good condition		22	N			

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** SPAN **Group Number:** 2

Span Length (m): _____ (CL to CL) **Span Length (m):** 11.184 (Clear Span)

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Beam	1-2	Steel	Existing	Linear m	100					Good condition		20	N			
Bearers	1-2	Jarrah	Existing	Each	50	50				Splitting through the centre of the timber bearers		20	Y	S607	Bearer - Repair	1
Bracing	1-5	Steel	Existing	Each	100					Good condition		20	N			
Tie Beam	1-6	Steel	Existing	Linear m	100					Good condition		20	N			
Spiking Beam	1-2	Jarrah	Existing	Each	100					Good condition		20	N			

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** SPAN **Group Number:** 3

Span Length (m): _____ (CL to CL) **Span Length (m):** 11.002 (Clear Span)

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Beam	1-2	Steel	Existing	Linear m	80	20				Minor corrosion to the beams		18	Y	S324	Bridge - Control Corrosion	2
Bearers	1-2	Jarrah	Existing	Each	100					Good condition		18	N			
Bracing	1-5	Steel	Existing	Each	100					Good condition		18	N			
Tie Beam	1-6	Steel	Existing	Linear m	100					Good condition		18	N			
Spiking Beam	1-2	Jarrah	Existing	Each	100					Good condition		18	N			

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** SPAN **Group Number:** 4

Span Length (m): _____ *(CL to CL)* **Span Length (m):** 11.029 *(Clear Span)*

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Beam	1-2	Steel	Existing	Linear m	100					Good condition		16	N			
Bearers	1-2	Jarrah	Existing	Each	100					Good condition		16	N			
Bracing	1-5	Steel	Existing	Each	100					Good condition		16	N			
Tie Beam	1-6	Steel	Existing	Linear m	100					Good condition		16	N			
Spiking Beam	1-2	Jarrah	Existing	Each	100					Good condition		16	N			

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** SPAN **Group Number:** 5

Span Length (m): _____ *(CL to CL)* **Span Length (m):** 9.827 *(Clear Span)*

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Beam	1-2	Steel	Existing	Linear m	100					Good condition		14	N			
Bearers	1-2	Jarrah	Existing	Each		100				Splitting through the centre of the timber bearers		14	Y	S607	Bearer - Repair	1
Bracing	1-5	Steel	Existing	Each		100				Minor corrosion common along the bracing		14	Y	S324	Bridge - Control Corrosion	2
Tie Beam	1-5	Steel	Existing	Linear m		100				Minor corrosion common along the tie-beams		14	Y	S324	Bridge - Control Corrosion	2
Spiking Beam	1-2	Jarrah	Existing	Each	100					Good condition		14	N			

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** SPAN **Group Number:** 6

Span Length (m): _____ (CL to CL) **Span Length (m):** 3.719 (Clear Span)

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Beam	1-2	Steel	Existing	Linear m		100				Minor corrosion common along the beams		52	Y	S324	Bridge - Control Corrosion	2
Bearers	1-2	Jarrah	Existing	Each			100			Splitting through the centre of the timber bearers		52	Y	S607	Bearer - Repair	1
Bracing	1-2	Steel	Existing	Each		100				Minor corrosion common along the bracing		52	Y	S324	Bridge - Control Corrosion	2
Tie Beam	1-3	Steel	Existing	Linear m		100				Minor corrosion common along the tie-beams		52	Y	S324	Bridge - Control Corrosion	2
Spiking Beam	1-2	Jarrah	Existing	Each	100					Good condition		52	N			

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** SPAN **Group Number:** 7

Span Length (m): _____ (CL to CL) **Span Length (m):** 5.873 (Clear Span)

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Beam	1-2	Steel	Existing	Linear m		100				Minor corrosion common along the beams		12	Y	S324	Bridge - Control Corrosion	2
Bearers	1-2	Jarrah	Existing	Each	50		50			Splitting through the centre of the timber bearers		12	Y	S607	Bearer - Repair	1
Bracing	1-5	Steel	Existing	Each		100				Minor corrosion common along the bracing		12	Y	S324	Bridge - Control Corrosion	2
Tie Beam	1-4	Steel	Existing	Linear m		100				Minor corrosion common along the tie-beams		12	Y	S324	Bridge - Control Corrosion	2
Spiking Beam	1-2	Jarrah	Existing	Each	100					Good condition		12	N			
Cross Beam	1-4	Steel	Existing	Linear m		100				Minor corrosion common along the cross-beams		54	Y	S324	Bridge - Control Corrosion	2

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** SPAN **Group Number:** 8

Span Length (m): _____ (CL to CL) **Span Length (m):** 13.538 (Clear Span)

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Beam	1-2	Steel	Existing	Linear m		100				Water staining and minor corrosion common along the beams		10	Y	S324	Bridge - Control Corrosion	2
Bearers	1-2	Jarrah	Existing	Each	100					Good condition		10	N			
Bracing	1-7	Steel	Existing	Each		100				Water staining and minor corrosion common along the bracing		10	Y	S324	Bridge - Control Corrosion	2
Tie Beam	1-8	Steel	Existing	Linear m		100				Water staining and minor corrosion common along the tie-beams		10	Y	S324	Bridge - Control Corrosion	2
Spiking Beam	1-2	Jarrah	Existing	Each	100					Good condition		10	N			

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

Bridge Number: 9250 **Group:** SPAN **Group Number:** 9

Span Length (m): _____ *(CL to CL)* **Span Length (m):** 12.193 *(Clear Span)*

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Beam	1-2	Steel	Existing	Linear m		100				Water staining and minor corrosion common along the beams		8	Y	S324	Bridge - Control Corrosion	2
Bearers	1-2	Jarrah	Existing	Each	100					Good condition		8	N			
Bracing	1-5	Steel	Existing	Each		100				Water staining and minor corrosion common along the bracing		8	Y	S324	Bridge - Control Corrosion	2
Tie Beam	1-6	Steel	Existing	Linear m		100				Water staining and minor corrosion common along the tie-beams		8	Y	S324	Bridge - Control Corrosion	2
Spiking Beam	1-2	Jarrah	Existing	Each	100					Good condition		8	N			

DETAILED VISUAL (LEVEL 2)
BRIDGE INSPECTION REPORT

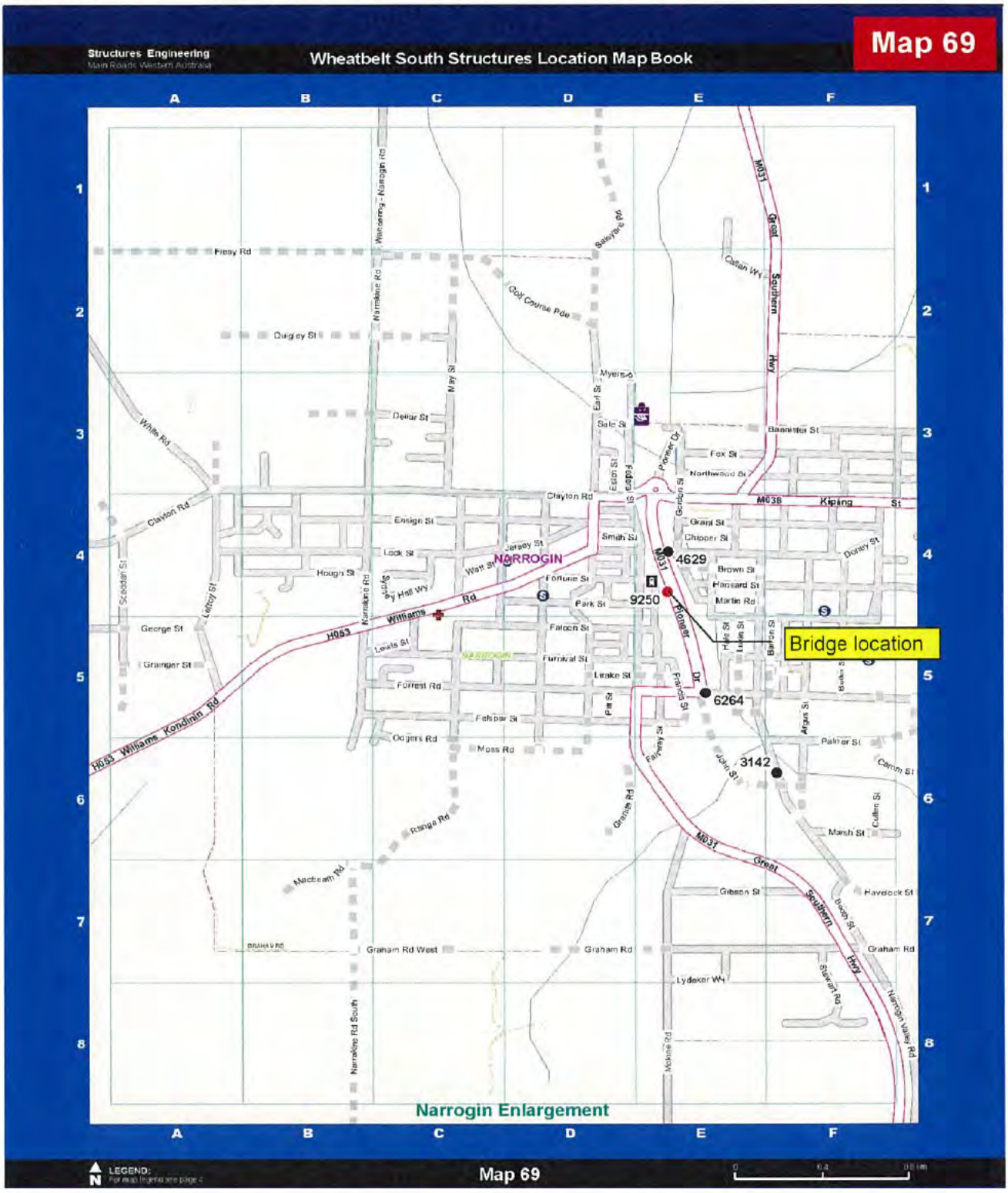
Bridge Number: 9250 **Group:** SPAN **Group Number:** 10

Span Length (m): _____ *(CL to CL)* **Span Length (m):** 5.837 *(Clear Span)*

Component Type	Component Number	Component Material	Modification Status	Unit	Percentage of Inspected Component in Each Condition State 1	2	3	4	Not Inspected (%)	Comments Full description including details of: * Location of defect/condition/item * Description of defects including type, magnitude and extent	Sketch Number	Photograph Number	Work Required	Work Item Number	Work Description	Priority
Beam	1-2	Steel	Existing	Linear m	100					Water staining to the face of the beams		6	N			
Bearer	1-2	Jarrah	Existing	Each	100					Moisture has caused the paintwork to flake off along the top of the bearers		6	N			
Bracing	1-3	Jarrah	Existing	Each	100					Good condition		6	N			
Tie Beam	1-4	Jarrah	Existing	Linear m	100					Good condition		6	N			
Spiking Beam	1-2	Jarrah	Existing	Each	100					Good condition		6	N			

DETAILED VISUAL (LEVEL 2) BRIDGE INSPECTION REPORT

Bridge Number:	**9250**	***Crossing:***	**Northam - Cranbrook Hwy And Rail**
LGA:	**Narrogin (T)**	***Road Name:***	**Northam Cranbrook**
Inspector:	**J Hesketh**	***SLK:***	**167.89**



BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	**9250**	**LGA:**	**Narrogin (T)**	**Date:**	**08/02/2013**
Road Name:	**Northam Cranbrook**	**SLK:**	**167.89**		
Crossing:	**Northam – Cranbrook Hwy & Rail**	**Inspector:**	J Hesketh		

Photo No. 1: Bridge identifier

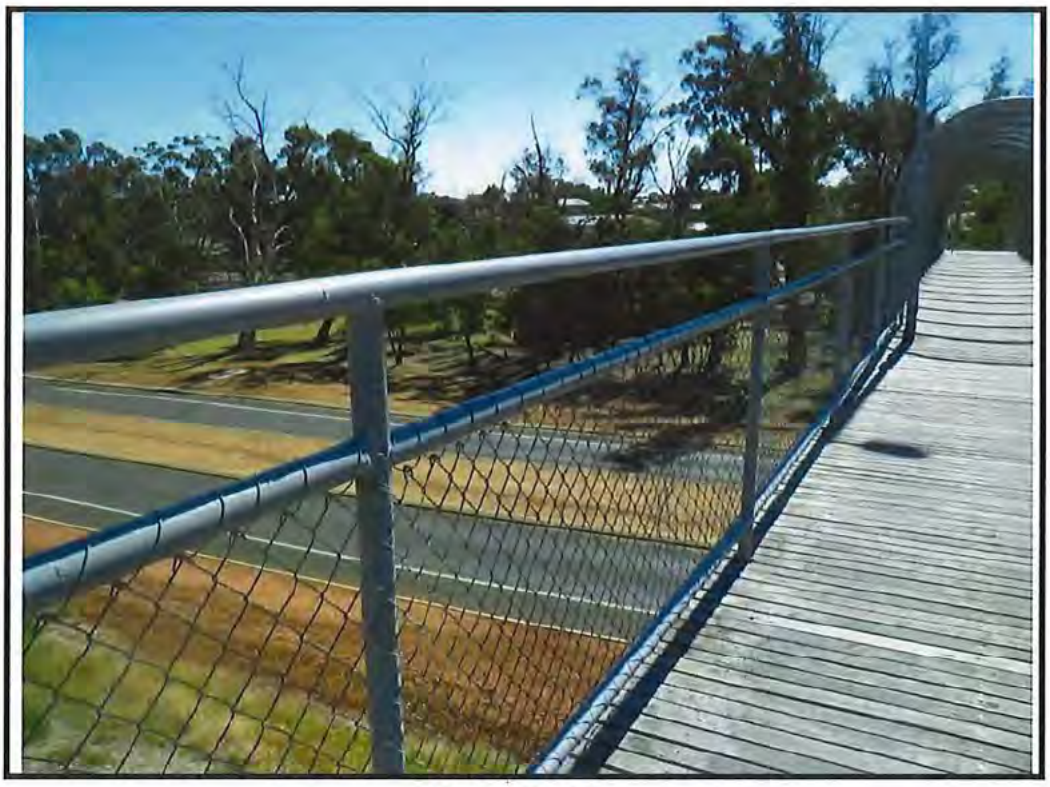


Photo No. 2: LHS

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 3: RHS

Photo No. 4: Deck

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 5: Pilaster 2

Photo No. 6: Span 10

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 7: Pier 9

Photo No. 8: Span 9

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 9: Pier 8

Photo No. 10: Span 8

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 11: Pier 7

Photo No. 12: Span 7

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 13: Bracing to Pier 5 and 6

Photo No. 14: Span 5

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 15: Pier 4

Photo No. 16: Span 4

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	**9250**	**LGA:**	**Narrogin (T)**	**Date:**	**08/02/2013**
Road Name:	**Northam Cranbrook**	**SLK:**	**167.89**		
Crossing:	**Northam – Cranbrook Hwy & Rail**	**Inspector:**	J Hesketh		

Photo No. 17: Pier 3

Photo No. 18: Span 3

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 19: Pier 2

Photo No. 20: Span 2

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 21: Pier 1

Photo No. 22: Span 1

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 23: LHS Elevation

Photo No. 24: RHS Elevation

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 25: Pilaster 1

Photo No. 26: Rusting to all Pilaster 1 bolts – minor surfacing rust to steel

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 27: cracking to surface concrete – Pier 2

Photo No. 28: Inadequate pier protection – Pier 2

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 29: Inadequate pier protection – Pier 3

Photo No. 30: Inadequate pier protection - Pier 4

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 31: cracking to concrete surfacing Pier 3

Photo No. 32: Timber bearing split

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 33: Minor surface corrosion common throughout

Photo No. 34: Carriageway surfacing

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 35: cracking to concrete 4

Photo No. 36: Bolts Pier 7 badly corroded – sheared off

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 37: Typical surface corrosion to Piers

Photo No. 38: Minor surface corrosion to beams - typical

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 39: Pilaster 2 LHS

Photo No. 40: Pilaster 2 RHS

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 41: A2 end view

Photo No. 42: A2 LHS

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 43: A2 RHS

Photo No. 44: Surfacing A2 cracked

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 45: Rusting to approach 2 rails

Photo No. 46: Minor trip hazard A2 end

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 47: A1 view

Photo No. 48: Cage on bridge

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 49: Rotten timber to deck – Span 2

Photo No. 50: Anti-slip surfacing come of the ramp section of deck

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 51: Pier 6

Photo No. 52: Span 6

BRIDGE INSPECTION REPORT
PHOTO SHEET

Bridge No.:	9250	LGA:	Narrogin (T)	Date:	08/02/2013
Road Name:	Northam Cranbrook	SLK:	167.89		
Crossing:	Northam – Cranbrook Hwy & Rail	Inspector:	J Hesketh		

Photo No. 53: Pier 5

Photo No. 54: Surface corrosion to Pier 5 and 6 bracing

Bridge No.:	**9250**	**LGA:**	**Narrogin (T)**	**Date:**	**08/02/2013**
Road Name:	**Northam Cranbrook**	**SLK:**	**167.89**		
Crossing:	**Northam – Cranbrook Hwy & Rail**	**Inspector:**	J Hesketh		

Photo No. 55: Corroded bolts to Pilaster 2

Bridge 3142
Doney Street
Pedestrian Bridge
L2 Inspection

MRWA 51 –4629– 15

DETAILED TIMBER BRIDGE INSPECTION SUMMARY

Bridge No	**4629**	Region:	**Wheatbelt South**
River Name:	**Narrogin Brook**	SLK:	**0.03**
Road:	**Doney Street**	Road No:	**0004**
LGA:	**Narrogin**		

---

1. General

The bridge is very old and is used only by pedestrians.

2. Substructure

2.1 Abutments

Both abutments have failed sheeting that requires replacement.

2.2 Fullcaps

Fullcap ends at both piers are in poor condition. In many places fullcaps are tilted. Abutment 2 fullcap at its joint is drilling poorly.

2.3 Corbels

Pier 2 corbel 1 LHS end is rotted. In many places corbels are tilted.

3. Superstructure

Stringer 5 in span 1 has failed. There is a large hole in road surface above the stringer. Decking in many places is in poor condition.

5. Recommendations

Close the bridge for all traffic.

S. Savic
BRIDGE INSPECTIONS

24 April 2001

ROUTINE MAINTENANCE SUMMARY REPORT OF BRIDGE NO: 4629

File :	51- 4629 -15	RIVER NAME:	**Narrogin Brook**
LGA:	**Narrogin**	ROAD NAME:	**Doney Street**
REGION:	**Wheatbelt South**	SLK:	**0.03**
Date :	**24 April 2001**		

This summary report should be read in conjunction with the attached field inspection report.

A full inspection was carried out on this bridge and the following remarks may be applicable.

Where possible this will be shown by the form ie: [Y] for YES, and [N] for NO.

A	Clean the scuppers and install flashings as required.	N
B	Tighten all the bolts in the bridge and replace the rusty ones.	N
C	Treat the structure for active termites.	N
D	Preventative timber treatment to piles, stringers and ends of all exposed timber.	N
E	Straighten, tighten the bolts, minor repairs and paint the guardrail on the bridge.	N
F	Replace the width marker boards and the signing on the bridge.	N
G	Remove debris and farmers fences under the bridge.	N
H	The approaches at the ends of the bridge require repairs.	N
I	Deck joint maintenance.	N
J	All vegetation around the bridge should be cleared including debris and weed build-up along kerbs.	N
K	Embankment status.	N
L	Monitor scour.	N

PRIORITY FOR ENGINEERING ASSESSMENT:

LOW [ ] MEDIUM [ ] HIGH [ ] URGENT [Y]

(Signed) G. Howe

SHEET No 1 PAGE ..... OF .....

MAIN ROADS Western Australia

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspection No: 3
Bridge No: 4629

Inspected By: PL
Date: 29.3.2001
Checked By: S.SAVIC
Date: 24.04.01

Region : WHEAT BELT SOUTH

Local Government : NARROGIN Road No. : 004

Road Name : DONEY ST SLKm : 0.03

Stream Name : NARROGIN BROOK Overall Length: 11.850m (between ℄ of supports at abutments)

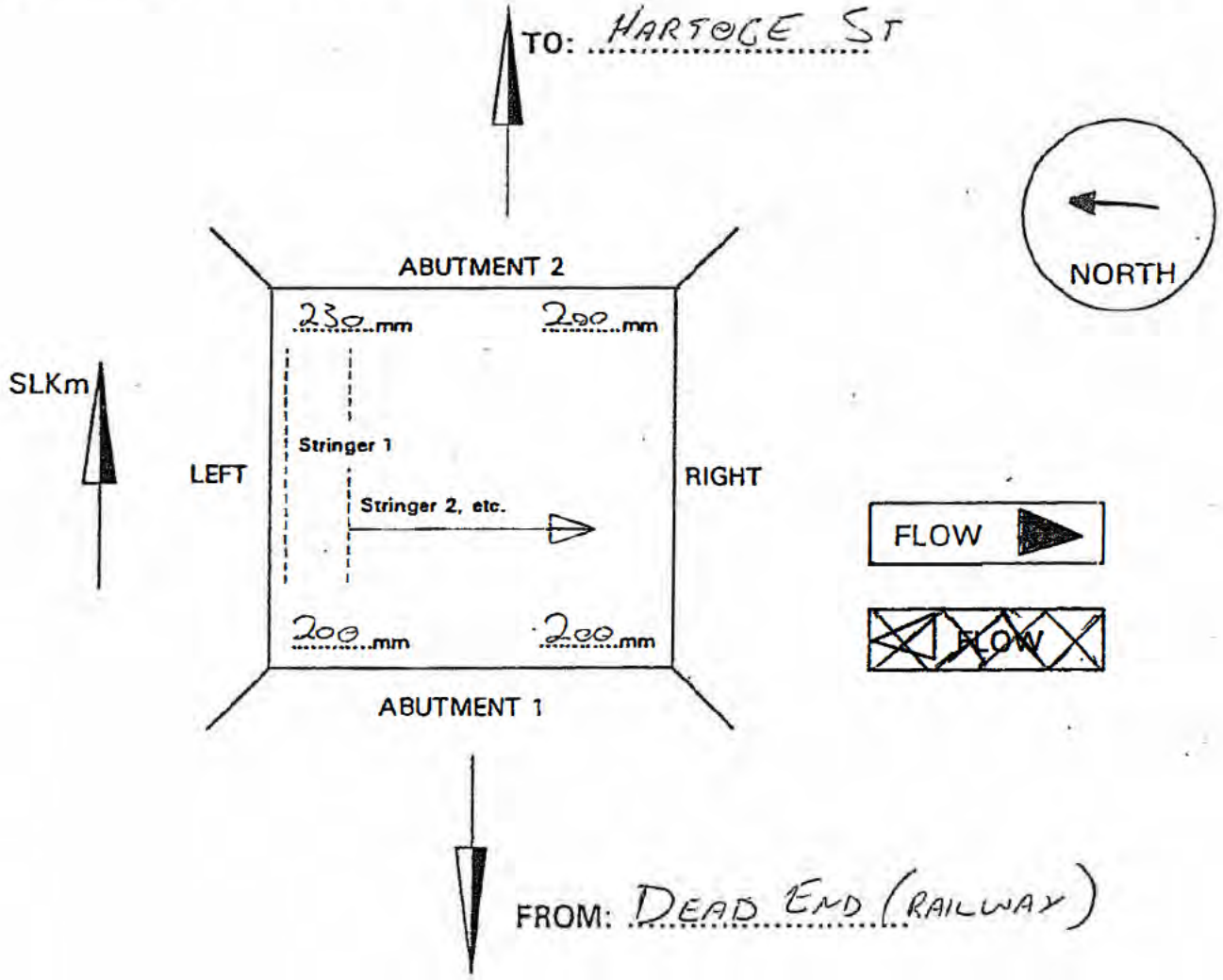
Width Overall : 10.600m Head Room : 1.400m

Spans : 3 Width Between Kerbs: 10.440m Existing Conc Overlay: Y / (N)

GENERAL INFORMATION

Piers are numbered along the bridge in ascending order from ABUTMENT 1 to ABUTMENT 2.
Piles are numbered across the bridge in ascending order from LEFT to RIGHT.
Stringers are numbered across the bridge in ascending order from LEFT to RIGHT.

Pavement depths noted in corners of sketch.



SHEET No 2 PAGE ..... OF .....

MAIN ROADS Western Australia

Inspection No: 3

Bridge No: 4629

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspected By: PL

Date: 29.3.01

Checked By: SS

Date: 24.4.01

GENERAL INFORMATION (cont.)

VEGETATION	MEDIUM GROWTH REQS CLEARING.
STREAM BED CONDITION	MUDDY. GOOD - WATER DEPTH 0.200m MAIN STREAM FLOW SPANS 1 & 2
FENCING AND PAINT CONDITION	NONE
RBING	TIMBER 200W x 80H AT A1 RHS ONLY (1.0m ONLY) WEATHERED - FAIR. THE REST OF KERB IS MISSING. PHOTO
SCUPPERS / FLASHINGS	NONE
ROAD SURFACE CONDITION	SEALED CRACKED & MINOR UNDULATIONS THRU-OUT - FAIR. Large Wheel Track
APPROACHES	SEALED CRACKED MINOR UNDULATIONS - FAIR. MAJOR SCOURING A2 RHS DUE TO STORM WATER DRAINAGE PIPE - PHOTOS.
SIGNING	NONE REQS 4 x WIDTH MARKERS
MITES	ACTIVE SPAN 1 STRS 5 & 6, SPAN 3 STRS 2, 11. ACTIVE ABUT 2 STR 8.
PREVENTIVE FUNGICIDE	NOT TREATED.
SERVICES	NONE. 7 x 120 mm GALV WATER PIPES 1.000 m RHS OF BRIDGE NOT ATTACHED.
ATTACHED FENCES AND OTHER WATERWAY OBSTRUCTIONS	NONE
BRIDGE CONDITION	PRIORITY FOR ENGINEERING ASSESSMENT LOW ☐ MEDIUM ☐ HIGH ☐ URGENT ☑

COMMENTS : ALL STRS ARE SQUARE SAWN. ALL SPANS BEDLOGS BELOW STUB PILES DRILLED IN FEW LOCATIONS - CONSIDERED SOLID T/OUT.

SHEET No 2A

PAGE.....OF.....

MAIN ROADS
Western Australia

Inspection No: 3

Bridge No: 4629

TIMBER BRIDGE DETAILED INSPECTION REPORT

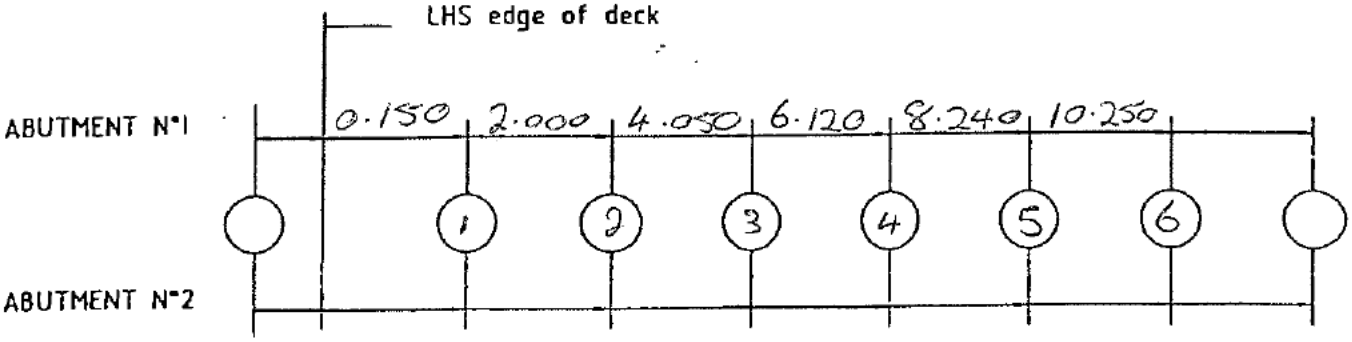
Inspected By: PL

Date: 29.3.01

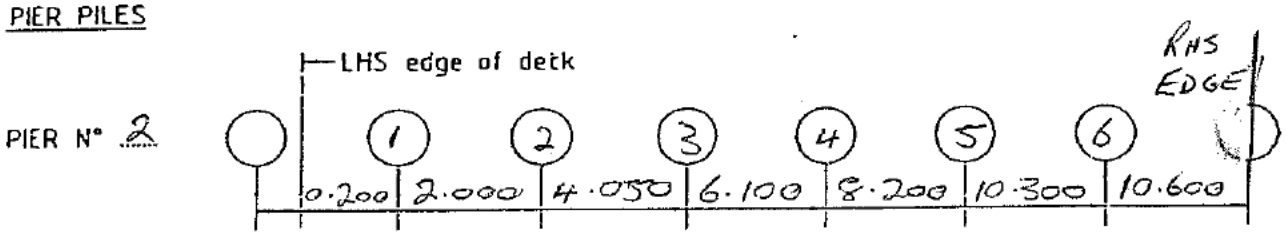
Checked By: SS

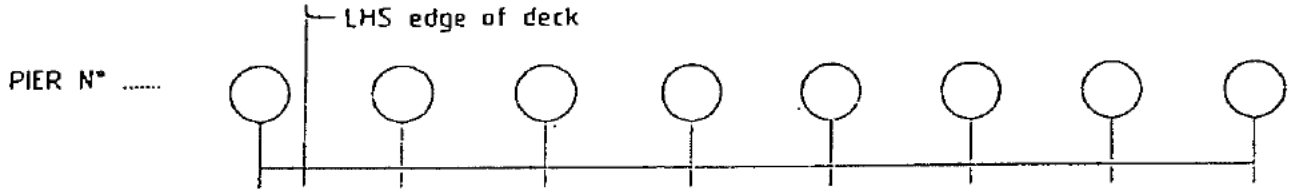
Date: 24.4.01

PILE CENTRES



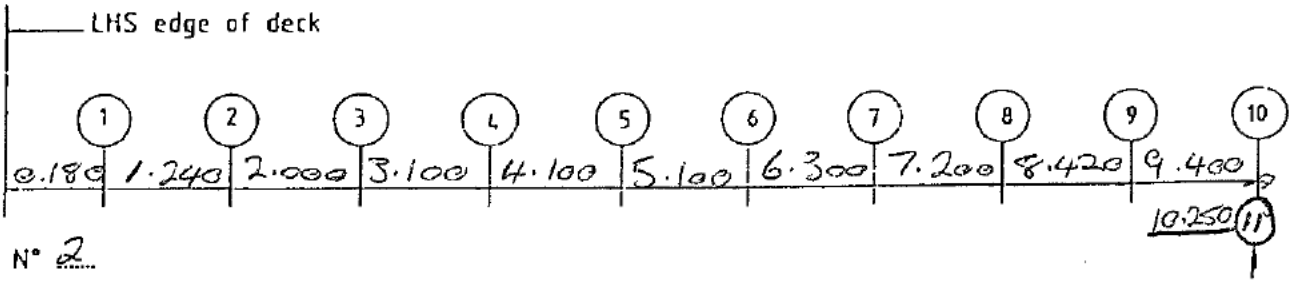
PIER PILES



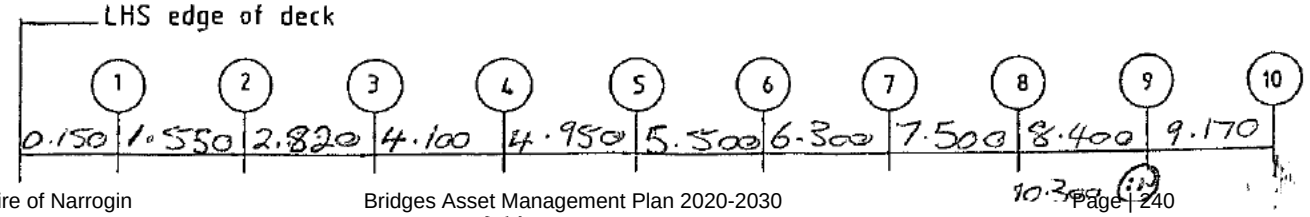


STRINGER SPACING

SPAN N° 1+3



SPAN N° 2



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MAIN ROADS Western Australia

Inspection No: 3

Bridge No: 4629

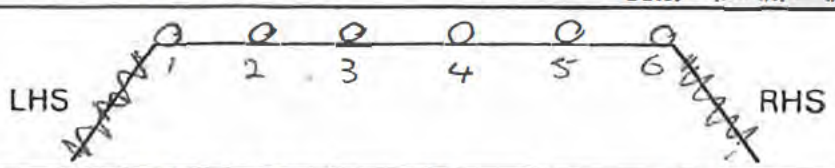
TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspected By: PL

Date: 29.3.01

Checked By: SS

Date: 24.04.01



ABUTMENT : 1

PILE N⁰	DIA mm	TIMBER DRILLING			EXTENT OF ROT		PILE SPLITS		BLAZE MARKINGS		
		Solid	Rot	Pipe	Below GL	Above GL	Type	RQS Band	Marking Fl / m	Ht H/C to Blz	Ht Blz to GL
1	300	120		30		AT TOP	LV ↕	✓2	–	0.800	–
2	270	115		20			–		–	0.500	–
3	250	105		20		AT TOP	–		–	0.300	–
4	260	110		20			–		–	0.300	–
5	280	240					–		–	0.300	–
6	300	130		20			LV ↓	✓2	–	0.0	–
7											
8											
9											
10											
11											
12											
13											
14											
15											

~~SHEETING~~ - WINGWALLS LHS : NATURAL GROUND - MINOR SCOURING - FAIR

RHS : NATURAL GROUND

SHEETING - ABUTMENT ℄ : TOP SHT 10/S REST SOLID

LHS : SOLID

RHS : TOP SHT U/S REST SOLID

WING CAP CONDITION : NATURAL GROUND

FULL ~~HALF~~ CAPS / SILL BEAMS - SIZE : 300 x 300 No. 1 ① LHS END 20/PIPE

COMMENTS : REST SOLID WEATHERED + TERMITE DAMAGE

℄ SOLID RHS END SOLID

TOP SHEET HAS FAILED BEHIND STRS 7, 8, 9, 10, 11

FULL CAPS ARE JOINED BETWEEN PILES 2+3 5+6 BOTH ABUTS.

FULL CAPS ARE PLACED ON CORBELS THAT ARE PLACED ON PILES

IRON WORK HAS HEAVY RUST. T/OUT.

MAIN ROADS
Western Australia

Inspection No: 3
Bridge No: 4629

TIMBER BRIDGE DETAILED INSPECTION REPORT

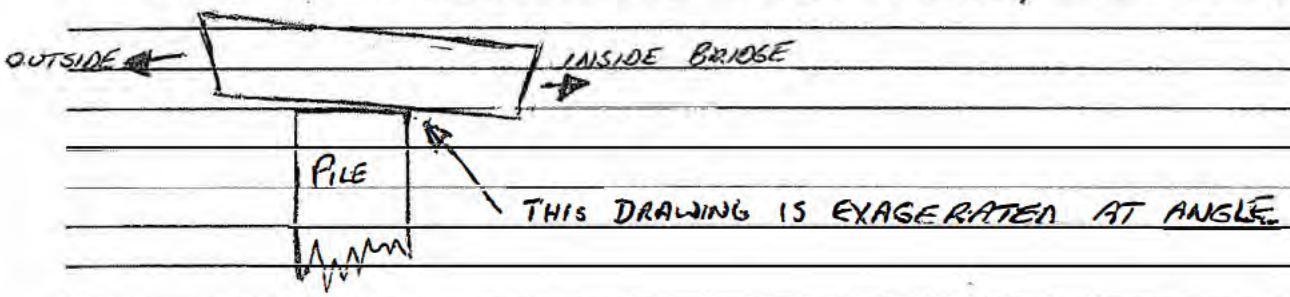
Inspected By: PL
Date: 29.3.01
Checked By: SS
Date: 24.4.01

SPECIAL COMMENTS BRIDGE PART:.....

ABUT 1 CORBELS
#1 BADLY WEATHERED AT LHS END SOLID BUT LOOSE
PHOTOS. REST OF CORBELS SOLID.

BED LOG AT ABUT 1 EXCAVATED LHS BELOW PILE 1
0.900m BELOW. BEDLOG Ø 400 SOLID

ALL PILES ARE STUB PILES PLACED ON BEDLOGS
ALL OUTSIDE CORBELS ARE TILTED SLIGHTLY ON PILES



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MAIN ROADS Western Australia

Inspection No: 3

Bridge No: 4629

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspected By: PL

Date: 29.3.01

Checked By: SS

Date: 24.4.01

PIER Nº : 1

PILE Nº	DIA mm	TIMBER DRILLING			EXTENT OF ROT		SPLITS		BLAZE MARKINGS			HALF CAPS
		Solid	Rot	Pipe	Below GL	Above GL	Type	RQS Band ?	Marking Ft / m	Ht H/C to Blz	Ht Blz to GL	Sags (mm)
1	320	140		20		AT TOP	LV ↑	✓2	–	0.800	–	
2	250	105		20		AT TOP	LV ↕	1 ✓	–	0.800	–	
3	260	100		30		AT TOP	MV ↑		–	0.800	–	
4	260	230					MV ↑		–	0.900	–	
5	300	120		30		AT TOP	NUM LV ↑	✓3	–	0.900	–	
6	280	100		40		AT TOP	NUM LV ↕	✓1	–	0.900	–	
7												
8												
9												
10												

CORBELS : ok 0

IRONWORK : HEAVY RUST

WALERS : SIZE N/A x –

BRACING : SIZE 220 V x 70 H SPLIT AT ENDS REST ok.

~~HALF~~ FULL CAPS : SIZE 300 x 300 LHS END-SOLID. RHS-SOLID.

COMMENTS : RHS END-SOLID.

PILES 1, 2, 3, 5, 6 HAVE SUBSIDED DUE TO SETTLEMENT OF BEDLOGS, MAINLY 1, 2, 3, 6 APPROX 50-60 MM

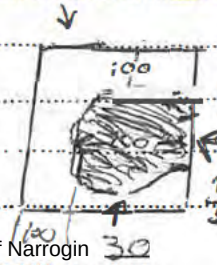
CORBELS 1 & 6 HAVE TILTED OVER - PHOTO

FULL CAP IS JOINED OVER PILE 3 + BETWEEN PILES 4+5

BEDLOG EXCAVATED AT PILE 1 0.900m BELOW. BEDLOG Ø400

APPROX SOLID BEDLOG IS WANDOO

* END VIEW OF FULL CAP LHS – PHOTOS.



PIER 1 SUBSIDED LHS 60-70 MM - PHOTO

RHS POSSIBLY SUBSIDED 20-30 MM

PILE 4 (CENTER OF PIER) IS AT CORRECT HEIGHT? 70MM ABOVE STRING LINE - PHOTO.

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MAIN ROADS Western Australia

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspection No: 3
Bridge No: 4629

Inspected By: PL
Date: 29.3.01
Checked By: SS
Date: 24.4.01

PIER Nº : 2

PILE Nº	DIA mm	TIMBER DRILLING			EXTENT OF ROT		SPLITS		BLAZE MARKINGS			HALF CAPS
		Solid	Rot	Pipe	Below GL	Above GL	Type	ROS Band ?	Marking Ft / m	Ht H/C to Blz	Ht Blz to GL	Sags (mm)
1	300	SEE BELOW					LV ↕	✓ 1	→	0.600	—	
2	290	115		30		AT TOP	NUM LV ↕	✓ 2	→	0.700	—	
3	270	105		30		AT TOP	LV ↓	✓ 2	—	0.700	—	
4	340	170					LV ↓	✓ 2	—	0.500	—	
5	320	130		30		AT TOP	MV ↓		—	0.800	—	
6	320	140		20		AT TOP	NUM LV ↕	✓ 1	—	0.800	—	
7												
8												
9												
10												

CORBELS : #1 REQS REPLACING [1]

IRONWORK : HEAVY RUST

WALERS : SIZE — x N/A

BRACING : SIZE 220V x 70H WEATHERED AND SPLIT AT ENDS - OK

~~HALF~~ FULL CAPS : SIZE 300 x 300 LHS 20/PIPE REST SOLID LHS END

COMMENTS : FULL CAP WEATHERED - OK. & SOLID
RHS END 20/PIPE REST SOLID
FULL CAP JOINED BETWEEN PILES 2+3 PLUS 4+5
BED LOG EXCAVATED AT PILE 1 0.900m DOWN. Ø400 APPROX SOLID.
CORBEL 1 VERY LARGE PIPE & TERMITE DAMAGE
AT LHS END. CONTACT TO PILE 50mm X 80 mm APPROX
AT RHS TOP OF PILE. CORBEL AT THAT POINT A2 30/S
A1. 100/S AT CONTACT POINT. #6 A1 100/S A2 90/S
PILE 1 A1 - 80/S CORBEL 1 END VIEW LHS. PHOTO

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11/96

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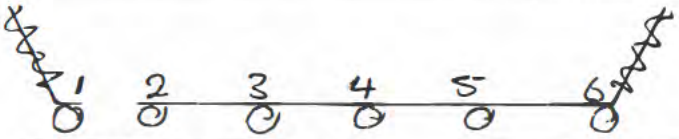
MAIN ROADS Western Australia

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspection No: 3
Bridge No: 4629

Inspected By: PL
Date: 29.3.01
Checked By: SS
Dat e 24.4.01

ABUTMENT : 2



PILE N⁰	DIA mm	TIMBER DRILLING			EXTENT OF ROT		PILE SPLITS		BLAZE MARKINGS		
		Solid	Rot	Pipe	Below GL	Above GL	Type	RQS Band	Marking Ft / m	Ht H/C to Blz	Ht Blz to GL
1	300	120		30		AT TOP	LV ↓	✓	–	0.100	–
2	320	SEE SHT.	COMMENTS		0.400+	TO TOP	–		–	0.400	–
3	290	125		20			–		–	0.400	–
4	280	140					MV ↑		–	0.400	–
5	300	120		30			LV ↑	✓	–	0.300	–
6	300	SEE SHT	COMMENTS			TOP 300 OF PILE	LV ↑	✓	–	0.300	–
7											
8											
9											
10											
11											
12											
13											
14											
15											

~~SHEETING~~ - WINGWALLS LHS : NATURAL GROUND - MAJOR SCOURING - PHOTO
RHS : NATURAL GROUND - ok

SHEETING - ABUTMENT ℄ : TOP SHT U/S REST SOLID
LHS : SOLID
RHS : TOP SHT U/S REST SOLID

WING CAP CONDITION : NATURAL GROUND RHS - ok, LHS MAJOR SCOUR.

FULL CAPS.
~~HALF CAPS~~ / ~~SH1 BEAMS~~ - SIZE 300 x 300 No. 1 LHS END 20/PIPE

COMMENTS : REST SOLID WEATHERED AT END - ok.

FULL CAP AT PILE 4 - 130/S FRONT 40/S BACK REST PIPE. FULL CAP BELOW STR 6 - 130/S FRONT PIPE TO BACK. VERTICLE 90/S BOTTOM 60/S TOP REST PIPE. BEDLOG BELOW PILE 6 EXCAVATED 0.900m DOWN Ø 300 SOLID. TOP SHEETING U/S BETWEEN STRS 4 + 11.

IRON WORK HAS HEAVY RUST.

MAIN ROADS Western Australia

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspection No: 3
Bridge No: 4629

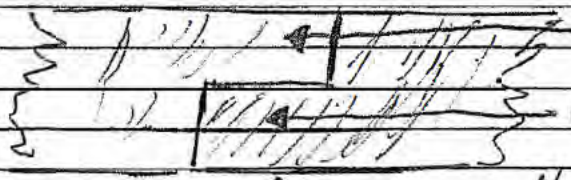
Inspected By: PL
Date: 29.3.01
Checked By: SS
Date: 24.4.01

SPECIAL COMMENTS **BRIDGE PART:**.....

ABUT 2

CORBEL 1 A1 100/S A2 80/S ONLY SEATED RHS OF PILE DUE TO CORBEL TILTING

FULL CAP UNDER STR 8



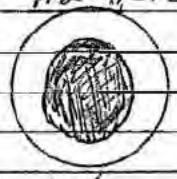
FULL CAP BELOW STR 9 50/S FRONT 20/S BACK REST IS PIPE. VERTICLE 40/S BOTTOM 50/S TOP REST PIPE

FULL CAP BELOW STR 10 40/S FRONT 40/S BACK REST PIPE. VERTICLE 30/S BOTTOM 90/S TOP REST PIPE.

FULL CAP RHS END BELOW STR 11 50/S FRONT 60/S BACK REST PIPE.

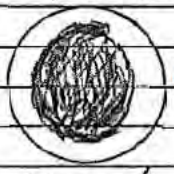
CORBEL 6 SEATED LHS DUE TO TILTING 160/S FRONT 90/S BACK REST PIPE & ROT.

PILE 2 A2-70/S



A1 - 60/S

PILE 6 A2-50/S



A1-50/S

SHEET No 6 PAGE ..... OF .....

MAIN ROADS Western Australia

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspection No: 3
Bridge No: 4629

Inspected By: PL
Date: 29.3.01
Checked By: SS
Date: 24.4.01

STRINGERS - SPAN Nº : 1

FAILED

*REFER TO LEGEND FOR DRILLING LOCATIONS

	STRINGER Nº		1	2	3		5	6	7	8	9	10	11	12
ABUT 1	H DIAMETER		260	260	260	260	260	260	260	290	260	260	260	
	V MEASUREMENT		260	260	260	260	260	260	260	260	260	260	260	
	DRILL VERT	Solid	110	110	110	110	110	110	90	110	60	110	100	
		Rot												
		Pipe	20	20	20	20	20	20	P TO TOP	20	P TO TOP	20	30	
	DRILL HORIZ.	Left							100		80			
		Right							50		60			
	VERTICAL SPLIT	Large / Minor					✓				✓	✓		
	HORIZ. SPLIT	Large / Minor			✓									
	ROS BOLTING?	V.Split / H.Split			✓		✓				✓	✓		

MID SPAN	H DIAMETER		260	260	260	260	260	260	260	260	260	260	260	
	V MEASUREMENT		260	260	260	260	260	260	260	260	260	260	260	
	DRILL VERT	Solid	130	120	80	130	100	130	110	110	110	100	100	
		Rot												
		Pipe		P TO TOP	50		30		20	20	20	30	30	
	DRILL HORIZ.	Left		70	70									
		Right		100	90									
	SPLIT	Vert / Horiz			L		L L				L	L		
	ROS BOLTING?	V.Split / H.Split			✓		✓ ✓				✓	✓		

ABUT 2	H DIAMETER		260	260	260	260	260	260	260	260	260	260	260	
	V MEASUREMENT		120	260	260	260	140	120	120	120	120	260	130	
	DRILL VERT	Solid	40	70	130	130	50	60	70	40	60	110	25	
		Rot												
		Pipe	20	60			20		P TO TOP	20		20	50	
	DRILL HORIZ.	Left		70					90				110	
		Right		80					90				90	
	VERTICAL SPLIT	Large / Minor	✓				✓				✓	✓	✓	
	HORIZ. SPLIT	Large / Minor			✓		✓						✓	
	ROS BOLTING?	V.Split / H.Split	✓		✓		✓ ✓				✓	✓	✓ ✓	

COND OF BEARERS : NOT APPLICABLE ✓ SIZE — X — S — Rot —

COND OF SPIKING PLANK : NOT APPLICABLE ✓ SIZE — X — S — Rot —

CONDITION OF DECKING : S/Rot 80 20 % COND OF DECK ENDS : S/Rot 50 50 %

COMMENTS : STRS ARE PLACED ON FULL CAPS THRU-OUT.
ACTIVE TERMITES STRS 5,6,11 . DECKING SIZE 220H x 120V
STR 5 U/S A2END DUE TO LARGE HORRIZONTAL SPLIT - PHOTO.
STRS OVERLAPPED Nos 1,5,6,7,8,9,11

SHEET No 8 PAGE ..... OF .....

MAIN ROADS
Western Australia

Inspection No: 3
Bridge No: 4629

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspected By: PC
Date: 29.3.01
Checked By: SS
Date: 24.4.01

SPECIAL COMMENTS

BRIDGE PART:.....

SPAN 1 1 PCE DECKING NEAR U/S BETWEEN STRS 8+9 PICK 1 END.

SHEET No 6 PAGE ..... OF .....

MAIN ROADS Western Australia

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspection No: 3
Bridge No: 4629

Inspected By: PL
Date: 29.3.01
Checked By: SS
Date: 24.4.01

STRINGERS - SPAN NO : 2

*REFER TO LEGEND FOR DRILLING LOCATIONS

	STRINGER NO		1	2	3		5	6	7	8	9	10	11	12
ABUT 1 END	H DIAMETER		260	260	260	260	260	260	260	260	260	260	260	
	V MEASUREMENT		260	260	260	120	120	260	120	260	130	260	130	
	DRILL VERT	Solid	110	130	130	110	60	120	60	130	55	110	45	
		Rot												
		Pipe	20			20		10			10	20	20	
	DRILL HORIZ.	Left												
		Right												
	VERTICAL SPLIT	Large / Minor		✓		✓	✓				✓		✓	
	HORIZ SPLIT	Large / Minor				✓								
	RQS BOLTING?	V.Split / H.Split		✓		✓					✓2			

MID SPAN	H DIAMETER		260	260	260	260	260	260	260	260	260	260	260	
	V MEASUREMENT		260	260	260	260	260	260	260	260	260	260	260	
	DRILL VERT	Solid	100	130	110	130	130	110	130	130	130	100	110	
		Rot												
		Pipe	30		20			20				30	20	
	DRILL HORIZ.	Left												
		Right												
	SPLIT	Vert / Horiz		✓		✓					✓			
	RQS BOLTING?	V.Split / H.Split		✓		✓					✓2			

ABUT 2 END	H DIAMETER		260	260	260	260	260	260	260	260	260	260	260	
	V MEASUREMENT		120	260	260	120	120	120	120	260	120	260	120	
	DRILL VERT	Solid	40	100	130	60	60	40	60	130	40	130	40	
		Rot												
		Pipe	20	30	20			20		FSP	20		20	
	DRILL HORIZ.	Left								50				
		Right								90				
	VERTICAL SPLIT	Large / Minor	✓	✓		✓		✓		✓	✓			
	HORIZ. SPLIT	Large / Minor				✓		✓	✓					
	RQS BOLTING?	V.Split / H.Split	✓	✓		✓		✓	✓	✓	✓			

COND OF BEARERS : NOT APPLICABLE ✓ SIZE — X — S — Rot —

COND OF SPIKING PLANK : NOT APPLICABLE ✓ SIZE — X — S — Rot —

CONDITION OF DECKING : S/Rot 80 | 20 % COND OF DECK ENDS : S/Rot 50 | 50 %

COMMENTS : .....

.....

.....

SHEET No 6 PAGE ..... OF .....

MAIN ROADS Western Australia

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspection No: 3
Bridge No: 4629

Inspected By: PL
Date: 29.3.01
Checked By: SS
Date: 24.4.01

STRINGERS - SPAN NO : 3

*REFER TO LEGEND FOR DRILLING LOCATIONS

	STRINGER NO		1	2	3	4	5	6	7	8	9	10	11	12
ABUT 1 END	H DIAMETER		260	260	260	260	260	260	260	260	260	260	260	
	V MEASUREMENT		260	260	260	260	120	260	120	260	120	260	120	
	DRILL VERT	Solid	20	130	190	100	20	120	60	70	60	110		
		Rot												
		Pipe	P TO TOP		30	30	40	P TO TOP		60		20	20	
	DRILL HORIZ.	Left	60				120	60		80				
		Right	90				90	80		60				
	VERTICAL SPLIT	Large / Minor	✓			✓	✓				✓	✓		
	HORIZ. SPLIT	Large / Minor											✓	
	ROS BOLTING?	V.Split / H.Split	✓			✓	✓				✓	✓	✓	

MID SPAN	H DIAMETER		260	260	260	260	260	260	260	260	260	260	260	
	V MEASUREMENT		260	260	260	260	260	260	260	260	260	260	260	
	DRILL VERT	Solid	70	110	110	110	110	70	130	80	130	130 AT TOP	60	
		Rot												
		Pipe	P TO TOP	20	20	20	20	P TO TOP		P TO TOP		130	70	
	DRILL HORIZ.	Left	80					70		40		80	60	
		Right	110					50		80		90	100	
	SPLIT	Vert / Horiz			L	L	L				L	L	L	
	ROS BOLTING?	V.Split / H.Split			✓	✓	✓				✓	✓	✓	

ABUT 2 END	H DIAMETER		260	260	260	260	260	260	260	260	260	260	260	
	V MEASUREMENT		260	260	260	260	260	260	260	260	260	260	260	
	DRILL VERT	Solid	90	80	130	80	90	40	120	50	110	110	70	
		Rot							R TO TOP					
		Pipe	40	50		P TO TOP	P TO TOP	P TO TOP		80	20	20	P TO TOP	
	DRILL HORIZ.	Left	110	80		70	80	80	70	60			70	
		Right	100	90		130	110	40	70	40			50	
	VERTICAL SPLIT	Large / Minor				✓	✓				✓	✓		
	HORIZ. SPLIT	Large / Minor			✓								✓	
	ROS BOLTING?	V.Split / H.Split			✓	✓	✓				✓	✓	✓	

COND OF BEARERS : NOT APPLICABLE ✓ SIZE — X — S — Rot —

COND OF SPIKING PLANK : NOT APPLICABLE ✓ SIZE — X — S — Rot —

CONDITION OF DECKING : S/Rot 80 20 %

COND OF DECK ENDS : S/Rot 50 50 %

COMMENTS : STRS 2,11 ACTIVE TERMITES. STR 7 IS JARRAH

STR 10 PIPE

CROSS SECTION. PIPE IN STR 10 EXTENDS FROM A1 END TO NEAR A2 END

ACTIVE TERMITE NEST STR 8 A2 END

MAIN ROADS Western Australia 3912/01/03/11 Rev 2 11/96

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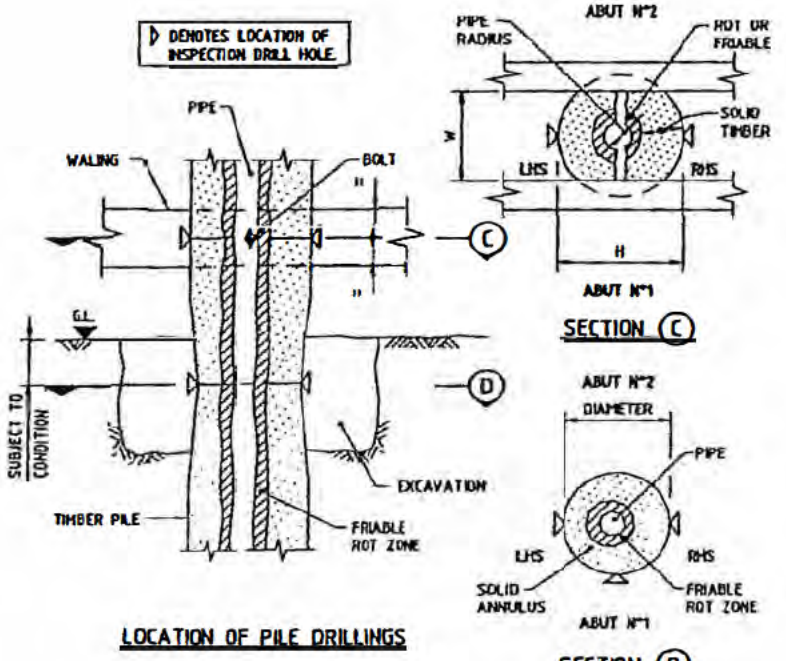
MAIN ROADS
Western Australia

Inspection No:.....

Bridge No:.....

TIMBER BRIDGE DETAILED INSPECTION REPORT



LOCATION OF PILE DRILLINGS

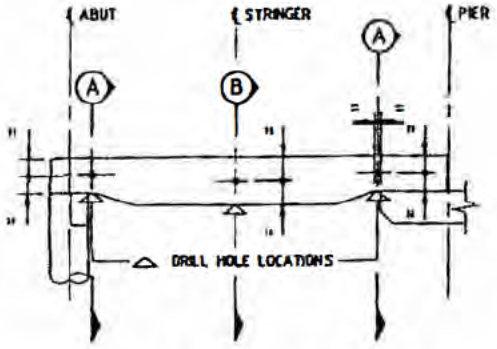
IF FIRST DRILL LOCATION IS ≤ 100 THEN DRILL BOTH ALTERNATE LOCATIONS.

LEGEND

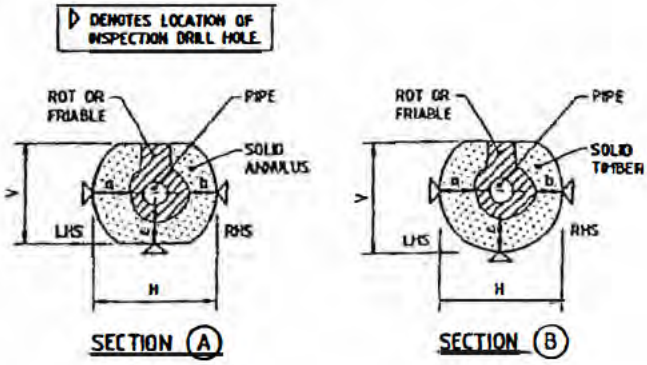
LVS - LARGE VERTICAL SPLIT
MVS - MINOR VERTICAL SPLIT
LHS - LARGE HORIZONTAL SPLIT
MHS - MINOR HORIZONTAL SPLIT
LDS - LARGE DIAGONAL SPLIT
MDS - MINOR DIAGONAL SPLIT
RQS - REQUIRES BANDING/BOLTING

PRIORITY BOLT/BAND
0 - A.S.A.P.
1 - ROUTINE MAINTENANCE
2 - LOW PRIORITY

P - PIPE
F - FRIABLE
S - SOLID
N/A - NOT APPLICABLE
V - VERTICAL
H - HORIZONTAL
D - PIPE DIAMETER
W - WIDTH BETWEEN WALING
GL - GROUND LEVEL
Str - STRINGER
Ht - HEIGHT
℄ - CENTRE LINE
H/C - HALF CAP
Blz - BLAZE
O/A - OVERALL
LHS - LEFT HAND SIDE
RHS - RIGHT HAND SIDE
Ft - FEET
Cond - CONDITION
US - UNSOUND (STRUCTURALLY)



LOCATION OF STRINGER DRILLINGS

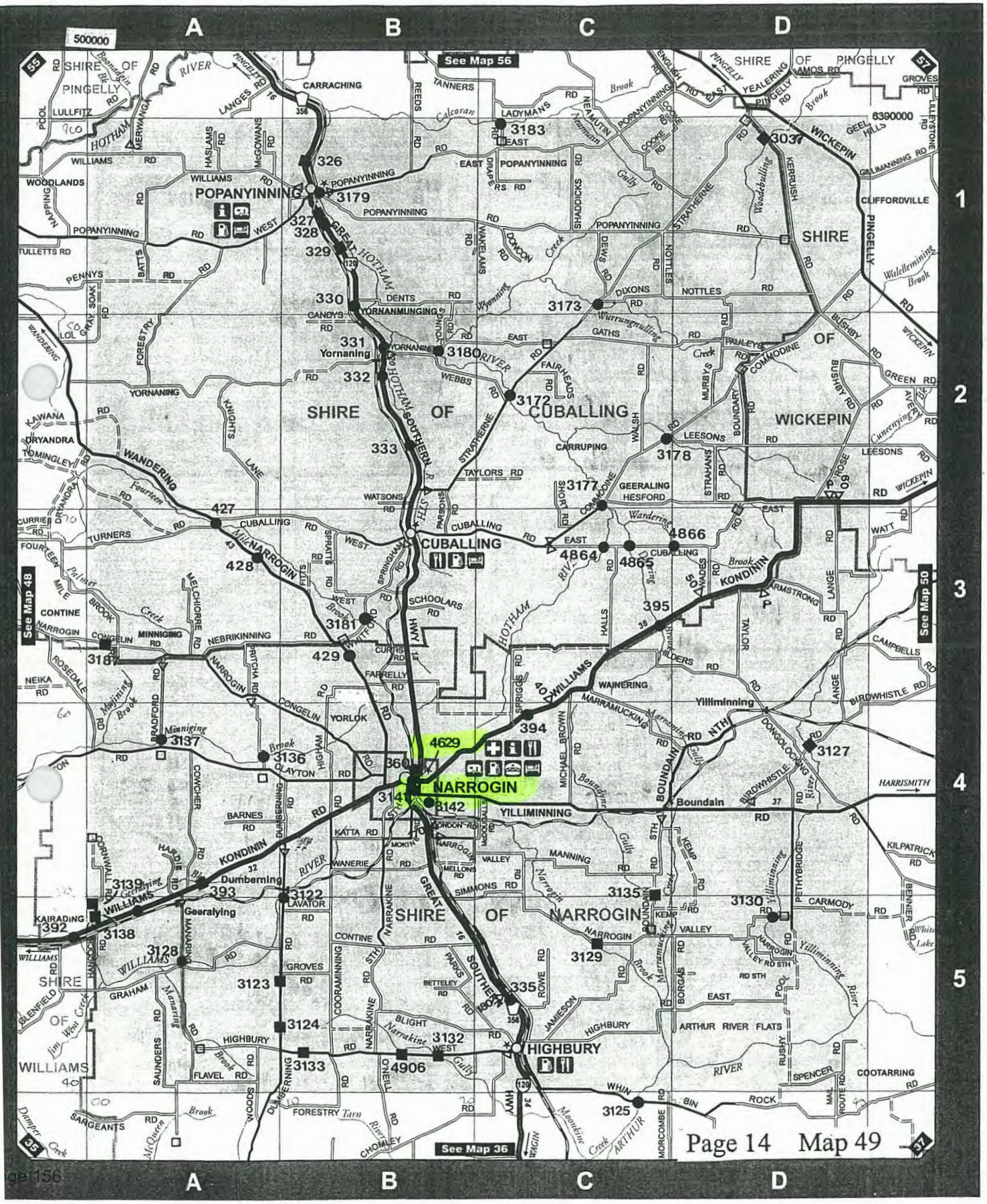


WHEN 'c' ≤ 100 THEN DRILL 'a' AND 'b'

NOTE: All dimensions are of solid timber excluding sap wood and any surface rot on piles and stringers

MAP 49

Scale 1 : 250 000
(1cm = 2.5km)
For scale bar see page14



MAIN ROADS Western Australia

Inspection No: 3

Bridge No: 4629

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspected By: PL

Date: 29.3.01

Checked By: SS

Date: 24.4.01

PHOTOGRAPHIC RECORD

PHOTO CHECK LIST

- General view of Bridge, for site information.
- Abutment detail, especially if scour a problem.
- Wing wall detail - show scale of piles.
- Pier detail - show widening if present.
  do half caps change in size, or are they repaired?
- Accident or fire damage, or vandalism?
- Significant services - how do they interact with abutments. piers?
- Footway details?
- Extent of scour holes, and subsequent structural damage (broken half caps, etc.).
- Are spans propped?
- Serious decay, termite attack or splitting of major members.

Where views of individual structural members are taken, details of Pier/Span N° and Pile/Stringer No should be recorded with comments.
Several aspects from the check list may be included in each photograph. In darkened areas, flash photography should normally be used.

NEGATIVE N° (from camera dial)	CAPTION
12	4629
13	OVERAL VIEW FROM ABUT 1
14	LHS VIEW FROM ABUT 2
15	RHS VIEW FROM ABUT 1
16	MAJOR SCOUR AT ABUT 2 LHS APPROACH - FROM A2 END
17	MAJOR SCOUR AT ABUT 2 LHS APPROACH - FROM LHS
18	KERB MISSING BOTH SIDES TYPICAL
19	ABUT 1 LHS + LHS WING LAYOUT.
20	ABUT 1 LAYOUT -LHS
21	ABUT 1 LAYOUT RHS
22	ABUT 1 CORBEL 1 LHS END COND. NB FULL CAP
23	ABUT 1 CORBEL 1 TILTED
24	PIER 1 LAYOUT AT LHS FROM A1
25	PIER 1 LAYOUS AT RHS FROM A1

SHEET No 9 PAGE ..... OF .....

MAIN ROADS Western Australia

Inspection No: 3

Bridge No: 4629

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspected By: PL

Date: 29.3.01

Checked By: SS

Date: 24.4.01

PHOTOGRAPHIC RECORD

PHOTO CHECK LIST

- General view of Bridge, for site information.
- Abutment detail, especially if scour a problem.
- Wing wall detail - show scale of piles.
- Pier detail - show widening if present.
  do half caps change in size, or are they repaired?
- Accident or fire damage, or vandalism?
- Significant services - how do they interact with abutments. piers?
- Footway details?
- Extent of scour holes, and subsequent structural damage (broken half caps, etc.).
- Are spans propped?
- Serious decay, termite attack or splitting of major members.

Where views of individual structural members are taken, details of Pier/Span N° and Pile/Stringer No should be recorded with comments.
Several aspects from the check list may be included in each photograph. In darkened areas, flash photography should normally be used.

NEGATIVE N° (from camera dial)	CAPTION
	NEW ROLL.
0	4629
1	PIER 1 LHS END SHOWING SUBSIDENCE 60-70 MM
	FULL CAP COND + CORBEL 1 LHS END COND.
2	PIER 1 RHS END COND. NB STR 11 A2 END
	LARGE HORRIZONTAL SPLIT AT CHECK OUT.
3	SPAN 1 STR 5 A2 END COND FROM A1 LHS.
4	SPAN 1 STR 5 A2 END VIEW FROM BOTTOM.
5	PIER 2 LHS END COND. NB CORBEL 1 COND.
6	PIER 1 LHS END A1 SIDE COND.
7	PIER 2 LHS END A2 SIDE COND OF CORBEL
8	PIER 1 PILE 4 AT CORRECT HEIGHT.
9	PIER 1 AT PILE 4 SHOWING TIEING BARS TYPICAL
10	PIER 2 RHS END COND NB OVERLAPPING STRS
11	PIER 2 LAYOUT FROM A1 RHS.
12	ABUT 2 LHS LAYOUT FROM LHS A1

SHEET No 9 PAGE ..... OF .....

MAIN ROADS Western Australia

Inspection No: 3

Bridge No: 4629

TIMBER BRIDGE DETAILED INSPECTION REPORT

Inspected By: PL

Date: 29.3.01

Checked By: SS

Date: 24.4.01

PHOTOGRAPHIC RECORD

PHOTO CHECK LIST

- General view of Bridge, for site information.
- Abutment detail, especially if scour a problem.
- Wing wall detail - show scale of piles.
- Pier detail - show widening if present.
  do half caps change in size, or are they repaired?
- Accident or fire damage, or vandalism?
- Significant services - how do they interact with abutments. piers?
- Footway details?
- Extent of scour holes, and subsequent structural damage (broken half caps, etc.).
- Are spans propped?
- Serious decay, termite attack or splitting of major members.

Where views of individual structural members are taken, details of Pier/Span Nº and Pile/Stringer No should be recorded with comments.
Several aspects from the check list may be included in each photograph. In darkened areas, flash photography should normally be used.

NEGATIVE Nº (from camera dial)	CAPTION
13	ABUT 2 RHS LAYOUT FROM RHS A/
14	ABUT 2 LHS FULL CAP & CORBEL / COND.
15	ABUT 2 LHS FULL CAP + CORBEL / COND.
16	ABUT 2 LHS END FULL CAP + CORBEL FRONT VIEW
	NB END OF BRACING TYPICAL
17	ABUT 2 FULL CAP COND BELOW STRS 7, 8, 9
18	ABUT 2 RHS END FULL CAP + CORBEL 6 COND
19	SPAN 3 STR 10 SHOWING LARGE PIPE AT BOTTOM.
	ALMOST FULL LENGTH OF STR
20	STR OVERLAPS TYPICAL
	MAJOR FAILURE IN ROAD SURFACE OVER STR 5 SPAN 1
	STRINGER 5 SPAN 1 - SPLIT & BROKEN
	DECKING COLLASPED AT STR 5 ABT 1 END

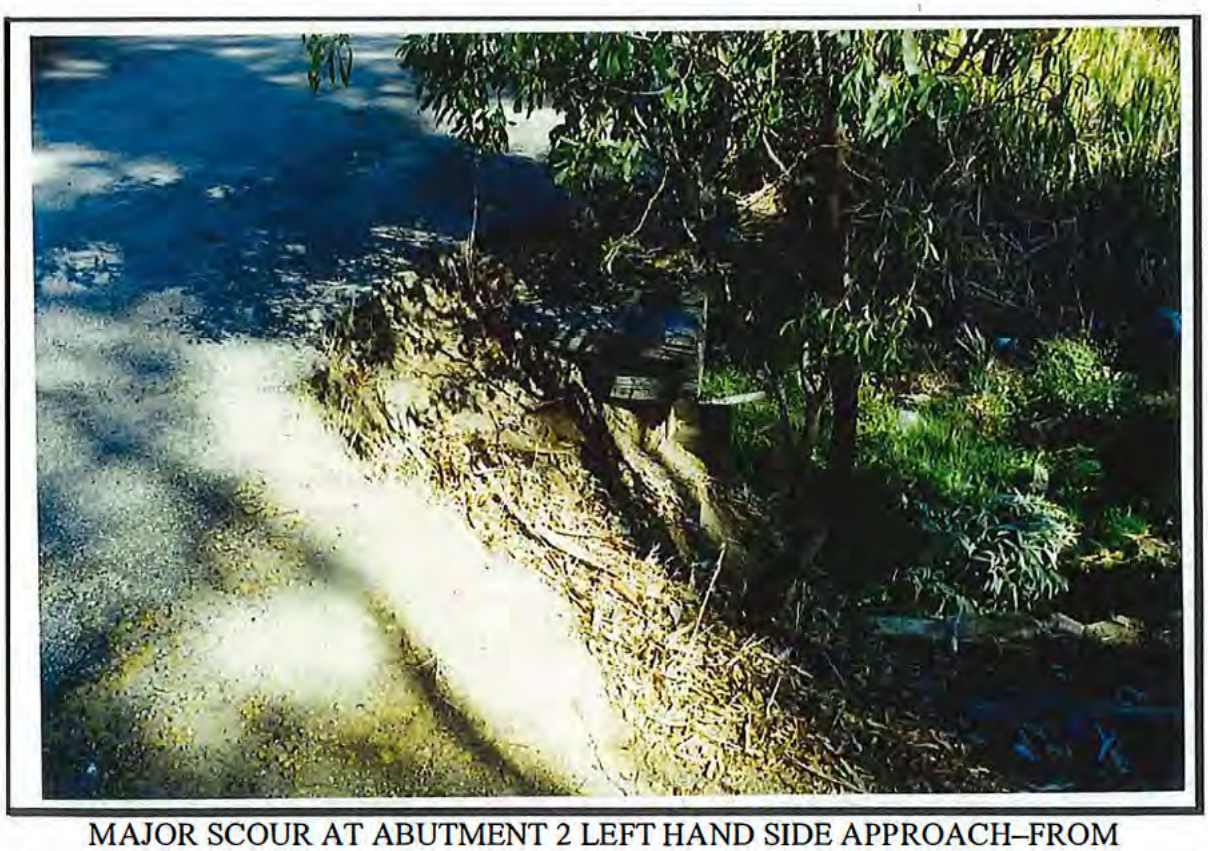
Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

OVERALL VIEW FROM ABUTMENT 1

LEFT HAND SIDE VIEW FROM ABUTMENT 2

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

RIGHT HAND SIDE VIEW FROM ABUTMENT 1



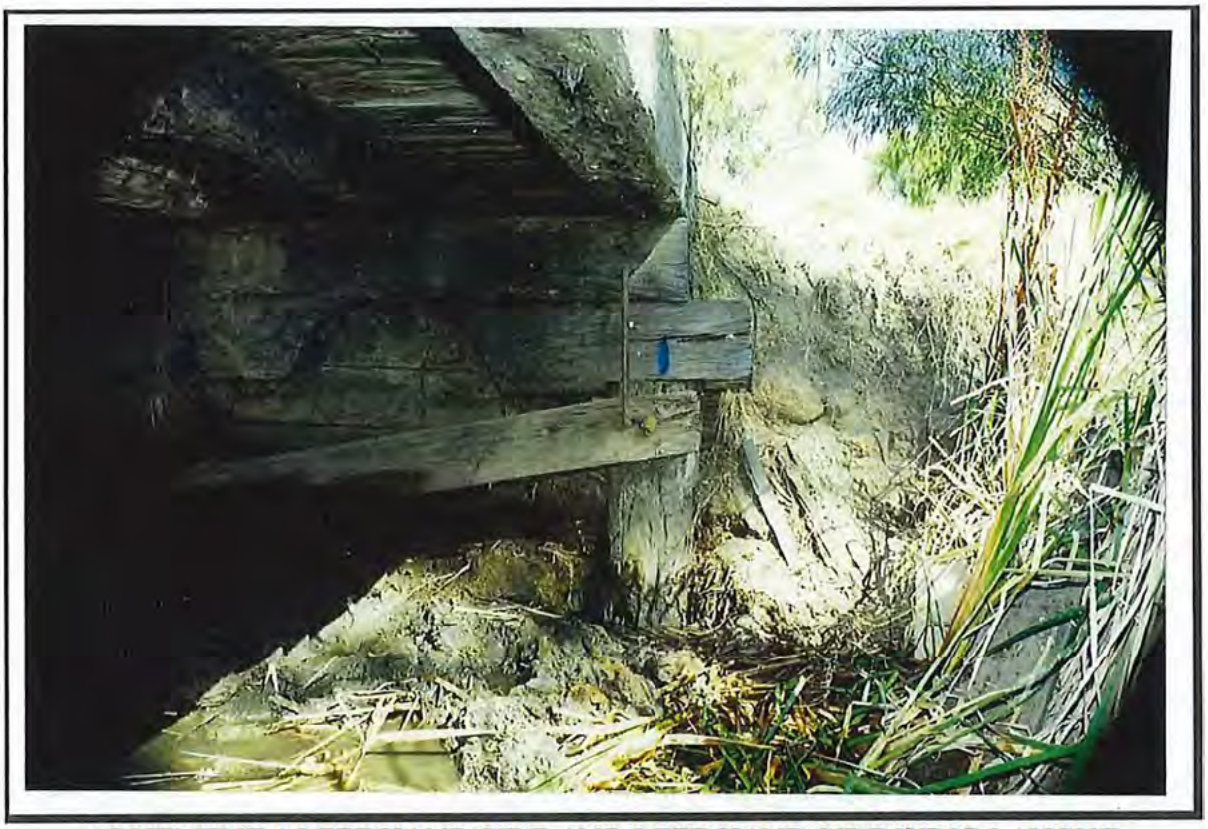
MAJOR SCOUR AT ABUTMENT 2 LEFT HAND SIDE APPROACH–FROM ABUTMENT 2 END

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

MAJOR SCOUR AT ABUTMENT 2 LEFT HAND SIDE APPROACH – FROM LEFT HAND SIDE

KERB MISSING BOTH SIDES TYPICAL

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**



ABUTMENT 1 LEFT HAND SIDE AND LEFT HAND SIDE WING LAYOUT

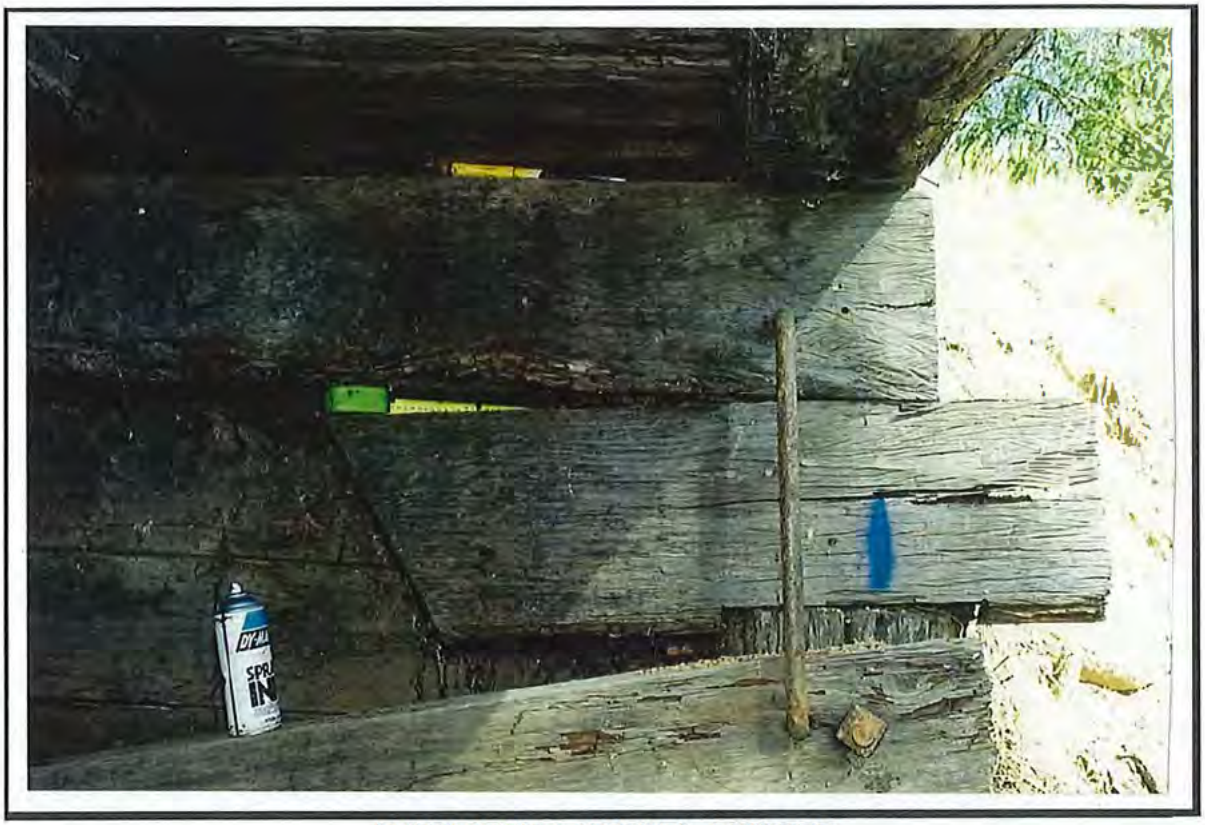
ABUTMENT 1 LAYOUT LEFT HAND SIDE

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

ABUTMENT 1 LAYOUT RIGHT HAND SIDE

ABUTMENT 1 CORBEL 1 LEFT HAND SIDE END CONDITION - NB FULL CAP

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**



ABUTMENT 1 CORBEL 1 TILTED

PIER 1 LAYOUT AT LEFT HAND SIDE FROM ABUTMENT 1

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

PIER 1 LAYOUT AT RIGHT HAND SIDE FROM ABUTMENT 1

PIER 1 LEFT HAND SIDE SHOWING SUBSIDENCE 60-70MM FULL CAP CONDITION & CORBEL 1 LEFT HAND SIDE END CONDITION

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

PIER 1 RIGHT HAND SIDE END CONDITION - NB STRINGER 11 END LARGE HORIZONTAL SPLIT AT CHECK OUT

SPAN 1 STRINGER 5 ABUTMENT 2 END CONDITION FROM ABUTMENT 1 LHS

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

SPAN 1 STRINGER 5 ABUTMENT 2 END VIEW FROM BOTTOM

PIER 2 LEFT HAND SIDE END CONDITION-NB CORBEL 1 CONDITION

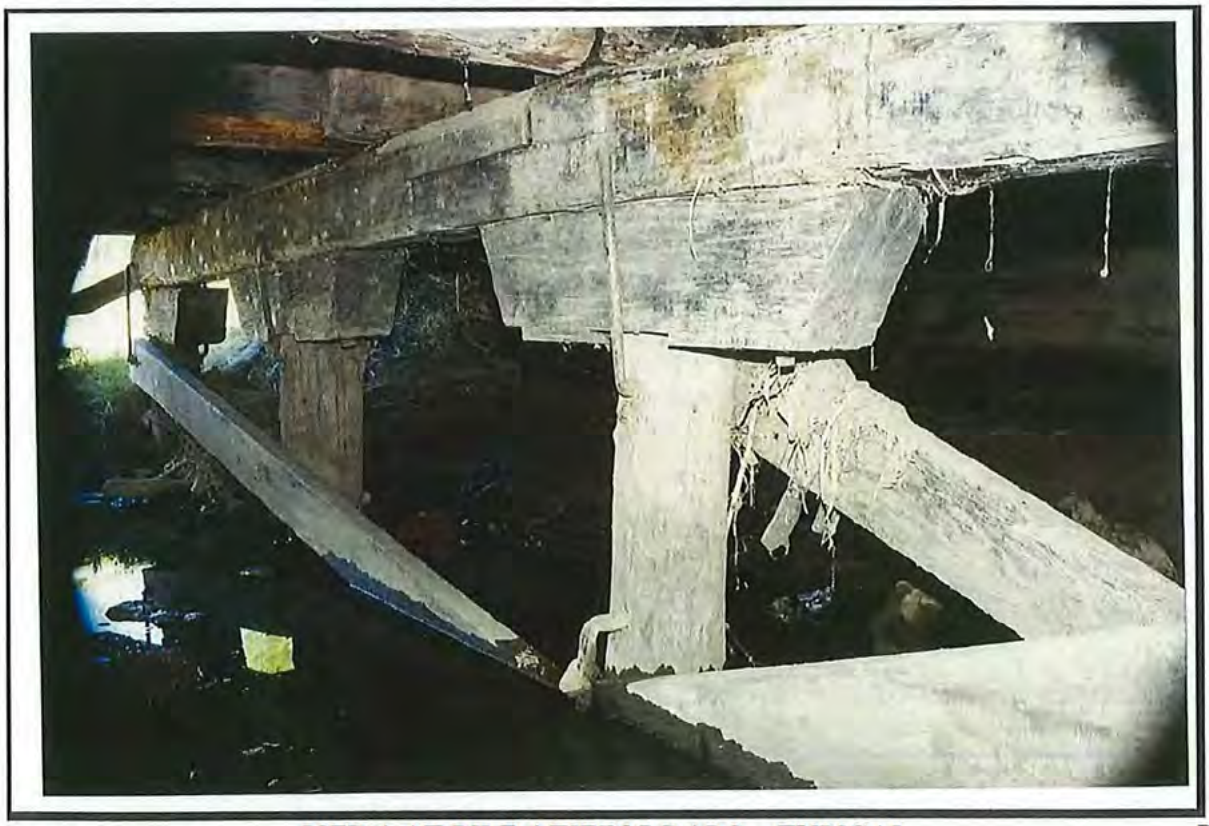
Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

PIER 1 LEFT HAND SIDE END ABUTMENT 1 SIDE CONDITION

PIER 2 LEFT HAND SIDE END ABUTMENT 2 SIDE CONDITION OF CORBEL

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

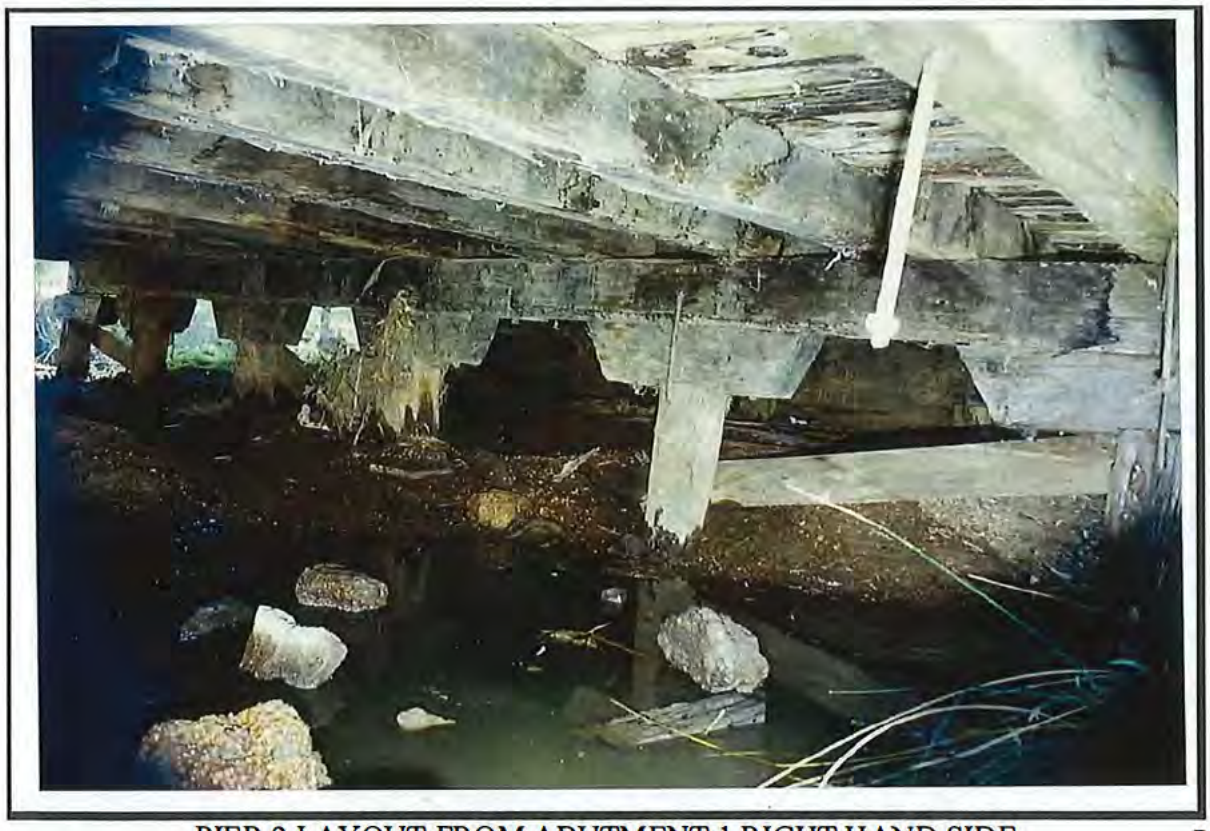
PIER 1 PILE 4 AT CORRECT HEIGHT



PIER 1 AT PILE 4 TIEING BARS – TYPICAL

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

PIER 2 RIGHT HAND SIDE END CONDITION – NB OVER LAPPING STRINGERS



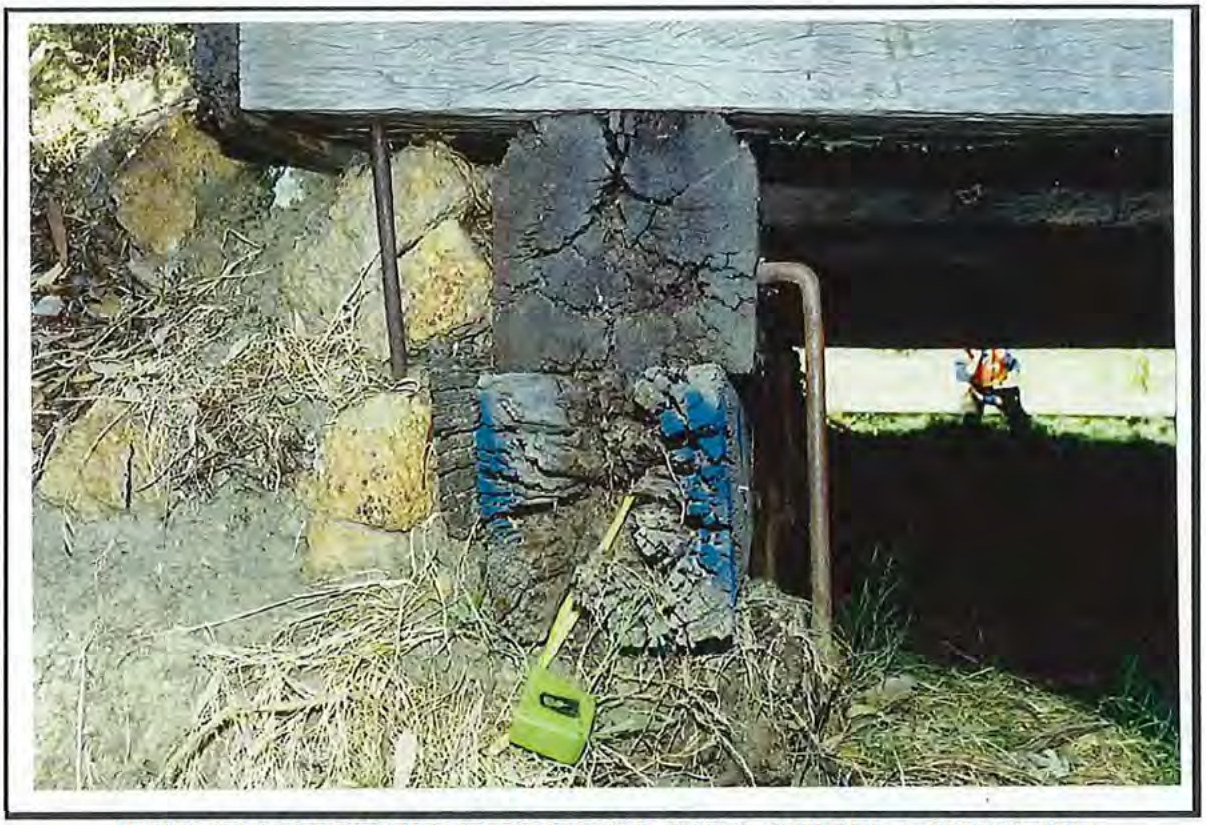
PIER 2 LAYOUT FROM ABUTMENT 1 RIGHT HAND SIDE

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

ABUTMENT 2 LEFT HAND SIDE LAYOUT FROM LEFT HAND SIDE ABUT 1

ABUTMENT 2 RIGHT HAND SIDE LAYOUT FROM RIGHT HAND SIDE ABUTMENT 1

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

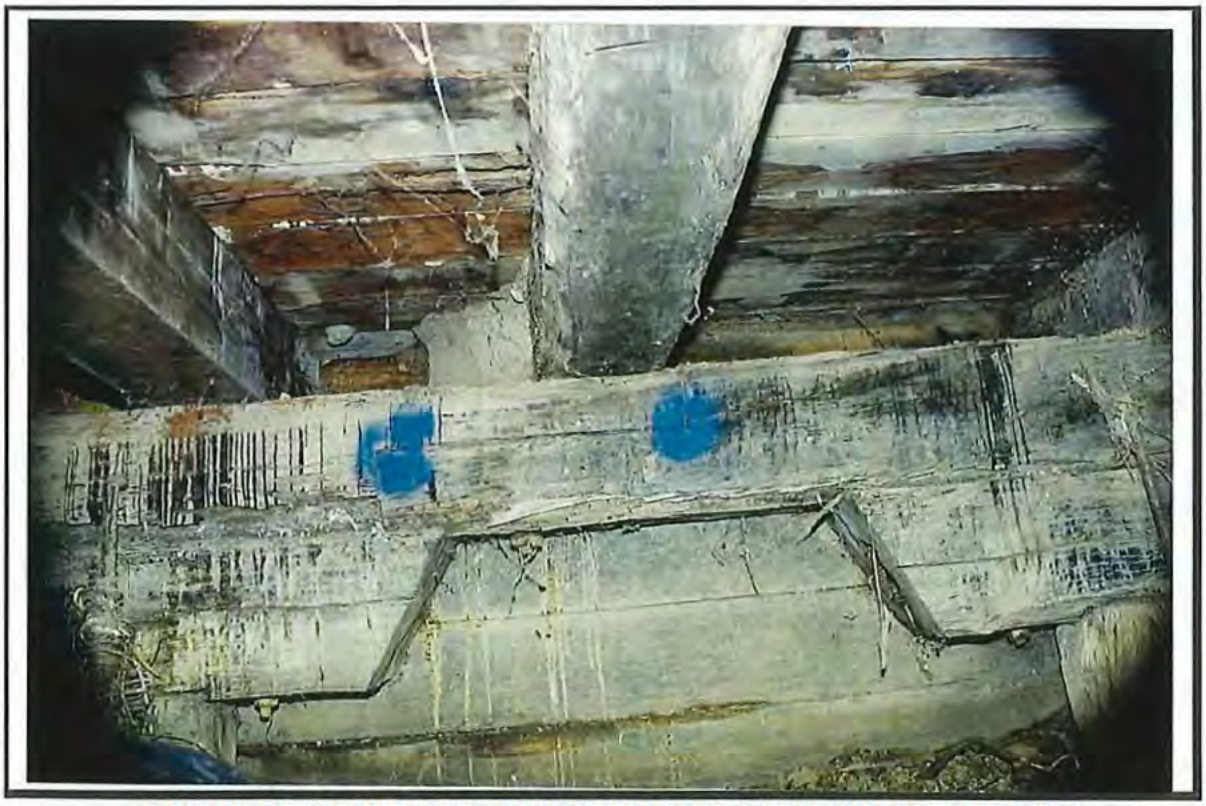


ABUTMENT 2 LEFT HAND SIDE FULL CAP & CORBEL 1 CONDITION

ABUTMENT 2 LEFT HAND SIDE FULL CAP & CORBEL 1 CONDITION Page 14

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

ABUTMENT 2 LEFT HAND SIDE FULL CAP & CORBEL FRONT VIEW – NB END OF BRACING TYPICAL



ABUTMENT 2 FULL CAP CONDITION BELOW STRINGERS 7, 8 & 9

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

ABUTMENT 2 RIGHT HAND SIDE END FULL CAP & CORBEL 6 CONDITION

SPAN 3 STRINGER 10 SHOWING LARGE PIPE AT BOTTOM ALMOST FULL LENGTH OF STRINGER

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

STRINGER OVERLAPS TYPICAL

MAJOR FAILURE IN ROAD SURFACE OVER STRINGER 5 ABUTMENT 1 END

Region:	**Wheatbelt South**	Bridge No:	**4629**	Date:	**29.3.01**
Road:	**Doney St**	Road No:	**0004**	SLK:	**0.03**
Over:	**Narrogin Brook**	Spans:	**3**	Height:	**1.400m**
LGA:	**Narrogin**	Inspector:	**P. Lewkowski**	Length:	**11.850**

STRINGER 5 SPAN 1 SPLIT & BROKEN

DECKING COLLAPSED AT STRINGER 5 ABUTMENT 1 END

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Main Roads WA
10 Year Bridge program

MAIN ROADS WA 10 YEAR BRIDGE PROGRAM

Bridge No.	Road Name	SLK	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	Inspection Date	Scope of Works
3122	Tarwonga Road	2.82			$0					$0					17-08-17	2020/21 - Preventative Maintenance - As per Shires schedule $8,150; Refer D18#627892
3122	Tarwonga Road	2.82							$1						17-08-17	2024/25 - Replace With Culvert - due in 2022. Only work required is Preventative Maintenance, to be done by the Shire. Then consider replacement at end of RCO life 2026/27; Waterways report Existing Bridge ARI 20 dry 50 wet; Option 1: single span 5m long Bridge ARI 10 dry 20 wet; Option 2: 3x 1500 dia pipe culvert ARI 10 dry 20 wet; Option 3: 3x1200x1200 box culvert ARI 10 dry 20 wet; [A J Humphreys - March 2019].
3125	Whimbin Rock Road	6.10	$0				$0								17-01-18	2018/19 - Preventative Maintenance - As per Shires schedule $14,560; Refer D18#627892. 2018/19 - Preventative Maintenance - As per Shires schedule $14,560; Refer D18#627892.
3125	Whimbin Rock Road	6.10		$0		$15,001									17-01-18	2019/20 - Substructure Repairs - Shire to undertaken: Timber sheeting repairs Abutment 1 between piles 3 and 5, 5 and 9 (two bottom sheets), 10 and 11, Abutment 2 between piles 2 and 3 (three bottom sheets), 3 and 4, 5 and 6 (two bottom sheets), 8 and 9, 9 and 10 (two top sheets); Stringer/half-cap packing between Span 3 stringers 1 and 6, Abutment 2 full-cap; Bolt tightening; Stringer bolting 2021/22 - Substructure Repairs - Pot Abutment 2 pile 10 and repalce span 3 stringer 3. [AJ Humphreys - Sept 2019] Span 3 stringer 7 AB2 end; Wing capping replacement all wingwalls; Spiking rail repairs. [AJ Humphreys - Sept 2019]
3128A	Manaring Road	3.58						$270,000							17-01-18	2023/24 - Replace With Culvert - 2x 2100 dia pipe culvert, Shire to design and construct, Refer D19#639389 for shires estimate.
3142	Havelock Street	0.61					$0					$0			25-11-14	2022/23 - Preventative Maintenance - As per Shires schedule $11,100; Refer D18#627892 2027/28 - Preventative Maintenance - As per Shires schedule $11,100; Refer D18#627892
3142	Havelock Street	0.61						$0							25-11-14	2023/24 - Replace With Culvert - Consider for Replacement. Town of Narrogin to Design n Construct. Waterways report Complete; Existing Bridge ARI 50 dry; Option 1: 7x1800x1800 box culvert ARI 50 dry; Option 2: 5x 1800 dia pipe culvert ARI 20 dry 50 wet; Option 3: 4x1800x1800 box culvert ARI 20 dry 50 wet; Option 4: single span 12m long Bridge ARI 20 dry 50 wet; Shire need to do Preventive Maintenance - for funding. [A J Humphreys - Feb 2018]

MAIN ROADS WA 10 YEAR BRIDGE PROGRAM

4551	Tarwonga Road	22.78		$0					$0						15-01-19	2019/20 - Preventative Maintenance - As per Shires schedule $27,990; Refer D18#627892 2024/25 - Preventative Maintenance - As per Shires schedule $27,990; Refer D18#627892
4551	Tarwonga Road	22.78				$0					$0				15-01-19	2021/22 - Substructure Repairs - Consider repairs to Pier 3 halfcap, Abutment 2 halfcap between piles 7 and 8; Settlement at Piers 1 and 2; Pier 3 pile 4 pot extension. Remove Prop at Abutment 2 stringer 1 not required, prop installed 2005 -repairs undertaken 2008. [AJ Humphreys Sept 2019] 2026/27 - No work – await next L2 Inspection - due in 2024. [A J Humphreys - Sept 2019]
4629	Former Station Access - Was Doney Street	0.04				$0					$0				29-03-01	2021/22 - Preventative Maintenance - Footbridge - As per Shires schedule $11,080; Refer D18#627892 2026/27 - Preventative Maintenance - Footbridge - As per Shires schedule $11,080; Refer D18#627892
9250	Northam Cranbrook	167.89					$0					$0			08-02-13	2022/23 - Preventative Maintenance - Footbridge - As per Shires schedule $18,100; Refer D18#627892 2027/28 - Preventative Maintenance - Footbridge - As per Shires schedule $18,100; Refer
9250	Northam Cranbrook	167.89								$0					08-02-13	2025/26 - Substructure Repairs - Corrosion protection a bearing repairs, or await next DIR due in 2027 or until bridge recieve preventative maintenance. [AJ Humphreys - Nov 2018]
		Totals($)	$0	$0	$0	$15,001	$0	$270,000	$1	$0	$0	$0	$0	$0		

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Shire of Narrogin
Annual L1 Bridge Inspections 2020

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT

(Level 1 Inspection)

Bridge Number:	3125	**Crossing Name:**	
Road Name:	WHIMBLD ROCK	**Road Number:**	
SLK:		**Local Authority:**	SHIRE OF NARROGIN
Responsibility Area:		**Latitude:**	
Inspected By:	CRD CURRI	**Longitude:**	
Inspection Date:	30-04-2020		

Have structural issues been found that require further investigation? (Y/N) N

Inspection Item	Defect Yes	Defect No	Comments *(Including location and extent)*	Maint. Required
1. Road Surface Signs and Delineators: missing, damaged, obscured Road Surface and Footpaths: material defects, surfacing defects, settlement, depressions, joint transitions, kerbing, shoulders	☑	☐	NEW WIDTH MARKERS NEED TO BE ON POSTS AND REALIGNING. ROAD SURFACE NEEDS PREMIXING EITHER END	☐
2. Guardrails/Barriers Accident damage, connections, alignment, material defects	☐	☑		☐
3. Road Drainage Scuppers, drains, gully traps, erosion	☐	☑		☐
4. Waterways, Vegetation and Debris Vegetation and debris in waterways and clearance envelope Embankment erosion, scour, damaged guide-banks	☐	☑		☐
5. Footpaths Drainage, even surface, surface condition, railing	☐	☐	NOT APPLICABLE	☐
6. Expansion Joints and Deck Joints Loose/damaged fixings, damaged/missing seals, damage to deck/nosings, obstructions in gap, gaps closed, decks in contact/damaged	☐	☐	NOT APPLICABLE	☐
7. Bearings Bearings displaced or damaged, seating, corrosion, seized	☐	☑		☐
8. Superstructure Material defects or damage to beams/stringers, fasteners, soffit, cross bracing or coatings Debris/dirt build-up, impact damage, excessive movement/vibration, dampness through deck, condition of air release holes	☐	☑		☐
9. Substructure Material defects to piles, footings, walls or capbeams Movement of abutment or wing walls Substructure protection (bridges over road/rail)	☑	☑	WING CAPPING NEEDS REPLACING ON ALL FOUR CORNERS OF BRIDGE	☐

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT
(Level 1 Inspection)

Defect Descriptions

Material	Defect Descriptions
Concrete	Cracking (hairline: ≤0.1mm) (fine: >0.1 & ≤0.3mm) (medium: >0.3mm & ≤0.7mm) (heavy: >0.7mm), spalling, corrosion of reinforcement, rust staining, efflorescence
Steel	Bending, buckling, cracking, distortion, corrosion, protective coating damage/deterioration, loose fasteners
Timber	Splitting, crushing, rot, failure, termites/termite nest
Masonry	Cracking, opening of joints, mortar loss, bulging
Bituminous Surfacing	Cracking, crazing, breaking up, heaving, shoving, rutting
Protective Coating	Cracked, weathered, peeling, flaking, oxidising

General Comments

BRIDGE IS A THREE SPAN BRIDGE.

CONCRETE OVERLAY, STEEL POSTS AND RAILING, WOOD ABUTMENTS, WOOD PIERS, TIMBER DECKING.

PREVENTITIVE MAINTENANCE CARRIED OUT BY C&D CURRI IN FEBRUARY 2019

SHEETING REPAIRS CARRIED OUT BY C&D CURRI IN APRIL 2020.

WORK NEEDED:

APPROACHES TO BRIDGE BOTH ENDS NEED PREMIXING.

NEW WIDTH MARKERS NEED REPLACING AND PUT ON POSTS.

NEW WIRE CAPPING NEEDED ON ALL FOUR CORNERS.

(3)

Ancillary Items (such as service attachments etc.)

This bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Bridge Inspection Manual for Level 1 Inspections.

Signature: _____ **Position:** Maintenance Foreman **Date:** 30-04-2020

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT

(Level 1 Inspection)

Bridge Number:	4551	**Crossing Name:**	
Road Name:	NARROGIN	**Road Number:**	
SLK:		**Local Authority:**	SHIRE OF NARROGIN
Responsibility Area:		**Latitude:**	
Inspected By:	C&D WRI	**Longitude:**	
Inspection Date:	30-04-2020		

Have structural issues been found that require further investigation? (Y/N) N

Inspection Item	Defect Yes	Defect No	Comments *(Including location and extent)*	Maint. Required
1. Road Surface Signs and Delineators: missing, damaged, obscured Road Surface and Footpaths: material defects, surfacing defects, settlement, depressions, joint transitions, kerbing, shoulders	☐	☑		☐
2. Guardrails/Barriers Accident damage, connections, alignment, material defects	☐	☑		☐
3. Road Drainage Scuppers, drains, gully traps, erosion	☐	☑		☐
4. Waterways, Vegetation and Debris Vegetation and debris in waterways and clearance envelope Embankment erosion, scour, damaged guide-banks	☑	☐	SCOURING AROUND BOTTOM OF PILE 4 ON PIER 3. (NEEDS ROCKING)	☐
5. Footpaths Drainage, even surface, surface condition, railing	☐	☐	NOT APPLICABLE	☐
6. Expansion Joints and Deck Joints Loose/damaged fixings, damaged/missing seals, damage to deck/nosings, obstructions in gap, gaps closed, decks in contact/damaged	☐	☐	NOT APPLICABLE	☐
7. Bearings Bearings displaced or damaged, seating, corrosion, seized	☐	☑		☐
8. Superstructure Material defects or damage to beams/stringers, fasteners, soffit, cross bracing or coatings Debris/dirt build-up, impact damage, excessive movement/vibration, dampness through deck, condition of air release holes	☐	☑		☐
9. Substructure Material defects to piles, footings, walls or capbeams Movement of abutment or wing walls Substructure protection (bridges over road/rail)	☐	☑		☐

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT
(Level 1 Inspection)

Defect Descriptions

Material	Defect Descriptions
Concrete	Cracking (hairline: ≤0.1mm) (fine: >0.1 & ≤0.3mm) (medium: >0.3mm & ≤0.7mm) (heavy: >0.7mm), spalling, corrosion of reinforcement, rust staining, efflorescence
Steel	Bending, buckling, cracking, distortion, corrosion, protective coating damage/deterioration, loose fasteners
Timber	Splitting, crushing, rot, failure, termites/termite nest
Masonry	Cracking, opening of joints, mortar loss, bulging
Bituminous Surfacing	Cracking, crazing, breaking up, heaving, shoving, rutting
Protective Coating	Cracked, weathered, peeling, flaking, oxidising

General Comments

BRIDGE IS A FOUR SPAN BRIDGE.

CONCRETE OVERLAY. STEEL POSTS AND RAILING.

TIMBER ABUTMENTS. TIMBER PIERS. TIMBER HEADSTOCKS, STRINGERS, DECKING AND CORBELS.

PREVENTITIVE MAINTENANCE CARRIED OUT BY CLD CREW IN FEBRUARY 2020.

SCOURING AROUND BOTTOM OF PILE 4 ON PIER 3. (NEEDS RACKING)

(1)

Ancillary Items (such as service attachments etc.)

This bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Bridge Inspection Manual for Level 1 Inspections.

Signature: _____ **Position:** Maintenance Foreman **Date:** 30-04-2020

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT

(Level 1 Inspection)

Bridge Number:	3122	**Crossing Name:**	
Road Name:	NARROGIN	**Road Number:**	
SLK:		**Local Authority:**	SHIRE OF NARROGIN
Responsibility Area:		**Latitude:**	
Inspected By:	C&D CONSULTANTS	**Longitude:**	
Inspection Date:	30-04-2020		

Have structural issues been found that require further investigation? (Y/N) ☑ N

Inspection Item	Defect Yes	Defect No	Comments *(Including location and extent)*	Maint. Required
1. Road Surface Signs and Delineators: missing, damaged, obscured Road Surface and Footpaths: material defects, surfacing defects, settlement, depressions, joint transitions, kerbing, shoulders	☐	☑		☐
2. Guardrails/Barriers Accident damage, connections, alignment, material defects	☐	☑		☐
3. Road Drainage Scuppers, drains, gully traps, erosion	☐	☑		☐
4. Waterways, Vegetation and Debris Vegetation and debris in waterways and clearance envelope Embankment erosion, scour, damaged guide-banks	☐	☐		☐
5. Footpaths Drainage, even surface, surface condition, railing	☐	☐	NOT APPLICABLE -	☐
6. Expansion Joints and Deck Joints Loose/damaged fixings, damaged/missing seals, damage to deck/nosings, obstructions in gap, gaps closed, decks in contact/damaged	☐	☐	NOT APPLICABLE	☐
7. Bearings Bearings displaced or damaged, seating, corrosion, seized	☐	☑		☐
8. Superstructure Material defects or damage to beams/stringers, fasteners, soffit, cross bracing or coatings Debris/dirt build-up, impact damage, excessive movement/vibration, dampness through deck, condition of air release holes	☑	☐	CABLE N°8 HOLLOW THROUGH MIDDLE (NEEDS BOLTING)	☐
9. Substructure Material defects to piles, footings, walls or capbeams Movement of abutment or wing walls Substructure protection (bridges over road/rail)	☑	☐	CRACK IN MASONARY WALL OF PIER. ABUTMENT WALLS AND PIER NEED RENDERING.	☐

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT
(Level 1 Inspection)

Defect Descriptions

Material	Defect Descriptions
Concrete	Cracking (hairline: ≤0.1mm) (fine: >0.1 & ≤0.3mm) (medium: >0.3mm & ≤0.7mm) (heavy: >0.7mm), spalling, corrosion of reinforcement, rust staining, efflorescence
Steel	Bending, buckling, cracking, distortion, corrosion, protective coating damage/deterioration, loose fasteners
Timber	Splitting, crushing, rot, failure, termites/termite nest
Masonry	Cracking, opening of joints, mortar loss, bulging
Bituminous Surfacing	Cracking, crazing, breaking up, heaving, shoving, rutting
Protective Coating	Cracked, weathered, peeling, flaking, oxidising

General Comments

BRIDGE IS A TWO SPAN BRIDGE.

CONCRETE OVERLAY, STEEL POSTS AND RAILING, MASONARY ABUTMENTS, MASONARY PIER, TIMBER STRINGERS AND CORBELS.

PREVENTITIVE MAINTENANCE NEEDED:

FUNGICIDE TREATMENT TO OUTSIDE STRINGERS.
FUNGICIDE TREATMENT TO BED LOGS.
END GRAIN TREATMENT
BOLT TIGHTENING.
CORBEL NEEDS BOLTING.
ABUTMENT AND PIER WALLS NEED RENDERING.

(3)

Ancillary Items (such as service attachments etc.)

This bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Bridge Inspection Manual for Level 1 Inspections.

Signature: _____ **Position:** Maintenance Foreman **Date:** 30-04-2020

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT
(Level 1 Inspection)

Bridge Number:	3128 A	**Crossing Name:**	
Road Name:	MANARING	**Road Number:**	
SLK:		**Local Authority:**	SHIRE OF NARROGIN
Responsibility Area:		**Latitude:**	
Inspected By:	C & D CURL	**Longitude:**	
Inspection Date:	30-04-2020		

Have structural issues been found that require further investigation? (Y/N) [N]

Inspection Item	Defect Yes	Defect No	Comments *(Including location and extent)*	Maint. Required
1. Road Surface Signs and Delineators: missing, damaged, obscured Road Surface and Footpaths: material defects, surfacing defects, settlement, depressions, joint transitions, kerbing, shoulders	☐	☑		☐
2. Guardrails/Barriers Accident damage, connections, alignment, material defects	☑	☐	REPLACE FISHTAILS WITH BULLNOSES.	☐
3. Road Drainage Scuppers, drains, gully traps, erosion	☐	☑		☐
4. Waterways, Vegetation and Debris Vegetation and debris in waterways and clearance envelope Embankment erosion, scour, damaged guide-banks	☑	☑	SCOURING UNDER BRIDGE IN SPAN 1	☐
5. Footpaths Drainage, even surface, surface condition, railing	☐	☐	NOT APPLICABLE	☐
6. Expansion Joints and Deck Joints Loose/damaged fixings, damaged/missing seals, damage to deck/nosings, obstructions in gap, gaps closed, decks in contact/damaged	☐	☐	NOT APPLICABLE	☐
7. Bearings Bearings displaced or damaged, seating, corrosion, seized	☐	☑		☐
8. Superstructure Material defects or damage to beams/stringers, fasteners, soffit, cross bracing or coatings Debris/dirt build-up, impact damage, excessive movement/vibration, dampness through deck, condition of air release holes	☐	☑		☐
9. Substructure Material defects to piles, footings, walls or capbeams Movement of abutment or wing walls Substructure protection (bridges over road/rail)	☑	☐	ABUTMENT 2 RIGHT HAND SIDE. PIECE OF WING CAPPING NEEDS REPLACING.	☐

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT
(Level 1 Inspection)

Defect Descriptions

Material	Defect Descriptions
Concrete	Cracking (hairline: ≤0.1mm) (fine: >0.1 & ≤0.3mm) (medium: >0.3mm & ≤0.7mm) (heavy: >0.7mm), spalling, corrosion of reinforcement, rust staining, efflorescence
Steel	Bending, buckling, cracking, distortion, corrosion, protective coating damage/deterioration, loose fasteners
Timber	Splitting, crushing, rot, failure, termites/termite nest
Masonry	Cracking, opening of joints, mortar loss, bulging
Bituminous Surfacing	Cracking, crazing, breaking up, heaving, shoving, rutting
Protective Coating	Cracked, weathered, peeling, flaking, oxidising

General Comments

BRIDGE IS A TWO SPAN BRIDGE.
WOOD POSTS, STEEL ROLLING.
TIMBER ABUTMENTS (ABUTMENT 1 PILES DRIVEN)
(ABUTMENT 2 PILES SITTING ON BEDLOGS / MASONARY FOOTING)
(PIER PILES SITTING ON BEDLOGS / MASONARY FOOTING)
TIMBER STRINGERS & DECKING AND CORBELS. (NO OVERLAY)

PREVENTITIVE MAINTENANCE NEEDED.
FUNGICIDE TREATMENT TO PILES.
FUNGICIDE TREATMENT TO BEDLOGS
FUNGICIDE TREATMENT TO OUTSIDE STRINGERS.
END GRAIN TREATMENT.
BOLT TIGHTENING

(2)

Ancillary Items (such as service attachments etc.)

This bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Bridge Inspection Manual for Level 1 Inspections.

Signature: _____ **Position:** Maintenance Foreman **Date:** 30-04-2020

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT

(Level 1 Inspection)

Bridge Number:	3142	**Crossing Name:**	
Road Name:	HAVELOCK STREET	**Road Number:**	
SLK:		**Local Authority:**	SHIRE OF NARROGIN
Responsibility Area:		**Latitude:**	
Inspected By:	C.J.D WITH	**Longitude:**	
Inspection Date:	30-04-2020		

Have structural issues been found that require further investigation? (Y/N) N

Inspection Item	Defect Yes	Defect No	Comments *(Including location and extent)*	Maint. Required
1. Road Surface Signs and Delineators: missing, damaged, obscured Road Surface and Footpaths: material defects, surfacing defects, settlement, depressions, joint transitions, kerbing, shoulders	☐	☑		☐
2. Guardrails/Barriers Accident damage, connections, alignment, material defects	☑	☐	REPLACE FISHTAILS WITH BULLNOSES (TWO WEED POSTS NEEDED)	☐
3. Road Drainage Scuppers, drains, gully traps, erosion	☐	☑		☐
4. Waterways, Vegetation and Debris Vegetation and debris in waterways and clearance envelope Embankment erosion, scour, damaged guide-banks	☐	☑		☐
5. Footpaths Drainage, even surface, surface condition, railing	☐	☐	NOT APPLICABLE	☐
6. Expansion Joints and Deck Joints Loose/damaged fixings, damaged/missing seals, damage to deck/nosings, obstructions in gap, gaps closed, decks in contact/damaged	☐	☐	NOT APPLICABLE.	☐
7. Bearings Bearings displaced or damaged, seating, corrosion, seized	☐	☑		☐
8. Superstructure Material defects or damage to beams/stringers, fasteners, soffit, cross bracing or coatings Debris/dirt build-up, impact damage, excessive movement/vibration, dampness through deck, condition of air release holes	☐	☑		☐
9. Substructure Material defects to piles, footings, walls or capbeams Movement of abutment or wing walls Substructure protection (bridges over road/rail)	☑	☐	ABUTMENT WALLS NEED RENDERING.	☐

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT
(Level 1 Inspection)

Defect Descriptions

Material	Defect Descriptions
Concrete	Cracking (hairline: ≤0.1mm) (fine: >0.1 & ≤0.3mm) (medium: >0.3mm & ≤0.7mm) (heavy: >0.7mm), spalling, corrosion of reinforcement, rust staining, efflorescence
Steel	Bending, buckling, cracking, distortion, corrosion, protective coating damage/deterioration, loose fasteners
Timber	Splitting, crushing, rot, failure, termites/termite nest
Masonry	Cracking, opening of joints, mortar loss, bulging
Bituminous Surfacing	Cracking, crazing, breaking up, heaving, shoving, rutting
Protective Coating	Cracked, weathered, peeling, flaking, oxidising

General Comments

BRIDGE IS A TWO SPAN BRIDGE -

MASONARY ABUTMENTS AND WINGS - MASONARY PIER .
CONCRETE TOP .. TIMBER DECKING - WOOD STRINGERS - WOOD POSTS AND STEEL RAILING

PREVENTITIVE MAITENANCE NEEDED -
FUNGICIDE TREATMENT TO SILL BEAMS AND OUTSIDE STRINGERS .
END GRAIN TREATMENT .
BOLT TIGHTENING -
REPLACE FISHTAILS WITH BULLNOSES .
ABUTMENT WALLS NEED RENDERING .
TWO NEW WOOD POSTS .

(3)

Ancillary Items (such as service attachments etc.)

This bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Bridge Inspection Manual for Level 1 Inspections.

Signature: _____ **Position:** Maintenance Foreman **Date:** 30-04-2020

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT

(Level 1 Inspection)

Bridge Number:	4629	**Crossing Name:**	
Road Name:	DOWEL STREET	**Road Number:**	
SLK:		**Local Authority:**	SHIRE OF NARROGIN
Responsibility Area:		**Latitude:**	
Inspected By:	C & D CURRI	**Longitude:**	
Inspection Date:	30-04-2020		

Have structural issues been found that require further investigation? (Y/N) N

Inspection Item	Defect Yes	Defect No	Comments *(Including location and extent)*	Maint. Required
1. Road Surface Signs and Delineators: missing, damaged, obscured Road Surface and Footpaths: material defects, surfacing defects, settlement, depressions, joint transitions, kerbing, shoulders	☐	☑		☐
2. Guardrails/Barriers Accident damage, connections, alignment, material defects	☑	☐	TERMITE DAMAGE TO ONE POST AND RAIL WOOD POSTS NEED TIGHTENING.	☐
3. Road Drainage Scuppers, drains, gully traps, erosion	☐	☑		☐
4. Waterways, Vegetation and Debris Vegetation and debris in waterways and clearance envelope Embankment erosion, scour, damaged guide-banks	☑	☐	BULLRUSHES CLOGGING CREEK.	☐
5. Footpaths Drainage, even surface, surface condition, railing	☐	☑		☐
6. Expansion Joints and Deck Joints Loose/damaged fixings, damaged/missing seals, damage to deck/nosings, obstructions in gap, gaps closed, decks in contact/damaged	☐	☑	NOT APPLICABLE.	☐
7. Bearings Bearings displaced or damaged, seating, corrosion, seized	☐	☑		☐
8. Superstructure Material defects or damage to beams/stringers, fasteners, soffit, cross bracing or coatings Debris/dirt build-up, impact damage, excessive movement/vibration, dampness through deck, condition of air release holes	☐	☑		☐
9. Substructure Material defects to piles, footings, walls or capbeams Movement of abutment or wing walls Substructure protection (bridges over road/rail)	☐	☑		☐

TIMBER AND NON-TIMBER BRIDGE ROUTINE VISUAL INSPECTION REPORT
(Level 1 Inspection)

Defect Descriptions

Material	Defect Descriptions
Concrete	Cracking (hairline: ≤0.1mm) (fine: >0.1 & ≤0.3mm) (medium: >0.3mm & ≤0.7mm) (heavy: >0.7mm), spalling, corrosion of reinforcement, rust staining, efflorescence
Steel	Bending, buckling, cracking, distortion, corrosion, protective coating damage/deterioration, loose fasteners
Timber	Splitting, crushing, rot, failure, termites/termite nest
Masonry	Cracking, opening of joints, mortar loss, bulging
Bituminous Surfacing	Cracking, crazing, breaking up, heaving, shoving, rutting
Protective Coating	Cracked, weathered, peeling, flaking, oxidising

General Comments

BRIDGE IS A THREE SPAN BRIDGE.

CONCRETE TOP, STEEL STRINGERS, WOOD PIERS AND PILES,
ONE CONCRETE ABUTMENT, ONE WOOD ABUTMENT, WOOD POSTS AND RAILING.

PREVENTITIVE MAINTENANCE NEEDED:
FUNGICIDE TREATMENT TO TWELVE PILES.
END GRAIN TREATMENT.
TIGHTEN WOOD POSTS.
FIX TERMITE DAMAGE.

(4)

Ancillary Items (such as service attachments etc.)

This bridge has been inspected in accordance with the requirements of the Main Roads Western Australia Bridge Inspection Manual for Level 1 Inspections.

Signature: _____ **Position:** Maintenance Foreman **Date:** 30-04-2020.

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Shire of Narrogin Annual Bridge Routine Maintenance Checklist Template

Shire of Narrogin Annual Bridge Routine Maintenance Checklist Template

Bridge No: _____

Frequency	Elements	Activities	Completed ✓
Annual Routine Maintenance	Inspections	Annual Visual Inspections	
	Drainage - Deck	Clean deck gully drains / scuppers / down pipes	
	Drainage -	Clean, repair drainage systems inside abutments	
	Guard railing	Clean / repaint	
		Repair accident damage	
		Install / Replace delineators	
		Replace broken bolts, tighten loose bolts	
	Expansion Joints / Deck Joints	Clean seals	
		Replace broken bolts, tighten loose bolts	
	Bearings	Clean bearings	
	Approaches	Level pavements	
		Lines	
		Kerbs	
	Signs	Width markers, Signs	
	Deck	Clean fascia panels, repair / replace damaged removable	
	Other	Remove debris & vegetation from roadway, waterway, under	
		Remove Graffiti	
		Clean plaques	
		Maintain landscaping / artwork	
		Minor Scour repairs	
		Maintain access doors & security / locks	
		Remove fences attached to bridges	
		Termates Eradicate	
		Maintain Footpaths	

Shire of Narrogin Five Year Bridge Preventative Maintenance Checklist Template

Shire of Narrogin Five Year Bridge Preventative Maintenance Checklist Template

Preventative Maintenance for Bridge No: _____

Description of Works		Specification 850	Y/N
1	Superstructure		
1.01	Seal all exposed timber decking end grain	850.93.01	
1.02	Reseal all exposed timber decking end grain	850.93.01	
1.03	Guardrail maintenance - timber	850.93.11	
	Replace fishtails with bullnoses		
1.04	Deck drainage	850.93.07	
1.05	Removal of deck vegetation	Table 850.1	
1.06	Regulatory and warning signs	Table 850.1	
1.07	Treatment of decking planks - top surface	850.41.07	
1.08	Treatment (fungicide) of gravel pavement	Table 850.1	
1.09	Fungicide treatment of timber stringers - spiral grain	850.93.03	
1.10	Fungicide treatment of outside timber stringers	850.93.02,03	
1.11	Fungicide treatment of ends of wandoo stringers (end spans only)	Table 850.1	
1.12	Stringer / corbel bolting and repair splits	850.29,30	
2	Substructure		
2.01	Seal all exposed timber end grain	850.93.01	
	Abutment / wingwall piles	850.93.01	
	Abutment sheeting	850.93.01	
	Halfcaps	850.93.01,06	
	Fullcaps	850.93.01,06	
	Braces	850.36 and 93.01	
	Walers	850.36 and 93.01	
2.02	Reseal all exposed timber end grain	850.93.01	
	Abutment / wingwall piles	850.93.01	
	Abutment sheeting	850.93.01	
	Halfcaps	850.93.01,06	
	Fullcaps	850.93.01,06	
	Braces	850.36 and 93.01	
	Walers	850.36 and 93.01	
2.03	Tighten all existing bolts and fasteners	850.35	
2.04	Tighten all existing bolts and fasteners within 1.5m of ground line	850.34	
2.05	Fungicide treatment of timber piles at ground line	850.93.04	
2.06	Fungicide treatment of timber piles in permanent water	850.93.04	
2.07	Fungicide treatment of bedlogs and bearers (in contact with ground)	850.93.05	
2.08	Fungicide treatment of timber bearers, pier bedlogs (off ground)	850.93.05	
2.09	Pile banding and repair splits	850.28	
2.10	Vegetation and debris clearance under bridge	850.93.08	
2.11	Marine organism protection	Table 850.1	
3	Specific Works		
3.01	Repair gaps in the abutment / wingwall sheeting - pgi strips		
3.02	Repair rotten abutment / wingwall sheeting - new timber sheet.		
3.03	Scour repairs		
3.04	Reinstall wingwall capping		
3.05	Remove old bolts - dangerous		
3.06	Remove fences off bridge or guardrailing		
3.07	Packing of Halfcaps		
3.08	Packing of Stringers and Corbels		
3.09	Render Masonary Abutments and or Pier walls		

Routine Maintenance - Typically 1 year interval
Perodic Maintenance - Typically 5 year interval
Specific Works - As required
Specification 850 is located on the Main Roads Western Australia website. //www.mainroads.wa.gov.au/